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QazaqGreen

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IN SOLIDARITY FOR A GREEN WORLD



QAZAQ GREEN
RES ASSOCIATION

UNITED PLATFORM



for Kazakhstan and international players
in the field of renewable energy sources

AIM – SECTOR CONSOLIDATION



to bring together actors in the
field of renewable energy sources
in order to create favorable
conditions for development of the
sector

MISSION:



formation of a holistic position
of association members to
obtain attractive conditions for
investing in the projects of
renewable energy sources

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Members and partners of the Association



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THE WELCOME SPEECH OF NURLAN KAPENOV THE CHAIRMAN OF THE BOARD OF DIRECTORS QAZAQ GREEN RENEWABLE ENERGY ASSOCIATION

DEAR READERS! DEAR FRIENDS!

The 2024 year grinds to an end. Despite various external and internal factors, I should note that the renewable energy sector continues to grow steadily. The achievement of 6.67% of electricity generation in the country by renewable energy capacities in the first 9 months of 2024 can rightfully be considered as the main achievement of the year. I should note that this indicator was achieved ahead of schedule, because the share of renewable energy generation in the amount of 6% was planned to be achieved in 2025.

Currently, there are 148 RES facilities in the country with a total installed capacity of 2903.7 MW. According to the results of auctions for selection of RES projects, 1271.5 MW of wind, solar and hydroelectric power plants were selected for implementation. This means that in the coming years, additional new RES facilities will appear in the country's energy system. It is especially encouraging to observe the activity of domestic companies in auctions of hydroelectric power plants – an increase in marginal auction prices and simplification of participation conditions, which were hotly discussed in 2022-2023, is yielding results.

I should note an important and truly historic event in 2024 – the adoption of the Law of the Republic of Kazakhstan "On Amendments and Additions to Certain Legislative Acts of the Republic of Kazakhstan on support for use of renewable energy sources and electric power industry" on June 19, 2024. The adopted amendments imply a package of measures aimed at stimulating the development of small-scale renewable energy sources. Firstly, the concept of small-scale renewable energy sources is legally fixed, their installed capacity is determined up to 200 kW. Secondly, measures have been taken to simplify the connection of small-scale renewable energy sources to regional grids. Thirdly, as an incentive, norms have been adopted that involve offsetting the generated electricity

by the installation of renewable energy sources and consumed electricity from the grid, as well as mechanism for buying excess "green" electricity. These norms have been discussed for several years at various levels. RES Association Qazaq Green took a direct part in these discussions, including in the working group in the Mazhilis of the Parliament of the Republic of Kazakhstan. Thanks to the support of UNDP-HPP project "Reducing the risks of investing in RES", as well as determination of the deputies of Mazhilis of the Parliament of the Republic of Kazakhstan, these amendments were adopted. It is this segment for households and businesses that will allow every citizen of Kazakhstan to have the opportunity to use RES for their own needs.

The main achievement of RES Association Qazaq Green in 2024 was also a contribution to improving the conditions for investing in RES projects. Thus, thanks to the direct work of Qazaq Green, the tariff indexing mechanism has been improved. Firstly, indexing has become possible not only for US dollar, but also for other currencies, the exchange rate of which is set by the National Bank of the Republic of Kazakhstan. After all, investors can potentially attract debt financing from different institutions using different currencies. Secondly, investors are given the opportunity to change the indexing mechanism once during the life cycle of the project, for example, from indexing to a change in the consumer price index, to exchange rate indexing or vice versa.

In addition, investors, as part of the elaborated amendments to the LSI, are given the opportunity to extend the period of construction of RES stations for a period not exceeding one (1) calendar year, subject to a corresponding extension of the validity period of financial security for purchase agreement.

Thanks to the work of our association, energy-producing organizations using renewable energy

sources were excluded from the criteria for classifying as objects vulnerable to terrorism for the simple reason that RES cannot be classified as critical infrastructures, since the production of electric or thermal energy depends entirely on nature factors. This decision, in turn, simplified the requirements for RES facilities that performed tasks unusual for them. We are confident that all the above amendments will contribute to the further development of RES sector.

In the past year, we organized the III International Business Festival on RES Qazaq Green Fest, released three issues of Qazaq Green magazine, and ensured functioning of Qazaq Green.com portal with the number of users increased to 63 thousand. With the support of German Society for International Cooperation GIZ, 5 round tables were organized on topical issues of RES development: RES support policy, development of local content, financing of RES projects, development of corporate PPA-contracts for RES, problems of gender policy in a fair transition. In October 2024, with the support of GIZ, a study tour on RES development to Germany was also organized, which was attended by members of Parliament, representatives of the system operator, development institutes, industry associations, and energy experts. In addition, travelling courses of RES School were held in three regions of Kazakhstan – Astana, Almaty and Karaganda.

I should note that RES School, launched in 2023, has become a point of attraction for experts interested in the development of RES. To date, 13 three-day courses of Qazaq Green RES School have been held, the total number of graduates amounted to 134 students. I am confident that Qazaq Green RES School has a great future, taking into account the growing interest in the development of RES sector throughout the country.

As you know, there has been a discussion in the expert community for several years about the need to develop energy storage systems in Kazakhstan. During this time, a variety of options were proposed: to introduce obligations for RES facilities to be equipped with electrochemical energy storage systems in the amount of 50% of the installed capacity, to oblige all RES facilities over 10 MW to install such systems, etc. In the absence of empirical experience in the operation of such systems, as well as regulatory and technical regulation, so far we have to admit the presence of a conceptual gap in understanding why the country's energy system needs energy storage systems and through what mechanisms they need to be implemented. To this end, RES Association Qazaq Green, with the support of Huawei Technologies Kazakhstan, has begun developing a White Book

"Potential of using BESS battery-type energy storage systems in the Unified Energy System of the Republic of Kazakhstan". We hope that the white book will become a guide for decision makers and all interested industry experts and will allow them to take the right measures to stimulate this segment.

In general, I should note that there are important issues of sector development on the agenda of Qazaq Green in 2025. Firstly, the Ministry of Energy of the Republic of Kazakhstan has begun to develop a draft Law of the Republic of Kazakhstan "On alternative energy sources". These are sources such as industrial gases, waste heat, waste disposal, etc. Here we consider it very important that the sources under consideration, which are not a priori renewable energy sources, do not mix with renewable energy sources, since this may lead to a substitution of concepts and conceptual miscalculations. Secondly, the issues of development of corporate PPA contracts, as well as the functioning of the qualified consumer mechanism, remain relevant. In these issues, there are certain regulatory and legal gaps that should be eliminated in order to support business initiatives for development of renewable energy sources.

We thank all our colleagues for participating in the work of Qazaq Green and invite to further cooperation. Taking this opportunity, I wish you all a Happy New Year, good health and success!



Nurlan Kapenov
Chairman of the Board of Directors
QAZAQ GREEN RES Association

THE MESSAGE OF PRESIDENT KASSYM-JOMART TOKAYEV

TO THE PEOPLE OF KAZAKHSTAN "FAIR KAZAKHSTAN: LAW AND ORDER, ECONOMIC GROWTH, PUBLIC OPTIMISM"



“

"The current standard conditions for financing the construction of new generation facilities cannot be called acceptable. Therefore, the Government needs to explore ways to ensure affordable long-term lending from financial institutions.

The Government will also need to clearly plan its long-term tariff policy. This is essential for attracting "long money" to the industry. However, unjustified tariff increases for consumers must be avoided.

By the end of the year, a national project for the modernisation of the energy and utility sectors should be approved. The issue of fostering a culture of conserving communal resources remains pressing. Starting next year, it will be necessary to introduce clear consumption norms based on the principle of "the more you consume, the more you pay." At the same time, consumers should not be left to navigate their relationships with private monopolists alone. Legislation should introduce the concept of socially significant services and regulate them similarly to public services.

Given the growing global energy shortage, we are in dire need of reliable and environmentally friendly energy sources. Therefore, in my opinion, it is essential to focus on the development of nuclear energy. This type of generation can largely meet the rapidly growing needs of our economy. Currently, about 200 nuclear power plants are operating in thirty developed and developing countries.

We must think about the future, considering long-term national interests and the specific needs of our country. This is why I have always emphasized the importance of making well-considered decisions on issues like the construction of a nuclear power plant (NPP) and of widely discussing strategic plans with society...

President of the Republic of Kazakhstan
Kassym-Jomart Tokayev
September 2, 2024

COP29 OUTCOMES: \$300 BILLION TO FIGHT CLIMATE CRISIS

The UN Climate Conference (Conference of the Parties to the United Nations Framework Convention on Climate Change - COP29) closed with a new financial goal to help countries protect their people and economies against climate disasters, and share in the vast benefits of the clean energy boom, reports UN News.



The main theme of COP29 in Baku (Azerbaijan) was climate finance. The event brought together representatives from nearly 200 countries and a breakthrough agreement that will:

- *Triple finance to developing countries, from the previous goal of USD 100 billion annually, to USD 300 billion annually by 2035.*
- *Secure efforts of all actors to work together to scale up finance to developing countries, from public and private sources, to the amount of USD 1.3 trillion per year by 2035.*

Known formally as the New Collective Quantified Goal on Climate Finance (NCQG), it was agreed after two weeks of intensive negotiations and several years of preparatory work, in a process that requires all nations

to unanimously agree on every word of the agreement.

"This new finance goal is an insurance policy for humanity, amid worsening climate impacts hitting every country," said Simon Stiell, Executive Secretary of UN Climate Change. "But like any insurance policy – it only works – if premiums are paid in full, and on time. Promises must be kept, to protect billions of lives."

"It will keep the clean energy boom growing, helping all countries to share in its huge benefits: more jobs, stronger growth, cheaper and cleaner energy for all" - he added.

The International Energy Agency expects global clean energy investment to exceed USD 2 trillion for the first time in 2024.

The new finance goal at COP29 builds on significant strides forward on global climate action at COP27, which agreed an historic Loss and Damage Fund, and COP28, which delivered a global agreement to transition away from all fossil fuels in energy systems swiftly and fairly, triple renewable energy and boost climate resilience.

COP29 also reached agreement on carbon markets – which several previous COPs had not been able to achieve. These agreements will help countries deliver their climate plans more quickly and cheaply, and make faster progress in halving global emissions this decade, as required by science.

Important agreements were also reached on transparent climate reporting and adaptation as summarized below.

Simon Stiell, Executive Secretary of UN Climate Change, also acknowledged that the agreement reached in Baku did not meet all Parties' expectations, and substantially more work is still needed next year on several crucial issues.

UNFCCC Executive Secretary Simon Steele also acknowledged that the agreement reached in Baku fell short of all parties' expectations and that significant work remains to be done in a number of key areas next year.

“No country got everything they wanted, and we leave Baku with a mountain of work to do,” said Stiell. “The many other issues we need to progress may not be headlines but they are lifelines for billions of people. So this is no time for victory laps, we need to set our sights and redouble our efforts on the road to Belem.”

The climate finance agreement at COP29 comes as stronger national climate plans (Nationally Determined Contributions, or NDCs) become due from all countries next year. These new climate plans must cover all greenhouse gases and all sectors, to keep the 1.5°C warming limit within reach. COP29 saw two G20 countries – the UK and Brazil – signal clearly that they plan to ramp up climate action in their NDCs 3.0, because they are entirely in the interests of their economies and peoples.

“We still have a very long road ahead, but here in Baku we took another important step forward,” said

Stiell. “The UN Paris Agreement is humanity’s life-raft; there is nothing else. So here in Baku and all of the countries represented in this room we’re taking that journey forward together.”

A brief summary of other key achievements at COP29 follows below.

ARTICLE 6 OF THE PARIS AGREEMENT

A notable achievement during the past two weeks was the progress made on carbon markets. After nearly a decade of work, countries have agreed on the final building blocks that set out how carbon markets will operate under the Paris Agreement, making country-to-country trading and a carbon crediting mechanism fully operational.

On country-to-country trading (Article 6.2), the decision out of COP29 provides clarity on how countries will authorize the trade of carbon credits and how registries tracking this will operate. And there is now reassurance that environmental integrity will be ensured up front through technical reviews in a transparent process.

On day one of COP29, countries agreed standards for a centralized carbon market under the UN (Article 6.4 mechanism). This is good news for developing countries, who will benefit from new flows of finance. And it is particularly good news for least developed countries, who will get the capacity-building support they need to get a foothold in the market.

This mechanism, known as the Paris Agreement Crediting Mechanism, is underpinned by mandatory checks for projects against strong environmental and human rights protections, including safeguards that ensure a project can’t go ahead without explicit, informed agreement from Indigenous Peoples. It also allows anyone affected by a project to appeal a decision or file a complaint.

Under the text agreed on Article 6.4, there is a clear mandate for the UN carbon market to align with science. It tasks the Body getting this market up and running to consider the best available science across all work going forward.

The work on carbon markets doesn’t stop in Baku. The Supervisory Body setting up the new carbon crediting mechanism has been handed a long 2025 to-



do list by Parties and will continue to be accountable to them.

TRANSPARENCY AND ACCOUNTABILITY

Transparent climate reporting made big strides forward in Baku, building a stronger evidence base to strengthen climate policies over time, and helping to identify financing needs and opportunities. To date, 13 Parties have now submitted their first Biennial Transparency Reports (BTR) – due from all Parties by the end of the year. Andorra, Azerbaijan, the European Union, Germany, Guyana, Japan, Kazakhstan, Maldives, Netherlands, Panama, Singapore, Spain, and Türkiye have led the way on transparent climate reporting, and set an example for others to follow. The list of received BTRs is continuously being updated [here](#).

In addition, all transparency negotiating items concluded successfully at COP29, with Parties expressing their appreciation for the timely completion of the Enhanced Transparency Framework (ETF) reporting tools, the technical trainings, the support provided to developing countries for reporting under the ETF that took place in 2024, and the successful launch of the review process.

A total of 42 events were organized under #Together4Transparency, a UNFCCC collaborative initiative that promotes climate transparency with Parties and non-Party stakeholders. These events emphasized the vital role of transparency in preparing NDCs and net-zero pathways, as well as in recognizing climate action from non-Party stakeholders. Events included high-level sessions, mandated events and

training sessions to prepare countries for their BTRs, as well as to equip technical experts for the upcoming review process.

The critical role of REDD+ was recognized through a £3 million pledge by the UK International Forest Unit to support UN Climate Change's work over four years. This funding will bolster REDD+ activities in many countries, enabling the secretariat to create dedicated spaces for REDD+ experts to engage in technical dialogue. These efforts are expected to enhance the transparency and implementation of REDD+, in line with the Global Stocktake objective to halt and reverse deforestation and forest degradation by 2030..

ADAPTATION

COP29 was an important moment for adaptation, with the delivery of several key outcomes. The COP decision on matters relating to the least developed countries (LDCs) contains a provision for the establishment of a support programme for the implementation of National Adaptation Plans (NAPs) for the LDCs. Parties extensively discussed the second five-year assessment of progress to formulate and implement NAPs, and will continue that in June 2025.

A High-Level Dialogue on National Adaptation Plans convened ministers from least developed countries and small island developing States, financial experts and international donors to address the growing urgency of climate adaptation. Their discussions focused on innovative financing, technical support, and accelerated action to meet the 2025 submission deadline for NAPs. The event concluded with a strong call to action to expedite NAPs and translate plans into tangible outcomes.

The outcome on the global goal on adaptation sets a clear path forward on the road to COP30 for the indicators work programme, providing a process for experts to continue their technical work before passing the baton to Parties. COP29 also launched the Baku Adaptation Road Map and Baku high-level dialogue on adaptation to enhance the implementation of the UAE Framework. Finally, the outcome raises ambition by agreeing to continue unpacking transformational adaptation moving forward.

CONSTRUCTION OF A PLANT FOR WIND POWER COMPONENTS BEGINS IN ZHAMBYL REGION

The construction of a plant for the production of components for wind power plants (WPPs) has started in Shu district of the Zhambyl region, according to the regional Akimat. This facility, a first of its kind in Central Asia, aims to enhance Kazakhstan's renewable energy infrastructure.



A groundbreaking ceremony for the plant took place, attended by prominent figures including Yerbol Karashukayev, Akim of Zhambyl region; Ilyas Bakytzhan, Vice-Minister of Energy of Kazakhstan; Nurlan Zhakupov, Chairman of the Board of Samruk-Kazyna JSC; Jiang Wei, Consul General of China in Almaty; and Zhou Fugui, Executive President of Sany Renewable Energy.

The plant will be located within the "Jibek Joly" special economic zone and developed through a partnership between the Chinese company Sany Renewable Energy and Samruk-Kazyna Invest LLP. The total investment for the project amounts to 53.6 billion tenge, with the facility expected to be operational by the end of 2025. The plant is set to create approximately 300 new jobs and will have a production capacity of 2 GW in wind power equipment, catering to both domestic needs and export demands.

The broader investment landscape of the Zhambyl region includes 80 projects valued at 3.3 trillion tenge, which are projected to generate 6,362 jobs. Among these, 12 major initiatives worth 1.6 trillion tenge are currently under development, expected to create 4,500 positions. In 2024, plans include the implementation of 35 projects worth 214 billion tenge, generating 1,453 jobs, while 20 projects valued at 146.7 billion tenge have already launched, providing 674 jobs.

Zhambyl region stands as a national leader in renewable energy development, hosting 22 renewable energy facilities with a combined capacity of 571.3 MW. These include six hydroelectric plants (24.4 MW), 10 wind power plants (275.6

MW), and six solar power plants (251.25 MW). In the first ten months of 2024, these facilities produced 588.4 million kWh of electricity. Future plans, in collaboration with international companies, involve constructing large wind power plants in Moyinkum, Talas, and Sarysu districts.

During his visit, the regional Akim also reviewed ongoing developments within the Jibek Joly FEZ, including the construction of enterprises such as Taraz Gelatin (gelatin, soap, and leather processing), JVictorNewEnergy (silicon production), and Kazakhstan Hydrogen Peroxide (hydrogen peroxide production). In total, 19 projects are planned within the FEZ, with three enterprises already operational and construction underway for seven more.





INTERVIEW



Dilyara Yedenbayeva

SOLIDCORE RESOURCES: MAINTAINING A BALANCE BETWEEN DEVELOPMENT AND SUSTAINABILITY



Solidcore Resources, one of the largest gold producers in Kazakhstan, pays special attention to sustainable development issues. In an interview for our publication, the company's Director of Sustainable Development, Dilyara Yedenbayeva, talks about the company's key projects, decarbonization goals and support for local communities, as well as the challenges that the corporate sector faces on the way to "greening".



– Please, can you tell us about the activities of Solidcore Resources in Kazakhstan.

– Solidcore Resources is the second largest gold producer in Kazakhstan. The company manages two operating assets: Kyzyl in the Abai region and the Varvarinskiy hub, which unites the Komarovskoye and Varvarinskoye deposits in the Kostanay region. We also have a key development project — Ertis hydrometallurgical complex (EHMC) in Pavlodar.

The last two years have been a transformational period for us. In 2023, the company transferred its registration from Jersey Island to Kazakhstan, passing into the jurisdiction of the AIFC, and ceased listing on the London and Moscow Stock exchanges. Today, 100% of our business and production are concentrated in Kazakhstan.

I would especially like to mention our strategic Ertis HMC project, which will become the first full-scale and high-tech full-cycle pressure oxidation complex for processing



In general, sustainable development is already a key goal for our company, and within its framework we focus on four main tasks

refractory ores from the Kyzyl deposit. This technology is considered one of the most stable and safe in hydrometallurgy.

– You are the head of Solidcore Resources' sustainable development department. Why does the company pay special attention to this area?

– We actively adhere to the ESG principle, and one of our key priorities is leadership in sustainable development. We pay special attention to this area for several reasons.

Firstly, it is reducing risks and strengthening the company's reputation — responsible approach and investments in environmentally friendly technologies help to minimize reputational risks.

Secondly, ESG factors are important for attracting investments, especially from institutional investors who pay significant attention to them. Thirdly, compliance with regulatory requirements: as the requirements for disclosure of data on sustainable development and carbon footprint become more stringent, our company strives to meet these standards.

There are many of these reasons, I have identified the main ones.

– What goals and objectives does Solidcore Resources set for itself as part of the development of sustainable development?

In general, sustainable development is already a key goal for our company, and within its framework we focus on four main tasks:

The First is to reduce greenhouse gas emissions. We strive to introduce technologies that reduce the carbon footprint, modernize equipment and production processes, and improve the energy efficiency of our enterprises.

The Second is to reduce the consumption of fresh water, which will allow us to take more care of this important resource.

The Third is to ensure the health and safety of employees. We create favorable conditions for their development and self-realization, respect their rights and take care of their well-being.

The Fourth is the support of local communities and social development. We actively invest in infrastructure and social projects in the regions where we are present, create jobs and contribute to the local economy.

After completing the restructuring of the company, we plan to update the Sustainable Development Goals by April 2025. At the same time, our main priority remains unchanged: to



minimize the impact on the environment, while maintaining a balance between the economic and operational efficiency of our enterprises.

– One of the direct tools for decarbonizing energy consumption is the introduction of renewable energy sources. Please can you tell us about the plans for the development of this area.

– Our decarbonization plans include the construction of solar power plants with a capacity of 23 MW in Kostanay region and 17 MW in Abai region, as well as 40 MW gas engine power plant that will compensate for the uneven generation of solar energy. These projects are important to us because they will improve energy security and fulfill our commitments to reduce our carbon footprint.

The first stage of the project is being implemented actively — the energy cluster at Varvarinskiy, which will combine solar and gas engine power stations, as well as all the necessary gas distribution infrastructure. Next year, we plan to launch the second phase of the project — the construction of a solar power plant in Kyzyl. The full launch of all power plants is planned for 2027, and the total investment will amount to about 75 million US dollars. These capacities will almost completely replace the consumption of electricity generated by coal-fired power plants and reduce greenhouse gas emissions of our enterprises by 27% compared to 2023.



– **The President and the Government of Kazakhstan pay special attention to environmental issues. Thus, in the Message of 2020. The President instructed to plant 2 million trees in forests and 15 million trees in populated areas. What are your company's plans in this direction?**

– The President and the government of Kazakhstan really pay great attention to the environment, and this inspires us to take action, and we, for our part, also actively support this course.

This year we launched a pilot project to create a new forest area in Kostanay region: we are planting a forest on the territory of 500 hectares, which we will eventually expand to 1.5 thousand hectares. This forest will not only help improve the climate and maintain biodiversity, but will also become a new home for animals and a recreation area for local residents. In addition, the project has already been included in the national register of carbon projects, which will allow us to produce carbon units to compensate for our own greenhouse gas emissions.

We are also planning similar projects in Pavlodar region and Abai region. Our project is innovative for the carbon market in Kazakhstan, and although it is not moving so fast due to a number of regulatory and bureaucratic difficulties, we hope to work with representatives of the MENR to develop a more effective approach to such initiatives. We believe that in the future such projects will receive even more significant support."

– **What problems do companies in the industrial sector face in implementing their sustainable development policies?**

– Sustainable development for the industrial sector is like a path through the wilds of the forest. The main difficulties along the way resemble large rocks that have to be bypassed.

Firstly, it is the high cost of technology. The introduction of "green" solutions requires significant investments: the development and launch of environmentally friendly technologies sometimes cost a lot of money, and not every company is ready for such costs.

Another challenge is the slow pace of innovation. The industrial sector is inherently conservative, and here every new approach is met with caution, if not with apprehension. In this realm of reliable traditions, the transition to sustainable technologies sometimes seems like something out of the realm of fiction.

Next comes the resistance within the company. Sometimes the biggest obstacles don't come from the outside, but from the inside. Managers and employees may fear that new methods will affect profits or disrupt familiar processes, and sometimes this inertia prevents them from moving forward.

In addition, companies have difficulties with supply chains. It is not enough to introduce "green" technologies only at home; it is important that each partner in the chain



follows the same standards, and this is difficult to control.

Finally, there is a shortage of specialists. To move towards sustainable development, we need professionals who understand ecology, technology and the principles of sustainable development. And such specialists are literally worth their weight in gold today.

The path is difficult, but companies understand that it needs to be passed. Success awaits those who are ready to go forward and solve each of these tasks."

– What support measures are needed by the corporate sector for further greening of industrial and business processes?

– Rather, a set of measures is needed to encourage companies to implement environmental initiatives.

In order for a business to truly "green up", a whole arsenal of support is needed, helping not just to take a step forward, but to move to a new sustainable stage. We can say that this is an integrated approach, where each element is a support on the way to the future, where both profit and ecology go hand in hand.

The first element is regulation. For stable and consistent movement, stricter and more transparent standards of sustainable development are needed, in line with international standards. Mandatory reporting and transparency of data on decarbonization and sustainability at the national level will be the basis for increasing trust and responsibility.

Further, without financial incentives and tax incentives,

the path to a sustainable future may seem too difficult and costly. Subsidies, grants and soft loans for "green" projects are not just help, but motivation for business. The launch of full-fledged carbon market will provide an opportunity to offset emissions and invest in environmental technologies.

The third measure is development of the market for "green" bonds and investments. The environmental projects supported by financial instruments will open up a new source of capital for companies. Moreover, the standards for such bonds and the confidence in them from banks and investors will make green investments a natural part of the economic landscape.

Another important support is innovation and research. Without a scientific base and innovative solutions, the implementation of environmental practices may stall. R&D support, partnership with universities and research centers, and support for startups are important here. Such steps will create innovations, test them and make them part of our common sustainable future.

And, of course, public recognition is important. Ratings, certificates, and awards are a sign of respect for those who sincerely care about the environment. Recognition inspires and motivates, and also shows other companies that moving towards a "green" future is not only necessary, but also prestigious.

These measures together will become not just support, but the basis for transition to a new, sustainable and responsible stage of business development.

PV MODULE TAKE-BACK AND RECYCLING IN GERMANY



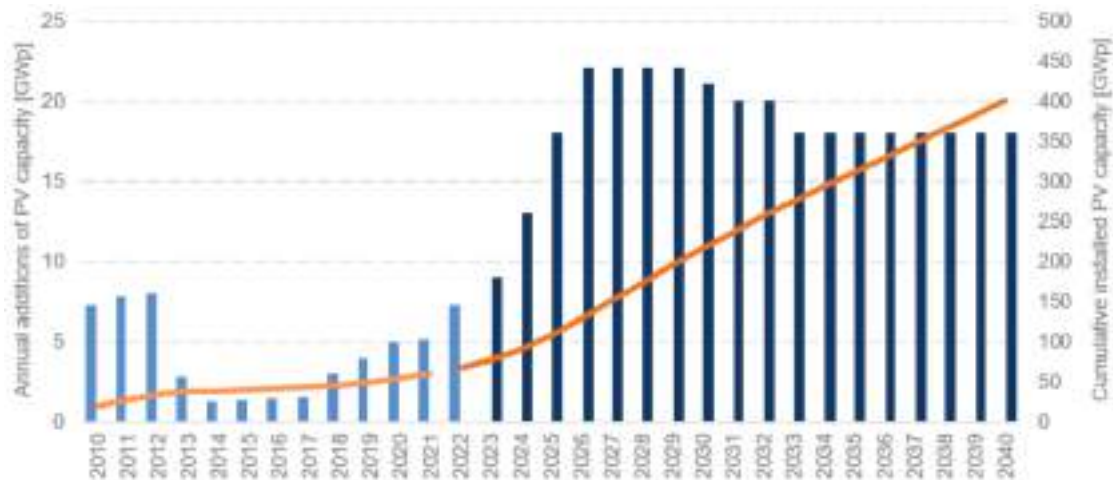
Alex Bologna,
RES expert, Global Factor



Photovoltaics (PV) is one of the key technologies needed for transforming Germany's energy system and meeting the targets of a low-carbon electricity generation system. Germany is one of the top five countries in terms of installed PV capacity, together with China, the United States of America, Japan, and India.

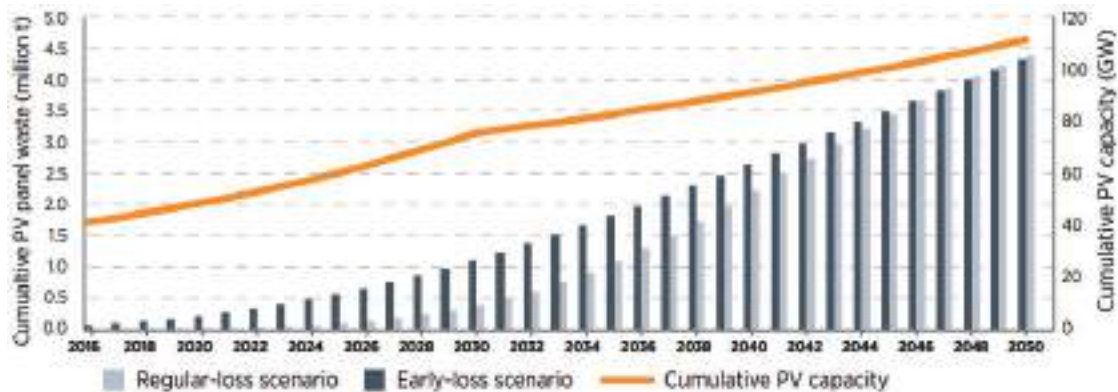
According to Fraunhofer Institute for Solar Energy Systems (ISE), approximately 67 GWp of cumulative PV power were installed in Germany by the end of 2020. With the update to Germany's RES Act [3] in 2023, the PV expansion targets were significantly increased to the cumulative installed PV power of 215 GWp in 2030 and 400 GWp in 2040 (Figure 1).

Figure 1: Development of annual additions and cumulative PV capacity in Germany according to Fraunhofer ISE, EEG, Statista



During this period, the first larger PV plants will also reach the End Of their Life (EOL) and will need to be gradually replaced (Figure 2).

Figure 2: Estimated cumulative PV waste volume in Germany according to the 2016 IRENA and IEA report



Because Germany was the first country to install large numbers of PV modules, it will be the first country that will need to handle large numbers of EOL modules. The current returns of EOL PV modules are still comparably low in number but will start to significantly increase by the end of the decade. It is estimated that the waste streams in Germany for 2030 will range from 400,000 to 1,000,000 tons.

With regard to PV as part of a sustainable energy system, it is necessary to provide appropriate treatment and recycling processes for returned PV waste streams to ensure the circularity of used materials. Additionally, the recycling capacities need to be expanded to meet future demand. Further, professional coordination and infrastructure for the take-back and collection of PV module waste are required to ensure that EOL modules are treated via the intended recycling routes.

LEGAL FRAMEWORK FOR TAKE-BACK AND RECYCLING OF PV MODULES

In Europe, PV modules that reach their EOL are classified as electrical and electronic waste. The take-back and treatment of EOL PV module waste in Europe is covered by the legal framework of the WEEE directive.

The first version of the WEEE directive, enacted in 2002, did not include PV waste; this was added in an updated version in 2012, 2012/19/EU. The deadline for transposition into national legislation was 2014, but it wasn't until the beginning of 2016 when every member state implemented it into national law.

The requirements of the WEEE directive are implemented into Germany's legislation by ElektroG (German Electrical and Electronic Equipment Act). The first version of ElektroG was enacted on March 15, 2005, with a major update (ElektroG2) on

October 24, 2015, which became obligatory for manufacturers to follow on February 1, 2016. With this update to ElektroG, electrical and electronic equipment manufacturers must take more responsibility throughout the life cycle of their products:

- For PV modules, the minimum recovery rate is 85%.

In this context, the recovery rate includes the preparation for reuse and refurbishment, the recycling of material, and the energy recovery from thermal treatment, e.g., waste incineration.

- The recycling rate for PV module waste is 80% of mass.

These minimum quotas - the 85% recovery rate and the 80% recycling rate of PV mass - are applied as target quotas for Germany.

Since the implementation of the revised WEEE directive into national law, all manufacturers or authorized representatives that place PV modules on the German market must register the modules with the German WEEE register, Stiftung EAR. Stiftung EAR, as a joint body of manufacturers, has been assigned sovereign tasks by the Federal Environment Agency to ensure the implementation of ElektroG.

According to ElektroG, manufacturers of PV modules bear responsibility for the products they place on the market, i.e. the manufacturers are responsible for the products' return, logistics, sorting, dismantling, recovery, and recycling. To this end, the manufacturers must provide financial guarantees. Stiftung EAR records the quantities placed on the market and coordinates the provision of waste containers at public locations of the waste management authorities.

In Germany, PV modules are classified as business-to-consumer (B2C) and business-to-business (B2B). The different regulations apply for the collection and take-back of PV modules.

- PV modules from private households can be handed in free of charge at collection points of municipal waste management authorities or points registered by Stiftung EAR. In Germany, however, these are limited to typical quantities that are customary for households - for a maximum of 20–50 modules. The collection and further treatment of residential volumes are coordinated by the public legal waste management authorities.
- The collection of larger quantities is organized by the manufacturers, which can commission haulers to collect the EOL modules directly from the end user and transport them to the appropriate treatment facilities.

STAKEHOLDERS OF TAKE-BACK LOGISTICS, AUTHORIZATIONS AND OBLIGATIONS

Public waste management authorities, distributors, manufacturers, and authorized representatives of the manufacturers are entitled to collect and take back WEEE, according to ElektroG, including PV modules, and third parties can also participate in the collection process; however, commercial collection without a commission from the authorized players is not permitted. A distinction is made between B2C and B2B PV modules. PV modules that can be used in residential and commercial applications are referred to as B2C modules. PV modules that are for commercial use only, and for which the manufacturer can demonstrate that they are not usually used in residential applications, are referred to as B2B modules.

The public waste management authorities have an obligation to take back PV modules from “private households.” For this purpose, they must set up municipal collection points, called bring systems. Currently, approximately 1,700 collection points exist in Germany, which can be supplemented by collection systems. The PV modules can come either directly from the end user or from a distributor that has set up collection points. Distributors that have a sales area of at least 400 m² for electrical and electronic equipment are obliged to take back old electrical or electronic equipment when selling a similar one.

Distributors that are not obliged to do so may carry out the take-back on a voluntary basis. WEEE must be collected in containers that are separated into six collection groups, of which Collection Group 6 includes PV modules.

Manufacturers whose PV modules are



distributed in Germany are responsible for taking back and disposing of their PV modules. Manufacturers that do not have a branch in Germany must appoint an authorized representative to fulfill this obligation; otherwise, their PV modules may not be distributed. The manufacturers must set up collection containers at the transfer points of the local authorities. Once the collection containers are full, the manufacturers must transport the container to certified primary treatment facilities (Erstbehandlungsanlage [EBA]), where either the contents are prepared for reuse, or a depollution and separation of recyclable materials is carried out. To perform this step, manufacturers can contract with third parties, such as private logistics or waste management companies. Manufacturers can set up an individual take-back system or join a collective take-back system, such as PV Cycle. A manufacturer can also set up private collection points.

The public authorities, manufacturers, and distributors of PV modules and the operators of the initial treatment facilities have obligations to provide information, notification, and reporting, as well as verification and registration. The most important obligations are summarized as follows:

- Module manufacturers must provide treatment facilities free of charge with information on the treatment of their products, including hazardous substances contained therein.
- All participants involved in the take-back of WEEE have reporting obligations to Stiftung EAR. They must report the quantities of electrical and electronic equipment that are placed on the market, collected, recovered, or disposed according to the collection group and category.
- Module manufacturers, distributors, and operators of collection points and initial treatment facilities are listed in registers of Stiftung EAR.
- The transport of WEEE from the collection point to the initial treatment facilities and recycling sites require accompanying documentation.
- WEEE volume or associated parts leaving the initial treatment plant are considered hazardous waste, so verification obligations must be fulfilled in



accordance with the Circular Economy Act (KrWG) for their transport to waste treatment facilities.

FINANCING SYSTEM OF TAKE-BACK LOGISTICS AND RECYCLING

In Germany, there are two mechanisms for financing the take-back and recycling of PV modules:

1. In the B2C mechanism, PV modules are sold directly to private households or users with similar requirements.
2. In the B2B mechanism, product responsibility is transferred to the end owner of the PV modules for commercial use.

In the B2C mechanism, there are two levels of financing: Level 1 and Level 2.

- Level 1 covers collection operations and direct collection and recycling costs. Costs for legacy EOL PV modules, i.e., EOL modules from manufacturers that no longer exist, are included here.

- Level 2 ensures funding for the collection and recycling of future waste. When a manufacturer registers with Stiftung EAR, it assumes the Level 1 costs according to its current market share, and it declares covering the Level 2 costs of its products placed on the market. Manufacturers can operate their own take-back and recycling system or join a cooperative. Among these cooperatives, PV Cycle and take-e-way are the most relevant associations. If a manufacturer leaves the market, other manufacturers must take over its market share.

In the B2B mechanism, manufacturers or authorized representatives must take over the costs for the take-back and recycling of modules that were placed on the market after October 24, 2015. In the case of legacy modules, end users are responsible for the take-back and recycling costs. The B2B mechanism applies to operators of solar parks.

RECENT UPDATES OF THE ELEKTROG3

The latest update to ElektroG, ElektroG3, took effect on January 1, 2022. Despite the previous updates, this revision was not based on new WEEE requirements but on a national revision.

- Among other points, ElektroG3 provides stronger liability for online markets. These updates should ensure that online vendors have authorized representatives and are registered with Stiftung EAR, and hence they are responsible for the consequential obligations for financing, take-back, and recycling. Online vendors and fulfilment service providers are committed to regularly reviewing that their offered products are registered and comply with the current regulation. In addition, from January 2023 on, online traders from other countries must designate an authorized representative for the German market, and they must register with Stiftung EAR. Further, traders are committed to informing users and customers about the options of free returns of WEEE, and they must ensure that the return collection points are located within a reasonable distance to end users.

- Further, the initial treatment facilities (EBA) can now also be collection points, thus extending the availability of return points for private end users. A new uniform logo should give WEEE collection points better visibility. As part of the initial registration, manufacturers of B2B products must present a take-back and recycling concept to Stiftung EAR. These concepts must be reviewed and accepted by the manufacturers.

- ElektroG3 also sets new take-back obligations in commerce, such as the possibility for end users to return WEEE to grocery stores that sell electronic products; and even occasionally for stores within an 800 m² sales area, which were previously exempt from the 400 m² rule, to allow the free return of up to three old appliances to the store, even if no new goods are purchased, or obligations for free-of-charge take-back in online trade.

- Further updates to ElektroG3 are related to providing better information and communication to customers and end users on the return options, the use of hazardous substances (e.g., in light bulbs), and the chemical systems of used batteries in products. Batteries in products must be removable with standard tools without damaging the product, and information must be provided for this purpose.



GERMANY'S CIRCULAR ECONOMY ACT (KRWG)

In addition to ElektroG, the Circular Economy Act (KrWG) provides a legal framework for the treatment, recovery, and disposal of waste. The Circular Economy Act took effect on June 1, 2012, and it implemented the requirements of the European Union Waste Framework Directive (2008/98/EC) into national law. According to paragraph §1 of the KrWG, “the purpose of this Act is to promote circular economy in order to conserve natural resources and to ensure the protection of human health and the environment in the generation and management of waste”.

The KrWG regulates the point at which products receive a waste status (§3) and the point at which the status is revoked (end of waste status) (§5). According to paragraph §5 of the KrWG, the waste status of a product or substance ends when it has been treated in a suitable



Figure 3: Waste hierarchy of the Circular Economy Act

recovery process; there is a use, demand, or market for the substance; and certain technical and legal requirements are met. In addition, the use of the substance must be harmless.

In paragraph §6, the KrWG defines a five-level waste hierarchy that follows the basic principle of recovery before recycling and determines the order of waste management measures (Figure 3).

According to the Circular Economy Act (KrWG), a product receives a waste status from the moment the product is no longer used and the owner wishes to dispose of it or when a product is no longer used for its originally intended purpose. The waste status ends when a product has completed the designated recovery or recycling process.

Owners must ensure compliance with all waste regulations that are required to dispose of waste. The return and disposal of PV modules is carried out in accordance with the regulations for PV modules in ElektroG. In paragraphs §20 and §21 of ElektroG, the basic principle of recovery before recycling (KrWG paragraph §7) applies. Accordingly, reuse and recycling have priority over waste disposal.

- To ensure this, nondestructive dismantling and transport of the modules is mandatory.
- Upon receipt of the EOL modules at the primary treatment facility, the modules must first be tested for reuse. If the tested modules are suitable for reuse, they must be marketed under the requirements of ElektroG paragraph §23 (certificate of origin, test certificate, appropriate packaging).
- If the test determines that the modules are not suitable for reuse, they must be sent for recycling, material recovery, and/or waste disposal via the designated disposal system. In an initial treatment, pollutants (e.g., lead or cadmium [Cd]) or valuable materials (e.g., aluminium [Al] or copper [Cu]) must be separated if technical feasible before the modules are shredded for recycling.

- Si-based and non-Si-based modules must be treated separately. The waste hierarchy shown in Figure 5 also applies here.

In case PV owners want to sell used modules via a secondary market, PV modules continue to be treated as a product. Prior to the sale, the owners must ensure that the modules are still functional for their originally intended use. Also, in this case, modules must be dismantled, transported, and tested in a nondestructive manner before they are supplied to a secondary market. Further, the obligations to provide evidence according to paragraph §23 of ElektroG apply.

MONITORING AND STATISTICS ON THE PROVISION OF EVIDENCE IN ELEKTROG

Manufacturers and authorized representatives that place PV modules on the German market must register with Stiftung EAR (WEEE register) and report the monthly quantities of PV modules sold as well as the EOL modules that will be disposed via the take-back system. On this basis, Stiftung EAR compiles the annual statistics for WEEE, and they are also reported to the European Commission to demonstrate compliance with the specified collection and recovery targets, which are accessible via the statistical database Eurostat [8]. Stiftung EAR publishes the statistics once per year. Manufacturers and authorized representatives must report the annual statistics of the previous year (reporting year) to Stiftung EAR by April 30. The data are evaluated by independent experts and forwarded to the German Federal Environment Agency (UBA). If necessary, the data are further processed before they are forwarded to the European Commission. All manufacturers and authorized representatives that were registered in the reporting year are obliged to report.

With the reporting obligation to Stiftung EAR, the following quantities are queried:

- **Input quantities:** Products put on the market: Total amount of PV modules that were put on the German market in the reporting year.
- **Output quantities:** PV modules prepared for reuse: Includes PV modules that were initially reported as waste but after testing are prepared to be reused for their originally designated use without further pretreatment
- **Recycled PV modules:** Represents the share of PV modules or fractions from EOL treatment from which materials or substances have been used for the manufacture of new PV modules or another purpose. Here, the summarized weight of EOL modules along the treatment chain is decisive. All quantities of modules recycled in Germany, within the European Union, and outside the European Union are reportable, provided they were recycled according to European standards.
- **Recovered PV modules:** Describes the proportion of PV modules or fractions from treatment that are prepared for reuse, recycled, and/or sent for other recovery. Here, too,

the quantity includes the modules recycled in Germany, within the European Union, and outside the European Union, provided compliance with the European standards. The evaluation quantity is the weight that is fed into the last plant in the treatment chain and whose output is the successful preparation, recycling, or recovery of the device or the recovered materials.

- **Disposed PV modules:** Includes the share of PV modules or fractions from the treatment that were not fed into any of the previously mentioned types of use or recovery but were disposed of as waste - for example, landfilled or disposed of via waste incineration plants. Here, too, the quantity includes the modules disposed of in Germany, within the European Union, and outside the European Union.

- **PV modules exported for treatment:** Total quantity of PV modules exported for treatment. The decisive factor is in which country the first treatment step of depollution, separation of recyclables, or preparation for reuse was carried out. If the initial treatment was subcontracted, the metric is counted as an initial treatment in the corresponding state only if it included the first treatment step.

Summary of Main Findings on PV Sector Circularity in Germany

In March 2021, the nongovernmental organization Environmental Action Germany (Deutsche Umwelthilfe [DUH]) published a white paper addressing the challenges and opportunities for improving the circularity in the PV sector in Germany. DUH defines the main targets for improving the circular economy of PV modules as follows:

- **Waste prevention:** PV modules have comparably long lifetimes, from 20–30 years; hence, appropriate use and maintenance is necessary.
- **Preparation for reuse:** In case of early exchanges of intact modules, e.g., for repowering PV plants, the repair or the reuse of intact modules must be ensured.
- **Recycling:** Broken or unfunctional modules must be recycled by modern, advanced processing to recover rare materials and to avoid contaminations of pollutant substances.

The white paper highlights the need for:

- improvements to the current collection of used PV modules and PV module waste with regard to the collection process but also in terms of transparency and economic aspects.
- Due to improper treatment, the repair and reuse of used modules is not always ensured.
- Further, improper collection might lead to the disposal of modules.
- Also, there is the need for better communication and information to the relevant stakeholders as well as the public regarding the collection and take-back processes and responsibilities in the recycling and disposal of used PV modules or PV module waste.

Kazakhstan on the path to carbon neutrality: insights from Global Factor's international team

Experts from the international team at Global Factor have shared their perspective on Kazakhstan's transition to a low-carbon future. In an interview with QazaqGreen, they discussed the country's major challenges in decarbonization, highlighted notable achievements, and explored opportunities to attract investment in green energy. Additionally, they proposed practical solutions to accelerate Kazakhstan's transition to a sustainable economy.

? – How do you assess Kazakhstan's efforts on the way to achieving carbon neutrality? What successes and in what areas can you note, as well as challenges facing the state and the private sector?

– First of all, we need to understand that Kazakhstan's total emission is only ~0.8% of world's total, however, per capita emission is high close to USA and Australia (14-15 t/cap). Kazakhstan has also committed to the NDC to reduce emission by 15% from 2019 level and pledged to reach carbon neutrality by 2060. So, if we examine Kazakhstan's action list as per those commitments, then we can see not much visible progress has been made other than the above-mentioned government commitments and efforts undertaken by some private entities, like Qazaq Green, ECOJER, ERG и Solidcore Resources. As for example, ERG's recently approved (2024) net zero strategy has outlined broad measures which is promising. The main areas of some success is in the area of decarbonization of electricity. However, both the government and the private sector are facing lots of challenges, which were discussed in details during the training sessions delivered by international consultancy Global Factor during September 24-27, 2024. Of all challenges, lack of serious public-private agreement stands out.



Abdul Qader,
Decarbonization
expert, Global Factor

? – Our country has a high proportion of enterprises that produce products with a long carbon footprint. It is obviously not easy to reduce atmospheric emissions, install special equipment at production facilities, etc. at once. Moreover, these measures require additional costs for business. What can be the way out in this situation?

? – Representatives of the MMC industry fear that the introduction of a carbon tax will reduce their competitiveness on world markets. What do you think about this? What other risks can business face in the process of implementing the current climate agenda?

– Concerns regarding loss of competitiveness due to the introduction of carbon pricing are not without foundation or precedent. Many industries have harboured similar concerns during the run up to the introduction of carbon pricing systems that will affect their products or services. But, in general terms, carbon pricing can be well designed in order to successfully manage issues related to loss of competitiveness, for example through a phased-in pricing approach and the strategic reinvestment (of the funds raised through carbon pricing) in measures to actually increase companies' overall competitiveness.

Furthermore, it is important to understand that world markets for metals and mining products are evolving and will continue to do so. Witness for example the EU's imposition of its carbon border adjustment mechanism. It is also increasingly likely that other key regional markets with high demand for metals and minerals, including those of China and India, will implement carbon pricing systems, thereby negatively affecting the economics of companies that produce goods in high-carbon production processes, because they will be at a clear disadvantage when it comes to competing. The important aspect here is to understand that carbon pricing systems are set to be introduced in a greater number of markets, and countries and companies that fail to prepare for that eventually will sooner or later be penalized.

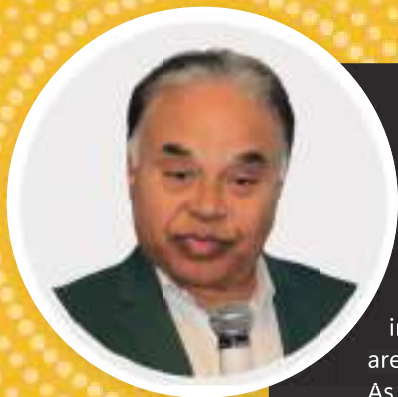


Craig Menzies,
Head of energy
department, Global
Factor

– We have to look at your question in two ways – one for small enterprises and the other for large ones. For the first category, yes, it is difficult to impose mandatory requirement of installing special equipment, however, it is not that difficult if the state comes forward with help, mainly in funding for that equipment and/or creating financial incentives by tax cuts or grants. For the large entities, also government help is required but it must be shared between the state and enterprises, better at a national level. In both cases, government should take the lead.



? – How are industrial companies in other countries navigating the transformational period? What modern technologies that contribute to the greening of production exist in the world, and which of them can we introduce in the near future in Kazakhstan?



Abdul Qader,
Decarbonization
expert, Global
Factor

– In developed countries, government is taking the leading role in facilitating climate action measures by incentivizing private sectors and formulating conducive regulations. Private sectors are also enthusiastically participating in the dialogues and continuously negotiating for a better outcome. As a result, we can see no new coal fired industries will be approved in those countries. All the best available technologies (BATs) are under development in those countries, some are at higher TRL levels in some countries. As for example, Germany and Japan are taking concrete steps towards hydrogen-based economy. All 5 pillars: technology, infrastructure, creating demand for environmentally friendly products, policies and funding capital are being addressed in most developed countries.

When it comes to the developing countries, like Kazakhstan, it has been a slow process. The lack of state's concrete approach to tackle this as well as lack of meaningful efforts by the private sector are the main barriers. Both need to accept the fact that we have to deal with the decarbonization efforts mainly for reducing climate change effects for the benefits of the whole of mankind. So, climate change awareness and getting worldwide mandatory agreement is a pre-requisite to have positive effects. The next immediate two actions should be in 1) establishing an auditable and transparent MRV system, and 2) decarbonization of energy (mainly by renewables). In parallel energy and operational efficiencies should be as ongoing measures.

? – In your opinion, how can the government stimulate the transition to a low-carbon economy?

Craig Menzies,
Head of energy
department, Global
Factor



– Government has a key role to play in several ways. It should provide clear signals to the private sector, investors and supply chains that the country is committed to achieving clear, realistic, timebound and meaningful decarbonization targets. Governments should design rules, regulations, incentive and penalty systems and support frameworks that incentivize meaningful actions among industry and consumers to support low-carbon production and consumption patterns. This is linked to government's role in supporting the creation of markets for low-carbon industrial products for internal consumption, and for exporting to relevant international markets. Furthermore, governments can support the timely development of low-carbon supply and value chains, and training and skills development needed to support low-carbon industrial development. Finally, governments can play an important role in allocating financial resource to industry and flagship low-carbon production projects.

? – Renewable energy is still a small percentage of Kazakhstan's energy mix. However, energy consumption is growing every year. How do you assess the potential for the use of alternative sources in Kazakhstan's metallurgical industry and other sectors?

– Shifting from fossil fuels to electric energy to power mining operations is one of the most important current topics in green mining. Switching to green electricity is a powerful method for instantly reducing the level of carbon emissions produced by mining. It is estimated that switching to green electricity can drop 30 to 50% of scope 2 emissions.

Replacing fossil-fueled vehicles with electric vehicles has a huge potential. The use of electric vehicles can reduce total mining emissions by 50%.

Recently, the first hybrid-electric loader for underground mining was developed. The hybrid engine decreases the volume of noxious gas emissions by 40 to 70%.

Mining relies heavily on the use of numerous underground vehicles fueled by diesel. Since this pollution is being released underground, it also requires vast amounts energy to power ventilation systems. Due to the decreased need for ventilation, a further 20 to 40% reduction in energy use can be obtained by reducing ventilation systems to meet the needs of the lower emissions vehicles.

RE Resource Potential in Kazakhstan

Wind: 820 billion kWh/year

Hydro: 62 billion kWh/year

Solar: 2.5 billion kWh/year



Alex Bologa,
RES expert, Global
Factor

? – Recently Kazakhstan and GIZ signed a project implementation agreement aimed at expanding cooperation in the field of green energy between our countries. What specific actions will be taken to implement the agreements? And how, in your opinion, will it affect the development of Kazakhstan's RES sector?

– Kazakhstan has every chance to become a leader in the field of green energy in Central Asia. The transition to renewable energy sources will not only help reduce dependence on fossil fuels extracted from the earth in various ways, but also strengthen the country's energy security.

The agreement, signed on September 17, 2024, is an important stage in the implementation of Kazakhstan's strategy for the transition to green energy. It provides for the creation of favorable conditions for the regional and national expansion of the use of renewable energy sources (RES), which is in line with the global goals of sustainable development and combating climate change.

Cooperation with GIZ can help to open access to advanced technologies and international experience, which will significantly accelerate the transition to sustainable energy sources.

? – How do you see Kazakhstan's industries positioning themselves in the global shift toward decarbonization, and what role should the government and private sector play in fostering the necessary investments?

– The global decarbonization trend is undeniable and will require massive investments. Kazakh industries have the potential to emerge as significant players in the global low-carbon market. To achieve this, it is essential for the Government of Kazakhstan to create an enabling environment with harmonized regulations and infrastructure development. Currently, new business models that would allow Kazakh industries to adapt to and capitalize on the global economy's decarbonization, remain unseen. It is also critical that investments from both the private sector and the government avoid being directed toward assets that may become stranded, such as those relying on fossil fuels.

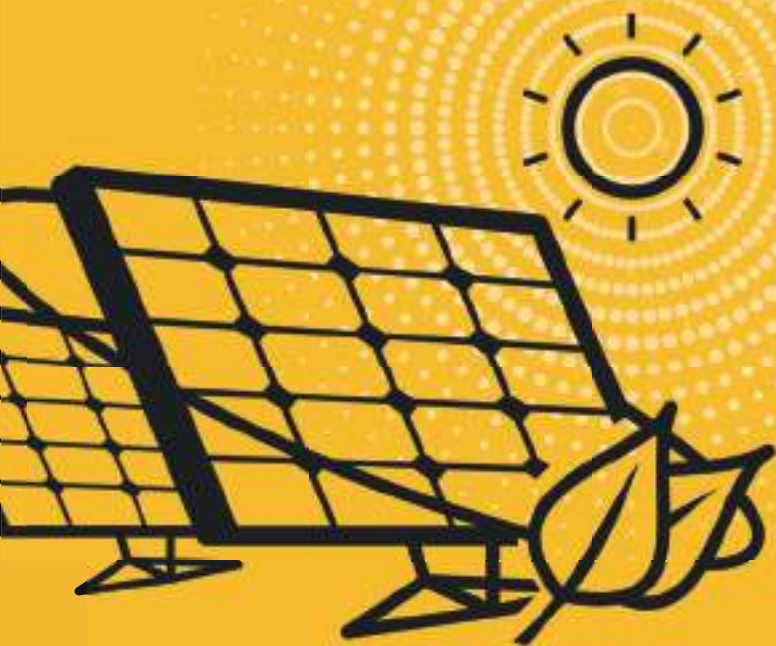


Dana Yermolyonok,
Senior Advisor of CDCPIII in
Kazakhstan, GIZ

? – What steps do you believe are necessary to ensure effective implementation of Kazakhstan's Carbon Neutrality Strategy?

– The approval of the Carbon Neutrality Strategy represents a significant step forward in Kazakhstan's journey toward decarbonization. However, the lack of specific emission reduction targets for individual sectors poses a risk to achieving the overarching goal of reducing emissions across the economy. It is essential to establish a clear vision, develop concrete plans for each sector, and define relevant indicators to track progress effectively.

Additionally, Kazakhstan's commitment to the Global Methane Pledge has been well received by many experts. However, it is crucial not to become overly reliant on international assistance for implementation. To effectively achieve these targets, Kazakhstan should focus on strengthening domestic capabilities.



INFORMATION ON THE PRODUCTION OF ELECTRIC ENERGY BY RENEWABLE ENERGY FACILITIES FOR 9 MONTHS OF 2024

Installed capacity including: 2,903.7 MW



WIND POWER PLANTS

1,409.55 MW



SMALL HPP

269.785 MW



SOLAR POWER PLANTS

269.785 MW



BIOELECTRIC POWER PLANTS 1,77 MW

Power generation including: 5 782,6 million kWh



WIND POWER PLANTS

3 224,7 million kWh



SMALL HPPS

944,4 million kWh



SOLAR POWER PLANTS

1 612,62 million kWh



BIOELECTRIC POWER PLANTS 0,56 million kWh

The share of electric power generated by the RES in the total volume of electric energy production

6,67%

Increase in electricity generation by renewable energy facilities in 9 months of 2024 compared to 9 months of 2023 is

18%

GREEN WEEK

IN KAZNARU: 500 PARTICIPANTS,
KILOGRAMS OF COLLECTED
PLASTIC AND NEW IDEAS
ABOUT A "GREEN" FUTURE



In Almaty, from November 11 to 15, the Kazakh National Agrarian Research University (KazNARU) held the Green Week 2024, which became a significant event promoting the ideas of sustainable development and environmental awareness. The events were attended by more than 500 students, teachers and international guests from leading organizations such as the United Nations, Coca-Cola İçecek and Chapter Zero Kazakhstan. The participants discussed strategies on environmental education, innovation in agriculture and waste management together, drawing attention to the priorities of sustainable development in Central Asia.





THE MAIN RESULTS OF THE EVENT

The Green Week opened on November 11 with a solemn ceremony, during which the Principal of KazNARU Akhlybek Kurishbayev and key experts presented the concept of sustainable development, emphasizing the need for joint efforts to preserve ecosystems and combat climate change. The guests visited such important facilities as the Green Eco greenhouse and the Issyk Fruit Canning Plant, where they could see sustainable practices in action. The program included a variety of seminars and workshops on such topics as "green" entrepreneurship and the practical application of innovative approaches to waste recycling.

"We have achieved incredible results thanks to the high activity and involvement of students and teachers. These events highlighted how important sustainable development is for the younger generation, and showed how global cooperation in the field of ecology can contribute to solving pressing problems," - said Dr. Rafis Abazov, Vice Principal for International Cooperation at KazNARU.

"The Green Week at our university has become an important step towards the formation of environmental awareness among young people. We are proud that we were able to create a space for the exchange of knowledge, practical skills and inspiration for the future. I am sure that such initiatives will help us contribute to the development of a more sustainable society," said Gulsim Aitkhozhayeva, Lead Manager of KazNAIU's International Office.





THE RESULTS OF PLASTIC COLLECTION COMPETITION AMONG THE FACULTIES

One of the central events was the plastic collection competition organized by KazNARU and Yeleshev Foundation. This competition not only focused attention on the problem of plastic waste, but also contributed to the formation of an environmentally responsible attitude among the participants. Students and teachers of the Faculty Higher School of Business and Law took the first place, collecting 74.12 kg of plastic and receiving a prize of 75 000 tenge. The second place was taken by the Faculty Veterinary and Animal Engineering with a result of 66.12 kg of plastic and a prize of 50 000 tenge, and the third place was taken by the Faculty Engineering Technologies, which collected 22.14 kg and received 25 000 tenge.

"The competition was a prime example of how small efforts can lead to significant changes by cleaning up our campus and raising awareness of the importance of recycling," - Dr. Abazov commented.

INFLUENCE ON STUDENT COMMUNITY AND INTERNATIONAL RELATIONS

According to Tatyana Brankov, Associate Professor of the Faculty of Economics at Novi Sad



University and coordinator of AgroKaz project, an important result of the week was strengthening of student leadership and environmental initiative.

"The enthusiasm of the students is impressive. They organized and led events discussing current environmental issues such as climate change and biodiversity conservation. This is not just an educational process, but the development of real responsibility for the environment," - Brankov said.

In addition, Green Week showed the practical application of new knowledge through seminars and practical exercises that addressed the issues of renewable energy sources and responsible consumption.

FUTURE PLANS

The results of the event inspired the university management to make Green Week an annual event in order to support sustainable initiatives in the academic environment.

"We are on the verge of an environmental crisis, and only through joint efforts can we cope with the challenges that the environment poses to us," - Dr. Abazov stressed.

As noted at the university, the support of students and teachers inspires the development of new projects and the expansion of KazNARU's contribution to global environmental initiatives.

WATER AS A STRATEGIC RESOURCE:

WHAT WILL KAZAKHSTAN'S NEW WATER CODE BRING?



Raushana Chaltabayeva,
Partner at Unicase Law Firm



Alexandra Mussina,
Junior Associate at Unicase Law Firm



Water resource management is a strategically vital component of national security and a key resource for development.

According to Article 1, Paragraph 2 of the Environmental Code of the Republic of Kazakhstan, public relations arising in the field of natural resources use, their conservation, restoration, and reproduction, to the extent applicable, are regulated according to the type of a natural resource involved.

The primary legislative act governing the regulation of water resources in Kazakhstan is the Water Code.

The current Water Code of the Republic of Kazakhstan was adopted in 2003 and has since been amended more than 70 times. It is noted that the existing Water Code primarily focuses on the economic use of water resources, treating water to achieve economic benefits, such as in agriculture. According to data from the National Bureau of Statistics, the level of water losses in agriculture through water transport channels was 51% in 2022. Moreover, the legislation weakly incentivises water users to adopt water-saving technologies and use water efficiently.

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Currently, significant technical and economic challenges exist in all segments and stages of water use, as well as deficiencies in the legal relations, regulatory control, and the development of strategies and plans, all of which require adequate addressing.

These issues are significant obstacles to sustainable development and strategic security of Kazakhstan. Given that half of Kazakhstan's river flow is formed outside the country's borders, the reduction of water volumes in important transboundary rivers underscores the special importance of water diplomacy and cross-border cooperation in water resource management.

For this reason, during a special government meeting on 8 February 2022, the President of the Republic of Kazakhstan instructed the new Ministry of Water Resources and Irrigation to develop a Draft of a new Water Code.

On 5 February 2024, the Government of the Republic of Kazakhstan approved the Concept for the Development of the Water Resource Management System of the Republic for 2024–2030. On 18 March 2024, the First Deputy Minister of Water Resources and Irrigation, Bolat Bekniyaz, presented the Draft of Water Code to the deputies of the Mazhilis.

WHAT CHANGES ARE EXPECTED IN THE NEW WATER CODE?

The new Water Code aims to protect water resources from depletion and pollution to ensure the country's water resource potential. It seeks to create a more efficient and transparent system of state regulation and management in the field of water fund protection and use, with the goal of improving legal framework and mechanisms for implementing a unified state policy to ensure water security in the country, including in the interests of future generations.





The Code revises approach to water resource management in favour of prioritising the conservation of the country's water potential and recognising the economic value of water. It aims to delineate and clarify the competencies of the authorised body and other state bodies through the coordinating role of the authorised body, strengthening the role of society and science in the formation and implementation of state policy, and introducing other measures of legislative regulation.

THE NEW WATER CODE WILL REGULATE THE FOLLOWING MAIN AREAS:

- Establishing the priority of water fund protection over its use;
- Revising the tasks and competencies of state bodies in the water resource management system;
- Encouraging water users to implement water-saving measures;
- Strengthening the role of society and science in water resource management;
- Creating a National Water Resource Information System;

- Introducing state supervision in the field of water fund protection and use;
- Addressing issues of planning, monitoring, accounting, protection, and standardisation of water resources.

MAIN DIFFERENCES OF THE NEW WATER CODE:

- A new article on water security in Kazakhstan has been introduced. It focuses on water conservation and addresses potential problems in the event of water shortages.
- The responsibilities of representatives from territorial subdivisions of authorised bodies to participate in basin council meetings have been added. Basin councils will not only discuss current issues but also the progress of implementing basin agreements and resolving water disputes.
- A new point has been added to the article on the principles of water legislation, concerning the protection of the interests of the Republic of Kazakhstan in protection and use of transboundary water bodies.
- Rights and obligations of water users have been established through rules for water consumers, including their duties regarding water conservation and wastewater treatment.
- New measures have been provided to improve the quality of drinking water and ensure access to it for all segments of the population, especially in remote and rural areas, to address water supply issues.
- New measures have been proposed to improve water resource accounting and monitoring systems, modernise infrastructure, and introduce new technologies for water management.

Special permits for water use will be issued only if there is a plan for a phased transition (of no more than five years) to using recycled and return water.

Government support in the form of subsidies and reduced tariffs for water supply services will be provided for the use of water-saving technologies in agriculture and industry, depending on the integration degree of such.

Moreover, it is anticipated that the re-treated wastewater will be one of the sources of water supply and will be actively used across various economy sectors.

A separate article in the Water Code proposes to expand the forms of state control through legislation. These forms include preventive control with and without on-site visits, inspections for compliance with qualification or permitting requirements, and unscheduled inspections. These tasks will be carried out by a state water inspector, and the developer of the Code promises that micro and small businesses will be subject to preventive control no more than twice a year.

The law not only aims to protect and conserve water resources but also considers modern challenges associated with water scarcity and climate change. Innovative initiatives, such as enhancing the management of transboundary water use, improving drinking water quality, and modernising infrastructure, will enable

effective distribution and protection of water resources. The role of basin councils in resolving water disputes and implementing agreements highlights the need for different levels of management and interaction between stakeholders.

Additionally, the Water Code introduces the terms "interested parties" and the "interest of society" in establishing water protection zones and publishing information about the water fund, which is a significant step towards transparency and accountability for water users. It is expected that this measure to improve the quality of water supply in remote areas will help ensure fair access to water for the health and well-being of local population.

The current Draft of the Code also provides for special regimes related to zones of emergency environmental situation or of ecological disasters on water bodies and prohibits commissioning of facilities that negatively affect the state of water bodies.

CRITICISM OF THE DRAFT WATER CODE

Criticism of the Draft Water Code includes issues regarding the safety of hydraulic structures for irrigation and drainage, drinking water, and water supply. It is noted that hydroelectric power plants are included among hydraulic structures, which creates certain discussions regarding



the use of water resources for generating energy from renewable sources.

Another significant issue not adequately addressed in the Water Code Draft is the impact of climate change on water resources and measures to adapt to the risks they pose.





Nevertheless, the work on the new Water Code reflects Kazakhstan's desire not only to solve current water supply problems but also to ensure the country's long-term development and sustainability. The adoption of the Code is expected to create conditions for achieving a balance between the tasks of preserving the water fund and providing water to the population, including sectors of the

economy, thereby ensuring the sustainable development of the country. Thus, the adoption would be an important step towards sustainable water resource management in Kazakhstan.

The Draft Water Code is currently under revision, and the Draft can be reviewed via the link:

<https://legalacts.egov.kz/npa/view?id=14382473>



The Ministry of Water Resources and Irrigation has developed a Draft of the new Water Code, which has been submitted to the Mazhilis of the Parliament. It is expected that the Water Code itself will be submitted to the President of the Republic of Kazakhstan for signature by the end of 2024.

INFORMATION REFERENCE

According to the National Development Plan, Kazakhstan ranks among the top 15 countries in terms of per capita water consumption, with most water withdrawals used for irrigation in agriculture. The specific water consumption for irrigation is quite high, exceeding the levels of climatically comparable countries by 2–3 times. Almost universally, inefficient water use is due to low water tariffs that do not encourage the adoption of water-saving practices and technologies. The deteriorating water management system and insufficient water accounting lead to high water losses (up to 40%) during transportation.

Kazakhstan's main water resources are provided by surface waters—river flows, lakes, and glaciers. At the same time, the level of water security in the country is declining and significantly lags behind other countries. Since half of Kazakhstan's river flow is formed outside the country, the reduction in volumes of important transboundary rivers underscores the special importance of water diplomacy and transboundary cooperation in water resource management.

As part of the priority to address the growing threat of water scarcity in Section 4.3, the National Development Plan of Kazakhstan aims to reduce the imbalance between water consumption and water resource levels, decrease per capita water consumption by 1.5 times, maintain the country's river flow level, and increase the volumes of alternative water sources used by 2029. The main tasks are to improve water use efficiency in agriculture, establish interstate cooperation on water resource management issues, modernise water management infrastructure, use alternative water sources, and apply modern technologies.



CHALLENGES AND OPPORTUNITIES OF GREEN ENERGY: THE PATH TO THE 2030 AGENDA



Rafis Abazov,
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THE UNCTAD INTERNATIONAL CONFERENCE, HELD ON OCTOBER 9-10, 2024, HAS BECOME AN IMPORTANT PLATFORM FOR DISCUSSING KEY ISSUES OF SUSTAINABLE, GREEN AND TRANSFORMATIVE DEVELOPMENT WITHIN THE FRAMEWORK OF THE INITIATIVE "BELT AND ROAD" IN ASIA. SPECIAL ATTENTION WAS PAID TO ENERGY AS THE MAIN ELEMENT FOR ACHIEVING THE SUSTAINABLE DEVELOPMENT GOALS (SDGs) UNTIL 2030, AS WELL AS REGIONAL COOPERATION IN THE FIELD OF GREEN GROWTH. THE PARTICIPANTS DISCUSSED INTEGRATED POLICY STRATEGIES AND COORDINATION OF EFFORTS TO PROMOTE GREEN ENERGY IN CENTRAL ASIAN COUNTRIES AND KAZAKHSTAN.

ENERGY IN CENTRAL ASIA: CHALLENGES AND POTENTIAL

Central Asia, with its vast reserves of fossil fuels and renewable energy sources, faces a choice — how to balance economic growth and environmental sustainability. One of the key challenges is the region's dependence on hydrocarbons, which creates serious barriers to the development of green energy. According to the data presented at the conference, Central Asia produced about 88% of its electricity from coal and natural gas in 2023, i.e. significantly higher than the global average.

Nevertheless, the region's potential for switching to renewable energy sources is huge.



Nevertheless, the region's potential for switching to renewable energy sources is huge. For example, according to a study by the Asian Development Bank, Central Asia could produce up to 20-30% of its electricity from renewable sources by 2030. During the conference, it was discussed that in order to do this, it is necessary to strengthen regional coordination, develop a clear policy framework and attract international investment.

Mr. Dawei Wang, an economic affairs specialist at UNCTAD, stressed that "Central Asia has unique opportunities for development of green energy, but systemic changes are needed to achieve this goal, including infrastructure modernization and the transition to digital technologies for energy management." He also noted that regional cooperation between Central Asian countries can accelerate this process, especially through joint projects in the field of clean energy and technology transfer.

KAZAKHSTAN: LEADERSHIP IN GREEN ENERGY

The conference discussed the question - will Kazakhstan be able to become one of the regional leaders in green development and transition to renewable energy sources?. Since 2015, the country has been actively promoting initiatives to develop renewable energy and reduce carbon emissions. During the conference, specific examples were given of how Kazakhstan is making progress in these areas.

Thus, in 2024, the share of electricity from renewable sources in Kazakhstan may reach almost 6%, which is 3% more than in 2019. According to official data, the number of renewable energy facilities reached 148 by mid-2024, which¹ is an impressive result, given that only 6-7 years ago, renewable energy accounted for less than 1% of the total electricity production in the country. Such rapid growth is due to a number of factors, including political support, development of new technologies and attraction of international investors.

¹ The share of renewable energy sources in the production of electricity in the Republic of Kazakhstan for 6 months of 2024 amounted to 6.5 percent (www.gov.kz)
<https://www.gov.kz/memleket/entities/energo/press/news/details/814318?lang=ru>



An example of a successful project is a solar power plant in Zhambyl region with a capacity of 100 MW, commissioned in 2022. This project was implemented with the support of the European Bank for Reconstruction and Development (EBRD) and has become one of the largest solar energy facilities in Central Asia. Mrs. Ainur Sospanova, Chairman of the Management Board of the Renewable Energy Association “Qazaq Green”, noted: "Projects like this demonstrate that Kazakhstan is able to attract large investments in green energy, as well as implement complex technological projects at the international level."

REGIONAL COOPERATION: THE KEY TO A GREEN FUTURE

One of the central issues discussed at the conference was the possibilities of regional cooperation in Central Asia to promote green development. Mr. Alexander Nikolayenko, Regional Adviser to the Green Central Asia Initiative, noted

One of the central issues discussed at the conference was the possibilities of regional cooperation in Central Asia to promote green development.

that the key to success will be the creation of an integrated policy framework that takes into account the specifics of each country and allows them to cooperate in the field of energy, environmental protection and sustainable development.

During the discussion at the conference, the participants came to the conclusion that regional cooperation can include several key areas:

1. Joint projects in the field of renewable energy: creation of cross-border energy networks that will allow Central Asian countries to exchange renewable energy, reducing dependence on fossil fuels.
2. Technology and know-how exchange: Countries in the region can cooperate in research and development by sharing best practices and technologies in the field of energy conservation and renewable energy sources.
3. Development and implementation of innovative projects in the field of energy saving and renewable energy sources that are maximally adapted to the geographical climatic features of the country in the region.

ROLE OF INTERNATIONAL ORGANIZATIONS

International organizations such as UNCTAD play an important role in promoting regional cooperation and green development in Central Asia. They can contribute to the creation of platforms for dialogue between countries, as well as provide financial and technical assistance for implementation of projects in the field of sustainable development.

Mr. Kenzhehan Abuov from the Asian Development Bank stressed that the ADB is ready to support the Central Asian countries in their efforts to switch to green energy. He said: "Our bank will continue to support sustainable infrastructure projects that contribute to reducing carbon emissions and adapting to climate change."

UNCTAD also plays an important role in promoting regional cooperation through its initiatives and research. For

example, the ongoing UNCTAD Sustainable Development project under the Belt and Road Initiative helps Central Asian countries develop strategies to transition to a low-carbon economy and reduce their dependence on traditional energy sources.

CONCLUSION

The UNCTAD Conference, held on October 9-10, 2024, confirmed the importance of regional cooperation and integration in Central Asia for achieving green and sustainable development. Kazakhstan has the potential to become a leader in this process, and is already making significant steps towards increasing the share of renewable energy sources and reducing carbon emissions.

However, achieving the Sustainable Development Goals will require not only national efforts, but also active cooperation with the countries of the region, as well as support of international organizations and investors.



HOW TO PHASE DOWN COAL IN KAZAKHSTAN IN A JUST WAY?



2024 is on track to becoming the hottest year on record, with the global average temperature from January to September at 1.54 °C above pre-industrial levels. Achieving net zero greenhouse gas (GHG) emissions has become more critical than ever. Climate change in Kazakhstan is progressing faster than the global average, with the country's 2022 average annual air temperature at 1.78 °C above the climate norm for the period 1961 to 1990.

At the 2023 United Nations Climate Change Conference (COP28) in Dubai, countries committed to transitioning away from fossil fuels in energy systems in a "just, orderly and equitable manner". They also agreed to triple global renewables capacity and double the global average annual rate of energy efficiency improvements by 2030, as well as accelerate efforts to phase down unabated coal power.



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KAZAKHSTAN IS DEPENDENT ON COAL

Kazakhstan is one of the most coal-dependent countries in the world, with vast coal reserves of 25 to 33 billion tonnes, ranking tenth globally by this indicator. These supplies could last 300 years or more. In 2023, Kazakhstan ranked eighth worldwide in total coal production, mining 116 million tonnes – 72% of which was consumed domestically.

Today, coal provides 66% of Kazakhstan's electricity and 80% of residential heat, and it also remains a key component of several industrial processes. The average age of coal power facilities in the country is 50 years. Coal combustion accounts for about 55% of GHG emissions in the energy sector and more than 40% of total GHG emissions. Despite this, Kazakhstan currently has no plans for a coal phase-down and is developing more than four gigawatts of new coal power plants.

Renewable energy, meanwhile, is starting to play an increasingly important role in Kazakhstan's electricity production. In the first half of 2024, solar and wind together accounted for 5.5% of generation. However, as the country moves towards its 15% renewables target by 2030, integrating variable renewable energy into an energy system dominated by inflexible, old coal capacities will become increasingly challenging.

Coal production is also a major contributor to air pollution in Kazakhstan, leading to over 10,000 premature deaths annually. This is primarily due to fine particulate matter (PM2.5) pollution, which often significantly exceeds levels recommended by the World Health Organization, especially during winter in cities like Almaty and Astana. The World Bank estimates that the economic cost of air pollution in Kazakhstan exceeds USD 10.5 billion each year in healthcare expenses and productivity losses due to air quality-related health impacts.

Coal's contribution the national economy is not as significant as one might expect, given its dominance in power and heat production – accounting for just 1.5% of gross domestic product (GDP).

COAL IS THE CHEAPEST FUEL BUT ITS ROLE IN THE ECONOMY IS MODERATE

Coal's contribution the national economy is not as significant as one might expect, given its dominance in power and heat production – accounting for just 1.5% of gross domestic product (GDP). The World Bank estimates coal rents at a mere 0.8% of its GDP in 2021, compared to 14.8% for oil and 2.0% for gas in the same year. Interestingly, just before the collapse of the USSR, coal rents were estimated by the World Bank to be much higher – at 2.9% of GDP in 1990 – suggesting coal's diminishing role in Kazakhstan's economy.

However, the economic influence of coal is much more pronounced for the local economies of regions that mine and use coal, such as Karaganda and Pavlodar regions (which produce about 90% of the country's coal), as well for cities in these regions like Ekibastuz.

Similar to coal's contribution to GDP, its importance for employment is small on the national



scale but plays an important role in several regions. Nationally, coal mining provides around 33,000 of direct jobs, while coal-fired power plants might provide another 13,000, jointly accounting for less than 1% of all jobs in the country. Indirect jobs related to the coal industry that are created in coal-dependent regions, as well as jobs not related to coal but created with the use of income generated from coal mining (such as at cafes and restaurants in coal mining regions) are also significant.

Coal provides Kazakhstan with cheap electricity and heating. The low price of coal generation in Kazakhstan is due to several factors. One of



these is that 92% of coal generation assets are over 40 years old and therefore have long been paid off. The coal industry also enjoys generous government subsidies. According to United Nations Development Programme estimates, eliminating coal subsidies in Kazakhstan would raise heat tariffs by up to 35% and electricity tariffs by 11%. According to the International Energy Agency, fossil fuel subsidies in Kazakhstan were equivalent to 6% of GDP in 2023.

Kazakhstan's energy system is characterised by the close interconnection of coal power and heating, since many coal-fired power plants operate

as combined heat and power plants. These facilities generate both electricity and thermal energy (heat) from the same fuel source, which is much more efficient than separate production as they use waste heat from electricity generation for district heating systems. However, the high centralisation and interdependence of electricity and heat production in Kazakhstan complicate energy transition efforts, as coal phase-down would require a costly, comprehensive and simultaneous overhaul of power, heat and infrastructure systems. However, a comprehensive overhaul of these systems will be required in any case due to their obsolescence.

66% OF COAL IN GENERATION IS INCOMPATIBLE WITH CARBON NEUTRALITY

In 2016, Kazakhstan committed to an unconditional goal of reducing GHG emissions by 15% below 1990 levels by 2030, with a conditional target of 25% contingent on international investment. In 2020, the country further pledged to become carbon neutral by 2060. In February 2023, Kazakhstan formalised this ambition in a strategic document outlining necessary transformations to achieve net-zero carbon emissions.

However, Kazakhstan's updated nationally determined contribution in 2023 left its 2030 targets unchanged. Kazakhstan's 2060 carbon neutrality strategy still lacks a clear coal phase-down plan, while new coal power plants are being planned. Renewables are gradually expanding, but simply adding them to the existing system is not enough to meet the country's climate goals.

The strategy for achieving carbon neutrality by 2060 assumes that up until 2040, the reduction in GHG emissions will be minimal, with most decarbonisation occurring between 2040 and 2060. This suggests that coal phase-down will not begin until the 2040s. Coal power generation is already in deep crisis, facing aging equipment, frequent accidents, personnel shortages and the reluctance of young people to work in the industry. If Kazakhstan does not promptly plan to phase down coal in a just way, the natural decline of the industry due to economic factors may result in significant social, economic and environmental challenges, especially in coal-dependent regions.

JUST COAL PHASE-DOWN POLICIES

Kazakhstan can use the international experience for the fair abandonment of coal.

Kazakhstan is not the only country with coal dependency. It can thus benefit from the experiences of others that have already developed and started to implement coal phase-out strategies, such as Germany, Spain, Poland or Chile. The experience of these countries offers valuable insights into how to design transition strategies that incorporate renewable energy expansion, ensure energy security and address social and economic challenges. Kazakhstan can then adapt these lessons to its own needs.

In Germany, the creation of the Coal Commission was a critical step in building broad consensus for the coal phase-out. This inclusive process helped to develop a balanced transition plan by incorporating diverse perspectives. Similarly, Spain created a Just Transition Institute, an autonomous governmental body attached to the Ministry for Ecological

Transition and Demographic Challenge, to develop and implement measures to ensure a just transition in affected territories and to coordinate the cross-cutting inclusion of just transition principles into all the administration's public policies.

Other common practices in many countries to move away from coal have included financial compensation to utilities for coal-fired power plant closures, subsidised retraining programmes, reemployment assistance or early retirement for former coal workers, financial support for coal regions and measures to diversify regional economies. These measures can be replicated and fine-tuned to suit Kazakhstan's unique context.

To support a just transition from coal, Kazakhstan can also leverage targeted financial and policy tools. These could include green bonds issued by governments, development banks and companies to finance energy transition projects, diversify energy sources, retrain workers and close coal-fired power plants.

An emissions trading system (ETS) can also provide additional financial incentives for companies to reduce emissions, as it imposes a cost on carbon-intensive activities like coal use, thus encouraging



cleaner energy investments. Kazakhstan's ETS launched in 2013 and currently covers 43% of the country's emissions. However, it has limited impact due to a high cap and low carbon prices. Strengthening the ETS with a stricter cap and regular quota reductions could increase its effectiveness and boost cleaner energy investments. Revenues from the ETS could also be used to fund retraining and social measures in coal-dependent communities; this potential remains largely untapped in Kazakhstan.

Another tool is policies mandating the adoption of best available techniques (BAT) for coal-fired power plants. Kazakhstan's 2021 Environmental Code mandates that coal plants with significant environmental impact obtain a comprehensive permit and apply BAT to meet standards. Companies that switch to BAT are exempt from emission fees; for the rest, emission fees gradually increase every three years. This mechanism, if the price for emissions is high, could stimulate the reduction of coal generation but delays in implementation and low emission fees remain key obstacles.

International climate funds like the Climate Investment Funds and the Asian Development Bank (ADB) offer additional support for reducing the use of coal. The ADB's Energy Transition Mechanism aims to retire coal plants early and replace them with renewables. Kazakhstan could participate in these global efforts to accelerate its transition.

To make its energy transition journey more comprehensive and effective, Kazakhstan may also consider implementing a multifaceted strategy informed by the aforementioned international experiences and opportunities. This plan should include the following components.

It is crucial to bring all key stakeholders together—from government, industry, labour unions, local communities and civil society—for a comprehensive dialogue to ensure a smooth and equitable transition. To coordinate the coal phase-down and just transition processes, a dedicated independent institution or responsible ministry should be appointed. This body will oversee dialogue with stakeholders, manage transition plans and ensure that all voices are considered.

The construction of new coal power plants should be prohibited, while some of the existing coal fleet that will stay in the system at least for a time should be retrofitted to increase their flexibility and thus ability to help renewables' integration into the grid.

A coal exit date aligned with the Paris Agreement shall be defined and supported by a comprehensive closure plan, with named coal facilities. The plan should also be supported by federal laws. There should be no opportunity to sell coal assets to new

A coal exit date aligned with the Paris Agreement shall be defined and supported by a comprehensive closure plan, with named coal facilities. The plan should also be supported by federal laws. There should be no opportunity to sell coal assets to new owners instead of closure.

owners instead of closure.

Regions that are dependent on coal need alternative sources of income. This problem cannot be solved without a significant economic restructuring of these regions. An effective coal phase-down plan needs to be supplemented by programmes supporting investment in renewable energy and other related technologies, as well as in other green industries such as waste management, local entrepreneurship initiatives and exploring other economic diversification opportunities. A particularly important part of economic diversification should be retraining former coal workers. For some regions, in particular for cities such as Ekibastuz and Karaganda, proactive, early planning for retraining, reemployment assistance and early retirement can help pre-empt and address any social concerns resulting from the diminishing coal industry.

Finally, Kazakhstan should renew and enhance its grid infrastructure regardless, as it is outdated and does not meet current needs. However, this renewal should be focused not simply on fixing the existing coal generation infrastructure, but instead on supporting an increased integration of renewable energy sources into the grid.

Эта статья основана на исследовании Agora. This article is based on a study by Agora Energiewende and Qazaq Green: "Enabling a just coal transition in Kazakhstan. Opportunities, challenges and strategic pathways". The full study can be accessed here : <https://www.agora-energiewende.org/publications/enabling-a-just-coal-transition-in-kazakhstan>.





SUBCONTRACTING IN EPC CONTRACTS: PROBLEMS AND RECOMMENDATIONS



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unicase

Our experience in consulting construction projects, many of which are EPC-contract based, shows that many disputes and conflicts between the customer and the contractor are repetitive and typical for most projects. The conflicts arise regardless of the industry, be it electric power, oil and gas, petrochemical, or other. Identifying such systemic problems allows for the development of strategies that can significantly reduce their number and negative impact, thereby reducing delays in the project and budget expenditures.

In case of EPC contracts with a fixed price (EPC Lump Sum), commonplace in the West and in Kazakhstan, if the EPC contractor is a large international company, the customer has minimal opportunities to influence the selection of subcontractors. The EPC contractor undertakes obligations at a fixed price and term, so they are given the right to choose their own subcontractors. In contracts with a fixed price, the approach changes: the customer now can either directly participate in the selection of subcontractors or coordinate their candidacies, which can lead to a number of conflicts.

This analysis presents the most common contentious situations and recommendations for their prevention or reduction of negative consequences.

01

LEGAL RESTRICTIONS ON THE USE OF SUBCONTRACTORS



The legislation of the country where the project is being implemented may contain certain restrictions on the possibility of subcontracting part or on all of the works. For example, according to paragraph 11 of Article 66 of the Law on Architectural Activities of the Republic of Kazakhstan, the construction contract must specify the types and scope of work (services) that the contractor (or general contractor) intends to subcontract. It is not allowed to subcontract more than two-thirds of the total contract price.

In practise, the question often arises: what is meant by the contract price? According to paragraph 8.1 of MCCS RK 8.01-08-2022 "Procedure for Determining the Estimated Cost of Construction in the Republic of Kazakhstan", the estimated cost of construction is divided into construction and installation works (CIW), costs of equipment, furniture, and inventory, among other

costs. The cost of construction materials is an integral part of CIW. Therefore, the contract price includes all these costs as part of the construction estimated cost.

02

PARTICIPATION OF THE CUSTOMER IN THE SELECTION AND INVOLVEMENT OF SUBCONTRACTORS

An EPC lump sum turnkey contract allows the customer to completely relinquish control over the project. The EPC contractor is fully responsible for the organisation and project implementation, including the selection of subcontractors. The customer must only pay for the work and accept the completed project. However, in practise, customers (especially in Kazakhstan) are rarely ready to provide such a degree of trust and prefer to have intermediate control, especially when using open pricing (open book) or cost-plus-fee, where the cost of subcontracting contracts directly affects the overall project budget.



Paragraph 1 of Article 619 of the Civil Code of the Republic of Kazakhstan provides for the right of the general contractor to engage subcontractors to perform work. This right may be modified by the introduction of appropriate clauses in the contract. The law also allows for intermediate solutions, where the contractor has the right to engage subcontractors but with limited powers in favour of the customer.

Restrictions on the EPC contractor's right to choose a subcontractor may include:

- Establishing criteria for the selection of subcontractors, while the customer retains control over compliance with these criteria.
- Requiring the customer to coordinate subcontractor candidates.

- Negotiating subcontract terms, including price terms.
- Allowing the customer to appoint a subcontractor for certain works, with the EPC contractor concluding an agreement with them.

03

DISTRIBUTION OF RESPONSIBILITY BETWEEN PROJECT PARTICIPANTS

According to paragraph 2 of Article 619 of the Civil Code of the Republic of Kazakhstan, the general contractor is liable to the customer for the non-fulfilment or improper fulfilment of obligations by subcontractors. Approval of subcontractor candidates by the customer should not be considered as taking responsibility for their actions. Even in case the customer chooses the subcontractor, the EPC contractor who entered into the contract with them will remain responsible for their shortcomings. However, the EPC contractor may seek to reduce the liability in court if the customer's choice of subcontractor contributed to an increase in losses based on Article 364 of the Civil Code of the Republic of Kazakhstan.

04

CONFLICTS RELATED TO THE TERMS OF SUBCONTRACTS

The terms of subcontracting contracts must be synchronised with the terms of the EPC contract. An EPC contract may contain mandatory conditions for subcontracting contracts (e.g., termination terms, transfer of rights and obligations, and quality requirements). However, there are situations when a subcontractor or equipment supplier refuses to include the terms and conditions required by the EPC contractor in the contract.



05

TRANSFER OF SUBCONTRACTED CONTRACTS TO THE CUSTOMER

In the event of termination of a large EPC contract, the customer or a new EPC contractor may need to reassemble a team of subcontractors and conclude new contracts. An alternative is the transfer of previously concluded contracts from the withdrawing EPC contractor to the customer. The transfer can be provided for as the customer's right in the EPC contract. It is not advantageous for the customer to assume obligations under contracts with significant debts, so the transfer requires the subcontractor's consent.

An EPC contract may provide for two options for the transfer of subcontractors:

1. Transfer based on separate transactions between the customer and the EPC contractor.
2. Transfer of rights and obligations under contracts based on a unilateral statement in the event of a significant breach of the contract by the EPC contractor, simultaneously with the termination of the contract.

It is recommended to include the option of transferring rights under subcontracts in the EPC contract (option 2 above). If the EPC contractor provides constructive interaction in the event of default, option 1 can also be implemented.

06

TRANSFER OF RIGHTS UNDER QUALITY GUARANTEES

If the warranty period for equipment purchased from the subcontractor or the result of the subcontractor's work exceeds the total period under the EPC contract, it is advisable to provide for the transfer of rights to warranty claims from the EPC contractor to the customer upon the expiration of the EPC contract.



07

TERMINATION OF SUBCONTRACTS UPON TERMINATION OF AN EPC CONTRACT

An EPC contract usually grants the customer the right to unilaterally withdraw from the contract. The EPC contractor also has the right to withdraw from the contract in the event of a material breach of terms by the customer. In such cases, the customer must compensate for the EPC contractor's losses, including the amounts paid to subcontractors.

To minimise compensation payments from the customer, the EPC contract should include requirements for subcontracts aimed at reducing payments in case of their termination due to the termination of the main contract.

Unicase is a leading Central Asian law firm operating locally and internationally, with a strong presence in Kazakhstan, Uzbekistan, Kyrgyz Republic, Tajikistan, and Turkmenistan. Unicase has one of the strongest Expert Teams, well known for regulatory and law drafting capabilities, who, alongside a strong transactional background and expertise, have allowed the firm to win major development projects and continue to be the first-choice advisers for legislation development issues.



Outcomes of the 2024 Auction for wind, solar, and hydropower projects selection

| Date of the auction | Company name | Type of RES | Auction price tg/kWh (without VAT) | Installed capacity, MW |
|---------------------|--|-------------|---------------------------------------|---------------------------|
| June 10, 2024 | WPP Tolkyn LLP | HPP | 10 | 0.5 |
| | National Energy Company Zharyk Energo LLP | HPP | 28 | 8.6 |
| | FaB Stroy LLP | HPP | 35.47 | 1.3 |
| | WPP Tolkyn LLP | HPP | 35.48 | 3 |
| | Aksugidro LLP | HPP | 35.49 | 4.9 |
| | Zhabykgidroresursy LLP | HPP | 36.5 | 3 |
| June 11, 2024 | Cascade of Karatal HPPs LLP | HPP | 10 | 9.9 |
| | Verkhne-Talaptinskaya HPP LLP | HPP | 11 | 4 |
| | Altyn-Hydro LLP | HPP | 33.9 | 2 |
| | Verkhne-Talaptinskaya HPP LLP | HPP | 36 | 4.8 |
| June 12, 2024 | Verkhne-Talaptinskaya HPP LLP | HPP | 8 | 4 |
| | Cascade of Karatal HPPs LLP | HPP | 30 | 9.9 |
| June 13, 2024 | EcoWind LLP | WPP | 6.9 | 100 |
| June 14, 2024 | EcoWind LLP | WPP | 9.01 | 200 |
| June 17, 2024 | Shual LLP | WPP | 9 | 10.001 |
| | Neptune Wind LLP | WPP | 10.37 | 89.999 |
| September 23, 2024 | Damona LLP | SPP | 15.93 | 100 |
| September 24, 2024 | Azhur LLP | SPP | 14.95 | 20 |
| September 25, 2024 | DALA SOLAR LLP | SPP | 14.49 | 20 |
| September 26, 2024 | Vigor Holding LLP | SPP | 14.22 | 20 |
| November 11, 2024 | Korinskaya HPP-2 LLP | HPP | 37 | 18.5 |
| | Standard Hydropower LLP | HPP | 37.01 | 18.2 |
| | ADM Energy LLP | HPP | 37.05 | 12 |
| | Eskeldinskaya HPP LLP | HPP | 37.3 | 23.2 |
| | Kalzhygidro LLP | HPP | 37.35 | 19 |
| | National Energy Company Zharyk Energo LLP | HPP | 37.4 | 10.5 |
| | Korinskaya HPP-2 LLP | HPP | 37.49 | 26 |
| | BOROHUZIR HPP LLP | HPP | 37.8 | 10.5 |
| | Baskan Irrigation LLP | HPP | 37.99 | 30 |
| November 12, 2024 | Consortium between KOKSU HYDRO LLP and Qamqor Energy LLP | HPP | 41.21 | 53 |
| | Korinskaya HPP-2 LLP | HPP | 40.93 | 18.5 |
| | KALZHYR RIVER ENERGY LLP | HPP | 40.94 | 16 |
| | Korinskaya HPP-2 LLP | HPP | 40.99 | 26 |
| | Cascade NRG LLP | HPP | 41 | 10.5 |
| | Baskan Irrigation LLP | HPP | 41.22 | 30 |

| | | | | |
|-------------------|-----------------------------|-----|-------|-----|
| November 13, 2024 | DALA SOLAR LLP | HPP | 10 | 1 |
| | DALA SOLAR LLP | HPP | 28.8 | 1 |
| | Myrzashol Kus LLP | HPP | 32.5 | 2 |
| | Azhur LLP | HPP | 33.95 | 2 |
| | DALA SOLAR LLP | HPP | 34.81 | 1 |
| | Sary Aigyry-Kuat LLP | HPP | 35 | 2.7 |
| | Koksu Kuat LLP | HPP | 35.99 | 4.2 |
| | WPP Tolkyn LLP | HPP | 40.5 | 0.5 |
| November 14, 2024 | Smart ReEnergy LLP | HPP | 38 | 1 |
| | Koksu Kuat LLP | HPP | 39.99 | 4.2 |
| | Cascade of Karatal HPPs LLP | HPP | 40 | 9.9 |
| | Smart ReEnergy LLP | HPP | 40.01 | 1 |
| | Electrical Energy LLP | HPP | 41.17 | 1 |
| | Turan Energy LLP | HPP | 41.18 | 2.2 |
| November 15, 2024 | Alpha wind LLP | WPP | 12.33 | 100 |
| November 18, 2024 | Kaindy Energy LLP | WPP | 11.83 | 100 |
| November 19, 2024 | Hyperboreya Bet LLP | WPP | 12.99 | 100 |

Source: Kazakhstan Electric Energy and Capacity Market Operator JSC



ENERGY TRANSITION IN GERMANY



In October 2024, the German Society for International Cooperation (GIZ) organized a study tour to Germany on expanding the use of renewable energy sources within the framework of the project "Capacity Development in the field of climate policy in the countries of South-Eastern and Eastern Europe, South Caucasus and Central Asia". The tour was attended by Deputy of the Senate of the Parliament of the Republic of Kazakhstan Yevgeniy Bolgert, representatives of KEGOC JSC, KOREM JSC, Energy System Research Design Institute, Kazakhstan Electric Power Association, Qazaq Green Renewable Energy Association, energy and environmental experts.



Ainur Sospanova,
Chairperson of the Renewable
Energy Association Qazaq Green



Timur Shalabayev,
Executive Director of the
Renewable Energy Association
Qazaq Green

During the tour, meetings were held with representatives of the Federal Ministry of Economy and Climate Protection (BMWK), the Federal Grid Agency for Electric Power, Gas Supply, Communications, Post and Railways (Beundesnetzagentur), the Ministry of Economy, Labor and Energy of Brandenburg (MWAE), the German Renewable Energy Federation (WEE), the Federal Association of Heat Pumps (BWP), the Institute of Energy Technologies of the Technical University of Berlin, Agora Energiewende GG GmbH, also visit to demonstration studio of the Tennet system operator was carried out.

The tour provided a clear understanding of policies, support measures, problems and the role of various institutional stakeholders in the process of forming and implementing renewable energy policy at the federal and regional levels.

RES POLICY AT THE FEDERAL LEVEL

In Europe, Germany is one of the first leaders in the field of energy production from environmentally friendly sources.

Germany has been encouraging more active use of RES for 20 years — for environmental, economic and democratic reasons. The energy turnaround (or energy reform) not only ensures the availability of carbon-neutral energy, contributing to the fight

against global warming. It reduces dependence on expensive energy imports, increases value added in one's own country and allows citizens to participate in energy production. However, the concept of "energy turnaround" does not only mean the construction of new wind turbines and solar power plants. Essential aspect is also the rational use of energy.

Back in 1990, Germany adopted the world's first law on supply of electricity from renewable energy sources to the general grid (the so-called Stromeinspeisungsgesetz), for which remuneration was provided, although relatively modest. Everything changed ten years later with the adoption of the Renewable Energy Act (EEG). Higher subsidy rates were introduced and better conditions were created in the electricity market. Investments in wind turbines and photovoltaic plants have become attractive to many citizens and businesses. The expansion process accelerated, as a result of which prices fell sharply and renewable energy sources became competitive. Subsidy rates were repeatedly reduced, and eventually an auction model was introduced to achieve the most acceptable prices.

According to the International Energy Agency (IEA), electricity generation in Germany in 2023 amounted to 520 003 GWh, of which 27% was wind energy, 27% coal, 17.1% natural gas, 11.8% solar, 4.9% hydropower, 7.7% - biofuels. The output of renewable energy



The tour provided a clear understanding of policies, support measures, problems and the role of various institutional stakeholders in the process of forming and implementing renewable energy policy at the federal and regional levels.



The structure of electricity generation in Germany



Source: International Energy Agency

power plants exceeds the output of fossil fuel-based power plants.

At the same time, increased electricity consumption is also taken into account. After all, when millions of electric vehicles appear on the roads, heat pumps will replace old boilers, and many industrial processes will be electrified, demand for electricity will increase by a third by the end of the decade. Therefore, the economical use of energy is the central pillar of the energy revolution. The general rule is that the less energy is consumed, the easier is achievement of the goals in the fight against climate change.

On July 29, 2023, amendments to the Renewable Energy Sources Act (EEG) came into force in Germany. According to the new amendments, renewable energy sources are the "main public interest" and serve public safety. The Ministry of Economy and Climate Protection clarifies that due to the worsening climate crisis and Russia's aggressive war in Ukraine, the expansion of renewable energy has become a matter of national and European security. In this regard, the government is doing everything possible to improve significantly the political environment for renewable energy.

Amendments to the legislation imply a priority for the placement of renewable energy generation plants. Thus, they should be given preference where the law allows for compromises between different

legal interests (for example, in historical buildings and nature conservation). In addition, it is planned to increase funding for new photovoltaic installations on roofs: the remuneration for solar energy for owners of such installations can now be up to 13.4 cents per kilowatt hour (kWh). At the same time, connecting to the grid will become easier.

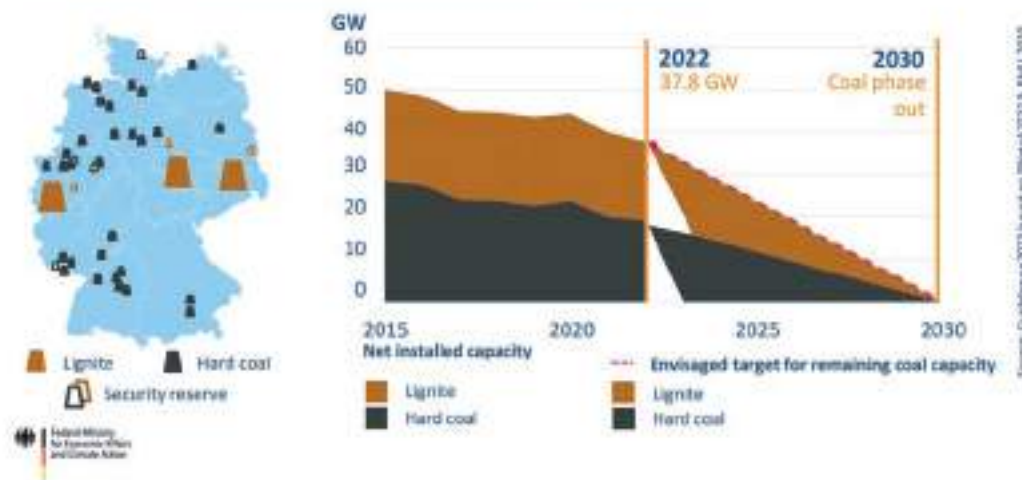
The guidelines for expanding the use of renewable energy sources mean that the Renewable Energy Act 2023 is consistently focused on achieving the 1.5 degree target set in the Paris Agreement for the first time.

Agroelectric installations and other special solar installations will be subject to regular financing. In the future, this will allow, in principle, financing agroelectric installations on all arable lands through the Law on Renewable Energy Sources. This will facilitate the use of the same land for both agricultural and energy purposes.

The concept of participation of all citizens of the country in the energy transition and the possibility of financial participation of municipalities in this process has been expanded and strengthened. Thus, according to the German Federal Grid Agency (Bundesnetzagentur), 220 000 balcony photovoltaic systems with a total capacity of 200 MW were installed in the country in the first

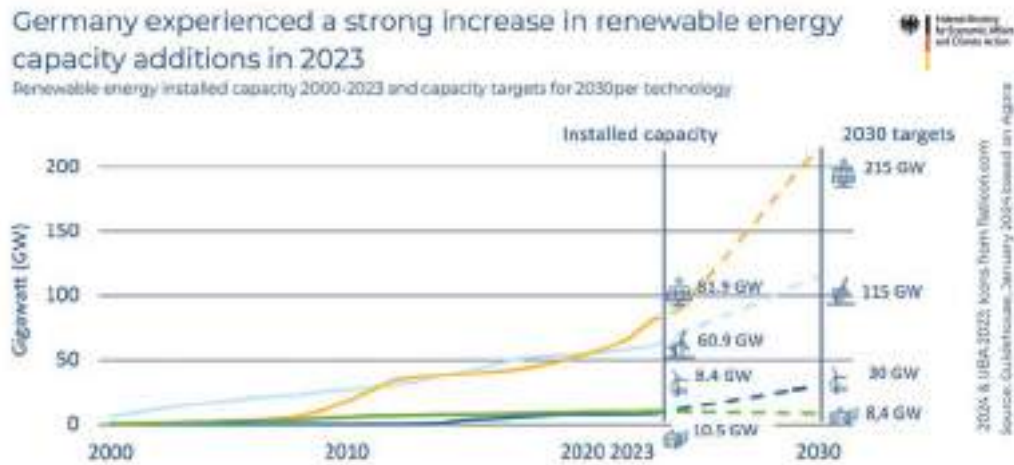
Germany's plans to increase installed renewable energy capacity

Germany will phase out coal ideally by 2030



Source: Federal Ministry of Economy and Climate Protection

Germany's plans to increase installed renewable energy capacity



Source: Federal Ministry of Economy and Climate Protection

half of 2024. It explained the recent growth of more simplified registration of plug-in solar devices, which have been available since April this year. The average registered gross power of these systems has increased from 800 watts last year to about 900 watts this year. Bundesnetzagentur stated that the actual total installed capacity may be higher as many PV system owners may still need to register their installations.

In an effort to end Germany's dependence on fossil fuels in the construction sector, the Federal government has decided that from 2024, wherever possible, renewable energy sources should provide 65% of the energy for all newly installed heating systems.

This decision shifted the relevant provision of the coalition agreement by a year — from 2025 to 2024 — in view of Russia's aggressive war against Ukraine and the energy crisis caused by it.

More than 80% of the heat demand is currently covered by burning fossil fuels. Natural gas dominates the heating of premises in the building sector. Almost every second household in Germany uses gas for heating, almost 25% use heating oil and more than 14% use district heating. The share of gas heating in newly installed heating systems was about 60% in 2021.

Therefore, the Law on Energy in Buildings requires that newly installed heating systems must use at least 65% of renewable energy for heating. The obligation to use renewable energy for heating applies only to newly installed heating systems. However, there may be exceptions that suggest that existing heating systems can continue to be operated, and systems that have failed can be repaired. If the gas or oil heating system cannot be repaired (heating failure), pragmatic transitional solutions and transitional periods spanning several years are provided. Gas heating systems can continue to be installed in existing buildings if these systems operate using 65% green gas or in combination with a heat pump.

Although the new approach is generally open to any technology, the Federal Ministry of Economy and Environmental Protection assumes that the installation of heat pumps will continue to gain

momentum. Heat pumps are the best and most economical option for many buildings when it comes to decarbonizing heat supply. In the context of the 2022 German Heat Pump Summit, stakeholders agreed to install 500 000 heat pumps per year from 2024.

REGIONAL RENEWABLE ENERGY POLICY: BRANDENBURG

The German capital region is a pioneer of innovative energy and environmental technologies in national and European comparison. In particular, the development of new systems and processes for use of renewable energy sources and their improvement serve the main

Example of a balcony PV installation



Source: open data

objectives of the Berlin Program on Energy and Climate Protection 2030 and the Energy Strategy 2040 of the land of Brandenburg.

According to the regional Energy strategy 2040 of the land of Brandenburg, by 2030 the share of renewable energy in final electricity consumption should be 100%, and by 2040 the share of thermal energy generated by renewable energy should be 82%.

The installed capacity of WPP by 2040 should be 15 GW, the SPP – 33 GW. By 2032, about 2.2% of the total land area of the Brandenburg region should be provided for WPP projects. At the same time, clear guidelines have been given to simplify the installation procedures for small-scale solar plants. Thus, the Brandenburg Building Code (BbgBO) states that solar installations inside and on roofs and surfaces of exterior walls of houses, with the exception of high-rise buildings, and building-independent solar installations with a height of up to 3 meters and a total length of up to 9 meters are not subject to approval by authorized bodies.

The expansion of renewable energy sources is accelerated by the support offered by the federal lands. The developed Brandenburg Solar Atlas, which has been integrated into the Brandenburg Energy Portal, shows the potential of using solar energy on roofs and open spaces in the ground. In addition to data on heating needs in the construction sector and heating networks, the Brandenburg Thermal cadastre also provides data on the potential for use of renewable heat sources on a global scale that can replace fossil heat sources in the future. Berlin, on the other hand, has set itself the goal of radically increasing rooftop solar energy production in the city with its Solarcity master plan. Thus, the solar atlas shows the solar potential of the roofs of individual buildings.

Thus, photovoltaic (PV) systems are already making an important contribution to the supply of the capital region. With 2.6 kWh, Brandenburg now has the highest installed capacity of

photovoltaic systems per capita in Germany (2023). Expansion is also gaining momentum in Berlin: in 2023, more than 10,000 new photovoltaic systems were installed — more than ever before - reaching a historic high of 72.7 MW of new connected capacity.

With an installed capacity of about 8.6 GW and more than 4,000 wind turbines, Brandenburg ranks second in Germany in terms of wind power (as of early 2024). Berlin-Brandenburg is home to numerous providers of wind farm planning, construction, operation, maintenance and repair services such as ENERTRAG, Energiequelle and Turbit Systems. In addition, various companies and scientific institutions in the region are engaged in research on rotor blades and foundations, as well as modernization and predictive maintenance of wind turbines.

Large number of companies and research institutions are working together on solutions in the field of agroforestry systems and algae research, as well as biogas, biofuels and biochar. Research at the Leibniz Institute of Agricultural Engineering Potsdam-Bornim (ATB) is aimed, among other things, at studying the energy use of biomass. By providing practice-oriented application laboratories for business partners, ATB promotes agricultural innovation until they are ready to enter the market.

In addition, as a support measure for the areas where renewable energy facilities are located within a radius of 3 kilometers, a profit support measure is provided for local municipalities in the form of a subsidy of 10,000 euros per 1 wind turbine (on average about



2,000 euros per 1 MW of installed capacity). At the same time, all renewable energy stations cannot be located closer than 1 km to a populated area. All this increases interest in the issue of renewable energy expansion among the local population.

THE ISSUE OF INTEGRATING RENEWABLE ENERGY INTO THE GERMAN ENERGY SYSTEM

The German transmission system is divided into four regions, known as control zones. Each control area has a transmission system operator, or TSO, responsible for the safety and stability of the grid: Amprion GmbH, TransnetBW GmbH, TenneT TSO GmbH and 50Hertz Transmission GmbH.

The German power grid is divided into several voltage levels, with transmission systems being the highest. They cross the entire country with a voltage of at least 220 kilovolts (kV), transporting electricity over long distances from the main generating plants (power plants and offshore wind power plants) to downstream distribution systems. This is the only way to meet the electricity needs in the south of Germany, for example, by using energy generated by wind turbines in the north. Transmission systems also connect the German grid to those of its neighbors through cross-border interconnections and submarine cables, allowing electricity to be traded across European borders.

The role of the TSO in Germany is specified in law. As stated in section 11(1) of the German Energy Industry Act (EnWG), their job is to "operate and maintain a safe, reliable and efficient energy supply grid, as well as optimize, strengthen and expand the network in accordance with the requirements in a non-discriminatory manner."

They operate the grid independently of the generation and sale of electricity and must make the grid accessible impartially to all market participants.

Thus, TSO is responsible for operation, maintenance and expansion of the transmission system infrastructure in accordance with the requirements. To avoid fluctuations in the frequency of the system, they must take certain measures to maintain grid stability, such as using balancing services.

Given the ambitious plans for development of renewable energy, the integration of renewable energy into the grid is a key challenge for the energy system. The problem is complicated by the fact that wind power plants are mainly located in the north of the country, and solar power plants are located in the south, which, taking into account the weak grid infrastructure in the north-south direction, the closure of nuclear power plants in 2023, which were mainly located in the south of the country, as well as the high energy consumption of the southern regions (Bavaria, Baden-Württemberg, etc.) form certain problems in the transmission and balancing of renewable energy.

This problem is partially solved due to effectively built interstate flows and built market relations between subjects, including within the framework of the balancing issue.

Thus, the European Network of Electricity Transmission System Operators (ENTSO-E) regulates issues of interstate flows. As of June 2021, the European Network of Electricity Transmission System Operators (ENTSO-E) comprised 42 TSO members from 35 European countries. ENTSO-E unites the knowledge and interests

System operators in Germany



Source: <https://www.smard.de>

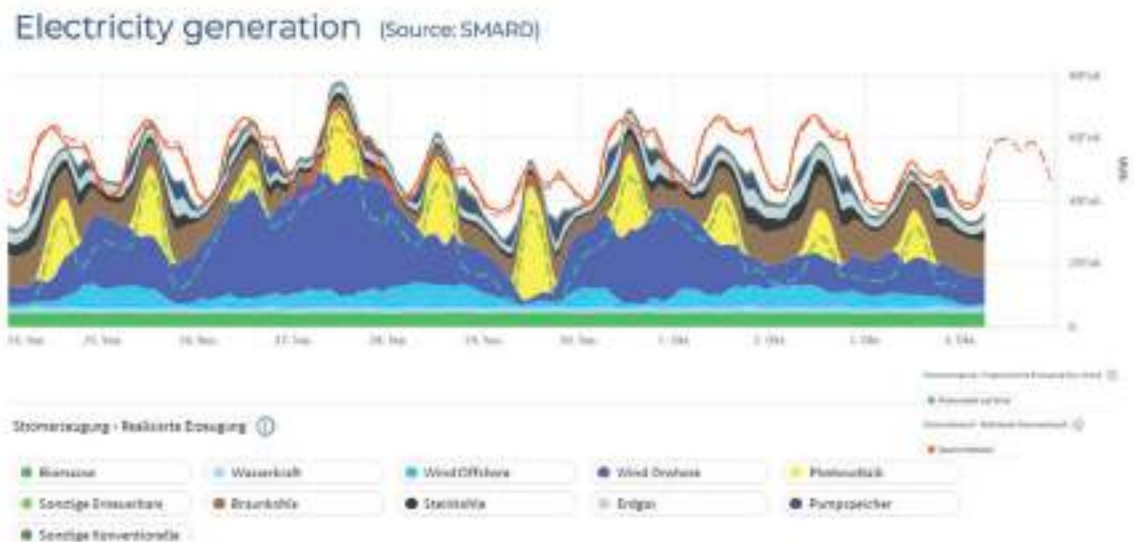
of all European TSO and coordinates the operation of grids in Europe, ensuring the functioning of grids and the European internal electricity market. Regulation (EC) No 543/2013 requires TSO to notify ENTSO-E of its data on electricity markets, consumption and generation. This makes events in the electricity market transparent.

In addition, system operators in Germany are responsible for resolving imbalances and, moreover, are responsible for forecasting the generation of electric energy by stations located in the energy system, including renewable energy stations. That is, renewable energy stations are not financially responsible for imbalances. Forecasting of electric power generation is performed by the system operator at the system level, which makes it possible to have clearer data and respond promptly to weather changes.

In addition, there is no obligation in Germany to install energy storage systems for renewable energy generating capacities. Basically, the storage systems are installed by households to ensure uninterrupted supply of their own energy consumption. At the same time, the prospects for using storage on the scale of the energy system are being considered within the framework of the auxiliary services market. In this direction, separate auctions for hybrid stations are being prepared: WPP + storage or SPP + storage.

According to Dr. Frank Behrend, Representative of the President for International Affairs at the Technical University of Berlin, the prospects for using energy storage systems have a limited vision: "First, it is necessary to understand that electrochemical energy storage systems are expensive solutions. Secondly, if we talk about more efficient technologies, for example, pumped storage power plants, then this is also a very significant investment. It is very difficult to build such a structure in Europe, it is possible to face a lot

Daily electric power consumption and generation schedule in Germany



Source: Federal Ministry of Economy and Climate Protection

of opposition from the population. Thirdly, you need to understand that the operation of any storage systems is limited in time. Do we need huge expenses to get savings for only 2-3 hours?

In this regard, if energy storage technologies are used, then it should be a mix, one should not give preference to any particular technology.

After all, Europe does not rely on ESSs as a solution for regulating energy systems. We are more focused on building effective management of interstate flows for regulation."

INDEPENDENT REGULATOR: GERMAN FEDERAL GRID AGENCY (BUNDESNETZAGENTUR)

The Federal Grid Agency for Electricity, Gas, Telecommunications, Post and Railways is an independent supreme federal body with its headquarters in Bonn, working in the field of activities of the Federal Ministry of Economy and Climate Protection Measures (BMWK) and the Federal Ministry of Digital Technologies and Transport (BMDV). The Agency has been responsible for the main infrastructures of the German electric power industry, gas



supply, telecommunications and postal services for more than 20 years.

The Agency's Advisory Board consists of members of both houses of the German Parliament (16 from the Bundestag and 16 from the Bundesrat). The management is appointed for a period of 5 years by the Federal President of Germany on the recommendation of the Agency's advisory board. The Agency has 330 employees involved in the regulation of the electric power industry and about 220 employees in the planning and expansion of networks. The total annual budget of the agency is about 300 million euros.

The Agency was founded in 1998 as part of the process of liberalizing the postal and telecommunications markets. The main task was to ensure fair and non-discriminatory competition for all market participants. Successful regulatory experience has led to the fact that the energy and railway sectors have also come under the responsibility of the agency.

The Telecommunications and Postal Regulatory Authority, which took over the responsibilities of the former Federal Ministry of Posts and Telecommunications and the Federal Office of Posts and Telecommunications, was renamed Bundesnetzagentur on July 13, 2005.

On January 1, 2006, the scope of the Bundesnetzagentur was expanded to include regulation of the railway sector.

In 2011, the Bundesnetzagentur also took on tasks related to the grid development plans. If the grid development plan indicates

the need to expand the ultra-high voltage network, effective Bundesnetzagentur planning and approval procedures help accelerate implementation.

In June 2013, the Bundesnetzagentur received additional tasks related to the expansion of the electric grid. Since then, it has been responsible for conducting plan approval procedures for expansion projects crossing federal lands or national borders. The Agency is responsible for fair access to the electric grid for all market participants, as well as for stimulating regulation of electricity tariffs in the grids.

Today, as the main body responsible for infrastructure, the agency establishes general conditions for fair competition in these sectors and, as a supervisory authority, also assumes some consumer protection functions. Modern energy, communication and transport networks are the daily arteries of life in the German economy. Without these networks, a thriving economy based on the division of labor would be impossible. Germany's competitiveness and its future as a successful export country depend on the capabilities of these networks. Basic infrastructures allow achieving market power. The interests of companies, politics, economics and society do not always coincide. Competition that strikes a balance between these interests usually doesn't happen on its own.

The regulation of these infrastructures by an independent institution such as the Bundesnetzagentur is a key task in the German national economy.

The results of the tour: key conclusions

THE KEY CONCLUSIONS THAT CAN BE DRAWN FROM THE RESULTS OF THE STUDY TOUR CAN BE STRUCTURED AS FOLLOWS:

1. Germany has set ambitious goals for development of renewable energy sources for generation of electric and thermal energy. The country has already achieved great results, despite a sharp reduction in basic generation (closure of nuclear power plants in 2023, plans to close coal plants by 2024). At the same time, the country is limited in gas supplies. In this regard, the energy crisis that has arisen has prompted to strengthen measures for development of renewable energy sources. The legislation stipulates that renewable energy meets the highest public interests.
2. Renewable energy facilities are not responsible for imbalances. According to the legislation, the system operator assumes full responsibility for imbalances. Balancing is carried out due to effective interstate flows and well-established market relations, including within the framework of the issue of regulation in the energy system. For example, there is a requirement to have up to 70% redundancy in the networks to ensure an unhindered flow of electricity between neighboring countries on the territory of Germany. At the same time, one of the priorities is to ensure energy security and independence of the energy system.
3. There is no obligation for renewable energy facilities to install energy storage systems. Germany is developing ESSs as a separate type of support services. In this regard, auctions are organized separately: WPP + storage or SPP + storage. At the same time, experts note that it is impossible to rely only on storage systems and a mix of technologies is needed.
4. System operators are responsible for forecasting the generation of electric energy by renewable energy plants. The ability to make forecast schedules for the entire power system provides advantages for the operational management of the power system.
5. Conditions have been created for development of small-scale generation: private households, balcony installations in apartments, requirements for equipping all new buildings with heat pump systems, government subsidies for use of renewable energy by the population.
6. The basis for development of the electric power industry and renewable energy sources is based on market relations. The main mechanism for implementation of renewable energy projects is auctions. Additionally, renewable energy facilities on the market have the opportunity to make additional profits on the spot market (market premium model). Price signals for market participants form the technological development of the industry.

"GREEN" CONSTRUCTION IN KAZAKHSTAN: A STEP TOWARDS A SUSTAINABLE FUTURE AND ACHIEVING THE SDGs



In Kazakhstan, there are growing discussions about the transition to "green" construction. Energy-saving technologies, eco-friendly materials and sustainable architectural solutions are gradually becoming part of our reality. But what is behind this trend? Is it just trendiness or is it really a vital step to solve the environmental and economic challenges of our country? We will try to find answers to these questions together with the experts of the Kazakhstan Green Building Council (KazGBC).



Alexander Bely,
KazGBC Executive Director



Aiman Shopayeva,
KazGBC Technical Director



Zhaniya Saimbetova,
KazGBC Communications Manager



According to the Bureau of National Statistics of the Republic of Kazakhstan, the total area of the housing stock in 2023 amounted to 419 058.1 thousand square meters, which is 13 899.5 thousand square meters more than in 2022. This year, these indicators are also projected to increase due to population growth. Moreover, this applies not only to residential real estate, but also commercial, office, public buildings and infrastructure facilities. The growing level of construction, like any other type of activity, is associated with the impact on the environment and consumption of resources, primarily energy. In Kazakhstan, buildings and their operation consume up to 45% of energy, which leads to a serious burden on the environment and an increase in the carbon footprint. As part of the Paris Climate Agreement, adopted in 2015, Kazakhstan committed to achieve carbon neutrality by 2060. This

"Green" construction is the concept of designing and constructing sustainable and energy-efficient buildings, the methods of which minimize the negative impact on the environment and improve the quality of life of people. Such construction is aimed at creating energy-efficient, environmentally friendly and healthy buildings for living. "The key criteria of "green" building are saving water, energy, heat, prevention and timely prevention of water and heat loss. The maximum use of local materials and their environmental friendliness are also important. The safe radiation background of the building, the correct choice of the construction site, and a high class of energy efficiency are also priority indicators," - explains Alexander Bely, Executive Director of the Kazakhstan Green Building Council KazGBC.

Advantages of green certification



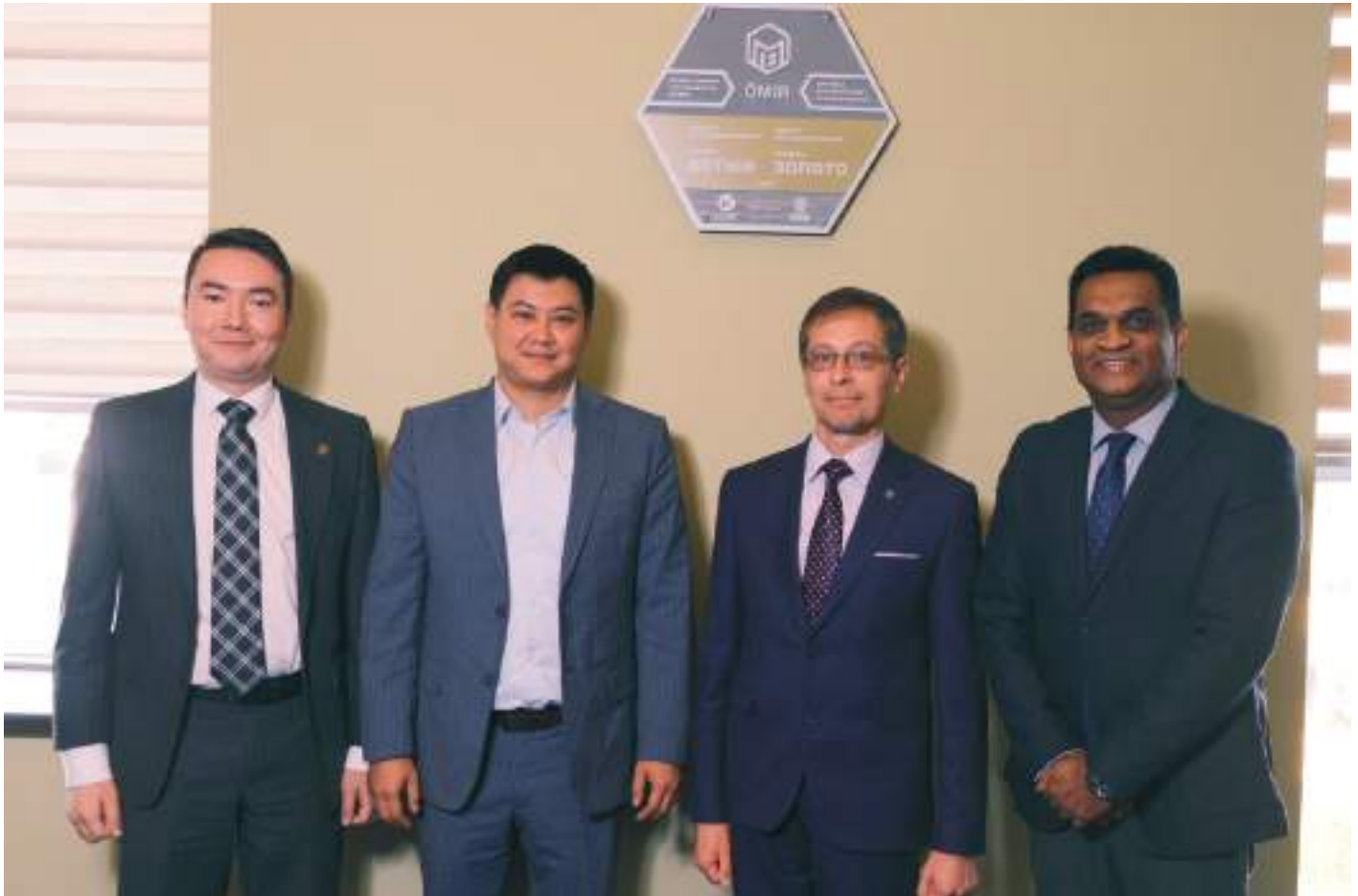
According to the EBRD/Bureau Veritas, using the example of the BREEM standard



- ✓ According to the WorldGBC report, green buildings have a sale price about 30% above the market, and rents are 5-7% above the average rate.
- ✓ Reduction of operating costs by 11-20%.

arises the logical question: what measures should be taken to decarbonize the economy without reducing the pace of construction? One of the solutions may be "green" construction.

The Kazakhstan Green Building Council (KazGBC) has been successfully operating in Kazakhstan for ten years. This non-profit organization operates under the World Green Building Council (WorldGBC) and is designed to promote and implement green building practices and methods in Kazakhstan. The organization is actively working on certification of buildings, development and improvement of the Kazakh standard of "green" construction, as well as training specialists in this field. One of the great successes of the organization was the introduction of the Kazakhstan OMIR building environmental assessment system. This is the Kazakhstan standard of "green" construction, created by professionals and experts of the architectural and construction industry, world-renowned specialists with the support of WorldGBC and UNDP. The OMIR standard has incorporated the best criteria from the world-famous LEED and BREEAM green building standards and has been adapted to the Kazakh market, taking into account the climatic, social and economic characteristics of the country. OMIR has a number of advantages for Kazakhstani users, such as language accessibility, adaptation to the local market and legislation, affordable certification and the availability of more accredited specialists in the country.



Over the years, OMIR has established itself as an effective, reliable and thoughtful standard for "green" construction, which can also serve as one of the tools for a country to achieve the UN SDGs. OMIR covers key aspects: energy efficiency, waste minimization, resource savings, improvement of the quality of the building's internal environment and much more. These indicators meet 11 of the 17 Sustainable Development Goals. For example, the OMIR standard can contribute to the achievement of goal No. 6 "Ensure availability and management of water and sanitation for all", the standard focuses on water conservation, and goal No. 7 "Ensuring access to affordable, reliable, sustainable and modern energy sources for all" is reflected in the Energy section. This section provides the maximum number of points to certified facilities, and also includes high points for renewable energy sources, which indicates the commitment of the standard to the principles of decarbonization.

SDG 13 "Taking urgent measures to combat climate change and its consequences" should also be noted. June 2024 was the hottest in the history of observations on the planet. "Green" construction can become one of the key tools in the fight against climate change. Green buildings significantly reduce carbon dioxide emissions

through energy-efficient technologies, while reducing the carbon footprint of the building. Using natural solutions such as green roofs and vertical gardens helps improve rainwater management and reduces the risk of flooding in cities. In addition, "green" buildings reduce dependence on external energy networks through the integration of renewable energy sources.

The Sustainable Development Goals are somehow related to responsible consumption of resources and conservation of ecosystems. The construction sector is a big consumer of materials, so the attitude to building materials in eco-construction is also special. It is a mistake to believe that all natural materials can be immediately classified as "green". "In the world,

"Green" construction can become one of the key tools in the fight against climate change.

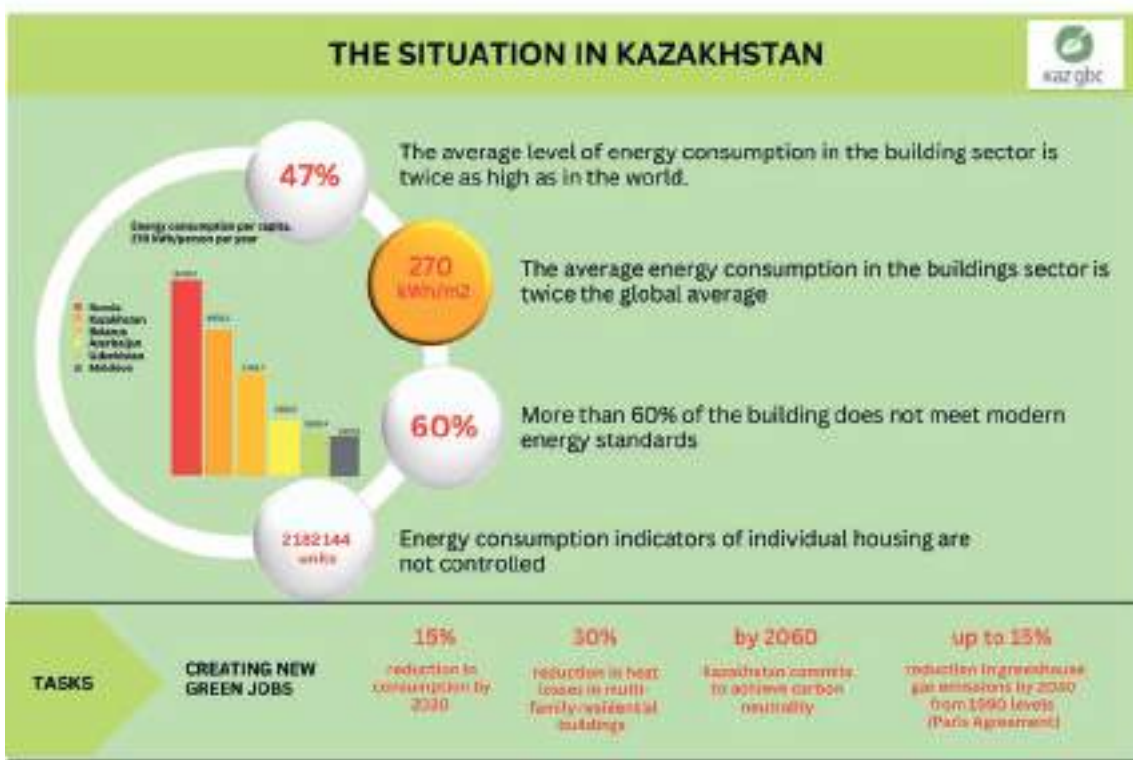
the environmental friendliness of building materials means not only the origin, but also the amount of energy spent on the extraction of raw materials and the production of this building material. Developed countries are switching to eco-friendly materials, for example, eco-concrete produced using environmentally friendly components and technologies,"- notes Aiman Shopayeva, Technical Director of KazGBC.

OMIR standard helps to create buildings that not only meet high environmental requirements, but also provide savings on operating costs. This standard also stimulates the growth of the market for qualified specialists and creates new jobs in the field of eco-construction. The next major area of work of the Kazakhstan Green Building Council is the training of specialists and experts in this field. The Council conducts training, then accredits specialists who have

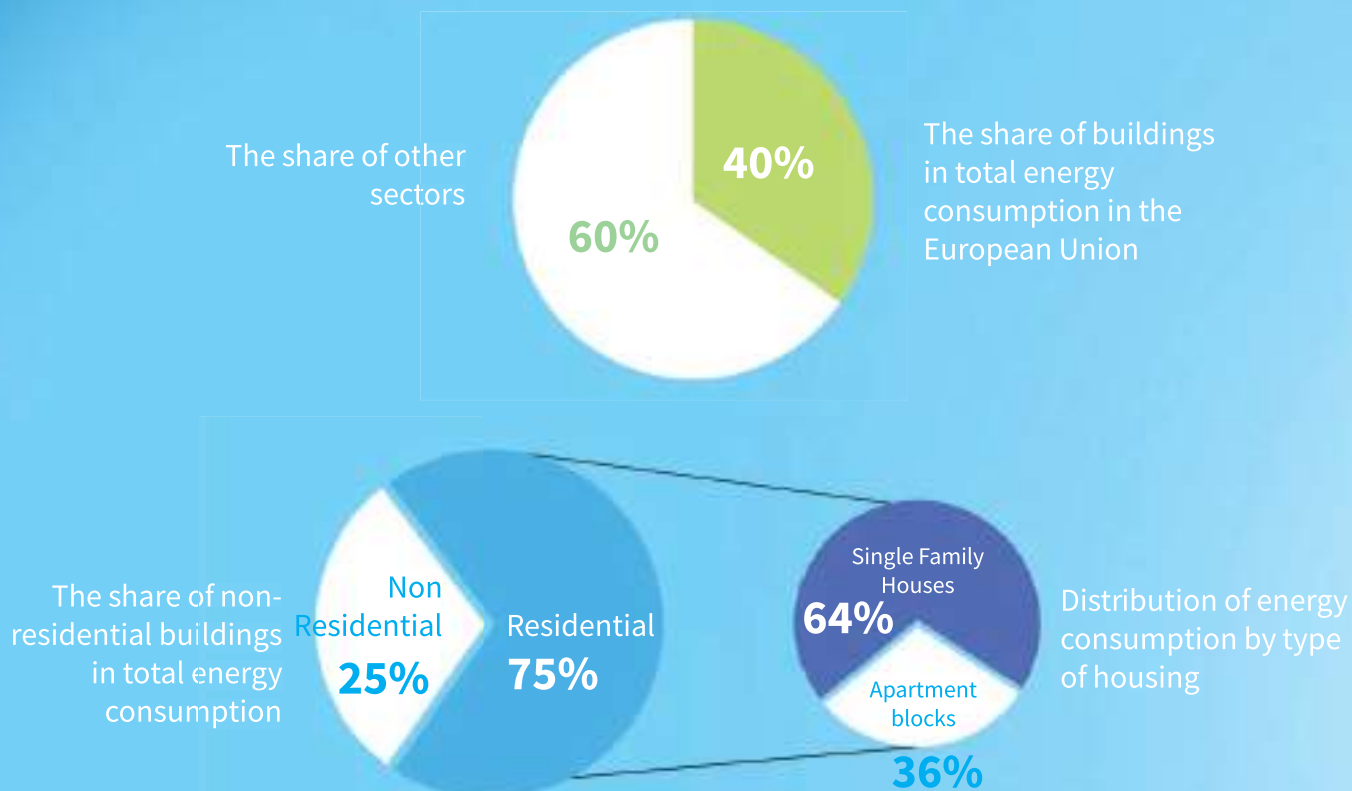
successfully passed the OMIR standard examination. Over the years, KazGBC has proudly certified 100 professionals and 9 green building experts of "green" construction, who have key skills and knowledge and can be useful in the eco-building industry.

Of course, during this time, Kazakhstan has its own leaders of "green" construction. These are construction and design companies, developers, consulting firms and suppliers of "green" materials, which make a great contribution to the development of "green" construction, actively applying its methods and principles in their area of activity.

For example, the construction company BAZIS-A has certified the largest number of its facilities (18 residential complexes) in Kazakhstan today. Many of the company's facilities have received OMIR gold certificates. The consulting firm Bureau Veritas Kazakhstan with activities closely related to sustainable development services for businesses, is also actively promoting the "green" certification of buildings. It was in cooperation with Bureau Veritas Kazakhstan that the assessment of the largest shopping malls in Kazakhstan was successfully carried out in this October. It is also worth noting the Aruna City residential complex in Astana, which was the first in Kazakhstan to place the "green" marking "OMIR" on its facility. This is a special label about receiving the certificate of compliance with "green" construction. Aruna City has an OMIR gold certificate, and its label is located in the sales office of this residential complex.



The relevance of the issue



Source: BPIE

In matters of labeling "green" buildings according to the OMIR system, it is also necessary to highlight the Dostyk Plaza and Shymkent Plaza shopping malls, owned by the TSPG investment fund, which placed OMIR label first among retail facilities, thereby setting an example of the need for "green" certification for commercial facilities as a symbol of commitment to sustainable development and environmental protection. Among the regional companies that are successful in "green" construction, developers Kanfar Building and Ontustik Kurylys Service can be distinguished, which build high-quality and energy-efficient residential buildings in Shymkent, observing the principles of "green" construction. International cooperation plays an important role in the issues of "green" construction. In 2024, KazGBC provided support in preparation of the Azerbaijani standard for "green" construction, which was developed using OMIR approaches, incorporating existing effective tools and methodologies of the Kazakh standard, which indicates its high appreciation and relevance. This work was carried out within the framework of the Agreement on Cooperation in the field of national standards of "green" construction "Central Asia – Caspian – Caucasus".

KazGBC has concluded a number of other international agreements and memoranda, within the framework of which cooperation is conducted in the field of "green" construction. Council also tries to actively work with government agencies, local executive authorities and local communities in Kazakhstan. This activity of KazGBC is in line with SDG 17 "Strengthening the means of implementation and enhancing work within the framework of the Global Partnership for Sustainable Development". OMIR standard contributes to the creation of effective partnerships to achieve sustainable solutions at all levels both within Kazakhstan and abroad.

Thus, the promotion of "green" construction in Kazakhstan opens up opportunities for sustainable and long-term development, reduces costs and improves the quality of life of citizens. After all, "green" buildings are primarily buildings for human health and comfort, not only in the present, but also with great investment for future generations. Kazakh standard of "green" construction OMIR is becoming a real prospect for Kazakhstan and an important tool for achieving a sustainable future.



ЫҚАРАЛЫҚ ЖАҢАЛЫҚ ЭНЕРГИЯ БИЗНЕС Ф
QAZAQ GREEN
III МЕЖДУНАРОДНЫЙ РЕГ ИОННОЙ ФЕСТИВАЛЬ

QAZAQ GREEN



CHARTER

APPEAL TO THE
GOVERNMENT OF THE
REPUBLIC OF KAZAKHSTAN

*ON BEHALF OF THE BUSINESS COMMUNITY
IN THE ENERGY INDUSTRY AND
RENEWABLE ENERGY SOURCES*

(based on the results of Qazaq Green Fest, III International Business Festival on Renewable Energy, May 30-31, 2024 in Burabay district of Akmola region)



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ON BEHALF OF THE BUSINESS COMMUNITY IN THE ENERGY INDUSTRY AND RENEWABLE ENERGY SOURCES

(based on the results of Qazaq Green Fest, III International Business Festival on Renewable Energy, May 30-31, 2024 in Burabay district of Akmola region)



THE BUSINESS COMMUNITY OF THE ENERGY INDUSTRY AND RENEWABLE ENERGY SOURCES (HEREINAFTER REFERRED TO AS RES) SUPPORTS THE INITIATIVES OF THE PRESIDENT OF THE REPUBLIC OF KAZAKHSTAN K.K.TOKAYEV REGARDING THE TRANSITION TO A GREEN ECONOMY AND SUSTAINABLE DEVELOPMENT IN THE COUNTRY.

As is well known, the Republic of Kazakhstan has declared its commitment to the goal of achieving carbon neutrality by 2060. In February 2023 The Head of State signed the Strategy for achieving Carbon Neutrality of the Republic of Kazakhstan by 2060. Under the Paris Agreement, Kazakhstan has committed to an unconditional 15% reduction in greenhouse gas emissions, as well as a 25% reduction (conditional on international support) by 2030, compared to the 1990 levels.

Today, more than ever, Kazakh society understands the great responsibility we have for the ecological future of our country and the health of our nation. One of the ways to achieve all set goals is through the introduction of renewable energy technologies.

At the same time, there are currently constraints to the development of renewable energy in the Kazakhstan's market, which were discussed at length at the III International Business Festival Qazaq Green Fest. The Festival brought together over 400 representatives from the business sector in the fields of both traditional and green energy. Based on the outcomes of the event, the business community has submitted the following proposals to relevant state authorities and the Government of the Republic of Kazakhstan:



2024

1

The further development of renewable energy directly depends on the state of the energy industry, which has accumulated many problems today: a shortage of

maneuverable capacities, obsolescence of generating equipment and an increase in accidents at stations, a shortage of power reserves in the system, isolation of the Western energy zone, dependence on flows from neighboring countries, social orientation of tariff policy in the absence of targeted assistance mechanisms, and shortage of personnel.

In general, all these problems pose a real threat to Kazakhstan's energy security. It is understood that the future development of all sectors of the economy will depend on the development of the energy sector, given the increasing consumption dynamics and the growing energy deficit.

Apart from that, it is important to consider such external factors as the introduction of the common electric power market of the Eurasian Economic Union (2027), the implementation of a carbon footprint tax in the European Union (2026), and Kazakhstan's commitments under the Paris Agreement (2030).

Considering all the challenges and obstacles, the Kazakhstan Electric Power Association and the "Qazaq Green" Renewable Energy Association have taken the initiative to elaborate a Strategy for the development of the electric power industry in the medium term (hereinafter referred to as the Strategy). The main objective of this document is to provide clear signals, understanding and a vision to all stakeholders: the state, business and the public on further ways to develop the electric power industry considering economic and financial indicators.

As part of the Strategy development, the following topical issues in the industry have been considered: a further vision for the development of coal generation, with regard to Kazakhstan's realities and environmental challenges, the development of the gas industry, considering the need for gas consumption in the domestic market, the development of renewable energy sources



CONSIDERATION AND ADOPTION OF THE STRATEGY FOR THE DEVELOPMENT OF THE ELECTRIC POWER INDUSTRY OF THE REPUBLIC OF KAZAKHSTAN UNTIL 2035

(issues of construction of maneuverable capacities, integration of solar and wind power plants into the energy system, development of hydropower), the development of the national electric grid and transnational flows, issues of heat supply development, tariff policy. We would like to emphasize that the developed Strategy meets, first of all, the interests of the country, the population and domestic business.

We request the Government of the Republic of Kazakhstan to consider the draft Strategy and determine its place as an official document in the state planning system.



SOLVING CHALLENGES RELATED TO THE PERSONNEL IN THE ENERGY SECTOR

2

In course of the meeting of the Supreme Council for Reforms on June 23, 2023, the Head of State K.J. Tokayev outlined the problems that require attention, that is, a shortage of qualified personnel, staff turnover at heat and power facilities and the energy system.

The main reasons for this situation include the low level of wages for power engineers as approved in tariff estimates, a lack of employee benefits, insufficient funding for professional development and retraining of personnel, as well as difficult working conditions.

Retaining qualified personnel and attracting young experts in companies is an urgent and priority area in the work of personnel management services of energy companies. The volume of accumulated issues has reached a point where their resolution requires immediate action from the government.

In this regard, we would like to request the Ministry of National Economy of the Republic of Kazakhstan to review the rules for tariff formation with a view to increasing the cost of personnel, both in terms of determining an

objectively fair number of employees based on standards and in terms of ensuring salaries that are not lower than the republican average. Salaries that are not lower than the national average should be considered fair. In those regions where the average salary is higher than the national average, it is recommended to use the regional average instead.

We note that the current binding to the regional average does not allow most regions to raise the wage level above the indicator of the forecast of socio-economic development. The Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan is asked to develop a program of state social support for employees of the electric power industry: for the purchase and construction of housing for resettlement to labor-deficient regions, medical and sanatorium services for workers engaged in work with harmful and dangerous conditions. The Ministry of Science and Higher Education of the Republic of Kazakhstan to increase the formation of a state educational order for personnel training in the educational programs "Electrical Engineering and Energy", "Thermal Power Engineering", "Electrical Engineering and Automation".

The above measures will serve as the foundation for maintaining optimal conditions for the operation and growth of the industry. This will ensure its viability, reduce the exodus of skilled personnel, and, consequently, enhance the reliability and quality of electricity supplies to consumers and the economy of our nation.

3

On July 1, 2023, a new market mechanism was implemented: the single buyer and real-time balancing of the electricity market. Conceptually, the introduction of new rules of the game for renewable energy facilities (hereinafter referred to as RES) implies: the sale of generated electricity to a "Single Buyer" and the application of financial liability measures for the imbalances in the energy system.

It should be noted that the renewable energy facilities that concluded long-term contracts for the purchase and sale of electricity before July 1, 2023, remained within the framework of the previous operating modes and conditions. For RES projects that enter into contracts with Accounting and Finance Center for RES LLP after July 1, 2023, financial liability is provided for positive and negative imbalances in the energy system, which are related to increasing and decreasing factors.

Specifically, in accordance with the Rules of Functioning of the balancing market of electric energy, for energy-producing organizations using renewable energy sources that have concluded a long-term contract for the purchase and sale of electric energy with a single buyer of electric energy after July 1, 2023, the values of the increasing and decreasing coefficients, as well as the values of permissible deviations specified in this paragraph, are to be determined in accordance with the procedure approved by the authorized body in accordance with paragraph 16 of Article 15-10 of the Law of the Republic of Kazakhstan "On Electric Power Industry".

It should be noted that the values of the increasing and decreasing coefficients, as well as the range of permissible deviations, are not determined at the moment. In this regard, based on the work of the balancing electricity market and the Single Buyer mechanism over the past year, we request the Ministry of Energy of the Republic of Kazakhstan to conduct analytical work and submit the above issues for discussion with the RES business community.

In addition, we would like to point out that in order to better predict and adjust planned



THE OPERATION OF RENEWABLE ENERGY FACILITIES WITHIN THE FRAMEWORK OF A SINGLE BUYER AND BALANCING ELECTRICITY MARKET IN REAL TIME

generation volumes from renewable energy sources, the rule for adjusting planned applications two hours before the relevant hour has a conditional nature and is only applied if the balance between production and consumption of electricity is maintained. That is, before the beginning of the operating hour for which the adjustment was scheduled, an application for a reverse adjustment from another entity should appear in the designated area. If this does not happen, the controllers of the National Dispatch Center of the System Operator will reject such adjustments. In turn, this condition makes the adjustment norm practically non-functioning. We ask you to consider the possibility of further improving the adjustment mechanism. We believe that this will provide an opportunity to more quickly adjust the schedule of generation by RES facilities, which will reflect the real conditions under which these facilities operate (weather conditions, technical conditions of the lines, etc.).

These measures will contribute to the successful implementation of renewable energy projects and significantly reduce risks for investors.

DIRECTOR GENERAL OF
SETTLEMENT AND FINANC
CENTRE FOR RENEWABLE
ENERGY SUPPORT LLP



DEVELOPMENT OF THE MARKET FOR BILATERAL RES CONTRACTS

4

It is essential to adopt a flexible approach towards the development of renewable energy in our country, taking into account the interests of both consumers and investors in order to meet our strategic goals of achieving carbon neutrality. The opportunity to implement these projects for their own needs and take advantage of the existing package of support

measures for renewable energy should be available to all businesses, regardless of their ownership structure. Thus, the development of RES as a direct tool for decarbonizing the economy should become a national task.

One of the tools for the development of the RES market is the segment of bilateral renewable energy contracts, when an industrial enterprise enters into a direct contract with a renewable energy generator to purchase green electricity in order to reduce its carbon footprint. According to experts, this segment has great

prospects due to the fact that most companies in the real sector of the economy have adopted strategies at the corporate level aimed at decarbonizing production processes. In general, the market of bilateral contracts can be much larger than the RES auction market and become a driver of further development of the sector, while not affecting the growth of tariffs for households and businesses in the country.

Despite the fact that the legislation regulating the development of renewable energy sources does not exclude the development of the market of bilateral contracts, the key barriers to the development of this segment include the following:

- uncertainty of the rules of operation of bilateral renewable energy contracts in the light of the introduction of the "Single Buyer" model;
- the lack of "rules of the game" for market participants in general;
- strict requirements of the system operator for connecting such facilities, despite the fact that renewable energy facilities are not directly connected to the network;
- The issues of balancing, free transportation and

priority dispatching for such projects remain debatable;

- the possibility of selling surplus electricity under bilateral contracts to a single buyer;
- there is no understanding of how financial organizations can lend to such projects, given the absence of any risk reduction mechanisms, in the event of termination of the purchase of electricity from a renewable energy facility by an industrial enterprise;
- for the state and quasi-public sectors that would like to implement RES projects, the access to a package of state support measures (investment,

customs, tax preferences) is limited. The Business Code limits the share and duration of participation by such organizations in investment priority projects, making the implementation of renewable energy projects problematic for them.

- allocation of land plots for bilateral renewable energy projects.

In this regard, we request the Ministry of Energy of the Republic of Kazakhstan to develop and implement rules for the implementation of bilateral projects in this area in cooperation with the renewable energy business community, and if necessary, to initiate legislative changes.





FURTHER STIMULATION OF SMALL-SCALE RES

5

In the spring of 2024, the Majilis of the Parliament of the Republic of Kazakhstan adopted the draft Law of the Republic of Kazakhstan "On Amendments and Additions to Several Legislative Acts of Kazakhstan Regarding Support for the Use of Renewable Energy Sources, the Electric Power Industry, and Natural Monopolies." The draft Law of the Republic of Kazakhstan was recently adopted by the Senate of the Parliament of the Republic of Kazakhstan (hereinafter – the draft Law of the Republic of Kazakhstan).

In accordance with the draft Law of the Republic of Kazakhstan, there are plans to introduce the concept of small-scale RES projects, to increase the capacity of renewable energy projects to 200 kW, to create the attractive conditions for connecting net consumers to the networks of energy transmission organizations and selling electric energy to energy supply organizations, as well as incentive measures to purchase surplus electricity generation of small-scale renewable energy from net consumers.

These measures will contribute to the development of the use of renewable energy technologies by households and small and medium-sized enterprises in the country. According to the UNDP assessment, the potential

for the development of small-scale RES can reach 2-3 GW. In this regard, the issue of monitoring the development of small-scale RES becomes relevant. It should be noted that official statistics from a sample household survey do not provide a comprehensive picture of the development of small-scale RES in the country. Furthermore, the collection of data on small-scale RES through local executive bodies does not accurately reflect the actual situation. In addition, the population and business of the country, having no experience in implementing RES projects, are practically deprived of the opportunity to receive qualified information about the development opportunities of small-scale RES projects. To address this information gap, it would be beneficial to establish an Information and Analytical Center to support small-scale RES projects. This center could be based on the Qazaq Green Renewable Energy Association, following the principles of a market council, in accordance with the laws of the Republic of Kazakhstan.

Therefore, such a Center could have the status of a non-profit organization engaged in monitoring the development of small-scale RES in the country and at the same time would perform the following functions:

- monitor the development and operation of small-scale RES facilities connected to electric grids;



- receive and process information from regional power grid companies on issued technical connection conditions, connected small-scale renewable energy facilities, refused connections to small-scale RES facilities;
- to receive and process information on the purchase of excess electricity generated by net consumers (volumes, tariffs) from energy supply organizations divided up by months;
- submit analytical information on the development of small-scale RES by region to the authorized body;
- to make proposals to the authorized body on improving the legislation of the Republic of Kazakhstan on the development of small-scale renewable energy sources;
- to carry out information and explanatory work with the public and business on the development of small-scale renewable energy sources, as well as maintenance of renewable energy plants
- perform other functions determined by the authorized body.

We request the Ministry of Energy of the Republic of Kazakhstan to consider this proposal and, if approved, initiate necessary amendments to the legislation of the Republic of Kazakhstan and the development of Rules for the operation of the Information and Analytical Center for the development of small-scale RES.



IMPROVING THE INDEXING MECHANISM FOR RENEWABLE ENERGY PROJECTS

6

To reduce currency risks in the implementation of renewable energy projects, a mechanism for currency indexing of fixed and auction tariffs has been implemented since 2017.

It was approved by the Decree of the Government of the Republic of Kazakhstan No. 271 dated March 27, 2014 "On Approval of the Rules for Determining Fixed Tariffs and Auction Prices". In addition, in 2022, a new system of indexing was introduced for the construction period of renewable energy facilities. According to fixed standards, this process can take from 2 to 5 years, depending on the specific technology used. The indexing formula has also been significantly improved.

However, in all existing currency indexing mechanisms, the US dollar is fixed in the current Rules. It should be noted that today the geography of investors working in the renewable energy sector covers countries such as China, Germany, France, Russia, etc., which allows them to attract affordable financing in other currencies, for example, yuan, euro, Russian rubles. Thus, the current mechanism

does not allow full use of the opportunities of foreign investors for the development of "green" energy in Kazakhstan. In this regard, it would be beneficial to provide investors with the option to choose the currency when implementing the indexing mechanism, rather than being restricted to the US dollar alone.

Apart from that, in order to ensure the flexibility of the indexing mechanism, it is important to provide investors with the opportunity to convert the US dollar to another foreign currency once, both during the indexing for the construction period and during the operational phase during the life cycle of the project.

It should also be noted that, at the moment, the indexing formula in the rules is selected only once when a purchase agreement is concluded for the entire duration of its validity. However, as a rule, the attraction of investments or loan funds from financial institutions (including international ones, such as the EBRD, EDB, etc.) is carried out after signing the purchase agreement. Therefore, all the conditions for financing the project are to be discussed after signing the purchase agreement. At the same time, the chosen indexing method plays an important role in the financial structuring of the project. It is necessary to provide investors with the right to change the indexation formula once, both during the construction period and during the operational phase of the agreement.

We request the Government of the Republic of Kazakhstan to consider the proposals of the business community to improve the indexing mechanism.

7

EXCLUSION OF RES FACILITIES FROM
THE LIST OF VULNERABLE TO TERRORISM

In accordance with the Regulations and Criteria for classifying facilities as vulnerable to terrorism, approved by Decree of the Government of the Republic of Kazakhstan No. 234 dated April 12, 2021, facilities vulnerable to terrorism include: TPP, SRPP (State Regional Power Plant), HPP, GTPP (Gas Turbine Power Plant), CHP and boiler houses. At the same time, local executive bodies have included renewable energy producing organizations in the list of facilities vulnerable to terrorism (solar and wind power plants).

According to the Law of the Republic of Kazakhstan "On Support for the Use of Renewable Energy Sources", an energy production organization using renewable energy is a legal entity that produces electric and/or thermal energy using renewable sources, excluding net consumers. Renewable energy sources include solar radiation, wind, hydrodynamic energy from water, and geothermal energy from heat within the soil, groundwater, and rivers. These are not energy-producing organizations as defined in Decree No. 234 of the Republic of Kazakhstan.

Renewable energy producing organizations do not meet any of the criteria for listing objects as vulnerable to terrorism:

1. They are not a part of the critical state facilities (central state bodies, judicial bodies, local executive bodies, etc.);
2. They do not belong to strategic objects, objects of economic sectors of strategic importance, vulnerable to terrorism (military units, state reserve facilities, etc.);
3. They are not a part of dangerous production facilities;
4. They are not places where people gather in large numbers.

Pursuant to the Law of the Republic of Kazakhstan "On Civil Protection" (paragraph 75 of Article 1), life support facilities include an energy supply facility, upon termination (suspension) of operation of buildings, structures, technological installations and aggregates of which the activities of social and engineering infrastructures of settlements and territories are disrupted. It should be noted that RES facilities are not energy supply organizations, the electricity generated by them enters the Unified Energy System of the Republic of



Kazakhstan and cannot disrupt the activities of social and engineering infrastructures of settlements and territories.

If energy-producing organizations that use renewable energy sources are considered vulnerable to terrorist attacks, investors may face unforeseen expenses that could directly affect their capital and operating expenses, leading to a decrease in profitability and a loss of interest in investing in renewable energy projects in Kazakhstan. This could result in a decrease in foreign and domestic direct investment in this sector.

We request the Government of the Republic of Kazakhstan to exclude energy-producing organizations using renewable energy sources from being vulnerable to terrorism and to make appropriate amendments to the regulatory framework.



INFORMATION SUPPORT FOR THE DEVELOPMENT OF RENEWABLE ENERGY SOURCES

8

Today, one of the few industry news online publications is the QazaqGreen.com information portal. Every year, the portal publishes about 1,500 materials in state, Russian and English languages and thye news on the development of the green economy. The users of the portal come from various countries, including Kazakhstan, Russia, the United States, Kyrgyzstan, Uzbekistan, Ukraine, Belarus, the United Kingdom, Germany, and Japan.

Therefore, today the Qazaq Green.com portal has become practically the only platform in

Kazakhstan that systematically and purposefully provides information and analytical support for the development of renewable energy sources. This work is extremely important due to the fact that the awareness of the population about the issues of energy transition, the principles of lean consumption of energy resources, and the use of clean energy sources is currently extremely low. In addition, unfortunately, at the state level, there is either no work done to inform the public and businesses, or it is done in a fragmented manner.



In this regard, we request the Government of the Republic of Kazakhstan to consider the possibility of allocating a state order for the implementation of state information policy at the republican level for the placement of materials on the development of a green economy, the development of clean energy sources, decarbonization, achieving the goals of carbon neutrality and ecology for the Internet portal "Qazaq Green.com".



"RENEWABLE ENERGY WORKER DAY" PROFESSIONAL HOLIDAY

An additional measure to stimulate the development of renewable energy sources could be the initiation of a professional holiday - the Day of the Renewable Energy Worker. This would not only encourage employees in the sector from an economic perspective, but also promote renewable energy as a whole.

It is commonly known that "people make all the difference" and the renewable energy sector is no exception to these rules. Thousands of specialists work in the sector today: power engineers, engineers, builders, economists, civil servants, investors, scientists, and analysts. Thanks to their work, a completely new sector of the economy has appeared in the country in a short period of time, and 148 renewable energy facilities with a total installed capacity of about 2.9 GW generate renewable energy.

In the period from 2018 to 2023 over 297 companies from 13 countries took part in the auction for the selection of renewable energy projects. A large amount of investment has been attracted to this sector.

International organizations such as UNDP, USAID, as well as international financial institutions (EBRD, ADB, EDB, Clean Technologies Fund, Green Climate Fund, etc.) operate in the Republic of Kazakhstan on renewable energy, and all of them have completed or ongoing projects in their portfolios. A separate division of the Astana International Financial Center is dedicated to the topic of "green finance". Global oil and gas companies ENI, Shell, Total are engaged in the implementation of renewable energy projects in different parts of our country.

Students studying energy at universities in the country are taught courses in renewable energy and a successful renewable energy landfill operates at Nazarbayev University. In addition, a full-fledged master's program in "Strategic Management of Renewable Energy and Energy Efficiency" was launched at the Kazakh-German University. Specialists are defending doctoral dissertations on renewable energy.

We request the Government of Kazakhstan to consider establishing a professional holiday for renewable energy workers as a means to encourage young professionals to enter the industry.



QAZAQ GREEN

III International business festival on renewable energy sources

QAZAQ GREEN FEST 2024

ACCEPTING THE CHALLENGES
OF THE PRESENT - TOGETHER TOWARDS
A SUSTAINABLE FUTURE



IMPLEMENTATION OF RENEWABLE ENERGY

I • Participation in the auction



1. Check the auction schedule

Order of the Minister of Energy of the Republic of Kazakhstan No. 202 of May 21, 2020 "On approval of the auction schedule for 2020"



2. Register at the website of KOREM JSC, conclude an agreement and undergo a training on the use of the trading system

- title documents *
- documents on the land plot
- documents on the connection point
- * Foreign legal entities shall provide the equivalent documents with notarized translations of each document into the Kazakh and Russian languages



3. Financial guarantee for auction participation

- for auctions without documentation - 2000 KZT per 1 kW of installed capacity
- for auctions with documentation - 5000 KZT per 1 kW of installed capacity



4. Auction participation

- FSC provides envelopes with financial guarantee
- observers gather in the hall
- 30 minutes before the auction, the envelope is opened, and the data is entered into the system
- trading session opens (accepting and changing bids)
- trading session closes, auction results



5. Auction results

- auction winners
- auction prices
- volumes of selected capacity

II • Post-auction activities and project implementation



1. Inclusion in the RE Facilities Siting Plan and the List of Energy Producing Organizations Using RES

The Ministry of Energy of the Republic of Kazakhstan shall include the winners in the RE Facilities Siting Plan and the List of Energy Producing Organizations Using RES within 5 working days from the date of receipt of the Register of winners from the organizer



2. PPA conclusion

The winner submits an application for the conclusion of the PPA to the FSC within 60 calendar days from the date of inclusion in the List of Energy Producing Organizations using RES



3. PPA financial guarantee

The amount of financial guarantee of the fulfillment of the terms of the purchase agreement is 10,000 (ten thousand) KZT per 1 (one) kW of installed capacity



4. Project implementation terms (from the date of PPA conclusion)

- for SPP - 24 months
- for WPP and BioPP - 36 months
- for HPP - 48 months



5. Registration of land rights, design and survey works

- land plot selection
- obtaining the permit to use the land plot for design and survey works
- design and survey works (D&S)
- obtaining the land plot rights
- obtaining the water use rights (for HPP)



6. Grid connection

- request to identify the closest connection point to the energy transmitting organization
- development of power generation scheme
- obtaining technical specifications for a connection to the electric grid
- approval of the power generation scheme by the system operator
- conclusion of an agreement on RE facility connection



7. Preliminary project procedures and design

- obtaining source materials to develop construction projects
- approval of schematic design with the construction authority
- development of project documentation (Feasibility study, Design and estimate documentation), approval, expert examination of DED by a design institute (state or private)
- installation and construction works



8. Environmental Permit

- environmental impact assessment (Ministry of Ecology)
- environmental emissions permit (egov.kz)



9. Investment preferences under Entrepreneurial Code



10. State registration of the right to a constructed renewable energy facility

- inclusion of identification and technical information on newly created immovable property in the information system of the legal cadastre (egov.kz)



Commissioning*

* SPP as an example



1. The contractor notifies the customer of the facility's readiness for commissioning

2. The customer asks to provide (within 3 days):

- contractor - declaration of compliance
- technical and designer supervision - conclusion on the quality of the works performed
- technical supervisor - conclusion on the quality of the completed construction and installation works



3. Substation commissioning

Grid connection:

- Acceptance in Commercial Operation of Automated Commercial Energy Metering System (ACEMS) and registration in the ACEMS register
- signing contracts for system services with SO and REC
- compliance with technical conditions for grid connection
- notification of FSC about carrying out complex tests in set period
- successful completion of complex tests
- connecting the substation to the grid

Substation commissioning:

- signing of the commissioning act by the customer, general contractor, authorized technical supervisor
- registration of the act with the justice authorities
- registration of rights to immovable property
- creation of a facility's technical passport
- sending documents to FSC in the set period



4. Solar park commissioning

- signing of the commissioning act by the customer, general contractor, authorized technical supervisor
- registration of the act with the justice authorities
- registration of rights to immovable property
- creation of a facility's technical passport
- sending documents to FSC in the set period



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Airport JSC



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PLATFORM FOR NATIONAL AND INTERNATIONAL PLAYERS IN RENEWABLE ENERGY SOURCES



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Member of the Board

ASSOCIATION AS INFORMATIONAL RESOURCE

The Association is a resource that will allow members of the Association to receive information about changes in legislation immediately.

Association is a resource that creates public opinion, and also contributes to the promotion of renewable energy. It will allow you to form a positive image around an event in the activities of both a member of the Association and the Association itself.



AIDA MAKSUT
Member of the Board



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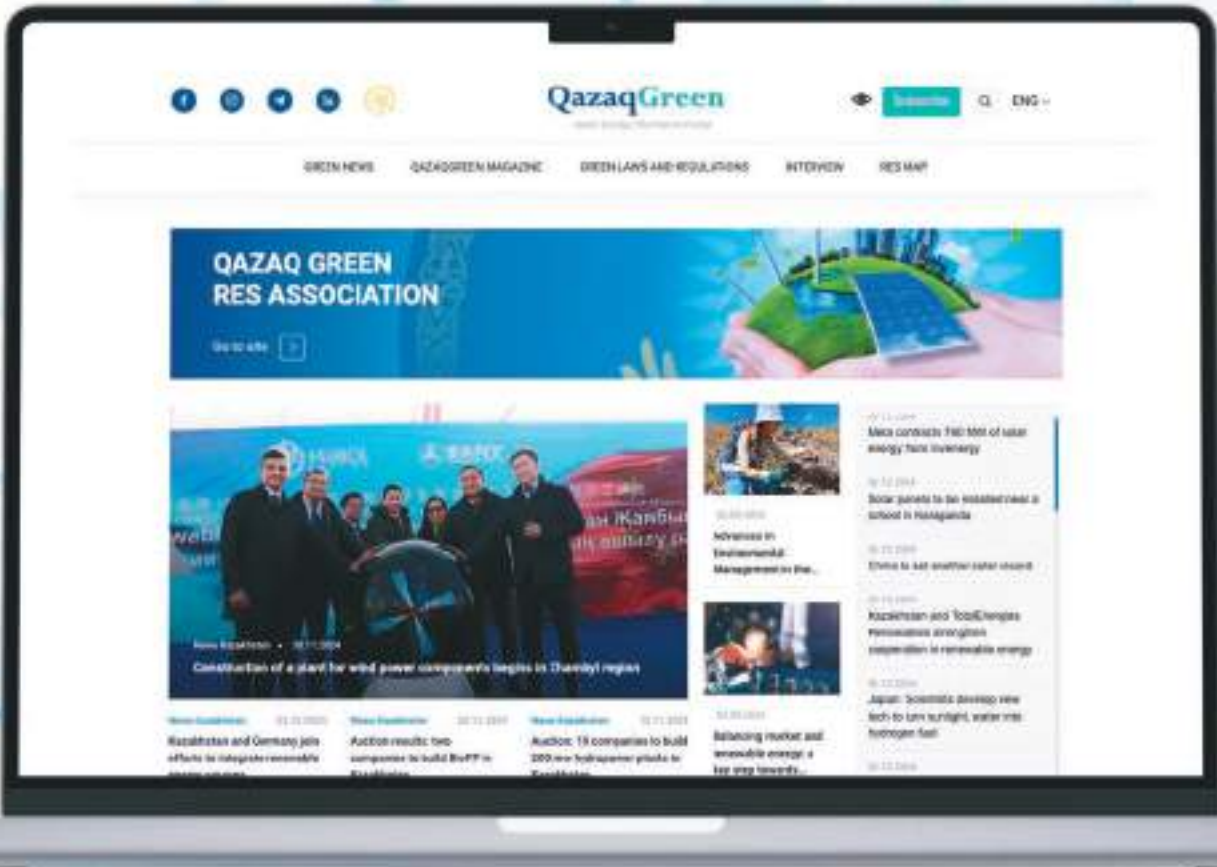
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The Konrad Adenauer Foundation is a political foundation of the Federal Republic of Germany. With its programmes and projects, the Foundation actively and effectively promotes international cooperation and mutual understanding.

The Representative Office of the Foundation in Kazakhstan began its work in 2007 at the invitation of the Government of the Republic of Kazakhstan. The Foundation works in partnership with government agencies, the Parliament of the Republic of Kazakhstan, civil society organizations, universities, political parties and enterprises.

The main purpose of the Foundation's activities in the Republic of Kazakhstan is to strengthen mutual understanding and partnership between the Federal Republic of Germany and the Republic of Kazakhstan through cooperation in the field of political, educational, social, cultural and economic development, thus contributing to the further development and prosperity of Kazakhstan.

The Konrad Adenauer Foundation has the following priorities in the Republic of Kazakhstan:

- Policy and Party Counselling
- Interparliamentary Dialogue
- Energy and Climate
- Local Self-Governance
- Political Education
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- Sur-Place Scholarships



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