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DEVELOPMENT OF THE ENERGY SECTOR OF THE NATIONAL ECONOMY IN THE CONDITIONS OF INDUSTRIALIZATION

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Industrialization is one of the key areas of development of Kazakhstan in the new economic reality. The article defines the importance of industrialization, which has actually become one of the few development tools that allows businessmen and investors to create new projects. The specifics of the development of the industrial and innovative potential of Kazakhstan, as well as the conditions conducive to the transition to sustainable development of the economy of the republic are investigated. In the industrial development of Kazakhstan, one cannot be limited to what has been achieved; it is necessary to expand and modernize measures to deepen the knowledge-based model of the economy. The emphasis is on the fact that each energy source has advantages and disadvantages, as a result of which, during industrialization, the development and consumption of these sources in the world and Kazakhstan energy is significantly different. The expediency of creating a common energy market within the framework of the Eurasian Economic Union (EAEU) is substantiated. It is noted that the energy sector of the largest EAEU participants - Kazakhstan and Russia - is the core of the economies on which the activities of all sectors depend, and it should be strengthened by integration cooperation within the Union.

РАЗВИТИЕ ЭНЕРГЕТИЧЕСКОГО СЕКТОРА НАЦИОНАЛЬНОЙ ЭКОНОМИКИ В УСЛОВИЯХ ИНДУСТРИАЛИЗАЦИИ

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Ключевые слова:
индустриализация, индустриально-инновационный потенциал, инновационный проект, антикризисный менеджмент, интеграция, модели экономики, технополисы, технопарки, технологические бизнес-инкубаторы.

Индустриализация является одним из ключевых направлений развития Казахстана в новой экономической реальности. Определяется важность индустриализации, которая фактически стала одним из немногих инструментов развития, позволяющим бизнесменам и инвесторам создавать новые проекты. Исследуются особенности развития индустриально-инновационного потенциала Казахстана, а также условия, способствующие переходу к устойчивому развитию экономики республики. В промышленном развитии Казахстана нельзя ограничиваться тем, что было достигнуто; необходимо расширить меры по углублению наукоемкой модели экономики. Акцент делается на том, что каждый источник энергии имеет свои преимущества и недостатки, в результате в ходе индустриализации разработка и потребление этих источников в мире и в Казахстане существенно отличаются. Обоснована целесообразность создания общего энергетического рынка в рамках Евразийского экономического союза (ЕАЭС). Отмечается, что энергетический сектор крупнейших участников ЕАЭС - Казахстана и России - является ядром экономик, которое влияет на деятельность всех секторов, и должно быть усилено интеграционным сотрудничеством в рамках Союза.

The main material of the research

There are periods in the development of society when only a year on the scale of the deed is equal to a decade. To such a period, compressed by cardinal changes and fateful decisions that fundamentally changed the face of Kazakhstani society, we must attribute the first 25th anniversary of the sovereign development of Kazakhstan.

Of course, the most important achievements of the country over the previous 25 years were the successful diversification of the national economy, the broad development of entrepreneurship, especially small and medium-sized businesses. This ensured its increased resistance to crises and shocks of the global economy. In general, the country's GDP over 25 years in dollar terms grew by 76.3 times (Table 1).

Table 1 - GDP dynamics over 25 years, billion dollars

A country	1992	2000 year	2005 year	2010 year	2015 year	2016 year
Kazakhstan	2.87	18.27	57.1	148.0	217.8	219
Ukraine	21,4	31.3	86.2	137.9	131.8	133
Azerbaijan	1,2	5.3	13,2	51.7	75,2	77
Belarus	4.1	12,4	30,2	55,2	76.1	74,4
Uzbekistan	3.57	8.8	14.3	38.9	62.6	66
Place in the world						
Kazakhstan	51	67	53	58	48	48
Ukraine	55	fifty	fifty	53	59	59
Belarus	72	83	71	67	67	67
Azerbaijan	68	93	98	69	68	68
Uzbekistan	79	82	91	80	73	73

Note. The data of work [1; nine].

According to the World Bank, the economy of Kazakhstan over the years of independence, from 1991 to 2015, grew 7.4 times. And according to the UNDP international agency, which publishes annual indices of well-being of countries, our country occupies 55th place in the world. In terms of human development index, Kazakhstan is ahead of China, Malaysia and Turkey, and among the 188 countries it is in 56th position [2; 4].

First, the achievement of these successes was facilitated by: the transition to economic development on market principles; decentralization of the national economic management system and the implementation of a set of administrative reforms; providing independence for all economic entities and their further democratization.

Secondly, for a period of less than 10 years, national and regional innovation systems with a network of technopolises, technology parks, and technology business incubators have been created. Now innovative clusters are being formed, national development institutions are operating, including the National Agency for Technological Development of NATR JSC and the National Innovation Fund, etc.

Thus, the path to innovative Kazakhstan was determined. According to the author of the article [3; 4], the contours of the national model of innovative development of Kazakhstan are formalized in the form of a knowledge-based model of the economy based on human capital. The priority areas are the development of innovative projects and the commercialization of technologies, the large-scale attraction of direct investments in the economy, primarily foreign ones.

Scientists of the Institute of Economics of the Science Committee of the Ministry of Education and Science of the Republic of Kazakhstan formulated a conceptual vision of what a knowledge-based economy is [4; 62]. This is an economy whose development is determined to a large extent by factors with a high content of scientific knowledge. In their opinion, the following groups of components can be distinguished that determine the possibilities for the formation of a knowledge-based economy.

1. Sociocultural components that determine the general cultural background of the development of science in the country, understanding of the universality of scientific knowledge, the role and functions of science in the formation of social and humanitarian values, worldviews and priorities, intellectual traditions and the style of thinking and decision-making.

2. Human resources of a knowledge-based economy. The creator and bearer of scientific knowledge, norms and values are the category of people that stands out in a certain professional group. The main function of this group is the creation and dissemination of new scientific knowledge, the preservation of scientific traditions, the reproduction of scientific schools. This professional group is adjoined by a large category of employees whose activities are associated with the active practical use of specialized knowledge in various sectors and sectors of the economy.

3. Intellectual information components are related to the fact that a knowledge-based economy requires the creation of resources that will fill the information space and ensure the availability of scientific knowledge.

4. Structural components are associated with the fact that among the types of economic activity, production and services should be widely represented, the development of which critically depends on the intensity of use of scientific knowledge. These are the so-called high-tech types of services and high-tech industries and production, which form the demand for scientific knowledge and development.

Now Kazakhstan is successfully implementing an effective innovation policy as an important component of state economic policy. To implement this policy, government programs have been developed and are being implemented. The implementation of the Five main institutional reforms that affect the leading sectors of the economy and the public administration system has begun, a step-by-step algorithm of the Government's actions "100 concrete steps", etc. has been developed. Thanks to the implementation of these documents, and most importantly, the development of the State Program for Industrial and Innovative Development for 2015–2019. (SPIID), the Nurly Zhol infrastructure developmen t program, managed to adjust the objectives of Strategy 2050 to the conditions of the current crisis in the global economy.

It is no accident in the Address of the Head of State N.A. Nazarbayev to the people of Kazakhstan dated January 31, 2017 "The Third Modernization of Kazakhstan: Global Competitiveness" was specifically noted: "Thanks to the economic policy of Nurly Zhol and the Plan of the nation" 100 concrete steps", we are worthy of going through the initial stage of a complex global transformation. In 2014–2016 alone, we additionally allocated 1.7 trillion tenge to support the economy. All this provided an opportunity for economic growth and business support, the creation of over 200 thousand new jobs.

As a result, in 2016, the gross domestic product grew by 1%. This is especially important in the current difficult conditions" [5; 2].

The state program of industrial and innovative development of the Republic of Kazakhstan for 2015–2019. - One of the acceptable ways of healing all the links of the national economy. The state program of industrial and innovative development of the Republic of Kazakhstan for 2015–2019. (hereinafter referred to as the Program), which was developed in accordance with the long-term priorities of the Kazakhstan-2050 Strategy, is a logical continuation of the State Program for the Forced Industrial and Innovative Development of the Republic of Kazakhstan for 2010–2014. (SPFIID). The first takes into account the experience of implementing the SPFIID.

Since the start of industrial policy in the republic, it has been possible to almost completely resolve the issue of the infrastructure necessary for industry - transport, energy, etc.

For example, the issue of energy deficit, rolling stock deficit has been resolved. Roads and railways connected different parts of the country. And this is not surprising when you consider that more than 60% of the total state program budget was allocated to infrastructure.

To support the business (SMEs, exporters, investors), special programs were developed, the financing of which went through DBK, KazAgro, the DKB-2020 program, Damu fund, familiar to all businessmen.

In total, in the real sector, taking into account transport, energy and industrial projects, over 6,700 small, medium and large companies were supported over 6 years. All this made it possible to create almost 193 thousand new jobs - almost every fourth (23.1%) - a new job created during this time in the economy.

In fact, a new industrial base has appeared in Kazakhstan, which has provided productive employment and economic stability in many regions of the country. Introduced 26 new significant sectors of the manufacturing sector. The range of exported products increased from 777 to 824 goods [6; 6].

Industrialization, as the pivot of the entire economic policy of the state, to a certain extent played the role of a "safety cushion", mitigating the impact of the crisis and preventing it from becoming a minus to the manufacturing industry.

According to academician K. Sagadiev [2; 4], over the years the SPFIID has been implemented, in terms of the technological level of production, our country has risen from 82nd to 56th place in the world, and in terms of innovation potential, from 101st to 59th place. And in terms of export potential, Kazakhstan now occupies 43rd place in the world ranking. These indicators indicate serious progress in the industrial development of the country.

As you know, after the SPFIID, the State Program for Industrial Innovative Development for 2015–2019 was developed, which focuses on the development of the manufacturing industry, with a concentration of efforts and resources on a limited number of sectors, regional specialization using a cluster approach and effective industry regulation.

The purpose of the Program is to diversify the economy of Kazakhstan and increase its competitiveness in the manufacturing industry [7; 223].

Program Indicators [8]:

a) a 43% increase in the volume of manufactured products from the level of 2012;

b) an increase in als added value in the manufacturing industry is not less than 1.4 times;

c) growth of labour productivity in the manufacturing industry by 1.4 times;

d) an increase in the value of non-primary (processed) exports by at least 1.1 times;

e) a decrease in the energy intensity of the manufacturing industry by at least 15%;

f) an increase in employment in the manufacturing industry by 29.2 thousand people.

As you know, the beginning of the implementation of SPIID (2015) coincided with a period of growing problems in the global economy affecting the country's domestic production. In this regard, on behalf of the Head of State, the following important adjustments were made to the Program [9; 12-15]:

The document states that it is necessary to create a favourable business climate and a new policy of attracting foreign investment in the country. Improving the conditions for investments will go in four directions. The first is a "country-based approach", i.e. implementation of programs to attract investment from priority countries (China, Russia, Iran and Turkey). At the same time, the implementation of joint projects will be monitored by the governments of Kazakhstan and partner countries. The second direction is supporting existing investors to stimulate reinvestment. Third, attracting infrastructure investment through the PPP mechanism. The fourth area is privatization. Within its framework, the issue of introducing new measures of financial support will be worked out. In addition, it is planned to attract giants such as Google, as well as create joint ventures with organizations such as the Fraunhofer Institute. The program says that such companies will become anchor investors for Kazakhstan.

The program is fundamentally changing the support system for domestic enterprises. Key benchmarks will now be productivity, export orientation, innovation and creativity. As indicated in the document, over time, Kazakhstan will have to move to the "economy of innovation." The main indicator of this transition will be

the achievement of labour productivity comparable to the OECD average of countries. And this is neither more nor less than 105.3 thousand dollars per employee by 2035. For comparison: according to the results of 2014, labour productivity in the Kazakhstani manufacturing industry amounted to about 42.6 thousand dollars, and according to the results of 2015. - 30–33 thousand dollars. Therefore, the state will primarily support those enterprises that pay special attention to this issue.

1. As for the priority areas of industrialization, only 8 sectors are identified in the Program that will receive the most support. These are ferrous and non-ferrous metallurgy, agrochemistry, oil refining, oil and gas chemistry, the production of automobiles, food and electrical equipment.

2. The program proposes to improve technology development centres in all priority sectors of the economy on the basis of research institutes. Their role will be to introduce the results of scientific and technological progress into the real economy. For example, within the framework of the Autonomous Cluster Fund Information Technology Park, by 2019 it is planned to create five centres in the areas of Smart Industry, New Materials and Additive Technologies, Smart Environment, Financial Technologies, New Energy and Clean technologies".

3. The program notes that the demand for innovation will be ensured through the development of a mechanism for the procurement of high-tech products by companies with state participation. To this end, national holdings will annually hold competitions to attract domestic and foreign start-up companies to solve specific technological problems. In total, it is planned to attract 500 projects, including foreign ones, through the Start-up Kazakhstan Program. The program will be implemented in three stages. The first, as indicated in the document, is "pre-sowing," or the collection and processing of projects that will allow creating a regional start-up hub by 2018. The second is attracting and selecting 150 competitive start-ups using acceleration programs. The final stage is the incubation of 50 start-ups, including 20 Kazakhstani technology companies that carry out more than 50% of sales outside the republic. The best international venture funds and world-class programs such as Silicon Valley will be involved in financing start-ups.

4. Considerable attention is paid in the program to the problem of training. Firstly, the emphasis will be on the targeted learning system, i.e. training students with simultaneous professional practice at specific enterprises. Secondly, they plan to develop educational programs on the basis of professional standards. Thirdly, enterprises will give an expert assessment of the quality of educational programs and plans. Fourthly, they intend to actively involve manufacturing specialists in the educational process. Fifthly, the results of scientific research conducted in basic universities will be introduced at enterprises. Commercialization of scientific projects is supposed to be carried out using PPP mechanisms. Resources will be distributed on a competitive basis, subject to mandatory co-financing from enterprises - at least 25% of the cost of the study.

In addition, basic higher education institutions and colleges together with enterprises will expand the areas of training. Taking into account professional requirements, it is planned to train specialists in the magistracy. All this, according to the developers of the Program, will provide the needs of the economy with highly qualified personnel in a shorter time.

Thus, over a quarter of a century, our country has made a powerful economic breakthrough and should reach a new level of economic growth. Innovative Kazakhstan is the next step that the republic needs to rise in order to become one of the 30 most developed countries in the world and realize its global strategy within the planned time frame. In general, all the above indicates that Kazakhstan has many reserves for the implementation of new innovative growth, including those that do not require significant capital investments and the republican budget.

Energy as a key area of the global economy in the context of globalization and integration. At present, their globalization is becoming a natural stage in the development of world energy markets. Moreover, its key factor is the growth in international trade in energy resources and services in this area. At the same time, the tendencies of the formation of world energy poles, diversification of transportation routes and transit of energy resources are intensifying. Under these conditions, the creation of common energy markets will allow the Eurasian Economic Union to establish itself on the new world map of the market as one of the main players.

It is known that the world is now on the verge of the sixth technological order, under which the accumulated prerequisites for the transition and to the new power structure. It is expected that by 2020 the forces of the European Union, the USA, Japan, China, Korea, Russia and Kazakhstan will build an international experimental thermonuclear reactor ITER in France.

In recent years, considerable attention has been paid to the formation of a common energy market in the territory of the Eurasian Economic Union. According to the Treaty on the EAEU, the common electricity market will start operating on July 1, 2019, the common gas market and the common oil and oil products market will start operating on January 1, 2025.

The full-scale work of the general electric power market will ensure an increase in the volume of mutual trade in electricity by 2–2.5 times and increase the utilization of generating capacities to 7%. The potential for electricity export outside the Union can grow up to 30 billion kilowatt hours [10; 5].

As is known from the EEAS Treaty, the Union accounts for 7% of world oil reserves and 1/6 of its production and export, about 1/5 of gas production and more than ¼ of its export, and also 5% of electricity production [11; 17].

In the future, the strategic goals of the member states of the Eurasian Economic Union in energy policy are, first of all, the transition from relying on the export of raw materials outside the Union to technological leadership in the field of energy storage and conversion, as well as the

fullest satisfaction of the growing demand for various energy carriers and power plants.

The main goal is to maximize the use of available natural resources, human and scientific and technological potential in order to ensure sustainable economic development of the EAEU member countries.

Opportunities for Kazakhstan to participate in the formation of rational conditions for the development of the global energy market. Today, Kazakhstan has unique reserves of mineral raw materials. According to this indicator, the republic ranks fourth in the world.

Over the years of independence, about 5 billion tons of mineral raw materials have been mined in the country. Oil production increased from 25.8 million tons in 1992 to 79.4 million tons in 2015. In the republic, during this period, gas production increased from 8.1 to 45.7 billion cubic meters, and coal production increased from 72.4 to 107.2 million tons. Now the Republic of Kazakhstan with the volume of mineral production of about 300 million tons per year takes the 12th place in the world in this indicator [1; nine].

Achieving the main goal of the national economy over the years of independence - increasing sustainability through its diversification - was carried out in three major areas. The first - the development of processing industries, the scope of services. The second - the implementation of cluster Noah concept by expanding and deepening the value chains. Third, the creation of new industries for the production of goods and services. As a result, progressive changes in the structure of the national economy were achieved.

Over the years of independence, the energy sector of Kazakhstan has provided a stable energy supply. New capacities were built at existing state district power stations and thermal power plants. Small hydroelectric power plants were introduced, wind and solar units were built. The number of combined-cycle power plants using associated gas has expanded. Especially, from the mid-nineties to the present, certain successes have been achieved in the production of mining products (Table 2).

Table 2 - Production of mining industry of Kazakhstan, billion tenge

Types of products	1995 year	2000 year	2005 year	2010 year	2015 year	2016 year (January-September months)
Crude oil production	119.3	683.3	2645.9	6154.1	5894.6	5760.9
Production of basic and precious metals	76.1	210.6	396.8	902.4	1379.1	1821.6
Production and distribution of electricity, gas and water	103.5	162.5	280,4	713.9	1255.9	1075,4
Metal ore mining	29.4	54.8	201.9	591.3	700.5	813.4
Production of coke, petroleum products	66.3	70,2	165.9	332,2	470.2	510.9
Coal mining	47.2	26.6	64.7	130.6	209.8	177.4
Natural gas production	11.3	9.3	27,2	38.8	113.8	142.9

Note. The data from [12; nine].

Currently, Kazakhstan, producing 85% of its electricity from fossil sources, has good opportunities for further transformation, reduction of hydrocarbon emissions, transition from oil to gas, as well as the development of all possible types of renewable energy sources.

It is assumed that in the future, the widespread development of Kazakhstan's energy resources should be accompanied by the introduction of innovations, new energy saving standards, as well as providing a multiplier effect on the processing sector of the economy. Experts [13, 14] put forward the following forecasts for the development of the global and domestic energy market:

1. In the future, the oil and gas industry in Kazakhstan will remain one of the segments of the national economy, the driving force of the country. Republic in the early 2020s able to reach production levels of more than 2 million barrels per day. This will lead our country to the ten largest producers of oil and gas.

However, in the further development of this industry, one must bear in mind that over the past two decades, mankind has scooped more than 60 billion tons of oil from the bowels. At the same time, the higher the demand for oil, the more it is extracted, the greater capital flows into the industry, the more active oil exploration is, the faster new fields are discovered and developed.

In addition, with existing methods of oil production in the world, its extraction coefficient ranges from 0.25–0.45. Most of its geological reserves remain in the bowels of the earth, creating the need for a huge amount of implementation of innovative projects.

2. Today, the world lives in a period of a drop-in oil and gas prices. The reason is not only a slowdown in the global economy, but a much more significant and long-term one - in the shale revolution.

According to the International Energy Agency [15; 42-47], the recoverable reserves of shale oil on the globe are estimated at 450 billion tons, which is double the reserves of ordinary oil. The United States takes first place in shale oil reserves, followed by Brazil and Russia. According to analysts, thanks to the shale revolution as a result of a technological breakthrough in well drilling, the current major US oil importer may eventually become its exporter.

In addition to shale oil, there are also shale gases. If the world'seserves of ordinary gas are estimated at 40 trillion

m3, then approximately the same amount lies in gas shales. Shale gas and oil are present in the world, everywhere, and heard talk about the end of the gas exports. Perhaps in the future, many countries on their own territory will begin to produce as much shale gas as they need. Even today, the country's shale lowered world prices for gas at 20% [15; 42-47].

Recently, the United Kingdom announced the opening of huge shale gas reserves on its territory. Japan announced the imminent production of gas hydrates on the sea shelf, a new colossal breakthrough, picked up by the coastal states of Asia. I worried major importer other hydrocarbons - China, which began intensive search of shale oil and shale gas. The main lesson of the shale revolution is that the market can change very quickly: by accelerating scientific and technological progress. However, it is he who, for 90%, has provided economic growth for more than 100 years [16; 56].

3. Currently, coastal gas hydrate resources are estimated at about 300 trillion m3 of gas. This significantly exceeds the proven reserves of natural gas and determines interest in the problem of gas hydrates [13; 44].

A special place among the countries of the world with gas hydrate deposits is occupied by Kazakhstan, Russia, Canada, and India.

Today, many energy experts believe that due to the development of gas hydrate deposits, it would be possible to abandon nuclear energy, the receipt of which, unfortunately, is inevitably associated with a certain degree of environmental, technical and social risk.

4. In the energy sector of Kazakhstan, coal will remain the main one in the near future. It has a high value of the net yield of useful energy in the production of electricity, heat generation for production processes and home heating.

But coal is extremely dirty, its mining is dangerous and harmful to the environment, as well as burning, if modern technologies are not applied and there are no special devices to control the level of air pollution.

Traditional methods of coal mining and consumption turn coal regions into ecological disaster zones. So, for every kW of installed capacity of today's coal electricity, 500 kg of ash and slag, 75 kg of sulphur oxides and 10 kg of nitrogen are released into the atmosphere annually. As a result, at small power plants with a capacity of 200 MW, 100 thousand tons of particulate matter, 15 thousand tons of sulphur compounds and 2 thousand tons of oxidized nitrogen enter the atmosphere during the year [13; 43].

While TPPs in economically developed countries use only enriched coals of constant composition, with an ash content of 5.5 to 15%, Kazakhstan's power plants still burn 28-30% of gross production coal, and in some cases more than 40-50 % ash. Domestic fuel and coal energy is urgently needed new, modern, environmentally friendly coal technology, otherwise the inevitable release of harmful substances will be enormous and lead to environmental disasters. Unconventional, environmentally friendly technologies for developing coal seams and burning coal primarily include underground coal gasification (CCGT) [17; 202-233].

It is expected that in the future, projects in the field of nuclear energy will be implemented. The fact is that it has long been recognized worldwide as an energy source that eliminates atmospheric pollution and has almost zero greenhouse gas emissions, a stable price and reliable energy supply. All this provided that the entire cycle of the nuclear process proceeds normally, with proper technological maintenance. The disadvantages of nuclear energy include [13, 45]:

- very high equipment costs;
- Nuclear power plants with today's technologies are usually used only for the production of electricity;
- with low technologies, risks of major accidents are possible;
- imperfect technologies for the storage and disposal of radioactive waste.

The above-mentioned shortcomings of nuclear energy are holding back its development in our republic. Meanwhile, uranium mining, which grew from 2 thousand tons in 2000 to 23.8 thousand tons in 2015, brought the Republic of Kazakhstan to first place in the world.

In the long term, the worsening ecology - pollution of soil, groundwater, airspace, acid rain, greenhouse effect, the appearance of local zones of technological disasters - require intensive search and use of renewable energy sources (RES).

In general, renewable energy attracts low emissions. At the same time, forcing the transition can lead to a loss of competitiveness of the economy, deindustrialization, rising electricity prices, job cuts in traditional industries, not to mention the problems associated with the need to ensure reliable energy supply. But delaying following global development trends entails social costs associated with anthropogenic environmental impact, as well as limited access to modern technologies and financial resources. The Concept of development of the fuel and energy complex of Kazakhstan, developed by the expert community and approved by the Government, takes into account all the challenges associated with such modernization. The fundamental principles of this program document are the improvement of industry regulation mechanisms, the systematic construction of clean energy sources, energy efficiency, energy and resource saving [18; eleven]

It is important to keep in mind that we cannot stay away from the global race for the quickest development of renewable (i.e., eternal) sources of cheap and safe energy, which ensure a transition to a qualitatively different standard of living and economy. We, following the example of highly developed countries of active energy consumers, should also develop a strategy for energy supply of Kazakhstan at the expense of renewable sources for the next 50 years. The fundamental principle of this strategy should be to obtain the most profitable energy through the use of natural phenomena, underground resources present in a particular region.

By the way, I would like to emphasize that in the conditions of Kazakhstan, the development of alternative energy makes it possible to indirectly save the country's water resources. Water-consuming power plants in huge

quantities (fuel, gas, coal, and nuclear) work according to one principle: they heat the water until steam forms, which rotates the turbines that generate electric current. Consequently, for the country's scientific and technological progress, own ideas and internal resources are needed.

In conclusion, summarizing the above, it can be noted that, despite the problems experienced by the energy sector of Kazakhstan, as well as all other extractive regions, large projects are able to maintain the level of production that exists in the country today, and even increase it in the future. The systematic work of power engineers to ensure the reliability of energy supply to consumers in Kazakhstan, effective answers to new global challenges will contribute to the development of the country's economy in the future.

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