Policy Report

green deal UKRAÏNA

Building Nuclear Transparency: Governance and Oversight Challenges in Energoatom

Berlin/Kyiv, November 2025

Mattia Nelles, Inna Nelles[1]

[1]Opinions expressed in this publication are those of the authors alone. They do not necessarily reflect the views of Helmholtz-Zentrum Berlin or the Green Deal Ukraïna project.

Bundesministerium für Forschung, Technologie und Raumfahrt

HZB Helmholtz Zentrum Berlin

About the Authors:

Mattia and Inna Nelles are the co-founders and researchers at the expert non-profit company German-Ukrainian Bureau (Deutsch-Ukrainisches Büro, DUB). DUB is the "think-and-do" centre focused on research and strategic advisory to enhance German-Ukrainian relations at the business, civil society, and state levels.

Version 1.0
Green Deal Ukraïna
Helmholtz-Zentrum Berlin für Materialien und Energie
Albert-Einstein-Str. 16, 12489 Berlin

Contact the authors
greendeal.ua@helmholtz-berlin.de

Contents

Executive Summary

Since Russia's full-scale invasion in 2022, Ukraine's energy infrastructure has suffered catastrophic damage – with available generation capacity dropping from over 37 GW to just 12 GW. Nuclear power, managed by the state-owned enterprise Energoatom, now accounts for roughly 60-70% of the country's electricity production. In response to reduced generation capacity, Ukraine launched the "Great Nuclear Construction" initiative to complete and expand the Khmelnytskyi Nuclear Power Plant (KhNPP), with the potential for up to four new reactors. Projected to cost up to $25 bn by 2030, the effort is viewed as vital for energy security and EU energy integration, despite facing significant financial, technical, and governance risks.

Corporate governance reforms in Ukraine's state-owned enterprises (SOEs) have made significant progress. This is evident with the March 2024 adoption of Law No. 3587-IX, which formalises supervisory boards and mandates accountability. Energoatom became a joint-stock company in January 2024, and its supervisory board was appointed in June. However, the board only began operating in January 2025 due to disputes over contracts, pay, and insurance. This board's independence has been further weakened by the resignation of Timothy Stone, one international expert who reportedly resigned due to aforementioned internal problems. Despite formal reforms, transparency, legal protections, and depoliticised governance remain incomplete, drawing criticism from EU and G7 partners. At the same time, Ukraine's EU accession process and obligations under the Association Agreement underscore the urgency of aligning Energoatom's governance with European norms, both as a condition for accession and for EU financial and technical support to Energoatom.

The KhNPP project presents itself with layered challenges. Units 3 and 4, partially built in the 1980s, are to be completed using Russian-made VVER-1000 reactor components acquired from Bulgaria, while Units 5 and 6 will feature Westinghouse AP1000 reactors. Adapting old infrastructure and sourcing missing components from non-Russian suppliers will be complex. Ukraine also lacks recent experience in nuclear construction, and many professionals have left or retired, increasing the likelihood of delays and cost overruns.

Ukraine hopes to fund the project through Energoatom's own resources and Western support, including from the U.S. EXIM Bank. However, this ambition is set against a wartime economy that relies heavily on foreign aid, with half the state budget allocated to defence. Law No. 4231-IX, which authorises the reactor purchase, has drawn scrutiny. The Anti-Corruption Committee flagged it for weak procurement procedures and oversight. Allegations of inflated prices and unauthorised pre-emptive spending have triggered an investigation by Ukraine's Anti-Corruption Bureau.

Ultimately, the "Great Nuclear Construction" reflects Ukraine's dual challenge: rebuilding its energy system during wartime while improving governance. International financing and credibility will depend on Energoatom demonstrating real reform and executing the project with transparency and accountability.

List of Abbreviations

AP1000 – “Advanced Passive”, a type of nuclear reactor designed by Westinghouse Electric Company

EMSS – PJSC ‘Energomashspetsstal’, Kramatorsk, Donetsk region

Energoatom – PJSC ‘National Nuclear Energy Generating Company Energoatom’

IAEA – International Atomic Energy Agency

IEA - International Energy Agency

IFI – International Financial Institutions

PJSC - Public Joint Stock Company

KhNPP – Khmelnytskyi Nuclear Power Plant

kWh – kilowatt hour

MW – Megawatts

NPPs – nuclear power plants

OECD - Organisation for Economic Cooperation and Development

PWR – pressurised water reactor

SOE – state-owned enterprise

VVER – “водо-водяной энергетический реактор”, translated as “water-water energetic reactor” (Russian)

ZNPP – Zaporizhzhia Nuclear Power Plant

List of Figures

Introduction

In recent years, nuclear energy has been consistently providing the largest share of Ukraine's energy mix. Before the full-scale invasion in 2022, nuclear power accounted for greater than 50% of Ukraine's electricity generation, with coal and gas-generated energy accounting for 23% and 9%, respectively. Renewables and larger hydro units accounted for only 13%, in contrast (World Nuclear Association 2024 & Omelchenko 2022).

Since its full-scale invasion, Russia has systematically targeted Ukraine's energy infrastructure. With its occupation of Enerhodar in March 2022, Russia also seized control of the Zaporizhzhia Nuclear Power Plant, Europe's largest nuclear power plant (NPP), adding to the uncertainty of generation capacity within Ukraine.

Continuous Russian aerial attacks have reportedly destroyed approximately 85% of thermal plants (Harmash, 2024). According to the International Energy Agency (IEA), of the more than 37 GW of available energy production capacity in early 2022, only 12 GW were available in summer 2024 (IEA, 2024). As thermal and hydro power plants have been especially targeted, the bombardments have increased the share of electricity produced by NPPs to around 60-70% (Grynszpan & Thomas d'Istria, 2024).

Energoatom, the state-owned enterprise (SOE) and sole operator of nuclear energy, managed four active NPPs in Ukraine, amounting to a total capacity of 13,835 MW. With its six 1000 MW reactors, Zaporizhzhia NPP provided approximately 40 TWh per year, or 20-25% of Ukraine's total electricity before the full-scale invasion.

With the uncertain return of one of Europe's largest NPPs and Russia's destruction of hydro and thermal plants, both Ukraine's Ministry of Energy and Energoatom have launched major projects – including the "Great Nuclear Construction", completing Units three and four and planning Units five and six at the Khmelnytskyi NPP. The estimated investment for these projects amounts to $25 bn by 2030, a significant sum amid Ukraine's ongoing war.

Earlier this year, some progress has been made to advance the project further. In February 2025, parliament passed a law allowing the government to buy two Russian-built reactors from Bulgaria for Khmelnytskyi. However, concerns have emerged over the deal's transparency, cost, and oversight.

Given the current developments and the significance of Ukraine's ambitious Nuclear Construction, this paper will examine Energoatom's governance structure to identify potential general risks related to oversight. Following this analysis, the paper will give a focused assessment of the "Great Nuclear Construction" plans. In this way, the paper aims to provide a holistic and balanced overview of the systemic and project-specific risks associated with Ukraine's "Great Nuclear Construction" plans.

Among Ukrainian experts, there is an ongoing discussion about alternative approaches to addressing the country's energy shortage beyond increasing nuclear capacity. While this paper briefly mentions these discussions, they warrant a separate, in-depth analysis, beyond the scope of this paper.

Chapter 1: Energoatom and Ukrainian corporate governance reforms - bumpy progress in the governance of state-owned enterprises

Establishing strong corporate governance within Ukraine's SOEs has been essential to reinforcing the broader reform agenda initiated after the 2014 Revolution of Dignity, including energy market deregulation and banking sector liberalisation (Sabadus 2023). Successive Ukrainian governments have made repeated efforts to strengthen the legal framework governing SOEs, recognising the need for reform due to the sector's large size and persistent inefficiencies. Despite these efforts, previous initiatives were fragmented and failed to eliminate outdated governance practices (Kinstellar 2024).

The 2021 OECD Review of Corporate Governance of State-Owned Enterprises in Ukraine examined these organizations for independence and efficiency. This report identified systemic shortcomings that continue to undermine SOE performance and accountability. Despite formal commitments to align with OECD standards, Ukraine's SOE governance remained fragmented and inconsistent. Legal conflicts—particularly between the Joint-Stock Company Law and the Law on State Property Management—have created overlapping mandates and unclear roles for supervisory boards, executive management, and state ownership entities. This has enabled ongoing political interference in strategic decisions, including appointments and financial oversight (OECD 2021).[2]

The OECD report finds that most SOEs lacked genuinely independent boards, robust audit and remuneration committees, and transparency in procurement and reporting practices. The review also recognises progress, notably Ukraine's formal adoption of OECD principles, pilot governance reforms at several large SOEs, and the enactment of a new SOE law aimed at strengthening board autonomy and reducing state interference.

Additionally, Ukraine adopted a new Law on Corporate Governance of State-Owned Enterprises (Law No. 3587-IX) on 8 March 2024, marking a significant step toward aligning SOE oversight with OECD standards. The law introduces a two-tier governance structure with independent supervisory boards, formalises board authority over executive appointments, and mandates internal controls for risk management, compliance, and auditing. It also requires performance evaluations every three years and empowers the Cabinet to define a unified State Ownership Policy. These reforms aim to enhance transparency, minimise political interference, and bolster investor confidence – especially crucial as Ukraine advances its EU accession and post-war recovery plans (Bandura, Figlus, Timtchenko, 2024).

[2] The legal conflict between Ukraine's Joint-Stock Company Law (JSC Law) and the Law on State Property Management (SPM Law) arises because the two laws define different governance structures, roles, and powers for SOEs, especially regarding supervisory boards, management, and the rights of the state as a shareholder. For instance, The JSC Law is designed to align with OECD corporate governance standards, granting supervisory boards the authority to appoint and oversee executive management, approve strategy, and monitor compliance. In contrast, the SPM Law gives significant powers to state ownership entities (such as the Cabinet or relevant ministries), including the ability to approve company strategies, appoint and dismiss executives, and even influence internal decisions—thus bypassing or undermining the supervisory board.

Energoatom's incomplete corporatisation

However, these SOE corporatisation reforms — aimed not only at creating separate legal corporate entities but also at enhancing efficiency, performance, and accountability by aligning operations and governance more closely with private sector practices — have yet to be fully implemented across the sector. For companies like Energoatom who operate in politically sensitive and capital-intensive industries, the absence of strong, independent governance structures poses significant risks. Full compliance with OECD standards is essential not only for operational integrity, but also for building investor confidence, meeting conditions tied to EU accession, and securing international financing of new nuclear construction projects.

Energoatom has long operated under a governance model characterised by limited transparency and significant political influence (OECD 2021). While reforms to corporatise the enterprise and establish an independent supervisory board were mandated by Ukraine's commitments to the IMF and the EU, progress lagged. Under the EU Association Agreement, particularly the Euratom chapter, Ukraine committed to aligning its SOEs with OECD corporate governance standards. These reforms were due by 2022 but only saw meaningful advancement in 2023, when parliament took the first formal steps to transform Energoatom into a joint-stock company (JSC).

This corporatisation process involved registering the company as a JSC in January 2024 and initiating an asset inventory, drafting a governance charter, and preparing regulatory filings with the national securities commission. A key milestone occurred in June 2024, when the Ukrainian Cabinet appointed a five-member supervisory board comprising a majority of independent experts: Timothy Stone, Michael Kirst, and Jarek Niewierowicz. The board was completed by two government representatives, Tymofii Mylovanov and Vitalii Petruk.

The selection process was overseen by a commission chaired by the First Deputy Prime Minister and Minister of Economy. While the Ukrainian government praised the selection, some Ukrainian media criticised the board's composition as reflecting a broader pattern in Ukraine: supervisory boards serving as ceremonial bodies of "retired pensioners and officials" that rubber-stamp internal decisions rather than genuinely checking management (Maskalevych 2024).

Despite the formal appointment, the board remained essentially non-functional until early 2025. This delay in activation significantly weakened oversight at a critical period of procurement decisions and reactor development plans by Energoatom. Disputes over compensation and unclear liability terms revealed political friction within the governance framework, raising concerns about the board's true independence and the state's continued influence over corporate decisions. Notably, foreign board members were reportedly reluctant to sign contracts without Directors and Officers (D&O) insurance or legal protections under Ukrainian law, highlighting structural vulnerabilities that still remain unresolved (Interfax 2024).

This delay drew concern from Ukraine's international partners. The EU and G7 ambassadors publicly emphasised the need for fully operational corporate governance. At the same time, the head of the EU delegation in Ukraine, Katarina Mathernova, emphasised that the EU will not take part in Ukraine's efforts to attract donor funding saying, "The European Union does not finance the development of nuclear power plants, including due to different opinions on nuclear power among Member States of the EU" (Sydorenko & Protz 2025).

Energoatom's board met for the first time in January 2025, when it elected Jarek Niewierowicz as Chair and Michael Kirst as Vice Chair, and established internal structures, including an audit committee. However, on its first meeting, Timothy Stone, Chair of the United Kingdom's Nuclear Industry Association, resigned from Energoatom's supervisory board (Orlyuk 2025). While Mr Stone did not publicly address the reasons for his resignation, Ukrainian media reported his departure was due to disputes over contracts, pay, and insurance (Deyna 2025).

As of late July 2025, his seat remains vacant, and no public appointment has been announced to replace him. This vacancy reduces the board's independent majority and underscores ongoing challenges in maintaining effective and balanced supervisory oversight. In its updated Extended Fund Facility (EFF) review for Ukraine, published on 1 July 2025, the IMF emphasised the need to further strengthen the corporate governance of state-owned enterprises, specifically highlighting the importance of completing the formation of the supervisory board of Energoatom (Energy Reform 2025).

Petro Kotin, long-time acting chairman of Ukraine's nuclear operator Energoatom, was dismissed in August 2025 after the company's Supervisory Board accepted his resignation and simultaneously launched reforms to strengthen transparency and governance. Kotin had been appointed acting chairman of the board of Energoatom in 2023 in a non-transparent manner, without a competition (NV Business 2025).

While the official line emphasised organisational restructuring and preparation for the critical autumn-winter energy season, Ukrainian media and investigative reports quickly pointed to deeper causes of the hasty dismissals: allegations of corruption tied to electricity trading schemes worth hundreds of millions of hryvnias, revelations about undeclared luxury property linked to his family, and speculation about looming anti-corruption probes by NABU (Tarchynets & Orel 2025). Analysts also noted a possible political dimension, suggesting Kotin's departure reflected shifting power balances and the erosion of protection from influential allies close to President Zelensky. This blend of governance reform and yet uncorroborated corruption suspicions has fuelled debate over whether his exit was a clean transition or a politically charged move against a weakened figure in Ukraine's strategic energy sector.

In light of Energoatom's corporate governance reforms, some early progress is evident, including regular reporting to EU counterparts and the inclusion of foreign experts in decision-making. However, full compliance with OECD and EU governance norms remains incomplete. Questions persist regarding the board's legal protections, contract terms, and actual independence from state ministries, particularly in light of the prolonged dispute over remuneration and director liability coverage. Moreover, its oversight role remains limited until all contracts are signed and full independent representation is restored — particularly within key governance committees. Until the board is fully empowered, reduced independent influence leaves the company vulnerable, especially as Ukraine enters a high-stakes phase of nuclear development.

Impact of the EU accession

Further impacting Energoatom's corporatisation is Ukraine's EU association agreement and the EU Accession process. Ukraine's alignment with the EU-Ukraine Association Agreement, including engagement with Euratom, influences Energoatom's operations and nuclear projects. Under this Agreement, Ukraine participates in the Euratom Research and Training Programme, gaining access to EU nuclear safety expertise, funding, and research collaboration — available on equal terms with EU member states. Meanwhile, Euratom has provided EUR 300 million in safety-focused loans (between 2017 and 2021) to Energoatom for upgrading nuclear power plants (European Commission n.d.). This underscores how the EU financial mechanisms can, in principle, support the modernisation of Ukraine's nuclear infrastructure.

At the same time, the EU accession has spurred broader energy-sector reforms that potentially benefit Energoatom. Ongoing regulatory convergence and institutional restructuring are necessary to attract investment and rebuild Ukraine's energy infrastructure to EU standards. In theory, aligning with EU norms means that nuclear construction in Ukraine is no longer just about capacity expansion, but about embedding projects within a European regulatory, market, and governance framework, striking a balance between stricter oversight and enhanced access to technology, investment, and political support. Real compliance with Euratom safety directives and alignment with EU energy market rules bear the potential to transform Energoatom into a more accountable, Western-integrated nuclear operator. The critical question remains: How quickly will the various EU norms, ranging from radiation protection and safety standards to licensing reforms and updated administrative terminology, as well as technical safety oversight, be adopted and implemented, aligned with EU methodologies?

Chapter 2: The "Great Nuclear Construction": ambitious plans and formidable challenges

Amid relentless Russian strikes on critical energy infrastructure — a strategy widely described by experts as a campaign of "energy terror" — Ukraine is urgently seeking pathways out of its energy crisis. One of the responses has been the acceleration of plans to build new, modern energy facilities that can restore stability and ensure long-term resilience.

At the heart of these efforts lies the ambitious "Great Nuclear Construction" initiative, spearheaded by the Ukrainian government through the Ministry of Energy and Energoatom. With this programme, government officials are positioning nuclear expansion as a cornerstone of energy independence and economic recovery.

Meanwhile experts from DiXi Group, a Ukrainian energy think-tank, caution that nuclear power lacks the flexibility to address short-term load spikes or power cuts; the solution requires a diversified generation mix, including renewables and gas turbines. Other experts caution that nuclear construction projects have very long lead times, unexpected cost increases and delays – such as the case of the cancelled VC Summer project. This VC Summer project was one key driver in Westinghouse's bankruptcy in 2017 and has become a symbol of the risks and failures associated with modern nuclear expansion (Conca 2017).

Despite criticism, Energoatom and the government are eager to complete and expand the KhNPP. Located in the Western part of Ukraine, this site is regarded as the most viable platform for enhancing Ukraine's energy export potential to the European market and growth in nuclear capacity (Kommersant Ukrainian 2024).

Background Khmelnytskyi NPP

Construction of the KhNPP began in 1981. Today, it operates two Soviet designed VVER-1000 reactor units: the first commissioned in 1987 and the second in 2004, with a combined capacity of 2,000 MW, generating nearly 15 TWh of electricity annually.

Originally envisioned as a four-unit plant, KhNPP's expansion was interrupted when construction of Units three and four — launched in 1985 and 1986, respectively — was halted due to a moratorium on new nuclear construction in 1990. According to the Ukrainian government, the construction of the third unit was 75% complete, implying that civil infrastructure and auxiliary systems were in place, but not the nuclear active core. The building construction of the fourth unit was roughly 28% ready when both projects were frozen (WNA 2024). Despite partial completion in place, any restart or modernisation will require entirely new systems for safety, instrumentation, and a new reactor vessel.

In 2008, Ukraine announced plans to resume construction of KhNPP Units three and four by 2010, with a target completion date of 2016-2017. A 2010 intergovernmental agreement with Russia stipulated that Atomstroyexport, a Russian state company, would complete the reactors, with 85% of the €3.7 bn cost to be financed via a Russian loan. Although feasibility and cost were confirmed in 2012, construction remained delayed. After the annexation of Crimea and the war in Ukraine's east, these initial plans utilising Russian funding sources were formally cancelled in 2015 (NucNet 2017).

In November 2021, Energoatom and the U.S. company Westinghouse agreed to build four AP1000 reactors at existing sites across Ukraine, starting with a pilot project to complete KhNPP Unit four (Westinghouse 2021). The pilot construction of Unit 4 represents a hybrid approach to Ukraine's nuclear expansion, combining a partially completed Soviet-designed VVER-1000 reactor with Western-supplied components from Westinghouse. Rather than a full AP1000 reactor, Unit 4 will integrate select systems—such as turbine generators, control technologies, and safety infrastructure—manufactured initially for the cancelled U.S. VC Summer project. This arrangement introduces complex engineering and regulatory challenges, as the adaptation of American technology to a VVER platform requires custom integration and licensing by Ukraine's nuclear regulator (WNA 2024).

The whole agreement, covering five AP1000s reactors and including the pilot retrofit of Unit 4, is valued at roughly $30 bn and is expected to be financed by the U.S. EXIM Bank. In November 2021, the contract was signed for the first two AP1000 reactors for Unit five and six at KhNPP, each estimated to be worth $5 bn (Westinghouse 2021, Neutron Bites 2021).

In June 2022, Westinghouse and Energoatom further expanded their agreement to include nine AP1000 reactors in total (Westinghouse 2022). Beyond Khmelnytskyi, future AP1000 deployments are planned at Rivne, South Ukraine, Zaporizhzhia, plus new sites at Chyhyryn (Cherkasy region) and another yet-to-be-developed site in western Ukraine (WNA 2024).

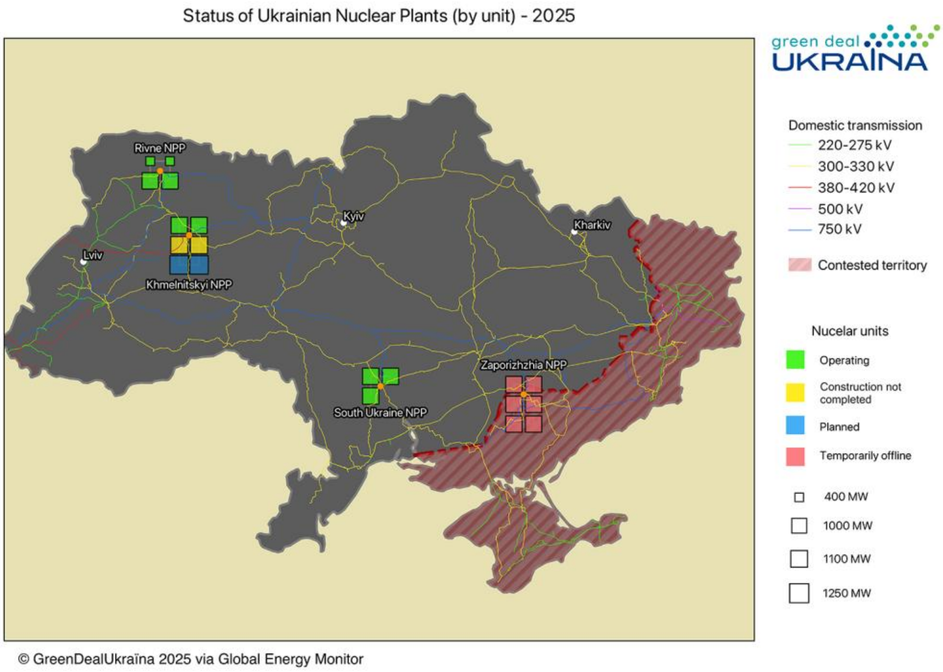
In January 2023, Ukraine's Cabinet authorised the start of project documentation for Units Five and Six at the Khmelnytskyi Nuclear Power Plant—an essential preparatory step for planning, licensing, and financing, and a critical prerequisite before construction can begin or international support can be secured. Officially, the plan is to finish the completion of unit five and six between 2030 and 2032 (NEI Magazine 2023).

In December 2023, the Ukrainian Energy Minister, Energoatom, and Westinghouse signed an agreement to purchase reactor equipment, including a reactor vessel, steam generators, coolant pumps, and control systems for KhNPP Unit 5, Ukraine's first-ever AP1000 reactor unit (Chaika 2023). If both the completion of Units three, four and the U.S.-provided reactors for Units five and six are fully realised, this amounts to a total installed capacity of 6,200 MW at KhNPP, making it the largest NPP in Europe. However, in times of war and scarce resources, the project is overshadowed by numerous engineering, financial, governance, and political challenges.

At the Ukraine Recovery Conference (URC) in Rome in July 2025, Energoatom and Westinghouse signed a series of strategic agreements. Both sides committed to establishing full-scale domestic production of VVER-1000 nuclear fuel components at AtomEnergoMash, ensuring a reliable Western supply chain, and agreed to expand Ukraine's nuclear fleet by building nine AP1000 Generation III+ reactors (Westinghouse 2025, Energoatom 2025).

However, in times of war and scarce resources, the project is overshadowed by numerous engineering, financial, governance, and political challenges.

Figure 1: Status of Ukrainian Nuclear Power Plants (by unit) - 2025



Source: GDU

Technologies and equipment

The KhNPP was initially designed as a four-reactor facility using the Soviet VVER-1000 reactors. The key impetus for completing the plant's third and fourth units was the opportunity to purchase two VVER-1000 reactors from Bulgaria.

The equipment in question was originally purchased by Bulgaria from Russia in 2006 for $600 mn as part of the now-defunct Belene NPP project (Vuets 2025). After terminating its contract with Russia and storing the reactors for years, the Bulgarian authorities, in principle, agreed in 2023 to sell the units to Ukraine. For Ukraine, securing this equipment is important given the scarcity of this equipment as it aligns with the original plans for Units 3 and 4 and the country's extensive experience operating VVER reactors.

However, these Bulgarian reactors are Russian-designed and partially assembled in Russia. As such, they come with significant drawbacks. Some essential components — such as the main circulation pumps — are missing, and there is no way to verify the completeness or functional integrity of the units. No manufacturer's warranty will be provided in this instance.

Due to the impossibility of continuing cooperation with the aggressor state, Ukraine must also diversify the fuel supply for the future VVER reactors, originally designed under Soviet engineering standards. Prior to proceeding, Energoatom confirmed that Westinghouse has officially validated the compatibility of American nuclear fuel with the VVER-1000 reactors from Bulgaria's Belene Nuclear Power Plant (Westinghouse 2025).

Lack of institutional knowledge and workforce

Institutional knowledge of reactor construction is a concern. Ukraine has not built new nuclear power units in over two decades. Much of the construction management infrastructure has been dismantled or privatised, and many skilled professionals have been lost. Contractors capable of handling such complex, long-term projects are scarce in Ukraine.

Experts also caution that despite acquiring the Bulgarian reactors, the Belene and KhNPP projects are structurally different (Radev 2025). Adapting the equipment may be complicated by the war, changing contractors, and a lack of technical documentation, much of which remains in the possession of Russia's Rosatom. The question of how to service equipment with such an origin, when Rosatom holds all original design documentation, remains a significant challenge.

Furthermore, some reactor components, including pressure vessel parts, were manufactured in Ukraine, notably by Atomenergomash's Energomashspetsstal (EMSS) plant in Kramatorsk, which is now close to the front line. Missing parts will need to be newly manufactured or sourced from alternate countries such as the Czech Republic — a technically complex and time-consuming process (Nikitin & Gorchakov 2024).

Potential to slow down Ukraine's energy sector modernisation

In parallel with the completion of Units three and four at the KhNPP, Ukraine is also exploring the possibility of transitioning to a new reactor technology — notably the AP1000 reactors from the American company Westinghouse. These represent more advanced technology with enhanced safety features but are new to Ukraine's energy infrastructure. This will require training of the workforce and operational adaptation. A feasibility study for constructing Units five and six at the KhNPP using AP1000 technology is currently underway.

In this context, some Ukrainian experts argue that investing in new-build projects using modern Western technologies would be more strategic than allocating resources to outdated units (Omelchenko 2024). On the other hand, proponents of installing two VVER-1000 as Units three and four argue that this could still be a cost-viable option, especially given the availability of supporting infrastructure, established grid connections, and the operational experience with similar reactors already in use in Ukraine.

Both approaches would represent first-of-their-kind developments in Ukraine and rank among the most significant infrastructure investments in the country's history. Within the Flyvbjerg Database on megaprojects (containing over 16,000 megaprojects, including over 150 nuclear power plant projects), nuclear power ranks among the projects with the largest average time and cost overruns, with a mean cost overrun of 120% across all nuclear power projects. Moreover, 55% of all projects experience a cost overrun of 50% or more (Flyvbjerg & Gardner 2023).

Bespoke designs and first-of-a-kind projects such as this are particularly vulnerable to time and cost overruns. Given their scale and complexity, unclear responsibilities, non-transparent governance, or inefficient project management within Ukraine's "Great Nuclear Construction" could risk leading to similar cost overruns, delays, or even project failure. If pursued, these projects would require exceptionally robust institutional and technical oversight to ensure their viability and long-term value. Finally, even without significant time and cost overruns, new nuclear projects are generally planned for five to ten years minimum, too long to address the immediate needs in Ukraine's power sector. This risks crowding out scarce investments from other energy sector investments in technologies with shorter construction lead times.

Timeline

Representatives of Energoatom and the Ukrainian government remain adamant about the timeline for completing Units three and four of the KhNPP, assuming Bulgarian equipment is delivered in 2025. Former Minister of Energy Herman Halushchenko has stated that Unit three could be completed within three years, by 2028, and Unit four within four years, by 2029. Furthermore, Units five and six are scheduled to be completed by 2030 and 2031, respectively. This timeline appears ambitious, as the average construction time for previous VVER-type reactors (both 440 and 1000 MW) at Ukrainian nuclear power plants has been approximately seven years (Voronovich, 2025).

In early August 2025, the Cabinet of Ministers, as outlined in Yulia Svyrydenko's government program, plans to launch the completion of both Units three and four in 2026, with an updated feasibility study to be finalized by October 31, 2025, and a draft law on their location, design, and construction submitted to the Verkhovna Rada by the end of that year. During 2026, they also want to begin construction of a facility for the production of fuel assemblies for nuclear reactors (Vodyani 2025).

The delayed Vogtle project in Georgia and the cancelled VC Summer project in South Carolina underscore the significant financial, managerial, and oversight risks associated with nuclear construction. Both projects used Westinghouse's AP1000 reactor design, but while Vogtle persevered—despite delays of over a decade and costs ballooning to more than $35 billion—VC Summer was abandoned in 2017 after $9 billion had already been spent, largely due to contractor mismanagement, regulatory failures, and the bankruptcy of Westinghouse (Amy 2023, Conca 2017). These cases highlight the dangers of inadequate project planning, premature construction starts, and weak governance—issues particularly relevant for Ukraine as it embarks on its own complex nuclear expansion.

Journalists from the Ukrainian media outlet NV spoke with several leading nuclear energy experts familiar with the Ukrainian context and the specific characteristics of the reactors in question. All of them expressed scepticism about the feasibility of the ambitious timeline set for the "Great Nuclear Construction" project, especially given that the project still lacks updated technical documentation. The fact that Russia has repeatedly targeted energy infrastructure also raises questions about how the war will affect not just the construction itself but also the presence of needed international experts (Bobrytskyi 2025).

Maksym Pyshnyi, a former employee of the State Scientific and Technical Center for Nuclear and Radiation Safety, noted that Energoatom will need to make a significant effort just to get the project off the ground.

Georgi Kaschiev, a Bulgarian professor specialising in nuclear energy, expressed scepticism regarding the completion dates announced by Energoatom, comparing the situation to that of Iran, where reactor construction was delayed by 15-16 years due to changes in contractors and war (Radev 2025).

Financing

According to Ukraine's former Minister of Energy, Herman Halushchenko, preliminary estimates suggest that completing just Units three and four could cost around 160 bn UAH (approximately equivalent to €3.5-3.7 bn) (LB Live 2025). The costs of constructing one or two new reactors are estimated to be at least $5 bn per reactor (NEI 2024). However, previous AP1000 projects, like the VC Summer or the Vogtle 3 and 4 raise doubts about the costs and timelines.

Overall, the estimated investments in Ukraine's nuclear energy are up to $25 bn until 2030 alone. These are ambitious plans, considering that Ukraine heavily relies on international loans and aid to support its state budget (Reuters 2024). In 2024 and 2025, about half of its $80 bn budget came from external donors. Moreover, Ukraine currently spends approximately 50% of its state budget on defence (RBC Ukraine 2025). According to the former Minister of Energy, the project will not be financed with state budget funds or European aid (LB Live 2025). Nevertheless, in 2024, Energoatom announced that for the expansion of the KhNPP, it will primarily rely on its own funds in conjunction with Western financial institutions and the possibility of US export credit agencies (Ukrayinska Pravda 2025).

Ukrainian law (No. 4231-IX) authorises the purchase of equipment for Units three and four of the KhNPP, permitting the Government of Ukraine to procure reactor vessels and related components exclusively from the state-owned energy company of the Republic of Bulgaria, Natsionalna Elektricheska Kompania EAD (Verkhovna Rada 2025). While the definitive price of the deal has yet to be disclosed, the law explicitly caps Energoatom's purchase of Bulgarian reactor equipment at a total value of not more than $600 mn (Volokita 2025).

The Bulgarian side has estimated the cost at $600 mn, however, Energoatom specialists are aware that the Bulgarian-sourced reactors are only partially equipped, and the missing components will need to be sourced from non-Russian alternative suppliers. A previous cost estimate for the completion of Units three and four was conducted in 2018, which put the figure at approximately 72 bn UAH, equivalent to around $2.8 bn at that time (NV 2025). Since then, the Ukrainian currency has depreciated significantly, and global construction and equipment costs have risen. The Ukrainian government expects a revised feasibility study completed by early June 2025[3] (ProZorro 2025).

Regarding the construction of Units five and six with modern AP1000 nuclear reactors, a feasibility study is currently ongoing in cooperation with Westinghouse. More than $400 mn will be required for the purchase of U.S.-manufactured reactor zone equipment, which has already been reserved for the project.

The U.S. Export-Import Bank (EXIM) is currently in advanced discussions with Energoatom to finance the construction of AP1000 reactors, with initial funding linked to equipment procurement for Unit five (Interfax 2023). Additionally, in 2021, the U.S. Development Finance Corporation (DFC) initiated preliminary talks to explore long-term financing options (Kraev 2021). While no reactor construction loans have yet been finalised, these negotiations,

[3] At the time of publication of this study, it was not known whether the update of the technical documentation and the final cost of the project had been completed.

alongside the involvement of Western commercial banks like Barclays and Deutsche Bank in nuclear fuel financing, signal growing institutional interest from external sources.

However, billions worth of loans from the U.S. or other banks or IFIs over a 4-10-year construction period, without a clear guarantee of completion in a country at war would require substantial political backing.

Issues with oversight and transparency

In the Ukrainian media landscape, the “Great Nuclear Construction” project is often described as the most controversial infrastructure initiative in the country. Overall, the project remains shrouded in persistent allegations of inadequate oversight, and several Ukrainian media outlets have highlighted the potential corruption risks (Nikolov 2024).

The controversy is closely linked to the adopted law (No. 4231-IX), which gives the political green light to the “Great Nuclear Construction” project. During the legislative review process, the Verkhovna Rada’s Anti-Corruption Policy Committee concluded that the draft law did not comply with anti-corruption legislation and safeguards (Verkhovna Rada 2025). Specifically, the committee’s opinion noted that the bill failed to ensure a competitive procedure for selecting the type of reactor units for the planned power blocks. It also highlighted the lack of justification for providing maintenance services without involving the aggressor state that holds the original technology for VVER-1000 reactors. Despite these warnings, the committee’s concerns did not prevent the draft law from passing a parliamentary vote (Verkhovna Rada 2024).

Another issue with the law concerns the manner in which it was adopted. As such, Law 4231 was not originally registered as a government proposal. Instead, it was submitted to the Verkhovna Rada for a vote (second reading) under the guise of Draft Law 11392, which had previously addressed an entirely different issue (‘On Amendments to Certain Legislative Acts of Ukraine on Simplification of Conditions for Conducting Business’). During a session of the Verkhovna Rada’s Energy and Utilities Committee on 16 January 2025, the entire text of the draft was replaced at the initiative of MP Andrii Zhupanyn and approved by the Committee (Energy Committee 2025). The revised draft was then submitted to the Verkhovna Rada’s plenary session.

This process violated Ukrainian legislative procedures for adopting laws, as noted by the Verkhovna Rada’s Main Legal Department (Verkhovna Rada 2025). It means that the law allowing the government to purchase the reactors from Bulgaria was only adopted in one reading, underlining the haste and limited discussions the Verkhovna Rada had on this important law.

Additionally, analysts have noted that the $600 mn price tag may be excessive for outdated equipment and critical components to the reactor, steam generators, are missing from the Bulgarian reactors (Kunytskyi 2025). Olha Kosharna, co-founder of the NGO “Anti-Crisis Expert Nuclear Center of Ukraine” and an expert in nuclear energy and safety, estimated that only about half the parts are covered, suggesting that equipment might be bought at an inflated price, posing possible corruption risks (Espresso 2025).

Initial concerns regarding procurement practices

Even before the necessary draft law was voted on in Parliament, investigative journalists analysed the procurement of various Energoatom units over several months, aimed at preparing for the construction of nuclear power units at KhNPP. The findings revealed that as early as April 2024, Energoatom began purchasing modular housing for workers from the Zaporizhzhia NPP involved in reconstruction work on Units three and four at KhNPP, as well as related infrastructure, including medical facilities and dressing room trailers, for a planned workers' village. These contracts were valued at roughly €10 mn. Additionally, the company actively procured construction equipment and machinery for the site, with contracts exceeding €3 mn last year. Journalists compared the contracted prices with market rates for specific items and concluded that many appeared overpriced (Nashi Groshi 2024).

Ukrainian opposition MP Yaroslav Zhelezniak and several of his parliamentary colleagues spent months collecting "evidence of how Energoatom's leadership was spending funds on various activities related to the construction of new units" without the approval of the Verkhovna Rada. Such approval is legally required for actions involving the design and construction of nuclear facilities. In January 2025, based on evidence collected by members of parliament, the National Anti-Corruption Bureau of Ukraine opened an investigation into this alleged embezzlement of 430 mn UAH (approximately €9.5 mn) related to the construction of new nuclear power units (Tarasovsky 2025).

Moreover, factors such as perceived insufficient corporate governance, lack of financial transparency, and allegations of corruption significantly undermine creditors' trust in the borrower. In the case of ambitious industrial projects, such as the "Big Nuclear Construction," this can result in delays or cancellations of funding, increased borrowing costs, or stricter oversight and reporting requirements.

Domestic politics in Bulgaria

Despite challenges and criticism, the Ukrainian government remains committed to implementing the "Great Nuclear Construction". However, as of late June 2025, the agreement with Bulgaria has stalled due to internal political dynamics or possibly Bulgaria's attempt to raise its bargaining position.

The Bulgarian parliament's permit to sell equipment to Ukraine expired on 11 March 2025. In April, Bulgaria's Deputy Prime Minister Atanas Zafirov stated that Bulgaria would not sell the reactors to Ukraine, hoping instead to attract American or British investment for the construction of a data centre in Bulgaria — a project that experts consider highly unlikely to materialise (BTA 2025, Bobrytsky 2025). This position was also endorsed by Boyko Borissov, leader of the centre-right GERB party. Given the composition of the newly elected Bulgarian Parliament, the prospects for securing another round of approval appear doubtful for the time being.

On 20 June 2025, Ukraine's then Energy Minister stated, "We have not received a formal refusal from Bulgaria to continue negotiations." He added that legal advisers from both countries are still working on a revised agreement, and that Ukraine remains optimistic that the process is moving forward. Ukraine continues to work on the project and hopes for the active participation of the International Atomic Energy Agency (IAEA) (NV 2025). The new Energy

Minister, Svitlana Hrynchuk, in mid-August 2025, said that there is no progress in negotiations with Bulgaria and that Ukraine is preparing, working, and consulting on "alternative options" (Interfax 2025).

Assessment in light of OECD recommendations

The 2020 OECD Nuclear Energy Agency (NEA) report, "Unlocking Reductions in the Construction Costs of Nuclear," offers a framework for understanding how governance structures, regulatory clarity, and institutional coordination affect the success and cost-effectiveness of nuclear power projects (OECD 2020). Drawing on lessons from global reactor builds, the report identifies systemic drivers of delay and cost escalation—such as inconsistent policy environments, fragmented supply chains, and lack of qualified oversight—as key areas requiring reform. These findings are highly relevant to Ukraine's "Great Nuclear Construction" initiative, which involves completing and expanding the Khmelnytskyi Nuclear Power Plant under conditions of war, financial strain, and institutional fragility. Applying the OECD's recommendations to the Ukrainian context highlights the importance of clear early-stage planning, stable financing mechanisms, rigorous regulatory independence, and transparent procurement practices to ensure project viability and international credibility. These frameworks are further outlined and expounded on in the comprehensive table below.

Recommendation	Explanation	Assessment for Ukraine	Explanation
Capitalise on lessons learned from recent Gen-III construction projects	Countries that recently built first-of-a-kind Gen-III reactors should follow up with timely new-build decisions to sustain capabilities	**Negative**	Ukraine has not built a Gen-III reactor yet; the last Gen-II reactors were commissioned over 20 years ago
Prioritise design maturity and regulatory stability	Policy support mechanisms should include requirements for design maturity and, more specifically, construction readiness. Mechanisms should ensure that the regulatory framework for nuclear safety remains stable and predictable throughout construction	**Negative**	Due to the unique features of integrating the Belene VVER-1000 reactor units into the existing KhNPP Unit three and four sites, the bespoke challenges of the project negate design maturity. The regulatory environment is uncertain, with unresolved issues regarding the incomplete corporatisation and questions regarding the full independence of the supervisory board.
Consider committing to a standardised nuclear programme	Commit to a standardised nuclear programme, which allows capitalising on the series effect, multi-unit construction and continuous design and process optimisation	**Negative**	Splitting the plans between two VVER-1000 and additional AP1000 units reduces possible learning effects and process optimisation gains

Recommendation	Explanation	Assessment for Ukraine	Explanation
Enable and sustain supply chain development and industrial performance	Carefully articulate industrial and energy strategies and commit to a clear and predictable long-term pipeline of new nuclear construction to ensure continuous activity, sustaining a robust supply chain development	**Negative**	The Energy Strategy of Ukraine until 2050 is kept confidential, which does not provide guidance for investors; uncertainties regarding financing, procurement of key parts and a lack of credible, realistic timelines hinder supply chain development
Foster innovation, talent development and collaboration at all levels	Develop timely demonstration projects and licensing framework to foster market deployment; support talent development and international cooperation	**Neutral**	No Gen-III demonstration projects are currently under development. There is a lack of information regarding the licensing framework as well as support for talent. International cooperation with Westinghouse, other companies and institutions is ongoing.
Support robust and predictable market and financing frameworks	Long-term government planning involving both specific commitments and market Regulations, as well as financial support, are essential to deliver cost-competitive new nuclear construction	**Negative**	Large uncertainties with regard to financial support

Recommendation	Explanation	Assessment for Ukraine	Explanation
Encourage concerted stakeholder efforts	Environment that fosters a social contract with industry and society to reduce nuclear construction costs	**Negative**	Lack of transparency regarding the decision and alternatives for VVER-1000 purchase and new nuclear construction hinders an open discourse with industry and society
Tailor government involvement to programme needs	A larger government involvement is needed for countries restarting a nuclear programme	**Neutral**	Lack of information on the extent of government involvement in the "Great Nuclear Construction" programme

Source: Adapted from Organisation for Economic Co-operation and Development. (2020). *Unlocking reductions in the construction costs of nuclear: a practical guide for stakeholders*. OECD Publishing.

When assessing Ukraine's "Great Nuclear Construction" programme against the OECD recommendations, it becomes clear there is considerable room for improvement in both the programme itself and the regulatory and financing environment. In particular, the OECD recommends a standardised nuclear programme with one type of mature reactor design, a clear long-term project pipeline, regulatory stability, a robust and predictable financing framework, as well as transparent management of industry and societal stakeholders. Without all these conditions in place, there are significant tail risks of time and cost overruns for nuclear power projects, which can easily exceed 100% or 200% of initial cost estimates, as demonstrated by Flyvbjerg and Gardner (2023).

Conclusion

Despite real progress on the legislative front, Ukraine's corporate governance reform in the nuclear sector remains incomplete. The transformation of Energoatom into a joint-stock company and the formal appointment of a supervisory board represent important milestones. However, the board was delayed by almost a year and operates without full independent representation, undermining both its functionality and international credibility.

The "Great Nuclear Construction" project, while aiming to secure Ukraine's energy future, faces large uncertainties amid a fragile wartime economy, an opaque regulatory environment, and unresolved political interference. Public procurement has raised red flags, with inflated prices and missing components in the $600 mn reactor deal. Early signs of pre-emptive spending without parliamentary approval have already triggered a formal anti-corruption investigation.

Energoatom's strategic importance and the unprecedented scale of investment planned for nuclear expansion demand robust oversight, transparency, and capacity. Without restoring parliamentary control, empowering the supervisory board, and ensuring open and competitive procurement processes, Ukraine risks repeating the governance failures of the past. In the current context, Energoatom's ability to deliver on its promises depends as much on good governance as on technical execution.

References

Actualno.com (2025, March 12). Проф. Касчиев: Ако не отидат в Украйна, реакторите от АЕЦ „Белене“ ще стоят като паметник на глупостта [Prof. Kaschiev: If not sent to Ukraine, the Belene NPP reactors will stand as a monument to stupidity]. Actualno. https://www.actualno.com/economy/prof-kaschiev-ako-ne-otidat-v-ukrajna-reaktorite-ot-aec-belene-shte-stojat-kato-pametnik-na-glupostta-video-news_2398599.html

AP News (2023). Georgia nuclear plant Vogtle rates and costs. https://apnews.com/article/georgia-nuclear-power-plant-vogtle-rates-costs-75c7a413cda3935dd551be9115e88a64

Bandura, A., Figlus, J., & Timtchenko, K. (2024). Corporate governance of SOEs in Ukraine: Progress and challenges. Kinstellar. https://kinstellar.com/upload/Corporate%20Governance%20Alert_ENG.pdf

Бобрицький, Ю. (2025, February 10). Зеленський підписав скандальний закон про закупівлю болгарських реакторів для Хмельницької АЕС [Zelensky signed the controversial law on purchasing Bulgarian reactors for Khmelnytskyi NPP]. NV. https://biz.nv.ua/ukr/economics/zelenskiy-pidpisav-skandalniy-zakon-pro-zakupivlyu-bolgarskih-reaktoriv-dlya-hmelnickoji-aes-50498101.html

BTA (2025, March 10). Sale of Belene N-plant equipment will be suspended. Bulgarian News Agency (BTA). https://www.bta.bg/en/news/economy/872657-sale-of-belene-n-plant-equipment-will-be-suspended

Bright, J. (2024, March 15). After Vogtle, what’s next for nuclear? E&E News. https://www.eenews.net/articles/after-vogtle-whats-next-for-nuclear/

Center for European Policy Analysis (CEPA). (2023). Preparing for a successful peace: Consolidating corporate governance in Ukraine’s energy SOEs. https://cepa.org/comprehensive-reports/preparing-for-a-successful-peace-consolidating-corporate-governance-in-ukraines-energy-soes/

Center for Strategic and International Studies (CSIS). (2023). Removing bottlenecks for the private sector in Ukraine’s recovery. https://www.csis.org/analysis/removing-bottlenecks-private-sector

Чайка, А. (2024, January 5). «Енергоатом» ще не заплатив 16,4 млрд грн Westinghouse за обладнання для нового енергоблока Хмельницької АЕС [Energoatom has not yet paid ₴16.4 billion to Westinghouse for equipment for the new unit at Khmelnytskyi NPP]. Forbes Україна. https://forbes.ua/news/energoatom-shche-ne-zaplativ-164-mlrd-grn-westinghouse-za-obladnannya-dlya-novogo-energobloka-khmelnitskoi-aes-05012024-18334

Conca, J. (2017, March 31). Westinghouse bankruptcy shakes the nuclear world. Forbes. https://www.forbes.com/sites/jamesconca/2017/03/31/westinghouse-bankruptcy-shakes-the-nuclear-world/

Denya, O. (2025, January 17). Наглядова рада «Енергоатома» провела перше засідання та обрала голову [The supervisory board of Energoatom held its first meeting and elected a chair]. Forbes Україна. https://forbes.ua/news/naglyadova-rada-energoatoma-provela-pershe-zasidannya-ta-obrala-golovu-odin-z-nezalezhnikh-chleniv-vidmovivsya-vid-posadi-17012025-26382

Енергетичний комітет Верховної Ради (2025). [Відео засідання комітету] [Video of session]. https://www.youtube.com/watch?v=P7VAxmEtS9I

Energoatom (2024). Хмельницька АЕС [Khmelnytskyi NPP branch]. https://energoatom.com.ua/branch/xmelnicka-aes

Energoatom (2025, July 11). URC 2025: Westinghouse and Energoatom Reinforce Ukraine's Energy Independence with Partnership for Fuel Assembly Capability. https://www.energoatom.com.ua/en/news/urc-2025-westinghouse-ta-energoatom-posiliuiut-energeticnu-nezaleznist-ukrayini-zavdiaki-partnerstvu-u-sferi-virobnictva-iadernogo-paliva

Espresso (2025). Unprecedented case in nuclear energy history. https://global.espreso.tv/unprecedented-case-in-nuclear-energy-history-expert-on-buying-reactors-from-bulgaria#goog_rewarded

European Commission. Euratom. https://commission.europa.eu/strategy-and-policy/eu-budget/eu-borrower-investor-relations/euratom_en

Flyvbjerg, B., & Gardner, D. (2023). How big things get done: The surprising factors that determine the fate of every project. Penguin Random House.

Grynszpan, M., & Thomas d'Istria, S. (2024, July 25). Russia's relentless air strikes are forcing Ukraine to revolutionize electricity production. Le Monde. https://www.lemonde.fr/en/international/article/2024/07/25/russia-s-relentless-air-strikes-are-forcing-ukraine-to-revolutionize-electricity-production_6698499_4.html

Harmash, O. (2024, May 8). How Ukraine is keeping lights under Russian fire. Reuters. https://www.reuters.com/world/europe/how-ukraine-is-keeping-lights-under-russian-fire-2024-05-08/

International Energy Agency (2023). Ukraine's energy security and the coming winter. https://www.iea.org/reports/ukraines-energy-security-and-the-coming-winter

Interfax-Ukraine (2024, March 18). Ukraine moves forward with Energoatom reforms. https://interfax.com.ua/news/economic/965008.html

Interfax (2025, August 18). Hrynchuk confirms search for new suppliers beyond Bulgaria for nuclear units. https://en.interfax.com.ua/news/general/1096946.html

Kholodova, A. (2025, February 3). Чи зарадить блекаутам в Україні атомна енергія? [Will nuclear power help with blackouts in Ukraine?]. Nakypilo. https://nakypilo.ua/teksty/chy-zaradyt-blekautam-v-ukraini-atomna-enerhiia

Kommersant Ukrainian (2024). Чому Україна не має втратити можливість побудувати нові енергоблоки на Хмельницькій АЕС [Why Ukraine should not miss the chance to build new units at Khmelnytskyi NPP]. https://www.komersant.info/en/chomu-ukraina-ne-maie-vtratyty-mozhlyvist-pobuduvaty-novi-enerhobloky-na-khmelnytskiy-aes-2/

Kraev, A. (2021, October 1). Energoatom confirms plans for five new Westinghouse AP1000 reactors. NucNet. https://www.nucnet.org/news/energoatom-confirms-plans-for-five-new-westinghouse-ap1000-reactors-10-1-2021

Kunytskyi, S. (2025, February 5). Чому критикують російські реактори з Болгарії [Why Russian reactors from Bulgaria are criticized]. DW. https://www.dw.com/uk/dobudova-haes-comu-kritikuut-rosijski-reaktori-z-bolgarii/a-71587101

Kyiv Post. (2020). Ukraine could invest up to $25 billion in nuclear construction by 2030. https://www.kyivpost.com/post/9593

Maskalevych, O. (2024, May 20). Давайте допоможемо наглядовій раді «Енергоатома» знайти свої обов'язки [Let us help Energoatom's supervisory board find their responsibilities]. ZN.UA. https://zn.ua/eng/let-us-help-energoatoms-supervisory-board-find-their-responsibilities.html

NEI (2023, January 24). Ukraine to start work on Khmelnitsky 5 and 6. Nuclear Engineering International. https://www.neimagazine.com/news/newsukraine-to-start-work-on-khmelnitsky-5-and-6-10538316

NEI (2024). Ukraine begins construction of new units at Khmelnytsky NPP. Nuclear Engineering International. https://www.neimagazine.com/news/ukraine-begins-construction-of-new-units-at-khmelnitsky-npp-11690350/

Neutron Bytes (2021, November 24). Westinghouse inks major nuclear reactor deal in Ukraine. https://neutronbytes.com/2021/11/24/westinghouse-inks-major-nuclear-reactor-deal-in-ukraine/

Nikitin, A., & Gorchakov, D. (2024). Росатом у воєнні роки 2023 і 2024: Основні події, проєкти, рішення, факти та проблеми [Rosatom in the war years of 2023 and 2024: Main events, projects, decisions, facts and problems]. Bellona Foundation. https://www.laka.org/docu/boeken/pdf/2-34-6-50-14.pdf

Nikolov, I. (2024, March 18). Невмолима потреба у великому атомному будівництві [The pressing need for large-scale nuclear construction]. ZN.UA. https://zn.ua/ukr/anticorruption/nevmolima-potreba-u-velikomu-atomnomu-budivnitstvi.html

OECD (2021). OECD review of the corporate governance of state-owned enterprises: Ukraine. OECD Publishing. https://doi.org/10.1787/7755a3f9-en

OECD (2020). Unlocking reductions in the construction costs of nuclear. OECD Publishing. https://www.oecd.org/content/dam/oecd/en/publications/reports/2020/08/unlocking-reductions-in-the-construction-costs-of-nuclear_2ca6777b/33ba86e1-en.pdf

Omelchenko, A. (2022, August 8). Ukraine's renewable energy sector before, during and after the war. Razumkov Centre. https://razumkov.org.ua/en/articles/ukraines-renewable-energy-sector-before-during-and-after-the-war

Prozorro (2025). Tender UA-2025-02-04-004858-a. https://prozorro.gov.ua/uk/tender/UA-2025-02-04-004858-a

Sydorenko, S., & Protz, K. (2025, December 16). ЄС попереджає про корпоративне управління «Енергоатома» перед фінансуванням [EU warns on Energoatom governance before nuclear financing]. Українська правда. https://www.pravda.com.ua/eng/news/2024/12/16/7489381/

Тарасовський, М. (2025, February 10). НАБУ відкрило справу про розтрату 430 млн грн в «Енергоатомі» [NABU opened a case on the embezzlement of UAH 430 million at Energoatom. Forbes Україна. https://forbes.ua/news/dobudova-energoblokiv-nabu-vidkrilo-spravu-pro-roztratu-430-mln-grn-v-energoatomi-10022025-27018

Tarchynets, M., & Orel I. (2025, August 22). **«Величезний сюрприз».** Петро Котін неочікувано звільнився з «Енергоатому». Чому та що він залишив після п’яти років біля керма компанії. https://forbes.ua/company/velichezniy-syurpriz-petro-kotin-neochikuvano-zvilnivsya-z-energoatoma-chomu-i-shcho-vin-zalishiv-pislya-pyati-rokiv-u-rulya-kompanii-22082025-32138?utm_source=chatgpt.com

Verkhovna Rada (2025). Закон № 4231-IX [Law No. 4231-IX]. https://zakon.rada.gov.ua/laws/show/4231-IX#Text

Vodyani,A. (2025, August 18). Кабмін сподівається розпочати будівництво ХАЕС-3 і ХАЕС-4 у 2026 році. Розширення Хмельницької атомної електростанції увійшло до програми уряду Юлії Свириденко. https://biz.liga.net/ua/all/tek/novosti/kabmin-spodivaietsia-rozpochaty-budivnytstvo-khaes-3-i-khaes-4-u-2026-rotsi

Westinghouse Electric Company. (2021). Westinghouse and Energoatom sign AP1000 contract. https://info.westinghousenuclear.com/news/westinghouse-energoatom-ap1000-contract

Westinghouse Electric Company. (2022). Energoatom and Westinghouse reaffirm clean energy partnership. https://info.westinghousenuclear.com/news/energoatom-and-westinghouse-reaffirm-clean-energy-partnership

Westinghouse Electric Company. (2025). Болгарські реактори ВВЕР-1000 з АЕС «Белене» зможуть працювати на американському паливі [Bulgarian VVER-1000 reactors from the Belene NPP will be able to operate on American fuel]. https://energoatom.com.ua/news/westinghouse-oficiino-pidtverdiv-shho-bolgarski-reaktori-vver1000-z-aes-belene-iaki-planujetsia-vstanoviti-na-energoblokax-3-ta-4-xmelnickoyi-aes-zmozut-praciuvati-na-amerikanskomu-palivi

Westinghouse (2025, August 4). Westinghouse Reinforces Commitment to Ukrainian Recovery. https://info.westinghousenuclear.com/blog/westinghouse-reinforces-commitment-to-ukrainian-recovery

World Nuclear Association (2024). Nuclear power in Ukraine. https://world-nuclear.org/information-library/country-profiles/countries-t-z/ukraine