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Witnesses:	A. Lykens

(U 933-E)

Liberty Utilities (CalPeco Electric) LLC

2025 General Rate Case

Before the California Public Utilities Commission

Chapter 2: Capital

Tahoe Vista, California
September 20, 2024

Liberty-02: Capital

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CAPITAL

A. Capital Expenditure Overview

Liberty's capital forecast is divided into five major categories: (1) Safety & Reliability – Distribution, (2) Safety & Reliability – Substation, (3) Safety & Reliability – Wildfire Mitigation, (4) Customer-Driven, and (5) Other Capital Projects. Table I-1 below identifies Liberty's capital forecast by the five categories and provides a snapshot of the forecast for years 2024 to 2027.

Table I-1
Capital Summary
$(000)

	2024	2025	2026	2027
Safety and Reliability - Distribution	6,568	11,743	10,123	14,008
Safety and Reliability - Substation	4,188	7,913	37,373	30,608
Safety and Reliability - Wildfire	24,572	45,098	20,713	20,673
Customer-Driven	7,579	7,787	8,001	8,221
Other Capital Projects	11,451	17,460	15,071	6,894
	54,358	90,001	91,280	80,404

Liberty's capital forecast reflects its commitment to the safety and reliability of service for its customers, employees, and the public. As discussed in Chapter 1 – Policy, the capital forecast includes significant investment in safety and reliability initiatives, with the vast majority allocated to wildfire mitigation, distribution, and substation projects.

B. Safety and Reliability – Distribution

The Safety and Reliability – Distribution forecasts include annual routine investments to sustain a safe and reliable distribution system. Other activities include pole replacements, rebuilds, transformer replacements, and street and highway improvements. Table I-2 shows the capital forecast for distribution projects from 2024-2027.

Table I-2
Safety and Reliability Projects - Distribution
$(000)

	2024	2025	2026	2027
Pole Replacements Per Test	464	477	490	504
Overhead Failures/Services	1,741	1,789	1,838	1,889
Underground Failures/Services	1,161	1,193	1,225	1,259
Overhead Rebuilds	2,259	2,321	2,385	2,450
Underground Rebuilds	478	5,486	3,693	7,402
Submersible Transformer Replacements	5	5	5	6
Claims	195	201	206	212
Street and Highway Improvements	265	272	279	287
Total	6,568	11,743	10,123	14,008

As depicted in Table I-3 below, Liberty primarily utilized either a five-year or three-year average of recorded expenditures to develop the forecasts for the routine work identified in Table I-2.

Table I-3
Safety and Reliability Projects - Distribution
$(000)

	2018	2019	2020	2021	2022	3-yr Avg	5-yr Avg	Forecast Method	2024	2025	2026	2027
Pole Replacements Per Test	321	308	1,305	256	26	529	443	5-yr Avg	464	477	490	504
Overhead Failures/Services	1,728	934	1,043	813	3,023	1,626	1,508	5-yr Avg	1,741	1,789	1,838	1,889
Underground Failures/Services	566	537	743	1,469	1,792	1,335	1,021	5-yr Avg	1,161	1,193	1,225	1,259
Overhead Rebuilds	3,694	3,130	2,851	1,369	2,365	2,195	2,682	5-yr Avg	2,259	2,321	2,385	2,450
Underground Rebuilds	808	(131)	133	310	423	289	309	5-yr Avg	478	5,486	3,693	7,402
Submersible Transformer Replacements	-	1	-	335	33	123	74	5-yr Avg	5	5	5	6
Claims	35	130	407	(162)	368	204	156	3-yr Avg	195	201	206	212
Street and Highway Improvements	513	712	-	(3)	114	37	267	5-yr Avg	265	272	279	287

1. <u>Pole Replacements Per Test</u>

Pole replacements per test include the replacement of aged wood poles identified during intrusive pole inspections. To develop this forecast, Liberty utilized a five-year (2018-2022) average of recorded costs as the number of poles requiring replacement has increased due to the aging of Liberty's distribution system.

2. <u>Overhead Failures and Services</u>

The overhead failures and services category includes the ongoing capital investment to replace overhead service infrastructure that has failed in service. To develop the forecast, Liberty utilized a five-year (2018-2022) average of recorded costs.

3. Underground Failures and Services

The underground failures and services category includes the ongoing capital investment to replace underground service infrastructure that has failed in service. To develop the forecast, Liberty utilized a five-year (2018-2022) average of recorded costs.

4. Distribution Rebuilds – Overhead

Distribution rebuilds – overhead includes the ongoing capital investment to replace and rebuild aging distribution overhead infrastructure. To develop the forecast, Liberty utilized a five-year (2018-2022) average of recorded costs.

5. Distribution Rebuilds – Underground

Distribution rebuilds – underground includes the replacement and rebuilding of aging distribution underground infrastructure. To develop the forecast, Liberty utilized a five-year (2018-2022) average of recorded costs for routine underground replacement and developed additional cost forecasts for specific larger underground rebuilds that will be completed in 2024-2027, as shown in Table I-4 below.

Table I-4
Distribution Rebuild – Underground Projects
$(000)

	2024	2025	2026	2027
Routine UG Rebuilds	278	286	293	302
Tahoe Keys	200	3,000	3,000	3,000
Pioneer Village	-	-	100	1,925
Highway 50	-	-	100	1,975
Upper Martis	-	1,000	-	-
Lower Martis	-	1,000	-	-
Vault Lid Replacements	-	200	200	200
	478	5,486	3,693	7,402

6. Claims

Claims includes the annual capital investment to replace or repair company or customer property damaged unintentionally by third parties. For the forecast, Liberty utilized a three-year (2020-2022) historical average to calculate expenditures.

7. Street and Highway Improvements

Street and highway improvements include maintenance work on streets and highways for safety and reliability. For the forecast, Liberty utilized a five-year (2018-2022) average of recorded costs.

C. Safety and Reliability – Substations

Liberty's capital forecast for substations projects reflects its commitment to the safety and reliability of service for its customers, employees, and the public. Table I-5 shows the projects scheduled from 2024 through 2027 and the associated forecasts. In 2023, Liberty commissioned a substation study to identify, assess, and plan for mitigation of substation projects. The study assessed the following factors for each of the substations:

- Risk of wildfire: evaluation of vegetation within the substation facility, aged wooden structures within the substation, the presence of gravel surrounding the electrical equipment and risk of aged equipment.
- Impact to customer reliability: reviewed data specific to each circuit that terminates within the evaluated substations, including but not limited to SAIDI and SAIFI reports reviewing customer count per circuits
- Existing contingency plans for service backup during failures: operational contingency in the event of a single substation outage
- Risk to the environment: Three major categories were reviewed: (1) aging oil equipment that will need replacement, (2) Spill Prevention Control and Countermeasure (SPCC) status and compliance, (3) status of green jacket animal guarding
- Equipment age/health and risk associated with failure: onsite assessments to evaluate health and aging of substation equipment, including age and known operational issues.

Liberty used the results of the study to identify and prioritize the substation projects and develop its long-term capital plan. The forecasts are based on the scope of work needed at each substation according to the substation study and derived using a substation tool that estimates the costs by assessing the equipment being installed and the labor required.

Table I-5
Safety and Reliability Projects - Substations
$(000)

	2024	2025	2026	2027
Portola Substation	1,379	-	-	-
Squaw Valley Substation	-	-	2,358	4,031
Prosser Substation	-	-	276	1,234
Stateline Substation	100	1,482	6,218	13,588
Sierra Brooks Substation	100	-	1,024	4,620
Cemetery Substation	-	-	1,380	5,918
Glenshire Substation	100	1,754	5,443	-
Meyers Substation	1,643	2,308	19,582	-
Beckworth Peak Substation	-	-	200	300
Emergency Equipment Replacement	816	2,108	624	641
Substation/Distribution Automation	50	261	269	276
	4,188	7,913	37,373	30,608

1. Portola Substation

The Portola Substation rebuild, commissioned at the beginning of 2024, will provide improved service to the town of Portola. The substation offers more redundancy, which allows for reduced outages while Liberty performs routine maintenance on equipment. The rebuild also removes aged equipment and replaces it with more modern equipment, including replacing oil circuit breakers and wooden box structures and installing an improved security fence around the substation. Liberty has been able to navigate through several challenges with the project. For example, the original office building suffered damage during the heavy winter. To preserve the safety and reliability of Liberty's services to its customers and employees, Liberty built a permanent structure to act as an Emergency Operations Center supporting enhanced response to outages impacting Liberty's Loyalton and Portola customers. For safer and more efficient access to the substation and warehouse, Liberty also paved the parking lots for these areas. Liberty has faced challenges with this project due to supply chain delays and the unforeseen need to decommission hazardous materials associated with the old substation.

2. Squaw Valley Substation

The Squaw Valley Substation located north of Lake Tahoe provides electricity to 1,764 customers. Given this vast area, the Squaw Valley Substation requires several maintenance and replacement items to support safe and reliable service to customers. This substation and its service lines

can be difficult to access in winter due to being in a high avalanche risk area. This substation also serves one of the largest ski resorts in the region. This substation ranked third in priority of required maintenance of the large substation groups.

This substation consists of steel structures for the 60kV and 120kV equipment, but the distribution circuits are currently served out of extremely old wooden box structures dating back to the 1990s. Steel bus structures will replace these decrepit box structures. Liberty will place a new switchgear control enclosure onsite.

Because circuit switchers have limited fault-clearing capacity and lack Current Transformers (CTs) for proper protection zones, Liberty will replace the 1003CS circuit switcher at this substation with a new 120kV rated circuit breaker. The transition to a circuit breaker enables bus protection relaying. The bus protection relaying will improve the protection of the transformers and bus structures in the substation, protecting critical equipment in the event of a fault.

Additionally, the 629 and 609 oil circuit breakers in the lower 60kV yard of the Squaw Valley Substation are 33 and 44 years old, respectively, and the 6003 breaker is only rated for 69kV operation. These will be replaced with new 120kV breakers to facilitate a smoother transition as the 60kV system is upgraded to 120kV.

To improve the reliability of the substation in the event of a fault on the 120kV bus, Liberty will install a bus tie switch. The bus tie switch will allow the faulty part of the bus to be sectionalized, enabling distribution to continue with limited interruption. Additionally, Liberty will install a motor-operated (MO) switch to provide better protection, support auto-restoration, and eliminate the need of a switchman to be on-site. The MO switch is a more efficient and reliable choice compared to other alternatives, such as a manual switch.

Additionally, the porcelain coupling capacitor voltage transformer (CCVT) on the 120kV 132 Line at Squaw Valley is broken and will be replaced. Liberty will also add two more CCVTs to provide true line potential for the line protection relays. This is especially important if a 120kV bus tie switch or breaker is installed, as it provides redundancy.

3. <u>Prosser Substation</u>

The Prosser Substation is located near Prosser Dam (north of Lake Tahoe). The equipment at this substation is aged and requires replacement. As discussed below, multiple replacements and upgrades are necessary to support service reliability and safety at the substation.

With respect to the safety upgrades, Liberty will replace the barbed wire fencing that has multiple gaps around this substation and reattach the gate that is off its hinge. Other conditions Liberty

will address include: (a) gravel on the site has bald spots making the gravel uneven; (b) existing vegetation requires significance maintenance and application of alternative herbicides because the site is close to a waterway; and (c) substation needs a transformer, multiple fuses, insulators, and lightning arrestors. To minimize risks and protect employee and public safety, Liberty will add gravel and remove vegetation. Among other benefits, the addition of the gravel to the site will facilitate the establishment of an oil berm, as the current oil berm has degraded over time.

To enhance protection of the transformer, Liberty will replace the current high side expulsion fuses with a Viper-HV recloser. High side expulsion fuses could disperse sparks during a fault. In contrast, the Viper-HV recloser—rated for 72.5kV, 2000A continuous, 31.5kA interrupting, and 80kA peak for short-circuit making—provides the same function but reduces the risks of sparks being dispersed during a fault. It is pole-mounted and controlled by an SEL-651 relay, which maintains instantaneous overcurrent protection and adds time overcurrent capability. This setup, which includes the installation of a small RTU cabinet for remote information and control, will interrupt the circuit inside the viper mechanism during a transformer fault, addressing concerns associated with expulsion fuses.

For the 14.4kV distribution system, the current fuse will be replaced with a new Viper-ST recloser controlled by an SEL-651. This replacement will mitigate the possibility of spark eruption from the fuse during fault clearing. The Viper-ST recloser allows multiple trips and recloses outside fire season to improve reliability on unsustained faults. The installation of an RTU cabinet will also enable remote control and monitoring of the recloser, allowing for adjustments during inclement weather and providing dispatch with real-time relay status.

4. <u>Stateline Substation</u>

The Stateline Substation is located in South Lake Tahoe and serves approximately 5,500 customers. The Stateline Substation has several action items, as it ranks second on the priority list of large substation rebuilds. This substation has an increased risk of wildfire due to the presence of wooden structures and older oil filled equipment, along with the vegetation in its vicinity.

The inability to transfer the entire distribution load to another transformer when one transformer is faulted or undergoing maintenance makes the current setup of the substation vulnerable with the potential of disrupting 5,500 customers.

The wooden fence that protects Stateline Substation is in poor condition with many vulnerabilities and needs to be replaced. There are multiple points of weakness in the fence, including wood that has rot and holes, gaps at the bottom, and broken sections. These issues with the fence compromise public safety, station security, and system reliability. The fence stands approximately six feet

in height with three strands of barbed wire on top. In several places, the barbed wire is broken or loose, making it easily climbable and posing risks for safety, theft, or wild animals. As such, Liberty will replace the fencing at this substation with a new uniform eight-foot chain link fence and barbed wire. The main entrance will be shifted slightly to the north to provide proper clearance and more efficient vehicle access.

The station currently has three transformers (#1, #3, #4). Transformer #4 is one of the older transformers and has limited capacity. Transformer #4 is not equipped with a load tap changer (LTC), so it requires a separate voltage regulator. The LTC or voltage regulator allows Liberty to monitor the voltage for customers fed from the substation. This transformer feeds to an old 14.4kV wooden box structure that only has one feeder served by a Viper recloser, controlled by an SEL-351 inside the small control enclosure.

For optimal reliability and ease of service restoration, the best practice is for two distribution power transformers to be of equivalent size and able to operate in parallel with a bus tie breaker. Each transformer would feed its respective 14.4kV bus with the bus tie breaker in a normally open position. That way, in the event of a fault or maintenance requirement, one transformer would be able to handle the entire distribution load of both transformers. Presently, Stateline Substation is not equipped and cannot perform in this way. At this Stateline Substation, if Transformer #1 fails during peak load periods, there would be significant issues with supplying the load, as the entire load cannot be shifted to Transformer #4. Similarly, the potential loss of Transformer #4 during peak load would cause Transformer #1 to be overloaded. As such, Liberty will add Transformer #2, and Transformer #4 will be removed from service.

5. <u>Sierra Brooks Substation</u>

The Sierra Brooks Substation located north of Lake Tahoe serves nearly 300 customers, consists primarily of steel structures, and is fenced.

Sierra Brooks Substation is furnished with a single aged power transformer and, similar to other smaller-sized substations in the area, is vulnerable to equipment-related failures. To address and reduce this risk, Liberty will replace Transformer #1 with a new LTC transformer. The present transformer needs to be replaced to enable power supply to the peak load and load growth. Liberty will remove the aged transformer and replace it with a modern LTC (Load Tap Changer) transformer. This process will include, but is not limited to, the removal of the voltage regulators, upgrading the Spill Prevention, Control, and Countermeasure (SPCC) for enhanced oil containment, and installing CTs

(Current Transformers) to enable relay protection capabilities. The CTs will also provide live transformer data to system operations for continuous monitoring and alarm points.

Additionally, Liberty will replace the transformer high-side fuses with new 60kV circuit breakers, offering enhanced capabilities such as more flexible protection zone options and a higher interruption prevention capacity. This upgrade will improve system reliability and protect performance. The new circuit breakers also provide differential and time overcurrent protection enhancing the overall safety and reliability of the system. These equipment replacements improve Liberty's system resilience and performance by better mitigating risks associated hot spots, hot oil, and sudden pressure.

6. Cemetery Substation

Cemetery Substation is furnished with a single aged power transformer, and similar to other smaller-sized substations in the area, is vulnerable to equipment-related failures. To address and reduce this risk, Liberty will replace Transformer #1 with a new LTC transformer. Liberty will remove the aged transformer and replace it with a modern LTC (Load Tap Changer) transformer. This process will include, but is not limited to, the removal of the voltage regulators, upgrading the Spill Prevention, Control, and Countermeasure (SPCC) for enhanced oil containment, and installing CTs to enable relay protection capabilities. The CTs will also provide live transformer data to system operations for continuous monitoring and alarm points.

Additionally, the replacement of high side fuses with a new 60kV circuit breaker provides more options for protection zones and higher interruption prevention capacity and differential and time overcurrent protection. The updated transformer and breaker enhance protection against hot spots, hot oil, and sudden pressure.

Liberty will replace the current 14.4kV distribution system, fed by two ABB vacuum reclosers, with new Viper-ST reclosers controlled by an SEL-651. The Viper-ST recloser allows multiple trips and recloses outside fire season to improve reliability on unsustained faults. The station RTU can remotely enable fire mode or other settings during inclement weather, with dispatch monitoring the relay's state. Additionally, Liberty will replace the old bypass switches with new fused bypasses to address fusing issues on lines external to the substation.

7. Glenshire Substation

Glenshire Substation is located north of Lake Tahoe near Truckee. Glenshire Substation is furnished with a single aged power transformer, and, like other smaller-sized substations in the area, is vulnerable to equipment-related failures. To address and reduce this risk, Liberty will replace Transformer #1 with a new LTC transformer. Liberty will remove the aged transformer and replace it

with a modern LTC (Load Tap Changer) transformer. This process will include, but is not limited to, the removal of the voltage regulators, upgrading the Spill Prevention, Control, and Countermeasure (SPCC) for enhanced oil containment, and installing CTs (Current Transformers) to enable relay protection capabilities. The CTs will also provide live transformer data to system operations for continuous monitoring and alarm points.

Additionally, the replacement of high side fuses with a new 60kV circuit breaker provides more options for protection zones and higher interruption prevention capacity and differential and time overcurrent protection. The updated transformer and breaker enhance protection against hot spots, hot oil, and sudden pressure.

Liberty will replace the current 14.4kV distribution system, fed by two older viper reclosers, with new Viper-ST reclosers controlled by an SEL-651. The Viper-ST recloser allows multiple trips and recloses outside fire season to improve reliability on unsustained faults. The station RTU can remotely enable fire mode or other settings during inclement weather, with dispatch monitoring the relay's state. Additionally, Liberty will replace the old bypass switches with new fused bypasses to address fusing issues on lines external to the substation.

8. <u>Meyers Substation</u>

The Meyers Substation located in South Lake Tahoe serves nearly 17,000 customers, the most of Liberty's substations. This substation consists primarily of steel structures, some of which are significantly aged. Additionally, the capacity of the existing transformers restricts the ability of the system to support the full distribution load if one transformer should fail during peak load periods.

Transformer #1 has very aged external slipover CTs. Both Transformers #1 and #2 have separate voltage regulators. According to the peak loading sheet from 2022, Transformer #1 was loaded at 17.5 MVA, while Transformer #2 was loaded at 23.67 MVA. Such results indicate that, during transformer maintenance or a fault, the ability to support the entire distribution load on one transformer would depend on the time of year, raising concerns about system integrity and lack of redundancy. Liberty will replace Transformer #1 and #2 with new LTC transformers whose capacity can be increased to allow one transformer to carry the full distribution load alone.

Transformer #3 is aged and contains external slipover CTs, some of which are visibly cracking. Transformer #3 is not equipped with an LTC and is associated with Regulator #3. Liberty will replace the transformer with a new 120/60kV auto transformer (the standard size at other Liberty substation sites being 75MVA) which allows for significant room for growth. Replacing Transformer #3

enables the removal of Regulator #3. The scope also includes new 120kW line CCVTs and new 120kV bus Tie Breaker and other associated equipment.

9. Emergency Substation Equipment Replacement

The emergency substation equipment replacements program replaces substation equipment that has failed in service or has been identified as at risk of failure during substation inspections. Liberty utilized a five-year (2019-2023) average of recorded costs to develop its forecast for emergency substation equipment replacements.

10. Substation/Distribution Automation

Distribution automation is an ongoing program designed to improve the restoration times and reliability of distribution feeders. By incorporating advanced sectionalizing devices with communication capabilities and "smart technology," outages can be automatically isolated to affect the smallest number of customers possible. These devices eliminate the need for manual field switching operations, significantly reducing restoration times, and improving overall system performance.

11. Northstar Redundancy

The Northstar Substation located north of Lake Tahoe near Northstar ski resort has one transformer, Transformer #2. In 2022, Northstar's load peaked at around 17.5 MVA, a significant load for a single transformer. In the event of a transformer fault, maintenance, or inspection, this substation lacks auto restoration to keep the distribution system energized. Liberty will add a second transformer, Transformer #1. This second transformer will add redundancy, support reliability, and increase the overall capacity of the site to support future load growth.

To improve the reliability of the substation in the event of a fault on the 120kV bus, Liberty will install a bus tie switch. This switch would allow the faulty part of the bus to be sectionalized, enabling the distribution to continue with limited interruption. Liberty will also install a motor-operated (MO) switch or a 120kV bus tie breaker for better protection. To enhance redundancy and reliability, Liberty will install 120kV line CCVTs at the 188 Line and 187 Line terminals. This is particularly important if a 120kV bus tie switch, MO, or breaker is installed, as it ensures that line protection remains functional even if the bus potential is deenergized.

Additionally, Liberty will replace the CS1002 circuit switcher with a new 120kV rated breaker. Circuit switchers have limited fault-clearing capacity and lack CTs for proper protection zones. The update to circuit breakers provides better protection and faster response through bus differential relaying.

D. Safety and Reliability – Wildfire Mitigation

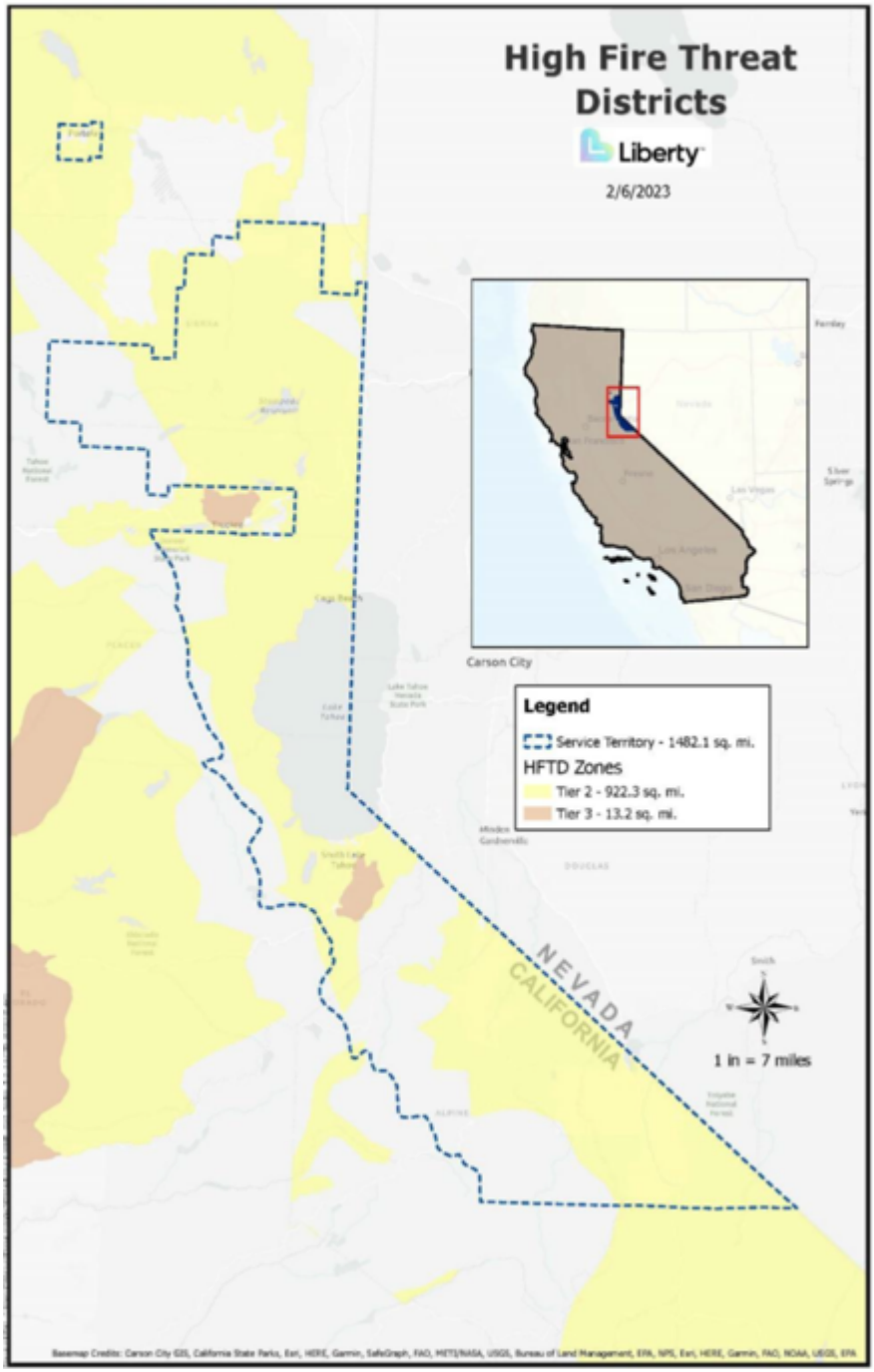
Liberty continues to make significant capital investments in its system to mitigate the potential impact of wildfires. Table I-6 provides a list of the various wildfire mitigation programs Liberty forecasts from 2024-2027.

Table I-6
Safety and Reliability Projects – Wildfire Mitigation
$(000)

	2024	2025	2026	2027
Automatic Reclosers and Fast-Curve Setting	1,000	1,500	-	-
Covered Conductor	7,135	11,160	7,081	6,361
Distribution Fault Anticipation	50	50	-	-
Fuse Replacement Program	1,000	1,000	2,000	2,000
Resiliency Program (Poles and Fuses)	8,800	25,786	-	2,000
Emerging Technology	-	-	2,500	100
Traditional Overhead Hardening Initiative	3,500	2,500	5,000	5,000
Tree Attachment Program	1,072	1,102	1,132	1,163
Weather Stations	15	-	-	-
Northstar Redundancy (2nd Transformer)	-	-	-	1,049
Wire Upgrade Program (Open Wire/Gray Wire)	2,000	2,000	3,000	3,000
	24,572	45,098	20,713	20,673

As shown in the figure below, the majority of Liberty's service territory (approximately 63 percent of total service area, or 936 square miles) is located within High Fire Threat Districts (HFTD). The vast majority of Liberty's electrical equipment and infrastructure (approximately 93%) is located within HFTD Tiers 2 and 3 areas. See Chapter 5 of the testimony for a discussion of how Liberty analyzes risk and prioritizes projects. There are many additional considerations in determining project prioritization (such as outage history, reliability, capacity considerations, and asset condition), but with respect to location, Liberty prioritizes projects in the highest fire threat areas each year based on the available wildfire risk analyses performed prior to planning mitigations.

Figure I-1
High Fire Threat Districts



1. Automatic Reclosers and Fast-Curve Setting

The objective of the Sensitive Relay Profiles (SRP) Program is to enhance protection on Liberty's primary conductor lines by implementing sensitive relays and optimized relay settings. SRP improves response during high-wildfire-risk conditions by enabling fast tripping and disabling reclosing, thereby mitigating wildfire risks in the service territory. In 2024, Liberty will continue working toward full coverage of ~700 miles of primary conductor with SRP, with the current forecast targeting full coverage by the end of 2025. Circuit data from Liberty will be analyzed by the University of Nevada, Reno (UNR), which will conduct fault analysis studies to design proper fast-tripping schemes for individual feeders. UNR will provide Liberty with a detailed report with recommended changes. These changes are anticipated to include SRP implementation and potentially the installation of additional recloser units in areas where blind protection zones are identified.

2. Covered Conductor

Liberty will replace overhead lines with covered conductor to protect against wildfire ignitions in high fire risk areas and to improve system reliability during volatile weather events. Liberty takes a targeted approach for its covered conductor projects by engaging in the following steps: (a) identify at-risk wildfire areas by High Fire Threat Districts (see Figure 1-1), (b) gather and organize risk-related data by circuit and analyze data such as SAIDI and SAIFI data for the associated circuit, (c) develop a plan for each circuit that reviews covered conductor and alternatives based on risk, impact and cost, and (d) continue to track performance of covered conductor program by circuit or segment using visualization applications.

The project scope and design for covered conductor projects includes replacing and installing new overhead assets, pole loading analysis, and addition of new crossarms, lightning arrestors, fuses, and other hardware. The vegetation management group also inspects the proposed line installation route for capital jobs to evaluate need for additional tree work. Table I-7 below provides a list of Liberty's covered conductor projects between 2024 and 2027.

Table I-7
Safety and Reliability Projects – Covered Conductor
$(000)

	2024	2025	2026	2027
Meyers 3400 Angora Ridge MicroGrid	3,000	-	-	-
640A Line & 3100 Underbuild	100	1,200	-	-
Meyers 3400 Fallen Leaf C	2,047	-	-	-
Meyers 3400 Fallen Leaf D	100	2,805	-	-
Fir Crags 7200	100	750	-	-
Tahoe City 7300 9	1,438	-	-	-
Tahoe City 7300 10	300	1,500	-	-
Tahoe City 7300 11	-	120	1,800	-
Tahoe City 7300 12	-	120	1,800	-
Meyers 3100	50	2,115	-	-
Beckworth Microgrid	-	1,000	-	-
640B Line	-	1,300	-	-
Stateline 2300	-	-	3,281	-
Brockway 5100	-	-	-	2,100
7202 Line	-	-	-	2,100
Tahoe City 7200	-	-	-	100
Spring Creek Tract	-	50	-	1,861
Ski Hill	-	200	200	200
	7,135	11,160	7,081	6,361

a) Meyers 3400 Angora Ridge Covered Conductor

The Meyers 3400 Angora Ridge Covered Conductor project addresses the need for wildfire mitigation and reliability improvements. Due to regulations established by the Wildfire Management Plan, Liberty is required to decrease the fire risk presented by the Angora Ridge Distribution Line. The current Angora Ridge Distribution Line runs from Fallen Leaf Lake to Angora Lakes, running approximately 1.8 miles through Tier-2 wildfire territory. The line follows Angora Ridge, serving a total of 17 individual electric meters in an incredibly remote, high elevation area of the territory. Dominant loads include a vacation resort and a collection of private summer cabins. For the entire line, the estimated peak demand is 51 kW and peak monthly usage is 6,150 kWh/mo. Most of the usage occurs during the summer months, with usage dropping significantly during the winter. This project is in a Tier 2 HFTD, which is an increased wildfire risk area. This project will replace approximately 3,807 circuit FT. (8,376 cable FT.) of Tree Wire Covered Conductor and approximately 35 poles. Due to the difficult access points, Liberty will have to long line the poles and crews in the area to complete the work. Due to the

constraints outlined by the Forest Service and the snowy conditions, which do not typically abate until June, Liberty has a limited window to access the area. Liberty is also required to move any vegetation by helicopter incurring additional costs.

b) 640A and B Line & 3100 Underbuild

The 640A Line and 3100 Underbuild project involves reconductoring six miles of 60kV conductor and two miles of 14.4kV conductor. The project consists of two phases. Phase A includes three miles of 60KV and two miles of 14.4KV under build starting at Meyers Substation. Phase B consists of three miles of 60KV line. The single pole structures will be designed to 120 kV spacing to match other 60 kV lines. This project continues the System Hardening component from Liberty's 2020 Wildfire Mitigation Plan (WMP) submitted on February 7, 2020. System hardening relates directly to system infrastructure or design enhancements or modifications. Liberty plans to re-conductor bare electrical lines with covered conductors within Liberty Utilities Tier 2 and Tier 3 HFTD.

c) Meyers 3400 Fallen Leaf C and D

The Fallen Leaf C and D projects are a continuation of the covered conductor projects in the heavily forested area around Fallen Leaf Lake. The projects address the need for wildfire mitigation and reliability improvements on one of the highest risk circuits in the system. The area along these projects has limited access by a one lane road that is not open in the winter. Replacing this aged circuit is a project included in Liberty's previously approved WMP. The third and fourth phase are planned for this GRC cycle and involve replacing the Fallen Leaf portion of the 3400 circuit. The projects are located along the east shore and access road to Fallen Leaf Lake. This area is in Tier 2 HFTD adjacent to a Tier 3 HFTD. The Fallen Leaf C Covered Conductor Project includes 1.5 circuit miles of tree wire covered conductor and 46 pole replacements. The Fallen Leaf D Covered Conductor Project includes 2.1 circuit miles of tree wire covered conductor and 51 pole replacements.

d) Fir Crags 7200

The Fir Craggs 7200 project located along the Truckee River outside of Tahoe City on the 7200 Circuit involves the replacement of existing poles and conductor. The existing line features an extended run of secondary wire, approximately 1,800 feet, that will be upgraded to primary. There is also approximately 1,400 feet of bare #4 copper primary that will be replaced with tree wire, as this is a densely forested location.

e) Tahoe City 7300 Phases 9-12

The Tahoe City 7300 Circuit reconductoring projects are a series of projects to convert 15 miles of the aged, bare, overhead primary conductor. Eight phases of this project have

previously been completed, and phases 9 through 12 are planned for construction within this GRC cycle. Additional phases will be required in the future to complete the circuit. These projects are located along the west shore of Lake Tahoe near and north of the Tahoma and Homewood communities. These projects are part of the Liberty's previously approved WMP. They are being done on a high-risk circuit in a Tier 2 HFTD area. They will also provide for improved reliability by reducing outage times.

Phase 9 consists of installing 0.4 miles of covered conductor and replacing 16 poles just south of the Homewood Ski Area. Phase 10 will cross the Homewood Ski Area and phases 11 and 12 continue the replacement of the circuit heading north.

f) Beckworth Microgrid

Beckworth Peak serves critical load in Liberty's service territory providing service to cell towers in the Portola Loyalton service territory with underground lines initially installed in the 1960s. Over time, the lines have become problematic and, when the line experiences outages, the crews spend hours identifying and replacing the underground lines. Although the cell towers have generators, they are insufficient to sustain the outage duration. Liberty plans to replace the underground lines with a solar plus backup battery storage microgrid and connect them to the generators owned by the communications companies providing additional redundancy. The microgrid will mirror the design of the successfully completed SageHen microgrid in an effort to reduce outages and the costs associated with crew responses.

g) Stateline 2300

The Stateline Resiliency Project involves undergrounding a portion of the 2200 and 2300 circuits originating from the Stateline Substation in South Lake Tahoe. The work will commence and conclude at existing underground primary sections, resulting in a significant portion of these circuits being converted to underground.

This project seeks to mitigate wildfire ignition potential by replacing overhead distribution lines with underground infrastructure. It will also enhance reliability by providing a dependable power source for public shelters during emergencies or Public Safety Power Shutoff (PSPS) events. Specifically, the project will keep the Raley's Shopping Center and the Casino Corridor powered during a PSPS, enabling these locations to serve as shelters and to continue to operate.

The project includes the removal of nine poles and the undergrounding of approximately 0.4 miles of aged overhead primary distribution. County permitting is required before the project can proceed to the construction phase.

h) Brockway 5100

The Brockway 5100 project located in Kings Beach is fed by the Brockway Substation. This line ties into Nevada Energy and feeds a local warming shelter. As such, reliability is imperative. This project will replace poles and upgrade 1.5 miles of primary to covered conductor. By converting to covered conductor, Liberty will address the need for wildfire mitigation and grid hardening on a vulnerable circuit.

i) 7202 Line

The 7202 Line project located along the Truckee River outside of Tahoe City will replace existing poles and conductor to reduce wildfire risk and improve reliability. This area is densely forested and will be more resilient with the installation of 2.5 miles of covered conductor. Poles on this circuit were installed in the 1950s and require replacement to achieve system hardening.

j) Tahoe City 7200

The Tahoe City 7200 project located along the Truckee River outside of Tahoe City on the 7200 Circuit will replace existing poles and conductor in a densely forested area with limited access. Aging poles will be replaced, and conductor will be upgraded to tree wire. These efforts further wildfire mitigation efforts in a high fire risk region of Liberty's service territory.

k) Spring Creek Tract

The Spring Creek Tract Project located on Tahoe's west shore is fed by the Meyer's 3400 circuit. This project will be completed in two phases and addresses the need for wildfire mitigation and reliability improvements on one of the highest risk circuits in the system. The project consists of replacing approximately 75 poles and upgrading the primary to covered conductor. This area is heavily forested and currently features aging infrastructure that requires replacement.

l) Ski Hill

The Ski Hill Projects are designed to address clearance issues caused by overhead lines in ski resort areas which experience extreme snow conditions that exceed the standards set forth in G.O. 95. This program focuses on collaborating with ski resorts to either underground or elevate and reinforce overhead lines, promoting operational integrity throughout the ski season. The harsh winter conditions in these areas pose significant challenges to restoration efforts when outages occur. By improving the infrastructure, the program enhances reliability and minimizes downtime aiding the ski resorts and protecting the safety of their patrons and staffs during the busy winter months.

3. Distribution Fault Anticipation

Distribution Fault Anticipation (DFA) is a technology developed by Texas A&M Power System Automation Laboratory that interprets variations in electrical currents on electrical circuits caused by potentially deteriorating conditions or equipment. Liberty continues to pilot the technology and evaluate the benefits for potential expansion of the program. In Liberty's service territory, DFA remains in the implementation phase. Ten DFA units have been installed at the Meyers, Stateline, and Northstar Substations monitoring 10 circuits and evaluates the electrical current and voltage wave forms in high fidelity. This data is used to generate reports with recommendations of which circuits to investigate for specific problems identified by the algorithmic report process. Liberty is currently evaluating the effectiveness of this technology for informing preventative maintenance and anticipating fault events.

4. Fuse Replacement Program

The Fuse Replacement Program enhances safety and reliability by replacing expulsion fuses in Liberty's territory with Expulsion Limiting Fuses (ELFs). Unlike traditional expulsion fuses, which can release high-energy arcs during fault scenarios, ELFs are designed to restrict current flow, thereby minimizing the energy released during a trip event. This reduction in energy significantly lowers the risk of sparks or slag contacting the ground and potentially igniting a fire. By upgrading to ELFs, the program aims to improve overall system safety and reduce fire hazards and provide greater protection for the surrounding environment and communities.

5. Resiliency Program (Poles and Fuses)

The Resiliency Program is a multi-year wildfire mitigation effort that began in 2023. The program combines T-Link fuse replacements, secondary and service replacement and replacement of the associated poles, as determined by the G.O.165 detailed inspections. This combination of different work activities helps maximize labor costs of crews working at the same or approximately close locations. The work is prioritized based on wildfire risk level and circuits' SAIDI/SAIFI values to improve system reliability. In addition to protecting the system, the program will collect data that will further strengthen Liberty's GIS mapping system. Since the inception of the project, Liberty has seen significant improvements to resiliency of the system.

The program has three components:

1. Replacing fuses (see Section 4 for more details) that have high sparking risk. Liberty will replace over 500 existing traditional T-link fuses with ELFs to meet Liberty's WMP obligations. ELFs are approved by Cal Fire for use in the forest areas of Liberty's service territory.

2. Replacing poles where this project aligns with mandated pole replacement projects for end-of-life poles, as defined in G.O. 165 detailed inspections. Liberty expects to replace over 850 poles throughout the service territory.
3. Replacement of over 10 miles of open wire and grey wire secondary.

The Resiliency Program is a multi-year wildfire mitigation effort that began in 2023. The effort combines T-Link fuse replacements, secondary and service replacement and replacement of the associated poles as defined.

6. Emerging Technology

The Emerging Technology Program focuses on identifying and testing innovative, capital-intensive projects through pilot programs in smaller-scale scenarios. The objective is to evaluate effectiveness and assess cost-to-risk ratio before broader implementation. These pilot projects often originate from collaborative efforts with other utilities through joint IOU calls, during which successful technologies and strategies are shared. By incorporating these promising solutions into Liberty's program, Liberty aims to stay at the forefront of technological advancements, enhance operational efficiency, and make informed decisions on scaling up these innovations based on real-world performance and outcomes.

7. Traditional Overhead Hardening Initiative

Liberty's traditional overhead hardening initiative includes the replacement of aged electrical infrastructure with hardware that meets current standards and is designed to be reliable during extreme weather conditions, with both fire mitigation and overall grid reliability. In areas of Liberty's service territory that are not as heavily forested, or where there is sufficient vegetation clearance, traditional overhead hardening can be the most cost-effective method of building system resilience. Installation of stronger electrical poles and wire, installation of CalFire exempt hardware, reduction of span length and wire sag, and enhancement of vegetation clearances all fall under this initiative.

The Topaz 1261 circuit experiences high winds and has a history of higher-than-average forced outages. The main Topaz line has been replaced with covered conductor. However, the taps and distribution coming off that line have areas where traditional overhead replacement is the most cost-effective solution for system hardening. The replacement work will be conducted in this area over the next several years. Liberty will conduct approximately four miles of traditional overhead hardening in the Topaz area in 2023. Approximately two miles of traditional overhead hardening in the same area is planned for 2024, and an additional two miles is planned for 2025. Traditional overhead hardening can provide effective wildfire mitigation when completed in the appropriate locations. The planned work in

the Topaz area will both improve reliability and reduce wildfire risk. Combined with SRPs and other system hardening efforts, this work can also reduce the need for potential PSPS events.

8. Tree Attachment Program

The Tree Attachment Program addresses the safety and reliability issues associated with conductors that are currently attached to trees rather than poles. Liberty will remove these conductors from trees and relocate them to new poles equipped with modern materials and specifications. This transition provides conductors proper support and insulation, significantly reducing the risk of ignition caused by contact with tree branches or other natural elements. By updating the infrastructure, the program aims to enhance system stability and minimize potential fire hazards associated with tree-mounted conductors.

9. Weather Stations

Liberty installed four weather station locations in 2023. This installation completes the list provided by Western Weather Group for adequate coverage in Liberty's territory for weather data. Moving forward, Liberty will conduct annual inspections of existing weather stations and perform maintenance to keep them in service.

10. Wire Upgrade Program (Open Wire/Gray Wire)

Liberty's wire upgrades program includes the replacement of open wire and grey wire to reduce potential vegetation contact, which could lead to fire ignitions. Liberty will replace open wire and grey wire with wire that meets the current construction standards, which requires the installation of an insulated triplex or quadraplex conductor. Liberty forecasts $2 million in wire upgrades in 2024 and $3 million a year from 2025-2027.

E. Customer-Driven Projects

Customer-driven projects include new business and streetlights and nightguards. Table I-8 below provides Liberty's 2024-2027 capital forecasts for these activities.

Table I-8
Customer-Driven Projects
$(000)

	2024	2025	2026	2027
New Commercial	1,091	1,121	1,152	1,184
New Residential	5,535	5,688	5,844	6,005
New Meters	452	464	477	490
Rule 24 EV Chargers	500	514	528	542
	7,579	7,787	8,001	8,221

New business includes the ongoing capital investment to install new service installations for residential and commercial customers. Liberty relied on a five-year average (2018-2022) to develop costs for these activities. Liberty has seen significant growth in residential customer-driven projects over the last few years, largely driven by upgrading homes for permanent residents and new residential development in the territory.

F. Other Capital Projects

Liberty is undertaking various other capital projects, as listed in Table I-9 below.

Table I-9
Other Capital Forecast
$(000)

	2024	2025	2026	2027
Fleet	2,000	2,893	2,639	3,861
Buildings and Grounds	484	175	175	175
NLT Campus	-	6,500	-	-
SLT Campus	-	-	6,500	-
Portola Land Purchase	-	-	1,500	-
Information Technology	2,788	4,703	4,257	2,858
EV Charging Infrastructure	100	1,650	-	-
Luning Buyout	6,079	-	-	-
Turquoise Buyout	-	1,540	-	-
	11,451	17,460	15,071	6,894

1. Fleet

Liberty operates a fleet of vehicles and equipment out of its Tahoe Vista, South Lake Tahoe, and Portola locations. The fleet is a mix of vehicles including small SUVs, light duty trucks, medium and heavy-duty trucks, specialized line trucks, and a diverse range of specialized equipment,

including wire/cable reel trailers, snow mobiles, ATVs, Snow Cats, and back hoes to support the requirements of building and maintaining an efficient, reliable, safe electrical system.

During 2024-2027, Liberty will replace several vehicles in the fleet that are now meeting or exceeding Liberty and/or California General Services' fleet replacement criteria. Liberty will also add vehicles to its fleet to address the growth in WMP activities and other work.

Replacing certain vehicles in the fleet and bringing the fleet up to standard with Liberty and/or California General Services' criteria delivers financial, operational, and sustainability benefits, including:

1) Reduction in maintenance cost and increased safety, efficiency and reliability;
2) Investment in renewable fuel technology (hybrids, renewable diesel) and the subsequent "greening of the fleet," meeting both Liberty and California's drive to use more sustainable fuels; and
3) Increased fuel efficiency due to technological advances in engine design and performance in newer vehicles.

Liberty's workpapers include the detailed fleet upgrade plan. Liberty will utilize a national fleet manager to leverage the pricing agreements Liberty has in place with Ford and Toyota providing improved warranty terms and controlling the total costs incurred.

2. Buildings and Grounds

Liberty continually makes various improvements to its facilities, including planned work at its Dunlap Building and its Apprenticeship Program facility. Liberty will make investments in facilities improvements between 2024 and 2027, including replacing fencing and adding covered storage at various sites.

3. NLT and SLT Campus

Over the past five years, Liberty's operations team has experienced significant growth. Since 2020, the operations team has expanded by 30% with the addition of 10 new operations staff members. As a result. the North and South Lake Tahoe campuses can no longer adequately support the current staffing levels and will not allow for future expansion. This underscores the need for facility improvements to accommodate the growing team and sustain operational efficiency.

Liberty will optimize the space at the North and South Lake Tahoe campuses by repurposing existing buildings for onsite mechanical and material storage to make better use of the available space. Additionally, at the North Lake Tahoe campus, Liberty will construct an operations

center that will include a metering shop, an operations meeting space for training, and a linemen facility. This development aims to enhance the functionality and efficiency of the campus.

During the 2022 winter storm season, Liberty discovered that the flat roof of the North Lake office was unable to withstand the Tahoe winters of wet snow rendering it prone to leaks. To address this problem, Liberty will pitch the roof to allow for proper snow shed and provide better durability and protection against future winter conditions.

With growing staff, the parking areas also need to be addressed. Liberty plans to repave the parking lots and provide adequate space to accommodate the expanding team and customer base.

4. Portola Land Purchase

Liberty has experienced significant growth over the last five years due to the capital requirements around wildfire mitigation and resiliency efforts. Since 2020, Liberty's capital plan has grown from $10 million per year to nearly $75 million. For Liberty to maximize the benefit to customers, procurement of materials well in advance and maximizing quantities will enable Liberty more cost-effectively acquire replacement materials.

Materials such as utility poles require significant space and access routes to mitigate safety incidents. Liberty currently does not have sufficient storage capacity to accommodate large quantities of materials at its North and South Lake Tahoe campuses. Space and land for this use is a limited resource in the Tahoe basin. Therefore, Liberty plans to acquire land in the Portola and Loyalton vicinity which is significantly less costly than the Tahoe basin. The area has ready access to highways in and out of the territory and less severe weather conditions, making deliveries more accessible for vendors and for crews.

5. Information Technology

Information Technology (IT) contains the costs for various hardware and software upgrades as needs change, and existing applications reach end of life. The capital forecast for IT includes Liberty's allocated share of enterprise-wide projects such as SAP cloud migration, Endpoint security enhancements, website modernization, auto opt-in for all customers for outage communications, ADMS electric SCADA system replacement, and various other hardware and software improvements to meet emerging needs.

6. EV Charging Infrastructure

Liberty's Transportation Electrification (TE) is designed to aid in the adoption of electric vehicles. TE is divided into five programs: Phase 1, Phase 2, Electric Vehicle Infrastructure Rule 24, Plug-in Electric Vehicle Submetering Protocol, and Transportation Electrification Policy and Investment; these programs are detailed in the Chapter 4 - Public Purpose Programs testimony. Between 2024 and

2027, Liberty will make capital investments in the Phase 1 - DC Fast Charger (DCFC) Project, Phase 2 - Schools and State Parks Charging Programs, and Rule 24 Commercial EV Charger Installations. Liberty forecasts $0.100 million in EV Charging Infrastructure in 2024, $1.650 million in 2025, and $0.500 million annually from 2026-2027.

7. Luning Buyout

In D.24-02-021, the Commission authorized Liberty to capitalize the final buy-out price of the tax equity partners, which is $6.079 million. Liberty expects to complete this buyout by the end of 2024. As stated in D.24-02-021, "assigning the costs as a capital investment will distribute the rate impact to Liberty's customers across the life of the solar plant instead of being recovered within a single year, significantly reducing the rate impact to customers."[1]

8. Turquoise Buyout

Similar to the Luning Buyout, in its current ECAC Application (A.24-04-010), Liberty has requested authorization to capitalize the final buy-out price of the tax equity partners. Liberty expects to complete this buyout by the end of 2025. The buy-out price is estimated at $1.540 million.

[1] D.24-02-021, pp. 12-13.

Appendix A

Witness Qualifications

LIBERTY UTILITIES (CALPECO ELECTRIC) LLC

QUALIFICATIONS AND PREPARED TESTIMONY

OF ANDREW LYKENS

Q. Please state your name and business address for the record.

A. My name is Andrew Lykens and my business address is 701 National Avenue, Tahoe Vista, CA 96148.

Q. Briefly describe your present responsibilities at Liberty Utilities (CalPeco Electric) LLC.

A. I currently serve as the Senior Manager of Engineering at Liberty CalPeco, where I am responsible for the development and execution of the utility's Capital Budget. I act as one of the subject matter experts on our Wildfire Mitigation Plan and provide oversight to our Engineering and Project Management teams, ensuring the successful delivery of projects and initiatives. Additionally, I oversee our New Business Program.

Q. Briefly describe your educational and professional background.

A. I have a Bachelors of Science Degree in Electrical Engineering from Kansas State University. I am a registered Professional Engineer in the state of California. I have held various position in the Electric Utility and Power Industry at Liberty Utilities and Kiewit Power Engineers.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor Chapter 2: Capital.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgement, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.