

HONEYWELL ASSISTS DTEK IN DEPLOYING UKRAINE'S FIRST GRID-SCALE BATTERY STORAGE SYSTEM

Case Study

The installation of the energy storage system comes at a crucial time for DTEK and Ukraine as we tackle the challenge of climate change and seek to transform the energy sector by introducing low-carbon energy solutions. Our goal is to become the leading entity in the decarbonization of Eastern Europe.

Maxim Timchenko,
DTEK CEO

Honeywell

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OVERVIEW

Honeywell's Battery Energy Storage System (BESS) solution and Experion Energy Controls platform integrates asset monitoring, distributed energy resource management, and supervisory control and analytics functionality. For energy industry stakeholders like DTEK, it supports the safety and stability of energy grid, ensures the smooth integration of renewable energy, and helps to meet sustainability and decarbonization objectives.

BACKGROUND

Sustainability is a key focus for the power generation and distribution industry, and energy storage is a very important part of it. The demand for energy storage systems is growing exponentially to meet decarbonization and renewable targets globally. An estimated 350GW of grid-related battery storage will come online by 2030.

Front-of-the-Meter (FTM) applications for grid support are driving demand for reliable battery energy storage technology throughout the European Union (EU). Most countries in the region have established carbon net zero objectives. At the same time, there is a critical need to maintain utmost grid stability

Increasingly, the European energy industry is seeking out energy storage options to balance power grids and save surplus energy, help improve energy efficiency, and integrate more renewable energy sources into electricity systems. Other reasons to focus on energy storage include ensuring energy security and setting up an internal market with lower prices for consumers.

CHALLENGES

Around the world, one of the reasons for the heightened interest in energy storage system technology has been the rapid growth of renewables. However, this situation has created several hurdles for industry stakeholders.

The first challenge is that the peak of renewable energy generation does not coincide with the peak of consumption. Thus, at certain periods there is an excess of generated power. Energy storage systems can eliminate the daily imbalance between the generation of renewable energy and the demand for electricity and, thereby, continue to increase the share of renewables in the energy system.

The second challenge is that a sharp increase and decrease of power (in particular, wind power plants) lead to a deterioration in power quality and instantaneous changes in frequency and voltage, and consequently create the need for a fast reserve capacity. Energy storage systems can react to voltage fluctuations and sudden frequency changes much faster than traditional thermal generation. Most importantly, they are carbon neutral.

SOLUTION

Honeywell is a recognized leader in supporting both Front-of-the-Meter (FTM) and Behind-the-Meter (BTM) applications in the renewable energy industry. As a supplier of advanced Battery Energy Storage System (BESS) solutions, Honeywell offers the resources and expertise to help power suppliers in the EU and other regions comply with strict carbon reduction requirements. BESS solutions also play an important part in enabling improved grid stability to meet today's growing global energy demand.

Honeywell recently provided BESS technology to DTEK, Ukraine's largest private-sector energy company, to help develop the country's first grid-scale energy storage system.

DTEK is the leading and biggest private investor in Ukraine's energy sector. DTEK's companies are involved in coal and natural gas extraction; electricity generation from wind, solar, and thermal power plants; energy resources trading in national and international markets; distributing and supplying electricity to consumers; providing energy efficiency services to customers; and developing high-speed charging station networks.



Figure 1: DTEK chose Honeywell to deploy BESS technology at its Zaporizhzhya power plant.

DTEK's use of advanced energy storage technology will be crucial to ensuring the energy security of Ukraine, as well as a new point of development for the country's energy industry. The installation of an energy storage system will enable the integration of renewables into the energy mix and decrease fossil fuel power generation.

Moreover, the system will increase the flexibility of Ukraine's power grid and help pave the way for the country to join Europe's energy community (ENTSO-E) in the future.

Honeywell has executed numerous successful BESS projects that have been behind the meter, but DTEK is one of its first major FTM customers. DTEK is using Honeywell's BESS system to support the stability of the energy grid and provide a wide range of ancillary energy service capabilities.

DTEK chose Honeywell to deploy BESS and supporting technology solutions for a 1MW/2.25MWh lithium-ion energy storage system at the Zaporizhzhya thermal power plant in the city of Energodar, Ukraine. Honeywell was selected for the project based on its advanced technology for the renewable energy industry and recognized track record serving customers in Eastern Europe. Honeywell and DTEK had worked together on previous projects involving the implementation of Distributed Control Systems (DCS) and Supervisory Control and Data Acquisition (SCADA) systems for power generation operations.

In this case, DTEK was seeking proven solutions to support different renewable energy use cases and to help drive revenue streams associated with Frequency Containment Reserves (FCR) and energy arbitrage. This required a bankable and competent technology provider offering both local service and lifetime asset support.

While there are numerous companies supplying battery energy storage systems, Honeywell is unique in its ability to provide robust solutions for controlling these assets. In addition to the BESS equipment, Honeywell provided DTEK with a battery and energy management system, power plant controller, and battery storage scheduler software for the SCADA system. It also customized the algorithm for the BESS system to meet DTEK's specific FTM requirements.

Emanuele Volpe, DTEK Chief Innovation Officer, said, "The future of energy is focused on the transition from a

centralized energy system to one that is decentralized and flexible, with an increasing focus on the provision of energy from multiple sources—including renewables. DTEK is the driving force behind changes that will determine the future of Ukraine's energy sector, and our partnership with Honeywell exemplifies our commitment to leading the way on this national objective."



Figure 2: Honeywell is unique in its ability to provide robust solutions for controlling battery storage system assets.

Despite the challenges posed by the COVID-19 pandemic in project execution, Honeywell assisted DTEK in deploying a utility-scale BESS to provide an ancillary service (FCR) and energy bulk service (arbitrage) solution. The overall scope of supply included a 1MW/2.25MWh BESS, 1043 kW MW power conversion system, Experion energy management system, Balance of Plant (BOP) systems, and Experion SCADA system. Honeywell also provided project engineering, installation supervision and commissioning services.

RESULTS

With this project, DTEK has established itself as a key player in the use of energy storage systems in various segments of Ukraine's energy market, as well as the drive towards decarbonization of Eastern Europe in support of the EU Green Deal.

Honeywell's BESS solution, along with its remote operations systems and Experion Energy Control System, will enable automated and agile operations and help optimize dispatch of energy storage capabilities. The batteries function as operating reserves that constantly work to manage frequency fluctuations on the grid (FCR), charging up during off-peak times, and discharging when energy demand and electricity costs increase (energy arbitrage).

This approach is also beneficial in adding new revenue streams by trading stored energy.

By utilizing BESS technology, DTEK will be able to provide ancillary services to system operator and develop optimal models for participation in various energy markets.



Figure 3: Honeywell's BESS platform, along with remote operations systems and the Experion Energy Control System, enables automated and agile renewable energy operations.

Additionally, within this project with Honeywell, DTEK will develop best practices in the installation and scaling-up of energy storage systems that can be shared with other stakeholders to help create a completely new market segment that supports a more flexible, sustainable, and secure energy sector.

Key to Honeywell's success with DTEK was its technology-agnostic approach, innovative safety features, and future system flexibility—all backed by a strong local presence in Ukraine and extensive global support resources.

CONCLUSION

Around the world, consumers, producers, utilities, and grid operators are facing increasing pressure and expectation to manage energy consumption, reduce electricity costs, and improve sustainability. Due to this situation, there is a critical need to create a bankable business model to manage energy storage assets and help balance the grid as the renewable energy mix increases.

As demonstrated by its work with DTEK, Honeywell's BESS technology opens the door to the future for the power generation, transmission, and distribution sectors.

ABOUT HONEYWELL RENEWABLE ENERGY SOLUTIONS

Honeywell Renewable Energy Solutions help the renewable energy sector produce energy more efficiently, reliably, and economically, while reducing the environmental impact and improving safety and regulatory compliance.

Honeywell delivers contractual guarantees on performance and competency KPIs supported by a reliable data strategy and infrastructure for our customers with distributed assets.

For more information

To learn more about how Honeywell renewable energy solutions can improve performance, visit www.honeywellprocess.com or contact your Honeywell Account Manager.

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