



# Russian War Against Ukraine: Energy Dimension

DiXi Group alert

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#StopRussianAggression

#StandWithUkraine

## Summary

- The purposeful activity of the Russian military in relation to the Zaporizhzhia NPP has unprecedentedly **exacerbated the risks to global nuclear and radiation safety**. On August 5-7, the Russians shelled the ZNPP site and the satellite city of Energodar. The nitrogen-oxygen station and the combined auxiliary building, as well as the 330 kV high-voltage line were seriously damaged; the occupiers struck close to the dry spent nuclear fuel storage facility (SNFSP), with three radiation monitoring sensors damaged. Some heavy military equipment and munitions are placed in the engine rooms of units 1 and 2. In addition, there are reports of mining at the ZNPP facilities (which are used as an "atomic shield") and adjacent territory for further nuclear blackmail of Ukraine and the international community.
- The President Volodymyr Zelenskyi called on the international community to provide a **decisive response to the Russian strikes on the ZNPP**. Earlier, he emphasized that the Russian actions are not only an argument to recognize Russia as a state sponsor of terrorism, but also an argument of tough sanctions against the entire Russian nuclear industry, including Rosatom and all related companies and individuals. The Ministry of Foreign Affairs of Ukraine called on the international community to take immediate action to force Russia to withdraw from the ZNPP site and transfer it under the control of Ukraine. The State Nuclear Regulatory Inspectorate called on the IAEA and other international organizations to exclude Russia from any international agreements.
- As of August 7, 765 settlements (app. **607,200 consumers**) were left without electricity supply due to damage caused by hostilities. App. **235,700 consumers** were left with no gas supply.
- In July, **146 million cyberattacks were carried out** on the IT perimeter of Ukrenergo, incl. 61% from Russia and 26% from the temporarily occupied Donetsk and Luhansk regions. The peaks of the attacks occurred when the company reported on the successful exports of electricity to the EU.

- GTSOU reacted to the Minister of Natural Resources of Canada Jonathan Wilkinson's statement that the Ukrainian gas systems cannot replace the Nord Stream pipeline. GTSOU indicated that, before the Russian pipeline was constructed, the Ukrainian transit corridor was **Germany's only supply route for Russian gas**.
- The Presidential Office formed a special **working group to implement a mechanism for compensation of damages** to be borne by the aggressor state. Work continues on the launch of a special compensation commission through the conclusion of a multilateral international agreement.
- The government approved the draft law on **turning the state-owned enterprise Energoatom into a joint stock company**, as well as draft additional agreements with the European Commission on financing EE4U and EE4U-II energy efficiency support programs.

## Attacks

On August 5 and 6, the Russian military **shelled the Zaporizhzhia nuclear power plant** several times. First, the industrial site of the ZNPP was [shelled](#), the projectiles hit the 330 kV high-voltage communication line of the open autotransformer switchgear (ZNPP - Zaporizhzhia TPP). For the second time, attacks were [recorded](#) close to one of the power units, with the nitrogen-oxygen station and the combined auxiliary building seriously damaged. As a result of the attack, emergency protection was [activated](#), and one of the three active units was forced to be disconnected from the grid.

In the evening of August 6, the occupiers [struck](#) close to the stationary dry spent nuclear fuel storage facility (SNFSP), as a result three radiation monitoring sensors at the SNFSP site were damaged. Therefore, timely detection and response in case of deterioration of the radiation situation or leakage of radiation from containers of spent nuclear fuel is currently impossible.

[In addition](#), on August 5, the occupiers [opened fire](#) on Energodar, the ZNPP satellite city, destroying the Luch substation, with almost 6 of 7 districts of the city left without electricity and water supply.

[According to](#) Energoatom, the artillery shelling of the ZNPP site is aimed at destroying the station's infrastructure, damaging all power transmission lines and, as a result, cutting off power supply in the south of Ukraine. Therefore, the shelling of the station is likely to continue. In addition, the Russians [openly declare](#) they have mined the NPP site and are ready to detonate munitions in case of "necessity". Coordinated actions of security organizations, including the UN, the IAEA and the WANO, as well as constant pressure on Russia from the international community to withdraw the military from Europe's largest nuclear facility and its complete demilitarization, can prevent this.

In the city of **Kherson**, the Russian occupiers mined vital communications ahead of a possible counteroffensive by the Armed Forces of Ukraine, as the press service offices of the Main Intelligence Directorate of the Ministry of Defense Andrii Yusov [reported](#). In particular, infrastructure and gas, electricity and water supply facilities were mined.

In July, 146 million cyberattacks were carried out on the IT perimeter of Ukrenergo, of which 61% came from Russia and 26% from the temporarily occupied Donetsk and Luhansk regions. The peaks of the attacks occurred when the company reported on the successful exports of electricity to the EU and the corresponding revenues for the state.

## Nuclear and Radiation Safety

### **Zaporizhzhia NPP**

According to the estimates of the State Nuclear Regulatory Inspectorate, Russia has significantly expanded the acts of nuclear terrorism in relation to the ZNPP. As of August 8, the ZNPP [operates](#) with the risk of violating radiation and fire safety regulations. The occupiers [have placed](#) heavy military equipment and munitions in the engine rooms of units 1 and 2, which **sharply increases the risks of a global nuclear disaster** due to detonation and fires. At the same time, the accumulation of Russian military equipment will limit the access of special fire equipment to places of potential ignition.

According to the president of Energoatom Petro Kotin, the Russian army is [covering](#) by the ZNPP as an "atomic shield" and continues shelling from its territory. At the same time, near the village of Vodyane, which is the closest one to the ZNPP, a division of Grad multiple launch rocket systems, and the occupiers are [storing](#) mines and munitions in the immediate proximity to the power units, under the overpasses. The occupiers seized all the basements of the station, [hiding](#) from the shelling. On the other hand, Ukrainian personnel does not have access to these premises and, in case of new shelling, will not have any shelter and thus will be in danger.

In addition, there are signs of [mining](#) at the shoreline of the ZNPP along the cooling pond and the adjacent shore of the Kakhovka Reservoir. The Russian nuclear terrorists also claimed to detonate munitions at the ZNPP site and openly [blackmailed](#) the world with their readiness to blow up the facility.

The State Nuclear Regulatory Inspectorate is constantly monitoring the radiation situation at the ZNPP. According to the information received by the SNRI specialists directly from the station personnel, as of 21:00 on August 5, [no changes](#) in the radiation status at the NPP site, in the sanitary protection zone and the monitoring zone were recorded by the standard control systems. At the same time, after the shelling, three radiation monitoring sensors close to the dry spent nuclear fuel storage of the ZNPP [were damaged](#).

The Ministry of Foreign Affairs of Ukraine [called](#) on the international community to take immediate action to force Russia to withdraw from the ZNPP site and transfer it under the control of Ukraine. In turn, the State Nuclear Regulatory Inspectorate [called](#) on the IAEA and other international organizations to exclude Russia from any international agreements as a party that resorted to nuclear blackmail, occupied nuclear facilities and jeopardized the safe existence of the world.

In turn, the IAEA Director General Rafael Grossi expressed another deep [concern](#) due to the significant worsening of the situation at the ZNPP and the urgent need to organize an expert mission of the Agency to the site. Grossi also stated that recent events have led to the violation of most of the 7 fundamental principles of nuclear safety, and any military actions that threaten the safety of the ZNPP are unacceptable.

## Electricity Sector:

### ***Power system operation***

**Interaction with ENTSO-E:** As of August 8, Ukraine exported electricity to Eastern European countries at the total level of app. 660 MW. Exports to [Poland](#) via the Dobrotvirsk TPP - Zamosc transmission line were reported at 210 MW on a flat schedule. The total exports to [Romania](#) and [Slovakia](#) amounted to 250 MW - 125 MW on a flat schedule in each of the directions. Exports to [Moldova](#) amounted to 200 MW. Technical [cross-border flows](#) also continued between the energy systems of Ukraine and Eastern European countries (Romania, Slovakia, Hungary, Poland and Moldova).

According to Ukrenergo data, on August 1-7, 80.7% of electricity in the United Power System of Ukraine was [produced](#) without CO<sub>2</sub> emissions.

### **Daily capacity allocation auctions ([for August 8](#)):**

*Ukraine->Poland:* DTEK Zakhidenergo purchased all available 63 MW on a flat schedule; marginal price - "zero".

*Ukraine->Moldova:* out of 490-530 MW available capacity (for different hours of the day), 100 MW was booked by Ukrhydroenergo on a flat schedule; marginal price - "zero".

*Ukraine->Romania:* 125 MW available capacity for every hour of the day was distributed among all 7 companies competing at the auction. The results were characterized by a significant increase in concentration, since the largest total share of cross-border capacity was purchased by DTEK Zakhidenergo (78.1%), and the remaining 21.9% were distributed among 6 companies. The Herfindahl-Hirschman index, HHI, was at 6,201. The marginal price for various hours of the day continued to decrease and ranged from 5,513.7 UAH/MWh (for 03:00-04:00) to 11,308.54 UAH/MWh (for 22:00-23:00). This caused a relative decrease in the Ukrenergo revenues from the auction to about 23 million UAH.

*Ukraine->Slovakia:* 125 MW available capacity for every hour of the day was distributed among all 5 companies competing at the auction. At the same time, there was a decrease in the level of competition and the distribution concentration has further increased - the largest total share was booked by DTEK Zakhidenergo (77%), and the remaining 23% were distributed among 4 companies (HHI = 6,076). The marginal price for various hours of the day decreased and fluctuated in a range from 6,423.38 UAH/MWh (for 02:00-03:00) to 10,980.64 UAH/MWh (for 22:00-23:00), which caused a decrease in the Ukrenergo revenues from the auction to 23.8 million UAH.

**Infrastructure restoration:** on August 1-7, at one of the 750 kV substations, [Ukrenergo specialists began work](#) on changing transformer oil, at another one, works on replacing defective transformer equipment continued. At a 330 kV substation, the portals were repaired with the replacement of insulators and a 110 kV cell was tested after the repairs. At another 330 kV substation, the repair of a transformer has been completed. At another 330 kV substation, planned works on equipment repair were ongoing. Replacement of reinforced concrete supports continued at one of the 330 kV power lines.

## **Electricity market performance**

**Bilateral contracts market (BCM):** On August 1-5, [9 auctions](#) for the purchase/sale of electricity were held at the Ukrainian Energy Exchange (UEEX): 1 in commercial sections, 8 in specialized ones. The bidders included Energoatom-Trading, Guaranteed Buyer, distribution system operators (DSOs) and universal service suppliers (USSs). As of August 5, the monthly base load index for August was reported at 2,136.3 UAH/MWh.

Energoatom-Trading sold 168.38 GWh of base load at the weighted average price of 2,300 UAH/MWh with delivery in August and 2.93 GWh at the weighted average price of 2,708 UAH/MWh with delivery in September-December. Guaranteed Buyer sold 47.72 GWh of daytime block positions at the weighted average price of 2,380 UAH/MWh with delivery in August.

**Day-ahead market (DAM):** As of August 8, the Base, Peak and Offpeak price indices [decreased](#) slowly to 2,861.04 UAH/MWh (-3.5% vs the previous day), 3,163.42 UAH/MWh (-4.7%) and 2,558.67 UAH/MWh (-2%), respectively. As a result, the weighted average settlement price also [decreased](#) slightly to 2,997.56 UAH/MWh (-4.6%). At the same time, the highest prices were reported in the evening (18:00-23:00) peaks, being close to the upper price cap and ranging 3,858-3,888 UAH/MWh. Meanwhile, exchange prices in the Eastern European markets have shown a synchronous increase. The Base DAM indices of Romania, Slovakia and Hungary were app. 4.6-4.9 times [higher](#) than the Base DAM index of Ukraine; while the price spread to Poland increased to 3.2 times.

The total volume of trading [increased](#) by more than a quarter - to 34,221.7 MWh (+28.9% vs the previous day); the supply also increased significantly to 58,561.4 MWh (+33.3%). Together, these factors resulted in a slight increase of market surplus: the gap between the volumes of purchase and sale bids was at 1.7 times. At the same time, certain hours of the day (in particular, 23:00-24:00) were characterized by a deficit. In the [structure of purchase](#), 88% was occupied by suppliers, 11.7% by system operators, and 0.3% by traders and producers.

**Intraday market (IDM):** On August 7, the weighted average price [decreased](#) moderately to 2,950.34 UAH/MWh (-10.8% vs the previous day). At the same time, the highest prices were observed during

the morning (09:00-10:00) and evening (17:00-23:00) peaks, were close to the upper price cap and varied 3,661.8-3,724.02 UAH/MWh and 3,935.16-4,000 UAH/MWh, respectively.

The total volume of trading increased significantly to 2,916.1 MWh (+72.2%); at the same time, supply significantly decreased to 23,943 MWh (-44.4%). Together, these factors resulted in the further decrease of market surplus: the gap with the volume of purchase bids dropped to 7.2 times. At the same time, some hours (00:00-01:00, 06:00-07:00 and 23:00-24:00) were characterized by a deficit. In the [structure of purchase](#), the dominant part (89.8%) was occupied by suppliers, 10.1% by system operators, and 0.1% by producers and traders.

**Other:** As of August 3, Guaranteed Buyer [reported](#) settlements with universal service suppliers (USSs) for services of ensuring the availability of electricity for households in the amount of 58.6 billion UAH since the beginning of 2022, while the company's debt amounts to 14.4 billion UAH. Also, as part of the CoM Resolution No. 775 implementation (in force since July 12), Guaranteed Buyer reported receiving 459.3 million UAH from electricity exporters.

## ***Disruption and resumption of supply***

[According](#) to the Ministry of Energy, as of August 7, a total of app. 607,200 consumers in 765 settlements were disconnected from electricity supply due to damage caused by hostilities, while supply to app. 17,700 consumers was restored during the day.

Large-scale power supply disruptions and, consequently, active recovery works were taking place:

- in the **Donetsk region**, [according](#) to the local DSO, during the last week, specialists restored electricity supply to over 81,000 households in 104 settlements. According to the Ministry of Energy, about 368,100 consumers were left without electricity supply;
- in the **Luhansk region**, [according](#) to the Ministry of Energy, more than 128,200 consumers remained without electricity supply;
- in the **Kharkiv region**, [according](#) to the Ministry of Energy, about 29,100 consumers remained without electricity supply, and supply to 1,200 consumers was restored during the day;
- in the **Zaporizhzhia region**, [according](#) to the local DSO, as of 07:00 on August 8, 17,055 consumers in 71 settlements remained without electricity supply (data not including 8 district offices, where the occupation "authorities" had restricted access). During the day, emergency crews restored supply to 390 consumers in the Orikhiv, 379 in the Zaporizhzhia, and 360 in the Vilnyansk power grids, that were offline as a result of enemy shelling;
- in the **Mykolaiv region**, [according](#) to the Regional Military Administration, as of August 8, 546 electricity supply facilities were partially or completely damaged. 89 settlements of the Bashtanka and Mykolaiv districts remained completely without power supply, and 5 - partially ([according](#) to the Ministry of Energy - a total of 31,080 consumers);
- in the **Dnipropetrovsk region**, [according](#) to the local DSO, on August 6-7, the enemy shelled the Nikopol and Kryvyi Rih districts again. As a result, several thousand households in the cities of Nikopol and [Marhanets](#), and the village of Maryanske were left offline due to the damaged power grids;
- in the **Chernihiv region**, [according](#) to the Regional Military Administration, as of 06:00 on August 8, due to weather conditions and other technical reasons, 24 settlements (6,917 consumers) remained without electricity supply;
- in the **Kyiv region**, [according](#) to the local DSO, as of 9:00 on August 8, specialists repaired 1,075 transformer substations and 51 overhead lines with a voltage of 6-10 kV, which were disabled due to bad weather. Specialists fully restored power supply to 33 settlements and to 73 - partially; however, 22 settlements still remained without electricity supply;
- in the **Sumy region**, [according](#) to the Regional Military Administration, on August 5, as a result of enemy fire on the Shostka district, power grids were damaged and 71 households

were disconnected. On August 6, the Russian military shelled the villages of the Bilopillia and Nova Sloboda communities, damaging a transformer, power grids and the transmission line, with blackouts recorded. [According](#) to the Ministry of Energy, electricity supply to 100 consumers was restored during the day;

- in the **Poltava region**, [according](#) to the Ministry of Energy, electricity supply to 1,800 consumers was restored during the day;
- there was no up-to-date consolidated information on power supply in the **Odesa and Kherson regions** at the time of the review preparation.

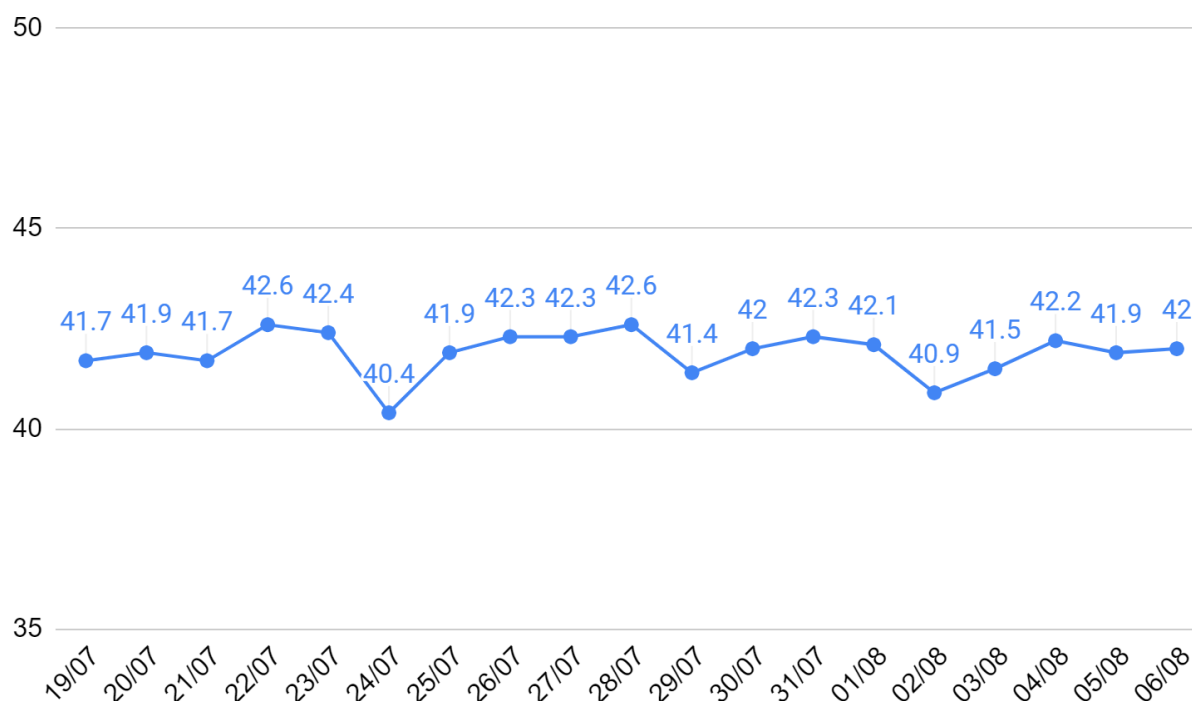
## Gas Sector:

### Gas system performance

On August 4-6, the gas transit through the territory of Ukraine ranged 41.9-42.2 mcm. These volumes were only 38-39% of the capacity contracted by Gazprom (109 mcm per day). There were no transit flows via the Sokhranivka interconnection point.

The total physical imports of gas from the EU for the 3 reported days amounted to 10.9 mcm (average daily volume - 3.6 mcm): 7.6 mcm were reported via the Hermanowice interconnection point (Poland), 3.3 mcm were reported through the Budince interconnection point (Slovakia). On August 4-6, there was no gas shipped on Ukraine's gas system exit via the Berehove interconnection point (virtual interconnection point "Bereg").

**Gas transit through Ukraine (at Sokhranivka and Sudzha interconnection points), mcm**



Source: [GTSOU](#)

GTSOU [reacted](#) to the Minister of Natural Resources of Canada Jonathan Wilkinson's statement that the Ukrainian gas systems cannot replace the Nord Stream pipeline as a supply route to Germany. GTSOU indicated that, before the Nord Stream pipeline construction, the Ukrainian transit corridor was Germany's only supply route for Russian gas. However, the current reduction in

supplies through Nord Stream and the refusal to redirect gas flows through alternative routes is an attempt by the Russians to revive the Nord Stream 2 project and gain new leverage in the gas war against Europe.

### ***Disruption and resumption of supply***

The **Donetsk, Luhansk, Zaporizhzhia, Kherson, Mykolaiv, and Kharkiv regions** had the most challenging situation. [According](#) to the Cabinet of Ministers, as of August 4, more than 237,400 consumers remained without gas supply; and supply was restored to 1,487 consumers during the day.

In the **Donetsk region**, the situation didn't change: almost the whole region remained without gas supply due to the main gas pipeline damage.

In the **Luhansk region**, there were no changes in gas supply: it was completely suspended due to hostilities which were deeply destroying the region's critical infrastructure.

In the **Kharkiv region**, the local DSO [continued to restore](#) gas supply in two communities of the region, in particular in the city of Chuhuiv, which suffered from constant shelling.

In the **Mykolaiv region**, as of the morning on August 5, 767 gas infrastructure facilities (+2 as compared to the previous day) were [damaged](#) for the whole period of war. As a result, 7,127 consumers were left without gas supply. The enemy was also [destroying](#) the facilities of the local DSO - in recent days, two sites of Mykolaivgaz JSC were partially destroyed.

In the **Zaporizhzhia region**, as of August 5, the situation didn't change: 226,989 consumers in 270 settlements [remained without gas supply](#).

[According](#) to the **Chernihiv** Regional Military Administration, as of the morning on August 5, 659 consumers in 20 settlements have not received gas supply service.

Operational information on gas supply in the [Kherson](#) region was not available at the time of the review preparation.

## Countermeasures of Ukrainian Companies and Public Authorities

The Chairman of the Verkhovna Rada Committee on Finance, Tax and Customs Policy, and Secretary of the National Reconstruction Council Danylo Hetmantsev [announced](#) plans to create a special state Development Agency to implement the Ukraine Recovery Plan. According to him, it will be an executive body, following the example of InvestUkraine, which has an end-to-end function - reconstruction of the country. Hetmantsev explained that the National Reconstruction Council is finalizing the draft Plan, but cannot give instructions to authorities and monitor its implementation. Therefore, it is proposed to create an agency that will be an executive body and will be able to coordinate the activity of ministries, maintain contacts with foreign partners, propose changes to the Plan, and at the same time, take care of the issues of culture, education, medicine, and security.

At the meetings with leadership of 15 regions, the Minister of Communities and Territories Development Oleksii Chernyshov defined the tasks for the winter preparations of communal district heating systems. The local authorities of the Sumy region [are instructed to](#) resume the operation of the Okhtyrka CHP before the heating season begins. As part of the preparation of the Chernihiv CHP, the priority is not to fall behind the schedule. Oleksii Chernyshov also [instructed](#) the Poltava Regional Military Administration Head Dmytro Lunin and the mayor of Kremenchuk Vitalii Maletskyi to prepare a list of measures to ensure resolution of the stressful situations at the Kremenchuk CHP.

The Minister of Energy Herman Halushchenko [reported](#) that gas consumption in Ukraine fell by 40% after the start of the full-scale Russian invasion. According to him, taking these facts into consideration, as well as developments at the battlefield, the government may revise plans of filling gas storage facilities in preparation for the heating season. At the same time, the Minister emphasized that the planned volumes of gas and coal reserves are focused, first of all, on critical scenarios.

The Ministry of Economy published for discussion a [draft](#) of the joint order with the State Property Fund on the approval of the Methodology for determining damage and losses in connection with the Russian armed aggression, as well as lost profits from the impossibility or obstacles in the conduct of economic activity. Meanwhile, MP Olena Shulyak [said](#) the draft law on compensation for destroyed housing (reg. No. 7198) is being considered by a dedicated Verkhovna Rada committee and may be adopted in August or in the first decade of September. According to Shulyak, the restrictions on compensation by area (<150 m<sup>2</sup>), by citizenship and purpose of real estate, laid down in the previous version, are currently being discussed.

At the meeting on August 4, the National Energy and Utilities Regulatory Commission (NEURC) [decided](#) to carry out unscheduled on-site inspections at the request of Ukrenergo due to the debts of universal service suppliers. Inspections will be conducted at Dnipro Energy Services LLC, Donetsk Energy Services LLC, Kyiv Energy Services LLC, KOEK LLC, Odesa Regional Energy Supply Company LLC.

The Minister of Social Policy Oksana Zholnovych [said](#) the government does not expect an increase in the number of recipients of housing subsidies due to the war. According to her, the planned subsidies budget was increased by 3 billion UAH as compared to 2021. Since May, subsidies have been allocated and paid, there may be some delays related to the Treasury operations.

For subscriptions, comments and other questions, please email to: [author@dixigroup.org](mailto:author@dixigroup.org)

## **SUPPORT UKRAINIAN ENERGY SECTOR**

*Ukraine urgently needs emergency energy equipment to restore energy supply in the regions affected by war. More than 10.000 items are on the list of requested emergency energy equipment. If your company, association or country is ready to help, please [contact the Energy Community Secretariat's Ukraine Support Task Force](#)  
[More information](#)*

## **SUPPORT UKRAINIAN ARMY**

*To financially support Heroic Ukrainian Army, please follow the [link](#)  
(The National Bank of Ukraine)*