



Kit Carson Infrastructure Expansion and Renewable Energy Development

Presented by Luis A. Reyes, Jr.

August 13, 2021

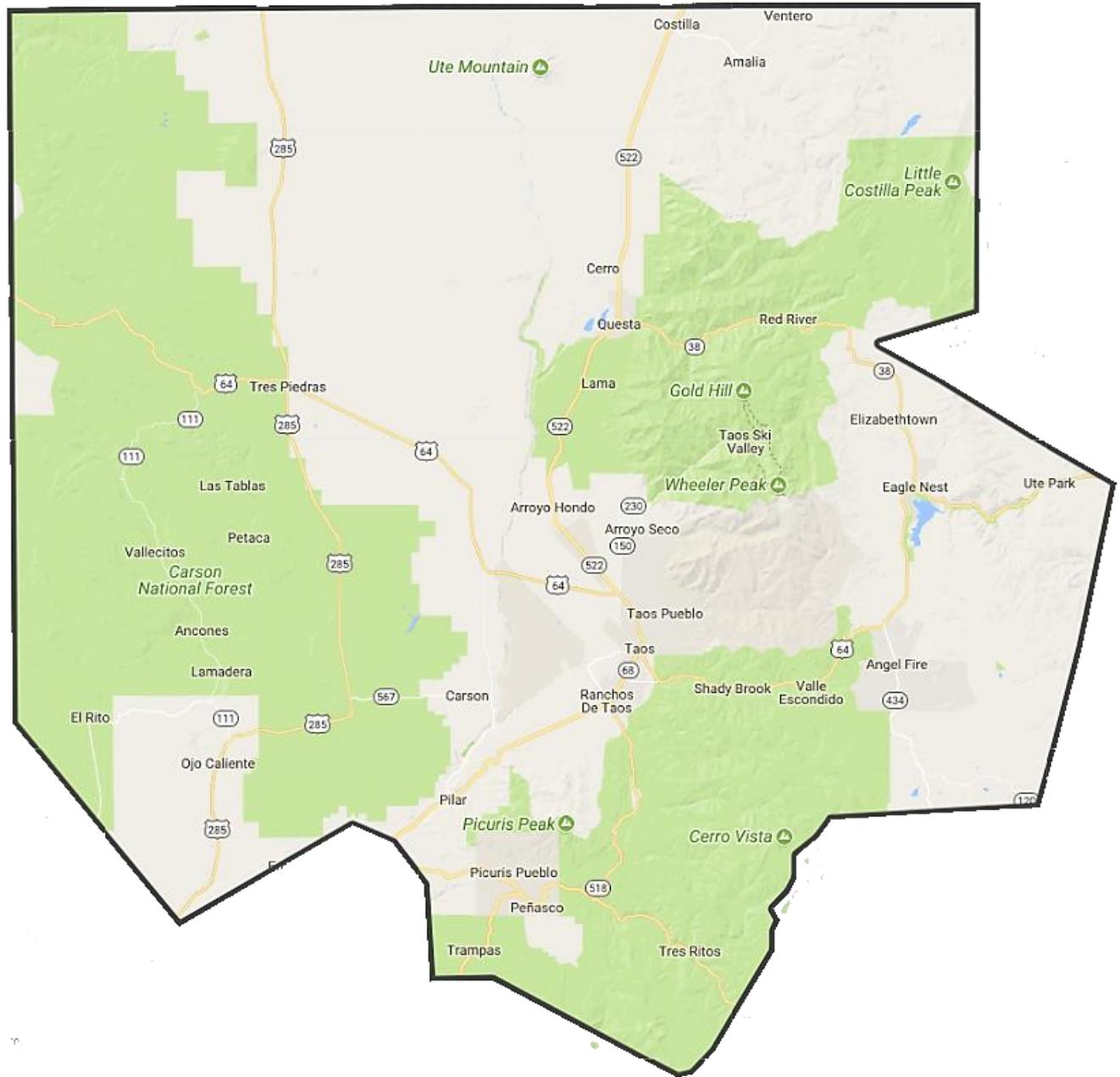
Water and Natural Resources Committee

Taos, NM

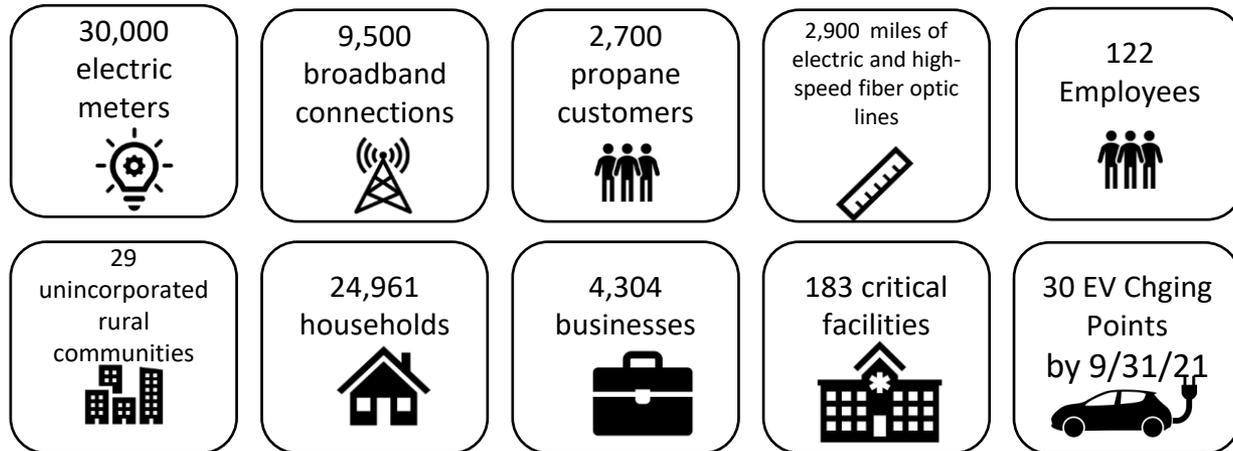


Where We Serve

Taos, Colfax and Rio Arriba counties in North Central New Mexico. KCEC serves the Village of Questa, Town of Taos, Village of Eagle Nest, Village of Red River, Village of Angel Fire and Village of Taos Ski Valley. KCEC also serves Taos and Picuris Pueblos.



Kit Carson Electric Co-op (KCEC) by the Numbers



Kit Carson Electric Coop's Energy Transition & Grid Modernization Goals

- ❖ Reaching 100% Daytime Solar in 2022 (DER)
 - ❖ Currently at 63% Daytime Solar (Capacity), 24% Energy
 - ❖ 41 MW Solar and 15.75 MW BESS
 - ❖ Diversifying the Energy Portfolio by adding Wind and additional battery storage (Under Contract 2024)
- ❖ Affordable and Stable Cost of Power
 - ❖ Energy Efficiency Programs
 - ❖ Fuel Conversion Program
 - ❖ Rate Design
- ❖ Connecting the Grid for Real-Time Visibility– Camus Energy
- ❖ Partnerships with Schools, Municipalities and Governments
- ❖ Implementation EV Infrastructure Plan
- ❖ Fiber Optic / Broadband Upgrade 10 – 100GB
- ❖ Creating Microgrids (El Rito, UNM Taos and Picuris)
- ❖ Cybersecurity
- ❖ Achieving NM State's ETA Goals & Decarbonization



Kit Carson's Outcomes

Cost of Electricity

Affordable and stable cost of electricity for all and maintain low electric rates.

Access to Renewables & Equity

Ensure equal access to solar. Support solar energy for low-medium-income (LMI) households and provide opportunities for Indian nation participation in solar development. Provide technology and broadband access for all from grid modernization.

Economic Development & Jobs

Empower private sector participation in solar development, stimulate growth, and create local jobs.

Resilience and Reliability

Utilize distributed generation to enhance resilience, support grid reliability, and reduce GHG emissions.

Grid Modernization

Integrate renewable energy, storage, broadband access, smart devices and microgrids thereby, building a modern grid.



KCEC Timeline in Phases

Phase 1 & 2



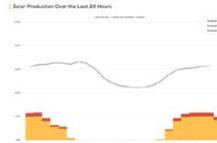
1

Smart Green Grid
(1999-2016)

Diversification of services



5% Solar Production



Tri-State Buy Out



\$64 Million ARRA Fiber-to-the-Home Award



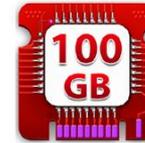
Policies



2

Enhanced Infrastructure
(2016-2020)

100GB Internet Broadband Capacity



KCI Reaches 9,000 Customers



Implementing Cybersecurity Measure



Increasing Smart Meter Deployment (97%)



Built/Contracted 41 MW Solar Plus 30 MWH Battery

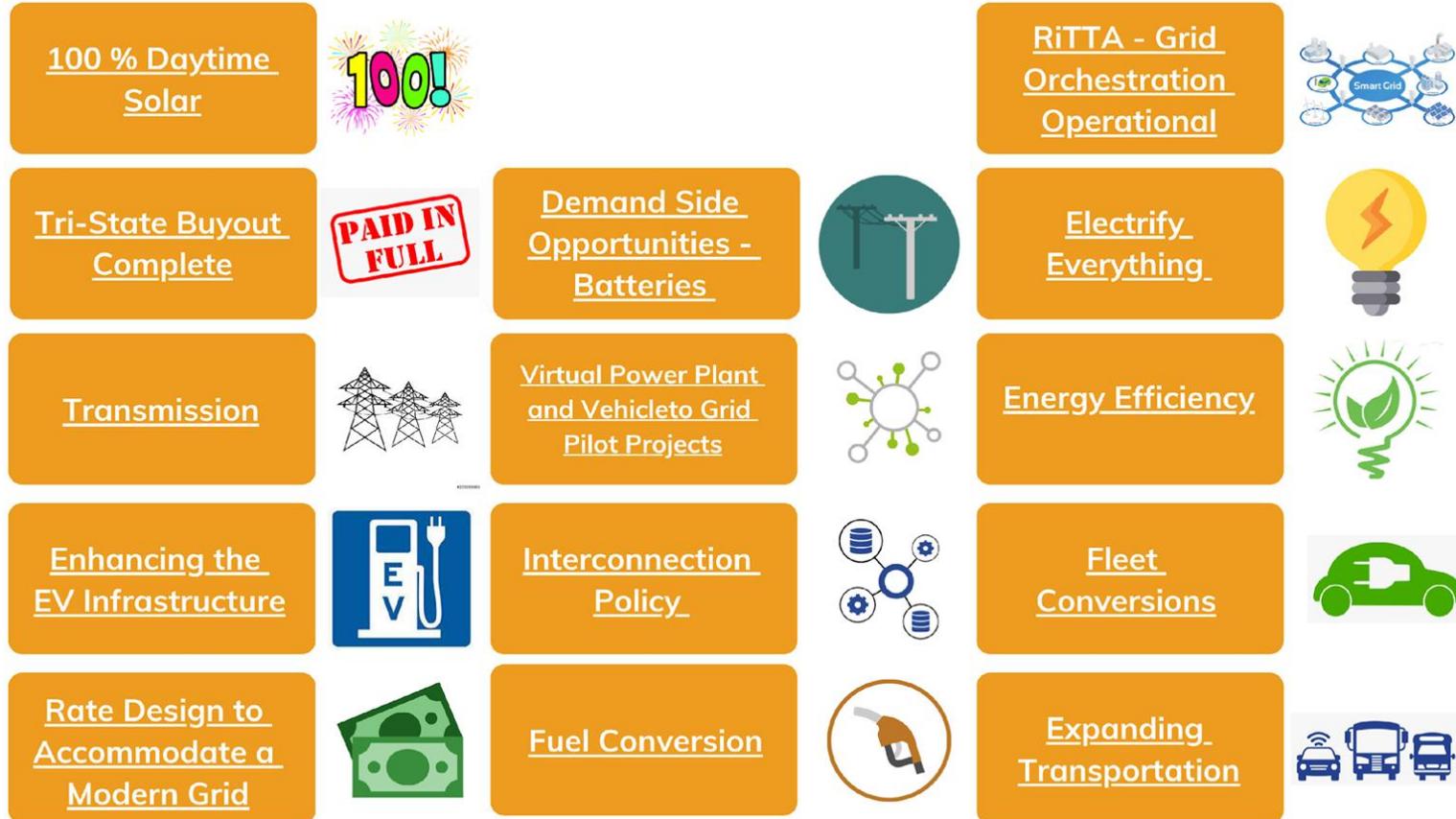


KCEC Timeline in Phases

Phase III

3

(2022 and beyond)



The Shifting Business Model/ Multiple 3rd Party Participation

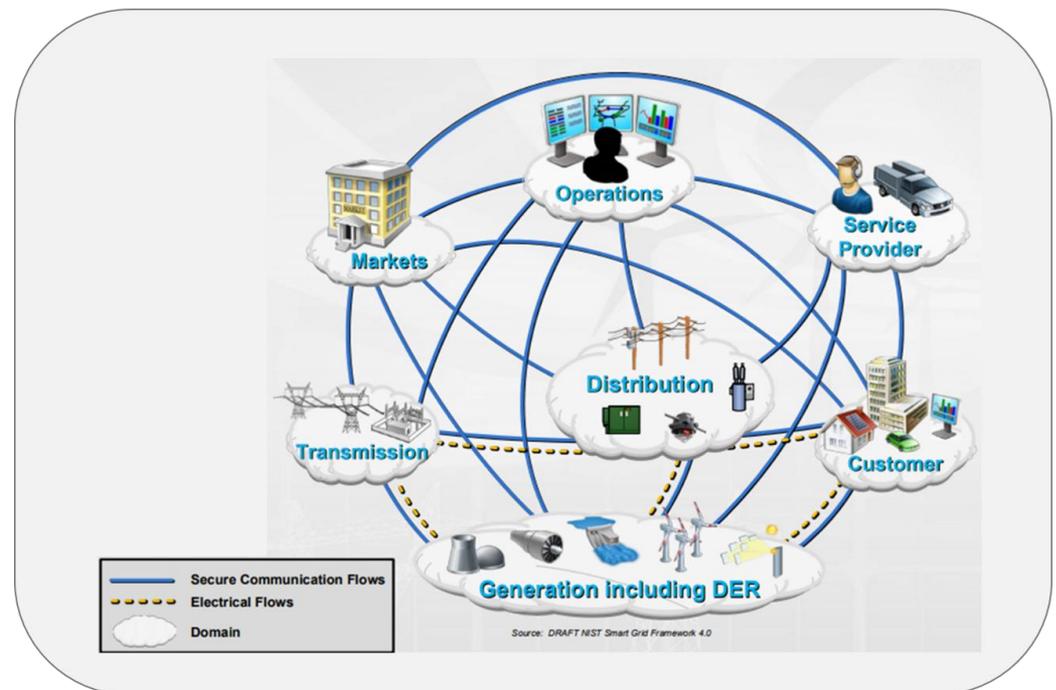
Finding opportunities for multiple solar-plus-storage value streams

- Peak shaving
- Ancillary services
- Resilience
- Line Losses

New Business Partnerships

- Guzman Energy
- Torch
- Camus Energy
- EPSCOR
- Grid Modernization Advisory Group

Electrical and Communications Flows in a Future More Complex Market

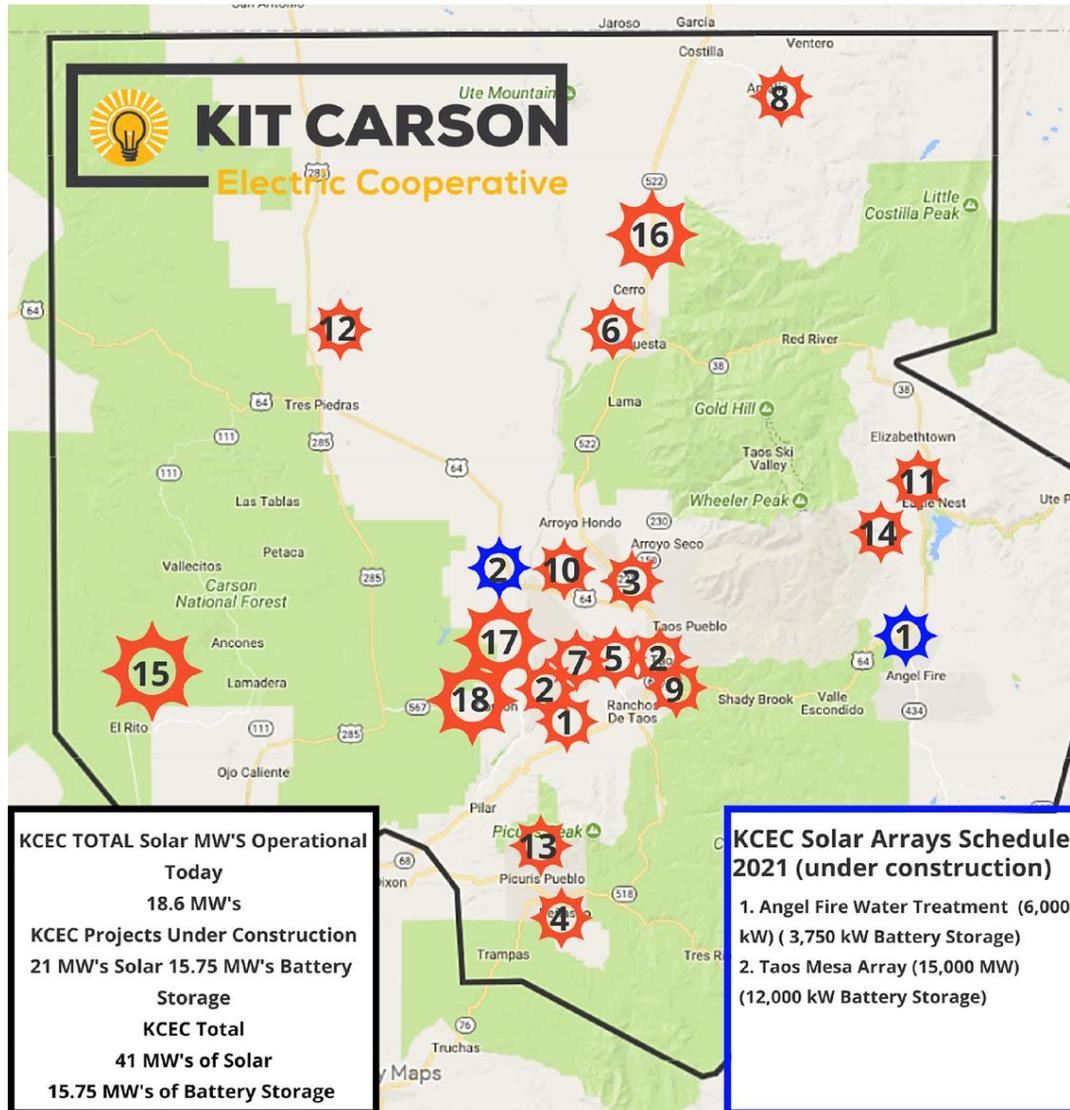


Job Creation

- ARRA Project created 490 jobs
- Added 40 jobs per MW built. Approximately 500 jobs
- Supporting four contractors at KCI
- Contracting local installers on solar plus battery installations
- KCI – 21 Employees
- KCP – 15 Employees



KCEC Solar Arrays



Map Legend

- KCEC Solar Arrays Online
- KCEC Solar Arrays 2020-2021 Scheduled
- KCEC Service Territory

- KCEC Solar Arrays Online**
1. UNM Taos Array (445 kW)(11/1/2009)
 2. KCEC Array Canopy (82 kW) (1/14/2010)
 3. KTAO Array (38 kW) (2/13/2010)
 4. Penasco Schools (50 kW)(12/30/2010)
 5. Taos High School (50 kW) (12/30/2010)
 6. Chevron (1,050 kW) (2/1/2010)
 7. Amalia RCCLA (1,250 kW)(5/21/2012)
 8. Taos Eco Park (60 kW)(12/30/2011)
 9. Taos Charter Community Solar (100 kW) (08/27/2012)
 10. Blue Sky Energy (1,250 kW) (8/1/2012)
 11. Eagle Nest Elementary (100 kW) (8/24/2015)
 12. Tres Piedras (2,000 kW)(8/1/2017)
 13. Picuris Pueblo Community Solar (1,000 kW)(12/18/2017)
 14. Eagle Nest (1,040 kW)(10/05/2018)
 15. Northern NM College, El Rito (1,500 kW)(12/19/19)
 16. Questa (1,500 kW) (1/02/20)
 17. KCEC Town of Taos (3,000 kW) (7/30/2021)
 18. Town of Taos (1,000 kW) (08/25/2021)
 19. Net Metering Members(561) (3,032)

KCEC TOTAL Solar MW'S Operational Today
 18.6 MW's

KCEC Projects Under Construction
 21 MW's Solar 15.75 MW's Battery Storage

KCEC Total
 41 MW's of Solar
 15.75 MW's of Battery Storage

KCEC Solar Arrays Scheduled 2021 (under construction)

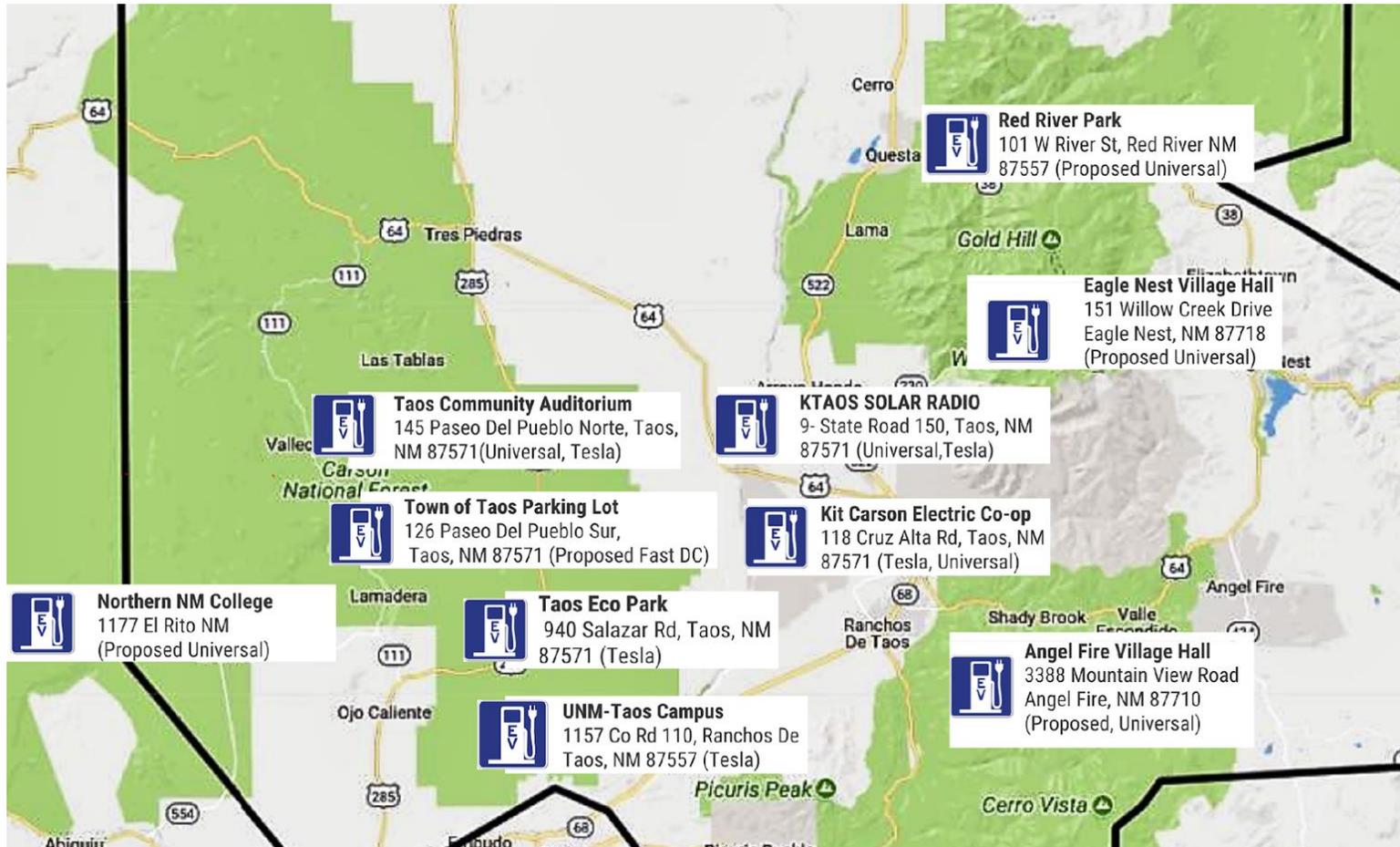
1. Angel Fire Water Treatment (6,000 kW) (3,750 kW Battery Storage)
2. Taos Mesa Array (15,000 MW) (12,000 kW Battery Storage)

- KCEC has been working with solar since 2006
- KCEC TOTAL Solar MW'S Operational:
 18.6 MW's
- KCEC Projects Under Construction:
 21 MW's Solar
 15.75 MW's Battery Storage
- KCEC Total:
 41 MW's of Solar
 15.75 MW's of Battery Storage
 Completion by end of 2021

KCEC Electric Vehicle Charging Stations

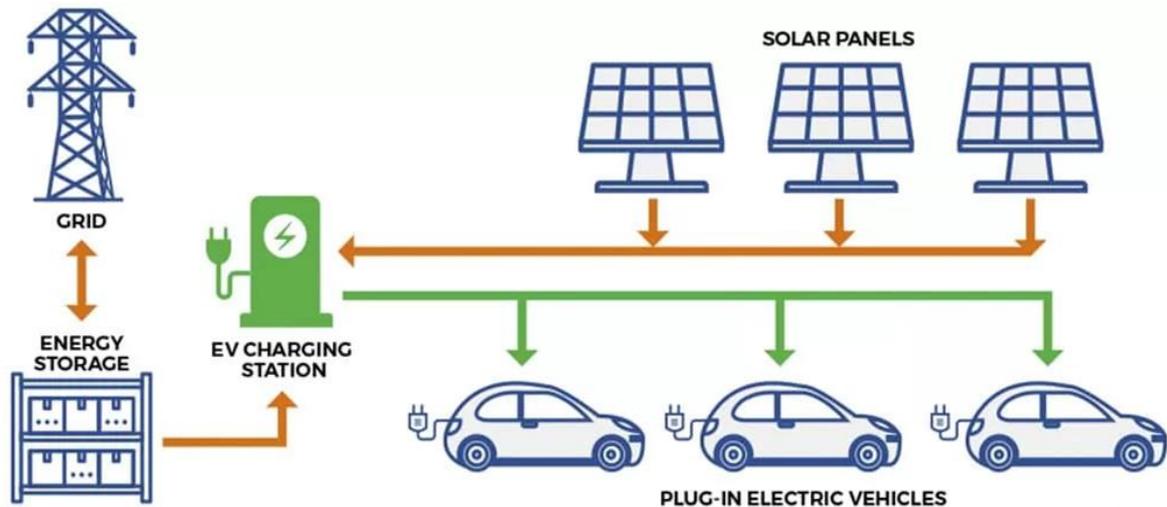
KCEC has 30 Charging Point Connections

10 single port charging stations (existing) and 10 dual port charging stations which is 20 points by 9/30/21



The EV Infrastructure Plan

- Infrastructure for EV Charging
 - Enchanted Circle – Visitors
 - Businesses and Municipalities
 - Home Charging
- Transportation
 - EV Buses
 - NCRTD
 - Schools
 - Bikes & Scooters
- Fleet Conversion
 - Municipalities, Pueblos, Businesses
- EVs for All
 - Secondary Car Market
- Rate Design



Phases of Grid Modernization

1. Instrumenting the existing grid

- Smart meter deployment
- Grid device telemetry
- Communications infrastructure

2. Understanding grid data in context

- Smart grid operations
- Grid analytics
- Modeling old and new assets

3. Incorporating new resources

- Grid planning for new resources
- Interconnection policy
- Direct management of generation, storage, flexibility

4. New operating models

- Net metering -> grid-supporting DERs
- Local generation & regional markets
- DSO models

Multiple Layers of Management



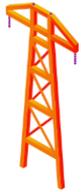
Distribution

Local utility
Large utility

Operate & maintain distribution network
Balancing supply & demand
Managing market & contract participation

Demand & Flexibility

Supply



Transmission

G&T Provider
Large utility
ISO / RTO

Operate & maintain transmission network
Balancing supply & demand
Provide energy / access to energy

Demand



Generation

G&T Provider
Asset owner

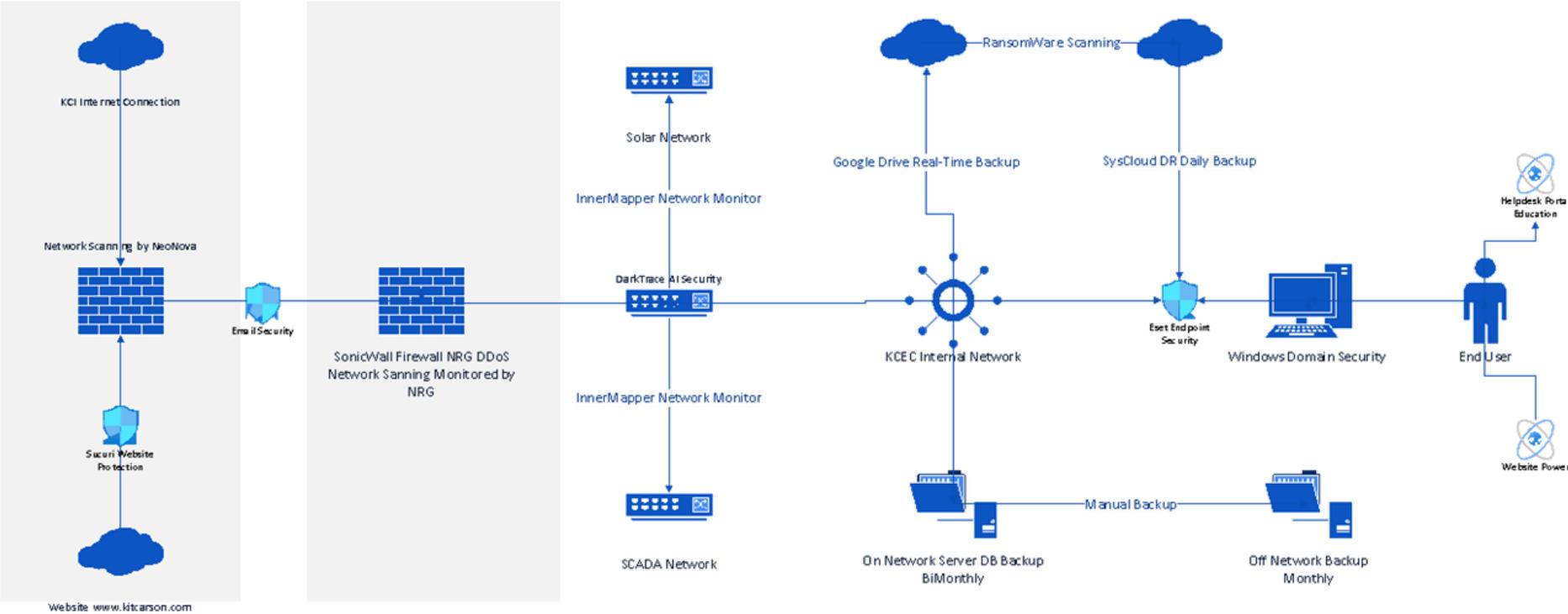
Operate & maintain assets
Forecasting
Contracts & market participation

Demand

Supply

KCEC Cybersecurity

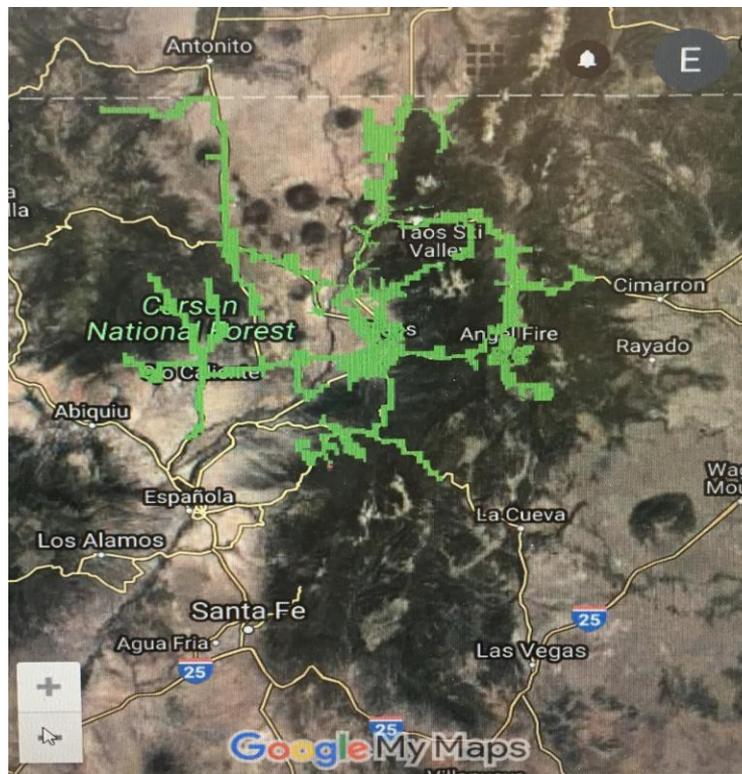
KCEC Cyber Security Network Diagram



Kit Carson Internet - Broadband is Essential

- Core network is expanding to 40 GB
- New equipment has the capacity to upgrade to 100 GB
- KCI can currently supply customers with 1 GB service to the Home or Business
- KCI will be able to supply residential and business customers with up to 10 GB by 4Q 2021
- KCI leases and maintains dark fiber
- KCI has three redundant broadband paths for resilience and reliability
- Just because a home has a connection doesn't mean they have broadband
- KCI is both a Competitive Local Exchange Carrier (CLEC) and Eligible Telecommunications Carrier (ETC)
- FCC pledge taken- NO DISCONNECT OR LATE FEES

The Carrier Class FTTH Network



KCI currently has three redundant broadband paths for resilience and reliability

Initiating New Broadband Collaborations

- Working with NCNMEDD on possible grants; e.g., EDA, USDA, DOC, etc.
- Expanding throughout North Central New Mexico: from Colorado border to north Santa Fe to Mora to Rio Arriba
- Received funds to connect students and Pueblos

THANK YOU

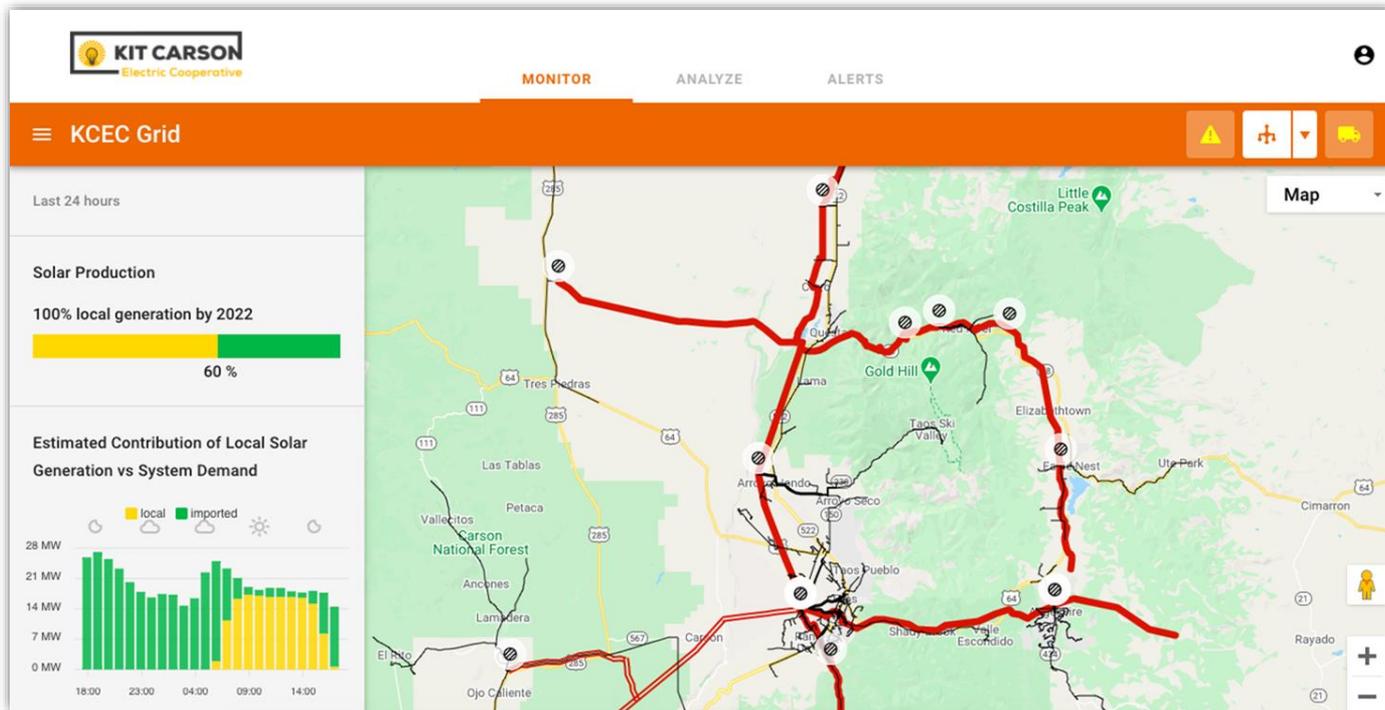
Luis A. Reyes Jr.
CEO- Kit Carson Electric Cooperative Inc,



Appendices

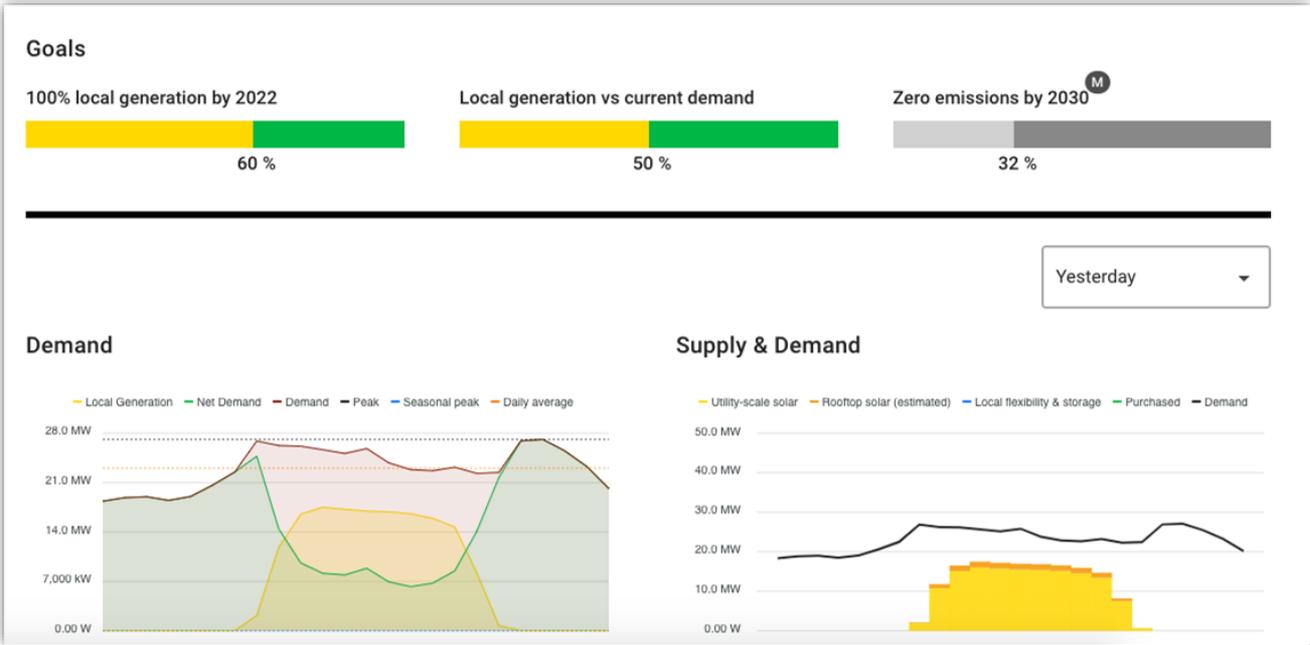
Connecting the Grid in Real-Time

Leveraging the broadband network to collect data in real time from multiple sources gives KCEC an overview of what's happening across the grid.



Sharing Progress with the Community

Tracking ongoing progress towards renewable energy goals provides insight to the utility and also provides tools for engaging the community.



Resilient El Rito Partners



THE UNIVERSITY OF
NEW MEXICO.

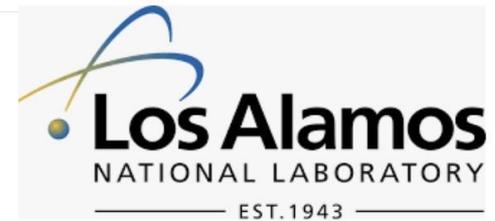
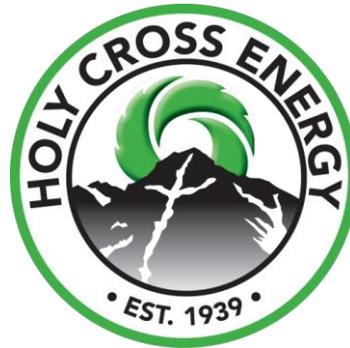
NM
STATE



CAMUS

Zero Carbon Grid Orchestration

MICROGRID
Systems Laboratory



Resilient El Rito

- **NNMC** seeks to revitalize and expand workforce training opportunities and sustainability topics and practices on the El Rito campus, and specifically to introduce microgrid concepts and training through a campus microgrid as part of a “living laboratory”; and to utilize the 1.5 MegaWatt PV array installed there in partnership with KCEC and Guzman Energy to provide community value.
- **KCEC** seeks to provide resilient solutions to its customers as part of its general grid modernization strategy, and its progress toward 100% daytime solar generation and distributed battery energy storage throughout its system, while demonstrating the potential of utility microgrids for rural coops and learning more about their deployment.

NNMC's El Rito Campus - A Microgrid within a Microgrid

Goals of the El Rito Campus Project

- Scalability and replicability: across KCEC's system, state-wide, and beyond
- Support R&D, testing, validation, demonstration (keyed to risk tolerance at the campus)

KCEC Community Microgrid Benefits

- Resilience
- Reliability
- Grid services
- Support entrepreneurial & economic development

NNMC Campus Microgrid Benefits

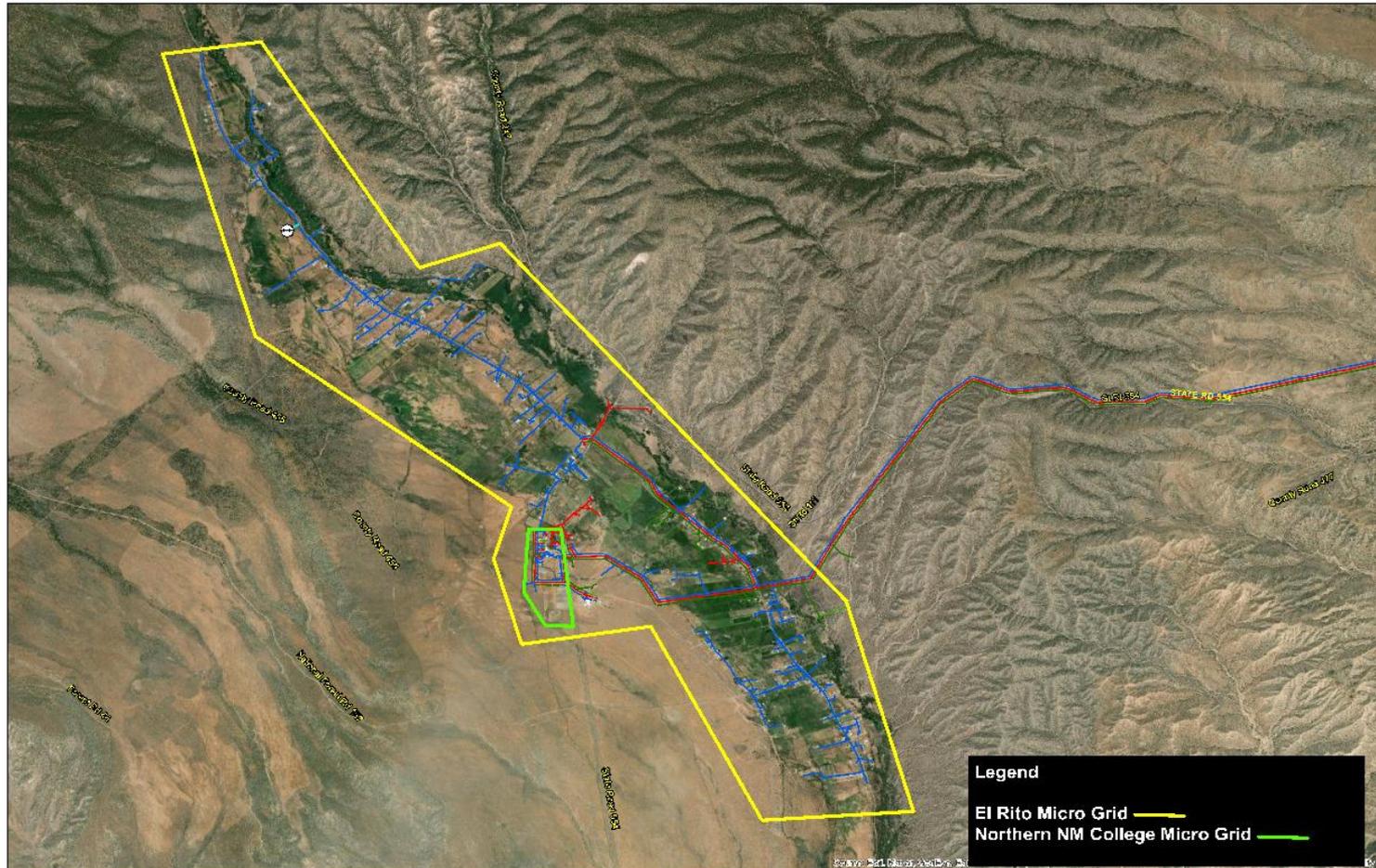
- Instruction
- Sustainability
- Supply power to campus critical buildings
- Seven NNMC vans
- Thermal loads in the winter



Northern New Mexico College and KCEC are partnership with these high schools. NNMC is revitalizing the Trades Program in El Rito, NM.
In the near future, each school will be served by an EV Bus.

- Espanola
- Chama
- Mesa Vista
- Pojoaque
- Jemez Mountain

El Rito Microgrid



Vision to Reality

A community-centric grid led by a DSO.

