LOS ALAMOS
Department of Public Utilities
Electric, Gas, Water, and Wastewater Services

Summary of Distribution System Electrification Study

Presentation to Los Alamos County Council
August 19, 2025

Major Assets of DPU

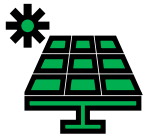
- The Los Alamos County Department of Public Utilities currently owns a substation in White Rock and takes delivery of power in Los Alamos from a LANL substation with a 20 MVA contract limit.
- The transformers in White Rock are in need of repair or replacement and not of sufficient capacity for load growth forecasted within the study.
- For Los Alamos Townsite load growth forecasted within the study has identified a need to construct the East Gate Sub-Station.

WHAT IS ELECTRIFICATION?

The electric distribution system is increasingly exposed to a wide variety of uncertain future grid scenarios and pressures including:

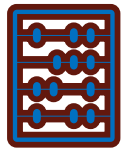
Evolving customer behavior and **expansion of electrification**

Increasing incidence of **inclement weather**



Proliferation of **distributed energy resources**

Heightened **customer sensitivity** to service interruptions



Aging infrastructure and **outmoded technology**

Electrification Scenarios

Comply with the Climate Action Plan

100% EV Adoption by 2055

100% Home & Commercial Electrification By 2055
20% Building Efficiency

50% Homes with Solar
20% Homes with Batteries

Climate Action Plan Scenario

1

Comply with Current Policies

Historical EV Trend in LAC

50% Home & Commercial Electrification By 2055
10% Building Efficiency

25% Homes with Solar
10% Homes with Batteries

Current Policy Scenario

2

Assume Government Regs. Play No Role

Historical EV Trend Statewide

25% Home & Commercial Electrification By 2055
0% Building Efficiency

10% Homes with Solar
5% Homes with Batteries

Natural Behavior Scenario

3

Three Load Growth Scenarios were Studied

2040 Electrification Forecast	Adoption % by 2040	MW Growth by 2040
EV Adoption		
Scenario 3 (Low)	15%	3.5
Scenario 2 (Med)	31%	7.1
Scenario 1 (High)	50%	11.5
Building Electrification		
Scenario 3 (Low)	22%	2.2
Scenario 2 (Med)	25%	4.1
Scenario 1 (High)	55%	16.0
Total Additional Electrification Peak Load		
Scenario 3 (Low)	NA	4.4
Scenario 2 (Med)	NA	8.5
Scenario 1 (High)	NA	20.9

2055 Electrification Forecast	Adoption % by 2055	MW Growth by 2055
EV Adoption		
Scenario 3 (Low)	30%	8.1
Scenario 2 (Med)	79%	18.2
Scenario 1 (High)	97%	22.4
Building Electrification		
Scenario 3 (Low)	38%	9.9
Scenario 2 (Med)	59%	18.7
Scenario 1 (High)	100%	33.3
Total Additional Electrification Peak Load		
Scenario 3 (Low)	NA	13.5
Scenario 2 (Med)	NA	28.0
Scenario 1 (High)	NA	44.4

Current Peak Load is Approximately 17 MW

What Is The Capacity of Electric Panel?

Customer electrification may require service upgrades

Panel upgrades, new conduit/trenching, circuit rewiring, make ready improvements, etc. Equipment and installation costs to the customer - $3,000 - $20,000+

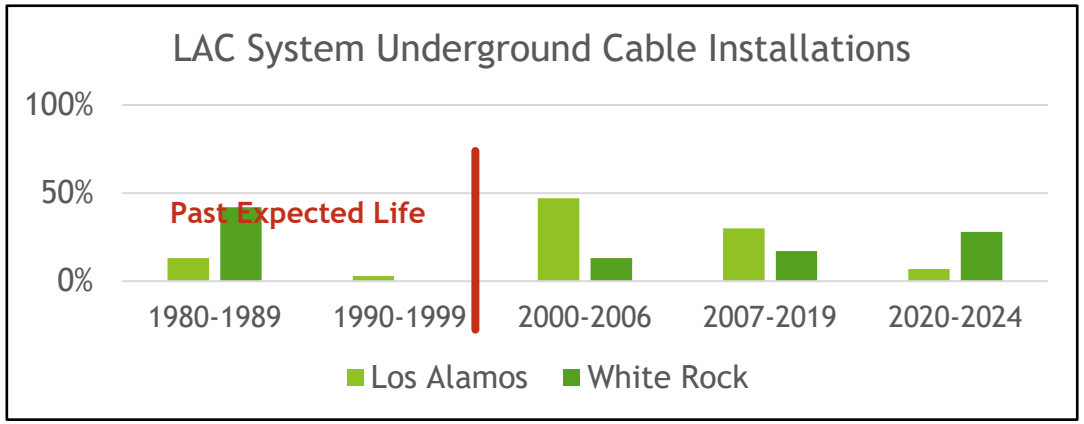
Utility upgrades include new service transformer, new service conductor, primary system upgrades, etc. **These costs impact utility operating budgets.**

Residential Panel Capacity Examples*

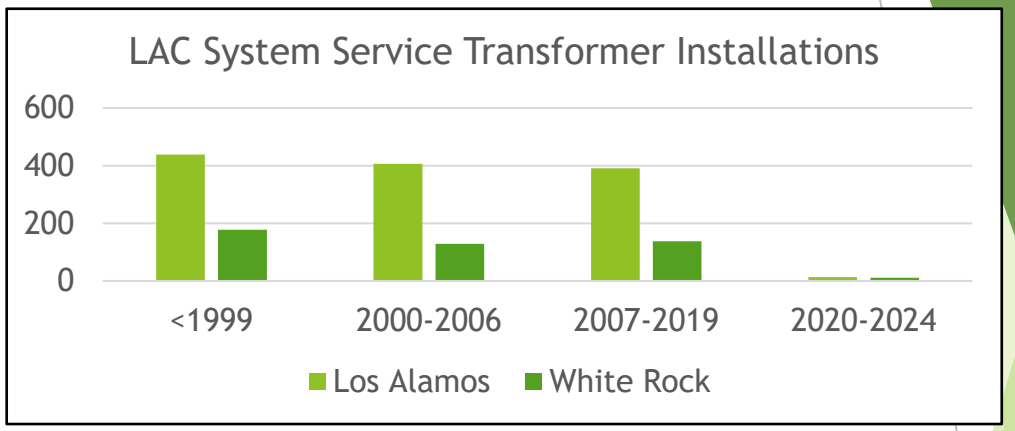
60 Amp	100 Amp	200 Amp	300 Amp+
Lighting	Lighting	Lighting	Lighting
Wall Outlets	Wall Outlets	Wall Outlets	Wall Outlets
Dishwasher	Dishwasher	Dishwasher	Dishwasher
	Clothes Dryer	Clothes Dryer	Clothes Dryer
	Oven/Range	Oven/Range	Oven/Range
	Mini Split/Wall Mount AC Unit	Water Heater	On Demand Water Heater
	Low Power EV Charging	Heat Pump/Air Conditioning	Heat Pump (s) and Strip Heating
		Medium Power EV Charging	High Power EV Charging
			Hot Tub/Pool Pump
			Shop/Outbuildings

Example of the age of DPU Lines

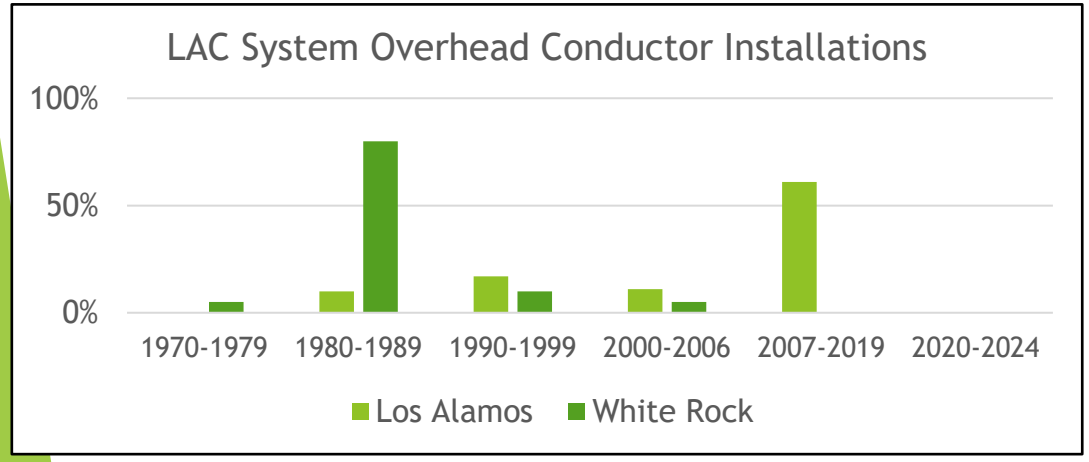
WHAT ARE THE DRIVERS OF THE COSTS FOR ASSET REPLACEMENT?



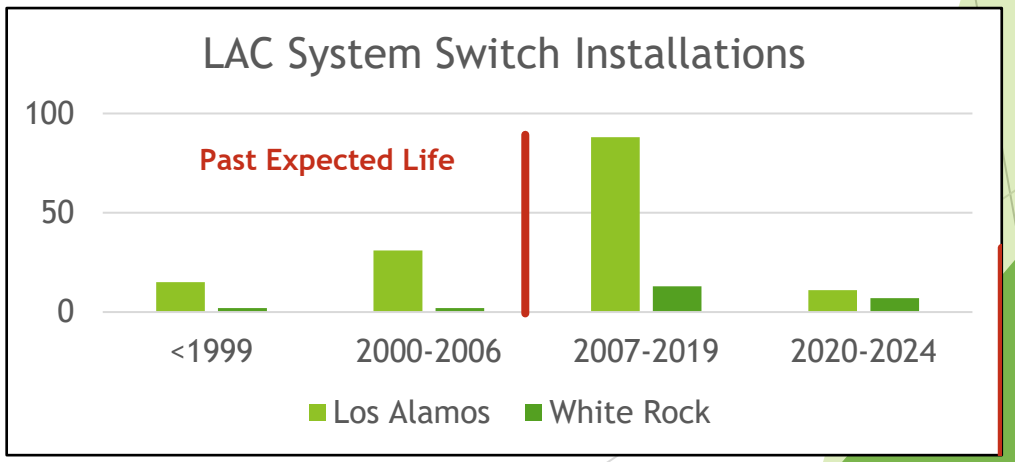
Expected life of URD cable – 30 Years



Typical Life of Service Transformer – 25 to 40 Years



Expected Life of Overhead Line – 40 Years



Expected Life of Switch - 20 Years

Attachment A

Financial Impact for Growth vs. Aged Assets

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.

What is being Done to Mitigate Costs?

- Vintage underground electric lines were direct buried in the earth. Replacement requires digging new cable into the ground – sometimes under streets or sidewalks. Repairs of failed cable require digging and splicing a section of cable.
- New underground electric lines are being installed in electrical conduit so that cable replacement can be more easily accomplished without the cost of digging.

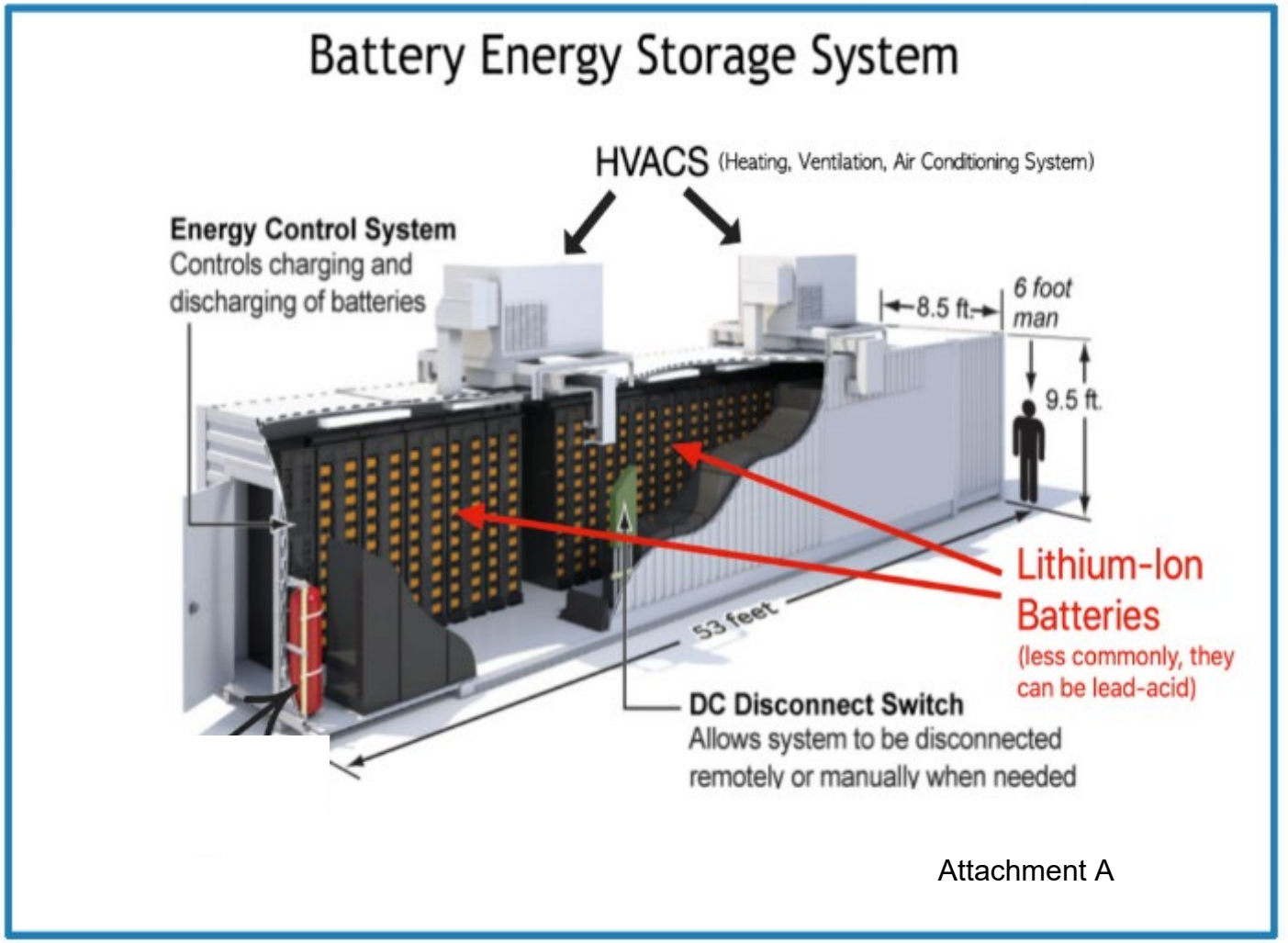
Attachment A

Efficient Load Growth

- Load Growth can be beneficial and it can be impactful.
- Efficient load growth is added when the system is lightly loaded. This can be related to the hour of the day (Early Morning) or the month of the year (Spring and Fall).
- Los Alamos Utilities is planning to implement a time-of-use rate design to encourage a shift in usage to off-peak hours. This would be easy for consumers to do with electric car charging since most systems can be programmed to charge after midnight.
- New combination washer/dryer units offer a delay start and dry clothing with heat pump technology. They can move their cycle to off-peak hours.

Additional Mitigation being Evaluated

- The report suggests the evaluation of adding Battery Energy Storage to assist in peak load management. The Department of Public Utilities has been evaluating the use of such systems and where one or more could be placed to benefit the community. These could lower wholesale power costs.



Attachment A

Summary

- The supportive detail is contained in the Electrification Study provided by 1898 & Co. – a division of Burns and McDonnell Engineering, Architectural and Construction Firm.
- The Electrification of LAC is not a driving costs for operating the distribution system. The costs are primarily driven by aging assets.
- With slow adoption, there is not enough additional sales to meet the financial needs of the utility. With the capital investments identified in the study, increased rates will be necessary to provide acceptable electric service.

Summary

- The Electric Department Personnel are highly effective and tightly integrated but hold a lot responsibility with few people. To prepare for success, it must transform to a more specialized group with greater depth so that the loss of key personnel minimizes impact on the team.
- The Team should be divided into three key groups that include Engineering and Planning, Project Management and Daily Operations which are functionally aligned.

Recommendations

- Work with Milsoft to improve the fidelity of the computer model for electrical studies. This is in development.
- Implement Volt-Var control for new PV consumers to mitigate voltage issues from their systems. This is being drafted for BPU's consideration.
- Construct Eastgate Substation to provide necessary capacity for Los Alamos. The design of the station is budgeted.
- Upgrade the White Rock Substation for expanded capacity. This is proposed with the transformer replacement.
- Investigate Demand Side Management Programs. This has been initiated with the Time-of-Use and Demand rates proposed no sooner than July1, 2026.

Recommendations

- Develop a holistic asset replacement plan that aligns with the system needs. DPU has an asset management team with a 10-year plan for each utility considering these plan recommendations.
- Analyze all DPU departments to identify workforce transition plans and cross-functional roles for staffing. DPU has an annual organizational assessment as part of the County's budget. Also, there will be a mid-year request to convert an overfill FTE to an Electric Distribution Superintendent.
- Perform a new Integrated Resource Plan to determine optimal resource selection based on the market. This will be done after the ECA with LANL is finalized.
- Perform an organizational assessment for cross-departmental synergies through a Project Management Office. This will be part of the organizational assessment.