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Policy reforms supporting Ukraine's green reconstruction

Rouven Stubbe
Manuel von Mettenheim
David Saha
Ievgenii Cherviachenko
Pavel Bilek
Robert Kirchner



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Economics

About Low Carbon Ukraine

Low Carbon Ukraine is a project that continuously supports the Ukrainian government with demand-driven analyses and policy proposals to promote the transition towards a low-carbon economy.

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Low Carbon Ukraine

c/o BE Berlin Economics GmbH

Schillerstr. 59

D-10627 Berlin

Tel: +49 30 / 20 61 34 64 0

Fax: +49 30 / 20 61 34 64 9

info@berlin-economics.com

www.lowcarbonukraine.com

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1 Introduction

The war started by Russia's invasion is raging on in Ukraine, with high losses of human lives and massive damages caused to Ukraine's infrastructure, assets, and environment. Nevertheless, while Ukrainians are defending their country and fighting to push out the invaders with support from its international partners and allies, the process of preparing for the reconstruction of the country has begun, with the first main conference bringing together Ukrainian stakeholders and international partners at the URC2022 conference in Lugano¹.

Massive investments into the reconstruction of assets damaged or destroyed by the war are required. In addition, it is generally agreed that the reconstruction should aim to "build back better" – not only recreate the pre-war state of play but build assets and infrastructure that enable Ukraine to grow strongly and sustainably after the war is over. Green reconstruction will be a core element of the reconstruction process and a necessary facet to ensure long-term economic competitiveness.

In order to ensure implementation, apart from deciding on the institutional setup, financing and governance of the reconstruction process, there is a need for Ukraine to continue pursuing policy reforms with redoubled efforts. The Ukrainian government recognises the need for policy reform to accompany reconstruction: In the "National Recovery Plan" blueprint presented during the Lugano conference², the government listed several reforms, focused on overarching topics such as the rule of law and public service reforms as priority initiatives.

Reforms are also needed on more specific topics. In order to achieve the desired green reconstruction, specific reforms are required for the regulation of the energy sector and connected, energy-consuming and emissions-generating sectors. Pressing reform needs however already existed before the war. In the energy sector, highly regulated markets often reduced or distorted incentives such as those to invest in flexible power generation capacities or energy efficiency. Also, regulated consumer tariffs especially for power and heat caused fiscal losses for the government and heating companies. Now, as it is neither realistic nor desirable to expect the reconstruction investments to be made in a bureaucratically planned top-down way, many or most decisions will have to be taken at decentralised levels by private individuals, private companies, and sub-national government authorities. Reforms need to eliminate regulatory obstacles and disincentives to long-term future-proof investment decisions.

The Low Carbon Ukraine project has already contributed to the debate on the development of a "green reconstruction" with several publications, papers, and inputs. Previous work focused mainly on the institutional setup and programming side of the reconstruction process.^{3,4} This paper focuses on the reform needs in the energy sector. Based on previous work undertaken in the project and our understanding of the different sectors with energy and climate relevance, we outline what reform needs are most pressing to support the reconstruction process.

¹ Ukraine Recovery Conference. 4-5 July. Lugano, Switzerland, 2022

² Ukraine's National Recovery Plan, 2022

³ Low Carbon Ukraine (LCU). 2022. *Economic reasons for a green reconstruction programme for Ukraine*

⁴ Low Carbon Ukraine (LCU). 2022. *Putting the green reconstruction of Ukraine into action: Requirements for programme design and policy.*

This process is defined by the needs of Ukraine for a sustainable asset base in the current context:

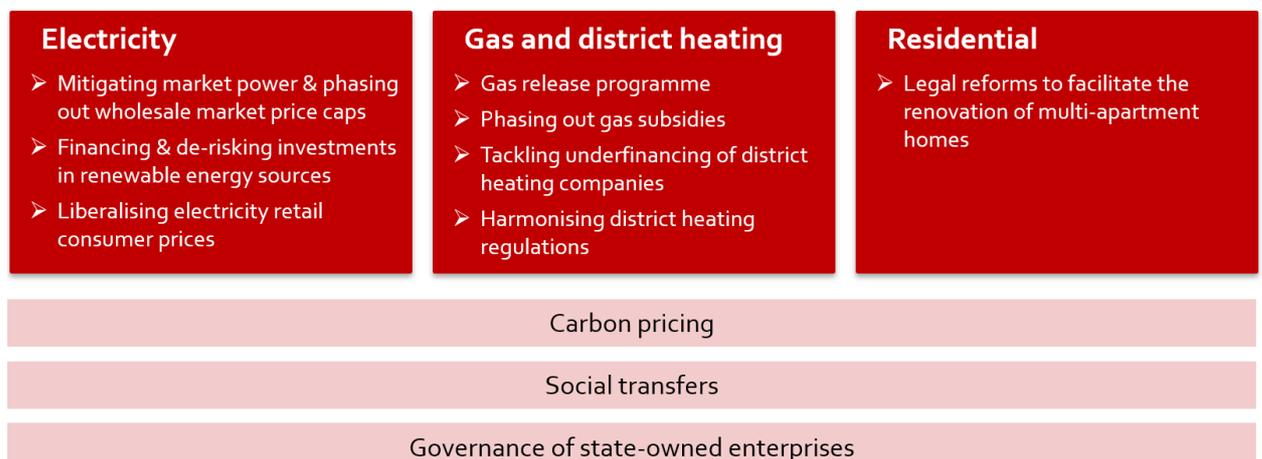
- War-related destruction and damages
- High fossil fuel imports prices and the expected disconnection of not only Ukraine but also the EU from Russian fossil exports
- Ever deeper integration with the economies of EU and other Western countries
- Pressures to sharpen energy- and climate related policy, stemming from existing obligations, international developments and especially Ukraine’s EU candidacy

The two principal aims that policy reforms in the energy sector need to fulfil are:

1. Ensuring that incentives in Ukraine are set properly to guide forthcoming investments into appropriate assets and technology by removing regulatory hindrances and distortions
2. Cutting inefficient budget expenditures that would be a drain on Ukraine’s own resources as well as the received international assistance

It is important to note that the reconstruction needs to satisfy two requirements: (1) the need for emergency assistance and (2) the need for building an efficient, modern and either zero- or low-emissions asset and infrastructural base. While this paper focuses primarily on the second aspect, the process is also highly interrelated with the first need. Assets built or repaired in emergency reconstruction mode might not generate the most efficient and green types of assets (i.e. house, power plant, infrastructure or industrial asset etc.) and hence most desirable in a long-term perspective. While the design of emergency assistance is outside the scope of this paper, we emphasise that emergency assistance should anticipate the need for sustainable assets in the long term or prioritise temporary solutions that do not prevent investment into more modern and green assets.

The structure of the paper will present the various policy considerations by the sector: For the electricity, gas and district heating, as well as the residential sector, we first outline the known challenges and regulatory obstacles and identify reform needs to address these challenges. Where possible, concrete reform items are outlined. In some cases, strategic decisions on a path need to be taken before identifying individual reform needs. These strategic options are identified here. Finally, we touch upon key cross-sectoral reform needs concerning carbon pricing, social transfers, and the governance of state-owned enterprises.



2 Electricity sector

Ukraine's electricity market was opened in July 2019. While generally in line with European legislation, several unique provisions have remained in place reflecting Ukrainian political and economic peculiarities, notably a Public Service Obligation (PSO) for household electricity supply and regulatory price caps across all segments of the organised wholesale market.⁵

The PSO for households remains in place⁶ largely due to political economy reasons: More efficient and equitable solutions exist (see Chapters 2.3 and 5.2) but liberalising consumer prices requires substantial political capital and political will as it would lead to electricity prices for residential consumers increasing to more cost-reflective levels. Subsidised residential electricity prices imply low incentives to conserve electricity and to invest in energy efficiency. Furthermore, the current setup of the PSO creates sizeable fiscal losses for the state and an inability for state-owned Energoatom and Ukrhydroenergo (the state-owned enterprises financing the household PSO) to adequately invest in existing and new capacity.

The price caps on the wholesale market, on the other hand, owe their existence to the strongly oligopolistic structure of Ukraine's power production. Particularly among price-setting thermal power plants, a large share of installed capacity is concentrated in one pivotal entity, DTEK, which wields considerable market power. In addition, most balancing capacity in the form of hydropower plants is concentrated in Ukrhydroenergo. The limited effective competition in wholesale market segments allows dominant firms to extract monopoly rents in the absence of regulation. Price caps, while not addressing the underlying structural problem of market concentration, are designed to reduce the ability of dominant firms to set arbitrarily high prices.⁷

This results in a series of dynamic inefficiencies. First, in the short-run, price caps can lead to strategic bidding behaviour resulting in an inefficient dispatch of power plants. Second, and more importantly, price caps limit potential revenues of flexible capacity providers such as peaker plants, electricity storage facilities, or aggregators of demand response. This distortion leads to an underinvestment in such assets and services, which is especially problematic against the backdrop of increased investment needs due to war-damaged infrastructure in general and increasing needs for flexible balancing capacities to integrate variable renewable power generation in particular.

Finally, investment in renewable energy sources (RES) throughout the last years has been stimulated by an administratively set feed-in tariff. This promised RES producers a generous profit beyond usual required rates of return, hence creating a substantial quasi-fiscal burden.⁸ In practice, the feed-in tariff has only been partially paid out to RES producers and has also been

⁵ An additional legacy problem from the previous single buyer wholesale market model has been accumulated debt between market participants and the single buyer of around EUR 1 bn, which should have been settled before market opening. While the relevant law resolving debt repayment has been adopted in July 2020, it does not resolve debt accumulation (see https://www.lowcarbonukraine.com/wp-content/uploads/20200922_MEMO_5_ENG.pdf).

⁶ First steps for liberalising household consumer prices were scheduled for 2022. In August 2021, the President issued a decree requiring the cabinet to develop and approve a plan for establishing cost-reflective reasonable electricity prices for households. Implementation, however, is postponed due to martial law, and subsidised tariffs for households were extended until October 31, 2022, with additional extensions likely.

⁷ However, price caps are currently not governed by a transparent methodology. While phasing out price caps should be the goal, in the short term, a transparent methodology for setting price caps should also be developed.

⁸ We speak of quasi-fiscal and not fiscal burden since the feed-in tariff is supposed to be financed via a public service obligation (PSO) through the (state-owned) Guaranteed Buyer and ultimately the (state-owned) transmission system operator's (TSO's) consumer levy.

cut retroactively, leading to an accumulation of debt between (state-owned) Guaranteed Buyer, (state-owned) TSO and RES producers, as well as significant uncertainty for RES investors. While debt redemption, as well as an adequately set TSO tariff to cover ongoing RES support costs should be implemented to resolve the legacy problems from the old support system, we focus below (Chapter 2.2) on policy design for an appropriate future RES support scheme.

2.1 Mitigating market power & phasing out wholesale market price caps

As discussed above, the core issue within the Ukrainian electricity wholesale market is excessive market power of dominant firms. Wholesale market price caps are a symptom of this underlying problem, creating additional problems, notably insufficient incentives to invest in flexible capacities. Solving the problem of inadequate investments due to regulated prices thus requires a two-step approach: First, the highly concentrated market power of existing players needs to be reduced, and then wholesale market price caps should be phased out.

There are several ideas for how to address market power of dominant electricity producers:

- Market coupling with Ukraine's European neighbours could allow potential importers to compete with domestic electricity producers. This process is already underway with Ukraine's emergency ENTSO-E synchronisation on March 16th and subsequent fast-tracked market integration. However, by itself, the effect of market integration alone is unlikely to significantly mitigate market power on the Ukrainian wholesale market, first, due to limited physical capacities for electricity imports, and second, due to the extraordinary price difference between the EU's and Ukraine's wholesale market prices.
- Adopting and implementing REMIT regulation and strengthening regulatory authority could significantly improve market transparency. This has the potential to reduce the most direct forms of abuse of market power such as insider trading and should be undertaken as soon as possible. However, REMIT by itself would most likely not be sufficient to address wider concerns of market power by dominant firms.
- Standardisation of products on the forward market could increase transparency of this market segment. A bolder reform of electricity market design around long-term standardised forward contracting obligations for retailers could potentially reduce market power by stimulating new entries on long-term markets and reducing incentives for price-setting behaviour on short-term markets.⁹
- Antitrust measures such as compulsory divestment of price-setting power plants or energy release programmes could reduce effective horizontal concentration in short-term markets. In particular, antitrust considerations should be taken into account in potential reconstruction programmes for the electricity sector, such as through conditions for co-financing ruling out further market concentration.

Several possible avenues for market power mitigation exist. However, it should be made clear that there are no "silver bullet" solutions. ENTSO-E integration and REMIT implementation will be beneficial but not by itself fully sufficient. Smart market design could be employed to reduce the ability for converting market concentration into market power through long-term

⁹ A. Wolak, F., 2021. *Market Design in an Intermittent Renewable Future*.

standardised forward contracting obligations. However, there is currently no real-world precedence for an electricity market with such an emphasis on regulated long-term markets. Finally, antitrust regulation provides powerful tools for mitigating monopoly power if used wisely but might easily be politicised. Changes to market design or antitrust measures could be implemented through legislation or directly by the regulator. Political independence as well as adequate funding and staffing of the regulator is key for ensuring a stable regulatory environment and impartial antitrust intervention, if necessary.

Last but not least, it should be mentioned that problems of insufficient capacity investments can also be addressed via capacity mechanisms. However, according to the EU's fourth energy package which has also been adopted by the Energy Community¹⁰, capacity mechanisms should be temporary, only address identified resource adequacy concerns, and only be a measure of last resort after removing price caps and other regulatory distortions.¹¹ If a temporary capacity mechanism was found necessary to overcome resource adequacy concerns, it should be designed transparently and be non-discriminatory, selecting capacity providers in a competitive process such as auctions. Importantly, capacity mechanism design should anticipate the additional risk of excessive market power by dominant firms on the new capacity market.

2.2 Financing & de-risking investments in renewable energy sources

Optimal expansion of renewable energy sources (RES) requires additional policy support in the absence of very high carbon prices that fully internalise the external cost of carbon.¹² Competitive auctions for feed-in premiums are increasingly recognised as the most efficient mechanism to determine financial support for RES investments.¹³ Since long-term electricity market revenues are inherently uncertain due to a combination of factors¹⁴, RES auctions can also serve a secondary function as an effective de-risking instrument. By reducing price uncertainty and hence investor risk, auctions can thus decrease capital costs for RES investments. Once expected market revenues of RES plants are sufficient to refinance up-front investment costs, support costs would fall to zero with sufficient competition or potentially even turn negative, meaning that governments would earn money from the scheme as investors are effectively paying for market risk insurance.

To realise the above benefits, future RES expansion in Ukraine should be implemented through competitive auctioning of feed-in premiums.¹⁵ Auction volumes should reflect increased climate ambitions, be based on transparent modelling, and determined for several years in advance in

¹⁰ Energy Community.org. 2021. *Energy Community adopts Clean Energy Package*.

¹¹ REGULATION (EU) 2019/943 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 June 2019 on the internal market for electricity. 21.

¹² Abrell, J., Rausch, S., & Streitberger, C. 2019. The economics of renewable energy support. *Journal of Public Economics*, 176, 94-117.

¹³ German Economic Team (GET). 2022. *Auctions for Renewable Energy Support – Overview on terminology, design elements, and lessons learnt*.

¹⁴ A non-exhaustive list of these factors include long-term fossil fuel prices, climate policy ambition and resulting carbon prices, degree of competition from other renewable generators, volume of available storage and other flexible capacities to complement RES production, speed of decommissioning of fossil baseload capacities, and regulatory uncertainty.

¹⁵ Low Carbon Ukraine (LCU). 2021. *Increasing RES electricity generation through competitive auctioning of feed-in premiums*.

order to reduce uncertainty for investors, including investors for complimentary flexible capacities.

Last but not least, long-term infrastructure investments will most likely require political risk insurance including relevant categories such as military risk in the context of a post-war reconstruction. This could most effectively be provided by international partners such as the EU, potentially using frozen Russian assets as collateral.¹⁶

2.3 Liberalising electricity retail consumer prices

The existing household PSO is both inefficient and inequitable. Subsidised household electricity tariffs incentivise wasteful consumption and are a barrier to energy efficiency investments. Moreover, wealthier households, who usually consume more electricity per capita, profit more from subsidised energy than less wealthy households in comparison to targeted subsidies or broad-based social transfers. Finally, the current household PSO is fiscally wasteful and negatively affects the finances of state-owned enterprises Energoatom and Ukrhydroenergo (Chapter 5.3).

If adequate competition on the retail market is ensured¹⁷, a gradual phase-out of the household PSO could reduce the fiscal burden while setting adequate incentives for energy efficiency and energy conservation. Strengthened social transfers (Chapter 5.2) could mitigate negative effects for vulnerable consumers.

Reform needs

- **Market power mitigation on the electricity wholesale market**
 - *As soon as possible:* REMIT adoption & implementation, full commercial integration with ENTSO-E markets, standardisation of forward products
 - *To be considered:* Antitrust measures (energy release programmes, compulsory divestments, market concentration rules for reconstruction support) and reform of market design (long-term standardised forward contracting obligations for retailers)
- **Phasing out wholesale market price caps**
 - *Before phase-out:* development of transparent methodology for setting price caps
- **Implement auctions for renewable feed-in premiums**
 - Based on transparent modelling
 - Announcing auction volumes for several years in advance
- **Phasing out electricity household PSO**
 - *In parallel:* Introduction of social transfers to compensate vulnerable consumers (Chapter 5.2)

¹⁶ Low Carbon Ukraine. 2022. *Putting the green reconstruction of Ukraine into action: Requirements for programme design and policy.*

¹⁷ Proper regulation of distribution companies, many of which currently still perform the role of retail supplier, is a necessary prerequisite for retail market competition. See e.g. <https://www.lowcarbonukraine.com/wp-content/uploads/Reforming-Ukraines-electricity-market.pdf>

3 Gas and district heating sector

Ukraine has an extensive district heating supply and demand network. Around 40% of the heat demand is covered by the district heating system, which thus represents an important source of heat supply for the population. Heat production facilities consist of combined heat and power plants and boiler houses which mostly rely on natural gas as fuel.¹⁸

Despite the opening of the retail gas market in August 2020, it remains highly concentrated and poorly competitive. Naftogaz's monopolistic position on the retail gas market results from the fact that most domestic gas production is carried out by UGV, a subsidiary of Naftogaz. Therefore, wholesale market traders do not have access to gas domestically produced by UGV. Competition on the wholesale market is better due to active participation of local and international traders. However, the market will be more transparent and competitive if authorities would launch the gas release programme and support development of a full-fledged energy exchange.

Over the past decades, there has been continued political pressure to keep heat supply cheap for households. Therefore, state-owned gas company Naftogaz was obliged to provide natural gas to district heating companies at regulated low prices resulting in foregone revenues (difference between cost of gas and the regulated price) for the state. The implementation of the district heating tariff methodology (so-called cost-plus methodology) further reduced the price of heat supply to households. This led to a systemic underfinancing of district heating companies, which were not able to fully cover the operational costs or make investment in energy efficiency measures and new assets. This underfinancing is exacerbated by low payment discipline by the consumers. Due to a complex institutional set-up, attempts to efficiently reform the heating market have proved difficult in recent years.

In the wake of the Russian invasion of Ukraine, district heating production facilities and networks have been damaged, making investment in the sector even more urgent. Such investments in new district heating infrastructure must not lead to the perpetuation of already existing inefficiencies. Therefore, we present three policy reform proposals for the district heating sector in Ukraine.

3.1 Gas release programme

The implementation of the gas release programme would envisage obligating Naftogaz to sell their produced gas on a transparent trading platform to ensure access for competitors to domestically produced gas.¹⁹ It should provide liquidity for trading development and derivate products in order to improve pricing on the local market.

3.2 Phasing out gas subsidies

In Ukraine, the gas and district heating market are intricately linked as 68% of fuel used in heat production facilities is natural gas. The provision of natural gas at regulated prices to district heating companies results in lost revenue for Naftogaz, as the cost of gas production exceeds

¹⁸ Fuel supply is subdivided into 68% natural gas, 17% coal, 13% biomass and 2% other fuels.

¹⁹ USAID Energy Security Project (ESP). 2021. *Development of Ukraine's wholesale & retail gas market: gas release program – application in Ukraine.*

the regulated prices. As Naftogaz is a state-owned company, foregone revenues by the company also mean a burden for the state. The quasi-fiscal cost of the gas price subsidy for the 2021/22 heating season was around EUR 3.4 bn. Due to higher gas prices, higher losses are expected in the coming heating season. Further, energy subsidies distort economic signals along supply chains and reduce incentives to implement energy efficiency measures, reduce consumption or pollution.

To protect vulnerable households from higher energy tariffs while phasing out energy subsidies, we propose to strengthen targeted or broad-based social transfers (Chapter 5.2).

3.3 Tackling underfinancing of district heating companies

In recent years, there has been little investment in modernising district heating facilities, resulting in an outdated generation and network infrastructure. This can generally be traced back to an underfinancing of district heating companies.

Firstly, even before the invasion, there has been a low payment discipline from heat consumers, making it difficult for district heating companies to cover costs. Secondly, the introduction of the district heating tariff is vulnerable to political interference. In Ukraine, the current district heating tariffs are based on the cost-plus methodology and according to the law should cover “all economically justified costs.” In practice, however, the tariffs do not reflect operational and investment costs due to political decisions to keep tariffs on a low level.

To ensure the financial well-being of district heating companies, low payment discipline must be addressed. Therefore, an improvement of the bills collection framework is needed. It should allow for adequate fines and penalties for non-payment, such as disconnecting the building from the heating system.²⁰

A tariff reform will be essential to the economic sustainability of district heating companies. Regulation and tariff setting must be changed to allow for timely and full coverage of operational and investment expenditures of district heating companies. Therefore, the current cost-plus methodology should be replaced by an incentive-based regulation system. While tariff methodologies differ from country to country, some elements should be included in the tariff. Tariff calculations should be transparent, take into account the pass-through of costs to consumers (e.g., higher fuel prices), and include rewards (incentives, inducements) and penalties (sanctions) to incentivise companies to meet efficiency and quality of service targets. As a result, district heating tariffs would become cost-covering, which would solve the problem of underfunded district heating companies and the inability to invest in equipment and network modernization. In this way, outdated equipment can be retrofitted and mobilising investments in new low-carbon technologies based on solar-thermal heat, biomass, or utility-scale heat pumps becomes possible.

²⁰ Emergency measures in the context of the war include prohibitions to increase household tariffs for heating and hot water supply, as well as natural gas distribution until six months after the end of martial law. At the same time, suppliers are prohibited from carrying out debt collection in any compulsory manner. Without passing judgement on the adequacy of the measure in current circumstances, debt collection and payment discipline will need to be addressed in the context of post-war reconstruction.

3.4 Harmonising district heating regulations

Effectively, Ukraine has two parallel district heating regulation systems: one based on NEURC regulations and the other based on government authorities, namely the Ministry for Communities and Territories Development and the Cabinet of Ministers of Ukraine. According to the Law, NEURC has the authority to set the rules defining which district heating companies or activities are subject to what system. In 2021, NEURC transferred all tariff setting powers except combined heat and power tariffs to local authorities. Such duality and instability of regulatory fundamentals makes developing robust, consistent policies very challenging, and today, there is no overarching coordination mechanism specifically for district heating.

We propose to move from two- to a single-tariff system (unified methodology). It will be important to consolidate NEURC and government regulations so that there is a single, fair, and consistent set of rules and clearly define regulatory rights and responsibilities of central and local authorities in district heating regulation.

Reform needs

- **Gas release programme**
- **Phasing out gas subsidies in the district heating sector**
- **Tackling underfinancing of district heating companies**
 - Improve bills collection framework to tackle low payment discipline
 - Guarantee cost-covering district heating tariffs
- **Harmonising district heating regulations**
 - Move from two- to a single-tariff system (unified methodology)

4 Residential sector

As of July 2022, 20,000 multi-apartment buildings and 120,000 individual buildings were destroyed or damaged due to the war. Before the next winter, heating and housing must be adequately restored and secured for all people in Ukraine. The challenge of green reconstruction in the housing sector is therefore to balance long-term considerations for energy-efficient homes, including low carbon heating systems, with the immediate need for shelter and heat. Already before the invasion, Ukrainian housing consumed two to three times more energy per square meter than EU member states. With increasing energy prices, there is a clear economic incentive to reduce energy consumption in residential buildings by implementing energy efficiency measures.

In recent years, the parliament adopted a variety of laws to improve energy efficiency in buildings, including new housing management legislation, commercial metering of utility services, contractual relations for market participants as well as obligatory energy certificates to classify buildings according to their energy efficiency classes. However, the laws are not fully

implemented yet, some gaps need to be covered in the primary legislation in order to achieve harmonisation with EU policies. Secondary regulation needs to be streamlined accordingly.

There is currently limited state support of energy efficiency measures in the residential sector. According to recent regulation²¹, the Energy Efficiency Fund will provide grants not only for energy efficiency measures but to other housing programmes, including the reconstruction of buildings. Further, the government announced a renovation programme, which is currently under preparation. The “Warm Loans” programme remains the only state programme for individual buildings. We expect further support from the international community to provide funds for the Ukrainian residential sector to rebuild damaged buildings.

The main barrier to energy-efficient renovations and construction are energy subsidies in the electricity and heat sector. These have so far reduced the incentive for households to decrease its energy consumption (Chapter 2.3 and 3.1). Furthermore, legal reforms are needed to facilitate the renovation of multi-apartment buildings.

The EU candidate status and eventual accession will add further requirements on energy efficiency in residential buildings. Climate-related EU policy requirements hugely favour green reconstruction to reduce the impact of high carbon prices or replacement needs in the near future. Therefore, it will be crucial for Ukraine to ensure that residential buildings reconstruction is governed under the “build back better” mantra that complies with EU regulation.

4.1 Legal reforms to facilitate the renovation of multi-apartment homes

To foster the implementation of energy efficiency measures in residential buildings, updating the legislation on the management of multi-apartment buildings is needed. Ukraine has laid a solid foundation for the development of the housing sector. For example, the legislation provides that co-owners have the right to form a homeowner association (HOA) to manage a building, including the implementation of energy efficiency projects. However, the establishment of homeowner associations is not mandatory, which is why they are only established in 30-40% of buildings, while the proportion of active HOAs is even lower. Since most multi-storey buildings are co-owned (usually one household equals several co-owners), it is extremely important to ensure that co-owners are motivated to form a homeowner association while maintaining control over decision-making. In addition, co-owners must be motivated to accumulate money in joint protection accounts to invest in energy efficiency measures.

Reform needs

- **Update legislation on the management of the multi-apartment buildings**
 - Establishment of homeowner associations should be incentivised
- **Completing harmonisation of regulation for energy efficiency in buildings with EU legislation**
 - Closing gaps in primary legislation
 - Streamlining secondary legislation

²¹ Draft law No. 6485 was adopted by the Verkhovna Rada on 09 July 2022.

5 Cross-sectoral policy reforms

5.1 Carbon pricing

The green reconstruction of Ukraine should not be seen as an expensive luxury but should be seized as an opportunity for the modernisation of the country to maintain long-term competitiveness on the global market and avoid stranded assets.²² While Ukraine has official climate targets²³, there are also clear economic incentives to decarbonise the economy. The current Ukrainian CO₂ tax is very low (1 EUR/tCO₂) with a narrow tax base and has been virtually ineffective in strengthening energy efficiency and reducing carbon emissions.²⁴ An adequately high carbon price covering all sectors, including hard-to-abate sectors such as transport and industry, including the historically significant iron and steel sectors, should be the centrepiece of Ukraine's decarbonisation efforts. It ensures the most cost-effective path to reach the country's decarbonisation goals, modernise its economy, and avoid investments in stranded assets during the reconstruction process.

Furthermore, there is pressure from the international community for higher carbon pricing. Whether through the prospect of EU accession and implementation of the EU Emissions Trading System (ETS) or the planned EU Carbon Border Adjustment Mechanism (CBAM), which would affect Ukrainian carbon-intensive exports to the EU, Ukraine will have to increase its CO₂ price. To avoid an abrupt increase of the CO₂ price and to smooth the transition towards the EU ETS carbon price of 50 EUR/tCO₂ (2021 average), Ukraine should design carbon pricing in a way compatible with the EU ETS and converging to a comparable price level in the long run to ensure a smooth transition upon EU accession.

A higher carbon price increases production costs for carbon-intensive products. Therefore, compensation for industry and households needs to be considered. Vulnerable households could be protected via social transfers (section 5.2) potentially using the revenues from CO₂ pricing. The risks to economic competitiveness of Ukrainian companies are small since the CO₂ price would be lower in the coming years than in high-income economies and that of comparable economies. Nevertheless, suitable policy instruments to protect against carbon leakage or unfair disadvantage to Ukrainian exports are available (e.g., use CO₂ price revenues to investments in low carbon technology or Ukrainian CBAM compatible with EU CBAM).

Reform needs

- **Implement cross-sectoral carbon price with adequate price level**
 - Coverage of all sectors
 - Compatible with EU ETS
 - Gradual convergence to EU ETS price level

²² Low Carbon Ukraine (LCU). 2022. *Economic reasons for a green reconstruction programme for Ukraine*.

²³ In July 2021, Ukraine updated its NDC targets, which now call for a 65% reduction in greenhouse gas emissions by 2030 (vs. 1990). The country also aims for climate neutrality by 2060 and has signalled support for the European Green Deal aiming at climate neutrality by 2050.

²⁴ Low Carbon Ukraine (LCU). 2021. *A revision of Ukraine's Carbon Tax*.

5.2 Social transfers

It should become clear from the previous sections that a cornerstone of the necessary reforms for the Ukrainian energy sector is the cost-reflective pricing of electricity and heat, whether through liberalisation of the household electricity retail market or phasing out cheap gas provision to district heating companies. This is even more urgent in the current context of limited supply and sustained high fossil fuel prices due to the decoupling of the European Union and its partner countries, including Ukraine, from Russian energy supply.

At the same time, increasing energy retail prices can have significant adverse effects for vulnerable consumers. Thus, social transfers – independent from energy consumption to maintain incentives for energy conservation – should be strengthened to mitigate negative effects. This could be done either through targeted transfers to vulnerable consumers, such as an improved version of the existing Housing and Utilities Subsidy (HUS)²⁵, or a new broad-based transfer mechanism:

- If targeted transfers are chosen, vulnerability criteria need to be designed carefully and up-to-date consumer information should be collected to ensure nobody is left behind. This is especially challenging in an immediate post-war context where the income, wealth, home ownership, electricity and heat supply situation of many consumers might have changed drastically and might not be known in the short-term.
- While targeted transfers to vulnerable consumers minimise the fiscal burden of the measure, broad-based transfers in tandem with retail price liberalisation could increase popular support for the proposal and make tariff reform politically feasible.

Therefore, if the fiscal situation allows, well-calibrated broad-based transfers might be preferable in the context of a post-war reconstruction, enabling energy tariff reform along the lines discussed above. Ultimately, the decision between targeted transfers and broad-based transfers remains a strategic decision that needs to be taken on a political level.

Reform needs

- **Introduce targeted or broad-based transfers to compensate vulnerable consumers for increased energy tariffs (Chapters 2.3, 3.2 and 3.3)**
 - Policy design remains strategic decision, several suitable models exist

²⁵ Please find a recent Policy Evaluation assessing pre-war targeting and coverage of the HUS at <https://www.lowcarbonukraine.com/wp-content/uploads/The-Ukrainian-Housing-and-Utilities-Subsidy-HUS.pdf>

5.3 Governance of state-owned enterprises

State-owned and municipal-owned enterprises (SOEs, MOEs) such as Energoatom, Ukrhydroenergo, Naftogaz and the municipal district heating companies are currently being used in various ways to cross-subsidise and support schemes and deficiencies in the power, gas and heat markets. This includes de-jure and de-facto obligations to sell to households (or supplier companies to households) at below-market prices and the direct transfer of such large portions of revenues to other state entities such as Ukrenergo. In effect, SOEs are essentially completely reliant on the state budget to finance necessary investments and even maintenance of their assets as they have been deprived of their own revenues. This makes them and their leadership unable to take efficient decentralised decisions and act, to the extent possible, like private companies.

As a result, a substantial investment gap is emerging (e.g. in heating companies not investing in more efficient and cleaner technologies to replace ageing heating plants and combined heat and power plants) and investment decisions are becoming more politicised than desirable. The transparency of the financing of the energy sector also becomes very blurred, as e.g. the real costs of the PSO scheme are hard to assess, hence making proper regulation and governance yet harder.

Reasons for this specific treatment are understandable, but still misguided. There are clear financing needs inside the energy system (e.g. support to vulnerable households, financing of the feed-in tariffs or premiums for RES, etc.). SOEs with low variable costs and largely amortised/financially depreciated assets can be expected to generate substantial windfall profits due to economic rents if receiving market prices, formed due to other suppliers using technology with much higher marginal costs. SOE profits would eventually end up in the state budget anyway. And risks of capture of SOEs by particular interests and criminal, corrupt schemes are a very real and persistent threat.

Nevertheless, this approach must be revised entirely. As much as possible, SOEs and MOEs should be treated like private companies, taking their own price and investment decision whilst subject to the same, unified, and consistent regulation as private companies. Profits of SOEs should be booked as revenues of the central government budget, profits of MOEs in the municipal budgets, without any further legal earmarks to disentangle revenues from expenditure decisions. Of course, corruption and capture risks must be addressed, but they exist equally in the present setup, with the opaque financial flows comprising of prices unlinked from markets making then in effect easier than in a regular setup. Such a reform needs to be part of a reform of the PSO schemes (see 2.3 and 5.2), strengthening the independence of the regulator, and unifying the regulatory oversight.

Reform needs

- **Removing all irregular obligations of SOEs and MOEs, such as**
 - provision of energy services at non-market prices
 - financial cross-subsidisation inside energy markets
 - Only profits should be disbursed to the national/municipal budgets, being fully fungible (not subject to earmarks for specific uses or supplying “special funds”)
- **Ensuring that SOEs’ and MOEs’ management has the ability to independently manage** and run the companies, subject to oversight by the public owner as per international best practice
- **Interrelation** with the reform needs for
 - Independent and unified regulation (Chapters 2.1 and 3.4)
 - Replacement of the power PSO (Chapter 2.3) by targeted social transfers or general redistribution/minimum income schemes (Chapter 5.2)

6 Conclusion

The post-war reconstruction of Ukraine will require massive investments in infrastructure that will shape the country for years and decades to come. To ensure the country’s future competitiveness in a decarbonising global economy, it is paramount to “build back better” and channel investments into low- or zero-carbon assets.

Besides a well-designed institutional setup, financing, and governance of the reconstruction process, a successful green reconstruction requires strong rules and incentives guiding investment decisions by individuals, private companies, and sub-national government authorities. Known regulatory barriers to adequate incentives need to be tackled and appropriate policies implemented in the energy sector and related sectors that stimulate investments in energy efficiency, renewable energies, and other low-carbon technologies. Many reform needs have been well-known before the outset of the war. Now, as preparations for the reconstruction process gain traction, there is a need for Ukraine to continue pursuing policy reforms with redoubled effort.

The proposed policy reforms aim to:

1. Create sufficient competition on wholesale and retail markets for energy
2. Overcome regulatory distortions that currently reduce incentives to invest in energy efficiency and flexible power generation capacities
3. Efficiently incentivise investments in renewable power generation capacities and low-carbon technologies in energy-consuming sectors (heat, buildings, industry, transport)

4. Ensure good governance and adequate financing of state-owned and municipal-owned companies in the energy sector to allow sufficient investments in infrastructure such as district heating networks
5. Reduce the fiscal and quasi-fiscal burden from wasteful energy subsidies
6. Mitigate the financial burden from cost-covering consumer prices for vulnerable consumers

The proposals presented should not be seen as an exhaustive list of reforms required for a successful green reconstruction. Rather, they represent the most pressing reform needs identified in the energy sector and related sectors. In parallel – but beyond of the scope of this paper – there is a need for equally important reforms regarding anticorruption efforts, the rule of law (judicial and police reform, protection of human rights), transparency and accountability in government procurement and public financial management, and inclusion of civil society and wide range of stakeholders in decision-making processes.

While the war effort and addressing immediate needs for the upcoming heating season should now take absolute priority to prevent an even worse humanitarian disaster, preparing for a successful green reconstruction and “building back better” Ukraine’s infrastructure will be paramount for securing long-term competitiveness, prosperity and stability for Ukraine and her people. The proposed policy reforms are a key cornerstone in this process, both for guiding reconstruction investments domestically, and for securing the confidence of international partners and donors that financial assistance for the reconstruction will be well utilised.