

OIL and GAS of kazakhstan

30 Years of Independence Path to Creation





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KAZENERGY Association is pleased to introduce this unique book project – "Oil and Gas of Kazakhstan. 30 Years of Independence. The Path to Creation". It recounts the results of the development of Kazakhstan's oil and gas industry over the three decades since the country gained its independence. This is a special edition which recounts the facts and events which took place in the Republic during those years of independence. It tells of the complex developmental path of the oil and gas industry, of the people, who helped to achieve impressive growth in oil and gas exploration, production, transportation and processing. We hope that this book will become a guide to the history of the country's oil and gas industry.

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Content



DEAR OIL AND GAS INDUSTRY WORKERS AND VETERANS!

This year Kazakhstan is celebrating the 30th anniversary of its independence. Throughout all these years, the oil and gas industry has been and remains an important sector of our country's economy.

The major foreign investors in the landmark oil and gas projects of Tengiz, Kashagan and Karachaganak at the dawn of independence have all demonstrated the international community's confidence in Kazakhstan and are an important signal for Western companies to invest in other sectors of the young country's economy.

In order to improve the investment attractiveness of the oil and gas sector, legislative reforms have been introduced to encourage subsoil users to introduce new technologies to ensure the country's energy and environmental security.

Today, the domestic oil and gas industry is an integral part of the world's fossil fuel resources extraction and processing industry. The country has an extensive network of oil and gas pipelines, supplying exports of Kazakhstan's energy resources to world markets.

In terms of hydrocarbon reserves, Kazakhstan is one of the largest producers. Over the years since independence, crude oil production in the country has more than tripled, and natural gas production has increased sevenfold since 1991. Major modernization of oil refineries has been achieved. Offshore geological exploration, oil and gas chemistry and carbon chemistry are being systematically developed. As a result, the country's dependence on imports has been reduced and the needs of the domestic market are satisfied with domestic petroleum products.

The national budget and National Fund revenues from tax payments from the oil and gas industry provide a reliable financial cushion during crises in the global economy.

All these and many other achievements did not happen spontaneously.

The achievements of this sector are backed up by many years of hard work by the managers and specialists of the oil and gas industry. They are the real patriots of Kazakhstan who have worked selflessly over all these years for the good of the industry and the country.

They have been involved in complicated international negotiations, taken courageous, unconventional and responsible decisions, drafted legislative reforms, designed and developed, constructed and drilled, and carried out difficult but very necessary work for the country – each in their own place.

I am sincerely grateful to the people who have worked for many years to build the new Kazakhstan and the foundations for the economic and social well-being of our country.

The world does not stand still, and today our economy and its oil and gas sector are facing new environmental, energy, technological and other challenges.

I am sure that the domestic oil and gas industry will continue its sustainable development, considering the interests of the present and future generation of the people of Kazakhstan.

Nursultan NAZARBAYEV,

The First President of the Republic of Kazakhstan -Elbasy



OIL AND GAS OF KAZAKHSTAN 30 YEARS OF INDEPENDENCE PATH TO CREATION



PROLOGUE

"ONLY THAT NATION WHICH DOES NOT REST ON ITS LAURELS AND LOOKS AHEAD TO THE FUTURE CAN SHOW THE WORLD ITS ACHIEVEMENTS."

Kassym-Jomart TOKAYEV, President of the Republic of Kazakhstan

he oil and gas industry of Kazakhstan has a rich history. It did not begin during the Soviet era when the industry was actively developed, nor after the country gained independence as many people used to think. It actually began several centuries ago during early explorations of this land of plenty. The first information about the presence of oil on the territory of the present Atyrau region was recorded in 1717 by the Kabardian Prince Alexander Bekovich-Cherkassky. He was a prominent political and military figure and the first hydrographer of the Caspian Sea. The discovery was made during a militarytopographic expedition to Khiva via the lower course of the Emba River organized under the decree of Peter I. In the middle of the XIX century, when Kazakhstan as a part of the Great Silk Road became a focal center for merchants, scientists, and ethnographers from all over the world, researchers noted that these vast boundless spaces

in the heart of Asia could be rich in hydrocarbons. In 1846, the first signs of oil were discovered on the Mangystau peninsula. Then in 1899, the first productive oil flow started at the Karashungul field in the Guryev (now Atyrau) region. This date is officially considered the beginning of oil development in Kazakhstan.

At the beginning of the XX century, the entire world began to talk about oil in Kazakhstan. Major Western magnates expressed interest in the abundant hydrocarbon treasures of the Kazakh Caspian Sea. The discovery of the Dossor field in 1911 and the Makat field in 1915 in the Guryev region put Kazakhstan on a par with the world's major oil and gas provinces.

As the energy in the reservoirs decreased, the free-flow production method of oil extraction was soon replaced by bailingup (pumping oil out of a recess with a cylindrical container). Then in the second half of the 1920s, oil was extracted by means of



deep-oil pumps and compressors. The more advanced rotary drilling method was then introduced. This contributed to the development of drilling operations, an increase in the depth of wells and in the scope of work on the exploration of oil deposits. In 1932, Emba oilmen were the first not only in the USSR, but also in Europe, to develop ultra-deep (for that time) drilling at Dossor and Makat fields. They achieved depths of up to 2,500 – 2,800 meters, a significant breakthrough in the development of oil and gas industry in Kazakhstan. The construction of the Caspian-Orsk pipeline in 1935 provided 65% of Emba oil production delivery to the Orsk refinery.

The oil and gas industry in Kazakhstan received another major boost during the war and post-war years, which were a period of severe hardship for the entire country. Thanks to the dedicated work of Kazakhstani oilmen who supplied the army with high-quality fuel, and despite the difficulties, production at Emba increased by 39%. The Kulsary, Sagiz, Zholdybai, Komsomolskoye, and Koshkar fields were put into operation. The Komsomolsk-Makat and Koshkar-Sagiz oil pipelines, the steam turbine power plant at Kamyskul and the Guryev oil refinery (now the Atyrau Refinery) were built.

While in 1940 the annual oil production in Kazakhstan was 750 thousand tons, and in 1941-1945 800 thousand tons per year

on average, by the end of the 1940s it had come close to 1 million tons per year.

The 1950s, marked by a period of active exploration, gave Kazakhstan new deposits in Terenozek, Tazhigali, Tyules and Karaarna. In the 1960s, the replacement of rotary drilling with more high-speed turbine drilling allowed oil companies to increase the fleet of drilling rigs with enhanced technology capable of developing the subsurface at a depth of up to 3,000 – 4,000 meters. In 1968, production at Emba alone reached 2 million tons. In 1979, the discovery of the Tengiz supergiant by the famous oilmen Zholdaskali Dosmukhambetov, Bulekbai Sagingaliyev, Bulat Elamanov, Asabai Khismetov, Kumar Balzhanov, Valentin Avrov, Makhash Balgimbayev, and Oryngazy Iskaziyev, as well as the Karachaganak giant by the geological expedition of the Uralskneftegazgeology Trust of the USSR Ministry of Geology, ensured Kazakhstan's special role in the development of world oil and gas history for many years to come.

Once seen as an economic miracle, oil and gas remain an important source of energy and a unique commodity that changes people's thinking and transforms the world. Oil and gas are not just fuel for transport, but also provide raw materials for clothes, plastic household items, furniture, dishes, computers, phones and tablets, children's toys, pharmaceuticals, hygiene products,

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cosmetics, fertilizers for agriculture and much more. Modern life is unthinkable without them. Despite the development of alternative energy sources, including renewables, and contrary to arguments about the depletion of oil and gas reserves in the earth's core, hydrocarbons will continue to be the primary fuel source for consumers around the world for many years to come. Affordable costs, availability, rapid development of innovative and even revolutionary technologies in exploration, production, processing, and transportation make them an important component of the energy balance.

The economic future of Kazakhstan is connected with the development of the oil and gas industry. Our country has significant proven hydrocarbon reserves - 3.3% of the world's total. Proven recoverable oil reserves amount to 3.9 billion tons (ranked 12th in the world), and gas reserves exceed 2.7 trillion cubic meters including new fields on the Kazakhstani shelf of the Caspian Sea, (ranked 14th).

Much of the country's hydrocarbon resources are concentrated in the west of the country, in the Atyrau, Mangystau, West Kazakhstan and Aktobe regions. More than 200 oil and gas fields have been discovered in Kazakhstan, including such giants as Tengiz with more than 1 billion tons of recoverable oil reserves. Karachaganak has estimated resources of 1.35 trillion cubic meters of gas and 1.2 billion tons of oil and gas condensate. Kashagan, which has become the world's largest discovery over the past 30-years, has total geological reserves of 38 billion barrels (about 4.8 billion tons) of fuel equivalent. Today, these three leviathans together provide more than half of the entire oil production of the Republic. Proven, as well as promising and forecast hydrocarbon resources are a reliable foundation for the further development of the oil and gas complex.

Since it became a sovereign state in 1991, ensuring national energy independence has been one of the priorities of Kazakhstan's

state policy. During the Soviet era, despite the seemingly unlimited treasures in its interior, Kazakhstan had never felt like a real owner of these riches. It was totally dependent on the Soviet center and faced unprecedented difficulties at the time of independence, such as galloping inflation and growing budget deficits leading to a sharp decline in production and a drop in living standards. Despite the availability of skilled personnel and significant hydrocarbon potential, the severance of industrial ties with the former USSR ministry, the lack of technology, machinery and equipment, investment capital, access to international markets through main oil pipelines, and modern and advanced management and experience in negotiating with foreign partners limited Kazakhstan's ability to compete successfully in the world market. There were pressing issues of paying wage arrears, environmental protection, and the development of oil and gas export pipelines. After the collapse of the USSR, these pipelines now passed through the territory of another country - Russia. Solutions were required for the problem of eliminating heavy manual labor. Large-scale and gradual reforms were needed to transform the planned economy into a market economy, including in the oil and gas industry. An efficient infrastructure, energy efficiency and resource conservation all needed to be created. This was all aimed at averting the impending collapse of the young republic. These goals were achieved in a historically short period of time, thanks to the wise and balanced policy of the country's leadership represented by the first President Nursultan Nazarbayev. The chosen effective strategy of transformation that fulfilled the interests of millions of Kazakhstani people changed not only the political and economic model of the young sovereign republic in the shortest possible time, but also promptly and reliably integrated our country into the modern world order. The oil and gas industry became a mainstay of the economy, a symbol of the state's independence, the main source of income for Kazakhstan's budget, and the hope for a better future.

In the 30 years since independence, oil production in Kazakhstan has increased almost 3.5 times, from 26.6 million tons in 1991 to 90.5 million tons in 2019 and 85.7 million tons in the crisis year of 2020, securing a place in the world's top dozen.



PROVEN OIL RESERVES (according to BP)



OIL AND CONDENSATE PRODUCTION (according to BP)



PROVEN NATURAL GAS RESERVES (according to BP)







NATURAL GAS PRODUCTION AND COMMERCIAL GAS PRODUCTION IN KAZAKHSTAN in 1991-2020. billion cubic meters meters



Gross gas production according to the Bureau of National Statistics of ASPR of RK

Production of commercial gas according to BP



According to BP 2020 data, our country is among the top 5 major oil producers which have more than tripled oil production in the period from 1990 to 2019. While the top five countries, such as Kuwait and Brazil, have performed better in oil and gas condensate

production than Kazakhstan over the past few years, our country has remained steadily in the growth range of Qatar and Angola, even slightly ahead of them in dynamics.



According to OPEC, the steady and stable growth of hydrocarbon production indicators in Kazakhstan for many years has helped the country become one of the top 10 oil-exporting countries. Oil exports have increased from about 12 million tons in 1991 to 70.5 million tons in 2020, with a geographical spread of crude supplies to more than thirty countries worldwide.





Since 2001, oil and gas condensate have accounted for about 60% of Kazakhstan's goods exports.

The growth in the oil and gas sector has contributed to a real economic recovery for Kazakhstan from the times of crisis towards a path of high economic growth and increased prosperity for the country's population. While in 1998, due to the global financial and economic crisis, there was still an economic decline of 1.9%, in 1999 the economy grew by 2.7%, and in 2000 – by 9.8%. State revenue began to rise, creating the prerequisites to reduce

debts for eliminating arrears to the population in the payment of pensions, social benefits, and wages to employees of statefinanced organizations. Between 2001 and 2005, the economy grew consistently at an average annual rate of 10.2%, mainly due to the development of the oil and gas sector, with its commodities being in constantly high demand on the global market. Between 2010 and 2020, the oil and gas industry accounted for an average



of about 21% of Kazakhstan's GDP and declined only during periods of a sharp drop in global hydrocarbon prices. No other industry has made such a contribution to the economic growth of the country. Over the past twenty years, the average share of oil and gas in the value of national industrial production has been around 50% and only declined significantly in 2020 due to the Covid-19 coronavirus pandemic, which significantly damaged world markets and hence the demand for energy resources.

Foreign currency revenues into the budget at that time were growing at a high rate. Nevertheless, despite the rapid success in the development of the oil and gas industry and the high rate of economic growth generated by the hydrocarbon industry, Kazakhstan's leadership had to consider creating a "safety cushion", in order to reduce risks to the economy in the event of such crises as in 1998. At that time as a result of a collapse in world oil prices to below \$10 per barrel and a drop in export earnings, the Kazakh government was forced to cut social expenditure and allowed the tenge to devalue in the spring of 1999. This led to inflation and a deterioration of the socio-economic situation in the country. At the initiative of the head of state, a National Fund was created in August 2000. The National Fund accumulated payments from the commodity sectors which generate significant foreign exchange earnings, and became an insurance fund for the country. The purpose was to ensure stable socio-economic development in Kazakhstan, accumulate financial resources for future generations and reduce the economy's dependence on the impact of unfavorable external factors. Thus, by accumulating a portion of tax revenue from private oil and mining and metallurgical companies, the fund was intended to perform two main functions: stabilizing and saving. The National Fund provided for official transfers from national and local budgets and, conversely, for the receipt of targeted transfers from the fund to the budgets for purposes determined by the Head of State.

At that time stabilization funds which relied on super-profits from oil and gas, already existed in Iran, Kuwait, Venezuela, Saudi Arabia, Libya, Nigeria, Oman, Norway, the state of Alaska, US, and the Canadian province of Alberta. The establishment of the fund in Kazakhstan was based on the most effective Norwegian model of managing natural resource revenues for the public good. It was one of the first of its kind in the former Soviet Union. The International Monetary Fund (IMF) helped with the development of specific provisions of the Fund. In his letter, Emmanuel van der Mensbrugge, Head of the Eastern Division of the IMF's Second European Directorate, proposed conditions to ensure "transparency and simplicity in its operations, as well as state control over the resources allocated to it".

The first contribution to the National Fund was \$660 million transferred by Chevron company (US) for a share in the Tengizchevroil JV, which is developing the giant Tengiz oil and gas field. Initially, only six companies contributed to the Fund, but subsequently the number of contributors from the oil and gas industry increased.

Currently, revenue to the National Fund is made up of the following items: direct tax from the oil sector companies (except for tax credited to local budgets); other revenue from operations carried out by oil sector organizations (except for revenue credited to local budgets); proceeds from the privatization of republican property. The fund is also made up of proceeds earned from the transfer to the competitive environment of assets from national management holdings, national holdings, national companies and their subsidiaries, dependent and other legal entities affiliated with them, in the order and according to the list determined by the Government of the Republic of Kazakhstan. Other proceeds come from the sale of agricultural land plots, investment income from the management of the fund, return of the transfer from the republican



PROCEEDS TO THE NATIONAL FUND OF KAZAKHSTAN (excluding investment income from fund management) and the Brent price in 2001-2020

budget, as well as other income and revenue not prohibited by the legislation of the Republic of Kazakhstan.

Between 2001 and 2020, the National Fund received about 34 trillion tenge (more than \$180 billion at average exchange rates) from the oil and gas industry. Excluding funds from the fund's asset management, the oil and gas sector generates more than 99% of its revenue. During the same period, transfers from the National Fund to the national budget to cover the deficit, to implement priority socio-economic reforms and aimed at supporting the economy

and the population amounted to about 30 trillion tenge. The share of transfers from the National Fund as a part of all national budget revenues over the last ten years has ranged from 27% to 45%. Given the amount of export custom duties on crude oil and petroleum products which go directly into the national budget, the share of the oil and gas sector in the national budget revenue was between 33% and 50%. Today, the National Fund serves as a guarantee for the social well-being of future generations of Kazakhstanis - those who are to build the new Kazakhstan.



Transfers from the National Fund to the republican budget

The impressive growth of the country's oil and gas industry would not have been possible without significant investment by national and foreign oil and gas companies. Almost all the wellknown oil giants from the US, China, Europe and Russia have been operating for many years in Kazakhstan. They recognize the investment climate in the country as one of the most favorable in the entire post-Soviet region. During the years since independence, foreign direct investment in the industry has amounted to more than \$110 billion. Over the past twenty years, the average share of oil and gas in the gross inflow of foreign investment to Kazakhstan amounted to about 34%. Investments in Kazakhstan resulted in

the construction of the Caspian Pipeline Consortium (CPC). This was the first private export system in the former Soviet Union that provided the growth of oil production at the Tengiz field, and its transportation to the Black Sea coast and further to world consumers. Countless oil and gas deposits were discovered at the Kashagan field located on the Kazakh shelf of the Caspian Sea, as well as at other promising offshore and onshore structures. The infrastructure for the production, processing and transportation of liquid hydrocarbons at the Karachaganak field was expanded. Oil and gas pipelines were built to the east to ensure reliable supplies of the Kazakh raw materials to the rapidly growing Chinese market.



Oil refining capacities were modernized. Oil and gas chemical projects were developed to help produce the high value-added products demanded in export markets. Direct investment into Kazakhstan's oil and gas sector is based on the principles of stability, predictability, transparency of the legal and regulatory system, protection of investors' rights, equal conditions for foreign and local investors, compliance with contractual obligations, encouragement of direct investment in priority sectors of the economy and ensuring information transparency of the domestic stock market.

The main imperative over all these years has been to maintain social stability. Without this there can be no effective development of industry. Since the country's independence many years ago, oil and gas companies have traditionally been the main sources of social finance. Over the past period, oil and gas contributions have allowed significant improvements to the social infrastructure in the regions where they operate, as well as in the capital Astana (now Nur-Sultan), with the construction of new hospitals, clinics, schools, kindergartens and parks.

For many years, an effective bridge between the social, energy and public sectors of Kazakhstan has been the KAZENERGY Association. It was established on November 2, 2005 as an independent voluntary non-commercial association bringing together several dozen of oil and gas production, energy, service and engineering companies. These included Chevron, Shell Kazakhstan, Eni Spa, PetroKazakhstan, Total, Lukoil Overseas, KazMunayGas, KazTransOil, KazTransGas, KazMunayTeniz, KEGOC, and others. Over the years it has become a key player in creating favorable conditions for the dynamic and sustainable development of the country's fuel and energy complex. It is a true "voice" for oil, gas, and other subsoil users, energy companies, transporters, and a wide range of users and consumers of oil, gas and energy products and services in developing a common approach to resolving industry issues and discussing them with the Government and Parliament. The KAZENERGY Association has contributed to the creation of a favorable environment in the country for attracting investment in oil and gas projects and technology transfer. Laws have been adopted that meet the interests of the state and do not infringe the rights of foreign and domestic subsoil users, while valuable social programs are being implemented to improve the quality of life in the regions.

Over a period of 30 years, an entire generation of new qualified personnel in the oil and gas industry has grown in Kazakhstan, capable of successfully competing with specialists from large international corporations. We have learned to live, create, and work in a new way in a rapidly changing world. The reward for this is the untold wealth in the interior of Kazakhstan, which will form a secure base for a better future for the people who inhabit this promising land for many years to come. Kazakhstan, a country which occupies a significant place on the political and oil and gas map of the world, has today not only become a treasury of inexhaustible hydrocarbon potential, but also a large receptacle of unique knowledge, experience, and qualifications. Today Kazakhstan is ready for any global change.



DEAR READERS!

Over the past 30 years since Independence, our country has travelled a long way along the road of consistent socio-economic progress and large-scale transformations. Over these years, the robust foundations of systemic modernization have been laid, guaranteeing the welfare of the citizens of Kazakhstan and building a strong modern state.

The development of the hydrocarbon industry is one of the key factors of Kazakhstan's economic growth. At the very dawn of sovereignty beneficial conditions were created to attract global oil and gas companies to our country, bringing with them foreign investment and advanced technologies. The development of the Tengiz, Karachaganak, and Kashagan fields were all major milestones in the history of the industry. These three projects now account for 60% of Kazakhstan's oil production.

A total of 6 thousand kilometers of export pipelines have been built to ensure the transportation of oil. The most significant of these is the Caspian Pipeline Consortium, whose 25th anniversary we are also celebrating this year.

We have successfully established an independent gas transmission system and provided for the large-scale gasification of our country. Now almost 10 million Kazakhstan citizens have access to environmentally friendly fuel.

Since independence, more than \$200 billion in foreign direct investment has poured into the oil and gas sector of Kazakhstan. Oil and gas production has become the driving force behind economic growth, contributing to the development of related areas such as pipeline and sea transport, oil and gas engineering, oilfield services, and petro-gas chemistry.

Today the future potential of industry is closely connected to the deep processing of hydrocarbons and the enhanced role of natural gas.

The global move towards decarbonization and the quest for carbon neutrality is an ambitious challenge facing the domestic oil and gas industry today. A sustainable balance must be found between ensuring economic growth, energy security and environmental protection. Kazakhstan possesses all the capabilities to adequately respond to these pressing challenges.

I am convinced that this book devoted to the formation and development of the oil and gas industry in Kazakhstan will also contribute to a comprehensive understanding of its role and place in energy transformation of the country and the pressing need for global energy transition.

Kassym-Jomart TOKAYEV,

President of the Republic of Kazakhstan



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THE EVOLUTION OF STATE MANAGEMENT IN THE OIL AND GAS INDUSTRY

Chapter 1

"GOVERNMENT FALLS TO HE WHO IS SUITED TO IT BY NATURE."

Abu Nasr Muhammed ibn Muhammed al-Farabi, philosopher, mathematician, musical theoretician, and scholar of the East or more than one hundred years, prior to Kazakhstan's independence, the oil and gas industry of Kazakhstan had always been managed from Moscow. The industry was first governed by the People's Commissariat of the Oil (later Fuel) Industry, and then by the Ministry of Oil Industry of the USSR.

It was only during the Great Patriotic War (1941-1945) that the Central Committee of the Communist Party of Kazakhstan established a department for the oil industry. It was led by experienced engineers and party workers: Ilya Ryabov (secretary of the Central Committee), Viktor Fedorov and Tarbai Shaukenbayev.

The industry was transferred to the management of Kazakh oilmen 20 years later when the Council of Ministers of the Kazakh SSR was established. Article 8 of the Law of the Kazakh SSR dated October 15, 1965, provided for the creation of the Oil Industry Association - "Kazakhstanneft" which directly managed the Embaneft Combine, Mangyshlakneft, Trunk Oil Pipeline Administration, and the Guryevsk Machine-Building Plant. Safi Utebayev, one of the outstanding oilmen of Kazakhstan, was appointed

the Head of the Association. Over the years it was led by Leonid Alyanchikov, Utep Balgimbayev, Pyotr Gibizov, Nikolai Smolnikov, Zhansha Tankibayev, Ashot Durmishyan, Sagidulla Nurzhanov, Ilya Lapan, Vladimir Avilov, Yuri Yuferov, Kiponi Ogai, and Bulekbai Sagingaliyev. However, the Association did not last long. On June 23, 1970, it ceased to exist with the transfer of all enterprises to the jurisdiction of the Ministry of Oil Industry of the USSR, which until the end of the existence of the Soviet Union was unable to part with the giant oil and gas "machine" of the Kazakh SSR. The list of major oil and gas associations and enterprises of Kazakhstan in Soviet times included Embaneft, Mangyshlakneft, Uzenneft, Aktyubinskneft, Tengizneftegaz, Yuzhkazneftegaz, Guryevsk refinery, Guryevskoye Trunk Oil Pipelines Administration, Management of Main Oil Pipelines of Kazakhstan and Central Asia, Yuzhnefteprovod, Chimkent Refinery, Pavlodar Refinery, and Karachaganakgazprom. This was indeed an impressive arsenal as Kazakhstan approached its state independence.

field, located in the Guryev (now Atyrau) region. Deputy Chairman of the Council of Ministers, Almabek Nurushev, Minister of Foreign Economic Relations, Syzdyk Abishev, and Deputy Prime Minister, Kalyk Abdullayev, took part in the negotiations on behalf of the Kazakh SSR. During Nursultan Nazarbayev's visit to the USA in the summer of 1990, a close, friendly and business-like relationship with the United States, represented by the Presidential Administration and the leaders of Chevron was established. Chevron was very interested in gaining access to Kazakh hydrocarbons and the historic visit was arguably instrumental in creating the first successful and major investment project called Tengizchevroil. This was to become Kazakhstan's national brand just a few years later.

Just before the collapse of the USSR, the fate of the Tengiz field was decided thanks to the determination and persistence of the Guryev oilmen, who insisted on the early adoption of the Law "Concerning the Property of the Kazakh SSR". This was



By the end of the 1980s, it became clear that the collapse of the USSR was imminent, and very soon (while still part of the USSR) the Republics would have to independently build the foundation of their political, economic, and social future. Under these conditions, the President of the Kazakh SSR, Nursultan Nazarbayev began the formation of an independent state management system of the energy industry as the basis of the republic's economy. This was important for developing a clear strategy and concrete steps for the further development of the industry in the future. Thus, in 1988, at the initiative of Nursultan Nazarbayev, the Council of Ministers of the Kazakh SSR became involved in negotiations between the US Chevron Corporation and the USSR Ministry of Oil and Gas Industry, in order to establish a joint venture to develop the Korolevskoye also supported by the creation of unified state concern for the exploration, production, transportation, refining and sale of oil, gas and oil products – Kazakhstanneft. The company would of necessity include, inter alia, the Tengizneftegaz Association. In letters sent on July 26 and 30, 1990 to the Chairman of the Supreme Council, the Council of Ministers of the Kazakh SSR and the leadership of the Ministry of Oil and Gas Industry of the USSR, the directors of the public organizations and oil and gas enterprises of Kazakhstan stated that "the proposal of the Ministry to subordinate Tengizneftegaz was motivated by the desire to become the sole owner of a unique field located on the territory of the Kazakh SSR. The state of the subsoil and the social conditions in the areas left to the indigenous population are in a state of extreme neglect. When adopting the concept 20

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Chapter **1** THE EVOLUTION OF STATE MANAGEMENT IN THE OIL AND GAS INDUSTRY



October 1994 to March 1997, Minister of the Oil and Gas Industry of the Republic of Kazakhstan

of the Ministry of Oil and Gas Industry, there is not the slightest doubt that the same fate awaits Tengiz". By pointing out the absurdity of the state officials' desire to keep the Tengiz treasury under their control and demanding in harsh terms that Tengiz be handed over to the Soviet republic, Kazakh oil workers restored historical justice: they returned the resources of the giant field to the people of Kazakhstan. It was a victory that would bring huge dividends to the country in the future.

A year later, on July 12, 1991, the **Kazakhstanneftegaz State Corporation** was established in Guryev (now Atyrau). The director was oil engineer Bulat Yelemanov, who at that time was responsible for the Emba district committee of the party. With its creation, for the first time in the century-long history of the oil and gas industry, Kazakhstan was able to independently manage its hydrocarbon resources.

A little later – on December 16, 1991 - the Law "Concerning State Independence of the Republic of Kazakhstan", proclaiming that "the land and its subsoil, waters, airspace, flora and fauna, other natural resources, economic and scientific and technical potential are the exclusive ownership of the Republic of Kazakhstan, constituting the basis of its state independence", opened the door to the newest period in the history of an independent Kazakhstan.

Kazakhstanneftegas State Corporation has played an important role in the process of formation of the oil and gas industry of the country. It is associated with the very first, and, therefore, the most significant independent steps of Kazakh oil workers on the path to the creation of the key industry for the country's economy and the creation of a large industry national holding in the future.

Shortly after its establishment, the state-owned Kazakhstanneftegas was renamed Kazakhstanmunaigas National Oil Company (NOC), and in September 1993, it was transformed into Munaigas State Holding Company (SHC). It incorporated the associations of Mangistaumunaigaz, Tengizneftegaz, Embaneft, Aktyubinskneft, Yuzhneftegaz, Karazhanbasterneft, Kazneftebitum Research and Production Facility, Atyrau and Shymkent refineries, Yuzhnefteprovod, the main oil pipelines of Kazakhstan and Central Asia, Aktobe Oilfield Directorate, Mangyshlakneftegeofizika, Kazakhstanmunaigas, Petrovsky plant, and other enterprises. Bulat Yelemanov was appointed President of Munaigas SHC and headed the company from September 1993 to April 1994. Munaigas SHC existed for more than three years. Members of the management staff of the state holding included Makhambet Batyrbayev, Viktor Begin, Nurlykhan Bekbosynov, Yusup Biskaliyev, Maksut Burambayev, Amanzhol Kabdolov, Akylbai Kuanbayev and Anatoly Lobayev.

As Askar Balzhanov, who was appointed vice-president of Kazakhstanmunaigas NOC in 1991-1994, later recalled, in Guryev the new company had offices in a building that had previously housed the regional executive committee and the executive committee: "The company president had only one office and a reception room. There was nothing else. Then they began to hire personnel to work in the company. Given my knowledge of English, I was offered the position of vice-president for external economic relations. I was 33 years old, and I had sufficient experience in the industry and the Soviet party bodies. After 3-4 months, the company was relocated to Almaty. The company had a president, five vice-presidents, chief accountant and three rotating posts of chairman. It was 1991-1992."

Galiausat Keshubayev, who was appointed Chief Specialist and Head of Technical Department at Kazakhstanneftegaz in 1991, said the establishment of the company gave the state leverage in managing the industry and the ability to objectively forecast industry revenue. At the same time, enterprises retained a certain amount of autonomy. With its establishment, the then Prime Minister, Sergei Tereshchenko, introduced quarterly field meetings with oil workers, in order to address not only oil workers' problems but also many issues concerning state administration of the economy, especially agriculture, food processing, railways, defense, and other areas.

The aim was to improve the situation in the gas sector, where local gas utilities and gas distribution organizations were excluded from the general gas system, which exacerbated their financial state and even led to bankruptcy. In addition, there was a tendency to reduce gas production, and in 1991, the **Kazakhgazprom** concern was established by analogy with the Russian Gazprom. It brought together the giant Karachaganak oil and gas condensate field, with all the existing gas pipelines and underground gas storage facilities. After several renamings, the concern was named **Kazakhgas National Company**, and then **Kazakhgas State Holding Company**.



In the early 1990s, it was particularly important for Kazakhstan that companies such as Chevron came to our country and their success would open the doors to other investors. The arrival of major global companies enabled partnership relations to be established with the Government of the USA. Their investments were to become a foundation and pledge for the close cooperation between our countries.



Signing of the Agreement concerning the creation of the consortium with Agip, Shell, Mobil and Total.

In February 1992, immediately after the collapse of the USSR, the management of the oil and gas industry was delegated by President Nursultan Nazarbayev to the **Ministry of Energy and Fuel Resources** (MEFR), headed by Deputy Prime Minister Kadyr Baykenov. The First Deputy Minister and curator of the oil and gas industry, Nurlykhan Bekbosynov, had managed the Mangyshlakneft Association for five years before this appointment. Anatoly Lobayev, General Director of the production association of the main oil pipelines of Kazakhstan and Central Asia, was also appointed Deputy Minister. The first OIL AND GAS OF KAZAKHSTAN 30 YEARS OF INDEPENDENCE PATH TO CREATION

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Ravil Cherdabayev, 1994, Minister of the Oil and Gas Industry of the Republic of Kazakhstan

employees of the Ministry included Uzakbai Karabalin, Galiausat Keshubayev, Nurbergen Balgimbayev, Zhaksylyk Zhangaziyev, Murat Kurbanbayev, and Kuanysh Sisembayev. Production associations, service, research, design, engineering, and other enterprises and organizations of the energy, coal, uranium, oil, gas, and oil refining industries, as well as sales systems, were transferred to the new Ministry.

As the first Minister of Energy and Fuel Resources and Deputy Prime Minister Kadyr Baykenov later recalled, the Ministry was responsible for the integrated development of Kazakhstan's energy sectors, ensuring external relations, drafting a sector development strategy, attracting investment, and monitoring the implementation of fuel production and distribution plans. "Specialists from a variety of fields were working in these concerns and corporations, and we relied on their knowledge and experience when taking any global decision. Attracting investment in the above-mentioned sectors was perhaps one of the main challenges facing the Ministry. The establishment of the Ministry of Energy and Fuel Resources in 1992 made it possible to ensure the comprehensive development of the country's fuel and energy complex within the framework of state policy".

Galiausat Keshubayev, who headed the Department of Foreign Economic Relations and Commercial activities of the Republic of Kazakhstan in 1993, also recalled: "The first weeks and months of work were associated with "pushing" all kinds



of decisions at the level of the Government of Kazakhstan. The need to adopt such documents was caused by complete "stupor" in the actions of the central authorities in Moscow and the lack of national documents regulating the work of oil industry enterprises. At that time, the Government apparatus was very compact and operational. Oil matters were supervised by the following chain of command from the bottom up: Uzakbai Suleimenovich Karabalin, Senior Reference Officer of the Industry Department of the Presidential Administration and the Cabinet of Ministers of Kazakhstan, Kairkhan Isengaliyevich Sarbufin, Deputy Head of the Industry Department, Kadyr Karkabatovich Baykenov, Deputy Prime Minister. Thanks to their professionalism, the draft documents were not left to become out of date. After their revision, the final version was agreed with the Ministry of Economy, the Ministry of Finance, and the National Bank. These three organizations were mandatory. Gosgortekhnadzor, the Ministry of Geology, and once even the Turan Bank (the former Stroybank) and others were added to them if necessary."

At the same time an oil and gas department was being formed in the **Ministry of Geology and Subsoil Protection**. The director in 1992 was Lev Trubnikov, and Serikbek Daukeyev from 1993. Baltabek Kuandykov was Deputy Minister, and Ural Akchulakov and Baktykozha Izmukhambetov were appointed as Heads of Oil and Gas Department.



The new managers were simultaneously responsible for restoring economic ties and reforming the industry. They clearly understood that oil production, which amounted to 26.6 million tons in 1991 (albeit in decline) actually had huge potential. A lot of work was required to ensure the much-needed economic growth in production, first of all, in terms of equipment and investments.

Ravil Cherdabayev, who headed the newly established Ministry of Oil and Gas Industry of Kazakhstan in 1994, said that the main challenges facing the Ministry at the time were linked to the strategic development program of Kazakhstan: "An urgent task was to adopt the necessary laws on oil, joint-stock companies, and attracting foreign investment, and others. By means of these laws, our aim was to accelerate reforms in the oil and gas sector, intensify the process of attracting foreign investment, and establish new joint oil companies, etc. Based on these challenges, we wanted to consolidate the structure of the Ministry and the industry, and hire the personnel required. Along with this, our responsibility was to achieve a constant increase in oil and gas production, and provide the country with the necessary volume of petroleum products".

Tolegen Khasanov, Deputy Minister of Oil and Gas Industry of the Republic of Kazakhstan in 1994, recalled "in order to ensure the effective development of the oil and gas industry, we needed contacts and to know the Russian leaders of the oil industry, on whom our industry was directly dependent". This



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Timur Kulibayev, 1994, Vice-president of NOC Kazakhoil

was a prerequisite for attracting foreign investment. "There was one such person, it was Nurlan Utepovich Balgimbayev, an oilman to the core, who had the experience of working both in a foreign company and in our republic. The first thing to do was to establish links and relations with the oil equipment factories that supplied our republic with spare parts and equipment (Russia, Azerbaijan, Ukraine). So he took his team everywhere negotiating and establishing contacts. Secondly, Nurlan Utepovich had to resolve the issue of transporting oil produced in Kazakhstan to Russian refineries and for export. He entrusted the matter of recovering the lost oil production in Kazakhstan to local experienced specialists. Thanks to the dedication and efforts of the oil workers of the time, the proper organization of work on the ground and with the help of local authorities, at the end of 1995 we reached the previous level of oil production - 25 million tons per year".

1994 saw the reorganization of state administration bodies in Kazakhstan, including the oil and gas industry. On June 13, 1994, by Presidential Decree, the Ministry of Energy and Fuel Resources of Kazakhstan was divided into the Ministry of Energy and Coal Industry and the **Ministry of Oil and Gas Industry**. Ravil Cherdabayev, who was in charge of the Tengizchevroil Joint Venture, was appointed Minister of the Oil and Gas Industry. His deputies were Uzakbai Karabalin, Nurlykhan Bekbosynov, Bulat Yelemanov, Viktor Novikov and Anatoly Lobayev.

In October 1994, Nurlan Balgimbayev, a former manager in the Ministry of Oil and Gas Industry of the USSR, who was



From left to right: B.N. Moskalenko, G.K. Keshubayev, U.A. Akchulakov, B.K. Khasanov

then working as a consultant for Chevron, replaced Ravil Cherdabayev. Cherdabayev was transferred to the post of Akim of the Atyrau region. His deputies were Uzakbai Karabalin, and later Tolegen Khasanov (1995-1997). At this time, there was frequent rotation of personnel in the public administration of the industry. Most in demand were specialists with experience in narrow segments working in foreign companies, oilfields, etc. Thus, Uzakbai Karabalin was sent on an internship at Italian company Agip, in order to later disseminate the international experience and knowledge he gained there in the Kazakh oil and gas industry.

With the creation of a state "machine" to manage the country's oil and gas sector, the oil industry has also set itself ambitious targets for large-scale exploration on Kazakhstan's Caspian Sea shelf. In February 1993, another state-owned company, **Kazakhstankaspishelf**, was set up to organize this work. The director was Baltabek Kuandykov with the rank of Deputy Minister of Energy and Fuel Resources. Later, it was joined by the major foreign companies, including Agip. The scope of work performed made it possible to discover the largest hydrocarbon fields in the Caspian Sea a few years later.

In the meantime, the process of denationalizing the oil and gas industry began, and entered an active phase. Oil and gas enterprises needed to be privatized, in order to attract much-needed money to the industry, pay off wage arrears to oilfield workers, upgrade machinery, equipment and increase drilling operations. At that time Kazakhstan's budget was insufficient to finance the required volume of work. The privatization process took place at the initiative of the Head of State and under the strict guidance of the relevant ministries. The first step was the creation of Kazakhturkmunay LLP Joint Venture on January 9, 1993. It was owned by the Ministry of Geology and Subsoil Protection of the Republic of Kazakhstan, and the Turkish Petroleum National Company (TPAO) with



President of the National Company "Kazakhstanmunaygas", B.D. Yelemanov (far right), Director of the Technical Department, G.K. Keshubayev, (next to him), 1992

a 51% and 49% share respectively. On April 6, 1993, long negotiations, which had begun in Soviet times, ended with the signing of an agreement between the Kazakh government and the US company Chevron, establishing the Tengizchevroil Joint Venture. Also in 1993, Yuzhneftegaz JSC, owner and operator of the Kumkol field (South Turgai Basin), and the German companies Feba Oil AG and Erbdol Erdgras Gommern GmbH, with the participation of the Government of Kazakhstan, signed a foundation agreement establishing the JV Kazgermunai LLP. The prospective deposits of Akshabulak, Nuraly and Aksai in the South Turgai Depression of Kyzylorda region were transferred to the new joint venture. Exploration soon led to the discovery of three commercial oil and gas fields: Akshabulak Central, Akshabulak South, Akshabulak East. In 1995, the Kumkol-LUKoil Joint Venture (later Turgai Petroleum) was established to jointly develop the Kumkol oil field. 1997 ended with the sale of stakes in the major oil and gas enterprises Mangistaumunaigaz, Karazhanbasmunai, Uzenmunaigas and the Pavlodar Refinery. Despite vociferous claims by opponents of privatization that the sale of assets was not in the national interest, it was largely thanks to these unpopular decisions that order was subsequently restored in the industry. Investors raised finance for the stable operation of oil and gas companies and the planning of oil and gas production volumes. This was vital for the industry. After all, by 1994, the oil and gas industry was particularly hard hit by the economic crisis that followed the collapse of the USSR. Oil and gas condensate production fell to 20.3 million tons from 26.6 million tons in 1991. Payments for supplied oil had ceased. Investments and more significant transformations were required.

The Development Program for the Oil and Gas Complex was the real salvation for the stalled oil and gas industry. This document was rapidly developed (in just half a month) by the Ministry under Nurlan Balgimbayev. It was submitted to the



First Official Presentation of the Program to Develop the Caspian Sea, Houston, April 1993



Signing the Kazakhstankaspishelf Consortium Agreement, Almaty, 3 December, 1993

After Signing the Kazakhstankaspishelf Consortium Agreement, Almaty, 3 December, 1993



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Nurlan Kapparov, President of KazTransOil

Government on November 17, 1994, and included several priority tasks, such as strengthening refining capacities, in order to fully meet domestic needs for petroleum products and increase oil exports.

The entry of foreign investors into the industry also excluded the need for active government intervention in the economic activities of market operators. It also created the need for a fundamentally new structure capable of reacting guickly to changes in external and domestic market conditions and of defending national interests in negotiations with foreign companies and in international oil operations. In order to ensure the transition from the administrative and command structure, to structures more suitable for a market economy, on March 4, 1997, President Nursultan Nazarbayev signed the Decree "On regular measures to reform the system of state bodies of the Republic of Kazakhstan". It abolished the Ministry of Oil and Gas along with other ministries, state committees, and commissions and created the Ministry of Energy and Natural Resources, entrusted with the strategic management of the industry. It was headed first by Viktor Khrapunov, and then by Dyusenbai Duisenov.

In order to consolidate the disparate oil and gas assets and develop activities within the framework of a single strategy, on the same day, March 4, 1997, **Kazakhoil National Oil and Gas Company (NOC)** CJSC was established by Decree of the Head of State and at the suggestion of Minister Nurlan Balgimbayev.

The new national company was entrusted with participation in the capital of almost all major enterprises in the oil and gas industry of Kazakhstan. It consisted of more than 40 legal entities, in 35 of which it owned 5% or more shares. The main assets were Kazakhoil-Emba OJSC and Uzenmunaigas OJSC, which developed 45 oil and gas fields. Of these 39 were located in Atyrau, and 7 in Mangystau regions. Oil and gas production was carried out at 39 fields that had different degrees of reserves development and were at different stages of development. In terms of reserves, these were all medium and small fields with the exception of Uzen with initial geological reserves of more than 1 billion tons. In addition, the oldest Dossor and Makat fields were incorporated within Kazakhoil. Nurlan Balgimbayev himself became the head of Kazakhoil NC, Murat Salamatov became his first deputy, while Timur Kulibayev and Galiausat Keshubayev became vice-presidents.

Later, Timur Kulibayev, who in 1997 - 1999 was entrusted with resolving the complex economic and financial challenges of Kazakhoil NOC CJSC, recalled: "At the beginning of 1997, the Minister of Oil and Gas Industry, Nurlan Utepovich Balgimbayev, proposed the creation of the National Oil and Gas Company. He invited me to work there and I agreed. Together with my colleague Kanatbek Safinov, we drafted a package of constituent documents for the registration of the new national company. Nurlan Utepovich himself was appointed director. He is a very interesting and strong-willed person. The idea of creating a national company was to preserve and unite under corporate management the disparate oil and gas enterprises which, for a variety of reasons, had not been privatized. As you may recall, the end of the 1990s was marked by a powerful wave of privatization. In order to attract investment, the Government sold assets in all sectors, including oil and gas. By that time, the Pavlodar and Shymkent refineries, Mangistaumunaigaz and other enterprises of the industry had already been transferred to investors attracted to the country. However, some of the unsold assets that were not of interest to foreign investors were transferred to the new national company. Kazakhoil started working with such assets. The situation at the oil-producing enterprises united under Kazakhoil was very challenging at that moment. For example, during my first visit to the Uzen field we found huge wage arrears. All the warehouses were full of material and technical supplies which were part of a barter payment scheme for supplied oil".

"Since 1997, we had gone through all the stages of oil industry development: from the crisis of the late 1990s, when the price per barrel was only \$9 in the world market, to the growth in oil prices and the consequent increase in state revenue from the oil and gas sector, which very soon became the leading sector of the country's economy. However, in the beginning we developed projects from scratch that were later



Kairgeldy Kabyldin,

1996, Director of the Department for the development of pipeline transport and production infrastructure of the Ministry of the Oil and Gas Industry of the Republic of Kazakhstan

to become the driving force behind the country's oil and gas industry," he added.

Nurlan Balgimbayev himself recalled in an interview that by appointing the young financier Timur Kulibayev to Kazakhoil, new activities emerged, such as setting out the criteria for evaluating the efficiency of oil and gas companies. It was Timur Kulibayev who pioneered the Eurobond issues. He was also key to helping Kazakhoil learn corporate finance and new forms of resource management.

At his first press conference as head of Kazakhoil, Nurlan Balgimbayev said the new national company "sees its main objective in defending Kazakhstan's strategic interests on global markets and in implementing international projects with the participation of the republic." "We needed a new flexible and capable structure to work in market conditions, respond to changes in the situation on domestic and international







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Lyazzat Kiinov, 1999, Deputy General Director of KTK JSC

markets, perform management with international standards, introduce the latest technologies, defend our interests on the world market, earn money from oil, not just manage oil. Kazakhoil is intended to become such a structure," he said.

An experienced and dedicated oilman, he believed that in the new conditions it would be possible to change "the abnormal situation where oil workers were actually ,plugging black holes' in other sectors of our economy." His hopes were justified in the very near future. The new national company was structurally and strategically very different from its predecessors in the early years of independence. Thanks to the efforts of Kazakhoil's top management, as well as the supervision of the Ministry, the Government and the President himself, the national company was soon able to manage the industry in a new way. It was soon able to cooperate equally with the major international corporations that had entered the local market. Its establishment was an important milestone in the development of the domestic oil business and contributed to improving and increasing the efficiency of the industry's management. During the period of active operation of Kazakhoil, many strategic projects in the oil and gas industry of Kazakhstan, such as the North Caspian, Tengiz, Karachaganak, and the Caspian Pipeline Consortium, were launched, and the industry gained strength. Historically important production sharing instruments were signed, and the first oil export pipeline systems to transport Kazakh hydrocarbons to international markets were designed and built. Finally, during this period, Kazakhstan became known and talked about by major oil and gas producers and consumers around the world. Much of the credit for this was due to the quality of Kazakhstan's top management that initiated and successfully conducted important negotiations with foreign partners and made crucial decisions on various sectoral projects.

As Nurlan Kapparov, head of the Kazakhoil NOC, recalled in 1999, "We were convinced that Kazakhoil should be owned by the state and should ensure conditions for preserving the energy security of the republic. However, state ownership should not mean that any government official could manage its activities. Thus the state while owning a strategic industry would transfer management to professional managers. Otherwise, we would go back to an administrative-command system, with bureaucrats running production at private oil companies from their offices."

While restoring order in oil and gas enterprises and increasing the volume of oil and gas production, an equally important issue arose related to the supply of extracted hydrocarbons to world markets in accordance with the national interests of the Republic of Kazakhstan. The reorganization of republican state enterprises Yuzhnefteprovod and Kazakhstan and Central Asia Trunk Oil Pipelines resulted in the establishment of Kazakhnefteprovod National Company for Oil Transportation CJSC, incorporating PA Yuzhnefteprovod, PA Trunk Oil Pipelines of Kazakhstan and Central Asia, and Aktobe Oil Pipeline Directorate. This was based on Resolution of the Government of the Republic of Kazakhstan No. 461 dated April 2, 1997. In 1998, Kazakhnefteprovod JSC was renamed KazTransOil National Oil Transportation Company JSC. More than 6,400 km of oil trunk pipelines and more than 2,000 km of water pipelines were transferred to the new company. Regional branches were set up to facilitate management. KazTransOil became a monopolist in the oil pipeline transportation market, transporting about 80% of the oil produced in Kazakhstan, and was authorized to represent the interests of the Republic of Kazakhstan in all pipeline projects, including international ones.

Kairgeldy Kabyldin, Vice-President for Strategic Development of KazTransOil in 1997, recalled: "In order to implement state policy on the management, design, and construction of main oil pipelines in Kazakhstan, in October 1995, Minister Balgimbayev addressed the President of the country with a proposal to create an enterprise that would control all pipeline assets. The President approved the creation of the national oil transportation company and adopted a resolution: "I ask you to consider and make a decision on these important issues for the country. I personally am for it! N. Nazarbayev". Later, by the Decree of the President of the Republic of Kazakhstan, the oil pipeline assets were classified as strategic assets not subject to privatization. After a while, a



positive movement in this direction began... On April 2, 1997, a resolution was issued on the establishment of the company. In general, the draft resolution was supposed to be issued on April 1, but I said that no one would believe, let's postpone it to April 2."

Over the years, the company was headed by Kainulla Kasenov (April 1997 – Kazakhnefteprovod), Nurlan Kapparov (July 1997), Yerlan Upushev (April 1998), Timur Kulibayev (1999-2001), Bolat Palymbetov and Abai Sadykov (2002), Askar Smankulov (2002-2004), Kairat Krymov (2004-2006),

Berik Tolumbayev (2006-2007), Nurtas Shmanov (2007-2008 and 2015-2016), Nurbol Sultan (2008-2011), Kairgeldy Kabyldin (2011-2015), and Dimash Dossanov (since August 2016).

Kairgeldy Kabyldin recalled that the company's management initially changed several times, before the young managers came to the fore: "Naturally, at first there were contradictions between the older and younger generations, but when they took into account the experience of the older generation of specialists, the ambitions of the younger generation gave positive results...".

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Uzakbai Karabalin,

1994-1995, Deputy Director of the Ministry of Energy and Fuel Resources of the Republic of Kazakhstan, Deputy Minister of the Oil and Gas Industry of the Republic of Kazakhstan

Sharing his memories of the establishment of KazTransOil, Nurlan Kapparov recalled that at the very beginning of his work he had to deal with huge amounts of receivables and payables arising from barter payments for oil transportation made by oil producing companies instead of cash. "Cash payment at that time was about 30% of the total volume. All other payments were made by barter, often with delays. Our main objective was to establish financial discipline. And we did it - when I left the company, almost 95% of payments were made on time, with prepayment and in cash. The second objective was to raise tariffs because the prices for transportation of raw materials were unacceptably low and did not even cover the company's production costs. The tariffs had to include expenses for our future investment projects, as well as for the expansion and repair of existing pipeline systems. The changes that we made to the company became a general concept that was approved and recognized by the majority," he noted.

In general, the appearance of a powerful state-owned oil pipeline company on the market was dictated by the time. Kazakhstan needed to meet the challenges of securing interests in oil transportation, exports and imports, including through diversification, optimization of the management structure of the enterprises, attracting investment and pursuing a single tariff policy for all main oil pipelines. The measures taken by KazTransOil senior management soon showed the first results. Along with increased hydrocarbon production, transportation volumes increased and plans were outlined for the reconstruction of existing oil pipeline systems and the construction of new ones. Very soon, KazTransOil became the driving force behind the promotion of Kazakhstan's largest oil transportation projects, making a significant contribution to the economic and social development of the country.

Timur Kulibayev said that the company was technically, managerially, and operationally well organized. "To ensure their professional development, every employee who came to the central office of the company on my instructions must first have worked in a production branch in the region, that is, to undergo practical training at a real production facility. Two or three years later, when they returned to the central office, they knew every step of production thoroughly. In addition, we have always supported employees who wanted to enhance their qualifications abroad. As a result, the work experience and human potential that we developed in KazTransOil at that time became the basis for the creation of KazTransGas and many other companies that we subsequently set up", he recalled.

The success of the work of the top management team was the issuing of 5-year Euronotes to the amount of US \$150 million in London in the summer of 2001. This issue was the debut for securities not only in the company's history but also the first issue of corporate bonds among Kazakh companies in the non-banking sector on the international capital markets. The total order book for the bond purchase significantly exceeded the volume of the issue and allowed us to set the final yield at 8.67% per annum with a coupon rate of 8.50% per annum - the lower limit in the preliminary yield discussion. In August 2001, the Euronotes of KazTransOil of the first issue were included into official list of Category A securities of the Kazakhstan Stock Exchange.

In order to further develop the infrastructure for the transportation of extracted hydrocarbons and to ensure the energy security of Kazakhstan, the Kazmortransflot National Maritime Shipping Company (NMSC) LLP was established by Resolution of the Government of Kazakhstan No. 1239 dated December 4, 1998. The main objective of the company was to develop the country's national merchant marine fleet and organize the international maritime transport of domestic cargo using its own resources.

On February 5, 2000, more than a year later, **KazTransGas CJSC** was established by Resolution No. 173 of the Government of Kazakhstan in the aims of establishing state control over the national gas transportation network. At that time, the gas transportation system included a main network of gas pipelines which extended more than 14,000 kilometers. It provided an annual capacity of up to 190 billion cubic meters of gas, three underground gas storage facilities - Bozoi UGS facility in Aktobe region, Poltoratskoye UGS facility in South Kazakhstan region and Akyrtobe UGS facility in Zhambyl region. The system also incorporated 22 compressor stations with 298 gas-pumping units of various types and models. The key initial task was to return state control over the facilities of the gas transmission system, which had been transferred on a 15-year concession to the Belgian company Tractebel back in 1997. The investors were its subsidiaries Intergas Central Asia (ICA) and Almaty Power Consolidated. Secondly, KazTransGas planned to reconstruct and re-equip the gas transmission system, since most of the facilities were in extremely unsatisfactory condition. First of all attention was focused on the only gas export route, the Central Asia – Center pipeline, which transported Central Asian gas to Russia through Kazakhstan.

As Uzakbai Karabalin, the Head of KazTransGas, later recalled, the new national company initially had only five employees: himself, Daniyar Berlibayev, Aidarkhan Kussainov, Roza Zhumina and a driver.

"Over several years ICA had shown that as a private company, it was not recognized by colleagues in neighboring

countries – Uzbekistan and Turkmenistan. At the time they were acting as the main gas transmitters through the territory of Kazakhstan. Nor did Russia recognize it and they were the main purchaser of Central Asian gas. Naturally, without such recognition the prospects for Kazakhstan's gas company, whose main operation was gas transit services through its territory, were dire. (...) We had long and difficult negotiations with Tractebel on a "civilized return" of our gas pipelines. As a result, we agreed to buy out the entire system for \$100 million, thus halving the initial "appetite" of the then owners of the gas assets. The amount agreed was adequate, but we still had to find the money. It seems ridiculous now, but at the time it was a big figure for the republic and we had to collect this amount all over Europe," Timur Kulibayev said.

"We approached the Head of State, Nursultan Nazarbayev, with our proposal (to purchase assets from Tractebel – author) and he supported us. After negotiations with the company and the allocation of funds by the Government to the amount of \$100 million, the assets of the Central Asia - Center gas pipeline



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2007-2012 Prime Minister of the Republic of Kazakhstan

on the territory of Kazakhstan and the energy system of Almaty were purchased... After that, we started work on restoring our gas transportation system which was in very challenging condition. (...)Timur Kulibayev recalled.

In an interview Uzakbai Karabalin confessed that the top managers of KazTransGas at the dawn of the company, dreamed that "one day KazTransGas would grow and become a major company with an annual turnover of \$200 – 250 million. Could we have imagined then that the state company KazTransGas would become a much larger business! Only those who conceived the idea could have envisaged that. "

In the course of its establishment, KazTransGas has grown into a highly effective gas company of international level. Its achievements are supported by global quality standards ISO 9001-2009, 18001-2007 and 14001-2006. The team of professionals managed in a short period of time to conserve and modernize the main gas pipelines. They established gas pipeline operations in cities and towns and achieved fair prices for gas transit through Kazakhstan. They also began the development of Amangeldy group gas fields in Zhambyl region and built an effective system of gas distribution to private consumers, including through the KazRosGas Joint Venture established in 2000 with the Russian Gazprom PJSC. They built the first gas pipeline in the history of independent Kazakhstan connecting the fields in Turkmenistan with the Western border of China ensuring the reliable export of Central Asian gas, and later Kazakh gas to the fast-growing Chinese market. In 2012, by Resolution of the Government of the Republic of Kazakhstan,

KazTransGas JSC was defined as the national operator in the field of gas supply.

On May 2, 2001, in order to systematize the operation of the oil and gas industry and create a unified system of trunk pipeline management, the Government of Kazakhstan issued Resolution No. 591 on the establishment of the Transport of Oil and Gas National Company CJSC (TOG), with 100% state participation in its share capital. The new company consolidated 100% stakes in KazTransOil and KazTransGas, Atyrau International Airport, EuroAsia Air helicopter company, 99% of Munai-Impex, 90% of KazTransSvyaz and Aktubeneftesvyaz, and 50% of the Kazmortransflot shipping company. It thus consolidated unprecedentedly diverse assets. The core businesses of the merged company included participation in all domestic and international Kazakh projects related to the transportation of hydrocarbons, as well as oil and gas sales marketing. The senior management at the time of the company's creation included CEO Timur Kulibayev, his first deputies Kairgeldy Kabyldin and Bolat Palymbetov, and deputy Danivar Berlibavev.

However, TOG did not last long. It was a stepping stone in becoming a powerful player on the oil and gas map, not only in Kazakhstan but also in the Eurasian region. On February 20, 2002, in accordance with the Decree of the President of the Republic of Kazakhstan No. 811, by combining the largest assets of Kazakhoil NOC and Transport of Oil and Gas NC, the **KazMunayGas National Company** was established with the Government as the sole founder. Lyazzat Kiinov, formerly Akim of Mangystau Region, was appointed head of the holding company, while Timur Kulibayev, who previously headed TOG, was appointed first vice-president. The Board of Directors was chaired by Uzakbai Karabalin, Vice-Minister of Energy and Mineral Resources.

The creation of KazMunayGas was a real breakthrough in the development of Kazakhstan's oil and gas sector. There had been no nationwide structure like the new national holding company before. Its establishment was based on the need for a unified state policy on the rational use of the oil and gas resources available in Kazakhstan, taking into account the globalization factor at a time when mergers of major oil companies were standard in global practice. KazMunayGas became one of the largest state-controlled holdings in the former Soviet Union. The total value of the consolidated balance sheet of the new national company has been estimated at approximately US \$2 billion.

As Timur Kulibayev recalled: "At that time, the general experience of the Kazakhoil and Transport of Oil and Gas NC showed that production, technical and commercial issues are best managed within the framework of a single strategy of the national company. The ministry should oversee the



1993, Deputy President of the Atyrau branch of Kazakhstantkaspishelf JSC activities of the industry, determine the rules of the game, and engage in law-making. The corporate management of oil and gas assets should be handled by a national company. This management system in the oil and gas sector soon proved effective because the integrated management of the oil and gas sector became possible within the established KazMunayGas National Company. This was particularly important for large projects such as Tengiz, Karachaganak, and Kashagan, where production, transportation, financing, and other tasks had to be addressed simultaneously. It was the only way we were able to present and protect the interests of Kazakhstan in these major projects."

Years later, Uzakbai Karabalin noted that "the creation of this company was an evolutionary development of the oil industry of Kazakhstan". "This decision was influenced by the process of globalization that was taking place worldwide. In



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Bakhtykozha Izmukhambetov,

1993, General Director of Kazakshturkmunay Ltd.

order to participate fully in international and Kazakh oil and gas projects, there was a need for a powerful national company that could, on the one hand, consolidate the finances, HR, and technical capacities of all state-owned specialized companies, while, on the other hand, becoming a serious player in the market. When Kazakhoil, KazTransOil, and KazTransGas were united "under the same roof", we got a single mechanism that worked flawlessly," he said. "KazMunayGas as a powerful player was not welcomed by all market participants. It's like in the savannah: one feels uncomfortable when a lion appears."

According to Lyazzat Kiinov, who headed the national holding company in 2002 – 2003, when establishing KazMunayGas, Kazakhstan was guided by the models of such state-owned companies as Statoil in Norway, Petronas in Malaysia, and PDVSA in Venezuela. These state-owned national companies not only operate successfully today, but also develop oil and gas policies in their country with the most favorable conditions.

The KazMunayGas development strategy included the objectives of maximizing the benefits to the Republic of Kazakhstan from developing the oil and gas industry and becoming a highly efficient world-class oil and gas company.

To this end, legislation was passed establishing the participation of KazMunayGas in all new oil projects as an operator with at least a 50% stake.

Karim Massimov, who held the post of Deputy Prime Minister of the Republic of Kazakhstan in 2002, when

commenting on the creation of the largest association in the country's oil and gas market, said that KazMunayGas should be transparent to the Government, the public, and foreign investors alike. "The merger of Kazakhoil and TOG into one national company will allow the latter to attract investment and borrowing on foreign and domestic markets with more beneficial terms. (...) The concentration of management and professional personnel of Kazakhoil and TOG in a single company will play a positive role. (...) The role of the state in controlling the transparency of oil state assets will be enhanced," he noted.

The state, by concentrating its control over the largest and most strategically important oil and gas production and transportation assets in the country, began to create economic and political conditions aimed at achieving high rates of economic growth through the oil and gas sector and strengthening the role of KazMunayGas therein, with oil prices rising considerably (in 2004 they reached a record high of over US \$40 per barrel).

At first, as part of the national holding company, a 100% subsidiary, KazMunayGas Trade House LLP (KMG TH) was established in 2002, in order to protect the interests of the state in such important areas as the oil and refined products export policy and to incorporate the largest oil refineries (Atyrau, Pavlodar and Shymkent refineries), as well as a network of petrol stations of the KazMunayGas brand. Then, on March 14, 2003, under Order No. 80 of the President of KazMunayGas NC JSC, Uzakbai Karabalin, KazMunayTeniz Offshore Oil **Company (OOC)** was established, in order to participate in oil operations in the Caspian and Aral seas and coastal territories. It was entrusted with offshore oil projects, as well as with ecology of sea, flora, and fauna. A year later, in March 2004, another new subsidiary KazMunayGas Exploration Production JSC was formed as part of KazMunayGas through the merger of Uzenmunaigas JSC (7 fields) and Embamunaigas JSC (37 fields, of which 2 are in conservation). It became the third in the Republic of Kazakhstan in terms of annual crude oil production and had residual balance oil reserves in the amount of 1,200.2 million tons, recoverable reserves - 269 million tons of oil, 34 billion cubic meters of natural gas and 2.9 million tons of condensate.

The main objective of KMG Trade House from the very first days of its establishment was to set up a competitive, innovative, and highly efficient downstream company, while its main achievements were the active expansion of the retail network of KazMunayGas petrol stations, more effective implementation of the state program to support agricultural producers and arranging supplies of cheap fuels and lubricants to villages during the sowing and harvesting campaigns. Its objective was also to develop extensive marketing channels



Zhakyp Marabayev,

1993, Director of the Maritime Department of the Ministry of Energy and Fuel Resources of the Republic of Kazakhstan, 1993-1995, Deputy President of KazakhstanCaspiShelf JSC

for the sale of petroleum products, as well as large-scale projects on the modernization of three large refineries of the country aimed at introducing new and efficient technologies and production, increasing refining capacity and depth, as well as producing high-quality petroleum products that meet international environmental quality standards. Business process management at the refineries was brought up to industry-leading levels. International financing was secured, production safety was ensured, environmental risks were reduced, and corporate governance and human resources policy were improved. Later, the inclusion in the company's asset portfolio of Caspi Bitum JV LLP (50%) and the large Romanian holding Rompetrol Group, with its refineries, petrochemical plants and an extensive network of petrol stations throughout Europe, (in 2010, KMG TH was renamed KazMunayGas – Refining and Marketing JSC) enabled it to consolidate its status as a significant player in the Eurasian market with a population of several hundred million people.

In the few years since the establishment of Kaz Munay Teniz, there have been promising offshore hydrocarbon areas established in the Caspian Sea.

KMG EP, in turn, immediately focused on implementing its growth strategy by embarking on a major geological survey and supplementary exploration in addition to the development of the existing fields in its arsenal. This resulted in the discovery



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Aset Magauov, 2021-2016 General Director of KAZENERGY Association

of new deposits, as well as the purchase of oil assets, both in Kazakhstan and abroad.

"When KMG EP was founded, it inherited old fields – such is the fate of national oil companies in all countries. New investors tend to come to work in new fields, while the old ones remained state-owned, with people, social concerns, etc. In order to develop and enter new exploration projects, there needs to be investment. However, it has not been possible to profit from the exploitation of the old fields. Therefore, KazMunayGas and KMG EP began buying out shares in new field development projects in the domestic market. (...) We must become an equal among the strongest," - this is how Uzakbai Karabalin, who headed KazMunayGas in 2004, described the goals and objectives of the new conglomerate.

As Zhakyp Marabayev, KMG EP's CEO from 2004 to 2006, later recalled, the management was ready to meet the challenges set by our parent company: "If we have to work onshore, we will develop the fields onshore, and if we have to work offshore, we will go there – the sea does not scare us. We are not limited to the territory of Kazakhstan, we are also ready to operate abroad, but to do so we need to improve our performance to be more attractive and interesting".

The ambitious plans of KMG EP to expand its resource base was made possible by the successful arrangement of external financing. During the initial offering of common shares on the Kazakhstan Stock Exchange (KASE) in September 2006, and Global Depositary Receipts (GDRs) on the London Stock Exchange, KazMunayGas conceded 40% of shares to foreign and Kazakh investors, including domestic pension funds. KMG EP itself managed to raise US \$2.3 billion in the results of the IPO compared to the planned US \$2billion. This enabled it to expand locally and internationally.

According to Zhakyp Marabayev, the value of KMG EP "grew by leaps and bounds as we streamlined our business processes." He added "We have managed to readjust almost the entire management system. In fact, there has been a global transformation of the company, not only technically but also corporately. We have done a lot of work with all ministries, departments, and members of parliament. It was very difficult to explain the need to motivate management, which at the time was not completely formed. Our IPO program was based on real opportunities," he said.

Over the next few years, KMG EP used the funds raised from the IPO to carry out several deals that enabled it to significantly increase its production and reserves of hydrocarbons. The company managed to increase its consolidated reserves by around 33% and production by around 47%, as a result of the US \$1 billion acquisition of a 50% stake in Kazgermunai JV in 2007, the US \$150 million acquisition of a 50% stake in CCEL (Karazhanbasmunai). In late 2009, as result of acquiring a 33% stake in PetroKazakhstan Inc., it moved up from the 3rd to the 2nd place among Kazakh oil and gas majors. The acquisition of a 50% stake in Ural Group Limited (UGL) from Exploration Venture Limited (EVL), the 100% owner of Ural Oil and Gas LLP, for US \$149.1 million in March 2011, soon brought dividends to KMG EP in the form of new deposits at the Fedorovsky block. Acquisitions of shares in oil producers Mangistaumunaigaz, Kazakhoil-Aktobe, Kazakhturkmunay, and others contributed to an even greater increase in the share of oil and gas production by the company in Kazakhstan.

Although the plans of KMG EP to enter foreign markets and purchase high-yield exploration and production assets abroad with lifting costs well below those of its existing Kazakh assets were not successful, the company still managed to become a serious player with large investment opportunities. This was evidenced by its ranking of 101 in the Platts Top 250 Global Energy Company Rankings in 2010.

Returning to the national oil and gas holding, its significant growth and the strengthening as a major player in the market enabled the state to increase its share, first in the North Caspian project in 2008 and in the Karachaganak project in 2011. This clarified their future and fundamentally changed the balance of power in the largest and most profitable oil and gas assets in the country. As Karim Massimov, Kazakhstan's Prime Minister, recalled: "Despite unprecedented lobbying pressure from outside, the authorities have secured the country's national interests while remaining within the framework of existing
legislation and international standards. The Government will continue to pursue a firm policy of protecting national interests in the commodities sector of the economy."

Today and over a period of many years KazMunayGas JSC has been part of Samruk-Kazyna Sovereign Wealth Fund (NWF) established under the Decree of the President of the Republic of Kazakhstan dated October 13, 2008 No. 669 entitled "On Some Measures on Competitiveness and Sustainability of National Economy" and Decree of the Government of Kazakhstan dated October 17, 2008, No. 962 entitled "On Measures to Implement the Decree of the President of the Republic of Kazakhstan dated October 13, 2008 No. 669". This led to the merging of joint stock companies Kazyna Sustainable Development Fund and Samruk Holding for Management of State Assets. The Fund, which consolidated stakes (participatory interests) in national development institutions, national companies (including KazMunayGas), and other legal entities aimed at improving their competitiveness in global markets. From the outset it has been a fundamentally new and strong structure capable of reacting guickly to changes in external and domestic market conditions and defending national interests in international oil operations.

Thanks to state policy, the years since independence have led to a redistribution of power on the hydrocarbon map of Kazakhstan, where the national company is now dominant. Now at the 30th anniversary of sovereignty and after more than one reorganization (transformation of KazMunavGas Refining and Marketing into KMG International, dissolution of KMG EP. and transfer of KazTransGas to Samruk-Kazyna Sovereign Wealth Fund), the holding is still a powerful force in the oil and gas market of the country. It participates in all strategically important development projects, from the Caspian shelf and pipeline systems to innovative oil and gas chemical production facilities, providing a significant part of the country's oil production. This amounts to about 8-10% of the country's GDP and accounts for the same share of state budget revenues. It also possesses large engineering and research organizations which have become known in many countries of the world. Last but not least it possesses highly professional personnel capable of implementing the most complex international projects.

These policies have been supported for many years by **KAZENERGY**, an independent voluntary non-profit association of legal entities (oil and gas producing, service, and engineering companies) established on November 2, 2005, at the suggestion of Uzakbai Karabalin. Its purpose was to facilitate the creation of favorable conditions for the dynamic and sustainable development of the fuel and energy sector of the Republic of Kazakhstan and to consolidate the interests of major companies in the oil and gas and energy market.

According to Timur Kulibavev, market players acted separately despite the integrated nature of the Kazakhstan oil and gas and energy industry. A large number of international oil and gas and energy corporations were working there. Relations between state and business were regulated by the legislative framework, and main production indicators and investments were growing. "Everyone was forced to defend their interests separately with the state bodies. This did not always facilitate effective dialogue between the official apparatus and business. The parties listened to each other, but did not hear each other. (...) Under these circumstances, there was a need for a kind of "mediator" of initiatives between the government and market participants. At the time, the establishment of such an organization in the market in Kazakhstan was unprecedented. There had only been weak attempts to bring its participants together which did not lead to effective results. We wanted to create a non-profit organization for constant and effective interaction with government agencies for all industry companies", he said.

"The two areas of greatest concern to the companies were taxation and environmental legislation. The latter was a matter of concern due to the lack of a clear description of the standards. The state authorities supported us and a separate working group was set up. Chevron financed a preliminary review of environmental legislation, and as a result, a number of proposals were drafted. These were incorporated into the Environmental Code in the spring of 2016. First of these was the requirement to obtain permits for gas flaring for technological reasons, regulation of greenhouse gas emissions, and temporary storage of oil waste. In terms of tax legislation, progress was made on the scale of export duty levied, linked to the price of oil, and a preferential Mineral Extraction Tax rate. These and other issues were resolved thanks to the association acting as a unified "force". The government agencies also saw the issue thoroughly researched, backed up by the necessary analyses and letters from companies. I think they were also comfortable making decisions in such conditions," he said.

As soon as the KAZENERGY Association was founded, Coordination Councils were established to oversee important areas of activity. These included oil and gas sector development, offshore oil operations in the Caspian Sea, power generation, energy-saving and renewable energy sources, Kazakhstani human resources, taxation and law-making, and Extractive Industries Transparency Initiative. The main area of their activities was the review of information on economic, political, environmental, social, and other aspects. They were also focused on the discussion, monitoring, and drafting proposals for legislative regulation of energy-related markets, participation in drafting and implementation of program documents of the government and line ministries on the OIL AND GAS OF KAZAKHSTAN

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2016-2018 Minister of Energy of the Republic of Kazakhstan

development of the oil and gas and energy industries. Since its establishment, KAZENERGY has held the Eurasian Energy Forum in the capital of Kazakhstan with the participation of reputable international majors, and this event has become an effective dialogue platform to discuss topical industry issues. In terms of the evolution of oil and gas governance at the state level, it has undergone significant changes since 1997, when certain regulatory functions were transferred to national holdings. Thus, by Government Resolution No. 1433 dated November 22, 1997, the Ministry of Energy and Natural Resources was transformed into the Ministry of Energy, Industry and Trade (MEIT). After the abolition of the MEIT in December 2000, its functions were transferred to the new Ministry of Energy and Mineral Resources (MEMR). The Ministry of Oil and Gas was established based on Decree of President Nursultan Nazarbayev as of March 19, 2010, No. 936 entitled "On Further Improvement of the State Control System of the Republic of Kazakhstan". It was headed first by Sauat Mynbayev, the previous head of the MEMR, and since 2013 - by Uzakbai Karabalin. The line ministry took over the responsibility of KazMunayGas to represent the government in major oil and gas projects, such as Karachaganak and Kashagan. As Nursultan Nazarbayev explained, the transfer was due to the fact that "KazMunayGas should be exclusively commercial in nature: only then should it become a national champion, a corporation

of international standing, something I strive to achieve every year by adding new assets to this company". Due to the lack of coordination in the activities of various state bodies in the electricity sector in 2014 and an appeal by power engineers to the Prime Minister of the Republic of Kazakhstan to establish a Ministry of Energy in the Republic, a Presidential Decree dated August 6, 2014, was issued transferring the functions and powers of the Ministry of Oil and Gas, as well as a some of the powers of the Ministry of Industry and New Technologies and the Ministry of Environment and Water Resources to the newly established Ministry of Energy. Vladimir Shkolnik was appointed Minister, Uzakbai Karabalin was appointed First Deputy Minister, Kanatbek Safinov was appointed Executive Secretary, Talgat Akhsambiyev, Bakhytzhan Dzhaksaliyev, Magzum Mirzagaliyev were appointed deputy ministers. The leadership of the line ministry has changed over the past period, with Kanat Bozumbayev becoming Minister in 2016-2019 and Nurlan Nogayev becoming Minister in December 2019.

At the present time, the Ministry of Energy develops and implements state policy, coordinates the management process in the oil and gas, petrochemical industry, transportation of hydrocarbons, uranium mining, state regulation of oil products, gas and gas supply, trunk pipelines, electric power, heat supply from thermal power plants and boiler plants that produce thermal energy in the district heating zone, as well as nuclear energy and the development of renewable energy sources. It is possible that in the future, following the lessons learned from the recent market shocks associated with the sharp fall in global oil prices and hydrocarbon demand resulting from the long Covid-19 pandemic, the structure of government in the oil and gas sector may again be transformed to meet new global challenges. New industry strategies will again be developed and adopted with an emphasis on oil and gas. Time will tell.

One thing remains unchanged: the oil and gas complex of Kazakhstan still plays an important role in the country's development, as it did 30 years ago, providing a significant part of the country's tax revenues and contributing about a quarter of its GDP. This will continue for many years to come, as long as the Kazakh land is rich in hydrocarbon resources.





DEAR FRIENDS AND COLLEAGUES!

The 30th anniversary of Independence of the Republic of Kazakhstan is a special day for all Kazakhstanis. This milestone anniversary is a symbol of pride for our country, for the historical achievements of the people who defended their sovereignty and free development.

The enormous contribution of Kazakhstani oilmen to all the achievements and victories must be noted. For three decades they have created and developed reliable and effective oil and gas projects which are justly considered to be the national heritage of the country. As a result of their dedication and selfless work, as well as with the personal support of the first President of Kazakhstan Nursultan Nazarbayev, unique innovative production facilities at the Tengiz, Karachaganak and Kashagan fields appeared in Kazakhstan within a short time, as well as the opportunity to export Kazakhstani hydrocarbons to world consumers through the Caspian Pipeline Consortium system, the Kazakhstan-China Oil Pipeline and the Asia Gas Pipeline. Oil refining capacities have been modernized to meet international petroleum products quality standards. The Gasification Project in Nur-Sultan, the capital of sovereign Kazakhstan, has become a new symbol of Independence, demonstrating improvements in the country's well-being.

The Head of State Kassym-Jomart Tokayev has made progress in the formation of the oil and gas chemical industry, which is to bring our oil and gas industry to a completely new stage of development. The application of innovative solutions in all sectors of the industry contribute to an increase in production efficiency, environmental safety, and strengthening social guarantees for our citizens.

Many projects have long become a Kazakhstan's brand in the global arena. All these high achievements, which are reflected in this book, are the result of hard daily work and professionalism of hundreds of thousands of industry professionals.

Today, there is a great potential for further development in the oil and gas sector. The work and talent of every oilman is important to achieve new impressive goals, energy security and economic prosperity. I believe that the enthusiasm of young specialists backed up by the experience of industry veterans will be the key to a successful future.

I wish all oil and gas industry professionals and all citizens of Kazakhstan good health, prosperity and success in your future endeavors!

Magzum MIRZAGALIYEV, Minister of Energy of the Republic of Kazakhstan



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DEAR COLLEAGUES AND READERS!

Please accept my congratulations on the occasion of the 30th anniversary of the independence of the Republic of Kazakhstan. This is a significant date that demonstrates the country's political and economic success. This success is based on the oil and gas industry.

Over the past years, Kazakhstan has trodden a difficult path in its development, and as a result, it is now a firm part of the world oil architecture. Today our country is among the top 15 countries in terms of oil reserves.

Billions of investments by the participants in the Tengiz, Kashagan and Karachaganak oil and gas projects, and the Caspian Pipeline Consortium have enabled the Republic to increase the production and export of crude oil and natural gas, replenish the volume of cash receipts to the National Fund and the country's budget, and improve social infrastructure. Against the background of increased production, other related segments are also developing. Oilfield services, mechanical engineering, and new jobs are emerging and the share of Kazakhstan goods, works and services is growing.

It should be noted that, for many years, the multilateral activities of the KAZENERGY Association have contributed to the growth of industry indicators, the improvement of the legal framework in subsoil use, as well as the strengthening of relations between the Republic and the largest international partners.

Kazakhstan is a key center of attraction for investments and new technologies throughout Central Asia. Our country is ready to confront new challenges related to climate change, decarbonization and energy transition.

I hope that this book will become an encyclopaedia, a guide to the history of the development of the oil and gas industry in Kazakhstan. Already the young generation of Kazakhstan appreciate the timeliness of the steps that oil workers once made at the dawn of independence, those who dreamed of preserving, increasing and bequeathing the treasures of our country to descendants.

Timur KULIBAYEV, Chairman of the KAZENERGY Association

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Chapter **2**

"KNOWLEDGE OF LAWS IS NOT ONLY IN REMEMBERING THEIR WORDS, BUT **UNDERSTANDING THEIR MEANING.**"

> Marc Tullius Cicero, politician and philosopher, one of the greatest orators of Ancient Rome

LEGISLATIVE TRANSFORMATION

n the early days after state independence, having designated the oil and gas industry as a priority for the development of the economy, Kazakhstan, began to develop the regulatory environment necessary for its full and effective functioning. This was necessary to ensure the most suitable working environment for investors, on the one hand, and compliance with national interests, on the other.

In the process of development of Kazakhstan and its integration into the world community, as well as the global development of the hydrocarbon market, there was a perceived need to improve legislation. It should be noted that the oil and gas industry at that time was one of the main and significant "juggernauts" in the country's economic growth and promoting foreign investments.

Nursultan Nazarbayev, commenting on the first legislative initiatives of the state in the field of subsoil use, wrote: "The lack of laws regulating oil operations was a negative factor that hindered investment in the Republic". During the 30 years of independence in Kazakhstan, several entire new laws and regulations governing the relationship between the state and investors in subsurface use have been developed. Over this 30-year period, many of the best legislative practices have been adopted and some of the laws have been so significantly improved that today they could well serve as an example for other countries of the region.

The laws adopted in the first years of Kazakhstan's independence provided a powerful impetus to the development of the oil and gas industry.

On December 27, 1994, the President of the Republic of Kazakhstan Nursultan Nazarbayev signed the Law "Concerning Foreign Investments" of the Republic of Kazakhstan No. 266-XIII. It was adopted in order to create a favorable investment environment, and to provide a legal and economic basis for attracting foreign capital to Kazakhstan.

At this time, major Western oil companies were beginning to show serious interest in the Kazakh oil and gas industry. In Soviet times, the oil industry had operated almost in isolation, and now they saw a lot of opportunities in the new Kazakhstan. Foreign investors were sure that they would be welcomed with open arms, bringing capital, technologies, and asset management experience to a young and emerging country. However, despite the serious need for money and innovations, the Kazakh Government never intended to give oil and gas assets on any terms to the West. The lack of money, technology and experience in working with the international corporations was fully compensated by the presence of a huge resource base, and the serious gualifications of Kazakhstan oil workers. This was also well supported by previous achievements associated with the discovery of giant fields, the construction of oil refining and transportation of hydrocarbons in the Soviet period.

According to the recollections of Ural Akchulakov, who in 1994-1998 was the Head of General Administration of Mineral

Resources in Kazgosnedra, the working groups on foreign investment legislation consisted of economists, lawyers, geologists, geophysicists, who were sent abroad to study the legislation of the international oil powers. "We studied the experience of America, Canada, the Netherlands, Japan, Germany, France, Turkey. However, it was impossible to implement it automatically in Kazakhstan, we had to adapt it to our country's environment," he said. - "At that time, we were negotiating with major oil companies as part of the government group. We prepared contracts and licenses. The foreigners knew that we had never worked in market conditions, and had no experience in negotiations. Company representatives made huge promises in exchange for permission to work in Kazakhstan. During one meeting, I asked the secretary to bring a certificate for this or that company and I started asking guestions such as: "Why have your assets been steadily falling over the past five years? Why do you have reduced funding for geological exploration? Why has oil production fallen?". The foreigners were very surprised by my awareness. Then when negotiations began, we were able to defend our public interests, and they achieved their own".

According to Ural Akchulakov, the matter of attracting investments and introducing new technologies into the oil and gas industry was top priority. However, it was important to think not only about the development of fields and production facilities in the oil fields, but also to take into account the interests of society. Therefore, the representatives of akimats were included in the working group participating in negotiations on a particular project. Their job was to defend the interests of their region, including to attract funds for personnel training and social infrastructure development in the regions.

The Law "Concerning Foreign Investments" was designed to protect foreign investors from risks resulting from legislative changes that could exacerbate their situation. It also provided guarantees against expropriation and illegal actions of the state bodies and officials, granted the right to compensation for damage as a result of an armed conflict, to free use of investment income, free settlements in foreign currency, dispute resolution in the courts of Kazakhstan or international arbitration. The document was enthusiastically received by investors who were the first to come to work in Kazakhstan.

"The existence of such a Law was very well welcomed by all investors. I think that this Law played a big role in attracting huge investments in the oil and gas industry of Kazakhstan, and it remains relevant to this day. If before there was no legislation that regulated and protected investments, then such conditions appeared", recalled Uzakbai Karabalin who served as the Deputy Minister of the Oil and Gas Industry of the Republic of Kazakhstan in 1994. "The Law concerning investments was developed in accordance with the general system and the interests of the state, which provided mineral resources for investors. It should be noted that no country can satisfy the wishes of investors 100%, and this could not be expected in Kazakhstan. Nevertheless, many

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Ural Akchulakov, 1994-1998 Deputy Director of the Main Department of Mineral Resources of Kazgosnedra

investors believe that Kazakhstan had a fairly favorable investment environment from the outset. Today this environment remains, and every year it is being improved in the direction of providing greater comfort for investors".

In order to facilitate the attraction of foreign investments in the development of Kazakhstan's oil and gas resources, another equally important document was being developed at that time - the Law "Concerning Oil".

"At that time, there was only one flight to Alma-Ata from abroad - a Lufthansa flight which arrived early on Tuesdays. Visas were sold at the airport, and by 10-11 a.m. the first "walk-in visitors" from various companies and adventurers were arriving at our ministry. All of them were sent to our department. We had to explain to everyone the content of the Law "Concerning Foreign Investment". We tried to find out everyone's interest and potential, and to give recommendations if the visitor was worthwhile. Naturally, under these terms, the Law "Concerning Oil" was in demand as a priority", recalled Galiausat Keshubayev, Deputy Minister of the Oil and Gas Industry of the Republic of Kazakhstan in 1995. "Initially, the draft law development group consisted of 5-6 people. It was headed by Uzakbai Suleimenovich Karabalin who by that time had transferred from the Government Apparatus to the Ministry of Energy and Fuel Resources. The group also included Zhakyp Nasibkaliyevich Marabayey, - earlier the chief specialist of the Ministry of Foreign Economic Relations, Askar Kumarovich Balzhanov, Vice-President of Kazakhstanmunaigas NC and others".

As Uzakbai Karabalin recalled, they needed to develop and adopt a law at very short notice. "And then the Minister decided

to place our group in the third government residence in Almaty, so that no one could distract us from our work. We had been actively studying the laws of many countries", he said.

"I remember that Western lawyers once suggested: "Give us 10 million US dollars, and we will write you a law that will fully satisfy you". At that time, we didn't have that kind of money. So we set to work on our own. The participants of the working group actually occupied a holiday home for weeks on end, working out the provisions of the Law. They wrote out the articles "by hand", cut them out and glued them together. This is how the first Law "Concerning Oil" was formed in Kazakhstan", recalled Zhakyp Marabayev. From 1991 to 1993 he was the head of the hydrocarbon raw materials department of the Ministry of Foreign Economic Relations of the Republic of Kazakhstan.

Maidan Suleimenov, director of the Institute of State and Law of the National Academy of Sciences of the Republic of Kazakhstan until 1995 and who took part in the development of this draft bill, noted that the drafting of the document took more than three years. During the discussions and consultations, about a hundred reviews and comments were received from consulting and law companies, large oil companies with interests in Kazakhstan, including British Gas, British Petroleum, Oryx, Agip, Mobil, Total, Amoco, Chevron, Exxon and others, as well as from the World Bank.

According to Maidan Suleimenov, the main problem when drafting the new legislation was the choice of a system for providing mineral resources for use. "Initially, the draft Law "Concerning Oil" was based only on a contractual system. However, when the draft law was almost completed, I was invited for lunch by representatives of British Gas and said that they were very satisfied with our draft law, since it takes into account the interests of both the Republic and foreign investors as much as possible. So they had no more comments on it. I went back to the group meeting and said: "We must have done something wrong. If the international companies have no comments, it means that the interests of Kazakhstan are not sufficiently protected by the draft law". After lengthy discussions, it was decided to abandon the contractual system, at least for the time being. As a result, a mixed system was selected in Kazakhstan: a license and contract system. This was an obligatory step, since it was impossible to leave everything to the discretion of the contract, when we had no experience in signing such contracts. This would have allowed for huge opportunities for abuse by state officials. At the same time, it was impossible to introduce a licensing system in its purest form, since we would need to have a powerful, well-developed tax system, which we did not have at that time," he commented. - "To a certain extent, the adoption of such system was the result of a kind of compromise between the dominant departments at that time: the Ministry of Geology and Subsoil Protection and the Ministry of Oil and Gas Industrv".

The Decree of the President of the Republic of Kazakhstan Nursultan Nazarbayev No. 2350 "Concerning Oil" which had the force of Law, was adopted on June 28 and was promulgated on July 1, 1995. The Law stated that "All oil of natural occurrence in the subsoil of the Republic of Kazakhstan is the exclusive property



of the Republic of Kazakhstan. The owner of oil raised to the surface is determined by contract. The right to dispose of oil raised to the surface belongs to the owner, unless otherwise provided by the contract". This document regulated the contractual terms with subsurface users: for exploration operations - 6 years, with prolongation twice for two years; for production - up to 25 years, and at fields with recoverable reserves of more than 100 million tons of crude oil and (or) more than 100 billion cubic meters of natural gas - up to 45 years; for combined exploration and production - for such a period that includes the period of exploration and production, taking into account possible prolongation terms. The costs incurred by the contractor during exploration and production were subject to compensation in the manner and on the terms stipulated by the contract. The annual program of work for exploration or production was subject to mandatory approval on the part of the authorized body for the study and use of subsurface resources. A progressive element of the law was the establishment of a ban on the waste dumping into the sea and the sea bed during oil operations.

The Laws "Concerning Foreign Investments" and "Concerning Oil" were the longest-running laws, but they lost their force after the introduction of the new Law "Concerning Subsoil and Subsurface Use" on June 24, 2010. However, on January 27, 1996, Law No. 2828 "Concerning Subsoil and Subsoil Use" was initially adopted to regulate extraction operations to ensure the protection of the interests of the Republic of Kazakhstan and its natural resources, as well as the rational use and protection of natural resources and protection of the interests of subsoil, creating the environment for equitable development of all forms of economic management, strengthening of legality in the subsoil use relations area. According to Serikbek Daukeyev, who headed the Ministry of Geology and Subsoil Protection of the Republic of Kazakhstan in 1996, "this document was the basis for subsurface use". "It was a simple, and understandable for everyone and easy to use. There was also a provision encouraging those persons who discovered deposits, which was subsequently removed (which was a huge mistake), as well as a regulation that a subsurface user should direct 1% of the invested funds to train Kazakhstani personnel. There was

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a simple outline for contract signing and strict deadlines for their consideration".

The Law "Concerning Subsoil and Subsurface Use" was combined with other legislative acts of the Republic of Kazakhstan, in particular, with the Law "Concerning Oil", which had priority provisions. It included the same terms of validity of contracts for exploration, production and combined operations as the Law "Concerning Oil", and, inter alia, provided for contract signing without a tender on the basis of direct negotiations with a subsurface user who has the exclusive right to subsurface use for

production arising from commercial discovery on the basis of an exploration contract. It also provided for the construction and/or operation of underground structures not related to exploration and (or) production, as well as for exploration and (or) production with a national company.

Kazakhstan approached its first 10-year anniversary of independence with a legislative framework that generally defined the main criteria for joint work of the Government and investors.

By this time, there had been discussions on regulating the economic activities of subsurface users in the Kazakh sector of the Caspian Sea, where active geological surveys had been carried out for a number of years. In this context **the National plan for oil spills prevention and response in the sea and inland waters of the Republic of Kazakhstan** was first developed and then ratified. This was achieved by means of **Resolutions No. 876 of the Government of the Republic of Kazakhstan** dated June 29, 1999 and No. 676 dated May 6, 2000.

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Given that Kazakhstan was also exploring its potential in the world water system, the development and further effective use of sea transport was also an important economic factor. Thus the Law "Concerning Merchant Shipping" was first adopted on January 17, 2000 by the Decree No. 284-II of President Nursultan Nazarbayev. It was developed taking into account international maritime law and included administrative, legal, commercial issues, as well as regulations in relation to maritime safety, environmental protection, including the prevention of marine pollution from ships, the prevention of discriminatory measures and unnecessary restrictions affecting international commercial shipping within the territorial waters of Kazakhstan. By this time, the discovery of the giant Kashagan field

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Приватизация

Участие Государства

"Участие государства в данных случае имеет место в условиях частного предпринимательства и выражает степень государственного контреля и воелечения его в деятельность по разведке и добъче, горада большей мере, чем предусматривают объчение соглашения о конциссии."

Выражается через: контракты на обслуживание риска, контракты "нало и роклти", соглашения типа "продакци шеринг" или совместные продпонятия с национальными компаниями.







By accident I found my own materials, which we had once studied and discussed in the group that was preparing the Law "Concerning Oil", based on the presentation by the consulting company. You can see how deeply and in detail the issue was studied (in this case, by me, as the leader of the group). Now, when I look at my notes in the margins, I myself am amazed at how much energy and thirst for knowledge we had, to ensure that our Law was "no worse than that of others" and I fully protected the interests of our young Republic.

I think it will be interesting for our readers.

(From the commentary of Uzakbai Karabalin during work on this publication)

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> had already been announced in Kazakhstan. The giants Tengiz and Karachaganak and other oil-producing fields were also increasing their production of raw materials. The most urgent issue was the operation of tankers to organize transportation of Kazakh oil through the Caspian Sea to neighboring states and further to world markets. The Law dealt with all aspects of ownership of vessels, identification, flag and nationality, technical supervision of vessels, as well as their registration and rights to them. In particular, pursuant to article 11 of the Law, a vessel enjoying the right to sail under the national flag of the Republic of Kazakhstan enjoys the nationality of the Republic of Kazakhstan. At the same time, a vessel of the nationality of the Republic of Kazakhstan shall be obliged to fly the flag of the Republic of Kazakhstan. In addition, specific procedures for the transportation of goods and passengers by sea were defined. The entire technological process was regulated - from vessel preparation to load cargo, sea crossing, to cargo delivery to the recipient, as well as the registration of appropriate documentation both in coastal and foreign navigation. The legal regulations laid down in the Law created a legal basis for the production activities of subjects for transportation, trans-shipment, and storage of goods using maritime transport infrastructure. The issues of claims and lawsuits in the field of merchant shipping were also considered. A separate section of the draft law was devoted to the activities, legal status and economic aspects of seaports, the largest of which in Kazakhstan at that time was the Aktau International Commercial Sea Port on the Caspian Sea.

> In the same year, a 50% participation of the national holding in all industrial contracts in the country was established by Government Decree No. 708 of the Republic of Kazakhstan dated June 29, 2002 "On Approval of the Rules for Representation of State Interests by the National Company in Contracts with Contractors Carrying out Petroleum Operations, through Required Equity". This took into account the strategic interests of the state and calculations represented by KazMunayGas. Based on proposals from the national oil and gas company, the Government would henceforth annually approve the list of subsurface areas (blocks) proposed for investment programs. It would show those provided by the competent authority on the basis of direct negotiations, as well as those for which the national company would have a mandatory and specific participation share.

> An important part of the provisions of the "Strategy for Use of Energy Resources of Kazakhstan and the Strategic Development Plan of the Republic of Kazakhstan until 2010" adopted at that time was the development and approval of **Decree No. 1095 of the President of the Republic of Kazakhstan dated May 16, 2003**

of the State Program for the Development of the Kazakhstan Sector of the Caspian Sea (KSCS). The adoption of the relevant program, in fact, meant the activation of work in the Kazakhstan Sector of the Caspian Sea. Subsequent to the approval of this Decree, the Government of the Republic intended to start tendering for the exploration of offshore structures, of which, according to oilmen, there were about one hundred. By the order of the head of KazMunayGas CJSC, Uzakbai Karabalin, KazMunayTeniz CJSC was formed within the structure of the national company. It was charged with overseeing a number of projects in the Caspian and Aral Seas, including the Zhambai, Khvalynskoye, Tsentralnoye, Nursultan, and Kurmangazy structures. By this time, a tender for exploration works on the Zhambai offshore structure had already been announced. The state program covered the development period for 2003-2005, while simultaneously assessing and predicting development until 2015. The global trend towards increasing the importance of the sea shelf as a source of minerals, especially oil and gas, as well as the need to combine the rational use of natural resources with the requirements of environmental protection were also taken into account. While setting out the procedure for the transition from mainly geological exploration to the use of KSCS hydrocarbon reserves, the State Program aimed to turn KSCS into the main hvdrocarbon production zone in the Republic of Kazakhstan. In addition to the development of the offshore oil and gas complex at KSCS, it also considered the possibility of improving the associated industrial, social and environmental facilities.

It should be noted that for many years in Kazakhstan, oil operations both onshore and offshore of the Caspian Sea were performed pursuant to Production Sharing Agreements (PSAs). which in many respects were very profitable for foreign investors. The PSA mechanism, which was vital for the country in the early 1990s, played a key role in attracting investors to the oil and gas industry. However, these operations were not regulated by law in any way. In order to fill this gap, on July 8, 2005, the Law of the Republic of Kazakhstan No. 68-III "Concerning Production Sharing Agreements (Contracts) during Offshore Oil Operations" was adopted. The validity period of the PSA did not exceed 35 vears for combined exploration and production, 25 years for production operations and 45 years for unique reserves. It was envisaged to extend the right of subsurface use for oil production by concluding a new PSA for fields under development, provided that the contractor fulfilled its obligations. An advantage of the law was that the national company passed on at least 50% equity participation in all contracts made by the Kazakhstan PSA in the sea. It also took into account the economic interests of the state, such as the introduction on the territory of the Republic of high technology, development of new processing facilities, mainline and other pipelines, infrastructure and other facilities, as well as the use of petroleum operations of goods, works and services of Kazakh origin in the amount determined in PSA. It thus ensured the delivery of a certain volume of contractor oil for processing within the country, the provision of a signature bonus based on the economic value of the deposit and forecast calculations of the volume of minerals and commercial discovery bonus. The downside was that the PSA excessively insured investors against all kinds of risks. The state began to profit from the exploitation of national natural resources only after investors reimbursed their own costs. In addition, foreign companies were removed from national tax liability, and exempted from paying excise taxes on oil, excess profits tax, land and property tax. Subsequently, the Kazakh authorities became disillusioned with the PSA. The law became invalid on January 1, 2009 and it was decided that previously signed PSAs would not be reviewed.

Considering that, along with the goals of increasing oil production onshore and offshore, the oil companies faced the task of transporting the extracted hydrocarbons to world markets, the Law of the Republic of Kazakhstan dated March 26, 2003 No. 396-II ratified a Framework Agreement on the Institutional Framework for the Establishment of Interstate Oil and Gas Transportation **System**. The corresponding agreement was signed in Kiev on July 22, 1999, and 21 states joined. It established uniform rules and mechanisms to ensure the effective operation of the interstate oil and gas transportation system in accordance with international practice. It contained the main obligations related to the Kyoto Agreement on environmental issues, provided for guarantees for the safety of transport infrastructure, the establishment of rules governing issues related to the design, financing, rehabilitation, construction, as well as maintenance of the intra-state sections of the interstate oil and gas transportation system.

In the period from 2003 to 2008, in order to ensure not only reliable transportation, but also the deep processing of crude oil and the sale of petroleum products on the domestic market, a number of laws were adopted for the first time in the country setting out the relationships between participants in this segment.

The Law of the Republic of Kazakhstan No. 402-II of April 7, 2003 "Concerning State Regulation of Production and Turnover of Certain Types of Petroleum Products" established the conditions for the sale of petroleum products, introducing a ban on the use of leaded gasoline, as well as the sale of substandard petroleum products and their storage without further processing on the territory of the country. The action **plan for the formation of world-class petrochemical** complexes in Kazakhstan and the creation **of the first Kazakhstan petrochemical complex brought the processing segment to a new** qualitative level of development by establishing the production of high added value products. The law was adopted by the Resolution of the Government of the Republic of Kazakhstan No. 989 of October 13, 2006.

The Law of the Republic of Kazakhstan No. 7-IV of July 5, 2008 "Concerning Transfer Pricing" regulated public relations arising from transfer pricing, in order to prevent losses of state revenue in international business transactions and deals related to international business transactions.

In the process of reforming subsurface use legislation, the state established clear rules for the oil and gas industry which was increasingly becoming the mainstay of the country's economy, and a guarantee of the safety and prosperity of the citizens of Kazakhstan. Against the background of the increase in hydrocarbon production, the barrel price on the world markets increased significantly. If in December 1998 the average monthly price of Brent fell to a minimum value of US \$10 per barrel, then six months later prices doubled, and by July 2008 they reached a maximum of US \$146.08 per barrel. All this gave the authorities grounds to review the tax base for oil production and transportation. On December 10, 2008, the Code of the Republic of Kazakhstan "Concerning Taxes and Other Mandatory Payments to the Budget" (Tax Code), which entered into force on January 1, 2009, was adopted. It provided for an increase in the tax burden on the raw materials sector, the introduction of an export customs duty (ECD) on oil and a rent tax, which increased the tax burden on the oil and gas companies.

Representatives of the international companies, when comparing Kazakhstan's hydrocarbon reserves with the two North Seas, stated that for the further effective development of the oil and gas industry, the tax legislation in the republic for foreign oil investors should not be changed, not at least until they began to receive sufficient profit from the development of fields. This was the case, in particular, with investors who began developing the Brent and Fotis fields in the North Sea back in the 1970s. The contract terms for them changed only 15-18 years after the commencement of exploration work there, i.e. after investing huge investments in the deposits development and receiving the same huge income. However, the Kazakh authorities had their own views on this.

By 2009, the Head of State set the Parliament and the Government of Kazakhstan new objectives for the further improvement of the legislation in the field of subsoil use. In the context of the further reform of the oil industry, Nursultan Nazarbayev instructed the adoption of a new Law "Concerning Subsoil and Subsurface Use" in the country. The new law would radically simplify the system of granting rights to explore deposits in it and ensuring the return to the state of those fields whose owners did not invest in their development. Thus, according to the President, the deposits would be protected from the practice of ill-considered speculation, and make it possible to attract new investments in their exploration.

The new Law of the Republic of Kazakhstan "Concerning Subsoil and Subsoil Use", signed by the President of Kazakhstan on June 24, entered into force on July 7, 2010, replacing two laws - the Law of the Republic of Kazakhstan No. 2350 "Concerning Oil" dated June 28, 1995 and the Law of the Republic of Kazakhstan No. 2828 "Concerning Subsoil and Subsoil Use" dated January 27, 1996. With its adoption, the Law "Concerning Production Sharing Agreements" dated July 8, 2005 also became invalid. The new law represented a more complete integration of laws and regulatory legal acts. It contained detailed procedures and deadlines, for example, granting the right to subsurface use, preparation, negotiation, signing and registration of contracts, termination/ possible extension of subsurface use rights, priority right of the state, and permission of the competent authority to transfer shares. The law expanded and clarified the powers of various state authorities, providing new definitions.

It also provided for sanctions in the event of violations of procurement legislation. According to the results of 2010, 70 oil and

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> gas companies which had violated their contractual obligations and the provisions of the Law "Concerning Subsoil and Subsurface Use" on the Kazakh content received notifications – the first step towards termination of the contract. The government took a tough stance against violators. It expressed its intention to unilaterally terminate the contract ahead of schedule, if the subsoil user did not eliminate more than two violations specified in the notification.

> Prior to the adoption of this Law, exploration contracts were granted for a 6-year period, providing for two extensions of 2 years. as well as prolongation of the evaluation period. The duration of production contracts ranged from 25 to 45 years and also allowed prolongation. Contracts for combined exploration and production were granted for a period of 6+25 (45) years, with possible prolongation. Since 2010, the duration of the exploration was made six years, with an extension possible only once for two years and only for marine contracts. Evaluation terms were also extended. The duration of production contracts was determined by the production plan (extensions are possible). Contracts for combined exploration and production were permitted only for strategic fields and/or fields with a complex geological structure. Also, henceforth in the event of a commercial discovery, no later than 3 months after the completion of the exploration contract, the subsurface user could apply for a production contract. With a period of 2 months, the parties were required to establish the amount of Kazakhstan participation in terms of goods, works, services and personnel, as well as payments for social infrastructure. Within 3 months, the protocol of the direct negotiation meeting had to be signed, and within 24 months - the contract for production. At the same time, other necessary contractual obligations included a signing bonus (the amount and terms of payment); payments for social infrastructure; the percentage of Kazakhstani personnel; training of local specialists; purchase of domestic goods, works and services; provision of equal conditions and remuneration for Kazakhstani personnel (including subcontractors); fines for non-compliance with the requirements for Kazakh participation; obligations for processing (recycling) of associated gas (for production contracts). In the event of disagreement with the proposed conditions, the subsurface user lost its exclusive right to direct negotiations, and the right to extract was put up for tender. The successful bidder who accepted all the conditions of the competent authority, was obliged to reimburse exploration costs to the subsurface user who made the commercial discovery as a one-time payment within 3 months from the date of signing of the contract. In addition, if previously there had been no established list of required documents or a time frame for issuing a state refusal for the priority right and

the permission of the competent authority, then with the adoption of the Law in 2010, this gap was eliminated. The law required the submission of the request and documents in Russian and Kazakh, and in the case of foreign applicants - notarized translations into both languages.

Then, in compliance with the provisions of the new Law concerning Subsoil, more than 50 by-laws were adopted in the country. However, more than a year after the adoption of the new Law concerning Subsurface Resources, lawyers were forced to point out many shortcomings that hindered the normal operations of the subsurface users in Kazakhstan. These shortcomings had to be eliminated as soon as possible.

On March 1, 2011, in order to further strengthen the influence of the public sector on the economy, with the adoption of amendments to Law of the Republic of Kazakhstan No. 413-IV ZRK "Concerning State Property", the country introduced the concept of a "nationalization" into legislation for the first time in its sovereign history. This was still something feared not only by foreign investors, but also, as it seemed at the time, by the government itself, which preferred to talk about "restoring the balance of interests". The authorities claimed that "nationalization is a process of seizure of property, which is used only in emergency cases, when all other forms of seizure or coordination with the owners of property have been exhausted". It promised to resort to this rule of the law really "in extreme cases", when there is a "threat to national security", while paying compensation to investors. These innovations were met with hostility by operating companies who believed that they could lead to the freezing of a number of oil and gas projects, especially at low oil prices. The Kazakh authorities, in turn, were confident that it was time to turn back the history of the development of the country's oil and gas complex, which from now on, based on improved legislation, should work for the benefit of every citizen of Kazakhstan.

In order to create a comprehensive legal framework in the field of energy saving, as well as the formation of a national infrastructure in the field of energy saving to ensure the transition of the economy to energy-efficient development on January 13, 2012 the President of Kazakhstan Nursultan Nazarbayev signed the Law of the Republic of Kazakhstan "Concerning Energy Saving and Increase in Energy Efficiency". The document regulated the provisions on establishing the competence of state bodies in the aims of modernizing the production, storage, transportation and consumption of energy carriers, as well as the monitoring and supervision of the effective use of energy resources, establishing measures of responsibility for compliance with the law in the field of energy conservation and energy efficiency. It was intended also to create a state energy register, in which subjects with a consumption of more than 1.5 thousand tons of conventional fuel per year were required to undergo an energy audit. Based on its results, they would draw up plans for energy saving measures and ensure an annual reduction in energy consumption. According to Albert Rau, Vice-Minister of Industry and Trade, by analogy with EU countries, the authorized body in the field of energy saving, the akimats introduced voluntary agreements in the field of energy

saving which were to be signed between large enterprises in the register. This agreement stipulated the level of reduction of energy intensity of the enterprise on a yearly basis. Commenting on the adoption of the Law at that time, Sauat Mynbayev, the Minister of Oil and Gas of the Republic of Kazakhstan noted that given the importance of energy conservation and energy efficiency in all spheres of the economy and society, "everyone should be interested in its effective implementation – the state, the business, and the population of our country".

Following this, on January 29, 2012, the President Nursultan Nazarbayev signed the Law of the Republic of Kazakhstan "Concerning Gas and Gas Supply", which defined the legal, economic and organizational bases for regulating public relations in the field of gas and gas supply in Kazakhstan. The aim was to create conditions for ensuring the internal needs of the republic for gas. Until that time there had been no such law in Kazakhstan. The document provided for the development and approval of the general gasification scheme. This in fact was a step-by-step plan for the modernization of existing and construction of new gas supply system facilities, the necessary financial resources and their sources, as well as promising resources of commercial and liquefied petroleum gas. State regulation of the prices on the domestic gas market was also streamlined. In addition, for the first time in the sovereign history of Kazakhstan, the Law introduced



OIL AND GAS OF KAZAKHSTAN

30 YEARS OF INDEPENDENCE PATH TO CREATION

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2012, Minister of Oil and Gas of the Republic of Kazakhstan

the definition of a national operator. By Decree of the Government of the Republic of Kazakhstan No. 914 dated **July 5, 2012, the state company KazTransGas JSC was appointed as the national operator in the field of gas and gas supply of Kazakhstan.** The main goal of KazTransGas as a national operator was to ensure the domestic needs of Kazakhstan for commercial gas. This company was entrusted with the responsibility of providing centralized operational and dispatching control of the technological operation of the unified gas supply system with commercial gas (UGSS) and the implementation of wholesale and retail sales of commercial gas. The aim was to resolve the strategic task of gasification of the country at the expense of domestic gas resources.

On June 22, 2012 the President of the Republic of Kazakhstan Nursultan Nazarbayev signed Law No. 20-V of the Republic of Kazakhstan "Concerning the Main Pipeline", aimed at bolstering the economic and energy security of the Republic of Kazakhstan by regulating relations in the field of the main pipeline, of strategic importance for the country's economy. One of the key provisions of the document was the consolidation of the priority right of state participation in the project of any newly created main pipeline, which can be both public and private. The priority right of the State did not apply to cases of expansion of the existing main pipeline, when pipes are replaced in separate sections or parallel lines of the pipeline are installed.

According to Sauat Mynbayev, Minister of Oil and Gas of the Republic of Kazakhstan in 2012, "at that time, the regulatory legal framework in the field of the main pipeline did not meet the existing needs, an important part of these legal relations was not regulated at the legislative level and did not create a sufficient basis for the adoption of by-laws". All this significantly hindered the development of the infrastructure of the main pipelines. Sauat Mynbayev added, "with the adoption of the Law of the Republic of Kazakhstan "Concerning the Main Pipeline", the issues of systematization of the current legislation were resolved, and gaps in the legal regulation of public relations developing in the field of the main pipeline were filled".

Indeed, the adoption of a new law in this area was more relevant than ever before, taking into account the annually increasing oil production.

The Law also introduced the institution of national operator. In accordance with the Resolution of the Government of the Republic of Kazakhstan dated October 8, 2012 No. 1273, the state oil pipeline company KazTransOil JSC was designated as the national operator for the main oil pipeline. The company was granted the exclusive right of operational management of the trunk pipelines in which the state or state-owned companies owned more than 50% of the voting shares. The main duties of the national oil pipeline operator were: ensuring the interests of the Republic of Kazakhstan and other participants in relations when transporting products by trunk oil pipelines to the domestic and foreign markets; ensuring the innovative development of the trunk oil pipeline system and its integration into the world energy system; developing and submitting proposals for draft regulatory legal acts aimed at improving legislation of the Republic of Kazakhstan related to the trunk pipeline; participating in the development of draft regulatory and regulatory-technical documentation in the field of trunk oil pipelines. The national operator was also responsible for the development and implementation of state and national programs for the development of the oil and gas sector in terms of oil transportation through participation in the preparation and implementation of international agreements in the field of oil transportation through trunk pipelines. It also was responsible for participation in international projects aimed at strengthening energy security and diversifying oil transportation routes.

Meanwhile, an independent analysis of the Law "Concerning Subsoil and Subsurface Use" as of June 24, 2010 in force at that time, by experts from the World Bank and the University of Dundee (Great Britain), showed that from the point of view of investment attractiveness, the current legislation of the Republic of Kazakhstan in the field of subsurface use was fragmented, contained many uncertainties, subject to frequent changes, difficult for investors to understand, inefficient, overly regulated and, most importantly, did not meet the current form of economic organization of our country. This was primarily due to the fact that the legal regulations in this area inherited the Soviet experience, based on a command and planned economy, while largely ignoring the realities of the market economy. The attention of the legislators was mainly focused on the development of previously explored deposits of hydrocarbons and solid minerals. The current regulation did not fully take into account all the features and diversity of existing legal relations on the use of subsurface resources and their resources, as well as relations that have developed, but remain unresolved to this day.

The Address of the President of the Republic of Kazakhstan to the people of Kazakhstan "Kazakhstan's way – 2050: Common aim, common interests, common future" dated January 17, 2014, noted: "It is important for us to increase the efficiency of the traditional upstream. This is our natural competitive advantage. We need new approaches to the management, production and processing of hydrocarbons, while preserving the export potential of the oil and gas sector. We need to finally decide on possible scenarios for oil and gas production. It is important that we increase the development of rare earth metals, given their importance for high-tech industries - electronics, laser technology, communication and medical equipment. Kazakhstan should enter the world market in the field of geological exploration. We need to simplify the legislation for foreign engineering companies in order to attract investments in this industry".

Thus, the Law concerning Subsoil Resources in force at that time, having fully achieved the historical mission assigned to it for the development of previously discovered deposits and the formation of a system of general regulation of exploration and production of solid minerals and hydrocarbons, needed to be replaced by new, more progressive, comprehensive and systematic legislation. Such a law was signed by President Nursultan Nazarbayev on December 27, 2017. This was the Code of the Republic of Kazakhstan "Concerning Subsoil and Subsurface Use" No. 125-VI ZRK. The innovations of the Code were recognized as corresponding to the best international practices. The document provided for the transition to an international procedure for evaluating reserves; simplification of the granting of subsoil use rights by analogy with the Australian model by introducing a licensing procedure on the principle of "first come, first served"; providing guarantees for the stability of subsurface use conditions; ensuring the availability of geological information with its translation into digital format; openness of data concerning subsurface use conditions and final beneficiaries. In the oil industry, the state retained the priority right in relation to strategic areas for hydrocarbons, where KazMunayGas National Oil and Gas Holding is present.

As Bolat Akchulakov, the Vice Minister of Energy of the Republic of Kazakhstan, commented, the adoption of the Code was aimed at resolving those objectives when there is a need for a compromise between the interests of the state and investors' expectations. "For example, the Code provided for the possibility of signing contracts for subsurface use in terms of hydrocarbon raw materials on the principle of combining exploration and production. In other words, a potential investor engaged in oil and gas exploration, if commercial reserves are discovered, subsequently has the opportunity to switch to production under a single contract. Previously, these stages were divided into two contracts, and the investor who carried out exploration and discovered hydrocarbon reserves spent considerable time on drafting and preparing a new contract. As a result of the improvement of the investment environment and additional investment attraction, an increase in explored oil and gas reserves is expected, which is really important for Kazakhstan", he noted.

The adoption of the Code helped to attract new investments in geological exploration with the aim of discovering new mineral deposits. The positive effect of liberalizing the legislation on subsoil and subsurface use of Kazakhstan, and bringing it in line with the best international practices should lead to enhanced interest on the part of investors and an increase in production in the country by 10-13%. This in turn will lead to an increase in tax revenue from subsurface users by approximately 300 billion tenge per year, GDP growth by 1.9-2.5%, as well as an increase in employment in the industry and the growth of services of servicing and contracting organizations.

The Code of the Republic of Kazakhstan "Concerning Taxes and Other Mandatory Payments to the Budget" was simultaneously adopted with the Code "Concerning Subsoil and Subsurface Use". This was all part of the program set out by the Head of State to improve the investment environment and attract additional investment. This document which became one of the most discussed and criticized in 2017 due to its initial volume and complexity, canceled the commercial discovery bonus in the geological exploration and proposed an alternative tax on subsurface use for offshore and deep oil and gas fields.

Another important document regulating the activities of oil and gas companies in Kazakhstan is the new Environmental Code of the Republic of Kazakhstan dated January 2, 2021 No. 400-VI ZRK. Its adoption led to significant changes in the principles of operation of oil and gas enterprises, whose interests were directly and significantly affected by innovation. The document signed by the President of the country was put into effect on July 1, 2021, with the exception of some cases, and obliged companies to invest significantly in the best available technologies. It replaced the previous principle of "pay and pollute" with "a polluter pays", while at the same time it introduced a 10-fold increase in administrative sanctions for excessive emissions into the environment. The previous Environmental Code, which had been in force in the country since 2007, underwent about 70 amendments, and was eventually recognized as imperfect and gave way to a new version. Now it will be more beneficial for subsurface users to eliminate the violation than to pay a fine. This will also reduce the number and complexity of accidents that periodically occur at oil and gas industry facilities.

Over the 30 years of sovereign development, the young and growing country of Kazakhstan has been building its unique foundation of lawmaking, constantly improving laws in the field of subsurface use. The Republic did not copy the "economic miracle" model but boldly set out on the path of progress chosen by itself. The resulting mechanism of relations between the state and investors has enabled the country to attract multibilliondollar investments, ensure GDP growth, and implement social infrastructure projects. Today the stability of legislation and predictability of the Government's behavior are key factors in the attractiveness of the investment environment in Kazakhstan.



Today, the oil and gas sector is a foundation for our development, bringing in a significant part of the country's total tax and export revenues. It is also an object of interest for foreign direct investment. The wide presence of world leaders in the energy industry in our country testifies to the attractiveness of the region for investors.

JSC NC KazMunayGas is the national leader of the oil and gas industry in Kazakhstan. Being one of the flagships of the economy of Kazakhstan, KazMunayGas is growing and developing together with our state. The priorities of the group of companies have been and remain to promote the strengthening of the independence of our Republic, strengthening its position in the global oil and gas community and sustainable development of the country's economy.

Today we can say with confidence that we are living in a strong and prosperous state with a stable economy and ambitious plans for the future.

I wish our country further development and prosperity, and I wish people of Kazakhstan happiness and prosperity!



Alik AIDARBAYEV, Chief Executive Officer of NC KazMunayGas JSC

58 OIL AND GAS OF KAZAKHSTAN

30 YEARS OF INDEPENDENCE

ANCIENT TREASURY IN THE SUBSOIL

Chapter **3**

"NOT ONLY MUST WE DEVELOP OUR UNDERGROUND MINERAL RESOURCES, BUT PROTECT THEM!"

Kanysh Satpayev,

well-known academic geologist, and first President of the Academy of Science of the Kazak Soviet Republic n the early days of independence, Nursultan Nazarbayev, the First President of Kazakhstan, said: "... blessed are the people whose country abounds in subsoil riches. Since ancient times, the poets have sung of this land as "maily kiyan" – "the land treated in miracle oil".

According to information from the State Reserves Commission of the Republic of Kazakhstan, the liquid hydrocarbons reserves (oil and natural gas liquids) in Kazakhstan amount to 5.3 billion tons, 4.8 billion tons of which are oil reserves, and the rest – 445 million tons of natural gas liquids.

Officially, the Republic has 332 hydrocarbon deposits (271 oil fields and 61 natural gas liquids fields). However, only slightly more than 250 fields have been explored in the country, and extraction comes from approximately 55 oil and gas fields. The largest of these are Kashagan (oil and gas), Tengiz (oil and gas), Uzen (oil and gas), Karachaganak (oil and gas condensate), Zhanazhol (oil and gas condensate), and Kalamkas (oil and gas). These fields have provided the main

yield from oil and gas field operation during the entire period of the country's independent development.

The vast majority of Kazakhstan's fields are associated with subsalt deposits and lie at depths of about 5 thousand meters or more. Most of them present unique geological features.

As confirmed by the audit of De Golyer & Mac Naughton International Independent Consulting Company, prepared in accordance with the international PRMS standards, as of December 31, 2020 proven and probable hydrocarbon reserves (2P) of the national oil and gas holding KazMunayGas alone made up 635 million tons of oil equivalent (4,894 million barrels of oil equivalent) – a decrease of 6.1% compared to 2019 as a result of mature fields development, lower oil prices and exchange rate volatility. Proven reserve multiplicity (1P) of the annual production amounted to a period of 16 years, which is significantly higher than the average among the largest international oil companies in the world – about 11 years.

In the first years after independence, the state of subsurface use for hydrocarbon facilities was shown in the unique map developed by Kazakh geologists in the 1990s, containing invaluable geological information. As Bulat Uzhkenov recalled, in 1995, as Head of General Administration of Mineral Resources, Kazgosnedra under the Ministry of Geology and Subsoil Protection of the Republic of Kazakhstan, all 16 oil and gas basins with hydrocarbon deposits, as well as the infrastructure available at that time, were located on the map. The territory of Kazakhstan was split latitudinally and longitudinally into blocks, with a block size of 10' of the geographical net onshore and shelf of the Caspian Sea. The map included deposits and contours of the contract areas for which licenses/contracts were issued, as well as State Fund deposits, and field numbers. The contours of the areas are marked with the names of the subsurface users. In the explanatory tables to the map, their items, type and names of subsurface user companies were given to the numbers of deposits according



Chapter **3** ANCIENT TREASURY IN THE SUBSOIL



Bulat Uzhkenov,

1995, Director of the Main Department of Mineral Resources of Kazgosnedra at the Ministry of Geology and Subsoil Protection of the Republic of Kazakhstan

to regions. The concepts of 1° "superblock" and "semi-block" were introduced. On 16 November, 1995, the Government of the Republic of Kazakhstan issued Resolution No. 1552 "Concerning the approval of the Map of blocks and hydrocarbon deposits prepared for geological study and development". In this way the attention of large private investors was drawn to the industry. The map was updated on a quarterly basis and was available to all subsurface users and potential applicants for subsurface use. Based on this map, the Ministry of Geology and Subsoil Protection accepted requests for the geological study and development of mineral resources for hydrocarbon raw materials. It should be noted that most of the international subsoil users who came at that time are still operating in Kazakhstan to this day.



FROM A PROFESSIONAL POINT OF VIEW, "EURASIA" IS A COMPLETELY DIFFERENT LEVEL OF APPROACHES AND TECHNOLOGIES. IN ADDITION TO THE MAIN GOALS, IT WILL PROVIDE INVALUABLE INFORMATION ABOUT THE DEEP GEOLOGICAL STRUCTURE OF THE REGION, WILL HELP IN ESTABLISHING THE PATTERNS OF DISTRIBUTION OF HYDROCARBONS AT GREAT DEPTHS.

According to the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan, as of 2020, 15 sedimentary basins with forecasted recoverable resources of fuel equivalent to 76.4 billion tons have been allocated in Kazakhstan. These are Caspian, Ustyurt-Buzashi, Mangyshlak, Aral, Syr-Darya, North Torgay, South Torgay, North Kazakhstan, Teniz, Shu-Sarysu, Ili, Balkhash, Alakol, Zaisan and Priirtysh.

The discovery of the potential of Kazakhstan's hydrocarbon resources in the new conditions was made possible by enormous work of Kazakhstani scientists, all competent geologists and oil men. In 2012-2015, by order of JSC NC KazMunayGas, they performed a comprehensive study of the sedimentary basins of the Republic of Kazakhstan. The Kazakh Institute of Oil and Gas under

Reserves category	Hydrocarbons n of oil equivalen	drocarbons million barrels oil equivalent		s million barrels lent
	2019	2020	2019	2020
Proven (1P)	3860	3550	499	459
Proven and probable (2P)	5220	4894	676	635
Proven and probable and possible (3	P) 6089	5832	790	757

Net reserves¹ in accordance with the PRMS standards, as of December 31, 2020

Source: 2020 report, JSC NC KazMunayGas







the leadership of Uzakbai Karabalin performed extensive work. The main objective was to re-evaluate the oil and gas resource base. The result was the preparation of the "Scientific justification of the hydrocarbon potential of the Republic of Kazakhstan", based on which the Atlas of oil and gas-bearing and promising sedimentary basins of the Republic of Kazakhstan was published. This was the first time that such work demonstrating the potential of domestic geological science and practical professionals had been performed in Kazakhstan during the period of sovereignty. This helped raise the assessment of the recoverable oil and gas resources of the Republic by more than three times – from 22.7 billion tons to 76.4 billion tons.

According to Uzakbai Karabalin who held the post of the First Vice-Minister of Energy of the Republic of Kazakhstan in 2015, the insufficient level of knowledge of the sedimentary basins under the existing assessment methods led scientists to undertake research and system analysis of the data. "All available data concerning geological and geophysical studies, including subsoil seismic exploration, gravimetry, and magnetic electric exploration etc., was comprehensively investigated. The data and results of aerial studies were also used", he commented. "After performing a scientific analysis of the hydrocarbon potential of Kazakhstan, our scientists made recommendations for each of 15 basins, in order to define further prospecting surveys. New facilities and horizons in the subsalt complex of the Caspian Basin have been identified as a key priority".

The award of high state awards was recognition of their largescale work during the years after independence. On December 15, 2015, on the eve of Independence Day, at the Akorda residence, President Nursultan Nazarbayev presented State Prizes in the field of science and technology in honor of Al-Farabi for a series of works on the topic "Scientific justification of the hydrocarbon potential of the Republic of Kazakhstan" to six authors of an invaluable geological study: Ural Akchulakov, Deputy General Director of AkAi Consulting LLP, Geroy Zholtayev, Head of the Department of Oil and Gas Geology of Satbayev University, Kurmangazy Iskaziyev, General Director of JSC KazMunayGas Exploration Production, Pyotr Kovrizhnykh, Deputy General Director of Geoken Research and Production Center LLP, Baltabek Kuandykov, President of Meridian Petroleum LLP and Evgeny Ogai, Deputy General Director for Development and Drilling of KazMunayGas Research and Development Institute of Production and Drilling Technology.

As Nursultan Nazarbayev stressed during the presentation of the state award: "This business area is extremely relevant in our time. Science and technology have enhanced our thinking, and expanded human capabilities. It is of great importance that we are implementing new developments that form the foundations of the advanced economies".

According to Pyotr Kovrizhnykh, one of the winners of the state prize, "The Al-Farabi State Prize in the field of science and technology is being awarded this year for the first time, and it is a great honor, a great pride that our work was among the first seven prize winners. Such high recognition of the works of our team is extremely inspiring, and at the same time commits us to maintain

Chapter **3** ANCIENT TREASURY IN THE SUBSOIL

the same high bar in the future and not negate the effectiveness of our works".

Kazakhstan scientists and oil men clearly understand that, despite the policy of decarbonization of economies announced worldwide, there will be no alternative to oil and gas in the foreseeable future. Even if the growth rates of their production and consumption slow down, their dominant role in the global energy balance will remain for many years to come. However, as the Minister of Oil and Gas of the Republic of Kazakhstan, Uzakbai Karabalin, emphasized, the era of "light oil" remains in the past, and the main oil and gas resources of the Earth now need to be searched at depths of 7-15 km. This assumption was based on the discovery of deep-seated large deposits of Tupi in Brazil and Tiber in the waters of the Gulf of Mexico, as well as a significant increase in deep geological surveys around the world.

"The development of the oil and gas industry in Kazakhstan was mainly due to the development of deposits in the Caspian Basin, where 75-80% of hydrocarbon resources are concentrated. However, within 15-20 years, we can expect a decrease in production at the largest fields of Tengiz, Karachaganak and Kashagan. The resource base can be replenished mainly by exploring deeper horizons where professionals predict the probability of detecting about two dozen large (more than 300 million tons) hydrocarbon deposits at great depths. The discovery of new super-giants is also expected", he commented.

However, analysis has shown that despite active geological surveys, the quality and detail of the seismic data still do not meet current requirements. Therefore, the subsoil of Kazakhstan, and especially the potential of the deep horizons of the Caspian Sea, still remains insufficiently studied in comparison with other countries which are major developers of hydrocarbon resources. So, the degree of study of the sedimentary basins is very different: five – developed, five - under-investigated, five – with little promise.

In foreseeable future, Western Kazakhstan will remain a key oil and gas producing area and at the same time a promising oil and gas region of the country, while the Caspian oil basin is the most attractive for investors. However, for the further clarification of the qualitative and quantitative estimates of the prospects of oil and gas occurrence of the Caspian Basin, as well as the ranking of zones by the degree of prospects and the magnitude of forecast hydrocarbon resources, there is a need for detailed geological models of the basin. This will be achieved by a range of geological and geophysical studies, including seismic, gravimetric, magnetometric, electrical exploration and other types of geological exploration. Taking all this into account, a few years ago, Nursultan Nazarbayev ordered the intensification of geological surveys in Western Kazakhstan, in order to identify new discoveries in the oil and gas industry. "It is essential that we intensify the exploration of new fields. Oil and gas production tends to grow, reach a peak and fall. You, oil producers, are aware that even our largest fields – Tengiz and Karachaganak will reach their peak in 10-15 years. If we do not add new volumes by exploration during this time, things will begin to look deplorable. We know that there are huge undiscovered deposits in the Caspian basin at a depth of 6-7 thousand meters. There are also huge oil and gas reserves along the edges of the salt deposits, but exploration has lagged far behind in recent years. KazMunayGas, the Ministry of Energy, and the Government should pay attention to this and involve global



THE REPUBLIC OF KAZAKHSTAN

Location map of licensed fields and blocks of hydrocarbon raw materials



companies in oil and gas exploration", he noted at the meeting in Atyrau with the akims of the western regions.

The interests of the world oil and gas majors in the hydrocarbon treasury of Kazakhstan were quick to respond.

In October 2013, during the VIII KAZENERGY Eurasian Forum held in Astana, Kazakhstan oil men presented a largescale, unprecedented geological exploration project unique in the CIS. This project named "Eurasia" was aimed at exploring the ultra-deep layers of the Caspian Basin – up to a depth of 14-15 km. This was the case not only in Kazakhstan, but also throughout the Eurasian land mass! Previously, domestic geological prospectors had drilled wells only to a depth of 5-7 thousand meters, however, exploration has given Kazakhstan such world-record deposits as Kashagan, Tengiz, Karachaganak. With the deep research and drilling that was implied by the Eurasia Project, the country's extraction industry has incredible potential. An ambitious project initiated by Kazakh geologists and oil men, and which promises serious investments and global production growth in the Caspian Basin in the future, has the potential of becoming a new discovery in the global geological survey. Such was the opinion of the oil men. The news about a fundamentally new project in the field of geological exploration caused such a remarkable resonance that at its presentation during the KAZENERGY forum, some participants could not find seats and they listened to the speakers standing up.

The Eurasia Project developed by the KAZENERGY Association, so named due to their geographical location on the border of Europe and Asia, represented a completely different



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> professional level of approaches and technologies. In addition to the main goals, it provided invaluable information about the region's deep geological structure, as well as helping to establish patterns of the hydrocarbon distribution at great depths.

> "We have studied the experience of drilling deep basins such as the Gulf of Mexico, as well as the latest achievements in Brazil and Sakhalin. Industrial oil inflows have been achieved there at depths of 10 kilometers. All this led us to the idea of carrying out a detailed study of the materials of the Caspian Basin within Kazakhstan and Russia", he said during a round table meeting concerning "New opportunities for geological exploration in Kazakhstan". President of the Society of Petroleum Geologists of Kazakhstan, Baltabek Kuandykov, noted that the Eurasia Project, is as good an option as any as a testing ground for progressive scientific tests under KAZENERGY Eurasian Forum.

> Uzakbai Karabalin, the Minister of Oil and Gas of the Republic of Kazakhstan during the round table meeting said that since the depth of the Caspian basin is about 20-25 thousand meters, and there is a huge volume of oil generating rocks, Kazakhstan's potential may be doubled. "The exploration will be performed not only in the Kazakhstan section of the Caspian Basin, but also in wider territories under the jurisdiction of the Russian Federation, since Eurasia is a joint project for the future. The Caspian Sea is only part of the Caspian basin which stretches to Orenburg, in the north - to Aktobe and in the east, and the Volga region in the west. This is a large region which, according to experts has great prospects and has great potential in generating hydrocarbons. However, until today we have explored and studied only in the socalled adjacent zones of this basin", he said.

> According to forecasts of Russian independent research institutes, the unexplored deep subsurface of the Caspian Sea may contain up to 40 billion tons of conventional oil. According to Kazakhstani experts, there is a probability of discovering two dozen hydrocarbon deposits with reserves of more than 300 million tons. First of all, this will allow Kazakhstan to provide the oil and gas industry with a stable resource base – as a "strategic reserve" of hydrocarbon raw materials. Secondly, it will prevent a production drop in the country. Thirdly, it will become the foundation of energy security and a protective mechanism in the case of possible economic tremors.

The expensive and technically complex work on the Eurasia Project will consist of three stages (the first – collection and re-processing of materials from previous years; the second – conducting a large-scale geological and geophysical study; the third – a new Caspian-1 drilling support and parametric well).





ONE OF THE SPECIFIC FEATURES OF THE PROJECT IS THE CURRENT ABSENCE OF A DRILLING RIG CAPABLE OF DRILLING A VERTICAL WELL TO A DEPTH OF 15 KILOMETERS, AS WELL AS ALL THE WELL FITTINGS, PIPES AND REAGENTS. IF THERE IS A CONTRACT TO BE AWARDED, THE LEADING COMPANIES ARE READY TO BEGIN DESIGN AND CONSTRUCTION.



OIL AND GAS PROSPECTIVE SEDIMENTARY BASINS



Chapter **3** ANCIENT TREASURY IN THE SUBSOIL

It will require significant investments from public and foreign corporations which express a desire to participate.

As Uzakbai Karabalin noted, the high hydrocarbon potential of the Caspian Basin is well known to professionals and does not need additional advertising. Therefore, the majority of the international companies from Russia, Europe, the USA, and Asia working in Kazakhstan have expressed their unconditional interest in taking part in the project. "Our task is to create a favorable investment environment through a balanced system of guarantees, benefits and preferences, in order to reduce technical risks and financial burden for this ambitious project", he commented.

Kazakhstan, which is preparing for the implementation of the new large-scale and unprecedented Eurasian Project,

understands that its business blueprint needs to be based on the principle of non-discrimination between its participants. The participation shares, rights and obligations of the participants shall be determined by a Consortium Agreement in accordance with the legislation of the Republic of Kazakhstan. The benefit for Kazakhstan and Russia is to acquire fundamentally new technologies for geophysical exploration and superdeep drilling. This will provide invaluable experience for the two countries, as well as information concerning the hydrocarbon potential of the deep-lying horizons of the Caspian Lowland. This will enable the development of a strategic brief for subsequent prospecting surveys. It is assumed that all the project information will be stored in Kazakhstan, but the members of the Eurasian Consortium will have the right of free access to.

Today, proof of the undiscovered potential of Kazakhstan's subsoil is the announcement in February 2021 of the discovery of a large hydrocarbon field in Tepke subsoil site located on the territory of two districts – Mangystau and Beineu in Mangystau region, closely bordering the Caspian oil basin. This deposit of hydrocarbons is the largest discovered in the region in recent years.

Nº Basin	Basin	Facility	resources, million tons of fuel equivalent		ranking by volume of geological resources/ group
	racinty	geological	extracted		
1	Caspian	PZ, MZ	89716,9	63132,4	I (10 billion tons and more)
2	Ustyurt-Bozashinsk	PZ, MZ	8117,14	1848,01	II (3-10 billion tons)
3	Mangyshlak	PZ, MZ	6355,6	4011,63	
	Western basins, total		104189,64	68992,04	
4	North-Torgai	PZ	5439,5	1087,9	II (3-10 billion tons)
5	South-Torgai	PZ, MZ	4037,7	1450,0	
6	Shu-Sarysu	PZ	3723,6	1114,3	
7	Syrdaria	PZ	3696,6	924,2	
8	Aral	PZ, MZ	3168,0	950,4	
9	Balkhash	PZ	1997,9	399,5	III (1-3 billion tons)
10	Priirtyshskiy	PZ, MZ	1947,8	584,3	
11	Alakol	MZ+KZ	1008,0	302,4	
12	lli	MZ+KZ	803,4	265,7	IV (up to 1.0 billion tons)
13	North-Kazakhstan	PZ, MZ+KZ	512,31	102,41	
14	Teniz	PZ	422,2	126,7	
15	Zaisan	PZ, MZ+KZ	396,4	118,9	
	Eastern basins, total		27153,41	7426,71	
	Resources, million tons of fuel equivalent, total		131343,1	76418,8	

BASIN CHARACTERISTICS IN TERMS OF THE VOLUME OF FORECAST C₃, D₁, +D₂ CATEGORY RESOURCES

As part of the work, it is planned to attract investments for the exploration of 5 poorly studied oil and gas prospective sedimentary basins, the forecast resources of which are estimated at 4.5 billion tons of conventional fuel.

In March 2021, in order to enhance the geological study of the country's territory, the Ministry of Ecology, Geology and Natural Resources, KazMunayGas National Oil and Gas Holding and KazGeology National Geological Exploration Company signed a cooperation agreement.

The overall assessment of investments in Kazakhstan geological exploration by the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan demonstrates the need to invest 800 billion tenge in examining subsoil potential in 2021-2025. At the same time, research into the deeper horizons in the territory of the five developed basins (Caspian, Ustyurt-Bozashi, Mangyshlak, South Torgay, Zaisan) will be carried out at the expense of private investments. State budget funds will be directed towards the poorly studied basins (North Torgay, Priirtysh, Aral, Syr-Darya, Shu-Sarysu).

As a result of the geological research carried out by Kazakhstani scientists, it is likely that in the next decade a significant part of Kazakhstan forecast resources will be transferred to the category of proven ones. This will enhance the country's place and role in the global oil and gas arena. Kazakhstan's high hydrocarbon potential and the favorable geographical position along major transport routes set the country apart as a promising region for prospecting surveys. The potential of oil and gas development is so extensive that despite skeptical statements concerning the imminent decline of the oil era, it can now confidently be said that there will be enough mineral resources in Kazakhstan for future generations. Thus, the expectations of Kazakh oil companies to increase crude oil production to an annual volume of 150 million tons are quite feasible.





When Kazakhstan gained independence, the country's leadership, foreseeing a progressive and prosperous future, created conditions for attracting foreign investment, new technologies and new ideas.

From the first days, Kazakhstan has focused on building a market economy to attract investment. This gave investors confidence in their investment, and an excellent example of this is Chevron's time-honored partnership with Kazakhstan, the Tengizchevroil Joint Venture.

Our joint work was based on trust, transparency and partnership. From this, our relations with Kazakhstan began to develop. We believe that energy contributes to human progress. We see this all over the world when we provide affordable, reliable and clean energy that is used by billions of people around the world every day. We also see it here in Kazakhstan, where our successful partnership has been a catalyst for economic development, job creation, business support, community development, opening up new opportunities for people and advancing critical sustainable development goals.

We are proud of our joint achievements over the past three decades, and I am confident that our future cooperation will allow us to surpass the achieved successes.

On behalf of Chevron, I congratulate Kazakhstan on the 30th anniversary of independence and wish all Kazakhstan good health and prosperity.



Nigel HEARN, President EurAsia Pacific Exploration and Production Co at Chevron

PRODUCTION GIANTS

Chapter **4**

"THE MEEK SHALL INHERIT THE EARTH... BUT NOT ITS MINERAL RIGHTS."

John Paul Getty, American industrialist, one of the first dollar billionaires in history



Serikbek Daukeyev, 1993, Minister of Geology and Subsoil Protection of the Republic of Kazakhstan with the Minister of Energy of Turkey In 1993 Chevron was the first major Western company to begin work in an independent Kazakhstan. Kenneth Derr, Chevron CEO, and President of Kazakhstan, Nursultan Nazarbayev, signed the "TengizChevroil" Joint Venture Agreement to develop the giant Tengiz field.

espite the crises and shocks that periodically plunge the world oil market into depression, as well as the large-scale regional and supranational measures of the world's largest economies, the Kazakhstan oil and gas industry has demonstrated stability from year to year, traditionally providing strong support to the country's budget. Half of all oil production in Kazakhstan is provided by the oil titans – Tengiz, Karachaganak and Kashagan who are constantly increasing the production of hydrocarbons, investing billions of dollars in improving production technologies. The largest oil corporations representing these unique mega-projects in the world came to the country at a time when the Republic was taking the first steps towards independence, and they stayed for many years.

At the initial stage of independence, when no one in the world knew about Kazakhstan, and the situation was so difficult that exploration wells began to be conserved one after another due to the lack of high-strength casing pipes that needed to be purchased abroad, the first investment "swallow" was the creation of the Kazakh-Turkish joint venture Kazakhturkmunay. The founding agreement on the establishment of the Kazakhturkmunay Joint Venture was signed between the Ministry of Geology and Subsoil Protection of the Republic of Kazakhstan and the Turkish National Oil Company (TPAO) on January 9, 1993. A month later – on February 4, 1993 – the first joint venture established in the oil industry of independent Kazakhstan was registered, with a participation share in 49% of the TPAO and 51% of the Republic of Kazakhstan. Bakhtykozha Izmukhambetov, who headed the joint venture, recalled that all Turkish specialists and managers of the joint venture received the same salary as the Kazakh ones. "25% of the production costs were directed at social issues of the regions. All the decisions were made only taking into account and after the consent of the Kazakh side. The Turkish company brought advanced world equipment and technology of the USA, Western countries, Japan. We had complete understanding and mutual respect. We tried to accept the best aspects of Turkish management", he noted.

The joint venture demonstrated the willingness of foreign companies to work in the oil and gas industry of the newly independent country, and also raised the level of confidence in the young oil state among the international community.

Following the TPAO, other foreign oil and gas companies, representing the United States, Great Britain, Italy, Norway, and China, were attracted to Kazakhstan.



On behalf of ExxonMobil, I sincerely congratulate the people of Kazakhstan on the 30th anniversary of the independence of your state. Today, the sovereignty and territorial integrity of the Republic of Kazakhstan does not raise any doubts – it is a huge multinational country that embodies tolerance, modernity and a high level of education.

The forward-looking policy proclaimed by the leadership of the Republic has made Kazakhstan an investment-friendly country attracting a large share of foreign direct investment in the region. Over the past 30 years, the oil and gas industry has transformed Kazakhstan society, and the industry itself has undergone changes in the process, making the country one of the largest leaders in hydrocarbon production, thanks to the hard work of world-class Kazakhstan professionals. Throughout this time, a spirit of cooperation has allowed industry and government to work together as Kazakhstan moves to create a legislative and regulatory framework that meets high international standards.

ExxonMobil is proud that the company was able to contribute to the development of the country through its participation in three world-class projects – Tengiz, Kashagan and the Caspian Pipeline Consortium. We look forward to further developing such a successful partnership as we begin to move in a new direction – ensuring sustainable growth while helping the world move towards a low-carbon future.

Once again, I want to congratulate the people of Kazakhstan and wish them good health, prosperity and a bright future.




Chapter 4 PRODUCTION GIANTS

TENGIZ "EMPIRE"

A real sensation that revealed the economic potential of Kazakhstan and contributed to the formation of a favorable image of the country on the international arena was the arrival of the famous American corporation Chevron to the giant Tengiz field in the Atyrau region, which was then claimed by Russia. The scale and geological features of the Tengiz deposit, characterized by abnormally high intra-reservoir pressure (more than 830 kg/ cm), high temperature and high content of hydrogen sulfide, required completely new approaches that Moscow did not have at that time. A well-known accident that occurred three and a half decades previously confirmed the inability of Soviet oilmen to operate the large scale Tengiz without the necessary technologies and funding. On June 23, 1985, oil and gas were released into

the atmosphere at well No.37 from a depth of more than 4 km. The burning column rose to a height of 200 meters, as a result, 3.4 million tons of oil, 1.7 billion cubic meters of gas (including 516 thousand hydrogen sulfide), 900 thousand tons of soot were released into the atmosphere. The radius of the negative impact of the accident was estimated at 400 kilometers. The battle with the elements lasted for a year and the well was silenced only in July 1986 using the technology of a foreign company, Cameron Otis. They had the appropriate equipment and experience to perform such operations. This event was a serious lesson for Kazakhstani specialists.

"In Russia, the oil lobby put a lot of pressure on Yeltsin to transfer the Tengiz field to Russia. I had many unpleasant





Bolat Akchulakov,

2003, Executive Director for Managing Shares in the Joint Ventures of JSC NC KazMunayGas

conversations with Boris Yeltsin on this subject. Once, when meeting Boris Yeltsin in Moscow, he said to me: "Give Tengiz to Russia." I looked at him, I could see he's not joking. I answered: "Well, if Russia gives us the Orenburg region, because Orenburg was the capital of Kazakhstan". He replied: "Do you have territorial claims on Russia?" I answer: "Not at all". He laughed, and so did I. Russia did not have the money and technology to develop such a complex field. If the Russians had got Tengiz then, they would have mothballed the field, and Kazakhstan could have remained their economic hostage," Nursultan Nazarbayev wrote many years later in his book "Kazakhstan's Way".

The partnership with Chevron promised Kazakhstan significant benefits – from large financial investments to innovative technologies possessed by one of the world's largest titans of the oil industry. After long and difficult negotiations, which at times were on the verge of collapse, the leadership of the Chevron was invited to 19.4% of the distributable income instead of 33%, which the company insisted on. The remaining 80.6%, including taxes was to be held by Kazakhstan. The production area of the Tengiz oil field was reduced to 4,000 square kilometers of the originally discussed 23,000 square kilometers, and the term of the lease for up to 40 to 50 years. If the Kazakh terms were not accepted, Nursultan Nazarbayev was ready to cancel the deal.

The 40-year agreement on the creation of the Tengizchevroil Joint Venture (TCO) on the terms of Kazakhstan was signed by the President of the Republic of Kazakhstan, Nursultan Nazarbayev, and the Chairman of the Board of the American Chevron Corporation, Kenneth Derr, on April 6, 1993, which was later called the "contract of the century" in the oil and gas history of the country. This truly historic document marked the beginning of a large-scale project for the development of the largest Tengiz oil and gas field. This required the investment of a total of \$20 billion and had no analogue in the entire post-Soviet region. According to Nursultan Nazarbayev, "in the early 1990s, it was fundamentally important for Kazakhstan that such a large company as Chevron paved the way here, had success and showed the way to other major investors. The entry of the largest world-class companies in the country allowed us to build friendly partnerships with the US Government in general, and their investments became the key to close cooperation between our countries".

As Ravil Cherdabayev, who was appointed as the General Director of the Tengizchevroil Joint Venture in 1993, recalled later: "Our partners represented a capitalist system, a powerful state, and advanced technology. They looked at us warily. We as students of the socialist system, with a communist ideology, a planned economy, as well as Soviet technology and appropriate management methods, in turn, took a closer look at them. We needed to develop a common acceptable system of collective work, without being distracted from the main goal. We guickly found common ground and mutual understanding. We were encouraged by the fact that the knowledge of production and technology and the level of training of Kazakhstani specialists pleasantly surprised our partners. Our specialists, participating from scratch in the construction and launch of the Tengiz complex, as well as successfully extracting oil for two years, had accumulated vast experience, and they generously shared this with their foreign colleagues. The desire of our specialists to accept innovations, and the desire of American specialists to impart them and, in turn, adopt our experience, inspired everyone".

A little later, other large oil and gas companies joined the ambitious Tengiz project, and the equity participation in it was distributed as follows: Chevron (50%), ExxonMobil (25%), JSC NC KazMunayGas (20%) and LukArco (5%) controlled by Russian LUKOIL.

In the period from 1991 to 2000, five Complex Technology Lines (CTL) were built by the project partners over an area of approximately 10 square kilometers in Tengiz, guaranteeing stable production of crude oil in Tengiz. So, with the construction of CTL-1 in 1991 back in the USSR, the first million tons of oil were produced at the field. The start of operation of CTL-2 and two oil demercaptanization units at CTL-1 in 1994, after the arrival of the American Chevron Corporation, allowed us immediately to double oil production. The TCO production complex was significantly strengthened after the modification of CTL-1 in 1995, the introduction of new automatic production management systems and the modernization of power supply systems, the construction of the second complex technological line CTL-2 and the commissioning of a filling overpass for railway tanks in 1996, as well as the completion of the program to improve oil recovery in 1997. In 1998, due to the use of highly sophisticated drilling bits, the drilling speed was increased eight times. The construction of the fifth process train and "Project 12" in 2000 provided for the modernization of infrastructure, expansion of production capacities for the construction of "Process Train 5" and elimination of defects found on the other four trains. After commissioning

OIL AND GAS OF KAZAKHSTAN

30 YEARS OF INDEPENDENCE PATH TO CREATION

Chapter **4 PRODUCTION GIANTS**



Anuarbek Dzhakiyev, 2006, Head of Department, TengizChevroil

of new production facilities, TCO began to produce and pour liquefied propane and butane of European quality into tankers. By its tenth anniversary, with a design capacity of five CTL to the amount of 6 million tons of oil per year, the company achieved impressive production of over 12.7 million tons. At the same time, in comparison with the beginning of the 1990s, the reliability of the

fully automated production complex increased to world standards – 98%.

However, the oil production technologies used at that time had a negative impact on the structure of the Tengiz deposit, as a result of which, within a few years, the reservoir pressure fell by half - to 400 atmospheres. The production regime led to strong volumetric deformations of oil-containing rocks, deterioration of oil inflows, and in some cases to subsidence of geologically younger horizons. In order to increase production, the use of technologies for maintaining reservoir pressure was required. This gave rise to an unprecedented project for the construction of the Second Generation Plant and the Sour Gas Injection (SGP/SGI), which presupposed doubling of production. This gigantic structure included the largest oil refining and gas extraction plants, facilities for pumping gas into a pressure tank, processing gas into propane, butane and commercial gas, as well as for extracting sulfur from hydrogen sulfide. The purpose of the SGP construction was to stabilize oil, remove sulfur-containing components and separate natural gas and sulfur. It was planned to supply gas to the SGI via an in-field gas pipeline and pump it into the reservoir at an unprecedented high pressure - 500 bar. This was the achieved by using a special compressor ordered for this project from the world-famous manufacturer, Nuovo Pignone.

In order to finance the project, the issuing of Eurobonds was organized, and the road show held in Europe and America became one of the most successful in the history for attracting external borrowing in Kazakhstan.

According to Bolat Akchulakov, who in 2003 was the executive director for managing shares in joint ventures of JSC NC KazMunayGas, the initial cost was over \$4 billion. This was a





lot of money at that time, despite the fact that oil prices had just begun to level out to \$20-25 per barrel and were not the highest and most profitable for financing such a large-scale project. "On the day when we had to close the requests book, it was full! This was evidence that Western investors believed in our project. This was the result of the work of our entire team. We managed to close the deal at a little more than 6%. This was much lower than the minimum threshold that we have been given. It was a success, as a result of which we managed to implement the new Tengiz project," he recalled.

The foundation stone of the future facilities was laid at the Tengiz field on July 2, 2002. The operations began with the construction of more than 4000 piles cast from Kazakh concrete with an anti-corrosion coating.

According to eyewitnesses, when the first peg was hammered in a festive atmosphere to mark the beginning of the construction of a gas processing complex in Tengiz, a huge steppe eagle landed on the only trailer on the entire boundless steppe. "Probably, the proud bird, thus, blessed our large construction site, which soon became a symbol of the economy and high production potential of the Republic of Kazakhstan", said Anuarbek Dzhakiyev, Deputy General Director of TCO in 2009-2016. More than 200 domestic companies were involved in the construction of the facilities. For example, contracts were signed with MunayGazKurylys for the road to deliver goods to production sites, with Atyrau Tengiz Construction Services – for the construction of the pipeline base near Kulsary railway station, with Chemimontazh-Atyrau - for the construction of the modern concrete plant in Tengiz, and with the Belkamit plant - for the supply of air heat exchangers. The volume of goods, works and services provided and performed by Kazakh companies at that time broke all possible records, reaching \$2.5 billion.

The SGI project was implemented in two stages. The first stage involved the construction of the gas injection facility equipped with a compressor with a capacity of 35 megawatts, located 12 kilometers from the TCO gas processing plant. At the same time, during the first stage, it was planned to pump purified gas that does not contain hydrogen sulfide into the layers. At the second stage, the compressor was to be transferred to the injection of raw gas already containing hydrogen sulfide into the same wells. The implementation of this project was aimed at increasing oil production in Tengiz by 3 million tons per year.

The development of technical solutions for the SGI project was carried out by TCO specialists together with Parsons Fluor

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Daniel (PFD), who were selected as the general contractor of the SGP/SGI.

On November 6, 2006, TCO started pumping raw desulfurized gas into the formation of the Tengiz field for the first time at the maximum pressure at the compressor outlet of 513 bar. This was one of the highest pressure indicators for reverse injection in the world practice. A year later, on October 22, 2007, the first oil was produced at the SGP, as well as the first injection of the sour gas was made, thus marking the success of a unique project. Prior to this, no project in the world has carried out the reverse injection of sour gas under such conditions, combining such a high reservoir pressure, large volumes of injection and a high content of hydrogen sulfide.

According to Aset Magauov, who served as Deputy General Director of TCO LLP in 2006, when implementing the project, the risks of an early gas breakthrough in nearby production wells were considered. Therefore, a number of situations were simulated, which made it possible to successfully fulfill the tasks assigned to the team of oil workers.

In 2008, the production facilities of the SGP/SGI were put into operation, significantly increasing the TCO's production potential.

"Being a direct participant in the commissioning of the Tengiz oil and gas complex, I remember well that significant day when the first well No. 8 was launched at 6 o'clock in the evening. The oil collection chain in the field was achieved, incorporating measuring unit No.15, the central field manifold and slug catcher, and the





first oil finally reached the plant. These were the long-awaited moments of our work and our aspirations. From that moment, the countdown of the oil Tengiz began", Anuarbek Dzhakiyev recalled.

As a result of the project, the daily oil production at the Tengiz field reached approximately 75 thousand tons (600 thousand barrels), and the daily production of natural gas – 22 million cubic meters (750 million cubic feet). The launch of the SGP at full capacity occurred in the second half of 2008. Since that moment, the company started pumping up to about a third of the extracted sour gas back into the collector. The remaining volumes of gas were used for the production of commercial gas, propane, butane and sulfur. As a result of gas injection into the reservoir and an increase in the oil recovery factor, the volumes of sulfur produced, which by that time had already accumulated about 9 million tons, significantly decreased.

The launch of the project was the culmination of many years of work by the best specialists in the field of design, production and construction. The expansion of production was also a significant achievement for the Kazakh oil industry. Due to the injection of gas into the reservoir and an increase in the oil recovery factor, the volumes of sulfur produced, which by that time had already accumulated about 9 million tons, significantly decreased. Looking ahead, we note that by the fall of 2015, thanks to the project, as well as the operation of granulation plants to ensure the complete processing of sulfur produced by CTL and SGP plants, TCO delivered the last batch of sulfur reserves accumulated on the maps two years ahead of time. Today, the Tengiz production complex is a combination of the most modern and unique technologies, which, perhaps, have no analogue in the world. It is the deepest field in the world. The upper oil reservoir lies at a depth of about 4,000 meters, and the area of the deposit is so large that it would take two marathon distances to run around it. The five CTL, built back in the 1990s, and SGP/SGI facilities, an innovative breakthrough in the oil and gas industry of Kazakhstan in the 2000s ensuring the uninterrupted operation of TCO, are currently successfully collaborating with each other. Investments in the modification of the process lines and the construction of expansion facilities in the amount of \$5.5 billion have long and repeatedly paid off.

The Tengiz oil is known for its high quality. TCO commercial oil consists of light hydrocarbon molecules, which facilitates its processing and production of gasoline, diesel fuel and other petroleum products. Dry and liquefied petroleum gas (LPG), which meets the technical characteristics of the European standards, as well as elemental sulfur, are produced from oil and associated gas extracted at TCO production facilities at Tengiz. This ensures stable and guaranteed sales of products. TCO oil is delivered via the Tengiz-Novorossiysk oil pipeline of the Caspian Pipeline Consortium (CPC) to Europe and North and South America. LPG is shipped to consumers in Kazakhstan and in Europe by rail. Most of the drained gas produced is used in Kazakhstan. High-quality sulfur is sold to countries mainly in the Mediterranean basin and Central Asia, including Kazakhstan, Russia, Ukraine and China. TCO has created an extensive, geographically diverse and reliable

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base of long-term buyers by signing long-term contracts for the sale of its products.

In parallel with ensuring the growth of oil production at Tengiz, the company implemented a gas recycling project, thereby stopping the routine flaring of gas (today flare installations are used only when there is a need for safe pressure relief at the plant). In October 2012, at the global forum on reducing the burning of associated petroleum gas in London, TCO was recognized as a world leader in this field.

For many years, TCO has annually demonstrated strong production indicators, due to the modernization of infrastructure facilities, increased reliability of production equipment, improved parameters of the drilling regime, as well as expanded production capacities using the most modern technologies.

In recent years, the SGP has been working at the limit of its productivity, producing about 43.2 - 43.4 thousand tons of oil per day - about the same as five CTL trains – 41 thousand tons per day. The Nuovo Pignone compressor is also operating at maximum capacity, pumping about 410 thousand cubic meters of crude gas per hour into the reservoir. This is twice as much as at the early operation stage in 2007 – 220 thousand cubic meters per hour.

Kazakh oilmen have always known that the potential of the ambitious and powerful Tengiz is inexhaustible. Therefore, the program of further expansion of the field's production capacity, announced in 2009, shortly after the successful commissioning of the SGP/SGI facilities, even more impressive than the previous one, was perceived as another logical step on the way to Kazakhstan becoming one of the largest and most reliable suppliers of hydrocarbon raw materials in the world.

Despite the huge investment burden that Chevron, ExxonMobil, KazMunayGas A and LukArco incurred during the implementation of the SGP/SGI, it was clear that next stage of production expansion was essential. The world oil and gas market was looking forward to Tengiz hydrocarbons. The cost of the new project was first estimated at \$10 billion, then \$20 billion. It was then increased to \$36.8 billion. This was subject to the contingency reserve, and the period of its implementation, originally planned for 2016, against the background of discussions about the choice of the technological scheme of the project at a time of global economic crisis, was postponed to 2022. Despite the use of different technology proposed by some officials and an increase in the production capacity of the Tengiz field not by means of a new plant, but by means of the more economically feasible modernization of the SGP/SGI, the TCO partners still managed to convince everyone of the viability of implementing the FGP-WPMP. At the same time, TCO promised to take a critical approach to its operating costs and capital expenditures, in order to ensure a stable cash flow for the project. The arguments of the oilmen forced the government to admit that the project of expanding production at Tengiz met the interests of both TCO and Kazakhstan.

With regard to attracting investments for the implementation of the project, according to the international agency Project Finance International, the financing of the FGP-WPMP was recognized as the best deal of 2016 for the issue of bonds on the European market.

In 2012, TCO began, and in 2014 completed, the preliminary design of new facilities with the involvement of design institutes from Kazakhstan. Great Britain and India. At the same time. tenders were organized for the selection of contractors, and the signing of the relevant contracts, the construction of offices, residential premises, roads, works on the preparation of the port, construction site, and the purchase of necessary equipment got underway. In 2013, the Central Commission for Exploration and Development of the Committee of Geology of the Republic of Kazakhstan agreed on the technical and economic schemes for expanding the production project at the field in option 10-C. The necessary documents were provided to the government. The volume of oil production at Tengiz was to increase by 12 million tons or 260 thousand barrels per day, reaching about 39 million tons per year or 850 thousand barrels per day. During the period of maximum production, this indicator was planned to exceed 900 thousand barrels per day. The increase in production would ensure the drilling of additional wells, the construction of the third-generation oil stabilization plant (SGP) with a capacity of 12 million tons per year, 3rd generation gas injection facilities (SGI), as well as related power units and auxiliary systems. It was decided that the delivery of oil and associated gas to the plant would be carried out by the ring highway of the new oil collection system, laid along the perimeter of the field. All associated gas would be pumped back into the collector using several crude gas injection compressors at a pressure of 700 bar. The main compressor was to be manufactured specifically for the project by GE Nuovo Pignone – a world engineering company with a rich history. This technology is widely used in other countries, but for the first time in Kazakhstan, and at a field with high reservoir pressure and a high content of hydrogen sulfide.

As a result of the new project, the recoverable reserves of Tengiz would increase by 100 million tons. The recoverable oil reserves in the reservoir of the Tengiz field by April 2033 are estimated from 750 million to 1.1 billion tons (6-9 billion barrels). The total proven reserves of Tengiz are 3 billion tons (26 billion barrels), and the Korolev Field – 190 million tons (1.5 billion barrels). The increase in reserves will occur due to the displacement of captured intra-reservoir oil by mixing gas and slowing down the rate of decline in reservoir pressure. In this case, the FGP is based on the success of the SGP/SGI, which previously demonstrated the effectiveness of the technology for injecting crude gas into the Tengiz collector. However, unlike the previous project, no gas and sulfur extraction sites will be built here. The implementation of the FGP will increase production volumes, and the WPMP will ensure full utilization of the processing capacities of the plants operating at Tengiz by reducing the wellhead pressure of the gushing wells and increasing the inlet pressure of the six existing integrated process lines.

In 2018, a grandiose construction project was launched in Tengiz, aimed at transforming the existing production into the most modern and intelligent plant of the third generation. There is probably no analogue in the world. 19 centers from 11 different countries of the world were involved in the implementation of the FGP-WPMP. Engineering and technical works of the project were carried out in the cities of Atyrau and Almaty, as well as in the USA, Great Britain and India. For example, KPJV participated in the design joint venture of KazGiproNefteTrans Engineering Company LLP (KGNT), Kazakhstan Institute of Oil and Gas JSC (at the time of joining the project, an independent institute, subsequently absorbed by KGNT) and an alliance of foreign companies, Worley Parsons Limited and Fluor Limited. TCO attracted Kazakh companies providing services in the field of design, procurement and manufacturing of modules to participate in the FGP-WPMP.

By implementing the FGP-WPMP, TCO laid a solid foundation for creating a legacy in such areas as engineering and technical

work, maintenance of high-tech equipment, project management, construction and manufacturing of modules. According to Ted Etchison, head of TCO at that time, this would provide a huge inflow of funds to the budget of the Republic of Kazakhstan. The amount can be determined as several tens of billions of US dollars. "This is a very interesting, exciting and responsible time for the company. After all, simultaneously with the implementation of the FGP-WPMP, we are operating a huge base production. We are making large investments, which will benefit all interested parties benefit", he stressed.

In fact, the FGP was designed as a modular structure, assembled according to the principle of the famous Lego designer. Since October 2016, production of pipe racks for the facility has been carried out at the production site of the company "Ersai" (Mangystau region). They are partnered with Daewoo Shipbuilding & Marine Engineering Co Ltd. The production of gas turbine generator modules was carried out in Italy, and prefabricated modular units of process installations - in South Korea. The finished modules were delivered from foreign production sites to trans-shipment bases, from where they continued their way along the system of inland waterways of the Russian Federation to the Caspian Sea and then to the cargo unloading terminal located in the port of Prorva near the Tengiz field. Seventeen



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specialized vessels specially built in Vietnam and Romania were involved in the transportation of the modules. A Cargo Transport Route (CaTRo) was constructed from Prorva to Tengiz, including a 71-kilometer long sea channel, cargo unloading and storage terminals, as well as a highway for cargo transportation. The modern technology demonstrated at the international specialized exhibition EXPO-2017 in the Kazakh capital and mentioned in the National Geographic project was used directly on the construction site, in order to fill in the foundations. It injected warm air into the ground with the help of special guns, thus creating a temperature of +5 Celsius necessary for concrete to solidify.

By the 30th anniversary of Kazakhstan's independence, the implementation of the FGP-WPMP is nearing completion. All production wells have been drilled, and work on the reverse assembly of modules has been completed. In June 2021, TCO launched a new plant for the production of granular sulfur at Tengiz with a monthly capacity of 40 thousand tons. This allows for the processing of almost all liquid sulfur produced at the facilities, in turn, increasing environmental safety and reducing production risks. Tengiz was preparing for a new, impressive stage of its development.

Today, the pioneer-innovator Tengizchevroil is the undisputed leader of the oil industry of Kazakhstan. It is the pride and leader

of the oil and gas industry of Kazakhstan, providing about a third of the national crude oil production and demonstrating the highest indicators in all segments of activity.

Since 2000, TCO has invested more than \$3.13 billion in the implementation of environmental measures, reducing the total amount of atmospheric emissions per ton of oil produced by 71%. Since 1993, TCO's direct financial payments to the Republic of Kazakhstan have exceeded \$154 billion, including salaries to Kazakhstani employees, purchases of goods and services from domestic producers and suppliers, payments to state-owned enterprises, payments of dividends to the Kazakh partner, as well as in the form of taxes and royalties transferred to the state budget. Since 1993, TCO has purchased goods and services from Kazakhstani suppliers to the amount of more than \$37.3 billion.

According to Nursultan Nazarbayev, TCO has breathed life into thousands of Kazakhstani enterprises in various sectors of the economy: mechanical engineering, oil and gas services, transport and construction. These also include tax, dividends, purchases of goods and services from Kazakhstani companies. More than 30 thousand Kazakhstanis were employed within the framework of the project..

In turn, the TCO management expressed confidence that the implementation of these world-class projects will be based on long-term partnership relations with the Republic of Kazakhstan to ensure stable and reliable production at the Tengiz field, the fruits of which will be enjoyed by future generations of Kazakhstanis.

Despite such inspiring achievements, today we can confidently say that the main success of Tengiz, which consists in generating a return on investment to the people of Kazakhstan, still lies ahead.





REFERENCE:

Tengiz Oil and Gas Field is located 350 km southeast of Atyrau, in the Caspian oil and gas province. This is the deepest supergiant oil field in the world, the upper oil reservoir of which lies at a depth of about 4,000 meters or 13,000 feet. Tengiz reservoir stretches for 21 kilometers or 13 miles in length and 20 kilometers or 12 miles in width, and the height of the oil reservoir is 1.5 kilometers or 1 mile. The area of the deposit is so large that it would take two marathon distances to run around it. The license area also includes Korolev Field, which is large in reserves, as well as several promising areas for exploration.

The recoverable reserves of Tengiz and Korolev Fields are estimated from 750 million to 1.1 billion tons of oil. The total proven reserves in the drilled and undeveloped sections of the reservoir of the Tengiz field are projected to amount to 3.1 billion tons or 26 billion barrels. The reserves of Korolev Field are estimated at 188 million tons or 1.5 billion barrels, which is one-sixth of the reserves of Tengiz.

Oil content is associated with deposits of the Middle-Lower Carboniferous and Devonian ages. The oil saturation coefficient is 0.82. The initial gas factor is 487 m³/t, the initial oil flow rate is 500 m³/day with a 10 mm fitting. The initial reservoir pressure is 84.24 MPa, the temperature is 105°C. The density of oil is 789 kg/m³. Sulfur oil 0.7%, paraffin oil 3.69%, low-tar 1.14%, contains 0.13% asphaltenes.





It is a great honor for me to express on behalf of Royal Dutch Shell our congratulations on the occasion of the 30th anniversary of the Independence of the Republic of Kazakhstan!

Over the past three decades, Kazakhstan and its people have achieved impressive results in the socio-economic development of the country.

Shell is proud to be one of the first major foreign investors in Kazakhstan's economy to contribute to the country's successful development. Together with our partners and the Republic of Kazakhstan, we have created strong joint ventures based on the principles of safety, reliability, efficiency and high business standards, thanks to which Kazakhstan has become a recognized key player in the global hydrocarbon market.

The KAZENERGY Association continues to play a unifying role, providing the platform that the Republic, energy companies and many stakeholders need, for which our industry provides jobs and helps stimulate economic activity in other sectors of the economy.

We are sincerely convinced that the success of Shell's operations in Kazakhstan is the result of our long-standing and trusting relationship with the country, and we look forward to continuing our cooperation in the future. Happy Anniversary, Independent Kazakhstan!

German BURMEISTER,

Senior Vice President and Chairman of Shell Kazakhstan

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Nursultan Nazarbayev and Al Gore during the signing of the Caspian Sea Production Sharing Agreement, 1997, Washington

HERITAGE -KARACHAGANAK

The confidence of the world oil and gas community increased with the arrival of Chevron and other foreign participants in the Tengiz project in Kazakhstan. Other large Western corporations were also attracted to the country. At a time when Kazakhstan and foreign partners were still discussing the large-scale prospects for the development of Tengiz, in the second half of the 1990s, grandiose deals were being signed on oil and gas projects that later would become the property of the Republic.

One of these concerned the Karachaganak oil and gas condensate field (West Kazakhstan region) – the true pearl of the oil and gas industry of Kazakhstan, discovered in 1979 and developed since the mid-1980s by the "Orenburggazprom" production association of the Ministry of Gas Industry of the USSR.

In the late 1980s and early 1990s, on the eve of the collapse of the USSR, there were alarming notes from officials about the need to close the field under the pretext of conserving the environment. The fate of thousands of people who worked in Karachaganak, as well as the prospects for the socio-economic development of the region were seriously threatened. The heads of the Karachaganakgazprom enterprise, V. M. Kazakov, L.V. Trufanov, N.P. Kobyshev and others seconded from Orenburg, deservedly considered real patriots of the region by representatives of local administrative units and the population, stood up to protect the

deposit. According to later comments by Kunduz Nupov, chairman of the Burlinsky District Executive Committee of the Communist Party of the USSR in the early 1990s, it was with their support and thanks to their efforts that all the main social and cultural facilities were built in Aksai. A ballroom dance school, sports clubs were opened, other infrastructure was built, which, among other things, became a venue for official receptions of foreign delegations. In order to prevent the collapse of Karachaganak and support the local residents, the management of Karachaganakgazprom initiated a public discussion with meetings held in each locality located in the field zone. At the same time, decisions were made regarding the construction of roads, gasification, and relocation of residents of the Tungush settlement, which then found itself in the sanitary protection zone of the field. In the conditions of the collapse of the Soviet Union, these were the most important preventive measures that allowed perhaps the greatest mistake leading to the closure of a real pearl of oil and gas to be avoided.

As a result of the discussions, one of the important documents at the local level was adopted on January 20, 1991 entitled "On some results of the discussion of the problems of field development and environmental conservation in the region". This decision was submitted to the session of the district Council of People's Deputies, where, following heated discussions, a verdict was given in favor of the further development of the



The specially created Karachaganak Petroleum Operating company included Agip (Italy, 32.5%), British Gas (United Kingdom, 32.5%), Texaco (USA, 32.5%) and Lukoil (Russia, 15%)

Karachaganak field. This would envisage condensate production up to 13 million tons per year, construction of a processing complex and attracting investors. "I believe that these documents reflect issues that have not lost their relevance at the present time. The support of the central authorities in Kazakhstan and Moscow allowed us to start negotiations with potential investors, and already on November 13, 1990, the first presentation of British Gas was held in the building of the district executive committee, and the next day a protocol of intent was signed in the Ural Regional Executive Committee", Kunduz Nupov recalled.

It is worth noting that the subsequent historical collapse of the USSR had a painful impact on Karachaganak, which was inextricably linked with the Orenburg Gas Processing Plant, Salavatnefteorgsintez and the Ufa Processing Plant located on the territory of Russia. There was a large outflow of Karachaganak specialists to Orenburg and Bashkiria.

"At that time, there was no money in the country's budget. Meanwhile, large funds were needed to ensure the safe operation of the Karachaganak field, which, let me remind you, is characterized by a high content of hydrogen sulfide, mercaptan and high reservoir pressure. In the event of an accident, we would face serious consequences comparable to Chernobyl. The funds from the sale of the Karachaganak gas condensate and gas were scant. This was due to the fact that the Orenburg gas Processing and Ufa oil refineries raised their processing tariffs, since it was also difficult for them to survive during that period, and each was intent of extracting the maximum profit for themselves. The rates for processing were much higher than the world ones, and there were 15-20% losses", recalled Bolat Nazarov, who held the position of Vice President for gas and condensate sales of Karachaganakgazprom JSC in 1995. "...the cost of the gas that we sold under contracts to Orenburg was only \$1.5 per 1 thousand cubic meters. (...) That is, Karachaganak gas was given almost free of charge. The price of condensate at that time was 3, 5, 7 dollars per ton. The proceeds from the sale of extracted gas and condensate were not enough not only for the maintenance and safe operation of the field, but even for the payment of wages to employees. The situation was very difficult".

The competition, re-initiated by the Government of Kazakhstan already a sovereign state, allowed for the selection of foreign investors for the development of Karachaganak. The competition between two alliances – British Petroleum and Norwegian Statoil, and Italian Agip and British Gas – for the right to work at the largest field in Kazakhstan ended with the victory for the Italian-British duo.

"Later, with the advent of experience, I realized that the BP-Statoil alliance was stronger than the Agip-BG alliance. The advantage was, first of all, in technological terms, and the financial potential was more significant", Galiausat Keshubayev, Deputy Minister of the Oil and Gas Industry of the Republic of Kazakhstan, commented years later in 1995.

However, the process of negotiations on the terms of equity participation of the selected companies in the project was delayed. It was only on March 2, 1995, that the Karachaganak Production Sharing Principles Agreement (PSPA) was signed between Agip, British Gas, as well as the Russian RAO Gazprom and the Republic of Kazakhstan. It was an interim document before the signing of the Final Production Sharing Agreement (FPSA).

"At first, when the alliance of foreign companies was formed in 1995, Russian companies did not join in. In fact, the project underwent key development already at this stage, when only British Gas and Agip were in the project. Over a period of two years, they invested about \$300 million in the project. After all, Kazakhstan inherited the field with serious environmental problems that needed to be resolved, and we did not have money at that time. A little later, Gazprom was invited to participate in the

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General Director of KPO, John Morrow with President of Kazakhstan, Nursultan Nazarbayev

Kadyr Baikenov, 1997. General Director of InvestConsulting

project with a 15% share, but after much hesitation, the chairman of the Gazprom Management Board, Rem Vyakhirev, sent an official letter with a refusal to participate in the consortium and a proposal to include the Russian company LUKOIL instead of Gazprom. This proposal was taken into account", recalled Uzakbai Karabalin, who was Deputy Minister of the Oil and Gas Industry of the Republic of Kazakhstan in 1995.

According to Galiausat Keshubayev, the products extracted at Karachaganak were processed at the Orenburg Gas Processing Plant. The funds from the sale were transferred to a deposit account in a foreign bank. This account covered the operational costs of the field, the costs of investors, and the balances were to be credited to the state. "I can attest that during the period of the FPSA, a little more than \$100 million passed through this deposit account. For such a huge field, these are small amounts, sufficient only for wages and basic office equipment for the well fund. Investors provided funds to support the field only within the limits of the field's ability to return them," he noted.

Nevertheless, Kunduz Nupov would later call the arrival of investors to Karachaganak a timely and uncontested decision that allowed the viability of the field to be preserved and developed. It was important that from the very beginning the main emphasis was placed on the priority of investing in ensuring the safety of production at the field.

According to Bolat Nazarov, numerous negotiations were held in Kazakhstan and Moscow in the period from 1995 to 1997, aimed at the signature of the Karachaganak FPSA. "We had a very busy schedule, business trips and negotiations were endless", he recalled.

The culmination of the huge preparatory work carried out under the personal supervision of the Kazakh leader Nursultan Nazarbayev was the signing of the FPSA for the Karachaganak oil and gas condensate field during his visit to Washington, USA, on November 18, 1997. In the presence of Nursultan Nazarbayev and US Vice President Albert Gore, the document was signed at the US State Department by the heads of American Texaco, Italian Agip, British Gas and Russian LUKOIL on the part of investors, as well as First Deputy Prime Minister, Chairman of the State Investment Committee of the Republic of Kazakhstan Akhmetzhan Yessimov on the part of Kazakhstan. The shares of participation in the international consortium "Karachaganak Integrated Organization" (later renamed Karachaganak Petroleum Operating, KPO) included Agip (32.5%), British Gas (32.5%), Texaco (20%) and LUKOIL (15%). At the same time, under the terms of the agreement, Agip and British Gas became a single operator of the project.

The agreement was entered into for a period of 40 years. It entered into force on January 27, 1998 and provided for the maximum level of annual oil and gas condensate production of 12 million tons and gas – 25 billion cubic meters, and for 40 years of operation of the field – 320 million tons of liquid hydrocarbons and 797 billion cubic meters of gas. The capital investments for the project were fixed at \$10 billion. Kazakhstan received \$330 million in the form of a bonus for the 40-year period of its validity. The expected divisible income was estimated at \$65 billion, of which \$47 billion – to the Republic (profit oil – \$38 billion and tax \$9 billion), the remaining \$18 billion – to the parties to the agreement.

Thus, by the end of the 1990s, Kazakhstan reached a new level of cooperation with foreign partners, thanks to the support of Nursultan Nazarbayev, and the strategy for the development of the oil and gas industry developed with his personal participation.



Anatoly Tegisbayev,

1992-1997, Senior Engineer – first Deputy Director of KarachaganakGasProm, first Deputy President of KarachaganakGasProm JSC, 1997-1998 President of KarachaganakGasProm JSC

In order to maximize the extraction of liquid hydrocarbons and obtain benefits from the development of the Karachaganak field, it was proposed to pump the extracted gas back into the reservoir, in order to maintain pressure. "We even considered the possibility of pumping 120% of gas into the reservoir, that is, not only the entire Karachaganak gas, but also what we planned to buy in Orenburg. However, foreign investors doubted the feasibility of this proposal. They refused 100% gas injection. The negotiations on this issue took for more than a year. We proposed the figures 20%, 30%, 60%, 80%. As a result, investors assumed obligations to pump at least 40% of gas into the reservoir", Bolat Nazarov said in an interview. According to his recollections, with the arrival of investors, there were also requirements for gas exports: "At that time, Karachaganak raw material had access to Orenburg, Ufa, that is, to the Russian market. We had the Atyrau-Samara oil pipeline which went to Samara and from there to the Russian "Transneft" system. The investors also put forward a mandatory condition for selling into Europe, in order to achieve a return on their investments in hard currency. Then it was decided to build the Karachaganak - Bolshoy Chagan - Atyrau condensate pipeline with a tie-in to the Caspian Pipeline Consortium for the release of Karachaganak raw material to the Black Sea ports, through the Bosphorus Strait to European markets, with which there were also difficult negotiations later."

Thus, the foundation was laid for the future of the Karachaganak field.



Chapter **4 PRODUCTION GIANTS**



Bolat Nazarov, 1995-1997 Deputy President for Gas and Condensate at KarachaganakGasProm JSC In August 2003, the official ceremony of commissioning the production facilities of Stage II of the Karachaganak oil and gas condensate field development project was held. The President of the Republic of Kazakhstan, Nursultan Nazarbayev, took part, thus marking the start of the work of the Karachaganak Processing Complex (KPC). This was one of the largest facilities built by the international consortium Karachaganak Petroleum Operating B.V., Unit-2 with a gas re-injection unit comprising three compressors, as well as the 635 kilometer export pipeline Karachaganak – Bolshoy Chagan – Atyrau, which connected the field with the CPC system.

The technology of gas injection into the reservoir, applied at Karachaganak, had no analogue in the world. Nuovo Pignone gas compressors on Unit-2 were examples of the most advanced technology. Injection of gas containing 4-6% hydrogen sulfide began at a pressure of 70 atmospheres at the inlet and up to 550 atmospheres at the outlet.

With the commissioning of new facilities, KPO announced an increase in the production of liquid hydrocarbons to more than 10-10.5 million tons per year from 5.2 million tons in 2002, and gas – to 10-13 billion cubic meters from 4.7 billion cubic meters, respectively. At the same time, KPO announced plans to transport up to 7 million tons of oil per year to world markets via the CPC system, while 3 million tons of liquid hydrocarbons





would continue to be sent for processing to the Orenburg Gas Processing Plant in Russia.

To show his appreciation of the merits of KPO and contractors, Nursultan Nazarbayev in 2003 awarded the Kurmet Order to Pietro Cavanna, Eni Deputy Chief Executive Officer, Nurlan Kuanshaliyev, Intergazstroy JSC President, Zhakyp Marabayev, KazMunayGas Managing Director and John Morrow, KPO General Director.

"I am sure that in the near future the Karachaganak field will become the largest center for the deep processing of hydrocarbon raw materials. I believe that we have complete understanding on this issue with the main investors. The Kazakh government will insist on the early start of the construction of the next stage", the Head of State said. "This experience will be useful at the largest Tengiz oil field and the Kashagan offshore structure. This will allow the more efficient use of the subsoil of Kazakhstan. On this basis, our oilmen are learning how to transfer their experience to other facilities. This is very important".

Due to the implementation of Stage II, in June 2004, KPO shipped the first batch of oil from the CPC sea terminal in Novorossiysk. This made it possible to bring this export oil pipeline system up to the design capacity of the first stage – 28 million tons per year, including 21.7 million tons of oil from Kazakhstan. At that time, CNPC-Aktobemunaigas, JV Arman,

KazMunayGas Trading House LLP and Kazakhoil-Aktobe LLP and Turgay Petroleum JV were the CPC shippers from Kazakhstan.

In addition to income growth, the updated Karachaganak project promised significant socio-economic benefits, including the creation of new jobs, the expansion of the local production base, the transfer of experience and technologies and the development of appropriate infrastructure. It was also a great opportunity to significantly increase the competitive production potential of Kazakhstan. At the time this field remained the only one where its interests as a shareholder were not represented.

Even at the very beginning of the process of attracting foreign investors to the development of the Karachaganak field, Kazakhstan had been thinking very seriously about joining this project. But I abandoned this idea. Firstly, according to the FPSA, as the founders of the Karachaganak consortium the Republic received a share from the production division, regardless of its participation in the project, without investing significant investments in the development of the field. Secondly, at the time of signing the FPSA, Kazakhstan did not have sufficient potential to make billions of dollars of investments in such projects. This was the main reason why Kazakhstan at that time did not apply for a share in Karachaganak as a contractor", Uzakbai Karabalin explained. "Nevertheless, today few people know or have forgotten that the Protocol to the Final Production Sharing Agreement for

Chapter **4 PRODUCTION GIANTS**

Karachaganak stated that Kazakhstan had the right to apply for 10% participation in the development of the field, provided that it could make an additional contribution to the project to increase its efficiency. For many years, we have never used this right and were able to do it only when the national company KazMunayGas increased the potential for full participation in the financing of this project."

One of those who insisted on Kazakhstan receiving at least a 10% stake in Karachaganak was Timur Kulibayev, who headed the association of companies and organizations of the energy sector KAZENERGY, created in 2005. There were also alternative proposals involving the acquisition of a smaller share. The relevant negotiations were entrusted to the Minister of Oil and Gas of the Republic of Kazakhstan Sauat Mynbayev.

The difficult negotiations were aggravated by the economic dispute that began at that time between the Government of the Republic of Kazakhstan and the project partners. This had developed against the background of the latter's disagreement to invest significant funds in the further stage of the field development, contrary to the obligations assumed. The fact is that soon after the end of Stage II of the development of Karachaganak, its participants were supposed to move to Stage III. This would involve the construction of a new processing complex at the field. However, they were not ready for such rapid and urgent new investments. In addition, in 2009, two counterclaims were filed in international arbitration. The BG Group were suing Kazakhstan for more than \$1 billion, in which oil export duties were disputed. Kazakhstan, which did not recognize the consortium's claims in turn, demanded payments of more than \$2 billion from BG and Eni, in order to join the project and establish control over the financing



of the Stage III of the field development. In 2010, the lawsuits were withdrawn, and the parties sat down at the negotiating table. This became a real test of the strength of the relationship.

To conduct the negotiation process, a young and talented manager, Bolat Akchulakov, who had extensive experience working in Tengiz and KazMunayGas, was instructed to urgently assemble a team and create a company managed by the Ministry of Oil and Gas.

"We had to create such a company from scratch, from writing the Charter, registering, inventing a logo. The logo was based on a Kazakh leather vessel, which I turned to the right in the form of a shaped arrow. It was a combination of national motives and an indication that we are moving in the right direction. I had to think about the name. It was a very long one – "the authorized body for production sharing agreements"... It was impossible to find an abbreviation. Then I said, "Let's just call it PSA". This did not mean "production sharing agreement", but its essence was exactly that. The company became the authorized body for Production Sharing Agreements in the Republic of Kazakhstan", said Bolat Akchulakov, who headed PSA LLP in 2010, immediately after the company was created as part of KazMunayGas.

As Timur Kulibayev noted, by the time of negotiations regarding the entry of the Kazakh side into the Karachaganak project, KazMunayGas had already had successful experience as a shareholder in Tengiz – another large project. Later, he would say: "When implementing any projects, especially such large ones as the Karachaganak one, economic disputes may arise, which the partners try to settle in various ways – by means of penalties, revocation or modification of the terms of the contract, and so on. In our situation, the foreign participants of the project were asked to compensate for the economic dispute with the additional economic interest of Kazakhstan. It should be noted that during the negotiations, we did not exert pressure on our partners, nor did we create any contradictory situations, or take recourse to arbitration".

The negotiations, which lasted for two years, ended in June 2012 with the acquisition of a 10% stake in KPO by Kazakhstan. As a result of the transaction, the shares in the Karachaganak project were distributed as follows: BG Group and Eni each got 29.25%, Chevron - 18%, LUKOIL - 13.5%, and the Republic of Kazakhstan - 10%. Kazakhstan entered the project by receiving 5% in exchange for the settlement of economic disputes and buying another 5% for \$1 billion, as well as settling previously voiced claims. Expenses in the total amount of \$2 billion were provided to pay for the 5% share of participation and taxes in the draft amendments to the republican budget of 2012. At the same time, the contractor immediately returned part of the amount paid, namely \$1 billion, into the budget in the form of taxes from the sale of a share in the project. For the remaining \$1 billion, the investor provided a loan to KazMunayGas - this money was also returned to the budget through the national Samruk-Kazyna fund.

Following the signing of the transaction documents, the Minister of Oil and Gas Sauat Mynbayev issued a verdict:



"Kazakhstan's participation in the Karachaganak project will bring additional revenues in the amount of \$3.3 billion to \$5 billion in Cash Flow or between \$1.4 billion and \$2 billion in the form of discounted cash flows (NPV) of KazMunayGas during the remaining term of the FPSA, which will end in 2037. The amount of this additional income is tied to the cost of oil for the period from 2012 to 2037. Its lower limit – \$3.3 billion – will be achievable with the world price of crude oil at \$85 per 1 barrel. If a higher oil price is fixed, these amounts will increase proportionally. Kazakhstan will receive this income in addition to tax deductions to the budget

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from KPO, as well as to profit oil received by KazMunayGas from participation in the PSA. Also, the amount of revenue will depend on the scenarios of the subsequent development of the Karachaganak field. Hydrocarbon production here will increase if approved by the authorities and the implementation of Stage III, which implies a significant increase in production".

Since then, Karachaganak has brought dividends not only to the former, but also to the new shareholder in the person of Kazakhstan.

Immediately after Kazakhstan's entry into the project, new and no less difficult negotiations on the implementation of the Stage III began. This stage was fundamentally important for the country's economy and the development of the region. Against this background, a new dispute arose in 2015, this time related to the calculation of the share of the product section. In particular, the Government of the Republic of Kazakhstan proposed a new method for calculating the "objectivity index", which would provide Kazakhstan with a larger share of future income. It would allow it to demand from foreign participants of the Karachaganak Consortium compensation for income lost in previous years.

"We believe that over a certain period of time we had not received the share due to our Republic. In our opinion, the methodology by which contractors considered their share and the share of the Republic was not entirely fair and did not correspond to the production sharing agreement. We will defend our position to the end, because this is the people's money, and the people's mineral resources – whether anyone likes it or not", said Kanat Bozumbayev, Minister of Energy of the Republic of Kazakhstan at the time.

The very difficult negotiations with KPO lasted for about three years and ended with the unconditional surrender of



foreign shareholders. Such a long period testified not only to their complex content and nature, but also to the fact that Kazakhstan placed the economic interests of the state at the forefront, and, accordingly, insisted on maximizing the benefits for the Republic.

On September 13, 2018, the authorized body of the Republic of Kazakhstan - PSA LLP with the support of the Ministry of Energy of the Republic of Kazakhstan, on the one hand, and the shareholders of KPO represented by Shell (after the merger with BG Group), Eni, Chevron, LUKOIL and KazMunavGas, on the other hand, signed an agreement on the KPC Gas debottlenecking Project of Karachaganak Processing Complex (KGDBN). In fact, a large investment project was launched at Karachaganak under the Stage III. This would allow the maximum production level to be maintained at the field. As part of its implementation, the minimum share of Kazakhstani content in the purchase of goods, works and services would be 40% and 75% when hiring staff. In fact, since the signing of the FPSA in 1997 and by 2017, the share of local content in KPO purchases has reached \$6.23 billion. The project enabled the processing of additional volumes of crude gas up to 4 billion cubic meters per year. These volumes of gas were to be used for re-injection into the reservoir to maximize the level of hydrocarbon production. It would also serve as a resource for the implementation of subsequent investment projects at the field

As Murat Zhurebekov, who by that time had taken the position of General Director of PSA LLP, noted: "This project is characterized by the use of the so-called cost control mechanism, the essence of which is that the responsibility for the implementation of the project within the agreed budget and schedule falls on the consortium. If the agreed parameters of the project cost are exceeded, such excess costs will be incurred at the expense of the project shareholders".

Just a few days later, on October 1, 2018, the Government of the Republic of Kazakhstan represented by the Ministry of Energy of the Republic of Kazakhstan, the Ministry of Finance of the Republic of Kazakhstan and PSA LLP, as well as the shareholders of the Karachaganak project, reached agreements in principle on an amicable settlement of the dispute on the "objectivity index", and signed an agreement on principles that fixed the main conditions for ending the disputes. The document provided for monetary compensation on the part of the consortium to the Republic in the amount of \$1.111 billion. It also provided for amendments to the FPSA production sharing mechanism to provide Kazakhstan with additional revenues from the project in the amount of about \$415 million until 2037 at a price of \$80 per barrel. It envisaged a long-term loan from KPO for a period of 10 years for the construction of an infrastructure project in the amount of \$1 billion, or payment of an equivalent loan value (in case the republic refuses the loan) in the amount of about \$200 million.

Thus, the total monetary value of this settlement for the Republic of Kazakhstan amounted to more than \$1.7 billion, of which the state was to receive about \$1.3 billion in the coming



years. In addition to the above proposal, the Government agreed on the acceptance of obligations by the consortium regarding the timely implementation of investment projects which were important for the future development of Karachaganak. Previously, the volume of investments had been estimated at up to \$5 billion, with a possible additional income increase for the country until 2037 of about \$23.5 billion (or about \$6.4 billion in NPV10) at a price of \$80 per barrel. The parties also agreed on possible supplies of oil and gas on commercial terms for local refineries and for the development of a gas chemical complex in the West Kazakhstan region.

It was important for Kazakhstan to settle this dispute, since it was causing uncertainty in the further development of the Karachaganak project. One of the principal elements of these



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agreements was the acceptance of obligations by the consortium for the timely implementation of important investment projects aimed at the future development of the field. The amicable settlement of the dispute reflected the Republic's commitment to the friendly settlement of disputes with strategic partners in accordance with the provisions stipulated in the contract.

The KGDBN project was completed in March 2021, and provided the production capacity to implement all other projects for extending the production shelf. This included the project of the fourth gas back-injection compressor, which has entered the implementation stage, and the approved project of the 5th gas back-injection compressor. The launch ceremony of the production facilities was attended by the senior management of the Akimat of the West Kazakhstan region, headed by Akim, Gali Iskaliyev, JSC NC KazMunayGas, headed by Chairman of the Management Board, Alik Aidarbayev, General Director of KPO and head of the contracting company "Sichim".

In his comments on the launch of the project, Edwin Blom, CEO of KPO, noted: "We are pleased to announce this significant achievement, which fully corresponds to the vision of the President of the Republic of Kazakhstan, Kassym-Jomart Tokayev, for the further development of the Karachaganak field. The successful completion of the KGDBN project represents a historic milestone in the continuous development process of the Karachaganak field. The KGDBN project has raised the bar in the industry, thanks to the application of the highest standards of safety, cost efficiency and early completion".

Today, Karachaganak accounts for 49% of all gas and 16% of all liquid hydrocarbon raw materials produced in Kazakhstan. Since the signing of the PSA, over \$27 billion has been invested in the development of the field. The Republic's budget received over \$27 billion in taxes and profits from participation in the project. The indicators of operating costs at Karachaganak in terms of a barrel of oil equivalent are among the best not only in the Republic, but also in the whole world. Hundreds of millions of dollars have been invested in the development of the social infrastructure of the West Kazakhstan region.

As one of the former heads of KPO, Renato Maroli, said: "The past 20 years have been difficult, but at the same time extremely eventful. The KPO team is rightfully proud of its success and is





determined to fulfill all its obligations to the republic. Together we will strive for new heights for the benefit of the people of Kazakhstan and the partner companies of the Karachaganak project. (...) Further plans for the development of the Karachaganak field lie ahead. New projects will help attract additional investment and create new jobs. At the same time, Kazakh specialists, as before, will play a leading role in the forthcoming work. The use of advanced technologies in production will allow us to keep the volume of production and export of liquid hydrocarbons at a consistently high level, which, in turn, will have a positive impact on revenue from the Karachaganak project. This additional profit will increase the economic effect for the Republic of Kazakhstan and partner companies".





REFERENCE:

The Karachaganak Oil and Gas Condensate Field was discovered in 1979. Today it is one of the largest fields in the world with initial balance reserves of 1.35 trillion cubic meters of gas and 1.2 billion tons of oil and gas condensate. It is located on the northern port zone of the Caspian depression.

The deposit is oil and gas condensate, massive. The height of the gas condensate part reaches 1420 m, the thickness of the oil layer is 200 m. Sediments from the Upper Devonian to the Lower Permian are productive. The condensate density varies from 778 to 814 kg/m³. The density of oil varies from 810 to 888 kg/m³. The oil contains: sulfur – up to 2%, paraffin – up to 6%. The reservoir gas consists of methane – 70%, ethane – 6%, propane – 3% and other gases – 21%. The gas has a hydrogen sulfide content of up to 4%. The gas pressure in the reservoir is about 600 atmospheres. **30 YEARS OF INDEPENDENCE** PATH TO CREATION

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ON 4 JUNE, THE PRESIDENT OFFICIALLY ANNOUNCED THE DISCOVERY OF THE KASHAGAN FIELD, DEMONSTRATING TO ALL THOSE PRESENT A CONTAINER WITH KASHAGAN OIL PRODUCED FROM ALMOST A FIVE-KILOMETER DEPTH.

> "Kashagan is yet another major project which will boost the prosperity of the people of Kazakhstan."

> > Nursultan Nazarbayev





The achievements of Kazakhstan and its people within these 30 years, which is a relatively short period in historical terms, are a clear testimony both to the enormous potential of the country and to the growth path it has undertaken. Today, Kazakhstan is recognized as a leader in Central Asia. Gaining independence in 1991 and the determination of its citizens to achieve even greater heights have played a decisive role in this regard.

The long-standing partnership between Eni and Kazakhstan began from the very first moments of the country's independence. By then, we had already witnessed the increasingly pivotal role of the Country in the wider Region as well as internationally - its successes, its modernization, its increasing attractiveness for investment.

Our joint projects – the Kashagan and Karachaganak fields - are cornerstones in the history of the Republic, and due to their unique features, as they are among the largest fields in the world with extremely challenging characteristics, they certainly deserve a place in the history of the energy sector. The development and management of the Kashagan and Karachaganak projects have represented for Eni moments of growth and evolution. The technologies and solutions implemented have always been at the forefront of the industry. Both consortia have always been capable of finding the right answer to often unknown and unexpected questions.

In carrying out its activities, Eni together with Kazakhstan is committed to supporting the energy transition. Eni aims to become an integrated "Zero carbon" energy company by 2050 across Scopes 1, 2 and 3 and deliver to the market a mix of entirely decarbonized products.

In July 2021, I visited Kazakhstan and witnessed the desire and readiness of the country to pursue the 2030 Agenda. Thus, Eni and KazMunayGas signed cooperation agreements for the development of renewable, hydrogen and biofeedstock projects in Kazakhstan, strengthening and widening the historic partnership to accelerate the energy transition.

Over the years of independence of Kazakhstan, hundreds of local oil and gas specialists have undergone Eni's training program by doing Master's Programs with Italy's and Kazakhstan's top universities.

I would like to close by saying that Eni has grown and matured together with Kazakhstan over the last few decades, reaching new heights and undergoing successful transformations together and I have no doubt that this partnership will carry on for many years to come.



Claudio DESCALZI, Chief Executive Officer Eni S.p.A



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1997-1998 President of NOC Kazakhoil

KASHAGAN-THE CRADLE OF THE CASPIAN SEA

Since ancient times, the Caspian region has been a truly mysterious land, with countless hydrocarbon riches hidden in the depths. Its energy is inexhaustible, and its potential is so huge that it could, perhaps, share it with the people inhabiting this region for many tens or even hundreds of years, if necessary. The foreign corporations that came to Kazakhstan at the dawn of its state independence must certainly have realized this. This region, with its dozens of promising oil and gas fields, attracted Western majors, promising them significant benefits.

In 1992, based on the available Soviet geophysical data, the Government of Kazakhstan organized a presentation of tenders

for the promising hydrocarbon areas, including the Kazakh sector of the Caspian Sea, in Houston (USA) and London (Great Britain). Dozens of companies expressed interest in participating in projects in the Caspian Sea, and in 1993 it was decided to establish an international consortium to conduct geological exploration. According to the resolution of the Cabinet of Ministers of the Republic of Kazakhstan dated February 13, 1993 "Concerning the Formation and Development of Hydrocarbon Production in the Kazakh Part of the Caspian Sea", the state company JSC "Kazakhstankaspiyshelf" (KKSH), created specifically for this purpose, acted as the operator of the project. "The founding fathers" of this Caspian pioneer were Baltabek Kuandykov, who headed the KKSH, and Zhakyp Marabayev, who later took the post of general director of the international consortium. They were the first to start negotiations with Western companies to attract them to the Caspian Sea. They also prepared the basis for creating an international consortium and conducting geological exploration at sea.

"The first team fulfilled its historic mission. In fact, the first negotiations, presentations, and consultations were carried out by



us together with Baltabek Mukanovich (Kuandykov. – author). We accomplished titanic work in a very short time from the preliminary agreement to its final signing. The negotiating positions were set out and the concept of the consortium's functioning was developed", Zhakyp Marabayev later recalled.

On December 3, 1993, the negotiations resulted in the signing of an agreement on the establishment of an international consortium for geological exploration on the Kazakh shelf of the Caspian Sea – KKSH. It includes the world's largest oil companies: Mobil, Shell, Agip, British Gas, Total and the Statoil – British Petroleum alliance. The foreign consortium was responsible for the implementation until 1997 of the program for assessing the oil and gas potential of the Kazakh sector of the Caspian Sea. This was based on attracting Western capital and highly efficient technologies, as well as the socio-economic development of the region.

"We set very ambitious conditions for Western companies. The Kazakh side was to be the operator in the project", Zhakyp Marabayev said. "That is, Kazakhstanis were to be in key positions. Our Western partners reproached us for this. 'You have no TRANSLATED FROM THE KAZAKH LANGUAGE, THE WORD "KASHAGAN" MEANS "RESTIVE, ELUSIVE" 104

OIL AND GAS OF KAZAKHSTAN 30 YEARS OF INDEPENDENCE PATH TO CREATION

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experience working at sea'. But we gave them an example: an instructor is assigned to a person who wants to learn how to drive a car. Therefore, experienced managers of these Western companies were literally assigned to support us. The first stage of the development of the international consortium was very difficult. It was a period of overlapping. It was not easy to manage the process when you have so many companies in the consortium, which all differ in philosophy and internal policy. Despite this, we looked ahead, trained specialists and eventually created a company which would serve as the basis for all offshore oil production".

In 1993, when creating a consortium for conducting geological exploration on the Kazakh shelf of the Caspian Sea, the foreign partners assured Kazakhstan of their readiness to provide their own geophysical vessels. They also undertook to train local specialists to participate in these works at their own expense. These were the first messages and the first indicators for the major foreign companies working in oil projects around the world, that the policy of developing national content is a priority. They saw the fact of attracting domestic goods, works and services not as an obligation or an encumbrance, but as a component of their own business. After all, the involvement of local society in the project is cheaper, more stable, and, therefore, more effective. There had been no such practice in Kazakhstan up to that time. The foreign partners in KKSH defined the architecture of building relationships

in the local market in general terms. Kazakh specialists conducted extensive research with well-known foreign companies, such as McDermott and others with experience in other countries, in the aims of understanding how the marine infrastructure should develop.

"We realized that the oil service is a huge array in which Kazakh companies should occupy a worthy niche. This involves the construction of roads, power transmission lines, water supply systems, the creation of new industries and jobs, deductions to the budget, and the construction of social facilities for the benefit of the local population", Zhakyp Marabayev noted. "Over time, the mentality of the business community changed, experience was gained, and the dynamics of attracting local content grew".

After completion of research in 1994-1997, real prerequisites were created for the development of the offshore oil and gas industry in Kazakhstan. Facilities of great interest were identified throughout the water area of the Kazakh sector of the Caspian Sea. Large-scale environmental studies were carried out, the first infrastructure facilities were created and project management was determined to support marine geophysical work. A training program for local personnel was also carried out. The government approved and prepared a map of blocks for the study and development of offshore oil and gas fields. About \$200 million were invested in the development of the region. Following the results of the work



Akhmetzhan Yessimov,

1997, Deputy Prime Minister, Chairman of the State Investment Committee of the Republic of Kazakhstan

and as a result of the negotiations between the Government of the Republic of Kazakhstan and foreign companies, it was decided to create a Northern Caspian PSA (PSANC).

The document was signed on November 18, 1997 in Washington, USA, in the presence of President of the Republic of Kazakhstan, Nursultan Nazarbayev, Deputy Prime Minister, Chairman of the State Investment Committee of the Republic of Kazakhstan, Akhmetzhan Yessimov, and the companies Agip, British Gas, British Petroleum, Statoil, Mobil, Shell, Total and KKSH. The PSA entered into force on April 28, 1998 and was viewed by the oil and gas community around the world as a strategically important document that testifies to the huge trust of the largest corporations on the planet in the recently unknown Kazakhstan.

Akhmetzhan Yessimov later recalled: "...I remember more the day before (the signing of the PSA. – author), when I submitted the draft to the Head of State. We had to finish the document before his visit to the United States. It was a huge volume with more than 100 bookmarks. He looked through each one very carefully, and spent several hours getting acquainted with the document. The work was carried out in several areas. A very robust working group was created in the government, each unit of which was headed by either a relevant minister or his deputy. Foreign specialists were also involved. In fairness, it should be noted that this was the first experience of performing such a large-scale task in the country. I think that most of our amendments were repulsed even at the stage of working groups."

The key points of the PSA were: the exploration period of 6 years from the date of entry into force of the PSA with the right to extend for 2 years; the development and production period of 20 years from the date of commercial opening at the contract site with the assumption of two extensions of 10 years; the total amount of capital investments in the development of fields in the Northern Caspian Sea – \$28 billion; planned total revenue – \$800 billion, including divisible income – \$690 billion.

In September 1998, as a follow-up to the agreements under the PSA for the exploration and production of hydrocarbons in the Caspian Sea, an international consortium for the development of offshore fields of Kazakhstan - Offshore Kazakhstan International Operating Company (OKIOC) was established. This included all the participants of the international consortium for the exploration of the Caspian shelf "Kazakhstankaspiyshelf" with proportional shares of the participants. Kazakhstan was represented by Kazakhoil" the national oil and gas company. However, immediately after the creation of OKIOC, in October, it sold its 14.3% stake to two new participants - the Japanese Inpex North Ltd and the American Phillips Petroleum. "Kazakhstankaspiyshelf" was transformed into an open joint-stock company, engaged in geological and geophysical research in the structure of "Kazakhoil".

Explaining the forced withdrawal of Kazakhstan from the project, the well-known Kazakh oilman Nurlan Balgimbayev, who in 1998 was the Prime Minister of the Republic of Kazakhstan, and then head of NOC Kazakhoil, recalled that in 1998 there was a peak in the payment of public debts taken out by the government in 1992-1994. "In 1998, the crisis in Southeast Asia was already raging. The ruble had collapsed in Russia, and our financial situation was not so good. External obligations had to be fulfilled, and then the Government decided to sell 1/7 of its share. (...) A tender was announced, and we sold our 7% fairly well for \$550 million to the Japanese National Oil Company and Phillips Petroleum."

In 1998, the exploration of hydrocarbons began at the PSANC site with an area of 5,600 square kilometers. Due to the geological features, it was decided to drill exploration wells from artificial islands, since the sea depth here was from 3 to 10 meters. OKIOC specialists, in cooperation with Kazakhstani experts, conducted an environmental impact assessment study before drilling. It obtained all the necessary permits and licenses for carrying out work. A professional environmental group was created in the consortium and a clear reporting and monitoring system was established. When choosing the technologies and methods for drilling wells, waste disposal and equipment, a number of features of the ecosystem of the North-Eastern Caspian Sea were taken into account: shallow water, winter ice cover, ice movement and ice piles around the structures, reservoir pressure and high concentration of hydrogen sulfide in the subsalt hydrocarbon reservoirs.

As Kenzhebek Ibrashev recalled, (in 1998 president of Kazakhstankaspiyshelf JSC, and in 1998-2001 - OKIOC administrative manager, business support manager) the consortium office was based in Almaty, where the exploration program for the Northern Caspian was being prepared. This included drilling, construction of production infrastructure, support bases for offshore operations. "There were a lot of problems related to collaboration with the local authorities. We had to resolve customs, tax and other issues. OKIOC management entrusted me with this work. We worked very closely with the leadership of the Astrakhan province. The late Anatoly Petrovich Guzhvin, a great friend of the President of Kazakhstan, helped us a lot. Of course, this was also the first experience of working with such a large consortium in Astrakhan. It was the first investment in the shipbuilding industry of the Astrakhan province. In addition, I was assigned to work on the development of the Bauta base for support of maritime operations.

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Fariza Ongarsynova

(25.12.1939, Manash aul, Guryev district – 23.01.2014, Astana) Poetess, National Writer of the Republic of Kazakhstan (1991), Laureate of the State Prize of the Kazakh SSR named after Abai (1979), public figure, author of a series of works of poetry and publications

It had previously belonged to Kazakhstankaspiyshelf JSC. We built a lot of facilities within the framework of our obligations under the social infrastructure development programs in Atyrau and Magystau regions. We worked closely with local communities, explaining what the Kashagan project is, and what we intended to do. There were key environmental issues related to the ecology of the Caspian Sea which concerned the local population. All the wellknown scientists in Kazakhstan were involved in resolving these issues," he was to note later.

In order to drill the first exploration well on the Kazakhstan shelf of the Caspian Sea, it was decided to use the "Sunkar" floating submersible drilling barge rig. The submersible barge was chosen as the best option for drilling in shallow water conditions. The water depth in the area of Eastern Kashagan reaches 3.5-4 meters. In addition, such barges have been successfully used at similar depths in environmentally sensitive areas in the Gulf of Mexico and Nigeria.

The modification of the barge began at a shipyard in the US state of Louisiana and was completed at the Astrakhan Marine Shipyard in Russia over a total period of 12 months.

Uzakbai Karabalin, in 1999, the first vice-president of Kazakhoil NOC JSC, said: "In America, the floating barge was cut lengthwise into three parts. This was so that it could be transported across the

Mediterranean, Black and Azov Seas, through the narrow Volga-to-Don Channel to Astrakhan. At the Astrakhan Marine Shipbuilding Plant, these three parts were assembled together as a single barge. A drilling rig with a large capacity was installed here, in order to drill to the necessary depths on the Caspian shelf. Such work was, of course, very time-consuming. It was a technical challenge that was eventually overcome. The choice of a place for the construction of a drilling barge was also difficult. Although there are very large shipbuilding facilities in Astrakhan, in the 1990s they were all in such disrepair that we could not decide which of these shipyards to use. The "Sunkar" drilling barge was eventually installed at the Astrakhan Marine Shipbuilding Plant. Then the finished barge had to be floated down the Volga into the Caspian Sea. Here, too, there were difficulties, because it was necessary to choose a time when the Volga was full-flowing, so that this barge could reach the Caspian Sea without delays and without grounding".

During the modification, the "Sunkar" barge was updated by 75%, including drilling equipment, mast and living quarters. The total cost of the modification costs exceeded \$100 million. This unique engineering structure was specially designed to take into account the harsh conditions of the Caspian Sea. In particular, the drilling barge was equipped with special sponsons to increase the volume, reduce precipitation and resist ice loads. The design of the sponsons provided for ice reflectors with a height of 4 meters. The workers living quarters were modernized and prepared as temporary accommodation. Heating, ventilation, fire and gas monitoring systems were redesigned for Arctic conditions and potential hydrogen sulfide emissions. High-tech equipment for the purification of domestic wastewater was also installed on the barge.

The "godmother" of the ship was the famous Kazakh poet, Fariza Ongarsynova, who in a festive atmosphere to the sounds of a brass band, broke a bottle of champagne on the bows of the ship and "launched it".

In June 1999, the "Sunkar" barge was launched, and on 10 July it was installed at the drilling point on an artificial island. On 12 August, in accordance with the PSA signed by the Republic of Kazakhstan with partners in the North Caspian project, the OKIOC consortium started drilling "Vostochny Kashagan-1", the first exploration well on the Kazakh shelf of the Caspian Sea.

The whole world was watching the events on the Kazakh shelf at that time, and foreign investors were aware that the outcome of the work might be unpredictable. David Varney, Chief Executive of British Gas, noted at the time: "We must remember that exploration is a risky business, and the probability of not discovering a huge deposit is higher than the possibility of discovering it".

The risks were amplified by three factors. The reservoir of the deposit lies at a depth of about 4,200 meters below the sea floor and is under high pressure (770 bar – about 800 times higher than atmospheric pressure at sea level). The crude oil in the reservoir is characterized by a significant content of high-sulfur gas (up to 19% hydrogen sulfide, H2S). The harsh working conditions are caused by extreme temperatures (from +40 to -40), and the low level of mineralization due to the influx of fresh water from the Volga and

the Urals. This is further combined with shallow water and low temperatures in winter, as a result of which the Northern Caspian is covered with ice for about five months a year. The movement of ice and the formation of furrows from the movement of ice on the sea floor represent serious restrictions for construction work. The enclosed nature of the sea creates difficulties for material and technical support, production safety, solving engineering and logistics problems. The Northern Caspian Sea is a very sensitive ecological zone and a habitat for a variety of flora and fauna, including some rare species.

"I would like to emphasize that the difficult factors listed above are often encountered separately in world practice, but as to yet there was been no general combination of them. So these are unique conditions", Paul Jeffrey, OKIOC's operations manager, once said.

However, the risks were justified a year after the start of drilling.

On June 30, 2000, during the testing of "Vostochny Kashagan-1", the first exploration well on the Kazakhstan shelf of the Caspian Sea, an influx of hydrocarbon raw materials with a daily flow rate of 600 cubic meters of oil and 200 thousand cubic meters of gas was obtained. On July 4, 2000, President of Kazakhstan, Nursultan Nazarbayev, and the leaders of OKIOC officially announced the discovery of a giant deposit. It was named after the famous Kazakh poet-zhyrau of the XIX century Kashagan Kurzhimanul.

"Many people think that the Kashagan field was discovered by Western companies who came to work in this project. In fact, this super-giant was discovered by Kazakh oilmen in the early 1990s. I gave the name "Kashagan" to this deposit together with our chief geologist, Leonid Petrovich Dmitriyev, a wonderful person and a professional in his field. Shortly before that, the Mangystau (formerly Mangyshlak) region celebrated the 150th anniversary of our fellow countryman, the poet and improviser, Kashagan, after whom the deposit was named. We learned that there is definitely oil there, even 2-2. 5 times more of than in Tengiz, because the structure itself is 2-2.5 times larger than Tengiz. But we moved rather slowly towards the official discovery of the field, since the northern part of the Caspian Sea is a protected area - ships are not allowed here, and work is prohibited," Lyazzat Kiinov, akim of the Mangystau region in 2000, would later recount. "Kadyr Baikenov and I, who at that time held the positions of Minister of Energy and Fuel Resources and Deputy Prime Minister of the Republic of Kazakhstan, discussed several times whether we should deal with Kashagan right now or postpone it for the future. As a result, the country's leadership came to the conclusion that we needed Kashagan at the present moment for the rapid growth of the economy of Kazakhstan. After that, we handed over the materials we have on Kashagan to Western companies. When they realized what reserves they could deal with, they, of course, agreed to take up this project".

"What did I feel when the information about the discovery of the Kashagan field was confirmed? Euphoric! It had been a long time since new discoveries. In the 1970s and 80s, following the results of huge geological exploration, oilmen annually discovered two or three oil fields. For about 30 years, there had been no



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Потандент Республики Казахстан Нурсултан Назарбаев

ORUOK KAMMAUMER luisti tanadom okutata Kyr enin, mensiven zop erginah zopon malarius ereieriggi gen zyanomza Булел байленда, Казах Булел байленда, Казах халхынан, онну шанинетніх тәуелегіздігі нен бақыст тәуелегіздігі нен бақыст болашадына Қазагень енесін! hpermons P. Hadrang Mra-arror. Cyyskap:



discoveries of deposits of this magnitude, and finally, Kazakhstan confirmed the presence of a supergiant on the Kashagan structure. It was a real oil feast!" Uzakbai Karabalin shared his joy during the interview.

As Kenzhebek Ibrashev emphasized, the announcement of the discovery of hydrocarbon raw materials in the first exploration well of the Kashagan field became the most important news of that period. "It was beneficial for everyone, because this information sharply raised the share prices of the consortium participants. President Nursultan Nazarbayev immediately flew to the field. (...) During that visit to the platform itself, the President noted the special light quality of Kashagan oil. He smeared his face with this oil, and then smeared the faces of Nurlan Balgimbayev, who then headed Kazakhoil, and the akim of Atyrau region, Imangali Tasmagambetov".

At a historic press conference immediately after visiting the "Sunkar" drilling platform, the Head of State made a statement that Kazakh and Western journalists instantly quoted around the world: "Today is a happy day for the people of Kazakhstan. The discovery of oil at Kashagan is a huge boon to our independence,
"Today is a happy day for the Kazakh people. The discovery of oil at Kashagan is a huge boost for our independence, for our future prosperity, and for improving the lives of our people. The great hopes of the people of Kazakhstan have come true.

Today I declare to you the very fact that there is oil, it is great and many times greater than Tengiz, it is of high quality, and it will work for the benefit of Kazakhstan and the world community, to whom we are going to supply it. I am happy that I was able to open the first well and bring you the first Kazakhstan oil.

As you know, we celebrated the centenary of Kazakhstan oil last year. Today's event stands out in this century-old history. The discovery of huge oil reserves on the shelf has made us witnesses of this event. So let this national wealth serve the people of Kazakhstan, the independence of the state and contribute to the happy future of our country. "





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for our future prosperity, and for improving the lives of our people. The great hopes of Kazakhstanis have been justified. (...) Today I am telling you that there is oil, it is huge, many times higher than Tengiz, high-quality, and it will work for the benefit of Kazakhstan and the world community, to whom we are going to supply it. I am happy that I had to open the first well and bring you the first Kazakh oil".

It was symbolic that Kazakh oilmen celebrated their first victory in the Caspian Sea shortly after a truly historic event in the development of the oil and gas industry of Kazakhstan - the celebration of the 100th anniversary of the beginning of industrial oil production on 3 September , 1999 in Atyrau. On this day, in the Atyrau Regional Drama Theater, the President of the Republic of Kazakhstan awarded medals of honor to many famous oil workers, including Prime Minister Nurlan Balgimbayev, who addressed his award to all employees of the oil industry of the republic. Viktor Chernomyrdin, former Prime Minister of the Russian Federation, Chairman of the Gazprom Board of Directors, was rewarded for the development of cooperation between Russia and Kazakhstan in the energy sector. Akims of the main

oil-producing regions of Kazakhstan also received honors: Atyrau – Imangali Tasmagambetov and Mangystau – Lyazzat Kiinov. During the festive events, Nursultan Nazarbayev promised that in the foreseeable future, the priorities in the sectoral structure of investments would remain precisely for the oil and gas industry and, in particular, for projects on the offshore shelf. This was all to come true very soon.

In May 2001, a second exploration well was drilled at Kashagan, which showed a daily flow rate of 540 cubic meters of oil and 215 thousand cubic meters of gas. Such impressive results from the two wells allowed the partners in the North Caspian International Consortium, by that time renamed Agip KCO, to declare the most significant discovery in the world after the Prudhoe Bay Field, discovered on the Northern Slope of Alaska in the 1960s.

In the period 1998-2004, in accordance with the program, all six planned exploration wells had been drilled on the contract territory: two at Kashagan and one each at Kalamkas, Aktoty, Kairan and Southwestern Kashagan (a small structure southwest of Kashagan). All wells yielded positive results. On June 30, 2000,



hydrocarbons were discovered at Kashagan; on September 3, 2002 – at Kalamkas Sea; on August 10, 2003 – at the Southwestern Kashagan; on September 2, 2003 – at Aktoty; on 10 September, 2003 – at Kairan. In total, according to the North Caspian project, preliminary geological oil reserves are estimated at 5,705 million tons, recoverable – 1,917 million tons.

In accordance with the project for the implementation of the Stage I, it was decided to pump the extracted hydrocarbons through pipelines from the drilling islands to D Production Island. Technological installations for the separation of the liquid phase (oil and water) from raw gas would be located here, as well as compressors for the reverse injection of gas into the formations. At this stage, about half of the total volume of gas produced was to be pumped into the reservoir. The extracted fluids and crude gas were to be supplied via an offshore pipeline to the Bolashak onshore processing complex in Karabatan, where it was planned to process the oil to marketable quality.

At the beginning of 2005, the Kazakh Government announced the need for detailed forecasting of oil production for the next three years. The Ministry of Economy and Budget Planning of the Republic of Kazakhstan developed a forecast plan for the development of the economy, in which it proposed three possible situations. The baseline scenario assumed that world oil prices would be in the range of \$28.5 – 34 per barrel, as a result of which the average annual GDP growth in 2006-2008 was expected to be 8.1%. Under the low prices scenario, it was assumed that the level of world prices would be in the range of \$22-24 per barrel, and real GDP growth rate would be 7.4% on average over three years. According to the high price scenario, the level of world prices was predicted at a level close to \$40 per barrel. This would accordingly affect GDP growth, which in this case was estimated at 8.8%. By that time, the price of oil had exceeded the expectations of even the most daring analysts, soaring to a record high of \$70 per barrel, and, thereby, fueled the interest of the governments of oil-bearing countries and private oil producers in the hydrocarbon sector.

Of course, all this, combined with the stunning victories in the Caspian Sea, could not but revive the desire of Kazakh oil workers to return to the profitable Kashagan project which had been abandoned at an economically difficult time for the country. By that time, KazMunayGas National Company had already been

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established. It was appointed by decree of the Government of the Republic of Kazakhstan No. 248 of 25 February, 2002 as the authorized body for representing the interests of the Republic of Kazakhstan in the PSA for the Karachaganak and North Caspian projects. Therefore, when British Gas decided to withdraw from the Kashagan project in the spring of 2003, and five of the six PSA partners – Eni (operator), ExxonMobil, Total, Shell (each owned 16.67%) and ConocoPhillips (8.33%) – expressed a desire to purchase the released shares (only Inpex with an 8.33% stake refused such a right), Kazakhstan, in accordance with the laws, declared its preferential rights to purchase them.

As a result of lengthy negotiations, the members of the consortium ceded half of the shares of the BG Group to Kazakhstan. On March 30, 2005, the British company signed a package of agreements with Agip, ExonnMobil, Shell, Total and ConocoPhillips to sell them its entire 16.67% stake in the project for \$1.79 billion ex-tax. On the same day, the Government of the Republic of Kazakhstan, the Ministry of Energy, KazMunayGas and five



partners in the North Caspian project, who bought the shares of BG Group, signed a package of documents to assign half of this share to the Kazakh side. The transaction amount amounted to \$913.142 million and included a fixed market price of the share as of 1 January, 2003. This amounted to \$615 million, and all historical expenses, including operating, capital and other expenses in the amount of \$298.142 million, incurred in the period 2003-2005 before the date of signing of all documents. KazMunayGas allocated its own funds to purchase a stake in the Kashagan project - \$868.2 million, including proceeds from the Tengizchevroil Joint Venture (where KazMunayGas has 20%) in the amount of \$766.6 million, and the money released as a result of internal restructuring in the amount of \$44.9 million. At the same time, no credit funds were used. The deal was very profitable for Kazakhstan. During the two years of negotiations, the price per barrel increased from \$35 in 2003 to \$50 in 2005, while the real price remained the same when the market value of the asset purchases increased. On May 4, 2005, in Astana, KazMunayGas and Agip KCO participants signed an agreement on





amendments and additions to the PSA for the North Caspian Sea dated November 18, 1997. A deal was finalized for the acquisition by the Kazakh side for an 8.33% stake in the Kashagan project. On the same day, the Government of the Republic of Kazakhstan issued a resolution approving this transaction. After the completion of legal formalities, the shares of Eni, Total, ExxonMobil, Shell in the North Caspian project were 18.52% each, ConocoPhillips – 9.26%, and Inpex and KazMunayGas – 8.33% each.

Generally speaking, participation in the North Caspian project promised huge benefits to the national company. Firstly, it provided protection against crisis situations, which, according to the experience of previous years, often required immediate and direct state intervention to resolve them. Secondly, the exploration already carried out, and, most importantly, the discovery of commercial oil reserves at Kashagan significantly reduced the risks to the minimum level in the future. Thirdly, in accordance with the economic model of production sharing for the North Caspian project for the entire period of its implementation, the Government of Kazakhstan expected to receive about \$65 billion in revenue. The income of KazMunayGas for the period 2005-2041 was estimated at \$10.6 billion. Fourthly, the national company was given the opportunity to intervene in the future transportation of part of the Kashagan oil. In fifth place, if necessary, Kazakhstan could sell its share to other countries for great benefit or use their interest as a powerful argument when selling the share to other project participants. In final and sixth place, against the background of the future growth in the number of project employees, including contractors, it was Kazakh enterprises, at the insistence of KazMunayGas, that would receive the largest number of profitable contracts. In the end this was to have a positive impact on the social situation in the region and the country as a whole.

Thus, Kazakhstan's participation in the North Caspian project significantly strengthened the state's position both regionally and globally. It served as the driving force of the ideology of striving for the future and allowed the country to raise the political arena to a higher level of relations with other countries.

However, not everything at Kashagan was so smooth at that time.

As Timur Kulibayev, Chairman of the KAZENERGY Association, recalled: "The situation around the Kashagan field from the very beginning of this project was quite difficult. Firstly, the implementation of the project in technical and technological terms turned out to be very difficult, which is why the deadlines for putting the field into operation were postponed several times. Secondly, its cost dramatically soared, significantly increasing the financial



burden on the oil giants that were shareholders in the project, as well as on KazMunayGas. Thirdly, we saw big mistakes in project management. All this contributed to delaying the payback".

The fact is that, in accordance with the PSA of 1997, investments in the Kashagan development project were to amount to \$10 billion in the first phase and \$19 billion in the second and third phases. Production of the first oil was planned for 2005. In 2002, the consortium appealed to the Government of the Republic of Kazakhstan to postpone the start of production for 2008. In 2004, the Government received a penalty of \$150 million from the consortium for its consent. In 2007, the project operator again initiated amendments to the agreement due to another postponement of the start of production from 2008 to 2012 and an increase in the project budget to \$136 billion. In exchange for

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this, the Government of Kazakhstan, represented by the Ministry of Energy and Mineral Resources of the Republic of Kazakhstan and JSC NC KazMunavGas, signed additional agreements with foreign participants of Agip KCO in November 2008 to the PSANC in force since 1997, doubling its share of participation in the project and strengthening the interests of the state in it. The share of KazMunayGas in Kashagan increased from 8.33% to 16.81%, which cost it \$1.78 billion. It promised to pay this amount in three equal shares with the start of commercial operation of Kashagan at the expense of cash flows from the project. Similar shares were owned by Eni, ExxonMobil, Shell and Total (previously they owned 18.52% each). The share of ConocoPhillips decreased to 8.40% from 9.26%, and Inpex - to 7.56% from 8.3%. In fact, a new version of the PSA was adopted, which not only increased the share of KazMunayGas to the level of major participants - Eni, ExxonMobil, Shell and Total, but also secured a dominant role in the project for it. The current, and now final agreements further improved the economic conditions for the Republic of Kazakhstan, as well as establishing strong mechanisms for controlling deadlines and costs. This time, the amount of penalties for delaying the start of commercial production amounted to \$120 million for each year of delay. The parties also agreed that in the event of another postponement of production at Kashagan beyond December 31, 2013, Kazakhstan would not reimburse the costs incurred by the consortium for the development of the project from the extracted oil. Kazakhstan was guite satisfied with the new terms of the PSA, as were the foreign partners.

Paolo Scaroni, Chief Executive Officer of Eni, noted that from now on "quite close relations have been established between the parties"... "which will have a positive impact not only on this project, but also on other projects."... "An important result is that all parties are satisfied with the results of the negotiations and the opportunity to continue implementing the project further", said ExxonMobil President, Neil Dafin. Shell Executive Director, Jeroen Van der Veer, also expressed satisfaction with the results of the agreement, noting that the purpose of this document is "to establish the best possible relations between the companies included in the consortium and the Government of Kazakhstan, in order to field the best football team to win". President of Total, Christophe de Margerie, called Kashagan "a multibillion-dollar project in which everyone will receive the necessary benefits". "Undoubtedly, the implementation of the Kashagan project will be important not only for the European or Asian economy, but also for the global economy as a whole", he said. In turn, ConocoPhillips President, James Malva, and Prime Minister of Kazakhstan, Karim Massimov, thanked each other for the work done to reach agreements acceptable to all parties. The head of Inpex, Kunihiko Matsuo, expressed gratitude to the Kazakh Head of Government for his personal role in achieving a mutually beneficial agreement for all parties. "The consortium is a unique organization, and its minority shareholders are satisfied that the opinions of all parties were listened to when drafting the agreement", he said. Karim Massimov also expressed satisfaction with the completed negotiations between the government and the participants of the Kashagan Consortium. "Despite unprecedented lobbying pressure from outside, the government has guaranteed the national interests of the country, while remaining true to the framework of current legislation and international standards", he said at the meeting with the deputies of the Senate of the Kazakh Parliament on Monday. He stressed that "the Government will continue to firmly pursue a policy of protecting national interests in the raw materials sector of the economy".

In January 2009, a new operating company, North Caspian Operating Company (NCOC), commenced operating. It took over the functions performed by Agip KCO. NCOC's functions included supervising all project activities, planning, coordinating, reservoir modeling, conducting conceptual studies, drawing up plans for initial field development, and interacting with government authorities on behalf of the entire enterprise. Agip KCO, a subsidiary of the Eni concern, was announced as the NCOC agent responsible for the implementation of the first stage of the Kashagan development and the implementation of the ground project at the second stage. In 2012, NCOC sent a proposal to the Government of the Republic of Kazakhstan to increase the cost of the first phase to \$46 billion.

The long-awaited ceremony of launching the production facilities of the giant Kashagan field and completing the construction of facilities necessary for initial production took place on June 30, 2013 with the participation of President of the Republic of Kazakhstan, Nursultan Nazarbayev, and British Prime Minister, David Cameron. The launch and testing of the installations of the Bolashak complex oil and gas treatment plant with a design





capacity of 450 thousand barrels of oil and about 9 million cubic meters of gas per day began with the supply of commercial gas for initial technical needs from the main gas pipeline. Nursultan Nazarbayev thanked the international partners, and engineers, in fact everyone who took part in the implementation of one of the largest projects in the world.

"Two decades ago, the decision to begin development of the Northern Caspian was not easy. Today I can absolutely confirm that was the right decision. The development of Kashagan has provided a powerful impetus to the economic growth of the country. It has also served to strengthen the international authority of the young state. The development of this unique giant deposit helped to strengthen the position of our republic in the global geopolitical space. Having an invaluable significance for the future development of Kazakhstan, the North Caspian Project will contribute to ensuring global energy security. I am sure that our joint work and the strength of our partnership will allow us to achieve these goals", he said at the opening ceremony of the Bolashak plant.





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David Cameron stressed that the impressive scale of the Kashagan project showed additional indicators of Kazakhstan's potential.

On September 11, 2013, oil production began at the Kashagan field. The oil was extracted from the first well that had not been conserved at the field. However, on September 24, 2013. during a scheduled inspection of the gas pipeline running from D Island to the Bolashak plant, a leak of raw gas was detected. After the repair work on 6 October, the wells at Kashagan were reopened and production resumed without complications. By this date, a production level of 75 thousand barrels per day was reached. On 9 October, due to the discovery of another gas leak, the wells were closed again. After repairing the damaged connection, a full hydrotest was carried out, during which other places of potential gas leaks were identified. A thorough investigation has begun. In May 2014, it was announced that both the oil and gas pipelines require

complete replacement. This blow was an unpleasant surprise for all partners in the North Caspian project, including Kazakhstan.

As Sauat Mynbayev, who has been the head of JSC NC KazMunayGas since July 2013, commented: "The initial design and technical characteristics of the metal fully met the requirements of international standards and reasonable world practice in the field of oil and gas field development, taking into account the hydrogen sulfide environment and the availability of water, as expected at Kashagan. In addition, according to the results of laboratory studies of the pipe metal, including modeling of its reaction to the effects of sulfur dioxide, it was concluded that the metal met the conditions of the Kashagan field. Taking into account all the above, there was no reason to assume that such a situation could happen".

First of all, it was decided to abandon the existing operating model of Kashagan development and create a new unified consolidated joint company - NCOC. Uzakbai Karabalin, Minister



Deposits

Kashagan **Kalamkas** Southwest Kashagan Aktoty Kairan **Total for North Caspian Project**

Geological

4862 million tons of oil 304 million tons of oil 64 million tons of condensate 305 million tons of condensate 170 million tons of oil 5705 million tons

Extractable

1647 million tons 100 million tons 20 million tons 100 million tons 50 million tons 1917 million tons of Oil and Gas of the Republic of Kazakhstan, explained that the changes were related to the lack of efficiency of the former operator and expressed the hope that "the work of this operator should be much more efficient than it was before". After three years of painstaking work on replacing pipelines, oil production at Kashagan was resumed.

On September 28, 2016, NCOC began the commissioning and testing of equipment at the offshore and onshore complex of the field. At island "A" several wells were discovered. After stabilization of the operation of the equipment of the offshore complex, oil and gas were delivered to the Bolashak plant. On October 14, 2016, the first batch of Kashagan oil produced as part of the commissioning works was shipped to the CPC oil pipeline and the pipeline system of KazTransOil JSC, and the first batch of commercial gas was delivered to the main system of Intergas Central Asia JSC. In October 2016, Energy Minister Kanat Bozumbayev told reporters that "oil production at the Kashagan field was proceeding normally" and had already reached 90 thousand barrels per day.

In total, the development of the North Caspian Project took 21 years, of which 4 years were spent on geological and geophysical studies of the Kazakh sector of the Caspian Sea by the KKSH consortium. 9 years were spent on the construction of the marine complex itself. 5 years were spent on the construction of the land complex. Additional 3 years were spent on the complete replacement of offshore and onshore pipelines. Thanks to the development of Kashagan, a domestic marine service infrastructure was created from scratch in compliance with the highest international standards. Factories were built for the production of large-capacity metal structures, including: "Ersai" (Kuryk village) and "Caspian Offshore Marine Construction" (Aktau seaport). Other facilities were constructed including: a ship repair plant in Bautino village; a base for supporting marine operations (Bautino village); and an oil spill response base.

At the present time, Kashagan consists of islands D and A, where oil and gas are extracted, and is being prepared for transportation to land, as well as the Bolashak complex oil and gas treatment plant. Early Extraction Centers 2, 3 and 4 are under construction. These facilities are an example of the engineering genius and joint work of foreign and Kazakhstani specialists. The design took into account the difficult climatic conditions, shallow water and glaciation of the water area; the environmentally sensitive zone of the Northern Caspian Sea; ultra-high pressure; and the content of hydrogen sulfide in oil.

As Timur Kulibayev noted: "Today we have worked on our mistakes and recommenced oil production at Kashagan. After that, the cash flow for the oil sold will begin to accrue, and the return on investment will begin, and the project itself will look different".

According to Zhakyp Marabayev, Deputy Managing Director of NCOC since 2008, and then Deputy Chairman of the Management Board for exploration and production of KazMunayGas, today the configuration of facilities at Kashashan allows for the production of 350-370 thousand barrels of oil per day, with the possibility of



Chapter **4 PRODUCTION GIANTS**

increasing to 450 thousand tons. Realizing that market conditions may not always favor the consortium's plans for the sales of sulfur, it is planned to create conditions for its storage. The sulfur created at the Bolashak installation will be stored in sealed conditions. Liquid sulfur will be poured into sealed containers and then monitored using sensors. Before marketing, the sulfur will be converted back into a liquid state, without crushing, with subsequent transformation into solid granules. This technology will avoid the formation of dust.

Planned oil production before the end of the PSA – it is 2041 - is 308 million tons and 211 billion cubic meters of gas, of which more than 62 billion will go to the domestic market to meet the needs of citizens and industry of the country.

Despite the numerous difficulties associated with the sharp increase in the initial investments and production delays, the Kashagan project remains profitable for the state. Due to frequent delays and increases in the cost of the project, Kazakhstan was able to significantly improve the PSA conditions to the benefit of state. It was able to create social infrastructure, increase the Kazakh content in the project, and provide jobs for several hundred thousand local residents. Currently, about 300 companies with a share of more than 50% of Kazakhstan ownership are involved in the Kashagan project. About 70 joint companies/partnerships were created. These included international companies such as Schlumberger, Siemens, Energy Wood Group, Saipem and others with their knowledge, technologies and experience. In total, 3,760 Kazakhstani companies are registered in the operator's database, all contributing to the development of Kashagan. Thanks to the policy of social responsibility, more than \$500 million have been invested in the social and infrastructural development of Mangystau and Atyrau regions.

In March 2021, GPC Investment LLP announced plans to start construction of a gas processing plant with a design capacity of 1.1 billion cubic meters of gas per year at Kashagan. Annually, the plant will produce 694 million cubic meters of commercial gas, 119 thousand tons of liquefied petroleum gas, 212 thousand tons of sulfur and 35 thousand tons of gas condensate and will increase production at Kashagan by 12 million tons. Problems with the recycling of associated petroleum gas have restricted the growth of oil production, and in addition, commercial gas will meet the growing needs of the domestic market. The investor will invest \$860 million in the implementation of the project. 600 jobs will be created at the new production facility, and 2,800 people will be employed during construction. The plant will start operating in 2024 and will become another significant contribution to the development of local content in Kazakhstan.

By discovering Kashagan so many years ago, Kazakh oilmen gave the whole world a special pearl. It was to become a guarantee of stability and energy security of Kazakhstan for many years to come. Today, Kashagan oil is extracted for the benefit of the people of the great steppe. The country's gratitude for the discovery was marked by the presentation of the honorary medal "Kazakhstan Republikasyn ken ornyn algash ashushy" to the discoverers

EVOLUTION OF THE STRUCTURE OF PARTICIPANTS IN THE DEVELOPMENT OF KASHAGAN

Year	Participants	Shares, %
1998	Mobil	14.3
	Shell	14.3
	Agip	14.3
	British Gas	14.3
	Total	14.3
	Kazakhoil	14.3
	British Petroleum	9.5
	Statoil	4.8
1998	ExxonMobil	14.3
	Shell	14.3
	Agip	14.3
	British Gas	14.3
	Total	14.3
	British Petroleum	9.5
	Statoil	4.8
	Inpex	7.1
	Phillips Petroleum	7.1
2002	ExxonMobil	16.7
	Shell	16.7
	Agip	16.7
	British Gas	16.7
	Total	16.7
	Inpex	8.3
	British Petroleum	8.3
2005	ExxonMobil	18.5
	Shell	18.5
	Agip	18.5
	Total	18.5
	ConocoPhillips	9.3
	Inpex	8.3
	KazMunayGas	8.3
2008	ExxonMobil	16.8
	Shell	16.8
	Agip	16.8
	Total	16.8
	KazMunayGas	16.8
	ConocoPhillips	8.4
	Inpex	7.6
2013	KazMunayGas	16.8
	ExxonMobil	16.8
	Shell	16.8
	Agip	16.8
	Total	16.8
	CNPC	8.3
	Inpex	7.6



of the giant deposit. On March 30, 2018, at a celebratory meeting dedicated to the professional holiday - the Day of the Geologist - Kaiyrbek Uskenbayev, Deputy Minister for Investment and Development of the Republic, awarded the medal to Uzakbai Karabalin (Chairman of KAZENERGY Association), Baltabek Kuandykov (President of Meridian Petroleum), and Maris Nazarov, Chief Geophysicist of Meridian Petroleum, Ashiraly Bizhanov (Deputy General Director of Batys Geofizservice), Kenzhebek Ibrashev (NCOC Deputy First Managing Director, President of Kazakh-British Technical University), Klara Rayeva (Manager of ENI ISATAY) and Oleg Turkov (Chief Geophysicist of Smart Engineering). The medal "Zher koynauynn kurmetti barlaushysy" was awarded to V. Tapayev (Centrgeolsemka LLP Vice-president) and S.Belyakov (Chief Geophysicist of KazGeology JSC Complex Party of Geology). A. Beketov, the geologist of the first category of the Department of Geology of KazGeology JSC was awarded the medal "Zher koynauyn barlaudyn uzdigi". In addition, Academician of the Academy of Sciences of the Republic of Kazakhstan, Serikbek Daukeyey, head of the corporate Fund "Zhas Geologist", Ismailova Zhanat, chief expert of the Committee of Geology and Subsoil Use, Sholpan Agybayeva, and many others were awarded the Certificate of Honor and letters of appreciation on behalf of the Minister for Investment and Development of the Republic of Kazakhstan.

In the words of the well-known oilman, Nurlan Balgimbayev, whose name is associated with many significant initiatives and major projects in the oil and gas industry of Kazakhstan: "The North Caspian project has become a real forge of world-class personnel for our country. When the project for the development of the Kashagan field in the Kazakh sector of the Caspian Sea began, we had no experience. We had to involve not only top foreign managers, specialists, but also workers in the project. Over the years, hundreds of Kazakhstanis have been trained in the world's leading training centers, and undertaken internships in oil companies. Today, these are highly qualified specialists including workers, middle managers, and top managers. The result is that about 80 percent of those currently employed in the project are Kazakhstanis. In my opinion, this is very important. After all, we have new projects ahead of us, and now we can implement them independently".

According to Zhakyp Marabayev, "three decades ago we lived in a completely different country, which, like air, needed new approaches and solutions for the development of its own economy. Over the past years, thanks to the successful cooperation of the partners of the North Caspian Project and the Government, Kashagan has become the main news maker in the oil and gas industry. I am sure that while maintaining leadership in the industry, we will serve as a benchmark for the development of the economy of Kazakhstan for many years to come".

At a briefing at Atyrau airport, after returning from the "Sunkar" barge, when the discovery of the Kashagan field was announced, Nurlan Balgimbayev once said: "Kashagan is only the first spring swallow in the Kazakh sector of the Caspian Sea. A number of offshore fields will be discovered in the next decade". His prediction was to come true very soon.

IUKOIL

In the 30 years since independence, the Republic of Kazakhstan has become a prosperous country with a favorable investment climate, including for oil and gas companies.

LUKOIL has been working here since 1995 and is one of the largest foreign partners. The company's investments in the country have already exceeded \$10 billion.

We have been participating in the Caspian Pipeline Consortium (CPC) since its inception, as well as in the onshore Tengiz and Karachaganak projects, and we are now starting to develop new projects in the Kazakhstan Sector of the Caspian Sea. With the support of the Government of the Republic, a lubricants production facility was launched, which brings additional revenues to the budget of Kazakhstan and provides the local market with high-quality products. It is important for us to maintain the social infrastructure of the Republic. We have implemented small business development projects and infrastructure improvementsin the regions of Kazakhstan, as well as helped medical institutions during the coronavirus pandemic.

LUKOIL will continue to strengthen cooperation with Kazakhstan, developing its production and social projects for the benefit of its residents.



Vagit ALEKPEROV, President of PJSC LUKOIL

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30 YEARS OF INDEPENDENCE PATH OF CREATION



THE MIGHTY SHELF

"THE SEA HAS ITS MIGRAINES TOO."

Victor Marie Hugo, a French writer

he emergence of new independent states in the post-Soviet region necessitated the resolution of myriad problems associated with the establishment of state sovereignty by the former republics of the USSR. One of these problems was territorial issues. The states adjacent to the Caspian Sea faced the task of fair and civilized territorial division, based on the generally recognized principles of international law and world practice. If before 1991 the Caspian belonged to two countries – the USSR and Iran, with the collapse of the Soviet Union, its waters washed the shores of five states – Russia, Iran, Azerbaijan, Kazakhstan and Turkmenistan.

The Treaty between the RSFSR and Persia in 1921 and the Treaty between the USSR and Iran in 1940 did not correspond to the changed political situation and could not fully regulate the



MOSCOW

Russia

BAKU BOJION

Iran

Cotox Ston

irkmenistan

NUR-SULTAN

ASHGABAT

TEHRAN

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Kassym-Jomart Tokayev, 2002, Foreign Minister of the Republic of Kazakhstan

relations between the coastal states. The aforementioned treaties regulated only the issues of merchant shipping and fishing, not any components of the legal regime of the seabed or its subsoil, airspace, and environmental regime inter alia. This served as the basis for the negotiation process between the Caspian states with the aim of jointly working out a new legal status of the Caspian Sea.

Prior to 1993, geophysical surveys and well drilling in the Caspian Sea were carried out by Russian and Azerbaijani enterprises. Azerbaijan, which inherited the hydrocarbon deposits on the Caspian shelf from the USSR, continued the development of marine subsoil in its sector. Russia, which possesses promising structures also in Caspian areas disputed with Kazakhstan, began preparations for exploration of its sea shelf. At that time, Kazakhstani organizations were not engaged in offshore oil operations, since they did not have experience in planning and implementing them, nor the necessary financial resources, technical and personnel potential for this. Offshore exploration in Kazakhstan intensified with the adoption in 1993 of the State Program for the Development of the Kazakhstan Sector of the Caspian Sea (KSCS) and the creation of the international consortium "Kazakhstankaspiyshelf" with the participation of the largest Western oil and gas corporations.

Meanwhile, the lack of a legal status for the Caspian threatened to aggravate relations between the Caspian neighbors in the event of developments in the disputed sea areas.

Nursultan Nazarbayev was the first of all the leaders of the Caspian countries to declare the need for flexible constructive dialogue to resolve this problem. On July 6, 1998, his birthday, he paid a visit to Moscow, during which an interstate Agreement on



Signing of documents for the transfer of Russian and Kazakh assets in the Caspian Pipeline Consortium, Moscow



the delimitation of the northern part of the Caspian Sea was signed between Kazakhstan and Russia. In accordance with this agreement, the bottom of the Caspian was divided along a median line into segments belonging to each Caspian state. The water area and biological resources were declared common property. Although all states fulfilled such conditions, the legal status of a number of controversial hydrocarbon structures remained uncertain.

On November 29, 2001, the Republic of Kazakhstan and the Republic of Azerbaijan signed an Agreement in Moscow on delimiting the bottom of the Caspian Sea, to which the corresponding Protocol was signed on February 27, 2003 in Baku.



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On May 13, 2002, in order to exercise sovereign rights to subsoil use, the Presidents of Kazakhstan and Russia, Nursultan Nazarbayev and Vladimir Putin, also signed the Protocol to the Agreement on the delimitation of the bottom of the northern part of the Caspian Sea from 1998. This was a real step towards resolving the Caspian issue for the first time in the long history of independence. This was a really significant shift. However, the signing of this important document was preceded by an unpleasant incident related to the issuing by the Ministry of Foreign Affairs of the Republic of Kazakhstan of a note of protest against Russia regarding LUKOIL's ongoing exploration of the reserves of the Khvalynskoye border field without approval from Astana. Kazakhstan, which also laid claim to Khvalynskoye, called the actions of the Russian oilmen illegal. The signed Protocol regulated for the Khvalynskoye field and the Central structure to come under the jurisdiction of the Russian Federation, and

the Kurmangazy structure would belong to the Republic of Kazakhstan. All three were to be developed jointly by the two countries. Kazakhstan's partner in the Khvalynskoye development project for the Russian side was LUKOIL; in the Central field – LUKOIL and Gazprom; and in Kurmangazy – Rosneft.

"... During the negotiations, we found an original formula – a "modified" median line. In practice, this led to the diversion of Khvalynskoye to the Russian part of the seabed, while Kurmangazy fell under the full jurisdiction of Kazakhstan. The compromise concerned not only the legal status of the northern part of the seabed, the key factor was that the parties agreed on joint development of the fields, proceeding from the capabilities and interests of the producing companies", commented Kassym-Jomart Tokayev, who in 2002 was Secretary of State – Minister of Foreign Affairs of the Republic of Kazakhstan.

According to the recollections of Uzakbai Karabalin, who at that time held the position of Deputy Minister for Energy and Mineral Resources of the Republic of Kazakhstan, disputes arose during the negotiation process. For example, Russia proposed the attribution of Dolgy Island, consisting of reclaimed sand, to its jurisdiction and from there to draw the median line. Dolgy island appeared when the water level in the Caspian fell, and submerged when it rose. So in reality such an island did not exist. The Russian side argued that it was a ,collective farm', a mainland island, with fishermen. Kazakhstani specialists were forced to land there, take samples and prove that the "island soil" was not continental, and there was no corresponding continental vegetation. So the dispute around Dolgy ended", he said.

The achievement of agreements on the division of the Caspian Sea between Kazakhstan and Russia was the greatest achievement of bilateral diplomacy and opened the way to the shelf for our country.

"The joint equal development of the largest deposits in the Caspian not only raises our relations to a new level, but also serves as an example for others", President of the Republic of Kazakhstan, Nursultan Nazarbayev, stated at the time. President of the Russian Federation Vladimir Putin emphasized: "It is always easier to work with states that have no disputes and have legal documents".

By the early 2000s, onshore oil production in Kazakhstan was being carried out by 33 oil-producing enterprises at more than 100 fields located in five regions – Atyrau, Mangystau, West Kazakhstan, Aktobe and Kyzylorda. The main increase in production was at the Tengiz, Karachaganak, Uzen, Kumkol and other fields. By 2002 most of the developed hydrocarbon deposits reached maximum annual production. At the same time, research showed that the main increase in the explored reserves and production of hydrocarbon raw materials for that period could be expected in the water area of the Caspian Sea.

By this time, Kazakhstan had achieved significant results in the development of its sector of the Caspian. More than 120 promising structures had been identified, including Zhambai, Darkhan, Akbota, Sandugash, Al-Farabi, Nursultan, Ulytau, Sary-Arka, Peschanomyskoye-2, Akmola, Azat, Zhenis, Shell Sea, Okzhetpes, Turkestan, Bulbul, Maral, Alatau, Kazakh Bay, Sauskan and many others. The predicted resources were estimated, while the geological and geophysical work carried out on the shelf in combination with exploration work on land areas adjacent to the sea made it possible to fairly accurately identify areas of large hydrocarbon reserves. In addition, the commercial discovery of oil at the Kashagan field and the discovery of a field at the Kalamkas-Sea structure were also announced. Preparations began for the signing of subsoil use contracts. An assessment of existing infrastructure facilities was carried out and priority projects were defined and special environmental conditions for conducting operations at sea were developed.

Government Decree No. 876 of June 29, 1999 took into account the intensification of oil operations in the Caspian Sea, and was aimed at minimizing the impact of oil spills on





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the environment, especially in the area of vulnerable natural environment. It also took into account the protection of fish stocks and areas of water intake for desalination units. Another Government Decree was approved on May 6, 2000 No. 67, establishing a National Plan for the Prevention of and Response to Oil Spills at Sea and in Inland Waters of the Republic of Kazakhstan. The National Plan regulated the actions of all parties involved (i.e. oil companies and state authorities) in the case of an ecological disaster at sea and was intended to minimize the impact of oil spills on the environment, human health, flora and fauna.

All these and other logical and effective measures allowed Kazakhstan to start developing a new State Program for the Development of the Kazakhstan Sector of the Caspian Sea. This was approved by the Decree of the President of the Republic of Kazakhstan No. 1095 dated 16 May, 2003. This program was developed on the basis of the provisions of the Program of the Government of the Republic of Kazakhstan for 2002-2004, and in accordance with the Strategy for the Use of Energy Resources of Kazakhstan and the Strategic Development Plan of the Republic of Kazakhstan until 2010. The Ministry of Energy and Mineral Resources was instructed to provide information on the progress of the program to the Administration of the President of the Republic of Kazakhstan and the Government of the Republic of Kazakhstan at the end of each half-year and year. Its adoption led to the intensification of work on the shelf, an increase in future hydrocarbon production and attracted billions of dollars in investments. It also enhanced infrastructure development and created thousands of new jobs. Its successful implementation was to put Kazakhstan on a par with the largest oil and gas producers in the world.

The current state program was a logical continuation of the State Program for the Development of KSCS (stage 1), approved 10 years previously – in 1993. The need to clarify the strategic provisions and methods of carrying out offshore oil and gas operations was associated with the current positive trends in the socio-economic development of the country, changes in the world hydrocarbon markets and the directions of their transportation. It was also associated with the establishment of CJSC National Company KazMunayGas established to ensure the interests of the state in the oil and gas sector.



The new state program covered the development period between 2003-2005, at the same time assessing and forecasting development until 2015. The program also took into account the global trends of boosting the importance of the sea shelf as a source of minerals, especially oil and gas, as well as the need to combine rational nature management with the requirements of environmental protection. While disclosing the procedure for the transition from predominantly geological exploration to the use of hydrocarbon reserves of the KSCS, the document actually aimed to convert the shelf into the main zone of hydrocarbon production in Kazakhstan. The addition of the oil resources of the Kazakhstani shelf to the world's proven reserves was a determining factor in global energy strategies. The government stated that Kazakhstan needed to be prepared for a flexible combination of strategies for the systematic transfer of oil production to the Caspian Sea while developing certain promising projects.

According to the state program, the development of KSCS at that time was facilitated by a number of positive factors. These included the dynamic and constructive domestic and foreign policy of Kazakhstan which guaranteed political stability and contributed to maintaining high rates of economic development. Other factors were economic growth, especially in developing countries, which led to demand for energy resources outstripping the growth of new hydrocarbon reserves; limited world reserves of hydrocarbon resources; dominance of hydrocarbons as a resource for various types of transport; petrochemical production; the desire of large world oil producers to ensure an economically justified level of prices; readiness of foreign investors to come to the Kazakhstani shelf, and other factors. In addition, although Kazakhstan was experiencing a shortage of gualified personnel in certain specialties, for which enterprises were forced to attract foreign specialists, the country still generally had the necessary labor resources of adequate quality for the oil and gas sector. The objective was to develop Kazakhstani science and to train local personnel capable of working at sea. Another requisite was to develop a Kazakhstani law school able to defend its interests and carry out negotiation processes on certain contracts. It was also important to ensure the Kazakhstani content of goods, works and services in offshore projects.

While noting positive trends, it was impossible not to take into account individual constraining factors, of which there were also many. These included the high cost and length of time required for the implementation of offshore oil projects compared to onshore projects. Other important factors to be taken into account were the difficulty of extraction due to the geological, hydrological and climatic conditions of the Caspian and the sensitivity of the natural environment of the KSCS to technogenic impacts. Also to be considered were the content in the hydrocarbon of a poisonous toxic substance – hydrogen sulfide; the problems of recycling of associated petroleum gas and other components (sulfur); and the likelihood of industrial and transport accidents. Other serious negative factors for the intensification of work in the maritime sector were the insufficient regulatory framework governing legal relations in the prevention of emergency situations during oil









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operations at sea and response to them, lack of an appropriate system for control and monitoring the water basin of the KSCS, lack of marine emergency rescue service to response emergency situations at sea, and also the lack of an international treaty of the Caspian states in the field of oil spill prevention and response. However, the risk justified the goals.

On March 14, 2003, in the aims of the efficient and rational development of oil and gas resources of the Caspian shelf of Kazakhstan, increasing oil and gas resources, as well as performing the functions of a contractor for subsoil use in offshore projects, Offshore Oil Company KazMunayTeniz JSC, a 100% subsidiary of the national company was established by order of the President of CJSC NC KazMunayGas. 50% participation in all future offshore projects was transferred to this new company. Moreover, all the risks associated with the exploration of the Caspian structures, prior to the commercial discovery of the field, were assigned to the foreign partner, which was very beneficial for the newly formed and as not yet consolidated Kazakhstani national company.

The Government had by that time allocated about 23 land plots with large and medium-sized promising structures to be put up for tender first. The period of their development was divided into three stages. The first was designed for 2003-2005 and provided for the creation of conditions for complex work. This included a comprehensive assessment of the potential of the KSCS, laying the foundations for a unified national bank of oil and gas data, monitoring the North Caspian project (as a pilot Kazakhstani offshore project). It also envisaged the creation of infrastructure to support offshore oil operations and the service industry, defining key parameters of agreements, holding tenders and negotiations on the terms of contracts, areas for exploration and production, as well as studying and selecting routes for the transportation of Caspian hydrocarbons. The second stage was 2006-2010. This was a period of accelerated shelf development. An increase in offshore hydrocarbon production and economic results from the first oil and gas projects for the development of KSCS was expected. At the same time, it was planned to systematically put up for tender new offshore blocks, and improve environmental protection requirements in line with international ecological standards. This would involve the active training and retraining of Kazakh specialists for the oil and gas industry and related industries, as well as the creation of infrastructure for onshore support of offshore operations and the construction of additional pipeline facilities for non-export purposes. In world practice of working on offshore shelves, it usually takes 8-10



years from the start of exploration work to the receipt of the first commercial oil. Thus in 2011-2015, during the third stage, the program envisaged drilling more than 1,100 oil and gas wells from 56 platforms and artificial islands, in order to increase offshore oil production and bring the republic wide volume to 100 million tons from the current 50 million tons. This also envisaged stabilizing production of hydrocarbons at this level over the next 25-30 years. In the third stage, offshore operations would begin to dominate operational activities.

For the first time, contracts would provide for the mandatory use of local goods, materials and services, the involvement of Kazakh specialists, as well as the implementation of projects for the utilization of gas and sulfur contained in Caspian oil. During the first stage, 2,620 new jobs would be created by prospecting, geophysical and extracting operations on the Caspian shelf, the development of marine, coastal and social infrastructure, as well as the solution of issues related to the transportation and sale of raw materials. The second - 16,530, and the third – 25,390. The oil and gas industry thus consolidated its role as the largest employer in the country.

Of course, oil operations in the KSCS required a huge amount of investments in prospecting and geophysical work, the development of identified fields and the organization of production, the expansion of production, transportation and marketing, the formation of marine and coastal infrastructure, and the development of labor resources and social infrastructure. According to calculations by the relevant ministry, in 2003-2005 the required amount was projected at the level of about \$6 billion, in 2006-2010 – \$10.3 billion, and in 2011-2015 – \$15.6 billion. At the first stage of shelf development, direct revenues to the state budget from offshore oil and gas operations would be provided through the payment of signing bonuses, a commercial discovery bonus for the Kashagan field, development of capital investments for field exploration and preparation of infrastructure facilities. At the second stage, these amounts were envisaged to decrease due to a reduction in one-time payments. However, at the same time an increase in investments, production of importsubstituting goods and services, and the volume of services of infrastructure facilities of maritime operations were expected. At the third stage, the state budget expected significant revenue from maritime operations.

In the summer of 2003, the Ministry of Energy and Mineral Resources, headed by Vladimir Shkolnik, held a "world presentation" of the state program for potential investors in Canada and the UK. During this global meeting it was proposed that at least three blocks be put up for exploration and production competition annually. Part of the blocks were to be put up for open tender by Kazakhstan, and part were completely transferred to KazMunayGaz, which was to independently choose partners from among foreign and domestic investors. Subsequently the candidates for future subsoil users were to be discussed and approved by the Government of the Republic of Kazakhstan. This approach, in the opinion of the Ministry of Energy, did not violate the principles of transparency of the contracts entered into in the conditions of state control of the decisions and actions of the national company.

In anticipation of the tenders, representatives of foreign oil companies operating in the Republic, announced that Kazakhstan over the next 100 years would remain a huge oil and gas country and compared it in terms of hydrocarbon reserves with the two North Seas.

However, despite the initial interest of Western companies in the Caspian blocks, negotiations intensified only after the Government of the Republic of Kazakhstan agreed to loosen some of the requirements of the new tax regime for subsoil users, introduced on January 1, 2004. In this sense, 2005 was especially active. In order to organize joint work with the Russian side, an agreement was signed between KazMunayGas and



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OIL AND GAS OF KAZAKHSTAN 30 YEARS OF INDEPENDENCE PATH TO CREATION

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LUKOIL on the establishment of a joint venture named Caspian Oil and Gas Company LLC. This was on a parity basis for the development of the Khvalynskoye field with investments of over US \$1 billion. It entailed an agreement between KazMunayGas and Centrkaspneftegaz LLC (a joint venture between LUKOIL and Gazprom) on the formation of a consortium to develop the structure of the Centralnava field under the PSA. A PSA for a period of 55 years was entered into between the Ministry of Energy of the Republic of Kazakhstan, KazMunayGaz and Rosneft regarding the development of the Kurmangazy oil and gas structure in the Kazakhstan sector of the Caspian with an investment of US \$23 billion. In addition, KazMunayGas and the Korean National Petroleum Corporation, representing the Korean consortium in oil projects in the Caspian Sea, signed an agreement on principles for the Zhambyl Caspian section, securing the key conditions for future joint activities in its exploration and development. One of the leaders of the Chinese oil sector, CNOOC, reached an agreement with the state oil giant CNPC and KazMunayGas on the exploration and development of the Darkhan block. KazMunayGas and Norwegian Statoil signed a memorandum of understanding to carry out a feasibility study of the Abai site. The interest of Western corporations in the Kazakhstan sector of the Caspian Sea increased significantly, even despite the unsuccessful drilling of the first exploration well in the Tyub-Karagan area by KazMunayGas and Lukoil-Shelf.

The plans of the Government and oil-producing companies to intensify the development of Kazakhstan subsoil in the Caspian region inevitably led to the need to develop marine and coastal infrastructure here. However, joint and individual investment projects, no matter how attractive, without serious infrastructure support would not ultimately be able to have a marked effect on the country's economy. The success of the planned oil operations largely depended on the availability of basic service facilities. It would be only through the integration of production and infrastructure projects that billions of dollars in budget revenue could be ensured.

On December 26, 2003, for the effective implementation of plans to create a marine and coastal infrastructure, a specialized service company named TenizService LLP, was established in the KazMunayGas structure. It was the owner and operator of onshore infrastructure facilities, as one of the main factors in the successful development of the Kazakhstan Sector of the Caspian Sea. It began to provide a wide range of logistics and production services to support oil operations.

In 2005, Kazakhstan developed and approved the "Comprehensive Plan for the Development of the Coastal Strip of the Kazakhstan Sector of the Caspian Sea". This plan was updated in 2010 by Kazakh Institute of Oil and Gas JSC (KIOG) under an agreement with JSC NC KazMunayGas, taking into account the latest changes in the implementation of Caspian projects. By this time, the real scope of work became clear. It would require certain adjustments in the timing, number and capacity of onshore infrastructure facilities. The scenario for the development of offshore fields was described in detail. According to the updated

version of the plan, coastal infrastructure facilities were to be built in parallel with the development of offshore fields, in order to prevent downtime and, accordingly, wasted maintenance costs.

The cities of Atyrau and Aktau, as well as the villages of Bautino and Kuryk in the Mangystau region, were defined as the main points for the location of the coastal infrastructure. By 2010, all the coastal infrastructure facilities necessary for the initial support of offshore oil operations had been built on the coast of the Caspian Sea - about two dozen, most of which in Bautino. In particular, Agip KCO set up two bases for supporting offshore operations - its own and jointly run with Tenizservice LLP. A refueling station for sea vessels and a mooring complex for offloading rocks were also built. The facilities of Balykshi LLP, Caspian Energy Services JV, Geo Energi Group LLP, Saga Atash LLP, the Bautino seaport, and moorings for the Ministry of Defense of the Republic of Kazakhstan were also built. Aktau International Sea Trade Port, three tank farms of the Terminallex company, Artis Overseas LLP, KazTransOil JSC, as well as the Keppel metalwork plant began to operate in Aktau. In Kuryk, the Ersai Caspian shipyard and a pipe concreting plant were built, and new port facilities began to develop. In 2010, a base for supporting offshore oil operations was commissioned in the village of Atash. A production site and a plant for the repair of small vessels were also built in the area of the village of Bautino. In 2005-2010, Tenizservice LLP invested about 112.5 million tenge in the construction and development of a landfill for the disposal of toxic industrial waste with an installation for the disposal of oil waste. The Bautino base for supporting offshore oil operations required more than 1.1 billion tenge in investment, the maritime refueling station - over 3.1 billion tenge, and the rock transshipment mooring facilities - almost 1.3 billion tenge, among other projects. Within the framework of the future development of Kazakhstan fields in the Caspian, many artificial islands for drilling wells were planned along with moorings for shipment, further development of capacities for the production of pipes, coatings and metal structures.

Due to the expected growth of offshore oil operations in KSCS and the lack of capacity in the drilling services market in the Caspian Sea, already saturated by drilling rigs from other regions, particularly from Russia, Azerbaijan and Turkmenistan, it became necessary to build the first offshore drilling barge in Kazakhstan. The presence of our own drilling barge reduced the risks of failure to meet deadlines for fulfilling contractual obligations to carry out exploration, appraisal and operational work in promising areas by Kazakh subsoil users. The construction of the Caspian Explorer semi-submersible drilling rig (SSDR), intended for geological and exploration work in the Kazakhstan sector of the sea, was completed by KazMunayGas and the Korean consortium of the Caspian oil project in the summer of 2012. It costed \$150 million, and the contractor was Daewoo Shipbuilding & Marine Engineering Co., LTD.

The drilling platform modules were assembled in parts in different countries, then delivered to Kazakhstan via the Volga-Don canal. Subsequently they were assembled at the production



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facilities of Ersai Caspian Contractor LLP. The barge was designed to carry out drilling operations in shallow water with a sea depth of only 2.5-5.5 meters, and maximum well drilling depth of 6,000 meters. Under the terms of trust management, the new SSDR was transferred for operation to Teniz Burgylau LLP, a subsidiary of KazMunayTeniz. After the "Sunkar" SSDR of the American company Parker Drilling, this drilling rig became the second to commence operations in the Caspian Sea under the state flag of the Republic of Kazakhstan. The first area in which the new drilling rig began to operate was the Caspian section of Zhambyl. Development was entrusted to KazMunayTeniz JSC OOC (73%) and the Korean consortium (27%), which since 2008 included seven large South Korean companies. At the same time, it was assumed that the barge could also be used for offshore operations in other Caspian blocks and fields, in order to reduce the dependence of the highly specialized market for drilling services in the Caspian on external drilling rigs.

In 2015, the construction of the first jack-up floating drilling rig (JFDR) "Satti" with a width of 72 meters and a height of 64 meters, capable of drilling wells at depths of up to 6,000 meters was completed in the dry dock of Ersay Caspian Contractor LLP. The JFDR differed from the Caspian Explorer SSDR and consisted of a modified triangular hull with three triangular support legs. Its height of 119 meters was comparable to a high-rise building of 36 floors. This allowed it to drill at a sea depth of 5 to 80 meters. The JFDR also provided living guarters for personnel and a helipad. The total weight of the structure was 10,800 tons. 86 people could work on board at one and the same time. It is important to note that JFDR systems are designed to operate in corrosive conditions, as well as in the presence of hydrogen sulfide. They comply with the requirements of zero discharge, i.e. a complete ban on the discharge into the marine environment of any type of waste generated as a result of production activities. All waste is collected and transported in sealed containers ashore for processing and disposal. These issues are of paramount importance in offshore oil drilling. After all, the accident on the Deepwater Horizon platform in the Gulf of Mexico was still fresh in our minds at the time. This accident caused enormous damage to the marine environment and aggravated the problem of ensuring environmental safety during oil operations to be carried out at KSCS.

One of the supporting factors for offshore oil operations in the Caspian was the deployment on the coast of the North Caspian Environmental Oil Spill Response Base (NCERB). In the case of accidents, it is designed to protect the ecosystem (including wetlands) of the Caspian from harm. Without this, it would have been impossible to begin industrial development and operation of the giant Kashagan field, where the high-pressure reservoir lies at great depth. It also contains paraffinic base oil with high acid gas content. There was even a proposal to consider the possibility of creating similar facilities for responding to oil spills, in addition to the construction of the North Caspian Environmental Oil Spill Response Base. This would provide services and centers for environmental monitoring in Bautino, Aktau and Kuryk. All this indicated the serious attitude of the oil companies operating in the Caspian to the issues of ensuring ecological safety during offshore oil operations.

However, despite the enormous preparatory work for the development of the Kazakhstani shelf of the Caspian Sea, the oil industry's hopes for an increase in offshore drilling, oil and gas production and export, and budget revenues did not come to pass quickly nor to the full extent. The Caspian showed its strength and demanded the implementation of completely new approaches. The State Program for the Development of KSCS from 2003 ended in 2015. At the same time the French Total (Zhenis area), Italian Eni (Shagala area), American ConocoPhillips (Kashagan field and block "N"), Norwegian Statoil (now Equinor ASA, Abai block) left Kazakhstani offshore projects.

However, the departure of foreign companies from the shelf did not disappoint Kazakh oilmen. Over the past period, they have worked on their mistakes, improved legislation in the field of subsoil use, attracted long-term effective and reliable partners to negotiations, thus fueling new interest in the Caspian citadel.

In 2019, the Russian company "LUKOIL" signed a contract with the Ministry of Energy of Kazakhstan and KazMunayGas for the development of the Zhenis block, with a minimum obligation to drill one exploration well and conduct seismic operations. Parallel negotiations between LUKOIL and KazMunayGas on another subsoil block – Al-Farabi (formerly I-P-2) - ended with the signature in June 2021 of an agreement on the acquisition by the Russian side of 49.99% in Al-Farabi Operating LLP. LUKOIL also announced the possible resuscitation of joint projects for exploration and development of the Khvalynskoye and Centralnaya fields which are being successfully developed on the Russian shelf. These new relationships will open up new opportunities for Kazakhstan and Russia to work together in the Caspian.

Today several more promising projects are on the waiting list on the Kazakh shelf – "N", "Zhambyl", "Pearls", "Isatai", and "Satpayev". All of them have the opportunity to prove themselves in the coming years.

Considering the steady growth in onshore hydrocarbon production achieved in the early years of Kazakhstan's independence, as well as the promising plans to develop offshore operations, the issue of exporting oil and gas arose at the very outset. The territorial proximity of such large and dynamically developing countries as Russia and China have opened up broad possibilities for hydrocarbon extraction in Kazakhstan. In order to ensure access to their markets, the system of trunk pipelines needed to be created and improved. Thus, Kazakhstan began this work immediately, from the first days of gaining sovereignty.

"THE JOINT EQUAL DEVELOPMENT OF THE LARGEST DEPOSITS IN THE CASPIAN NOT ONLY RAISES OUR RELATIONS TO A NEW LEVEL, BUT ALSO SERVES AS AN EXAMPLE FOR OTHERS."

Nursultan Nazarbayev, The First President of the Republic of Kazakhstan – Elbasy



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It is quite symbolic that the 30th anniversary of sovereign Kazakhstan coincided with the 25th anniversary of one of the most ambitious projects for the state – the Caspian Pipeline Consortium (CPC), which over the years of its existence has become a reliable and mutually beneficial bridge of cooperation between Kazakhstan, Russia and the largest international oil companies.

After the collapse of the USSR, which severed long-established ties, the young state had to overcome many difficulties in the process of rebuilding and building the economy. An important part of this difficult work was the implementation of the CPC international project, which, as should be especially noted, has always received significant support at the highest level both in Kazakhstan and in Russia.

The solid foundation laid 25 years ago, based on mutual consideration of the interests of all participants, has become a reliable foundation for the subsequent development of the Consortium, aimed at the dynamic increase in the capacity of the Tengiz - Novorossiysk pipeline system. Today the 11 shareholders are continuing their close, successful and effective cooperation. We believe that such a strategic partnership will continue to grow stronger, improve, fill with new content and lead to new, even more striking achievements!

I wish all Kazakhstan peace, prosperity and stability!

Nikolay GORBAN, CPC General Director

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"ONLY PEOPLE MADE OF IRON CAN DEAL WITH OIL. THE SOFT DON'T SURVIVE."

Boris Akunin,

writer, literary critic, translator, public figure

rom the first days of gaining independence Kazakhstan's policy in the field of pipeline transport was largely determined by the pace of the oil and gas industry development. The growth of production volumes depended on the capacity of existing oil and gas transportation systems.

At the time of the collapse of the USSR, Kazakhstan had a relatively well-developed pipeline infrastructure for the transportation of oil and gas. Oil was pumped through the Uzen-Aktau (built in 1966), Uzen-Atyrau (1970), Uzen-Atyrau-Samara

(1971), Kalamkas-Karazhambas-Aktau (1975), Emba oil pipelines (1977-1983), Pavlodar-Shymkent (1977-1983), Zhanazhol-Kenkiyak (1984), Prorva-Kulsary (1986), Kenkiyak-Orsk (1986), Tengiz-Grozny (1988-1990) and Kumkol-Karakoin (1990). In addition, gas transportation was provided by the Bukhara-Ural gas pipelines (1961-1964), the Bukhara Gas-bearing Region – Tashkent-Bishkek-Alma-Ata (BGR-TBA, 1961-1968), Central Asia-Center (1967-1986), the Soyuz, Orenburg-Novopskov (1975), Okarem-Beineu (1975), Makat-North Caucasus (1987), and Gazli-Shymkent (1988).





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Dimash DOSSANOV, CEO of KazTransOil JSC



ON THE COMPANY'S MAIN MILESTONES:

KazTransOil JSC, like most of the enterprises formed in the first decade of Kazakhstan's sovereignty, inherited production facilities built during the existence of the Kazakh SSR. In order to form a full-fledged hydrocarbon transportation system on the territory of Kazakhstan, a number of investment projects were implemented aimed at expanding and modernizing the pipeline network. Thus, the separate western and eastern branches of the main oil pipelines were integrated. The Kenkivak-Atvrau. Alibekmola-Kenkiyak, Severnye Buzachi-Karazhanbas, Atasu-Alashankou, Kenkiyak-Kumkol oil pipelines were put into operation. The capacity of Atyrau-Samara oil pipeline and the numerous rail loading and unloading terminals at the port was increased. This tremendous work made it possible not only to improve the safety and reliability of the domestic oil pipeline system, but to strengthen export capacity of the country.

Today Kazakhstan is one of the world leaders in the production and export of hydrocarbons. About 38% of all oil produced in the country is transported through the system of main oil pipelines of KazTransOil JSC. The company is consistently providing oil transportation in several directions: the ports of the Black and Baltic Seas, the countries of Central and Eastern Europe, the Transcaucasian corridor, and the People's Republic of China.

More than 80 oil producers in Kazakhstan export oil through the pipeline system of the company. In parallel, KazTransOil is developing its transit potential. Since 2014 alone, the transportation of Russian oil along the Priirtyshsk-Atasu-Alashankou route has increased to 10 million tons per year.

At present, the construction of the Kazakhstan-China trunk pipeline system is underway. The implementation of this strategically important project began in the 2000s, as part of the policy of independent Kazakhstan to create a multi-vector hydrocarbon transportation system and ensure the country's energy security. Its completion will ensure the loading of the Pavlodar and Shymkent refineries, and increase the supply of West Kazakhstan oil to China. At present the share of KazTransOil JSC accounts for more than 90% of the supply of raw materials to domestic oil refineries.

As a national operator, KazTransOil JSC carefully monitors the emergence of innovative solutions in the industry and introduces the best of them into the production process. Thus, a dispatch control and management system (SCADA) has been introduced to manage oil transportation in Kazakhstan. In addition, the main dispatch office was established in the city of Nur-Sultan.

Every year, KazTransOil JSC invests in the construction, modernization and repair of production facilities, since this process is an integral part of its activities. Over the past five years alone, about 228.5 billion tenge has been allocated for these purposes.

KazTransOil JSC is one of the first companies in Kazakhstan to successfully introduce international management system standards in the area of environment, health and safety into its production processes. As part of the program to eliminate historical pollution in the Atyrau and Mangystau regions, the company has also invested 4.5 billion tenge in the restoration and return to economic use of more than 24 hectares of disturbed land.

The company considers the formation of a professional team, ensuring safe working conditions and training new personnel for oil pipelines as its priority. In 2019, a project was approved for professional paid internship at the production facilities of KazTransOil JSC for students of educational institutions of the country.

Today the company employs 6.7 thousand Kazakhstan citizens. They are able to continuously learn and improve their skills. Thanks to the personal contribution of each employee of KazTransOil JSC, Kazakhstan is successfully fulfilling its export obligations and resolving issues of the national energy security. 142

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TRANSPORTATION

The majority of the existing pipeline systems constructed to provide transportation of hydrocarbons in the country and supply oil outside of the Republic was carried along the Atyrau-Samara artery. There was also the commercial marine port of Aktau. However, the capacity was morally and technically obsolete. In addition, there was the railway system with its limited opportunities for export. For example, the volume of export of Kazakh oil depended on the quota allocated by the Russian Company Transneft to the amount of 3-4 million tons per year. Gas was also transited from Central Asia.

Meanwhile, with the arrival of large foreign oil and gas companies in Kazakhstan, production growth and the stunning

prospects of offshore projects in the Caspian Sea, there was an urgent need to develop export systems capable of bringing Kazakh hydrocarbons to world markets. Nursultan Nazarbayev and the Cabinet of Ministers who fully supported him were sure that no existing export route would operate without Kazakh oil: "Kazakhstan has a principled position - the more pipelines there are, the more profitable it is for the Republic. There are no political prejudices here," Kassym-Jomart Tokayev, the Prime Minister of the Republic of Kazakhstan, later spoke about this.

In parallel with the negotiations on the creation of a joint venture to develop the giant Tengiz field, Kazakhstan began discussing the possibility of exporting Tengiz oil to foreign markets

through the territory of Russia. This route seemed to be the shortest and required the least implementation costs. The construction of such oil pipelines through the territories of other countries always contains significant geopolitical considerations, so negotiations with the Russian side were quite difficult from the very beginning.

Many years later, Nursultan Nazarbayev recalled the situation in his book "Kazakhstan's Way": "One day our Prime Minister N. Balgimbayev came to us and said: That's it! Complete refusal and sabotage, I don't think the issue will ever be resolved". I instructed him to prepare a brief and clear note, simple enough even for a cook to understand. I wanted it to show how much Russia would lose from not transporting oil through its territory, if it refused to participate in the construction of the oil pipeline. Boris Yeltsin was in the Kremlin hospital. So I went to see him there. After two hours of conversation, the issue was resolved".

The project of creating an export system for bringing Tengiz oil to world markets through the territory of Russia started with the signing of the intergovernmental agreement on the establishment of the Caspian Pipeline Consortium (CPC) between the Republic of Kazakhstan and the Government of the Sultanate of Oman on June 17, 1992. On July 23, 1992, the Russian Federation joined this agreement. The agreement stipulated that Russia and Kazakhstan would transfer existing pipeline assets to the Consortium, and Oman would finance the project. The shares of the participants in the Consortium were to be distributed equally. However, Oman was unable to attract the necessary funding. The State Expertise of the Russian Federation sent the feasibility study of the investment project prepared in 1995 for revision. The main problem was that the agreement was concluded at the interstate level, without taking into account the privatization process that had begun and, consequently, the interests of the main oil operators in the Caspian Sea. This was also pointed out by the European Bank for Reconstruction and Development, which refused to provide Oman with the project financing guarantees.

Also, ratification of the CPC agreement due to be approved in the State Duma of the Russian Federation did not take place, because there were opponents who insisted on using the existing branch of oil transportation through Russia.

As Kadyr Baikenov, the Deputy Prime Minister, Minister of Energy and Fuel Resources of the Republic of Kazakhstan in 1992, recalled, that negotiations with Russia were very difficult, because Transneft, which represented Russia in the negotiation process, did not want an independent oil transportation company competing with it. "The reason for the long negotiations was the consideration of environmental issues, the approval of the passage of the pipeline route with many regions. This exposed a variety of problems, including financial compensation and others. Russia's entry into this project was greatly supported by Viktor Chernomyrdin, who was then Deputy Prime Minister of the Russian Federation. After the creation of the joint venture Tengizchevroil, Russia set a condition that Transneft would accept Tengiz oil into its pipe, if it underwent a demercaptanization process. This led to a forced reduction in production at the Tengiz field to 1 million tons and to the need for urgent construction of a demercaptanization unit".



June 17, 1992, the first Framework Agreement concerning the creation of the Caspian Pipeline Consortium between the Republic of Kazakhstan and the Sultanate of Oman was signed. The Russian Federation joined one month later



April 1996, Almaty.

Signing of documents to reorganize the Caspian Pipeline Consortium From left to right: G.K. Keshubayev, N.U. Balgimbayev, and also the Minister of Oil of the Sultanate of Oman, Maqbool Ali bin Sultan

Russia joined the CPC

From left to right: Minister of Oil of the Sultanate of Oman, S. Al Shanfari, Deputy Chairman of the Government of the Russian Federation, V.S. Chernomyrdin Deputy Prime Minister – Minister of Energy and Fuel Resources, K.K. Baikenov, 1992



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On April 27, 1996, as a result of the insistence and perseverance of the Kazakh leader, the protocol on the reorganization of the Caspian Pipeline Consortium (CPC) was signed in Almaty. On December 6, 1996, the CPC reorganization agreement and the CPC shareholders' agreement were signed in Moscow.

The President of the Republic of Kazakhstan N.A. Nazarbayev proposed 10 principles of partnership, which later laid the basis for the provisions of the CPC Shareholders' Agreement. The

basic principle was to "Split the apple equally!" "International oil companies received a 50% stake in the project for guarantees of 100% financing of the project. The other share - 50% - belonged to the participating countries - the Russian Federation, the Republic of Kazakhstan and the Sultanate of Oman. (...) From May to December 1996 - over a period of six months without a break, negotiations on the draft Agreement of Shareholders of CPC JSC were held at the Metropol Hotel in Moscow", said Kairgeldy Kabyldin, Head of Pipeline Transport and Production Infrastructure Development Department of the Ministry of Oil and Gas Industry of the Republic of Kazakhstan in 1996. "It was the first time that we had participated in such a large-scale project. Negotiating with international companies was a completely new experience for Kazakhstan. We began discussing issues at nine in the morning and finished late at night. Myself, G.K. Keshubayev, Vice-Minister of Oil and Gas of the Republic of Kazakhstan, T.M. Kassymov, General

Caspian Pipeline Consortium


Director of Yuzhnefteprovod, I.D. Kasper, Deputy General Director of Yuzhnefteprovod participated in the negotiations from the Kazakh part. We had no consultants familiar with international law. The ministry hired Sherman&Sterling as a legal consultant. This experience proved extremely useful, and we began to understand the attitude of international oil companies to transactions of this kind. (...) Russia and Kazakhstan transferred the corresponding assets of the Tengiz-Grozny oil pipeline as a contribution to the project. Ernst & Young acted as an appraiser of the assets of the Tengiz-Grozny pipeline. We, as pipeline specialists, were not interested in reducing the estimate of the cost of pipes transferred to the CPC as a contribution from the Republic of Kazakhstan. Nevertheless, this issue was also resolved. Oman, Kazakhstan and Russia divided their shares, taking into account financial contributions and the value of assets. Thus, the Kazakh part was estimated at about US \$231 million, the Russian part - about US



\$270 million. Based on this, Kazakhstan received a 19% stake, Russia – 24%, Oman – 7%. 50% of the shares were transferred to private oil companies in exchange for obligations to fully finance the construction of the first stage and commissioning".

As a result, according to the documents, Russia's share in the CPC was 24%, Kazakhstan – 19%, Oman – 7%, the rest was distributed among 8 oil companies: Chevron, British Gas, Agip, Mobil, Lukoil, Rosneft/Shell, Kazakhoil/Amoco, Oryx. Kazakhstan, Russia, Oman and a consortium of international oil companies signed an agreement on the construction of oil pipeline with a capacity of 67 million tons along the route Tengiz-Tikhoretsk-Novorossiysk (CPC pipeline). Edward Smith became the first CEO of the restructured CPC.

Kadyr Baikenov recalled: "It was only the full support of our President that allowed us to create the CPC, since this project was not only technical, but also politicized. Without the political support of the President, it would have been impossible to achieve progress on this project, since the main participants in this project, except for Kazakhstan, were the Russian Government and the American company Chevron, which was supported by the US State Department, both in the CPC project and in the project of creating the joint venture Tengizchevroil. I know that during the years of our negotiations on these projects, Nursultan Nazarbayev had several meetings with Mr. Gore, the former Vice President of the United States, during which problematic issues were "unleashed."

It should be noted that at that time there were initiatives concerning alternative routes in Kazakhstan. For example, Turkey proposed the Baku-Tbilisi-Ceyhan export route, and the Kazakhstan-Turkmenistan-Iran artery was also considered. However, as Nursultan Nazarbayev later recalled, the CPC was chosen because it was shorter. It assumed fewer transit risks and took into account the long-standing friendly relations of Kazakhstan with Russia as part of the USSR. At the beginning of the CPC project development, Kazakhstan and the Sultanate of Oman invited Azerbaijan to the negotiation process on creating this pipeline system. However, after some time Azerbaijan refused to participate in the CPC project, since at that time it was developing the Baku-Tbilisi-Ceyhan oil pipeline project.

As Sergey Gnatchenko, the CPC General Director, later recalled: "The decision to build the CPC in the early 1990s was made in conditions of the most acute competition between Turkey and Russia for transportation of Kazakh oil. Russia's refusal to build the CPC oil pipeline would have meant that Kazakhstan's oil would not go through the territory of Russia at all, and this would have had enormous negative consequences for the country."

After the creation of the CPC, a very long process of coordinating issues related to the work of the consortium began. Lyazzat Kiinov, Deputy General Director of CPC CJSC in 1999, said that there were disputes over every detail: "Western companies had their own approaches to resolving them, our post-Soviet specialists assessed the same issue differently. For our part, we demanded that local companies be involved in carrying out all work on the territory of Kazakhstan. The representatives of some CPC shareholders got up and left the meeting sometimes, after failing to

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come to a common opinion. When we became more accustomed to things, we began to understand that in general we want the same thing, but the directions and experiences are different".

Kairgeldy Kabyldin, who held the position of Vice-President for Strategic Development of KazTransOil CJSC in 1999, said that on October 28, 1998, the CPC project received a positive evaluation from the State Expert Commission of the Republic of Kazakhstan. In less than six months, the development of the feasibility study for the construction of the oil pipeline system was completed. Then in November 1998, the feasibility study for the construction of the Tengiz-Novorossiysk oil pipeline CPC project received a positive expert opinion from four commissions of the Russian Federation. Thus, in almost a year, the new shareholders had completed the preparation of all the necessary documents for the transfer of land plots for the construction of the oil pipeline.

On May 12, 1999, a ceremony to lay the symbolic first stone in the construction of the CPC oil pipeline system was held near Yuzhnaya Ozereyevka village near Novorossiysk (Russia). The event, which took place in the area of the construction of the Sea Terminal, was attended by representatives of the Government of Kazakhstan – Kassym-Jomart Tokayev, Deputy Prime Minister of Kazakhstan, Nurlan Kapparov, President of JSC NOC Kazakhoil, Kairgeldy Kabyldin, Vice President of KazTransOil JSC, heads of oil producing companies-shareholders of CPC, and administrations of the regions through which the pipeline route was to pass.

Viktor Fedotov, CPC CEO, Richard Matzke, Director of Chevron Corporation, and heads of other oil companies-shareholders



On 12 May, 1999, near the village of Yuzhnaya Ozereyevka near Novorossiysk (Russia), a ceremony was held to lay the symbolic foundation stone for the construction of the oil pipeline system of the Caspian Pipeline Consortium (CPC).





congratulated CPC, Russia and Kazakhstan on the start of the largest investment project. They noted the enormous amount of work done and the importance of the project for the economies of the participating countries. In honor of the beginning of the construction of the oil pipeline system, CPC CEO, Viktor Fedotov, unveiled a monument on which in gold letters in Russian and in English were carved the words: "Caspian Pipeline Consortium", CPC logo and route.

"Our pipeline will be the safest and most environmentally friendly of those which exist in Russia and Kazakhstan. It is significant that we are starting our construction with the planting of eleven trees, the same as the number of CPC shareholders, symbolizing our determination to do everything possible to preserve nature during the operation of the oil pipeline", Viktor Fedotov said at the ceremony.

Construction proceeded at a record pace – almost 750 km of the oil pipeline was laid during the year. At the same time, work was

carried out on the premises of the Sea Terminal. In a short time, a tank farm had grown up in the mountains, 8 km from the coast. It was designed for 10 tanks of 100 thousand cubic meters each. In Kazakhstan, KazTransOil and Chernomortransneft diagnosed and modernized the existing section of the oil pipeline system.

The length of the Tengiz-Novorossiysk pipeline was 1,560 kilometers. The initial capacity of the CPC project was 28 million tons, with a design capacity of 67 million tons per year. The cost of the initial construction project with a capacity of 28 million tons per year was estimated at about US 2.2 billion, with 67 million tons per year – US 4.5 billion.

On March 26, 2001, the official start of filling of the CPC system with oil from the Tengiz field in Atyrau took place. Kassym-Jomart Tokayev, Prime Minister of Kazakhstan, and then CPC CEO Sergey Gnatchenko, opened the valve of a new pipeline to let oil into the pipeline. The ceremony on this occasion was attended by the heads of oil companies-shareholders of CPC, including Nurlan



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Balgimbayev from Kazakhoil, Richard Matzke from Chevron, deputies of the Parliament of the Republic of Kazakhstan, and Serikbek Daukeyev, Akim of the Atyrau region.

However, for a long time CPC management could not decide on the exact date of the symbolic start of operations of the Tengiz-Novorossiysk pipeline and the Sea Terminal on the Black Sea. By that time, the CPC pipeline had already become an axis of political intrigue, firstly, because the project at that time was the only new export artery in the post-Soviet region, and, secondly, it solved the problem of oil supplies not only from Tengiz, but also from other fields in Western Kazakhstan. This was to determine the investment priorities of the world's largest corporations operating in the Caspian region. Western companies regarded this project almost as the main test for the real investment attractiveness of the CIS oil-producing countries for foreign capital. With the commissioning of a new pipeline system, CPC was opening a

direct "window to Europe" for Kazakh and later Russian oil. It was quite clear that Russia also benefited from the support of the CPC. It was still trying to get the maximum benefit for itself from the activities of the Consortium. The parties could not consent to or sign an agreement on the transportation of oil through the CPC. The main document they could not agree was one regulating all issues of pipeline operation, including the creation of a Quality Bank, a system for submitting applications for oil pumping, commercial issues and much more. If, by the time the pipeline system was ready to be put into operation, Kazakhstan had outlined its transit policy on the territory of the Russian Federation and consolidated all oil and gas transportation assets within the framework of a single national company Transport of Oil and Gas CJSC, then the Russian company Transneft, which was supposed to become the operator of the pipeline under the 1996 Agreement, but lost out on that opportunity in 2000, would be prevented from receiving guarantees of no damage from CPC activities. Therefore, it was strongly opposed to the signing of the transportation agreement.

Despite the fact that the official commissioning ceremony of the CPC with the participation of the Presidents of Kazakhstan Nursultan Nazarbayev and Russia Vladimir Putin was announced for August 6, 2001, on the eve of the event, the representative of Russia again refused to sign the document. However, on August 3, 2001, at the CPC shareholders meeting held in Moscow, the oil transportation agreement was approved, eliminating the last obstacles to the delivery of "big" oil from Kazakhstan to world markets.

In October 2001, the first oil was poured into a tanker at the CPC Marine Terminal. On November 27, 2001, the official launch ceremony of the CPC pipeline system was held in Yuzhnaya Ozereyevka. It was attended by the Deputy Prime Minister of Kazakhstan, Vladimir Shkolnik, the first Deputy Minister of Energy of Russia, Ivan Matlashov, the U.S. Ambassador to Russia, Alexander Vershbow, the assistant US Secretary of Energy Vicky Bailey, the President of Kazakhoil, Nurlan Balgimbayev, General Director of JSC NC Transport of Oil and Gas, Timur Kulibayev, and his Deputy Kairgeldy Kabyldin, the Chairman of the Management Board and Chief Executive Officer of ChevronTexaco, David O'Reilly, Deputy Chairman of the Management Board of this Corporation, Richard Matzke, as well as high-ranking representatives of other CPC shareholders.

"Prior to the CPC oil pipeline commencing operation, the Kazakh side experienced many problems. We were not included in the oil pumping schedules, we were not provided with the necessary transportation volumes, etc. I had to persuade them with a feeling that at the same time I owed them something... But when the pipeline was launched, we felt great relief. All the necessary issues have already been resolved in the right way", said Lyazzat Kiinov, Deputy General Director of CPC CJSC in 1997-1999.

The commissioning of the Tengiz-Novorossiysk oil pipeline was highly appreciated in the West. US Congressmen in their message to the President Nursultan Nazarbayev on the occasion of this event noted: "The CPC is a significant frontier in economic cooperation between Kazakhstan, Russia and the United States







and plays an important role in the development of the states of the region. (...) The oil pipeline will contribute to strengthening the economic independence of Kazakhstan and will give a powerful impetus to the economic growth of the region by attracting American investments. (...) The long-awaited transport infrastructure will open access to the energy resources of the Caspian basin" (...)". Jim Bindra, President of Chevron Pipeline Company, said: "The pipeline will become a magnet that will attract both direct and indirect investments to the region".

David O'Reilly, Chief Executive Officer of ChevronTexaco, called CPC a project "that serves as a vivid example of successful international cooperation and demonstrates to the entire global business community that it is possible to make investments in Russia and Kazakhstan with confidence". Richard Matzke, President of Chevron, said that "CPC is a catalyst for American, Russian, and Kazakh companies in the ability to work together" and an important step towards the development of two interrelated projects – CPC and Tengizchevroil.

Thanks to the CPC pipeline, TCO, which from 1993 to 2001 transported Tengiz oil through the Atyrau-Samara system, by rail and by barges across the Caspian Sea, was able to diversify its supplies. From that moment on, the Tengiz-Novorossiysk oil pipeline became the main route for transporting Tengiz oil for export. TCO was able to significantly reduce the costs of oil transportation and increase the export opportunities before expanding production. Gradually, more and more oil produced by TCO was sent to the Tengiz-Novorossiysk pipeline, and its transportation by rail, by barges and through the Atyrau-Samara pipeline decreased. Railway tankers freed up as a result of this were used for the supply of liquefied gas (propane and butane) to the domestic market of Kazakhstan and to the CIS and European countries. Even when a few years later, in December 2005, TCO signed trade contracts for the export of its oil along the so-called "Southern Route". This involved deliveries from the port of Aktau through the Caspian Sea to Baku (Azerbaijan) and

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Batumi (Georgia) and further to the Black Sea, so CPC continued to be the main export oil pipeline for the company.

At the time of commissioning the CPC system, TCO was the only supplier of oil. Later other consignors from Kazakhstan began to transport as well. These included KPO – the developer of Karachaganak, which became the second largest shipper of CPC. Stage II of the Karachaganak project required the export of liquid hydrocarbons through Atyrau, so in this regard, in 1999 it was decided to build the Karachaganak – Bolshoi Chagan-Atyrau connecting pipeline. It was to be 635 kilometers long with a capacity of 7 million tons per year at the first stage, with subsequent expansion to 11 million tons per year. The total obligations of the Karachaganak contractor to the CPC were estimated at 6 million tons per year. LUKOIL's quota in the CPC was also taken into account and could partially be attributed to the transportation of the Karachaganak product.

There was actually no concept of oil guality at the legislative level in Kazakhstan. This was introduced by the Law of the Republic of Kazakhstan "Concerning the Main Pipeline of the Republic of Kazakhstan" dated June 22, 2012 No. 20-V ZRK. Nevertheless, after the appearance of other shippers in the CPC, the shareholders established a system for determining compensation payable by suppliers of lower-quality oil to suppliers pumping higherquality raw materials into the pipeline. As explained by Kanatbek Zhumin, Deputy General Director of the CPC for Relations with the Government of the Republic of Kazakhstan in 2001: "CPC records the quantity and quality of oil entering the system at each entry point. A map of 11 standards of oil grades listed on the London Stock Exchange was created, and incoming oil is evaluated on this basis. All the mutual settlements between shippers through the guality bank are carried out in monetary terms, volumes are counted in tons".

The grade of oil transported through the CPC system, became known as the "CPC Blend" – a low-sulfur light oil with a density

of 46.2-46.7 degrees API, and mass fraction of sulfur of 0.54-0.56 percent. The composition of the oil included in the mixture was quite consistent, and from the outset the oil began to be in demand in many countries of the world.

The consortium reached its primary design capacity -28.2 million tons of oil per year - in mid-2004. According to the results of 2008, it shipped 31.47 million tons of oil at the Sea Terminal - more than its original capacity. In December 2009, a project to expand the capacity of the CPC main pipeline was launched.

In 2008-2009, due to an aggravated situation related to the approval of the CPC Transit System Expansion Project, two shareholders, the Sultanate of Oman and British BP, left the consortium at once. Oman decided to sell all its 7% shares in the CPC back in early 2008, offering them to Russia and Kazakhstan which had a pre-emptive right to repurchase. In November 2008, Oman's shares in CPC were acquired by Russia, which due to this transaction increased its own share in this project to 31%. During the meeting between Nursultan Nazarbayev and Vladimir Putin on October 30, 2008 in Astana, the President of Kazakhstan proposed to the Russian Prime Minister that Oman's share in the CPC be divided between the countries. The Head of the Russian Cabinet of Ministers then replied: "I can't say for sure, but, in my opinion, we have already bought it". This news caused a mixed reaction among analysts in Kazakhstan and Russia. After a short consultation, Kazakhstan started negotiations with BP on the purchase of its shares in the largest pipeline project. The acquisition became possible sooner than expected. In December 2008, BP and KazMunayGas signed the agreement on the basic principles. This provided for the purchase by the Kazakh side of 49.9% of BP's share in the KPV Joint Venture, which in turn owned 1.75% of the participation in the CPC. In April 2009, this US \$250 million worth transaction was successfully completed. As a result, KazMunayGas became the 100% owner of the Kazakhstan Pipeline Ventures (KPV) Joint Venture - a shareholder of CPC (1.75%). Thus it significantly increased the rights to oil pipeline capacity. So, at that time, KPV had the right of the CPC's throughput capacity of 5 million tons of oil per year, which after the implementation of the Project to expand this export system was due to increase to 10.5 million tons per year. As a result of this transaction, KazMunayGas, as a shareholder of CPC (19% - the share of the Republic of Kazakhstan plus 1.75% - the share of KPV), received





the right of access to CPC facilities amounting to 14.3 million tons per year, taking into account the Expansion Project. BP remained owner of CPC shares through a joint venture with Russian LUKOIL – Lukarco B.V. (12.5% in CPC). Almost at the same time, Russia, having acquired 7% (Oman's share) for US \$700 million, received an additional 1.5 million of system capacity.

"It is important to note the three main aspects in this transaction. The first is the acquisition by KazMunayGas of the rights to pump significant volumes along the most profitable existing route and, accordingly, significant savings for shippers on transport costs. The second is the total increase in the share of KazMunayGas from 19% to 20.75% in the profitable CPC Project, taking into account the CPC Expansion Project planned for that period. The third is the resolution of the problem of delaying the authorization of the CPC Expansion Project. As a rule, there are no easy negotiations. Some are difficult, while others are more complex. The distinguishing feature of this transaction was that

so many interested parties participated. In addition, there was a connection with the project for the future expansion of TCO. In order to complete the transaction, consent was required from all eleven CPC shareholders, four TCO participants, as well as the authorized state bodies of the Republic of Kazakhstan. A negotiation group was created at KazMunayGas from among the best employees who were appointed to conduct negotiations with BP, and obtain the consent of CPC shareholders to the transaction. During the negotiations, every employee of KazMunayGas clearly understood that he represented and protected the interests of not only our Company, but also the country, and this was a great responsibility. Thanks to the efforts of the group, successful and effective negotiations were held. This ultimately produced a positive result in the form of approval for the CPC Expansion Project. At the same time, the initial cost requested by BP was significantly reduced, and the share was purchased below the requested cost. The transaction was fully financed out of KazMunayGas own



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funds with minimal impact on financial stability", Sauat Mynbayev, who headed the Ministry of Energy and Mineral Resources of the Republic of Kazakhstan in 2009, commented on the transaction.

The CPC system capacity expansion project involved the modernization of existing units and construction of 10 additional oil pumping stations (2 in Kazakhstan, 8 in Russia), 6 oil storage tanks near Novorossiysk and the third outrigger berthing device at the CPC Marine Terminal. The project also included the replacement of an 88-kilometer pipeline section in Kazakhstan with a larger diameter pipe. The result of the Expansion Project was to increase the mechanical capacity of the CPC oil pipeline system from 28.2 million tons to 67 million tons per year, including for Kazakh oil – from 27 million tons to 52 million tons per year.

The urgency of increasing the CPC's capacity was obvious, given the increase in production in Kazakhstan, the main supplier of oil to the CPC system. The expanded pipeline system was due to receive oil from existing shippers, such as Tengiz and Karachaganak. In addition, oil was expected from new Caspian fields - Kashagan in Kazakhstan and Filanovsky in Russia.

The parameters of the Expansion Project were developed on the basis of long-term oil supply applications submitted by the CPC shippers. The reality of these plans was confirmed by the fact that the volumes of oil supplied were guaranteed by the "ship or pay" agreement. The application of this principle after the expansion of the system's capacity was approved on September 28-30, 2009 during the meeting of the Board of Directors of CPC-R JSC and the extraordinary meeting of shareholders of CPC-K JSC in Almaty. The agreement was signed with each oil supplier and will be valid until the costs of implementing the expansion project are recouped. The cost of the CPC capacity expansion project was approved at the level of US \$5.4 billion. The main source of financing for the expansion was CPC's own funds, formed as a result of the accumulation of tariff revenues pursuant to the decisions taken earlier by shareholders on an increased tariff, reduced loan interest and a complete suspension of debt payments. The projected tariff revenue after the completion of the CPC Expansion Project was estimated at US \$2.3 billion.

The general contractor of the CPC for the construction and reconstruction of the oil pumping station (OPS) in Kazakhstan was OGCC KazStroyService JSC. The main construction work in Kazakhstan was assigned to 7, and in Russia – 11 contractors.

According to Sauat Mynbayev, Minister of Oil and Gas of the Republic of Kazakhstan at the time, negotiations on the implementation of the CPC Expansion Project began several years before its authorization. There were many controversial issues, since each of the eleven shareholders were pursuing their own











goals and objectives. "There were especially many disputes when discussing the procedure for financing the project, he recalled: "As a result, we agreed to postpone the repayment of the CPC debt, and the use of these funds for the construction of the Expansion Project. In the event of a shortage of funds, the consortium would attract external financing. However, this was not required. During the difficult negotiations, KazMunayGas and Transneft agreed with other shareholders that the repayment of CPC's debt would be on the principle of "on an equal basis and simultaneously" for all shareholders. This approach was fundamental for us, since back in 1996, CPC shareholders approved the priority for the return of their investments. First of all, CPC was obliged to repay all the debt to the shareholders - the operating companies that had financed 100% of the cost of the Initial Construction Project, and only then to the government shareholders from the Republic of Kazakhstan and the Russian Federation on the contributions made by their pipeline assets. Thanks to the introduced principle of "on an equal footing and at the same time", KazMunayGas and Transneft received the first payments from CPC in 2015."

Alexander Blagov, Deputy General Director of CPC-R CJSC, noted that the increase in CPC capacity was the dictate of the time. "The time that passed from the loading of the first tanker has shown that the CPC project is one of the most successful in the field of energy in the post-Soviet region. The CPC calling card is advanced organizational and managerial technologies, modern and reliable equipment, highly professional and responsible personnel. The additional volumes of oil that will enter international markets will contribute to the growth of global energy security. The expansion project has been thoroughly and comprehensively justified, and additional volumes of oil will be delivered to consumers, regardless of the prospects for the construction of pipeline routes bypassing the Black Sea Straits".

A ceremony dedicated to the start of construction work on the CPC Oil Pipeline System Expansion Project was held on July 1, 2011 on the territory of the Atyrau OPS (the Atyrau region). The Minister of Oil and Gas of Kazakhstan Sauat Mynbayev and the Minister of Energy of Russia Sergey Shmatko began the process of welding the first joint of the new pipeline using the control panel of the welding module.

Sergey Shmatko at the ceremony called the project "one of the most ambitious for the development of a cross-border network". "The fact that since 2004 we have almost reached the design capacity and we are steadily increasing the volume of oil pumping year after year indicates that we have scored a bull's eye. The CPC project is in demand by both the companies that work here and the market situation, and has earned recognition on the world market. (...) This is not just an investment decision, it is a recognition of the role of Kazakhstan, Kazakh oil in the global energy balance. It is recognition of successful interstate cooperation. The CPC will become not only a large-scale, large-

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scale project of regional significance, but a project well-known in the field of bilateral relations between Russia and Kazakhstan. It will rightfully take its place in the list of successfully implemented projects of global significance in our time", he said at the time. According to him, the Tengiz-Novorossiysk pipeline is of great importance for the development of large fields in the Caspian region, including those developed by Russian companies. "Mining companies in Kazakhstan and Russia receive the full value for their oil, and reduce the cost of its transportation compared to alternative export routes. Therefore, I would also like to note the importance of this project for the economies of the two countries. Its implementation will actively contribute to the development of promising cooperation between Russia and Kazakhstan in the energy sector", he stressed.

In turn, Sauat Mynbayev called the CPC "an example of successful and effective cooperation between leading Russian, Kazakh and international oil companies on the territory of the two countries". "Currently, the Consortium is entering a new stage of its development – a more than double increase in the capacity of the CPC oil pipeline, which is especially important in the light of the increase in production volumes in the Caspian region", he announced.

In 2011, as Nikolay Platonov, CPC General Director, noted at the launch ceremony of the CPC Expansion Project, "since the beginning of the system operation, the Consortium has shipped over 260 million tons of oil, while over ten years of operation no oil spills on the water have been allowed, and no accidents have occurred. This shows that operations comply with international quality standards."

The implementation of the first phase of the Expansion Project in the Republic of Kazakhstan was completed on September 9, 2014 with the commissioning of the modernized Tengiz and Atyrau oil pumping stations. In October 2017, CPC commissioned all the facilities within the framework of this project, with a ceremony to mark the completion of the last of the Kazakh oil pumping stations – A-OPS-3A. On the eve of August 12, 2017, half a billion tons of oil had been shipped at the CPC marine terminal from the beginning of operation of the oil pipeline system. The oil was poured into the tanks of the Ohio oil tanker freighted by Karachaganak Petroleum Operating.

On April 18, 2018, the last station of the OPS-2 Expansion Project in Kalmykia was brought into permanent operation. Then on October 22, 2018, a ceremony was held in Moscow to mark the completion of the entire Project. It was attended by representatives of the Ministries of Energy of Russia and Kazakhstan, shareholders and management of CPC, representatives of regional authorities



General Director of CPC, Nikolay Gorban and the Akim of Atyrau district, Makhambet Dosmukhambetov, signed a cooperation agreement for social projects as part of the CTC charitable assistance scheme

and local administrations, specialists of the Consortium and its contracting organizations. The main results of the grandiose project were summed up, and awards were presented by the Ministries of Energy of the Russian Federation and the Republic of Kazakhstan to those who made a special contribution to the overall success. Deputy Minister of Energy of the Russian Federation, Anatoly Yanovski, Deputy Minister of Energy of the Republic of Kazakhstan, Bolat Akchulakov, representatives of CPC shareholders, in particular, Chairman of the Management Board - President of Transneft, Nikolay Tokarev, addressed the audience with a welcoming speech. He remarked on how difficult it is to overestimate the political and economic significance of the CPC Expansion Project, establishing Kazakhstan as one of the largest centers of world oil production. Russia, he added, is a reliable partner in transporting Kazakh oil to world markets. James Johnson, Executive Vice President for Exploration and Production at Chevron, noted the importance of international cooperation and the common interest of all parties in the successful implementation of the Project. Words of deep gratitude to all those involved in its implementation were expressed by Nikolay Gorban, CPC General Director: "Through joint efforts, we have implemented our plans, and this success was facilitated by the fact that no one among us was indifferent, everyone was rooting for the final result, working on their site, and sparing neither effort nor personal time", he said.

The implementation of this large-scale project in 2011-2018 made it possible to create an advance reserve of capacities to meet the growing demands of shippers. Since that day, the capacity of the Tengiz–Novorossiysk pipeline has reached a level of oil transportation equivalent to 67 million tons of oil per year.

However, the volumes of oil delivered to the CPC pipeline have been dynamically increasing. In 2017, 55.1 million tons were exported – 10.8 million tons higher than in 2016. In 2018, more than 61 million tons of oil were shipped at the Marine Terminal. The largest volumes of oil in the CPC pipeline system in 2018 came from the Tengiz, Karachaganak, and Kashagan fields – 28.7 million tons, 10.3 million tons and 13.2 million tons, respectively. Against the background of the implementation of a large-scale future Expansion Project and a Wellhead Pressure Management Project in Tengiz, requiring an increase in oil production by 12 million tons per year from 2023, the question arose about the export of growing volumes of Tengiz raw materials. Therefore, in 2019, CPC shareholders decided to implement the "De-bottlenecking Project Program" (DBPP). After its implementation, the throughput capacity of the Tengiz-Novorossiysk system will allow for the transportation of oil from the territory of Kazakhstan of at least 72.5 million tons, and with the optimized use of a drag reducing additive (DRA) – up to 83 million tons per year. This concerns the eastern section of the oil pipeline which transports oil from Kazakhstan.

Investments in the period between 2019-2023 will amount to US 599.9 million, of which CPC-K JSC will invest US 156.4 million and CPC-R JSC – US 443.5 million. All investments will be made from CPC's own funds and there are no plans to attract loans.

The work will be carried out at all 15 CPC oil pumping stations and at the Marine Terminal. In order to implement the DBPP in the territory of the Republic of Kazakhstan, the following factors shall be envisaged: the replacement of 3 main pumps and modernization of the SSPV (spring safety valve) node at the Tengiz OPS; modernization of the SIKN004 (system of measuring quality and quantity parameters of crude oil) at the Tengiz OPS (construction of additional measuring lines); construction of a new backup pumping station with VFD, 2 new vertical steel tanks with floating roof 20,000m3 and related structures at the Tengiz OPS; construction of a new 220/10kV substation and 2220kV power lines at the Tengiz OPS and a new MNA (Main Line Pump) and related structures at the Tengiz OPS Atyrau gas station; replacement of MNA rotors at Isatai and Kurmangazy OPSs. The package of Final Investment Decision documents set out the necessary deadlines for the completion of the DBPP in the territories of Kazakhstan and Russia. It is envisaged that the program be implemented in a single stage, with the main construction work to be completed in Q1 and Q2 of 2022. The final dismantling of the replaced facilities and other work should be completed by the end of 2023. The DBPP participants have set themselves the task of increasing the capacity of the oil pipeline in advance, prior to receiving applications for pumping, scheduled for July 1, 2022.

In June 2019, the CPC started implementing the DBPP. The tables of personnel and budget disciplines were approved, and engineering surveys, selection of suppliers, recruitment of personnel were commenced. In July 2019, CPC leaders undertook a working trip to the consortium's facilities located in Kazakhstan and Russia. CPC General Director, Nikolay Gorban, First Deputy General Director for Operations, Kenneth Yoss, and General Manager for Operations, Vladimir Shmakov, visited the Eastern, Central and Western regions of the Consortium, as well as the marine terminal near Novorossiysk. Senior managers held meetings with specialists and carried out unscheduled inspections of the operational personnel readiness. They inspected the equipment and studied the sites where the DBPP would be implemented. It was announced that within the framework of the DBPP, work is planned to be carried out on the modernization of the station at the Atyrau OPS, including the construction of a new main pumping unit. At the Tengiz OPS the possibility of the modernization of the oil metering unit, replacement of three main sediments, installation of several back-up pumping units, construction of two vertical steel tanks with floating roof with a volume of 20,000 cubic meters, construction of a substation, power lines, and modernization of a protective switchgear, etc., is also being considered. The impellers of the Main Line Pumps on A-OPS-3A and A-OPS-4 will be replaced. In November 2019, CPC-K identified Aktau Machine Engineering Plant (AMEP) as the supplier of equipment for the DBPP. In December 2019, engineering surveys were completed and the design stage began, and mobilization was carried out.

On March 16, 2021, the head of Novorossiysk, Igor Dyachenko, and CPC General Director Nikolay Gorban signed an agreement on the modernization of the marine terminal in Novorossiysk as part of the DBP Program. According to the CPC, in 2021-2024, over 9.2 billion rubles will be invested in the implementation of the program. In March 2021, the construction of new facilities at the CPC oil pumping stations and at the Marine Terminal began.



TRACK RECORD OF SHIPMENT THROUGH THE CPC MARINE TERMINAL

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OIL AND GAS OF KAZAKHSTAN 30 YEARS OF INDEPENDENCE PATH TO CREATION

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PIPELINE FACILITIES annual transportation volume is million tons/year

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As one of the largest exporters of hydrocarbons to international markets, Kazakhstan was extremely interested in the sustainable development and smooth functioning of its oil transportation system. Having declared multi-vector transportation a priority policy, Kazakhstan deliberately implemented a strategy of diversifying the supply routes for extracted hydrocarbons to world consumers. At that time, oil prices also began to rise. If in December 1998 the average monthly price of Brent fell to a minimum value of US \$10 per barrel, then six months later prices doubled, reaching a maximum in July 2008 of US \$146.08 per barrel. This fueled the oil industry's interest in production and export.

"We should not limit ourselves to existing directions. Kazakhstan will adhere to the strategy of multi-vector hydrocarbon exports and consider various projects for the development of oil transportation routes. Now we are actively working on other pipeline directions", Nursultan Nazarbayev said.

By the beginning of the 2000s, the oil and gas industry had already undergone privatization, and corporations that had a decisive voice in discussing oil export policy had gained a foothold





in the local market. The largest players in the market at that time were Chevron, ExxonMobil, Agip, BP, Total, Shell, LUKOIL, CNPC and others.

In the early 2000s, a real struggle began to unfold in the world for export routes for oil from the Caspian region and, mainly, from Kazakhstan.

At that time, the United States of America were actively lobbying for the Baku-Tbilisi-Ceyhan (BTC) oil pipeline under construction in Azerbaijan, Georgia and Turkey. Washington referred to this as the Main export Pipeline. On November 18, 1999 in Istanbul, Kazakhstan participated in the signing between Azerbaijan, Georgia and Turkey of a package of documents concerning the construction of the BTC oil pipeline. Kazakhstan immediately declared its readiness to legally enjoin this project. Long negotiations on transit began and as a result in June 2006, the Presidents of the two countries, Nursultan Nazarbayev and Ilham Aliyev, signed an agreement to facilitate the transportation of oil from Kazakhstan through the Caspian Sea and the territory of Azerbaijan to international markets through the BTC system. The volume discussed was 10 million tons with a subsequent increase



to 25 million tons per year. In January 2007, KazMunayGas, the North Caspian PSA contracting companies (Eni, Total, ExxonMobil, Royal Dutch/Shell, ConocoPhillips and Inpex) and the Tengiz Group (Chevron Limited and ExxonMobil Kazakhstan Ventures Inc.) signed a memorandum of understanding on the basic principles of cooperation on the project of creating the Kazakhstan Caspian Transportation System (KCST) to export Kashagan and Tengiz oil through the Caspian Sea to international markets through the East-West energy corridor along the Eskene-Kuryk-Baku-Tbilisi-Ceyhan route. In the autumn of 2008, oil from the Tengiz field began to be transported to BTC. However, a few months later TCO was forced to abandon the corresponding supplies due to the high transportation tariff.

Relations between Astana and Moscow in matters of oil supplies have always been built on infrastructure components inherited from the USSR. For Russia, Kazakhstan is the most powerful economic and political model in the entire CIS, the corridor between East and West, the heart of Eurasia, and also has real prospects for further impressive growth. In turn, for Kazakhstan, Russia is the largest economic and political player on the world market, one which the whole world has taken into consideration for some time. Taking into account these long-standing trusting relations, Kazakhstan has relied on the Russian direction for export.

In order to ensure guaranteed supplies of Kazakh oil for export through Russia, as well as to continue the activation of Kazakh-Russian relations in the oil and gas sector, on June 7, 2002 in St. Petersburg, Deputy Prime Minister of the Russian Federation, Viktor Khristenko, and Deputy Prime Minister of the Republic of Kazakhstan, Karim Massimov, in the presence of the Presidents of the two countries, Vladimir Putin and Nursultan Nazarbayev, signed an agreement on the transit of oil from Kazakhstan through the Atyrau-Samara system. Volumes would amount to at least 15 million tons of oil per year, and through the Makhachkala-Tikhoretsk-Novorossiysk oil pipeline system – at least 2.5 million tons per year. The agreement was valid for 15 years. According to the document, ownership of oil transported by pipeline and other modes of transport in transit mode was retained by shippers in accordance with contracts between economic entities.

In addition, in the presence of the two Presidents, a founding agreement was signed between Gazprom and KazMunayGas

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National Company CJSC on the establishment of a joint venture KazRosGaz CJSC, entitled to carry out market research of natural gas sales markets and products of its processing, gas processing at gas processing plants, provision of natural gas transportation, gas sales on domestic and foreign markets, development and introduction of new technologies, etc. Nursultan Nazarbayev, when assessing the signed documents, noted then that "there are no such agreements between CIS countries". In turn, Vladimir Putin stressed that the documents signed between the Russian Federation and Kazakhstan in the energy sector "create a very solid basis for long-term cooperation in the energy sector", that



President Nursultan Nazabayev takes part in the festive opening of the Aktau Sea Port, 04.09.1999



they "fully correspond to the interests of both Kazakhstan and Russia" and will have consequences for energy policy in Europe and the world as a whole. He noted then that the level of interaction between the two countries "takes on a character that has never been before", and also stressed that Kazakhstan will be a priority partner of Russia in the process of developing infrastructure in the energy sector. KazRosGaz establishment was an important event in the development of bilateral relations in the oil and gas sector – we will talk about this in this chapter a little later.

Timur Kulibayev described the evolution of oil transport relations between Kazakhstan and Russia with the following words: "In the 1990s, the quotas established by Russia for pumping Kazakh oil in the amount of only 3.5 million tons per year did not meet the export needs of Kazakhstan. When I joined KazTransOil, I set myself the task of increasing oil exports by almost 4 times – up to 15 million tons per year. However, the technical condition of the main oil pipelines at that time was extremely unsatisfactory. The oil transportation system facilities were in working condition, but they required major repairs and modernization. We calculated the economically feasible tariffs for pumping oil to the domestic market and export. Thanks to high oil prices and our arguments in favor of upgrading oil pipelines, all oil producers agreed to increase the cost of transportation. In addition, we arranged the issuing of Eurobonds for KazTransOil on fairly good terms. The funds borrowed would be repaid at the expense of the tariff. As a result of the general measures taken, the throughput capacity of our main Atyrau-Samara export oil pipeline at that time increased from less than 10 million tons to 15 million tons per year. At that time, I was working a lot in Moscow with the specialized Russian ministry. We prepared an intergovernmental agreement, according to which Russia would provide free passage of Kazakh oil through its territory. This helped a lot in the following years, when the price of oil on the world market began to rise. It provided stable cash flow to the budget as a result of exports. By the first half of the 2000s, we were fully satisfying the needs of our oil workers in terms of oil exports. The CPC oil pipeline was put into operation, the capacity for pumping oil along the Atyrau-Samara route was expanded, the port of Aktau was successfully transporting oil by



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tankers, and a pipeline to China had been built. We had completely abandoned rail transportation of oil and began to use the most profitable pipeline method of delivering Kazakh oil to consumers. All this created favorable conditions for the development of the oil and gas industry".

In November 2009, with the strengthening of the Kazakh-Russian partnership, a decree of the Government of the Russian Federation guaranteed Kazakhstan annual oil transit supplies through Russian territory: in 2010 – at least 46 million tons, in 2011 – 45 million tons, in 2015 – 64 million tons, and by 2020 – up to 69 million tons. Including the Atyrau-Samara route, 15-16 million tons of Kazakh oil per year were to be delivered by transit, 26 million tons of oil through the CPC system in 2010 and 2011, 45 million tons in 2015, 50 million tons in 2020 (without taking into account the new expansion of CPC capacity).



AKTAU PORT IS LOCATED ON THE EASTERN SEABOARD OF THE CASPIAN SEA AND IS THE ONLY MARITIME PORT IN THE REPUBLIC OF KAZAKHSTAN CAPABLE OF THE INTERNATIONAL SHIPPING OF DRY GOODS, OIL AND OIL PRODUCTS.









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WE HAVE NOW BUILT ANOTHER HIGH TECH VESSEL WHICH WILL ALSO BE SAILING THE CASPIAN UNDER THE KAZAKH FLAG. THE VESSEL WAS DEEMED SHIP OF THE YEAR BY THE BRITISH INSTITUTE OF MARINE ENGINEERING.

At the same time, NMSC Kazmortransflot was developing the port infrastructure and a merchant marine fleet capable of delivering oil from the port of Aktau to Russia, Azerbaijan, and Iran.

Analysis of the sea cargo transportation market in the Caspian Sea at that time showed that Kazakhstan was the main cargo-forming state in the region. For example, in 2005, the total volume of cargo transported in the Caspian basin by water was about 27 million tons, while the share of the ports of Aktau and



Bautino in providing sea transportation with a cargo base exceeded 37%. The huge share of sea transportation was, of course, oil.

The growth of Caspian trans-shipment in Kazakhstan was facilitated by the development of the Aktau International Commercial Marine Port (AICMP). It was the only seaport in the country that transported dry cargo, oil and petroleum products internationally. As a natural monopoly, it was highly competitive in the market with a share of about 40% of the total volume of sea cargo transportation in the Caspian Sea. Between 1997-1999, the Government of the Republic of Kazakhstan together with the European Bank for Reconstruction and Development (EBRD) implemented the first phase of cardinal reconstruction, for which a loan in the amount of US \$74 million was allocated. President Nursultan Nazarbayev took part in the capacities were completely updated, the infrastructure and management structure



was improved, and the capabilities of the loading and unloading complex for servicing dry cargo increased to 1.55 million tons per year. At the same time the previous oil trans-shipment capabilities were maintained at 8 million tons per year, and the port of Aktau itself was turned into a modern multi-purpose terminal.

In order to provide new transport capacities for the transportation of Kazakh oil to international markets and strengthen the transport independence of Kazakhstan for the export of hydrocarbons in the mid-2000s, a national tanker fleet was created by the Head of State.

On August 5, 2004, the Vyborg Shipyard (Vyborg, Leningrad Region, Russia) launched the first Kazakh tanker "Astana" built by order of Kazmortransflot, the national marine shipping company. The launching ceremony was attended by shareholders and representatives of JSC Vyborg Shipbuilding Plant, KB Vimpel, JSC NMSK Kazmortransflot, and the administrations of the city of Vyborg and the Leningrad region. According to a long-standing marine tradition, the "godmother" of the first Kazakh tanker was the pianist Zhaniya Aubakirova, People's Artist of the Republic of Kazakhstan. According to tradition, she broke a traditional bottle of champagne on the new vessel during the acceptance ceremony and wished her "bon voyage".

In June 2005, the Vyborg shipyard launched the second oil tanker – Almaty, also built by the order of Kazmortransflot. Her "godmother" was Ayman Musokhodzhayeva, the famous violinist, and People's Artist of Kazakhstan.



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On August 10, 2006, the third tanker Aktau was delivered to its customer – Kazmortransflot – in Vyborg. The ship's "godmother" was TV presenter, Aigul Mukey. The ceremony was attended by the representative of the Parliament of the Republic of Kazakhstan in the interparliamentary assemblies of the CIS and EurAsEC, Khalel Bakenov, Consul General of the Republic of Kazakhstan in St. Petersburg, Sergey Nurtayev, General Director of JSC NMSK Kazmortransflot, Marat Ormanov, as well as the heads of JSC NC KazMunayGas and its subsidiaries. In early August, the tanker passed sea trials on the Baltic Sea.

All three tankers with a deadweight of 12 thousand tons were designed and built under the supervision of the Russian Maritime Register of Shipping and have a maximum load capacity at the existing capacities of the ports of the Caspian Sea, taking into account passage through the river channel systems of Russia. They became the most modern in the Caspian Sea and met the current international maritime safety standards.

Three more tankers were built in 2009-2010 at the Krasnoye Sormovo Shipyard (Nizhny Novgorod, Russia). On September 11, 2009, the fourth Atyrau tanker with a deadweight of 13 thousand tons was commissioned to Kazmortransflot. It became the largest Kazakh vessel equipped with an inert gas system and capable of transporting three types of petroleum products in one voyage. In May 2010, the Aktobe oil tanker was registered on the balance sheet of Kazmortransflot. In August 2010, another Oral tanker came to the home port of Aktau (both also with a deadweight of 13 thousand tons). The state and public figure, Gulshara Abdikalikova, representative of the Majilis of the Parliament of the Republic of Kazakhstan, Svetlana Ferkho, and state and public figure Aitkul Samakova were invited to be "godmothers" to the new tankers.

In an expression of gratitude to the Nizhny Novgorod shipyard, the General Director of JSC NMSK Kazmortransflot,

Marat Ormanov, noted: "This is a special event for Kazakhstanis, because the tankers built in Nizhny Novgorod are the first Kazakh vessels of such a deadweight. They will become the flagships of the fleet of sovereign Kazakhstan. I would like to express my special gratitude to the representatives of the shipyard who once again proved the skill of Russian shipbuilders with their painstaking work. (...) To date, the tankers of this series are the largest in terms of cargo capacity in the Caspian Sea".

The creation of a competitive marine port infrastructure which meets international requirements, the formation and further promotion of the Kazakh merchant fleet, as well as the improvement of the regulatory framework in the field of maritime transport in accordance with the norms of international treaties was supported by the adoption by the Government of the Republic of Kazakhstan of Decree No. 916 of September 26, 2006 for the Program for the Development of Maritime Transport of the Republic of Kazakhstan for 2006-2012. Its implementation was planned in two stages in 2006-2008 and 2009-2012. The total amount of financial resources for the implementation of the measures provided for in it was estimated at 107.6 billion tenge, including 19.7 billion tenge in 2006, 17.4 billion tenge in 2007, 24.8 billion tenge in 2008, 14 billion tenge in 2009, 21.4 billion tenge in 2010, 5.5 billion tenge in 2011, 4.8 billion tenge in 2012. Borrowed funds, direct investments and funds of the republican budget were considered as sources of financing. The result of the implementation of the domestic marine trade program was the creation of a fleet consisting of large-capacity oil tankers, tankers with a load capacity of 12-13 thousand tons, dry cargo ships, a support fleet for maritime operations. It also included a ship repair complex to cover the demand for this type of services from shipping companies operating in the Caspian Sea. Modern ship traffic management systems and rescue operations were introduced to ensure maritime safety in the Kazakh sector of the Caspian Sea in accordance with the requirements of international regulations and standards. A system for training and retraining of domestic maritime transport specialists was also created.

At the same time, in accordance with the multi-vector export policy for hydrocarbon raw materials, Kazakhstan actively developed a strategically important route to the East.







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Bian DEZHI, President of CNPC Central Asia



On behalf of China National Petroleum Corporation (CNPC) I would like to sincerely congratulate all the people of Kazakhstan, our oil worker colleagues and the personnel of CNPC enterprises in Kazakhstan on the occasion of this important anniversary – the 30th anniversary of the independence of the Republic of Kazakhstan. I would like to offer the young state the gift of prosperity and progress, and the people of Kazakhstan – peace and prosperity.

In the history of a country 30 years is a very short period, but during this time Kazakhstan's journey has taken it from a Soviet republic to a sovereign independent state, a fully fledged member of the world community. China was one of the first countries to recognize the independence of Kazakhstan and establish diplomatic relations.

CNPC has been operating in Kazakhstan since 1997, and during this time we have witnessed a period of vibrant social and economic development of the country as a whole, along with tremendous progress in the oil and gas industry. Today Kazakhstan is one of the world leaders in the production of hydrocarbons and is the most attractive investment market in Central Asia. Over 24 years of mutually beneficial strategic cooperation, our corporation has invested more than \$45 billion into the development of the Kazakhstan oil and gas industry. Chinese oil companies have paid close to \$50 billion in the form of tax into budgets at various levels. CNPC's investments in charitable and social projects has exceeded \$400 million.

Attaining independence, establishing a democratic society, strengthening the unity of the nation, creating a stable economy, and developing friendly relations with neighboring countries are certainly the fruit of the wise and forward-looking policy of the Kazakhstan leadership. We are proud of our cooperation with such a strong, experienced and reliable Partner.

Once again, I would like to congratulate Kazakhstanis on the anniversary of its independence. With all my heart I would like to wish you and your families well-being, health, prosperity and new achievements.

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Kazakhstan cooperation with China on the development and export of hydrocarbon resources began in the 1990s. On September 24, 1997, during a visit to Kazakhstan by the Chinese delegation headed by Premier of the State Council, Li Peng, important historical agreements on cooperation between the two countries in the oil and gas industry were signed. These were to set out the further priorities of the parties for many years to come.

Minister of Energy and Natural Resources of the Republic of Kazakhstan, Dyusenbai Duisenov, and CNPC CEO, Zhou Yongkang, signed an agreement that finally set out the construction of the West Kazakhstan – West China oil pipeline at a length of 3,200 kilometers and a cost of about US \$3.5 billion. The signing of the document had an important historical significance for both states. It ensured the start of exports of Kazakh crude oil to the promising and growing market of China. In addition, it placed the deal almost on a par with the CPC project, if not in scale, then in importance for the economy.

Nursultan Nazarbayev noted the presence of two members of the Standing Committee of the Political Bureau of the Communist Party of China and eight members of the Central Committee in "The Chinese direction was considered very promising. The negotiation process was quite serious and lasted for six months. After the signing of the Agreement, we built this oil pipeline over a thousand kilometers long in the most difficult conditions within just 365 days."

V. Shkolnik

the Chinese delegation, indicating a serious approach to building relations on the part of Chinese partners.

"Investments and the construction of oil pipelines will create thousands of additional jobs in Kazakhstan.", Nursultan Nazarbayev said after the signing ceremony. Kazakhstan retained certain levers of influence on the implementation of the pipeline project, as written in the agreement that the oil pipeline should be built within 5 years + 2.5 years without sanctions. However, after this period, if it was not built, all property along with investments would be returned to Kazakhstan.

By the order of the Prime Minister of the Republic of Kazakhstan dated June 7, 1999, in order to ensure access of oil producers of the Aktobe region to the export pipelines CPC and Atyrau-Samara, NCTC KazTransOil CJSC was instructed to consider the construction of a connecting oil pipeline from the Kenkiyak field, owned by the China National Petroleum Corporation (CNPC), to Atyrau. This section was to become part of the "big" Chinese export pipe.

Before the construction of the Western Kazakhstan-China oil pipeline, access for Kazakhstan oil producers to the Chinese market was provided by a new railway oil loading gantry at the Atasu oil pumping station (OPS) in the Karaganda region, on 680 km of the Pavlodar-Shymkent oil pipeline. The facility was launched on July 24, 2000 and was designed for trans-shipment and delivery of oil by rail to the Pavlodar refinery and to China. It was also designed to carry out the filling of Russian oil transported via oil pipeline from Western Siberia. The design capacity for oil loading was up to 3 million tons per year, including 1 million tons of Kumkol oil per year. The two-sided loading ramp was designed for the simultaneous filling of 40 tankers (20 tankers on each side). At the first launch facility, the gantry was equipped with 18 filling systems. The volume of capital investments amounted to US \$7,317 thousand, including the launch facility – US \$5,546 thousand. The project for the construction of an oil loading ramp was fully financed by KazTransOil.

On October 3, 2001, NC Transport of Oil and Gas CJSC and CNPC International Kazakhstan LLP, CNPC's subsidiary, signed a framework agreement on the construction of the Kenkiyak-Atyrau oil pipeline at a length of 448.8 kilometers and a diameter of 24 inches. In accordance with the terms of this agreement, North-Western Pipeline Company MunayTas CJSC was formed. The founding parties were KazMunayGas (51%) and CNPC International Kazakhstan (49%).

On May 23, 2002, a construction commencement ceremony for this section took place in the presence of the Prime Minister of the Republic of Kazakhstan, Imangali Tasmagambetov. He referred to the project as "the beginning of a very large promising work on the diversification of pipeline routes, primarily oil ones".

The general contractor was the Russian company "StroyTransGaz". A mandatory condition of the contract was the involvement of a Kazakh company as subcontractor to perform 53%



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2014-2016 Minister of Energy

of construction works. The subcontractor was KazStroyService CJSC, a subsidiary of KazMunayGas. The main design and financial documentation was drafted by SRDI Caspiymunaygas JSC (Atyrau). The working draft was prepared by Gas Research Institute Project (Samara), while technical supervision of the supply of pipes and the entire construction of the facility was performed by Moody International Ltd, a British independent inspection company. Operations were carried out at different sites in seven streams with the help of subcontractors from Moscow, Minsk, Rostov, and Almaty. Pipe products for laying the oil pipeline were manufactured by factories in Russia and China. The average speed of pipeline construction was 7-8 kilometers per day. New engineering solutions were found to minimize the risk of environmental pollution. Thus, when crossing the Ural River, the method of horizontal directional drilling was applied. This was designed to prevent negative impact on nature and conserve riverbeds and banks in their natural state. The pipeline was laid at a depth of 19.49 meters under the river bottom with the drilling of a well with a length of 841.18 meters. As a result of the coordinated work, the trenchless pipeline laying through the main water barrier was successfully completed. Pneumatic hydraulic ball valves supplied by the German company ITAG were installed on the Kenkiyak-Atyrau main oil pipeline. This ensured water-tightness, and reduced emissions into the atmosphere. During the construction of the linear part of the pipeline, 470 units of special equipment were used and more than 1,000 workers were involved.

In March 2003, the Kenkiyak-Atyrau oil pipeline was brought on line. This section connected the Kenkiyak OPS with the Atyrau OPS of KazTransOil JSC and further with the CPC export terminals and the Atyrau-Samara oil pipeline. The capacity of the first stage Kenkiyak-Atyrau oil pipeline commissioning ceremony



of the pipeline was 6 million tons of oil per year. The subsequent stages – second and third – were aimed at increasing the capacity to 10 million tons and 14 million tons per year. The commissioning of this section allowed for the export of oil produced at the fields in the Aktobe and Atyrau regions. In particular, all oil-producing enterprises located along the Kenkiyak-Atyrau oil pipeline route, including CNPC-Aktobemunaigas, Kazakhoil-Aktobe, Embamunaygas, Kazakhturkmunay and others, became clients of this system.

Timur Kulibayev, who was at that time first Vice-President of CJSC NC KazMunayGas, noted: "In Kazakhstan, this project is recognized as unique, and the first in the history of a sovereign republic. It allowed us to diversify the directions of oil transportation, as well as reduce the risks of investing in the region. The project followed the strategy of accelerated work implementation. The construction project became a creative laboratory for testing and implementing new technological solutions which had not yet been used in the construction of the oil and gas sector in Kazakhstan. This enabled us to complete the construction of the linear part of the Kenkiyak-Atyrau oil pipeline in a short time".

The Kenkiyak-Atyrau oil pipeline became the first stage of a large-scale project for the construction of a transcontinental trunk oil pipeline West Kazakhstan-West China in which both Kazakhstan and China were interested.

In order to implement the second stage of the project, a framework intergovernmental agreement on the development of bilateral cooperation in the field of oil and gas was signed on May 17, 2004 in China. The signing ceremony was attended by the President of the Republic of Kazakhstan, Nursultan Nazarbayev, and President of the People's Republic of China, Hu Jintao. The



document was signed by KazMunayGas President, Uzakbai Karabalin, and CNPC CEO, Chen Geng. On June 30, 2004, pursuant to the new agreements, KazTransOil JSC and the China National Oil and Gas Development Corporation (CNODC) established the Kazakhstan-China Pipeline LLP with equal shares of participants. They were then entrusted with the construction of the Atasu-Alashankou oil pipeline.

The welding of the "golden" joint of the oil pipeline to symbolize the unification of the strategic goals of the two friendly states, was carried out on November 14, 2005 in the border zone of the Republic of Kazakhstan and the People's Republic of China. Already on December 15, 2005, on the eve of the Independence Day of the Republic of Kazakhstan, President N.A. Nazarbayev brought into operation a 988-kilometer section of the oil pipeline – from the Atasu station in the Karaganda region of Kazakhstan to the border with China near the Druzhba-Alashankou railway terminal. He switched on the pumping unit from the Main Dispatching Department of KazTransOil JSC. Audiences in Astana and Atasu watched events by teleconference. Nursultan Nazarbayev stressed that the oil pipeline had been built in record time. 4,500 people had worked on the construction, and more than 500 Kazakhstanis were employed.

According to Vladimir Shkolnik, Minister of Energy and Mineral Resources of the Republic of Kazakhstan in 2004, the negotiations with the Chinese on the construction of Atasu-Alashankou were quite difficult and lasted six months. "After signing the Agreement, we built this oil pipeline of over a thousand kilometers, in the most difficult conditions, in just 365 days. The work was completed on very good contractual conditions: there were bank guarantees from the PRC, and a local content of 50-50. Moreover, the responsibility for filling this pipeline with oil was assumed, at our insistence, by the Chinese side", he said.

US \$688.4 million were invested in the pipeline which was laid along the route of the Atasu-Agadyr-Akchatau-Aktogai-Ucharal State Transport System. It passes through the territory of the Karaganda, East Kazakhstan and Almaty regions ending at the Alashankou railway station in China. The diameter of the pipeline was 813 mm with an initial capacity of 10 million tons of oil per year, and a projected capacity of 20 million tons. The process of filling the Atasu-Alashankou pipeline with oil was completed on May 25, 2006. The total volume of technological oil required for filling was 600 thousand tons. Commercial operation of the Atasu-Alashankou oil pipeline began in July 2006.

As Vice-president of CNPC Wu Yaowen stressed at the time: "The idea of a new oil pipeline does not contradict the idea of the CPC, in addition to the route through Afghanistan and Pakistan, since it is beneficial for Kazakhstan to have the maximum number of transport outlets".

Uzakbai Karabalin shared in his memoirs – "It has always been difficult to negotiate and bargain with Chinese partners. The

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Chinese are very uncooperative, they defend their interests robustly and work very methodically. During negotiations, they always demonstrate good preparation and knowledge of the issue. All the state-owned companies that we have ever dealt with clearly pursue a single policy, work as a single system, a single machine"... "In addition to the large infrastructure projects that were implemented with the participation of Chinese investors, the oil and gas fields developed by them have also been developed seriously. One of the most striking examples is the development of the Zhanazhol field by CNPC-Aktobemunaigas. I think that the construction of gas processing facilities at Zhanazhol is an indicator of how successfully our Chinese colleagues from CNPC can implement such projects. Such projects with the participation of the Chinese side have opened up access to the oil and gas industry of Kazakhstan for other companies as well".

The Atasu-Alashankou project is one of the first worldclass export oil pipelines built in independent Kazakhstan. With its introduction, Kazakhstan received the role of one of the main regional oil suppliers to China. Work began immediately on the development of technical documentation for the construction of the third section – Kumkol-Kenkiyak (from the Kyzylorda region to the Aktobe region) with a capacity of 10 million tons of oil per year at the first stage, and up to 20 million tons per year in the future.

Construction was started by Karim Massimov, Prime Minister of the Republic of Kazakhstan, on December 11, 2007, on the eve of Independence Day. The ceremony took place at the Kenkiyak field





of the Temir district of the Aktobe region. Deputy Chairman of the Energy Committee of the State Council of the People's Republic of China, Ma Futsai, took part in the welding of the first docking seam of the oil pipeline at the Kenkiyak head oil pumping station. He read a letter of congratulations from Wu Yi, the Deputy Prime Minister of the People's Republic of China, and co-Chairman of the Kazakh-Chinese intergovernmental Commission on cooperation from the People's Republic of China. "In recent years, the political relationship between our countries has been continuously deepening, and the spheres of economic cooperation have continued to expand. The Kazakhstan-China oil pipeline as a link of friendship connects our two countries. (...) The beginning of the construction of a new stage of the oil pipeline will play an important role in further consolidating mutually beneficial cooperation and promoting the economic development of Kazakhstan and China", the text of the letter said.

The construction of the oil pipeline was carried out by Kazakhstan-China Pipeline LLP, the founders of which were KazTransOil JSC and the China National Corporation for Oil and Gas Exploration and Development on a parity basis.

The construction work experienced a number of technical difficulties. The pipes had to be laid in difficult terrain, with sand dunes, and irrigated and cultivated lands. The project required the pipeline to cross the Mugolzhar Mountains, characterized by a significant difference in altitude. In these places drilling and blasting operations were required. In total, more than 1,000 specialists were



TECHNICAL CHARACTERISTICS OF THE KENKIYAK-KUMKOL OIL PIPELING:

- length 761km
- diameter 813 mm
- initial throughflow capacity 10 million tons per annum with the possibility of further expansion to 20 million tons per year
- approximate cost \$1 billion
- oil from the Aktobe region and West Kazakhstan used as feedstock resources

involved in the construction of the pipeline, as well as more than 800 different machines and mechanisms.

The Kenkiyak-Kumkol oil pipeline (761 kilometers in length and 813 mm diameter) was laid through the territories of the Aktobe, Kyzylorda and Karaganda regions and allowed for a connection of the Kenkiyak-Atyrau oil pipeline with the Kumkol-Atasu oil pipeline. This ensured the supply of hydrocarbons from the Aktobe and West Kazakhstan regions to the Chinese market. Construction required an investment of about US \$1 billion.

The construction of the linear part of the pipeline was completed ahead of schedule, enabling the process of filling it with technological oil to begin on July 11, 2009. Filling was completed in September, and commercial operation of the new KenkiyakKumkol oil pipeline began in October 2009. The first and main shipper of oil through this pipeline was CNPC-Aktobemunaigas JSC. Other oil-producing companies of the Aktobe region and Western Kazakhstan were also considered as the resource base for the project.

With the construction of the third section of the Kazakh-Chinese oil pipeline, a single, interconnected oil pipeline system was created in the country, connecting the West and the East. Kazakhstan thus obtained a pipeline infrastructure that provides stable and reliable oil exports to the promising market of China, where demand is increasing on an annual basis, and then further afield to the countries of the Asia-Pacific region. A significant positive factor in this direction was the absence of risk associated with transit through the territory of other states, since the route of the Western Kazakhstan-China oil pipeline passes only through the territories of Kazakhstan and China – both states interested in exporting Kazakh hydrocarbons. There was no involvement of third transit countries – another victory of the Kazakh oilmen.

Years later, the presence of this route was to allow Kazakhstan for the first time to ensure the transit of Russian oil through its territory to the Chinese market. On December 24, 2013, Uzakbai Karabalin, Minister of Oil and Gas of the Republic of Kazakhstan and Alexander Novak, Minister of Energy of the Russian Federation, signed an intergovernmental agreement on cooperation in the field of transportation of Russian oil through the territory of the Republic to China. The signing took place during a meeting of the Supreme Eurasian Economic Council in Moscow with the participation of the Presidents of the Republic of Kazakhstan and the Russian Federation. On December 27, 2013, the General Director (Chairman of the Management Board) of KazTransOil JSC, Kairgeldy Kabyldin, and the President of Rosneft, Igor Sechin, signed an agreement for the provision of oil transportation services. The Russian side was offered acceptable transit tariffs, while Kazakhstan, - the opportunity to earn money from the transit of Russian oil.

On January 1, 2014, KazTransOil JSC began to provide the Russian company Rosneft with oil transportation services to the People's Republic of China along the route Priirtyshsk-Atasu-Alashankou. The agreement was based on a mutual supply scheme for 5 years, with the possibility of automatic extension for another 5 years. According to the agreements, Russia guaranteed the supply of 7 million tons through Kazakhstan to China, with the possibility of increasing this figure to 10 million tons per year.

Uzakbai Karabalin called this agreement a "radical upturn" in the relations of the parties. Kairgeldy Kabyldin said: "The territory of Kazakhstan has become a transit base for the supply of oil from the Russian Federation to China. This has never happened before and no one could even have imagined such a thing! Thus, we have created a system that is also in demand in other countries. I think that in 2020-2030, the Chinese market will become interesting not only for us, but also for our neighbors. Then Kazakhstan will become an energy hub". 174

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KazTransOil

MAP OF MAIN PIPELINES





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Serik SULTANGALIYEV, CEO, KazTransGas JSC (2005-2007, 2009-2014)



ON THE COMPANY'S MAIN MILESTONES:

I was head of KazTransGas JSC from May 2005 to September 2007, and then from December 2009 to October 2014. At the same time, I was also Chairman of the Board of Directors between 2009 to 2015. Over the years, the public gas transportation company has grown into a robust and stable structure with strong positions in the international market. The volume of natural gas transportation through the main gas pipelines has increased, the existing gas pipeline systems have been modernized and new gas pipeline systems have been built to ensure gas transit and export to China. The regions of Kazakhstan have been gasified, capital investments in the gas transportation system and deductions of taxes and other mandatory payments to the country's budget have increased.

In 2012, an important industry document was adopted: the Law of the Republic of Kazakhstan "Concerning Gas and Gas Supply". This document sets out the rules in the gas market of Kazakhstan. It also defines KazTransGas JSC as a single national operator for the purchase of gas from gas-producing organizations, transportation, transit, export, import and distribution in the Republic of Kazakhstan to accumulate the financial resources necessary for the modernization and development of gas transportation infrastructure. Work on drafting the law was started by KazTransGas JSC in 2009. According to the Prime Minister's instruction of February 11, 2010, a working group under the Ministry of Oil and Gas was set up. In addition to representatives of state bodies and the national holding of JSC NC KazMunayGas, the working group also brought in foreign oil and gas companies (British Gas, Conoco Philips), and World Bank experts. The document led to the development and approval of the State Gasification Program of the Republic of Kazakhstan. It also included measures for the reconstruction and modernization of existing gas distribution networks, as well as the development of gas transportation and gas distribution infrastructure. All gas transportation and gas distribution systems of the country were consolidated on the basis of the national operator, and a single dispatch control with automated trunk and distribution systems management was built.

Now as a result of high-quality management, KazTransGas JSC is a self-sufficient company working to good effect to ensure the energy security of the republic and has the necessary experience and professional potential to fulfill its tasks.

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Kairat SHARIPBAYEV, Chairman of the Management Board, KazTransGas JSC

ON THE COMPANY'S MAIN MILESTONES:

KazTransGas CJSC was incorporated on the basis of a decree of the Government of the Republic of Kazakhstan in 2000. It was renamed KazTransGas JSC in 2004.

The company inherited the compressor stations and main gas pipelines that extended through the territory of Kazakhstan and Russia (Central Asia – Center, Soyuz, Bukhara-Ural, Orenburg-Novopskov). These main pipelines were built back in the 1960s and 1970s and were already considered obsolete by that time.





KazTransGas immediately had to modernize almost the entire infrastructure. At the same time, a gas pipeline network was being created to ensure stable and reliable supplies of natural gas to consumers in the domestic and foreign markets.

During the years of operation of KazTransGas JSC, advanced main gas pipelines Kazakhstan-China, Beineu-Bozoi-Shymkent and Saryarka were built. These are now considered the property of independent Kazakhstan.

Thanks to these investment projects, KazTransGas was not only able to increase the capacity of existing gas pipelines, but also created a system that allows diversification of gas flows in any direction, something which is very important for a state with a favorable geographical location.

In February 2008, a joint venture, Asian Gas Pipeline LLP was incorporated to manage the Kazakhstan-China gas pipeline on a parity basis of KazTransGas JSC and Chinese Trans-Asia Gas Pipeline Company Ltd. Today, the gas pipeline, with a length of 2,612 km for A and B lines, 1,304 km for C line and a total annual capacity of 55 billion cubic meters, provides transit for Turkmen and Uzbek gas, as well as export of Kazakh gas to China.

In December 2010, Beineu-Shymkent Gas Pipeline LLP was established. The constructed and commissioned gas pipeline connected the western oil and gas fields with the southern regions. The length of the gas pipeline is 1,454 km, and the annual throughput capacity is 15 billion cubic meters.

In addition to stable gas supply to Kazakhstanis, since 2017 gas exports to China have been ensured. Initially, it was planned to supply 5 billion cubic meters per year, then a long-term contract was signed to increase annual exports to 10 billion cubic meters.

In 2020, the Beineu-Bozoi-Shymkent main gas pipeline reached full capacity. The project is of the most important strategic importance for the energy security of the Republic of Kazakhstan. It unites the entire gas transportation system of the country, allowing diversification of the transportation of Kazakh gas in any direction and providing natural gas to the southern regions, thus preventing any shortage of "blue" fuel in winter.

Also in 2020, the construction of Saryarka main gas pipeline was completed. This will realize the long-standing dream of Kazakhstanis – gasification of the central and northern regions of Kazakhstan.

Gasification became possible after the construction of the Beineu-Bozoi-Shymkent gas pipeline, from which the first stage of Saryarka gas pipeline to Nur-Sultan and Karaganda was then built.

Plans are for 2.7 million people to gain access to gas as a result of the project. Along with this, new production facilities will be formed using natural gas. All this will significantly affect the improvement of the environment and the quality of public life.

In December 2020, KazTransGas JSC received permission from the state to purchase crude associated natural gas from the Kashagan field. KazTransGas JSC and NCOC signed the agreement for crude associated natural gas intake services.

Today, KazTransGas JSC is the main gas-energy and gas transportation company of the Republic of Kazakhstan. It represents the interests of the state both in the domestic and offshore gas market. Being a portfolio company of JSC Samruk-Kazyna SWF, the Company manages a centralized infrastructure for the transportation of commercial gas through main gas pipelines and gas distribution networks. It also provides international transit and sells gas in the domestic and offshore markets, and also develops, finances, builds and operates pipelines and gas storage facilities.

The JSC KazTransGas group of companies operates gas pipelines with a total length of about 76 thousand km. These include more than 20 thousand km of main gas pipelines with an annual capacity of up to 267.8 billion cubic meters and gas distribution networks with a length of more than 56 thousand km.

KazTransGas has become the most important and technologically powerful operator of gas flows in the Central Asia. Kazakhstan has made the most of the existing gas transportation routes. New gas corridors, high-tech compressor stations, gas pumping units have been built introducing the latest digital technologies. As a result, Kazakhstan has managed to create a Central Asian gas hub with huge transit and transport potential.

The Company provides commercial gas to more than half of the country's population, successfully operating in 12 regions of Kazakhstan. Over the past seven years alone, more than 3 million Kazakhstanis have been able to use gas. The level of gasification of the population has increased from 30% in 2013 to 53.07% in 2020 and covers more than 9.5 million people. The number of gasified domestic enterprises has doubled – from 23,725 to 51,285. At the same time, the national operator sells gas to domestic consumers below cost price. Subsidies amount for the last 3 years made more than 255 billion tenge.

The structure of KazTransGas JSC includes subsidiaries and jointly controlled companies operating in various business areas, including the resource base (Amangeldy Gas LLP, Otan Gas LLP), main gas transportation (Intergas Central Asia JSC, Asian Gas Pipeline LLP, Beineu-Shymkent Gas Pipeline LLP), wholesale and retail gas sales (KazTransGas Aimak JSC, 50% of the participation in the trust management of KazRosGas LLP), and service companies (KazTransGas Onimderi LLP, KTG Finance B.V.). 180

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GAS TRANSPORTATION

The Central Asia-Center (CAC), Orenburg-Novopsk, Soyuz, Bukhara-Ural, Bukhara Gas-Bearing Region (BGR) – Tashkent-Bishkek-Almaty (TBA) gas pipelines, which existed in Kazakhstan at the dawn of independence, were designed and put into operation during the Soviet period. Together they formed a system of highways transporting natural gas to the pipeline infrastructure of Russian Gazprom. For a long time, the Russian export route remained the only possible option for the supply of Kazakh gas to European markets. This largely explained the imbalance of the internal gas pipeline system that existed in the country.

The internal gas pipeline system in Kazakhstan supplied gas only to certain regions of the Republic. Through these pipelines, gas from Uzbekistan was transported to southern Kazakhstan (the cities of Shymkent, Taraz and Almaty). At the same time, most of the country (including the cities of Ust-Kamenogorsk, Semey, Pavlodar, Astana, Karaganda and Taldykorgan) still remained without gas pipeline infrastructure, and had to use alternative energy sources or import natural gas. In 2001-2010, 684 kilometers of new domestic main gas pipelines were built. These included Amangeldy-KS-5 (Zhambyl region) (193 kilometers) and Akshabulak-Kyzylorda (Kyzylorda region - 123 kilometers). Although these projects were of great social importance, supplying gas to specific regions, they did not fully resolve the problem of gas supplies to the domestic market and, export diversification. In the Zhambyl region in particular, gas was supplied to consumers from the Amangeldy gas field. This field was brought into operation in October 2003, significantly reducing dependence on supplies from Uzbekistan in the south of Kazakhstan. This area had been experiencing a gas shortage for a long time, especially in winter. At the same time, it led to a reduction in the cost of gas for all categories of subscribers by a third.

In order to resolve the problem of gas supply on a more global level, on November 28, 2001, Kazakhstan and Russia signed the first intergovernmental agreement in the gas industry. This agreement was linked specifically to the sale of Karachaganak gas. So far, all attempts to resolve this issue at the level of economic entities, including the national companies KazMunayGas and Gazprom, had remained fruitless. Gazprom still enjoyed a monopoly position, and KazMunayGas sold its gas to it at the border between the countries at the bargain price of \$5-7 per 1 thousand cubic meters. The problem needed to be


resolved, so the issue of selling Karachaganak gas was raised at the level of the Governments of Kazakhstan and Russia.

As Bolat Nazarov recalled, (2001-2002, Vice-President for the Karachaganak project of KazTransGas CJSC, and since 2012 – Deputy General Director for production of KazRosGas LLP) when the Karachaganak gas condensate field was being developed with foreign investors, the marketing scheme for liquid hydrocarbons was very rational. Liquid hydrocarbons were processed at the Karachaganak processing complex, then exported through the Karachaganak - Bolshoi Kachagan - Atyrau condensate pipeline



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with a tie-in with the CPC system. "However, we were still tied to Gazprom for gas. During the extraction of liquid hydrocarbons, gas is also produced along the way, so we had to look for ways of selling it", he recalled.

Based on an intergovernmental agreement, on June 7, 2002, in St. Petersburg, two important documents were signed in the

European markets with its gas, and receive a decent price for its sale.

The agreements included the annual supply of 5 billion cubic meters of gas from the Karachaganak oil and gas condensate field for purification at the Orenburg gas processing plant in the Russian Federation. Of this volume, about 2 billion cubic meters of purified gas was to be returned to Kazakhstan for supply to Kostanay, Aktobe and West Kazakhstan regions. KazRosGas would export the remaining 3 billion cubic meters of gas to Europe.

At a joint press conference, Nursultan Nazarbayev said: "In the space of two months, we have reached colossal agreements in economic relations between Kazakhstan and Russia, something which we had not achieved in all 10 years of independence. I think that there are no other such agreements between the CIS

In 8-10 years, when Kazakhstan starts producing more than 100 million tons of oil, associated gas will amount to more than 80 billion cubic meters. If this gas goes through Russia, it will be beneficial for the mainland state of Kazakhstan to enter the world gas markets.

presence of the Presidents of the Republic of Kazakhstan and the Russian Federation, Nursultan Nazarbayev and Vladimir Putin. They were aimed at the further strengthening and development of bilateral relations in the oil and gas industry. The agreement on the long-term transit of Kazakh oil through the Russian territory was signed by Deputy Prime Minister of Kazakhstan, Karim Massimov, and Deputy Prime Minister of the Russian Government, Viktor Khristenko. A founding agreement was also signed between Gazprom and KazMunayGas National Company CJSC on the establishment of a joint venture KazRosGaz CJSC, in which both parties owned 50% of the participation share. A great contribution to the drafting and signing of these documents was made by the national oil and gas transport company which participated in all stages of the negotiations. Anuarbek Argyngazin, who had been vice-president of KazTransGas until then, was elected Chairman of the Management Board of KazRosGaz CJSC.

The new joint venture was created for the purchase and marketing of gas, including Karachaganak, as well as the transportation and processing of Kazakh gas at Russian gas processing plants. In addition, it was to perform the functions of a gas transportation operator through the territories of the two states to the markets of third countries. This event was of great importance for Kazakhstan, since it was now able to enter the countries. (...) In 8-10 years, when Kazakhstan starts producing oil to the amount of more than 100 million tons, the associated gas will amount to more than 80 billion cubic meters. If this gas goes through Russia, as a mainland state, it will be beneficial for Kazakhstan to enter world gas markets. It will also be profitable for Russia to receive dividends for the transportation of this gas and oil through its territory".

As Vladimir Putin stressed, with the signing of these documents, the level of interaction and the quality of partnership between Russia and Kazakhstan has acquired "a character that has never existed before" – one which will have very far-reaching consequences for the interaction of the two states in the long-term and for building energy policy in Europe and around the world.

"We highly appreciate these agreements. In fact, they create a very solid basis for long-term cooperation in one of the most important areas of our economies-the energy sector. (...) The agreement fully corresponds to the interests of both Kazakhstan and Russia. Kazakhstan – because it guarantees the pumping of Kazakh oil, and takes into account increased production. This is also good for us, because Russia is consolidating its status as a transit country. (...) For Russia, this means a change in the quality of our policy in this area. You probably know – and experts know for sure – in recent years, Russia has been focused on its own



Nursultan Nazarbayev, The First President of the Republic of Kazakhstan – Elbasy:

"Within the space of two months we have reached colossal agreements in economic relations between Kazakhstan and Russia, which we have not achieved in all 10 years of independence. I think that there are no such other agreements between the CIS states ...".

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Vladimir Putin, President of the Russian Federation:

"The level of interaction and quality of partnership between Russia and Kazakhstan is acquiring a form it has never had before. This has and will have very serious benefits for the interaction of the two states in the long term, as well as for our positioning in Europe, in the world. What we are signing today will undoubtedly have far-reaching implications for energy policy in Europe, at least. And, I think, all over the world."



capabilities. It has not always been easy for our partners to sell their goods on the CIS and Western European markets through Russian pipeline systems. In our relations with Kazakhstan, we are moving towards a different format of cooperation. In this sense, Kazakhstan is becoming a full-scale, fully-fledged participant in this process and this business. This fully corresponds to the interests of the Russian Federation, since it provides the necessary volumes for the long term. This, accordingly, is in the interests of Kazakhstan, because it is entering foreign markets with its product", the Russian leader noted.

Indeed, the real benefit of Kazakhstan from this agreement was, first of all, that KazRosGas not only began to provide guaranteed processing of Kazakh gas at facilities in the Russian Federation under a long-term contract, but also began supplying could have occurred due to the rapid increase in energy prices on world markets. In addition (and this is also very important!), we were able to directly export Kazakh gas, despite the fact that no major independent oil and gas producer in Russia itself even today is able to do so. They sell all the gas produced to Gazprom at domestic market prices. Thanks to consistent and constructive negotiations with this Russian company, KazRosGaz has managed to achieve a significant increase in the export price of Karachaganak gas at the border of Kazakhstan and Russia. Another significant point is that given that KazRosGaz LLP is registered in the territory of the Republic of Kazakhstan, our country receives taxes, fees and other mandatory payments to the budget from the activities of this joint venture. The company is making a significant contribution to the development of the economic and social spheres of the Republic.

The agreement is fully consistent with the interests of both Kazakhstan and Russia. For Kazakhstan it guarantees the pumping of Kazakhstan oil, taking into account increased production, which is good for us too. For Russia it is consolidating its status as a transit country.

the domestic market of Kazakhstan through swap operations with Russia. This was the first time that such thing had been achieved in the history of the independent Kazakhstan. A direct, transparent and efficient system of gas supply, as well as the processing and sale of final products was established on a mutually beneficial basis. Such swap operations were considered the most costeffective scheme of cooperation between Kazakhstan and Russia, since the existing gas pipeline system did not allow direct gas supplies to most regions of the Republic of Kazakhstan. The mechanism for ensuring swap supplies consisted of replacing Russian gas consumed by the Kostanay region and Uzbek gas supplied to the southern regions of Kazakhstan with similar volumes of processed Karachaganak gas at fixed prices, as agreed with the authorized organization of the Government of the Republic of Kazakhstan. The implementation of the scheme of mutual supplies of natural gas allowed for transport costs to be optimized and ensured a systematic (market-comparable) increase in gas prices for consumers of Kazakhstan. It also ensured improved social conditions for the life of the population and the growth of the economy of the Republic as a whole.

Timur Kulibayev assessed the Kazakh-Russian agreement at that time in the following way: "We managed to avoid a sharp increase in prices for imported gas on the domestic market, which KazMunayGas also receives annual dividends as a shareholder. The existing dynamics of procurement and supply volumes clearly demonstrate the growth and strengthening of the positions of KazRosGaz LLP in the market of Kazakhstan and Russia. With the further development of the company, a serious foundation is being laid for the effective protection of state interests in the gas industry."

The high level of appreciation of this project not only by Kazakhstan, but also Russia is evidenced by the fact that in December 2007, the Russian President Vladimir Putin awarded Timur Kulibayev, Head of the Transport of Oil and Gas company in the early 2000s, the Order of Friendship for "contribution to strengthening friendship and cooperation in the development of the fuel and energy complex of Russia and Kazakhstan".

After having approved gas relations with Russia, Kazakhstan began work on resolving issues on ensuring gas supplies to the growing Chinese market. By this time, the ambitious Kazakhstan-China oil pipeline project had already been implemented. The development of the gas artery in the eastern direction should also have been a significant achievement of our country.

By the end of the 2000s, an important project was implemented in the region from a geopolitical, economic and social point of view. This was to ensure the transit of Central Asian 186

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"This is a great project. The ancient Silk Road is being restored through this pipe, ensuring the friendship of the four SCO countries."

Nursultan Nazarbayev

gas to China through the territory of the Republic of Kazakhstan and allow the diversification of export routes of Kazakh gas. From the very outset, Astana saw this as a very profitable project, given China's impressive plans to increase gas production. Astana, for its part, quite rightly believed that the construction of a gas pipeline in China would strengthen its position in negotiations with Gazprom on gas supplies to the European market.

In August 2003, Kazakhstan and China signed a memorandum aimed at accelerating the construction of the first stage of the Kazakhstan-China main gas pipeline. In November 2003, they signed an agreement on the preliminary feasibility study of implementing the project, and in August 2005 – an agreement on joint development of investment justification. KazMunayGas and CNPC started work in 2006. The length of the route allocated for the construction of the Kazakhstan-China gas pipeline was about 1300 kilometers. The gas pipeline was to become part of the transnational artery Turkmenistan-Uzbekistan-Kazakhstan-China, the length of which reached about 7000 km. The Kazakhstan-China, the Kazakh-Chinese border near the village of Lugovoye, Zhambyl region. The capacity of the gas pipeline in two-line mode was 30

billion cubic meters of gas per year, the diameter was 1067 mm, and the design life was 30 years.

The state visit of Chinese President, Hu Jintao, to Astana, on August 17-18, 2007, ended with the signing of a general agreement on cooperation between the Governments of the two countries on the construction and operation of the Kazakhstan-China main gas pipeline. This led to the creation of the Asian Gas Pipeline LLP (50% of the share of KazTransGas JSC and Trans-Asia Gas Pipeline Limited, an affiliate of CNPC). Construction began of the first line ("A") in July 2008, in 42km section of the Almaty-Kapshagai highway. Sauat Mynbayev, Minister of Energy and Mineral Resources of the Republic of Kazakhstan attended the ceremony on the occasion of the first welding of gas pipeline pipe joints, referring to the event as "significant", and turning a "new page in the economic history" of Kazakhstan and China.

The general contractor of the construction was the Kazakh enterprise OGCC KazStroyService JSC. During the 14 months of construction work, 1,305 kilometers of the linear part of the gas pipeline were laid. This included 6 start-up and reception chambers for cleaning devices, 38 linear crane nodes, 2 crossings over the Syrdarya River, 132 crossings over the road and railway, and 374



thousand cubic meters of drilling and blasting operations in rocky soils were completed. The project involved 5 thousand specialists and 3 thousand machines. It required about 9.5 million man-hours and about 5 million machine-hours. 800 thousand tons of cargo was delivered, and 1,140 pieces of equipment with a value of US \$320 million were installed. In August 2009, a world record for pipe welding speed was set in the South Kazakhstan region. The number of pipe joints welded per shift reached 242, and 3,040 meters of pipes were laid in a single day. During the construction work, the most complex engineering tasks were solved. This involved changes in the route of the gas pipeline, especially bypassing sections where historical and cultural monuments are located. For the first time in Kazakhstan, the working pressure in the gas pipeline was set at 9.81 MPa (100 atmospheres!). There were no analogues of a gas pipeline with such performance characteristics in Kazakhstan at that time.







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The ceremony to commission the first stage of the Turkmenistan-Uzbekistan-Kazakhstan-China main gas pipeline took place on December 12, 2009 in Astana with the participation of President of the Republic of Kazakhstan, Nursultan Nazarbayev, and the Chairman of the People's Republic of China, Hu Jintao, Chairman of the Board of Directors of JSC NC KazMunayGas, Timur Kulibayev, Chairman of the Management Board of JSC NC KazMunayGas, Kairgeldy Kabyldin, President of CNPC, Jiang Zemin and other officials. Two days later, on December 14, the Presidents of Turkmenistan, Kazakhstan and Uzbekistan and China, Gurbanguly Berdimuhamedov, Nursultan Nazarbayev, Islam Karimov and Hu Jintao, switched on the Turkmenistan-Uzbekistan-Kazakhstan-China transnational gas pipeline at the Samandepe Turkmen field, from where it originates. This event marked the beginning of natural gas supplies from Turkmenistan to China through the territory of Kazakhstan.

"The launch of the gas pipeline will become a milestone in our relations and will be inscribed in history in golden letters."

Gurbanguly Berdimuhamedov, President of Turkmenistan

"The launch of a pipe to China is changing the geopolitical map of Central Asia, creating new routes for transporting energy from the region."

Islam Karimov, President of Uzbekistan Nursultan Nazarbayev called this project a "great" and new ancient Silk Road that guaranteed the friendship of the four countries. Islam Karimov noted that "the launch of the pipe to China changes the geopolitical map of the Central Asia, by creating new routes for the transportation of energy commodities from the region". Gurbanguly Berdimuhamedov said that "the launch of the gas pipeline will be a milestone in our relations and will be written in golden letters in history".

As the Deputy Director General of CNPC, Liao Yungyuan, rightly noted at the ceremony, that thanks to the implementation of this grandiose project of strategic importance, the cooperation of the parties in the field of energy has moved to a new historical stage.

Kazakhstan began earning money not only as a transit state, but also as a transit state providing coverage of construction costs and, importantly, direct budget revenues.

The commissioning of the second ("B") line of the Kazakhstan-China section in the summer of 2010 ensured the growth of the annual gas transit to China to 30 billion cubic meters of gas. It also created 700 new jobs in the regions of the route – Almaty, Zhambyl, Shymkent regions – necessary for the operation of the gas pipeline.

As Beimbet Shayakhmetov, head of the Asian Gas Pipeline LLP at that time, commented, the project for the construction of lines "A" and "B" was implemented with minimal financial risks. In











2008, at the peak of the global financial crisis, instability and a shortage of cash and the inability to attract an absolutely new company, as well as the US \$7 billion needed for the construction, conditions were developed to enable Asian Gas Pipeline to enter the borrowing market. In the first few years, during the construction period, the loan was secured by a CNPC corporate guarantee, later to be replaced by ship-or-pay contracts. These conditions meant the independence of the carrier's income from the actually pumped volumes of gas. The customer had to pay a strictly fixed amount, based on the available capacity of the gas pipeline, the initially declared volume of gas and the tariff calculated on their basis. This scheme minimized the risks of reducing (or fluctuating) gas production volumes in Turkmenistan. Thus, the Asian Gas Pipeline was guaranteed stable revenue which meant the ability to repay the loan.

The commissioning of the third ("C") line of the Kazakhstan-China gas pipeline on November 30, 2015 completed the implementation of the project for the construction of the Turkmenistan-Uzbekistan-Kazakhstan-China cross-border gas pipeline. The length of the "C" line of the Kazakhstan-China main gas pipeline was 1,303 kilometers. The route was along the same technical corridor as the "A" and "B" lines in South Kazakhstan, Zhambyl, Almaty regions. The throughput capacity was 25 billion cubic meters of gas per year. Thus, henceforth, the total capacity of the Kazakhstan-China gas pipeline increased to 55 billion cubic meters per year. The book value of the linear part of the "C" line amounted to 440 billion tenge, and for the two operating compressor stations – 36 billion tenge and 34 billion tenge, respectively.

The beginning of the work of the "C" line was timed to coincide with the celebration of the Day of the First President of the Republic of Kazakhstan and brought together many distinguished guests, including First Deputy Akim of the Almaty region, Makhabbat Bigeldiyev, Vice Minister of Energy of the Republic of Kazakhstan, Magzum Myrzagaliyev, Chairman of the Management Board of KazTransGas JSC, Kairat Sharipbayev, and Vice President of PetroChina, Lui Gongsiun. The Chinese side highly appreciated the quality of the pipe laying and construction of compressor stations, and acknowledged the delivery of the facility ahead of schedule.

"The operation of all three strands of the Kazakhstan-China main gas pipeline is the largest international gas transportation project in the history of independent Kazakhstan. Far beyond its important economic and geopolitical significance, this project meets the integration policy of the Head of State, connecting Turkmenistan, Uzbekistan, Kazakhstan and China in a "rainbow of friendship". The President of the country, Nursultan Nazarbayev, instructed that new effective routes for the supply of energy resources be created and their directions diversified. We can say that KazTransGas has coped with this task," Kairat Sharipbayev, Chairman of the Management Board of KazTransGas JSC in 2015, said at the time.

The implementation of this project allowed Kazakhstan, which had until then focused only on gas supplies to Europe

In order to supply the Zhambyl and Almaty regions with gas, the project provided for a connection to the existing gas pipeline from the Bukhara Gas-bearing Region – Tashkent-Bishkek-Almaty and the Kazakhstan-China gas pipeline. For Kazakhstan, this meant a guaranteed gas supply, especially during the heating season.











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Timur Kulibayev, Chairman of the KAZENERGY Association:

"We managed to avoid a sharp rise in prices for imported gas on the domestic market, which could have occurred due to the rapid rise in energy prices on world markets. In addition, which is also very important, we were able to directly export Kazakh gas, despite the fact that not a single large independent producer of oil and gas in Russia itself even today has such an opportunity."



through Russia, to redistribute its integration roles in the Central Asian region and change the geopolitical background.

As Karim Massimov, the Prime Minister of the Republic of Kazakhstan, noted in 2008: "We have not lost sight of the possibility of transporting energy resources to the south of the Asian continent. The course we have chosen remains unchanged – we are working on the basis of the agreements reached, regardless of fluctuations in the price of oil, the political situation or the global experience gained in using the "energy club".

The Kazakhstan-China main gas pipeline has played not only an important geopolitical and strategic role in the sovereign history of the country, but also enhanced the reliability of gas there were also opponents The latter considered its construction economically inexpedient and unjustified."

The length of the Beineu-Bozoi-Shymkent gas pipeline was 1,475 kilometers. The route passed through the territories of Mangystau, Aktobe, Kyzylorda and South Kazakhstan regions. In the first stage, a linear part of the Bozoi-Shymkent section (1,164 km) and a compressor station were built near Bozoi village (Aktobe region). In the second stage, the linear part of the Beineu-Bozoi section (311 km) and a compressor station in the area of the village of Karaozek (Kyzylorda region) were built. In order to provide the Zhambyl and Almaty regions with gas, the project provided for connection to the existing Bukhara Gas-bearing Region –

The Beineu-Bozoi section was commissioned in November 2015. Gas transportation capacity in this section is 10 billion cubic meters per year.

supply to the southern regions of Kazakhstan. This was achieved through the supply of Kazakhstan's own gas from the fields of the western regions along the Beineu-Bozoi-Shymkent artery built at the same time. This gas pipeline was built by Beineu-Shymkent Gas Pipeline LLP, a joint venture of KazTransGas JSC and the Chinese company Trans-Asia Gas Pipeline Company Limited. The JV was established in December 2010, in accordance with the agreement between the Governments of the Republic of Kazakhstan and the People's Republic of China on cooperation in the construction and operation of the Kazakhstan-China gas pipeline dated August 18, 2007 (with amendments and additions dated October 14, 2009).

In 2010, when the construction of the gas pipeline began, Serik Sultangali, head of KazTransGas JSC, said that this project was due to the historical orientation of the USSR towards Uzbek and Turkmen gas, the resulting high dependence of Kazakhstan on imports and frequent interruptions in gas supply. The objective of the gas pipeline was to resolve problems with gas supply in the Aktobe, Kyzylorda, South Kazakhstan and Almaty regions and was of huge benefit to the population. As Bakhtykozha Izmukhambetov recalled, (2003-2006 – First Deputy Minister of Energy and Mineral Resources of the Republic of Kazakhstan, and in 2015, the Akim of the Atyrau region) "there were supporters of this project, and Tashkent-Bishkek-Almaty gas pipeline and the Kazakhstan-China gas pipeline. For Kazakhstanis, this meant guaranteed gas supply, especially during the winter heating period. From this point of view, the project was of great socio-economic importance.

The Beineu-Bozoi section was brought into operation in November 2015. The gas transportation capacity at this site is 10 billion cubic meters per year. The completion of this project was planned for April 2016, but the gas pipeline was brought into operation 5 months earlier – for the beginning of the winter heating season. During the construction of this section, thanks to effective and innovative management, KazTransGas JSC saved about 150 billion tenge (US \$500 million) of the originally planned amount. Such effective approaches in the conditions of an unstable global economy and limited sources of financing enabled the development of infrastructure projects.

"The commissioning of the Beineu-Bozoi section of the gas pipeline is historic in its significance, because it connected all the main gas pipelines of the country into a single gas transportation system. This allowed for the diversified transportation of gas through the territory of Kazakhstan in any direction, completely eliminating dependence on imported gas. Thus, KazTransGas will continue to implement the tasks set by the Head of State aimed

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at increasing the transit potential and transport energy resources", Kairat Sharipbayev, the head of KazTransGas, commented at the time.

After resolving the problem of providing natural gas to the southern regions of Kazakhstan, the Government of the Republic of Kazakhstan intensified work in the north. Astana, the capital of the Republic, had no gas distribution system, which created certain difficulties, primarily from an environmental point of view.

The gasification of Astana has been considered by the authorities of Kazakhstan since 2010. Initially, it was planned to build the Kartaly-Tobol-Kokshetau-Astana gas pipeline (from the Chelyabinsk region of the Russian Federation to the Kazakh capital, with branches to the cities of Karaganda and Petropavlovsk). This would provide a capacity of up to 6 billion cubic meters per year, ensuring gas supplies to the center from the west of the country. At the beginning of 2012, the feasibility study for the construction of the gas pipeline received approval from the State Expert Inspectorate. The conclusion included various options for gas delivery to the north and north-east of Kazakhstan: Petropavlovsk to Kokshetau and Astana; Kostanay region directly to Astana; Kostanay to Kokshetau and Astana; as well as the option of joining the Beineu-Bozoi gas pipeline and extending the branch to Astana. The option of building a branch from Kartaly to Kokshetau and further down to Astana was also considered as "more or less acceptable", according to the government. The total cost of the implementation of the gasification project of the first stage was estimated first at 328.7 billion tenge, then at 209 billion tenge. It would only be feasible if it was financed from the republican budget, since the implementation of the project based solely on market mechanisms would not ensure an acceptable level of gas prices for end consumers. "The transition needs to be made from coal, so that there are certain volumes, and commercial justification. Instead of the current thermal power plants, gas turbines should be installed, and the networks should be brought into Astana. This will cost about US \$2 billion," Sauat Mynbayev commented when he was the Minister of Oil and Gas. "Can we do this or not? Clearly the project can't be implemented on a commercial basis, and the question will be whether the government will subsidize gas supplies or not. This is an integral part of the budget process". The Karachaganak oil and gas condensate field was named as a source of supplies for the future gas artery. It was here that a gas processing plant with a capacity of 5 billion cubic meters of gas per year and a cost of US \$3.736 billion had once been planned.







The signal for the start of the gasification project of the Kazakh capital was the corresponding instruction of President Nursultan Nazarbayev, on December 14, 2012 in his annual message to the people. "This will be a great event for many local regions in our country, and the capital. We are an oil and gas country, and we cannot provide ourselves with gas", the Head of State said at the time. In accordance with this instruction, the government was given a deadline by March-April 2013 to urgently organize the financing and start construction work. "At the expense of available resources", financing was assigned to Samruk-Kazyna Sovereign Wealth Fund. In 2013, 120 billion tenge was allocated for this purpose.

Soon Samruk-Kazyna had announced plans to halve by up to 3 billion cubic meters the annual design capacity of the pipeline. This was "due to the insufficient number of consumers and of the unwillingness of regional distribution networks". The Government was forced to review the plans. The cost of the pipeline, the additional costs associated with the conversion of Astana TPP to make it gas-fired, and the resultant dependence on Russian gas partner in organizing the supply of gas did not satisfy the experts. A more systematic approach was needed to resolve problems with gasification.

In June 2014, for the first time the Government approved the draft General Gasification Scheme. This scheme set out the economically justified strategic sectors aimed at ensuring reliable







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gas supply to consumers in Kazakhstan. At that time, gasification was already underway in the Republic. In the first half of 2014, domestic consumption of natural gas in the country increased by 120% compared to the same period in 2013. However, the general scheme was aimed at increasing the level of activity. Over the next 15 years new pipelines were planned to be built with a total length of 57.5 thousand km, including the available at that moment 28.5 thousand km. This would provide connections to the gas supply for 1,621 settlements (988 at the time). This would also increase the gasification coverage level of the population to 56% from 32%, the amount of gasified regions to 13 (only 10 of the regions were connected at the time), and the annual consumption of gas up to 18 billion cubic meters from the 10.9 billion cubic meters available at the time. Three scenarios were developed within the framework of the general scheme: pessimistic (continuation of gasification in the south and west); realistic (implementation of projects in already gasified regions and gasification of new consumers in the territories near major main gas pipelines. Astana and settlements of the Akmola region) and optimistic (gasification of regions at the request of akimats and full-scale gasification measures throughout the country). Of these the second, with emphasis on the capital city, was chosen as the most acceptable. Of the estimated 656 billion tenge for gasification, about 162 billion tenge was to be allocated from funds borrowed by KazTransGas JSC, the National Operator in the field of gas and gas supply. The rest of the financial burden fell on the republican and local budgets - 16 to 18 billion tenge per year - and other sources.

The review of the plan in the capital ended with an about turn. It was decided to gasify Astana at the expense of a new branch with a capacity of 3 billion cubic meters per year. This would be connected to the new Beineu-Bozoi-Shymkent gas pipeline built by that time. The feasibility study of the project, which subsequently passed the state expertise commission without difficulty, was prepared by KazTransGas JSC. It was decided that the pipeline route and its linear structures would be located in Kyzylorda (Syrdarya and Shieli districts), Karaganda (Ulytau, Zhanaarka, Shet, Bukhar-Zhyrau, Osakarovsky districts), Akmola (Arshalyn, Tselinogradsky, Shortandy, Akkol, Bulandy, Burabay, Zerenda districts), North Kazakhstan regions (Taiynshi, Akkaiy, Kyzylzhar districts). As usual, when choosing the location of the gas pipeline route, the rational use of land, compliance with gas transportation technology, engineering support, ensuring the safety of settlements, industrial, agricultural enterprises, and the environment, as well as the preservation of historical, cultural, and natural monuments were taken into account. The city authorities







considered that, thanks to the transition of the TPP operation from coal to gas, emissions would be reduced in the range of 70% to 90%.

On June 1, 2018, the Deputy Prime Minister of Kazakhstan, Yerbolat Dossayev, said that the Government had decided on the sources of financing for the first stage of the Saryarka gas pipeline. The funds would come from the Eurasian Development Bank and the Unified Accumulative Pension Fund. They would in turn borrow money from Astana Gas KMG project company (a subsidiary of KazTransGaz). "It is planned to provide borrowed funds to the amount of 102 billion tenge through lending by the Development Bank of Kazakhstan. For the first time, the Eurasian Development Bank will be financing an infrastructure project. The remaining 85 billion tenge will be found through the investment of funds of the UAPF or international financial organizations," he explained. He further added that out of the total cost of the first stage of the project, the own funds of the participants of the project company - Samruk-Kazyna Fund and the Baiterek



THE SARYARKA MAIN GAS PIPELINE SCHEME





1 Stage

Kyzylorda - Astana MGP 267.3 billion KZT 1,081 km. DN 820 mm

2 Stage

Astana - Kokshetau MGP 48.2 billion KZT 276 km. DN 630 mm

3 Stage

Kokshetau - Petropavlovsk MGP 18.9 billion KZT 177 km. DN 426 mm

4 Stage

Zhezkazgan KS Temirtau KS 35.5 billion KZT

Total

Investments – 369.9 billion KZT the gas pipeline length – 1,534 km.

Chapter **6** TRIUMPHAL PIPES

Holding – would amount to more than 80 billion tenge. A few days later, within the framework of the Council of Foreign Investors under the President of the Republic of Kazakhstan, the European Bank for Reconstruction and Development expressed an interest in financing part of the project. "In addition to budget financing, we want them to go to the distribution networks. This is a lot of money, comparable to the construction of the gas pipeline itself. The mechanism of possible financing from the European Bank for Development and Reconstruction of part of the highway is being worked out now", Kanat Bozumbayev said at the time.

At the end of 2018, the First President of Kazakhstan, Nursultan Nazarbayev, gave the start to the construction of MGP stage 1. The construction of the first stage of the linear part of the MGP began in March 2019. In September, the President elect, Kassym-Zhomart Tokayev, during his working visit to the North Kazakhstan region, gave instructions for the gasification of the northern region to be accelerated. As a result, in October 2019, a welding ceremony of the "golden joint" of the MGP was held near the capital of Kazakhstan.

The Saryarka gas pipeline (length of 1,061 kilometers, pipe diameter of 820 mm) was constructed along the Kyzylorda-Zhezkazgan-Karaganda-Temirtau-Astana route. Its throughput capacity was 2.2 billion cubic meters of gas per year. The project covered 171 settlements along the pipeline route, providing 2.7 million people with gas. In the capital city, natural gas was primarily supplied to the residential areas of Koktal-1,2, Zheleznodorozhny, Ugo-Vostok right and left sides, as well as to the TPP-1,2,3. In 2019, the Akimat of Nur-Sultan received approval from the State Expert Inspectorate regarding the detailed engineering design (DED) documentation of the first stage with nine launch complexes. In 2019, 2.2 billion tenge was allocated from the republican budget for their construction. This included 550 million tenge for complexes 1-2, and 1.7 billion tenge for complexes 3-6. Contractors were identified for all nine complexes and construction and installation work got underway. In July 2020, the first social facilities and private homes were connected to gas in the capital. At the end of 2020, the residential areas of Koktal-1, Koktal-2, Agrogorodok, Zheleznodorozhny and Promyshlenny were connected to gas. The cost of the first stage of the project amounted to 370 billion tenge (US \$1.11 billion), and the main investor was Samruk-Kazyna Sovereign Wealth Fund.

"A lot of work has been done in the country to develop the gas pipeline system and increase the supply of gas to the population. The level of gasification of the country is 50%, or 9 million people. With the implementation of the Saryarka main gas pipeline construction project, an additional 2.7 million residents of





Over the years since independence, the oil and gas transportation systems of Kazakhstan have been significantly updated. They have become highly profitable, reliable and efficient. In terms of technical equipment, they are among the best in the Eurasian region. Based on the principles of multi-vector supply of hydrocarbons, Kazakhstan will continue to develop all of its economically profitable routes related to transit and export supplies of oil and gas, remaining a powerful player in the global energy arena.



Chapter **6** TRIUMPHAL PIPES

Kassym-Jomart Tokayev, President of the Republic of Kazakhstan:

"A lot of work has been done in the country to develop the gas pipeline system and increase the supply of gas to the population. The country's gasification level is 50%, which is 9 million people. With the implementation of the Saryarka gas trunkline construction project, an additional 2.7 million residents of the country will be provided with gas. This is a good indicator."



the country will be provided with gas. This is a good indicator", commented the President of the Republic of Kazakhstan, Kassym-Jomart Tokayev.

In November 2020, Askar Mamin, Prime Minister of Kazakhstan, at the Government meeting instructed the Ministry of Energy, together with interested state bodies and organizations, to update the draft general scheme of gasification of Kazakhstan and obtain all the expertise relating to the implementation of the II and III stages of the Saryarka MGP project. This work began in 2021.

At the same time, wok on the preparation of the gasification concept of the East Kazakhstan region began. This

fuel" within the country and for export, and by doing so has fully ensured its energy security.

As of 2021, the level of gasification in Kazakhstan now exceeds 53%, including 6 regions that have been gasified by more than 90%. The active gasification of the regions has led to an increase in gas consumption. Over the past 5 years, the domestic market of Kazakhstan has increased by 40% - from 12 billion to 17 billion cubic meters per year. One of the key issues of the further development of Kazakhstan's gasification is improved pricing in the domestic market. The gas price in the Republic is currently one of the lowest among the CIS countries. Kazakhstan has formed an understandable and transparent pricing model with

The Saryarka gas pipeline with a length of 1,061 kilometers, with a pipe diameter of 820 mm, was laid along the Kyzylorda-Zhezkazgan-Karaganda-Temirtau-Astana route. Its throughput capacity was 2.2 billion cubic meters of gas per year. The project covered 171 settlements along the gas pipeline route, providing gas to 2.7 million people.

was an area which still remained without natural gas supply. In order to resolve the problem, Kazakhstan proposed that Russia construct the Power of Siberia-2 MGP (western route for gas supplies to China) through the territory of the East Kazakhstan Region, connecting the gas fields of Siberia with the Xinjiang Uygur Autonomous Region of China. However, Gazprom PJSC decided to construct a pipe through Mongolia and started designing the route. The best option for gasification may be the construction of a gas pipeline from the Russian Federation along the route Barnaul – Rubtsovsk – Semey – Ust-Kamenogorsk, with a branch towards the Pavlodar region in the Semey area. The construction of a gas pipeline along the specified route will allow gasification of the population of these regions numbering 2.1 million people. The volume of consumption is estimated at 2.3 billion cubic meters per year.

Thus, by the 30th anniversary of independence, Kazakhstan has managed not only to create a new developed gas infrastructure, it has established a robust supply of "blue a well-thought-out system of protection for socially vulnerable segments of the population and industries sensitive to gas prices.

These measures have made it possible to provide social support to the population of Kazakhstan and guaranteed social stability in the country for many years to come.

Over the years of independence, Kazakhstan's oil and gas transportation systems have been significantly updated. They have become highly profitable, reliable and efficient. In terms of technical equipment, they are among the best in the Eurasian region. Based on the principles of multi-vector supply of hydrocarbons, Kazakhstan will continue to develop all its economically profitable routes related to transit and export supplies of oil and gas, and thus remain a powerful player in the global energy arena.



PETROLEUM REFINING PROCESSES: **A TERRITORY OF INNOVATION**

Chapter **7**

"THE ONLY WAY TO A SUSTAINABLE WAY OF LIFE IS CONSTANTLY MOVING FORWARD."

Henry Agard Wallace, American politician, journalist he 1990s, when Kazakhstan was on a steep historical curve, were in many ways the defining years for the development of the refining industry. It was during this period that the young oil state set its sights on building a new, innovative industry, the foundations of which had been laid many years earlier.

The construction of the first oil refinery during the Great Patriotic War was predetermined by the presence of significant oil reserves in the west of the Republic. The decree of the USSR State Defense Committee on the construction of an oil refinery No. 441 (then the Guryev refinery, and since 1992 – Atyrau Refinery, AR) was promulgated on April 14, 1943. The plant itself was constructed within two years and brought on line on September 8, 1945 using complete equipment supplied from the USA on a lend lease basis. The technical design of the refinery with an initial annual capacity of 800 thousand tons was developed by the American Firm Badger and Sons, while local design was

carried out by project designers from Embaneftproekt. From the very outset, the refinery developed in the area of fuel production, refining aviation and automobile gasolines, various motor and boiler fuels from the oil of the Emba field, as well as distillate delivered from Baku. However, with the development of the region and the growth of production in the 1960s, the enterprise was faced with the question of replacing expensive imported distillate with a distillate of its own production. Thus, the plant set a course of increasing the volume of oil refining by means of constructing new technological units. In August 1969, a CDU / VDU unit with a capacity of 2 million tons per year was launched. This allowed for an increase in the production of gasoline, diesel fuel, fuel oil, and also to establish the production of white spirit, vacuum gas oil, and tar. The capacity of the unit was increased to 3 million tons per year. In 1971, with the commissioning of a catalytic reforming unit with a capacity of 300 thousand tons per year, the production of gasoline A-76 and AI-93, as well as liquefied gas for the population began. In 1965, the refinery began processing Mangyshlak oil, creating preconditions for processing heavy oil

with a primary annual capacity of 6 million tons was from the very outset technologically focused on the processing of low-sulfur oil from Western Siberia. This was among the highest quality in the republics of the USSR supplied via the Omsk-Pavlodar oil pipeline. The first Pavlodar gasoline was produced in June 1978. On September 18, 1978 the first "million" ton of oil was refined, while in December 1979 the bitumen production unit was brought on line. The new enterprise found itself faced with the task of supplying oil products to the regions of Kazakhstan and the Altai Territory. The range of products included A-76, A-72, A-66 gasoline, diesel fuel, jet fuel, fuel oil, and bitumen. In 1982, after intensification of the operations of the LK-6U unit, refining volume reached 7.6 million tons. Between 1983 and 1986, second-stage facilities were brought online at Pavlodar. These consisted of the following units: the sulfur production unit; the KT-1 complex for the deep processing of fuel oil; and the delayed coker unit. A series of reconstruction projects were undertaken, in the aims of enhancing the technological processes.



residues and increasing the depth of extraction. In 1980, the first Delayed Coking Unit (DCU) in Kazakhstan with a capacity of 600 thousand tons per year began producing petroleum coke, household furnace fuel, components of motor gasoline and motor fuel. In 1989 a unit for calcining petroleum coke with a capacity of 120 thousand tons per year came online. In 1980, the range of consumer goods was expanded to include phyto shampoos, foam detergents, canisters and medical containers, food bottles and solvents.

The construction of the second oil refinery in Kazakhstan was planned in 1949. However, work on the project began only in 1971. This was a period of the discovery of hydrocarbon-rich deposits in Western Siberia. The Pavlodar refinery built in the period between 1971 and 1978 to develop the fuel option and

The construction of the Shymkent oil refining complex began in 1972 with the main LK-6U facility. After many years of conservation, construction resumed in 1976. In 1978, a water supply, sewerage and treatment facility (WSSTF) was commissioned to purify waste water from the operating TPP-3, which supplied heat to the industrial zone of the city. In 1982, with the commissioning of the commodity shop (CS), the biological and mechanical wastewater treatment sections at the WSSTF began operation. In 1983, the first West Siberian oil was delivered to the refinery via the Tyumen-Omsk-Pavlodar-Shymkent pipeline. From 1984 to 1992, up to the moment of the declaration of state sovereignty by Kazakhstan, other important production facilities were built there. These included: a steam and air supply (SAS) plant as part of a nitrogen-oxygen station (NOS); central condensing 204

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station (CCS); air compressor unit (ACU); central plant laboratory (CPL); sulfur production unit, as well as sections of the LK-6U facility – section 100 (CDU-AU); section 200 (catalytic reforming); section 300/1 (diesel fuel and kerosene hydrotreating); and section 400 (gas fractionation unit). In 1987, construction began on a vacuum distillation unit for heavy fuel oil (VDU for HFO) with a capacity of 3.8 million tons per year, commissioned in 1992, and a DCU with a capacity of 600 thousand tons per year. In 1989, the construction of a catalytic cracking complex G-43 / 107M with a capacity of 2 million tons per year began. This was aimed at deeper oil refining and extraction of high content of light oil products. The Shymkent refinery was able to operate at its full potential, bringing the capacity up to 6 million tons per year.

In 1991, on the eve of the collapse of the Soviet Union, oil refining at three Kazakhstani oil refineries – Guryevsky (Atyrau), Pavlodar and Shymkent (since 1993 – Shymkentnefteorgsintez OJSC, SNOS) – amounted to more than 18 million tons with low depth indicators of oil refining and production of light oil products.

In the 1990s, the worsening economic and political crisis, the collapse of the all-Union transport system, the disruption of economic ties between industries negatively affected the activities of Kazakhstani refineries. This resulted in a decrease in oil supplies and a reduction in refining volumes. In the absence of a relevant ministry with a structural understanding of the further development of the industry and the investments required for this, each plant had to solve its problems independently.

Thus, in 1992, the Atyrau Refinery, as part of the Magyshlakneft association, first processed oil from the Tengiz field with a significantly higher content of light fractions and a high content of methyl-ethyl mercaptans. In 1993, a large-scale production of demulsifiers of the Atyrau brands was established



there. The plant also began production of solvent No. 651 for diluting enamel, paints and varnishes. In 1994, the CPL test center was one of the first to be accredited in the State Certification System of the Republic of Kazakhstan. In addition, a new type of product was also brought online - the export version of M-40 fuel oil, and the production of Tosol auto-cooling liquid and Afol cleaning agent. From 1995 to 1997, production of a new type of oil product also began at the refinery - TS-1 jet fuel for use on AN-24, MI-8, MI-2 aircraft of Atyrauavia JSC. The domestic catalyst for the reforming and hydrotreating system was replaced, enabling an increase in the octane performance of debutanized gasoline. This enhanced the unit's productivity from 300 thousand to 380 thousand tons of gasoline per year. The industrial production of A-80 gasoline was established and the processing of Tengiz oil allowed for an increase in the selection of light oil products to 43.7%.

In order to attract investment in technical re-equipment, in November 1996, 94,506 shares of the Atyrau refinery were transferred to the trust management of the Swiss company Telf AG, which simultaneously acquired 12.1% of the plant's shares transferred during its corporatization to related organizations: Embamunaigas JSC; Tengizmunaigas; Yuzhnefteprovod PA; Atyrauenergo JSC; and the Atyrau branch of the railway. However, the external management far from enabling the Company to overcome its problems, only further exacerbated the situation. The volume of crude oil processing at the refinery over 5 years fell from 4,416.2 thousand tons in 1992 to 4,129 thousand tons in 1997 and to 2,712.2 thousand tons in 1998.

There was also a fall in refining volumes at two other refineries – Pavlodar and Shymkent, which were beginning to look for investors.



In July 1996, the Government of Kazakhstan privatized SNOS OJSC by selling all joint shares in Kazvit Holdings Ltd. – a company registered in Gibraltar and affiliated with OJSC Kazkommertsbank. After several resales of the holding, on March 31, 2000, the Canadian company Hurricane Hydrocarbons Ltd completed the acquisition of ordinary shares of the plant from Central Asian Industrial Investment NV, integrating them with mining assets in the South Turgai basin.

A tender was held at the beginning of 1997, as a result of which the Pavlodar oil refinery, which had made the transition to operation in circulation mode, was ceded in concession to the American company CCL Oil for a period of three years. After this period the Government intended to review the question of the plant's sale.

After a series of visits to oil refineries and meetings with the teams, Head of State Nursultan Nazarbayev realized the need to create a vertically integrated company which would provide domestic refineries with raw materials and thus supply motor fuels to the domestic market. He made the strategic decision to put the oil refining industry on a new track in the shortest possible time. This led to the creation of Kazakhoil, the national company which would manage the country's production and processing assets. Under the leadership of Nurlan Balgimbayev, a professional oilman and generator of ideas, large-scale modernization projects were launched, which would subsequently reshape the entire industry.





Chapter **7** PETROLEUM REFINING PROCESSES: A TERRITORY OF INNOVATION



Daniyar TIYESSOV, Deputy Chairman of the Management Board of JSC NC KazMunayGas

ON THE COMPANY'S MAIN MILESTONES:

Between 2011 and 2018, three large-scale Kazakh oil refineries were brought up to date. Today we can say that the main objectives have been achieved. First – the domestic market of the country is fully provided with fuel produced by Kazakhstan refineries. Second – the country's obligations to produce motor fuels of ecological classes K4/5 have been fulfilled in accordance with the requirements of the Technical Regulations of the Customs Union. Third – by improving



the quality of manufactured products, this has led to a reduction of the harmful impact on the environment and the population. Currently, the refinery is implementing a set of projects aimed at improving operational efficiency.

In the Message to the nation of Kazakhstan dated September 1, 2020, the Head of State instructed that specific action be taken aimed at the development of the petrochemical industry. Diversification of oil and gas producing countries' economies through the formation of petrochemical industries is a global trend. The petrochemical industry creates elongated and branched value chains with high export potential.

The concept for the development of the petrochemical industry of the Republic of Kazakhstan until 2030 was approved on July 27, 2021. The current strategy in the field of petrochemical industry is to implement "anchor" petrochemical projects (production of polypropylene, polyethylene and butadiene rubbers), which have the greatest effect on the country's economy. JSC NC KazMunayGas is currently involved in the implementation of three "anchor" projects.

Construction of an Integrated Gas Chemical Complex Project in Atyrau Region, the First Phase (polypropylene, 500 thousand tons per year).

The polypropylene project includes the processing of propane into propylene, followed by the production of polypropylene. Polypropylene is the most widely used polymer due to such qualities as strength, wear resistance, resistance to chemical reagents, heat resistance.

The project was implemented by Kazakhstan Petrochemical Industries Inc. LLP (KPI) under the state program for industrial and innovative development (in accordance with the Decree of the President of the Republic of Kazakhstan dated August 1, 2014 No. 874) and the Republican Industrialization Map for 2015-2019 (in accordance with the Decree of the Government of the Republic of Kazakhstan dated December 31, 2014 No. 1418). The project is one of the first focused on production of the basic petrochemical on the territory of the Republic of Kazakhstan.

The National Industrial Petrochemical Technopark special economic zone (SEZ NIPT) was formed by the Decree of the President of the Republic of Kazakhstan, No. 495 dated December 19, 2007. The construction of the polypropylene complex is the first stage in the creation of oil and gas chemical cluster in the Atyrau region on the basis of SEZ NIPT with the subsequent production of key high technology products.

In December 2015, during the official visit of the Prime Minister of the Republic of Kazakhstan, K.K. Massimov, to China, an EPC contract was signed with the general contractor for the project – China National Chemical Engineering Co.Ltd. (CNCEC) to the amount of US \$1,865 million, including VAT.

On June 28, 2018, the project management was transferred to JSC NC KazMunayGas under the Trust Management Agreement.

The construction and installation work began in June 2018, with a completion date of Q4, 2021. Commissioning is scheduled for March 2022.

Construction of an Integrated Gas Chemical Complex Project in Atyrau Region, the Second Phase (polyethylene, 1.25 million tons per year).

To create a production facility for the production of polyethylene in Kazakhstan, the project operator (KLPE LLP) is implementing three major projects: construction of gas separation unit (GSU), ethane pipeline and the polyethylene production plant itself.

The raw material for the production of polyethylene is to be ethane released from the gas produced at Tengiz field. The first project is the construction of the gas separation unit (GSU Project) with an annual capacity of 9.1 billion cubic meters with extraction of 1.6 million tons of ethane per year. The GSU will be located at Tengiz field.

At the moment, the design work of the FEED stage (basic project) is being undertaken. In accordance with the agreement signed on December 28, 2020, FEED development is being implemented by JGC Corporation. Honeywell UOP (USA) has been identified as the licensor of ethane extraction and propane purification technologies.

The second project is the construction of the ethane pipeline with a length of 205 km for the transportation of liquid ethane from Tengiz to Karabatan. Currently, the scientific and survey works have been completed.

The third project, the production of the polyethylene, includes the following main technological installations: steam cracking (pyrolysis), polymerization plant, as well as an auxiliary ethylene dimerization plant.

In November 2019, the feasibility study for polyethylene production project was completed in accordance with international standards.

Today, the Russian company, PJSC SIBUR, has shown interest in participating in the project as a strategic partner. On June 3, 2021, JSC Samruk Kazyna, JSC NC KazMunayGas and PJSC SIBUR signed the basic terms of cooperation on the polyethylene and polypropylene projects.

Butadiene and its Derivatives Production Project (capacity of 190 thousand tons per year).

JSC NC KazMunayGas together with PJSC Tatneft is currently implementing the butadiene and synthetic rubbers production project. In April 2021, JSC NC KazMunayGas and PJSC Tatneft signed an agreement on the basic terms of cooperation and a framework agreement concerning the Project Company incorporation and management.

On May 28, 2021, PJSC Tatneft acquired a 75% stake in the project and joined as a strategic partner. KazMunayGas is currently implementing procedures to acquire a 25% stake in the project.

On August 25, 2021, the roadmap for a contract for raw materials was signed between the Ministry of Energy of the Republic of Kazakhstan, TCO, KazMunayGas and Butadiene LLP.

At the moment, the Project has completed the development of a preliminary feasibility study and a financial and economic model. The involvement of external financing is currently being worked out. 208

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ATYRAU REFINERY

In the early 1990s, the economic efficiency of the Atyrau Refinery (AR) was very poor. It was processing about 5 million tons of oil per year, mainly paraffinic Mangyshlak, potentially containing very little light oil products. Given the introduction of restrictions on the use of leaded gasoline in a number of cities, the issue of competitiveness was a top priority for AR. However, due to its tetraethyl lead content, gasoline was not in demand among consumers. Since 1996, the situation at AR had started to deteriorate. Decreased productivity and the rising wage bill led to a reduction in the number of employees and delays in salary payment. Debts to the budget amounted to several billion tenge. In the first half of 1999, the plant was operating under even more severe conditions – at 31% capacity. It was overstocked with fuel oil and diesel fuel. At the same time, there were questions of

increasing oil supplies, scheduled repairs to technological units and increasing the depth of oil refining, which at that time was only 56%.

A key event for in the oil refining industry took place on October 5, 1998. This was the signing between NOC Kazakhoil, Atyrau Refinery OJSC and the Japanese Marubeni Corporation of a joint protocol on further cooperation and completion of the feasibility study for reconstruction of the Atyrau Refinery. In 1999, in order to remedy previous mistakes made during privatization and to establish control over a strategically important processing enterprise, the Government of the Republic of Kazakhstan was forced to cancel the results of the tender with the participation of Telf AG and transfer the state-owned stake in the plant to the management of NOC Kazakhoil. This increased their stake from 41% to 86.7%, thus becoming the only major shareholder in the refinery. Transfer of control to the national company meant that it could now determine its own development strategy. In a very short period of time, the plant was able to increase its processing, pay off wage arrears, partially pay due taxes, and perform scheduled repairs to its technological units. Refining depth increased from 55.37% to 58.67%.

In June 1999, Marubeni presented a feasibility study for the AR reconstruction project, which was approved by the Government of the Republic of Kazakhstan in December of the same year. Foreign and Kazakhstani design institutes and organizations were involved in the preparation of design estimates. These included the Kazakh Institute of Oil and Gas JSC, Omskneftekhimproekt JSC, NizhegorodNIInefteproekt JSC and others.

On August 10, 2000, NOC Kazakhoil CJSC and Marubeni signed a Framework Agreement on the Atyrau Refinery Modernization, determining the new cost, and the main principles of the project. Within Kazakhoil, the project was undertaken by a management group responsible for organizational and technical issues. By that time, the Japanese partners had already been present on the Kazakhstani market for several years. Thanks to the efforts of the Head of State, Japanese business felt quite confident in Kazakhstan. However, all investments required a variety of guarantees, including governmental ones, which created certain difficulties in coordinating with government agencies. It took the group a lot of effort to prove the feasibility of the modernization project. Issues with the Japanese partners had to be dealt with both remotely and in person.

In 2001, a US \$235 million turnkey contract was awarded to Japanese contractors Marubeni and JGC Corporation. However, after the merger of NOC Kazakhoil JSC and NC Transport of Oil and Gas JSC and the establishment of the national company KazMunayGas in February 2002, the turnkey contract and financial agreements for the project had to be reissued. On December 13, 2002, an agreement was signed, under which JSC NC KazMunayGas confirmed the succession of rights and obligations under a loan agreement with the Japanese Bank for International Cooperation. On March 17, 2003, the contract for the reconstruction of the Atyrau refinery on a turnkey basis entered into force. Almost a year had been lost.

On April 10, 2003, a specialized subdivision was created at the Atyrau Refinery – the Directorate of the Enterprise Under Construction. This directorate was directly involved in the implementation of the project. In November of the same year, pile driving began at the construction site of the gasoline section of the combined installation.

The work was financed by the Japan Bank for International Cooperation (JBIC) under a guarantee issued by the Republic of Kazakhstan and Marubeni Europe Plc, BNP Paribas, and HSBC Bank Kazakhstan.

The general contractor selected the Turkish Joint Venture GATE (Gamma and Tekhfen) as its construction partner. The equipment and materials were supplied by 59 Kazakhstani companies from the leading manufacturing plants in Russia and



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Galymzhan Amanturlin, 2006, Director of Oil Refining Department, JSC NC KazMunayGas

Kazakhstan. In addition, Western European countries supplied units for the packaging and crystallization of sulfur (Germany) and equipment for the fire and gas alarm system for the new installations (Italy). 55 Kazakhstani companies were involved in the construction and installation work. The largest of these were Kazstroypromtekhmontazh JSC, OGCC KazStroyService JSC, Imstalkon JSC, Prommontazh-KIV LLP and others. In general, the work involved more than 3,000 specialists and workers of contractors and subcontractors.

The contractor trained the plant's operating personnel under a turnkey contract directly at the training centers of the process licensors UOP (USA), KTI (Italy). Additional training was also carried out by Yokogawa Electric, the developer of process control programs which installed the latest automation systems in the new and existing process plants.

The main objective of the first stage of the reconstruction was to improve the quality of petroleum products by reducing the content of sulfur, nitrogenous and other harmful substances in the various types of motor fuel. A solution was found for the introduction of hydrodesulfurization technologies with the processing of the separated sulfur into commercial products. Pursuant to the turnkey contract, new units for hydrotreating gasoline and diesel fuel, sulfur production, purification and hydrogen production were brought on line at the Atyrau Refinery. In addition, the CU-2-unit, reforming and delayed coking units, and a biological treatment unit, waste water and cooling water circulating system were modernized. A new central office building was also built. On May 12, 2006, an official ceremony attended by the Head of State Nursultan Nazarbayev was held to commission the technological units. On September 22, 2006 the State Acceptance Commission signed the Act on the Operational Approval for the sites which were part of the Atyrau Refinery Modernization Project.

For Atyrau oil refiners the project was seen as the "second birth" of the refinery, and in the words of representatives of Marubeni and JGC it was an epoch-making project.

After modernization, the crude oil refining capacity of the Atyrau refinery rose to 4.3 million tons per year, including 1.2 million tons of light oil. The refinery was able to increase the depth of oil refining, expand the range of processed oil, improve the range of products and ensure the production of oil products with a high competitive ability. In particular, it was able to ensure the production of winter diesel fuel and A-95 gasoline. As a result of the work carried out, the quality of oil products produced by the refinery began to comply with the Euro-2 international standard. All the production facilities of the refinery were brought in line with safety requirements through the transition to a safe automated control system. Emissions of harmful pollutants were significantly reduced, thus improving the environmental situation in the Atyrau region. In 2006, AR was certified and began operation pursuant to the requirements of the international standards of ISO 140001: 2004 series in the field of ecology and OHSAS 180001: 2008 series in the field of occupational health and safety. In 2006, the refinery processed 3,746.3 thousand tons of oil. In 2008, the production of Premium-95 motor gasoline, corresponding to the K2 (Euro-2) level, was brought on line. This was the first big step in improving the environmental performance of the plant's products. In the same year, oil refining reached 3,924.5 thousand tons. The main technological units of the plant were transferred to a two-year repair cycle, thus reducing production costs, as well as the number of recycling and forced technological losses.

In the words of Galymzhan Amanturlin, who in 2006 held the position of Director of the Oil Refining Department at JSC NC KazMunayGas, after the first stage of modernization, AR "was given a second life, it rejuvenated...We increased production of high-octane gasoline from 10% to 40%, and began production of best quality environmentally-friendly diesel fuel."

Although the first phase of the AR modernization, during which morally and physically worn-out equipment was replaced and new units were commissioned, had by the mid-2000s enhanced the technological capabilities of the refinery, it still did not allow deep refining of oil and production of high-quality oil products. Despite the high total capacity and comprehensive nature of oil refining, the current load and technological equipment of two other Kazakhstani refineries – Pavlodar and Shymkent – still lagged significantly behind similar oil refineries in the world. This necessitated the development of a Comprehensive Plan aimed at development of the refining industry in the Republic of Kazakhstan.

This plan was soon prepared by the relevant ministry, in accordance with the address given by the President of the Republic of Kazakhstan to the people of Kazakhstan on March 1, 2006









Kazakhstan's Strategy to join the world's 50 most competitive countries and the Concept of Transition of the Republic of Kazakhstan to Sustainable Development for 2007-2024.

On May 14, 2009 the Comprehensive Plan to Develop the Refineries of the Republic of Kazakhstan for 2009-2015 was approved by the Decree of the Government of the Republic of Kazakhstan.

"A number of factors were prerequisite for the development of this plan. In Kazakhstan, there was a high rate of motor vehicle use and, accordingly, an increase in the consumption of petroleum products. Meanwhile, there was a constant increase in environmental requirements for fuel quality. We needed to ensure the energy security of the Republic by fully satisfying the domestic demand for the main types of oil products. (...) It was not just a matter of replacing old equipment, but, actually the construction of new factories," Sauat Mynbayev commented in 2009 as Minister of Energy and Mineral Resources of the Republic of Kazakhstan.

According to the Comprehensive Plan, all three major refineries in Kazakhstan were to undergo reconstruction and modernization in the coming years – Atyrau Refinery, Pavlodar Oil Chemistry Refinery and Shymkent Refinery.

Pursuant to Technical Regulations for the "Requirements for the safety of gasoline, diesel fuel and fuel oil" in circulation in Kazakhstan, the country gradually began to introduce Euro-2, Euro-3, Euro-4 and Euro-5 environmental standards in the production of gasoline and diesel fuel for automotive and other equipment. With the introduction of the Euro standard, the import and production of cars which were not compliant with these standards were limited, while the improved quality of fuel for them was ensured. This in turn, created conditions for the renewal of the existing motor vehicles in current use, as well as resolving environmental problems (especially in large cities) and increased road safety.

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> Speaking at that time about the need for the comprehensive modernization of Kazakhstani oil refineries, Daniyar Tiyessov, Managing Director for Oil Refining and Marketing (member of the Management Board) of KazMunayGas at the time, noted: "The main task now facing us is to maintain prices. This has led to a rather paradoxical situation. On the one hand, we need to invest in oil refining while on the other the global industry is experiencing big losses, and they are very significant. In this regard, we owe our gratitude to the head of state Nursultan Nazarbayev, since it has become impossible to attract investors to the industry, and this

requires the full support of the state in order to invest money in oil refining, since there is no return on investment. We still need to maintain prices and stabilize the market. As a national company, we agree with this, and we will implement it. KazMunayGas is maintaining prices for oil products, although there is a shortage. Today, the production of high-octane gasoline in Kazakhstan is not sufficient to cover domestic demand. The aim of modernization is to completely satisfy the Republic with supplies of this fuel of its own production. (...) Now we need to diversify our business. One of the optimum methods of risk diversification is to improve profitability in oil refining. (...) The standard formula for refining depth is refining volume minus fuel oil and losses, divided by refined volume. If we use this calculation as our starting point, then our depth will be about 85-90%. This will fully cover the country's need for high-octane gasoline, diesel fuel, and aviation kerosene with a domestic product. All fuel will comply with Euro-4 standard.

The comprehensive plan for the second phase of AR modernization needed to be focused on creating an integrated



production unit capable of operating both in the fuel version, while ensuring the production of high-guality oil products. In the petrochemical version this would require products in the form of benzene and paraxylene. By order of the Government of the Republic of Kazakhstan, the Ministry of Energy and KazMunayGas were instructed to ensure the implementation of the benzene production project at the Atyrau refinery, providing for the creation of world-class petrochemical complexes in Kazakhstan for deep processing of hydrocarbon raw materials with the production of export petrochemical products with high added value. It should be noted that even before the adoption of the aforementioned Comprehensive Plan to Develop Refineries in the Republic of Kazakhstan for 2009-2015, the Japanese corporations Cosmooil and Marubeni had undertaken preliminary calculations for projects for the production of benzene and paraxylene based on the Atyrau Refinery. However, in June 2008, the investment committee of KazMunayGas JSC Trading House decided to combine both projects, in order to attract investment and more efficient management.

At the end of October 2009, AR and the Chinese company, Sinopec Engineering Group, signed a turnkey contract for the construction of the Complex for Production of Aromatic Hydrocarbons (CPAH). The flexible production scheme allowed for the production of high-octane gasolines, or annual production of up to 133 thousand tons of benzene, and up to 496 thousand tons of paraxylene – the basic feedstock for the petrochemical industry. The technology licensor was the French company Axens. ParamaX technology was chosen for the production of aromatic hydrocarbons. Axens and ExxonMobil Chemical formed an alliance to provide paraxylene production technology at new facilities around the world. Uhde's Morphylane® (benzene recovery unit) technology was also part of this portfolio.

On October 1, 2010, the construction of the CPAH began at the Atyrau Refinery. The aim of the project was to ensure production of aromatic hydrocarbons and environmentally-friendly gasolines. Carcinogenic substances emitted together with vapors of vehicle exhaust gases when using Atyrau gasoline would be isolated separately in the form of petrochemical raw materials. In order



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to finance this project, a general loan agreement for over US \$1 billion was signed on July 30, 2010 between the Atyrau Refinery and the Development Bank of Kazakhstan JSC. This loan for a period of 13 years at preferential interest was based on a loan from the Export-Import Bank of China (approximately 85% of the total amount) and funds from the National Fund of Kazakhstan (15%).

By the end of the year AR was processing 4.3 million tons of oil.

Within the framework of the CPAH project, over a period of 4 years, a number of technical facilities had been built: a continuous catalyst regeneration catalytic reforming (CCRCR) unit with a feed capacity of 1 million tons per year; a benzene and toluene extraction unit; a paraxylene extraction unit; a toluene and heavy aromatic hydrocarbons transalkylation unit; a raffinate separation section; as well as off-site facilities.

On the 25th of December, 2014 during a nationwide teleconference, Nursultan Nazarbayev launched the startup and commissioning works at CPAH. On July 3, 2015, a pilot batch of benzene was received at the first CPAH launch complex, and on October 2, 2015, the first batch of paraxylene was produced at the second launch complex. This event, in fact, marked the completion of the CPAH Construction project at the Atyrau Refinery. On December 4, 2015, the Act of Approval of the first start-up complex was signed by the State Acceptance Commission. On July 4, 2016, the plant shipped the first industrial batch of benzene for export. This event was truly important and significant in the history of domestic oil refining, marking a new stage in the development of the industry, a transition to a higher level of processing of raw materials and the formation of a new high-tech sector - petrochemistry. The internationally accredited laboratory Saybolt Nederland B.V. in Rotterdam gave a high assessment of the quality of benzene produced at the Atyrau Refinery. In June 2016, the quality of benzene was confirmed by an independent body - the Atyrau branch of the National Center for Expertise and Certification JSC. As a result, Atyrau Refinery received a certificate of conformity No. KZ2310317.01.01.04289 "Purified oil-545".

"We are interested in the participation of Kazakhstani machine-building companies in the CPAH construction project at the Atyrau Refinery, as part of the State Program for Accelerated Industrial and Innovative Development of the Republic of Kazakhstan for 2010-2014," said Muratzhan Musaibekov, General Manager for Oil and Oil Products Marketing Projects at JSC NC KazMunayGas.



As part of the third phase of modernization, another equally important facility was under construction at the same time as the CPAH. This was the Advanced Oil Refining Complex (AORC), with which the company planned to increase output of high-quality and environmentally-friendly petroleum products in line with international standards. This project was included in the State Program for Accelerated Industrial and Innovative Development of Kazakhstan as the final phase of the Atyrau Refinery modernization. Not only the development of the oil refining industry, but also the entire oil and gas complex of Kazakhstan depended on it.

On December 29,2011, aturnkey contract for the construction of AORC between Atyrau Refinery LLP and the consortium of China's Sinopec Engineering, Japan's Marubeni Corporation and Kazakhstan's OGCC KazStroyService JSC was signed. Sinopec Engineering acted as the leader of the consortium, Marubeni Corporation arranged for the financing from the Japan Bank for International Cooperation and Bank of Tokyo Mitsubishi UFJ, and also participated in procurement and logistics. KazStroyService took part in construction and local procurement under the leadership of Sinopec Engineering. The cost of the project was estimated at US \$1 billion 679 million, including VAT. The Export-Import Bank of China and the Development Bank of Kazakhstan also took part in financing the project.

The design and survey work was carried out by Omskneftekhimproekt OJSC (Russia). Work was also carried out on a comparative analysis of the AORC options with the



involvement of the specialized organization Rominserv S.R.L (a subsidiary of the Romanian The Rompetrol Group) and the participation of KBC, a UK company. This confirmed the correct choice of the process flows. In addition, licensing agreements were signed with Axens and UOP, and technologies were developed by the Italian company Foster Wheeler, and the Russian Omskneftekhimproekt.

There were many inconsistencies in the AORC. The main one was that the facility did not fit on the territory of the plant. Over a period of two years, the project was revised 6-7 times, as a result of which the complex was "positioned" within AR, requiring the expansion of the sanitary protection zone and the relocation of residential buildings.

AORC construction began on September 10, 2012 with the participation of heads of oil companies from Kazakhstan, China, Japan, representatives of state regulatory bodies and the media. It ended on December 15, 2017 in the presence of distinguished guests such as the Deputy Minister of Energy, Bolat Akchulakov; First Deputy Akim of Atyrau Region, Sagyndyk Lukpanov; and the Executive Vice President for Transportation, Refining and Marketing of JSC NC KazMunayGas, Daniyar Tiyessov; General Director of Sinopec Engineering (Group) Co., Ltd. Xiang Wenwu, as well as the directors of the contractors.

Galymzhan Amanturlin, the General Director of Atyrau Refinery LLP then noted: "After the commissioning of the Advanced Oil Refining Complex, the annual capacity of the oil refinery will increase from 5 million to 5.5 million tons, the It was not just a matter of replacing old equipment, but essentially constructing new facilities, without shutting down refinery operations. Modernization and reconstruction are complex and labor intensive processes, especially given that refineries are dangerous, and technologically complex production facilities.

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> production of motor gasoline – up to 1.7 million tons, diesel fuel – up to 1.4 million tons, jet fuel – up to 244 thousand tons. The Atyrau plant will switch to the production of motor fuels of K4 and K5 environmental classes (analogues of Euro-4 and Euro-5) and will increase the depth of oil refining to 84%." In turn the Deputy Akim of Atyrau region, Sagyndyk Lukpanov, noted the high importance of the AR modernization. In his words it was a strategic and city-forming enterprise both for the western region and for the Republic as a whole.

> As part of the AORC project, 12 process units and more than 40 off-site facilities were built, as well as over 1000 units of largescale equipment. During construction, secondary processes were introduced, in order to provide additional processing depth (coking, CDU-3 vacuum unit), as well as a basic advanced processing process such as catalytic cracking. In June 2012, a trial run of the catalytic cracking unit blower with a capacity of more than 20

MW was carried out. It is unique in terms of its parameters and the most energy-intensive equipment in Kazakhstan.

About 4,000 people in total were involved in the construction and installation work at the AORC. 490 new jobs were created for the subsequent operation of the complex. The management and production team of the new facility was mainly formed from the personnel reserve of the plant. AORC personnel underwent theoretical training and internship at Kazakhstani and foreign refineries.

Despite modernization, AR has not stopped investing in innovation.

Since August 1, 2017, the shipping of all products manufactured at the plant has followed a new logistics scheme: Atyrau Refinery – new station "Promyshlennaya" (built as part of the AORC project) – the main station "Tendyk", allowing the trains with oil products to be moved away from residential areas. In addition, a washing and steaming station was built at a new site at an additional distance from Atyrau, as well as a hermetically sealed loading rack gantry for light oil products.

Today, the plant is efficiently operated pursuant to 2018 project aimed at improving the efficiency of planning and carrying out major repairs. This is based on a set of unique tools and techniques provided by RLG International: $Px \stackrel{M}{,} TMP \stackrel{M}{,} FAIR \stackrel{M}{,} OR \stackrel{M}{,}$ as well as the laboratory information system LIMS Labware






which began trial operation, allowing the life cycle of a sample to be tracked by the minute – from sampling to result.

In 2019, the plant began production of Khazar -38°, the lowest-temperature diesel fuel in Kazakhstan at that time. In January 2021, the first batch of Altay-45 winter diesel fuel with a maximum pour point of minus 45°C was produced here. Diesel fuel grade DT-A-K5 Altay -45, manufactured according to ST LLP 403 19154-38-2020, was produced at the diesel fuel hydrotreating unit Prime D 3205 of the Advanced Oil Refining Complex. The new product meets K5 class environmental requirements. The minimum sulfur content and the absence of additives that improve low-temperature properties make the product consistent with the quality of Arctic diesel fuel. Atyrau Refinery is the first in the country to produce fuel with a record low freezing point.

On June 3, 2021, Atyrau Refinery LLP and the European Bank for Reconstruction and Development signed an agreement to finance the Tazalyq project, amounting to US \$80 million. It will stop discharges of wastewater from the plant into evaporation fields, and eliminate the negative impact on groundwater, flora and fauna of the Atyrau region as a whole. The project is planned to be implemented by 2023, and during the construction period up to 150 jobs will be created.

Today the Atyrau Refinery has reached a completely new level of development. It has the highest Nelson Complexity Index in Kazakhstan – 13.6, reflecting the technological equipment in use at the enterprise. It is the only producer of paraxylene in Kazakhstan. This is an export-oriented petrochemical feedstock, which contributes to an increase in the level of economic diversification. AR petroleum products meet the stringent requirements of Euro-5 and K5, enabling the company to export products to the countries of the European Union. Since November 2019, the plant has been shipping Euro-5 gasoline to the Netherlands, Georgia, Tajikistan, and Afghanistan. Vitol S.A, the world's largest oil trader, buys petrochemical products such as benzene and paraxylene. In addition, Atyrau benzene is used by KuibyshevAzot and ShchekinoAzot in the Russian Federation.

The major upgrade has helped keep AR competitive in today's fuel market and minimize the plant's environmental



impact. Today enterprise personnel are not slowing down. They are demonstrating their readiness to follow cutting edge trends in the downstream segment.

At the end of 2019, thanks to the joint coordinated efforts of the entire team, and the contribution of each employee, 5.388 million tons of oil were refined for the first time in the history of AR. The percentage of light oil products was 58.1%, the refining depth was 75%. Despite the fact that the decrease in energy demand caused by the impact of restrictions due to the marketparalyzing Covid-19 negatively affected the volume of processing in 2020, reducing it to 5 million tons, the modernization measures implemented demonstrate AR's commitment to further impressive growth.

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> Implementation of Construction of a Complex for Production of Aromatic Hydrocarbons investment project using borrowed funds:

1. Bank Loan Agreement No. KI225-E/10 August 25, 2010 Development Bank of Kazakhstan JSC:

Loan Currency	Tenge
Loan amount	26,401,037,000
Interest rate	9.0% per annum

2. Bank Loan Agreement No. KI225-E/10 August 25, 2010 Development Bank of Kazakhstan JSC:

Loan Currency	US Dollar
Loan amount	843,586,871.58
Interest rate	6 month LIBOR +4.5% per annum

3. Bank Loan Agreement No. DBZI75-E/05-01 May 4, 2015 Development Bank of Kazakhstan JSC:

Loan Currency	US Dollar
Loan amount	40,413,128.42
Interest rate	7.72 % per annum

Implementation of Construction of an Advanced Oil Refining Complex investment project using borrowed funds:

1. Bank Loan Agreement No. DBZI241-E/05-01 August 17, 2012 Development Bank of Kazakhstan JSC

Loan Currency	US Dollar
Loan amount	251 983 878
Interest rate	5,0% per annum



2. Purchasing Loan Agreement No.BLA201201 June 06, 2012 Export-Import Bank of China

Loan Currency	US Dollar
Loan amount	1,130,408,642
Interest rate	6-month Libor + 4.1% per annum

3. Loan Agreement, August 8, 2012, Japan Bank for International Cooperation and MUFG Bank, Ltd.

Loan Currency	US Dollar
Loan amount	297,500,000
	CIRR+2.19% per annum (Tranche
Interest rate	A), 6-month Libor + 1.10% per
	annum (Tranche B)

4. Bank Loan Agreement No. DBZI-229-19, December 26, 2019 Development Bank of Kazakhstan JSC

Loan Currency	Tenge
Loan amount	32,938,200,000
Interest rate	7.99% per annum

In addition, Ioan agreements No. 254-2012 July 27, 2012, No. 379-2012 November 13, 2012 and No.457-2012 December 9, 2012 with JSC NC KazMunayGas were concluded to cover the costs of financing.

Loan Currency	Tenge
Loan amount	20,790,000,000
Interest rate	3.5% per annum

ATYRAU REFINERY production indicators 2014-2020

Description	Unit	2014	2015	2016	2017	2018	2019	2020
Mineral Processing	tons	4920004	4 867 719	4 760 868	4 723 647	5 267 734	5 388 245	5 016 303
Depth of processing	%	62.8%	59.2%	65.2%	62.7%	68.2%	75.0%	77.2%
Light Oil Product Output	%	44.2%	41.6%	45.5%	45.0%	57.3%	58.1%	59.2%

Performance of existing process units (old and modernized) at the refinery

Name of technical installations	Design capacity	Unit of measurement
CDU-AU-2	252.2	t/h
CDU / VDU		
AT unit	378.8	t/h
VT unit	227.2	t/h
LG-35-11/300-95		
Hydrotreating unit	72.0	m³/h
Catalytic reforming unit	72.0	m³/h
CCR (Catalytic Reforming Unit)	126.2	t/h
PX (Paramax Unit)	362.0	t/h
TNPU (Technical Nitrogen Production Unit)	3300.0	m³/h
DCU (Delayed Coker Unit)	121.0	t/h
PCCU (Petroleum Coke Quenching Unit)	23.0	t/h
GHU (Gasoline Hydrotreating Unit)		
Gasoline hydrotreating unit	81.7	m³/h
Isomerization unit	32.0	m³/h
Hydrotreatment and diesel dewaxing unit	198.0	m³/h
SPU (Sulphur Production Unit)	1460.0	kg/h
HPTU (Hydrogen Production and Treatment Unit)		
Hydrogen treatment unit	11057.0	nm³/h
Hrydogen production unit	5612.0	nm³/h
Catalytic Cracking R2R	250.0 (summer)/300.0 (winter)	t/h
Sulfrex LPG desulfurization	55.9	t/h
Butene Oligomerization	55.2	t/h
Naphta HT Naphtha Hydrotreating	179.0	t/h
Prime D Gas Oil Hydrotreating	101.0	t/h
Selective naphtha hydrogenation Prime G+	162.0	t/h
TAME Esterification of Light Naphtha Catalytic Cracking	49.0	t/h
Benzene hydrogenation Benfree	44.0	t/h
Combined sulphur production unit 31 unit A	88.0	t/h
31 B unit	33.0	t/h
32 unit	65.0	t/h
33 A unit	4.9	t/h
33 B unit	4.9	t/h
Gas fractionation of saturated gases SGP	10.7	t/h
Parisom light naphtha isomerization	31.0	t/h
Hydrogen Production Section (HPS)	6.9	t/h
Hydrogen Treatment Section	8,700.0	nm³/h



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CONSTRUCTION OF A COMPLEX FOR PRODUCTION OF AROMATIC HYDROCARBONS (CPAH)

Project purpose:

Production of benzene, paraxylene and components of motor fuels of K4, K5 environmental class in accordance with the requirements of the Technical Regulations of the Customs Union.

The project goal has been achieved, as confirmed by EAEU declarations of conformity for paraxylene and benzene.

Project implementation period: 2010–2016

Basis for project implementation:

Decree of the Government of the Republic of Kazakhstan,28.04.2017 No.231 and amendments thereto in Decree of the Government of the Republic of Kazakhstan, 31.12.2014 No.1418 "Concerning Republican Industrialization Roadmap for 2015-2019"

Contract No: The EPC contract for the construction of the CPAH with Sinopec Engineering was signed on 29.10.2009.

Commencement Date: 01.10.2010

Completion date:

30.09.2015

Value of the contract:

\$1,040 million including VAT.

Project Status:

At present all Project related works have been completed.

New technological units:

1. CCR catalytic reforming (1 start-up facility). Nominal unit power amounting to 1,000 kt/y.

Indicators achieved:

A component of high-octane gasoline – stable reformate isomerizate, corresponding to warranty indicators - has been achieved. The first batch of K4 standard benzine was produced at the refinery by means of compounding.

2. PX paraxylene production (2 start-up facility).

Indicators achieved:

Production capacity up to 496 thousand tons of paraxylene per year. Paraxylene production reached 1,200 tons/day (April-June 2019). The production of benzene has

increased to 200 tons/day (May 2019).

Capability to produce up to 133 thousand tons of benzene per year.

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CONSTRUCTION OF AN ADVANCED OIL REFINING COMPLEX (AORC)



Project purpose:

- increase the balanced capacity of the plant from 5.0 to 5.5 million tons/year;
- increase the capacity of secondary processes and the depth of oil refining;
- improve the quality of motor fuels corresponding to K-4, K-5 environmental classes in accordance with the requirements of the Technical Regulations of the Customs Union.

Basis for project implementation.

Decree of the Government of the Republic of Kazakhstan dated 28.04.2017 No.231 and amendments thereto in Decree of the Government of the Republic of Kazakhstan dated 31.12.2014 No. 1418 "Concerning the Republican Industrialization Roadmap for 2015 - 2019".

Contract:

The EPC contract for the construction of the AORC was signed on 29.12.2011 with a consortium including Sinopec Engineering, JSC OGCC KazStroyService, Marubeni Corporation. Date of commencement of works under the EPC: 01.06.2013.

Completion date:

20.12.2019

Contract value:

\$1,804 million.

Project Status:

At present all Project related works have been completed. With the commissioning of the deep oil refining complex in 2020, the following results were achieved:

Depth of processing increased to 77.2%, with a design depth of 84%. 100% environmentally friendly diesel fuel and gasoline corresponding to K5 (Euro-5) environmental classes (sulfur content no more than 10 ppm) were produced.

Preparations for the production of Jet A-1 jet fuel for turbojet engines completed in accordance with ASTM D 1655B. Diesel fuel production Khazar -38, -32 (in 2020, 44.0 thousand tons shipped), and Altay -45.

Atyrau Refinery LLP has achieved international certification for REACH oriented products for three products "Paraxylene", "Benzene" and "Gasoline AI-92". The REACH certificate is a document issued for the registration and conformity assessment of chemicals for the purposes of their unrestricted circulation on the territory of the European Union. Pursuant to EC Regulation 1907/2006 of 18.12.2006 (EC Regulation No. 1907/2006), the REACH certificate (Registration, Evaluation and Authorisation of CHemicals) is necessary to improve and optimise the existing legal framework in the field of regulation of production and circulation of chemical products on the territory of the EU. According to the results of certification and registration of reach, the Atyrau Refinery received the right to export paraxylene, benzene and AI-92 gasoline to all countries of the European Union.



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NAME OF UNIT



Atmospheric Unit (CDU-AU-2)

DESIGNATION

The CDU-AU-2 unit with a thermal cracking unit was designed by Badger and sons. The unit was commissioned in November 1945.

In 1970, in order to improve the pre-treatment of crude oil, Petrico commissioned the ELOU-10/6 unit.

In 1986, the thermal cracking unit was decommissioned due to extensive physical and moral deterioration.

In 2005, the light oil processing section was reconstructed to accept Tengiz, Mangyshlak and Martyshin oils.

After reconstruction, the capacity of the section for raw materials is 2 million tons/year. Designed to separate desalted and dehydrated oil into separate fractions, by heating, evaporation, fractionation and condensation of distillate vapors.

- The CDU-AU-2 unit produces:
- hydrocarbon gas;
- straight-run naphtha;
- kerosene gas oil fraction;
- mazut



Crude Desalter Unit / Atmospheric, Vacuum Distillation Unit (CDU / VDU-3)

The CDU / VDU-3 unit was commissioned in 1969. General Designer – Azgiproneftekhim Institute.

In 1994-1997, the following types of reconstruction were carried out:

- technology for chemical and technological corrosion protection was introduced;
- technology of fuel production for TC-1 jet engines was introduced;
- replacement of the main K-2 rectification column;
- optimization of operation of condensate refrigeration equipment units.

The plant has a feedstock capacity of 3 million tons/year.

CDU / VDU-3 is designed for treatment and processing of crude Mangyshlak oil in a mixture with light oil (up to 15%). The following components of commercial products are received at the unit: - straight-run gasoline (35-1800C);

- white spirit (140-2000C);
- fuel for jet engines TC-1 (150-2500C);
- diesel fuel (180-3600C);
- vacuum distillate (350-5000C);
- fuel oil (>3600C);
- tar (>5000C).



The LG-35-11/300-95 unit operates on the gasoline version to produce a high-octane component. Commissioned in December 1971. General Designer - Lengiprogaz Institute. The plant has undergone reconstruction to increase its capacity to 450 thousand tonnes/year of feedstock.

- The unit receives:
- stable catalyst;
- dry gas;
- propane-butane fraction;
- hydrogen-containing gas.



Combined Naphtha and Diesel Hydrotreating Unit (CNDHU)

The design, supply of equipment and construction of the combined plant were carried out by JGC Coporation (Japan) using UOP technology (USA). The section commissioning in 2006. Gasoline hydrotreating units comprising the following units:

a) The gasoline hydrotreatment and stabilizing unit at CU-2. CDU /VDU-3 and DCU units is designed to clean gasoline from sulfur, nitrogen and oxygen compounds, as well as to stabilize gasoline from hydrotreatment and diesel dewaxing by means of rectification. The capacity of the unit is 470 thousand tons per year;

b) a unit for separating wide naphtha fraction, in order to isolate the NK-850C fraction. The capacity of the unit is 870 thousand tons per year;

c) the NK-850C fraction isomerization unit is designed to increase the octane number by isomerization on a special catalyst in the presence of hydrogen. The capacity of the unit is 173.3 thousand tons per year;

2. Hydrotreating and dewaxing units for diesel fuel designed to purify kerosene and diesel fuel from sulfur, nitrogen and oxygen compounds, as well as to improve the low-temperature properties of diesel fuel.

The feedstock design capacity is 1.3 million tons/year.



Delayed Coker Unit (DCU)

The DCU was commissioned in 1980. The section was designed by BashGiproNeftekhimInstitute. As a result of reconstructions, the feedstock production was increased to 1,000 thousand tons per year. In 2006, as part of the reconstruction project, a unit for amine treatment of coking gas with an aqueous solution of diethanolamine was commissioned. The unit receives:

- petroleum coke;
- DCU naphtha;
- light gas oil;
- heavy gas oil;
- wet coker gas.

The petroleum coke calcining unit was commissioned in 1989. Designed to produce calcined coke corresponding to requirements by removing volatile components and moisture from crude oil coke. The capacity of the feedstock section after the reconstruction in 2014 is 178 thousand tons/year.

Petroleum Coke Calcining unit



The unit is designed to produce sulfur from waste gases and acid effluents from process units

The sulphur production unit was commissioned in 2006.

by means of hydrogen sulfide absorption with amine solution and further catalytic conversion to crystalline sulfur based on Claus and CBA (Cold Bed Absorption) technology. Design, supply of equipment and construction of the combined unit were carried out by JGC Coporation (Japan) using KTI (Italy) technology . Design capacity of the liquid sulfur section - 26 t/day.



Hydrogen Treatment and Production Unit (HTPU)

The unit was commissioned in 2006 and is designed to provide the plant with high concentration make-up hydrogen. HTPU consists of the following units:

- hydrogen treatment unit is designed to purify hydrogen-containing gas from the catalytic reforming section by short-term adsorption with variable pressure to obtain hydrogen with a purity of 99.9% vol. The capacity of the unit is 18057 m³/h (7.8 thousand tons/year) for hydrogen 99.9% vol.;
- hydrogen production unit is designed to produce hydrogen from liquefied gas by catalytic steam reforming.
- The capacity of the unit is 5,615 m³/h (4.0 thousand tons/year) for hydrogen 99.9% vol.



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NEW TECHNOLOGICAL UNITS

GASOLINE/DIESEL HYDROTREATING UNIT

The technology licensor of the Unionfining DMVC Penex processes is the American company UOP.

• The Penex process is an isomerization process.

• "DMVC Unionfining Process" is a combined process consisting of one or more of the following processes: Distillate Unionfining Process, Unisar Process, and the UOP Catalytic Dewaxing Process for Hydrotreating.

The unit consists of two sections:

• The gasoline section, in turn, consists of gasoline hydrotreating, fractionation and isomerization units; <u>Purpose:</u> increase the yield and quality of gasoline products. The technological process of the unit will significantly increase the depth of treatment from sulfur compounds of the benzines sent to the existing reforming process, and as a result, reduce the sulfur content in commercial vehicle gasolines. Due to the isomerization of light gasoline fractions, it will be possible to increase production of high-octane gasoline.

<u>Capacity:</u> Gasoline hydrotreating unit – 470,000 tons/year; Fractionation unit – 880,000 tons/year;

Isomerization unit – 170,000 tons/year.

<u>Characteristics of the finished product</u>: Mass fraction of sulfur, ppm – no more than 30.

• **Diesel section consisting** of diesel fuel hydrotreating and dewaxing unit.

<u>Purpose:</u> production of clean diesel fuel with low sulfur content, which will reduce air pollution.

The unit will improve the flow characteristics of diesel fuel in cold conditions.

<u>The process licensor</u> is UOP. <u>Capacity</u>: Hydrotreating unit - 1,300,000 tons/year; Dewaxing unit - 1,166,000 tons/year; Amine gas purification unit - 38,000 tons/year.

Characteristics of the finished product:

Mass fraction of sulfur, ppm – no more than 50; Pour point, OC – not higher than minus 10 (summer variant); Pour point, OC - not higher than minus 35 (winter variant).

HYDROGEN PRODUCTION UNIT

<u>Purpose:</u> to eliminate hydrogen gas deficiency in winter. The installation is designed for the steam reforming process, which produces pure hydrogen gas from liquefied petroleum gas and water.

Licensor: AXSIA HOWMAR LTD (UK).

<u>Capacity</u>: Hydrogen treatment unit from existing reforming process – 8,000 tons/year;

Hydrogen production unit with purification section – 4 000 tons/year;

<u>Characteristics of finished products:</u> Hydrogen purity – 99.9% of volume.

SULPHUR PRODUCTION UNIT

<u>Purpose:</u> conversion of hydrogen sulfide H2S formed as a result of hydrotreating gasoline and diesel fuel, amine treatment of refinery gases and stripping of acid effluents into elemental sulfur.

The process licensor is Technip S.A./KTI Composition and capacity: Amine recovery section – 11,560 tons/year; Acid stripping section – 120,000 tons/year; Sulphur production section – 10,000 tons/year; Sulphur crystallization section – 10,000 tons/year. Characteristics of the finished product: Sulfur purity – 99% of the volume. Color – bright yellow; shape – granules; size – 2-6 mm;

H2S content – 10 ppm, wt., max.

DCU OFF-GAS AMINE PURIFICATION UNIT

<u>Purpose:</u> Extraction of hydrogen sulfide H2S from DCU gas with amine solution. Purified gas is returned to as fuel gas to the DCU and the plant fuel system. <u>Capacity:</u> 55,440 tons/year – purified gas output.

UTILITIES, INFRASTRUCTURE, AND OFFSITES (UI&O)

The cost of the program of construction and reconstruction of UI&O amounts to 24,206,157 thousand tenge, including:

• facilities constructed pursuant to the company's obligations under "Turnkey" contract - 11,662,074 thousand tenge;

• infrastructure facilities upgraded in accordance with the requirements of state authorities – 12,544,083 thousand tenge.

1. Preparation of sites for the construction of new units;

2. Inter-unit pipelines, electrical and instrumentation cables;

- 3. Main flare units;
- 4. New flare unit for acid effluents;

5. Water fire extinguishing system for hydrotreating gasoline, diesel fuel, sulfur production units;

6. Circulating water supply system for CDU-AU-2 and gasoline and diesel hydrotreating unit;

7. Biological treatment of wastewater;

8. Intermediate tanks;

9. Construction of el.power substations No. 1, 2a, 2b, 3;

10. Construction of part of the building for sulfur

crystallization and packaging;

- 11. Reconstruction of the CDU-AU-2 unit;
- 12. Solid waste landfill site;
- 13. Sanitary protection zone with drainage system;

14. Construction of ventilation chambers with ventilation system and heating system;

15. Construction of an awning for reagent storage.

LARGE SCALE INFRASTRUCTURE FACILITIES:

CIRCULATING WATER SUPPLY SYSTEM (CWS) for

CDU-AU and hydrotreating units for gasoline and diesel fuel with a capacity of 2,700 t/h.

The cooling tower installation consists of:

- Clarifier sections;
- Chemical reagentssSection;
- Cooling tower section;
- Side filters section.

Purpose: to reduce the consumption of water from the Ural river With the introduction of the new cooling tower, only 90 t/h of raw feed water is required for the new units and CDU-AU-2.

WASTE WATER TREATMENT PLANT (WWTP)

The unit with a capacity of 620 m³/h consists of:

- Flocculation and pressure flotation section;
- Chemical reagents section;
- Treated alkali section;
- Biological treatment section;
- Settling tanks section;
- Sludge dewatering section;
- Sand filters section.

<u>Purpose:</u> the plant is designed for chemical and biological treatment of plant wastewater by exposure to microorganisms. Characteristics of purified water. Oil products no more, mg/I - 0.3Phenol no more, mg/I - 0.1Suspended particles, no more, mg/I - 25BOD, no more than , $mgO_2/I - 8$ PH - 6,5-8,5 Chlorides (by CL-), no more than, mg/I - 650Sulphates (by SO₄) no more than, mg/I - 500Surfactants, no more than, mg/I - 0.5

NEWEST FLARE SYSTEM

<u>Purpose</u>: the general flare system ensures the safe removal of hydrocarbon vapors from the existing and new process units during process incidents, emergency situations and during start-up and shutdown. Capacity:

Flare system – 269,278 kg/h; Acid gas flare – 4,386 kg/h.

INTER-UNIT PIPELINES (IUP), ELECTRICAL, INSTRUMENTATION AND COMMUNICATION CABLES ARE ENVISAGED BETWEEN NEW AND EXISTING PROCESS UNITS AND UI&O

Length of IUP routes – 5.23 km; Installed and technological pipelines – 62.9 km; Electric cables – 129.8 km; Communication cables – 3.36 km; Underground water supply and sewerage networks – 3.5 km. 228

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PAVLODAR OIL CHEMISTRY REFINERY

After the unsuccessful management of the Pavlodar Oil Chemistry Refinery (POCR) in 1997-2000 by the American CCL Oil Ltd, which almost led to its closure due to a shortage of feedstock and insufficient funding, ownership was once again returned to the state. Since November 2000, POCR has managed to stabilize and increase the volumes of oil refining and production of petroleum products, and ensure regular supplies of raw materials. Between 2000-2009, in the aims of ensuring the stable operation of the plant, significant investments were set aside for annual repairs, modernization and technical reequipment of the enterprise. Oil sludge processing units were built. Sulfur granulation and hydrogen production facilities were

constructed, and modern instrumentation, diagnostic devices and systems were acquired.

In August 2009, Pavlodar Oil Chemistry Refinery was transferred to the national company KazMunayGas, thus marking a new stage in the development of the enterprise. The management company relied on the introduction of modern innovations and new technological thinking.

Pavlodar Oil Chemistry Refinery was set the task of increasing the volume and depth of crude oil refining, adjusting the production quality of products to comply with Euro-4, Euro-5 environmental classes, as well as minimizing the dependence of production on imports of raw materials, thus ensuring the plant's ability to process domestic oil. This required not just the reconstruction of the existing oil refineries, but major modernization. At that time the cost was estimated at \$1.2 billion.

On September 1, 2009, Resolution of the Government of the Republic of Kazakhstan No. 1293 was adopted. According to this act, Modernization of the Pavlodar Oil Chemistry Refinery was included in the list of investment strategic projects of the country.

POCR modernization began on November 5, 2009, with the signing of an agreement between JSC NC KazMunayGas and the Italian company, Eni S.p.A, for the development of a feasibility study for this project. The Italian company's interest was based on a number of decisive factors: the company's possession of international licenses for the use of modern technologies in the field of oil refining, experience of their implementation in production and significant financial potential. Throughout 2010, issues related to the selection of the best option for the implementation of the POCR modernization project were studied, discussed and resolved. In September 2011, work on the feasibility study of the project was completed. On October 31, 2011, a positive expert opinion was received from the Republican state enterprise "Gosexpertiza".

On October 20, 2011, the Agreement between the Government of the Russian Federation and the Government of the Republic of Kazakhstan on trade and economic cooperation in the field of supply of oil and oil products to the Republic of Kazakhstan dated December 9, 2010 came to an end. Thus KazMunayGas was faced with the task of providing the Pavlodar petrochemical plant with raw materials. A plan was developed for a phased transition of the plant's operation to refining oil from Kazakhstani fields. The first stage was to process 50% of oil from Kazakhstani fields (25% – oil from Aktobe fields, 25% – oil from Kumkol fields) and 50% of oil from West Siberian fields. The second stage was the complete transition to oil refining from Kazakhstani fields to 100% (75% – oil from Aktobe fields, 25% – oil from Kumkol fields).

A department was created within KazMunayGas - Refining and Marketing JSC to exercise direct control over the

implementation of the modernization project and assist in resolving related issues in the state agencies of the Republic of Kazakhstan. The working group was assigned a number of objectives. The first was the reverse pumping of raw materials through oil pipelines. This method was designed to transport oil, including highly paraffinic oil, at low temperatures and prevent oil freezing in a large-diameter oil pipeline when pumped at low productivity. The method included sequential pumping of oil, first forwards and then in the opposite direction where it is heated at oil pumping stations. In order to accomplish the second stage, the liquefied hydrocarbon gas alkalization unit and the kerosene hydrotreater required restoration. The third stage required a dosing system for a mixture of Kazakhstani oil for refining. The fourth objective was to establish the rates of specific consumption of reagents based on the results of fixed mileage when processing a mixture of Kazakhstani oil. Work then needed to be started on obtaining a permit for the production of aviation fuel of the TS-1 brand.

The use of oil from Kazakhstani fields in refining has proven to be a serious challenge. Kazakhstani oil supplied for processing is heterogeneous in terms of its composition with a high content of mercaptan sulfur and paraffinic compounds. This was the reason why production of TS-1 brand aircraft fuel, all grades of petroleum bitumen and winter diesel fuel was discontinued. The refinery also faced difficulties in pumping Kazakh oil through pipelines, since Kazakh oil is highly paraffinic, and its pour point varies from minus 4° C to minus 6° C. Nevertheless, despite all the difficulties, POCR coped with the task. Based on these results between October 2011 and February, 2021 POCR processed 874,876 tons of oil from Kazakh fields and provided the Republic of Kazakhstan with K2 environmentally compliant motor fuels.

These and other measures required \$385 million of investment in the development of the plant between 2009-2012.

The next stage in the project was the development of design and estimate documentation (DED). Participants in the tender included a number of world famous companies with experience in oil refinery design. The best possible technical and commercial



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proposal was submitted by the Italian company Technip Italy SpA. They were to become one of the counterparts in the trilateral agreement for the development of DED, signed on May 28, 2012 between POCR, Technip Italy SpA and the engineering company Kazgiproneftetrans. The objective was to adapt design documentation to the Kazakh regulatory requirements. At the same time, the refinery entered into cooperation agreements with world leaders in the field of oil refining, and technological process licensors: UOP (USA), Siirtec Nigi (Italy), Axens IFP group technologies (France), Bechtel (USA) and Haldor Topsoe, (Denmark).

Between 2010 and 2013, the enterprise carried out major work on replacing technological equipment with expired operational life in the following plants: the LK-6U complexes; the fuel complex 1 (KT-1); the hydrogen production unit (HPU); the bitumen production unit (BPU); and the delayed coking unit (DCU). In the commodity parks, repair work was carried out on crude oil reception tanks with a volume of 50 thousand cubic meters. In December 2013, a new nitrogen and oxygen plant (NOP) was built. This plant now supplies gas to the plants built under the modernization project. In the water supply and sewerage workshop, a new water treatment unit was installed for the treatment of circulating water with chemical reagents. This has increased the efficiency of cooling products and apparatus, and reduced the cost of repairing and cleaning equipment.

In January 2013, Technip Italy SpA presented an updated technical and commercial proposal for the implementation of the entire scope of the project, including design, equipment supply and construction. However, due to the high cost of services, cooperation with the Italian company had to be abandoned and other proposals considered. On July 30, 2013, an agreement was signed for the development of working documentation, procurement of equipment and materials, construction and installation work (EPC contract) with Rominserv SRL, a Romanian company. The engineering company Kazgiproneftetrans was also involved in the project.

At the same time, in order to ensure the production of K4 class fuels, the order of equipment with a long production period began. This included a total of about 137 units from suppliers from South Korea, Italy, France, USA, Russia, England and Germany. Of particular significance among this equipment were the three columns for new isomerization units and a naphtha splitter manufactured by Kazakhstan Belkamit LLP. In July 2014, the general contractor Rominserv SRL poured the first cubic meters of concrete for 72 piles for the foundations of the Kazakh columns of the isomerization unit.

On his visit to POCR on August 7, 2014, as part of a working trip to the Pavlodar region, Nursultan Nazarbayev noted: "This is one of the most important industrialization projects, so I have been personally following it. First, I believe it is the most modern oil refinery, and not only in Kazakhstan. When it was built in Soviet times, it was the most modern enterprise. Now reconstruction, modernization ...".

In August 2014, the Republican state enterprise "Gosexpertiza" issued its positive evaluation of the plant based on the amended project documentation. This would imply its division into three start-up complexes: PK-1, 2 and 3. The first PK involved the construction and commissioning of a number of installations enabling production of Euro-4 environmental fuels, including the technological units for isomerization and a naphtha splitter; an automatic station for mixing gasoline; and two tanks of five thousand tons for isomerate and eight off-site facilities. The launch of PK-2 was intended to increase the capacity of the refinery up to 6 million tons per year with Euro-4 class quality of produced gasolines and diesel fuel. The third start-up complex incorporated projects to increase plant annual capacity from 6 to 7 million tons with Siberian oil, the production of Euro-class gasolines and Euro-5 summer and winter diesel.

On December 25, 2014, an agreement was signed with regard to the financing of the project with the Development Bank of Kazakhstan JSC. They would provide about 25% of the required financing in the form of a loan in the amount of 51 billion 465 million tenge for a period of up to 10 years for construction and installation works. The total value of the turnkey contract exceeded US \$1,218 million. However, already in the spring of 2015, as a result of optimization of the scope of work, the cost of the project was reduced to US \$696 million, mainly due to the abandonment of facilities that were intended for the processing of Kazakh oil. By this time, the Government of Kazakhstan had signed a new agreement with Russia on the supply and transit of Russian oil for 10 years with the possibility of extension. This resolved the issue of the supply of Kazakh oil to POCR and the construction of facilities that would stand idle without domestic oil. These design decisions were postponed to a later date.

Decree of the Government of the Republic of Kazakhstan No. 1418 dated December 31, 2014, included the POCR modernization project as part of the Republican Industrialization Map for 2015-2019, guaranteeing it the broad support of the state.

The construction of new installations was carried out in parallel with the reconstruction of the existing technological equipment. POCR experts argued that it is sometimes easier to build a new facility than to reconstruct an existing facility. Most of the installations that required reconstruction – atmospheric distillation of oil, hydrotreating of naphtha, catalytic cracking, hydrotreating of gas oil and gasoline-kerosene cat-cracking units – were originally designed according to Soviet GOSTs, and were to be modernized based on modern Western technologies. At the same time, imported equipment and technologies had to comply with the standards of the Republic of Kazakhstan and the Customs Union.



The project was split between POCR and Rominserv. Rominserv's scope of work included: continued development of DED; construction of a combined isomerization unit, naphtha splitter, tanks for isomerate with a volume of 5,000 cubic meters; an automatic gasoline mixing station, and a central control facility and off-site facilities. POCR was assigned the construction of a combined sulfur production unit, including sulfur production and amine recovery units, two sour waste stripping lines, a sulfur granulation unit and other auxiliary facilities, as well as the reconstruction of the primary (LK-6U) and advanced oil refining (KT-1) complexes.

Reconstruction of the DCU began in the fourth quarter of 2014 and was completed in 2016. The project was initially included in the scope of work of POCR modernization, but after optimization, it was transformed into a separate project. The unique nature of this project was that the new coke ovens were assembled piece by piece, right on site. DCU modernization was entrusted to NFC (China Nonferrous Metal Industry's Foreign Engineering and Construction Co., Ltd./China international nonferrous metallurgy engineering and construction company), which implemented the work three times cheaper than American experts from Bechtel. The equipment was supplied by the Chinese company AVIC. After the replacement of coke ovens, reconstruction of two coking furnaces, fractionation columns, installation of air cooling devices, the DCU capacity in terms of feedstock increased from 600 thousand to 925 thousand tons per year, the depth of oil refining increased by 4%, and the possibility of the output of the target product – petroleum coke – doubled – from 140 thousand to 280 thousand tons per year.

The largest part of the project to reconstruct the operating technological units was the modernization of the LK-6U technological complex. This included the reconstruction of CU, naphtha hydrotreating and catalytic reforming, diesel fuel and kerosene hydrotreating units. At the same time, the kerosene hydrotreating unit with newly installed technological equipment, and a new unit for the preparation of fuel gas from liquefied

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> hydrocarbon gases were built from scratch. The world-famous Danish licensor Haldor Topsoe was involved in the reconstruction of the naphtha hydrotreating units, diesel fuel and kerosene hydrotreaters. They developed a basic reconstruction project and supplied a catalyst of their own production. UOP, another world leader suggested using the Undercut method, consisting of "lightening" the straight-run diesel fuel sent to the diesel hydrotreater. The Detailed Design was developed by the Russian company Omskneftekhimproekt PJSC, and an agreement was signed with the Pavlodar company MegaStrovPlus for the construction and installation work. The working group worked on every drawing, and every detail of the project together with field supervision specialists from the design company Omskneftekhimproekt, who came to the plant to monitor the construction progress. Reconstruction at the facilities was carried out around the clock. The maximum number of contracted personnel involved was 1,100 people. Up to 25 units of lifting mechanisms (truck cranes) were operated simultaneously on the passing ways.

> The culmination of the project was the transportation of two diesel hydrotreaters manufactured by Hyundai Heavy Industries, first via the Northern Sea Route, and then the Ob and Irtysh rivers. Each unit weighed more than 500 tons each and formed part of the LK-6U primary oil refining technological complex. The time to destination took 2 and a half months, and the delivery distance was 14 thousand kilometers! This was the first time that the delivery of such a large-tonnage cargo by the Northern Sea Route had been carried out in the history of independent Kazakhstan. A clear logistics plan had to be developed to receive reactors and other unique large-sized equipment. One of the key factors was the construction of a special port on the Irtysh, consisting of a water area, access roads and heavy equipment. On December 12, 2016, the reactors were installed in the design position at the plant. The unique nature of the LK-6U project lay in the fact that these reactors were the largest of all those used in Kazakh petrochemical plants.

> An important component in the POCR modernization project was the reconstruction of a deep oil refining complex (AORC) and, in particular, a catalytic cracking unit. Thanks to this unit, the KT-1 complex produces a high-octane gasoline component and a diesel fuel component with relatively high-quality indicators. The reconstruction of the facilities was aimed at increasing production capacity and ensuring safe operation of equipment under conditions of increased productivity. In 2015, UOP Limited developed the basic design for the reconstruction of the KT-1 complex units. The general designer was Omskneftekhimproekt



PJSC. As part of the reconstruction of KT-1, two large-scale reactors were replaced at the vacuum gas oil hydrotreating unit, 23 meters in length and 4 meters in diameter. The Saint-Petersburg company "SV-Trans" was involved in the installation of such large technological equipment. They are equipped with a heavy duty crane with a lifting capacity of 750 tons. A unique self-propelled LIEBHERLR11350 boom crane with a lifting capacity of 1,350 tons and a maximum boom reach of 132 m provided by SOPiG LLP, the Russian company operating in construction of industrial and urban facilities, was involved in the reconstruction of the KT-1 reactor-regenerator unit. As a result of the AORC reconstruction, the production capacity of the catalytic cracking unit was increased from 1,350 thousand tons to 1,900 thousand tons per year in terms of feedstock.

Another priority for the Refinery modernization was the construction of a combined isomerization unit and a naphtha splitter (UOP licensor), with the participation of one of the oldest construction and installation companies in Russia, Vladimirteplomontazh JSC. This allowed for a reduction in the benzene content in gasoline components to less than 1%, meeting the requirements of Euro-4 and Euro-5 fuel standards.

The capacity of the isomerization unit of 571 thousand tons per vear and the naphtha splitter of 1,961 thousand tons per year enabled separation of the hydrotreated gasoline fraction coming from the naphtha hydrotreating unit into light and heavy naphtha for subsequent isomerization and reforming processes. At the heart of it lies Penex technology - one of the best technologies for increasing the octane number of gasolines by structurally changing the carbon skeleton. More than 1,000 people were involved in construction and installation work at this complex. Also, an important part of the project was the construction of a complex of sulfur regeneration units (CSRU), due to the need to improve the environmental parameters. The following units were added to the complex: sulfur regeneration, tail gas cleaning, amine regeneration, two lines for stripping acidic effluents, and a sulfur granulation unit. Siirtec Nigi (Italy), the world leader in the design of processes for the extraction of sulfur from hydrocarbons, were selected to provide technologies using the modified Claus process and TGT (tail gas treatment). These technologies ensure

hydrogen sulfide to sulfur conversion at a level of more than 99.9%. The Chinese company NFC was assigned as general contractor (project development, supply of equipment and materials, construction, installation and commissioning) of the sulfur regeneration unit. The manufacturing of 257 units of equipment took place in China. Part of the mandatory equipment to ensure warranty performance was supplied by the licensor – Siirtec Nigi. At peak personnel mobilization, 1,300 people were employed at the CSRU construction site. Provision of water at the CSRU site enabled significant reduction of emissions of sulfur compounds into the atmosphere.

An added bonus was the supply of hydrogen used in the process of hydrotreating diesel fuel and gasoline, in order to reduce sulfur content, thus making road vehicle fuels cleaner. This became possible after commissioning on September 1, 2018 of the repaired hydrogen production unit for the French-Kazakhstani JV Air Liquide Munai Tech Gases (ALMTG). The share of Air Liquide accounted for 75%, and KazMunayGaz – 25%.



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The unit was brought to its design capacity of 20 thousand Nm³ / h (normal cubic meters per hour) the end of December 2017 with the supply of hydrogen to the sulfur regeneration complex, diesel fuel hydrotreating, naphtha hydrotreating, and isomerization units.

In total, during the POCR modernization and reconstruction project completed in 2018, 67,300 cubic meters of concrete were poured. In addition, 19,432 tons of metal structures, 209,500 meters of pipelines, 17,220 meters of engineering networks were installed. 1.567.563 meters of electrical and instrumentation cables were laid, 806 units of technological equipment and 5,093 items of instrumentation devices were installed. The process and business flows have also undergone change with an emphasis on digitalization. In 2016, the plant implemented a project to improve the efficiency of planning and carrying out major overhauls based on the IBM Maximo maintenance management system software, Meridium APM inspection and reliability management, Uniformance Asset Sentinel equipment monitoring management and Honeywell and Advanced Solutions equipment downtime management system. In 2018, a system for production planning optimization based on the SimSciSpiral information system was introduced. Since 2019, they have started to develop the annual production program for POCR, which is based on the LP-model. It has reduced operational and investment expenses and brought the plant to a new technological level compliant with the concept of digitalization.

The total cost of the POCR modernization project was 189.5 billion tenge, excluding VAT. On October 23, 2017, in order to complete the POCR modernization project, a final loan was prepared. As a result, POCR and Development Bank of Kazakhstan JSC signed an additional loan agreement to the amount of US \$49 million.

All these measures enabled the capacity of the oil refinery to be increased by 1 million tons, and the processing depth up to 85%, to ensure the production of K4 standard road vehicle fuels: diesel fuel and motor gasoline grades AI-92, 95 in accordance with the requirements of the Technical Regulations of the Customs Union TR CU 013/2011. The production and shipment of RT aviation fuel to consumers was resumed in full compliance with international standards and even surpassing them for certain indicators. In June 2018, the National Center for Expertise and Certification JSC registered a declaration of fuel conformity from POCR pursuant to the requirements of the Technical Regulations of the Customs Union 013/2011.

In 2018, its fortieth anniversary year, POCR was completely renewed and since then has achieved a qualitatively new level of oil refining.

In November 2018, during an off-site meeting at the Pavlodar petrochemical plant, Bulat Bakauov, the Akim of Pavlodar region, presented Daniyar Tiyessov, Deputy Chairman of the Management Board for Transportation, Refining and Marketing of KazMunayGas JSC, who played a significant role in the successful implementation of the POCR modernization project, the Award for Merit to the Region – for many years of his dedicated work, high professional qualifications, significant contribution to the development of the oil and gas industry in the region. This, according to the head of the region, "was merited by his large-scale vision of all production and business processes, as well as experience in modernizing the Atyrau Refinery."



Execution of key production indicators, January-May 2021

	ME of RK plan	actual	off +/-	(actual-plan)
Name	tons	tons	tons	% of plan
Raw material processing	2 345 000	2 389 901	44 901	1,91%
Gasoline:	660 761	702 501	41 740	6,32%
AI-92	520 761	566 262	45 501	8,74%
AI-95/98	140 000	136 239	-3 761	-2,69%
Jet fuel	56 000	69 766	13 766	24,58%
Diesel fuel	741 662	766 629	24 967	3,37%
Heating fuel	0	1 138	1 138	
Raw material for technical carbon	0	7 667	7 667	
Fuel oil	307 717	281 335	-26 382	-8,57%
Bitumen	110 000	106 233	-3 767	-3,42%
Petroleum coke	102 811	109 895	7 084	6,89%
Technical sulfur	22 445	23 379	934	4,16%
Liquefield gas	133 130	148 212	15 082	11,33%

Key production indicators, January-May 2021

Name	Production Program plan	Actual	off +/- (plan-actual)
Fuel and lossess total, %	7,31	6,25	- 1,06
including fuel	6,26	5,38	- 0,88
losses	1,04	0,86	- 0,18
Processing depth, %	84,05	86,34	2,29
Amount of light oil, %	67,87	70,66	2,94

Processing depth, %



Amount of light oil, %





Losses, %









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SHYMKENT OIL REFINERY

After the acquisition of Shymkentnefteorgsintez OJSC (SNOS) in 2000, with a design capacity of 5.25 million tons of oil per year, by the Canadian company Hurricane Hydrocarbons Ltd (in 2003, the company changed its name to PetroKazakhstan Inc. in order to clearly reflect the type of activity of the company and the country in which the company operated) from Central Asian Industrial Investment N.V., the new owner assumed investment obligations amounting to US \$150 million. The company was obliged to fulfill these obligations by December 31, 2001 by attracting investments or reinvesting the profits of OJSC SNOS. In the event of failure to comply with this requirement, Hurricane Hydrocarbons Ltd would be obliged to pay a fine of 15% of the investment amount not found.

According to SNOS OJSC, the volume of investments in fixed assets in 1997 amounted to 782 million tenge, in 1998 – 1.8 billion tenge, in 1999 – 906 million tenge. According to management estimates, at the end of 2000 it reached in aggregate about US \$87.1 million. All investments were made at the expense of the company's net profit. The main goals of these investments were reconstruction of existing production, in order to improve quality and optimize product range. Between 1993 and 1998, a computerized production management system was introduced at the plant and diesel fuel reforming and hydrodewaxing units were modernized. The construction of the catalytic cracking complex in 1997 was 60% completed and required an investment of a further US \$120 million in accordance with the original plan to increase production by about 1.8 times. However, the project was postponed, mainly due to the lack of appropriate demand. As a result of the reconstruction, the depth of oil refining at the refinery by 2000 averaged about 52%, depending on the processing option, from 50% to 58%.

In 1999, transition to the refining of oil from the Kumkol group of fields in the South Turgai basin necessitated the reconstruction of another part of the production facilities. Supplies of oil to the Shymkent refinery from the Kumkol fields, also owned by Hurricane Hydrocarbons Ltd, were subsequently carried out via the Kumkol-Shymkent pipeline. The pipeline had a throughput of about 7.5 million tons per year and was operated by CJSC NCTN KazTransOil. With its favorable geographical location and technical capabilities, SNOS had all the prerequisites from the very outset to delivery petroleum products to the domestic and foreign markets. The tariff for transportation at this time \$10.9 per ton in this section, payable in tenge. The exchange rate and, therefore, the amount payable depended on the purpose of the oil. When transported for further export, the exchange rate of the National Bank of Kazakhstan on the day of payment was applicable. On the other hand, if the oil was intended for processing at Kazakh refineries, then the April 1, 1999 exchange rate equivalent to 87.5 tenge per US dollar was applied (at the beginning of 2001 the difference in tariffs was 65%). When oil was purchased, its transportation was paid for by the supplier. Almost all oil purchases were prepaid. The oil pipeline enabled an increase in the production of petroleum products without additional investments in the development of infrastructure. Nevertheless, Hurricane Hydrocarbons made frequent requests for a reduction to their investment obligations with regard to SNOS, including the transfer of part of their investments into operational shares, based on reasons of economic profitability.

By 2001, an atmospheric oil distillation unit with a capacity of 7 million tons per year was operating at SNOS as part of the LK-6U complex. Other facilities included a unit for catalytic reforming of petroleum products with preliminary hydrotreating of feedstock with a capacity of 1 million tons per year; a hydrodewaxing (purification) unit for diesel fuel with a capacity of 1 million tons per year; a kerosene hydrotreater with a capacity of 600 thousand tons per year; as well as a gas fractionation unit with a capacity of 450 thousand tons per year. The vacuum distillation unit for fuel oil with an annual capacity of 3.8 million tons of feedstock per year and the unit for delayed coking built in 1992 were non-operational. The final products of oil refining were: gasoline of grades A-80, A-85, Al-92, AI-96, diesel fuel, aviation and lighting kerosene, boiler fuel (fuel oil), heating oil and liquefied gas. Total product yield after processing was 93%, including 18% of gasoline and 1% of liquefied gas. The output of diesel fuel and fuel oil depended on the processing cycle in use at the time. Using the summer version, output was 33% and 41%, while the winter cycle produced 26% and 48%, respectively.

At the same time, the market situation required improvement to the secondary processing system in order to increase yield of highly profitable light fractions products (gasoline and diesel fuel). This was to become one of the priority areas of investment in the Shymkent Oil Refinery. By this time, it had been renamed PetroKazakhstan Oil Products – PKOP. The most promising project would be the construction of a catalytic cracking unit, aimed at increasing the yield of light oil products. The catalytic cracking facility was to include a vacuum gas oil hydrotreater, an MTBE (methyl tertiary-butyl ether) unit and a hydrogen production unit. The cost of construction was estimated at US \$80 million. There were also plans to implement the second stage of the reconstruction of the diesel fuel dewaxing units with a budget of about US \$1 million. This would enable the quality of commercial diesel fuel to be brought in line with European standards. Another important project was the second stage of the reconstruction of the coking unit for thermal cracking of fuel oil (Visbreaking). The modification of the fractionation furnaces and columns would enable unfinished DCU to be converted to light thermal cracking of fuel oil (LTC). Further



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> reconstruction would also contribute to an increase in the yield of naphtha to 7-8% and diesel fuel to 22%, as well as the processing of tar from the fuel oil vacuum distillation unit at LTC. US \$250 million was required to complete the reconstruction. The plant also planned to construct its own proprietary steam supply by means of an in-house boiler facility at a cost of US \$4.1 million. Plans were also made to invest in expanding the automated management system, completion of the aviation fuel hydrocleaning unit and other projects.

> However, these and other projects began to take real shape only after a change to the PKOP shareholder and the Kumkol group fields. First in August 2005, PetroKazakhstan Inc. sold its assets to the Chinese CNPC subsidiary, CNPC International Ltd. for US \$4.18 billion (\$55 per share). Subsequently, in July 2006, KazMunayGas purchased 33% of shares in the operational assets of PetroKazakhstan from CNPC. Then a year later, in July 2007, it purchased 50% of PKOP. The final asset sale and purchase transaction in 2009 set out the new strategy for the development of the Shymkent Oil Refinery.

In 2011, with the appointment of Kazakhstani managers to the plant, large-scale modernization got underway within the framework of the State Program for Accelerated Industrial and Innovative Development of Kazakhstan. Construction and reconstruction of the 11 process units and 29 off-site facilities were envisaged in two stages. The general contractor was to be the Chinese CPECC (China Petroleum Engineering & Construction Corporation), one of the largest engineering and construction companies in the oil and gas industry.

In June 2017, the first stage was completed with the launch of a large isomerization unit. This guaranteed the production of K4 and K5 fuel standards compliant oil products. In the same month, the first automatic point oil loading unit (APOLU) to be constructed in Kazakhstan began operation. The facility also included a hydrocarbon vapor recovery unit, while the first batch of gasoline was loaded into the railroad tankers. The APOLU gasoline loading capacity was 2.5 million tons per year with the possibility of future expansion of annual capacities of aviation kerosene - 0.5 million tons and diesel fuel - 2 million tons. In June 30, 2017, another major process facility commenced operation. This was a light gasoline isomerization unit with a preliminary hydrotreating unit with an annual capacity of 600 thousand tons per year. The first certified batch of road vehicle gasolines compliant with K4 and K5 standards was produced. The inclusion of an isomerization unit in the refinery's process flow enabled a 460 thousand tons annual increase in the production of modern environmentally compliant high-octane gasolines. Shipments of the new products to suppliers





began in July. This event marked the completion of the first phase of the Refinery Modernization and Reconstruction Project.

The aim of the second and most technologically complex phase of modernization was to increase the refinery's annual capacity from 5.25 million to 6 million tons of oil, as well as the depth of its processing. This would include construction of a set of catalytic cracking units for advanced oil refining with an annual capacity of 2 million tons, aimed at producing high-octane road vehicle fuels. The second phase also aimed to ensure the mechanical completion of a number of off-site facilities required for the launch of the catalytic cracking facility. In March 2018, preliminary work began at the process units, and in the summer of 2018, the first feedstock was delivered to the Residue Fluid Catalytic Cracker (RFCC) with an annual capacity of up to 2 million tons.

The project used modern and advanced oil refining technologies provided by the world's leading companies, such as: UOP (USA), Axens (France) and CPE (China). Technip (Italy) and Kazgiproneftetrans LLP (Kazakhstan) were brought in as designers. The general contractor was China Petroleum Engineering & Construction Corporation. The funds for the project with the total value of \$1.9 billion were allocated in May 2017 by means of a credit line from DBK to the amount of US \$932 million for a period of up to 13 years.

The modernization of the Shymkent Refinery brought with it a number of benefits. These included: improved monitoring of environmental indicators and operational control; excellent operational indicators of the plant laboratory; guarantees of health and safety; and the excellent operational condition of the loading and unloading ramp. Reconstruction was also focused on maintaining the refinery's treatment facilities in working order with the aim of introducing a drainless system. After a successful certification audit, the company's management was awarded a certificate of compliance of the environmental management system with the requirements of ISO 14001: 2004 for the processing, transportation and storage of oil and oil products.

Daniyar Tiyessov, Deputy Chairman of the Management Board of JSC NC KazMunayGas, referred to the Shymkent Refinery Modernization Project as an example of Kazakh-Chinese cooperation in the energy sector. OIL AND GAS OF KAZAKHSTAN

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Refineries are technically and technologically complex and hazardous production facilities. Therefore, any modernization and reconstruction project without suspension of the core operations is a responsible and even sometimes challenging task and necessitates taking the individual characteristics of each refinery into account. No such largescale development projects had ever previously taken place in Kazakhstan at three large oil refineries.

After the modernization of its three large refineries in 2018, Kazakhstan was able to achieve several objectives at once. It was able to fulfill the needs of the domestic market with its own K4 and K5 environmentally compliant oil products. This led to a reduction in prices, and today in Kazakhstan, where state regulation of road vehicle fuel prices has been abolished, the cost of gasoline is among the lowest in the world. The modernization projects created a fuel surplus by displacing imports, and structured a raw material base to enable the future development of the petrochemical industry. Last but not least it transformed the county from a net importer into a POL exporting country.

It took Kazakhstan no more or no less than ten years to achieve these goals. Over the course of work, the comprehensive plan for the refinery development adopted in 2009 required certain adjustment. According to the initial plans, modernization was due to be complete in 2015. By the time the comprehensive modernization program had been achieved, the total cost had doubled to US \$6.2 billion. During this time, prices and POL market saturation continued to depend on Russian imports. The subsequent 2017 fuel crisis led to severe deficits, soaring POL prices, and dismissals of officials. All this contributed to the adoption of emergency decisions by the Government of the Republic of Kazakhstan, in order to save the market. In 2018, for the first time in many years the Kazakh fuel market was able to appreciate the benefits of modernization, and was finally both stable and predictable.

In 2020, Daniyar Tiyessov, Deputy Chairman of the Management Board of JSC NC KazMunayGas for Oil Refining and Marketing, commented that the completion of the modernization of the production capacities of oil refineries, was not the end of their development. "The main results of the project is that the production of light oil products has increased along with the same volume of oil. In fact, more gasoline, diesel fuel, and kerosene have also been produced. All the gasoline

produced at domestic refineries possesses an octane rating of 92 and higher (95, 98). Another important result is that the gasoline and diesel produced at our refineries is K4 and K5 environmentally compliant. This means that we are producing products with a low content of sulfur and harmful carcinogenic substances. This has a generally beneficial impact on the environmental situation in our country."

Further KazMunayGas policy in the oil refining sector has ensured a consistent increase in industry performance. The widescale reconstruction of large oil refineries and the construction of 32 mini-refineries during the years since independence may not have led to an increase in the volume of oil refining in the Republic in comparison with the Soviet period, but the main objective of modernization has been to improve product quality. The program has indeed accomplished the key objective of moving away from import dependence and ensuring the country's energy security.

OIL REFINING VOLUMES IN THE REPUBLIC OF KAZAKHSTAN in the period 1991-201, thousand tons

Year	AR	POCR	РКОР	Total*
1991	4 593,2	7 160,0	6 295,77	18 048,97
1992	4 416,2	6 445,0	6 048,17	16 909,37
1993	4 677,7	5 179,0	4 961,79	14 818,49
1994	4 804,3	3 290,0	3 719,21	11 813,51
1995	4 261,8	3 005,0	3 609,30	10 876,1
1996	4 450,9	2 936,0	3 743,70	11 130,6
1997	4 129,0	1 609,0	3 475,58	9 213,58
1998	2 712,2	2 193,0	3 654,44	8 559,64
1999	1 891,9	703,0	3 382,70	5 977,6
2000	2 200,0	1 183,0	3 050,42	6 433,42
2001	2 197,3	2 090,0	3 392,62	7 679,92
2002	2 281,5	1 988,0	3 497,04	7 766,54
2003	2 321,1	2 509,0	3 946,36	8 776,46
2004	2 912,1	2 995,0	3 508,84	9 415,94
2005	3 513,8	3 720,0	3 933,20	11 167,0
2006	3 746,3	3 897,0	4 035,40	11 678,7
2007	3 701,0	4 276,0	4 060,34	12 037,34
2008	3 924,5	4 056,0	4 308,19	12 288,69
2009	4 004,0	4 124,0	4 007,18	12 135,18
2010	4 300,1	4 800,0	4 583,16	13 683,26
2011	4 471,5	4 649,0	4 604,93	13 725,43
2012	4 422,8	5 037,0	4 754,23	14 214,03
2013	4 429,5	5 010,0	4 851,01	14 290,51
2014	4 920,0	4 926,0	5 065,23	14 911,23
2015	4 867, 7	4 810,0	4 493,31	14 171,01
2016	4 760,0	4 589,0	4 501,0	13 850,0
2017	4 723,6	4 746,9	4 685,6	14 156,1
2018	5 267,7	5 340,2	4 732,5	15 340,4
2019	5 388,2	5 290,0	5 400,7	16 078,9
2020	5 016,3	5 003,5	4 793,7	14 813,5
2021	5 364 7	5 360 5	5 088 2	15 813 4
(estimate)	0.004,7	5 500,5	5 000,2	10 010,4
Total	98 910	97 179	109 483	305 572

*Excluding mini refineries

Source: KazMunayGas - Refining and Marketing JSC



"These days hardware modernization alone is not enough. We are now working very actively on this matter. The funds invested in equipment upgrades also necessitate working with people. This requires modern methods of education, training, and monitoring. 2018 has been declared the year of improving the operating culture at all refineries. Much work has been done on the DuPont methodology, which is a world leader in ensuring occupational health and safety in industrial enterprises. We implemented it at all our refineries. We will be improving personnel and qualifications as well".

> Daniyar Tiyessov, Deputy Chairman of the Management Board of JSC NC KazMunayGas

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CASPIAN BITUMEN

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The first Kazakhstani "spring swallow" marking the beginning of the development of the petrochemical industry in Kazakhstan, was the commissioning on December 20, 2013 of JV Caspi Bitum LLP, a road bitumen plant based on the Aktau Plastics Plant. This took place on Industrialization Day and a nationwide teleconference with the participation of the President of Kazakhstan, Nursultan Nazarbayev. The plant was owned in equal shares by KazMunayGas and CITIC Kazakhstan LLP (a subsidiary of the Chinese CITIC Group). The event was attended by Alik Aidarbayev, Akim of Mangystau region, Le Yucheng, Ambassador Extraordinary and Plenipotentiary of the People's Republic of China to the Republic of Kazakhstan, as well as representatives of the Ministry of Oil and Gas of the Republic of Kazakhstan and JSC NC KazMunayGas, the management of CITIC Group, JV Caspi Bitum LLP and other partner companies.

In February 2007, the President of the Republic of Kazakhstan, Nursultan Nazarbayev, decreed that production of road bitumen be established in Kazakhstan. As part of the State Program for the Accelerated Industrial and Innovative Development of the Republic of Kazakhstan for 2010-2014, and the "Nurly Zhol" ("Path of Light") new economic policy announced by the President of the Republic to meet the domestic needs of the Republic of Kazakhstan for high-quality road bitumen for the highway construction industry, the decision was taken to build the plant in Aktau.

An enormous volume of preparatory work was carried out by the national company "KazMunayGas". On November 11, 2008, KazMunayGas signed a Memorandum of Mutual Cooperation with the Ministry of Transport and Communications of the Republic of Kazakhstan to ensure the production and consumption of highquality road bitumen for the needs of the Kazakhstan highway construction industry. In October 2009, the "Caspi Bitum" LLP joint venture was established between Chinese and Kazakhstan partners pursuant to an agreement between JSC NC KazMunayGas and CITIC (China). In June 2010, an EPC turnkey contract worth \$290 million was signed for the construction of the bitumen plant in Aktau. Between 2010 and 2013, the construction work was undertaken by a consortium of contractors, including OGCC KazStroyService JSC and CITIC Construction Co. Ltd (PRC).

The Aktau bitumen plant was built on lands neighboring the non-operational Plastics Plant (PP). This was due to the proximity

of the Karazhanbas bituminous field whose oil is a source of raw materials. Key benefits of the project were the presence of the Karazhanbas-Aktau-Sea port oil pipeline (230 km); the potential of using the extant infrastructure of the Plastics Plant; the proximity of Aktau seaport; the well-developed rail and road network; as well as the regional electricity and water supply compliant with the quality required for technological needs. The high-resin, high-sulfur, and low-paraffinic nature of the Karazhanbas oil proved most suitable for the production of bitumen and, most importantly, for the stable quality of road bitumen with a practically consistent composition. Oil is supplied to the bitumen plant by means of sequential pumping (using a mechanical separator) through the existing main KazTranOil JSC oil pipeline: Kalamkas-Zhanaozen-Atyrau-Samara (DN = 700 mm) and a newly constructed branch (11.3 km).

The production capacity of the Aktau bitumen plant was about 400 thousand tons of oxidized and 120 thousand tons of modified road bitumen, 15 thousand tons of gasoline fraction, 230 thousand tons of kerosene-diesel fraction, and 220 thousand tons of vacuum gas oil. In October 2015, the production of modified bitumen began for the first time at the Aktau bitumen plant. This is a component of asphalt concrete which makes the road surface resistant to dynamic and temperature loads, provides elasticity, and prevents deformation when vehicles are travelling upon it. The commissioning of the plant allowed Kazakhstan to move away from imports and fully provide the domestic road industry with its own products. Surplus exports were established to Uzbekistan, Tajikistan and Turkmenistan.

Soon after this event, a new workshop for granulation of powder polypropylene was established by Kompaniya Neftekhim Ltd. LLP in the Pavlodar region. The event was broadcast on a nationwide teleconference – New Industrialization of Kazakhstan: the Results of 2014 and the First Five-year Plan. The President of the Republic of Kazakhstan, Nursultan Nazarbayev, also participated. The plant has a capacity of 30 thousand tons per year, allowing the production of high-quality granular polypropylene for the production of finished products. Automated processes, modern research laboratories, available raw materials ensured an attractive cost of the produced material of the following brands: PP H003, PP H007, PP H013, PP H020, PP H030, PP H040, PP H060, PP H080, PP H130, PP H180, PP H250. This enabled the company to announce plans to expand the workshop in order to produce finished products: polypropylene containers, pipes and plastic dishes. From the very outset, petroleum gas, obtained in the process of oil cracking at the neighbouring Pavlodar refinery, began to be used as a raw material.

In addition, in 2015 within the framework of the broad modernization programs the construction and commissioning of the Complex for the Production of Aromatic Hydrocarbons (CPAH) was announced. It had a capacity of 133 thousand tons of benzene and 496 thousand tons of paraxylene per year, and became an event of national importance in the history of domestic chemical processing. It was to usher in a new stage in the development of the industry, transition to a higher level of raw materials processing and laying the foundation for a new technological field - petrochemistry. Investments in the facility, built using the technology of the French company Axens, amounted to US \$1,040 million. On July 3, 2015, a pilot batch of benzene was produced at the first CPAH start-up complex. On October 2, 2015, the first batch of paraxylene was produced at the second start-up complex. On July 4, 2016, the plant shipped the first industrial batch of benzene for export. Today, CPAH includes the following facilities: a continuous catalyst regeneration catalytic reforming (CCRCR) unit with a feed capacity of 1 million tons per year; a benzene and toluene extraction unit; a paraxylene extraction unit; a toluene and heavy aromatic hydrocarbon transalkylation unit; a raffinate separation section, as well as other off-site facilities. Such installations have no analogue in Kazakhstan.

During a nationwide teleconference on Industrialization Day in 2016, President of Kazakhstan Nursultan Nazarbayev stated: "... With today's unfavorable energy prices, oil and gas processing is our key objective. This is the main point of the country's industrialization – to process the raw materials that we possess. ... We will also undertake the development of petrochemistry in the Atyrau region".

The dynamic development of the gas industry over many years, has served as a prerequisite for attracting investments in deep gas processing.





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ROMPETROL

KAZAKHSTAN'S BLACK SEA BRAND

With its impressive success in the economy and the construction of a completely new oil and gas industry to stably and reliably ensure the growth of production, processing and transportation of hydrocarbon raw materials, Kazakhstan continued to strive to expand its capabilities and find its place in foreign markets. A key factor that made this possible was the country's wealth of accumulated experience and knowledge. In the early 2000s, after a number of attempts to expand abroad, in November 2007, KazMunayGas, the national oil and gas holding company finally entered the European market. It became the owner of 75% of the shares in the Rompetrol Group of Romania. By doing so KazMunayGas was dealt several trump cards at once. It was able to acquire its own oil refineries, capacities and

a wide retail network guaranteeing oil sales in the promising Black Sea region. With the approval of the European Commission, this transaction was valued at US \$1.650 billion. Two years later, in the context of the global financial crisis which also negatively affected the Rompetrol business, the remaining 25% of the shares were purchased for a total of US \$100 million under the terms of the original 2007 agreement. Thus, the cost of acquiring a 100% stake in Rompetrol amounted to US \$1,750 million. This figure was based on an analysis by international experts from ABN AMRO, PriceWaterHouseCoopers, Norton Rose, Wolf Theiss, Purving & Gertz, ENW and ERM. Rompetrol became the first oversea project of KazMunayGas. Previously the national holding company had tried unsuccessfully to buy the Unipetrom refinery in the Czech Republic, the Lithuanian concern Mazeikiu Nafta, as well as an Italian refinery.

As Karim Massimov, Prime Minister of the Republic of Kazakhstan, stated in 2007, "the expansion of KazMunayGas into Europe confirms Kazakhstan's aspiration to make its contribution to maintaining stable energy supplies throughout Eurasia". In turn, in 2007, Marat Tazhin, Minister of Foreign Affairs of the Republic of Kazakhstan, noted, "Kazakhstan is fully aware of its responsibility in ensuring international energy stability and security. We are actively working on large infrastructure projects which will allow us to diversify and ensure the sustainability of the channels through which Kazakhstan's resources are supplied to global markets".

The acquisition of technically attractive assets in the Eastern European market fully met the Kazakhstan's strategic interests. The country would benefit in the long term from the geographical location of Rompetrol with its direct access to the sea and its own logistics and transport infrastructure, thus creating a significant competitive advantage. The Kazakh shareholder was seen as the greatest opportunity for Rompetrol's growth, even during the global financial crisis.

When commenting on the transaction, Timur Kulibayev, who in 2007 held the position of Deputy Chairman of the Management Board of JSC Kazakhstan Holding for Management of State Assets Samruk, and in 2008 was Deputy Chairman of the Management Board of Samruk-Kazyna SWF JSC, said: "The purchase of Rompetrol was completely logical and beneficial for KazMunayGas. Firstly, the holding, which incorporates the Petromidia refinery, the Petrochemicals and Vega petrochemical plants, as well as Midia port, is one of the most up-to-date companies with cutting edge equipment. Secondly, the transaction has given us access to the most competitive market in Europe. Thirdly, in the case of oil transportation, we have managed to circumvent problems of traffic though the Bosporus. Fourthly, we do not have to deal with intermediaries in the supply of our oil. Kazakhstani oil is freely transported along the pipeline system in Russia. Then in Novorossiysk it is loaded into a Kazakh tanker which crosses the Black Sea and enters our own refinery in Constanta. Fifthly, we have gained access to the premium Black Sea markets in Turkey, Ukraine, and the Caucasus, all of which offer great opportunities for the development of the Rompetrol sales network. This is in contrast to Europe, which is oversaturated with refined products".

KazMunayGas started work in Rompetrol by undertaking an economic reassessment and then implementation of a large-scale transformation program covering all the areas of operation. This included the standardization and optimization of business processes, improvement of management efficiency, modernization of core operations, and the implementation of advanced information management systems. They relied on the use of the latest and most effective developments, as well as the establishment of an effective team.

In 2012, Rompetrol completed the large-scale modernization program of the Petromidia refinery. This facility was built in 1979 and is situated in a unique location next to the Danube-Black Sea canal. The project took about four years and required an investment of US \$450 million. The investment package provided for the implementation of several large projects, including the construction of a new hydrogen production unit, assuring a purity level of at least 99.98% at a pressure of at least 86 bar. Additional facilities included: mild hydrocracking and sulfur production units; a nitrogen unit and a new flare system; the reconstruction of catalytic cracking units;



"Firstly, the holding, which incorporates the Petromidia refinery, the Petrochemicals and Vega petrochemical plants, as well as Midia port with an off-shore mooring facility, is one of the most up-to-date companies with cutting edge equipment. Secondly, the transaction has given us access to the most competitive market in Europe. Thirdly, in the case of oil transportation, we have managed to circumvent problems of traffic though the Bosporus. Fourthly, we do not have to deal with intermediaries in the supply of our oil."

> **Timur Kulibayev,** Chairman of the KAZENERGY Association

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Claus process and amine cleaning; as well as the conversion of the vacuum gas oil hydrotreating unit into a diesel fuel hydrotreating unit. As a result of modernization, the plant, which previously had ceased operations for routine maintenance once every four years, was now able to extend this period to fives. It should be noted in particular that the modernization of the Petromidia refinery was undertaken during the financial crisis. This was a period when 22 oil refineries in Europe went bankrupt, since they were focused exclusively on the production of only one type of product – diesel fuel. This was their downfall. KazMunayGas' Romanian asset, however, was able to rebuild flexibly and take changed market demand into account.

Modernization led to an increase in the volume of oil refining at refineries. It grew from a previous annual volume of 3.5 million to 5 million tons. It also led to a change in the basket of petroleum products, including full transition to the production of Euro-5 standard fuel. Output of light oil products at the refinery reached 87% per ton. The plant also became the leading refinery in Romania. Oil refining capacities of the competitors OMV Petrom and LUKOIL in Romania, amounted to an annual volume of 4.5 million tons and 3.2 million tons, respectively; at the same time inferior to the competitors in the local market in terms of volumes of POL supplies.

In 2014, a project entitled "Dolphin" was developed in the aims of enhancing the operation of the Petromidia and Vegain refineries, in order to enable them to achieve their full potential and ensure significant sustainable improvement. Within a short period of time, a huge volume of work was done, leading to a drastic change in









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the architecture of the oil refining and petrochemical assets in Romania.

Today KMG International (KMGI is the new name for the Rompetrol Group) is a completely integrated international oil company operating in the sector of oil refining, sales of oil products, and trading. KMGI's assets in Romania consist of two refineries – Petromidia in Navodari and Vega in Ploiesti; the Petrochemicals petrochemical facility; an offshore remote terminal, as well as a network of more than 1,100 fuel stations and POS in Romania, Georgia, Bulgaria and Moldova. Thus, the company can now boast of previously unknown annual operating and financial records.

Over the years of managing these promising European assets, more than US \$600 million have been invested in the development of

the Petromidia refinery. Indeed, annual investments in maintaining the fixed assets exceed US \$60 million. Due to this, the refinery has not only been able to increase its processing capacity, but has also adjusted the basket of petroleum products it produces. All fuel products now comply with the Euro-5 standard, and oil refining is now at the level of 92.6%. Petromidia is currently operating at the limit of its capacity, while breaking new records in the processing of raw materials and the production of petroleum products.

Petromidia is able to process 100% of Russian Urals oil, while its cutting edge equipment enables it to operate with a wide variety of oil grades. This include: Kazakh-Russian mixture CPC Blend, Azeri Azeri Light, Iraqi Kirkuk, West Siberian Siberian Light, Nigerian Bonny Light, Libyan Es Sider, as well as fuel oil and dirty diesel from Russia and heavy oil products from the Vega refinery. The choice of varieties is dictated by market conditions. The upside of the Petromidia plant lies in the fact that it can quickly reorient itself to the production of any other product depending on market needs.

Raw materials enter the tank farm for treatment through the refinery's own Midia Marine Terminal. This is the only offshore mooring facility on the West coast of the Black Sea. It is able to operate without interruptions, regardless of weather conditions in the Constanta area. The offshore mooring installed by the Dutch



Index		Before modernization	After modernization
Volume	million tons / year	3.5	5
Nelson Index		8.3	10.5
Diesel fuel	million tons / year	1.5	2.5
Gasoline	million tons / year	1.3	1.4
Jet fuel	million tons / year	0.15	0.4
Energy Intensity Index Ell (according to the Solomon grading system)	%	129	94

company Van Oord at a depth of 23 meters and tested at 44 atmospheres, is capable of the transshipment in both directions of at least 16 million and maximum 24 million tons of oil per year. It can receive tankers with a load capacity of up to 160 thousand tons. Berths 1, 2, 3, 4 and 9a, 9b, 9c in the port of Midia are designed for the shipment of oil products and reception of raw materials for the Petromidia petrochemical complex. The liquefied petroleum gas (LPG) terminal built in 2010 at berth 9 is directly connected to the refinery's two LPG storage facilities. Midia Marine Terminal can handle several hundred ships and barges on an annual basis and dozens of oil tankers can be unloaded at the terminal. This is another advantage of the refinery. The construction project for the offshore oil terminal has become an important component in the supply chain of crude oil to Romania. After the purchase of the port of Batumi (Georgia) by the state-owned company KazTransOil in 2008, KazMunayGas obtained access not only to the Black Sea basin, but also further to Europe. Jan Bonde Nielsen, chairman of the Batumi oil terminal, referred to the purchase of Batumi port by a Kazakh investor as "a win-win solution for both the terminal's shareholders and the national oil and gas company of the Republic of Kazakhstan."

In 2020 the first stage of implementing the Advanced Process Control System at a cost of \$4 million was completed. These new technologies have enabled certain control functions at Petromidia to be set to autopilot. The pilot launch of APC systems produced an economic benefit of US \$1 million. At the present moment, Petromidia is implementing a digitalization program which was first launched in 2017. This is part of the KMGI general program to create a single digital platform and requires the implementation of about 100 IT projects within 5 years. It became the next stage of technological improvements after refinery modernization. The software solutions will improve and integrate all the links in the business chain – from oil refining to trading and retail.

The key advantage of the Petromidia refinery is that its refining facilities are integrated with the petrochemical complex. The production units are located both at the refinery itself and at the Vega petrochemical plant. Vega has been in operation for more than 100 years and combines history with advanced technologies. The petrochemical facility is capable of producing over 200 thousand tons of polymers on an annual basis. This includes 60 thousand tons of HDPE (high density polyethylene), 60 thousand tons of LDPE (low density polyethylene) and 90 thousand tons of polypropylene. The Vega plant specializes in the production of solvents and bitumen. Feedstock comes from the Petromidia refinery, and accounts for about 2% of dark and other processed products of this plant. KMG International is currently the only producer of polymers and bitumen in Romania. Production volume and sales of bitumen have more than doubled in comparison with 2012. Up to 40% of products are sold within Romania, while the rest is exported to Bulgaria, Italy, Turkey and other markets.

In the foreseeable future, the development program of the Kazakhstani oil refinery on the Black Sea envisages the complete transition to the Smart Refinery concept. This will involve the construction of a TPP in cogeneration mode within the framework of the Kazakh-Romanian investment fund, as well as the further development of the petrochemical unit. Petromidia is currently considering plans to double its design capacity by building new units or expanding the capacity of the existing primary oil refinery. The company also plans to further develop its logistics and retail network. This will require injections of investments. The specific figure depends on many factors. "In the long term, we want to take a leading position in the Romanian market, so therefore, we are thinking about expanding capacity to cover not only the Romanian, but also the Black Sea market," commented Edil Utekov, who served as CEO of Rompetrol Rafinare in 2019.

In addition, the Company sets a priority on increasing its market share in the retail segment through its own networks in its primary markets of operation. In the medium term, there are plans to increase market share in the retail segment in Romania from 16% to 25%, in Bulgaria – from 3% to 15%, in Georgia – from 17% to 22%, and in Moldova - from 23% to 25%. All four markets have two important elements in common. Firstly, the plant supplies Petromidia products with special additives to bring the quality in line with the Euro-5 standard under the Efix brand. Secondly, the product range is highly appreciated by consumers. In recent years, much attention has been paid to the development of non-fuel retail sales. The Hei gastro brand (cafes and restaurants at multifunctional gas stations) and the Fill and Go payment system are actively used by customers. In the foreseeable future, KMGI intends to expand its own petrol station network under the Rompetrol brand in Romania by building 82 new petrol stations from scratch through greenfield investments. Petrol station construction is already well under way.



Chapter **7** PETROLEUM REFINING PROCESSES: A TERRITORY OF INNOVATION



Saduokhas Meraliyev, 2009-2012, CEO, Rompetrol Group

Uzakbai Karabalin, who was the president of JSC NC KazMunayGas in 2008, stated: "This project is a harmonious component of the national holding's development strategy, aimed at increasing market capitalization, enhancing the competitiveness of its enterprises and diversifying export destinations for Kazakhstani oil."

Since the Company has been managed by Kazakhstani specialists, it has taken a qualitative leap forward – from minus US \$200 million to plus US \$200 million in terms of EBITDA. In 2016, for the first time, KMGI recorded EBITDA of US \$204 million. Since then it has consistently maintained positive financial dynamics by paying dividends to the shareholder.

The technological equipment, competitiveness, and successful work with clients have enabled Petromidia refinery to attain the highest levels of professional evaluations and research. Based on the Nelson index as used in global design and research practice, the complexity factor of this refinery is currently 10.5 (two years ago it was equal to 11.2, and on average Europe it is 8.6). Because of this indicator Petromidia is ranked among the top 25 oil refineries of comparable size.

Solomon Associates, an American consulting company most famous for refinery benchmarking, compares hundreds of refineries on a regional and global scale. They also named Petromidia as one of the best, when compared with similar refineries in the CIS countries, Eastern and Western Europe. The refinery's improved efficiency was also noted by the consulting company WOOD Mackenzie. Thanks to the highest production

The Rompetrol Group includes oil refineries and petrochemical plants, the Midia port with an off-shore mooring facility, 630 filling stations in Europe (Romania, France, Spain, Moldova, Ukraine, Bulgaria, Albania, Georgia), as well as several exploration blocks on the Black Sea shelf. The holding supplies oil products to Turkey, Ukraine, Croatia, Moldova, and also has a longterm five-year contract for the lease of tankers. TRG's refining capacity is over 4 million tons, and in the field of distribution – 7 million tons of oil products per year. The company is headquartered in the Netherlands. At the time of purchase, Rompetrol employed more than 8,000 highly gualified employees in 13 countries around the world.

level of pure petroleum products in the region – at 86% – Wood Mackenzie included it in the top 10 of 250 refineries in Europe and Africa. Brand Finance, another international consulting company assessing the competitiveness, quality of service and products, ranked Rompetrol for the first time among the ten most valuable brands in Romania, taking 9th place. The senior managers of KMGI responded at the time by saying: "We are ambitious people. 9th place does not suit us, and we want to rise higher."

Zhanat Tusupbekov, General Director of KMGI, noted in 2019 at the ceremony to mark the 40th anniversary of the Petromidia refinery, that the Company's success is an indicator of the impressive qualifications of the Kazakhstani specialists managing the refinery. It is they who helped Kazakh oil win its place in the highly competitive European market. With its direct access to the Black Sea region providing a sales market of 300 million people, Kazakhstan today has the potential of expanding its presence in this part of the world, and strengthening its position in the international market. Direct access of production assets to the Black Sea, as well as its own proprietary logistics and transport infrastructure, have not only created a significant competitive advantage for the company in the region, but also serves the interests of Kazakhstan which aims to expand its international presence. Taking into account the further plans for the development of KMGI, we can expect in the foreseeable future that the company will achieve further transformations which will raise it to new levels and strengthen the position of our country in the Black Sea and East European regions.



At the same time, KazMunayGas was able to exercise the option to the remaining stake within 9 months. The national company used this right in July 2009, purchasing the remaining 25% of TRG shares, thus becoming the full owner of a large oil refining asset in Europe. After the purchase, Daniyar Berlibayev, Vice President of KazMunayGas, was elected Chairman of the Board of Directors of Rompetrol. As a result of this transaction, TRG was assured long-term security for oil supplies, while KazMunayGas Trading House doubled its refining capacity and acquired a retail network in the European market in seven countries. It was a well-thought-out, strategically important move for Kazakhstan: given the growing demand for energy, Europe needed Caspian oil, light in composition, now more than ever.

OIL AND GAS CHEMICAL DRIVERSION

Chapter 8

"ALL THAT IS TRULY GREAT IS ACHIEVED BY SLOW, IMPERCEPTIBLE GROWTH."

Lucius Annaeus Seneca,

Roman philosopher, stoicist, poet and man of state

n the early 1990s, a deep crisis caused a landslide decline in the production of chemical and petrochemical products. It was caused by factors inherent in the entire industry of Kazakhstan. Reasons included the loss of existing economic ties between the republics of the former USSR and the loss of traditional sales markets; economic liberalization; high inflationary processes; a sharp increase in tariffs for electricity and rail freight in comparison with the growth rates of prices for chemical and petrochemical products; the growth of non-payments; a decrease in the provision of enterprises with technological equipment and materials due to a sharp rise in prices for material and technical resources and production services and the necessity for prepayment for them; significant wear and tear of fixed assets of enterprises; low consumer quality; a limited range of products and at the same time growing competition from imports into Kazakhstan. The situation was aggravated by a sharp drop in production in the consumer

sectors of petrochemical and chemical products and a decrease in their effective demand. It was further exacerbated by ineffective state policy in the field of protecting domestic producers of petrochemical and chemical products.

The capacities of petrochemical and chemical production enterprises were created in Kazakhstan with the participation of Russian research and design institutes, in order to satisfy the needs of the USSR. The petrochemical enterprises existing in Kazakhstan were focused on processing imported products, mainly Russian.

Of the two dozen chemical and petrochemical enterprises functioning in the Soviet era, by the beginning of the 2000s, only a few were still operating in Kazakhstan.

In order to improve the situation in the industry and in individual companies, a number of bankruptcy proceedings were carried out between 1999-2000, in accordance with the Law of the Republic of Kazakhstan dated January 21, 1997 "Concerning


Bankruptcy". This allowed for new owners of petrochemical enterprises to be assigned and for the production architecture to be restored.

The Shevchenko Plastics Plant (PP in Mangystau Oblast) was the largest complex for the production of polystyrene plastics in the USSR. It was built in 1976-1980 by Decree of the Council of Ministers of the USSR using imported equipment from the French company "Litvin". The general designer of the plant was the Leningrad company "Plastpolymer". The main technological chain of the plant included the production of: ethylene (capacity -100 thousand tons per year); ethylbenzene (346,3 thousand tons per year); styrene (300 thousand tons per year); high-impact and general polystyrene (110 thousand tons per year); and expandable polystyrene (100 thousand tons per year). In Soviet times, this plant produced more than half of the total production of these products in the Soviet Union. After the collapse of the USSR, in June 1992 the Shevchenko Plastics Plant was transformed into AKPO JSC. It continued to operate until 1993 on a complete technological cycle - from the synthesis of monomer (styrene) to the production of finished types of polystyrene in the form of beads and granules. An accident in December 1993 put the Alkar ethylbenzene production unit out of action, forcing the plant to operate on a reduced cycle using imported ethylbenzene as the main raw material. In accordance

with the Decree of the Government of the Republic of Kazakhstan No. 1248 dated December 7, 1998 "On the Joint-Stock Company "AKPO" (Aktau city)", a bankruptcy procedure was initiated. By Decree of the Government of the Republic of Kazakhstan No. 1215 P001215 dated August 7, 2000, this procedure was completed with special conditions for the sale of the property. In April 2001, the property of the bankrupt enterprise "AKPO" JSC was sold at open tender using the Dutch method for 85 million 849 thousand tenge to the Russian "ExtraPlast Trading House" LLC. The new owner enthusiastically set about restoring its former positions. From a market economy point of view, there was a need to restore the entire initial technological chain of polystyrene production, since it had significant market potential in China and Russia. China at that time was importing up to 1 million tons of these products annually, while the latter had limited production capacities. The plan for the technical re-equipment and expansion of production, then available to the Russian owner, required investment within 10 years of US \$1,249 million, taking into account bank interest. However, from the very beginning, this plan aroused considerable doubts - not only in terms of the volume of investments, but also the sources of financing (credit funds that were planned to be repaid through the export of products). At that moment no one in Kazakhstan could provide such a loan. The doubts were quickly justified - over the 254

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Alik Aidarbayev, Chief Executive Officer of NC KazMunayGas JSC

three years of Russian management, the plant was more often idle than working, only occasionally did its capacity reach barely 8-15% of design capacity.

The property of another petrochemical enterprise – Polypropylene OJSC (Atyrau) with a capacity of 30 thousand tons of products per year, idle since 1996 and also in need of immediate reanimation, was acquired by Plant for Composite Materials and Plastics CJSC (PCMP, Tomsk), associated with ExtraPlast. An open tender was held on 10 November, 1999. With the arrival of a new owner at the formed Polypropylene Plant LLP, once equipped with Montedison equipment, repair and restoration work began. Contracts for the supply of propylene from Russia and Azerbaijan and the sale of finished products were entered into.

However, due to debts on the payment of loans of ExtraPlast Trading House to one of the Kazakh commercial banks, the property of Aktau PP was sold collateral by auction in May 2004 to Sat & Company in Almaty. At the same time, it bought Polypropylene Plant LLP in Atyrau. After unsuccessful attempts to combine the Aktau PP and the Atyrau Polypropylene Plant into a single production complex with the involvement of Russian and then Kazakhstani investors in December 2004, 50% of the shares of these two plants in Sat & Company were acquired by KazMunayGas Exploration Production JSC, a subsidiary of KazMunayGas. However, despite efforts to reanimate both enterprises, the production of polystyrene in Kazakhstan completely ceased due to the impossibility of ensuring the supply of expensive foreign raw materials which made the cost of the finished product higher than its market price.

Despite the reanimation efforts, the largest LLP "Kazkhimvolokno" (formerly Kustanaykhimvolokno plant), which

could have become the only producer of chemical fibers and metaaramid thread in the CIS and Eastern Europe, ceased operation, as well as a number of other chemical and petrochemical enterprises in Kazakhstan.

The course of industrial and innovative development taken in early 2000, was strategically correct in identifying the main risks to the economy of Kazakhstan. It was designed to diversify the economy and move away from resource dependence. Meanwhile, the extensive nature of the growth of large-scale Kazakh business, focused as it was on quick profits from the export of raw materials, did not allow transition to higher redistribution. State initiatives did not receive proper support from the business community, since the young national business at that time had not matured enough to become an active player in diversification and build a new, innovative business in Kazakhstan. It was unable to break through and compete in the world market, or attract leading companies as strategic global partners. Accordingly, the priorities of business did not correlate with the priorities of the state in the development of manufacturing industries to produce products with high added value.

The formation of state policy on the development of the chemical and petrochemical industry required the drafting of a generalized document to reflect the problems and prospects for the development of the industry. The first profile program for the restoration and development of the chemical and petrochemical industry of the Republic of Kazakhstan for 2001-2002 was thus developed. It provided for the restoration of activity and stable operation of the industry, the preserving the range of chemical and petrochemical products, sources of investment, creation of capacities for the production of import-substituting products, and increasing export potential.

The development of petrochemistry in Kazakhstan was facilitated by the growth of production indicators at the Tengiz, Karachaganak, Karazhanbas and other fields, where significant volumes of produced associated gas were being flared. Associated gas is the most important strategic multi-component petrochemical raw material. An important role was played by the restrictions imposed by international organizations on the gas flaring, which were also supported by Kazakhstan.

Since petrochemical and most chemical processes are based on the use of catalysts, along with the organization of high-tech petrochemical production, production facilities for the production of catalysts in Kazakhstan needed to be established. The Kazakh catalysis school of thought was one of the most advanced in the world.

In subsequent years the creation of a domestic base for oil refining and petrochemistry was to become the general direction of the industry.

In 2001-2005, the foundations were laid for the radical restructuring of the oil and gas processing industry in Kazakhstan and the creation of petrochemical complexes of the Republic. According to research by Phillips Petroleum Kazakhstan, there was a requirement to build polystyrene and polyethylene plants in the country at an estimated cost of \$1.5-2 billion. According to

the relevant ministry, the most economically viable strategy was to set up petrochemical facilities for the production of polyethylene, polypropylene, styrene and polystyrene, ethylene glycol and benzene, and methanol. This would mean obtaining the basic petrochemical products, and subsequently implementing investment projects for the production of a wide range of petrochemical products (synthetic rubbers, aromatic compounds, motor oils and other products). This would also include those based on the use of oil and oil sludge. The main regions for the development of the petrochemical industry would be the oil-bearing Atyrau, Mangystau, West Kazakhstan, Kyzylorda regions, as well as the South Kazakhstan region, where one of the three domestic refineries is located.

In the hope of restoring the activities of existing enterprises, modernize them and create new modern production facilities near sources of raw materials, the Government focused on the development of a variety of specialized documents. These included the Program for the Restoration and Development of the Chemical and Petrochemical Industry for 2001-2002; the Strategy for Industrial and Innovative Development for 2003- 2015; Gas Industry Development Program for 2004-2010; Petrochemical Industry Development Programs for 2004-2010 and 2008-2013; State Program for Advanced Industrial and Innovative Development for 2010-2014; and the Concept for the Development of the Petrochemical and Chemical Industries of Kazakhstan until 2015.

For example, the Program for the Development of the Petrochemical Industry of the Republic of Kazakhstan for 2004-2010 and 2008-2013, envisaged the activation of projects in two areas. The first involved the creation of petrochemical production facilities for the raw hydrocarbons deep conversion for basic and high value-added petrochemical products on the basis of the National Industrial Petrochemical Technopark SEZ (Special Economic Zone). SEZ status provides for customs and tax preferences for the participants, allows for reduction of the prime cost of Kazakhstani petrochemical products, and increases competitiveness on the international market. The petrochemical SEZ was based on the umbrella or cluster principle. This required the inclusion of various geographic territories close to raw materials, production and infrastructural resources. The success of the clusters at that time was evidenced by the experience of countries with a developed petrochemical industry - Saudi Arabia, the United Arab Emirates, South Korea, Singapore, Russia and others. As a rule, the creation of a separate infrastructure in each case and keeping the cost of raw materials at an acceptable level during long-distance transportation requires significant costs on the part of the state and reduces profitability. At the same time, "anchored production" in one single place increases the profitability of enterprises due to the joint use of infrastructure and cheaper logistics, minimizing the delivery time of products, and quickly resolving organizational issues. This also provides synergy and the release of new products for further processing. By the time the profile program was developed in the country, the concept for the formation of a SEZ, feasibility study, and environmental impact assessment (EIA) had been prepared. In addition, the draft Regulations on the National Industrial Petrochemical Technopark SEZ, Government Decree, and Decree of the President of the Republic of Kazakhstan had been promulgated. Based on studies of the National Industrial Petrochemical Technopark SEZ, state and industry approvals were issued and a protocol of the meeting of the expert council on Special Economic Zones of the Ministry of Industry and Trade was also drafted. On November 5, 2007, public hearings were held in the city of Atyrau. 1,787.4 hectares were allocated for the territory of the SEZ in the Atyrau region.

The second area provided for the construction of small and medium-sized businesses for the additional processing of basic petrochemical products and the production of innovative industrial and consumer products with high added value. The dominance of the oil and gas industry in the economy of the western region of Kazakhstan led to a significant focus on the field of entrepreneurship. In all parts of the region, related services, mechanical engineering and infrastructure, including transport communications, were sufficiently developed.

One of the main tasks for the successful implementation of large projects was the completion of infrastructure construction by the state. In 2009-2011, the design and estimate documentation was developed for SEZ infrastructure. Within the constraints of budget financing, and using the possibilities of concession legislation, the construction of major facilities began. These included energy and water supply, transport, telecommunications and others.

The planned profile cluster on the SEZ territory was to include a number of umbrella-type enterprises. Its "heart" was to be the first integrated gas chemical complex. A high ROI and a threefold multiplier effect on related industries made petrochemical enterprises very attractive for investments. However, the petrochemical segment was unable to capture its niche. This was due to a lack of detailed business plans, expensive investments, as well as a lack of interest from large foreign oil and gas producers in establishing raw hydrocarbons deep conversion within the country, in favour of the more profitable and simple export of raw materials. The Government's hopes were pinned not only on foreign, but also on Kazakhstani investors. In recent years, most of them were by then standing on their own two feet and had high-quality management.

Taking into account the scale of investment projects, their compliance with global standards, as well as the volume of investments invested in projects, the Government of the Republic of Kazakhstan made a decision to establish public-private partnership mechanisms, in order to create favorable economic, administrative and infrastructural conditions. Significant changes were made to the Law "Concerning Gas and Gas Supply" in order to resolve the issue of providing petrochemical plants with raw materials (gas). First, the definition of "industrial consumer using commercial gas for the production of petrochemical products" was introduced. Secondly, a special gas pricing formula was introduced for this category, and the opportunity was provided to reserve the required volumes of raw materials (commercial gas) for the project within the republican gas balance. It also established the right to purchase liquefied petroleum gas at state-regulated prices for the

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production of petrochemical and gas products. The procedure for employing foreign labor was also simplified. In order to implement the ambitious task of creating production facilities for the deep processing of hydrocarbon raw materials at stages 4-5 – the National Project for the Development of the Petrochemical Industry until 2025 (medium term) and the Long-term Development Strategy for the Petrochemical and Gas Industries were developed. These projects defined specific tasks and measures aimed at creating a competitive industry with high added value.

As of 2021 as a result of these and other measures, in its petrochemical investment portfolio Kazakhstan has a number of promising large-scale projects, as well as those already completed. Their implementation would have seemed fantastic and unrealistic at the dawn of independence. The largest of them are the construction of a polypropylene production complex with a capacity of about 500 thousand tons per year, a facility for the production of polyethylene with a capacity of 1.25 million tons per year, and a plant for the production of 375 thousand tons of terephthalic acid and 400 thousand tons of polyethylene terephthalate (PET) per year. The raw material for these products is paraxylene produced at the Atyrau refinery and so far exported to Russia. There is also a project for the production of butadiene and its derivatives with a design capacity of 186 thousand tons per year and others.

An important factor is that all four production facilities will be located in the Atyrau region, in SEZ, just a few kilometers from the Tengiz and Kashagan fields, the sources of raw hydrocarbons.

Although these first two projects were united by the Government of the Republic of Kazakhstan under the brand of an integrated gas chemical industry, divided only into the first and second phases - polypropylene and polyethylene, they are in essence completely autonomous. Their "separation" occurred due to the high cost, fueled by the endless financial crises, and the impossibility of attracting single shareholders to bear the excessive investment burden. Thus, the value of the polypropylene plant is estimated at US \$1 billion 865 million, and the polyethylene plant – at US \$6.8 billion.

Contrary to the loan agreement between the Development Bank of Kazakhstan JSC and China's Eximbank on financing a polypropylene project signed in 2011, Kazakhstan Petrochemical Industries Inc LLP (99% of United Chemical Company LLP – fully controlled by Samruk-Kazyna Sovereign Wealth Fund JSC, 1% – from the Kazakh LLP "Almeks Plus Firm") did not start construction work. Active construction began only in 2018, after the project was transferred to the management of KazMunayGas. The design was completed with the participation of the Kazakh Institute of Oil and Gas. The general plan of the plant and the requisite process flow charts were approved, and the construction schedule was optimized. Specialists with experience in the implementation of large projects in Kazakhstan were contracted. Orders were placed for the manufacture of basic equipment and materials at AtyrauNefteMash, Petropavlovsk Plant of Heavy Machine Building, Imstalcon and other Kazakh enterprises. The EPC contractor was the Chinese company China National Chemical Engineering Co (CNCEC). 33 of the 36 subcontractors involved in construction sites, are local companies. The site is located 33 km north-east of the city of Atyrau, 8-9 km north of Karabatan, close to the existing railway (9.2 km) and motor vehicle roads (6.3 km). The industrial site is comprised of two main technological units: propane dehydrogenation with a capacity of 503 thousand tons per year (CATOFIN technology); and propylene polymerization with a capacity of 500 thousand tons per year (NOVOLEN technology), as well as the required infrastructure facilities. Lummus Technology Inc, a world-renowned company in the field of polymer production, was selected as a licensor for the project. It was the first time that such technologies had been introduced to the territory of the Republic of Kazakhstan, and the former Soviet Union. Enterprises with similar technology and similar production volumes were available only in the USA (Texas), PRC (China) and Saudi Arabia.

Completion of construction and installation work at the polypropylene complex in December 2021 will be a gift for the 30th anniversary of the sovereign development of Kazakhstan. The commissioning of the facility in 2022 will mark the implementation of this largest petrochemical and gas project in the history of a sovereign country. The project will allow KazMunayGaz to enter the world polypropylene market as a serious player. Polypropylene is widely used in mechanical engineering, medicine, electrical engineering, in the production of packaging materials, containers, fibers, pipes and fittings for hot water supply, office equipment and consumer electronics, consumer goods, garden and office furniture. The raw feedstock for the plant will be propane produced by Tengizchevroil LLP, the developer of the Tengiz field, the largest in Kazakhstan. In the future, the assortment will be supplemented by grades of high-impact copolymers to cover practically all areas of polymer use. The low cost and excellent physical and chemical properties of polypropylene will contribute to the development of many industries in the Republic of Kazakhstan.

The planned construction of a polyethylene production complex will be the second stage in the creation of an oil and gas chemical cluster in the region. This will be followed by the production of high-tech basic products. Polyethylene has high performance characteristics such as flexibility, transparency, non-toxicity, ease of processing and modification. It is the most demanded polymer in the world with an annual consumption of more than 100 million tons per year, or 32% of the total amount of consumed polymers. The high demand for polyethylene is due to the fact that a large number of household and industrial products and goods are made from this polymer, such as, for example, polyethylene pipes, construction and packaging materials, etc. Polyethylene production will include technological units such as a steam cracking unit (pyrolysis), a polymerization unit, as well as an auxiliary unit for ethylene dimerization.

In order to create a polyethylene production facility, KLPE LLP, the operator representing the interests of KazMunavGas in the project, plans to implement three projects: construction of a gas separation unit (GSU) with a capacity of 9.1 billion cubic meters per year with the extraction of 1.6 million tons of ethane from dry gas per year; an ethane pipeline with a length of 205 km, designed to transport liquid ethane from Tengiz to Karabatan; and the polyethylene plant itself. In August 2020, in order to ensure the reliability of feedstock supplies to the polypropylene plant, KLPE and TCO signed an agreement on the basic terms of interaction in the design of a gas separation unit. This provides for the return of processed gas amounting to 7.3 billion cubic meters per year to TCO. JGC Corporation was involved in the development of the design work for the FEED stage (basic design), and Honeywell UOP (USA) was appointed licensor of ethane recovery and propane purification technologies. As licensors of the pyrolysis process, the project has considered such world leaders as KBR, Linde, McDermott, Technip with their own know-how for production solutions. Technologies provided by large-scale licensors as Chevron Phillips Chemicals, Univation Technologies, Lyondell Basel, Sabic, Mitsui and others are being studied for the polymerization process. Gas from the Tengiz and Kashagan fields to the amount of 6.3 billion cubic meters per year will also be used as feedstock for polyethylene production.

Many large foreign companies were interested in this project at an early stage. In 2011, with the participation of the Presidents of Kazakhstan and the Republic of Korea. Nursultan Nazarbavev and Lee Myung-bak, the Korean LG Chem Ltd signed an agreement on a joint venture with Kazakhstan. However, the global economic crisis required adjustments to the investment plans. In 2018, Samruk-Kazyna SWF JSC and the Arab-Austrian Borealis (Mubadala - 64%, OMV - 36%) also signed an agreement on the development of the project. This provided for the construction of an ethane cracking unit and two polyethylene production units based on proprietary Borstar technology with a total capacity of 1.25 million tons per year with the possibility of further expansion of the cracking unit in the future. However, in 2020, at the final stage of the development of an intergovernmental agreement, as well as a government support agreement, aimed at establishing state support measures to ensure the transition to the design and structuring stage, Borealis announced its withdrawal as a result of the global crisis caused by the spread of the coronavirus infection Covid-19 and low oil prices. At the same time, the search for another strategic partner began. The conditions proposed for the implementation of the project were improved, in particular, with regard to the uninterrupted supply

TCD **BOLASHAK COMPLEX** TENGIZCHEVROIL **GAS PREPARATION UNITS GAS PREPARATION UNIT** NCOC Propane Butane NGLs 560 thousand tons 800 thousand 530 thousand **FKLPE** TCO GSU PROJEC tons tons NCOC GSS PLAN **NGLs - SEPARATION OF** 3.8 bln m3/year PROPANE AND BUTANE ΝΟΟ NCOC Propane 180 thousand tons TCO ethane Propane 400 thousand tons Propage Butane 1 600 thousand 300 thousand 209 tons tons thousand NCOC ethane 497 thousand tons tons **KLPE** Ethylene 1.275 Isobutane 109 Propane 630 POLYETHYLENE thousand tons thousand POLYPROPYLENE thousand tons KPI **ISOBUTANE EXPORT** CHLORINE Propane 680 Butane 250 Ethylene 260 thousand thousand tons **BUTANE EXPORT** KPI thousand 250 thousand tons WATER OXYGEN WATER OXYGEN Ethylene 75 Propane 240 Butane 380 PROPYLENE GLYCOL thousand thousand tons thousand tons **BUTADIENE RUBBER** 0 245 t Benzene 133 thousand tons Ethylene 50 Водород thousand tons 110 тыс.ті

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of raw materials for the future polyethylene plant. In addition, the design of a gas separation unit was started.

The result of the active search for a partner led to the signing of a trilateral agreement on the construction of an integrated gas chemical complex between Samruk-Kazyna SWF JSC, JSC NC KazMunayGas and the largest Russian petrochemical and gas producer "SIBUR Holding" PJSC in June 2021. "SIBUR's positive decision to enter the project will provide the reliable partner necessary for the implementation of such a significant complex for our country. I would also like to note that this project will receive comprehensive support from our side. We will take all necessary measures for its successful implementation", noted Alik Aidarbayev, the Chief Executive Officer of NC KazMunayGas JSC. "SIBUR has unique experience in implementing large-scale investment projects in the field of petrochemicals and is interested in expanding the petrochemical part of the business, including by entering new markets. In the event of the joint implementation of projects, we will be happy to share with our partners the accumulated expertise in the commissioning of projects and the operation of world-class polymer complexes. Our partners have extensive experience in the construction and operation of large production facilities, in the production, transportation and processing of oil and gas and, in turn, will be able to provide the projects with the necessary feedstock support and the existing infrastructure within the framework of the special economic zone," Dmitry Konov, the Chairman of the Management Board of PJSC SIBUR Holding, added.

Assessing the prospects of both projects, Daniyar Tiyessov, Deputy Chairman of the Management Board for Refining and Marketing of JSC NC KazMunayGas, stated that their implementation would provide a great impetus to the development of Kazakhstan's industry. "We have been producing oil for 120 years, processing it into petroleum products for 75 years, and now we are developing a new industry – oil and gas chemistry", he said.

Polymer Production LLP (in operation since 2012), established by United Chemical Company LLP (90%) and Propylene Pack LLP (10%) have future plans for the production of polymer containers (bags), polypropylene and polyethylene films. They are also planning to participate in the design of an integrated gas chemical complex, thus ensuring their own advantage in using proprietary, rather than imported raw materials.

In 2022, Zhaik Petroleum LLP intends to implement a project for the construction of a gas chemical complex in the West Kazakhstan region for the production of AA class methanol and a diesel fuel component with an average annual capacity of 350 thousand metric tons. The project was co-developed by Westgasoil

Pte. Ltd. (Singapore). The volume of investments is estimated at US \$166.1 million, with the following financing structure: 30% private investments (Haldor Topsoe, Denmark, Sanli Technologies, China, and SAS, Germany); and 70% state funds of the Development Bank of Kazakhstan JSC. Estimated tax revenues to the budget of the West Kazakhstan region will amount to 66 billion tenge for the period of operation in 2022-2042. The sales markets will be Kazakhstan (62%) and Russia (38%). There are already preliminary off-take contracts with Atyrau Refinery LLP and Ektokhim LLC. The methanol production process will be carried out using Haldor Topsoe GTM (Gas To Methanol) technology: 1. desulfurization. 2. gas processing (for hydrogen, carbon monoxide and carbon dioxide), 3. synthesis, and 4. purification of the final product from impurities. In 2020, the project for the construction of a gas chemical complex for the production of class AA methanol and a diesel fuel component in the West Kazakhstan region was included in the list of investment proposals of the national company Kazakh Invest JSC.

In 2023, Shymkent Chemical Company LLP (part of the ALMEX Holding Group JSC) plans to build a plant for the production of methyl tertiary-butyl ether on the territory of Ontustik, a special economic zone in the Enbekshi district of Shymkent (Turkestan region), with an investment of US \$36 million. The capacity of the enterprise for the production of polypropylene will be 81 thousand tons per year, and octane-enhancing additives for gasoline - 57 thousand tons per year. Methyl tertiary-butyl ether will be used at the Shymkent Oil Refinery for the production of high-octane gasolines of K4 and K5 environmental classes. The implementation of the project will contribute to an increase in the share of the processing industry in Kazakhstan by creating a petrochemical cluster in the Ontustik SEZ. The Development Bank of Kazakhstan JSC (DBK) in 2020 allocated a loan in the amount of 9 billion tenge for up to 10 vears for the construction of the new plant. The total cost of the project amounted to 13.7 billion tenge. The remaining investments in the amount of 4.7 billion tenge were made by Shymkent Chemical Company LLP at its own expense. The plant design was developed on the basis of the world famous Etherification technology of the French company Axens - one of the international leaders in the production of MTBE. The construction of the plant is due to the wide demand for MTBE in Kazakhstan. For example, the annual demand of the domestic market is 80 thousand tons. According to the company's plans, the plant's products will not only cover the industrial needs in Kazakhstan, but also have access to the markets of other countries (Russia, China, Turkey, Japan and others). 800 jobs will be created over the period of construction of the plant, and after the commissioning of the plant - up to 350 jobs. The Shymkent MTBE Plant meets the strategic state objectives for the development of the oil and gas industry and the integrated deep conversion of hydrocarbons. The commissioning of the new plant will increase the share of the processing industry in Kazakhstan, as well as allow the production of petrochemical products with high added value. The project is included in the Industrialization Map of the Republic of Kazakhstan.



"... High expectations for the development of the regional economy are associated with oil and gas chemistry. ... This industry is the basis for the future economy of the region and the entire country."

Kassym-Jomart Tokayev,

President of the Republic of Kazakhstan during a meeting on the socio-economic development of Atyrau region in 2021

In addition, in 2023, Standard Petroleum & Co LLP (part of the Ontustik financial trade and industrial corporation) will build a petrochemical combine named "Standard Petrolneftekhim" for the production of motor fuels and petrochemical products in the Ordabasy district of the Turkestan region with an investment of US \$257.45 million. It is planned to use the unconventional technology of advanced petroleum refining here, namely cyclonic refining, or vortex esterification. The production capacity of the plant will be from 1 million tons to 1.85 million tons of raw materials per year. The raw materials will be oil and gas condensate, as well as their mixtures from the Kenlyk field. The petrochemical products will be AI-95 class 5 gasoline, winter and Arctic class 5 diesel fuel,

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gas engine propane-butane fuel, petroleum coke (at the initial stage – M150 fuel oil), aromatics mixture (BTX), isopropyl spirit, naphthalene, polymers, urea, and oxygenates.

Almex Petrochemical LLP, part of the ALMEX Holding Group JSC, plans by 2024 to build a terephthalic acid (TPA) plant with a capacity of 375 thousand tons and PET with a capacity of 430 thousand tons per year in the Atyrau region on the territory of the National Industrial Petrochemical Technopark SEZ. The production will be mostly exported to the markets of Europe and Asia on an off-take basis, as well as used in Kazakhstan. The general designers were the Kazakh Institute of Oil and Gas (KIOG) from the Kazakhstani side and the project institute "Soyuzkhimpromproekt" of the Kazan National Research Technological University on the Russian side.

JSC NC KazMunayGas and PJSC Tatneft plan to build a plant in the Atyrau region by 2025 for the production of butadiene rubbers used in bitumen modification, production of adhesives, glues, rubbers and environmentally friendly tires. The plant's capacity will be 186 thousand tons of butadiene rubbers and 170 thousand tons of isobutane per year. Synthetic rubbers are widely used in the production of automobile tires, road surfaces, and industrial rubber goods. The world market for their production is over 5 million tons with an annual growth of about 3%. The feedstock for the plant will be butane produced by Tengizchevroil LLP. Finished products will be supplied to the KamaTyresKZ tire plant in the Karaganda region, as well as for export to European countries, Russia, China, Turkey and others. The implementation of the project will allow the creation of about 2,000 jobs during the construction period and 400 jobs during the operation of the plant. In April 2021, an agreement on the basic





terms of interaction and a framework agreement for the project were signed. The butadiene and synthetic rubbers production project is an important milestone for the development of the national petrochemical and gas industry. It is a high-tech industry and requires licensed butane dehydrogenation units from Lummus Technologies Inc., butadiene extraction units from Lummus-BASF, Nippon Zeon, Lyondell-Basell, as well as a polymerization unit for the production of Versalis, Sabic, Sinopec synthetic rubbers.

If we consider the prospects of this industry in Kazakhstan as a whole, the expected economic effect from the activities of an integrated gas chemical complex alone, as well as a plant for the production of butadiene rubbers is impressive. The volume of production of petrochemical and gas products by 2030 is expected to be more than 2 million tons and exports in 2030 with a value of more than US \$3 billion. The total amount of funds raised (borrowed funds and foreign investment funds) for the announced projects will be about US \$13 billion. During the construction period, more than 10,000 jobs will be created, and about 2,000 during the operation period. The contribution to the country's GDP from the implementation of petrochemical and gas projects is estimated to be from 1.3% to 1.5% by 2030. Import substitution by 2030 for polypropylene will be 90%, butadiene – 70% and polyethylene – 50%. At the same time, the synergy formed between the facilities will serve to lengthen the chain of deep processing industries. The use of Tengiz raw materials, in addition to production of polypropylene, polyethylene, PET, butadiene and synthetic rubbers, will allow for the production of monoethyleneglycol (140 thousand tons per year) and urea (790 thousand tons per year).

All of the above-mentioned projects have a high level of technical complexity and requirements for the production mode. They are also of high social importance. First of all, we are talking about both the creation of new jobs directly in projects, and the effect of scale. The construction of plants will serve as the basis for the creation of a number of other production facilities in the chemical, light, food, automotive, construction, mechanical engineering, medicine and other industries.

According to KazMunayGas forecasts, in the coming years more than 1,000 highly qualified engineers and 2,000 qualified technicians will be required at the stage of operation of petrochemical projects. Systemic measures will be taken to train

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personnel, including the development and adoption of professional standards in the petrochemical industry. The current educational programs of universities and colleges will be revised. New disciplines will be introduced, as well as new standards and teaching methods. Dual education will be introduced to facilitate the establishment of effective cooperation between educational institutions and petrochemical companies. This will also allow for the adaptation of educational programs and lists of professions to the current needs of enterprises.

Systemic measures are being taken within the framework of the development and implementation of research and development in the field of petroleum chemistry. Centers of Excellence and R&D Centers for the petrochemical industry development will be created for this purpose. The state with its promise to create special conditions for the development of the petrochemical industry in Kazakhstan has guaranteed investment protection, provided projects with guaranteed feedstock, and financed the construction of plant-wide infrastructure. Furthermore, since all these projects are being implemented within the framework of special economic zones, the state has also exempted them from tax and customs duties and simplified the procedure for attracting foreign labor.

The implementation of all these projects will make it possible to move away from the country's dependence on raw materials. They will enable Kazakhstan to produce products with high added value, increase the share of the processing industry, diversify the economy and give impetus to the development of small and medium-sized businesses. The lower volatility of polymer prices in comparison with oil and gas makes the forecasted export earnings attractive. Every tenge invested in petrochemistry, on average, gives a four-fold multiplier effect in the economy.

"After 2030-2035, many European countries and China are planning to completely abandon diesel engines. No one can fully predict what the demand for crude oil will be during that period. And therefore, the trend in the future is processing within the country. Support for petrochemistry is one of the main ways out of this situation", noted Kanat Bozumbayev, who served as the Minister of Energy of Kazakhstan.

Today, there are clear expectations of the rapid implementation of petrochemical projects in Kazakhstan. They should reshape the current structure of the country's economy, for which raw material production until now formed the basis for GDP growth.

During a meeting on the socio-economic development of the Atyrau region in 2021, President of the Republic of Kazakhstan, Kassym-Jomart Tokayev, said the following words "... great expectations for the development of the regional economy are associated with petrochemistry. ... This industry is the basis for the future economy of the region and the entire country".



... in the coming years, more than 1,000 highly qualified engineers and 2,000 qualified technicians will be required at the operational stage of petrochemical projects. In this regard, work is planned on taking systemic measures for the training of personnel, including the development and adoption of professional standards in the petrochemical industry.



Chapter 9

"WE SHAPE OUR BUILDINGS AND AFTERWARDS OUR BUILDINGS SHAPE US."

Winston Churchill,

British statesman, Prime Minister of the United Kingdom from 1940 to 1945 and from 1951 to 1955

At the dawn of independence, Kazakhstan was the first of the countries of the former USSR to engage in systemic support of entrepreneurs. An important element was establishing legislative measures to protect the interests of domestic suppliers of goods, works and services (GWS) for the oil and gas sector. The oil and gas industry was the leading front to ensure economic growth in the country. The efficient development and life support of oil and gas fields have always depended on high-quality oilfield services.

After the adoption by the President of the Republic of Kazakhstan, Nursultan Nazarbayev, on May 5, 1992 of the State Program for the Support and Development of Entrepreneurship in the Republic of Kazakhstan for 1992-1994, and then the signing in July 1992 of the Law "Concerning Protection and Support of Private Entrepreneurship", dozens and even hundreds of small and medium-sized businesses began to emerge in the country, all applying for participation in promising oilfield service contracts. However, the modest share of domestic companies in the oilfield services market in Kazakhstan at that time unfortunately demonstrated the inability of local businesses to meet international requirements in the provision of the relevant services. Large industrial corporations,

acting as shareholders of oil and gas projects, preferred to purchase goods, and to engage exclusively foreign suppliers in the performance of work and the provision of the best trained and compliant oil workers. For many years, the ratio of foreign and domestic companies and organizations in the oilfield services market of Kazakhstan was dominated by foreigners. This situation has improved only during the financial and economic crisis of the late 2000s when Nursultan Nazarbayev spoke on the need for a comprehensive increase in the Kazakhstani content in the projects of foreign investors, especially subsoil users.

"At first, not all partners took this positively, but we were persistent, firm and convincing. At the meeting of the Foreign Investors' Council in December 2008, I stated that the development of Kazakhstan's local content should be the number one issue for the Government", the Head of the State noted.

The development of Kazakhstan local content has become a strategic task for the Government of the Republic of Kazakhstan.

For the first time, a surge in activity and growth of local companies in the oil and gas market occurred in the 2000s, during the construction of large-scale and high technology facilities

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at the Tengiz and Karachaganak fields. At that time, dozens of domestic enterprises received contracts for the construction of the Second Generation Plant and Sour Gas Injection (SGP/SGI) at Tengiz, as well as the Karachaganak gas processing complex and the Karachaganak-Bolshoi Chagan-Atyrau oil pipeline. The incorporation of Teniz Burgylau LLP in 2008 stimulated the drilling services market of the country.

In 2007-2009, the Government, on behalf of the President of the Republic of Kazakhstan, began to monitor more consistently the activities of foreign companies, and check their compliance with their contractual obligations. Most importantly, they wanted ensure that the interests of Kazakhstan were not harmed. By that time, the level of development of Kazakh companies had risen noticeably, and it was clear that many oil and gas projects were within the capabilities of domestic producers, especially since the financial sector had sufficient capital for this.

As Nursultan Nazarbayev wrote in his book "The Era of Independence" (Astana, 2017), "...from now on, a clear state line – the development of Kazakh content – in cooperation with multinational companies became the main and unshakable line". Kazakhstani producers began to sign more contracts with national companies.

The concept of "Kazakh content" appeared in 2008 in connection with amendments to the Law of the Republic of

Kazakhstan dated July 21, 2007 No. 303 "Concerning Public Procurement", and since January 2012, with the introduction of new laws and regulations, it was replaced by "local content". In 2008-2010, the concepts of "domestic (Kazakhstani) supplier of works and services" and "domestic (Kazakhstani) producer of goods", or jointly - "national suppliers" were introduced into the legislation of the Republic of Kazakhstan. The law defined domestic suppliers of works and services as individuals and legal entities in which $\ge 95\%$ of employees are citizens of the Republic of Kazakhstan, as well as those whose goods have a CT-KZ certificate as Kazakhstani producers. National suppliers were given the right to a 20% conditional discount when participating in tenders of subsoil users. Almost all subsurface users were assigned percentage contractual obligations for local content in the GWS (for example, 30% - in purchased goods, 85% - in works, services) and the obligation to indicate the required percentage of local content (from 0 to 100%) in their tender announcements.

In order to develop Kazakhs content of goods, works and services (GSW) in industrial projects in the Republic, including oil and gas, the Government adopted a special program for 2010-2014. According to this program, by 2014, subsoil users were required to increase the level of economically profitable production of local goods to 16%, and works and services to 85%. The percentage of Kazakhstani personnel employed in their projects

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> was as follows: for senior managers, at least 70%; for middle managers, engineering and technical personnel and working specialties, at least 90%. For state institutions and organizations, national holdings and companies, as well as system-forming enterprises, these indicators were: for goods - 60%; for works and services – 90%. The program was financed from the republican budget to the amount of 2,845.6 million tenge. Firstly, with its adoption, Kazakh business received direct access to subsoil users purchase plans. If earlier domestic enterprises were on a one-onone footing with subsoil users who carried out purchases at their discretion, then the situation in 2011 drastically changed. From now on, any entrepreneur who is registered in the information system (IS) of the Register of the Ministry of Oil and Gas and the Ministry of Industry and New Technologies could see what, when and for what amount oil and gas companies purchased GSW. In 2010, the Ministry of Oil and Gas started analyzing purchases for compliance with the Rules approved by the Government for subsoil users. The purchases of 128 companies were tracked through the Register IS from the submission of the bid to the announcement of the bidding results. In addition, having felt the support of the state, Kazakh businessmen began to complain to the Ministry of Oil and Gas about violations during procurement. Statistics show that in 2010 violations were detected to the amount of 157 billion tenge, which is 25% of all purchases. In 2011, the amount of violations decreased to 18%. One of the most effective ways to reduce the number of procedural violations and increase the transparency of procurement is to transfer purchases to an electronic format. For example, the transfer of public procurement to an electronic format has reduced the number of procedural violations by 70%. At that time, about 25 subsoil users of the oil and gas sector introduced electronic procurement platforms. Secondly, outsider companies were obliged to develop their own corporate programs for the development of Kazakh content. If at an earlier stage the lack of clear obligations for Kazakh content in figures was a serious problem, now the number of such contracts significantly decreased. An important point when signing agreements with subsoil users was the introduction of fines for non-compliance with the level of Kazakh content provided for by the model contract approved by the Government. In the new agreements, the Ministry included penalties for non-fulfillment of the relevant procurement obligations to the amount of 30%. For this reason, many subsoil users refused to sign such agreements, as this greatly increased the risks of their business. However, other sanctions to increase the Kazakh content in the GSW seemed less effective to the Government.

Since January 1, 2014, the Law of the Republic of Kazakhstan "Concerning Public Procurement" dated July 21, 2007 introduced the concept of "national regime". This provided access to GSW by potential suppliers from the countries of the Eurasian Economic Union, enabling them to participate in public procurement on equal terms with national suppliers. This contributed to the growth in services and manufacturers from the Eurasian Economic Community countries. Since December 4, 2015, the relationship between subsoil users and suppliers of GSW has been regulated by the new Law of the Republic of Kazakhstan "Concerning Public Procurement" No. 434-V. An important step in the support of domestic business, namely Kazakh producers, including in the oil and gas sector, was the creation of the Kazakh content web portal.

With legislative transformations in this sector, as well as the implementation of major production projects, the number of Kazakh oilfield service companies has grown, and the thinking and approaches of domestic business to the quality of GSW have changed. The Head of State set a task to raise the development of local goods, works and services to 50% of GDP.

By 2017, the oilfield services market was still a very heterogeneous structure. In the drilling services sector, the leaders were foreign companies: American Schlumberger, Baker Hughes, Weatherford Kazakhstan, Halliburton, Chinese BGP Geophysical services and CNLC International. Kazakhstan's Geo Energi Group, RT Alliance, Techno Trading Ltd and Azimut Energy Services held only minor stakes in drilling projects. However, measures taken in recent years by the Government of Kazakhstan and the largest oilfield services customers have stimulated the growth of the share of local players in the national oilfield services market. They have also led to an increase in the number of joint ventures with foreign companies, indicating the prospects for the development of such cooperation. Unconditional confirmation of this was the creation in 2018 of a joint venture between KMG Drilling & Services and one of the world's oilfield service giants, Parker Drilling, to provide onshore drilling rigs for Karachaganak. Other important joint ventures were the opening of a service and production center in the Mangystau region with the participation of Schlumberger, as well as the incorporation of a joint venture between Baker Hughes and the Kazakhstan Nitrogen Plant. Incorporation of joint ventures was useful and important for Kazakh businesses, primarily from the point of view of using the unique experience, knowledge, technologies and management systems. They opened the way for local oilfield service companies to participate in large projects in oil and gas fields (and not only in basic works, but also more technologically advanced ones), successfully competing with leading international market players. The second sector covered foreign and major Kazakh companies engaged in the construction of onshore upstream facilities, laying pipelines, drilling wells, transportation of heavy and bulky cargo. The third sector, which required the implementation of basic construction and installation works, including the construction of office buildings and shift settlements, roads, transportation of simple goods, as well as catering, was set aside for local enterprises. The leading position



in the segment of oil and gas construction has been occupied for many years by TenizService LLP. It participates in the North Caspian Project in areas related to the design, construction and operation of coastal support facilities for offshore oil operations in the Kazakhstan Sector of the Caspian Sea. This includes a complex for the shipment of rock, a landfill for the disposal of toxic industrial waste, a support base for offshore oil operations, a refueling station for ships and others.

By the 30th anniversary of Kazakhstan's sovereignty, the oilfield services market has become one of the key sectors of the economy, involving more than 2 thousand companies with a total staff of over 200 thousand people. By comparison, in 2015, the number of oilfield service companies in Kazakhstan was estimated at more than 700. By the end of 2020,

"By increasing oil and gas production, we must create a modern oilfield service cluster. The development of oilfield services will give an impetus to the development of domestic SMEs, the creation of skilled and productive jobs, and the localization of production with high added value."

> *Kassym-Jomart Tokayev,* President of the Republic of Kazakhstan

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> the TOP 30, represented by 8 Kazakh companies, 9 joint ventures and 13 completely foreign companies, accounted for 30% of all oil sector procurements. According to a Deloitte study, the most noticeable increase in the volume of oilfield services in monetary terms in Kazakhstan occurred in the period from 2016 to 2019 – from more than US \$5 billion to US \$9 billion (in 2016 – US \$5.4 billion; in 2017 – US \$6.4 billion; in 2018 – about US \$8 billion; in 2019 – US \$8.9 billion). The main increase was due to construction works for the FGP-WPMP in Tengiz. By the end of 2020, this indicator decreased against the background of the global crisis caused by a sharp drop in oil prices and the Covid-19 pandemic.

> In 2020, the total share of Kazakh companies amounted to 44% of all orders in dollar terms. In the structure of local GSW, construction confidently occupies more than 70%; drilling – more than 60%; maintenance – more than 45%; geological services – more than 15%; and design – more than 12%. Thus, Kazakh business is least involved in engineering and geophysics projects. Nevertheless, in recent years, the role of Kazakh engineering organizations in the development of oil and gas projects has increased markedly.

One of the leading engineering companies in Kazakhstan, which provides a full range of services for industrial and civil design, project management and engineering, is Kazgiproneftetrans Engineering Company LLP (KGNT). Founded in 1974 to design the facilities of the oil product supply system, over a period of 46 vears it has significantly expanded its scope of business, having designed and commissioned more than 1,000 facilities. Over the past decades, KGNT has expanded to more than 16 cities and 15 offices around the world. In order to conduct sustainable business for the implementation of major international projects, KGNT, in partnership with world engineering leaders, has established joint ventures with Flour, Axens (Axens KGNT Energy Efficiency), WorleyParsons (in the UK - WorleyParsons-KGNT Kazakhstan Engineering Limited, in Kazakhstan - KGNT-Worley Parsons LLP). In addition, a joint venture KPJV was incorporated with the participation of KGNT, Kazakh Institute of Oil and Gas JSC, Worley Parsons and Fluor to implement the FGP-WPMP. This partnership marked a new milestone in the development of domestic engineering. It has established the best form of cooperation between local and foreign companies, allowing for the transfer of world experience and the establishment of parity relations. As part of KPJV, about 400 highly gualified KGNT employees are involved in the project, working in Almaty, Atyrau, at the Tengiz field, in Farnborough (Great Britain) and the Republic of South Korea. The portfolio of the largest KGNT projects includes the development

of the 4th Gas Re-injection Compressor Project for KPO (2018), the pre-design of the Second-Generation Plant Project for TCO (2017), engineering services for the Project of Expanding Sulfur Processing Capacities at Tengiz for WorleyParsons Kazakhstan LLP (2010), a feasibility study for the construction of the Eskene-Kuryk oil trunk pipeline for ILF Kazakhstan Engineering and UP LLP (2009), preparation of a detailed design and documentation for the expansion of the gas processing plant at the Akshabulak field and the development of the Nuraly field as part of its pilot operation for Kazgermunai LLP (2009). Other projects include a feasibility study for the construction of the 4th turbine of the gas utilization project at the Kumkol field for PetroKazakhstan Kumkol Resources JSC (2008), the development of design estimates for the modernization of associated petroleum gas collection and transportation systems at the Kumkol field of the contract territory of Turgai-Petroleum JSC (2007), adjustment of the feasibility study of the Aktau International Commercial Sea Port expansion in the northern direction project (without oil berths) for Kazgidro LLP (2005), development of design and estimate documentation for the storage and loading of liquefied petroleum gases tank farm as part of the reconstruction of Atyrau Refinery for Standard Gas LLP (2004) as well as many others.

The well-tuned interaction management system established between KGNT offices allows central monitoring of the progress of projects, as well as the exchange of knowledge and experience for their successful implementation. The project management team in Almaty effectively oversees large-scale projects at various locations: Nur-Sultan, Atyrau, Aksai, Tengiz, Pavlodar, Uralsk, Kiev, London, Farnborough, Manchester, Busan and Okpo-Dong (Korea).

Among other largest engineering companies in Kazakhstan are Kazakh Institute of Oil and Gas JSC (KING), with extensive experience in design and complex scientific and engineering support of oil and gas, energy, industrial facilities in the country, with offices in Nur-Sultan and Almaty, as well as one of the oldest design institutes in the country - SRDI Caspiymunaygas JSC in Atyrau. The bureau's history goes back to the middle of the last century, and during this time it has contributed to the development of almost all major projects in the oil and gas industry. Among the significant projects implemented by KING are the preliminary feasibility study for the construction of a plant to produce sulphurcontaining composites commissioned by TCO (2015-2015), the implementation of comprehensive technical studies and feasibility studies for the modernization of production facilities at the Karamandybas field for Ozenmunaigas JSC (2003-2004), the preparation of technical documentation for the "Kashagan field experimental program facilities development project. Offshore complex. Facilities for gas re-injection into reservoirs. Marine access channels 1, 2" in connection with the reconfiguration of Complex D as part of Phase 1 for Agip Kazakhstan (2006-2008), a comprehensive study of sedimentary basins for JSC NC KazMunayGas (2009-2011), updating the Integrated Development

TRENDS IN PROCUREMENT OF KAZAKH OILFIELD SERVICES

Nº	Segment	Payments by years, bin tenge						КZ
		2016	2017	2018	2019	2020	Rise/fail	Share
1	Construction & installation work	888	1032	1519	1875	1125	-40%	34%
2	Drilling	349	418	372	403	361	-11%	69%
3	Design & Engineering	334	493	517	389	251	-36%	12%
4	Maintenance & Repair	218	252	252	470	247	-47%	65%
5	Geology & Geophysics	253	135	186	259	193	-25%	29%
6	Total	2042	2330	2847	3397	2176	-36%	40%

PROCUREMENT STRUCTURE BY WORKS AND SERVICES OF OIL PRODUCING COMPANIES

N⁰	Segment	Amount, billion tenge	Share (%)
1	Construction and installation works	1.125	24.8
2	Oil and gas transportation	951	21.0
3	Drilling operations	361	8.0
4	Logistics and transport	344	7.6
5	Design and engineering services	251	5.5
6	Maintenance and repair	247	5.5
7	Geological and geophysical services	193	4.3
8	Recruitment services	185	4.1
9	Accommodation and catering services	172	3.8
10	Rental of specialized equipment	145	3.2
11	Partner expenses (shareholders' expenses)	93	2.1
12	Consulting services	85	1.9
13	Environmental services	46	1.0
14	Electricity, water, gas	39	0.9
15	IT services	29	0.6
16	Security services	24	0.5
17	Insurance	23	0.5
18	Laboratory services and inspection	12	0.3
19	Administrative expenses (office)	12	0.3
20	Medical services	7	0.2
21	Other services	206	4.5
22	Total	4.532	100.0

Plan for the coastal strip of the Kazakhstan Sector of the Caspian Sea for JSC NC KazMunayGas (2010-2011) and many others.

Given the importance of projects involving KGNT, KING and other companies, it has become clear that Kazakh engineering has grown significantly and strengthened over the years of independence. As for other GSW, in 2020, the construction of 807 oil and gas wells was completed in Kazakhstan's oil fields. This required an investment of US \$700 million, excluding VAT. The average cost of drilling one well after decreasing in 2015-2018 has stabilized at the level of US \$900-950 thousand, excluding VAT.

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Deloitte forecast



FINANCING OF PRODUCTION DRILLING, USD BILLION, EXCLUDING VAT



AVERAGE COST OF DRILLING PER ONE WELL, USD MILLION, EXCLUDING VAT



The financing of hydrocarbon exploration in 2020 amounted

to about US \$250 million, excluding VAT. The State Geological

Exploration Program assumes an increase in the total amount

allocated for hydrocarbon exploration to US \$1.5 billion during 2021-2025.

FINANCING OF GEOLOGICAL EXPLORATION IN KAZAKHSTAN, USD million, excluding VAT

for Oil and gas of Kazakshtan, Deloitte forecast



By funding sources



In recent years, hydrocarbon exploration has been fully funded by national companies and subsoil users. However, in the next 5 years – from 2021 to 2025 – the total amount of financing from the Republican budget may amount to 200 billion tenge, excluding VAT (about US \$450 million). Of this amount, 85 billion tenge (US \$200 million) is planned to be allocated for 2D seismic exploration and parametric drilling.

According to the Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan, as of 2021, the 50 largest oil and gas companies in the country employ about 70 thousand people under their subsurface use contracts. If we add all subcontractors, the number will increase to 130-140 thousand people. The largest number of employees of the oilfield services industry is employed in the Atyrau region: about 40 thousand people work at the facilities of the FGP-WPMP alone.

About 80% of Kazakhstan's oilfield services market is concentrated in the Atyrau region. This is due to the major projects aimed at expanding the Tengiz (US \$45.2 billion in 2016-2023)

and Kashagan fields (commercial production started in 2016, investments in the first stage of expansion are estimated at US \$5 billion in 2019-2024). At the same time, almost the entire growth of the market is associated with construction and installation works. This segment increased from US \$1.7 in 2014 to US \$4.9 billion in 2019. The largest customer of oilfield services in Kazakhstan is Tengizchevroil, accounting for 72% of the market volume. This includes more than 85% of construction and installation works, design and engineering; 56% of maintenance and repairs; 45% of exploration and geophysics; and 20% of drilling operations. The operators of the other largest fields in Kazakhstan: KPO – 8%, NCOC – 7%, Mangistaumunaigaz – about 3.5% are ranked second, third, and fourth in terms of procurements. The remaining customers account for about 10% of the market as a whole.

So, over a period of many years, TCO has consistently increased the Kazakh content in goods and services. The Company purchases various types of goods, works and services from almost all corners of Kazakhstan, working with existing and potential suppliers to ensure international standards of quality and safety of the oil and gas industry. The constant development of the Kazakh goods and services market to meet high international standards is the cornerstone of the company's continuous development strategy and creates significant value for Kazakhstan.

Goods	9,7%	
Works	67,3%	55,3%
Services	47,2%	

TCO RoK Economic Impact: TCO KC Spend by Oblast (\$MM), 4Q 2020 TCO direct spend impacts many oblasts in multiple sectors - more than \$3.5 bln of KC Spend



OILFIELD SERVICE AS A FOUNDATION Chapter **9** FOR INDUSTRY DEVELOPMENT

THE NUMBER OF EMPLOYEES OF THE LARGEST 50 OILFIELD SERVICE COMPANIES ACCORDING TO THE MINISTRY OF LABOR AND SOCIAL PROTECTION OF THE REPUBLIC OF KAZAKHSTAN:

N≌	Company	Sector	Number of employees	Region	
1	ССЕР	Construction	6264	Atyrau region	
2	SICIM	Construction	5000	Atyrau region	
 3	Neftestroyservice LTD	Construction	5846	West Kazakhstan region	
4	Senimdi Kurylys	Construction	4027	Atyrau region	
5	KKS-SICIM	Construction	2033	West Kazakhstan region	
6	Montazhspetsstroy	Construction	2006	Almaty	
7	Kazkomservice	Construction	1321	Atyrau region	
8	ISKER Consortium	Construction	1269	Atyrau region	
9	Velesstroy	Construction	1265	Atyrau region	
10	ARIADNA	Construction	1221	Atyrau region	
11	Munaygazkurylys	Construction	1020	Mangystau region	
12	UNEX STROY	Construction	946	Almaty	
13	Bonatti S.P.A	Construction	827	Atyrau region	
14	Oil Construction Company	Construction	519	Mangystau region	
15	Kentech Kazakhstan	Construction	500	Atyrau region	
16	KAZPACO	Construction	479	Nur-Sultan	
17	Ersai	Construction	370	Mangystau region	
118	KazStroyService	Construction	169	Almaty	
19	Denholm-Zholdas	Construction	86	Atyrau region	
20	GATE Insaat	Construction	52	Atyrau region	
 21	Oil Services Company	Mining	2548	Mangystau region	
22	Burgylau	Mining	2135	Mangystau region	
23	Vostok oil and service	Mining	865	Aktobe region	
24	IBK SiBu	Mining	448	Kyzylorda region	
25	KMG Nabors Drilling	Mining	674	Atyrau region	
26	Ozenmunaiservice	Mining	1354	Mangystau region	
27	Velikaya Stena	Mining	673	Aktobe region	
28	Halliburton	Mining	209	Atyrau region	

29	Baker Hughes	Mining	100	Mangystau region
30	Schlumberger	Professional scientific business	1211	Atyrau region
31	Kazgiproneftetrans	Professional scientific business	554	Atyrau region
32	PSN KazStroy	Professional scientific business	432	Atyrau region
33	WorleyParsons Kazakhstan	Professional scientific business	420	Almaty
34	BGP Geophysical Services	Professional scientific business	329	Atyrau region
35	Fluor Branch	Professional scientific business	288	Mangystau region
36	KMG Engineering	Professional scientific business	281	Almaty
37	KazMunayTeniz	Professional scientific business	17	Nur-Sultan
38	Bolashak-Atyrau	Administrative and auxiliary service	3026	Atyrau region
39	Fircroft Engineering	Administrative and auxiliary service	2790	Atyrau region
40	Fircroft Branch	Administrative and auxiliary service	787	Atyrau region
41	Sarens Kazakhstan	Administrative and auxiliary service	572	Atyrau region
42	Aksaigasservice	Processing	2031	West Kazakhstan region
43	Karat	Processing	1922	West Kazakhstan region
44	KazTurboRemont	Processing	871	Nur-Sultan
45	КСОІ	Processing	516	Mangystau region
46	USS Support Services	Others	5491	Atyrau region
47	Caspian Offshore Construction Realty	Others	2480	Almaty region
48	KazTransCom	Others	284	Almaty
49	KazMunayGas - Drilling	Others	1000	Atyrau region
50	Caspian Offshore Construction	Others	18	Atyrau region

According to the Oil and Gas Strategic Partnerships Development of the Republic of Kazakhstan, since 2017 within the framework of the FGP-WPMP implementation in Tengiz, TCO has purchased GSW to the amount of about 13.7 trillion tenge. Of this amount, 4.7 trillion tenge, or 34%, was paid to the local companies. Moreover, 2% of this amount was spent on local goods, 77% on works, and 21% on services. By the end of 2020, it was planned to involve 5,000 qualified specialists at the FGP-WPMP. However, in reality the figure turned out to be higher – a total of 15,405 employees were trained. In 2020, it was planned to build 40 thousand tons of modules, while 62 thousand tons were actually manufactured, or 41% more. The share of Kazakh content since the beginning of the project reached 33% instead of the expected 36%. From 2014 to 2019, 6 forums were held with the participation of contractors and suppliers of the FGP-WPMP. Instead of the planned 20 thousand jobs, 35,031 jobs were created for Kazakhstanis. 2,351 Kazakh companies were pre-selected, and 1,281 companies were pre-qualified.

As part of the North Caspian Project, and with the assistance of the authorized body represented by PSALLP, NCOC is successfully implementing a long-term program for the development of local content for 2017-2021. After the commissioning of the Kashagan field in 2017, the volume of NCOC procurements amounted to about 342.8 billion tenge, with 32% of this amount accounted for GSW supplied by local companies. In 2018, the volume of the company's procurements reached 361 billion tenge, 43% of which from local companies. In 2019, this indicator increased to 538.6 billion tenge, with 52% of procurements from Kazakh companies. Thanks to this program, the level of local content in the procurement of goods, works and services by the end of 2020 amounted to 55.3%. Chapter 9 OILFIELD SERVICE AS A FOUNDATION FOR INDUSTRY DEVELOPMENT

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NCOC is working to localize the production of original equipment in Kazakhstan, as well as to enter into contracts for the

supply of goods and equipment with domestic machine-building enterprises.



LOCAL CONTENT TRENDS IN GSW FOR 2011-2021 01

Source: PSA LLP

LOCALIZATION OF PRODUCTS

Nº	Potential Original Equipment Manufacturers	NCOC Localization Plan
1	Petrovalves	Petrovalves intends to develop local valve production through its company Petrovalves Kazakhstan LLP.
2	GE	A commitment has been made to ensure the local production of 34 spare parts positions through GE's partner, JSC West Kazakhstan Machine-Building Company. Negotiations are over. The contract with the Local Content (LC) obligations has been signed.
3	Flowserve	Localization of the production of goods (bushings, gaskets, nuts, pipes) will be carried out through a local partner. The negotiations have been completed, the LC obligations are included in the contract.
4	Emerson	An obligation has been made to assemble and test pressure sensors (PS) and pressure relief valves (PRV), the obligation is directly related to the need for PS and PRV. The negotiations have been completed, the LC obligations are included in the contract.
5	John Crane	Localization of production of hydraulic seals is considered.
6	ABB	ABB has committed to produce low and medium voltage motors and switchgears.

Source: PSA LLP

In order to further increase the share of local content, the Karachaganak project is also successfully implementing the Program for the development of local content for 2020-2021.

Goods	16.2%	
Works	72.8%	59.3%
Services	80.0%	

The level of local content in the procurement of goods, works and services by the end of 2020 was 59.3%.

A rapid increase in purchases was observed in 2019 - this indicator then increased by 68% and exceeded 459 billion tenge. In 2018 the increase was only 13% as compared to 2017.



LOCAL CONTENT TRENDS IN GSW FOR 2011-2021 Q1

Source: PSA LLP

LOCALIZATION OF PRODUCTS

Nº	Potential Original Equipment Manufacturers	KPO Localization Plan
1	John Crane	Liquid/mechanical seals. A roadmap has been signed.
2	Nvent	Elements of the heating system. A roadmap was signed and a contract was awarded in Q1 2021.
3	Stewart-Buchanan Gauges Ltd	Pressure gauges. The roadmap has been signed. Negotiations on the start of implementation are scheduled for June 2021.
4	Flowserve	Spare parts for pumps. Resumption of negotiations in the 2nd half of 2021 due to the current epidemiological situation.
5	Petrovalves KIOS	Spare parts for valves. Negotiations are continuing and the signing of the roadmap is planned.
6	ВН	Spare parts for NP compressors. A roadmap was signed and the contract is scheduled to be awarded in Q2 2021.
7	Honeywell	Gas detectors/cross-relay cabinets. A roadmap was and a contract was awarded.

In 2020, KPO signed 20 contracts with 11 domestic companies for the production and supply of local goods.

After the approval of changes to the tender procedures for the North Caspian and Karachaganak projects in 2020, concepts such as "conditional price reduction", "contract in exchange for investment" and "extension of the current contract subject to localization" appeared in the oilfield services market. In addition, mandatory criteria for local content were established in tender proposals, conditions for tenders exclusively among local suppliers and partnerships with local companies were included. The procedure for announcing procurement programs on operators' websites was established, allowing businesses to prepare for tenders in a due and timely manner. The initiatives implemented by Kazakhstan have made a significant contribution to the further development of local content, providing additional support to domestic producers, and also contributing to their maximum involvement in the operators' procurements. These measures were especially important and timely during the difficult period due to the pandemic and its consequences.

In June 2020, at the meeting of the Government of the Republic of Kazakhstan, the Ministry of Energy of the Republic of Kazakhstan proposed the creation of an International Center for the Development of Oil and Gas Engineering and Service. This item was included in the Action Plan for the Development of Oil and Gas Engineering of the Republic of Kazakhstan for 2019-2025, approved by the Ministry of Energy of the Republic of Kazakhstan and the Ministry of Industry and Infrastructure Development of the Republic of Kazakhstan. The new body will become a single window where local producers and service companies can interact with operators of major projects and coordinate ongoing work. It will also serve as a huge help in establishing production in Kazakhstan, leading to an increase in the share of local content in major projects. One of the priorities of Kazakhstan in the medium term should be an emphasis on the creation of domestic high-tech products such as electrical equipment, engines, generators, drill bits, pipes and other goods resistant to an aggressive environment.

Over the years of its independence, Kazakhstan has made a huge developmental leap, the foundation of which was and remains the oil and gas industry. Our country, which has significantly increased the production and export of oil and gas, will continue to occupy a leading position in the region. The strong state support provided to local oilfield service companies will serve as a robust foundation.

Chapter **9** OILFIELD SERVICE AS A FOUNDATION FOR INDUSTRY DEVELOPMENT

TOP-30 LARGEST OILFIELD SERVICE COMPANIES IN KAZAKHSTAN

NՉ	Company	Segment	Country of origin	Revenue*, bln. tenge (ex VAT)	
				2020	2019
1	ССЕР	Construction and installation works	Greece	156	164
2	Senimdi Kurylys	Construction and installation works	Turkey / USA	144	156
3	КРЈV	Engineering	Great Britain / Kazakhstan	160	271
4	Schlumberger	Geophysics	USA	86	95
5	Bolashak Atyrau	Recruiting	Great Britain / Kazakhstan	86	100
6	Oil Services Company-SIBU	Drilling	Kazakhstan / China	80	65
7	Caspian Offshore Construction Realty	Accommodation and catering	The Netherlands	71	71
8	Sarens Kazakhstan	Logistics	Belgium	66	92
9	Fircroft Engineering	Recruiting	Great Britain	63	69
10	Bonatti	Construction and installation works	Italy	60	46
11	GATE Inshaat	Construction and installation works	Turkey	55	70
12	TenizService	Technical support of facilities	Great Britain / Kazakhstan	50	96
13	Burgylau	Drilling	Kazakhstan	50	47
14	KKS-SICIM	Construction and installation works	Italy / Kazakhstan	47	45
15	Bertling	Logistics	Great Britain	46	83
16	KMG Nabors Drilling	Drilling	USA / Kazakhstan	43	58
17	PSN KazStroy	Construction and installation works	Great Britain / Kazakhstan	41	79
18	Compass Kazakhstan	Accommodation and catering	The Netherlands	36	38
19	ErSai Caspian Contractor	Construction and installation works	Kazakhstan / Italy	34	242
20	Neftestroyservice Ltd	Construction and installation works	Kazakhstan	30	37
21	Kazmunaigas-Burgylau	Drilling	Kazakhstan	30	20
22	Caspian Offshore Construction	Offshore marine fleet services	Kazakhstan	29	25
23	ISKER Consortium	Construction and installation works	Kazakhstan	28	41
24	Mustang Engineering	Construction and installation works	Great Britain	27	51
25	Velesstroy	Construction and installation works	Russia	26	31
26	Ozenmunaiservice	Drilling	Kazakhstan	25	17
27	Kentek	Construction and installation works	Ireland	24	21
28	Denholm-Zholdas	Maintenance and repair	Great Britain / Kazakhstan	22	36
29	Montazhspetsstroy	Construction and installation works	Kazakhstan	21	41
30	KazTurboRemont	Maintenance and repair	Kazakhstan	20	21
	*Revenue from oil and gas companies (v	vithout account of subcontract)	TOTAL:	1.655	2.228

Kazakh companies8JVs9Foreign companies13



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30 YEARS OF INDEPENDENCE PATH OF CREATION

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Chapter **10**

"WE DO NOT INHERIT THE EARTH FROM OUR FATHERS, WE ARE BORROWING IT FROM OUR CHILDREN."

Antoine De Saint-Exupery, French writer, poet, essayist and professional pilot ver the course of 30 years of development since the country became independent, Kazakhstan has developed interlinked industrial, energy and environmental policies. If the initial versions of contracts for the implementation of projects in the oil and gas industry paid little attention to important environmental aspects, then as the country's environmental legislation tightened, companies were required to introduce and strengthen environmental control at their production and processing facilities. Environment has become the cornerstone of all contracts regarding subsoil use, and in order to fulfill their obligations to protect the environment, investors have begun to channel significant funds into environmental monitoring and industrial innovation. These funds are increasing year by year. Among the environmental leaders in the oil and gas industry are the traditional giants NCOC, TCO, KPO, as well as enterprises operating as part of JSC NC KazMunayGas.

The Government of the Republic of Kazakhstan has always paid special attention to the North Caspian – an extremely vulnerable ecological zone with a rich and diverse fauna and flora. In 1974, in order to preserve the biological resources of this unique ecosystem, the water area of the eastern part of the North Caspian, including the deltas of the Volga and Ural rivers, was declared a protected area with a special status and protection regime by the Governmental decree. Due to the special environmental sensitivity of the North Caspian and the Ural River delta and the unique Ural-Caspian biodiversity, permission to start the North Caspian project was issued in 1993 subject to compliance with the Special environmental requirements for economic and other activities in the state-owned protected area in the northern part of the Caspian Sea. This environmental regulatory document was developed by a group of leading adhered to by NCOC. A number of extensive environmental monitoring programs have been implemented. A program for the study of biological diversity has been developed, and a network of automated air quality monitoring stations has been created in the Atyrau region. Annual studies of the soils and bird and seal populations, and the publication of a sensitivity map for the entire area of the Northern Caspian have begun. A number of Kazakh companies have been involved in an Environmental Impact Assessment (EIA) of the subsoil users' operations. According to the zero discharge policy in the Caspian, all drill slurry from the drilling process is now transported from the sea to dry land for cleaning from drill cuttings and oily water. Special environmental requirements for operations in this area have been included in a separate chapter in the Environmental Code of the Republic of Kazakhstan.

The issue of ensuring environmental safety during oil operations in the Kazakhstan Sector of the Caspian Sea was aggravated by the accident at the Deepwater Horizon oil platform



Kazakh scientists and international experts and approved by the Government of the Republic of Kazakhstan. It introduced seasonal restrictions on economic operations, requirements for special measures to protect biological resources, environmental monitoring, measures and guarantees in case of oil spills, environmental impact assessment inter alia. With the start of geological exploration in the Caspian, the operator of the North Caspian project for the first time introduced the practice of holding public hearings and consultations with environmental activists and local authorities. Later, this experience was adopted by all oil companies. Subsequently, a number of other legal environmental documents were developed and adopted, which today are strictly in the Gulf of Mexico in April 2010. This resulted in about 5 million barrels of oil spilling into the sea in 152 days, and the oil slick affected an area of 75 thousand square kilometers (about 5% of the area of the Gulf of Mexico). Kazakhstan was required to urgently revise the National Plan for Response to Oil Spills in the Sea, Water Bodies and Pollution in Coastal Areas of the Republic of Kazakhstan and plans for emergency oil spill response (OSR), since the closed ecosystem of the North Caspian Sea is more sensitive to pollution compared to the Gulf of Mexico. In early 2011, the management of OOC KazMunayTeniz JSC publicly supported the creation of a non-profit industry association for response to oil spills of second degree complexity, fully managed 280

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PATH TO CREATION

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2019-2021, Minister of Ecology, Geology and Natural Resources

by subsoil users. After just about six months, this idea came to fruition. At the end of November 2011, the largest oil companies NCOC, ConocoPhillips N Block BV, OOC KazMunayTeniz JSC and TCO signed an agreement to establish an organization to respond to emergency second degree oil spills. The North Caspian Environmental Oil Spill Response Base was established. Effective measures were needed for the real functioning of the Unified State System of Environmental and Natural Resources Monitoring (the USSENRM), at least in the conditions of the Caspian shelf.

Today, the NCOC uses an innovative approach and modern technologies to support its oil spill response capacity. Computer models and GIS-based tools (Geographic Information System), such as sensitivity maps, help to develop response plans and are a fundamental part of the Consortium's response planning systems. By predicting the trajectory of an oil spill in the environment, computer models assist the OSR management unit in preparedness and response. Sensitivity maps identify environmentally sensitive areas based on longterm environmental monitoring data. This enables priorities to be set and help conserve important habitats and minimize environmental impact. A wide range of innovative technologies are used to monitor, map and detect oil spills, as well as determine the density of the oil slick both in open water and during freeze-up. These include remote aerial observation using portable GPS-GIS tools, remote sensing techniques and the leak detection system (LDS). The offshore pipelines in the Kashagan field from Island D to the Bolashak oil and gas treatment facility are constantly

monitored by the LDS. They are designed in such a way that all critical components are standby. Failure of one component will not result in a complete loss of monitoring capabilities, data communications, or operator interfaces. These are innovations found only in the best practices of the global oil and gas industry.

In addition, the NCOC is committed to a "normal operation zero gas flaring" policy. The Kashagan Stage I project was initially designed to avoid normal operation gas flaring, that is, "regular" flaring of excess natural gas, since there is no other cost-effective way to recycle gas in oil and gas projects during oil production. However, in Stage I of the Kashagan development, the produced gas is injected back into the reservoir, used as fuel, or sent for sale. Nevertheless, gas flaring is required during production operations as the safest and most efficient way to dispose of gas that cannot be processed due to temporary technical reasons (for example, commissioning, small leaks through a valve into flare headers or one-time discharges to torch in case of operational failures). The NCOC is continually working to reduce the amount of technologically unavoidable gas flaring by improving onshore and offshore management. Every year, starting from the commissioning of the field, the volumes of gas flaring are reduced and optimized. The measures taken by the NCOC to protect the environment are governed by the Environmental Action Plan, which is approved annually by the environmental regulatory authorities.

Environmental considerations have become one of the priorities of TCO and its activities since the establishment of the enterprise in 1993. Since 2000, the company's investments in environmental protection have exceeded US \$3.13 billion. At the same time, over the specified period, the total volume of atmospheric emissions per ton of oil produced has decreased by 71%. TCO gas utilization rate for the first quarter of 2021 was 98.5%, the total water reuse rate was 48.3%, and the total share of recycled waste reached 32% – a significant contribution of the company to environmental protection in the country.

Since 1998, KPO has invested 73 billion tenge in environmental protection measures. The priority goals are to reduce emissions of air pollutants, as well as greenhouse gases, waste disposal, and the introduction of advanced "green" technologies. The improvement of technologies and the consistent increase in the enterprise's capacities are managing to keep pace with the decline in the level of environmental impact. When developing Karachaganak, the company used advanced, innovative technologies. It was here that an innovative high pressure sour gas re-injection scheme was first developed and applied. This scheme has proven to be highly effective in terms of increasing the production of liquid hydrocarbons and proved to be economically viable for the project. At the same time, the negative impact of production on the environment is significantly reduced, and gas resources have been saved. If necessary, they can be extracted from the reservoir and used in the future. Today, the gas utilization rate at Karachaganak is 99.94%, which is the world's best indicator in the oil and gas industry.

Gas is combusted at facilities for safety reasons, during scheduled preventive maintenance of equipment, commissioning of new equipment, as well as in case of failures, equipment malfunctions, to prevent accidents and is equal to only 0.06% of the total gas produced. This is a KPO's strong performance as compared to other global and European oil and gas producers, making Karachaganak the leading oil and gas condensate field in Kazakhstan for this indicator.

Today Kazakhstan has a special role in ensuring the environmental stability of the Eurasian continent, being a link in the development of landscape and environmental systems in the region. The "green" course, defined at the dawn of the independence by Elbasy Nursultan Nazarbayev and continued by the current President of the Republic of Kazakhstan, Kassym-Jomart Tokayev, serves as a guideline for state reforms. The policy of the Government of the Republic of Kazakhstan in the field of industrial development and environmental safety implemented in the country has made it possible to develop unique innovative projects in the field of "clean" production, transportation, processing of hydrocarbons, as well as to increase the capacity of renewable energy sources. An important landmark event which triggered their implementation in Kazakhstan was the specialized international exhibition "EXPO-2017" on the theme "Creating the energy of the future". This event opened up previously unthinkable prospects for the development of the oil and gas companies in Kazakhstan. The subsequent creation of the International Green Technologies and Investment Center facilitated the transformation of the energy sector and the transition to "green" business. These are the Sustainable Development Goals the largest countries strive to achieve.

With the adoption of the new Environmental Code in Kazakhstan on July 1, 2021, the country's environmental policy was completely updated. The principles of oil and gas companies' operation changed significantly as their interests were directly and significantly affected by legislative innovations. The document signed by the President of the Republic of Kazakhstan obliged companies to invest considerable funds in the best available technologies (BAT) based on modern achievements of science and technology in the field of environmental protection. It replaced the previous principle of "pay and pollute" with "a





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polluter pays", while at the same time it introduced a 10-fold increase in administrative sanctions for excessive emissions into the environment. Now it has become more beneficial for subsurface users to eliminate the violation than to pay a fine. From January 1, 2025, all Category I facilities that have the highest level of harmful environmental impact will be strictly supervised by the state. Their operation will be regulated by integrated environmental permits issued on the basis of industryspecific BAT conclusions. Those, in turn, will be an integral part of the BAT Technical Reference (TR). By July 1, 2023, Kazakhstan plans to develop 9 industry-related reference books. 97 selected companies will be subject to a comprehensive technological audit for compliance with BAT principles. Those who implement the principles of the best available technologies will be exempt from paying environmental fees.

The measures introduced by the Government will allow a reduction in the number and complexity of accidents that occasionally occur in the oil and gas industry. It is sufficient to recall the release of gas-water mixture at the well of the Karazhanbas field in 2016; ignition of the pipeline of the LK-6U primary oil refining unit at the Pavlodar Oil Chemistry Refinery in 2018; a technological accident with an intense release of water and gas at the Western Prorva field; ignition of the storage tank at the Arystanovskoye field; release of a gas-water mixture while drilling a well, followed by ignition and fire for three days at the Kalamkas field; issues with the gas reinjection compressor at the Kashagan field in 2019. In many cases, laboratory analyzes have shown concentrations of pollutants in the atmosphere, soil and stratum and underground water exceeding the maximum permissible. Today, many large industrial companies in the country are already implementing programs to introduce the





best available technologies and modernize their production facilities in order to improve environmental performance, investing significant funds for these purposes. For example, in 2020, KazMunayGas developed a comprehensive plan for a three-stage implementation of the principles of sustainable development in the company's daily life until 2028. During the first stage, six priority goals were selected on which the national company will focus over the next five years, including human health, energy efficiency, economic growth, environment, innovation and climate change mitigation. Significant results of the implementation of the environmental program of KazMunayGas were noted in all business segments - upstream, midstream, and downstream. Thus, in the upstream segment in 2020, the Company increased the recycling of associated petroleum gas to 98%, from 97% in 2019 and 86% in 2016. At the same time, the rate of gas flaring in 2020 was recorded as 2.2 tons per 1,000 tons of produced hydrocarbon raw materials - 24% lower than in 2019 and 79% less than the industry average. The most modern catalytic cracking facilities were built in the midstream segment at the Atyrau Refinery and the Shymkent Refinery. From the very outset their design included all the necessary BATs to minimize the negative impact on the environment. In particular,







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"The development of the fuel and energy sector should proceed without damage to the environment. A clean environment is an important condition for the well-being of Kazakhstan and the health of the nation. The introduction of innovative technologies plays an important role in improving the efficiency of the use of natural resources. We have legally obliged subsoil users to allocate 1% of revenues to research and development."

> **Kassym-Jomart Tokayev**, President of the Republic of Kazakhstan

the world's best catalytic cracking off-gas cleaning system (BELCO) has been introduced at these facilities. Also, in order to improve the environmental situation in the Atyrau region, at the request of the government bodies at the Atyrau Refinery in 2019, a draft environmental protection measure entitled "Tazalyq" was adopted. It included three subprojects: the reconstruction of mechanical treatment facilities (MTF); the reconstruction of biological treatment facilities and the construction of a post-treatment unit (PTU): and the reclamation of evaporation fields and a canal (EF). All are expected to be progressively completed by 2023. A US \$80 million financing agreement signed between

Atyrau Refinery LLP and the European Bank for Reconstruction and Development in 2021 launched the project implementation. A qualitative analysis of the availability of the implemented best available technologies at the Atyrau Refinery showed that in almost all cases the operating technological units, where applicable, comply with the BAT requirement. After the completion of the project, discharges to the evaporation fields from the refinery will be reduced due to the return of treated water for reuse at the facility. In addition, the water intake from the Ural River will decrease. The project implementation will improve the environment in Atyrau, promote the development of environment-friendly technologies and a "green" economy. They will have a beneficial effect on the health of city residents and allow the impact of the Atvrau Refinery on the environment. flora and fauna of the Atyrau region to be minimized. Another important project is the elimination of historical pollution. From 2016 to 2019, five waste landfills in Ozenmunaidas JSC and one landfill in Karazhanbasmunai JSC were cleaned up. The 10 landfills with oil waste at Mangistaumunaigaz JSC were cleaned and liquidated in 2020. At present, the newly generated waste of these enterprises is being transferred for disposal to third-party specialized companies without disposal in landfills. Reclamation of disrupted land is also being carried out by KazTransOil JSC. Thus, in the sections of the Uzen-Atyrau-Samara main oil pipeline, 20.07 hectares of land have been restored over 10 years. 4.5 billion tenge have been invested in the restoration of historically polluted lands. The reclaimed land is then returned to the local executive authorities to introduce it further into economic cycle.

"The main requirement of the state is the rational use of subsoil and ensuring the extraction of minerals with a minimum environmental impact. This task is set before the Government by the Elbasy and the President of Kazakhstan", noted Nurlan Nogayev, Minister of Energy of the Republic of Kazakhstan since December 2019.

Thus, over the past three decades, Kazakhstan has not only outlined the vision for environmental development, which is very important, but also made a great leap forward towards the introduction of the best world technologies, thus indicating the direction of further movement towards a "clean" future. Having announced plans for Kazakhstan to achieve carbon neutrality by 2050 at the UN Climate Ambitions Summit in December 2020, the President of the Republic of Kazakhstan, Kassym-Jomart Tokayev, set out the country's goals for the next 30 years. This will be a transition to "green" energy, implying decarbonization of the economy, but not by completely abandoning traditional energy, but through reducing greenhouse gas emissions into the atmosphere. When the "zero emission" targets are reached, oil and gas production will meet the criteria for the country's lowcarbon development. According to expert estimates, US \$350 billion of investments will be required to reduce greenhouse gases by at least 70% by 2050, guite an affordable amount for Kazakh investors in the context of a robust economic and environmental policy and a favorable investment climate.



THE STRATEGY OF GOOD DEEDS

Chapter 11

"SHOULD I BE THE CREATOR AND RULER OF ALL THINGS, I WOULD TEAR DOWN THE HEAVENS FROM THEIR FOUNDATIONS AND CREATE THEM ANEW, AND BENEATH THEM ALL GOOD WISHES WOULD IMMEDIATELY COME TO PASS."

Omar Khayyam,

Persian philosopher, mathematician, astronomer and poet

n the early 1990s, the young state of Kazakhstan faced a difficult task in overcoming not only the economic crisis, but also in supporting the well-being of the people and the further development of the country. It was impossible to support the social sphere which was lacking funding in the context of the failing economy and without the sponsorship of the large investors who were attracted to the country at that time. A huge amount of work had to be done. New infrastructure was needed, the quality of medicine and education needed to be improved and cultural, sports and scientific institutions required support.

The social responsibility of the oil and gas business in Kazakhstan was actively developed back in the 1990s, when major companies started to finance large-scale projects and programs aimed at improving people's living conditions. Improving the welfare of the people through social investments was the main requirement of the authorities who signed large-scale contacts for oil and gas exploration and production in Kazakhstan. At the same time, it was clear from the very beginning that there was no alternative to consolidating the efforts of the state and business in strengthening stability and social progress.

Speaking at the Republican Forum on Corporate Social Responsibility, Nursultan Nazarbayev noted: "...The state and business should become full-fledged partners in resolving not only economic, but also social issues".

Companies had to stop considering business only as profitmaking, and their success had to be evaluated by the authorities in terms of increasing all types of capital: production, financial, social, and human. From the very beginning, the state and business were united by a common interest in a highly efficient economy and improving the welfare of all citizens of the country. It was obvious that great results could only be achieved through joint efforts.

Over the years of independent development of Kazakhstan, the issues of social responsibility and social partnership received significant political support.



Today, oil and gas companies, as part of their activities in Kazakhstan, are investing in areas that directly affect the life of local communities. The portfolio of their social investments includes projects in the field of infrastructure development, medicine, school and preschool education, culture, sports, music, art and others. The main element in financing social projects are agreements of social and economic cooperation with the regions to coordinate the selection and implementation of projects with local authorities, for example, the construction or refurbishment of socially important facilities. We are talking about billions of tenge of social investments spent since Kazakhstan gained independence and became the foundation of social well-being of the population in the regions. However, it is sometimes impossible to assess the contribution of Kazakhstan's oil and gas companies to social development only in terms of numbers - the result of the work is much larger and more eloquent than the money invested.

Social investments have been a part of the sustainable development of Tengizchevroil LLP, Kazakhstan's largest oil and gas company, throughout its history. TCO rightly believes that positive business development is possible only when a business treats the community in which it is located ethically.

Since 1993, TCO has allocated more than US \$2.1 billion to finance the various social projects for the population of the

Atyrau region and employees. TCO investment in the Atyrau region communities is implemented through two programs: Igilik Voluntary Social Infrastructure Program, which was initiated shortly after the establishment of the company, and the Social Investment Program (SIP). The Igilik program is aimed at the construction of social infrastructure facilities (kindergartens, schools, parks, etc.), while the SIP is aimed at stimulating economic development, accessibility and quality of education and training opportunities and, of course, public health. It supports the creation of long-term potential in strategically important thematic areas.

Igilik has become an important factor in the social transformation of Atyrau region, and its annual fund has grown from US \$4 million in 1999 to US \$25 million annually since 2013, and to US \$30 million in 2021. In total, between 1999 and 2020, TCO has completed 133 projects under this program totaling more than US \$272 million. Among the projects implemented are: the construction of hospitals the purchase of the required modern medical equipment; the construction of 9 schools designed for 5000 students, as well as 14 kindergartens for more than 3000 children; 4 cultural centers, 4 sports and recreation centers; 3 parks; 82 projects to improve infrastructure, including gasification and electrification, repair of roads, sewage pumping station; reconstruction of water supply systems, embankment planning



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It is a great honor for me on behalf of Tengizchevroil (TCO) to celebrate with you an incredible milestone in the history of Kazakhstan – the 30th anniversary of the Independence, sovereignty and unity of the people of this great country. Since gaining independence, Kazakhstan has become a regional economic leader and strengthened its role in the international community.

Tengizchevroil is proud to be part of the success achieved by the people of the Republic of Kazakhstan. The history of the company is closely connected with the formation of an independent state.

For more than a quarter century, TCO has created value for the country by continuing to operate with due responsibility and relentless focus on safe and reliable production. It is hard to imagine that in 1993 the volume of oil produced by the company was only 1 million tons. At the end of last year, this figure increased to 26.5 million tons, which is approximately 35 percent of the country's total crude oil production. This is a truly impressive achievement that would have been impossible without the support of the Government and people of Kazakhstan.

This year is important for Kazakhstan, and we are proud that we continue to make a major contribution to the economic progress and future of the country.
Kevin LYON, CEO of Tengizchevroil LLP 290

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and much more. Today, Igilik is not only hospitals, schools, cultural centers, gas pipelines, water pipelines, but also more than 1,000 new jobs, a new level of education, new opportunities for local healthcare. This is development, this is transformation, this is a good deal – not just for reporting purposes, but in fact.

Within the framework of the SIP, launched in 2010, 80 projects with a total budget of about US \$9.5 million were implemented up to 2020. In 2018, TCO, which had so far implemented this program only in the Atyrau region, expanded it also to the Mangystau region in connection with the Future Expansion Project – the Wellhead Pressure Management Project. In 2021, TCO allocated more than US \$1.6 million to improve the quality of healthcare and education, as well as the development of social entrepreneurship in the Atyrau region and Borankul village (the Mangystau region) under the SIP. The social projects are selected upon the competition results with international, national and regional NGOs participating.

The major social projects implemented by TCO in Kazakhstan in various social initiatives include: support to the Zhylyoi district in technical water supply (total cost of the project amounted to US \$4.5 million) and the opening of Kazakhstan Maritime Academy in partnership with the Kazakh-British Technical University (KBTU) in 2013 in Almaty. This is the first higher educational institution in the country for training a merchant navy to support oil and gas exploration at sea and providing employment to citizens of Kazakhstan outside the traditional oil and gas sector (more than US \$28 million). Another important project was the modernization of the water supply system in Kulsary (Zhylyoi district) in the years 2014-2016, whose residents for decades experienced problems with drinking water because of the obsolete water supply system (about US \$63 million). Social funding also facilitated the purchase of medical equipment in 2015 (electrophysiology laboratory for surgical treatment of arrhythmias and the procedure of radiofrequency ablation of the American firm St. Jude Medical, spiral 128-slice CT scanner of Phillips Dutch-American company, Karl Storz video endoscopy system for cardiac operations, audiometric module and other ultra-modern diagnostic and surgical equipment) for Atyrau regional cardiology center in early



















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2019 (\$4 million). Other medical projects included: acquisition of equipment for resuscitation, reanimation, phototherapy apparatus, incubator for newborns, ultrasound system, mobile X-ray system for trauma unit, computers, etc. for Zhylyoi district (about US \$1 million). During Coronavirus crisis support was given to healthcare in the Atyrau region in 2020. This included the construction of a medical complex for 200 in-patient beds in Kulsary, and the acquisition of medical equipment and personal protective equipment (56 oxygen concentrators, more than 600 thousand units of personal protective equipment, 252 units of medical equipment, 20 ventilators, 33 freezers, designed for storage and transportation of vaccines). Medicines were supplied to Atyrau during the challenging period in the summer of 2020, and students were transported to their place of residence by DASH-8 aircraft under strict guarantine measures. Healthcare professionals in the Atyrau regional infectious diseases hospital were trained and emergency medical care facilities were provided to the Atyrau regional hospital for the amount of about US \$10.8 million (4.7 billion tenge).

In addition, in order to implement the Comprehensive Plan of Social and Economic Development of Zhanaozen, the Mangystau region for 2019-2021, approved by the Government of the Republic of Kazakhstan, in July 2019, the Aktau Training



















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Center began operating. The aim was to implement an annual training program for 250 unemployed residents of the region in disciplines in demand in the industry. In September 2019, the Higher College APEC PetroTechnic and the West Way Services LLP training center launched vocational training for unemployed residents of the Atyrau region. Within 2019-2021, it is planned to train and retrain 700 residents on an annual basis under the agreement signed on June 28, 2019 between Tengizchevroil LLP and the local akim. The cost of the training project amounted to US \$5-6 thousand per person. Many graduates have found new jobs for themselves or started their own business using new skills and knowledge. Thus, 79% of graduates of 2019 and 29% of graduates of 2020 are employed in the Mangystau region, 73% and 39%, respectively, in the Atyrau region.

Considering social entrepreneurship as a social innovation for Kazakhstan, TCO has been successfully implementing a special program of the Eurasia Foundation of Central Asia "Zharkyra" in the Atyrau and Mangystau regions since 2016. Since that time, the company has supported 53 projects by entrepreneurs in the field of child development, inclusion, environment, sports support, health, rehabilitation and family for a total amount of more than US \$290 thousand. For the first time in Kazakhstan, financing based on interest-free, repayable loans for five years was tested in a pilot mode. No bank or government program provides such conditions for small and medium-sized businesses in Kazakhstan. All returned funds were used to finance the new winners in new contests. Today, with the support of TCO, Zharkyra has produced an entire galaxy of new trainers and coaches for the western regions of Kazakhstan, who can offer training in the Kazakh language. The

















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program participants were trained in the basics of business: marketing, finance, strategic planning and public speaking. To strengthen leadership skills and innovative thinking, a series of training courses were organized: JV Personal Brand, Personal Growth Coaching, Fundraising, Emotional Intelligence and Design Thinking. In the space of just 5 years, 26 training courses were held on various current topics.

As part of the implementation of another social initiative - the Public Space project implemented by the Eurasia Foundation of Central Asia received financial support from TCO. In 2019-2020, 654 Kazakhstanis implemented 42 mini-projects in 9 settlements in the Atyrau and Mangystau regions worth a total of US \$250 thousand. Project participants of different age categories, from different walks of life, different professions, men and women, youth and pensioners, in partnership and dialogue with local authorities, improved the infrastructure of their villages using their own hands. Over the space of two years, the contribution of the community amounted to more than US \$50 thousand, including from local akimats. They helped with the delivery of equipment and specialists needed for the implementation of the project. To date, the results of these projects are enjoyed by 16,500 residents of Fort Shevchenko, the villages of Bautino, Kuryk, Borankul, Turgyzba, Akkiiztogai, Zhana Karaton, Koschagil, Maikomgen.

IGILIK PROGRAM OVERVIEW - 2021



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The 30th anniversary of independence is an important milestone on the stage of a long journey that Karachaganak Petroleum Operating BV has taken together with the Republic of Kazakhstan. KPO's achievements are the result of the favorable investment climate created in sovereign Kazakhstan. Over the years of independence, Kazakhstan has loudly declared itself and has become a recognizable state in the world. We are proud that there is a part of our work in this.

Ahead lies the implementation of big plans related to projects for the development and expansion of the Karachaganak field. The KPO team is striving for new production heights, while remaining faithful to its corporate principles and obligations, which are based on a creative partnership with the Republic of Kazakhstan and concern for the wellbeing of future generations.

On the eve of the anniversary, I cordially congratulate all citizens of sovereign Kazakhstan! I wish you new labor achievements, good health and prosperity!

Giancarlo RUIU, CEO of Karachaganak Petroleum Operating BV

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The philosophy of social entrepreneurship of another large oil and gas company in Kazakhstan, Karachaganak Petroleum Operating B.V., from the very outset was also based on the needs of residents of the region where the company operates. KPO annually undertakes social and infrastructure projects (SIP) in the West Kazakhstan region,

according to the terms of the Final Production Sharing Agreement. In total, from 1998 to March 2021, the consortium spent US \$433 million on the development of the social infrastructure of the region. The result was the construction and repair of 15 medical centers, 34 educational institutions (schools/kindergartens), 3 stadiums, an ice stadium, a swimming pool, a tennis complex, sports and recreation centers, many kilometers of urban and rural roads and bridges, family-type children's village, celebrations halls, youth and schoolchildren centers and the Kadyr Myrzaly Art House. The right bank of the Chagan River was landscaped in the city park. A 120-apartment building was constructed in Aksai. Gas supply facilities were built in Zhanibek, Burlinsky, and Chingirlau districts. Water supply facilities in Burlinsky district, thermal and electrical networks and other projects of local and regional significance were implemented. In accordance with the decision of the Joint

















District Tennis School for Children and Young People, Uralsk





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Management Committee (JMC), since 2010, KPO annually allocates US \$20 million for SIP in the West Kazakhstan region. For the period 2018-2022, it was decided that additional funds would be allocated for SIPs in the region in the amount of US \$50 million. In addition, for the 2019-2021 period, an additional list of SIPs to the amount of US \$9.6 million was approved for implementation at the account of the saved funds. These funds were allocated for the construction of sports and recreation centers and a children's youth sports school in the region, as part of the implementation of the Address of the President to the People of Kazakhstan dated October 5, 2018 on the development of sports infrastructure of the West Kazakhstan region. In 2020, the consortium launched 21 SIPs, including transitional projects. The total amount of social and infrastructure projects amounted to US \$27.37 million. According to the Resolution of the Government of the Republic of Kazakhstan No. 203 dated April 1, 2021, an additional list of SIPs in the amount of US \$7.7 million in Aksai was approved. The list of planned projects is annually coordinated by the KPO and the Akimat of the West Kazakhstan region in accordance with the priorities and programs of social development of the region.





Housing for the residents of Berezovka village in Aksai and Araltal















Palace of the Creative Arts, named after Kadyr Myrza Ali, Uralsk



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On behalf of NCOC, let me congratulate all Kazakhstanis on the 30th anniversary of the independence of the Republic of Kazakhstan. Congratulating you on such a significant anniversary, I would like to emphasize the importance of the decisions of the First President and the Government of Kazakhstan taken thirty years ago to define the oil and gas industry as the main driving force of the domestic economy. The correctness of the chosen course of general industrialization with a focus on the oil and gas industry was confirmed by the growth of the country's industry, the emergence of thousands of jobs and the development of local entrepreneurship.

The North Caspian project with the giant Kashagan field was the first ambitious offshore development project for a young independent country. It was a challenging time, but the perseverance, dedication and energy of the people involved in the project allowed us to overcome the difficulties and implement this ambitious plan. Today, being on the list of leaders in the domestic oil and gas industry, we, the operator of the North Caspian project, NCOC, are pleased to share our success with the entire country. We are delighted and proud to be part of such a rapidly developing

country. We wish all Kazakhstanis peace and prosperity!

Olivier LAZARE, Managing Director of NCOC

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Social responsibility, sponsorship and charity are an integral part of the corporate policy of the NCOC consortium as well. These values were laid out in the foundation of the Company's activities in 1997, when the signatures of seven shareholders in Washington gave birth to a new large ambitious undertaking – the North Caspian

Kashagan Project. During its history, it has experienced ups and downs, transformation of the operating model, postponement of the first oil production... Nevertheless, despite all these changes, one thing has always remained unchanged – NCOC's firm commitment to the sustainable development of the Atyrau and Mangystau regions and improving the well-being of the residents. The first "spring swallow" of the North Caspian Consortium in the social area was the construction of the Atyrau sports and recreation center (together with Tengizchevroil LLP) with a capacity of up to 1,500 people in 1998. This hall hosted tournaments of both national and international levels within its walls and to this day is one of the favorite places of Atyrau residents.

Since 1998, the company has completed 222 social projects for the total amount of US \$774.3 million, including the construction of schools, kindergartens, hospitals, sports and cultural facilities, and engineering support systems. 31 projects for the gasification of remote settlements have been implemented, with a total length of 1,130 kilometers of pipelines. In Atyrau region, the consortium built a secondary school with a total floor area of 2,100 square meters in the village of Shirina and a secondary school in the village of Bereke of Makhambet district of the Atyrau region (2017). A regional infectious diseases hospital in Atyrau (2016) and a dormitory at the Minor Academy of Arts for Gifted Children for 75 children (2014) were also constructed. According to Atyrau residents, the Academy is a cradle for future artists, musicians, singers, in a word, representatives of the creative force of the region. A major overhaul was undertaken at the regional children's hospital in Atyrau and the outpatient department, which were opened in 1974 (2014). A kindergarten was built in Damba village (2011). Major repairs were carried out at secondary school No. 3 in Atyrau (2010) and the regional Kazakh-Turkish Lyceum (now Bilim Innovation Lyceum) for gifted children (2008), which has long gained a reputation as a leading educational institution of the Atyrau region. As part of NCOC's obligations, the Blood Center building in Atyrau with a total area of 2,815 square meters and other facilities were commissioned in 2008

















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In Mangystau region, there are many projects which evoke the pride of local residents. These include: the "rock trail" built by NCOC in Aktau on the coast of the Caspian Sea (2019); the Abish Kekilbayev Cultural Center, capable of hosting up to 2,000 guests (2019); the House of Friendship, which became the shared home for the Assembly of People of Kazakhstan of Mangystau region (2017); the multifunctional sports complex Mangystau Arena with fixed and transforming stands for 532 seats on 2.5 hectares of land (2017); indoor universal sports complex in the village of Tauchik, capable of simultaneously receiving up to 80 people per hour for gymnastics, mini-football, basketball, volleyball and weightlifting (2015); three kindergartens in 33 microdistrict of Aktau for 280 children each (2015); and a wedding palace with an area of 2,000 square meters, inaugurated by Nursultan Nazarbayev (2004). Over the past three years alone, the amount of NCOC investments in social and infrastructure projects amounted to US \$75 million.

As part of its sponsorship and charity program, the NCOC directly responds to the needs and requests of the local population, annually allocating a budget of US \$1.5 million for these purposes, distributed equally between the Atyrau and Mangystau regions. The sponsorship and charity program is implemented in five main areas of support for the local population: health, education, sports, culture and charity. In total, since 1998, the total amount of investments in sponsorship and charity projects has reached US \$23.7 million. In 2020 alone, 38 such projects were implemented (19 each in Atyrau and Mangystau regions). In addition, since 1998, 31 gasification projects have been completed with a total length of 1,130 km of gas pipelines laid in the Atyrau and Mangystau regions.

In 2020, in the midst of the coronavirus pandemic, the NCOC supported the healthcare system in the regions of its presence by purchasing vital medical equipment. In total, the Company allocated more than 3 billion tenge to provide direct assistance to the healthcare systems of the Atyrau and Mangystau regions in the fight against Covid-19. Taking into account the urgent need for additional beds, in just two months two modular infectious diseases hospitals were built in Atyrau and Aktau, at the cost of 7 billion tenge each. They are fully equipped with modern medical equipment, including special oxygen supply lines for the treatment of particularly severe patients.

Today the NCOC considers it an honor to participate together with the local community in the development, growth and contribution to the national economy of the Republic of Kazakhstan. The Company has something to be proud of. In 2019, it won recognition at the "Big Hearts" forum of patrons in Aktau, receiving the prestigious award "Zhomart Zhurek". In 2018, it won









first place in the social responsibility competition "Paryz" in the nomination "The Best Socially Responsible Enterprise of the Year". The award was a recognition of the successful implementation of infrastructure projects, SIP and sponsorship and charity programs. In 2011, it received the Silver Paryz award at the competition on the social responsibility of business.

As noted by Baltabai Kuanyshev, NCOC Corporate Services Director, "We are proud to call Atyrau and Mangystau regions our home. Almost three thousand employees and tens of thousands of employees of contracting companies and suppliers working on the implementation of Phase 1 are residents of these regions. Infrastructure and social projects form an important part of NCOC's corporate and social responsibility. In close cooperation with the Republican and local executive bodies, we will continue to work on the construction of schools, hospitals, cultural centers, roads, sports facilities and many other facilities that directly improve people's living conditions."







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Today, the Foundation for Development of Social Projects "Samruk-Kazyna Trust" is implementing a unified policy for charity and socially significant programs of Samruk-Kazyna JSC and holding companies, including KazMunayGas, the national oil and gas holding. KazMunayGas contributes to the development of the regions of its presence and maintains constant dialogue with key stakeholders on all significant issues. The scale of the social activities, sponsorship and charity of the national company effects the interests of a huge number of people. For many years, subsidiaries and dependent organizations of KazMunayGas have been helping the population by making huge investments in the sustainable development of society and support for social initiatives.

The National Maritime Shipping Company Kazmortransflot, part of KazMunayGas, has been allocating an average of 1 million tenge annually to social projects for many years. Since 2002, the company has supported soldiers and sailors, veterans of the Great Patriotic War living in Aktau and Almaty. Since 2005, it has supported veterans and participants of the rear front in Aktau. In 2015, it presented Aktau with a square dedicated to the 70th anniversary of Victory in the Great Patriotic War, investing more than 56.6 million tenge. Since 2017, it has helped to maintain the ancient XIV-XX century "Kadi" cemetery which is a part of the cultural, historical and spiritual heritage of the Kazakh people.

In accordance with the terms of the contract for subsurface use, the oil-producing enterprise Kazakhturkmunay LLP, from 1999 to 2021, allocated a total of more than 735 million tenge for the social and economic development of the Aktobe region (556.6 million tenge) and the Mangystau region (about 179 million tenge). In addition, during the same period, the Company provided sponsorship for the amount of more than 138 million tenge.

Investments by JV Kazgermunai LLP in the largest socially significant projects in the Kyzylorda region in 2013-2021 amounted to 4 billion 312.5 million tenge. The Company allocated funds for the construction and renovation of the sports complex "Muz Aidyny" (ice stadium) in Kyzylorda (400 million tenge), the Korkyt Ata memorial in Karmakchi district (20 million tenge), sports grounds on the territory of schools No. 7, 235, 233, 187. Other projects included: the Kyzylorda recreation

















park square in the Shugyla microdistrict of Kyzylorda (40 million tenge each), a city horse riding center (over 819 million tenge), a psycho-neurological boarding house for 300 persons in Talsuat village (1.350 billion tenge), a youth resource center in Kyzylorda (about 1.495 billion tenge). Medical equipment and materials to fight coronavirus infection Covid-19 (160 million tenge) and medical freezing equipment for healthcare organizations of the city of Kyzylorda were purchased. A center was established in Kyzylorda for transportation and storage of vaccines against coronavirus infection (18.570 million tenge).

The most ambitious social project for Karazhanbasmunai over the years of independence was implemented in 2010-2013. This was the refurbishment of the 274 kilometers highway Aktau-Kalamkas-Aktau, used for the carriage of passengers and cargo from the regional center of Mangystau region to the oil fields of Karazhanbas, North Buzachi, Kalamkas, Arman and others (more than 495 million tenge). In addition, the company allocated more than 230 million tenge for the construction of a children's village in Aktau by order of the Akimat of Mangystau region. More than 76 million tenge was allocated for resolving social issues in Munailinsky, Mangystau rural districts and over 36 million tenge - for Tupkaragan district. 19 million tenge was set aside for 9 playgrounds in Aktau, Tupkaragan and Mangystau districts. Another 18 million tenge was invested in the construction of a power line in the area of the Kulbarak Aulie necropolis - the burial place of the glorious batyr Kulbarak ata, to which pilgrims annually come not only from the Mangystau region, but from the neighboring regions as well.

Between 2006-2020 Caspi Meruerty Operating Company B.V., the operator of the Production Sharing Agreement on the contract territory of Zhemchuzhina, located in the Kazakhstan Sector of the Caspian Sea financed social projects in the Mangystau region totaling over 8.5 billion tenge – a significant contribution of the Company to the development of the region. This company, one of the participants of which is KazMunayTeniz Offshore Oil Company LLP, a subsidiary of KazMunayGas, has annually invested US \$500 thousand and more in such projects as the reconstruction of Adai-Ata architectural monument, the supply of ventilators for children and newborns for the regional infectious diseases hospital and PCR equipment for the Mangystau Agro-Service State Enterprise, the construction of kindergartens, playgrounds, residential buildings, outpatient clinics, highways and other facilities in villages of the region.

Since its establishment, KazRosGas LLP, a joint venture of KazMunayGas JSC and Gazprom PJSC, has been providing comprehensive support to the development of sports, cultural and humanitarian areas, including help to vulnerable groups. For this company, social values are not just charity or sponsorship, but an integral part of a good, mature business, an entire philosophy that implies a certain level of development of the company and a platform for a social dialogue. This is a serious approach and close attention is paid to each induvidual. After all, the main criterion for sponsorship and charitable activities of KazRosGas LLP is targeted assistance. The social and sponsorship work of

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the joint venture is systemic and large-scale. At the same time, focus is made on long-term programs, assistance to vulnerable groups of people, children, athletes, orphanages, war and labor veterans, and persons with disabilities. Over the past years, help has been provided to a lot of people! So, in 2010, KazRosGas LLP supported the public award for people with disabilities "Samgau", acting as a general sponsor of this event. The uniqueness of the award was to unite all disabled people - with hearing and sight disabilities, general diseases, disorders of the musculoskeletal system - within a single creative competition. In fact, it was established for those who, despite their health condition, have not given up, but have found the strength to live a full life. In addition, today KazRosGas LLP is a sponsor of the Special Olympics Kazakhstan movement. The agreement on cooperation in the field of health improvement and social adaptation, rehabilitation and integration in society of children and adults with intellectual disabilities was signed between the parties in Almaty in 2007. At the same time, the first trip for athletes with disabilities to the Olympic competitions in China was sponsored by KazRosGas LLP. The company's participation in this movement is especially valuable because previously only foreign companies provided financial assistance to Kazakhstani athletes with disabilities.













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A major investor in the oil and gas industry of Kazakhstan – Chinese CNPC – has invested over US \$400 million in charity projects over 24 years of operation in the country. Chinese social investments have given a powerful impetus to the development of the regions of presence – the Aktobe, Mangystau and Kyzylorda regions, as well as the Kazakh capital

- Nur-Sultan. As a result, over the past period, a modern social infrastructure has appeared in Kazakhstan and several thousand jobs have been created. A striking example of Kazakh-Chinese friendship was the financing of the construction and subsequently sponsorship of the Kazakh National Academy of Choreography in Nur-Sultan. This is the first and largest university in Central Asia with a full cycle of multi-stage choreographic education - from the basics of dance ballet art to postgraduate training of masters and doctoral students. There are no more than ten such educational institutions in the world. The idea of creating the Academy of Choreography belongs to Elbasy Nursultan Nazarbayev, who said during its grand opening ceremony on August 31, 2016 that Kazakh traditions will develop in the institution, and new approaches to art will be formed. The Head of State expressed his special gratitude to those who realized the idea of creating a modern temple of art.

"I have to thank you for building this choreography academy with extra-budgetary money. At my request, the People's Republic of China, the CNPC Oil Company and Samruk-Kazyna Fund invested money, it was built thanks to their funds. Thank you! For such sponsorship, for such social assistance to our country. Please express my gratitude to all your teams. This is a significant gift to the country on the eve of the 25th anniversary of our Independence", Nursultan Nazarbayev said.

According to CNPC itself, the Kazakh National Academy of Choreography regularly contributes to the strengthening of friendly relations and cultural cooperation between Kazakhstan and the People's Republic of China.

Another landmark of the capital of Kazakhstan is "Beijing Palace Soluxe Hotel Astana". Located in the central part of the administrative center of Nur-Sultan, next to important state institutions such as the Ministry of Defense, the National Security Committee, the Supreme Court, the Prosecutor General's Office and the House of Ministries, it was built with money provided by CNPC-Aktobemunaigas JSC, an oil production subsidiary of CNPC. The construction of this building, combining a hotel and



















a business center with a total area of 42,563 square meters, has become a landmark event for the Kazakh capital. In 2008, when the construction of the Beijing Palace Soluxe Hotel Astana was completed, Nursultan Nazarbayev personally came to cut the ribbon.

The portfolio of large-scale social projects of PetroKazakhstan Kumkol Resources (PKKR), which is another subsidiary of CNPC, includes financing of Shapagat rehabilitation center for disabled children in Kazaly district of the Kyzylorda region. It was established back in 1995 through the UNDP and since 2001, under the patronage of the PKKR, it has established itself as one of the well-known public organizations in the region. Over the years, about 500 children with disabilities have received medical, psychological and methodological assistance here. In addition, for the past 20 years the Company has been providing financial support to the Balgyn kindergarten for children from lowincome families in Zhanakorgan district, and for twenty-five years it has been fully patronizing the Arai-Sunrise children's camp on the Syr-Darya riverside.

CNPC's subsidiary, Mangistaumunaigaz JSC, which develops oil and gas fields in the Mangystau region, has been one of the leaders of sponsorship programs in this region for many vears. It invested over 78 million tenge to open a Music School of Arts in Zhetybay village (2011) and 200 million tenge in the construction of a new sports center (2012). It also renovated kindergarten No. 10 in Aktau for the amount of more than 283 million tenge under the Balapan program and built an indoor sports center in Shebir village for the amount of 78 million tenge (2014). The company has implemented many other projects at its own expense thus demonstrating its commitment to helping those who work for the benefit of the country and deserve to live in comfortable conditions. In 2020, in the context of a global pandemic and an unprecedented drop in oil prices affecting revenue, Mangistaumunaigaz allocated over 1.9 billion tenge to support the local health system.



Chapter **11** THE STRATEGY OF GOOD DEEDS



Today, new prospects for cooperation between Kazakhstan and China in the oil and gas sector are emerging thanks to the implementation of the Silk Road Economic Belt Project, initiated by Chinese Leader Xi Jinping and supported by Nursultan Nazarbayev. Such a partnership will allow a new joint mechanism of

interaction for sustainable and social development in the regions of CNPC activity in Kazakhstan to be formed.























Chapter **11** THE STRATEGY OF GOOD DEEDS

One of the largest oil and gas companies in Russia, LUKOIL PJSC, operating in the Republic of Kazakhstan since 1995, has been following the principles of corporate social responsibility during many years of its operation in the country. It has supported education, culture and health institutions, promoting a healthy lifestyle, providing assistance to poor and vulnerable groups of the local population. One of the most successful and unique projects in Kazakhstan are Arai and Akniet social partnership programs. The idea of the Arai project, especially developed for the Republic of Kazakhstan in 2007, was to provide a grant in the amount of up to 850 thousand tenge for rural citizens of the Republic of Kazakhstan over 18 years old having a specific plan and a clear vision of their business. Preference was given to the poor, members of large families, oralmans (returnees to Kazakhstan), disabled people - representatives of socially vulnerable segments of the population who are unable to obtain bank loans for the business development. Over the 6 years of implementing this program in the Mangystau and Aktobe regions, more than 6 thousand applications from rural areas were considered, and more than 600 new small businesses and private entrepreneurs appeared in rural settlements. LUKOIL's investments over the years have exceeded US \$2 million. The Arai social partnership project has become an impetus for the growth of people's self-awareness. They now understand that even one person can change something in the lives of others. The project has become, to a certain extent, an impetus for the stable growth of small businesses in Mangystau and Aktobe regions. The high degree of economic activity of the Arai grant holders impressed even experienced entrepreneurs. Now livestock facilities, hairdressers, sewing workshops, shoe repair workshops, bakery and confectionery workshops, playgrounds, computer centers, mini-mills, pharmacies have been set up in the villages. In remote communities, facilities for production of blinds, plastic products, centers for the study of foreign languages, a puppet theater and even a beauty shop have opened - not all of them are traditional businesses for the area. The Arai program was awarded the Paryz Prize of the President of the Republic of Kazakhstan in 2008 as the "Best Social Project" and the Tanym Award of the Civil Forum of Kazakhstan in 2009. On December 25, 2012, LUKOIL was awarded the Paryz Award in the nomination "The Best Socially Responsible Enterprise", primarily for its social activities and, in particular, under the Arai program.



Based on the experience of conducting such programs in the regions of its opeation, in 2013 the Company launched an updated social partnership program entitled "Akniet" (Good Intention). The Kyzylorda region was chosen as the launch site. The need to reform the social partnership program arose from the development of the economy and the improvement of living standards. It also took into account the wishes and specific recommendations from local akimats, NGOs, mass media, and applicants aimed at improving the rules of the Arai project. The project retained the idea of issuing grants for the development of individual entrepreneurship as a form of small business, which have now grown to 1 million tenge. At the same time, the list of areas for which grants can be issued and the list of applicants have significantly expanded. Over 3 years of the Akniet program implementation, more than 3.5 thousand applications were received in 6 nominations: "Social Entrepreneur", "Innovation", "Applied Art", "Care", "Initiative", and "Goodness". More than US \$950 thousand (more than 170 million tenge) were allocated for the program. As a result, more than 170 small businesses were opened leading to new jobs.

"Supporting the initiatives of the local community is one of the principles of our socially-oriented work in the regions of presence," commented Vagit Aleperov, President of LUKOIL PJSC. "In 2020-2021, as part of the campaign to counter the spread of the coronavirus pandemic, LUKOIL Group supplied medical equipment to healthcare institutions in the Almaty and Kyzylorda regions for the total amount of more than 600 million tenge (about US \$1.5 million). Earlier, in the Mangystau, Aktobe and Kyzylorda regions, we implemented the Arai and Akniet social partnership programs. They are aimed at supporting one of the urgent tasks of the government – promoting employment growth in the regions and creating a socially responsible community. The Arai program in Mangystau and Aktobe regions has allowed the creation of more than 500 new small businesses and private entrepreneurs. The Akniet program was aimed at promoting the improvement in the rural social infrastructure, the growth of employment among socially vulnerable groups of the population".

LUKOIL's social initiatives in Kazakhstan have received significant support from the state. Like the projects of many other oil and gas companies operating in the country, they have been demonstrating commitment to social responsibility for many years.

Three decades after Kazakhstan gained sovereignty, Kazakh business has moved from episodic charity to systemic social investments. In the oil and gas companies operating in the country, there are people who can be called professional managers of corporate social responsibility. The invariable rule of business – to develop engaging society – has long been dominant in the industry. Thanks to multimillion-tenge investments by oil and gas companies, socially important infrastructure facilities have grown in cities, towns and villages of the country. They have made the lives of ordinary people better and more comfortable. As oilmen dreamed at the dawn of Kazakhstan's independence, oil has really begun to yield benefits to every citizen of Kazakhstan.





Жасампаздық және өркендеу Созидание и процветание 320

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Chapter 12

"MAN IS RAISED UP ONLY BY REASON, SCIENCE, WILL AND CONSCIENCE. ONLY A FOOL CAN THINK OTHERWISE."

Abai Kunanbayev, Kazakh poet, enlightener, and public figure

t the dawn of its independence, the Republic of Kazakhstan needed new highly qualified personnel to implement further reforms. The comprehensive training of young professionals was one of the important conditions for Kazakhstan's economic development. Motivated, active and educated personnel with qualified theoretical and practical knowledge and skills ensure stable growth of any enterprise, including oil and gas companies. This was well understood by the country's leadership, who implemented the first reforms in the education system at the beginning of the path of independence.

In the early 1990s, several hundred primary vocational schools and colleges, higher educational institutions and scientific institutions were operating in Kazakhstan. The new curricula and the list of professions were developed taking into account the realities of the economy. In order for higher education to overcome the crisis of the 1990s and, using the new opportunities, to reach a new level of development, the universities needed complete

modernization. The process of transformation also forced universities to reconsider their approaches to personnel training. New professions such as private service organizer, entrepreneur, tenant farmer, computer operator, programmer, hotel business manager began to appear. In 1996, a new Classifier of Higher Education which included over 300 different majors was approved. As a result of mergers and the structural reorganizations of universities, expanded educational institutions appeared, many of which included new faculties and departments. The development of cooperation of universities with research institutes, colleges, high schools, and producing companies, the establishment of international relations and the signing of cooperation agreements contributed to improving the quality of education. The government's requirements for the training of personnel with university degree increased. On an annual basis more than 30 thousand young Kazakhstanis received grants. In July 2001, a group of leading universities in Kazakhstan was awarded the status of national universities



With the establishment on November 5, 1993 by the President of the Republic of Kazakhstan, Nursultan Nazarbayev, of the "Bolashak" international scholarship program ("The Future" in the Kazakh language), talented young people were given the opportunity to receive education abroad for the first time in the history of the post-Soviet states. It allowed citizens of Kazakhstan to study at the best universities in the world at the expense of the republican budget and included both studies at those universities, and research and industrial internships in leading companies and universities on the planet. The Resolution of the Cabinet of Ministers of the Republic of Kazakhstan dated December 13, 1993 No. 1245 established the Republican Commission for Training Personnel Abroad. In 1994, a group of Kazakhstani students was sent to study at the foreign universities for the first time.

"I sent the first scholarship holders so that they would acquire new knowledge and be able to lead our country forward. The economy was in a state of collapse, almost all large-scale production facilities stopped. Inflation was going through the

GRADUATES IN THE CONTEXT OF THE TRAINING PROGRAM

Place of work	Number, person	%
Master's degree program	293	55.1
Bachelor's degree program	209	39.3
Internship	18	3.4
Specialist	10	1.9
PhD program	2	0.4
	Place of work Master's degree program Bachelor's degree program Internship Specialist PhD program	Place of workNumber, personMaster's degree program293Bachelor's degree program209Internship18Specialist10PhD program2

roof, and unemployment was rising. The country plunged into "wild capitalism". We were just beginning the transition to market relations. Few people knew what it was. Even the most experienced managers had only vague ideas about how to manage new economic and social processes, and create a sovereign state. At that time, there were no professionals in the transition to a new market economy in the country. Independent Kazakhstan urgently needed professional personnel with high-quality education of

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international level. It was necessary to privatize and attract investments into the country. And it was our right strategic choice", Nursultan Nazarbayev recalled.

In the 2000s, during the economic recovery, the state had new opportunities to expand the Bolashak international scholarship, and Kazakhstanis with technical and engineering education were able to receive this scholarship. If for the ten years, from 1994 to 2004, about 800 students had benefited from the program, then in 2005-2006 the Bolashak scholarship for bachelor's and master's degree programs was awarded to 2.5 thousand young Kazakhstanis. The diversity of the program has significantly expanded in terms of countries and universities. Among the recommended universities, along with European and American universities, universities of the Eurasian region and advanced universities of the countries of East and Southeast Asia were included. The scholars could now study in 30 countries, the list of priority professions was expanded to include oil and gas business, energy, programming, management, ecology and others.

As Nursultan Nazarbayev later emphasized, the development of human potential as a factor in increasing the competitiveness of the nation bore fruit. Thanks to Bolashak program, thousands of talented young Kazakhstanis received a brilliant education at the best universities in the world, all paid for by the state. Bolashak has become a real social lift for young people.

As of mid-2021, a total of 11,289 specialists had been trained in the best universities in the world within the framework of the Bolashak program. Out of the a total of 532 students completed their training in Oil and Gas Business, Petrochemistry and Petrochemical Synthesis, Development of Oil and Gas Fields. 434 students fully fulfilled their contractual obligations on mandatory specialized work placement in chosen degree, 97 people were currently being monitored with regard to the work placement in July 2021, while 1 person was granted a delay in fulfilling contractual obligations (in connection with continuing education). Graduates studied in the following countries: United Kingdom - 286 individuals, United States of America - 139 individuals, Canada - 29 individuals, Russian Federation - 32 individuals, People's Republic of China -14 individuals, Malaysia – 7 individuals, Azerbaijan – 5 individuals, Norway - 5 individuals, Japan - 4 individuals, the Federal Republic of Germany - 3 individuals, France - 3 individuals, Czech Republic - 3 individuals, New Zealand - 1 individual, Poland - 1 individual.

By 2021, graduates of the Bolashak program were working in such organizations as the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan, KazTransGas JSC, KazTransGas Aimak JSC, Embamunaigas JSC, Sozak Oil and















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Gas JSC, Tengizchevroil LLP, Schlumberger Logelco Inc., NCOC Branch, Karachaganak Petroleum Operating B.V., Shell Kazakhstan and others.

In the 1990s, after qualitative changes took place in the oil and gas industry of Kazakhstan, more and more young people began to strive to get into the industry. Due to the implementation of growth projects and the upcoming development of hydrocarbon projects on the Caspian Sea shelf, there was an increasing demand for the number of employees of various professions. In 2005, based on a study by KazMunayGas of the most in-demand specialists in the period up to 2015, data on 78 engineering and technical professions and 103 working professions was collected. This predicted an increase in the number of employees in the industry by more than 9 thousand. The management of the national company drew attention to the need to train young specialists to work in the oil and gas sector. The analysis of KazMunayGas employees profile showed that most of the specialists were over 40 years old, and at that time, serious competition was being felt more than ever between oil companies operating in the Republic in terms of attracting promising employees.

A key role in the training of qualified personnel for the oil and gas industry of Kazakhstan was being increasingly played by one of the oldest and largest technical universities in Kazakhstan – the Kazakh National Technical University (since 2014 – the Kazakh National Research Technical University named after K.I. Satbayev, KazNITU has been operating under the Satbayev University name since 2017), as well as the Kazakh-British Technical University, which opened in 2001 in Almaty under the patronage of British Prime Minister Tony Blair. In addition, the only specialized state university of the Republic of Kazakhstan, which has been training specialists in oil and gas for many years, is the Atyrau University of Oil and Gas named after Safi Utebayev.








NUMBER OF KBTU GRADUATES WITH DEGREE IN OIL AND GAS (the first graduation was in 2007)

NՉ	Major	Number of graduates with bachelor's degree	Number of graduates with master's degree
1	Drilling of oil and gas wells	33	
2	Geology and exploration of mineral deposits	135	8
3	Geology of oil and gas	12	
4	Geophysical methods of exploration activity (for the oil and gas industry)	25	
5	Hydrogeology, engineering geology and geoecology (for the oil and gas industry)	5	
6	Machines and equipment of the oil and gas industry	19	
7	Oil and gas business	1246	198
8	Applied ecology (for the oil and gas industry)	12	
9	Engineering, construction and operation of gas and oil pipelines and gas and oil storages	47	
10	Development of oil and gas fields	65	
11	Seismology (for oil and gas industry)	8	
12	Standardization and certification (for oil and gas industry)	17	
13	Technological machines and equipment	17	2
	TOTAL	1.641	208
	All	1.849	

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For more than 30 years since independence, Satbayev University has produced about 8000 professionals for the oil and gas industry of the Republic of Kazakhstan. On average, about 60-70% of graduates work in the country's oil industry. New bachelor's, master's and doctoral programs appeared in the areas of Oil and Gas and Ore Geophysics (classes are held on theoretical foundations and field work) and Seismology (processing, interpretation and modeling), with the main geophysical disciplines: gravity exploration, magnetic exploration, electrical exploration, and seismic exploration.

Today, the University closely cooperates with Moscow, Perm, Tomsk and the Far Eastern Universities of the Russian Federation. Universities of CGG and Lorraine (Nancy, France), University of Basilicata (Italy), the University of Mining and Technology of the People's Republic of China. Pennsylvania State University and Colorado School of Mines (USA). In 2017, the Oil and Gas Community Committee at the World Economic Forum (WEF), consisting of the heads of the world's largest energy companies, stated that the lack of talent in the oil and gas industry is a serious challenge in emerging markets around the world. The Committee recognized fluctuations in oil prices as one of the main reasons leading to cyclical hiring. In order to resolve this problem, the WEF and partner companies Chevron, Eni and Shell chose Kazakhstan and Satbayev University to launch a WEF pilot program to bridge the gap in supply and demand by creating highly qualified human resources and reducing the time for training in production due to high-quality educational content. The industry partners chose the Colorado School of Mines (CSM) as an academic partner



due to its experience in creating academic programs around the world. The WEF working group, which included representatives of Chevron, Eni and Shell, as well as heads of departments of oil and gas companies and SU, identified three priorities for improving the Petroleum Engineering program: I. Creation of an Industrial Advisory Council (IAC) to promote mutual trust and cooperation between academia and industry; II. Revision of the curriculum and improvement of educational materials with the support of Colorado Mining School; III. Internship programs for students and teachers to provide professional training and support the development of the faculty.

The number of KBTU graduates with degree inoil and gas from since the first graduation in 2007 amounted to 1,849, of which 1,641 bachelors and 208 masters graduates.

KBTU currently cooperates with Heriott Watt University, University of Aberdeen, Robert Gordon University, University of Birmingham from the UK, Gubkin Russian State University of Oil and Gas (2013). Ufa State Petroleum Technological University (2003), Tomsk State University (2005), Novosibirsk State Technical University (2005), Almetyevsk State Oil Institute (2012), Tyumen State Oil and Gas University (2013), D. Mendeleyev University of Chemical Technology of Russia (2013) in Russia; Stavanger University (2005) and Norwegian Drilling Academy (2013) from Norway, Ploiesti Oil and Gas University from Romania (2018), Saint-Etienne Mining University (2019) and Lotharingia University (2014) from France, EADA Business School from Spain (2015), University of Basilicata (2014) and Eni Corporate University (providing a Master's program in Industrial Project Management and Engineering) from Italy, Girne American University from Cyprus (2012), IFP Energies Nouvelles and IFP School of the French Petroleum Institute New Energy from France (2012), Petronas Technological University from Malaysia (2019), Chinese Petroleum University from Huadong, China (2019), Chinese Petroleum University from Beijing, China (2018), Asia-Pacific University of Technology and Innovation (2012) in Asia; as well as Ivano-Frankivsk National Technical University of Oil and Gas from Ukraine (2012), Baku Higher School of Petroleum and Azerbaijan State University of Petroleum and Industry from Azerbaijan (2018). In 2012-2016, KBTU students of the Energy and Oil and Gas Industry Department and Chemical Engineering REC were awarded Lloyds Register Foundation scholarships. Together with the Chinese Petroleum University, in 2018, KBTU established the Petroleum Engineering Institute "The Belt and Road Initiative", where research is conducted in the field of the use of nanomaterials and nanotechnologies in the oil and gas industry.

Atvrau University of Oil and Gas also has a rich history of development. The history of the university dates back to 1959, when an Education and Consulting Center (ECC) of the All-Union Correspondence Polytechnic Institute was opened in the city of Gurvev (now Atyrau). This marked the beginning of the training of highly gualified oil workers for Kazakhstan. Since 1978, the educational institution has been called the ECC of the Kazakh Polytechnic Institute named after V.I. Lenin (KazPTI). In 1990, a branch of KazPTI accepted the first students who were offered training in Drilling Oil and Gas Wells, Chemical Technology of Organic Substances, and Oil Machinery. By the Decree of the Government of the Republic of Kazakhstan dated March 24, 1998. a state higher educational institution was established entitled the Atyrau Institute of Oil and Gas, subsequently transformed into a university. On February 14, 2019, by the Decree of the Government of the Republic of Kazakhstan No. 64, Atyrau University of Oil and Gas was named after the famous Kazakh oilman Safi Utebayev. Over the years since independence, hundreds of qualified specialists who participated in key industry projects of the country araduated from this higher educational institution, which has become one of the best oil and gas universities in Kazakhstan. Today, the University is actively implementing the process of integration of Education - Industry - Science - Business based on approximating the learning infrastructure to the real conditions of production through the introduction of modern technologies in the educational process. By order of the Minister of Energy of the Republic of Kazakhstan, the University became the first Center for Industry Technological Competencies of the Ministry of Energy of the Republic of Kazakhstan in Kazakhstan, providing expert support on technological innovations in the energy industry. The university provides expert support for digitalization projects and the development of experimental educational programs on "professions of the future". It was one of the first universities in the Republic of Kazakhstan, to successfully begin implementation of paragraph 80 of the Decree of the President of the Republic of Kazakhstan dated September 14, 2020 No. 413 "On Measures to Implement the President's Address to the People of Kazakhstan dated September 1, 2020 - Kazakhstan in a new reality: time for action" by signing a patronage agreement with Atyrau Refinery LLP. As part of this agreement, the Institute of Petrochemical Engineering and Ecology



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was opened in December 2020. It incorporates a training center and research laboratories for applied research by subsoil users. The complete modernization of 15 chemical laboratories and the transfer of AXANS catalytic reforming units has been completed. In addition, the university is a leader in the pace and quality of the introducing dual education in the higher education system. On the basis of this joint work is being carried out with authorized bodies and NCE Atameken to form a model of dual education in Kazakhstan. The Industrial Committee, represented by the top management of industrial companies in the region, is effectively involved in resolving strategic tasks, and organizing dual training, while its representatives participate in curricula design and contribute to employment of graduates.

In February 2020, the educational West Hub was created under the University. The aim was to unite schools, colleges, and universities of the western region of the country into a single system which will contribute to improving the competencies and general literacy of secondary school students of the Atyrau region. The West Hub has become an impetus for better interaction between secondary schools, colleges and higher education institutions, improving the quality of education in the region, turning it into a continuous process.

The Caspian Hub for Sustainable Development Goals (Caspian SDG Hub) was created to unite more than 10 universities of the Caspian region. Work is now underway on the project "Development of a Map of the Sensitivity of the Caspian Sea to Environmental Factors". Joint research projects are being launched, and the Caspian Sustainable Development Network University is being created. In January 2021, with the participation of the global company Ernst and Young, the experience of the Atyrau University was disseminated to the universities of Ukraine.

By developing an investment and education partnership, Kazakhstan's specialized universities have established strong ties with the largest oil and gas companies. This is not sponsorship, in which all relations would be limited only to the transfer of money, but the implementation of unique joint educational and practical programs.

Thus, manyoil and gas companies of Kazakhstan are providing assistance to the Satbayev University. Bachelor's, master's and post-graduate degree programs in the field of oil and gas and ore geophysics are being implemented jointly with Geoken Scientific and Production Center. Contracts for mandatory internship have been entered into with IZDENIS LLP, PV-5 LLP, Tsentrpromgeofizika LLP, Uzenpromgeofizika JSC, Batys Geofizservice LLP, CNPC-Aktobemunaigas, Embamunaigas JSC, Institute of Hydrogeology and Geoecology named after U. M. Akhmedsafin, Azimut Geologiya LLP, Aksai Operating LLP, Atyraupromgeofizika LLP, Karachaganak Petroleum Operating B.V., KazPetroDrilling, Caspiymunaygas, Kazgiproneftetrans, Mangistaumunaigaz, KazTransOil and others.

FormanyyearsKBTUhasbeeninpartnershipwithKAZENERGY Association, TCO, Embamunaigas, NCOC, KazPetroDrilling, Total, Baker Hughes, Schlumberger, KMG Kashagan B.V. and other companies. As part of the additional education system in KBTU in 2019-2021, more than 300 courses and trainings were held. more than 1,000 people were trained. During the implementation of the Business Connections project, aimed at supporting small and medium-sized businesses, more than 1,000 people were trained over the period from 2016 to 2017. The first stage was to improve business competencies of participants in Kazakhstan, the second stage was a free four-week thematic business internship in Germany. Two-degree Executive MBA programs were established to train the talent pool of KazMunavGas. In 2017, for the first time KazMunayGas offered an educational project entitled "Focus on Success!", with the participation of the entire top management of the national company and subsidiaries of the holding. KBTU was in charge of the project development and administration.

Safi Utebayev Atyrau University of Oil and Gas is one of the organizations developing the industry project entitled "Atlas of New Professions and Competencies" in the oil and gas industry of the Republic of Kazakhstan, initiated by KAZENERGY Association.

In order to develop partnership between Kazakh and Asian universities, in 2011 an agreement was reached between the Chinese National Oil and Gas Company and the Ministry of Education and Science of the Republic of Kazakhstan on the establishment by CNPC of a scholarship to train Kazakhstani specialized technical personnel and encourage excellent Kazakhstani students to study oil disciplines in China. Every year between 2011 and 2015, 75 Kazakhstani students went to study Chinese to obtain a master's degree in the oil and petrochemical industry at the Chinese Petroleum University. Over the past period, CNPC has allocated 25 million yuan for the payment of scholarships to excellent Kazakhstani students.

For many years, the largest companies TCO, NCOC and KPO have been acting as a forge for the personnel of the oil and gas industry of Kazakhstan. Due to their scale and technological complexity, growth projects previously attracted foreign personnel to leading positions, but now with the launch of the personnel nationalization programs, they are being replaced by competent Kazakhstani specialists.

Investing in Kazakhstan's human resources is one of the strategic objectives of TCO. This will allow us to develop and support highly qualified employees, in order to achieve a high level of results. At the end of 2020, the percentage of full-time Kazakhstani employees in the base production of TCO was 92%, while the share of Kazakhstani managers in the base production of TCO was 85% of the total number of senior staff. As a result of ongoing training and personnel development programs, more and more employees are being promoted to more responsible positions.



ATYRAU INSTITUTE OF OIL AND GAS named after SAFI UTEBAYEV TODAY



URLAN OTEPULY

Student campus In Atyrau city, Privokzalny district	Scie Iabo Aza	entific and oratory facilities ttyk Ave	3500 students	2 fact men	50 alty mbers
95 candidates of sciences	2 Academicians of NAS RoK	2 Academicians of NEA RK	26 Doctors of Sciences	2 Student dorms	B Reading rooms
International Educational Programs	2 Educ Prog	S ational rams	Department of Assembly of Pe of Kazakhstan	the En ople de	glish-speaking partment
Virtual field Unique educational laboratory	SP Of	lID-2 fice	5 educational laboratories	9 virtual educationa I laboratori es	5 dual educational programms
Center for Innovative Educational Technologies		JCATION national ational vition	Student government President - Parliamen Deans	t-	OUNDATION OGRAM
35 Student clubs and creative teams	14 branches of departments at enterprises	85 enterprises- partners	17 sport sections	75 International HEI partners	2 training and production workshops

Source: Atyrau University of Oil and Gas

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CO EMPLOYEES ON FOREIGN APPOINTMENTS AND ASSIGNMENTS WITHIN KAZAKHSTAN

Since 2008, TCO has invested US \$81 million in training programs for its employees. The Horizons program aimed at the accelerated development of young specialists is being effectively implemented at TCO. It is attended by graduates of technical universities employed at TCO, as well as young specialists in a number of disciplines with less than 5 years of work experience. The program combines various training methods, including technical trainings, mentoring, work assignments and assessment of professional competencies that complement and support each other. The company is investing in the education of employees, providing them with financial assistance in obtaining higher education.

In order to increase the percentage of local personnel in the North Caspian Project and to gradually replace foreign specialists with Kazakhstani NCPOC personnel, local employees are also being trained on an annual basis to further improve their qualifications and leadership skills.



The total number of NCOC staff at the end of 2020 was 3,154 people, of which 2,935 were local staff (93%). In 2020,

52 positions previously occupied by foreign specialists were nationalized (with a plan of 18 positions).

TRAINING INFORMATION

Name	
Training of local employees of the company (direct hiring) / Training of local employees of the company (seconded employees of KMGK)	3,287 training courses were held with 2,548 employees trained
Scholarship program (Kazenergy)	3,959 students were sponsored (oil and gas, technical specialties)
Training of civil servants	More than 900 public employees have been trained (HSE courses were organized for access of civil servants to NCOC production facilities (onshore and offshore)

In order to increase the local content in terms of personnel and replacing foreign personnel with Kazakhstani employees, KPO has also developed a program to increase the local personnel content during the period 2020-2025. After discussing and endorsing the draft program with the PSA authority, it was decided that the overall target for local staffing by 2025 will be at least 96% of the contractor's headcount.



At the end of 2020, the total number of company staff was 3,920 people, of which 3,634 were local staff (94%). In 2020, 23 positions previously occupied by foreign specialists were

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nationalized in KPO (with a plan of 18 positions), an additional 54 foreign positions were reduced.

INFORMATION ON TRAINING FOR THE 2010-2020 PERIOD

Name	
Training of local employees of the company (direct hiring) / Training of local employees of the company (seconded employees)	489,295 employees have been trained
Scholarship program (Kazenergy)	1,359 students were sponsored (oil and gas, technical specialties)
Training of civil servants	More than 148 civil servants have been trained (environmental regulation measures were carried out at the request of state agencies)

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According to the Information and Analytical Center of Oil and Gas JSC of the Ministry of Energy of the Republic of Kazakhstan, as of 2021, the current legislation on subsoil and subsoil use in Kazakhstan provides subsoil users with a wide range of ways for fulfilling contractual obligations to train Kazakhstani personnel. At the same time, the subsoil users independently select the method of financing, guided by their current needs. In order to implement the provisions of the Subsoil Code (subparagraph 1, paragraph 1, Article 129 and subparagraph 1, paragraph 1, Article 178), Rules for financing the training of Kazakhstani personnel have been developed (approved by joint Order of the Minister of Energy of the Republic of Kazakhstan No. 185 dated 15.05.2018 and the Minister of Education and Science of the Republic of Kazakhstan No. 211 dated 17.05.2018). In accordance with these Rules, the following expenses of a subsurface user are recognized as fulfilling the obligations to finance training: 1) for the training of citizens of the Republic of Kazakhstan who are employees of the subsurface user in professions related to the production activities of the subsurface user; 2) for the training of citizens of the Republic of Kazakhstan who are not employees of the subsurface user, including for the career guidance of school students. In particular, funding is provided in the amount of up to 30% of the amount of obligations established by the contract for subsurface use for the training of socially vulnerable groups of population (people with disability of groups 1, 2, and 3, orphans and children left without parental care, under twenty-one years old, those who lost their parents before adulthood, large families, incomplete families); 3) funds transferred to the state budget for the training of citizens of the Republic of Kazakhstan; 4) actual expenses to procure goods, works and services according to the list submitted by local executive bodies of the regions, cities of Republican significance, the capital city, as agreed with the authorized body in the field of hydrocarbons and uranium mining. These are the goods, works and services required to improve facilities and resources of educational organizations providing training in professions related to subsoil use. It should be noted that these provisions, in accordance with paragraphs 2, 3 of Article 277 of the Subsoil Code, are applicable to relations in the field of subsoil use that arose under contracts signed after its introduction. In addition, as of 2021, about 71% of subsoil use

contracts were signed before the introduction of the Subsoil Code, and their implementation is regulated by subparagraph 12, paragraph 1, Article 76 of the Law of the Republic of Kazakhstan dated June 24, 2010 No. 291-IV "Concerning Subsoil and Subsoil Use". Currently, more than 95% of the existing subsurface use contracts provide for obligations to annually allocate funds for the training of Kazakhstani specialists (1% of the volume of investments, exploration and production costs, as well as fixed obligations in foreign currency).

The actual costs of subsurface users of the energy sector (exploration and/or production of hydrocarbons and uranium mining) for training Kazakhstani personnel in 2020 amounted to 11.8 billion tenge, in comparison with 21.08 billion tenge in 2019. This fall was primarily as a result of restrictive measures related to lockdown and the emergency regime in the country and around the world due to the Covid-19 pandemic.

Despite the external economic factors, Kazakhstan's oil and gas education continues to support the training of young specialists at a decent level. Large industry companies are creating and actively developing their own training centers, while continuing to work in tandem with educational organizations. High-quality education remains a key component of the success of the oil and gas business in Kazakhstan.

The Government of the Republic of Kazakhstan is looking at the human resources issue in the oil and gas sector in an evolutionary context, based on what the industry was like before and what it will be like tomorrow. Oil and gas education in the country is characterized not so much by a shortage of personnel, as by the difficulty of raising work to a new innovative level of the industry. At the same time, there is a constant demand for professionals with rare expertise, for example, in offshore development, who must not only possess theoretical knowledge, but also practical skills. This imposes special requirements on employees. Experts also predict the emergence of new areas in the sphere of subsoil use itself.

Today, the evolutionary development of the national oil and gas education is striving for new heights. These will not be difficult to achieve, given the wealth of knowledge and skills accumulated over three decades.

University	Name of educational program	Employment rate (according to the NCE)
	Oil and gas business	72%
	Chemistry	71%
K. Zhubanov Aktobe Regional University	Physics	83%
	Chemical technology of inorganic substances	77%
	Ecology	68%
	Ecology	83%
	Automation and management	77%
Almaty Technological University	Technological machines and equipment	74%
	Technology of processing industries	53%
	Chemical technology of organic substances	54%
G. Daukeyev Almaty University of Energy and Communications	Automation and management	76%
Aturau Engineering and Humanitarian Institute	Automation and management	86%
Atyrau Engineering and Humanitarian Institute	Oil and gas business	84%
Kh. Dosmukhamedov Atyrau University	Ecology	90%
	Automation and management	84%
	Geology and exploration of mineral deposits	89%
C Utobayay Aturay University of Oil and Cas	Oil and gas business	72%
S. Otebayev Atyrau University of Oil and Gas	Chemical technology of organic substances	82%
	Technological machines and equipment	75%
	Oil and gas engineering	-
	Automation and management	83%
Deishov University	Oil and gas business	80%
Baisney University	Geology and exploration of mineral deposits	100%
	Ecology	69%
	Technical physics	75%
D. Serikbayev East Kazakhstan	Automation and management	90%
Technical University	Geology and exploration of mineral deposits	88%
	Technological machines and equipment	68%
	Ecology	71%
S. Amanzholov East Kazakhstan University	Technology of processing industries	85%
	Chemistry	-
	Oil and gas business	67%
Akmeshit Humanitahan and Technical Institute	Ecology	-
	Engineering systems and networks	90%
	Automation and management	78%
	Technical physics	89%
L.N. GUMIIYOV EURASIAN NATIONAL UNIVERSITY	Physics	56%
	Chemistry	69%
	Ecology	85%
Eurasian Technological University	Ecology	67%
Ekibastuz Engineering and Technical Institute	Automation and management	100%
named after Academician K. Satpayev	Technological machines and equipment	100%

OIL AND GAS OF KAZAKHSTAN

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O.A. Baikonurov Zhezkazgan UniversityGeology and exploration of mineral deposits75%Technological machines and equipment69%I. Zhansugurov Zhetysu UniversityEcology80%Oil and gas business79%EcologyEcology81%West Kazakhstan Agrarian and Technical UniversityEcology81%Technological machines and equipment68%
Technological machines and equipment69%I. Zhansugurov Zhetysu UniversityEcology80%Oil and gas business79%Ecology81%Ecological machines and equipment68%
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Oil and gas business79%West Kazakhstan Agrarian and Technical University named after Zhangir KhanEcology81%Technological machines and equipment68%
West Kazakhstan Agrarian and Technical UniversityEcology81%named after Zhangir KhanTechnological machines and equipment68%
West Kazakhstan Agrarian and Technical University Technological machines and equipment 68% named after Zhangir Khan 68%
Technology of processing industries 75%
Chemical technology of organic substances 64%
Ecology 86%
West Kazakhstan Innovation and Technology Oil and gas business 77%
University Technological machines and equipment -
Chemical technology of organic substances -
M. Utemisov West Kazakhstan University Ecology 71%
Technological machines and equipment -
Innovative Eurasian University Chemical technology of organic substances -
Ecology 67%
M. Tynyshpayev Kazakh Academy of Transport and Communications Automation and management 73%
Technological machines and equipment 63%
S. Seifullin Kazakh Agro-technical University Ecology 74%
Automation and management -
Technological machines and equipment 40%
Kazakh National Agrarian University Technology of processing industries 62%
Ecology 77%
Automation and management 72%
Geology and exploration of mineral deposits 71%
Oil and gas business 68%
Satbayev Kazakh National Technical University Technological machines and equipment 66%
Chemical technology of organic substances 84%
Ecology 77%
Automation and management 71%
Technical physics 50%
Physics 75%
Al-Farabi Kazakh National University Chemical technology of inorganic substances 64%
Chemical technology of organic substances 57%
Chemistry 74%
Ecology 78%
Kazakh Railway UniversityAutomation and management88%

Kazakh University of Technology and Business	Chemical technology of organic substances	56%
Razakii Oniversity of Technology and Business	Ecology	81%
	Automation and management	79%
Kazakhstan Engineering and Technology	Technological machines and equipment	57%
University	Technology of processing industries	-
	Chemical technology of organic substances	-
	Automation and management	100%
Karaganda Industrial University	Technological machines and equipment	66%
	Chemical technology of organic substances	57%
	Automation and management	77%
	Geology and exploration of mineral deposits	70%
Karaganda Technical University	Oil and gas business	66%
	Technological machines and equipment	86%
	Chemical technology of organic substances	73%
	Ecology	67%
	Technical physics	-
Karaganda University named after	Physics	80%
Academician L.A. Buketov	Chemical technology of inorganic substances	89%
	Chemistry	93%
Karaganda Economic University of Kazpotrebsoyuz	Ecology	72%
	Oil and gas business	73%
Caspian Public University	Automation and management	67%
	Geology and exploration of mineral deposits	-
	Geology and exploration of mineral deposits	70%
Cashian University of Technology and Engineering		
Caspian University of Technology and Engineering	Oil and gas business	61%
Caspian University of Technology and Engineering named after Sh. Yessenov	Oil and gas business Ecology	61% 100%
Caspian University of Technology and Engineering named after Sh. Yessenov	Oil and gas business Ecology Oil and gas engineering	61% 100% -
Caspian University of Technology and Engineering named after Sh. Yessenov	Oil and gas business Ecology Oil and gas engineering Automation and management	61% 100% - 89%
Caspian University of Technology and Engineering named after Sh. Yessenov	Oil and gas business Ecology Oil and gas engineering Automation and management Oil and gas business	61% 100% - 89% 76%
Caspian University of Technology and Engineering named after Sh. Yessenov	Oil and gas business Ecology Oil and gas engineering Automation and management Oil and gas business Geology and exploration of mineral deposits	61% 100% - 89% 76% 70%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU	Oil and gas business Ecology Oil and gas engineering Automation and management Oil and gas business Geology and exploration of mineral deposits Chemical technology of organic substances	61% 100% - 89% 76% 70% 54%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU	Oil and gas business Ecology Oil and gas engineering Automation and management Oil and gas business Geology and exploration of mineral deposits Chemical technology of organic substances Marine engineering and technology	61% 100% - 89% 76% 70% 54% -
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU	Oil and gas business Ecology Oil and gas engineering Automation and management Oil and gas business Geology and exploration of mineral deposits Chemical technology of organic substances Marine engineering and technology Project management	61% 100% - 89% 76% 70% 54% - -
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University	Oil and gas business Ecology Oil and gas engineering Automation and management Oil and gas business Geology and exploration of mineral deposits Chemical technology of organic substances Marine engineering and technology Project management Ecology	61% 100% - 89% 76% 70% 54% - - - 80%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University	Oil and gas businessEcologyOil and gas engineeringAutomation and managementOil and gas businessGeology and exploration of mineral depositsChemical technology of organic substancesMarine engineering and technologyProject managementEcologyTechnology of processing industries	61% 100% - 89% 76% 70% 54% - - - 80% 58%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University Sh. Ualikhanov Kokshetau State University	Oil and gas business Ecology Oil and gas engineering Automation and management Oil and gas business Geology and exploration of mineral deposits Chemical technology of organic substances Marine engineering and technology Project management Ecology Technology of processing industries Ecology	61% 100%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University Sh. Ualikhanov Kokshetau State University Kostanay University of Engineering and Economics	Oil and gas businessEcologyOil and gas engineeringAutomation and managementOil and gas businessGeology and exploration of mineral depositsChemical technology of organic substancesMarine engineering and technologyProject managementEcologyTechnology of processing industriesEcologyAutomation and management	61% 100%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University Sh. Ualikhanov Kokshetau State University Kostanay University of Engineering and Economics named after M. Dulatov	Oil and gas businessEcologyOil and gas engineeringAutomation and managementOil and gas businessGeology and exploration of mineral depositsChemical technology of organic substancesMarine engineering and technologyProject managementEcologyTechnology of processing industriesEcologyAutomation and managementTechnology of processing industriesEcologyAutomation and managementTechnology of processing industries	61% 100%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University Sh. Ualikhanov Kokshetau State University Kostanay University of Engineering and Economics named after M. Dulatov	Oil and gas businessEcologyOil and gas engineeringAutomation and managementOil and gas businessGeology and exploration of mineral depositsChemical technology of organic substancesMarine engineering and technologyProject managementEcologyTechnology of processing industriesEcologyAutomation and managementTechnology of processing industriesTechnology of processing industriesTechnology and managementTechnological machines and equipment	61% 100%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University Sh. Ualikhanov Kokshetau State University Kostanay University of Engineering and Economics named after M. Dulatov	Oil and gas businessEcologyOil and gas engineeringAutomation and managementOil and gas businessGeology and exploration of mineral depositsChemical technology of organic substancesMarine engineering and technologyProject managementEcologyTechnology of processing industriesEcologyAutomation and managementTechnology of processing industriesTechnology of processing industries	61% 100%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University Sh. Ualikhanov Kokshetau State University Kostanay University of Engineering and Economics named after M. Dulatov A. Baitursynov Kostanay Regional University	Oil and gas businessEcologyOil and gas engineeringAutomation and managementOil and gas businessGeology and exploration of mineral depositsChemical technology of organic substancesMarine engineering and technologyProject managementEcologyTechnology of processing industriesEcologyAutomation and managementTechnology of processing industriesTechnology of processing industriesTechnology of processing industriesTechnology of processing industriesTechnology of processing industriesPhysics	61% 100%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University Sh. Ualikhanov Kokshetau State University Kostanay University of Engineering and Economics named after M. Dulatov A. Baitursynov Kostanay Regional University	Oil and gas businessEcologyOil and gas engineeringAutomation and managementOil and gas businessGeology and exploration of mineral depositsChemical technology of organic substancesMarine engineering and technologyProject managementEcologyTechnology of processing industriesEcologyAutomation and managementTechnology of processing industriesTechnology of processing industriesEcologySecologyEcologyEcologySecologyEcologySecologySecologyEcologySecologySecologyEcologySecology	61% 100%
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Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University Sh. Ualikhanov Kokshetau State University Kostanay University of Engineering and Economics named after M. Dulatov A. Baitursynov Kostanay Regional University Korkyt Ata Kyzylorda University Yasawi International Kazakh-Turkish University	Oil and gas businessEcologyOil and gas engineeringAutomation and managementOil and gas businessGeology and exploration of mineral depositsChemical technology of organic substancesMarine engineering and technologyProject managementEcologyTechnology of processing industriesEcologyAutomation and managementTechnologi of processing industriesTechnologi of processing industriesPhysicsEcologyTechnologi of processing industriesPhysicsPhysicsEcologyTechnological machines and equipmentAutomation and managementPhysicsPhysics	61% 100% - 89% 76% 70% 54% - - 80% 58% - 91% 64% 73% 65% 80% 83% 71% 67% 50%
Caspian University of Technology and Engineering named after Sh. Yessenov KBTU Abai Myrzakhmetov Kokshetau University Sh. Ualikhanov Kokshetau State University Kostanay University of Engineering and Economics named after M. Dulatov A. Baitursynov Kostanay Regional University Korkyt Ata Kyzylorda University Yasawi International Kazakh-Turkish University	Oil and gas businessEcologyOil and gas engineeringAutomation and managementOil and gas businessGeology and exploration of mineral depositsChemical technology of organic substancesMarine engineering and technologyProject managementEcologyTechnology of processing industriesEcologyAutomation and managementTechnology of processing industriesEcologyAutomation and managementTechnological machines and equipmentTechnology of processing industriesPhysicsEcologyEcologyTechnological machines and equipmentTechnological machines and equipmentAutomation and managementPhysicsEcologyEcologyTechnological machines and equipmentAutomation and managementPhysicsEcologyTechnological machines and equipmentAutomation and managementPhysicsEcologyTechnological machines and equipmentAutomation and managementPhysicsEcology	61% 100% - 89% 76% 70% 54% - 80% 58% - 91% 64% 73% 65% 80% 80% 71% 67% 50% 75%

OIL AND GAS OF KAZAKHSTAN 30 YEARS OF INDEPENDENCE

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Chapter **12** PERSONNEL FOR THE OIL AND GAS INDUSTRY

Develop if the developing the other the	Automation and management	100%
Rudnyi Industrial Institute	Technological machines and equipment	62%
M. Kozybayev North Kazakhstan State University	Ecology	100%
	Physics	50%
Taraz Innovative-Humanitarian University	Chemistry	-
	Automation and management	56%
	Chemical technology of inorganic substances	-
	Chemistry	60%
Mill Dulati Tana Danianal Hainana'n	Oil and gas business	63%
IVI.H. Dulati Taraz Regional University	Technological machines and equipment	25%
	Technology of processing industries	100%
	Physics	88%
	Ecology	42%
	Automation and management	77%
	Oil and gas business	57%
	Technological machines and equipment	68%
	Physics	-
Toraignyrov University	Chemical technology of inorganic substances	85%
	Chemical technology of organic substances	67%
	Chemistry	83%
	Ecology	89%
Bolashak University of Kyzylorda	Oil and gas business	70%
	Automation and management	58%
	Technical physics	68%
	Technological machines and equipment	67%
	Technology of processing industries	70%
Shakarim University of Semey	Chemical technology of inorganic substances	60%
	Chemical technology of organic substances	22%
	Chemistry	86%
	Ecology	100%
Narkhoz University	Ecology	68%
	Ecology	33%
	Automation and management	54%
	Oil and gas business	59%
	Technological machines and equipment	62%
M. Auezov South Kazakhstan University	Technology of processing industries	47%
	Physics	-
	Chemical technology of inorganic substances	100%
	Chemical technology of organic substances	42%
	Chemistry	57%



"The guys need to study to become engineers. Progress in society, movement in society is made by the engineer. A financier only counts what the engineer has done. Without engineers, it will be very difficult to move forward and advance progress."

> **Lyazzat Kiinov,** renowned oilman of Kazakhstan

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KAZENERGY OF LEADERS

Chapter 13

"CAN I ORDER ANYONE TO GO AHEAD, IF I AM NOT AT THE FOREFRONT OF ALL?"

Peter I, First Emperor of All Russia n November 2, 2005, an unprecedented event occurred in Kazakhstan, which was to give participants in the oil and gas and energy markets a fresh look at the industry. The KAZENERGY Association was created. This was an independent voluntary nonprofit association of legal entities (oil and gas production, service and engineering companies) and it was headed by the well-known oilman and businessman, Timur Kulibayev.

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By that time, the oil and gas and energy industry was already well established in Kazakhstan and producing impressive results in the context of independent development. The volume of oil production in the country had increased for ten years in a row, and not fallen since 1995 when this indicator was 20.6 million tons. In 2000, it was 35.3 million tons, and in 2005 it was recorded at 61.5 million tons – three times more than 10 years previously! The largest international oil and gas and energy corporations were successfully working in the country's oil and gas fields. Kazakhstani hydrocarbons were being exported to world markets. Direct investments in the industry had increased. Capacity expansion projects had been carried out at

the largest fields Tengiz and Karachaganak. The commissioning of the supergiant Kashagan was imminent. The legislative framework had been improved in the aims of regulating the relationship between the state and business in subsoil use.

Nevertheless, the market players were acting separately and therefore could not effectively protect their interests with the state authorities. This did not always contribute to effective dialogue between the bureaucratic apparatus and business. The industry needed a single and powerful structure that could unite all market participants. There was a need for a "bridge" between the state and investors and a "mouthpiece" for the industry. Oilmen Timur Kulibayev and Uzakbai Karabalin saw the great potential of oil companies that could act as a united "front" to protect the interests of the industry. So they created the KAZENERGY Association.

KAZENERGY Association was created on the initiative of Uzakbai Suleimenovich Karabalin in 2005, at a time when the oil and gas and energy industries were being formed in Kazakhstan. Many international oil and gas and energy corporations were already successfully operating in the country at this time. Relations between the state and business were regulated by the legislative framework, and the main production indicators and investments were increasing.

"He said to me: "The industry needs an organization that will protect the interests of oilmen and represent them in negotiations with the Government". Timur Kulibavev recalls. "The idea of uniting the players of the oil and gas and energy complex with the aim of its further effective and sustainable development was fully supported by the Prime Minister of our country Karim Massimov. There had been nothing like the creation of such an organization on the market at that time in Kazakhstan. There had only been halfhearted attempts to unite its participants, but they did not lead to actionable results. We wanted to create a non-profit organization for constant and effective interaction with state authorities for all industry companies. I and many of my colleagues understood all the complexities of relations with state authorities and representatives of the oil and gas and energy industries. There was also a vision of how to improve the processes taking place in this area without a fear of bold ideas and decisive actions - at first at the legislative level. After all, the quality of the relationship between authorities and business depends on how simple, comprehensive and understandable the legislation is at the same time".

In a short time, the main goals and objectives of the new association were formulated. The principles of building a dialogue with the authorities were established, international relations were



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built with the largest players in the world energy market and the most authoritative international organizations. From the very outset, the KAZENERGY Association united over 50 large companies in the oil and gas and energy markets, including Chevron, Shell Kazakhstan, Eni Spa, PetroKazakhstan, Total, LUKOIL Overseas, KazMunayGas, KazTransOil, KazTransGas, KazMunayTeniz, KEGOC, KMG Energo and many others. After a short time, the number of its participants increased to more than 80.

From the very beginning, the activities of the association touched upon the development of the oil and gas and energy industries, environment, investments, taxation, human capital development, social responsibility, improving legislation in these areas, and much more. It was designed to assist in the formation of favorable conditions for the dynamic and sustainable development of the fuel and energy industry in the Republic of Kazakhstan. It was also supposed to become a single information platform for oilmen, gas workers, other subsoil users, energy workers, trans-porters, as well as a wide range of users and consumers of products and services of the oil and gas and energy complex.

On the initiative of Timur Kulibayev, the Association Council was created as a consultative and advisory body. It included Uzakbai Karabalin, Boris Zilbermints, Kenzhegali Sagadiyev and other well-known oilmen and energy workers. Coordination Councils were established in all areas of activity (including international relations, legislation, import substitution, ecology and others), as well as the Interdepartmental Commission for the Development of Oil and Gas and Energy Industries, headed by the Prime Minister of Kazakhstan. As Timur Kulibayev recalled, for the first time in industrial practice, in addition to the heads of ministries, departments, national companies, the KAZENERGY Association as a non-profit organization became part of the Interdepartmental Commission. It provided an opportunity for its members to submit proposals requiring consideration at the Government level. Such relationships in the context of "state-business" in Kazakhstan had not previously existed.

"Due to all this, they began to listen to us in Kazakhstan. They also began to take us seriously in the foreign markets. Earlier, Kazakhstan was perceived abroad as a large producer and supplier of energy resources. Now – as a reliable partner in all areas related to energy", noted Timur Kulibayev. "Moreover, using the experience of KAZENERGY, I had developed proposals for the establishment of the "Atameken" National Chamber of Entrepreneurs of the Republic of Kazakhstan. We made sure that it was precisely such non-governmental public organizations that could represent a real expert force in negotiations with the Government on various issues. I found this experience very useful and very successful".



By the beginning of the global financial and economic crisis in 2008, one of the most significant in the world over the past 70 years, Kazakhstan was ready to overcome the difficulties that it later had to face. The oil and gas and energy sector not only managed to survive this difficult period, but also found an opportunity to develop further, increase the production of energy resources, and attract significant investments into the industry.

In turn, the activities of the KAZENERGY Association became a kind of challenge to the crisis. Competent and progressive work can turn even the most incredible difficulties into something good. So during the first years of the activities of the KAZENERGY





association in Kazakhstan, an import substitution program was launched to overcome the crisis. Forums for suppliers of goods, works and services, supported by the Government of the Republic of Kazakhstan, were held in the regional centers of the country. Centers for the training and retraining of specialists in the oil and gas industry were opened in the regions. In the field of environment, the industry established a unified position with regard to the current state policy on the regulation of greenhouse gas emissions. For the first time, an assessment was made of the full contribution of the oil and gas industry to the socio-economic development of the state. The Extractive Industries Transparency Initiative (EITI) was supported, and the association itself became a member of the National Council of Stakeholders of the Republic of Kazakhstan on the EITI. Particular attention was paid to the development and implementation of legislative initiatives. All this gave another impetus to the development of the industry.

"When I came to work at KAZENERGY in 2012, we were given the task of revising the work format, to focus on resolving the specific problems of KAZENERGY members. First of all, we expanded the number of members of the association to 80, organized regional meetings with all companies, conducted a survey among them and identified the main issues that needed to





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be addressed. Most of all, companies were concerned about two areas – taxation and environmental legislation. They were worried about the absence of a clear description of the rules. The state

authorities met us halfway, and a separate working group was created. Chevron financed a preliminary analysis of environmental legislation. A number of proposals were formed which in the spring of 2016 were included into the Environmental Code. First of all, these related to obtaining permits for technological gas flaring. regulating greenhouse gas issues, and temporary storage of oil waste. With regard to tax legislation, changes were made in the scale of export duties pegged to the oil price and the preferential rate of mineral extraction tax (MET). The solution of these and other issues was helped by the fact that the association really acted as a single "force". In addition, the state authorities saw a thorough study of the issue, as well as arguments supported with the necessary analytical materials, and letters from companies. I think they were also comfortable with making decisions under such conditions", said Aset Magauov, who served as the Director General of the KAZENERGY Association in 2012-2016.

Bolat Akchulakov, who was appointed to the position of head of KAZENERGY in 2016, com-mented that one of the main objectives was to optimize the current legislation: "As an associate member of the Atameken Chamber of Entrepreneurs, today we are represented in all working groups in the Government and Parliament. (...) Why did we set ourselves this task? Because we understand perfectly both the principles of the state management system and the problems of business. Experts, including me, have worked both in state system and in private business, specifically





FOR ALL ITS ADVANTAGES AND DISADVANTAGES, THE ENERGY CHARTER TREATY TODAY IS THE ONLY LEGAL DOCUMENT ON THE BASIS OF WHICH SOLUTIONS CAN BE FOUND IN THE EVENT OF INTERNATIONAL ENERGY CONFLICTS.

in the energy sector, therefore we know questions from the inside from both sides".

Currently, the Association is the largest industry nonprofit organization with the human, financial and organizational capabilities to ensure the development of a consolidated view of the industry on certain regulatory issues, as well as the ability to represent the industry's opinion in a constructive dialogue with authorized state authorities, both on the Association's platform, and on all other dialogue platforms (specialized interdepartmental commissions under the Government, expert and working groups under state authorities, commissions on social partnership and regulation of social and labor relations at the republican and industry levels, various collegial and consultative and advisory bodies, etc.).

Equally, KAZENERGY has developed its own authority as a key partner of the National Chamber of Entrepreneurs of the Republic of Kazakhstan (NCE) "Atameken" in developing positions and decisions affecting the oil and gas and energy industries.



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Jambulat Sarsenov,

Between 2014–2021, in accordance with established procedure, it was involved in the implementation of the functions and powers of Atameken in the oil and gas and energy sectors as provided for by the legislation. It also acts as a working body for the profile committee engaged in the development of the oil and gas industry under the Presidium of Atameken.

Over the years of its work, the association has made significant efforts to achieve real, conceptual results in improving the conditions for fiscal regulation of the industry (the new Tax Code of 2017), ecological regulation (the new Environmental Code of 2021), as well as the conditions for regulating subsoil use (the new Code on Subsoil and Subsoil Use of 2017).

In the field of technical regulation, KAZENERGY has facilitated the establishment of specialized technical committees for standardization (TC 88, 89 and 90), as well as a specialized scientific and technical committee (materials of which are published in collections for distribution among a wide range of interested parties), which function on an ongoing basis. Real results were achieved in the adoption of new regulations and standards, as well as in the improvement of existing technical regulations and standardization documents, which ultimately translates into significant savings for companies in the industry.

In general, in the rule-making field, the Association acquired the status of a "center of competence" and a reliable partner to the authorized bodies involved in the formation of expert opinion and positions on a wide range of issues of state regulation of enterprises in the oil and gas and energy industries. In addition, for the first time in Kazakhstan as part of the activities of the Association

various approaches to the development of an industry gualification framework and pro-fessional standards for the industry were considered (2009-2010). The European Union project "Support to VET (Vocational Education and Training) in Kazakhstan" was implemented. Production mentors were trained according to the German training program of the Chamber of Crafts (Trier, Germany) and NCE "Atameken" (2015). The Social Responsibility Survey of the Oil and Gas Industry of the Republic of Kazakhstan for 2012-2013 (2014) was published. KAZENERGY Women's Energy Club (2013) was established as a platform for the exchange of experience in the field of gender development in the oil and gas and energy industries. In past years it has organized many events, including 4 Forums and 3 offsite meetings at the sites of large oil and gas companies. Together with the European Bank for Reconstruction and Development, the first gender research in the energy sector of Kazakhstan "The Role of Women in the Energy Sector of Kazakhstan" (2020) was developed. The "List of professions in the oil and gas industry of the Republic of Kazakhstan, grouped by types of work and areas of professional activity" (2015) was published. For the first time among employee associations, training seminars on the development of professional standards for KAZENERGY members were held together with Ernst & Young (2018). A study of "The role of women in energy" (2020) was carried out. In addition, with the active participation of the association, active promotion began of the initiative of the first President of the Republic of Kazakhstan Nursultan Nazarbayev in the field of "green" strategies.

Throughout the entire period of its work, the association has taken an active part in the consideration of draft regulatory legal acts (RLA). Within the last 5 years alone, more than 200 draft RLA have been considered, and about 1,600 proposals were sent, a third of which were adopted by authorized bodies. In the first half of 2021 alone, 37 RLA were considered, 144 proposals were sent, and 53 of them were accepted. The association also assisted in the discussion and adoption of 3 industry qualification frameworks and 39 professional standards in the industry (2019).

In addition, starting September 2006, the KAZENERGY Association began holding an annual Eurasian Energy Forum in the capital of Kazakhstan. From the very outset, it became the only discussion platform in the Region capable of laying a solid foundation for resolving industry problems. Its success and credibility are largely due to the participation of influential political representatives, and recognized experts with a worldwide reputation.

Traditionally the partners of the Forum are the largest international organizations and transnational oil and gas and energy companies. World energy companies and organizations discuss key energy trends on its platform, as well as changes that have already led to serious economic and geopolitical shifts, and the impact of these processes on world energy markets.

These include issues and challenges related to the efficient management of sustainable energy sources; control over the production, storage and use of energy; ensuring universal access to energy sources; climate change and reduced carbon dioxide emissions; stimulating the use of alter-native energy sources;



and implementation of energy efficiency programs, among other matters.

In 2019, against the background of new transformations in the global energy industry, the KAZENERGY Association proposed a new energy project – KAZAKHSTAN ENERGY WEEK. The aim was to consolidate a variety of industry events on a single platform and create the best conditions for participants for effective work, exchange of experience, and business communication. This was the first time that such a wide format of discussions on energy problems was organized in Kazakhstan. It not only expanded the boundaries of discussions, but also attracted a large number of specialists and industry experts from Kazakhstan and abroad.

Currently, due to the activities of the KAZENERGY Association, Kazakhstan has huge and successful experience of international cooperation, in particular, in promoting the country's image on the world energy arena. Today, it interacts with all large reputable international industry organizations.

In June 2008, the KAZENERGY Association joined the World Petroleum Council (WPC) – an international non-profit organization representing the interests of the global oil and gas community



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> and providing a platform for discussing issues of the fuel and energy complex. The purpose of membership was to represent the interests of the oil and gas industry of Kazakhstan in this authoritative structure.

> Membership in the WPC has provided the country with maximum access to the newest information regarding the latest scientific technological discoveries and achievements, to general economic and highly specialized industry information, as well as to information about the current state of situation in the oil and gas industry in almost all countries of the world.

> In October 2012, a meeting of the National Committee of the WPC was first held in Kazakhstan, in Astana, within the framework of the VII KAZENERGY Eurasian Forum. This decision of the Council was recognition of the increasing authority of Kazakhstan in the international arena and the contribution of the association to the strengthening and development of international energy



cooperation. It became an important image event for the Republic, and a demonstration of the growing capabilities of the country's oil and gas industry.

After January 1, 2014, Kazakhstan chaired the Energy Charter Conference for the first time. This is the highest governing body of the international organization that sets legally binding rules in the international energy sector. The Republic was elected to chair the next Energy Charter Conference at its regular session in December 2013 in the capital of Cyprus, Nicosia. Then a new system of chairmanship of the Conference was approved, to promote greater political involvement of member countries into the Charter process.

Thus, Kazakhstan became the first member state to hold the chairmanship in accordance with the new practice. The Minister of Oil and Gas of the Republic of Kazakhstan, Uzakbai Karabalin, was elected the Chairman of the Energy Charter Conference, and the Deputy Chairman of the KAZENERGY Association, Jambulat Sarsenov, was elected as his Deputy.

In the words of Jambulat Sarsenov, who was one of the founders of the Association: "It is a great honor for Kazakhstan to become the first country to assume chairmanship. Our country is located in the very center of Eurasia and plays an important role in the energy balance and energy security of the region.

We have established ourselves as a reliable and experienced international partner and are ready to work on bringing the Charter to the fore in the global energy governance system. (...) Today the global energy industry has become a complex multi-level system, for which simplified political approaches are no longer suitable. I hope that our initiatives will help in the future to eliminate the gap that has arisen recently, an imbalance between the realities of the global development of the fuel and energy industry and some positions taken by individual states and politicians.

So the participation of Kazakhstan, in particular, the KAZENERGY Association, in the Charter processes is important from a geopolitical position."

By the time Kazakhstan joined the Energy Charter initiatives, the development of transit corridors was the key to global energy security. The state, which has no access to the sea and is located in the center of Eurasia, viewed this as a special priority direction.



"The Energy Charter plays an important part in the governance of the energy market in establishing links between the participants of this market. Consequently, the Energy Charter Treaty plays an important part in ensuring a level playing field for all participants in the energy production chain. In Kazakhstan we are fully aware of the potential that energy development has for the economy, for the creation of new high-quality jobs and improving living standards. Over the past few years, we have become one of the leading exporters in the world and now we are implementing the largest and most important projects" Prime Minister of the Republic of Kazakhstan Karim Massimov emphasized at the Energy Charter Conference in November 2014 in Astana.

In addition, the Association has been cooperating for many years with the International Energy Agency (IEA) and the Renewable Energy Agency (IRENA). It also represents the interests of Kazakhstan as a National Committee in the World Energy Council (WEC). In 2019, a meeting of the Executive Assembly of the World Energy Council was held in Abu Dhabi (United Arab Emirates), at which country presentations were submitted for the right to host World Energy Week in 2021. Following the results of the electronic voting, the members of the WEC supported the candidacy of the Republic of Kazakhstan by a majority of votes.

For KAZENERGY, international integration is the first step to be recognized by the world community. By participating in various international events, the association adopts the experience and understands the requirements of the world community for the industry. In this area, its activities are aimed at creating a stable, positive image of the country as an attractive state for investments.

In order to form a comprehensive understanding of the current situation and development prospects of the energy industry in Kazakhstan, in 2013 for the first time the Association issued a National Energy Report. This was a comprehensive document reflecting the strategic view of KAZENERGY on the sustainable development of the oil and gas and energy industries of the Republic of Kazakhstan as a single system. The idea of developing the National Report was voiced by Timur Kulibayev.

Its development involved the relevant ministries, research institutes, members of the Association and a number of consulting companies. The main task was to obtain systematized material on the current situation and development prospects of the basic sectors of the Kazakhstani economy, which together constitute the country's fuel and energy complex. ПРОГРЕСКЕ ЖІГЕРЛЕНДІРУ | ВДОХНОВЛЯЯ ПРОГРЕСС | FUEL







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> The official presentation of the National Energy Report took place during the 15th meeting of the Association Council on January 16, 2014. The document presented was highly appreciated by members of the association, representatives of state authorities of Kazakhstan, as well as a large number of domestic and foreign experts.

> The KAZENERGY National Energy Report became a significant event for the entire expert community of the country



WORLD ENERGY WEEK LIVE 2021

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and provided guidelines for the further development of the energy industry in Kazakhstan in the context of world energy. The conclusions and recommendations formed the basis for the process of making important and difficult decisions by the state and the business community. The preparation of this comprehensive industry document has become an annual event.

Social partnership has been one of the activities of the KAZENERGY Association for many years. The Association represents the interests of employers of organizations in the oil and gas, oil refining and petrochemical industries in the Industry Commission on Social Partnership and Regulation of Social and Labor Relations in the Oil and Gas, Oil Refining and Petrochemical Industries. During the period of the association's activity, 5 industry agreements were signed, covering 2008-2010, 2011-2013, 2014-2016, 2017-2019, 2020-2022.

By agreement with its members and in accordance with the decision of the Executive Committee on March 12, 2021, KAZENERGY became one of the signatories of the General Agreement between the Government of the Republic of Kazakhstan, republican associations (unions) of employers and republican associations (unions) of trade unions for 2021-2023.

The activities of the Coordinating Council for the Development of Human Capital, created in 2006, are aimed at uniting the joint efforts of companies in the development and capacity building of labor resources for the industry. In the course of its work, the KAZENERGY Educational Program was created. Over the years of its operation, about 4.5 thousand students of universities and colleges were awarded grants and scholarships by members of the association.

In general, youth and educational programs are a matter of special pride for the KAZENERGY Association.

Between 2007 and 2012, a joint project was implemented with Shell Kazakhstan Development B.V. to provide grants to the best 25 students of Kazakhstani specialized higher educational institutions. Over a period of 12 years – from 2007 to 2019 – during the implementation of the KAZENERGY Educational Program, Chevron provided social support to the talented youth of Kazakhstan in the form of scholarships. In 2009, on the occasion of the 110th anniversary of Kazakhstani oil, the national company KazMunayGas established scholarships and grants named after Safi Utebayev, one of the outstanding activists in the oil industry of Kazakhstan. The total number of scholars and grant holders over a period of 6 years was 144 individuals, of which 111 are scholars and 33 teachers of oil and gas and IT disciplines at institutions of vocational education and training. From 2010 to 2015, Intergas Central Asia JSC paid scholarships to 60 college students.



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KazStroyService JSC, Mangistaumunaigaz JSC, Rompetrol Group N.V., and ConocoPhillips North Caspian Ltd in the Republic of Kazakhstan paid scholarships to 50 undergraduates. From 2011 to 2016, grants were issued to 40 students from low-income families in Zhanaozen. Since 2015, the association has been performing the functions of the Working Body of the Commission for the selection of candidates for tuition fees at the expense of funds allocated by the KPO and NCOC consortia, created by order of the Minister of Energy of the Republic of Kazakhstan. The Commission includes representatives of the Ministries of Energy, Education and Science, regional Akimats, and contractor companies, etc. Between 2015-2021, training was paid for 3,500 students. The Commission gives priority to the socially needy strata of the population which annually make up more than half of those approved for payment. In 2018, due to the financial support of contractor companies, the activities







of the Working Body were automated by creating a system for collecting and processing data with generating and uploading reports, which was improved in 2021.

The Youth Forum, which has been held since 2008, is one of the most interesting annual events in Kazakhstan in terms of content and style. In total, 11 forums were held with the participation of young leaders of the country, representatives of the energy sector, business and state power. In 2017, within the framework of the Youth Forum, for the first time, the KAZENERGY Association,



in partnership and with the financial support of Shell Kazakhstan, held the Student Energy Challenge intellectual team competition to present a potential innovative solution to energy problems among student youth in Kazakhstan. Over the next four years, 225 teams from 17 regions of the country took part in the competition. Every year, the prize fund of US \$18 thousand was distributed among the winning teams.

Another team competition – StudentDigitalFest, initiated by the KAZENERGY Association and KPO in 2019, is aimed at

supporting initiatives and innovative projects of Kazakhstani youth to develop technological solutions in the field of digitalization. The total prize pool for 2021 was US \$15 thousand.

Since December 2019, the KAZENERGY Association, with the support of the Ministry of Energy of the Republic of Kazakhstan, has been actively involved into the project to develop the Atlas of new professions and competencies in the oil and gas industry in Kazakhstan together with BTS Education LLP – a methodological partner of the Ministry of Labor and Social Protection of the



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Population of the Republic of Kazakhstan for the implementation of the National Atlas of New Professions of Kazakhstan.

Today, the KAZENERGY Association, as the "conduit" of all industry initiatives of the oil and gas and energy business in the country, represents the interests of enterprises in the energy industry of Kazakhstan and on the development of regulation at the supranational level for the formation of common markets for oil, gas and oil products. It also is responsible for the common electricity market of the Eurasian Economic Union (EAEU), which was launched on the basis of the Customs Union on January 1, 2015, in accordance with the Agreement between Kazakhstan, Russia and Belarus. The parties spent several years discussing the document before signing it, consistently resolving complex issues during the negotiations. In 2015, Armenia and Kyrgyzstan joined EAEU. The creation of EAEU brought the participating countries to a higher level of integration. The participating states committed themselves to guaranteeing the free movement of goods, services, capital and labor, and to implement a coordinated policy in key industries of the economy: energy, industry, agriculture, transport. Thus, the largest common market in the CIS was formed with a population of more than 180 million people, a GDP of US \$2.2 trillion and a foreign trade turnover of US \$1 trillion. It was to become a new powerful center of economic development. Considering that



EAEU possesses large-scale reserves of primary energy resources and a powerful fuel and energy industry, it was decided to move towards the gradual formation of common energy markets by 2025. They will incorporate oil, gas and oil products, which in itself is one of the largest decisions in the field of integration.

As Danial Akhmetov, then Minister of Energy and Infrastructure of the Eurasian Economic Commission (EEC), commented in 2015: "...with the creation of a common hydrocarbon market, we will have deeper coordination, allowing us to be more competitive both in terms of pricing and from the point of view of obtaining products with high added value in this very interesting and important common market for us".

The Concept of the Formation of Common Oil and Petroleum Products Markets and the Concept of the Formation of the EAEU Common Gas Market were approved by the Prime Ministers of the Eurasian Economic Union countries at a meeting of the Supreme Eurasian Economic Council at the level of the Heads of Member States on May 31, 2016 in Astana. The documents have become an integral part of economic integration within the framework of the Union. Kazakhstan, like all EAEU member states, retained the priority right to protect its own interests and the domestic market for oil, oil products and gas. Thus, KAZENERGY today is involved in resolving specific problems in all segments of the oil and gas and energy industries.

Today, the association faces new challenges, largely due to structural changes in global energy and environmental policy. These are challenges to the traditional energy industries associated with the ongoing Covid-19 pandemic, a decline in energy resources consumption, price volatility in world markets with a general trend towards price decline due to restrictions on the level of production, international initiatives for the development of "green energy" and decarbonization, the development of coal chemistry, etc., and the ensuing international and national measures for ecological, fiscal and other regulation in relation to traditional segments of the oil and gas and energy business.

Under these conditions, the issue of ensuring the further growth of the country's geological re-serves of hydrocarbons, stimulating new investments in geological exploration and competition for such investments has not lost relevance.

The issues of providing employment, social responsibility of the industry, as well as effective and balanced measures for the development of domestic oilfield services are still relevant.

New challenges for the industry in the coming years will entail new requirements and approaches to ecological legislation related both to the ongoing reform to introduce integrated ecological permits and the best available technologies in Kazakhstan, and to the development of ecological and low-carbon requirements abroad.

All of the above trends at international and national levels have led to an updating of the association's development strategy for the period up to 2025 and corresponding changes in its personnel and organizational structure.

The Association's development strategy for 2021-2025 provides for the following key activities: ensuring sustainable development of member companies in the process of energy transition with the active use of best available technologies in production; development of "green" energy projects, petrochemicals, coal chemistry and gas industry; support for new investments in geological exploration and elimination of regulatory barriers for oil and gas and energy companies; creation of conditions for the development of supranational regulation, taking into account the interests of national domestic companies in the formation of common markets for oil, gas and oil products within the framework of the EAEU; the development of human capital, as well as strengthening the positive image of Kazakhstan in the international arena.

The work of the association continues to be focused on independence, transparency, professionalism, value for members – through resolving the issues of companies in the process of improving the state regulatory policy in the energy industry.

As emphasized by the establishment of KAZENERGY, Kazakhstan is now only at the beginning of its path of perfect and effective development. However, using its own potential and based on the experience of other countries, Kazakhstan will and must set out on a sustainable path of development in the name of the future, in the name of a healthy and strong nation. The activities of the Association will greatly contribute to this.



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EPILOGUE

"HONEST WORK, A CONSCIENTIOUS MIND, AND A SINCERE HEART SHOULD BECOME THE BASIS FOR A GOOD HUMAN LIFE. THESE ARE THE THREE QUALITIES THAT SHOULD DOMINATE EVERYTHING. WITHOUT THEM ONE CANNOT FIND PEACE AND HARMONY IN LIFE."

Shakarim Kudaiberdiyev,

Kazakh poet, writer, historian and philosopher

azakhstan has been an independent state for only 30 years, since the collapse of the Soviet Union, when the country began independently building a political, social and economic foundation. We had to create our own statehood from scratch in the literal sense of the word. Taking this into account, the growth achieved in all areas is outstanding. It demonstrates the scale of the reforms carried out in the country and reveals the potential for economic development in the future.

Oil has played a key role in the history of Kazakhstan. It is the wealth given to our land from on high. However, it is one thing to possess countless treasures, and quite another to be able to use them effectively for the benefit of the people who have inhabited this land since ancient times and deserve the right to a better life. Kazakhstan properly managed its hydrocarbon resources after gaining sovereignty. It has reformed the legislative framework and the tax system, creating favorable conditions for attracting foreign capital, establishing clear rules of the game for the industry. This eventually made it possible to increase the production and export of hydrocarbon raw materials to impressive indicators.

Now Kazakhstan is one of the largest producers of oil and gas in the world, ensuring reliable delivery to global consumers. Today, Kazakhstani hydrocarbons are supplied to consumers in Europe and Asia. Kazakhstan is ready to reach its 100 millionth annual oil production milestone, and is the largest supplier of resources to the system of the

Caspian Pipeline Consortium, oil and gas pipelines of the Russian PJSC Transneft and PJSC Gazprom. With the commissioning of the oil and gas artery to China, it became one of the most important suppliers of hydrocarbons to the East. By diversifying the export of hydrocarbons through the construction of new oil and gas pipelines, the country has guaranteed itself stable sales and revenue to the budget, upon which the well-being of the people and confidence in the future directly depend. It ensures consumers an uninterrupted source of energy supplies as the basis for their energy security.

The image of Kazakhstan that has developed over the years of independence as a reliable and equal partner in the international oil and gas arena has allowed it to participate in all global processes, closely interacting with the largest organizations that determine the key trends in the industry. Today, perhaps, it is difficult to imagine a segment of the global oil and gas industry where the interests of our state are not represented.

They listen to Kazakhstan and take our considerations into account. The world is interested in us, and today Kazakhstan has something to offer the world community. This was the young country's dream at the dawn of sovereignty. History has entrusted the industry with a magnificent mission – to become the foundation for the construction of a new state. After difficulties, trials and crises, the industry has justified these expectations. Today, after 30 years of independent development, on the world map of oil and gas, Kazakhstan is not only a country focused on the extraction and export of natural raw materials, but also ready for new discoveries and victories. We are a confident and prosperous state, keeping pace with the times, taking into account all new global trends in the industry, striving to achieve sustainable development, and relying on experience and knowledge, modern and progressive world technologies, scientific potential.

The key areas of development for the oil and gas industry in the foreseeable future will be the digitalization of production, processing and transportation of hydrocarbons, oil and gas chemistry and coal chemistry, as well as the introduction of "green" innovations aimed at improving ecological indicators. National identity and the interests of the state and people will remain key at all stages of achieving the goals of sustainable development of the country.

The oil and gas industry, as the mainstay of the economy, has long since proven its leading role in ensuring the well-being of Kazakhstan. The key secrets of success are knowledge, openness, and wisdom. Its future destiny is in the hands of the current and future generations of leaders who are capable of leading the country to the very summit of the world oil and gas Olympus.

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