Resource Adequacy: Example and perspective from a multi-state RTO

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The magnitude and pace of system change presents both opportunity and challenges for multistate planning and coordination.

The distribution and mix of renewables in the queue varies greatly by state.

MISO (GW)
- Wind: 33
- Solar: 214
- Storage: 75

PJM (GW)
- Wind: 11
- Solar: 47
- Storage: 73

SPP (GW)
- Wind: 36
- Solar: 214
- Storage: 18

2TW of capacity nationally. A historical 15% success rate still represents a monumental shift.

A once fairly homogenous system may look very different in the next decade.

75% of U.S. customers are served by a utility with a 100% carbon-reduction target.

13 States have either a 100% renewable/clean energy target or net zero requirements.

Interconnection Queues by Region

Interconnection Queues by State

Utility carbon reduction targets

1Lawrence Berkeley National Laboratory: Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection
2Smart Electric Power Alliance: Utility Carbon Reduction Tracker
In a rapidly changing world, multiple entities with a shared responsibility for reliability, have different roles and perspectives; we need stronger coordination

ISO/RTO
- For a rapidly changing world, need to send the right reliability and economic signals (short and long term)
- Resource investment decisions are being made now that operators will have to live with for years
- Limited visibility into individual utility plans
- Increasing concern not just about the capacity but the type and location
- Increasingly need to understand neighbors’ plans
- States have ultimate authority on resource adequacy; there is, however, the possibility for conflict with ISO/RTO processes, policies/market

Utilities:
- Meet ISO requirements, state regulations, and stakeholders’ objectives
- Balance both regional short-term RA requirements and long-term planning
- Different business models and pursuing different long-term strategies
- Increasingly need to understand neighbors’ and regions’ plans
- Changes in both supply and demand side technology: growth, features, and costs
- Have different levels of resources, data, and tools to do the increasingly complex analysis

With the speed and scope of change, are we speaking the same language?
An example: 4 entities looking at the same solar accreditation data but using it differently, with big implications for resource planning and adequacy

- 3 large utilities use data from an ISO-published\(^1\) chart in their IRPs differently

<table>
<thead>
<tr>
<th>Solar in IRP</th>
<th>Accreditation Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility 1 (6 GW system)</td>
<td>8 GW, 50% held constant, annual</td>
</tr>
<tr>
<td>Utility 2 (11 GW system)</td>
<td>6 GW, Disagrees with ISO value, hires consultant. Declining ELCC based on utility footprint only, 47% to 8%.</td>
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<tr>
<td>Utility 3 (11 GW system)</td>
<td>9 GW, Declines from 50% to a minimum of 30%</td>
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- ISO long-term assessment of all the member goals/IRPs combined shows
  - Solar ELCC dropping to 8% - 33%, for different seasons
  - Risk of [accredited] capacity shortfall in the next 5 years
  - Utility-specified units represent only 40% of the capacity needed to meet utility-announced goals

- Chicken and egg: what forward-looking RA assessments should the ISO do, and what utility assumptions (of the several dozen options) should be used

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\(^1\) Curves reflect a system with similarly changing wind capacity, but no storage

1MISO Renewable Integration Impact Assessment, and adapted for MISO MTEP
This is complicated and moving fast. We need better coordination and better collective understanding.
THANK YOU

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