



Poland's first energy storage facility for a bus depot - EKO BESS made by Ekoenergetyka-Polska S.A.

The huge potential of using energy storage as infrastructure to accompany electric vehicle charging stations is already evident today. Ekoenergetyka is responding to the demand in this area and is implementing another product in the area of sustainable EV charging infrastructure.

The dynamic development of fast charging infrastructure and the resulting rapid increase in demand for power and energy is becoming another problem for the electric power industry, after RES. Ekoenergetyka's latest realization - **EKO BATTERY ENERGY STORAGE SYSTEM**, called EKO BESS for short, is the first stationary battery energy storage facility in Poland, designed to operate at the MPK Łomża bus depot. We are pleased that we were able to develop and deliver a system that will allow MPK Łomża to further develop the sustainable transportation solutions implemented by the company.

What technology was used?

Engineers from Ekoenergetyka-Polska's R&D department, in cooperation with BMZ Poland, developed an energy storage system with a maximum capacity of 80.1 kWh. The battery is built from cells made with NMC technology that currently guarantees the highest energy density in commercial battery systems. Such a solution also enables relatively high charging dynamics during periods of excess energy in MPK Łomża's microgrid equipped with a photovoltaic system, as well as discharging energy from the storage during the night period, when the system no longer generates energy.

"The heart" of the device is a proprietary SCADA operator system configured in hardware and software by Ekoenergetyka-Polska engineers to ensure power balancing in MPK Łomża's plant microgrid strictly according to customer requirements. In this respect, it is a "tailor-made" solution, but thanks to the use of a distributed structure (measuring islands and programmable modular controller), it is also a developmental one and ensures, in addition to the high observability of the system, also flexibility in terms of future expansion of the microgrid with further microgrids and charging stations.

The SCADA system developed by Ekoenergetyka's engineers enables visualization of microgrid operation with energy storage, charging stations and energy sources (PV, genset, distribution grid) on both stationary and mobile devices. It records measurement data, alerts and warns. It has three levels of remote access: user, service, developer. Importantly, it has the ability to remotely update software and control algorithms.

The most important parameters of the energy store take into account the technical limitations of the battery used in the system developed by BMZ Poland and are selected to ensure its long-term operation under the assumed operating conditions:

- maximum capacity: 80.1 kWh
- rated voltage: 669 V
- maximum continuous charging current: 116 A
- maximum continuous discharge current: 200 A
- monitoring and protection at cell, module and entire battery level
- continuous monitoring of cell parameters with error logging

The EKO BESS energy storage system has been built in a climate-controlled concrete enclosure and is equipped with an extinguishing device for lithium-ion batteries.

What are the benefits of the EKO BESS energy storage?

The energy storage facility operating in the microgrid of MPK Lomza, in addition to reducing the demand for power on the side of the distribution network, also offers the customer additional benefits, such as the ability to reduce the cost of purchasing increasingly expensive, system-generated electricity thanks to the implemented functionality of increasing the consumption of energy generated in its own sources. It also increases energy security in this microgrid, as it can provide a source of backup power.

From the point of view of the distribution system operator, energy storage facilities such as EKO BESS, working with charging infrastructure and photovoltaics, can help solve the problems facing the power industry today, related to the rapid development of decarbonization technologies such as renewable energy sources and electromobility. In this regard, energy storage can become a good solution to temporary deficits in connection and operating capacity in the power system.

The solution developed by Ekoenergetyka-Polska also offers the **Municipal Transport Company in Łomża** additional functionality in the form of remote access to the company's microgrid monitoring system, which allows continuous monitoring of the state of equipment and power distribution in the microgrid, as well as remote service access and acquisition of e-mail information on the status of energy storage operation.

With its ability to store energy for long periods of time, bi-directional energy flow and the ability to smoothly regulate power in both directions, stationary, battery-based energy storage has unique properties that can find application in modern power generation.

In the case of modern electric vehicle charging infrastructure offered by Ekoenergetyka-Polska, stationary energy storage complements smart technologies such as power gatekeepers and dynamic power pooling/sharing systems, currently implemented in multi-output, ultra-high-speed charging stations and responding to temporary deficits in connection and operating capacity in the power system.

Potential uses of energy storage in electromobility - cooperation with electric vehicle charging infrastructure

BUS DEPOTS (reducing operating and fixed costs)

- balancing power and energy in multi-source systems with renewable energy sources
- control of energy distribution inside the plant microgrid and in the connection to the distribution grid
- reduction of the required connection power on the distribution grid side

- temporary power reduction on the distribution grid side - reduction on demand
- backup power supply of critical circuits in case of distribution grid failure

TRANSIT FAST CHARGING STATIONS AND HUBS (reduction of fixed costs)

o reduction of the required connection power on the distribution network side without reducing the charging power of ultra-fast charging stations

- temporary power reduction on the distribution grid side - reduction on demand
- power and energy balancing in multi-source charging hub power systems supported by renewable energy sources
- backup power supply in case of distribution grid failure

Energy storage will soon revolutionize the market, and experts predict that 2023 will be a record year for energy storage investments among prosumers.