



## PNM Uses Real-Time, Transmission DERMS to Decarbonize Generation Portfolio

**“We selected the AspenTech OSI DERMS advanced optimization technology to manage large renewable and battery resources and ensure reliable and safe transmission network management while enabling participation in the California ISO market.”**

**– Cesar Miron, Manager of Operations and Engineering, PNM**

## **CHALLENGE**

- Accelerate transition to renewable generation
- Optimize dispatch of new solar-plus-energy storage units
- Enable participation in California ISO Energy Imbalance Market (EIM)
- Utilize storage to provide reserves power and avoid frequency violations

## **SOLUTION**

AspenTech OSI Distributed Energy Resource Management (DERMS)<sup>™</sup>

## **VALUE CREATED**

- Real-time energy storage management based on forecasts and solar generation data
- Optimized energy storage charging and dispatch into the California ISO Energy Imbalance Market (EIM)
- Monitoring and adjustment of charging based on balancing area ACE
- Gained valuable DERMS expertise for future expansion of solar and energy storage assets



## Overview

During a time of great change, Public Service Company of New Mexico (PNM) remains the state's largest electricity provider, serving more than 530K New Mexico residential and business customers. In 2019, New Mexico passed the Energy Transition Act, which mandates PNM and other utilities generate 100% carbon-free electricity by 2045. The legislation includes milestones designed to ensure that utilities are making steady decarbonization progress. For example, 40% of the electricity investor-owned utilities like PNM produce in 2025 must come from carbon-free sources.

PNM has moved aggressively to decarbonize its generation assets. For example, PNM has invested about \$270M USD to deploy over one million solar panels in 23 solar plants able to power 60,000 homes. The utility's solar, wind and geothermal resources currently produce enough carbon-free electricity to power nearly 175,000 New Mexico homes. Carbon dioxide emissions at PNM-owned facilities fell by over 32% between 2005 and 2022.



# Transitioning from a Traditional Generation Portfolio

Though PNM has made impressive strides towards its decarbonization goals, the utility must still navigate a significant transformation of its traditional generation portfolio. By 2031, for example, PNM will no longer operate any coal power plants.

Shifting from coal to intermittent renewable generation requires PNM to adopt innovative new tools to maintain grid reliability and maximize the benefits of new resources, such as its recent adoption of distributed energy resource management system, or DERMS.

DERMS have traditionally been used to manage and optimize large numbers of distributed energy resources (DERs), like rooftop solar, connected to the distribution grid. PNM's use of AspenTech OSI DERMS is novel because the utility is using it to monitor and control two large solar-plus-energy storage systems connected to the high-voltage transmission grid. One of the energy storage systems is 150 megawatts and the other is 20 megawatts.

## AspenTech OSI DERMS Helps PNM Manage Complexity

PNM chose AspenTech OSI DERMS because the solution provided the type of control over new renewable generation assets that it was accustomed to with traditional coal and gas plants. It also helps the utility operate its solar-plus-storage units to achieve multiple, complex objectives.

To qualify for tax credits, for example, the energy storage units initially had to be charged using only solar power (the batteries can now also be charged using grid power). PNM also wanted the storage systems to be available to respond to frequency violations, also known as ACE events, that threaten grid stability. Additionally, PNM sought to participate in the California Independent System Operator's (ISO) Energy Imbalance Market (EIM). Finally, PNM wanted to leverage AspenTech OSI DERMS to manage the storage units to provide emergency reserve power in case a large power plant unexpectedly went offline.



# How Sophisticated Forecasting and Storage Management Optimize Market Participation

The Federal Energy Regulatory Commission (FERC) requires separation between utility market and grid operations. To allow PNM to participate in the EIM, a DERMS must reliably execute day-ahead bids developed by PNM's market operations team. Failure to do so can create financial implications for non-compliance.

Adhering to the EIM bid schedule depends on maintaining sufficient battery state-of-charge to dispatch promised electricity. AspenTech OSI DERMS manages the battery charge and scheduled dispatch based on forecasts of solar generation, which can fluctuate significantly on cloudy days and hours. It is also responsible for curtailing the dispatch of the battery if the forecasted solar generation is not enough to reach the state-of-charge necessary to meet PNM's bid obligations.

While it's important for PNM to avoid potential financial implications for not delivering on its market bids, AspenTech OSI DERMS also enables the utility to earn additional revenue when prices rise in the California ISO market. That's because the solution continuously monitors locational marginal price data provided by California ISO. By monitoring price fluctuations, it can curtail charging to dispatch electricity when prices are high while still ensuring that PNM maintains an adequate battery state-of-charge to deliver on its existing market obligations.





1 0 1 0 1  
1 0 1 0 1  
0 1 0 1

**“We were interested in the specific battery management capabilities of AspenTech OSI DERMS.**

**Because we wanted the batteries to be participating in California ISO’s market, we also needed the DERMS to interact seamlessly with the market and be able to utilize data from our generation and SCADA systems.”**

**– Cesar Miron, Manager of Operations and Engineering, PNM**



# PNM'S Future Vision for AspenTech OSI DERMS

One of the most important benefits PNM receives by using AspenTech OSI DERMS is the ability to automatically prioritize how its solar-plus-storage units operate. While market participation is important, PNM's highest priority is grid reliability and safety. The solution's monitoring capabilities ensures grid reliability by preventing potential transformer overload at the solar and battery's interconnection point. Similarly, it ensures PNM's grid reliability by monitoring and responding to frequency violations.

PNM's ability to derive value was enhanced by the fact that the utility already utilized AspenTech OSI generation and SCADA systems. This allowed for rapid integration of AspenTech OSI DERMS and made it simple for PNM operators to begin using the solution because they were already familiar with the user interface.

PNM's initial success controlling two large solar-plus-storage systems has made the DERMS solution an important addition as the utility continues to transform its generation portfolio. By 2031, PNM will no longer operate coal power plants and much of that lost generation will be replaced by solar and batteries, including additional assets connected to the high-voltage transmission system. More immediately, PNM is adding battery storage to many of its 23 existing solar power plants connected to the distribution grid. AspenTech OSI DERMS will be used to monitor and control the solar-plus-storage systems. Over the longer term, the solution will help PNM decarbonize its generation assets while maintaining the grid reliability and safety its customers expect.





### **About Aspen Technology**

Aspen Technology, Inc. (NASDAQ: AZPN) is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance lifecycle. Through our unique combination of deep domain expertise and innovation, customers in asset-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence.

[aspentech.com](https://www.aspentech.com)

© 2024 Aspen Technology, Inc. All rights reserved. AT-2235

