Kit Carson Electric Microgrid Project – Strengthening Energy Resilience in Northern New Mexico: Distributed Battery Storage for Wildfire Mitigation and Reliability

Project Background

Over the past decade, Northern New Mexico's regional energy provider, Kit Carson Electric Cooperative (KCEC), has been creating a roadmap for delivering safe, reliable energy to its 30,000 customers. The increasing risks posed by wildfires, extreme weather, and power disruptions present significant threats not only to our economy and infrastructure but also to the lives of our most vulnerable members. This includes individuals who depend on electricity for essential medical equipment, such as dialysis machines and oxygen concentrators, as well as those who rely on stable power for their jobs and businesses.

KCEC's Microgrid project aims to improve reliability and enhance services in key areas of KCEC's service territory. Utilizing the proposed battery energy storage systems (BESS) in identified high-risk areas will enable this project to supply critical and emergency power to communities during forest fires or extreme weather events.

KCEC Microgrid Project Details

1. 7.5 MW / 38.25 MWh of Battery Energy Storage Systems ("BESS") across three sites, to be installed and interconnected by PowerSecure to KCEC's 12.47-kV distribution electric grid
2. Full preventative maintenance, 24x7 monitoring, and warranty management services for all installed equipment on site.
3. Sites identified: Village of Taos Ski Valley, Penasco and El Rito West

Size	BESS Size	Inverter Transformer Size	Duration at Full Charge
Village of Taos Ski Valley	18,000 kWh	3,750 kW	**4.8 hours**
Penasco KCEC Substation	13,500 kWh	2,500 kW	**5.4 hours**
El Rito West	6,750 kWh	1,250 kW	**5.4 hours**
Total Overall:		**7.5 MW**	**38,250 kWh (38.25 MWh)**

KCEC Microgrid Project Benefits

Life-saving reliability for residents with medical needs, guaranteeing that those who rely on powered medical devices are never left without power during emergencies.

Fire stations, evacuation centers, and healthcare facilities remain fully operational during power outages to effectively support first responders and emergency services.

Reduce the risk of catastrophic wildfires ignited by utilities by alleviating strain on the power grid and ensuring stability in high-risk areas.

Keep small businesses, schools, and local economies running, allowing residents to work, learn, and communicate even in the face of extreme weather or grid disruptions.

Create jobs in clean energy infrastructure and train a future workforce, ensuring safer, more self-sufficient communities.

Frequently Asked Questions About the KCEC Microgrid Project

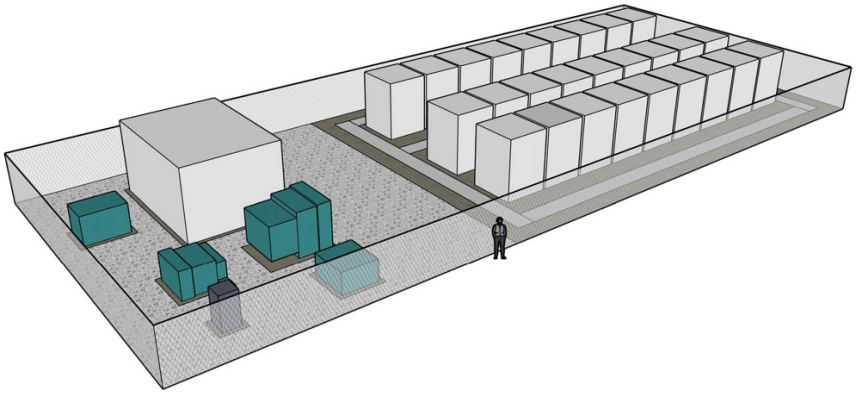

Photo: Illustration of the proposed Village of Taos Ski Valley. The site measures approximately 132 feet by 54 feet and includes 8 feet of height protective fencing. Facilities are located 10 ft from protective fencing.

1. What type of batteries are being used?

The systems will use Lithium Iron Phosphate (LFP) batteries, which are known for their high safety, stability, and long lifespan. Unlike older lithium-ion chemistries such as found in a laptop or electric bicycle, LFP batteries have a very low risk of thermal runaway (fire/explosion).

2. How will the battery system benefit the local community?

- Grid reliability: Reduces blackouts and stabilizes voltage.
- Renewable integration: Stores solar and wind energy for use during peak demand.
- Lower electricity costs: Helps manage energy supply more efficiently.
- Reduced fossil fuel dependence: Supports a cleaner energy future.

3. Will this system increase my electricity bill?

No, energy storage systems are designed to improve grid efficiency and lower costs by storing excess energy when demand is low and distributing it when demand is high. Over time, this helps stabilize electricity rates for consumers.

4. What environmental protections are in place for the system?

The system follows strict environmental regulations, including:

- Leak containment measures to prevent ground contamination.
- No emissions from normal operation.
- No noise pollution during operation
- Recyclable battery materials, reducing environmental impact at the end of life.

5. How does this project align with fire codes and safety regulations?

The system complies with NFPA 855 (Standard for Battery Energy Storage Systems), as well as local and national fire codes. Fire officials have been engaged in safety planning and emergency response training.

6. Will the system interfere with local wildlife, natural landscapes, or waterways?

No. The project is designed with minimal environmental impact and follows all wildlife protection guidelines. The site selection process considers ecological impact, and landscaping measures may be implemented to blend with the surrounding environment.

7. What fire prevention measures are in place for the battery system?

The facilities will include multiple layers of fire prevention:

- *A Battery Management System* (BMS) to monitor and control temperature, voltage, and current.
- *Fire Detection Sensors*: to serve as early warning systems for heat or gas buildup.
- *Thermal Barriers*: Fire-resistant enclosures prevent fire spread.
- *Deflagration panels*: to prevent internal pressure buildup.
- *Automated Shutoff Systems*: The system isolates affected modules if an issue is detected.
- *Fire suppression system*: The Stat-X™ system is a condensed aerosol technology to rapidly extinguish flames, limit thermal runaway, and prevent reflash, ensuring enhanced safety for energy storage systems
- *Dry-pipe water sprinkler system*: Additional sprinkler systems provide supplementary fire protection by cooling surrounding areas and equipment.

8. How does the system handle extreme weather conditions like heat, wind, or snow?

The BESS is designed to withstand New Mexico's climate, including:

- Active cooling and heating systems to regulate temperature.
- Weatherproof enclosures rated for extreme temperatures.
- Structural reinforcements for high winds and seismic activity.

9. What happens in case of a battery fire?

The systems proposed will have two types of fire suppression systems to contain and neutralize a potential fire:

- Stat-X System: A condensed aerosol system that quickly extinguishes lithium-ion battery fires, stops thermal runaway, and prevents re-ignition with minimal maintenance.
- Dry-pipe Water Sprinklers: A secondary system that releases water to cool surrounding areas and contain fire spread; though less effective against battery fires directly, it's worth adding to protect adjacent equipment and structures from escalating damage

Notifications will alert 1) the local fire department, 2) the system owner, and 3) the Contractor's customer service manager. Firefighters will receive onboarding and annual training on battery-specific response protocols.

10. Will the battery systems release toxic chemicals if there's a fire?

LFP batteries do not contain cobalt or other highly toxic materials found in some older lithium-ion chemistries, making them safer and less prone to extreme reactions. In a fire, smoke may contain some irritants, but the system is designed to minimize hazardous emissions through fire suppression and containment measures. In the event of a fire and a release of emissions, the primary emissions would be carbon dioxide (CO_2), water vapor (H_2O), and trace amounts of hydrogen fluoride (HF). These are managed by the Stat-X system and proper ventilation protocols to reduce risks to responders and the environment.

11. Can a fire spread from one battery unit to another?

No, the battery units are designed with modular fire containment. Each battery module is housed in a fire-resistant casing and separated by heat-resistant barriers to prevent fire spread.

12. Can the batteries explode?

LFP batteries are among the safest lithium-based chemistries and do not explode under normal conditions, unlike some older lithium-ion types. While explosions are not a risk, a fire could cause pressure buildup in a BESS enclosure due to gas generation. Deflagration panels are integrated to safely release this pressure, eliminating any explosion hazard. The system also includes multiple safety layers, such as the Stat-X system and sprinklers, to prevent overheating and contain potential failures.

13. How will first responders be trained to handle emergencies?

We will work with local fire departments to provide:

- Site-specific training on battery fire response.
- Emergency shutoff procedures for quick intervention.
- Access to safety data sheets and system schematics.

14. How far away is the system from homes and businesses?

The system is strategically located at a safe distance from residential and commercial areas, following national fire safety codes (NFPA 855) and local zoning regulations.

15. What happens if there's a power outage—can the batteries catch fire if suddenly overloaded?

No, the batteries are designed to handle power fluctuations safely. The Battery Management System (BMS) regulates charge and discharge cycles to prevent overheating or overloading.

16. How long can the battery system provide backup power in an emergency?

The system's backup duration varies based on energy demand and available charge. On a typical installation at full power discharge, it provides approximately 4 hours of power. Longer durations can be achieved by reducing the output gradually.

17. What happens when the batteries reach the end of their lifespan?

At the end of their lifespan (typically 15-20 years), batteries will be recycled or repurposed through responsible disposal programs. Many battery components, including lithium, iron, and phosphate, can be recovered and reused.

18. Does the battery system create noise pollution?

No, the battery storage system operates silently, with only minimal noise from cooling fans and power conversion equipment (less than 65 dBA or equivalent to an air conditioning unit running at a distance of about 100 feet). These systems are designed to comply with local noise regulations and are significantly quieter than traditional power plants.

19. Who is PoweSecure?

PowerSecure, a Southern Company subsidiary, is the nation's leading microgrid developer and manufacturer of generation solutions and LV & MV switchgear. PowerSecure's team of experts have developed, installed, managed and serviced nearly 2.5 GW of microgrid capacity across 2,600+ project sites over the past 20+ years, more than any other microgrid developer. PowerSecure is 875+ employees strong.

20. Is this project part of a Department of Energy Grant?

Yes. The U.S. Department of Energy (DOE) selected Kit Carson Electric Cooperative to receive $23 million ($15.4 million in Federal funding and $7.7 million in Recipient cost share) to enhance the U.S. power grid's ability to deliver affordable, clean energy to American communities across northern New Mexico. The funds will advance the **Building a Modern, Intelligent Distributed BESS for Resiliency in Northern New Mexico** project to mitigate the impacts of extreme weather and strengthen grid reliability.

21. Who can I contact if I have concerns or need more information?

We encourage community engagement! You can contact Richard Martinez at (575)-758-2258 or rmartinez@kitcarson.com.