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Rebuild,

Decarbonize,

and Integrate

Ukraine, the EU, and the Road
to a Net-Zero Energy Sector

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IDEAS LEADERSHIP HOPE

Jacob Funk Kirkegaard

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Introduction

As the frontline situation points to a longer war than was projected early on, uncertainties about Ukraine's long-term economic path and prospects have inevitably increased. At the same time, noticeable political progress has been made given the EU's agreement to start negotiations for full Ukrainian membership. This step provides the fighting Ukrainian people with a long-term perspective and a destination point as a prosperous, democratic, European market economy.

Anchoring Ukraine's economic future in the EU will have transformative implications for the country's economy, not least its energy sector. That sector, which is still exposed to Russian military attacks, is now compelled to assimilate into the rapidly decarbonizing EU. [More than half](#) of Ukraine's power production capacity has been damaged by Russia since February 2022 or is situated on territory now controlled by Russia.¹ The Net Zero World Initiative (2023) estimated that 43% of nuclear, 68% of coal-fired, and 33% of combined heat and power generation was lost to the war as of mid-2023.² Despite continuing attacks, more than two gigawatts (GW) of electricity production capacity were restored during 2023. Reconstruction of the Ukrainian energy sector is already underway despite the war. With it, the country's energy transformation has begun.

Yet, in March 2024, Russia returned to large-scale saturation missile attacks against Ukraine's energy infrastructure, including its large hydropower plants and thermal power stations, inflicting further long-term damage. Putin seeks to exploit the apparent drop in Ukrainian air defense efficiency as Western supplies of air

interceptor missiles have grown scarcer. Military risk consequently continues to cloud the outlook for Ukraine's energy production. It also reduces the interest of foreign and domestic investors in committing resources to the sector. Uncertainty plagues the prospects for Western public support for Ukraine, too. Despite the recent passage of a funding package, future US funding will remain hostage to domestic politics. In Europe, various veto players—led by Hungary—as well as other internal divisions pose an ongoing political challenge to the EU's financial support for Kyiv.

The scarcity of public and private investment funding sources for Ukraine stands in stark contrast to the level of ambition for the energy-sector transition inherent in Ukraine's EU accession process. One of the major energy-sector challenges facing Ukraine will be the expectation in Brussels that Ukraine will either enter fully into the EU Emissions Trading System (ETS) or implement an ETS-aligned national carbon-pricing system of similar ambition. It will not be possible for the Ukrainian economy to be granted a prolonged transition period here, and—for instance—enjoy free carbon-emission credits for affected industries, when these same industries will have been partially or fully phased out in the rest of the EU at the time of Ukraine's EU accession. While the EU ETS price is currently adjusting to the new post-2022 energy shock demand level (for example, prices have declined so far in 2024 to around €60–65/ton), the ETS auction price forward curve [slopes upward](#).³ This indicates that carbon market participants continue to believe that EU carbon prices will rise during Ukraine's EU accession process.

Adapting the economy to the EU's carbon price level will require urgent action on the part of the Ukrainian government as it prepares the long-term National Energy and Climate Plan (NECP) that will lay out the country's energy strategy for the rest of the 2020s. Certainly, Ukraine's Environmental Protection Minister, Ruslan Strilets, displayed the necessary ambition when he spoke after the UN Climate Change Conference (COP28) in Dubai in late 2023. He reiterated [earlier government statements from 2021](#) and committed Ukraine to [launching a pilot emissions trading system in 2025 with a full launch in 2026](#).⁴ This would enable Ukraine's entry into the ETS, and thus avoid negative effects of the EU's Carbon Border Adjustment Mechanism (CBAM) for Ukrainian exports.⁵ This is a timetable that necessitates immediate and sizable climate investments in Ukraine.

Ukraine has further committed itself in recent months to a significant scaling up of its already large nuclear power-generation capacity. The Ukrainian government has signed memoranda of understanding aiming at the construction of [up to nine new power units](#) using Westinghouse AP1000 technology.⁶ Just as the accelerated introduction of carbon pricing in Ukraine will

be costly, construction of new nuclear power units, even if located at one of Ukraine's existing nuclear plant facilities, will require large sums of capital investment upfront. The issue of upfront costs will similarly weigh on the broader issue of reconstruction of Ukraine, as more energy-efficient buildings will only gradually earn back the higher building and materials costs through lower long-term energy consumption.

Ukraine must be applauded for aiming to seize the opportunity to rebuild its energy sector and integrate it with the EU as quickly as possible. This follows the recommendations of several expert groups, including [GMF's earlier \(2023\) report on this issue](#), which called for rapid Ukrainian adoption of carbon pricing and highlighted the need to phase in EU-level building codes expeditiously.⁷ This paper will focus on the implications for both Ukraine and the EU of the Ukrainian government's recent energy-sector choices. What do these plans require institutionally and financially to succeed, and how will they alter not only the Ukrainian but the entire EU energy sector in the process?

Making Ukraine's Rapid Adoption of Carbon Pricing a Success

Under the Paris Climate Accord and its nationally determined contribution (NDC), Ukraine is currently committed to reducing its carbon emissions by 65% from 1990 levels by 2030. It will achieve net-zero emissions by 2060.⁸ A national strategy to implement these goals is likely to be introduced under the NECP forthcoming later in 2024, which will also have to include a new Ukrainian national adoption plan for climate commitments. Ukraine does not start this process from scratch, as it has had a carbon tax on emissions from stationary sources since 2011, generating broad coverage of more than 70% of all Ukrainian emissions. However, the level of taxation has remained very low, with the tax legislatively raised from UAH10 to only UAH30/ton of CO₂ emitted in 2022, giving Ukraine a CO₂ tax of roughly 80 US cents per ton today.⁹ With the EU-Ukraine Association Agreement that came into force in 2017, Ukraine also committed itself in principle to establishing a cap-and-trade system functionally similar to the EU ETS. This process began with the passage of the Ukrainian [Law on the Principles of Monitoring, Reporting, and Verification of Greenhouse Gas Emissions](#) in late 2020.¹⁰ However, the Russian invasion disrupted the rollout of Ukraine's monitoring, reporting, and verification (MRV) system for national greenhouse gas emissions as the first building block of a Ukrainian ETS system. Since carbon trading requires the active and coordinated participation of many economic and regulatory actors to ensure a verified basis of emissions quantities, widespread stakeholder involvement, comparable information levels, and a common understanding of key legal and regulatory concepts are important

prerequisites for a successful launch. Ukraine carried out such a stakeholder participation process from 2021 onwards (GIZ 2023)¹¹, though the Russian invasion and the imposition of martial law derailed the process.

Expeditious implementation of binding carbon pricing of the scale now in place in the EU will, however, be a politically challenging and highly complex undertaking. By design, it will dramatically change the relative prices of production for most of the Ukrainian economy, impose significant costs on the fossil-fuel-driven parts of it, and quickly smother the viability of coal-based economic activities especially. This will hurt economically in many parts of Ukraine and require a carefully calibrated political response. The experience of many EU members in recent years demonstrates how challenging it is to get this process right—even for countries at peace. Therefore, it is not surprising that the European Commission noted in its fall 2023 [Ukraine Progress Report](#) that environmental and climate change are areas in which Ukraine has achieved only “some level of preparation” for EU membership.¹² More specifically, on climate change, progress was seen to be “limited”. The Commission further calls on Ukraine to “[urgently step up on implementing the Energy Community's Decarbonisation Roadmap and in particular prepare for the Emissions Trading System \(ETS\)](#)”.¹³ As such, Minister Strilets' commitment to the ETS (referenced above) corresponds to the EU's expectations during the accession process. Without an expedited ETS introduction, early, or even timely, EU membership is not likely to materialize for Ukraine.

Like other countries aspiring to join the EU, Ukraine is a legally committed contracting party to the EU Energy Community framework, including its Decarbonization Roadmap.¹⁴ [This roadmap](#) currently calls for members to implement EU regulations on monitoring and reporting of greenhouse gas emissions, verification of data, the accreditation of verifiers, and (parts of) the EU ETS by 2024–2026.¹⁵ This would be a daunting political timetable for most governments. But it is further aggravated by the effects of the war and its intensity on carbon emissions. Significant destruction has taken place on Ukrainian territory.

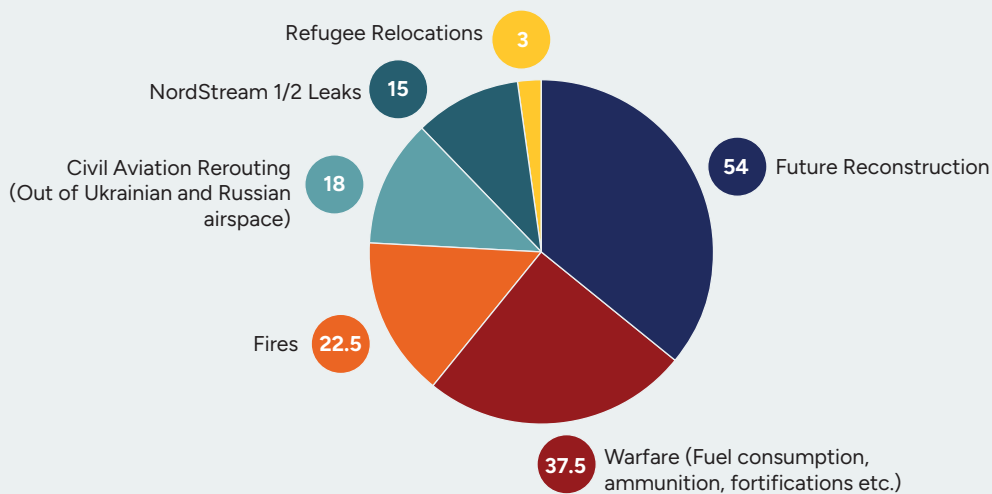
This is, after all, the first interstate war fought on land that in principle is to be governed by a CO₂ pricing regime very soon. This means that such unforeseen circumstances must be accommodated within the EU ETS in the coming years, potentially providing opportunities for Ukraine.

As the [third interim report](#) by the Initiative on Greenhouse Gas Accounting of War (IGHGAW)

shows, well over 150 million tons of additional CO₂ (more than the annual emissions of Belgium) will by now have been emitted due to the Russian invasion.¹⁶ Given the current EU ETS carbon price of approximately €65/ton, this would represent a further Ukrainian environmental “claims value” from unnecessarily emitted CO₂ against Russia of almost €10 billion to possibly be entered into the Council of Europe’s Registry of Damage for Ukraine, as the IGHGAW has pointed out.

Figure 1 shows the multiple channels through which large-scale industrial war has added to CO₂ emissions in and around Ukraine. Direct warfare and fires account for 40% of emissions, while related events such as the rerouting of international aviation around both Ukrainian and Russian airspace (the latter due to economic sanctions and Russian retaliation for being denied access to the air spaces of Ukraine’s allies) and the emissions from the Russian NordStream pipeline leaks account for one-third. Refugee relocation emissions also account for a small share of war-related emissions.

Figure 1 | Sources of War-Related Emissions in Ukraine Feb 22, 2022 - Sep 1, 2023, Millions tCO₂e



Source: Initiative on GHG Accounting of War (2023)

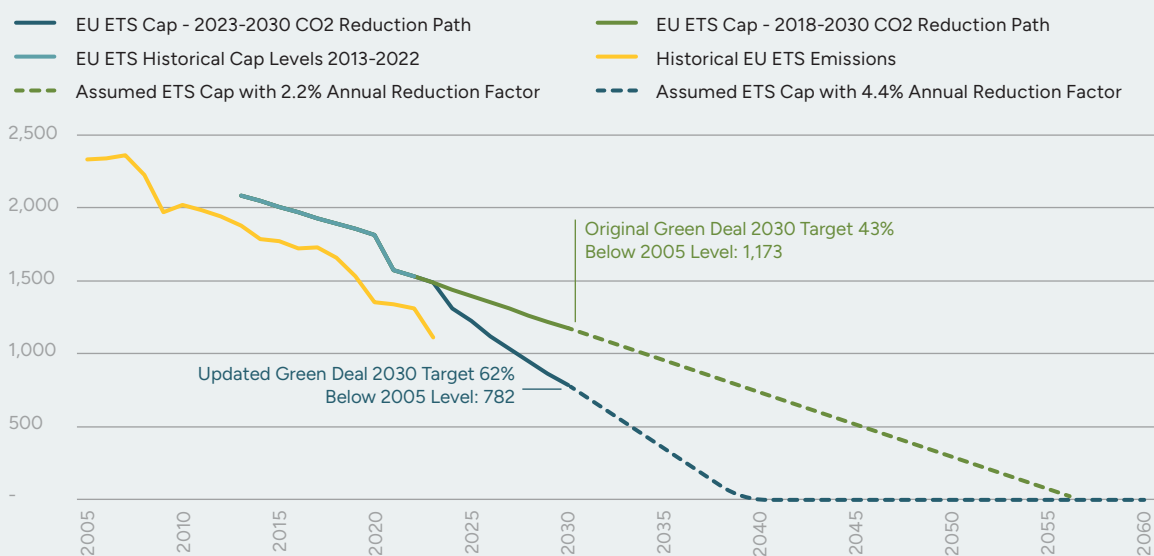
Over a third of war-related emissions come from the future need for reconstruction in Ukraine. Through accelerated introduction of better building codes, insulation, and low-carbon construction methods, Ukraine could theoretically help reverse the emissions damage now recorded for the first time on a carbon-priced battlefield. Accelerating the introduction of carbon pricing in Ukraine as much as possible and introducing it at ETS-level prices while the war is still raging would strengthen Ukraine's case to make Russia pay for this aspect of its aggression as well.

The principle of non-retroactive application of laws—that is, that they cannot apply to events that took place before the law was adopted—is common in criminal and international law.¹⁷ Stricter regulations to counter climate change in the form of carbon pricing, despite retroactive effects on actors, may well be adopted in the pursuit of this legitimate public policy objective. Were Ukraine to quickly introduce carbon pricing before the end of combat against Russia, most legal concerns about retroactive application of the law would abate. It is important to note that this action would not be

taken to affect the Russian position, but to remove any legal or political obstacle for Ukraine's claims of unwarranted CO₂ emissions from Russia's war on it before the Council of Europe's Registry of Damage for Ukraine. In other words, it would be meant to convince Ukraine's allies to use seized Russian sovereign assets to help pay for the additional CO₂ emissions Russia's aggression has caused. It is not Putin who must accept that today an aggressor has to pay also for the CO₂ emissions an invasion causes, but rather the G7 that must be convinced to make him pay from seized Russian assets.

It is crucial, however, to recognize that Ukraine's biggest challenge in introducing an EU ETS-comparable carbon pricing system may not be the war, but the EU's rapidly rising level of ambition within its current territory. A series of reforms was introduced to the EU ETS in 2023, resulting in a significantly higher level of legislated CO₂ emission reductions in the existing ETS system. A significant expansion of EU carbon pricing into new sectors of the economy was also approved. This first aspect is illustrated in figure 2.

Figure 2 | EU ETS Emissions and ETS Caps 2005-2060, Millions of Ton of CO₂



Source: European Environmental Agency; European Commission; Eurostat

Figure 2 shows the increased bite of ETS carbon pricing from the 2023 ETS reform's increase in the targeted ETS emissions reduction. In the original Green Deal the reduction was supposed to be 43% below 2005 emissions levels by 2030. Now that figure is 62%. The updated (blue) emissions reduction path implies a decline in annual EU emissions during the 2020s comparable to the drop witnessed in actual emissions (yellow line) during the COVID-19 lockdown in 2020.¹⁸ Figure 2 further shows that in a political base case EU ETS permits a drop to zero by 2039 (rather than by 2057).¹⁹ The late 2030s are not only within the lifetime of most of the stationary energy and heavy industry facilities currently included in the ETS, but almost surely less than a decade after Ukraine's first plausible accession date to the EU. In other words, full membership in the ETS will give the Ukrainian energy and heavy industrial sector less than a decade to completely decarbonize from the moment Kyiv receives the full benefits of EU membership.

International focus has often been on the EU's move to include the international aviation and maritime sectors (2% and 3.5% of 2021 emissions respectively) in the ETS. That is due to the extraterritoriality of EU carbon pricing in these sectors, which means that the emissions of non-EU actors within the EU jurisdiction are also captured. However, of far more importance is the EU's decision to establish an ETS-2 system to cap and trade emissions from fossil fuel combustion in road transportation and commercial, institutional, and residential buildings—and all by the late 2020s. In other words, in a few years, Europeans' cars, homes, and workplaces will be covered by EU carbon pricing, as will Ukrainians' no later than their date of entry into the EU. The expansion of EU carbon pricing to the aviation, maritime, road transport, and building sectors will see it cover around 75% of total EU emissions by the time

Ukraine can expect to become a member—a level likely to be as high in Ukraine itself.

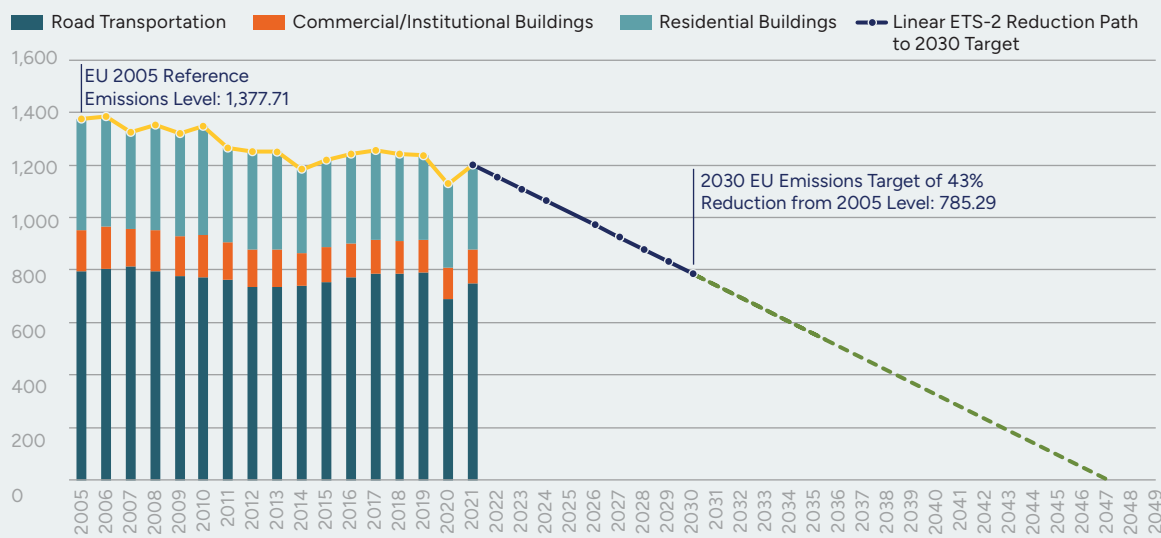
ETS-2 will be levied on the distributors that supply fuels to EU buildings and the road transport sector (as well as additional sectors) from as early as 2027. This means that individual households or SMEs will not be directly affected. Crucially, as households, commercial buildings, and road transportation are not subject to international competition, no free emission permits will be allocated in ETS-2. Ukraine cannot expect to be granted any transitional free emissions under the planned ETS-2 system upon its accession to the EU. Kyiv will be able to benefit from membership in the—by then surely expanded—"Social Climate Fund" to help affected vulnerable households, micro-enterprises, and commuters manage the price impacts of ETS-2. Unlike in the ETS system, where emergency measures to limit excessive price increases are (presumably deliberately) weak, prices in the more politically sensitive ETS-2 system will initially be capped at €45/ton (more than 50 times the level of Ukraine's current carbon tax) through the release of additional emission certificates. While the ETS-2 system is designed to cushion the price impact on EU populations, €45/ton potentially represents a material relative price effect and a level that was reached in the regular ETS system only in mid-2021. The economic impact of these changes on Ukraine, a far poorer country than the EU27 average, can reasonably be expected to be far higher.

EU legislators set a target of a 43% reduction (from 2005 levels) by 2030 in ETS-2 sectors. While the specific start time and the precise linear reduction factor remain to be determined, a range of 5.1%–5.38% per year (amounting to an annual reduction of roughly 46 million tons of CO₂) is prescribed in the legal text. Given the political sensitivity of these sectors and the limited

emissions reduction witnessed from 2005 to 2021, this is an ambitious target. Figure 3 illustrates how a material break in EU emissions in the covered

sectors—which were characterized by relatively stable emissions from 2005 to 2021—will be necessary to reach this goal.

Figure 3 | Historical Emissions in Road Transportation and Buildings in ETS-2, and Future Legislated Emissions Reduction Path, Millions of Tons of CO₂



The principal means through which emissions in road transportation will be reduced is through a switch to electrical vehicles (EVs) across Europe. This trend is already heavily incentivized by numerous national and EU support schemes, the automotive industry, and the EU's legal commitment to end the production of vehicles with internal combustion engines (ICE) by 2035. ETS-2 is a further incentive, on top of these powerful forces, to accelerate the EU switch to EVs, which are estimated to reach over 70% of new sales by 2030. In other words, beyond the next few years, Ukrainians cannot expect to be able to buy ICE vehicles as their country continues on its path to EU membership.

The same is true for buildings, as ETS-2 will financially incentivize the installation of heat pumps across the EU. Three million heat pumps were installed in 2022, but preliminary data for

2023 suggests the sales are now falling.²⁰ The expanding carbon pricing system will thus be a necessary complement to the regulatory bans on fossil fuel heating systems in new and existing buildings.

It is easy to see that ETS-2 membership makes not only green reconstruction an imperative in Ukraine, but also greatly incentivizes the rapid retrofitting and upgrading of the entire Ukrainian building stock. This will be an expensive but necessary process stretching over decades. It is a challenge that Ukraine will not realistically be able to meet without full access to all of Russia's currently frozen assets in the G7 nations during this time period, be it as part of Russia's future reparations payments, by way of rulings of an international claims court, or other, yet-to-be-developed legal processes.

A final challenge for Ukraine lies in the EU's carbon emission policies for the agricultural sector, which accounts for around 10% of Ukrainian GDP (higher than in France, the country leading the EU27 with 8% of GDP). Currently, agricultural sector emissions are not, nor are they planned to be, part of the common EU carbon-pricing framework. The sector's emissions are regulated as part of EU members' nationally determined contributions to carbon reductions. Each member state decides how it will reduce agricultural emissions. At the same time, an increasing number of member states are contemplating the introduction of national carbon-pricing schemes for their agricultural sectors, often facing intense political pushback from farmers. Given the level of controversy that is certain to surround the targeted level of agricultural emissions in the EU in the coming years, it is equally certain that Ukraine's highly competitive agricultural sector will also have to face far-reaching demands for emissions reduction upon full entry into the EU. How these will be estimated and determined has the potential to become a major sticking point in Ukraine's accession negotiations.

However, in spring 2024 the "realpolitik" approach to EU agricultural regulations has once again manifested itself in EU farmers' violent disruptions in various EU capitals and at the Polish-Ukrainian border. The street violence by a pampered, yet aggressive and unscrupulous interest group has (again) been successful in coercing EU political leaders into offering the EU farming sector various regulatory and financial concessions. There is simply no chance that EU farmers will accept allowing Ukrainian farmers into the EU on a level playing field. Instead, Ukrainian farmers will likely have to comply with more rigorous and earlier CO₂ emission constraints than their EU competitors.

At the same time, the EU carbon reduction agenda will provide Ukraine with important economic sector opportunities. Ukrainian agriculture has the scale and expertise to become the EU's dominant biofuels, biomethane, and advanced biodiesel producer. While the precise scope of these sectors in the EU's future nearly net-zero-emission economy remains to be determined, Ukraine's geographic size will provide opportunities for distributed local production of these energy sources based on captured agricultural emissions.

Timely entry into the EU carbon-pricing framework will probably be the most challenging and far-reaching aspect of Ukraine's EU accession process. And carbon pricing will come rapidly to Ukraine as the country seeks expedited entry to the EU. This makes it imperative for the Ukrainian government to accelerate society-wide preparation for this transition, even as the war grinds on. This means continuing and expanding earlier informational stakeholder initiatives across society aiming at implementing Ukraine's future MRV system for CO₂ emissions. But first and foremost, it means that the crucial discussion inside Ukraine about its carbon cap must start immediately. Without a credibly announced and enforced carbon cap, no price can be set on emissions, and the cap-and-trade framework cannot work. Deciding on the cap must be Ukraine's first step in a long journey towards carbon pricing.

To a degree, Ukraine's introduction of carbon pricing will be dictated by the EU's earlier decisions. The ETS and—when Ukraine enters—the ETS-2 will have (at least) the sectoral scope described above. Ukraine will not have access to transition periods of free allowance or other loopholes. At the same time, carbon pricing in a warzone is uncharted territory for the EU, and it seems inevitable that the parts of a reunified Ukraine that suffered most from fighting will have

to have lengthy transition periods for feasibility and enforcement reasons. Therefore, an important debate must be had on where to draw the internal Ukrainian borders between “early ETS/ETS-2 entrant regions” (Lviv or Kyiv) and war-ravaged

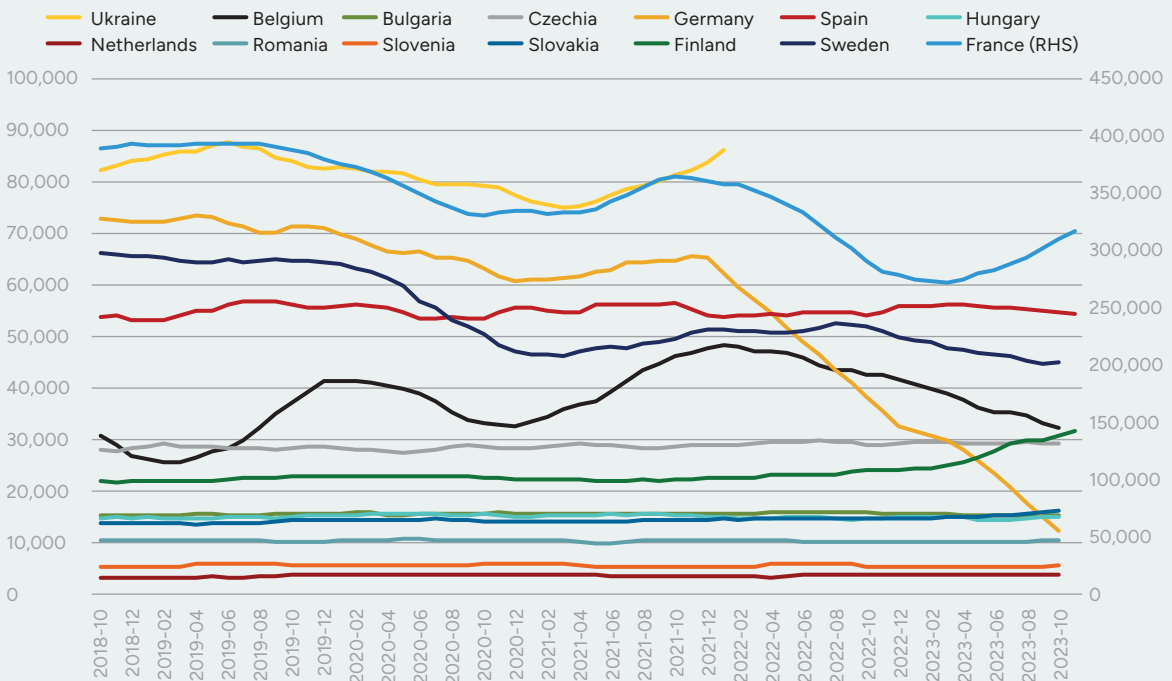
“late entrants” (Kherson, Donetsk, and Kharkiv). Further detailed sectoral demarcations must also begin immediately.

Making Ukraine’s Nuclear Sector the Pillar of a Decarbonized Economy

Ukraine faces a version of the EU27’s challenge to expeditiously free itself from dependencies on Russian fossil fuel and energy technology. For Ukraine, the issue is of particular relevance in the nuclear sector, where historical dependence on Russia is rooted in the Soviet origin of Ukraine’s nuclear reactors and has extended to both nuclear fuel and technological know-how. Prior to February 24, 2022, nuclear power production constituted about half of Ukraine’s electricity production, with coal accounting for the bulk of the rest and hydro, solar, wind, and biomass producing only a small share of Ukraine’s pre-invasion power supply.

The destruction of the Kakhovka Hydroelectric Power Plant dam in 2023 also significantly reduced Ukraine’s immediate postwar hydropower production capacity. Given Ukraine’s [repeated commitment](#) to phase out coal-fired power plants by 2035—that is, not long after a plausible EU entry—the importance of nuclear power in Ukraine’s baseload electricity supply will grow rapidly in the coming years.²¹ Figure 4 shows the nuclear production of Ukraine and the thirteen members of the EU with nuclear capacity from October 2018 to October 2023.

Figure 4 | EU27 and Ukraine Nuclear Power Production, GWh, 12months Rolling Sums



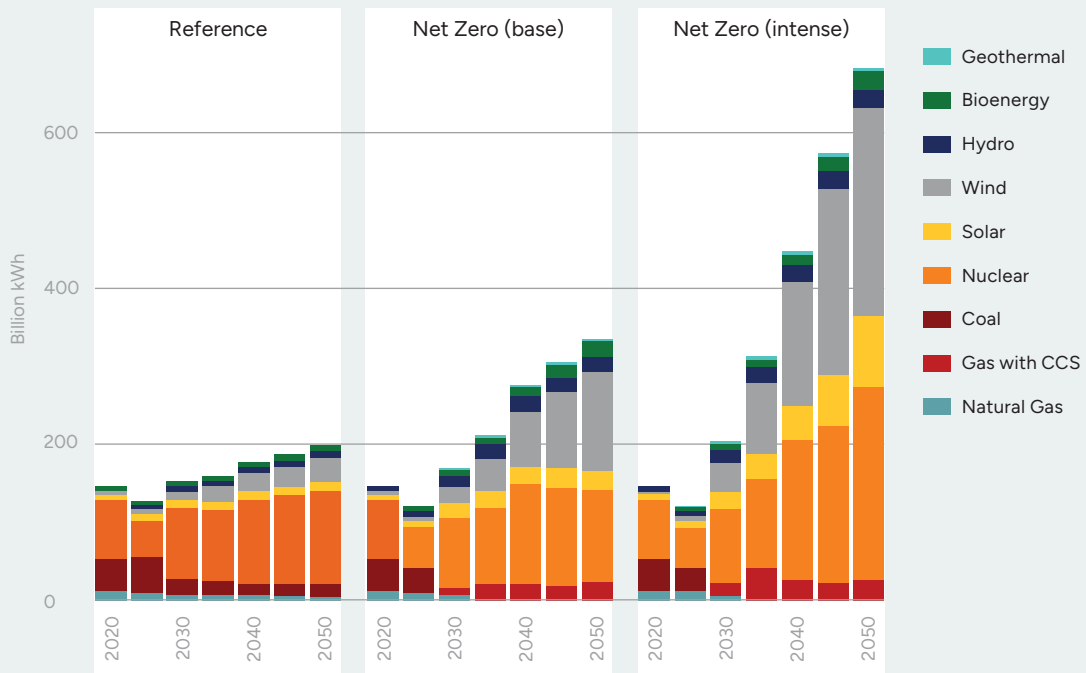
Source: Eurostat

France is Europe’s biggest nuclear producer by a significant margin, but Ukraine—where nuclear power production was increasing prior to Russia’s invasion—would be the EU’s second-largest producer.

At the same time, Russia’s assault on Ukraine has illustrated the strategic vulnerabilities of having a centralized and easily targetable nuclear-based electricity supply that relies on a limited number of large reactor sites. Ukraine’s need to find the right balance between the national security risks associated with large central and baseload providing nuclear power plants and safer and more resilient distributed renewable power production based on solar, wind, and bioenergy is uniquely acute in the EU. Ukraine’s commitment to building

up to nine new US-designed reactors has made the need for this balance all the more urgent. The [Net Zero World report](#) commissioned by the Ukrainian Ministry of Energy for presentation at COP28 outlines several scenarios for attempting to achieve this balance in Ukraine’s decarbonizing and electrifying economy by 2050.²² Figure 5 shows the electricity distribution by source up to 2050 for three scenarios: the “reference (status quo) scenario”, which assumes that essentially no fundamental changes or emission reduction measures are taken in Ukraine; the “net zero base scenario”, in which Ukraine achieves net zero emissions as part of its EU accession process; and the “net zero intense scenario”, in which the country fully develops into a green energy hub in Europe.

Figure 5 | Ukraine’s Electricity Supply to 2050—Three Scenarios:



Source: NZW (2023)

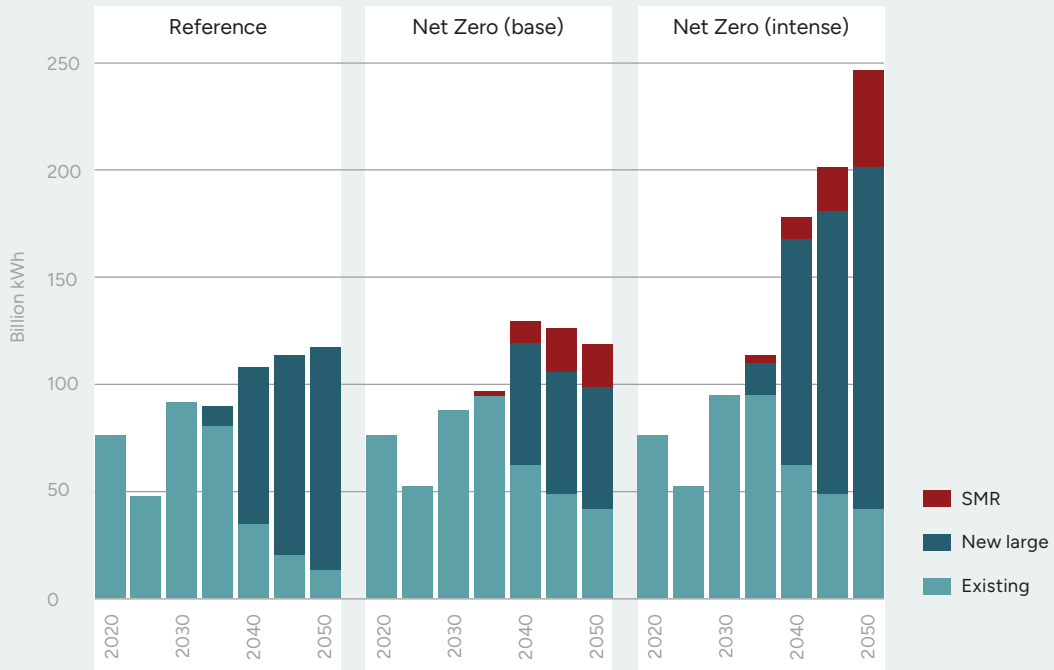
In both net zero emissions scenarios, nuclear power is estimated to account for about one-third

of Ukraine’s total future electricity supply (overall energy supply is much higher in the “intense”

scenario), with the expected buildout of wind power in Ukraine to account for the bulk of new renewable and distributed supply sources.

Existing and newly planned large power plants will account for the largest share of Ukraine's expected nuclear power production. As illustrated in figure 6, new small modular reactors (SMRs) will constitute only a minor part of the nuclear supply.

Figure 6 | Breakdown of Ukraine's Projected Nuclear Power Supply: Three Scenarios



Source: NZW (2023)

To a degree, the limits of expected reliance on the new SMR technology can be attributed to the untested nature of the nascent technology. But not relying on this technology puts the onus on the buildout of distributed renewable supply sources instead.

In particular, in the “net zero emissions intense” scenario, Ukraine would, by a significant margin, remain the EU's second largest nuclear power producer. While this remains an entirely national political decision, Ukraine's continuing role as a major nuclear power will also have to fit into the broader design of the future decarbonized EU electricity market.

Assuming that Ukraine will have the financial capability to build new US-designed nuclear reactors to largely replace aging Soviet-era ones, and be able to easily find non-Russian nuclear fuel suppliers, it will have the opportunity to complement planned variable load renewables production in many other member states. This could be a major export item for Ukraine and would help the overall resiliency of the future EU power supply.

Conclusion and Policy Recommendations

If Ukraine implements its commitment in a timely fashion to introduce EU-compatible carbon pricing, Kyiv will be able to bring forward the date of its EU accession. Important decisions must also be taken for the nuclear power sector. This paper has underlined the political challenges in rapidly introducing carbon pricing in any jurisdiction—not to mention one at war. The significant financial costs associated with carbon pricing, including the inevitable political need for compensation of some parts of the Ukrainian economy and/or some regions, is key, as are the high construction costs of planned nuclear reactors. Furthermore, Russia's aggression against Ukraine provides the first example of a battlefield soon to be (in principle) subject to carbon pricing. This offers Ukraine the possibility to add unnecessary carbon emissions directly related to Russia's aggression to the list of claims that the Council of Europe is assembling against Moscow.

These are massive economic and political challenges. While all future members of the EU and all countries having to decarbonize their economies face a version of these issues, no other country is being invaded by a neighbor at the same time. Ukraine's situation is therefore unique, and the fog of war literally clouds its path forward. Beyond applauding the Ukrainian government for its commitment to implementing carbon pricing and building out its carbon-free nuclear sector, Brussels-based analysts cannot pretend to be able to offer advice on how Kyiv should navigate the immense domestic policy tasks ahead of it.

Instead, this concluding section offers a set of policy proposals for the EU (and to a lesser extent the G7) to assist and facilitate Ukraine's energy sector transition, economy-wide decarbonization, and expeditious EU entry.

First, Western leaders must acknowledge that the large financial costs associated with a successful energy transition in Ukraine are a crucial part of the overall postwar reconstruction strategy. This holds true especially for the full societal costs of an expeditious introduction of carbon pricing, the planned build-out of the nuclear sector, and the energy efficiency retrofitting of Ukrainian buildings untouched by the war. Recalling the large costs of the EU's own decarbonization drive (and the other legitimate spending priorities of the rest of the G7) in the coming decade(s), it is unrealistic to suppose that adequate funds for a successful Ukrainian transition process and timely EU entry will be forthcoming predominantly from the EU budget, or other Western taxpayers. Consequently, there cannot be any illusion in Western capitals that a successful Ukrainian energy transition and integration with the EU sector ahead of EU entry will require that Ukraine gets access to the Russian central bank assets currently frozen in EU jurisdictions.

The timeline for possible transfer of the frozen assets to Ukraine is, in the eyes of many decisionmakers across the EU (and other G7 jurisdictions), dictated by the eventual end of hostilities and the content of a broader postwar settlement. While political and financial arguments

for this approach can be constructed, this highly uncertain timeline for transferring frozen Russian assets to Ukraine ignores and thus jeopardizes the very real near-term financial needs associated with Ukraine's current climate commitments. Unless Kyiv gets at least partial access to frozen Russian funds, its pledge to introduce carbon pricing in 2026 is likely to be unrealistic. Given the costs, failure to grant Ukraine full or partial access to frozen Russian funds will undermine its prospects for delivering on its current climate commitments and with it a timely Ukrainian EU accession.

Second, as Europe's legally enshrined 2030 carbon reduction commitments begin to bite harder in the coming years, a political backlash must be expected. The recent unrest unleashed by EU farmers illustrates the political impact of this challenge. Elements of the broader EU climate agenda and various national climate regulations affecting the agricultural sector have [already been watered down](#).²³ It is implausible that EU farmers will accept open and free competition inside the EU with the highly competitive Ukrainian agriculture sector on anything resembling a level playing field for a long time. And it is nearly certain that EU leaders will feel compelled to give in to their demands. Ukrainian farmers should consequently expect to be hit with tighter environmental regulations than the average for farmers inside the EU.

The intensifying degree of controversy concerning agricultural regulation underlines the broader point that Ukraine cannot expect to be granted meaningful exemptions or transition periods from the EU's climate agenda—especially the carbon pricing framework—as part of its EU accession process. This will prove true particularly in the important Ukrainian agricultural sector, as the EU's own farmers will increasingly feel the economic

and regulatory pressure to reduce their sector's emissions. Indeed, given the strong competitive position of the Ukrainian agricultural sector today, and the fact that agricultural emissions remain a largely national responsibility, the EU should insist that it be among those sectors of the Ukrainian economy subject to climate regulations equivalent to the highest national sector standards among EU members. Ukraine's overall EU accession prospects will benefit politically if one of its most competitive sectors shares the highest carbon-pricing and other emissions-related regulatory burdens.

Third, while the EU will not be able politically to grant Ukraine as a whole material relief from climate goals, the EU must accept the fact that integrating a war-torn nation into its carbon pricing framework is a unique situation demanding special solutions without precedent-setting effects. Given relatively static frontlines and the associated devastation across eastern and southern Ukrainian battlefield provinces, it is simply not realistic to expect carbon pricing to be introduced here at the same ambitious pace as in the rest of Ukraine. The EU will have to accept that parts of the territory of an ETS (or national ETS equivalent) member is for a prolonged period not covered by carbon pricing. This outcome can be achieved in several ways: An agreed number of war-scarred Ukrainian provinces could simply be declared "outside the ETS", not reporting emissions or in other ways adhering to ETS administrative requirements. This intentionally "light touch regime" for former frontline areas is likely to be the most realistic in the immediate aftermath of the war. A more administratively demanding solution would be—as in the early years of the EU ETS—to grant entities in frontline provinces free emission credits. This avoids the economic impact of CO₂ pricing but compels the

collection of relevant administrative and emissions data in a timely and regular way, preparing the region for eventual full ETS membership.

The precise geographic demarcation of ETS-exempt Ukrainian “frontline regions” will invariably be politically contentious, as will the expected expiry date of such exemptions. Given the anticipated relative price effect from CO₂ pricing, the ability to locate in a region without it will offer some economic activities an initially significant competitive advantage inside the EU internal market. This incentive could be an important initial driver of economic growth in regions devastated by the war. At the same time, to avoid locking these areas into ultimately economically outdated fossil-fuel dependent activities, no more than medium-term phase-out of any ETS exemptions should be required.

Ukraine’s successful energy transition and integration into the rapidly decarbonizing EU economy is ultimately likely to be too big to fail, if Ukraine is to become a member of the EU in the foreseeable future. It will require continued herculean political will in Kyiv, a lot of money soon—including from Russian assets—and an EU willing to compromise at least temporarily on otherwise inviolable carbon-reduction commitments.

ENDNOTES

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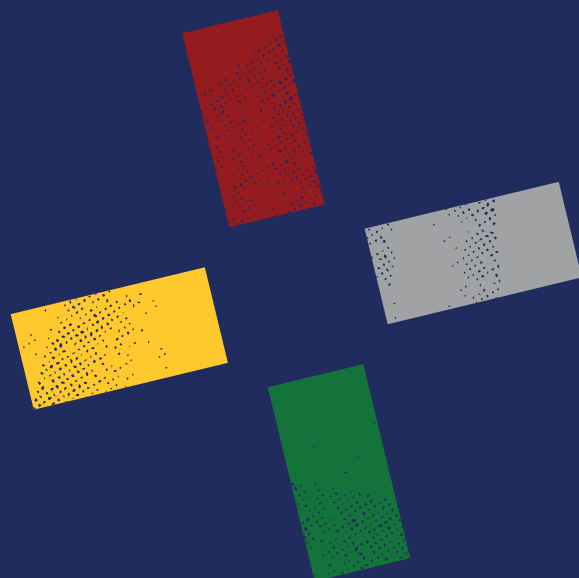
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Ukraine, the EU, and the Road to a Net-Zero Energy Sector

Jacob Funk Kirkegaard



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