ENERGY RESILIENCE IN NORTHERN NEW MEXICO

Energy Storage Opportunities for Electric Cooperatives and Municipal Utilities in the Northeastern Region of New Mexico

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What is Regional Energy Resilience?

Resilience- a sustainable distributed regional energy portfolio that includes: Biomass/ Wood Gasification, Photovoltaic, Wind, Pumped Hydro

Task:

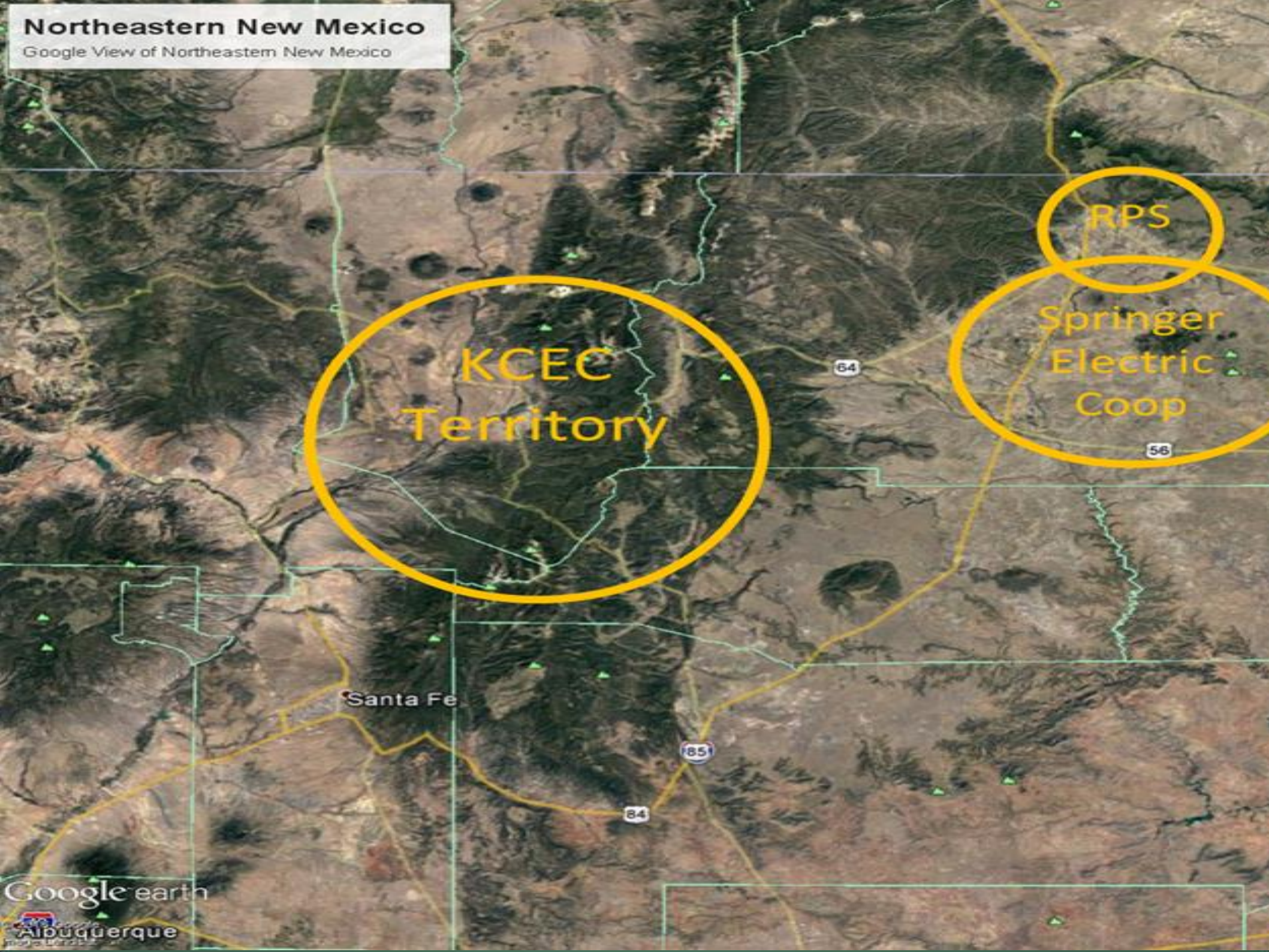
- Interview Rural Electric Cooperatives about Energy Storage Solutions
- Kit Carson Electric Cooperative
- Springer Electric Cooperative
- Raton Public Service Municipality owned utility

Regional assets-

- 270,0000 acres of Private land with over grown forest

with a 50 year sustainable thinning cycle

- Solar
- Wind
- Hydroelectric
- Unemployment higher than national average by 20%


Northeastern New Mexico
Google View of Northeastern New Mexico
RPS
Springer Electric Coop
KCEC Territory
64
56
Santa Fe
285
84
Google earth
Albuquerque

KIT CARSON ELECTRIC CO-OP

Luis Reyes- CEO

Current Status

- Radial Feeders that serve long rural runs
- 13 Substations 25kV Lines
- 30,000 customers
- $0.08 per kWh $.29 per kWh demand

- Town of Taos largest load is the waste water treatment plant
  - Demand charge can be up to 60% of power bill
  - 2026 expiration of contract with Tri-State G&T

- 4 MW Cooperative owned solar arrays
- Three 1 MW Power Purchase Agreements in the locations of
  - Eagle Nest
  - Picuris Pueblo-looking into islanding and energy storage
  - Angel Fire
- 1 MW are desirable because of existing Regulations

Kit Carson Electric Co-op

Challenges

- Net-metering benefits the user but not the Cooperative
- Would like to have a firm power at $0.07/kWh
- Rolling blackouts
- Heating climate

Opportunites

- Goal is cover 35 MW Summer peak load with renewable energy
- 60 MW Winter peak energy difference purchased from the Grid

- Load sampling every 15 minutes for WWTP to analyze profile
- Five 1MW arrays planned
- 1 MW are desirable because of existing regulations

- Plans for two natural gas peaking plants

potential energy storage substitution

SPRINGER ELECTRIC CO-OP

David Spradlin - General Manager

Springer Electric Cooperative Facts:

- Miles of Line: 1,818
- Consumers Served: 1,934
- Numbers of Meters: 2,728
- Date Incorporated: 1946
- Date Energized: 1947

http://springer.coopwebbuilder2.com/content/residential

Springer Electric Co-op

Current Status

- 80% of usage- 3 industrial companies
- Remaining 20% is split fairly evenly with commercial and residential.
- Day time Rate $0.13/kWh, 7 AM-8 PM
- Night time rate $0.07/kWh 8 PM-7 AM
- Power Purchase Agreement expires with Tri-State in 2050
- Currently own two 115kV lines
- Several 69kV older lines
- 1 MW Solar Array
- Currently billed on energy peak demand basis

Springer Electric Co-op

Challenges

- Colfax County suffering unemployment that is 20% higher than national average
- Renewable generation limited to 5% of system capacity
- Limited communication and coordination in Northeastern NM
- Third parties "cherry picking" the large consumers for Qualified Facility generation
- Springer Electric Cooperative desires to own their own assets
- Limited staff
- Demand is not large enough to warrant wind turbines

Springer Electric Co-op

Opportunities

- Solarized truck stops
  - Semi-trucks could plug in and turn off their engines
  - Potential energy storage for night time load
- RFP for two 1MW PV Array at Substations in Raton and Cimarron
- Willing to take a look at PPA for biomass if $0.07/kWh or below
- Interested in energy storage if Tri-State approves
- Economic development in sustainable local jobs

Raton Coal Fired Powered Plant

Produced Power 1919-2006

RATON, NEW MEXICO

Robert G. Walton General Manager

Raton Public Service

Current Status

- Municipality owns its distribution lines
- Low customer base approximately 5,000 members
- $.074 per kWh
- Raton produced its own power with a coal plant until 2006
- Twin Eagle is current energy provider

Challenges

- Many low income customers
- Old Infrastructure
- Declining population

Raton Public Service

Opportunities

- Microgrid potential on a town scale
- Hydro retrofit 484 feet of elevation difference between reservoir and town
- Surrounded by vast amount of private land with over grown forest
- 4.3 MW GE Natural Gas Generator being installed
- Power purchase agreement expires in 4 years
- Collaborating on planning a viable renewable energy portfolio with:
  - The Santa Fe Community College
  - New Mexico Energy Office
  - New Solutions Energy Inc.

Examples of Biobased energy storage systems in New Mexico

AGPower
Roswell, New Mexico

Multiple dairies formed a Cooperative to convert their waste streams through anaerobic digestion into methane then to send to California via the natural gas infrastructure.
This is reducing a major source of methane emissions and creating local jobs

Albuquerque Southside WWTP

LOCATION: Albuquerque, NM
MARKET SECTOR: Wastewater treatment
FACILITY SIZE: 76 million gallons per day (MGD) design, 120 MGD peak
FACILITY PEAK LOAD: 7.4 megawatts (MW)
FACILITY AVERAGE LOAD: 4.5 MW
EQUIPMENT: Two 1.1–MW biogas–fueled Cooper engines & two 2.2–MW natural gas–fueled Caterpillar engines
OPERATION: 30% of load supplied by biogas CHP, remainder from natural gas CHP or grid depending on price
USE OF THERMAL ENERGY: Heating digesters; building heat
ENVIRONMENTAL BENEFITS: Use of a renewable fuel, reduced fossil fuel use, high total efficiency

http://www.southwestchptap.org/data/sites/1/documents/profiles/Southside_Water_Reclamation-Project_Profile.pdf
http://www.abqjournal.com/298117/turning-waste-into-energy.html

OPPORTUNITIES

- Diversified portfolio for energy resilience that creates lasting local jobs
- Forest overgrowth is a concern for Federal, State, and private lands
- Woody biomass to energy- community support through regional jobs
- PV and Storage are not sustainable jobs because work is primarily done in the development phase
- Waste streams to energy
- Bio-based economies
- Energy independence through diversified energy production and storage

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Regional Opportunities for Energy Resilience in Northern New Mexico

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What is a Regional Resilience?
Utilization of Regional Resources through Sustainable Stewardship
Food- Local production, controlled environment green houses
Reduced transportation
Water- Hydro Power
Energy- Diverse locally powered bio-based energy portfolio
Biomass, Wind, Solar, Hydro and Municipal Waste

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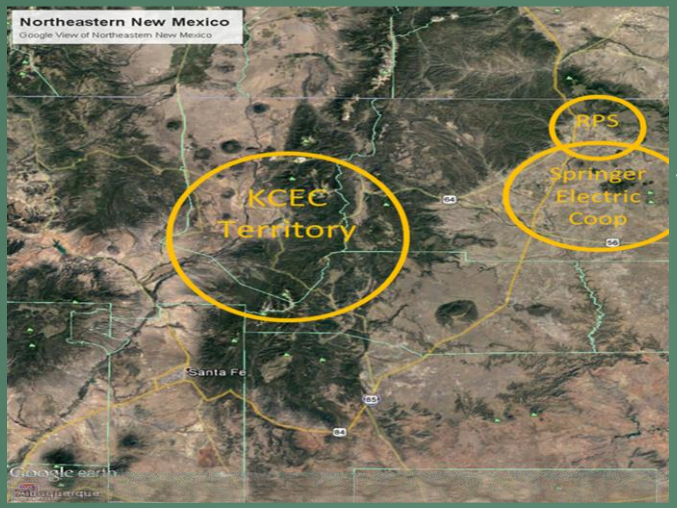
Tri-State Generation and Transmission Association energy provider



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Plans for 2 Natural Gas Peaking Plants- Energy Storage Substitution

Raton Power Plant

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Customer base of 1,934
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PPA with Tri-State is up in 2050
Own two 115kV lines and several 69kV older lines

Challenges

Colfax County suffering unemployment 20% higher than national average
Falling trees and branches on power lines is a real concern
No internal engineers
Renewable generation limited to 5% of system capacity
Lack of communication and coordination in North Eastern New Mexico
Third parties cherry picking the large consumers for QF generation
Important for Cooperatives to own assets
Renewable generation is problem when you over produce local demand
Demand is not larger enough to warrant wind turbines

Opportunities

Solarized truck stops where semi trucks could plug in and turn off engines
RFP for two 1MW PV Arrays at Substations in Raton and Cimarron
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Economic Development

Data compiled from interviews with electrical co-op representatives

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