

Marengo Frequency Control

Chicago, IL, USA - 2018



EESS within a building to participate in
the frequency regulation market for PJM

The Challenges



A critical value-add of battery energy storage technology is its ability to assist system operators to regulate the frequency of the power grid. Frequency regulation is critically important, keeping the demand vs. supply balance of the grid within safe operating boundaries. Historically, frequency regulation has been primarily accomplished by ramping up/down generation assets. However, this ramping process can take minutes, and often results in the inefficient use of those assets. By comparison, battery energy storage systems are capable of providing fast-response frequency regulation in milliseconds.

Among global frequency regulation markets, PJM is widely considered to be the most sophisticated and the most demanding. PJM generates two automated signals that frequency regulation resources such as battery energy storage can follow. The Regulation D signal (RegD) is a fast, dynamic signal that requires an almost instantaneous response, while the Regulation A signal is slower and is meant to recover larger, longer fluctuations in system conditions.

- PJM is one of the largest independent system operators (ISO) in the world, with over 178,000 MW of generating capacity on its system in the northeastern U.S.
- PJM manages over 84,000 miles of transmission lines across 13 states and serves 65 million customers.
- PJM's frequency regulation market is a critical component to maintaining grid stability throughout the region.

The Solution

In Marengo, Illinois, just outside of Chicago, Leclanché has completed a **20 MW / 20 MWh** battery energy storage system to provide RegD Frequency Regulation for the PJM Ancillary Service Market.

The Marengo Project, which was commissioned in Q4 2018 and is owned by Swiss energy storage investor, SGEM, was built under a Leclanché turnkey EPC contract. The Leclanché solution is a fully-containerized, integrated system, including all inverters, transformers, and switchgear. The solution also includes the EMS and control systems required to meet the rigorous demands of the PJM RegD signal while simultaneously optimizing both revenue and battery health over the expected 10-year life of the project.



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