

Regional Characterization of Colorado for Energy Storage

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Evaluation of Storage by Xcel for CO

- PSCo (*Xcel*) Evaluation of Energy Storage before the COPUC
 - Cites a lack of wind curtailment exposure to be corrected
 - Cites a lack of value from arbitrage opportunities
 - Cites a lack of potential value to provide Ancillary Services
 - Argues that increased natural gas prices could increase the value for storage
 - Storage is “strategic”
 - Xcel has a number of storage demonstration projects in its portfolio

The COPUC Viewpoint

- Colorado Public Utilities Commission:
 - “While the threat of climate change will likely mean serious economic consequences for continued carbon emissions, the problem also presents **an opportunity for states like Colorado with vast solar, wind, and geothermal resources to develop and export power to areas with fewer renewable resource options. We recognize that there are a number of issues, including transmission, energy storage, and integration of intermittent resources that must be overcome**; on the other hand, it is imperative that we enact policies that allow Colorado to realize its future as a leader in renewable resources.” Exhibit 60 at p. 8, ¶ 13 (emphasis added).

The COPUC Viewpoint

- Energy Storage Demonstration Projects in Colorado
 - Solar PV Energy Storage Battery
 - 1.5 MW, 1MWh PSCo solar integration demonstration
 - “Solar to Battery” project- ICT (Innovative Clean Technology Program)
 - Solar integration at the residential level: PV smoothing and voltage and frequency support with 25 kW ES
- Projects include deferred accounting for rate base

Energy Storage Deployment for A/S

- For Energy Storage to provide A/S:
 - PSCo must evaluate and submit to COPUC Energy Storage Projects for consideration and rate base
 - Must see a financial benefit from utilizing energy storage:
 - Lower generation costs or ability to sell generation to nearby regions
 - Difficulty in evaluating and proving multiple benefits
 - Must prove cost-effectiveness of energy storage benefit-cost analysis comparing to alternatives
 - COPUC may consider deployment incentivization for Energy Storage