

Los Alamos County Department of Public Utilities

**Goals to Meet the Objectives of the
Distribution System Electrification Study**

Needed Upgrades from the Electrification Plan

Scenario	2040 Model Year			2055 Model Year - Incremental Costs			Total Scenario Cost
	System Improvement Costs	Asset Replacement Costs	Total Financial Impact	System Improvement Costs	Asset Replacement Costs	Total Financial Impact	
Scenario 1	\$53.7M	\$119.8M	\$173.4M	\$14.1M	\$94.6M	\$108.7M	\$282.1M
Scenario 2	\$38.1M	\$125.3M	\$163.4M	\$15.1M	\$86.1M	\$101.3M	\$264.6M
Scenario 3	\$27.6M	\$125.3M	\$152.9M	\$8.3M	\$82.9M	\$91.2M	\$244.1M

Asset Replacement Costs are Anticipated to be more significant than the System Improvement Costs due to Electrification.

System Improvements have a similar Financial Impact as Major Substation Upgrades were Necessary for All Scenarios.

The Bulk of the LAC Electric Distribution System is of Sufficient Capacity but Age is the Primary Concern and driving costs.

Electrification is Primarily Focused on Residential

- Conversion of Space Heating to Heat Pumps
- Conversion of Water Heating to Electric Heat Pumps
- Conversion of Automobiles to Electric
- This would result in increased electrical usage by residential consumers



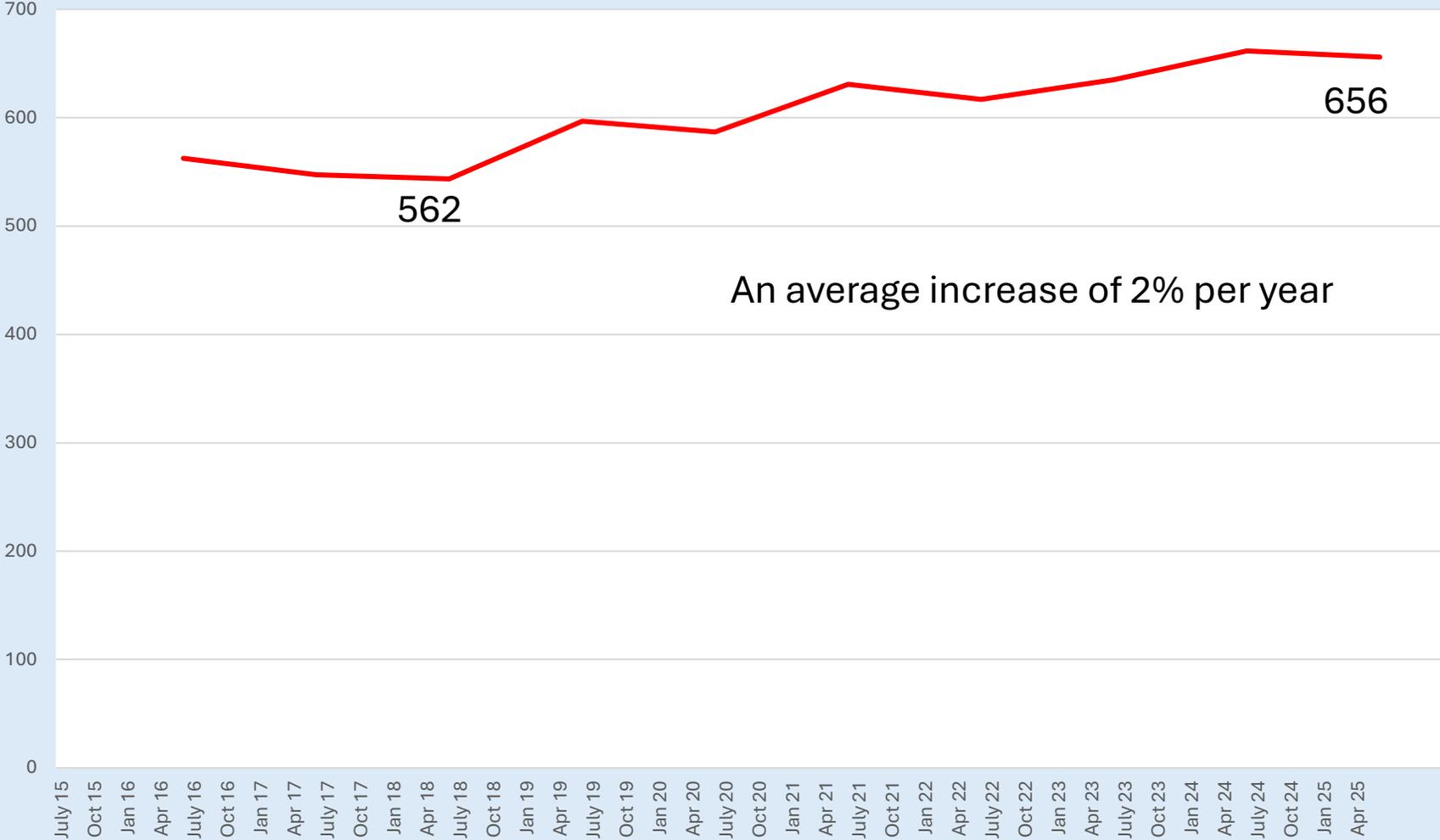
Energy Efficiency is also a Factor



- LED Light Bulbs are replacing Incandescent and CFL
- LED televisions are replacing CRT televisions
- Double pane windows
- Better wall and attic insulation
- Heat Pumps are more efficient than they were in the 1980's
- This should result in decreased residential usage

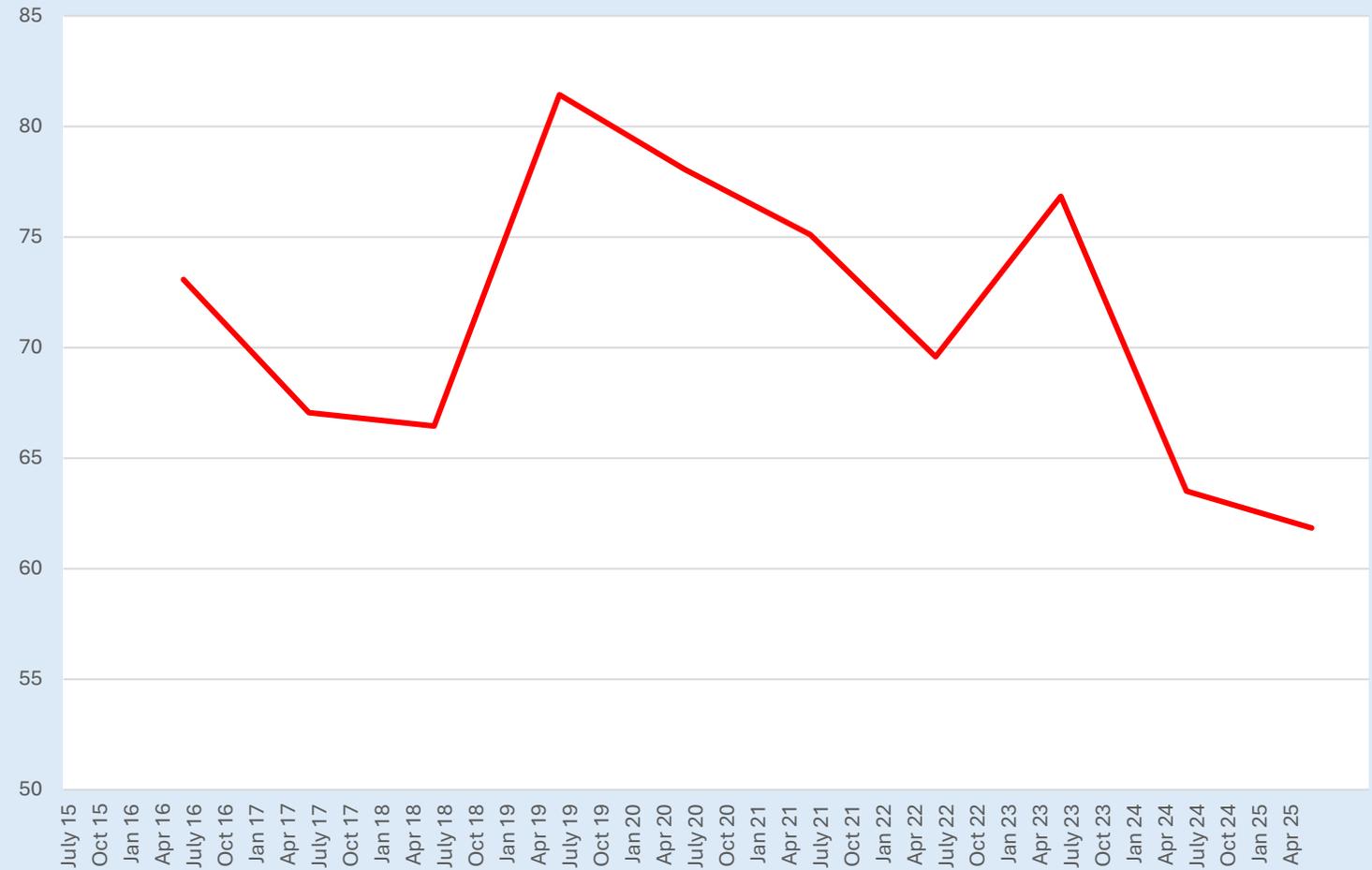
What is Happening with Residential Usage?

Average Annual Residential kWh Usage



What is Happening with Residential Usage?

Average Annual Residential Gas Usage



Suggested Improvements from the Study

- Increase Depth of the Electric Distribution Department. We recently added a Line Superintendent to the Team.
- Work with Milsoft to improve the Power Flow Model to align with the GIS system. This is in process by our GIS administrator.
- Implement Volt-Var Control for new PV Consumers. This will require an update to Rule E-5. Balcony Solar revisions should be included at the same time.
- Construct the East Gate Substation to increase Townsite Capacity. This is budgeted for Design next year. This will also require negotiation of a transmission line source from LANL.

Suggested Improvements from the Study

Upgrade of the EA4 line was identified

- This line is overhead from PCS to Redija Canyon and serves the wastewater treatment plant
- This line is at the end of its useful life and is not of sufficient capacity for future needs
- This project is designed and budgeted in the near future. We will apply for state funds in the next grant cycle.

Upgrade the transformers at White Rock Substation due to capacity limitations

- One of them is currently being upgraded

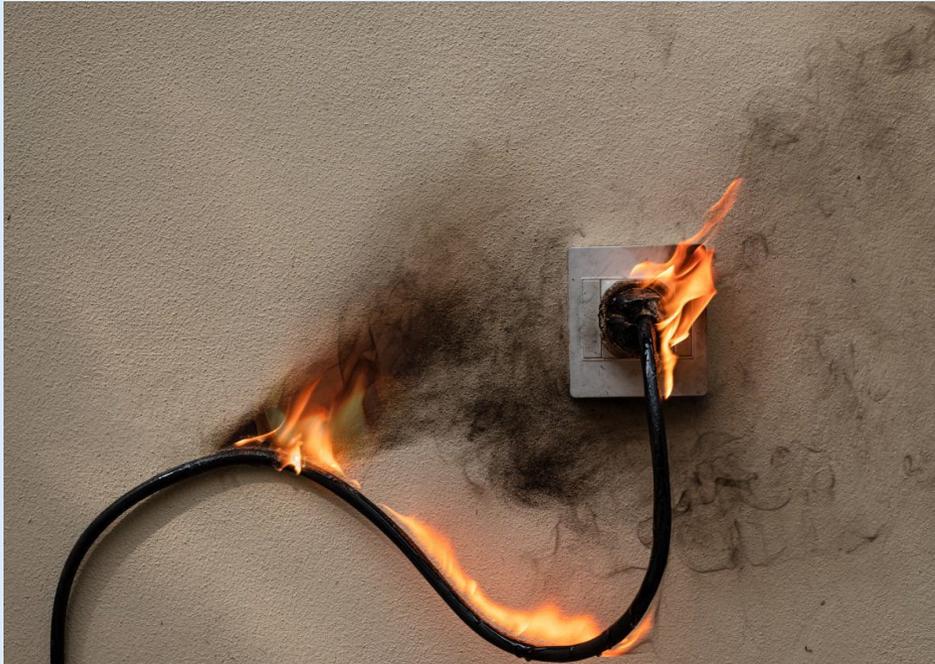
Suggested Improvements from the Study

- Investigate Demand-Side Management Programs. This will be evaluated by the Management Team after residential demand rates are implemented.
- Develop a holistic asset replacement plan that aligns with needs and budget. This is under review and will be performed with assistance of the line superintendent in coordination with the Broadband make ready needs.
- Perform an Integrated Resource Plan
- Perform an organizational Assessment for cross-departmental synergies. We are starting to work with other engineering project managers to share workload.
- Recruit an engineering project manager.

System Improvement Projects

- Underground Cable Replacement Projects were identified as a concern due to the circuits being at the end of their useful life
- Many of the older circuits are direct bury cables rather than being in conduit
- Underground Switchgear was identified due to many being at the end of their useful life. We are currently planning a number of switch replacements.

System Improvement Needs



- The bulk of the work on system improvement was the secondary services to the consumers
- Service wire capacities were installed undersized for many years
- Transformer capacities serving many consumers are also undersized
- There are some parallel secondary buses installed on some circuits

Broadband Project

- We have been contacted by the Broadband Team about their first seven sections of needed improvements to string fiber on the overhead lines
- This is called “make ready”
- They have called for some pole changes due to height and strength concerns
- They are calling for a lot of anchors due to stress on the poles from existing communications and additional stress from new fiber

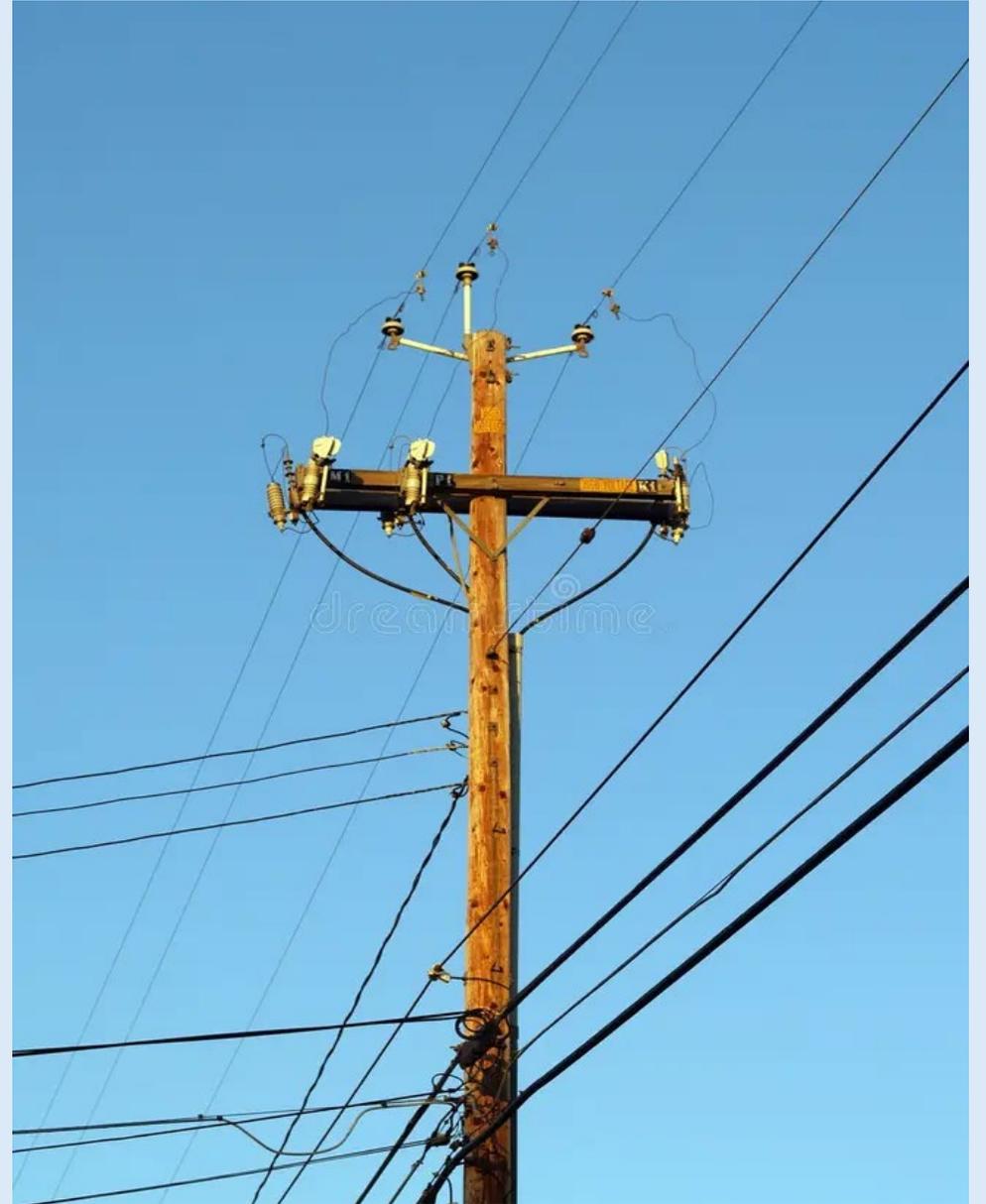


System Improvement Efficiencies

- We anticipate making progress toward overhead capacity improvements while performing needed “make-ready” work for the Broadband Project
- It is likely that some of the pole changes requested can be avoided by removing the open wire secondary circuits. These open wire secondary systems have been a concern for many years.
- By shortening the secondary runs to homes, we reduce voltage drop to the homes and improve the quality of service
- By improving the secondary services, we upgrade the services to residential consumers and get better prepared for electrification

What is on the poles?

- Overhead Power Lines
- Transformers
- Secondary Service Wires
- Telephone (Lumen)
- Comcast Cable Television
- Now County Fiber is being added
- NESC requires 40 inches between electric and communications



System Improvement Needs

- The County Broadband Initiative has identified a number of items of non-compliance on the overhead system to be corrected prior to installing fiber
- By completing the “make ready” projects, we will be mobilized once and able to do system improvements while on-site in back yards

Our Goals With Make Ready

- Update Overhead Lines with short spans by removing crossarms that tend to rot
- Replace crossarms with polymer post insulators
- Add transformers to reduce length of secondary runs
- Increase transformer size in some instances
- Remove open wire secondaries to free up pole space and loads
- Meet the needs of the Broadband Project, Distribution Reliability and Electrification Upgrades
- Inspect the condition of the overhead equipment
- Test to see if there is an advantage of the mobilization to meet internal and external goals at the same time

How it will be Done

- This is the backyard unit that can set a pole or lift a lineworker to the top of most poles
- It will be utilized to give us access to structures in the yards to update the construction



Ten Year Capital Improvement Plan

- Piedra Loop URD Replacement – FY 25
- Los Pueblos URD Replacement – FY – 26
- Camp May Road OH to URD – FY - 26
- Quemazon, North Road URD Replacement – FY – 27
- Eastgate Substation Design – FY - 27
- Aragon, Ridgecrest, Garver Catherine URD Replacement – FY - 27
- Sandia, 41st-47th, Ridgeway Tie URD Replacement - FY - 28
- Grand Canyon, Bryce, Richard Court, Rover URD Replacement – FY-28
- EA4 Power Line FY – 28
- La Senda URD Replacement – FY – 28
- Los Pueblos Phase 1 – FY - 28

Ten Year Capital Improvement Plan

- Tewa, Otowi, Nambe Loop, Santa Clara URD Replacement – FY – 29
- Los Pueblos Phase 2 – FY – 29
- Install SCADA for Electric Distribution – FY- 29
- Oakwood Loop, Nugget, Opal, Pinon, Spruce, Nectar URD – FY - 30
- Rover and Ridgecrest URD Replacement – FY - 30
- Construct Eastgate Substation and Feeders - FY - 30
- Sage Loop URD Replacement - FY - 31
- Kimberly Loop URD Replacement – FY -31

Ten Year Capital Improvement Plan

- Trinity from Diamond to Oppenheimer URD Replacement – FY -32
- Briston Pl, Brighton, Paul Pl, Todd Loop URD Replacement – FY -32
- Guaje Canyon Line Replacement – FY -33
- Unspecified URD in Los Alamos at \$1M per year
- Unspecified URD in White Rock at \$1M per year