Briefing

July 2022

REVITALISING EU-UKRAINE CROSS-BORDER INFRASTRUCTURE FOR A SECURE, CLEAN ENERGY FUTURE

ENERGY TRANSITION COALITION

RAP®

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We would like to thank the following people for their valuable contributions and expert reviews:
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About:

Regulatory Assistance Project, (RAP)®

RAP is an independent, global, non-governmental organisation advancing policy innovation and thought leadership within the energy community. In the next five years, RAP will focus on key policy areas to drive a more efficient and equitable decarbonised energy future and to ensure a sustainable and just transition: Accelerate electrification of buildings and transportation; accelerate the phaseout of gas infrastructure; remove barriers to distributed energy resources; and decarbonise the electric grid.

Energy Transition Coalition

“Energy Transition UA” is an all-Ukrainian coalition of non-governmental organisations, municipalities and active citizens who have joined forces to facilitate Ukraine’s transition to energy efficiency and the use of renewable energy sources. The coalition’s mission is to promote Ukraine’s transition to 100% renewable energy through advocacy, information and stakeholder engagement. At the state level, we are working to ensure that energy efficiency in all sectors and the development of renewables have turned into real priorities of the state energy and climate policy. At the local level, it assists municipalities in developing and implementing a Sustainable Energy and Climate Action Plan so that Ukrainians in cities and villages have the opportunity to implement energy efficiency measures and take advantage of renewable energy sources. The coalition includes 8 NGOS from different parts of Ukraine: Ecoclub, Ecoaction, All-Ukrainian Sustainable Development and Investments Agency, Solar Energy Association of Ukraine, Khmelnytskyi Energy Cluster, Ekoltava, Safe hub PravoPolice, and City of the Sun.

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KEY MESSAGES

The Russian invasion of Ukraine is having a significant impact on the Ukrainian power sector. In recent years, the sector had started moving towards greater integration with the European Union and was making inroads into the shift to renewable energy sources.

The current situation is very challenging; not only is it slowing the nation's energy transition, it is also disrupting past achievements. Burgeoning renewable energy sources are being curtailed or shut down at unprecedented rates, as a result of the destructive effects of the war coupled with inflexible generation sources.

One way to rectify this imbalance would be to maximise the current potential for interconnectivity between Ukraine and the EU. Increasing commercial energy flows would allow Ukraine to work towards three goals simultaneously:

- Increasing energy security
- Providing funds for continuing operation and reconstruction
- Allowing for greater integration of renewables and achieving decarbonisation objectives faster.

The benefits of increased cross-border electricity trading between the EU and Ukraine will be mutual. Restoring operation of the defunct Polish-Ukrainian interconnector would also provide additional flexibility to the Polish power system, help lower the carbon intensity of power supply, and reduce wholesale power prices at a time when they are at record levels, driven by the high cost of fossil generation.

While there are technical and legal requirements which must be fulfilled in order to expand Ukraine's connectivity with the EU, the value of the process can be maximised by:

- Implementing transparent, market-based instruments for cross-border capacity allocation.
- Ensuring solutions benefit all customers and do not only serve individual vested interests.
- Laying out a roadmap for long-term structural reform of the Ukrainian energy system, focusing on ensuring energy security and advancing European and Ukrainian decarbonisation goals.

INTRODUCTION

The expansion and integration of cross-border infrastructure capacity in Europe is one of the essential steps for implementing the Energy Union Strategy, which sets common rules and targets to secure the supply of clean energy in the EU. Achieving a common EU energy market and safeguarding energy security, however, cannot be pursued without the involvement of non-EU countries. With better interconnections, surplus renewable energy in parts of Europe can be transported to regions where it is needed most, lowering prices and minimising the curtailment of renewables. Cross-border power exchanges help to balance supply and demand in different countries, contribute to the optimal use of renewable power generation assets, and smooth out the effects of their variability over a larger geographical area. Increased cross-border trading also increases overall social welfare and system resilience.

The energy transition and the rapid development of renewables pose a dual challenge for transmission system operators (TSOs). They must integrate renewables while also maintaining and improving the reliability of the power grid. One of the essential tools for achieving these aims is to expand grid connectivity and couple markets, while including rigorous cost-benefit analyses to keep costs in check. In recent years, this goal was at the forefront of both EU and Ukrainian strategic priorities. Now, after synchronisation of Ukraine's power grid with the European Network of Transmission System Operators for Electricity (ENTSO-E) in the aftermath of the Russian invasion, achieving it is of utmost importance. This paper sets out a way forward to rise to the challenge.

THE CURRENT STATUS OF UKRAINE'S POWER SECTOR AND THE IMPACTS OF WAR

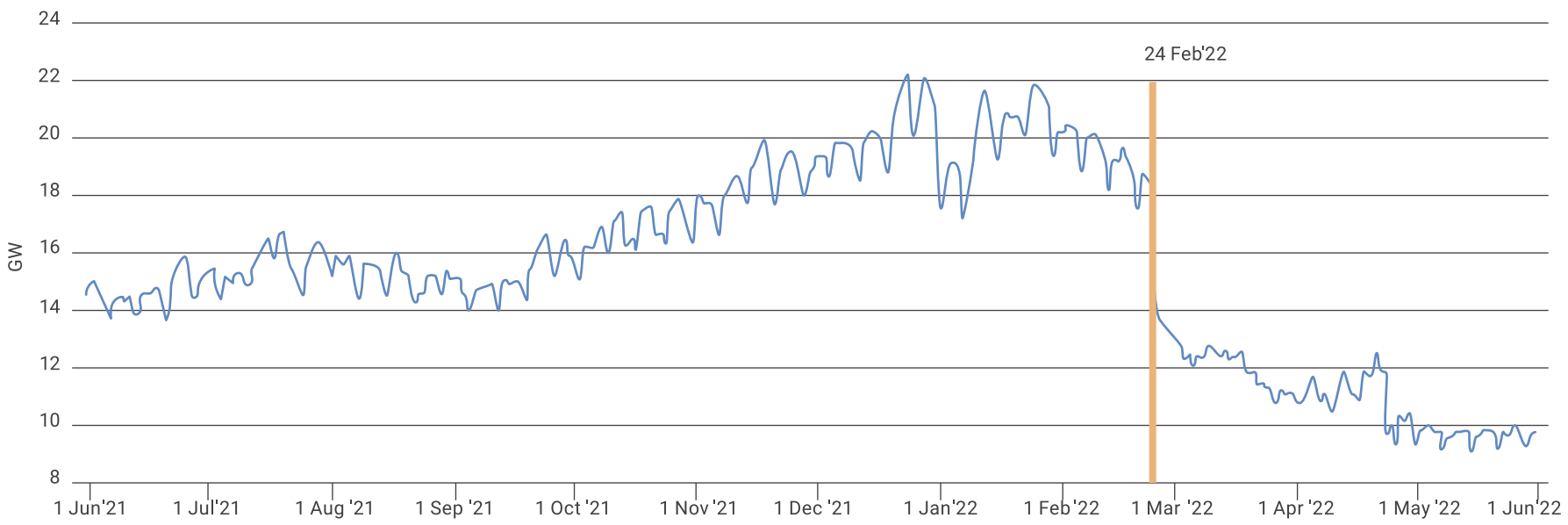
On 23 February 2022, just hours before Russia launched its full-scale invasion, Ukraine's power system was disconnected from the Russian and Belarusian power systems in what should have been a short, temporary test operation in isolated mode. Shortly afterwards, on 16 March, the Moldovan and Ukrainian power systems were synchronised with the EU Common Grid following a request for emergency interconnection. As a result, Ukraine now has the ability to access additional frequency stabilisation support and emergency power supply from TSOs in continental Europe. This was previously provided mainly by Russia and Belarus.

On 26 April, the Ukrainian TSO Ukrenergo became an Observer Member of ENTSO-E. This will further strengthen Ukraine's ties with the EU energy community, and will give Ukrenergo access to valuable technical, policy and legal expertise.

Electricity demand destruction

Following the Russian invasion and the extensive destruction of Ukraine's infrastructure, cities, industries, homes and neighbourhoods, electricity demand plummeted dramatically, as shown in Figure 1, and is now roughly 35% below pre-war levels (May 2021 to May 2022). Whole cities have been levelled to the ground, and large parts of south-eastern Ukraine currently remain under Russian occupation. According to United Nations High Commissioner for Refugees (UNHCR) data, 7.7 million Ukrainians have been internally displaced and more than 6.8 million have fled to Europe. The World Bank estimates that the Ukrainian economy will shrink by 45% this year. Considering the scale of economic damage and the level of migration, the current reduction in electricity demand in Ukraine might become a semi-permanent feature, taking years to rebuild.

Figure 1
Electricity demand in Ukraine, June 2021 - June 2022

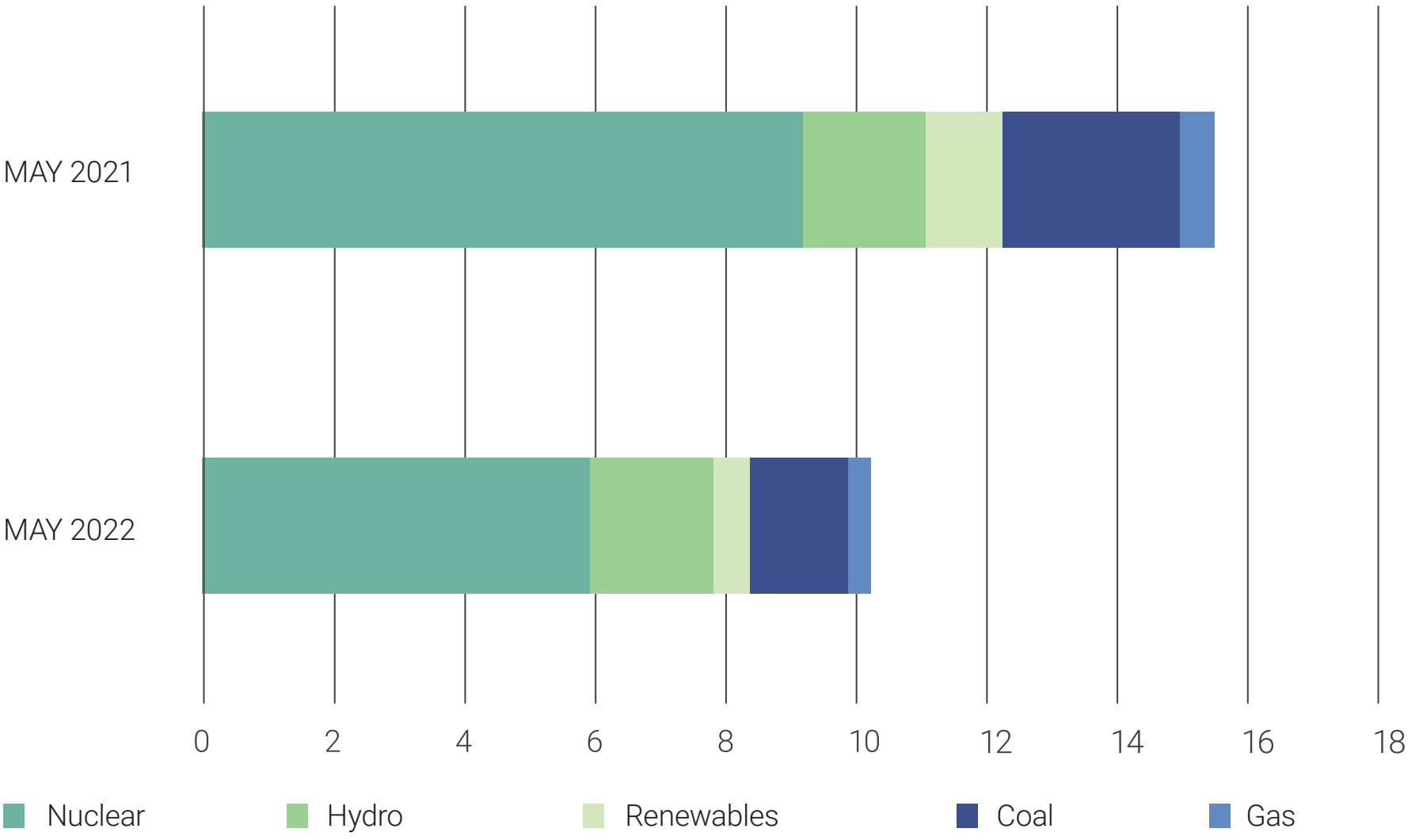


Source: IEA (2022), Ukraine Real-Time Electricity Data Explorer, IEA, Paris

Power generation

Ukraine's generation mix consists for the most part of large, inflexible, centralised generating capacity: nuclear and old coal-powered units that have been designed to operate in a stable baseload mode and have not been modernised to accommodate variable renewables. Furthermore, its hydropower plants' flexibility is limited due to the need to adapt production to hydrological conditions. Although the Ukrainian power sector was severely affected by the invasion and a number of facilities – including the Zaporizhzhya nuclear power plant – were occupied, damage to power generation capacities has so far been limited, and most power plants remain operational. However, destruction of demand has caused a corresponding reduction in generation, and while zero-carbon sources still account for over 80% of generation, renewables output is significantly lower compared to pre-war levels (see Figure 2). This is partly due to the fact that some renewable assets are located in the eastern and southern parts of Ukraine, where they are affected by direct hostilities, and partly due to curtailments caused by system inflexibility.

Figure 2
Generation mix (May 2021 – May 2022, GW)



Source: International Energy Agency, based on Ukrenergo

One of the immediate problems faced by all sectors of the Ukrainian energy system is lack of sufficient funds for continued operations. It is estimated that the power-generating companies are currently facing a 70%-75% drop in revenue sector-wide. The collective deficit of the three public generating companies could be as high as EUR 250-300 million per month. Furthermore, transmission and distribution companies do not have sufficient funds to repair the damages to the power infrastructure. Ukraine has established an Energy Support Fund, overseen by the Energy Community, to enable governments and international financial institutions to provide emergency financial support to its energy sector. International financial institutions such as the European Bank for Reconstruction and Development (EBRD) have also pledged additional funding and already provide emergency liquidity support; yet the scale of the challenge necessitates further measures.

Interconnectors

Before the full-scale war, the Ukrainian power system consisted of two separate, not interconnected, parts: the main one was part of the IPS/UPS synchronous grid, which also encompasses the energy systems of Russia, Belarus, Moldova and some central Asian countries, while a smaller one, so-called Burshtyn Island had been synchronised with ENTSO-E since 2003. Burshtyn Island is located in the western part of the country, and covered only 4% of Ukraine's total energy consumption.

Following an urgent request by Ukrenergo and Moldova for emergency synchronisation, the TSOs of continental Europe agreed to start trialling the synchronisation of the continental European power system with the Ukrainian and Moldovan power systems on 16 March 2022.

Currently, Ukraine has the following interconnections with the ENTSO-E countries:

Table 1:
Existing cross-border power lines

Interconnector	Voltage level	Remarks
Ukraine – Poland	220 kV	Radial connection to the Dobrotvir power plant
Ukraine – Poland	750 kV	Disconnected since the 1990s, after Poland synchronised with the continental European system
Ukraine - Slovakia	380-400 kV	Burshtyn Island's interconnectors
Ukraine - Hungary	750 kV	
Ukraine - Hungary	380-400 kV	
Ukraine - Hungary	2 x 220 kV	
Ukraine - Romania	380-400 kV	
Ukraine - Romania	750 kV	Under construction, not finished

Source: ENTSO-E

While the nameplate capacities of the Burshtyn Island interconnections are higher, the actual cross-border capacity for trade had been relatively limited at 650 MW, due to the isolated mode of operations (as shown in Figure 3). Following the synchronisation on 16 March, the only commercial flows between Ukraine and ENTSO-E countries as of the beginning of June 2022 had been 210 MW of exports to Poland through the radial connection, which resumed operation at the end of March. In addition, a 700 MW interconnection with Moldova is in operation: exports to Moldova resumed in June 2022, albeit with a very limited capacity of approximately 140 MW.

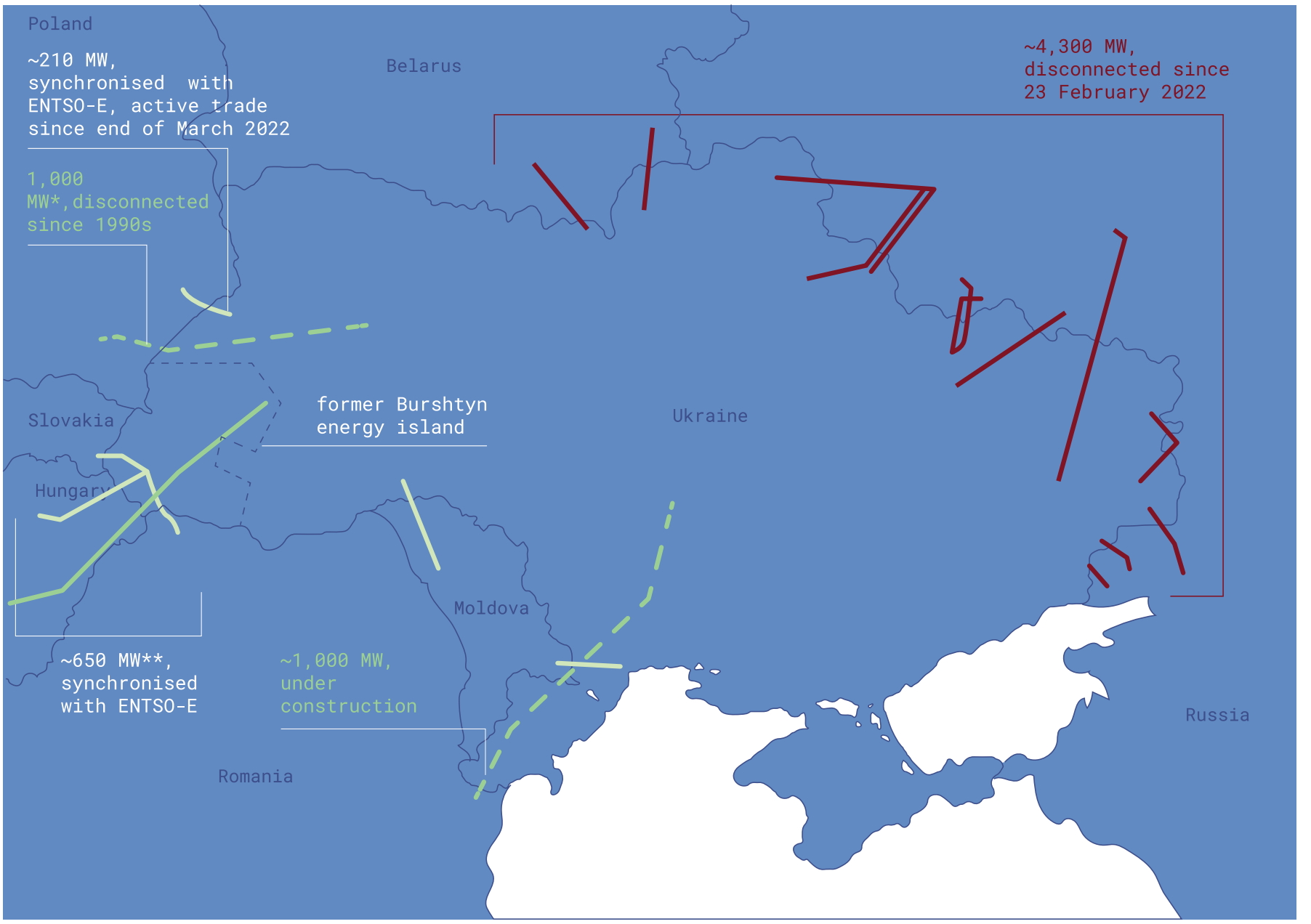
Following a request from Ukrenergo, continental European TSOs analysed the technical preconditions needed to reopen electricity trading on the interconnections with Ukraine.

On 7 June, continental European TSOs decided to approve Ukrenergo's request and confirmed the key conditions that, once met, will allow for a gradual opening of electricity trading with Ukraine. Ukrenergo and the European TSOs will work together to meet these requirements. The full implementation of these technical conditions is necessary to guarantee the security and stability of the extended power system. Following the ENTSO-E decision to resume electricity exports from Ukraine (with a limited pilot capacity of 100 MW), the first daily capacity auction was held on June 28 (to Romania) with the delivery on June 30. After this initial stage the traded values are expected to increase gradually, following a regular assessment of power system stability and security considerations.

The interconnectors with Russia and Belarus, with a total capacity of up to 4,300 MW, were disconnected on 23 February 2022, when Ukraine started a test of power system operations in isolated mode. It is highly unlikely that these interconnectors will be switched on again.

In summary, before the war, Ukraine was a fairly well interconnected country with total cross-border capacities of close to 5,900 MW – this has since tumbled to a fraction of the pre-war figure.

Figure 3
Schematic representation of the current status of Ukrainian interconnectors



* To be switched to 400kV voltage level, as discussed between PSE and Ukrenergo
** Allocated cross-border capacity before the war; future allocation to be determined by Ukrenergo and ENTSO-e

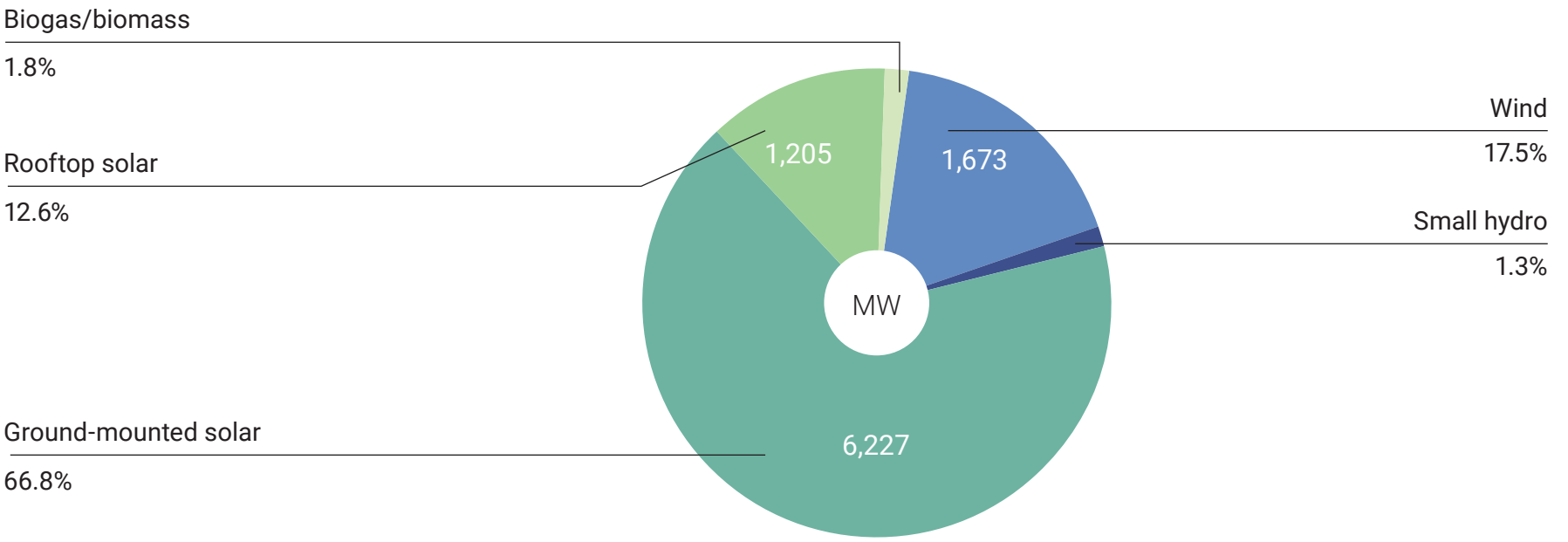
Source: ENTSO-E, Zachmann, G., & Feldhaus, L. (2021) Synchronising Ukraine's and Europe's electricity grids. Low Carbon Ukraine.

Renewable power sources deployment and curtailment

Ukraine's power sector has made significant progress with the deployment and expansion of renewable energy sources in recent years. As summarised in Figure 4, the total installed capacity of renewables more than quadrupled between 2018 and 2021, from 2.3 GW to 9.6 GW. This includes 1.2 GW of household solar photovoltaic installations.

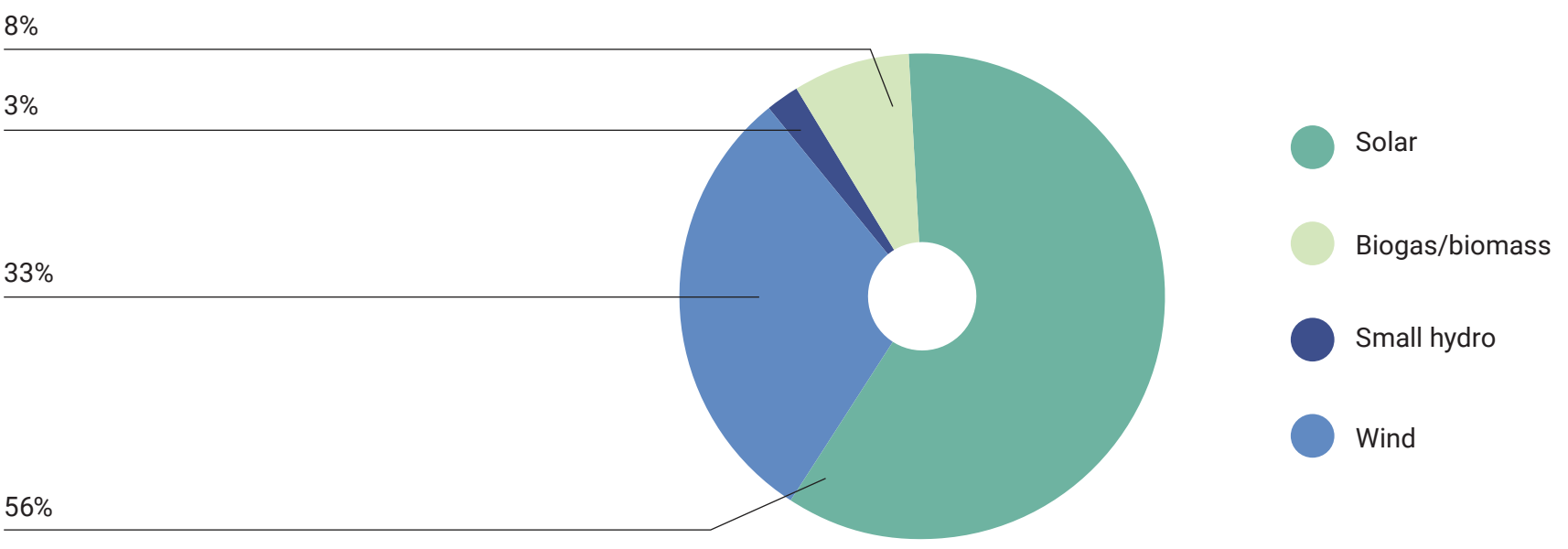
In 2021, the share of electricity generated from renewables reached 8.1% or 12.8 TWh, as depicted in Figure 5. Of that total, 56% was provided by solar, 33% by wind, almost 8% by biomass and biogas, and 3% by small hydro.

Figure 4
Installed capacity of renewables in Ukraine at the end of 2021



Source: Own calculations based on Dixi Group Energy Map

Figure 5
Shares of renewable generation in Ukraine, 2021



Source: Own calculations based on Dixi Group Energy Map

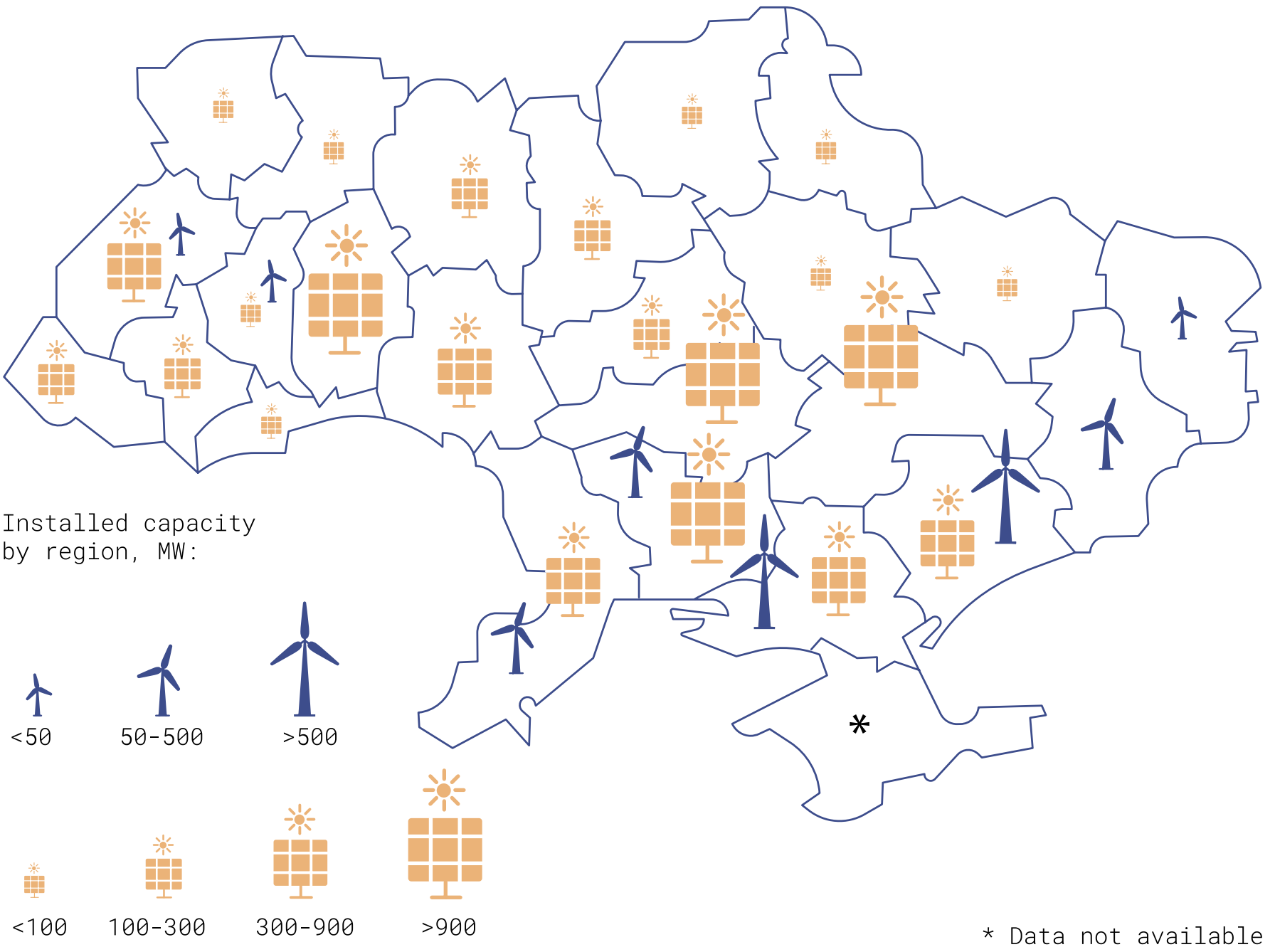
Whereas wind power plants are located mainly in the southeast region, solar generation in Ukraine is much more widely distributed, as illustrated in Figure 6.

Wind and solar generation are currently at less than half their normal pre-war levels. This is mainly due to two factors. First, as a result of the Russian invasion, 80% of Ukraine's wind power capacity has been shut down - either as a result of direct hostilities or to prevent damage to the electrical equipment. This could have been expected since most wind installations are located either at the heart of the fighting or in areas of partial or complete occupation in southern Ukraine.

Second, the compounded problems of demand destruction and highly inflexible dispatchable generation make it very difficult for the TSO to accommodate large amounts of variable renewables, especially solar, given that it has now reached more than 6 GW of capacity.

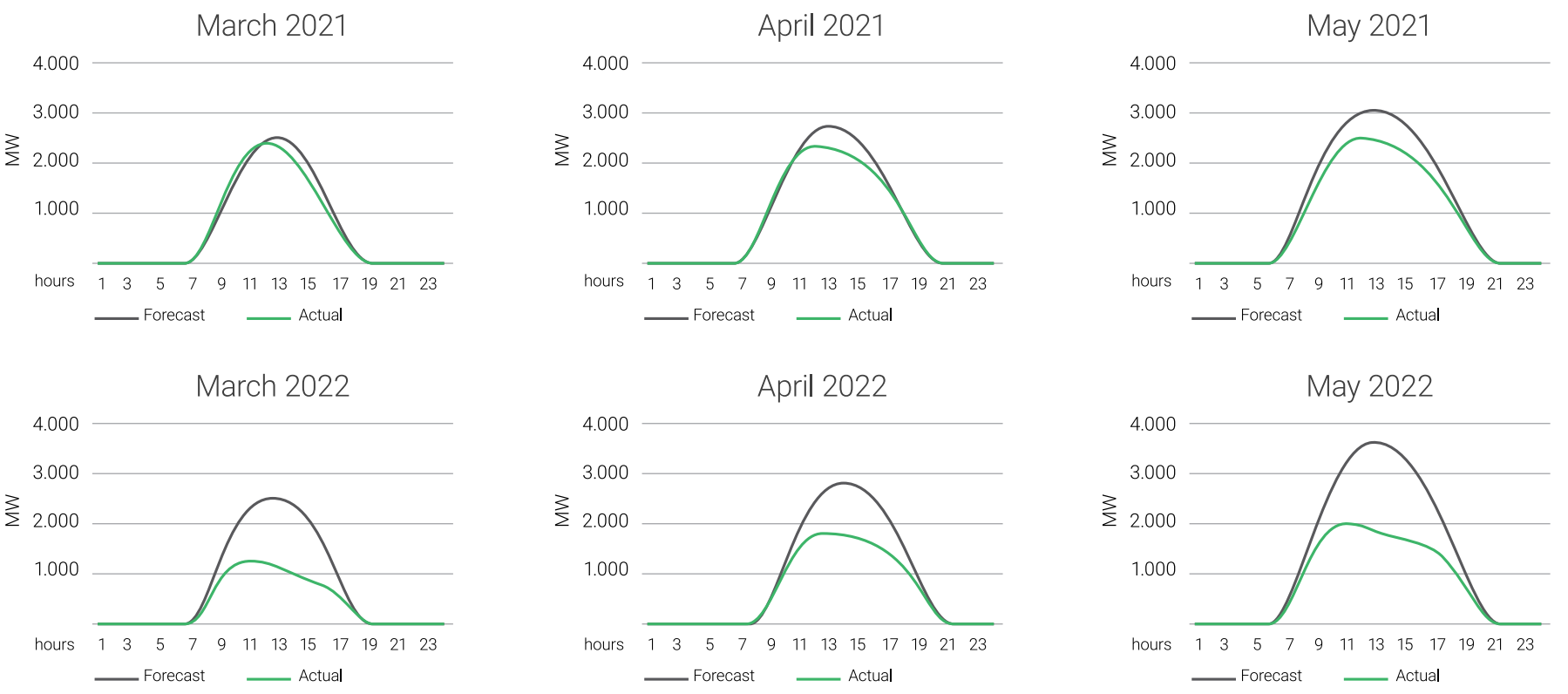
Figure 7 compares the actual solar load profile versus the forecast for March, April and May of 2021 compared to 2022, based on daily data published by the Guaranteed Buyer, the state-owned off-taker of renewable energy. There is a significant increase in the level of curtailment level compared to last year. Some of this electricity could be exported to other power markets, provided sufficient interconnections are in place.

Figure 6
Schematic representation of geographical scope of solar and wind power plants at the end of 2021



Source: Own calculations based on Dixi Group Energy Map

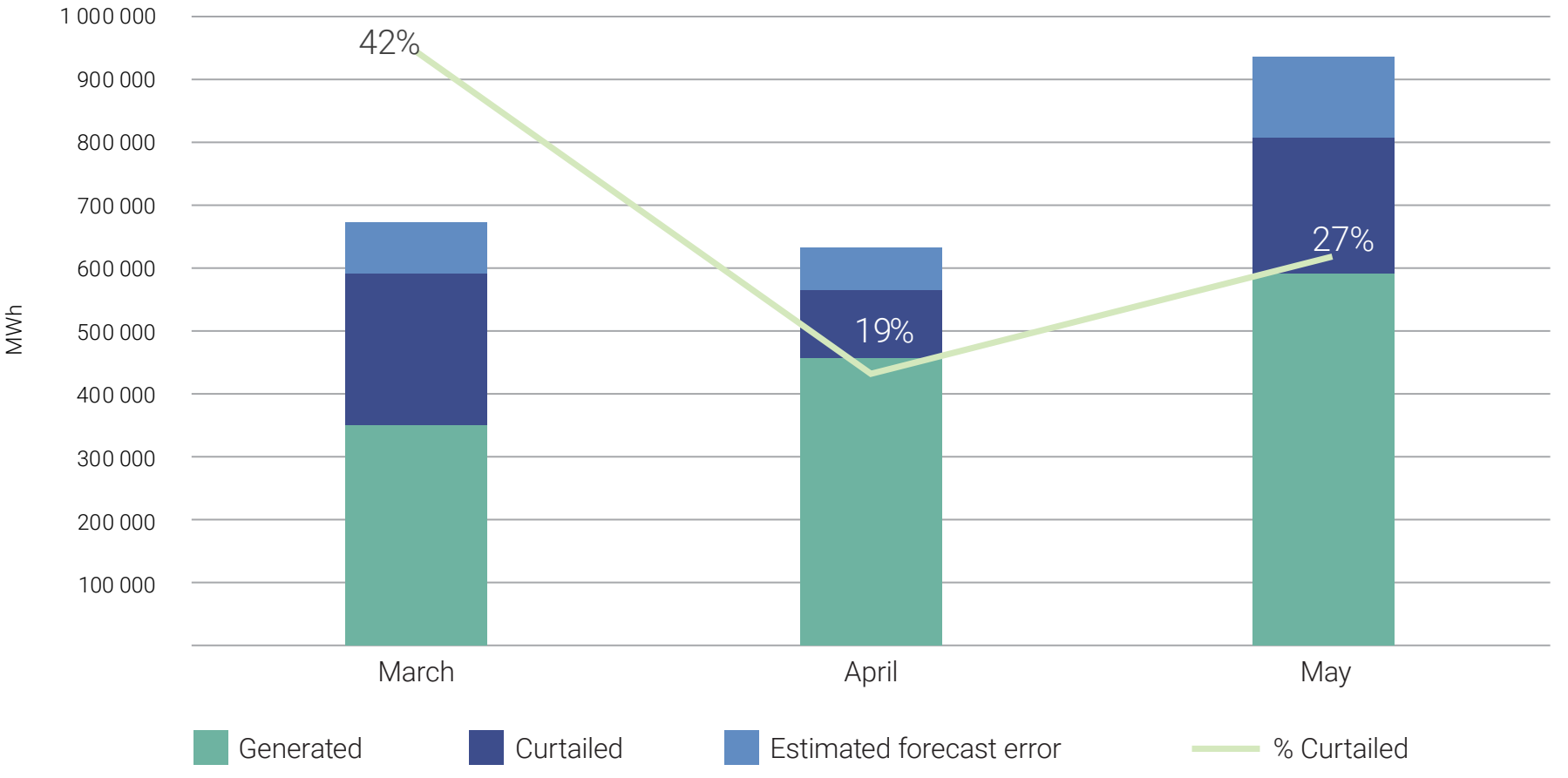
Figure 7
Actual and projected volumes of solar generation, Spring 2021 and 2022



Source: Clean Energy Lab calculations based on Guaranteed Buyer data

According to calculations by Clean Energy Lab (unpublished), the estimated total amount of solar power curtailed from March to May 2022 is 573 GWh, or 30% of potential electricity production, ranging from 42% in March to 19% in April. The high level of curtailment in March might be attributed to the system being operated in emergency mode after the start of the war; April was somewhat stabilised by favourable hydrological conditions; and May saw increased curtailment together with increased solar irradiation.

Figure 8
Solar PV actual generation and estimated curtailment due to system constraints



Source: Clean Energy Lab calculations based on Guaranteed Buyer data

Integrating rising volumes from restored and new variable renewables in the process of post-war reconstruction will require adding a significant amount of flexibility into Ukraine's power system. While some curtailment might still be necessary to provide the lowest-cost option to balance the system, current levels of curtailment are a waste of valuable resources which results in a loss of welfare to consumers, both in Ukraine and elsewhere.

This flexibility can be provided in many different ways: by adding flexible generation capacities while phasing out coal power plants; harnessing demand-side flexibility, enhanced by sector coupling (electric vehicle charging, heat pumps with heat storage); adding energy storage; allowing for flexible market responses, aided by electricity market reforms; and adding interconnections to neighbouring markets. Most of these options require either significant investment outlays (generation, storage, new interconnectors) or complex regulatory decisions (incentivising household demand response through time-varying prices), and will take a long time to implement. Making use of existing connectivity is therefore one of the fastest and simplest solutions, and it comes with additional benefits: securing additional revenues for a Ukrainian power system struggling with liquidity, enhancing security of supply, and contributing to emissions reductions by avoiding some curtailment of renewables while displacing more carbon-intensive generation.

OPTION TO INCREASE CONNECTIVITY – THE POLISH CONNECTION

The Rzeszów – Khmelnytskyi 750 kV overhead line between Poland and Ukraine, with a capacity of up to 2 GW, was built in 1984. It was disconnected in 1995, when Poland synchronised with the continental European grid and thus decoupled from the IPS/UPS system. There were preliminary discussions about reactivating this line after 2010 by constructing a back-to-back high-voltage direct current converter station on the Polish end of the line, but this has not been implemented.

Before full synchronisation with ENTSO-E, Ukraine's nuclear power company Energoatom expressed an interest in refurbishing the line, in order to export electricity from the Ukrainian Khmelnytskyi nuclear power plant to Poland. This would have meant the line and one of the power plant's units running in synchronisation with the continental European grid. The project, called "Energy Bridge," was promoted from the Ukrainian side in 2019, but has not been implemented.

Since the beginning of the Russian invasion, Polish-Ukrainian cooperation in the field of energy has rapidly intensified, with Poland actively promoting synchronisation, resuming imports of electricity from Ukraine through the Zamość-Dobrotvir line and providing technical assistance and equipment to help with restoring the electricity supply disrupted by Russia's actions.

Consultations on the Rzeszów-Khmelnytskyi line have also resumed, and at the beginning of June 2022 a bilateral memorandum was signed concerning the fastest possible restoration of this interconnector (with the voltage level to be reduced to 400 kV due to environmental concerns). It has been announced that this could happen as soon as the end of 2022, and lead to 1 GW of cross-border trade.

Benefits for Ukraine

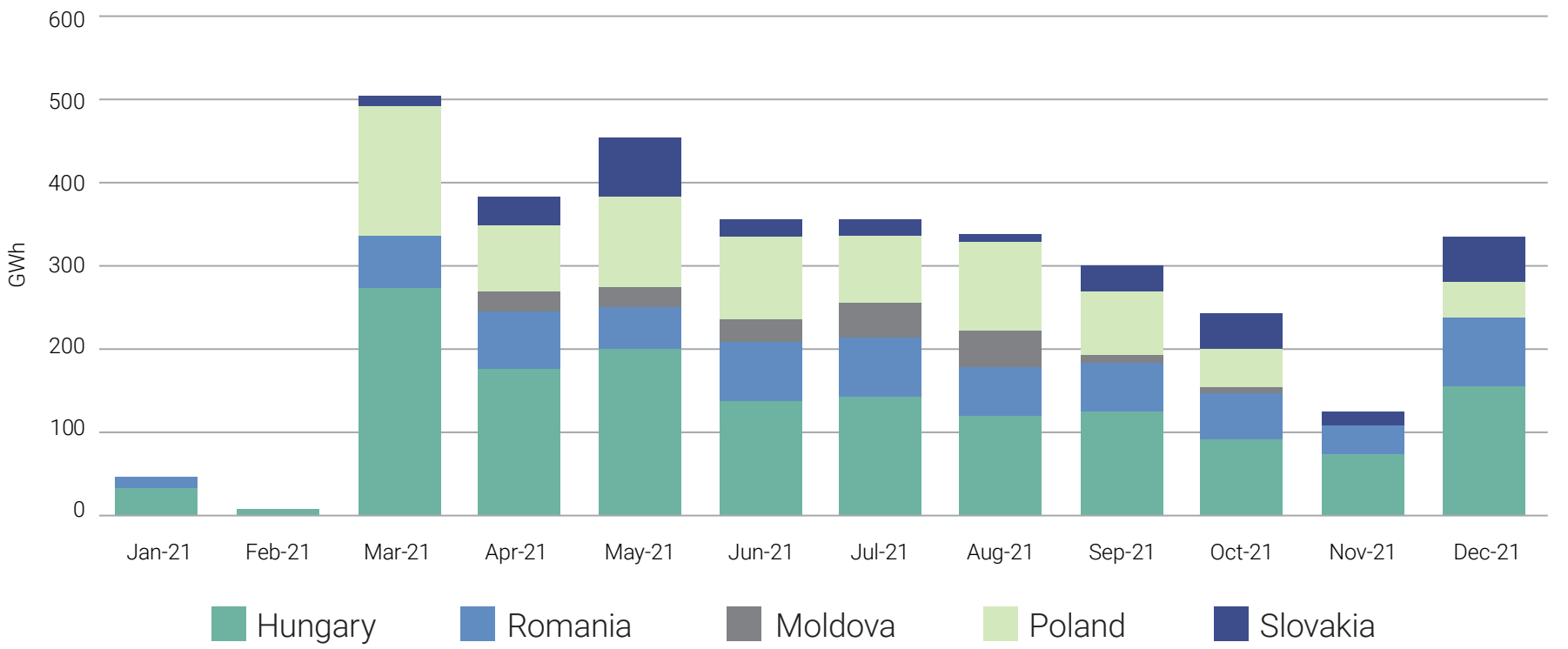
According to the State Customs Service of Ukraine, the value of Ukrainian electricity exports in 2021 amounted to over 250 million USD, with the bulk of exports going to Hungary, Poland and Romania (Figure 9).

With the restored Rzeszów-Khmelnytskyi power line as a system interconnector, Ukraine will be better connected to the EU's internal energy market. For Ukraine, this single project will mean more than doubling cross-border interconnection capacities with the EU (from the previous ~0.9 GW to almost 2 GW). In addition, Ukrenergo is working to expand the cross-border capacity allocation on other interconnectors, aiming for a total of up to 2.5 GW of cross-border capacity at the beginning of 2023. Having expanded grid links with the EU, and after dealing with the necessary technical and legal prerequisites for resuming trade, Ukraine will be able to receive practical economic and technical benefits from synchronisation with ENTSO-E.

With the expansion of cross-border trade, the Ukrainian TSO Ukrenergo will receive additional revenues from cross-border capacity allocation auctions, increase grid utilisation rates, improve its own financial situation, acquire additional flexibility and balancing options, and receive frequency support; while renewable energy generators will face less frequent curtailment.

Last but not least, Ukrainian and Polish power companies will receive access to cross-border trade and will be able to optimise the operation of their generation assets. Optimised operation of assets, combined with increased competition and higher market liquidity, will lower prices for consumers.

Figure 9
Exports of electricity from Ukraine in 2021



Source: Dixi Group Energy Map

Benefits for Poland and the EU

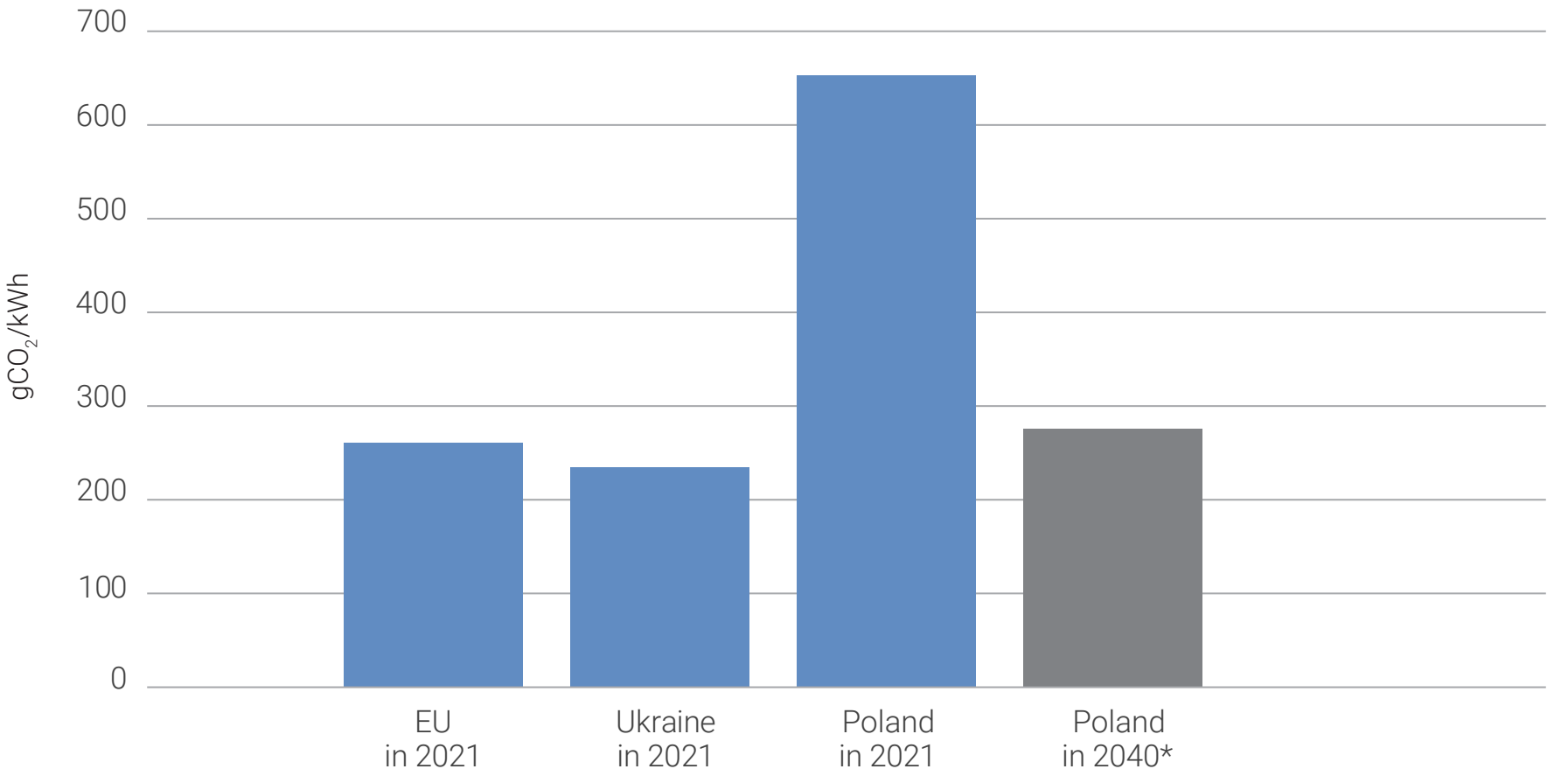
One of the pillars of the Polish Energy Policy until 2040 is the zero-emission power system. While the future nuclear programme (which is supposed to start adding capacities from the mid-2030s) could contribute about 16% of the electricity supply by 2040, there is a huge gap in renewable capacities: these currently supply around 17% of Polish electricity.

According to the recently published principles for the update of Poland's energy policy, the share of renewables in the Polish power mix is set to grow to 50% by 2040. In fact, this could be achieved well before that date: according to the draft Grid Development Plan published in March 2022 by PSE, the Polish TSO, renewables could make up 50% of the fuel mix as early as 2032. Given the current growth trajectory of photovoltaic capacities and the government's announced intention of reducing barriers to onshore wind development, this looks feasible – as has already been stated by the Polish Minister of Climate and Environment. After 2030, offshore wind will also provide additional capacities to those envisaged in the current energy policy, provided the second allocation round of offshore lease sites is successful and permitting procedures are accelerated. This significant expansion of renewables will require a corresponding amount of flexibility in the power system, which again can be provided by many different means, with interconnectors to neighbouring markets being one of the options in the toolbox. Adding more cross-border transmission capacity gives the TSO another method to ensure the smooth functioning of the power system.

The Polish electricity supply is currently the most carbon-intensive in Europe, and is 2.5 times more carbon-intensive than that of Ukraine. According to the analysis underpinning the current Polish energy policy, Poland will not attain the level of CO_2 intensity of today's Ukrainian power system until 2040. Although this might be an overly pessimistic view, given the recent and planned growth in renewables, Ukraine was planning to fully phase out coal from its power generation by 2035-2040, which would continue to provide an advantage over Polish emissions intensity.

Figure 10

CO_2 intensity of electricity generation



*Energy Policy of Poland is currently under review, figure might change

Sources: Ember (2021 data), Energy Policy of Poland until 2040

Maximising the use of interconnections with Ukraine will reduce Poland's CO_2 emissions and add more flexibility, while contributing to security of supply, cross-border trade, and increased market liquidity.

Poland's strategic priority, as announced recently by the government, is energy sovereignty, defined as relying on domestic sources for power generation capacity, but not necessarily for actual domestic generation at all times. Therefore, inexpensive low-carbon electricity from Ukraine will be a way to reduce Polish coal power output and thus reduce CO_2 emissions, reduce power prices, and contribute to safeguarding Poland's industrial position by lowering the carbon footprint of its industry. At the same time, the added electricity supply from Ukraine will not replace the need to urgently expand renewables: domestic renewables contribute substantially to the sovereignty priority, and Poland's ambition to add renewable capacities far outweighs the capacity of the interconnector. The Polish Ministry of Climate and Environment has announced that it will be possible to reach 50 GW of installed renewable capacity by 2030.

At the same time, additional flexibility resources will need to be promoted in order to fill the gap resulting from staged decommissioning of coal capacities – with energy storage, demand response and flexible low-carbon generation playing a big role in the future.

EU POLICY FRAMEWORK CONTEXT AND RECOMMENDATIONS

Being a contracting party to the Energy Community Treaty, Ukraine shares the EU's climate and energy goals and contributes to the implementation of the Energy Union Strategy and the European Green Deal.

The EU has set an interconnection target of at least 15% by 2030, stipulating that EU Member States must have at least 15% of import capacity in relation to their installed generation capacity.

Ukraine had previously set an ambitious goal of achieving that level by 2025. Although this might not be possible, as it would require 8 GW of interconnector capacity, increasing current interconnectivity will bring substantial benefits for all connected parties.

As asserted by the European Commission's Expert Group on electricity interconnection targets in their second report, the EU should "promote interconnectors that help increase the consumption of electricity from renewable sources in the EU but at the same time also encourage a growing renewable generation and consumption in the neighbouring countries".

According to ENTSO-E, expanding Europe's interconnections in an optimal way would avoid curtailment of up to 110 TWh of renewable electricity per year by 2040 and would promote renewable build-out by taking advantage of national differences between fuel mixes and renewable peaking periods. In addition, interconnectors decrease CO_2 emissions, decrease generation costs, promote greater convergence between electricity markets and provide opportunity for mutual support in times of stress.

According to expert estimates by Berlin Economics, Eastern Europe's power sector emissions can fall by 18%, or by 14 Mt/year, if Ukraine establishes strong connections with its EU neighbours and implements carbon pricing.

Roles of the European Commission and the Energy Community Secretariat:

European Commission

In response to the challenges caused by the Russian invasion, the European Commission has set out its approach for a long-term reconstruction framework in its Ukraine Relief and Reconstruction Communication and in the new EU External Energy Strategy – part of the REPowerEU package. Within this framework, a REPowerUkraine initiative is to be launched, to 'rebuild better' the Ukrainian energy system, with the aim of decarbonising it and promoting Ukraine's energy independence. The EU will support the reconstruction process both financially and technically, focusing on energy efficiency, renewables, renewable hydrogen, biomethane and future-proof infrastructure. Among the key actions that have been identified are:

- Support the repair and reconstruction of energy infrastructure in Ukraine.
- Increase cross-border capacity to enable electricity trading.

REPowerEU therefore serves as another platform to promote further integration of Ukraine with the European energy system, and to support the complementary goals of ensuring security of supply and achieving decarbonisation objectives.

Energy Community Secretariat

From the beginning of the full-scale war in Ukraine, the Energy Community has played a crucial role in synchronising the Ukrainian and Moldovan electricity networks with the continental European network and coordinating emergency supplies. Building on these achievements can create major positive shifts in Ukraine, Moldova and the wider region.

As the Energy Community is getting more discretion to address issues in Ukraine, it is crucial that the institution ensures the timely and full-scale coupling of the Ukrainian electricity market with European markets. To achieve these goals and facilitate the energy transition and overall decarbonisation in the region, both the regulatory environment and physical infrastructure need to be strengthened.

The potential to generate significant benefits for both Ukraine and the EU and advance EU energy policy goals calls for a swift, 'all-hands-on-deck' approach to tackling necessary physical work on the grid infrastructure while resolving technical and operating issues, such as balancing and frequency control and communication. In this context, the Energy Community Secretariat continues to support Ukraine and Moldova in aligning their legal and regulatory frameworks with EU rules, especially with electricity network codes and guidelines.

In addition to meeting all necessary technical and legal requirements as stipulated by national TSOs and ENTSO-E, the following recommendations will help decision-makers capture the most value when expanding Ukraine's connectivity with the EU:

- **Establish transparency and implement market-based instruments**

It is important that the allocation of cross-border capacities and trading arrangements follow transparent, harmonised, market-based rules and procedures, with timely information being provided to market participants. Ukraine and Moldova should adopt all relevant EU regulations and ensure independent oversight. While full market coupling might not be achievable in the short term, EU rules should be followed, as this will increase transparency and liquidity in the market.

- **Ensure interconnection serves consumer interests, not individual vested interests**

In order to deliver maximum system benefits all Ukraine-EU interconnectors should operate as often as possible as system interconnectors, and not in an island mode that limits the flow of electricity between power systems. The proceeds from the electricity trade can be earmarked for the reconstruction of the energy system and to support vulnerable households.

- **Develop a roadmap for long-term energy market reforms**

A roadmap for long-term structural reforms of the Ukrainian energy system can facilitate energy security and help advance European and Ukrainian decarbonisation goals. By speeding up the implementation of EU energy sector law and regulations, Ukraine can improve the liquidity of the energy market, open it to new entrants, and improve transparency and independent oversight, while protecting vulnerable consumers from an undue financial burden.

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Briefing

July 2022