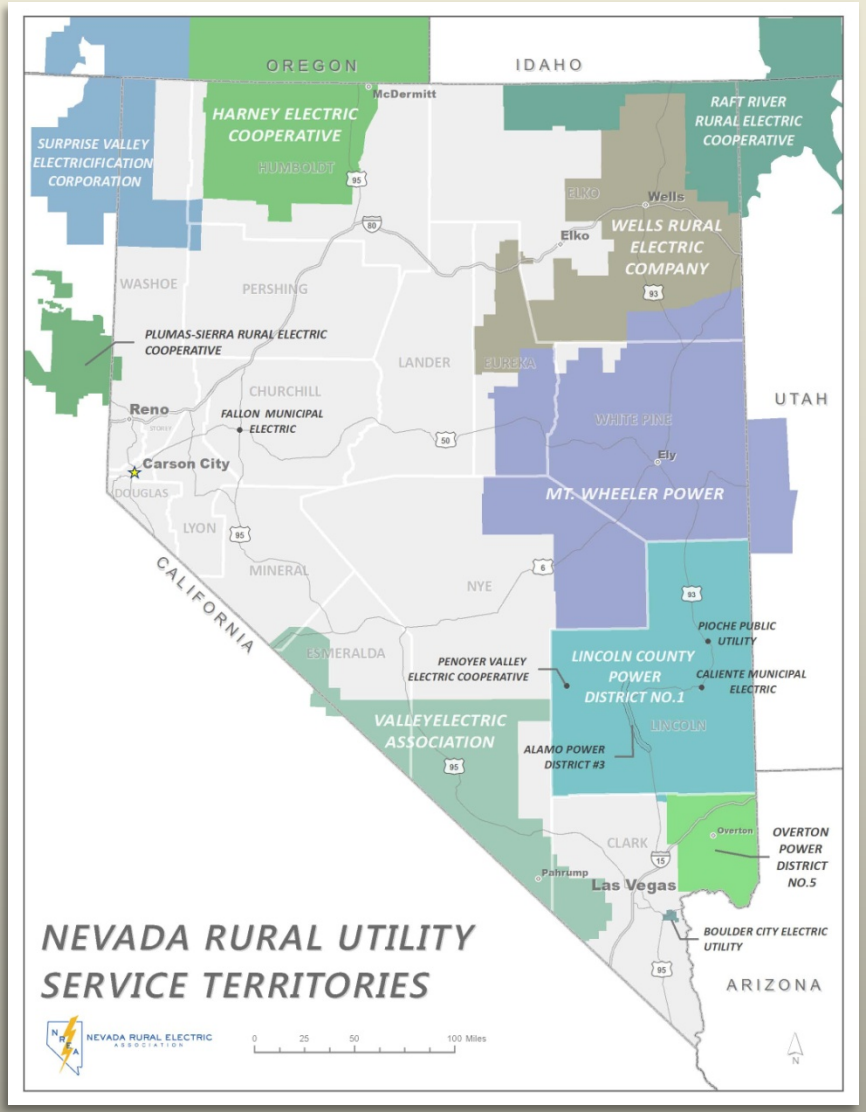
Grid Modernization and Resiliency Presentation

A Rural Perspective

Today's Discussion

- Nevada's Rural Utilities
- Lincoln County Power District No. 1
- Cost Effective Grid Modernization/Resiliency Efforts
- Issues Affecting Grid Modernization/Resiliency
- Q & A

Nevada's Rural Utilities



Nevada's Rural Utilities

- Serve More than 60,000 Consumers
- Cover Nearly 50,000 Square Miles – Nearly 50% of the State
- Low Density of Consumers Per Mile of Line – Averaging Less than 7 Per Mile of Line
- Don't Own Significant Generation
- Not for Profit
- Governed by Boards Elected from and by Consumers

Lincoln County Power Dist.

- Created June 24, 1935
- General Improvement District Under NRS 318
- Five Member Elected Board of Trustees
- Provides Electric Service Throughout Lincoln County and Coyote Springs

Lincoln County Power Dist.

- Transmission and Distribution

Lincoln County Power Dist.

- Transmission and Distribution

LINE NAME	YEAR CONST.	VOLTAGE	MILES
Tortoise – Sheep Mtn.	1937/1961	69 kV	22.1
Sheep Mtn. - Prince	1937	69 kV	91.5
Prince – Pony	1967	69 kV	37.1
Delamar - Tempiute	1975	69 kV	55.3
Dry Lake - Antelope	1993	69 kV	15.3
Yucca - Mesa	2002	138 kV	6.1
Total			227.4

Lincoln County Power Dist.

- Transmission and Distribution
  - 230 Miles of Transmission, 280 Miles of Distribution
    - 5.7 Consumers Per Mile of Line
  - Plant Investment of $43,988,260
    - $14,962 Per Consumer

Lincoln County Power Dist.

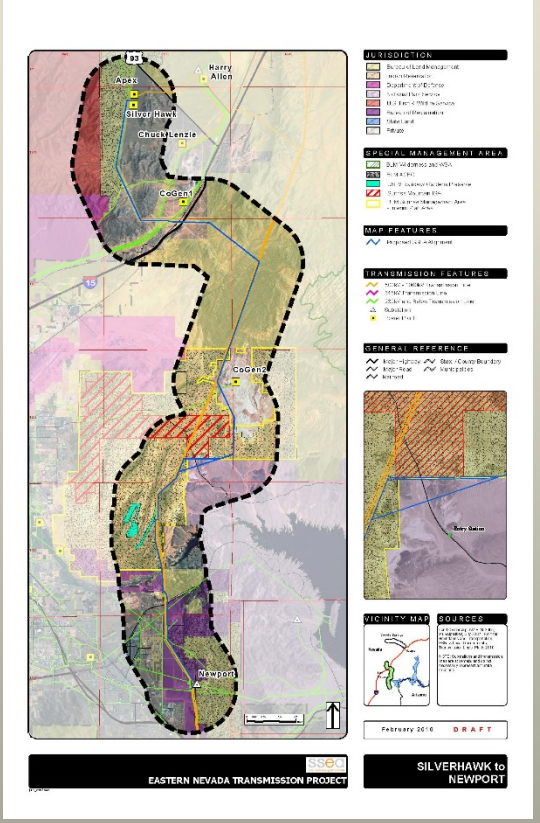
- Generation
  - Resource Mix
    - 85.3% Hydroelectric - Contract Through 2067
    - 14.7% Market Purchases – Natural Gas
    - <1% Self Generated Solar
  - Low Carbon Foot Print

Lincoln County Power Dist.

- Generation
  - Power Supply Cost 51% of Operating Expense, Exclusive of Depreciation Expense
    - Calendar Year 2015 Composite Power Supply Cost 1.8 cents/kWh
    - Wholesale Power Cost an Important Component of Affordable Rates in Rural Areas

Modernization/Resiliency Efforts

- Planning New Transmission
  - SSEA 230-kV Transmission Project
    - 54 Miles
    - $45,000,000 in 2006 Costs
    - 10/21/2008 Application Submitted to BLM
    - Final Stages of Permitting with BLM



Modernization/Resiliency Efforts

- Rebuilding Existing Transmission
  - 76.6 Miles Rebuilt, Framed for 138-kV Upgrade
  - Shield Wire Added

Modernization/Resiliency Efforts

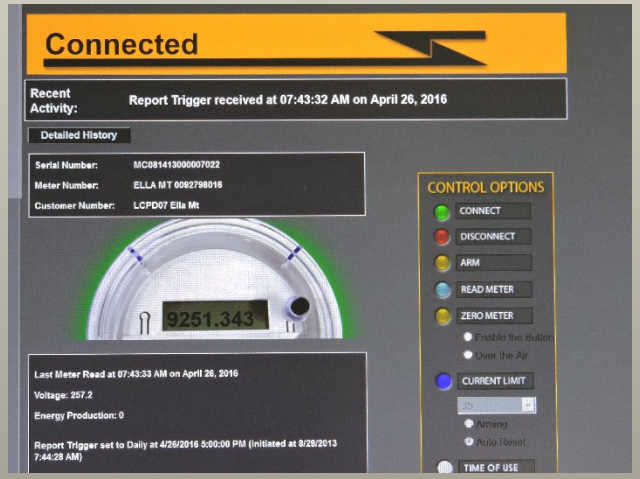
- Existing Distribution
  - Pole Testing and Change Out
    - 100% Tested, 8,800 Poles
  - Adding Shield Wire & Avian Protection
  - Adding Line Sectionalizing – Reclosers, Switches, Trip Savers

Modernization/Resiliency Efforts

- Existing Distribution
  - Undergrounding – Communities (Panaca, Caselton, new in Coyote Springs)
  - ROW Management
    - 2015 Began Program – 7.25 Miles Treated
    - 2016 – 32.2 Miles Planned at $155,000

Modernization/Resiliency Efforts

- Metering
  - AMI
    - Large Commercial
      - ION 8600 Meters – Web Based Access
    - Outage Management – Remote Areas
      - ITRON Nighthawk
  - AMR
  - Net Metering – 7 Locations in Lincoln County



Modernization/Resiliency Efforts

- Communication
  - Installing Overhead Optical Groundwire on Transmission
    - 41 Miles Complete
    - Isolate Substation SCADA from all Commercial Networks
  - Installing fiber optic cable in Coyote Springs
    - 4 Miles Complete
    - Goal is fiber to the home
  - Installing ADSS on Select Primary OH Distribution

Modernization/Resiliency Efforts

- Distributed Generation
  - Working with Solar Developer Proposing 3.75 MVA Project in Rachel Nevada
  - Constructed 90 kW Community Solar Project
    - Priced at $3,200 for 1 kW Share
    - Constructing 60 kW Phase 2 Addition

Modernization/Resiliency Efforts

- Capital Improvement Program
  - Annually Spending Nearly 25% of Operating Budget on Grid Modernization/Resiliency
  - Completed $4,203,886 in Capital Improvements Since 2011
  - Reduced SAIDI by Nearly 50% from 2011 Levels to 23.94 Minutes
  - SAIFI Reduced Slightly from 2011 Levels to 2.47%

Modernization/Resiliency Issues

- Radial Lines and Long Distances
  - Network and Underground Becomes Cost Prohibitive

Modernization/Resiliency Issues

- Right-of-Way Permitting
  - Rural Utilities Generally Located on Federal Land
  - Big Push for Roadless Construction
  - Last Distribution Line Permitted
    - 12.47-kV Single Phase Line
      Eight, 35-Foot, Wood Poles
    - Applied Dec. 2013, Granted Sept. 2015
    - Direct Line Material Cost $20,853.58
    - Direct Line Labor Cost $21,651.38
    - Total Project Cost $103,834.21
      - Biological Monitoring Cost
        $26,225.05 or 25.3%

Modernization/Resiliency Issues

- Snow/Ice Storms and Wildfire
  - Power Lines are Not Insurable
  - 1 Mile of Typical Distribution Line Costs $50,000
  - 1 Mile of Typical Transmission Line Costs $200,000

Modernization/Resiliency Issues

- Communications
  - To Grid Devices
  - To Support AMI

Modernization/Resiliency Issues

- Other Issues
  - Access to Facilities
  - Cost Effective Distributed Generation
  - Older Infrastructure

Questions/Answers

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