



2024 Future Grid Workshop #1 -Identifying Operational Needs

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ISO perspective of a grid with high amounts of DER

The ISO must consider how to maintain reliable operation of the transmission grid under various high DER use cases:

- DERs controlled and managed under intelligent power control systems responding to grid signals such as dynamic retail rates which are 'grid informed' or to meet customer needs.
- DERs aggregated into virtual power plants which can participate directly in ISO markets or be dispatched based on distribution system needs.
- DERs expected to be inflexible and somewhat immune to external signals.

Each of these DER scenarios will impact the grid in different ways

System operators must work together to maintain a reliable grid as DER deployment continues to accelerate.

Areas needing advancement and continued collaboration include:

- Visibility and Situational Awareness
- Reliability Coordination
- Communications and Data Sharing

Visibility

- Coordinated visibility of specific DER information to understand and anticipate their impacts on grid operations.
 - technology type, location, size, operational behavior and performance.
 - at various granularities (aggregated and/or device level)

What's needed:

Enhanced data collection, access, and reporting

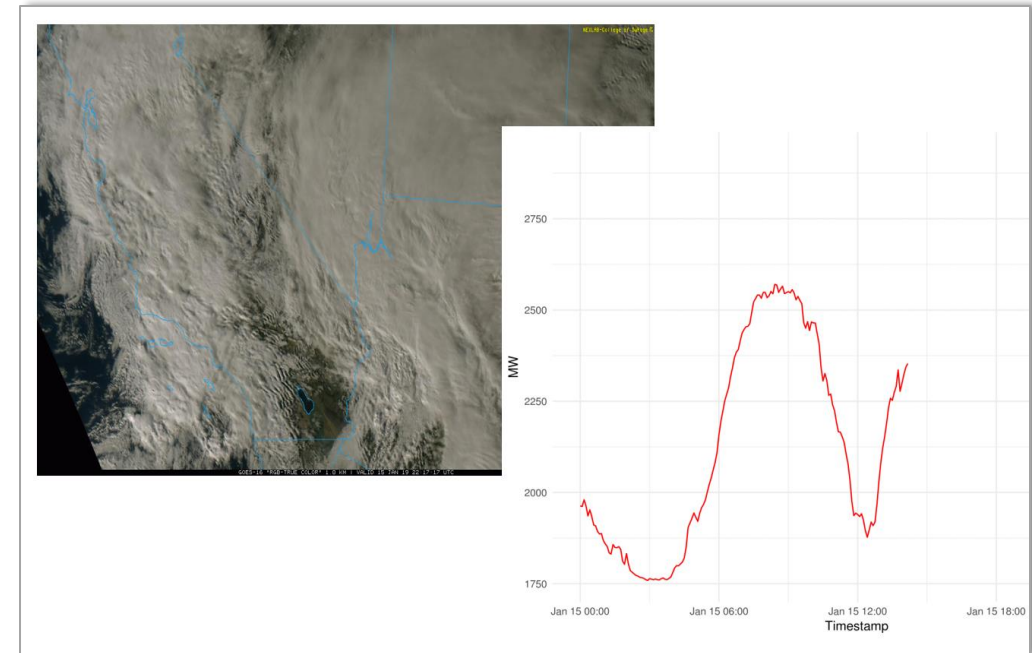
1. For planning and forecasting processes to improve grid asset utilization;
2. short term load forecasting accuracy; and
3. ISO market optimization and dispatch.

Need data for operational forecasting
Need data to understand DER response

Situational awareness of both market participating and non-participating DERs is critical for CAISO operations

- Behind-the-meter solar has been the most impactful DER for CAISO operations thus far.

- rapidly moving demand actuals when DER generation drops off due to cloud coverage (~725 MW example)



- Understanding the impact of all types of DERs under various uses is critical to situational awareness and reliability.
 - expect transportation electrification to present greater complexity

Reliability Coordination

- The ISO does not model the distribution system.
- The ISO cannot ensure that a resource dispatched through a wholesale market award or controlled through ISO EMS telemetry is safe or feasible to the distribution system.
- Additionally, the ISO must be able to anticipate how operation of non-market participating DERs may impact the transmission system.

What's needed:

A framework to coordinate operation of DER resources when they are providing services to the distribution system or to the bulk electric system to ensure the feasibility of those services and preserve reliability.

Communication and information sharing

- Reliability or feasibility checks must be performed and communicated in the day-ahead and real-time timeframes leading up to the provision of services to the grid between the grid operators and the entities representing the DERs including aggregators and Scheduling Coordinators.

What's needed:

A communications platform and information sharing framework used to advise appropriate entities, in the appropriate timeframe, the status and feasibility of DER activity in relation to grid operations and reliability.

to cover the uncertainty of what grid will need to respond to from the DER scenarios.

Summary of areas needing advancement and continued collaboration to prepare for a high DER future

- Forecasting DERs' load modifying affects on actual load consumption in the operational time-frame.
- Predicting the short term load forecast conditions so that sufficient capacity is committed at least cost for reliable operation of the grid.
- DER impacts on long-term load forecasts that inform infrastructure planning decisions.
- Current limitations in the coordination and communication between operators of the transmission and distribution systems.
- Lack of understanding of what additional communications will be needed and availability of robust communication framework to facilitate these communications.