

UNLEASHING UKRAINE'S ENERGY POTENTIAL THROUGH MARKET TRANSFORMATION AND PRIVATE INVESTMENT

POLICY BRIEF / EUROPE FACILITY PLATFORM

★ SUMMARY

Ukraine's energy landscape is at a crucial point, requiring an infusion of new generation capacity estimated at up to 15 GW to meet the nation's demands. This expansion is not just a matter of quantity; it underscores a strategic shift towards a green transition. Reaching these goals is impossible without private investment in this sector.

The urgency for this development is underscored by an already visible deficit in generation capacity, which, if unaddressed, is projected to worsen. Current market dynamics, however, are hampered by existing legislative frameworks and market distortions, including Public Service Obligations (PSOs) and price caps, which have been stifling the flow of investment. This situation, as anticipated, has led to a liquidity crisis. Staggering debts on the electricity market is 1.6 bln USD and the gas market is facing an even higher crisis with debts amounting to 3.2 bln USD.

To overcome these barriers and unlock Ukraine's full energy potential, comprehensive market transformation and legislative change are imperative. The design of this transformation has already been created and envisages implementation of the EU rules and G7 reform roadmap. The introduction of the transformation promises to catalyze the energy sector, paving the way for robust growth unlocking a private investment of 34.5 bln \$ (according to the Ukrenerg estimate, while the World Bank and the IFC provide different and bigger figures).

★ ENERGY SYSTEM DEMANDS

Ukraine's energy sector is taking the biggest hit throughout the war, with Russian missiles and drones destroying more than 50% power generation facilities. Rebuilding Ukraine's energy generation and transformation into a new, effective, modern one is a cornerstone of Ukraine's growth, recovery and future resilience.

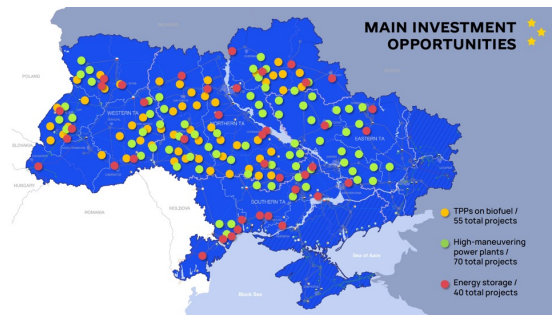
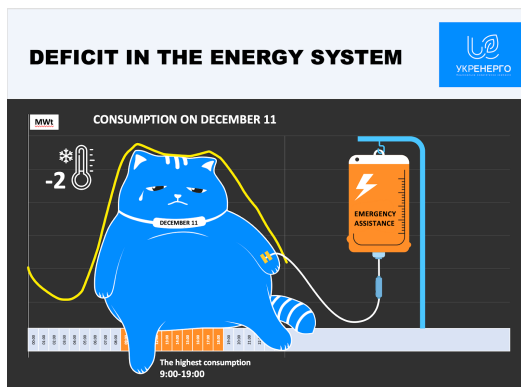
Generation type	WHAT NEEDS TO BE BUILT GENERATION						
	Nuclear power plant	new highly flexible plants	new thermal power plants on biomass	Solar energy	Wind energy	Energy Storage	Onistrowska pumped-storage plant
Installed capacity today	13.8	0	0.3	6.2	0.5	0	2.0
To be constructed, 15 GW	2.4	1.4	1.1	3.8	4.5	0.8	1.0
Resulting total	16.2	1.4	1.4	10.0	5.0	0.8	3.0
What needs to be done	Construction completion of Units 3 and 4 at Khmelnytska nuclear power	Building new High-mechanizing capacities with a control range of at least 80% of the installed capacity and the startup time not exceeding 15 minutes	Building new generating capacities on biomass, etc. at the expense of international financial institutions	Building new solar and wind power stations to replace existing thermal power plants that will be decommissioned as part of the National Emission Reduction Plan	Building energy storage systems that can deliver captured energy for 2-4 hours to balance the power system with a large number of solar and wind power stations	Building 5-7 hydro-power units at Onistrowska pumped-storage plant	
34.5 Investments (\$ billion)	20.0	1.5	3.9	2.7	4.0	1.2	1.7
Expected non-discounted payback period (years)	15	5	9	4	5	4	5-8

Unleashing Ukraine's Energy Potential through Market Transformation and Private Investment

Official data indicates that Ukraine requires a significant amount of new generation capacity (picture one - calculations of the national TSO operator "Ukrenergo" on the need of the new generation building that will provide sufficient amount of power to Ukraine's economy and will support Eastern Europe with the export capacity).

It is impossible to build this amount of capacity without significant private investment.

The strategic unlocking of Ukraine's energy generation capacity is a cornerstone for the country's resilience. Ensuring a robust electricity supply that can meet peak demand is a critical challenge, particularly given the difficulty in storing electricity with current technology, which remains limited in capacity and efficiency (December consumption pattern demonstrates generation deficit in 2023 even without massive missile attacks in 2023/24 season).



This shift not only impacts the operational dynamics of Ukraine's energy providers, but also emphasizes the need for a diversified and balanced energy portfolio. By focusing on a multi-faceted approach that includes the development of renewable sources and the modernization of existing infrastructure, Ukraine can navigate the complexities of energy supply, costs and storage challenges.

Prior to the conflict, Ukraine's peak electricity demands were satisfied through a combination of hydro generation, coal and natural gas-fired plants. The latter were particularly viable when natural gas prices were low, making the marginal costs of operating gas-fired plants favorable compared to coal-fired ones. However, the landscape shifted towards the end of 2020, as the marginal costs for natural gas plants began to exceed those of coal plants due to rising gas prices.

Current market dynamics, however, are hampered by existing legislative frameworks and market distortions, including Public Service Obligations (PSOs) and price caps, which have been stifling the flow of investment. It is noteworthy that despite very high prices in some hours, the average price in Germany was lower than in Ukraine.

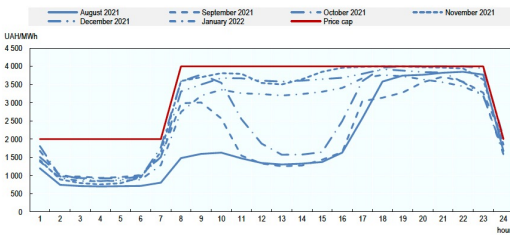
Since market liberalization, no new capacity has been installed in Ukraine, except for renewables under support schemes and new pumped hydro plants built by incumbent suppliers. In fact, a significant amount of capacity is to be decommissioned even after the end of the war.

★ BARRIERS FOR INVESTMENT

The current regulatory framework in the sector, marked by inefficiency and excessive political influence, acts as a barrier to the EU integration and distorts market dynamics. These barriers limit the range of technologies potentially available for investment in Ukraine, so new entry in the electricity market is likely to be limited to investments in renewables (excluding large hydro), modern storage technologies and gas-fired engines or turbines.

2 MARKET DISTORTION

Figure 4.10. Price cap and monthly average prices on the DAM (IPS trade zone), August 2021-January 2022

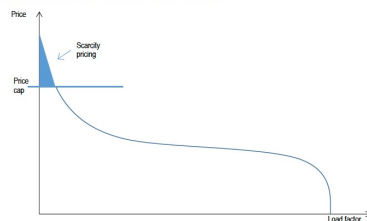


Source: Market Operator (n.d.[11]). Hourly electricity purchase and sale prices on DAM, <https://www.ore.com.ua/index.php/project>.

Price caps prevent market-based price formation and affect prices to a significant extent, especially during peak hours. By preventing price peaks, they reduce incentives for demand response by large electricity consumers and to a lesser extent by residential consumers. Further, they hinder the emergence of new business models relying on prices reflective of supply-demand conditions, such as arbitrage using energy storage technologies, fast-start peak generation and aggregators. The methodology behind the calculation of Ukraine's price caps has never been officially disclosed, but it appears that they are based on the costs incurred by coal-fired power plants.

Scarcity pricing is necessary to generate profits to cover the capital costs of marginal producers. Scarcity pricing is a natural occurrence in the market, as short-term price spikes reflect the mismatch between supply and demand during certain hours. By avoiding price spikes through price caps, a "missing money problem" may occur in electricity markets.

Figure 4.13. Illustration of the "missing money" problem



This refers to unrealised revenue from high prices that is needed to cover the long-term marginal costs of some generators (see illustration from the OECD Competition Market Study of Ukraine's Electricity Sector). This revenue is crucial to incentivise optimal levels of investment. If high prices and corresponding revenues during times of scarcity cannot be collected, generators may be tempted to bid above their short-term marginal costs, resulting in higher average electricity prices. In Ukraine, price caps do not allow scarcity prices.

Any potential entrant would receive false signals on which type of generation is required or how it would be priced. With increasingly variable power generation, accurate price signals are critical to encourage market participants to adapt generation or consumption in close to real time, and to promote investments in flexible units of all types, including demand response and energy storage.

2 FISCAL BURDEN TO THE BUDGET

Designed to provide every household with cheap heat, gas and electricity, has the biggest negative impact on the development of the sector. Household consumption accounts for 35% to 40% of total electricity supply in Ukraine. As a consequence households have no incentive to develop energy efficiency, there is no incentive to implement new technologies (cheap gas and heating block green technology) and market debt crisis eliminates resources even for the reparation. This situation, as anticipated, has led to a liquidity crisis and a debt crisis in the market.

The Public Service Obligation (PSO) for households has been instituted as a means to supply electricity at regulated prices, which are notably lower than wholesale market rates. However, these regulated prices fail to reflect the true cost of electricity, leading to a universal subsidy that benefits all households irrespective of income, without a clear definition of vulnerable consumers in the legislation. This not only inflates the cost of the scheme, but also diminishes the incentive for households to pursue energy efficiency and invest in small-scale renewable energy for self-consumption. Furthermore, such pricing distorts market signals for energy source choices and deters competition in the retail market, while simultaneously straining the financial liquidity of utility service suppliers (USSs) who must bridge the gap between procurement costs and sales to households, a discrepancy often addressed by the Energoatom through delayed budgetary compensations.

The inflexibility of the PSO system is laid bare in the face of market fluctuations, with fixed household electricity prices contrasting with the variable costs of the mechanism, influenced by shifts in wholesale prices and network tariffs. This precarious balance poses a risk to the financial health of entities like Energoatom and Ukrhydroenergo, whose profitability and investment capacity are compromised as they are forced to allocate a significant portion of their output and revenue to uphold the PSO, particularly when their own production diminishes. Consequently, the PSO not only obscures the full cost from taxpayers, but also jeopardizes the financial stability and growth potential of key energy producers.

3 ESSENTIAL PRECONDITIONS

Abolishment of price caps and the PSO reform, while necessary, will not be sufficient for a transformative impact. A more comprehensive approach is required, encompassing enhanced market monitoring to prevent manipulation, substantial investment in renewable energy to reduce reliance on traditional sources, and regulatory reforms to foster innovation and competition in the energy sector.

Artificial debts in the Ukrainian energy market are partly a result of excessive administrative regulation. This policy framework has led to a situation where, despite non-payment of electricity bills, consumers continue to receive power. This issue has escalated significantly, with 5500 companies ceasing payments and accumulating a debt of \$22 million per month and stockpiling debt crisis on the balancing market, reaching nearly \$1 billion. Additionally, the auxiliary services market contributes to the Ukrainian energy market's lack of appeal to investors. A key challenge in this segment is the limitation of contracts to a maximum of one year. This short-term nature of agreements is a deterrent for banks, which typically require documents that secure cooperation for a minimum of five years, thus creating a hurdle for long-term investment and stability in the sector.

The prevailing debt issue in Ukraine's energy sector poses a significant barrier to attracting new generation projects. With the current backlog, generators, especially peak ones, face the prospect of waiting up to a year to receive payments, which exacerbates the queue of pending settlements. This delay in payment hampers the financial viability of operations, as operators cannot recover their OPEX costs in a timely manner. Consequently, this situation deters new investments and entrants into the market, as the uncertainty surrounding the recovery of expenses and the extended wait for reimbursement makes it financially unfeasible for new generation projects to commence.

✧ UNLOCKING THE POTENTIAL

The adoption of free price formation in the power system promises to enhance both competition and operational flexibility. This shift would catalyze the creation of incentives for investment, encouraging the inflow of new technologies into the energy sector. Additionally, it would lead to the establishment of a distinct market dedicated to energy efficiency, fostering innovation and consumer choice in this critical area. The culmination of these changes would be the significant reduction of state influence on the market, paving the way for a more dynamic and responsive energy industry that is governed by market forces rather than regulatory mandates. These reforms are expected to not only stimulate economic growth within the energy sector, but also contribute to a more robust and sustainable energy infrastructure.

Key interventions include: (i) wholesale electricity market reform, (ii) tariff reform in electricity generation, transmission, distribution and end-users of electricity and district heating, (iii) tariff reform in gas to enable district heating switching to renewable fuels, (iv) auctions for renewable-based electricity and hybrid energy storage and generation, and (v) alignment with the EU standards.

A crucial prerequisite is the establishment of targeted subsidies within Ukraine's energy sector. For this system to be equitable and effective, the country must first delineate who qualifies as vulnerable and then ensure that support reaches these groups directly. Leveraging available digital tools can streamline this process, ensuring that subsidies are distributed efficiently and transparently. By focusing assistance where it is most needed, Ukraine can protect its most at-risk populations from the volatility of energy prices while simultaneously fostering a fair and inclusive market environment. This targeted approach stands to reinforce the social safety net and contribute to the overall stability and resilience of the country's energy framework.

In addition to this, strong measures are essential to address the prevailing debt crisis in the energy market. These measures should include the possibility of discontinuing electricity supply to non-paying customers and establishing a clear source of funding for the maintenance of critical infrastructure that is vital for environmental protection. By implementing these strategies, Ukraine can strengthen its social safety net and enhance the resilience and stability of its energy framework.

For these reforms to be effective, it is essential to restore the political independence of regulators and enhance their capacity, ensuring impartial oversight and fostering genuine competition among producers to drive innovation, service quality and fair pricing. Compliance with the rule of law is paramount to protect investor rights and maintain transparent market operations, thereby building a stable investment climate. Strong political will and government capacity are critical for the simultaneous implementation of reforms, requiring leadership that is both committed to and capable of efficient reform execution.

Additionally, engaging stakeholders and securing public support is vital, particularly given Ukraine's reliance on international aid and the energy market's liquidity crisis.

Emulating the successful energy market transformation observed in the European Union can serve as a persuasive model for Ukraine, helping to overcome populist resistance and garner wider support for a sustainable and independent energy sector.