



Ridgeway Briefing: Ukraine's Post-War Energy: Expanding Small Modular Nuclear Reactors

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Ridgeway Briefings offer analyses of emerging issues in international relations and security, prepared by Ridgeway's team of open-source analysts, linguists and subject-matter experts.

At a glance

- Ukraine is working to transform its war-torn energy sector into a European hub of energy supply and innovation, with nuclear at the core of its strategy. Ukraine is pursuing this strategy in close alignment with US and European interests and aiming to attract investments from public and private sector donors and partners.
- Ukraine's "Energy Strategy to 2050", which is currently being updated with World Bank support, will serve as a basis for developing an international investment portfolio for the recovery and modernisation of Ukraine's energy sector. A related Concept Note is expected in autumn 2026, and consultations with international partners will follow.
- In particular, small modular reactor (SMR) nuclear technology and deployment in cooperation with the US are seen as a way to speed up Ukraine's reconstruction of its energy sector. The country's parliament is reviewing a draft law in a bid to facilitate private sector investment and expedite deployment. Adopting SMRs is also expected to help Ukraine sever its traditional reliance on Russia's nuclear energy network.

Ukraine's Nuclear Energy

Nuclear energy currently provides 50-70% of [Ukraine's energy needs](#), one of the highest proportions in the world. Since full-scale Russian aggression started in February 2022, Russia's targeted attacks on Ukraine's thermal power plants have deepened the country's dependence on nuclear energy. Russian forces have been in control of Ukraine's largest Zaporizhzhia nuclear power plant since March 2022, heightening global attention on the critical importance of nuclear security. In March 2025, the [US started to express interest](#) in getting involved in Ukraine's nuclear power plants, sparking debates about shared operation, joint projects, or ownership.

According to the fifth [Rapid Damage and Needs Assessment \(RDNA5\)](#) on 23 February 2026, Russia's targeted attacks on Ukraine's energy infrastructure meant that reconstruction and recovery needs in the energy sector is estimated at US\$90.6 billion over the next decade. But Ukraine is looking beyond just post-war recovery.

"According to RDNA5, US\$4.9 billion is needed for rapid recovery of the energy sector in 2026 alone. However, our goal is not merely to rebuild what has been destroyed, but to create [an energy system that guarantees security and stability](#) for decades to come," First Deputy Prime Minister and Minister of Energy Denys Shmyhal stressed.

Ukraine updating Energy Strategy

In April 2026, the Energy Minister told the International Chernobyl Conference on Recovery and Nuclear Safety that Ukraine will need to restore 50GW of electricity generation, with [nuclear as a mainstay of Ukraine's power generation](#). At least half of the energy production will come from nuclear energy.

To envisage the future reconstruction and growth in the energy sector, Ukraine's Energy Ministry has been working with the World Bank to review and [update its "Energy Strategy to 2050"](#) since February 2026. The

updated Energy Strategy will become the “basis for developing an international investment portfolio for the recovery and modernisation of Ukraine’s energy sector,” according to the Energy Minister. In the interim, a related Concept Note containing some of the key directions of the updated Energy Strategy is expected to complete in the autumn of 2026, followed by consultations with international partners. Ukraine’s Energy Minister has emphasised [public-private partnerships and mobilising investment](#) as key drivers for Ukraine’s energy reconstruction.

US-backed nuclear reconstruction

Nuclear is envisioned by the Ukraine government as a backbone of the country’s reconstruction and future growth. Additional nuclear energy will be generated from both US-supplied large power plants and innovative SMRs. Beyond deploying reactors in cooperation with Westinghouse and Holtec, Ukraine also aims to become a nuclear manufacturing and innovation hub for fuel cycle technologies and components.

[Westinghouse](#) is planning to establish nine **AP1000** reactors in Ukraine to complete long-delayed nuclear expansion projects, beginning with Units 5 and 6 at the Khmelnytskyi Nuclear Power Plant. Ukraine’s traditional nuclear ties are with Russia based on the Soviet-supplied VVER reactors, so this marks a significant shift in direction.

For Ukraine’s SMR ambitions, US firms Holtec and Westinghouse have emerged as its most important partners. The Ukraine Government and Holtec International have a growing partnership predating the Russian war. In April 2023, Energoatom, Ukraine’s national nuclear power company, and [Holtec](#) signed a Cooperation Agreement to expedite implementation of a **Holtec SMR-160** pilot project to start supplying power by March 2029.

Holtec has no experience of deploying its SMR units but has plans to build two [SMR-300 units in Michigan, US](#). First commercial operation of these is targeted for the early 2030s, pending regulatory approvals. Earlier pre-application efforts towards a construction licence application on its SMR-160 design were suspended in late 2023 as the company shifted its efforts towards its [SMR-300 design](#).

In January 2025, Energoatom and Holtec announced their planned implementation of **SMR-300** technology in Ukraine. The site of the former [Trypillya thermal power plant](#), the [Chernobyl Exclusion Zone](#) and others are being considered for Holtec’s SMR deployment in Ukraine.

In July 2025, [Holtec](#) and Energoatom discussed their intention to establish a manufacturing plant for Holtec’s SMR components in Ukraine and [locally fabricate spent fuel storage casks](#) using Holtec technology. This builds on their existing cooperation on the [Centralised Spent Nuclear Fuel Storage Facility \(CSFSF\) in Chernobyl Exclusion Zone](#). The Facility uses Holtec’s US-manufactured dry-cask storage designed to hold up to 16,530 assemblies for 100 years. Having the facility means Ukraine can avoid sending fuel to Russia.

[Westinghouse](#) is also in discussion with Ukraine to deploy up to 20 units of its **AP300 SMR** reactors and build component manufacturing facilities in the country. In July 2025, at the Ukraine Recovery Conference in Italy, Westinghouse and Energoatom signed an agreement to create a plant for the [production of fuel assemblies](#) in Ukraine. [Westinghouse](#) has also been supplying VVER fuel for Ukraine’s power plants since 2005, and this agreement was expected to strengthen security of fuel supply for Ukraine’s nuclear fleet.

In a March 2026 policy roundtable by the Ukrainian Nuclear Society, Energoatom was reported to have shortlisted [three SMR technologies for detailed study](#), which are BWRX-300 (Hitachi GE), SMR-300 (Holtec), and Natrium (TerraPower). Hitachi GE and TerraPower are privately-owned SMR developers with no known plans for an IPO. [Holtec filed for an initial public offering \(IPO\)](#) in the US stock exchange in July 2026 in an attempt to attract capital market investment.

Ukraine's SMR roadmap

Ukraine is developing a [legal framework](#) to speed up SMR deployment in the country. In October 2025, a draft law (No. 14164) was submitted to the parliament. The [main goals](#) of the legislation are:

- to simplify licensing procedures;
- allow the use of destroyed thermal power plant sites to build SMR; and
- attract private investment while ensuring state control over safety and nuclear materials.

In [April 2026](#), a relevant parliament committee recommended the 2025 SMR draft law for a further [parliamentary review](#). The transition of Ukraine's coal-fired power plant sites to install SMR power plants had been investigated as part of the US State Department's US\$30 million [FIRST program for Ukraine](#), launched in November 2024. Earlier, the [US Trade & Development Agency](#) also provided technical assistance (US\$1.3 million) for Ukraine's nuclear regulatory authority to close regulatory gaps to facilitate SMR deployment.

Compared to traditional large nuclear power reactors, SMRs can appeal to investors due to their compact size, lower complexity, and accelerated construction timelines. Furthermore, their modular design can enable [investment flexibility](#) through staged financing and scalable capacity expansion. Currently, there are only two SMRs in operation – in China and Russia. Resolving technical issues and establishing rigorous regulatory frameworks will determine SMR's safety and economic feasibility.

The legal and regulatory preparations for SMR deployment have been taking place amid a change of nuclear leadership in Ukraine. Former Energy Minister German Galushchenko (2021-2025) was dismissed in November 2025 during a major [corruption investigation into the energy sector](#). Petro Kotin (2020-2025), chairman and acting CEO of Energoatom, was also dismissed in [August 2025](#). [Energoatom's governance reform](#) to enhance its operational transparency is one of the top priorities of the incumbent Energy Minister Denys Shmyhal, who was appointed in January 2026 and previously served as Prime Minister of Ukraine (2020-2025).

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