INTEGRATED RESOURCE PLANNING (IRP) STUDY

CLIENT: Green Mountain Power

LOCATION: Vermont

PROJECT DETAILS

The Integrated Resource Plan (IRP) Transmission and Distribution (T&D) Studies project was an IRP System Study performed by RLC Engineering, PLLC per the request of Green Mountain Power. The client requested a service territory-wide IRP to identify substations that possessed additional Hosting Capacity to allow them to meet Distributed Energy Resource (DER) renewable energy goals without causing additional reliability violations on their transmission or subtransmission systems. Such interconnected DER systems included photovoltaic (PV), hydroelectric, energy storage, and wind generation technologies.

The IRP study included both transmission and distribution voltages with the study specifically including a 10-year transmission DER/Load Forecast Study, Hosting Capacity Analysis, Distribution Time Series Analysis, and a Production Cost Analysis. Steady State thermal and voltage analyses were performed.

RLC employed an innovative, multi-step approach that went beyond traditional Hosting Capacity assessments—incorporating regional and system-wide constraints using advanced power system tools like TARA's Transfer Limit Analysis and Security Constrained Re-Dispatch (SCRD). This methodology provided the client with a more comprehensive understanding of how DERs could be reliably integrated across the state.

SCOPE OF SERVICES

- Performed Power flow case development of the client's transmission system incorporating load and DER forecasts.
- Performed transmission Steady State voltage, thermal, and Hosting Capacity analyses.
- Identified potential energy storage siting opportunities.
- Developed distribution feeder load and DER time series profiles for ten (10) representative substations based on forecasted and worst case growth assumptions.
- Performed a distribution Time Series Analysis over a period of 10 years.
- Conducted an evaluation of energy performance and curtailment of DER projects for Hosting Capacity improvement purposes.
- Produced guidelines for mitigation of distribution Hosting Capacity limitations for the client based on the Time Series Analysis.
- Performed production cost modeling case development of the client's transmission system including load and DER forecasts.