



2021 and 2025 Final LCR Study Results Greater Fresno Area

Vera Hart

Senior Regional Transmission Engineer

Stakeholder Call

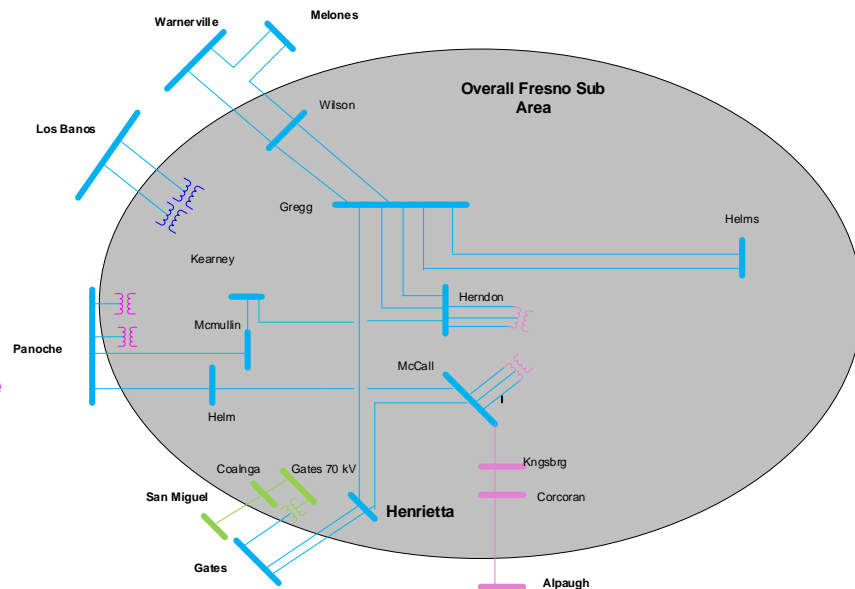
April 13, 2020

Greater Fresno Area

Electrical Boundaries and LCR Sub-Areas

Electrical Boundaries:

- Gates – Mustang #1 230 kV line
- Gates – Mustang #2 230 kV line
- Panoche – Tranquility #1 230 kV line
- Panoche – Tranquility #2 230 kV line
- Warnerville – Wilson 230 kV line
- Melones – Wilson 230 kV line
- Panoche 230/115 kV transformer #1
- Panoche 230/115 kV transformer #2
- Smyrna – Alpaugh – Corcoran 115 kV line
- Los Banos #3 230/70 kV transformer
- Los Banos #4 230/70 kV transformer
- San Miguel – Coalinga #1 70 kV line
- Gates 230/70 kV transformer #5



New major transmission projects

Project Name	Expected ISD
Oro Loma 70 kV Area Reinforcement	24-Apr
Reedley 70 kV Reinforcement (Renamed to Reedley 70 kV Area Reinforcement Projects Include Battery at Dinuba)	21-May
Wilson 115 kV Area Reinforcement	23-May
Wilson-Le Grand 115 kV line reconductoring	20-Apr
Panoche – Oro Loma 115 kV Line Reconductoring	21-Apr
Northern Fresno 115 kV Area Reinforcement	21-May
Bellota-Warnerville 230kV line Reconductoring	24-Mar
Herndon-Bullard 230kV Reconductoring Project	21-Jan
Gregg-Herndon #2 230 kV Line Circuit Breaker Upgrade	21-Jan

Power plant changes

Resource Additions:

- 1 new Solar/BESS resource (309 MW)

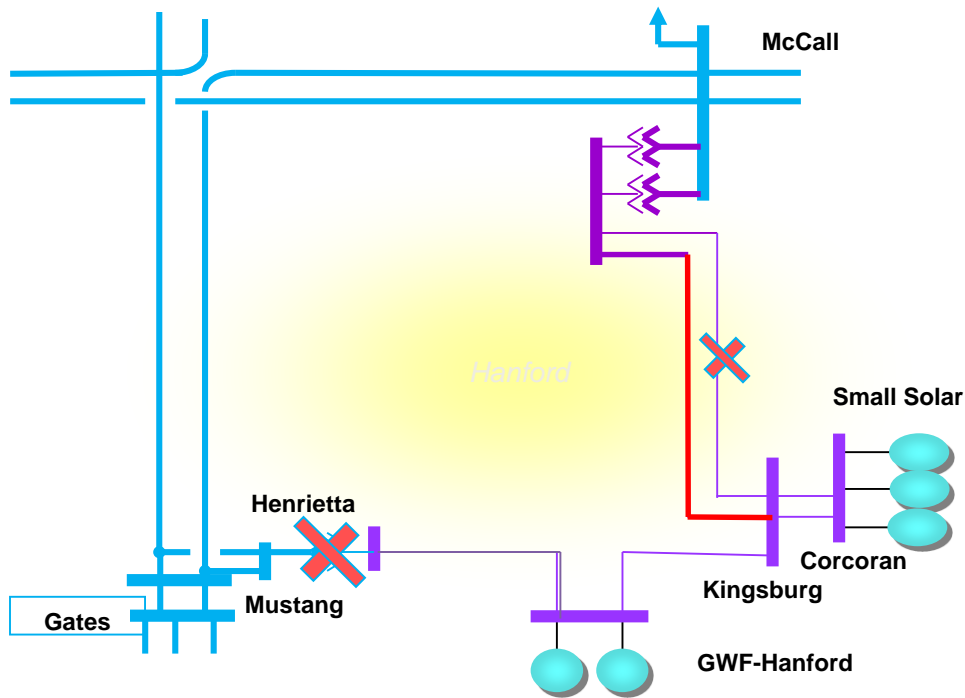
Resource Retirements:

- None

Hanford Sub-area: Load and Resources

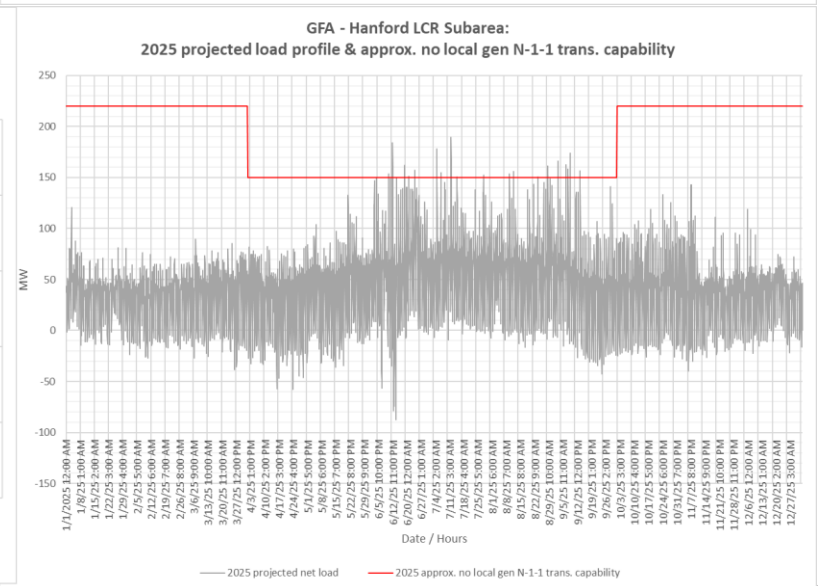
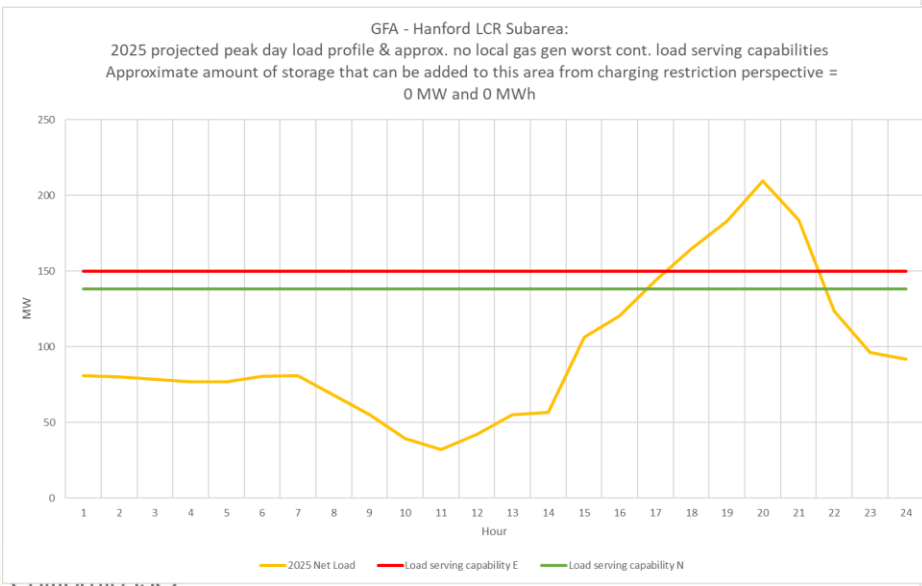
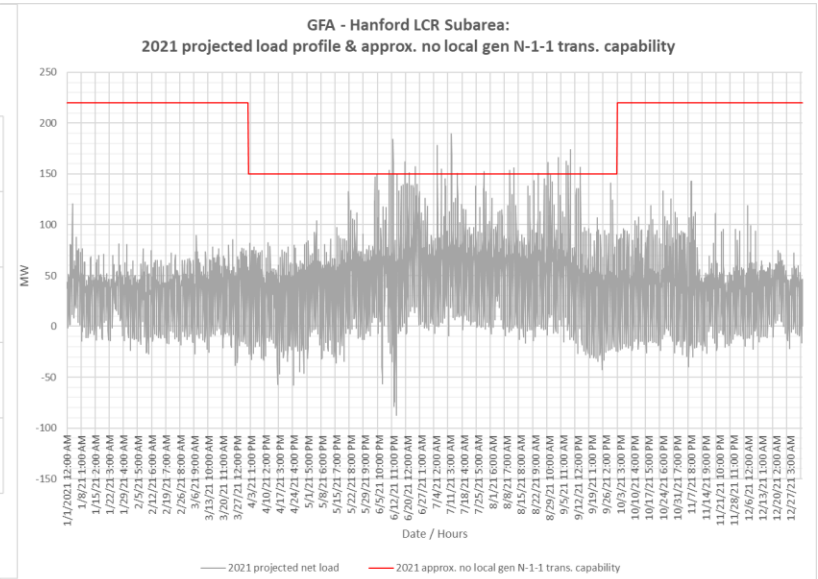
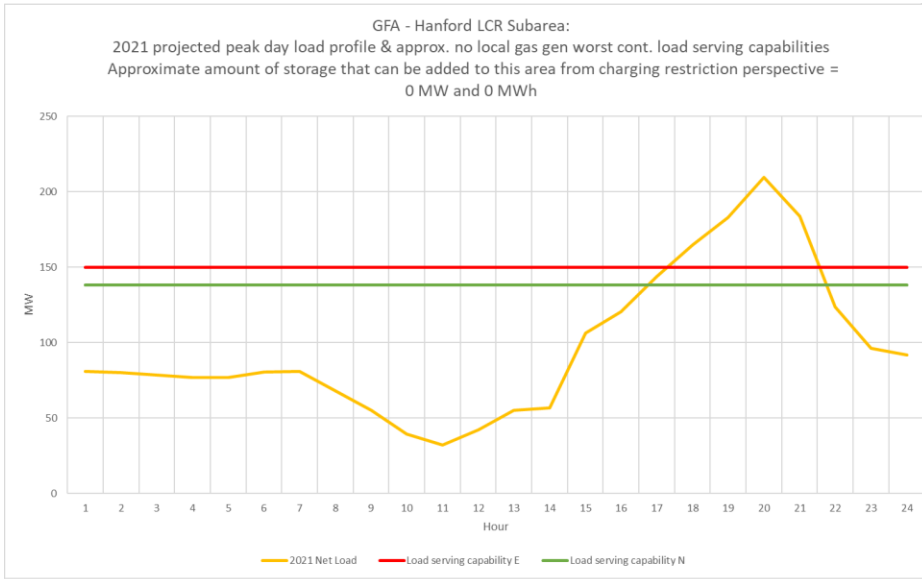
Load (MW)	2021	2025	Generation (MW)	2021	2025
Gross Load	207	209	Market	125	125
AAEE	-1	-1	Solar	25	25
Behind the meter DG	-3	-3	MUNI	0	0
Net Load	203	205	QF	0	0
Transmission Losses	6	5			
Pumps	0	0	Total Qualifying Capacity	150	150
Load + Losses + Pumps	209	210			

Hanford Sub-Area Requirements



Limit	Category	Limiting Facility	Contingency	2021 LCR (MW)	2025 LCR (MW)
First Limit	P6	McCall-Kingsburg #2 115kV Line	McCall-Kingsburg #1 115kV line and Henrietta 230/115kV TB#3	58	58

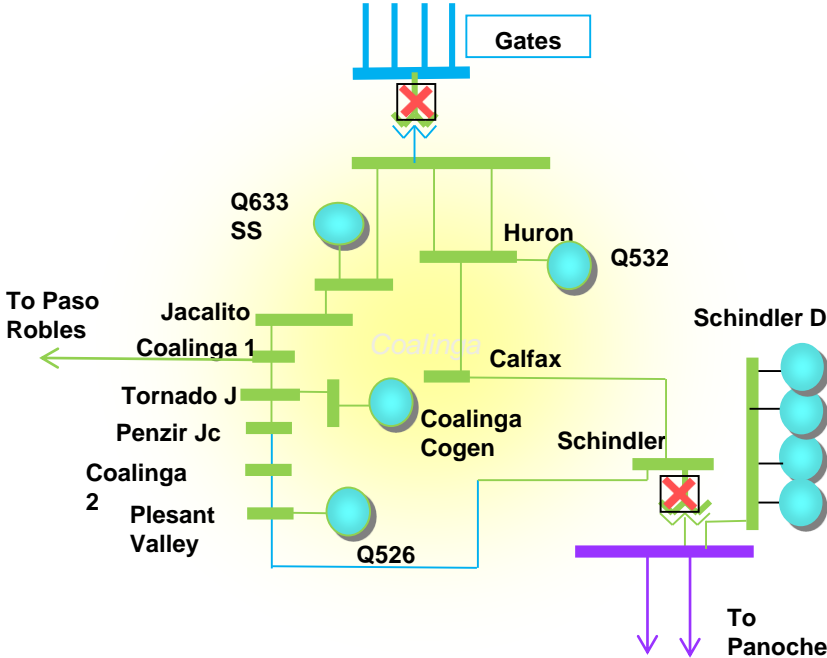
Hanford Sub-area: Load Profiles



Coalinga Sub-area: Load and Resources

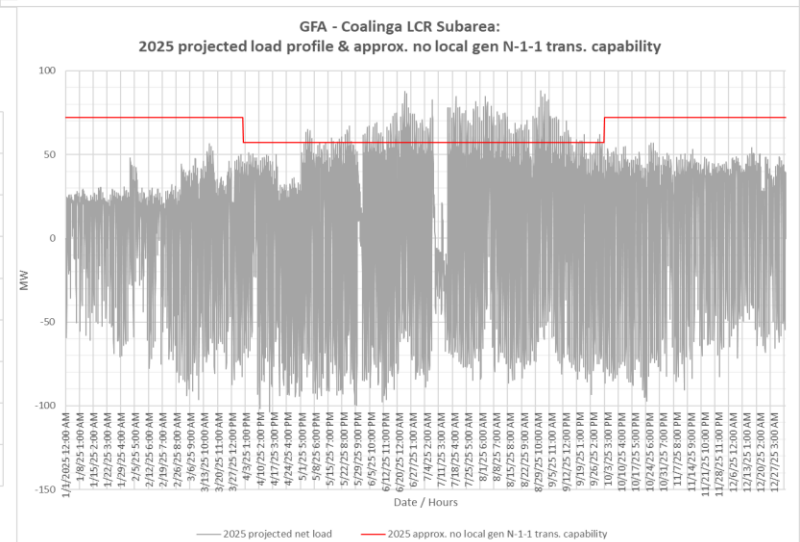
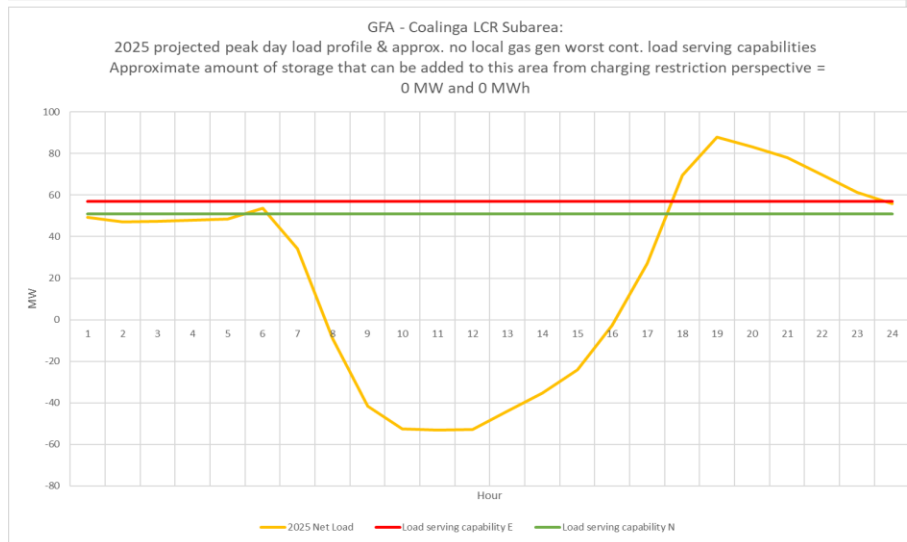
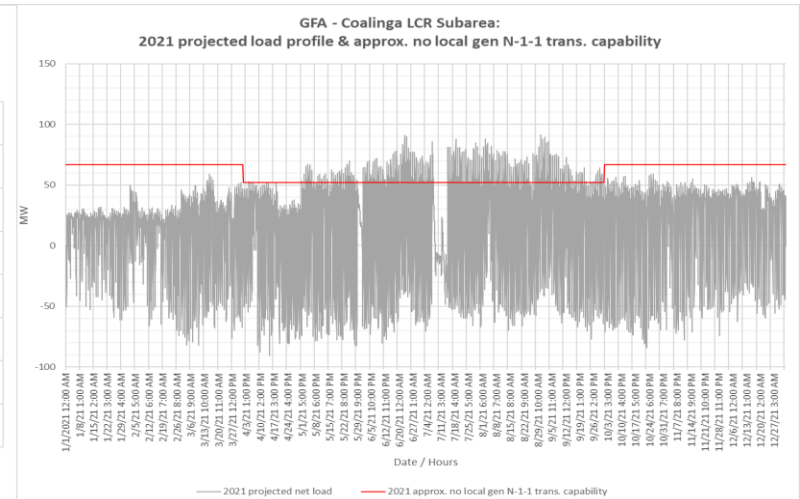
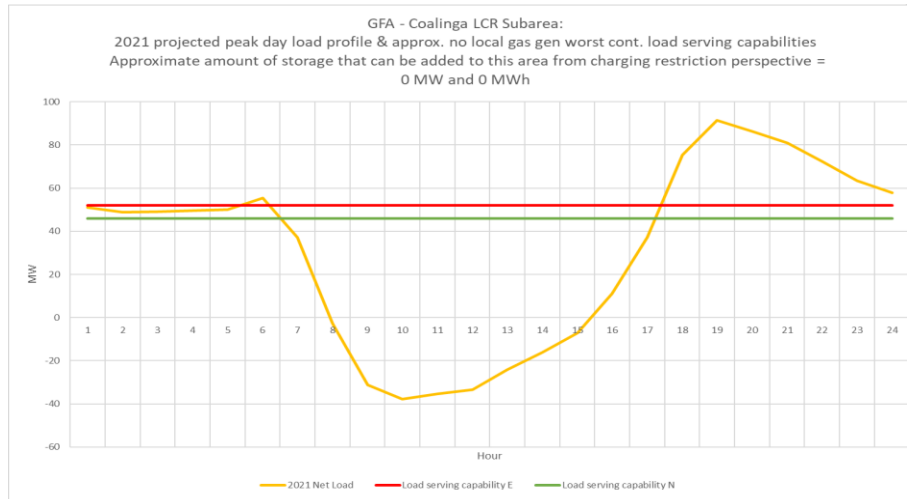
Load (MW)	2021	2025	Generation (MW)	2021	2025
Gross Load	92	89	Market	0	0
AAEE	-1	-1	Solar	13	13
Behind the meter DG	0	0	MUNI	0	0
Net Load	91	88	QF	3	3
Transmission Losses	2	1	Mothballed	0	0
Pumps	0	0	Total Qualifying Capacity	16	16
Load + Losses + Pumps	93	89			

Coalinga Sub-Area Requirements



Limit	Category	Limiting Facility	Contingency	2021 LCR (MW)	2024 LCR (MW)
First Limit	P6	Overload on San-Miguel-Coalinga 70kV Line and Voltage Instability	T-1/T-1: Gates 230/70kV TB #5 and Schindler 115/70 kV TB#1	57 (52 at Peak) (41 NQC)	52 (47 at Peak) (36 NQC)

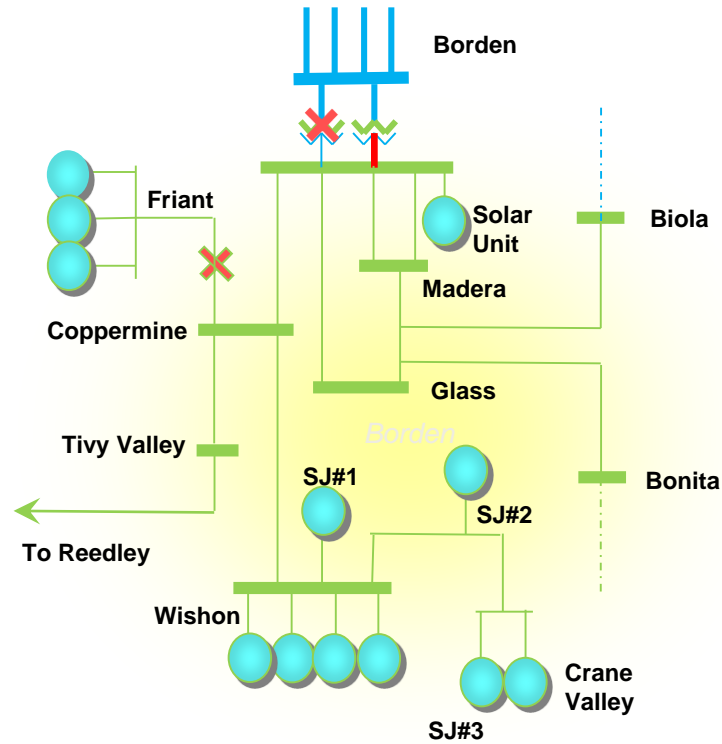
Coalinga Sub-area: Load Profiles



Borden Sub-area: Load and Resources

Load (MW)	2021	2025	Generation (MW)	2021	2025
Gross Load	132	136	Market, Net Seller	33	33
AAEE	-1	-1	Solar	13	13
Behind the meter DG	0	0	MUNI	0	0
Net Load	131	135	QF	0	0
Transmission Losses	2	2	Mothballed	0	0
Pumps	0	0	Total Qualifying Capacity	46	46
Load + Losses + Pumps	133	137			

Borden Sub-Area Requirements

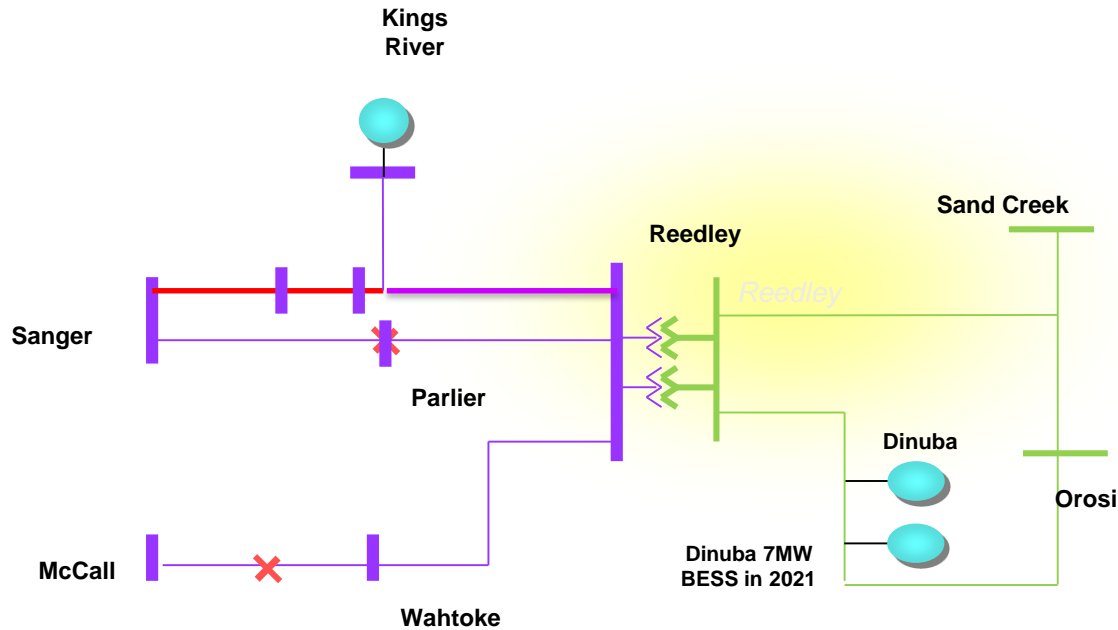


Limit	Category	Limiting Facility	Contingency	2021 LCR (MW)	2025 LCR (MW)
First Limit	P6	Borden 230/70 kV TB # 1	Friant - Coppermine 70 kV Line and Borden 230/70 kV TB # 4	0	4

Reedley Sub-area: Load and Resources

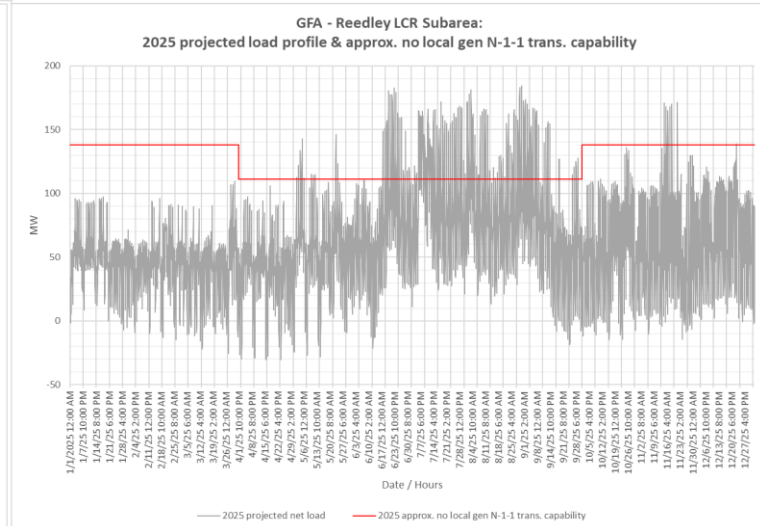
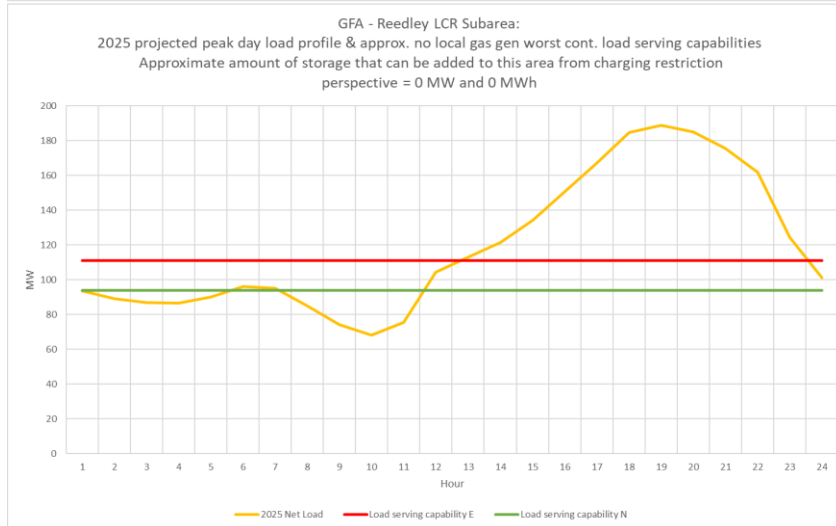
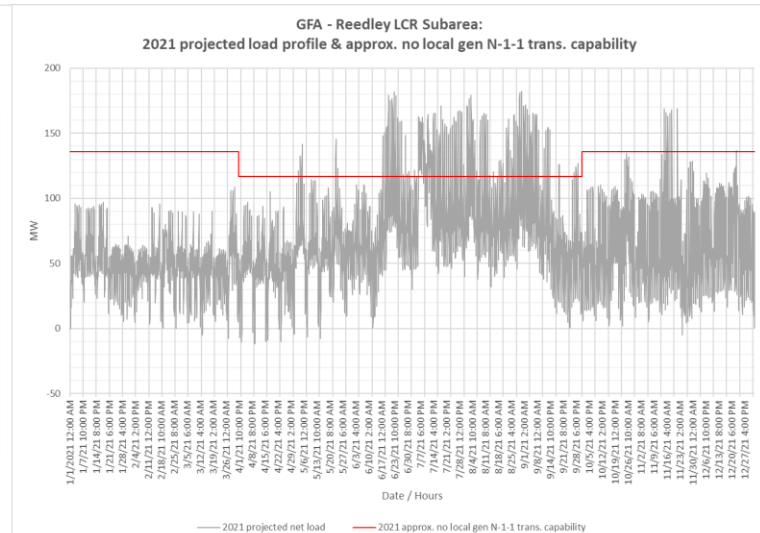
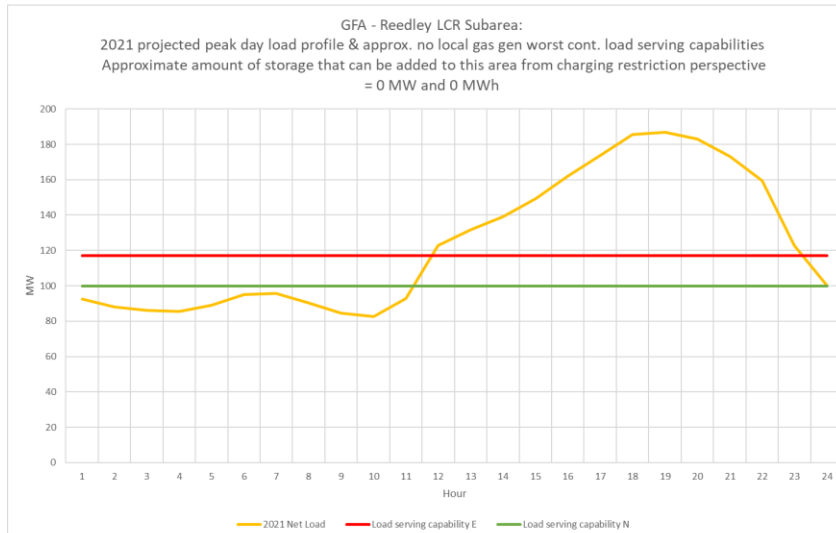
Load (MW)	2021	2025	Generation (MW)	2021	2025
Gross Load	207	212	Market	51	51
AAEE	-1	-2	Solar	0	0
Behind the meter DG	0	0	MUNI	0	0
Net Load	206	211	QF	0	0
Transmission Losses	58	59			
Pumps	0	0	Total Qualifying Capacity	51	51
Load + Losses + Pumps	264	270			

Reedley Sub-Area Requirements



Limit	Category	Limiting Facility	Contingency	2021 LCR (MW)	2025 LCR (MW)
First Limit	P6	Kings River-Sanger-Reedley 115kV line with Wahtoke load online	McCall-Reedley 115kV Line & Sanger-Reedley 115kV line	82 (31)	84 (33)

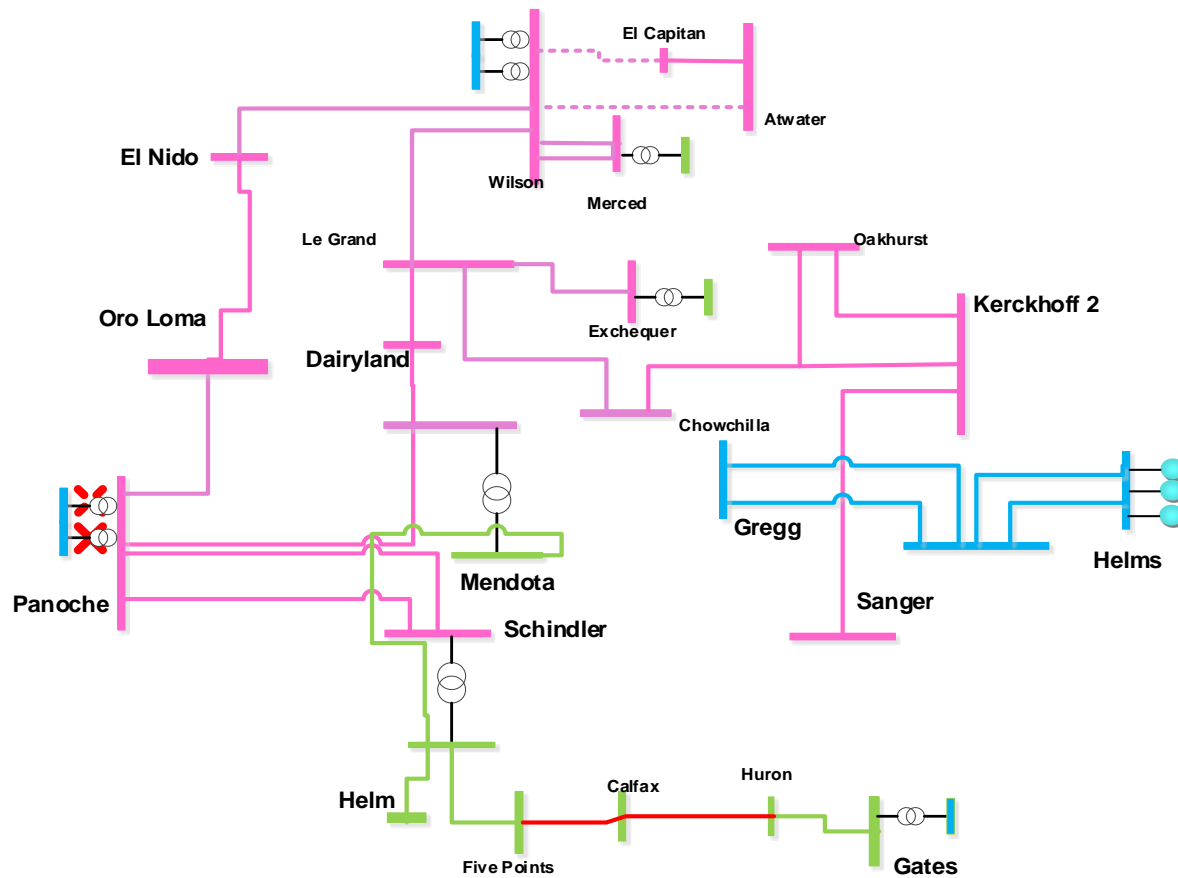
Reedley Sub-area: Load Profiles



NEW Panoche 115-70 kV Sub-area: Load and Resources

Load (MW)	2021	2025	Generation (MW)	2021	2025
Gross Load	415	427	Market/Net Seller	282	282
AAEE	-2	-4	Solar	89	89
Behind the meter DG	-1	-1	MUNI	100	100
Net Load	412	422	QF	3	3
Transmission Losses	12	8			
Pumps	0	0	Total Qualifying Capacity	474	474
Load + Losses + Pumps	424	430			

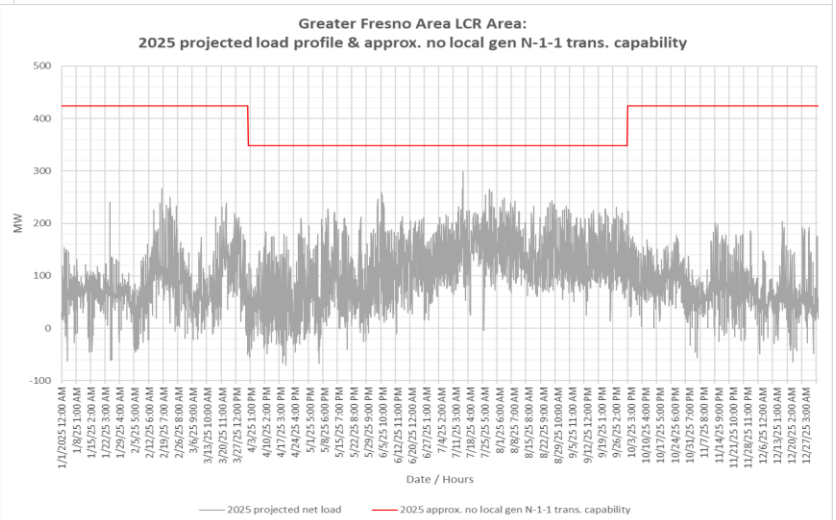
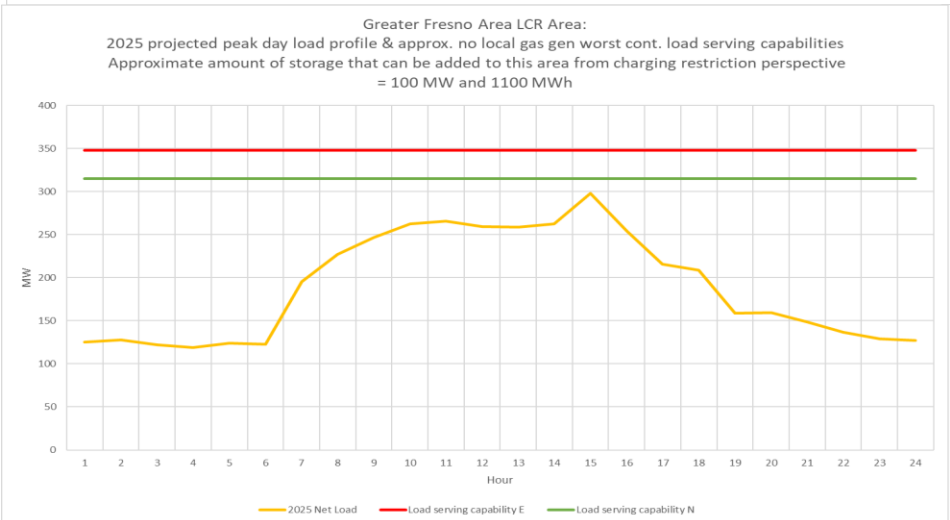
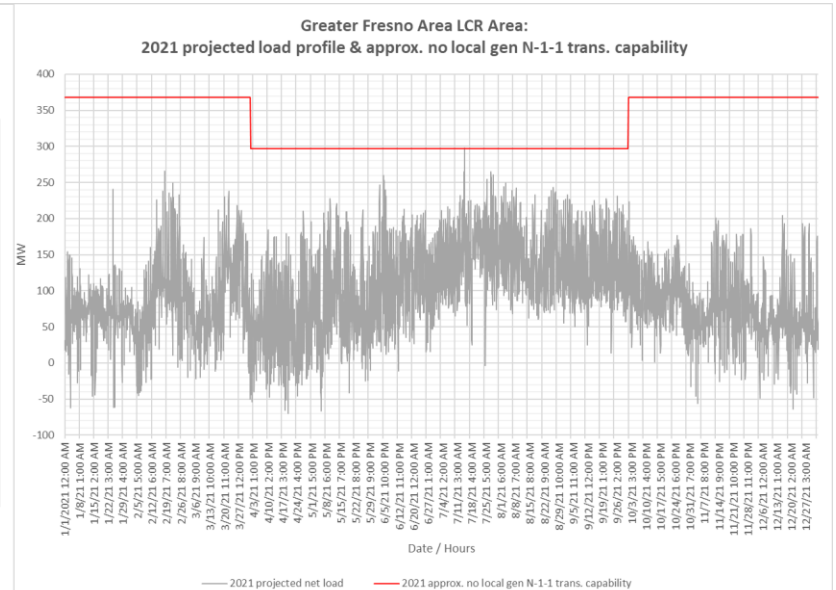
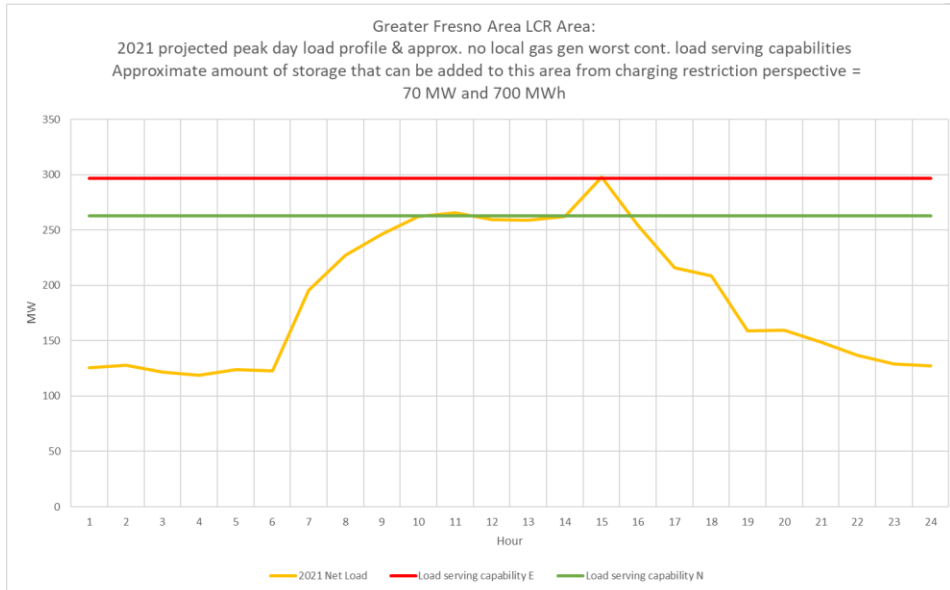
Panoche 115-70 kV Sub-Area Requirements



Limit	Category	Limiting Facility	Contingency	2021 LCR (MW)	2025 LCR (MW)
First Limit	P6	Five Points-Huron-Gates 70kV line	Panoche 230/115kV TB #2 and Panoche 230/115kV TB #4	198	164



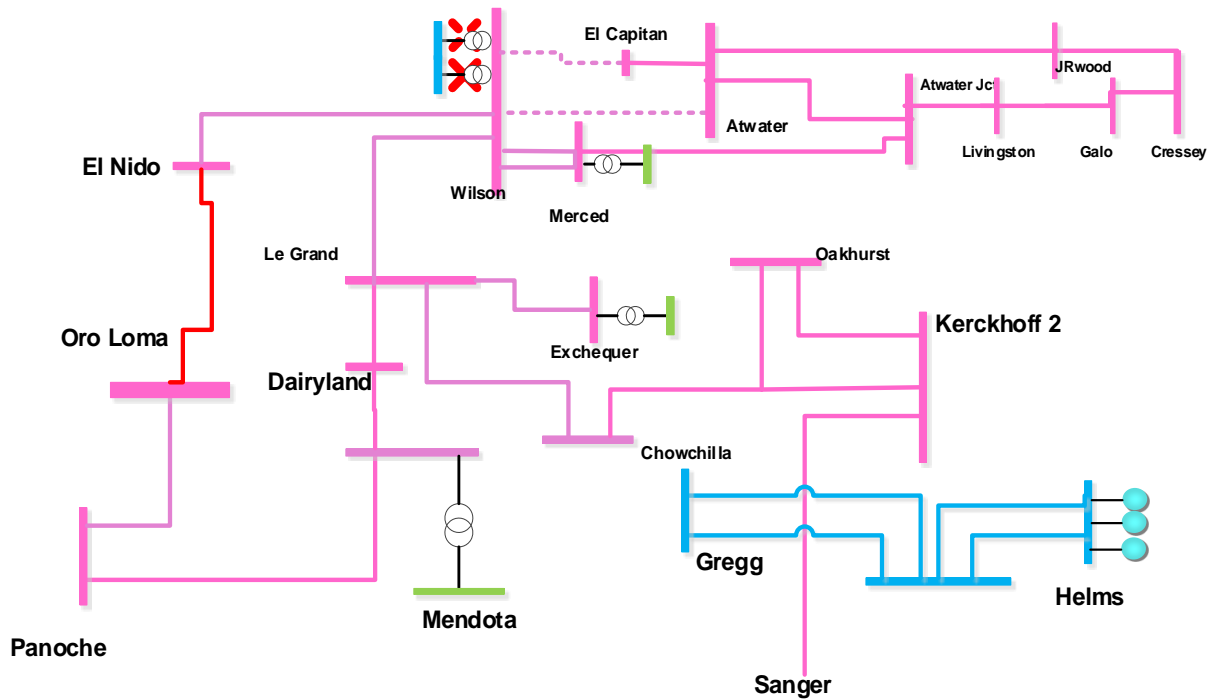
Panoche Sub-area: Load Profiles



NEW Wilson 115 kV Sub-area: Load and Resources

Load (MW)	2021	Generation (MW)	2021
Gross Load	NA – Flow through area.	Market/ Net Seller / Battery	260
AAEE		Solar	100
Behind the meter DG		Wind	0
Net Load		Muni	54
Transmission Losses		QF	0
Pumps		Future preferred resource and energy storage	0
Load + Losses + Pumps		Total Qualifying Capacity	414

Wilson 115 KV Sub-Area Requirements

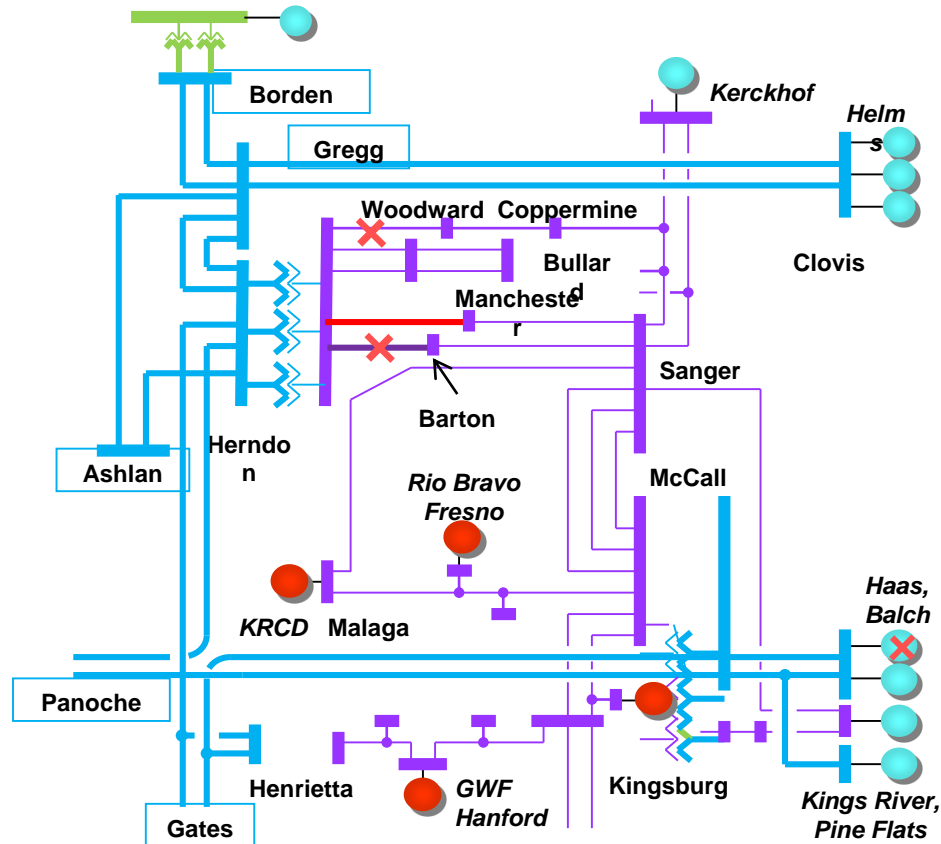


Limit	Category	Limiting Facility	Contingency	2021 LCR (MW)	2025 LCR (MW)
First Limit	P6	Wilson-Oro Loma 115 kV Line (El Nido-Oro Loma 115 kV)	Wilson 230/115kV TB #1 and Wilson 230/115kV TB #2	416 (2 NQC/32 Peak)	None due to the 3 rd Wilson 230/115kV TB

Herndon Sub-area: Load and Resources

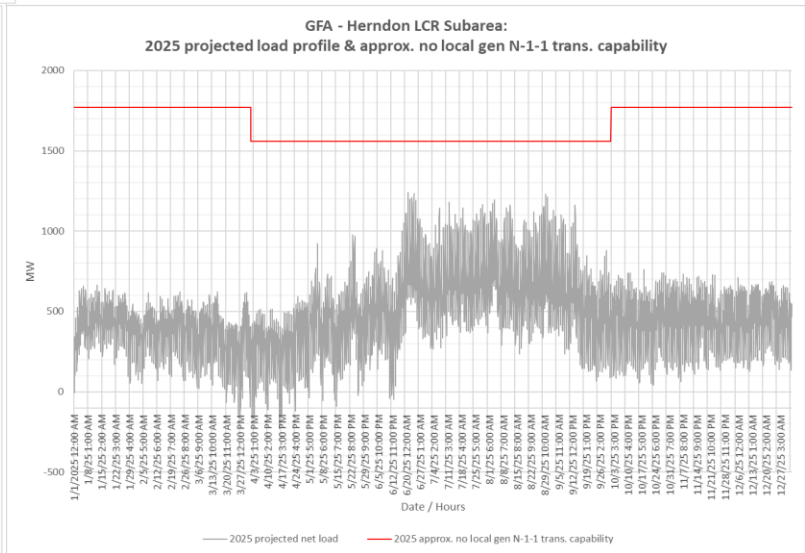
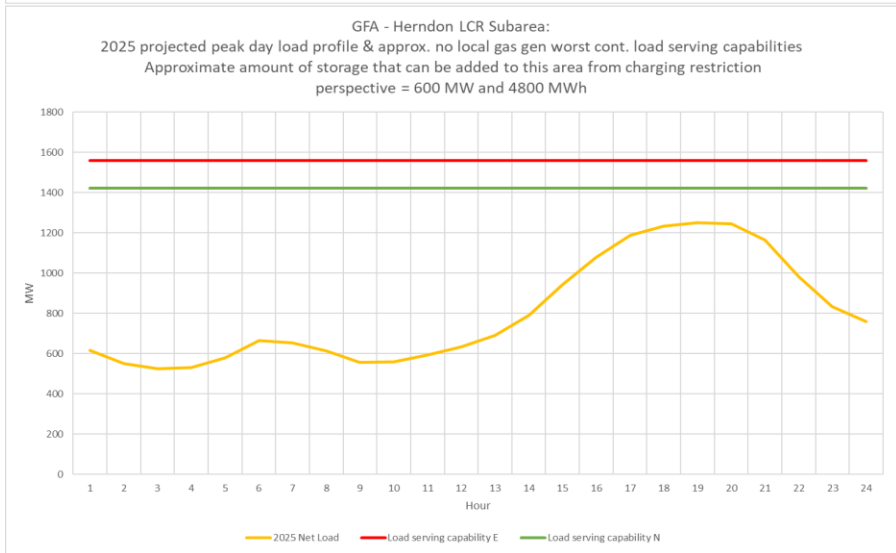
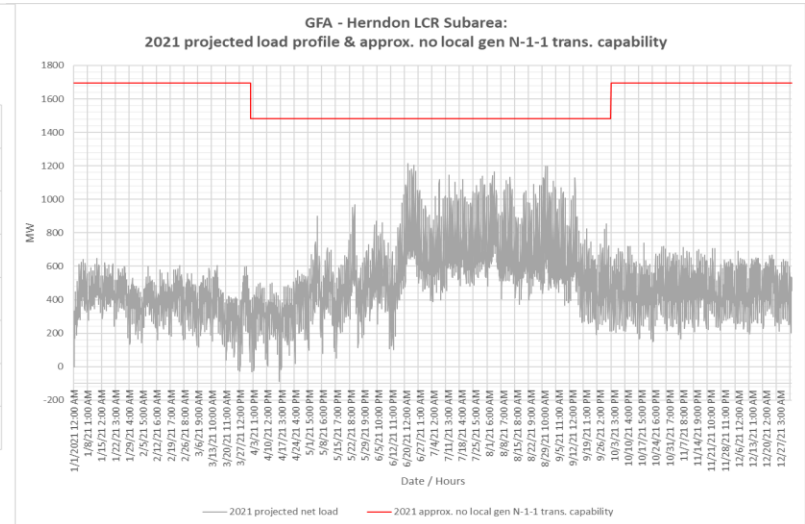
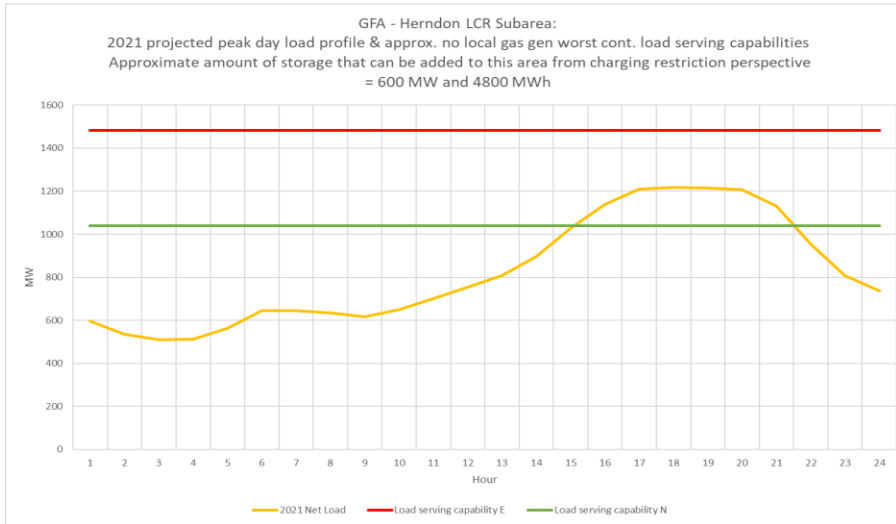
Load (MW)	2021	2025	Generation (MW)	2021	2025
Gross Load	1471	1523	Market	997	997
AAEE	-6	-13	Solar	63	63
Behind the meter DG	-3	-3	MUNI	98	98
Net Load	1462	1507	QF	1	1
Transmission Losses	24	25			
Pumps	0	0	Total Qualifying Capacity	1159	1159
Load + Losses + Pumps	1486	1532			

Herndon Sub-Area Requirements



Limit	Category	Limiting Facility	Contingency	2021 LCR (MW)	2025 LCR (MW)
First limit	P6	Herndon-Manchester 115 kV line	Herndon-Woodward 115 kV line and Herndon-Barton 115 kV line	334	441

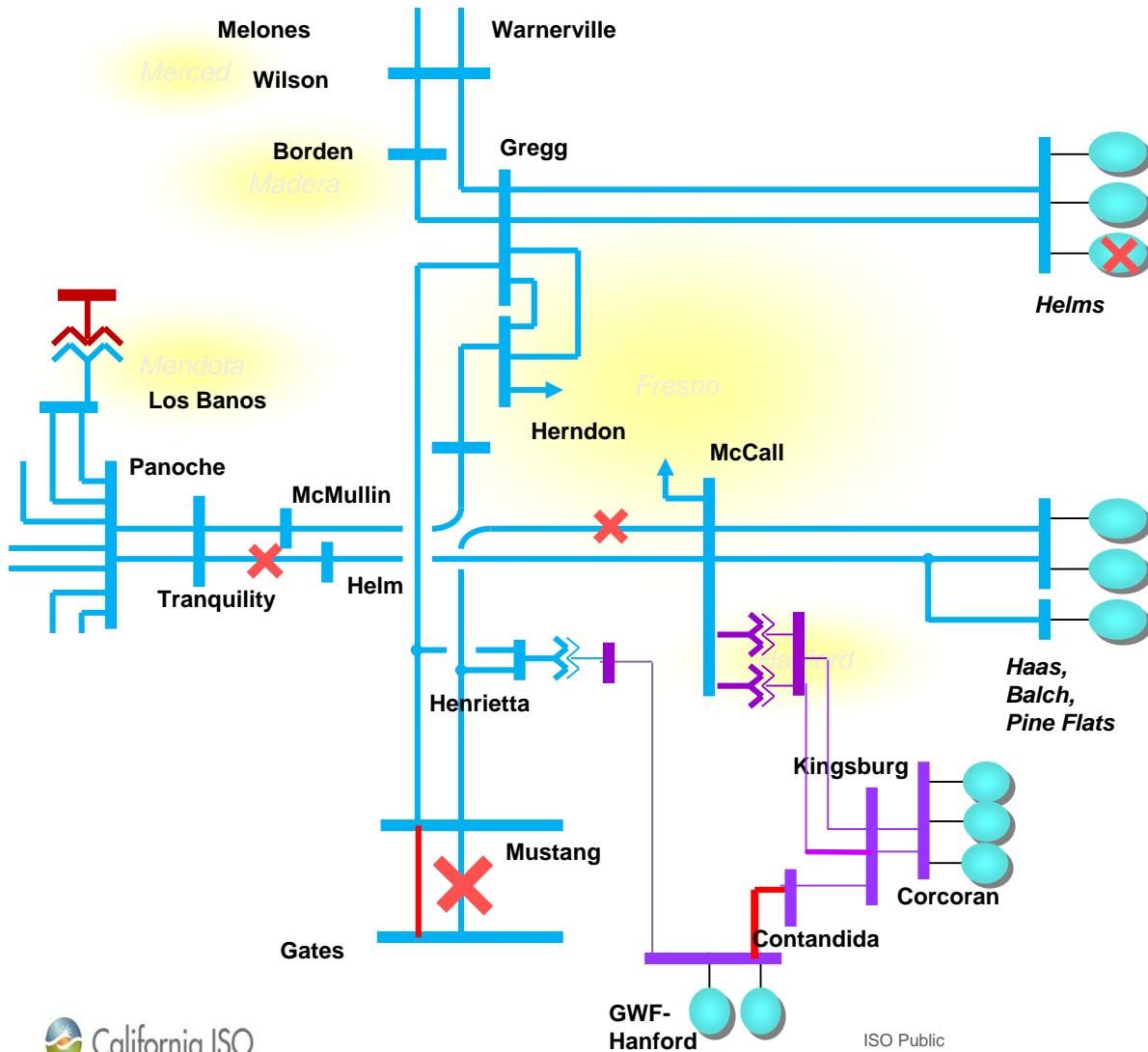
Herndon Sub-area: Load Profiles



Overall Load and Resources

Load (MW)	2021	2025	Generation (MW)	2021	2025
Gross Load	3099	3217	Market/Net Seller	2515	2515
AAEE	-12	-26	Solar	320	320
Behind the meter DG	-5	-5	MUNI	212	212
Net Load	3082	3186	QF	4	4
Transmission Losses	106	93	Battery	300	300
Pumps	0	0			
Load + Losses + Pumps	3189	3279	Total Qualifying Capacity	3351	3351

Overall Sub-Area Requirements

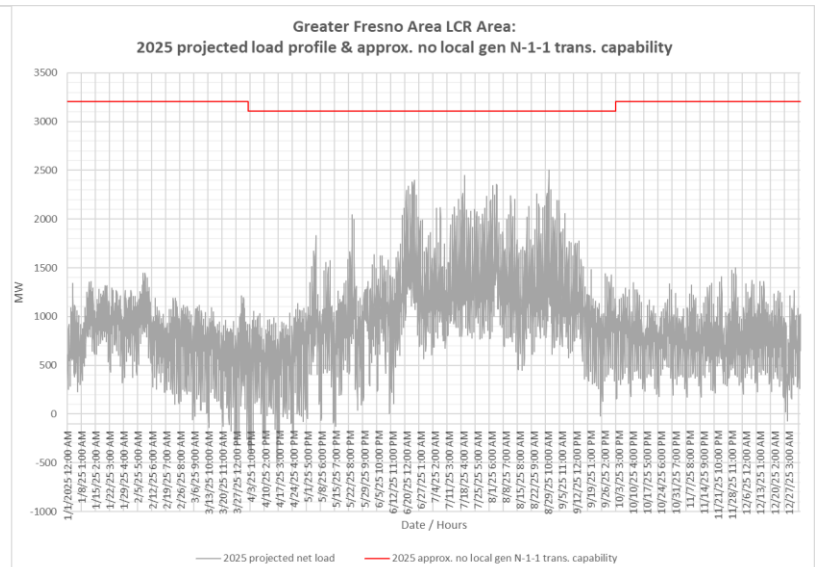
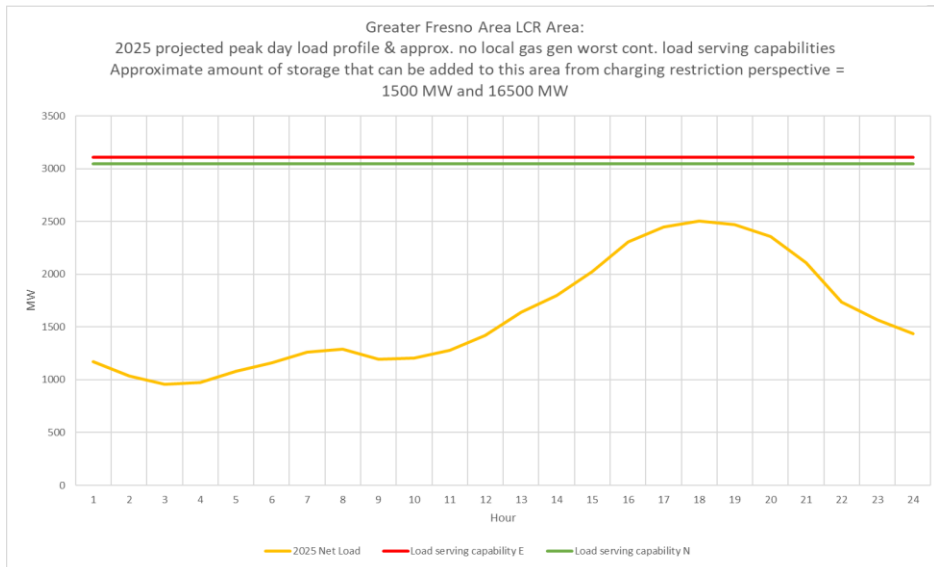
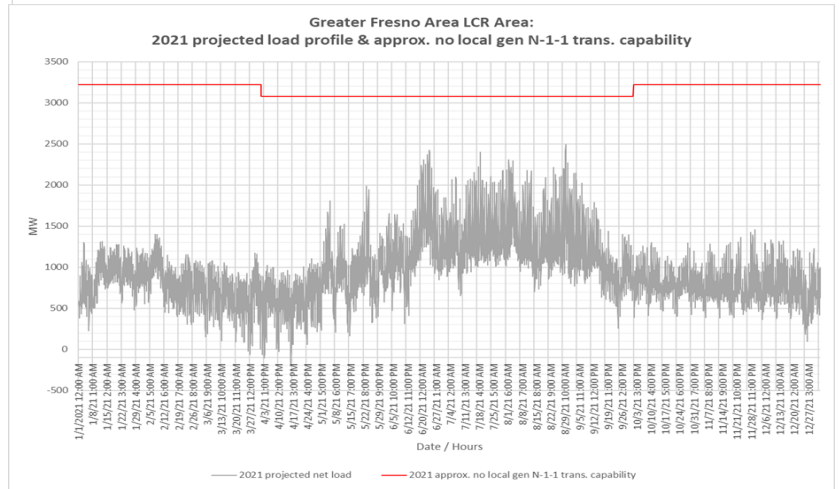
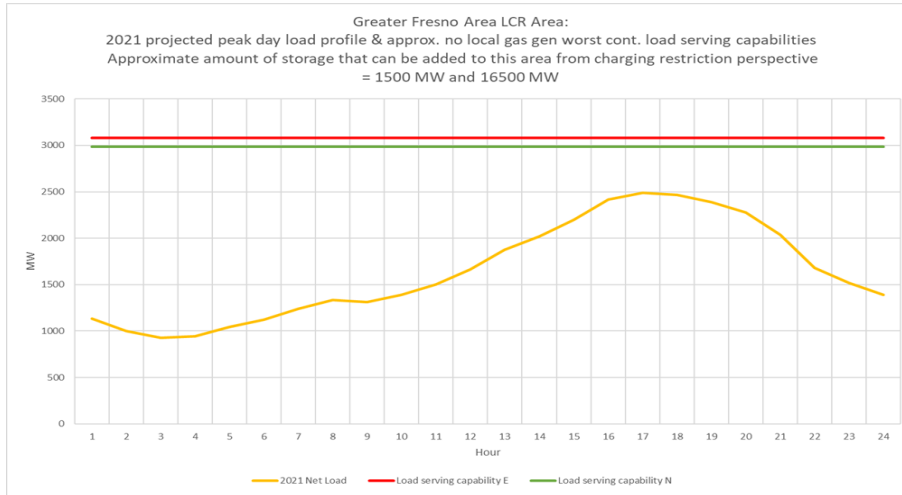


Overall Fresno Area : Requirements

Limit	Category	Limiting Facility	Contingency	2021 LCR (MW)	2025 LCR (MW)
First limit	P6	GWF-Contandida 115kV Line	Panoche-Helm 230kV Line and Gates-McCall 230kV line	1694	1971

Study Year	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Need
2021	1,694	72	1,766
2025	1,971	69	2,040

Overall Sub-area: Load Profiles



Changes Compared to Previous LCR Requirements

Sub-area	2020		2021		2024		2025	
	Load	LCR	Load	LCR	Load	LCR	Load	LCR
Hanford	226	82	209	58	231	93	210	58
Coalinga	91	35	93	57 (41)	89	33	89	52 (36)
Borden	143	19	133	0	148	19	137	4
Reedley	244	35	264	83 (31)	265	31	270	84 (33)
New Panoche 115 kV	N/A	N/A	424	198	N/A	N/A	430	164
New Wilson 115/70 kV	N/A	N/A	Flow-Through	416(2)	N/A	N/A	N/A	Eliminated due to Project
Herndon	1569	436	1486	334	1594	465	1532	441
Overall	3287	1694	3189	1694	3337	1711	3279	1971

LCR increase mostly due to changes to the LCR criteria.