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FROM ANALYSIS TO DEPLOYMENT: ENERGY STORAGE FOR TRIBAL RESILIENCE AT PICURIS AND LAGUNA PUEBLOS

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PROJECT PROFILE

Topic: Analytics & Tools
Verticals: Analytics, Grid Integration and Field Validation
Strategic Pathway: Optimize
Project start and finish: FY21-FY26

PROBLEM

- Many Tribal communities face high electricity costs, outage risk, and limited access to community-specific tools for evaluating energy storage investments.
- Energy storage systems (ESSs) can improve resilience, affordability, and utilization of local power generation while supporting longer-term energy sovereignty goals.
- A key challenge is moving from general interest in storage to project-specific technical, economic, and implementation decisions.

APPROACH

Picuris Pueblo (New Mexico)

- Used measured load and generation data to evaluate ESS sizing for resilience and stacked-value applications.
- Assessed backup-power requirements, outage-duration risk, and economic tradeoffs.
- Provided early-stage technical analysis, technical assistance, and project support
- Helped inform project development, ESS procurement, and microgrid planning.

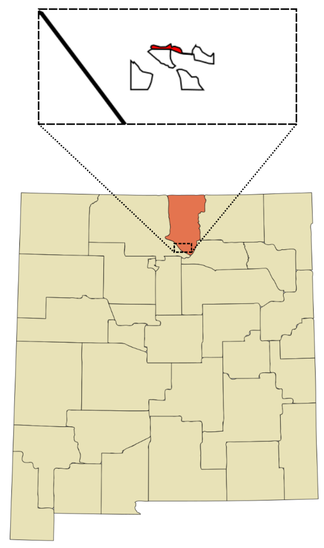

Fig. 1. Location of Picuris Pueblo, New Mexico

Laguna Pueblo (New Mexico)

- Conducted a preliminary survey of community energy infrastructure, resilience risks, and prior energy projects
- Assessed distribution topology, radial feeder exposure, hazard conditions, and candidate critical loads
- Identified opportunities for future microgrid and ESS feasibility analysis at village and community-facility scales

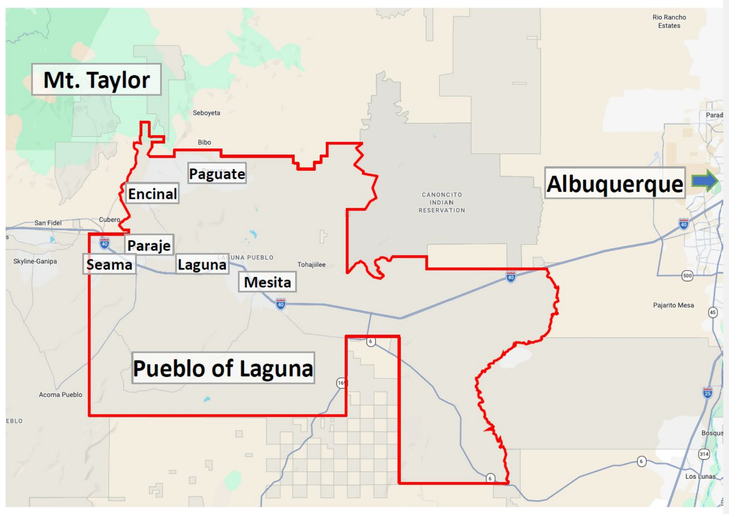

Fig. 2. Location of Laguna Pueblo, New Mexico

Methods and tools:

- Techno-economic analysis
- Resilience-oriented ESS sizing
- Review of utility structure, load characteristics, and outage risks
- Community-specific planning context and infrastructure mapping

RESULTS

Picuris Pueblo: From analysis to project implementation

Sandia's analysis and project support helped advance Picuris from storage evaluation to implementation planning

- Demonstrations Team provided engineering technical assistance, safety codes and standards review, cost share for implementation, and assisted in reviewing request for proposals
- A battery system has been selected
- Picuris selected a larger system and plans to sell excess capacity

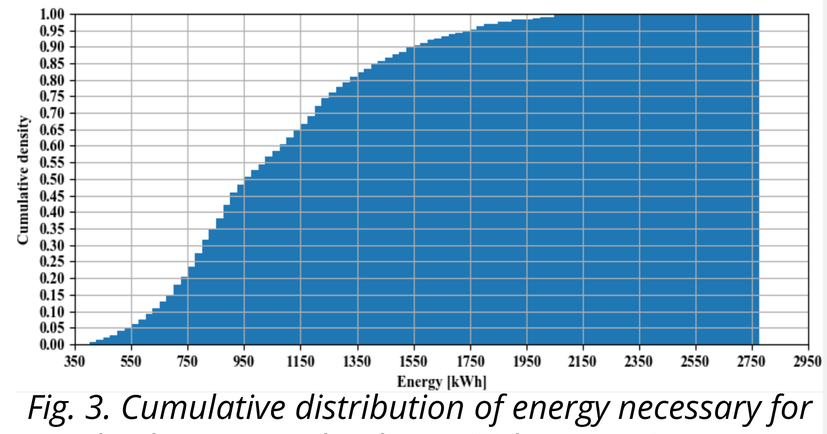

Fig. 3. Cumulative distribution of energy necessary for backing up net load over 24 hours in Picuris.

- Picuris secured additional funding for a microgrid with generation

Laguna Pueblo: High-value opportunity for future storage planning

- Potential for future village-scale storage and microgrid feasibility work

Laguna has:

- Six villages across a broad territory
- Long radial feeder exposure in some location resilience risks from wildfire, drought, flooding, storm, and outage restoration delays
- Earlier energy generation planning creates a strong foundation, but:
- No operating village systems are currently in place

Preliminary assessment suggests future opportunities for village-level resilience hubs, community-center with storage, critical-load microgrids, storage-supported resilience for water, communications, and emergency operations

CONCLUSIONS & IMPACT

Picuris Pueblo demonstrates a concrete success pathway:

- Sandia-supported analysis informed storage sizing and project design
- Sandia implementation support helped advance the project
- The Pueblo used that early support to secure additional resources and move toward deployment

Laguna Pueblo demonstrates the value of early-stage analytic work:

- Identifying where storage and microgrids may provide the greatest resilience value
- Reducing uncertainty before capital investment decisions

FUTURE DIRECTIONS

- Evaluate operational value of stacked applications ESS in Tribal grids
- Expand Tribal feasibility assessments to additional communities

For Laguna:

- Identify critical loads
- Gather site-specific load and utility data
- Assess battery sizing and use cases
- Evaluate village-scale microgrid concepts and implementation pathways

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