

Lodestone Energy Uses Emerson's Ovation™ Automation Platform to Help Ensure Safety and Reliability of New Zealand's First Large-Scale Photovoltaic Solar Project

RESULTS

- Front-end engineering and design optimize schedule and reduce costs
- Integrated, scalable solution provides the ability for the solar farms to autonomously respond and react to System Operator dispatches
- Advanced, comprehensive automation helps minimize the impact of variability and intermittency
- Full data access and increased operational visibility improve situational awareness and predictive decision-making
- Data aggregation from multiple systems supports compliance with New Zealand's energy participation code



APPLICATION

A large-scale multi-site photovoltaic solar project focusing on commissioned Kohirā and Rangitaiki solar farms that generate more than 100GWh/year—capable of powering 15,000 homes.

CHALLENGE

New Zealand's Climate Change Response (Zero Carbon) Amendment Act of 2019 set a target for net zero greenhouse gas emissions by 2050 which is an ambitious endeavor requiring many renewable power generation sources to be safely and rapidly brought online.

In response, Lodestone Energy is harnessing the sun's energy to help power New Zealand's future by constructing a nationwide portfolio of utility-scale solar farms. The certified renewable energy generated by these farms, feeds into the power grid and supports a range of commercial and industrial customers looking to actively reduce their carbon footprint. Lodestone's first two farms commissioned in early 2024 are capable of powering over 15,000 homes. It has two additional farms under construction that are due for completion in 2025 along with eight more sites in the planning phase.

Lodestone required smart, integrated automation solutions to help control, monitor and manage each solar farm individually. Connectivity to multiple third-party systems was paramount for collecting and aggregating operational data across all sites to meet regulatory requirements.

"To help meet New Zealand's net zero goals, we adopted the best technology innovations that play a key role in smarter solar operations, including the Ovation Automation Platform."

Emerson's expertise in automation software enabled Lodestone to deliver world-class solar farms that autonomously interact with the NZ electricity market, ensuring efficient operation over the lifecycle of our solar assets."

Peter Apperley
General Manager Engineering
Lodestone Energy

SOLUTION

Solar PV has become one of the fastest-growing renewable energy sources. However, efficiently generating and delivering solar PV power requires precise orchestration, integrating a wide variety of third-party systems with automation and control technology to provide operators with intuitive functionality and comprehensive visibility.

Emerson provided Ovation™ automation technology to support Lodestone Energy's first two utility-scale solar farm projects—Kohirā in Kaitaia and Rangitaiki in Edgcumbe. These two solar farms, commissioned in 2024, are part of Phase 1 of Lodestone's capital program plan to develop five grid-scale solar farms producing 320 GWh of energy per annum by 2025. These farms represent New Zealand's first large-scale photovoltaic solar projects—part of a national effort to decarbonize the country's energy sector and achieve carbon neutrality by 2050.

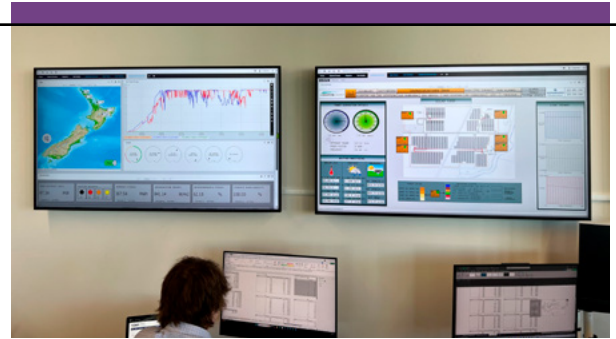
As part of this project, Emerson assisted with an Automation FEED (Front-End Engineering Design) study for the greenfield sites that clearly defined the automation technology architecture resulting in an optimized schedule and reduced costs.

The Ovation solar automation platform combines powerful control software and technologies with enterprise data solutions, creating an integrated, scalable control solution to maximize output and profitability while contributing to grid stability.

Ovation automation technologies provide comprehensive control to minimize the impact of variability and intermittency in solar PV power generation. The same technologies also make it easier for operators to respond to grid frequency events quickly. Ovation enterprise data solutions provide secure monitoring of solar PV operations from the control room or mobile devices, measuring, monitoring and reporting key performance indicators to increase visibility of plant operations.

Lodestone's solar PV project requires multiple interfaces to third-party systems, including inverters, high-voltage switchboards, weather stations, site security systems and grid authority remote terminal units. The Ovation system acts as a process orchestration tool to seamlessly connect these devices to provide fast and intuitive visibility for operators. In addition to providing flexibility and visibility of operations, Emerson's Ovation platform is ideally suited to support compliance with New Zealand's Electricity Industry Participation Code.

Lodestone's next two projects, due to be commissioned in 2025, including Te Herenga o te Rā in Waiotaha and Pāmu Rā ki Whitianga, will also use the Ovation automation platform. When completed, aggregated operational data from all sites will be sent to Lodestone's Auckland office for monitoring, forecasting and ensuring compliance with the country's NZ Grid Connection (Transpower) and Electricity Authority Regulations.



Lodestone's Takapuna Operations Center uses Ovation enterprise data solution site and system graphics to monitor solar farm operations.



Lodestone is the first first company in Aotearoa to adopt agri-voltaic technology that allows livestock to graze around the solar arrays.