KINSTELLAR

Energy Trends 2025

CEE and CENTRAL ASIA

Introductory note

We are delighted to share with you the first edition of **Kinstellar's Energy and Natural Resources Trends in the CEE and Central Asia for the year 2025**. This report brings together an overview of the latest and the up and coming developments in the energy and natural resources sector across our jurisdictions, with a particular focus on the opportunities and advancements in renewable energy, battery energy storage systems, hydrogen, nuclear, or oil & gas—each tailored to the specific energy landscape in: **Bulgaria**, **Croatia**, **Czech Republic**, **Hungary**, **Kazakhstan**, **Romania**, **Serbia**, **Slovakia**, **Turkey**, **Ukraine**, and **Uzbekistan**.

Through this report, we aim to provide both new and existing investors in our markets with an overview into the evolving trends and the more significant developments across the energy and natural resources sector in the regions that we cover, drawing on the expertise and insight of our team's professionals and practitioners.

Our markets are highly diverse, each facing its own challenges in the current geo-political climate, but across all our jurisdictions a few common trends emerge (irrespective of geography) such as the need to secure energy supply and independence (especially as regards natural gas), the transition towards an ecologically sustainable economy and renewable generation sources, together with longer term investments planned in the nuclear sector (both new build units and SMRs).

The start of the year proves that 2025 may be a year that brings significant changes in the energy space. Increased protectionism, tariffs and policy uncertainty are expected to drive up costs and supply chain risks. Demand for battery energy storage systems (BESS) is expected to increase considerably. Meanwhile, although investments in the clean energy transition and renewables are expected to continue rising in the short to medium term, they may be called into question in some countries, similar to what is happening in the US.

We hope you find this report insightful and valuable as we navigate together through the dynamic landscape of the energy and natural resources sector. Please do not hesitate to reach out for further discussions or if we can provide any additional information on the topics covered.

Iustinian Captariu
Partner, Firm Wide Head of the Energy and Natural Resources Sector
+40 21 307 1643
iustinian.captariu@kinstellar.com

Kinstellar at a glance

Kinstellar is a leading independent law firm in Central and Southeastern Europe, and Central Asia.

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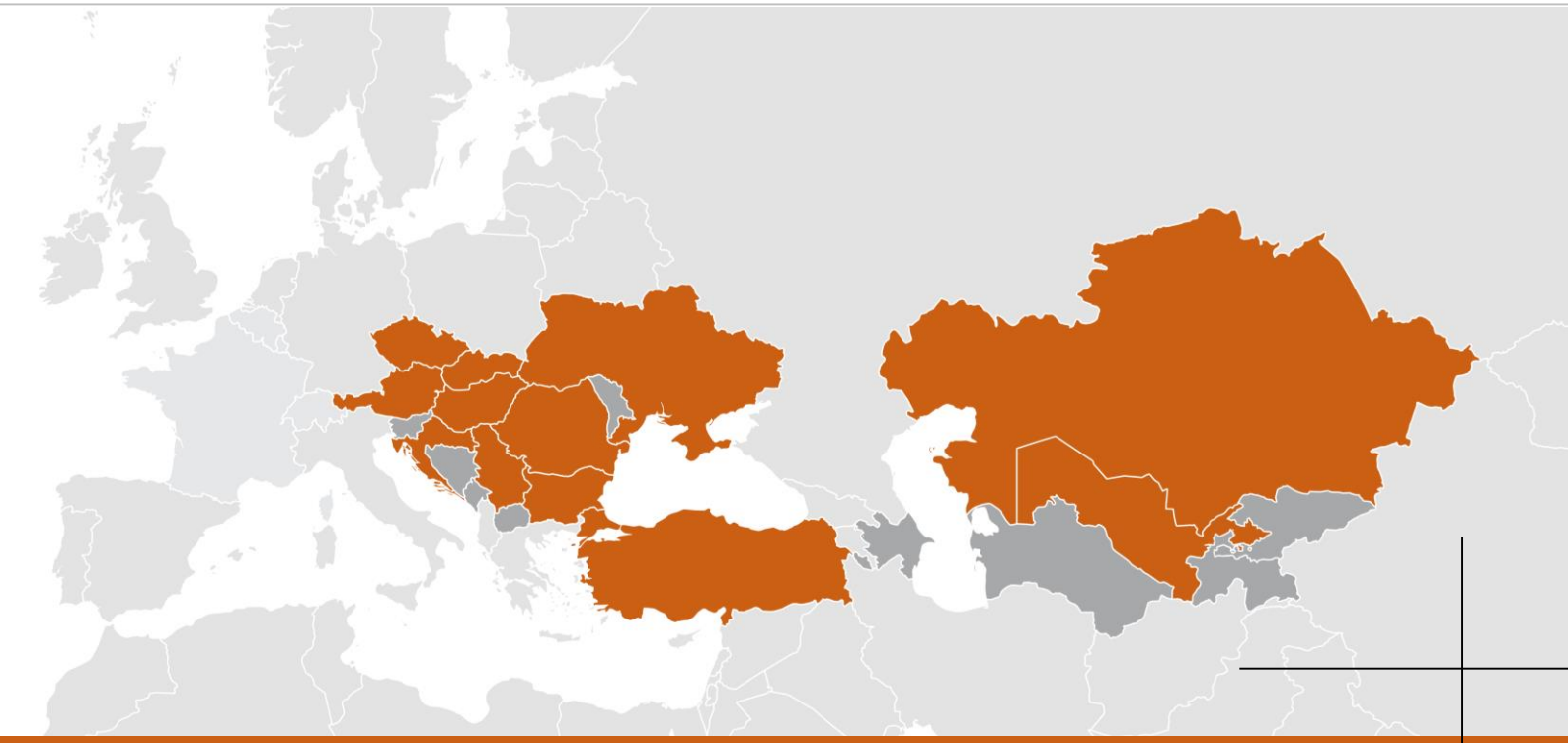


Table of contents

BULGARIA

Bulgaria's energy market has a strategic position in Southeast Europe as it acts as an energy hub that interconnects regional markets. The country's energy generation landscape is diverse, comprising nuclear power (37.36%), coal and gas thermal power (19.12%), hydroelectric (1.12%), and increasing inputs from renewable sources such as wind (9.24%) and solar (32.92%) energy. This mix not only ensures a stable supply (Bulgaria has the most energy-intensive economy in Europe) but also opens avenues for various trading opportunities (Bulgaria is a net exporter of electricity). The government intends to reduce its coal power capacity to gradually replace it with renewable power capacity. During this energy shift, the government plans to rely on nuclear power generation and natural gas to meet a significant portion of electricity demand.

Renewable energy

There has been a true revolution in solar energy. In 2019, solar capacity in Bulgaria was one gigawatt; in 2024, it has reached more than four gigawatts. The solar industry in Bulgaria is growing extremely fast, thus contributing to creating green electricity produced locally and partially replacing fossil fuel imported from Russia.

In order to achieve its goal of climate neutrality by 2050, Bulgaria has set as its priorities the acceleration of the process of introducing the production of energy from RES, the promotion of own consumption of energy from RES, the electrification of industry and grid development. Due to the electrification of industry, Bulgaria's gross electricity consumption is expected to reach 41,450 GWh—a 15% increase compared to current consumption. The planned development of RES projects by 2033 according to existing contracts for connection to the distribution networks is as follows: 14,785 MW of new solar power installed capacity, 830 MW of wind power, 1,608 MW of hydroenergy and small quantities of bioenergy. To accommodate this new capacity, the country's transmission system operator, ESO, has invested more than EUR 25 million in digitalisation of the grid. Modernisation and digitalisation of the medium-voltage grid is expected to be completed by end 2024.

Battery energy storage system (BESS)

The framework for the development of BESS was introduced in 2023 to secure the balance and flexibility of the power system. As a result, projects involving energy storage are already under development. Electricity storage facilities can be constructed as part of a new or existing power generation plant or as a standalone facility; their operation is not subject to a licensing regime. An ongoing national funding mechanism for the development of battery electricity storage systems under the National Recovery and Resilience Plan aims to achieve at least 3 GWh of capacity within the transmission electricity network (RESTORE). According to a press release from the Ministry of Energy, 151 bids were submitted, with a total value approaching BGN 5 billion, while the grant allocation amounts to nearly BGN 1.154 billion.

Offshore Wind Energy

Existing wind farms are onshore, as the country has not yet taken steps to tap into its significant offshore potential in the Black Sea. While new offshore wind projects are an integral part of Bulgaria's long-term plans for the development of its energy sector, the necessary regulatory framework for their development is still missing. The most attractive region of the Bulgarian coastal area, near the border with Romania, has a technical potential of 4.3-5 GW, with efficiencies of 45% to 48%.

Hydrogen

Bulgaria is currently producing large-scale grey hydrogen for industrial consumption, mainly through steam reforming. According to Hydrogen Europe, Bulgaria ranks 12th in hydrogen production out of the 32 EEA countries. Lukoil Neftohim Burgas, the largest oil refinery in Southeast Europe, uses around 80,000 t/g of hydrogen produced by steam reforming.

The 2023 National Hydrogen Roadmap sets out pathways for the transition to green hydrogen that could benefit a range of industries. These include regulatory and administrative measures such as initiating pilot projects, decarbonising power generation, modifying electricity trading regulations, and developing hydrogen transport infrastructure. Given the current EU and national funding dynamics, Bulgaria could potentially mobilise EUR 3.2 billion, supplemented by EUR 0.5 billion of own funds, including private investment, over the next decade, according to the National Hydrogen Roadmap.

Bulgartransgaz EAD, the Bulgarian natural gas transmission and storage system operator, and its Greek counterpart, DESFA, are currently conducting a joint assessment of the interest in the hydrogen market to identify the expected hydrogen capacity needs as well as possible production locations and delivery points to end users in both countries. The European Commission's First List of Projects of Common Interest and Projects of Mutual Interest includes a hydrogen project developed by Bulgartransgaz EAD as part of the Southeast European Hydrogen Corridor.

Nuclear

Bulgaria has one operating nuclear power plant, Kozloduy nuclear power plant, which is one of the largest such plants in the region. It provides for more than one-third of the national annual electricity generation. An expansion of the plant is currently underway. The state-owned company Kozloduy NPP – New Builds EAD has signed contracts with Hyundai and Westinghouse for the engineering and building of two new nuclear reactors using Westinghouse's latest, third-generation AP1000® technology. This is a massive project that will involve a large number of (sub)contractors for the various services involved in the development of the new units. The project is expected to be completed by 2034.

Gas

The gross consumption (delivery) of natural gas in Bulgaria in 2023 dropped to 2,552 million cubic meters, which is close to the absolute minimum for the last 23 years. Natural gas distribution in Bulgaria is carried out by private regional and local companies operating under a licensing regime and price regulation for distribution activities.

The natural gas market is fully liberalised. Bulgaria currently has two licensed gas exchanges in operation. Balkan Gas Hub EAD is responsible for the functioning of the organised gas trading market. The platform provides equal access, market prices, increased transparency, and improved competition in the natural gas market in Bulgaria.

In view of geopolitical developments in recent years and the halted supply of natural gas from Russia to Europe, the Ministry of Energy and Bulgargas EAD, the national natural gas distribution company, have taken actions to ensure diversification of natural gas supplies to the country and to fill the Chiren underground storage facility.

The gas interconnector Greece – Bulgaria (IGB) connects the natural gas transmission network of Greece and the Trans Adriatic Pipeline (TAP) with the Bulgarian transmission network. The pipeline provides about half of Bulgaria's domestic consumption needs and enables gas to be transported to other countries in the region. Its technical capacity allows for an increased gas transmission from 3 to 5 bcm/year.

An expansion project of the gas transmission infrastructure is currently underway: a public procedure was launched in early 2024 to increase the gas transmission capacity at the interconnection points from Greece to Bulgaria and from Bulgaria to Romania (the Vertical Corridor). Under the first public procurement procedure, new investments in the design, equipment, construction and commissioning of new facilities of the gas transmission infrastructure of Bulgartransgaz EAD are to be made with an estimated value of EUR 300 million.

Hydropower

In Bulgaria, the National Electric Company (NEK) owns 15 conventional hydro and pumped-storage plants. After delays in the repair projects and regulatory inconsistencies, the repair works of the second hydro unit of the Chaira Pumped Storage Hydro Power Plant were completed in December 2024. In addition, Toshiba Corporation and the ABB-Voith consortium have signed contracts for the repair and rehabilitation of hydro units 1 and 3, expected to be ready by the beginning of 2026, making three-quarters of the hydro power plant operational

Also, some new potential projects are in the pipeline. One of them is advised by the European Investment Bank, which will provide support to NEK regarding the construction of two large pumped-storage hydropower plants in southwestern Bulgaria, with a projected installed capacity of 800 MW per plant. With an estimated total cost of around EUR 900 million each, the plants are projected to become operational by 2032.

Another potential project is related to the construction of the hydrotechnical complex Turnu Magurele – Nikopol, consisting of two run-of-the-river hydropower plants on the Danube, with a projected installed capacity of 420 MW each. The project has been added to the annual list of approved cross-border energy projects for 2024, which enables the opportunity for support through Connecting Facility Europe.

Diana Dimova
Managing Partner (Sofia office)

+359 2 9048 331
diana.dimova@kinstellar.com

Mladen Minev
Counsel

+359 2 9048 381
mladen.minev@kinstellar.com

CROATIA

Croatia has significant green energy potential and a diversified energy mix including hydro, natural gas, nuclear, geothermal and renewables. Ranked 6th in BloombergNEF's 2023 Climatescope Index (and 1st in the European region), Croatia is recognised as the most attractive emerging market for energy investment in Europe. With its geostrategic position in the CEE region, abundance of natural resources and the government's positioning of the energy transition process at the forefront of the country's strategic interest, Croatia is on track to become one of the key players in the EU energy market.

Renewable energy

Croatia is strongly focused on increasing the share of renewable energy in its overall energy mix, with approximately 80% of electricity production coming from renewable sources and total investments in clean energy amounting to approximately EUR 240 million to date.

Hydropower plants, historically important in the Croatian energy matrix, are the leading production force in Croatia, accounting for approximately 40% of the total electricity production mix in 2024. The country continues to optimize existing plants and explore small-scale projects in river systems. Wind farms, mainly developed in coastal and mountain areas, have significant potential for scaling up the renewable energy sector. Solar projects are experiencing growth in total investment volume, supported by the government through incentives and subsidies targeting both the residential and commercial sectors, with additional incentives expected by late 2024. Recognizing the challenges posed by climate change, Croatia has introduced a regulatory framework for the development of agro-solar power projects, allowing PV plants on agricultural land. By integrating solar energy production into agriculture, agro-solar projects aim to increase energy independence, address climate change, and support the rural economy. Using agricultural residues and forestry by-products, Croatia is also developing biomass energy solutions, contributing to a circular economy and sustainable rural development.

In 2024, renewable energy production accounted for 22.3% (wind 15%, biogas and biomass 5%, and solar 2%), surpassing fossil fuel production of 19.7%. These trends reflect Croatia's strong commitment to the energy transition, supported by government incentives and subsidies, making Croatia one of the leading EU Member States in terms of RES production rates.

To incentivize investments and facilitate the development of renewable energy projects, Croatia has introduced regulatory changes enabling remuneration models for renewable energy producers, including:

- incentives provided to preferential producers through a market premium model, replacing the previous feed-in tariff and enabling competitive pricing approaches for quota allocation through public auctions conducted by HROTE, the Croatian energy market operator; and
- a regulatory framework for concluding PPAs, either as (i) physical PPAs or (ii) virtual (synthetic) PPAs (i.e., contracts for difference), allowing parties to freely negotiate contractual terms, including tariff and pricing arrangements.

Although demand and interest in renewable energy projects are growing, with around EUR 2 billion of investments pending, the Croatian RES market faces challenges, mainly related to limited grid capacity and the growing need for investments in grid development, complex permitting procedures and lack of regulation for grid connection, as well as a still-developing PPA market. Despite these challenges, new renewable energy projects continue to be deployed and banks continue to provide financing. Some of the key players in the market are: ENNA Group, INA, HEP, E.ON and MET.

Battery energy storage system (BESS)

With increasing balancing costs associated with renewable energy production, Croatia is witnessing growing demand and interest in the development of BESS projects, which are most often pursued alongside the development of PV production facilities. Although the BESS market is still developing, Croatia has a regulatory framework in place to ensure its implementation.

Hydrogen

In preparation for the transposition of the RED III Directive, Croatia has implemented a hydrogen strategy for the period up to 2050, focusing on developing the necessary infrastructure and enabling the use of hydrogen primarily in the transport sector. The country is also facilitating changes to the regulatory framework for hydrogen projects to achieve the European Green Deal and Europe's clean energy transition goals.

Geothermal

With its above-average natural characteristics, Croatia is one of the most attractive locations in Europe for geothermal development, with preliminary assessments indicating an estimated geothermal potential of over 1 GWh. In recent years, 75 areas have been identified, 43 of which are suitable for heating and 32 for electricity production. Seven exploitation fields and 28 exploration fields in the continental region are currently being exploited, with levels of approximately 10 MW each and expected investments of around EUR 400 million.

Gas

The Krk LNG Terminal, which started its operations in early 2021, is a key development for Croatia and one of the country's most profitable strategic projects. It enhances energy security, diversifies energy sources and reduces dependence on individual suppliers. The terminal enables the import of liquefied natural gas (LNG) from various global suppliers, thereby promoting competition in the energy market and improving price stability.

The successful operation of the terminal has resulted in capacity being sold out until 2037, and plans are underway to increase LNG capacity to 6.1 billion cubic metres by October 2025 (from the current 2.9 billion), positioning Croatia as a regional hub for gas supply in Southeast Europe and enhancing energy cooperation with neighbouring countries, including Slovenia, Hungary, as well as Austria and Germany. Some of the key players are: INA, PPD, HEP, MET and MVM.

Nuclear

As part of its long-term energy strategy, Croatia recognises nuclear energy as one of its strategic energy sectors, which provide reliable and low-carbon sources of electricity, ensuring energy independence and self-sufficiency. The Krško Nuclear Power Plant, equally owned by Croatia and Slovenia, accounted for 12.5% of Croatia's total electricity production in 2024 and will continue to operate until 2043. Croatia is interested in the development of small modular reactors (SMRs) and a possible joint venture with Slovenia for the construction of a second unit at the Krško Nuclear Power Plant (Krško 2), which could ensure a long-term strategic energy source for both Slovenia and Croatia, while private investors could be given the opportunity to participate in the project.By investing in sustainable practices and innovative technologies, Croatia is poised to build a resilient energy future, ensuring a cleaner environment and energy security for its citizens. Furthermore, the banking sector in Croatia is increasingly recognising the vital role of investment in energy, particularly in renewables.

Duško Žurić
Co-Managing Partner (Zagreb office)

+385 1 5555 630
dusko.zuric@kinstellar.com

Marija Vuchetich
Counsel

+385 1 5555 670
marija.vuchetich@kinstellar.com

CZECH REPUBLIC

The Czech Republic is strategically positioned as a key player in the Central European energy market, as characterised by its diverse energy resources and robust electricity networks and regulatory framework.

With a balanced energy mix that includes nuclear, renewable, and fossil fuels, the Czech Republic offers significant opportunities for international investors and businesses in the energy sector. According to the latest reports, the country ranks favourably in terms of investment attractiveness within the region.

Renewable energy

The Czech Republic is making substantial progress in its transition towards renewable energy sources, particularly in wind and solar power. The government has set ambitious targets to increase the share of renewables in the energy mix, aiming for 30% by 2030. Recent initiatives include a series of auctions for solar and wind projects that are expected to add over 1,500 MW of capacity by 2025. While investments in solar energy are leading the way, wind energy is also gaining momentum, supported by favourable policies and technological advancements.

The current geopolitical climate has heightened the sense of urgency around the need for energy independence and sustainability, making this an opportune moment for investment in the Czech Republic's renewable sector. Recent regulatory reforms aim to attract foreign capital and enhance project viability. These include:

- Streamlined permitting processes to reduce administrative burdens on new projects
- Enhanced feed-in tariffs and support mechanisms for renewable energy producers
- Initiatives to promote energy efficiency and reduce carbon emissions across sectors

As one of the most attractive markets in Central Europe, the Czech Republic is witnessing a surge in investments aimed at expanding its renewable generation capacity. However, challenges such as grid capacity constraints and land use regulations must be addressed to fully realise this potential.

Notable players actively investing in this space include ČEZ Group and PRE.

Battery energy storage system (BESS)

Demand is increasing for Battery Energy Storage Systems (BESS) in the Czech Republic, driven by the increasing integration of renewables into the grid and the need for reliable backup solutions. The market for BESS is in the initial stages of development. However, we expect this market to grow significantly in 2025 and beyond (as new legislation will allow stand-alone battery solutions and as more renewable projects come online and balancing costs rise). Investors have expressed interest in both standalone BESS projects and those integrated with renewable generation facilities.

Among key players in this sector are CEZ Group, E.ON, SUAS, C-energy and Solar Global.

Hydrogen

The hydrogen sector in the Czech Republic is emerging as a small but critical component of the country’s overall energy strategy. The government recognises hydrogen's potential as a clean energy carrier and is actively promoting research and development in this area. Initiatives are underway to establish hydrogen production facilities using renewable electricity, with an emphasis on so-called “green” hydrogen applications across various sectors including transportation and industry. Regulatory frameworks are being adapted to facilitate investment in hydrogen infrastructure.

The main current objective of the Czech strategy is to invest in hydrogen transportation capacities, both at the TSO and DSO levels, to better facilitate the efficient importation of green hydrogen.

Key players in this sector are NET4GAS and GasNet.

Nuclear

Nuclear power remains a cornerstone of the Czech Republic's energy strategy, providing approximately 35% of the nation’s electricity. The government is committed to maintaining and expanding its nuclear capacity, with plans to construct new reactors at existing plants in Dukovany and Temelín. This initiative not only aims to bolster energy security but also positions the country as a leader in low-carbon electricity generation within Europe.

The Czech Republic's focus on nuclear technology includes exploring innovative solutions such as Small Modular Reactors (SMRs), which promise enhanced safety and efficiency. The Czech Republic also has significant industrial manufacturing capacities in the nuclear industry sector, which will continue to play an increased role in the ensuing years.

Key players involved in this sector include ČEZ Group, the Korean firm KHNP, and the British firm Rolls-Royce SMR.

Subsidies

Various programs that contribute to implementing climate protection policies and energy targets make returns on investment for the construction of new renewable energy projects more feasible. Several government subsidy programmes are available to assist with capital expenditures for developing photovoltaic and other renewable energy projects. In this regard, the most significant subsidy scheme is the Modernisation Fund, which is a support scheme offering support for ten lower-income EU Member States in their transition to climate neutrality. The scheme offers assistance for the modernisation of energy systems and the improvement of energy efficiency via money generated mainly from the EU emissions trading scheme.

The allocation for the Czech Republic from this fund for 2021 to 2030 will likely be around EUR 20 billion, of which about EUR 8 billion has already been used. Several programmes operate under this scheme in the Czech Republic to support areas such as the modernisation of the heating sector, transportation modernisation, energy efficiency, as well as the development of new renewable energy source projects, to which nearly 40% of the entire Czech part of the fund is anticipated to be allocated. The subsidy is typically provided ex-post and covers up to 50% of the given project's costs.

For projects built prior to 2013, support continues to be provided through feed-in tariffs and green bonuses.

Through these transformative developments across its energy landscape, the Czech Republic aims to significantly expand its sustainable energy solutions. The combination of a supportive regulatory environment, strategic investments, and a commitment to innovation creates an attractive proposition for international investors looking to engage with one of Europe's most dynamic energy markets.

Kamil Blažek
Partner

+420 221 622 160
kamil.blazek@kinstellar.com

Michal Forýtek
Counsel

+420 221 622 228
michal.forytek@kinstellar.com

HUNGARY

Hungary serves as a major east-west, north-south interconnection point in Europe. The country has a diverse energy mix entailing renewable energy and conventional energy (including natural gas and nuclear power). The Hungarian economy is primarily export-oriented, which places great importance on foreign trade and investment. The export-orientated economy is dependent on energy, and it is the Hungarian government's objective to provide the required energy resources primarily from domestic sources.

Renewable energy

Electricity consumption is expected to rise continuously until 2050, when Hungary aims to achieve climate neutrality. According to the National Energy and Climate Plan, Hungary aims to make 90% of its electricity production carbon free by 2030, which is driving demand for renewable projects. Currently there is low installed wind turbine capacity, but the Hungarian government aims to expand production capabilities. Despite limited available grid capacities, there remains a significant focus on solar power plant developments.

Although geographical conditions do not provide significant opportunities for hydropower, the potential for relying on other renewable sources such as biogas and biomethane is expected to be further explored. The role of low-carbon emission gases and the geothermal energy are expected to play a significant role in the energy mix and to decrease Hungary's import dependency on natural gas. Therefore, changes in the regulatory environment for promoting low-carbon emission gases are expected to be adopted by the Hungarian government. Investments in the increased utilisation of non-recyclable waste in heat generation is also expected.

Although there are current difficulties in the integration of significant renewable electricity generation (such as the requirement to have greater power system flexibility), Hungary places more emphasis to overcome such difficulties (such as the establishment of new CCGT power plants to balance the grid, investments to the public grid development, support for electricity storage projects, etc.).

Regulatory initiatives reflect a proactive approach to adapting to the changing dynamics of the energy sector and ensuring the reliable operation of the Hungarian electricity system. In addition to the technical constraints mainly resulting from the lack of available grid capacities, the Hungarian RES market also suffers from regulatory interventions and a strict FDI control. Under the FDI rules, the Hungarian state has a statutory pre-emption rights regarding any PV transactions where the buyer is a foreign controlled entity. The regime applies also to EU companies.

As a result of the foregoing, investors are either from Hungary or from China, and the role of investors from the EU is decreasing. Main players on the market are MVM Group, MET, SEPM, EDPR.

Battery energy storage system (BESS)

The development of BESS can play a key role in achieving Hungary's climate neutrality target, and the Hungarian government intends to build significant capacity of energy storage facilities. Investment is being driven by the continuous expansion of solar capacity. In addition, as of 1 January 2024 a new tax incentive is available regarding investments in electricity storage.

Hydrogen

In line with the European trend, hydrogen is gaining more attention in Hungary. The main objectives of Hungary's National Hydrogen Strategy are the production of large volumes of low-carbon and decentralised carbon-free hydrogen, decarbonisation of industrial consumption (using hydrogen), developing hydrogen-based green transport, and developing green balancing energy infrastructure in order to ensure that Hungary becomes an active participant in Europe's hydrogen sector.

Nuclear

Hungary is dedicated to the use of nuclear power plants in its energy mix in order to meet its climate neutrality objectives. Currently, nuclear energy is the primary source of baseload electricity. Hungary currently operates the Paks Nuclear Power Plant and plans to extend its operation time.

In addition to existing nuclear capacities, the establishment of a new nuclear power plant (Paks II Project) is ongoing. The Paks II Project foresees the installation of two new blocks, each with 1,200 MW capacity.

Balázs Sepsey
Managing Partner (Budapest office)

+36 1 428 4417
balazs.sepsey@kinstellar.com

László Bujáki
Senior Associate

+36 1 428 4408
laszlo.bujaki@kinstellar.com

KAZAKHSTAN

Kazakhstan has world-class reserves of oil, gas, coal, uranium and many other strategic mineral resources. However, notwithstanding the plentiful supply of natural resources, the government of Kazakhstan has realized the benefits of encouraging the development of renewable energy sources. Since the adoption of the Law on State Support for the Use of Renewable Energy Sources in 2009, Kazakhstan has made significant efforts to diversify its energy sources. According to a report by FDI Intelligence, as at the end of 2023, Kazakhstan holds the 6th place among the world's top countries for attracting foreign direct investments. The top trends in Kazakhstan's energy sector are summarized below.

Renewable energy

According to an E&Y report on the investment attractiveness of Kazakhstan in 2024, the volume of investments into the development of renewable sources of energy in the country is increasing due to the government's decision to gradually reduce the dependence of Kazakhstan's economy on the extractive industries. According to UNCTAD data, during the period from 2015 to 2022, the volume of investments in renewable energy projects totalled USD 56.3 billion. In 2023, the number of renewable projects more than doubled compared to the previous year.

Further, in the first six months of 2024, electricity production from renewable energy sources totalled 3.8 billion kWh, which is 6.47% of Kazakhstan's total electricity production. There are currently 148 RES facilities in the country with a total installed capacity of 2,900 MW. By the end of 2024, six new RES projects are planned to be commissioned, with a total capacity of 196.9 MW.

The Concept of the Transition to the Green Economy approved by the government in 2013 sets the following renewable energy targets: 15% by 2030, 30% by 2040, and 50% by 2050 (including renewable and other "alternative" sources).

Overall, Kazakhstan has very favourable conditions for the development of renewable energy, particularly solar, wind, biomass and bioethanol energy. Hydropower energy and wind energy also have great prospects for growth in terms of their commercial use in the short and medium term. In addition, central and northern Kazakhstan are seen as being particularly suitable for locating wind power stations over the next five years: ten sites have been identified, which are each targeted to generate 500 MW or more. According to experts, the potential for wind energy in Kazakhstan is estimated to be 1,820 billion kWh of energy per year.

Nuclear

According to World Nuclear Organisation, Kazakhstan has been an important source of uranium for more than 50 years and became the world's largest uranium producer in 2009. Production in 2023 was 21,112 tU, and the National Atomic Company Kazatomprom Joint Stock Company (Kazatomprom) has said that it expects 2024 production to be 21,000 tU–22,500 tU. Of Kazakhstan's 13 uranium mining projects, three are wholly-owned by Kazatomprom and 10 are joint ventures with foreign equity holders. In 2023, Kazatomprom's share of production was 11,170 tU.

Kazakhstan's first nuclear power plant in the city of Aktau was in operation from 1973 until 1999. Ever since, there have been considerations regarding the construction of a new nuclear power plant. In recent years, these intentions have picked up speed. In September 2023, President Tokayev instructed the government not only to begin comprehensive discussions regarding the construction of a nuclear power plant but also to put it up to a national referendum, which took place on 6 October 2024.

Preliminary results released by the Central Election Commission of the Republic of Kazakhstan show that there was a 63% turnout for the referendum, with 71.12% of the 7.8 million people who voted answering yes to the question on the construction of a nuclear power plant in Kazakhstan. It remains to be seen what next steps will be taken and what technology will be chosen in the end (whether French, Korean or Russian).

Hydrogen

In 2022 the government of Kazakhstan and Svevind Energy GmbH signed an investment agreement on the construction of "green" hydrogen production and a distribution hub in the Mangystau region of Kazakhstan. At the end of 2022, Svevind signed a contract with ILF Consulting Engineers to procure the concept design study, the next important step in project development. Hyrasia One, Svevind Group's subsidiary, plans to produce two million tons of "green" hydrogen annually. The project involves building and operating a desalination plant with 255,000 cubic meters per day, 40 GW of renewable energy (wind, solar), and 20 GW of water electrolysis production, both for export and domestic consumption.

The project is moving forward with a preliminary front-end engineering and design program (pre-FEED), as outlined in the investment agreement signed during a visit by European Council President Charles Michel last year. The investment is preliminarily estimated at EUR 50 billion, with construction expected to start in 2027 and all facilities projected to be operational by 2032. If completed, it would become the world's largest green hydrogen facility and support Kazakhstan in increasing its share of renewable energy to 15% by 2030 and 50% by 2050.

Oil & Gas

Kazakhstan has demonstrated significant volumes of oil and gas production. In 2024, a total of 44.7 million tonnes of oil and gas condensate have been produced, with the bulk coming from Tengizchevroil, Karachaganak Petroleum Operating B.V. and North Caspian Operating Company B.V. Gas production also rose to 30 billion cubic metres, up 101% year-on-year.

In the first half of 2024, Kazakhstan's oil industry showed stable dynamics. In particular, the company 'Karachaganak Petroleum Operating. B.V.' (KPO) is actively working on the expansion of the Karachaganak field. The development plan includes the Karachaganak-1A and Karachaganak-1B expansion projects, aimed at maintaining current production of liquid hydrocarbons levels at 11 million tonnes per annum. These projects are expected to be completed in 2028.

Tengizchevroil ("TCO") continues to implement the Future Expansion Project / Wellhead Pressure Management Project, which will increase production by 12 million tonnes per annum. In April 2024, TCO commenced operation of the UMPP facilities, and the PBR facility is scheduled to launch in June 2025.

Joel Benjamin
Managing Partner (Central Asia)

+ 7 727 355 0530
joel.benjamin@kinstellar.com

Almas Zhaiylgan
Counsel

+ 7 727 355 0567
almas.zhaiylgan@kinstellar.com

ROMANIA

Romania is emerging as a pivotal player in the CEE regional energy landscape, thanks to its abundant natural resources and strategic growth initiatives. The country's energy generation landscape is diverse. As of October 2024, the primary sources of energy produced and delivered into the network were: 27.88% hydro, 22.84% nuclear, 20.02% gas, 13.85% coal, 11.78% wind, 2.63% solar and 0.85% biomass.

With a diverse energy mix encompassing natural gas, nuclear power, hydro, and renewable energy, Romania presents a unique opportunity for investors and businesses. Romania ranked 5th in BloombergNEF's 2024 Climatescope Index of the most attractive emerging markets for energy investments. Compared to 2023, Romania has improved in the power rankings by five places, from 10th to 5th place. The top trends in energy investments in Romania are listed below.

Renewable energy

Romania is leading the charge in reducing carbon emissions with substantial investments in solar, wind, and hydroelectric power. From 2025 to 2034, at least 267 projects with a total approved evacuation power of 11,191 MW are scheduled to be commissioned, with 145 projects (5,440 MW) expected to be operational by the end of 2025. The majority of investments are in photovoltaic ("PV") plants, followed by wind power, where investments are lower than solar. Hydro power remains underdeveloped due to multiple issues, such as regulatory and environmental challenges.

The current geopolitical situation, driven by a need to ensure energy independence and a sustainable path forward in terms of ESG, has accelerated the shift towards renewable energy sources, making now the ideal time to invest in Romania's energy sector. Recent regulatory changes are designed to attract investments and feature:

- competitive grid allocation mechanisms starting in 2026 (enabling producers to book grid capacity through auctions), unlike the current approach of granting grid capacity bilaterally on a first-come, first-served basis;
- new support schemes based on the Contracts for Difference mechanism (the first CfD auction was held at the end of 2024 for 1,500 MW solar and wind, the second round of auctions for the remaining 3,500 MW are expected in 2025), the Modernisation Fund and the National Recovery and Resilience Plan targeting, for example, wind and solar renewable energy production, green hydrogen production in electrolysis plants, battery energy storage systems.

Ranking second only to Poland in the CEE region, Romania is attracting some of the most significant investments in renewable energy generation capacity. Despite the optimism of the market, certain challenges remain, including limited grid capacity and availability and the growing need to invest in grid development, land fragmentation and cumbersome land securing rights process, a still-developing PPA market and new regulatory issues to overcome (including recent Foreign Subsidies Regulation-based in-depth investigations from the European Commission in Romania). Despite these challenges, investor interest in Romania's renewables sector remains high, and banks, together with IFIs such as EBRD, are financing projects that are at the ready-to-build stage.

Battery energy storage system (BESS)

Together with investments in renewable energy and rising balancing costs, we see the market rapidly evolving for the development of BESS projects, either as stand-alone projects or as behind-the-meter second-phase developments with renewable projects. While the market is still in its infancy, we expect it to grow rapidly and align with Western Europe within a few years. Several active players are already planning BESS projects that could achieve storage capacities exceeding 2 GWh.

Offshore Wind Energy

While offshore wind is currently mostly a North Sea and Baltic Sea game, a new era of potential investments is taking shape in Eastern Europe, and Romania is making significant strides in developing its offshore wind energy sector. In April 2024, a key piece of legislation entered into force, regulating the general framework for the implementation of offshore wind energy projects in Romania. This makes Romania the first country in the Black Sea region to adopt such legislation and is part of the country's goal to become central to Southeast Europe's energy security and growth strategy.

Hydrogen

The hydrogen energy market in Romania is showing promising developments. Clean hydrogen plays an important role in achieving the European Green Deal and Europe's clean energy transition, as it has various uses such as fuel, feedstock, energy carrier, and storage, as well as many possible applications across the industrial, transportation, power, and building sectors. At the national level, changes to the regulatory framework are being implemented in order to encourage the business sector to develop hydrogen projects.

Oil and Gas

The exploitation of Romanian natural gas from the Black Sea's depths has emerged as a tangible factor in strengthening energy supply security for the countries in the region and for the entire European Union. The largest producers of natural gas in Romania are Societatea Națională de Gaze Naturale Romgaz, OMV and Black Sea Oil & Gas SA. Societatea Națională de Gaze Naturale Romgaz was the largest producer of natural gas in 2024, reporting a gas production of 4.96 billion cubic meters (bcm), up by 3.64% compared to 2023.

It is worth mentioning that the first delivery of offshore gas took place in June 2022 through the Midia Gas Development (MGD) project, developed by Black Sea Oil & Gas SA (owned by Carlyle International Energy Partners and the European Bank for Reconstruction and Development) and its partners. The MGD project is the first new offshore gas development project in the Romanian Black Sea to be built in over 30 years and has the capacity to produce 10% of Romania's gas needs.

Additionally, OMV Petrom and Romgaz backed plans to develop two commercial natural gas fields in the Romanian Neptun Deep perimeter in the Black Sea, which are expected to generate approximately 100 billion cubic meters of natural gas over a decade.

In the second quarter of 2024, Romania emerged as the largest natural gas producer in the European Union for the first time, producing 2.3 billion cubic meters (bcm), according to data recently published by the European Commission. Moreover, Romania is poised to become even more significant as a natural gas producer once Neptun Deep becomes operational.

Nuclear

Nuclear energy is a cornerstone of Romania's energy strategy, providing a reliable and low-carbon source of electricity. Cernavodă Nuclear Power Plant currently covers around 20% of Romania's electricity needs. With one reactor scheduled for refurbishment in 2027 and plans to build two new reactors, Romania is set to significantly boost its nuclear output.

Romania's state-owned Nuclearelectrica has approved the investment decision and a deal with contractors for the project to build two new reactors at the country's only nuclear power plant, Cernavodă, each with a capacity of 700 MW. Candu Energy Inc., an AtkinsRéalis company, won the contract as part of a joint venture with Fluor Corp., Ansaldo Nucleare and Sargent & Lundy. Romania is also exploring the development of Small Modular Reactors (SMRs), seeking to become one of the first countries in the world to implement this technology in cooperation with the US company NuScale.

Conclusion

Through the historic level of investment in the energy sector, Romania has the potential to become a regional energy leader. Renewable energy, together with BESS projects, is expected to be a key driver of growth in the years to come. Natural gas from the Black Sea's Neptun Deep perimeter is expected to have a significant impact on both Romania and the region while also giving a boost to the local industry relying on natural gas.

Iustinian Captariu
Partner, Firm-wide Head of Sector

+40 21 307 1643
iustinian.captariu@kinstellar.com

Ioana Criste
Senior Associate

+40 21 307 1655
ioana.criste@kinstellar.com

SERBIA

Serbia is emerging as a key player in the Western Balkan region's economic landscape, driven by its growing industrial base, strategic location, and government-backed reforms. With investment opportunities spanning sectors such as energy, manufacturing, agriculture, and technology, Serbia offers a dynamic and diversified environment for businesses and investors. Serbia has also been improving its infrastructure and energy sectors, with increasing emphasis on renewable energy and digitalisation. Serbia stands out as an attractive place for investment in the region, offering easy access to Southeast Europe, supported by free trade agreements and a business-friendly environment. The top trends in energy investment opportunities in Serbia are listed below.

Renewable energy

Serbia is making significant strides in reducing its carbon footprint with new investments in solar, wind, and hydropower projects, bearing in mind that Serbia's electricity production is predominantly reliant on coal, particularly lignite, which accounts for around 70% of the country's total energy generation. Hydropower is the second-largest source of electricity, contributing about 25%–30% of total energy production. Serbia has significant hydroelectric potential, with major plants along the rivers Drina and Danube, such as the Đerdap (Iron Gate) complex, which is one of the largest hydropower stations in Europe.

Between 2024 and 2030, numerous renewable energy projects are planned, with a strong focus on solar power, followed by wind energy. The government is actively promoting investments in renewable energy through incentives and regulatory changes, aiming to diversify its energy portfolio and reduce reliance on coal. While solar dominates Serbia's renewable energy landscape, wind is steadily gaining ground, but hydroelectric power development faces challenges due to regulatory and environmental hurdles.

Recent regulatory updates aim to attract investors, including competitive grid allocation mechanisms that will allow producers to secure grid capacity through auctions. New support programs, such as Contracts for Difference (CfDs), are targeting key areas like wind and solar energy production and photovoltaic technology development.

Nuclear

Although Serbia currently does not have any nuclear power plants in operation, nuclear energy is increasingly being considered as part of the country's long-term energy strategy to reduce carbon emissions and ensure energy security. With rising energy demands and a commitment to decarbonisation, Serbia is exploring nuclear power as a potential low-carbon and reliable electricity source.

Serbia took a significant step by awarding a tender to France's Electricité de France (EDF) and the French engineering consultancy EGIS to conduct comprehensive feasibility studies for the potential deployment of nuclear power. This study is a key phase in evaluating Serbia's capacity to host nuclear reactors, including the potential introduction of Small Modular Reactors (SMRs), a technology that offers a safer, more flexible alternative to traditional nuclear plants. This could position Serbia to be an early adopter of SMRs in the Western Balkan region.

As Serbia seeks to diversify its energy mix and reduce reliance on coal, nuclear energy presents a significant opportunity for future investments, particularly in light of global trends toward clean and sustainable energy sources. Through potential partnerships and investments in nuclear technology, Serbia has the opportunity to become more energy independent and align itself with regional and global sustainability goals.

Battery energy storage system (BESS)

Alongside the growing investments in renewable energy, Serbia is beginning to see increasing interest in BESS projects to help address grid balancing and energy storage needs. While still in its early stages, the market for BESS is expected to develop rapidly as renewable energy projects grow and balancing costs rise. In Serbia, BESS projects are emerging both as standalone installations and as extensions of existing renewable energy developments.

Another notable initiative in Serbia is the Bistrica project, planned on the Lim River in southwestern Serbia, that aims to develop a pumped-storage hydropower plant (PSHPP) to enhance the country's energy storage capabilities. Pumped-storage hydroelectric plants like Bistrica are designed to store energy by pumping water to a higher elevation during periods of low electricity demand and releasing it to generate electricity during peak demand.

Radovan Grbović
Partner

+381 64 4064 447
radovan.grbovic@kinstellar.com

Sara Ostojić
Senior Associate

+381 62 8809 304
sara.ostojic@kinstellar.com

SLOVAKIA

Slovakia has steadily been moving towards sustainable energy solutions to meet its climate goals and energy needs. Although traditionally reliant on nuclear power and fossil fuels, the country is increasingly embracing renewable energy sources, in line with the European Union's ambitious targets to reduce greenhouse gas emissions. This section explores Slovakia's renewable energy landscape, including its progress, challenges, and potential for future growth.

Energy Profile

Historically, Slovakia has largely depended on nuclear power and natural gas for its electricity supply. Nuclear power alone accounts for about 55% of Slovakia's electricity production, making it one of the highest shares in the EU. While this has contributed to the country's relatively low carbon footprint in electricity generation, nuclear energy is not considered renewable. Although the government has plans to construct a new nuclear reactor at the largest nuclear power plant in the country, Jaslovské Bohunice, it has also recognized the need to diversify its energy mix, especially with increasing EU regulations and incentives pushing for renewable energy adoption.

Slovakia's current energy mix includes a significant share of hydropower along with a smaller but growing share of solar and wind energy, with plans to add geothermal energy to the mix as well. In recent years, the government has stepped up its commitment to achieving a higher percentage of its electricity from renewables. The EU's Renewable Energy Directive requires Member States to source at least 32% of their energy from renewable sources by 2030; Slovakia is currently at 23%.

Hydropower

Hydropower is the dominant source of renewable energy in Slovakia. The country's numerous rivers, including the Danube and the Váh, have facilitated the construction of a total of 24 larger (above 10 MW) and 198 smaller (under 10 MW) hydroelectric power plants, which contribute approximately 17% of Slovakia's total electricity output. The Gabčíkovo dam and Čierny Váh dam are the country's largest hydropower plants, with a combined generating capacity of 1,455 MW—more than half of the country's total hydropower production—while also providing flood control.

Hydropower is regarded as a reliable and cost-effective renewable energy source with benefits including full-process automation, remote control and a long lifespan of the process equipment. The utilization of Slovakia's hydropower potential is estimated at 57.5%.

Solar Power

Although the volume of solar power generation in Slovakia is around half that of its neighbor the Czech Republic, the country has seen a steady increase in solar power generation over the past decade. Slovakia's solar energy potential is concentrated in its southern regions, where there is higher solar irradiance. Although solar energy currently accounts for only about 2% of Slovakia's total electricity generation, the sector has experienced steady growth due to technological advancements, decreasing costs, and government incentives, such as feed-in tariffs.

Wind Energy

Wind energy in Slovakia remains underdeveloped compared to other EU countries. Currently, wind power accounts for a negligible portion of the country's energy mix, but there are efforts underway to explore suitable sites, particularly in lowland areas, and to develop this field. The government has put forward a plan to increase electricity generation from wind sources by 250% and to boost installed capacity from three megawatts to 750 megawatts by 2030.

Geothermal Energy

Geothermal energy, though still in its infancy in Slovakia, holds promise as a clean and sustainable energy source. The country's natural geothermal resources, particularly in the southern and eastern regions, are currently being studied for their viability in producing both electricity and heat.

The most promising projects are the geothermal borehole near Ďurkov and the geothermal power plant project near Prešov. The former, which, in the words of a former Minister for Investments, is a national priority, is the largest geothermal project in Central Europe. The project has been valued at nearly EUR 88 million and is expected to be completed in 2026. If completed as planned, geothermal energy could become a valuable part of Slovakia's renewable energy portfolio.

Battery energy storage system (BESS)

Slovakia is witnessing growing demand and interest in the development of BESS projects, which are most often pursued alongside the development of solar power production facilities. Construction of BESS projects was recently supported by the grants from the EU's Recovery and Resiliency Facility.

Nuclear

The intention to construct a new nuclear power source with an installed capacity of 1,200 MW using existing infrastructure at the Jaslovské Bohunice nuclear power plant was approved by the Slovak government on 15 May 2024. The new nuclear power source is planned to be a Generation III+ nuclear reactor. Experts estimate the price of construction at EUR 10 billion–EUR 15 billion. Deadlines for preparatory and implementation work, the expected timetable for construction, the financial arrangements for construction, and the process for selecting the investor and the technology suitable for the construction of the new nuclear power plant are expected to be announced by the end of October 2024. Work on the new nuclear power plant is estimated to start by the end of 2031.

In September 2024, Robert Fico, the prime minister of the Slovak Republic, travelled to South Korea to discuss the potential involvement of Korea Hydro & Nuclear Power (KHNP) in the construction of the new nuclear power plant. The prime ministers of Slovakia and South Korea signed a memorandum of understanding on energy cooperation between the two countries. Before his visit to South Korea, Robert Fico announced that the Slovak government would also talk to nuclear companies from USA and France.

Conclusion

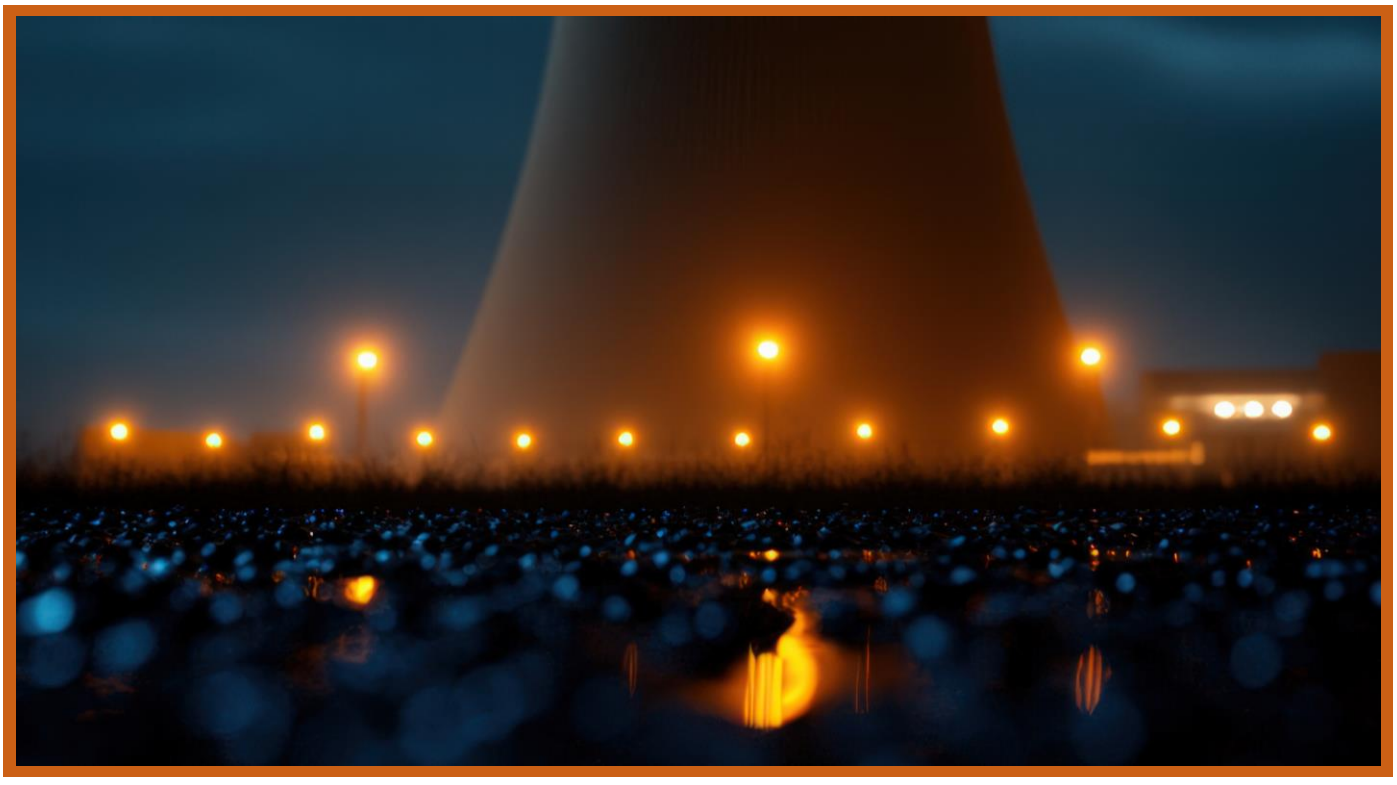
The future of renewable energy in Slovakia looks promising. As technology continues to advance and the cost of renewable energy sources like solar and wind decrease, Slovakia is well-positioned to diversify its energy mix and reduce its carbon footprint. The country's commitment to the EU's climate goals, combined with the untapped potential of renewable resources like geothermal and biomass, suggests that Slovakia could play an increasingly significant role in the global shift towards sustainable energy.

Roman Oleksik
Partner

+421 2 5929 1155
roman.oleksik@kinstellar.com

Miroslav Németh
Of Counsel

+421 2 5929 1116
miroslav.nemeth@kinstellar.com



TURKEY

Turkey has had the fastest-growing energy demand among OECD countries over the past two decades, ranking second to China in terms of the increase in electricity and natural gas demand worldwide. Aiming to decrease its energy import dependency, the country is diversifying its energy resources by increasing its renewable energy capacity, adding nuclear energy to the mix, and maximizing the use of indigenous resources.

Turkey has set a goal to increase the share of renewable energy sources from the current 53% to 64.7% by 2035 under the National Energy Plan for 2035, unveiled in 2023, and it offers lucrative investment opportunities, particularly for renewable energy investors.

Located in a region adjacent to approximately 60% of the world's proven oil and natural gas reserves, Turkey aims to be a hub for energy trade in its region and contribute to regional and global energy security. The Baku-Tbilisi-Ceyhan Crude Oil Pipeline (BTC), South Caucasus Natural Gas Pipeline (SCP), Baku-Tbilisi-Erzurum Natural Gas Pipeline (BTE), Turkey-Greece Natural Gas Interconnector (ITG), Trans-Anatolian Natural Gas Pipeline (TANAP), and TurkStream are among the projects that have been realized and considered within this scope.

Renewable Energy

Turkey, targeting net-zero emissions by 2053, is eager to realize its renewable energy potential to the fullest. In line with the National Energy Plan for 2035 unveiled in 2023, Turkey has set a target of increasing its installed solar power capacity from 12.4 GW to 52.9 GW by 2035 while tripling its installed wind power capacity to 29.6 GW (24.6 GW onshore, 5 GW offshore). The country also aims to increase its hydroelectric capacity to 35.1 GW and its geothermal and biomass capacity to 5.1 GW by 2035.

Turkey has offered a feed-in-tariff mechanism for renewable energy investments since the 2000s, though as of 2021, US dollar-based tariffs have been converted into a Turkish lira-based system.

Despite still having coal power (19.2%) and natural gas (21.7%) in its energy mix, the share of renewable energy sources in the country's electricity-generation landscape is increasing, and currently, renewables make up more than 50% of the country's total electricity generation capacity (as of August 2024: 28.3% hydroelectric, 10.8% wind, 16.2% solar, and 1.5% geothermal).

Aiming to achieve the targets set in the National Energy Plan for 2035, Turkey has introduced and plans to introduce legislative changes to open the path for further investments and ease the permitting process. Recent legislative changes enable investors to deploy floating solar power plants. Turkey also plans to implement a permitting scheme enabling investors to complete the permitting process in less than two years for greenfield renewable projects.

Turkey also conducts technical studies to identify potential offshore wind areas to harness its offshore wind potential, which is estimated at 75 GW by the World Bank (12 GW of which is deemed most suitable for fixed-bottom offshore wind and 63 GW for floating offshore wind). The first area designated for this purpose is in the Marmara Sea.

As an alternative to licensed and unlicensed renewable energy models, Turkey has developed an alternative model called Renewable Energy Resource Areas ("RERA," or "Yenilenebilir Enerji Kaynak Alanları" – YEKA in Turkish). Accordingly, state-owned areas suitable for renewable energy generation are designated by the state as RERAs and awarded through public tenders to private parties to build and operate solar and wind electricity generation plants. The model offers a purchase guarantee, though it also requires investors to either manufacture the equipment in Turkey or to undertake procurement of equipment from local manufacturers up to a certain percentage.

The renewable energy market in Turkey has some challenges mainly related to limited grid capacity and the growing need for investment in grid development. The country is taking steps to overcome these challenges, such as transitioning to a smart grid system. Challenges facing renewable energy development have not prevented banks from providing financing for new renewable energy projects, and such projects continue to be deployed. In addition to the feed-in tariff mechanisms, Turkey also offers investors renewable energy capacity through tenders with purchase guarantees, and the country remains one of the go-to jurisdictions for renewable energy investors.

Battery energy storage system (BESS)

In line with its energy transition targets and efforts to combat climate change, Turkey also offers BESS investment opportunities. Turkish legislation enables supply license owners, distribution license owners and consumption facilities to install storage facilities. Generation plant owners can also install storage facilities integrated with their generation facility, up to a capacity not exceeding the installed capacity of the generation facility.

Due to the high demand and numerous applications for such storage facilities over the past two years, Turkey's energy regulator is currently not accepting new applications; however, there are a significant number of projects in the market available for acquisition by investors from other parties.

Nuclear

The construction of Turkey's first nuclear power plant, Akkuyu NPP, located in the southern part of the country, started in 2013. Turkey is planning to build two more nuclear power plants—one in Sinop in the north (located on the shores of the Black Sea) and another in the eastern Thrace region. The state is currently in talks with several potential investors, and the projects are still under discussion and open to interested investors.

Hydrogen

Turkey is eager to leverage its renewable energy potential to become a hydrogen energy technology developer and unveiled a Hydrogen Technology Strategy and Roadmap in 2023. With this roadmap and the National Energy Plan for 2035, Turkey has set ambitious targets for hydrogen production, aiming to reach a price of USD 2.40 per kilogram by 2035, halve the price by 2053, and increase electrolyzer installed power capacity to 2 GW by 2030, 5 GW by 2035, and 70 GW by 2053.

This roadmap and strategy also set objectives for encouraging hydrogen energy production and investments, such as establishing incentive mechanisms and certification programs for the use of domestic components in green hydrogen generation and storage, encouraging R&D and product development (P&D) to develop and produce domestic and national technologies, and establishing public and private sector collaborations to encourage commercial demand and investments. Legislative changes to implement such strategies are on the horizon.

Conclusion

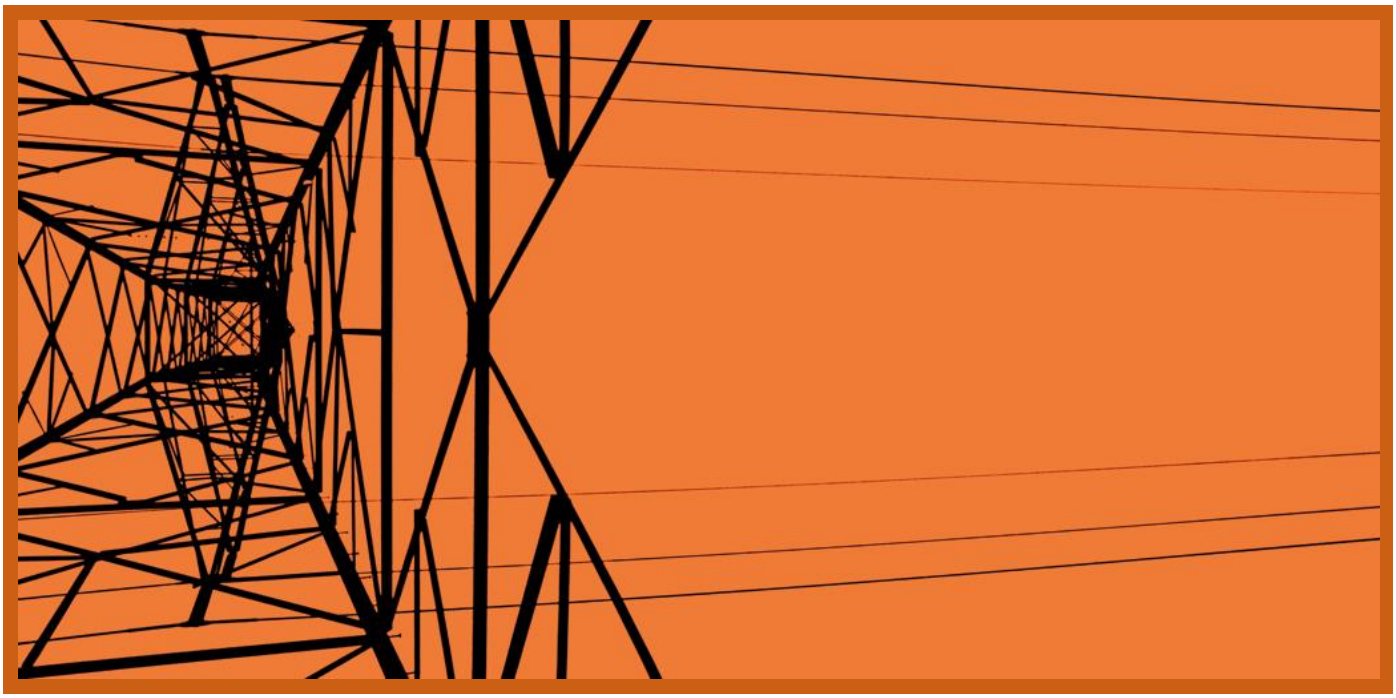
Turkey is setting ambitious targets to boost its efforts to achieve its energy transition and independence, as well as to tackle climate change. Despite legislative ambiguities and grid system challenges, the country offers many opportunities to both foreign and local investors interested in renewable energy projects and continues to support investors with feed-in-tariff mechanisms and purchase guarantees, making it a desirable jurisdiction for investment

Edmund Emre Özer
Partner

+90 212 214 78 10
edmund.ozer@kinstellar.com

Şeyma Olğun
Senior Associate

+90 212 214 78 10
seyma.olgun@kinstellar.com



UKRAINE

Despite the full-scale war and Russian missile strikes on Ukraine's energy infrastructure, Ukraine's Ministry of Energy announced that, by 2050, the country has the potential to increase the following capacities in the energy sector:

- wind generation capacity to 140 GW;
- solar generation capacity to 94 GW;
- energy storage to 38 GW;
- nuclear generation to 30 GW;
- CHP and bioenergy capacity to 18 GW;
- hydro generation to 9 GW.

In order to keep Ukraine's electricity system stable during the war, Ukraine, together with the European Commission, completed the synchronization process as part of the integration of Ukraine's power system into the European Network of Transmission System Operators for Electricity ("ENTSO-E"). As of January 1, 2024, Ukrenergo, the transmission system operator in Ukraine, became the 40th full member of ENTSO-E.

Oil and Gas

Ukraine has 12 underground gas storage facilities with a total capacity of 31 bcm. Despite Russian attacks, Ukrainian gas storage facilities have been functioning reliably, as the stored gas is located deep underground and is well protected from external attacks. In April 2023, Ukrtransgaz became the second European storage operator to successfully confirm its right to conduct gas storage operations pursuant to the rules of the European Union and the Energy Community.

Gas Storage

Ukraine has domestically located 12 underground gas storage facilities with a total capacity of 31 bcm. Despite the Russian attacks, Ukrainian gas storage facilities have been functioning reliably, as the stored gas is located deep underground and well protected from external attacks. In April 2023, Ukrtransgaz became the second European storage operator that successfully confirmed its right to conduct gas storage operations pursuant to the rules of the European Union and the Energy Community.

Renewable Energy

Renewables will play a crucial role in the reconstruction of Ukraine after the war. Between 2022 and 2023, more than 650 additional MW of renewable energy capacity was built in Ukraine. In October 2023, Ukraine adopted an updated Energy Strategy through 2050, stipulating that the share of renewables in the Ukrainian energy sector must be at least 25% by 2030 and that Ukraine should achieve climate neutrality by 2050.

On August 13, 2024, the Cabinet of Ministers of Ukraine (the "CMU") adopted the National Renewable Energy Action Plan for the period until 2030, establishing an increase in the share of renewable energy to 27.1% of the country's total energy consumption.

In addition, on August 13, 2024, the CMU approved certain resolutions aimed at accelerating renewable energy projects in Ukraine, namely:

- Pilot online auctions to distribute 110 MW of the renewable energy support quota for 2024; and
- Conditions for holding a tender to construct 700 MW of new, highly maneuvrable generation.

Battery energy storage system (BESS)

Recent changes in Ukraine's energy storage regulations focus on accelerating the deployment of battery storage systems and enhancing their role in grid stability and energy security.

Key updates include simplifying licensing procedures for energy storage projects and clarifying the legal status of energy storage operators. The government has also introduced financial incentives to attract private investments, including tax breaks and favorable tariffs for energy storage services.

Additionally, the regulations have expanded the role of energy storage in providing ancillary services, such as frequency regulation and peak load balancing, to support the increasing integration of renewable energy sources

Hydrogen

The European Commission defines Ukraine as a strategic partner in the development of renewable hydrogen under the Green Hydrogen for the European Green Deal: 2×40 GW Initiative. Ukraine produces approximately 360,000 tonnes of hydrogen per year, used mainly for ammonia production. By 2030, the EU hydrogen directives envisage the construction of up to 10 GW of electrolysis capacity in Ukraine to produce renewable hydrogen. Approximately 1.8 GW of this capacity is intended for the Ukrainian market, focusing on producing green ammonia for the agricultural sector. At the same time, Ukraine intends to supply the remaining hydrogen to the EU by pipeline through the Ukrainian gas transport system. The EC also supports establishing the Central European Hydrogen Corridor between Ukraine and Germany.

Nuclear

Nuclear energy in Ukraine was responsible for approximately 50% of Ukraine's electricity production. There are four operating nuclear power plants, namely: Zaporizhzhia NPP, Rivne NPP, South Ukraine NPP, and Khmelnytskyi NPP, which are owned and operated by Energoatom, a Ukrainian state enterprise. Energoatom is working closely with private American companies to develop nuclear power projects in Ukraine. In particular, Energoatom and the US company Holtec International are considering to replace thermal power plants in Ukraine with 20 small modular nuclear plants from the United States.

The first small modular nuclear reactor is planned to be built in 2029 under a cooperation agreement between the parties dated 21 April 2023 (the "Cooperation Agreement").

The Cooperation Agreement also stipulates the intention to build a plant in Ukraine to manufacture components for spent nuclear fuel storage, currently produced in the US. In April 2024, Energoatom and Westinghouse Electric Company announced plans to build two new power units at Khmelnytskyi NPP based on Westinghouse's AP1000 technology.

Conclusion

Despite the ongoing war in Ukraine and the damage to Ukraine's energy sector due to Russian missile strikes, Ukraine continues to increase its potential in the energy sector (i.e., gas and oil production, hydrogen production, gas storage, renewable power plants, and nuclear power generation).

Olena Kuchynska
Managing Partner (Kyiv office)

+380 44 394 9040
olena.kuchynska@kinstellar.com

Oleksandra Putiienko
Associate

+380 44 490 9575
oleksandra.putiienko@kinstellar.com

UZBEKISTAN

Uzbekistan is actively working to transform its energy landscape with the development of energy infrastructure and a strong focus on renewable energy sources, and it plans to become a regional leader in energy production, offering lucrative investment opportunities to both domestic and foreign investors. According to BloombergNEF's 2023 Climatescope Index, Uzbekistan is one of the top 15 emerging markets for renewable energy investment.

Renewable energy

The government of Uzbekistan has set a goal of increasing the proportion of renewable energy in its total electricity supply. The objective is to increase the share from 7.5% in 2020 to 25% by 2030. Of the 16 new power plants scheduled for construction between 2020 and 2026, 10 will be powered by renewable energy sources.

The country's solar potential is particularly significant, with an estimated technical capacity of 7,411 PJ, which is nearly four times the nation's current primary energy consumption. By 2030, Uzbekistan aims to develop 7 gigawatts (GW) of solar and 5 GW of wind capacity, thereby diversifying the energy supply and reducing carbon emissions.

Natural Gas

At present, natural gas is the predominant source of energy in Uzbekistan, accounting for approximately 85% of the country's total energy and electricity production. It is expected that gas demand will increase by 30% by 2030, reaching 65 billion cubic meters. Despite these projected demands, the country's gas reserves are expected to be completely depleted within the next two decades.

Nuclear Energy

As part of a long-term strategy for low-carbon energy generation, Uzbekistan is developing its nuclear energy capacity. Plans include the construction of two VVER-1200 reactors and the exploration of six Small Modular Reactors. Nuclear energy is anticipated to play a crucial role in enhancing Uzbekistan's energy security and reducing its reliance on natural gas. Nuclear power projects are expected to contribute significantly to the national grid, with the first reactor anticipated to be operational by 2027.

Hydropower

Hydropower constitutes a significant element of Uzbekistan's renewable energy strategy, currently accounting for approximately 10.2% of the country's electricity generation. The nation's total installed hydropower capacity is 1.85 GW, and there are plans to modernize existing plants and develop new facilities with the goal of further increasing capacity. Recent reforms now permit private ownership of hydroelectric power stations connected to the national grid.

Energy Efficiency and Consumption

Although Uzbekistan's per capita energy consumption is approximately 25% below the global average, its economy remains energy-intensive, with consumption per unit of GDP exceeding the global average by over 50%. The modernization of the country's energy infrastructure, including pipelines and power plants, is a crucial step in addressing inefficiencies and meeting the growing domestic energy demands.

Renewable energy generators are exempt from property tax on renewable energy equipment and from land tax on land occupied by renewable energy facilities (with a nominal capacity of 0.1 MW or more) for a period of ten years from the date of their commissioning.

Sherzod Yunusov
Partner

+99 878 150 6221
sherzod.yunusov@kinstellar.com

Kamilla Khamraeva
Counsel

+99 893 386 3032
kamilla.khamraeva@kinstellar.com

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