Ukrainian Energy Storage Association

EASE
European Association for Storage of Energy

Energy Storage in Ukraine - Upcoming Regulatory Changes and New Opportunities

EASE – Ukrainian Energy Storage Association Webinar

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Introduction

Ukraine is the biggest country in Europe by area, with a population of forty-two million people, and has one of the oldest, most centralised, most inflexible energy systems in Europe. Despite these challenges, Ukraine can decarbonise its energy system by embarking on an ambitious green energy transition agenda.

The Ukrainian government, supported by key industry players such as the local TSO, is eager to take on this important challenge: the country has signed the Paris Agreement; it has decided to support the European Green Deal; and it aims to have 80% of RES in the energy mix by 2050.

The ultimate goal is to transition to a carbon-neutral economy by 2070. Especially in the first months of 2020, the Ukrainian Government has increased its commitment to a greener energy system. Despite the COVID-19 pandemic, moreover, the Government does not plan to change its strategy. With the contribution of energy storage, Ukraine can achieve a greener, decarbonised, decentralised energy system.

EASE, the European Association for Storage of Energy, and UESA, the Ukrainian Energy Storage Association, welcome these initiatives. The associations and their members, coming from Industry, research centres, and universities, aim to support Ukrainian stakeholders in this transition.

Renewable Energy in Ukraine

Current trends

Ukraine currently faces a decrease in electricity demand. This trend started already more than 5 years ago, but the decrease has intensified in the last few months, due to structural changes in Ukraine's economic system: the country witnessed a significant reduction in heavy industry and, to a smaller extent, saw improved rates of energy efficiency. Predictably, in the spring of 2020, the COVID-19 epidemic has contributed to this decreasing trend.

The Ukrainian paradox

Ukraine has the highest green tariff in Europe: this has been a significant stimulus for the development of renewable power generation. Currently, Ukraine has some of the least expensive retail electricity prices out of any country in Europe.

In recent years, there has been a significant uptake of Renewable Energy Sources (RES). But this growth has been chaotic, and it has led to the Ukrainian Paradox: more RES deployment has led to an increase in CO2 production. This is because much of the RES capacity was deployed in one region of Ukraine: other areas of the country, due to difficulties of transferring energy throughout Ukraine, had to rely on traditional power generation to meet their balancing needs.

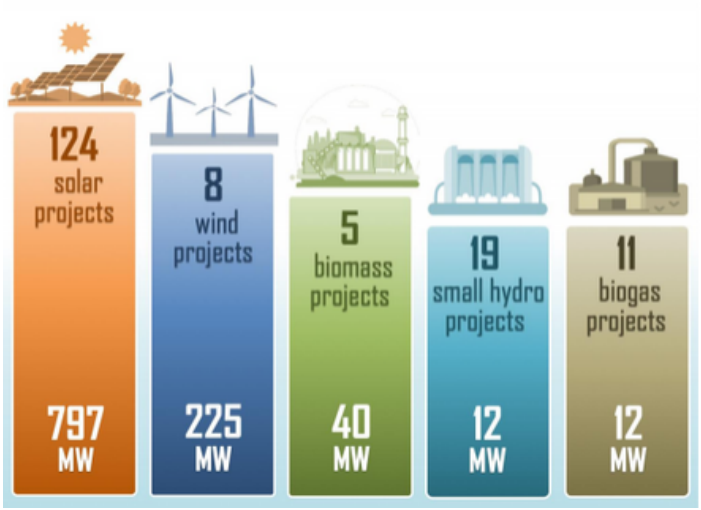
When RES generation is limited, grid operators are forced to rely on coal plants – which are always in constant mode. Finally, when there is an overabundance of generation, there are no energy storage systems (ESS) to rely on, leading to curtailment and related costs. In a nutshell, the RES growth has not been sufficiently coupled with uptake of energy storage to provide balancing services and support the grid.

RES generation in Ukraine

Conventional generation plants still dominate the Ukrainian energy mix. But in 2019 alone, investors committed about 3.7 billion euros to the construction of solar, wind, and biomass power plants in Ukraine, aiming to triple the existing RES capacity.

Currently, the Ukrainian energy mix consists of 55% nuclear energy – inflexible generation that serves as baseload; 25-30% thermal energy; 7% hydropower; and the remaining share is covered by other renewable sources. For wind, solar, and biofuels, there were a total of 2 GW at the beginning of 2018, which grew to 6.5 GW by April 2020. Looking at the currently signed Power Purchase Agreements, the installed RES capacity will easily more than double again to 15 GW in the next few years.

At the moment, there are 167 renewables projects active in Ukraine, among which we can count: 124 solar projects, 8 wind projects, 5 biomass projects, 19 small hydro projects, and 11 biogas projects MW. The total investment for all the aforementioned projects is € 573 million, for a total nominal power of 1086 MW.



Source: Ukrgasbank, 2020.

This rapid growth in RES generation has led to numerous challenges for Ukrenergo, the country's system operator. Consequently, Ukrenergo sees energy storage as a crucial solution for stabilising the system and improving the quality of its services.

The Crucial Role of Energy Storage in Ukraine

A dramatic growth for energy storage in the coming years

In the paper Energy Storage for a Decarbonised Europe by 2050, EASE highlighted how the development and deployment of energy storage technologies should be a central element of Europe's energy transition. In this context, to address the challenges listed in the previous paragraphs, between 2021 and 2023, Ukraine aims to reach a total installed capacity of energy storage of at least 1500 MW. Of this 1500 MW, 100MW (50MWh) will be dedicated to Frequency Control Reserve. Ukrenergo seeks to integrate this capacity as soon as possible, and it should be doubled to 200MW very quickly. In fact, as per ENTSO-E's request to have this capacity desynchronised, Ukrenergo aims to contribute 100MW (1000MW/Hour) to the ENTSO-E shared pool of primary reserve. 500 MW will be dedicated to Frequency Restoration Reserve (FRR). Finally, 800MW (3200MW/Hour) will be needed for peak shifting and the previously mentioned curtailment.

Particular interesting for Ukraine is Power-to-Gas: the country has conducted research on hydrogen since the Soviet Union era. Unfortunately, what is mostly hindering the uptake of hydrogen solutions is the lack of investments. Currently, several EU Member States are looking for partnerships with Ukraine, which has the potential to become a supplier of green hydrogen to the EU. Pipelines connecting to Europe are already present. As highlighted in EASE Power-to-Gas Business Cases paper, electricity-produced hydrogen can be used for transport, for heating, as raw material, to balance electricity demand & supply, and to support the management of the electricity grid.

Investments are paramount to making this happen, but also knowledge-sharing. In this sense, Ukrenergo is co-operating with other European counterparts, such as EASE members. Besides, changes in the regulatory framework are needed to attract investments and to allow system operators to dedicate the appropriate amount of resources to integrate energy storage. Ukrenergo recognises that the energy transition without energy storage is simply not possible.

Energy Storage Regulation in Ukraine

A wide array of legislation to foster the energy transition

As stated above, the Ukrainian government has decided to support the European Green Deal, aligning its legislation to the European Union's regulatory framework as much possible. The Ukrainian Parliament and government have in the pipeline a significant number of legislative proposals that will impact the energy storage sector.

A law on hydrogen and sector integration regulation is under preparation and energy transmission-related regulation is being discussed: energy producers will have the possibility to more easily transfer and distribute energy to other regions of Ukraine. Topics such as Guarantee of Origins and CO2 footprint calculation are also being looked into.

The Ukrainian government is additionally preparing a CO2 tax, in line with envisioned EU Carbon Border Tax. Revenues from this tax will be used for decarbonisation of the energy system, paying particular attention to energy efficiency.

A pivotal change in the regulatory framework

The key piece of legislation that is expected to dramatically foster energy storage in Ukraine is the Project Law №2582 "on Amendments to the Law of Ukraine "On the Electricity Market"". Its focus lies on energy security, balancing of the energy system, and deploying energy storage systems. At the moment, the legislation has yet to be finalised - public hearings and discussions at multiple levels are being held.

This upcoming law considers energy storage crucial for, among others, stabilising the energy system, aligning Ukraine to the EU energy policy framework, creating new sectors for energy and economy, supporting new market players, reducing CO2 emissions, and ensuring strategic energy security.

The law aims to provide a level-playing field for all market players active in energy storage - the same conditions and market access must be ensured. Besides, for the first time, the terms "energy storage technologies", "operator of energy storage" will be defined and integrated into Ukrainian law.

To promote investments and simplify the legislation, energy storage solutions are considered in the same category as renewable energy, with the intention that this will facilitate the approval of projects at the local level. Moreover, this law will allow new players to participate in the market with up to 5 MW of energy storage without a license and additional permissions. A matter often discussed at the European Union level, the law aims to reduce grid fees and tariffs paid by ES entities, trying to avoid double charging and making energy storage systems pay only for the costs they induce to the grid.

In a nutshell, the law is expected to bring significant benefits to, among others, energy storage system operators, including utilities; grid operators at the national and local level; citizens with residential energy storage solutions; and aggregators. The Ukrainian market will dramatically change, with a new market and a more stable system.

At the moment, the Ukrainian system operator has the responsibility to guarantee the quality of the service; but doesn't have the reserves, guarantees, and tools to do so. This means that the objective of balancing power and frequency and re-distributing the capacity in light of a transition towards a more decentralised system, cannot be achieved.

To solve this matter, the law will allow the system operator (Ukrenergo) and distribution operator (Oblenergo) to directly sign contracts for the construction of ES, for own operational needs (without direct business participation in a balancing market). Besides, energy storage systems built following the request of the system operator will obtain additional benefits: if the ESS consists of 20 MW or more, the transmission tariff will be refunded, allowing for more profits for primary balance. As highlighted before, this segment is expected to grow in the next two years to up to 1,500 MW of installed capacity or 200 million euros for the system operator.

The government also plans, as reiterated in a memorandum in May 2020, to regulate the "chaotic" Ukrainian RES generation sector by, a.o introducing fines for imbalances: these inefficiency costs should not fall on end-users. The best solution to avoid such fines, reduce costs, facilitate additional RES deployments, and avoid curtailment is energy storage. The law will allow for a simplified procedure to modernise existing renewable energy generation systems and locally install ES. It will also allow the deployment of stand-alone energy storage systems that will be able to operate in the balancing market. The share of this segment for the next 3-5 years is around 500 million euros.

The law envisions also a key role for energy storage in the commercial and industrial sector. Energy storage reduces costs for large industrial players: owners can install ESS to take electricity from the network at night and consume it during the day. Also, the law simplifies the installation of renewables-plus-storage systems in industrial facilities, promoting self-consumption and making possible to sell surplus energy in a balancing market.

Finally, the law also fosters the creation of a residential energy storage market. Licensing for storage systems up to 5MW will be simplified – there will be significant benefits from an energy efficiency point of view. Such provisions have the potential to empowers customers by giving them the possibility to produce, store, use, and sell their own electricity and be able to contribute to grid stability – as highlighted by EASE papers on unlocking the value of solar + storage at the customer Level.

Conclusions

Ukraine faces several challenges in its pursuit of a more cost-effective and greener energy system. The country is moving from an energy system based on centralised fossil fuel generation that can be dispatched to match energy consumption at all times, to a system with increasing shares of RES generation.

Energy storage is seen by policymakers and energy companies as an enabler of this transition, able to both improve the quality of the services and reduce costs. EASE and UESA fully share this conviction: the two Associations and their members are willing to support Ukrainian policymakers and decision-makers to facilitate the transition to a clean energy system driven by renewables and storage.

In January 2020, Mironovsky Hleboproduct (MHP), Ukraine's largest agricultural holding, announced the construction of Ukraine's first large-scale ESS. And as new regulation will be enshrined into law, the energy storage sector in Ukraine is expected to grow exponentially and present new business opportunities. For the renewable energy and storage sector, this can only be great news.

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About EASE:

The European Association for Storage of Energy (EASE) is the leading member - supported association representing organisations active across the entire energy storage value chain. EASE supports the deployment of energy storage to further the cost-effective transition to a resilient, carbon-neutral, and secure energy system. Together, EASE members have significant expertise across all major storage technologies and applications. This allows us to generate new ideas and policy recommendations that are essential to build a regulatory framework that is supportive of storage.

For more information please visit www.ease-storage.eu

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About UESA

The Ukrainian Energy Storage Association is the first professional organisation of participants in the energy market of Ukraine and representatives of additional industrial markets. The Association strives for the formation of legislative implementation and of a new energy strategy in Ukraine, based on new design energy storage technologies, hydrogen solutions and new energy distribution capabilities. In addition, the Association is also looking for new energy management systems and aggregators.

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