



# Sargent & Lundy

## Analytical Services for Renewable Resources

### AREAS OF EXPERTISE

Wind and Solar Energy Power Plants  
 Battery Energy Storage  
 Interconnection Studies  
 Collector System Design Studies  
 Model Development  
 Protective Relaying  
 Economic Analysis

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Sargent & Lundy's renewable energy and battery energy storage analytic consulting services are available to support you in all phases of the development of your projects, from preliminary feasibility studies to the detailed-design stage. Our experience includes engineering analyses for wind farms, solar photovoltaic (PV) plants, and battery energy storage projects. Our services include:

### Interconnection Studies

- Grid load-flow/contingency analysis
- Grid short-circuit analysis
- Grid stability analysis
- Subsynchronous control interaction (SSCI) analysis of wind turbines interconnecting near series-compensated lines
- Model development for submission to Independent System Operators (ISOs) and transmission owners: PSS/E, ASPEN, PSLF, PSCAD, EMTP-RV

### Economic Analysis

- Determine the most economically advantageous location in terms of future payoff, based on locational marginal prices
- Constraint risk assessment
- Provide insight into market procedures specific to individual ISOs
- Utilize security-constrained economic dispatch modeling software for market studies and grid congestion assessments

### Detailed Design Studies

- Reactive power compensation analysis in compliance with Federal Energy Regulatory Commission (FERC) Order No. 827
- Harmonic analysis and filter bank sizing
- Short-circuit analysis
- Collector system cable ampacity analysis
- Insulation coordination and transient analysis
- Safety grounding analysis
- Protection coordination analysis and relay settings development
- AC and DC arc-flash analysis

