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The Moonshot 100% clean electricity study:
Assessing the tradeoffs among clean portfolios with a PNM case study

Berkeley, CA. - Several states across the western United States, including New Mexico, have set 100% clean electricity targets but very few have conducted rigorous analysis to understand how these targets can be met. GridLab has released a new report, *The Moonshot 100% clean electricity study: Assessing the tradeoffs among clean portfolios with a PNM case study*. A collaboration between GridLab and a consortium of experts that includes Blue Marble Analytics, Energy Futures Group, Evolved Energy Research, Moment Energy Insights, Telos Energy and the University of California San Diego, the study analyzed multiple paths for reaching 100% clean electricity using the Public Service Company of New Mexico (PNM) as a case study. The analysis leveraged state-of-the-art commercial, academic and open-source utility planning software tools, and had a distinct focus on reliability.

The study highlights eight key findings that discuss the importance of both mature and emerging clean energy technologies, regional coordination, electrification demand growth and load flexibility, land and water use impacts, and how reliability risks will evolve in the future. A primary finding of the study is that while there are multiple economic and reliable paths towards achieving 100% clean electricity, a critical step to ensure reliability in the future is to accelerate the deployment of solar, wind and battery resources. “While we can’t say with certainty what the last mile of clean electricity will be, a least regrets strategy towards a future 100% clean power system is to deploy vast amounts of solar, wind and battery storage; and with IRA tax credits, these resources are on sale” said Priya Sreedharan, Program Director of GridLab.

The findings emphasize the benefits of regional coordination and planning, such as through a regional market, towards supporting a reliable decarbonized power system. Joining a regional market would allow PNM to benefit from geographic diversity in wind, solar, and demand—and mitigate periods of low renewable output and high peak demand, including higher winter demand due to electrification. “The nature of reliability risk will change, especially with more electrification and renewables, transforming PNM into a dual-peaking system where winter reliability risk will rival the summer. Leveraging resources across a wider footprint and sharing resources across the west can help mitigate this future risk” notes Derek Stenclik, Co-founder of Telos Energy. A regional market can increase access to low-cost renewables across the region, and open opportunities for merchant wind and solar development in the region.

The study finds that emerging technologies—hydrogen generation, multi-day storage, and geothermal resources—can support reliability during low renewable production and extended peak demand periods. The optimal mix of these resources is subject to change as these technologies mature, and costs and performance become more certain. As the study notes, the exact quantities needed will vary based on other decisions made—similar reliability benefits can arise through regional coordination and upsizing of wind, solar, and storage resources, especially if capacity expansion decisions are coordinated across the region. The study shows that water and land use requirements will likely be manageable; however, it will be important for policy makers to address issues like resource siting, community acceptance, and workforce development.

GridLab is a nonprofit organization with a mission to provide expert capacity and thought leadership to address technical challenges and reliability questions in the implementation of clean energy policies.

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