The Western Flexibility Assessment and Implications for New Mexico

New Mexico Grid Modernization Retreat
December 12, 2019
RPS and Clean Energy Policies for Western States:
Existing, Recently Enacted, and Conceptual Policies

Clean/Renewable Penetration Requirements in Baseline Case

**Key**
- Existing policy
- Recently enacted policy
- Conceptual policy

**Year**
- 2020
- 2026
- 2035

Assumed coordinated cap-and-trade in 2026

**Clean Energy Target Based on Assumed Policies**
- 2026: 33%
- 2035: 64%
What does “flexibility” mean in the context of the Western Flexibility Assessment?

Given the changing resource mix and new state energy policies...

- What resources do we need?
- What operational challenges do we face?
- Flexibility Assessment
- How effective are integration solutions?
- When will they occur?
- How are transmission flows impacted?
Baseline Case represents “default” amount of system flexibility

• **Renewable resources** are deployed to meet modeled state clean energy policy requirements

• **Regionalization** of energy markets occurs (i.e. no transmission service charges between BAAs)

• **Load growth** occurs consistent with recent regional and balancing area forecasts – 165 GW by 2035

• Assumed near-term integrated resource portfolios (IRPs) resources are constructed, then capacity expansion modeling (AURORA™) added resources for remainder of study period

• Announced and assumed **coal retirements** total 7 GW by 2026

• Assumes a small set of “near-term” transmission projects with a direct path to cost recovery are built

• **8.3 million new electric vehicles** (EVs) are deployed by 2035 (3.7 GWa of added load)
Scenarios consider flexibility levels higher and lower than the Baseline Case.

**Baseline**
- Default level of system flexibility

**Integration Strategies**
- Increases system flexibility

**Limited Regional Coordination**
- Decreases system flexibility

Added to Baseline:
- Regional Coordination

Removed from Baseline:
- Regional Coordination
Summary of Key Study Metrics

- Baseline Case
- Integration Strategies
- Limited Regional Coordination

Policy target met
Policy target not met

Curtailments (%)

Study Year

- 2020
- 2025
- 2030
- 2035
- 2040

Annual production cost via bubble size and $2019 value in billions

Flexibility “gains” through regional coordination

Flexibility “gains” from other strategies: transmission, storage, load management, diversity, etc.
In the 2020’s, interregional exchange is viable and a common flexibility strategy, however...
...a lack of buyers for excess renewable power is partially to blame for the flexibility challenges apparent in the 2030s.
Transmission “shortages” increase into the 2030s and significant build-outs may be required.

Circle size indicates interconnected renewable capacity.

Integration Strategies scenario included substantive transmission builds in California, Colorado, New Mexico, Wyoming/Utah, and Montana, with minor upgrades in the rest of the NW region.

Localized curtailments are caused by a lack of transmission.
Study Findings and Potential Implications for New Mexico

**Study Finding**

- West can achieve near-term (2020’s) policy targets. But over time policy targets become more difficult to achieve and more system flexibility is needed.
- An all-of-the-above approach to system flexibility is likely needed to hit policy targets (64% by 2035). If no action is taken, the West may lack sufficient grid flexibility to achieve state energy goals.
- Economic transfers are one of the most effective tools for increasing system flexibility. Exporting and importing excess power saves $$$ on both sides of the transaction.

**New Mexico Implication**

- NM’s 2020 goals may be met with status quo system and plans, but 2030 targets will require additional actions.
- Start planning for regionalization, storage, diverse resources, and enhanced customer engagement now to meet aggressive long-term goals.
- Consider how much you can rely on your neighbors for economic interchange when making investment decisions, and consider market and transmission options that make this possible.

Note of caution: This strategy, alone, fails in the long run!
### Study findings and implications for New Mexico (continued)

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<tr>
<th>Study Finding</th>
<th>New Mexico Implication</th>
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<td>Coordinated wholesale markets are effective at increasing system flexibility across the West and lead to operational cost savings and reduced emissions (both between 9-13% reductions).</td>
<td>While not technically required in the near-term, results indicate that might be difficult to efficiently achieve west-wide policy targets without enhanced market coordination.</td>
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<td>Significant work must be undertaken to build out renewables (9 GW per year) to meet West-wide policy objectives.</td>
<td>New Mexico wind resources will continue to be a sought after resource across the West, given demand for renewable volume and diversity.</td>
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<td>In the 2030s, the need for transmission becomes more obvious and resources face material grid constraints.</td>
<td>Consider local needs for infrastructure, including transmission, storage, and other assets that add flexibility to the system.</td>
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