City of Lompoc Electric Division Capital Improvement Plan 2026-2031

Utility Commission Meeting

Monday, February 9, 2026

Qualus Distribution Planning

Brandon Costello, Senior Distribution Planning Engineer

Kory Sandven, Lead Distribution Planning Engineer

John McMurray, Principal Consultant

Agenda

1. Introduction
2. Assumptions and Forecasted Growth
3. System Loading Assessment
4. Substation (Receiving Station) Asset Assessment
5. Limitations and Considerations
6. Recommendations

1. Introduction

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Qualus was retained by Lompoc to perform a Biennial (2-year) plan and the 2026 - 2031 Capital Improvement Plan (the outlook on system conditions), and load growth projections to determine potential improvement which may be required in the next several years.

Lompoc is at risk of experiencing load impacts from California Air Resources Board (CARB) mandates. This study evaluated the near-term impacts from the CARB objectives.

The study includes model development, load growth analysis, annual system load modeling, and recommended actions to alleviate overloads & replace deteriorated substation assets.

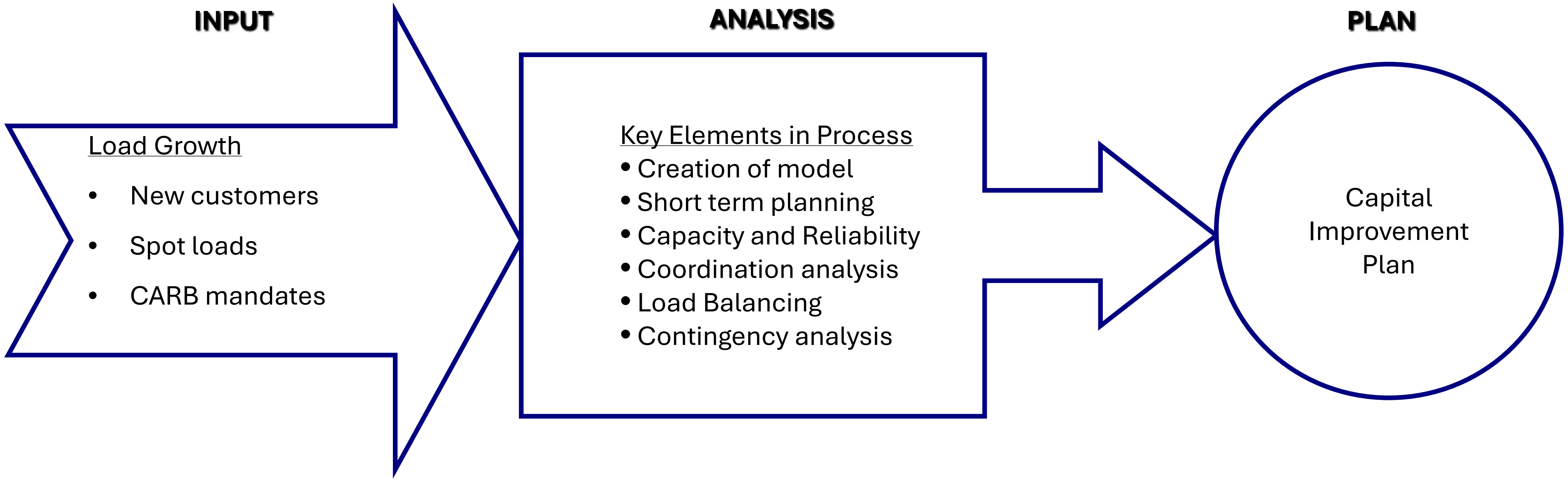

Figure 1: Typical Electric System Planning Process

2. Assumptions: California Air Resource Board Mandates

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- The following California Air Resources Board (CARB) mandates are identified as impacting Lompoc's Electric System:

Year	Focus	Goal Description
2030	Home	All new home appliances will be electric (conversion of water heaters & central heating)
2030	Vehicles	68% of new passenger vehicle sales must be zero-emission
2035	Vehicles	100% of new passenger vehicle and truck sales must be zero-emission (ZEVs).
2045	Carbon neutrality	Homes and all vehicles will be fully electric.

Table 1 CARB Sources:
Census Data
2022 Water Heater Adoption Year Documentation
Registered Vehicles and Santa Barbara County Population

- Additionally, existing customer loads will increase due to split dwelling units (City approval not required).

2. Current System Utilization

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- Lompoc's Electric System is presently well positioned from a loading perspective

Lompoc Substation and Feeder Utilization 2025							
Transformer	**Rating (MVA)**	**Transformer Utilization**	**Feeder**	**Customers**	**Emergency Rating (MVA)**	**Peak (MVA)**	**Feeder Utilization**
1	28	33%	101	4192	12.5	4.7	38%
			103	331	12.5	4.4	35%
2	28	30%	201	1762	12.5	2.4	19%
			202	4941	12.5	5.9	47%
3	28	19%	301	2868	12.5	3.5	28%
			302	1163	12.5	1.8	14%

Table 2: Lompoc provided monthly feeder peak readings & customers/feeder

- However, due to higher feeder utilization from CARB mandates & anticipated growth, transferring load to other circuits becomes more challenging in 2031 and beyond once circuits approach 60% loading (switching options diminish).

2. Forecast – Known Load Growth

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- Known projects by year

2026 – 2031 Spot Loads (MW)						
Project Name	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
River Terrace Subdivision	1.0	1.3	1.3	1.3	1.3	1.3
The Village at PCH	0.7	0.7	0.7	0.7	0.7	0.7
Hotel EV Charging	0.5	0.5	0.5	0.5	0.5	0.5
Other Load	0.3	0.5	0.5	0.5	0.5	0.5
Racines Wine Warehouse	0.2	0.2	0.2	0.2	0.2	0.2
Chick-fil-a	0.1	0.1	0.1	0.1	0.1	0.1
Castillo De Rosas			0.1	0.1	0.1	0.1
Las Flores Apartments			0.2	0.2	0.2	0.2
Northside Shopping Center		0.3	0.3	0.3	0.3	0.3
Burton Ranch DR 07-02					0.3	0.3
Burton Ranch LOM 629					0.3	0.3
Burton Ranch LOM 571					0.3	0.3
City Transit Yard		1.1	1.1	1.1	1.1	1.1
East Ocean Multi-Family		1.3	1.3	1.3	1.3	1.3
Bodger Meadows		0.2	0.7	1.2	1.7	1.7
Grand Totals (MW)	**2.7**	**6.1**	**7.0**	**7.5**	**8.9**	**8.9**

Table 3: Lompoc provided known projects with anticipated loads by year

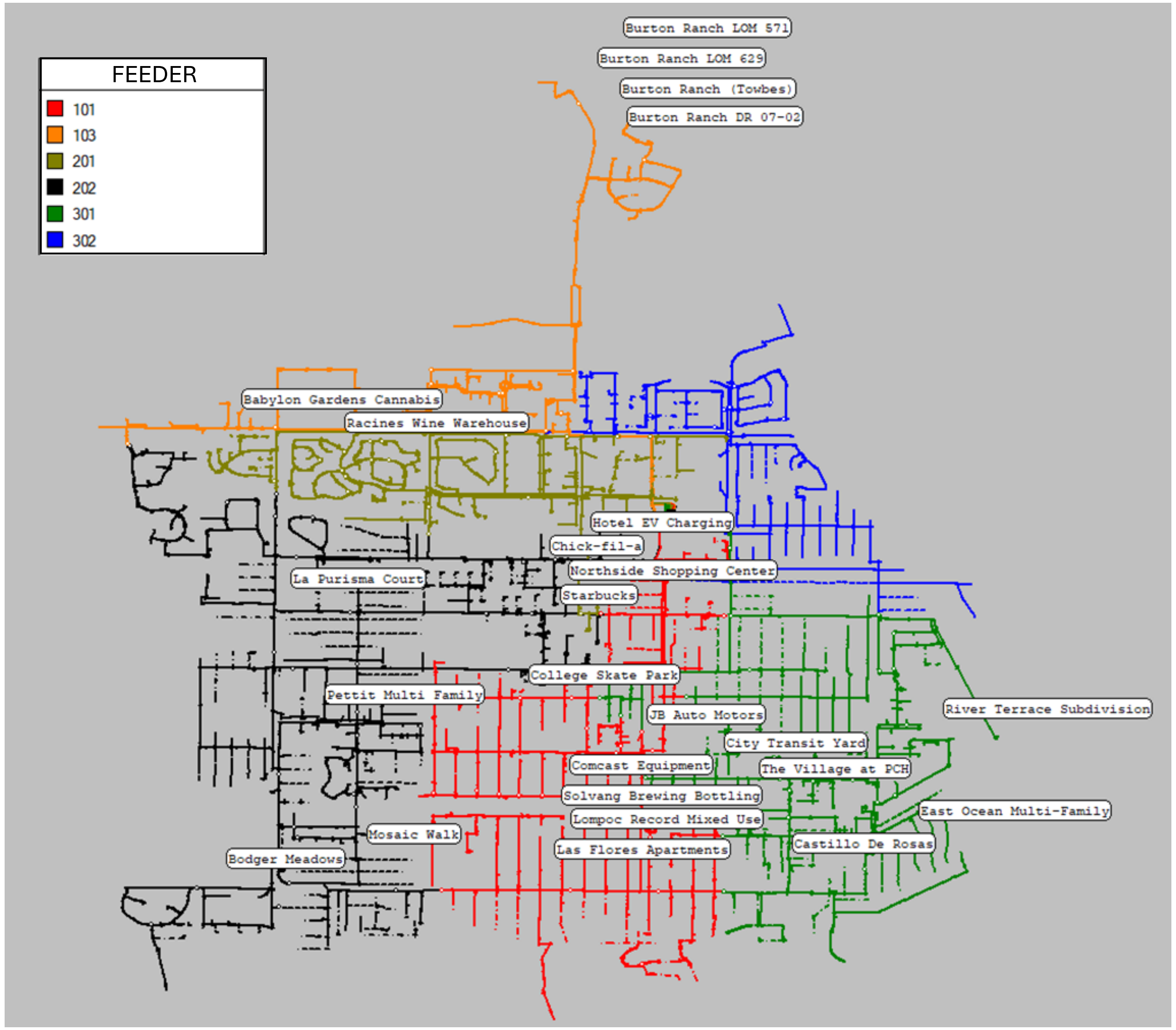

Figure 2: Lompoc provided known projects with anticipated loads by year

2. Forecast - Systematic Growth

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All calculations are based on Lompoc and Santa Barbara County populations with vehicle and appliance life cycles impacted by CARB mandates.

- ZEV purchase rate based on California Auto Q4, 2024 purchase history
- ZEV energy consumption based on IEEE Transportation Electrification factors and Level 2 charging.
- Water heater energy consumption based on US DOE studies.

- California Adoption Rate of Accessory Dwelling Units (ADU) compared to City of Lompoc's Population in 2024 using census data.
- ADU energy consumption based on historical loading from Lompoc.

Year	ZEV Adoption (MW)	Water Heater Adoption (MW)	Accessory Dwelling Unit Growth (MW)
2026	0.74	0.00	0.01
2027	0.74	0.00	0.01
2028	0.74	0.00	0.01
2029	0.74	0.00	0.01
2030	0.74	4.29	0.01
2031	0.74	4.29	0.01
Total	**4.44**	**8.58**	**0.07**

Table 4: Impacts from CARB mandates

Contributors: Brandon Costello & Kory Sandven

2. Forecasted Load Growth: 2025 through 2031

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In 2025, the system peak was 22.7 MW

By 2031, the system peak increases to 44.7 MW including

- 8.9 MW of known loads; and
- 13.1 MW of CARB load projections

Year	Spot Load Growth (MW)	Systematic Growth (MW)	Total Growth (MW)	System Totals (MW)
2025	[redacted]			22.7
2026	2.7	0.8	3.5	26.2
2027	6.1	1.5	7.6	30.3
2028	7.0	2.3	9.2	31.9
2029	7.5	3.0	10.5	33.2
2030	8.9	8.0	17.0	39.7
2031	8.9	13.1	22.0	**44.7**

Table 5: Load impacts from CARB Mandates

Contributors: Brandon Costello & Kory Sandven

3. System Loading Assessment

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- Known Spot Loads & EV adoption gradually impact growth through 2029.
- CARB mandates in 2030 introduce a higher growth rate.

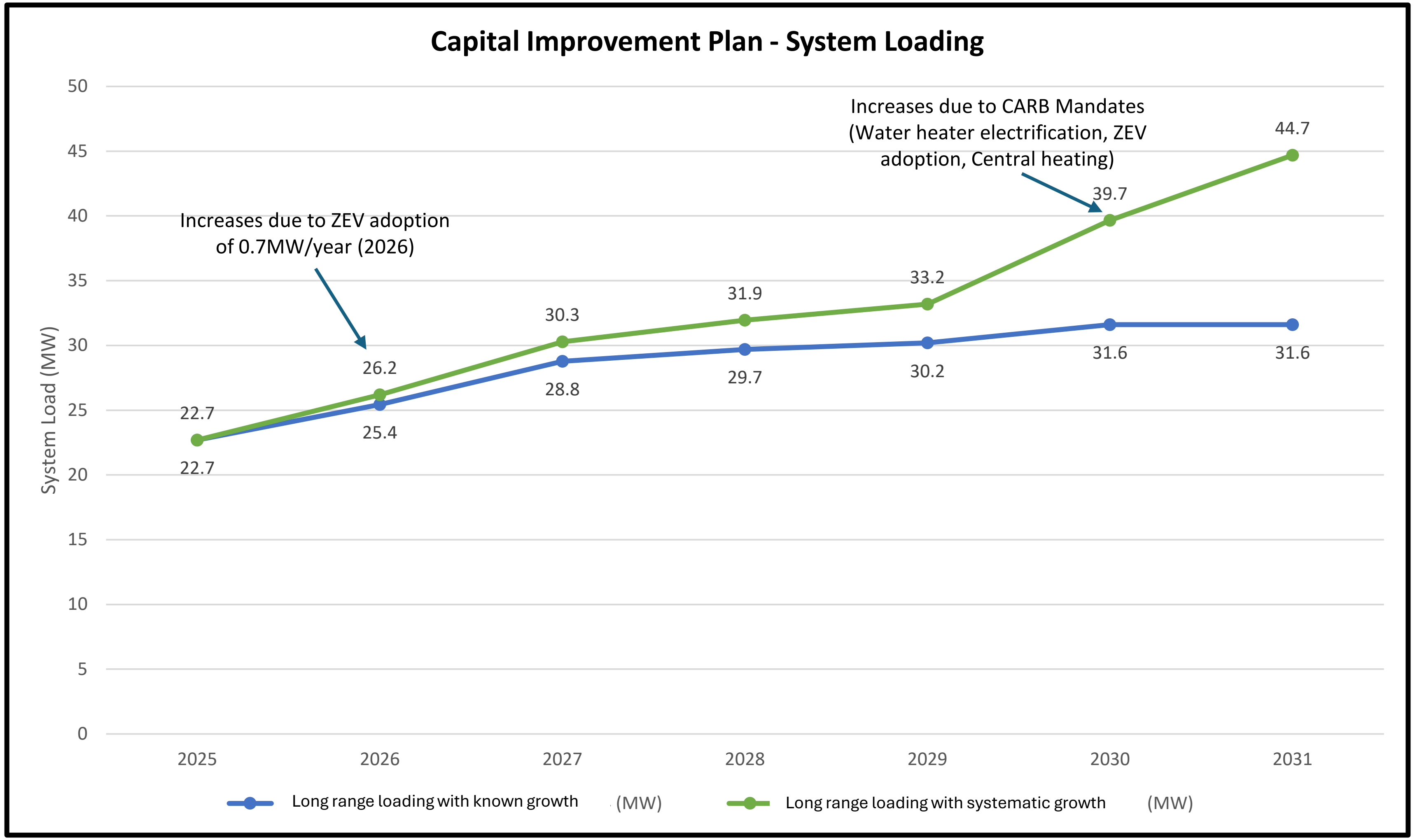

Figure 3: Lompoc System Load Projections from 2025 through 2031

Contributor: Kory Sandven

3. System Loading - Substation Forecast

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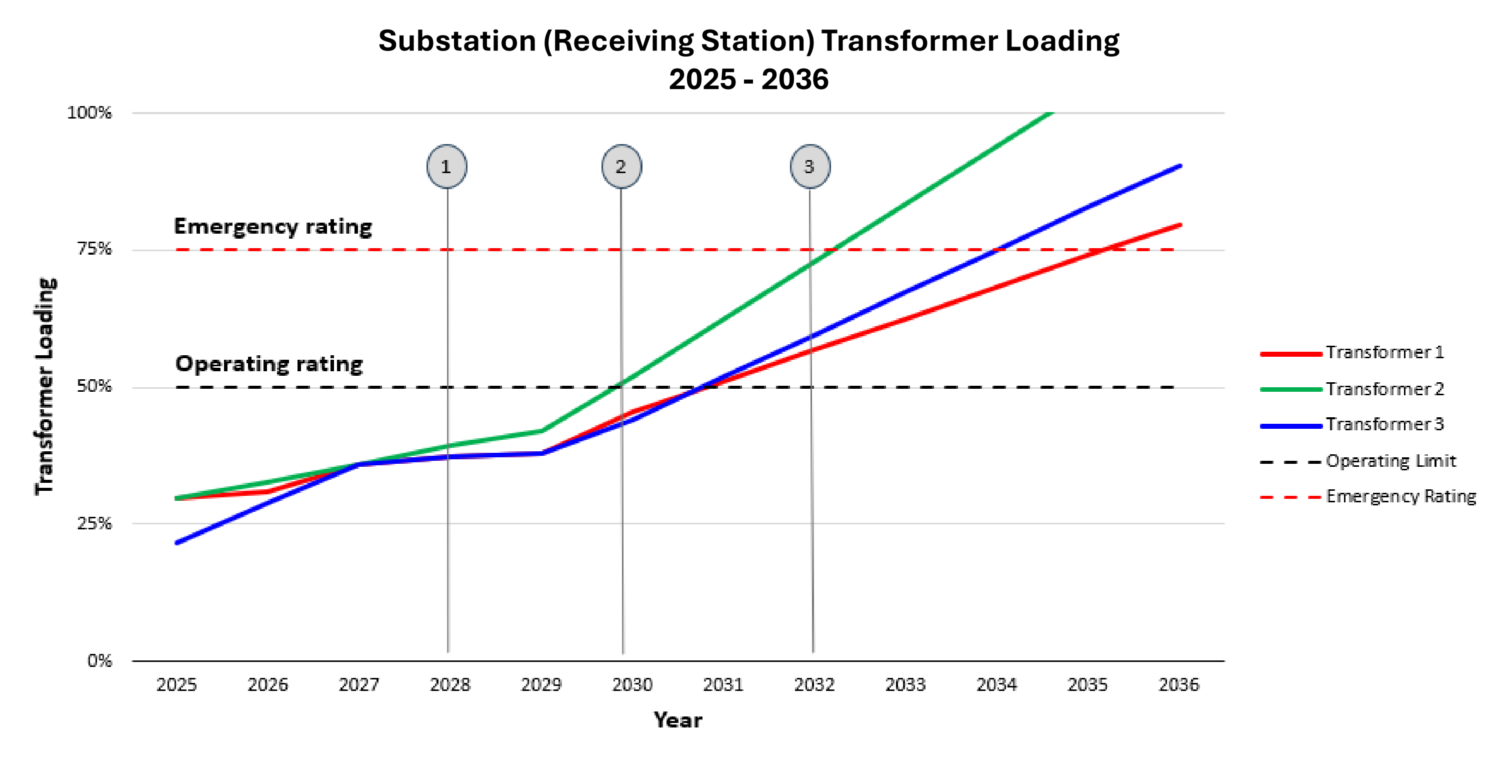
- Planning for a new substation should begin over the next few years due to new load growth (spot loads & impacts from CARB mandates)

- New substations take about 5 years from initial planning to energization



Stage	Description
1	Substation land acquisition
2	Begin fence, fill and grade
3	New substation in service

Figure 4: Lompoc Substation (Receiving Station) Transformer Loading

4. Substation Asset Assessment

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However, Lompoc's Electric Receiving Station is aging with many assets showing advanced deterioration and nearing the end of life.

Figures 5 and 6: Lompoc Receiving Station VT/CT lids are deteriorating with rust and swelling risk of water penetration
Source: Doug Restaino, Qualus Area Manager

4. Substation Asset Assessment

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Equipment examples of advanced deterioration

Figure 7: VT/CT junction box with rust

Figure 8: SF6 Circuit Breaker window with moisture

Figure 9: SF6 Circuit Switcher with broken skirt

Figure 10: Potential transformer damage

Source: Doug Restaino, Qualus Area Manager

5. Limitations and Considerations

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- Only assessed major equipment for capacity & condition of substation assets.
- Did not assess termination points, elbows, cabinets, junction box, switchgears, conduit, conductor, poles, switches, assemblies, mounting brackets, etc.
- The study evaluated life cycles for replacing aged assets in the substation, but not for the distribution grid.
- Historically, aged equipment and copper lines have derated ratings making it important to track age and loading.
- Fuse overloads were identified in future years; however, increased fuse sizes may impact coordination of upline fuses. The study did not evaluate fuse coordination to determine best course of action for fuse replacement.

6. Recommendations

1. Track and compare actual annual loading to forecasted loading.

2. Perform the Dissolved Gas Analysis (DGA) for the substation transformer Load Tap Changers (LTC's) annually, clean the LTC's every 2 years and replace the contacts every 5 years.

3. Perform a fuse coordination study to evaluate the coordination between distribution transformer fuses and upline lateral fuses. This study is recommended to determine the coordination standard for Lompoc to prepare for future load levels.

4. In 2026, replace the VT's/CT's (NCPA to handle); evaluate the transformer nitrogen gas leakage and attempt to repair (flanges, gaskets, etc.); and evaluate SCADA systems & budget for a new SCADA system (estimate $250k upgrade to $500k+ new system)

5. In 2027, replace the 2000 Amp, 115kV circuit breakers with main cabinets, estimate* is $230k each (12-to-18-month lead time) x 2 = $460k total – **requires an additional $85k added to the existing budget line item (752ERS-798450),** replace the 12kV potential transformers (PTs), and evaluate land acquisition for a new substation.

6. In 2028, replace the 1200 Amp, circuit switchers, estimate* is $115k each (12-to-18-month lead time) x 3 = $345k total.

7. By 2028, prepare a prioritized Small Conductor Replacement Program (e.g., replace all old #2 copper cable on feeder backbones).

8. By 2028, prepare a plan to replace cable and elbows to increase ratings along major feeder routes (increases capacity from 200 Amps to 600 Amps).

***Source:** Chris Pardington, Qualus Principal Engineer

Appendix

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California ZEV Charging Profile Assumptions		
Category	**Unit**	**Notes**
# of households in Santa Barbara County, CA	148,960	2020 Decennial Census Bureau Data
# of registered vehicles in Santa Barbara County, CA	279,865	April 1, 2025 California DMV Statistics (Autos only)
Vehicles per household in Santa Barbara County, CA	1.9	Ratio of vehicles per person
Households in Lompoc, CA	13,853	2020 Decennial Census Bureau Data
# of registered vehicles in Lompoc, CA	26,027	Using ratio from Santa Barbara County
# of new vehicles in CA per year	6.8%	# of new vehicles vs. registered vehicles in CA 2024
% of new Zero-Emission vehicles (ZEV) in CA in 2024	22%	California Auto Outlook Q4'24
IEEE Coincidence Factor	25%	IEEE Transactions on Transportation Electrification
Estimated # of new ZEVs in Lompoc per year	389	Annual ZEV adoption times number of Lompoc vehicles
Estimated # of new ZEVs in Lompoc per year after 2035	1,770	Annual ZEV adoption times number of Lompoc vehicles
Average kWh for charging	1.9	Diversified Level 2 EV charging (kWd)
Annual kWh growth 2026-2035	740	
Annual MWh growth from 2035+	3.4	

California Electric Water Heater Adoption Policy Assumptions		
Category	**Unit**	**Notes**
# of Residential Customers (Meters)	13406	Based on billing file used in allocation.
Electric Heat Pump Water Heater	5.8	Historical size of Lompoc Electric HP is 30A or 5.76kW
Water heater life (years)	17.5	Average life between tank and tankless electric
Forced Electric Adoption Start Date	2030	CA 2022 State Strategy for State Implementation Plan Goal
100% Conversion Year	2048	When all residences will have electric water heaters
Household conversions	745	Annual conversion such that 100% of customers converted by 2048
Annual MWh growth from 2030+	4	Growth from electric water heaters

California Accessory Dwelling Units Adoption Policy Assumptions		
Category	**Unit**	**Notes**
Annual Increase of Residential Dwellings	13	Additional meters per year. Based on CA allowance of property subdividing.
Average 2024 load per new dwelling (kW)	0.9	Assume 1,000 sq. ft. dwelling
Average w/ WH per new dwelling (kW)	3.78	Assume 1,000 sq. ft. dwelling and 1/2 HP water heater
Average ADU adoption rate for CA	0.05%	3-year rolling average
Average Total ADU MW through 2035	0.01	
Average Total ADU MW 2035-2045	0.05	

Appendix

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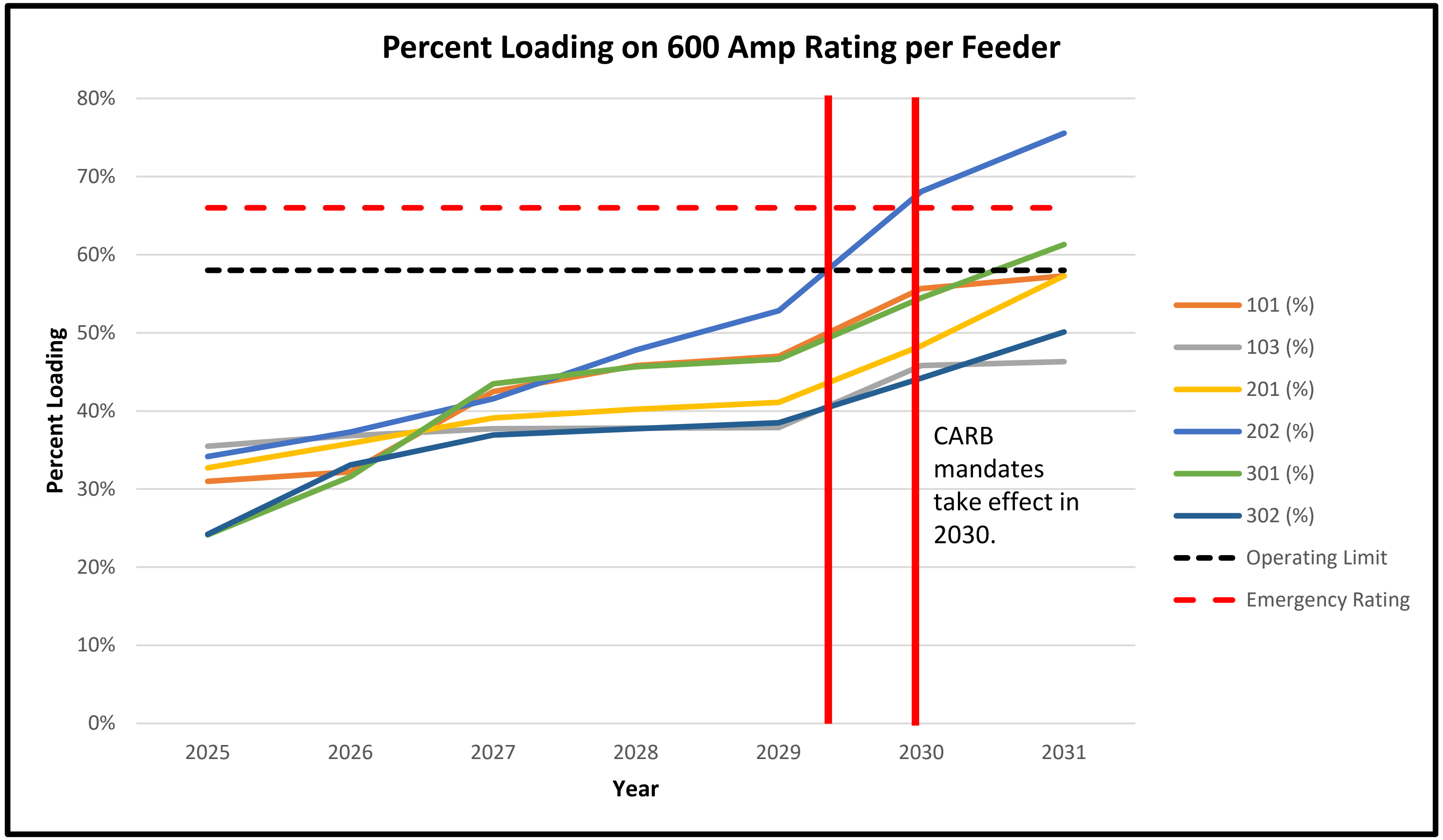
Year	Known Spot Load Growth (MW)[1]	CARB Mandate Growth [EV+WH+DU] [2] (MW)	Total Growth[3] (MW)	Long Range Loading with Known Growth[4] (MW)	Long Range Loading with Systematic Growth[5] (MW)	Long Range Deviation[6] (MW)
2025				22.7	22.7	0.0
2026	2.7	0.8	3.5	25.4	26.2	0.8
2027	6.1	1.5	7.6	28.8	30.3	1.5
2028	7.0	2.3	9.2	29.7	31.9	2.3
2029	7.5	3.0	10.5	30.2	33.2	3.0
2030	8.9	8.0	17.0	31.6	39.7	8.0
2031	8.9	13.1	22.0	31.6	44.7	13.1
2032	8.9	18.1	27.0	31.6	49.7	18.1
2033	8.9	23.2	32.1	31.6	54.8	23.2
2034	8.9	28.2	37.1	31.6	59.8	28.2
2035	10.0	35.9	45.9	32.7	68.6	35.9
2036	10.1	43.6	53.7	32.8	76.4	43.6
2037	10.1	51.3	61.4	32.8	84.1	51.3
2038	10.1	59.0	69.1	32.8	91.8	59.0
2039	10.1	66.7	76.8	32.8	99.5	66.7
2040	10.1	74.4	84.5	32.8	107.2	74.4
2041	10.1	82.1	92.2	32.8	114.9	82.1
2042	10.1	89.8	99.9	32.8	122.6	89.8
2043	10.1	97.5	107.6	32.8	130.3	97.5
2044	10.1	105.2	115.3	32.8	138.0	105.2
2045	10.1	112.9	123.0	32.8	145.7	112.9

Appendix

- Feeder limit at 600 amps and 12 kV is 12.5 MVA.
- By 2031, 4 feeders are at or estimated to exceed their operating ratings.



Appendix

Transformer overloads			
Size (kVA)	Total count	Count overloaded	% overloaded
25 OH	337	25	7%
25 UG	237	10	4%
50 OH	50	4	8%
37 OH	164	4	2%
37 UG	118	4	3%
150 UG	62	1	2%
Sum	**968**	**48**	**5%**

Fuse overloads			
Size (K)	Total count	Count overloaded	% overloaded
6	33	5	15%
10	63	4	6%
3	20	3	15%
100	13	1	8%
12	17	1	6%
80	6	1	17%
200	5	1	20%
40	16	1	6%
65	9	1	11%
Sum	**182**	**18**	**10%**

Conductor overloads					
Type	Size	Total Count	Count Overloaded	% Of Conductors Overloaded	Sum of Overloaded Length (Miles)
UG	2 CU (UG)	1031	7	0.7%	0.4

2025 through 2031 System Overloads:

- 5% of all transformers overloaded
  - ➢ Mainly 25 kVA's
- 10% of all fuses overloaded
- Only 0.4 mile of overloaded conductor
  - 1x section of #2 copper

Only adjustments in the Load Tap Changer (LTC) settings of the substation transformers were required to maintain voltage levels across the system in 2031