

Grid Reliability & Stability for PJM Regional Transmission Beckjord II

CASE STUDY



Ohio site says: hello storage, goodbye coal!

The retirement of a coal power plant in New Richmond, Ohio, USA, created a unique opportunity for Duke Energy in 2015. By placing a storage system at the retired coal plant, Duke is able to leverage the available transmission capacity at the site while providing ancillary services in PJM's (Pennsylvania-New Jersey-Maryland) frequency regulation market — generating a new revenue stream.

“Energy storage is becoming increasingly important to help strengthen the reliability and flexibility of the grid and integrate more renewable power onto the system. We are pleased to have partnered with Wärtsilä to support our Ohio Beckjord project, an innovative storage solution that provides tangible benefits to the grid operator and local customers.”

Phillip Grigsby, Senior Vice President for Commercial Transmission at Duke Energy

HIGH PERFORMANCE FOR GRID SERVICES

After 62 years of commercial operations on the Ohio River, aging infrastructure had rendered the final operating units of Duke Energy's W. C. Beckjord power plant economically obsolete. During a multi-year decommissioning process, Duke Energy continued to operate a transmission substation on the property. The solution: divert resources to energy storage, using Beckjord's strategic location to enter the PJM ancillary service market with a fast-response system regulating grid frequency.

Duke Energy and Wärtsilä announced a 2 MW storage system in May 2015. This project, known as Beckjord II, commenced construction in August and passed PJM's rigorous frequency response test on the first try, entering service immediately in November of the same year. Rapid deployment enabled Duke to start generating revenue quickly. The system continues to achieve a high performance score from PJM, close to 96 percent, a result that also translates into higher revenues.

FAST-RESPONSE SYSTEM ACTIVELY REGULATES ELECTRIC GRID FREQUENCY IN THE AREA

Wärtsilä provided end-to-end service for the Beckjord II project, including the design and configuration of the entire energy storage system, integration of the balance-of-plant components, and site commissioning. For this use case, Duke Energy acquired advanced lithium-ion batteries from LG Chem and inverters from Parker Hannifin. Wärtsilä's GEMS energy management platform delivers precise and synchronised response to PJM signals dispatched every two seconds while simultaneously minimising battery degradation.

This system delivers power in seconds, as opposed to a traditional power plant that could take up to ten minutes or more to ramp up.

CUSTOMER: Duke Energy

SITE SIZE: 2 MW / 800 kWh

SITE LOCATION:
New Richmond, Ohio, USA

APPLICATION:
Frequency regulation in PJM

SCOPE OF SERVICES: Turnkey (design, installation, integration, commissioning)

DELIVERY: 2015

Specifically, the combined energy storage and software management solution enables the high performance of grid services for Duke customers, ultimately driving revenue streams for the utility and increased grid reliability and services for the PJM transmission network.

THE CHALLENGE	WÄRTSILÄ'S SOLUTION	BENEFITS
Revamp the traditional energy operations of a retired coal plant to provide ancillary services to be competitive in the PJM market	Rapidly deployed solution including the advanced GEMS platform to manage the frequency regulation and optimise performance of the entire system	Fast-responding energy that optimises the available transmission capacity and revenue streams for the customer

