

## Weekly Alert

**Russian War Against  
Ukraine: Energy Dimension**

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**Russian War Against Ukraine: Energy Dimension**  
**DiXi Group weekly review**

(April 15 – 21)

**#StopRussianAggression**  
**#StandWithUkraine**

**Summary**

- In addition to continuing attacks on electricity transmission system facilities, the Russian Federation attacked gas pipelines and distribution networks during the week.
- Russia continues its nuclear terror in Ukraine - the third drone attack on the territory and objects of the Zaporizhzhia NPP was carried out in the last two weeks.
- Occupiers announced that they revised the ZNPP's radiation protection program and aligned it with the Russian Federation's regulatory framework. They also denied IAEA experts access to part of the ZNPP's territory for inspection.
- Energoatom started the construction of power units 5 and 6 at Khmelnytskyi NPP using Westinghouse AR1000 technology.
- Energoatom also plans to manufacture individual components for small modular reactors in Ukraine using Holtec International technologies.

- Imports and emergency support from ENTSO-E countries were used to meet electricity demand during the week. Exports were not carried out.
- Ukrenergo calls on households to reduce electricity consumption during peak evening hours to balance the system. On April 18, from 18:00 to 22:00, scheduled outages were applied for business and industrial consumers in all regions of Ukraine except the Kherson region.
- USAID, in cooperation with the Ministry of Recovery, the Parliamentary Committee on Energy, Housing and Utilities, and NEURC, is deploying a network of small and medium-sized cogeneration units (with a capacity of 50-1,500 kW). In total, 91 cogeneration units were purchased for 32 cities of Ukraine, and 80 units were distributed in 21 regions.
- The Ministry of Recovery is developing an Action Plan to decentralize power generating and heating facilities in the Kharkiv region. Six cogeneration plants are already operating in the region, while an alternative network – gas turbine plants and mobile boiler houses – is being developed.
- Ukraine unofficially presented Ukraine's Green Energy Transition Program (UGETP), which aims to support the stability of the energy system in the face of Russian attacks on the energy sector. The official program will be presented at the Ukraine Recovery Conference in Berlin.
- The price indices on Ukraine's electricity markets were monthly Base BCM (of UEEX) – 2,662.5 UAH /MWh and weekly Base DAM – 3,562.4 UAH/MWh.
- GTS Operator of Ukraine presented the company's 2024-2029 Strategic Development Plan, approved by the Supervisory Board. The plan was designed to fulfill Ukraine's obligations to the IMF.

## IMPACT OF THE WAR

### Attacks

[According](#) to Ukrenergo, as of 22 April, 414 settlements in Ukraine remained without electricity due to hostilities and technological disruptions. Hostile attacks and interruptions of electricity and gas supply took place in:

**Kharkiv region.** Between 17 and 20 April, power grids were damaged in at least 11 settlements. In addition, a number of gas distribution pipelines and gas networks were damaged, leaving more than 1,000 consumers without a gas supply.

**Donetsk region.** At least 28,000 consumers were cut off from electricity during the week. The shelling resulted in three disconnections of high-voltage overhead lines, which cut power to a coal mine and caused one of the energy companies to reduce its capacity.

**Dnipropetrovsk region.** On [19 April](#), a fire broke out at a substation as a result of a drone attack, damaging equipment. In total, 4,500 consumers were left without electricity during the week, and about 500 consumers were left without a gas supply due to damaged gas pipelines.

**Kherson region.** On [18 April](#), heating networks were damaged in the city of Kherson.

**Sumy region.** During the week, about 2,200 consumers lost power due to shelling, and 430 households were cut off from the gas supply due to damaged gas pipelines.

**Chernihiv region.** Overhead lines were damaged by hostile shelling, and 4,700 customers lost power. On [15 April](#), a vehicle of a local maintenance company hit an explosive device while performing work, and 2 electricians were injured.

## Nuclear and Radiation Safety

The IAEA has [reported](#) the third drone attack on a training center on the territory of the Zaporizhzhia NPP in the last two weeks. Last week, the General Staff of the Armed Forces of Ukraine [reported](#) that, according to intelligence, the Russians were preparing to conduct another provocation at the ZNPP - another false flag operation.

The occupiers also [informed](#) the IAEA team that the ZNPP radiation protection programme had been revised and aligned with the Russian Federation's regulatory framework. The occupiers also denied access to part of the ZNPP territory for IAEA inspection.

On 11 April, Energoatom [launched](#) a project of building KhNPP-5 and KhNPP-6 using Westinghouse's AR1000 technology at Khmelnytskyi NPP. In addition, Energoatom and Holtec International [signed](#) an Agreement on the transfer of Holtec's technology for the manufacturing of some SMR components in Ukraine. Another clause of the agreement provides for the establishment of a Ukrainian plant for the production of components for spent nuclear fuel storage.

## Countermeasures

USAID, through the Energy Security Project, in cooperation with the Ministry of Recovery, the Parliamentary Committee on Energy, Housing and Utilities, and NEURC, [is rolling out](#) a network of small and medium-sized cogeneration units. As of 15 April, 80 cogeneration units have been distributed to enterprises in 21 regions of Ukraine. A total of 91 cogeneration units have been purchased for 32 Ukrainian cities and two universities. The commissioning of all units, with a capacity of 50 kW to 1,500 kW, will ensure a stable heat supply for more than 1 million residents of apartment buildings and about 1,000 social facilities, regardless of planned or emergency power outages.

In turn, the Ministry of Health [reported](#) that almost 11.2 thousand generators have already been installed in Ukrainian medical institutions. This will allow medical facilities to continue providing medical services during power outages.

In addition, work [continues](#) on the preparation of the draft law "On the Principles of Reconstruction of Ukraine" with the involvement of a wide range of stakeholders. The updated text of the document was presented during the working group meeting. The main goal is to ensure the effective, transparent, and accountable recovery of Ukraine to ensure sustainable economic growth and reduce human suffering and damage caused by Russia's aggression. The draft law will strengthen public control over the recovery process and stimulate international cooperation at the national, regional, and community levels.

## MARKETS PULSE

### Electricity Sector

#### *Power system operation*

According to [Ukrenergo](#) and the [Ministry of Energy](#), domestic generation, imports, and emergency support were used to cover the electricity demand throughout the week. However, given the significant damage caused to the power grid by hostile attacks, as well as the sharp drop in temperature and increased load in the grid, there was an electricity shortage. On April 18, from 18:00 to 22:00, scheduled outages were applied to business and industrial consumers in all regions of Ukraine except the Kherson region. Due to network constraints in the TSO lines, hourly power outages were applied in the Kharkiv region, and consumption limits were imposed on industrial consumers in the Dnipropetrovsk and Donetsk regions on certain days.

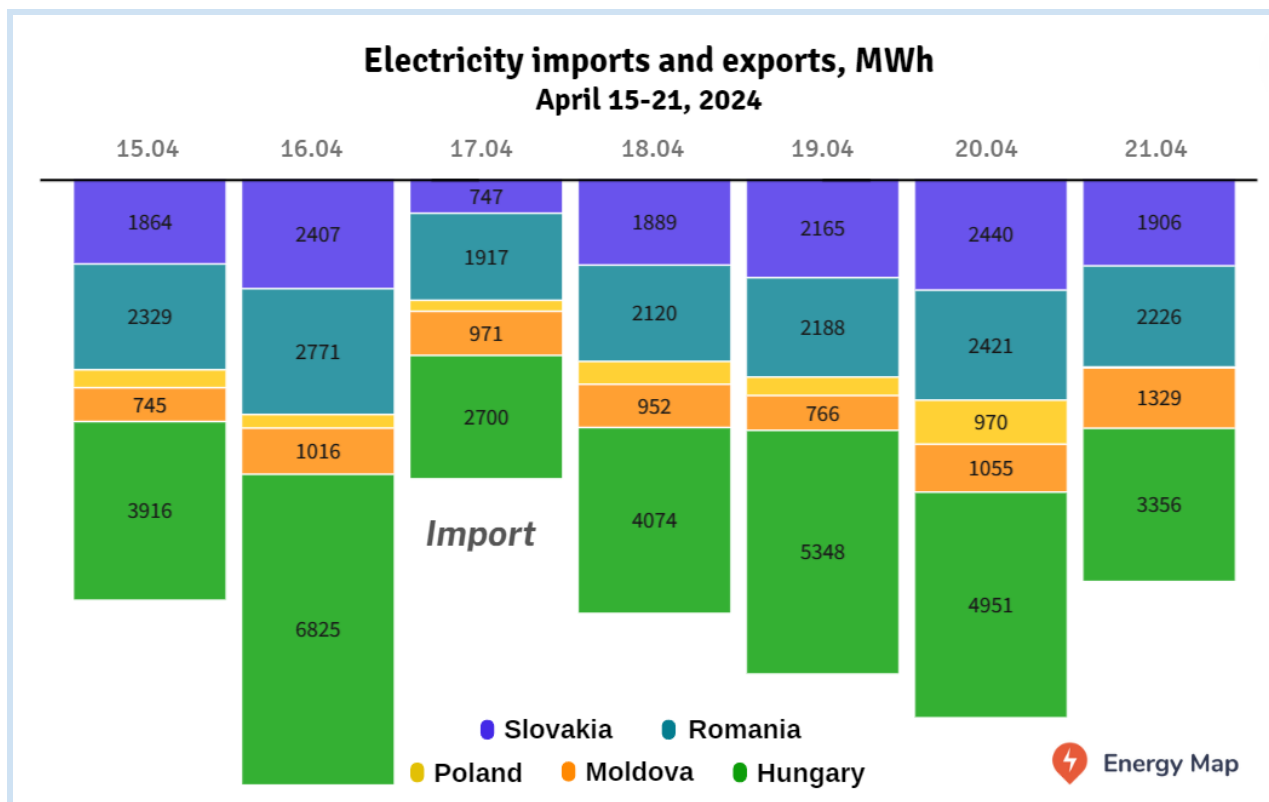
On April 15-20, emergency electricity supplies from Romania, Poland, and Slovakia were provided to cover the deficit. The volume of emergency support amounted to 1-3% of daily consumption. On April 21, due to sunny weather, the power system generated a surplus of electricity, which Ukraine transferred to Poland (1.6 GWh). Generation from renewable energy sources was also curtailed by 1.9 GWh.

Due to **technological disruptions**, On April 15, substations in the Mykolaiv and Chernihiv regions were shut down, and household and industrial consumers lost power supply. Over 3,300 consumers in the Odesa, Chernihiv, and Dnipropetrovsk regions were left without electricity for a day. On April 17, an overhead line in the Kharkiv region was disconnected, resulting in a power outage at high-voltage substations and overhead lines supplying household consumers in the city of Kharkiv and the region. Also, 456 consumers in the Sumy region lost power supply. On April 19, Ukrenergo's cross-border overhead line in the Zakarpattia region and equipment at a substation in the Khmelnytskyi region were shortly disconnected, cutting off power to about 16,000 households. On April 20, a high-voltage overhead line was shortly disconnected in the Mykolaiv region. On April 21, 3,677 customers in the Zaporizhzhia and Dnipropetrovsk regions lost power supply.

During the week, dozens of settlements in different regions of Ukraine were left without electricity due to **adverse weather conditions**, with the largest power outage on 16 April – 173 settlements in four regions.

According to the [NEURC](#) and [ENTSO-E](#), Ukraine did not export electricity during the week. Imports increased by 3.5 times to 70.2 GWh and were performed from 5 countries (Moldova, Poland, Romania, Slovakia, and Hungary).

	County	Supply days	Supply volume, GWh	Week-on-week dynamics	Capacity range, MW
<b>IMPORTS</b>	Moldova	all	6.8	↑ by 6.8 times	10-177
	Poland		2.8	↑ by 4 times	20-255
	Romania		16	↑ by 3.2 times	5-255
	Slovakia		13.4	↑ by 2.9 times	3-255
	Hungary		31.2	↑ by 3.6 times	20-680



Source: [Energy Map](https://www.energy-map.com)

#### Cross-border capacity allocation based on the results of daily auctions

Direction	Number of bidders/winners of the auction	Clearing price, EUR/MWh	Total revenue, thousand EUR	Ukrenergo's revenue, thousand UAH
Moldova - Ukraine	6-8	0.01-56.5	26.3	555.3
Poland - Ukraine	2-4 / 2-3	0.01-4.42	8.1	171.2
Romania - Ukraine	8-11	0.01-32.53	170.2	3,590.9
Slovakia - Ukraine	11-14 / 8-12	0.05-25.01	145.5	3,070.4
Hungary - Ukraine	4-6 / 4-5	0.01-22.83	256.2	5,403.4

## Market performance

**Bilateral contracts market (BCM):** Trading intensity at the Ukrainian Energy Exchange (UEEX) continued to decline. On April 15-21, UEEX held 10 one-side auctions for trading electricity (4 in commercial and 6 in specialized sections). Trades were initiated by Guaranteed Buyer, Ukrhydroenergo, Nyzhnyodnistrovska HPP, universal service suppliers, distribution system operators, etc. In total, 152.7 GWh were sold at UEEX (-30.8% week-on-week). The monthly Base BCM index for April remained at 2,662.5 UAH/MWh. Trading results for the week:



Company	Sales volume, GWh	Offer type	Price, UAH/MWh	Delivery period
Guaranteed Buyer	103.2	block positions	1,614.8 - 2,802.36	The third decade of April
Ukrhydroenergo	0.3	base load	3,000	April 18-30

In the commercial sections, companies traded electricity by individual load profiles.

**Day-ahead market (DAM):** According to the [Energy Map](#) service, on April 15-21, DAM prices demonstrated high [volatility](#): the deviation of hourly prices from price caps ranged from 0 to 92%, with an average deviation of 29.6%. The number of cases with significant price deviations (over 50%) from the price caps was observed in 13.2% of the settlement periods (hours of the week). At the same time, the number of cases when prices were close (with a deviation under 1%) or at the level of price caps increased and was observed in 18.5% of the settlement periods.

The average hourly electricity price (Base DAM index) significantly increased to 3,562.4 UAH/MWh (+41.5% WoW), while the weighted average daily price [ranged](#) from 2,815.8 to 4,445.6 UAH/MWh. At the same time, the ratio between the Base DAM indices in the markets of Eastern European countries (Poland, Hungary, Romania, Slovakia) and Ukraine significantly [ranged](#) from 0.68 to 1.31.

The total volume of electricity sales on the DAM of Ukraine moderately [decreased](#) and amounted to 391.6 GWh (-8.7%). The daily trading volume varied in the range of 53.6-59.7 GWh. The DAM remained in surplus: the ratio between the total daily volumes of sell and purchase bids ranged from 1.21 to 1.45. During the week, the total supply decreased to 528.9 GWh (-13.3%), while demand decreased to 401.9 GWh (-7.2%). At the same time, a deficit in the DAM was observed in 13.7% of the settlement periods. Suppliers [prevailed](#) in the purchase composition (87.9-90.7%), the share of system operators was 9.0-11.7%, and producers accounted for the rest (0.3-0.5%).

## **Policy and regulation**

The NEURC [has published](#) a resolution defining changes regarding the temporary connection of electrical installations to the distribution system during the period of martial law in Ukraine. Amendments were made to the Procedure for Temporary Connection and the Rules for Bringing Temporarily Connected Electrical Installations in Compliance with the Requirements of the Distribution Systems Code. The Resolution, in particular, excludes the year 2022 from the calculation of zero connection costs in case of funds deficit. At the same time, when calculating the deficit/surplus of funds for connection services, the cost of materials, equipment, and works calculated in the projects of new construction, reconstruction, and technical re-equipment of energy facilities in the DSO's investment programs should be used. Payment for non-standard connections in accordance with the requirements of the Distribution Systems Code may be postponed for the period of termination or cancellation of martial law in Ukraine.

## **Gas**

### **Gas system operation**

On April 14-20, the volume of gas transit through the territory of Ukraine amounted to 42.0-44.5 mcm per day, i.e., 39-41% of the capacity contracted by Gazprom (109 mcm per day). In the reporting week, the average daily transit was 42.8 mcm (+1.8% WoW).

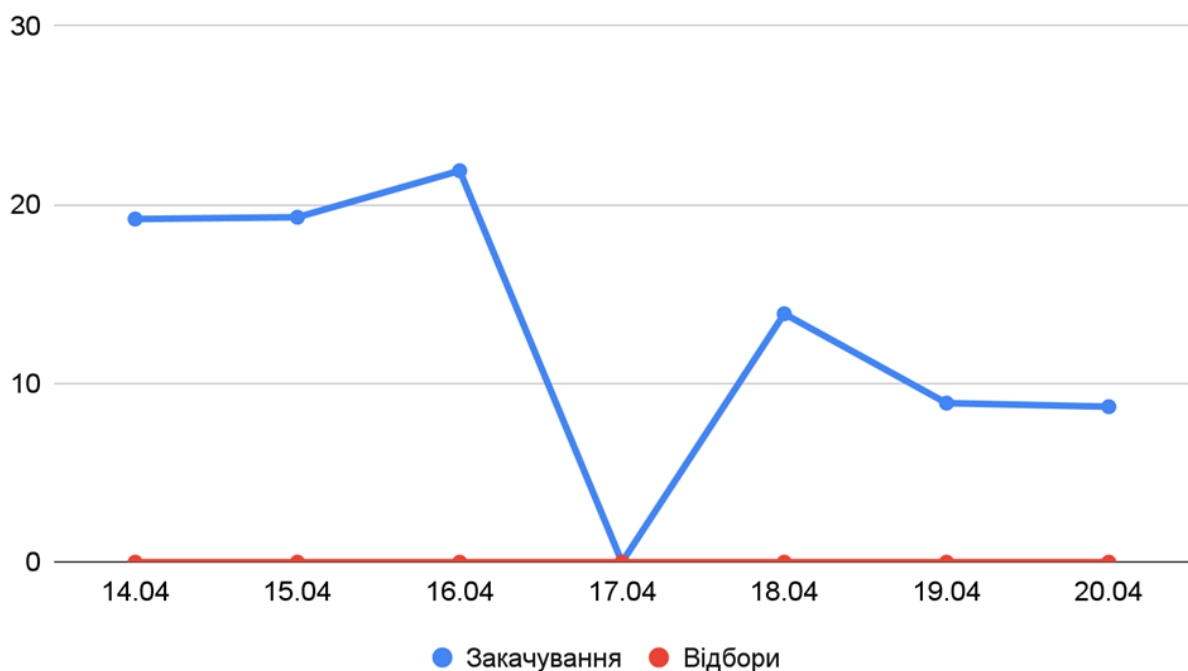
At the same time, in the reporting week physical imports of gas from Hungary amounted to 6.8 mcm (-46%). Probably, these flows or part of them pass through Ukraine in transit and are further transported to Moldova or Slovakia. Also, part of these flows could be subsequently injected into Ukrainian underground storages. Commercial flows into the Ukrainian system from Hungary were at 7.4 mcm. In particular, 0.6 mcm arrived in the "customs warehouse" mode and 0.6 mcm in the short-haul mode (service of the TSO, which provides a discount in the transmission tariff for transit over short distances).

Commercial exports through the VIP Ukraine-Poland were restored and amounted to 4.3 mcm. Also, it is likely that part of the volumes exiting the Ukrainian system to Moldova and Slovakia is the transmission of gas, which either was stored by foreign companies in Ukrainian storages or was previously imported from Hungary. This assumption is due to the fact that on April 14-20, 15.7 mcm of natural gas was transported to the exit from the Ukrainian GTS in the "customs warehouse" mode (-19% WoW). Also, in the reporting week, 16.6 mcm of gas exited Ukrainian GTS in the "short-haul" mode (-14% WoW).

### Underground storage facilities

According to the [AGSI platform](#), as of April 20, 3.67 bcm of gas was accumulated in the Ukrainian storage facilities. It corresponds to 12.2% of the total working capacity, i.e., without 4.662 bcm of "long-term storage" buffer gas. Injections in storages in the reporting week amounted to 91.9 mcm (-15% WoW); the average daily injection amounted to 13.1 mcm.

**Natural gas withdrawals and injections into/from Ukrainian storage facilities, mcm**



Source: [AGSI](#) (all indicators calculated by dividing the primary indicators in MWh by the conversion factor of 10.595 kWh/cm)

### Gas market performance

In the [trading sessions](#) of April 15-19, seven companies (five buyers and two sellers) submitted bids for purchasing gas at the Ukrainian Energy Exchange (UEEX). In the reporting period, UEEX received bids for 367.3 mcm of gas (+40% WoW) with a total starting cost of 4.6 billion UAH (+50%). The weighted average starting price of bids was 12.6 UAH/cm (excluding VAT, +6.6%).

In the monitoring period, 37.5 mcm (-37%) at a weighted average price of 12.76 UAH/cm (without VAT) (+5.4%) were purchased. 53.3% of the resource was bought by GSC Naftogaz Trading LLC, 46.3% was sold by Ukrnafta, and 0.4% - was bought by KP "Kyiv Metropolitan". 42.3% of gas was sold with transfer at a virtual trading point (transfer to GTS), and 57.7% - with transfer in storages. 57.7% was sold with delivery in April, 41.8% - in May 2024, and 0.4% - in May-October 2024.

## ***Policy and regulation***

The Verkhovna Rada has registered a draft law "On Amendments to Certain Legislative Acts Regarding the Procedure for Renewal of Subsoil Use Rights and Some Other Matters in the Field of Subsoil Use", which is an alternative to the previously registered [draft No 1137](#). Both acts are designed to regulate the issue of unblocking the production of Ukrnaftoburinnia, the corporate rights of which were transferred to Ukrnafta in 2023. In November 2023, the special permit of Ukrnaftoburinnia to use the subsoil for gas production at the Sakhalin field was canceled by a court decision.

The new draft law, as follows from the [explanatory note](#), aims to solve the problem more comprehensively compared to the previously registered act. In particular, its provisions provide that special permits that have ceased to be valid during martial law are considered to be automatically extended for the duration of martial law and for another 12 months after its termination or cancellation (before that, special permits were extended for only 6 months by the Code). Also, a new Article 16<sup>7</sup> is introduced into the Subsoil Code of Ukraine, which provides that a previously canceled special permit can be renewed in case of elimination of the violations that caused it, violations regarding the disclosure of the ultimate beneficial owner, recognition by the court as illegal of the decision to suspend the special permit and the removal of sanctions from subsoil user. Another reason for renewing the special permit is the need to take urgent measures to resolve crisis situations that threaten the national security of Ukraine, aimed at avoiding disruptions in the supply of heat, electricity, or natural gas. However, this basis is applicable if the subsoil area has been transferred to another subsoil user or if its reserves have been exhausted.

## ***Other***

GTS Operator of Ukraine [announced](#) a reduction in the use of natural gas for technological needs by 45% compared to the same period in 2023. In monetary terms, the savings amounted to about UAH 600 million.

Also, at a meeting with representatives of the Ministry of Energy and the Parliamentary Committee on Energy, Housing and Communal Services, the CEO of GTSOU, Dmytro Lyppa, [presented](#) the company's 2024-2029 Strategic Development Plan, approved by the Supervisory Board. The document was developed to fulfill Ukraine's obligations to the International Monetary Fund, established in the Memorandum on Economic and Financial Policy. The strategy defines the goals and priorities of the company in the new operating environment and focuses on the need to optimize the GTS, identify alternative sources of gas supply to Ukraine, and prepare GTSOU for the "zero transit" scenario.

## **International Cooperation**

In close coordination with the Ministry of Energy of Ukraine, the Czech company GasNet [has delivered](#) 3 cargoes of humanitarian aid weighing over 20 tons. The gas equipment has already been delivered to enterprises in the Kharkiv, Mykolaiv, Sumy, Chernihiv, Dnipro, and Zaporizhzhia regions.

At the initiative of the Director-General of International Renewable Energy Agency (IRENA) Francesco La Camera, the European Commissioner Kadri Simson, partners from the United States



and Iceland, and the Embassy of Ukraine in the United Arab Emirates, a special event [was held](#) as part of the 14th IRENA Assembly - a presentation of the Ukraine Green Energy Transition Program (UGETP) aimed at supporting the resilience of the energy system in the face of Russian attacks on the energy sector. Participants discussed the details of the UGETP, tools and mechanisms for implementing the program. The official program is expected to be presented at the Ukraine Recovery Conference in Berlin.

The Minister of Energy of Ukraine, Herman Halushchenko, [met](#) with the Ambassador Extraordinary and Plenipotentiary of Japan to Ukraine, Matsuda Kuninori. The parties discussed the energy sector's needs after the recent Russian attacks and the areas of deepening cooperation to prepare for the next heating season. Matsuda Kuninori assured that Japan is ready to continue supporting the Ukrainian energy sector and share its experience in implementing advanced technologies. Special emphasis was placed on ensuring and modernizing the protection of energy infrastructure facilities.

The [agreement](#) on the production of components for small modular reactors in Ukraine was signed by Petro Kotin, the Acting Chairman of the Board of Directors of Energoatom, and Chris Singh, the President of Holtec International. The agreement provides for the creation of facilities in Ukraine for the production of nuclear components for SMR, spent fuel storage and transportation systems, as well as other needs for the use of nuclear energy in Ukraine and other countries of the region. It is worth reminding that the cooperation between Holtec International and Energoatom has a significant practical result:

- The Centralized Spent Fuel Storage Facility was built and commissioned in Ukraine, which saves about \$200 million annually. This allowed the abandonment of the transfer of spent nuclear fuel to Russia;
- In November 2023, the companies agreed to build a plant in Ukraine to produce spent fuel casks, which are currently manufactured in the United States;
- The companies signed an agreement on cooperation in the deployment of Holtec small modular reactors in Ukraine.

The Minister of Energy of Ukraine, Herman Halushchenko, took part in an informal meeting of EU energy ministers to discuss the development of energy infrastructure. The Minister [emphasized](#) that in preparation for the next heating season, it is necessary not only to restore damaged facilities but also to increase the capacity of balancing and distributed generation, including renewables. Minister Halushchenko spoke about Russian attacks on gas infrastructure and noted the importance of Ukraine's underground gas storage facilities for European energy security. The Minister noted the possibility of using the air defense systems of neighboring countries to protect energy facilities, including those of critical importance for the security of supply of European countries. He also emphasized the importance of increasing the existing limits of cross-border electricity trade between Ukraine and ENTSO-E countries.

The team of the Ministry of Recovery of Ukraine [initiated](#) a meeting with representatives of diplomatic missions, international governmental and non-governmental organizations to discuss the situation in the energy system of the Kharkiv region. The respective action plan provides for the decentralization of power and heat generation facilities in the region. Six cogeneration units have already been installed and are operating in the region, and an alternative network is being developed, including gas turbine power plants and mobile boiler houses. The ministry's team is counting on the support of international partners, including Denmark, USAID, JICA, and others.

The President of Ukraine, Volodymyr Zelenskyy, [met](#) with the Vice Chancellor, Federal Minister of Economics and Climate Protection of Germany, Robert Habeck. During the meeting, they discussed restoring energy infrastructure after Russian missile strikes and ways to gain German assistance for the speedy repair of damaged power plants.

The report was prepared on the basis of carefully checked and analyzed reports from more than 100 official sources: ministries, state agencies, network operators and energy companies. The information was collected from official websites and social media pages, and in some cases, media reports. For subscription, comments and other questions, please write to [author@dixigroup.org](mailto:author@dixigroup.org)

### **SUPPORT UKRAINIAN ENERGY SECTOR**

As a result of intensified Russian missile attacks on the energy infrastructure, Ukraine urgently needs energy equipment and funds for emergency restoration.

If your company, association, or country is willing to provide:

- For financial assistance to Ukraine, please contact the team of experts of the Energy Support Fund for Ukraine established by the Energy Community Secretariat at [UkraineSupportFund@energy-community.org](mailto:UkraineSupportFund@energy-community.org). The Fund finances the purchase of critical equipment for the most affected energy companies.



- For critical equipment assistance, please contact the Energy Community Secretariat's Ukraine Support Task Force at [Ukraineemergencysupport@energy-community.org](mailto:Ukraineemergencysupport@energy-community.org) to learn about current needs. The team will help with coordination, logistics, and other related issues.

### **SUPPORT UKRAINIAN ARMY**

To financially support the Armed Forces of Ukraine, please follow the [link](#) (the National Bank of Ukraine special account).