



2020 and 2024 Final LCR Study Results Greater Fresno Area

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Stakeholder Call

April 10, 2019

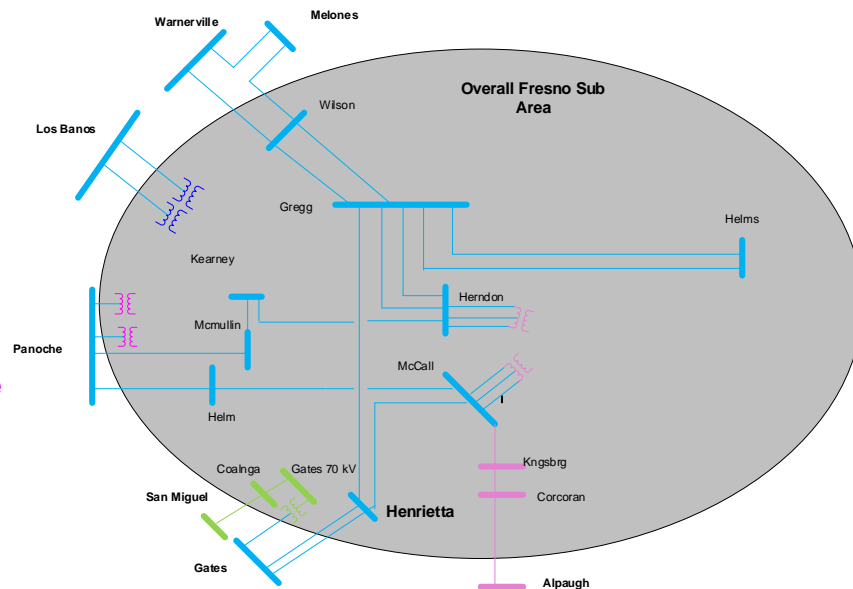
Greater Fresno Area

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 #1

LCR Sub-Areas:



New major transmission projects

Project Name	Expected ISD
Borden 230 kV Voltage Support	19-Feb
Oro Loma 70 kV Area Reinforcement	20-May
Reedley 70 kV Reinforcement (Renamed to Reedley 70 kV Area Reinforcement Projects Include Battery at Dinuba)	21-Dec
Reedley 115/70 kV Transformer Capacity Increase	Completed
Wilson 115 kV Area Reinforcement	23-Dec
Wilson-Le Grand 115 kV line Reconductoring	20-Dec
Panoche – Oro Loma 115 kV Line Reconductoring	20-Dec
Wilson 115 kV SVC	19-Dec
Gates #12 500/230 kV Transformer Addition	19-Dec
Kearney - Herndon 230 kV Line Reconductoring	19-May
Northern Fresno 115 kV Area Reinforcement	20-Mar
Bellota-Warnerville 230kV line Reconductoring	23-Dec
Herndon-Bullard 230kV Reconductoring Project	21-Jan

Power plant changes

Resource Additions:

- 4 new solar resources (about 85 MW NQC)

Resource Retirements:

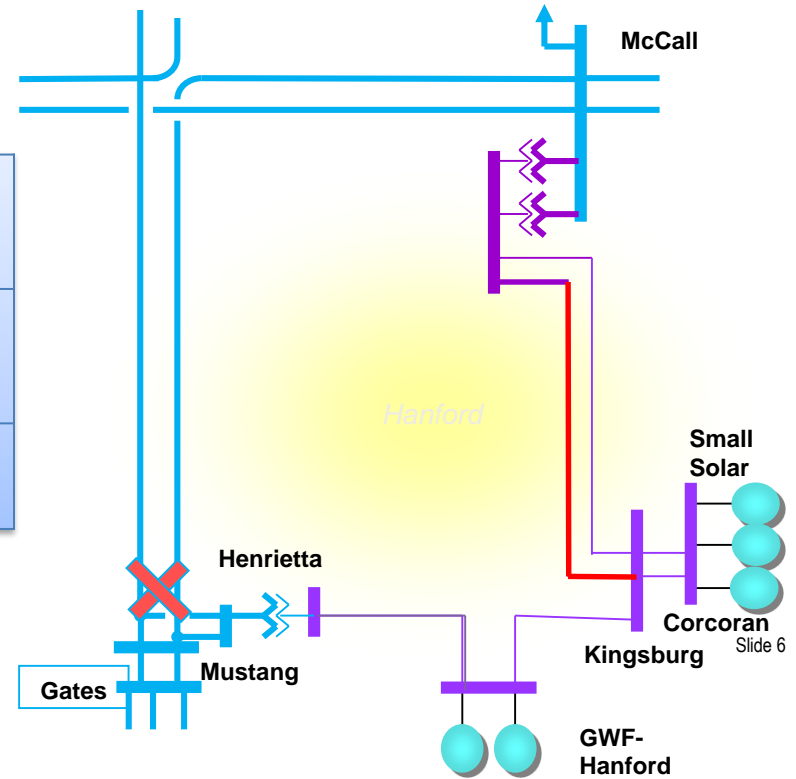
- None

Hanford Subarea: Load and Resources

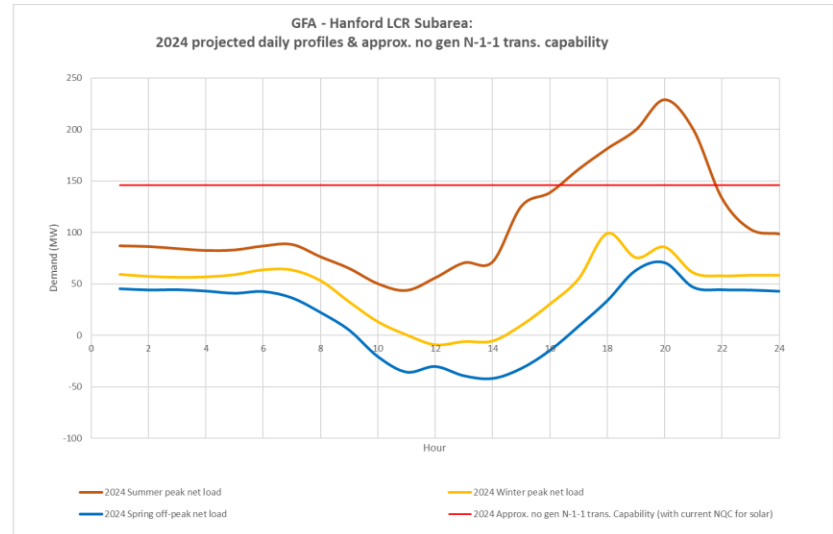
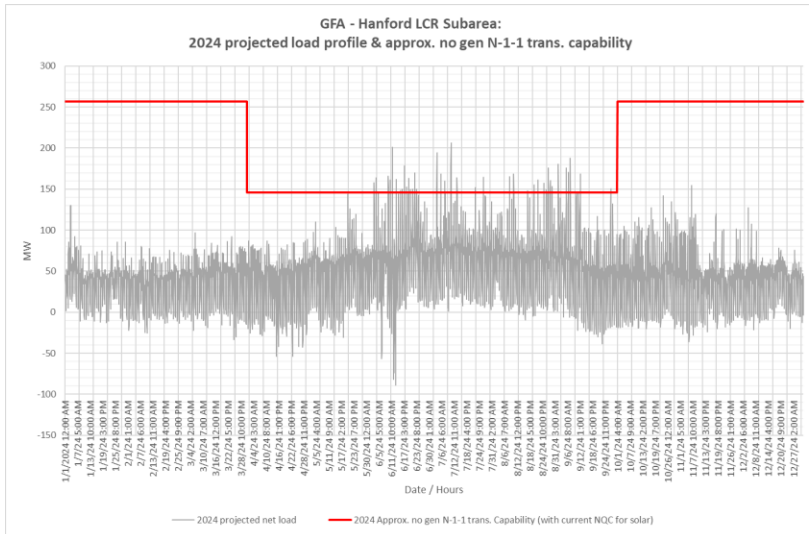
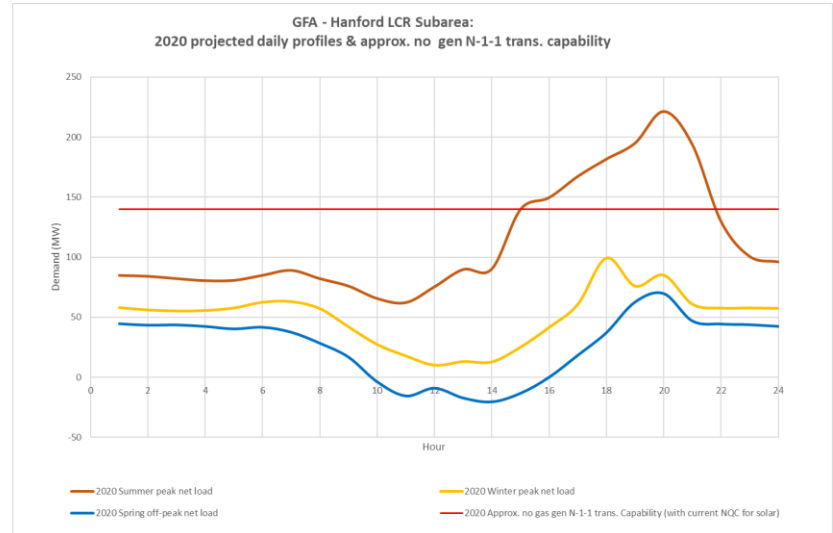
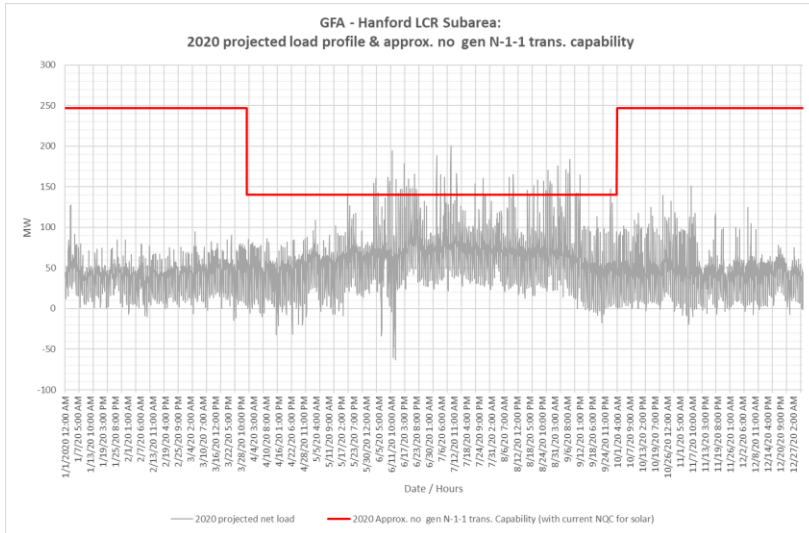
Load (MW)	2020	2024	Generation (MW)	2020	2024
Gross Load	224	235	Market	133	133
AAEE	-3	-9	Solar	37	37
Behind the meter DG	-3	-3	MUNI	0	0
Net Load	218	223	QF	0	0
Transmission Losses	8	7			
Pumps	0	0	Total Qualifying Capacity	170	170
Load + Losses + Pumps	226	230			

Hanford Sub-Area Requirements

Limit	Category	Limiting Facility	Contingency	2020 LCR (MW)	2024 LCR (MW)
First Limit	B	None	None	No requirement	No requirement
First Limit	C	McCall-Kingsburg #1 115kV Line	Mustang-Gates #1 and #2 230kV Lines	82	93



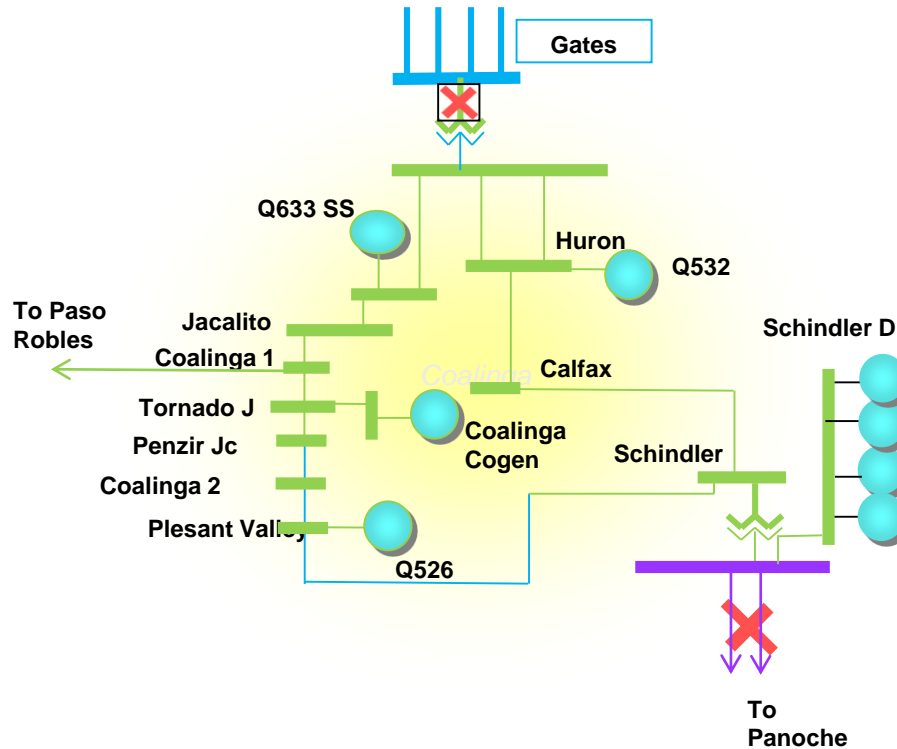
Hanford Subarea: Load Profiles



Coalinga Subarea: Load and Resources

Load (MW)	2020	2024	Generation (MW)	2020	2024
Gross Load	90	92	Market	0	0
AAEE	-1	-4	Solar	38	38
Behind the meter DG	0	0	MUNI	0	0
Net Load	89	88	QF	3	3
Transmission Losses	2	1	Mothballed	34	34
Pumps	0	0	Total Qualifying Capacity	75	75
Load + Losses + Pumps	91	89			

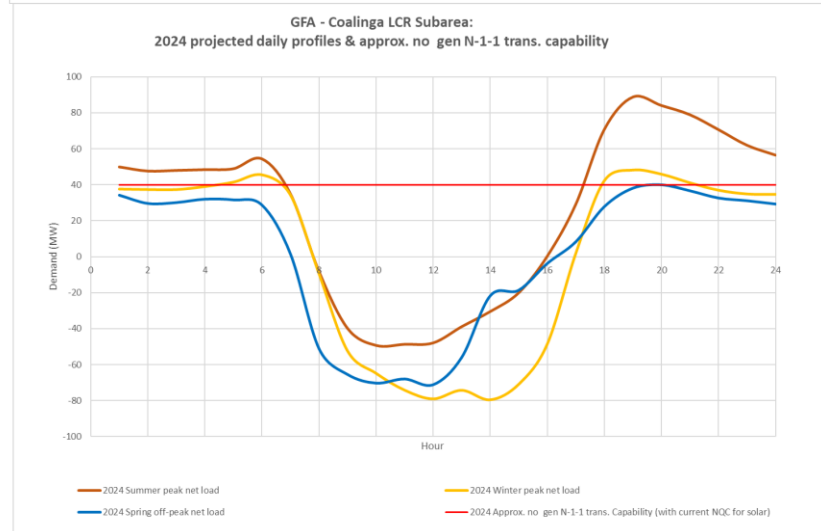
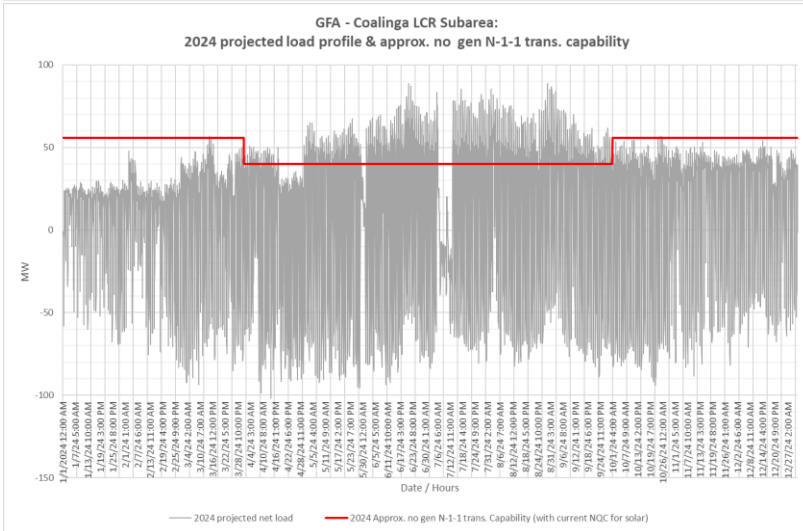
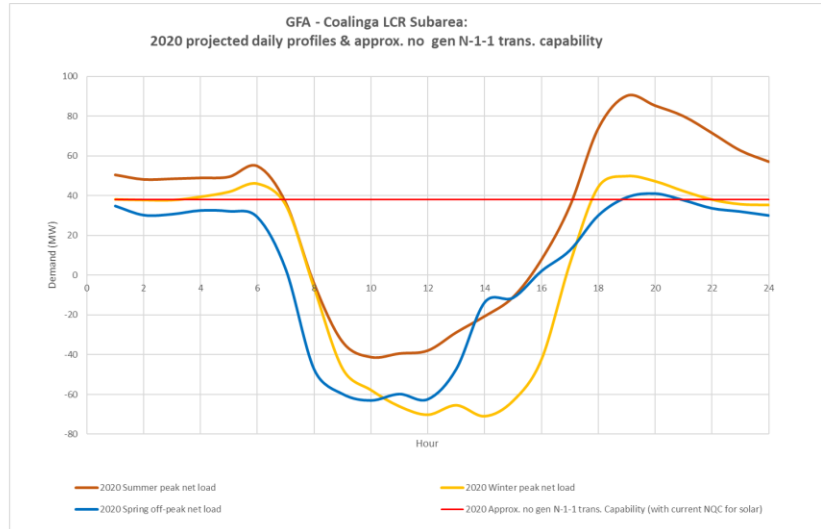
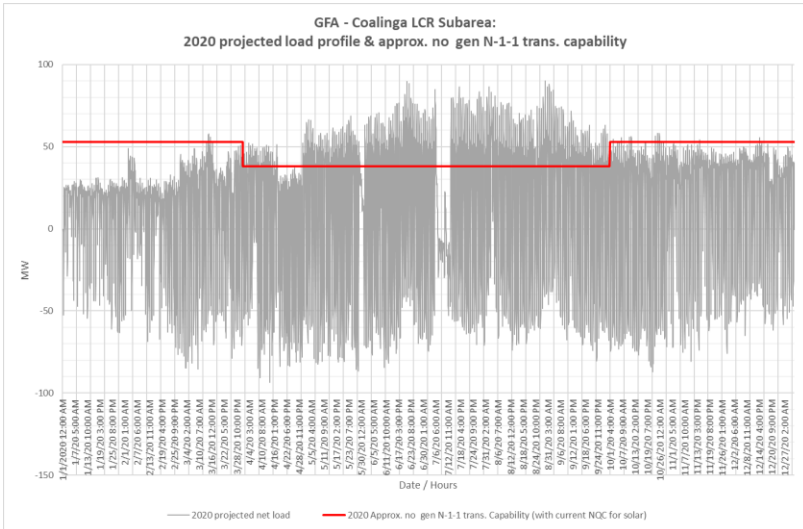
Coalinga Sub-Area Requirements



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Limit	Category	Limiting Facility	Contingency	2020 LCR (MW)	2024 LCR (MW)
First Limit	B	None	None	No requirement	No requirement
First Limit	C	Voltage Instability	T-1/L-2: Gates 230/70kV TB #5 and Panoche-Schindler #1 & #2 115kV common tower lines	35	33

Coalinga Subarea: Load Profiles

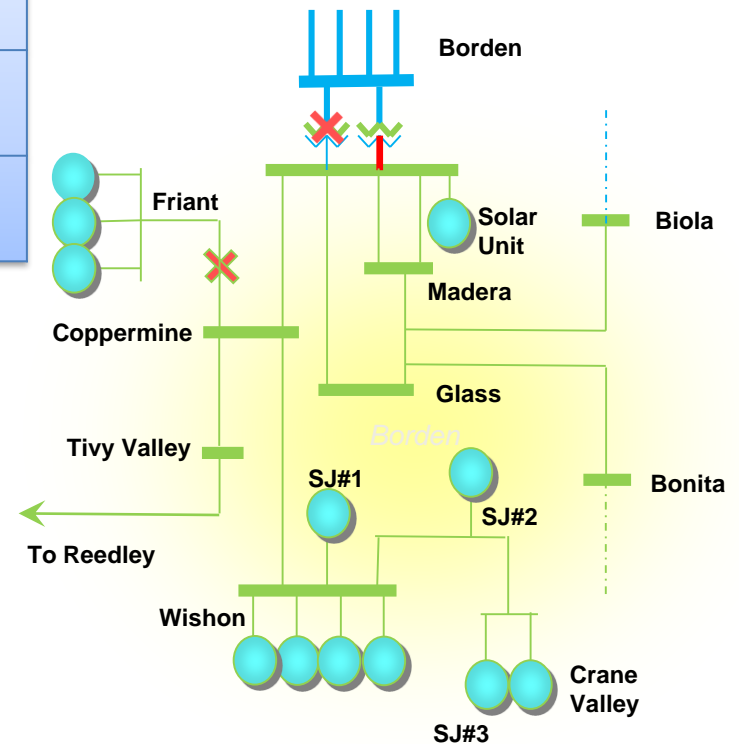


Borden Subarea: Load and Resources

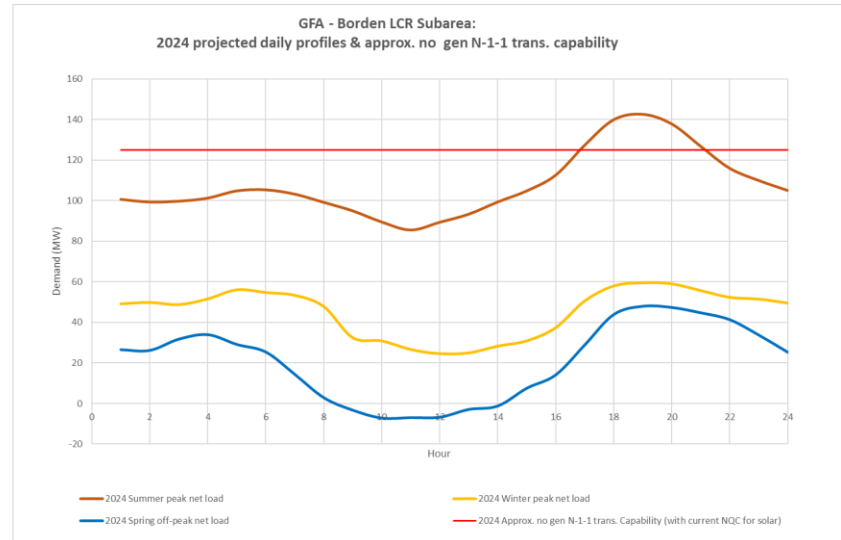
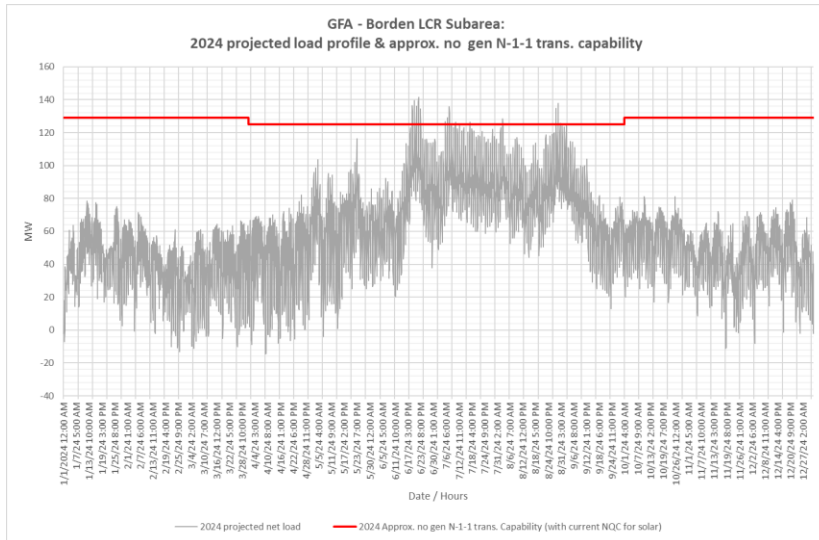
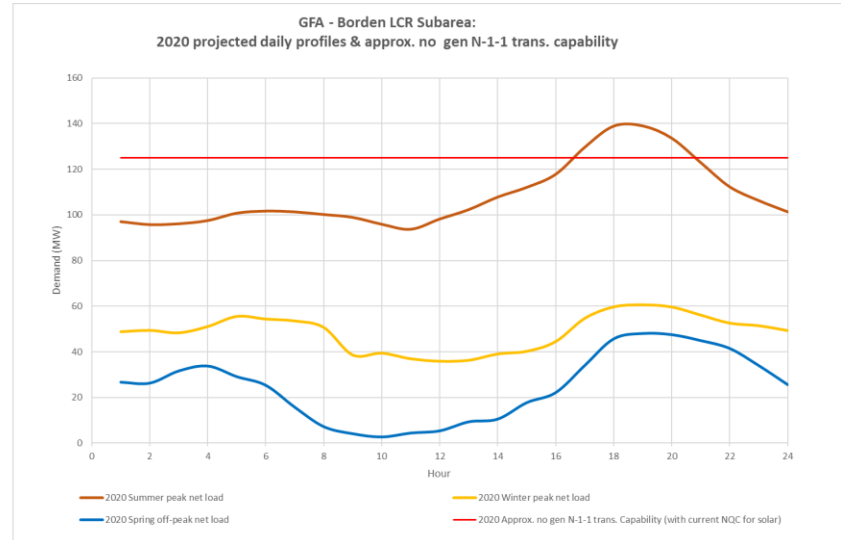
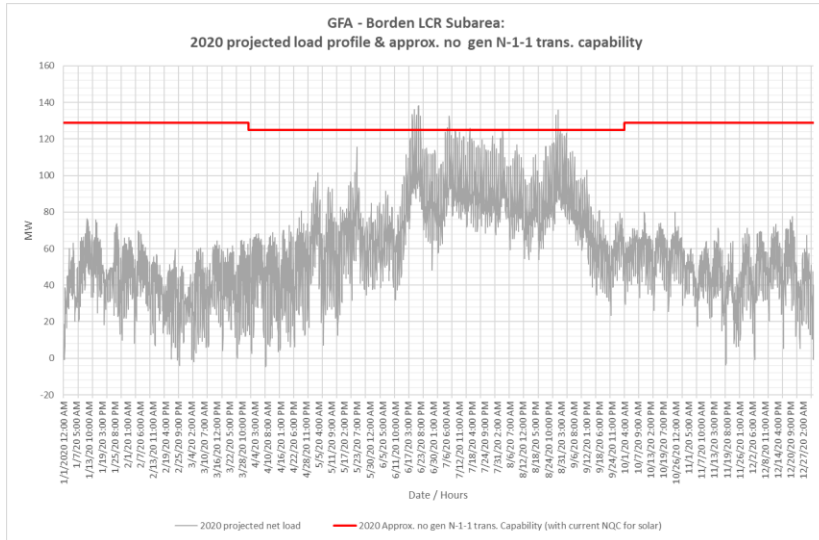
Load (MW)	2020	2024	Generation (MW)	2020	2024
Gross Load	143	148	Market	35	35
AAEE	-2	-6	Solar	0	21
Behind the meter DG	0	0	MUNI	0	0
Net Load	141	142	QF	0	0
Transmission Losses	2	2			
Pumps	0	0	Total Qualifying Capacity	35	56
Load + Losses + Pumps	143	144			

Borden Sub-Area Requirements

Limit	Category	Limiting Facility	Contingency	2020 LCR (MW)	2024 LCR (MW)
First Limit	B	Borden 230/70 kV TB # 1	Borden 230/70 kV # 4	13	13
First Limit	C	Borden 230/70 kV TB # 1	Friant - Coppermine 70 kV Line and Borden 230/70 kV TB # 4	19	19



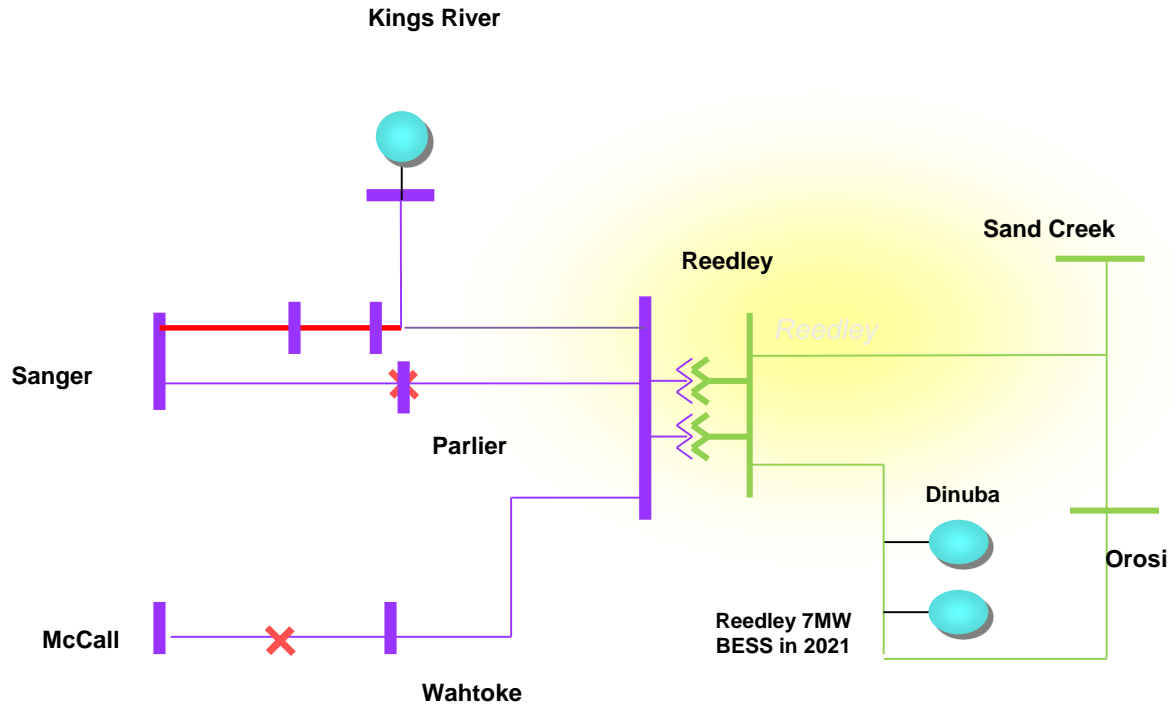
Borden Subarea: Load Profiles



Reedley Subarea: Load and Resources

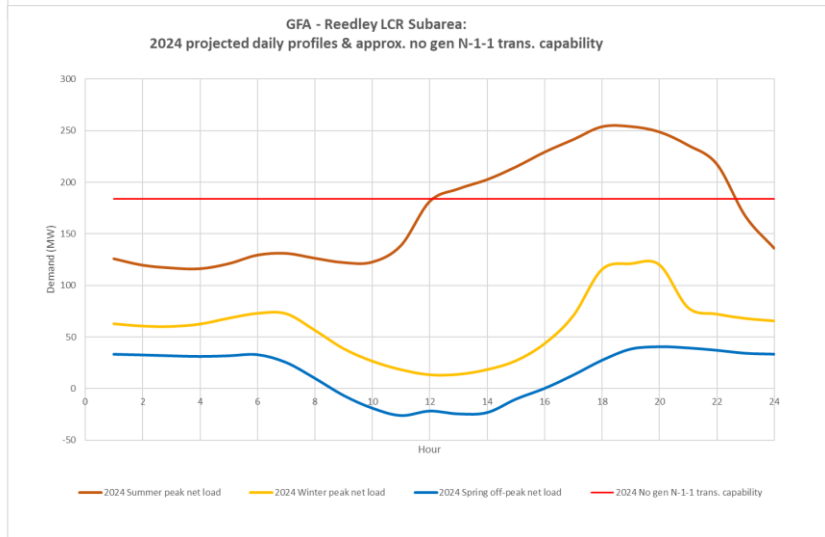
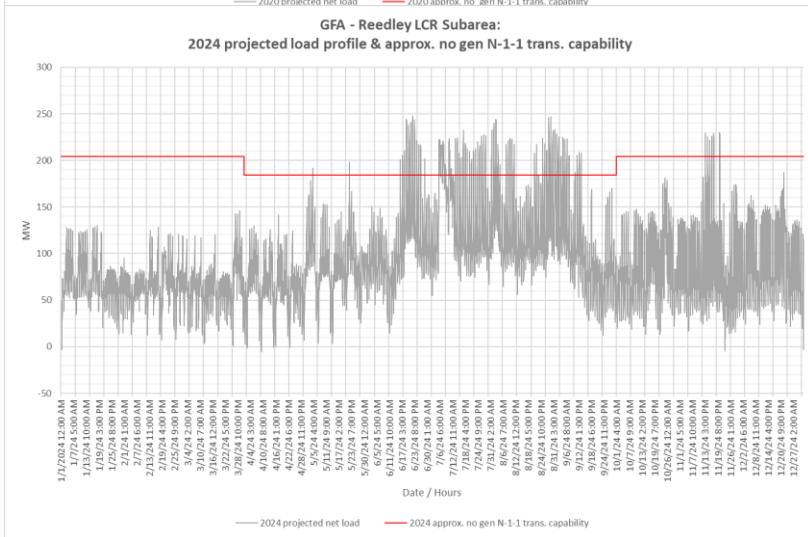
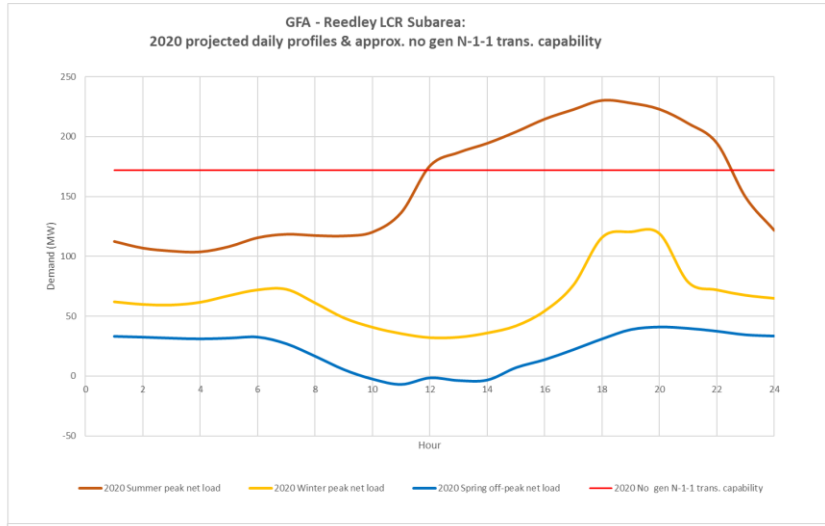
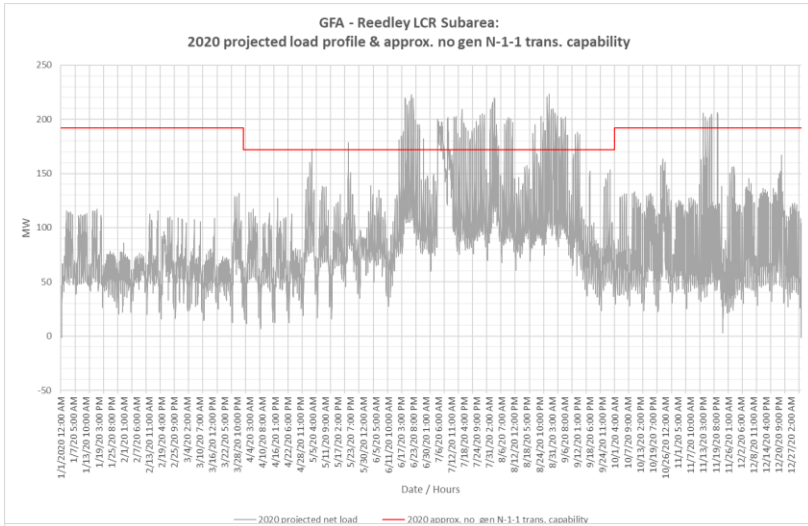
Load (MW)	2020	2024	Generation (MW)	2020	2024
Gross Load	215	223	Market	54	54
AAEE	-3	-8	Solar	0	0
Behind the meter DG	0	0	MUNI	0	0
Net Load	212	215	QF	0	0
Transmission Losses	31	50			
Pumps	0	0	Total Qualifying Capacity	54	54
Load + Losses + Pumps	243	265			

Reedley Sub-Area Requirements



Limit	Category	Limiting Facility	Contingency	2020 LCR (MW)	2024 LCR (MW)
First Limit	C	Kings River-Sanger-Reedley 115kV line	McCall-Reedley 115kV Line & Sanger-Reedley 115kV line	35	31

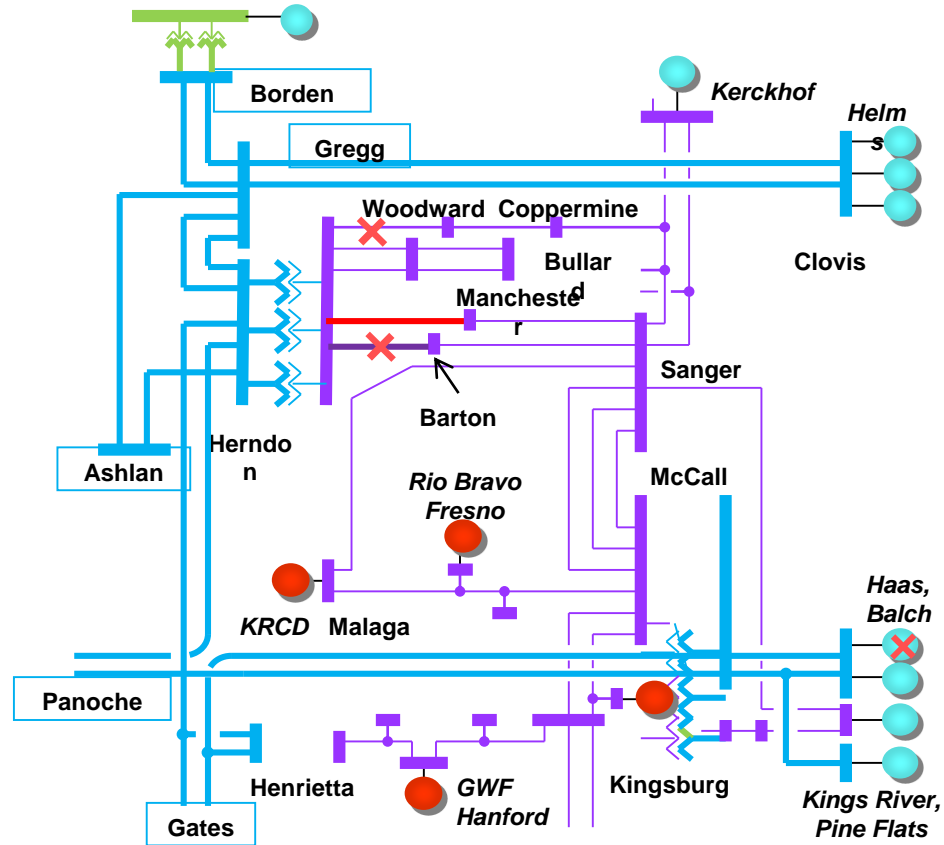
Reedley Subarea: Load Profiles



Herndon Subarea: Load and Resources

Load (MW)	2020	2024	Generation (MW)	2020	2024
Gross Load	1562	1623	Market	962	962
AAEE	-19	-58	Solar	47	47
Behind the meter DG	-3	-3	MUNI	80	80
Net Load	1540	1563	QF	0	0
Transmission Losses	29	31			
Pumps	0	0	Total Qualifying Capacity	1089	1089
Load + Losses + Pumps	1569	1594			

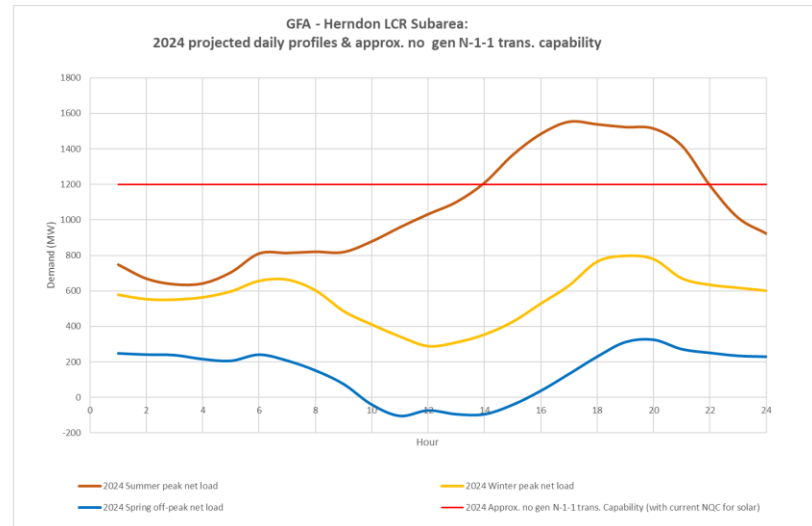
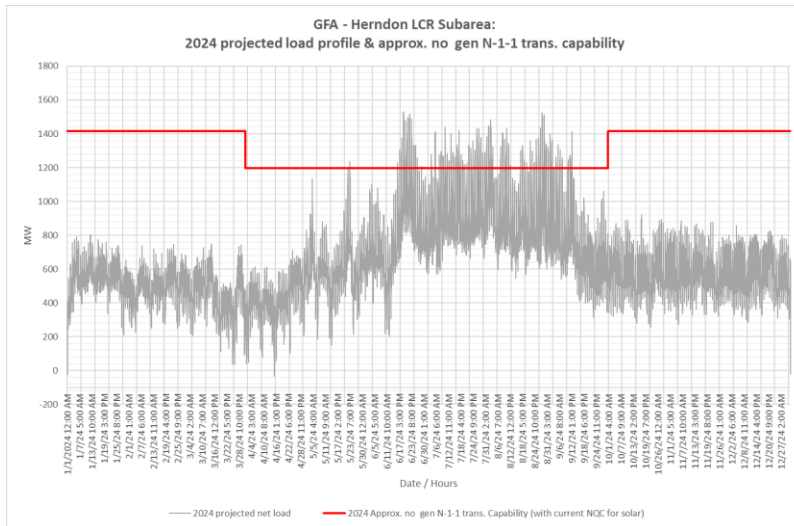
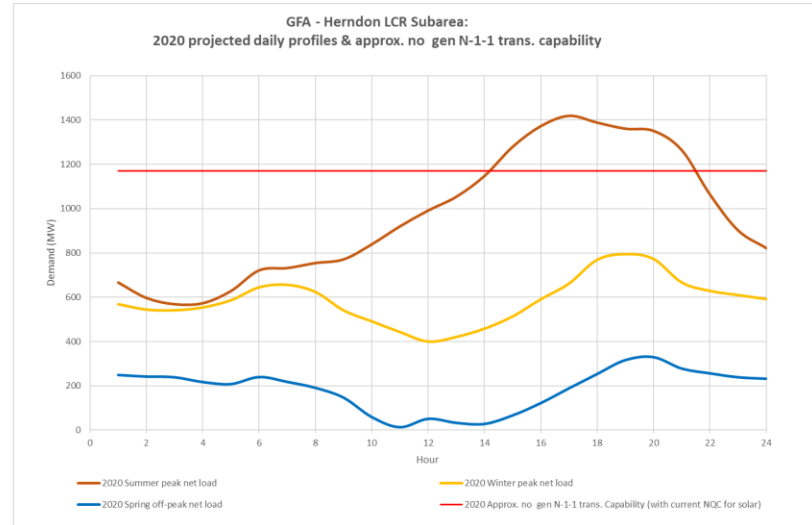
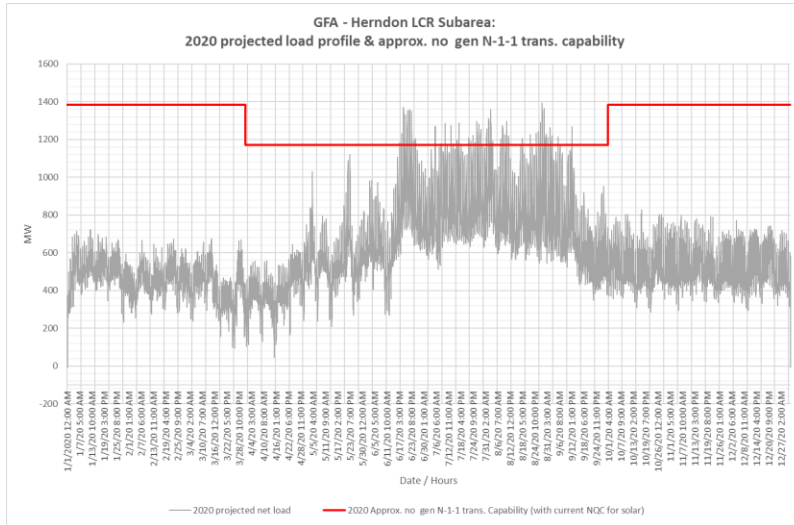
Herndon Sub-Area Requirements



Herndon Fresno Sub Area : Requirements

Limit	Category	Limiting Facility	Contingency	2020 LCR (MW)	2024 LCR (MW)
First limit	B	Herndon-Manchester 115kV line	Balch Unit 1 and Herndon-Barton 115kV line	Not binding	Not binding
First limit	C	Herndon-Manchester 115kV line	Herndon-Woodward 115kV line and Herndon-Barton 115kV line	436	465

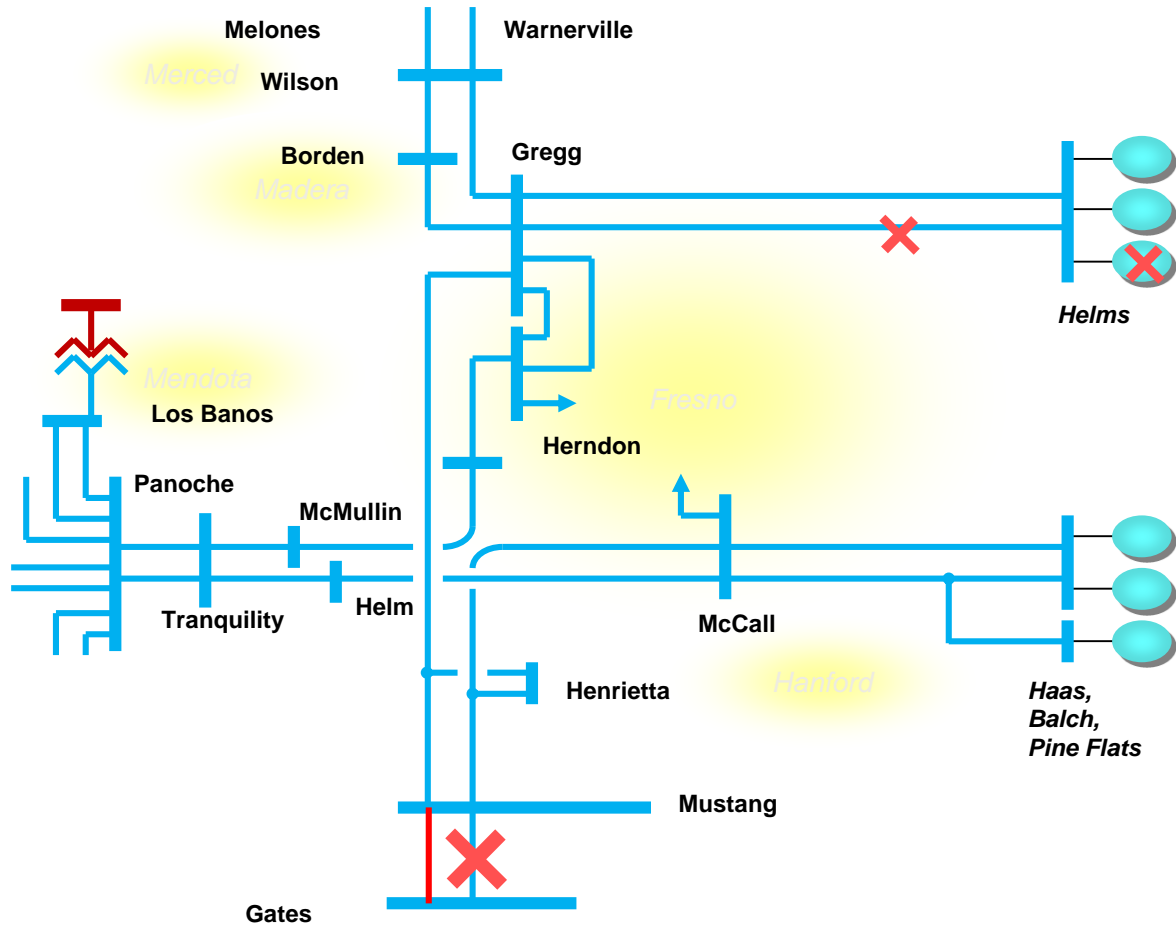
Herndon Subarea: Load Profiles



Overall Load and Resources

Load (MW)	2020	2024	Generation (MW)	2020	2024
Gross Load	3220	3342	Market/Net Seller	2548	2698
AAEE	-43	-128	Solar	372	393
Behind the meter DG	-3	-3	MUNI	199	199
Net Load	3174	3211	QF	23	23
Transmission Losses	104	125	Mothballed	35	35
Pumps	0	0			
Load + Losses + Pumps	3278	3336	Total Qualifying Capacity	3177	3348

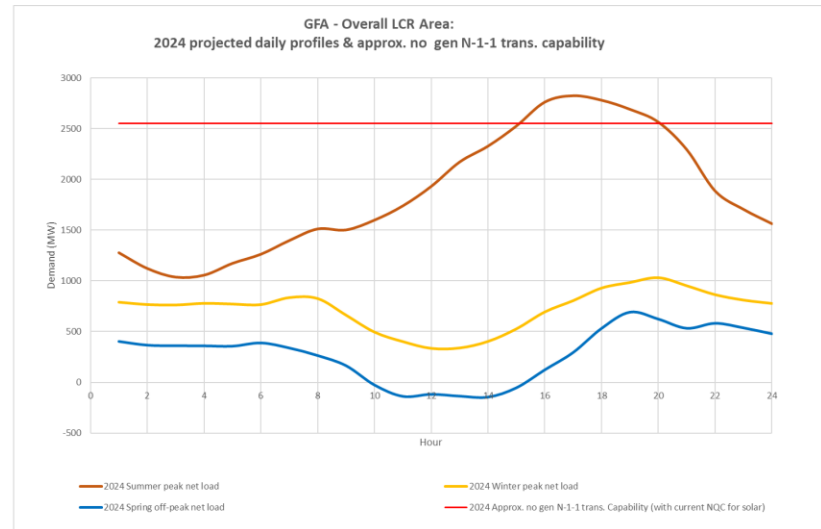
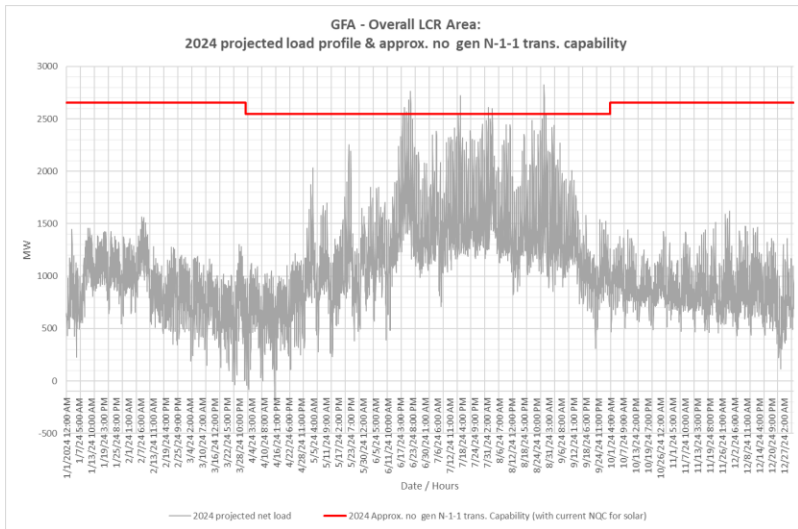
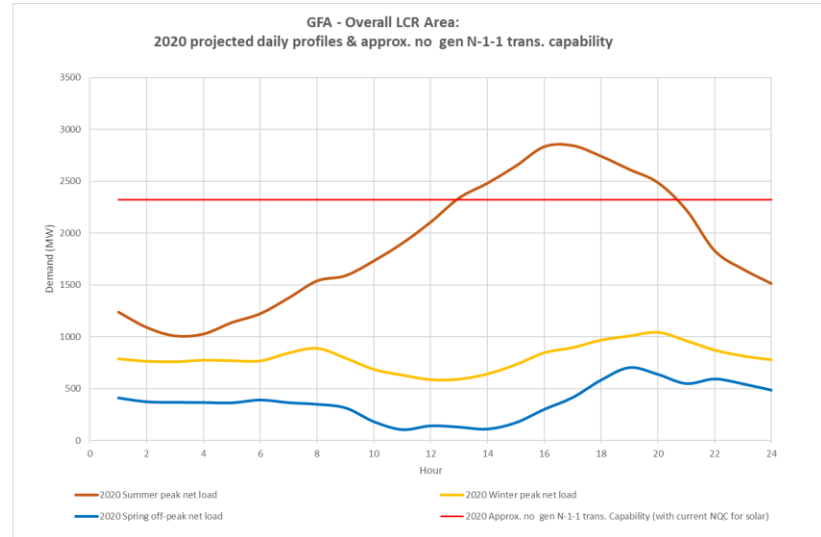
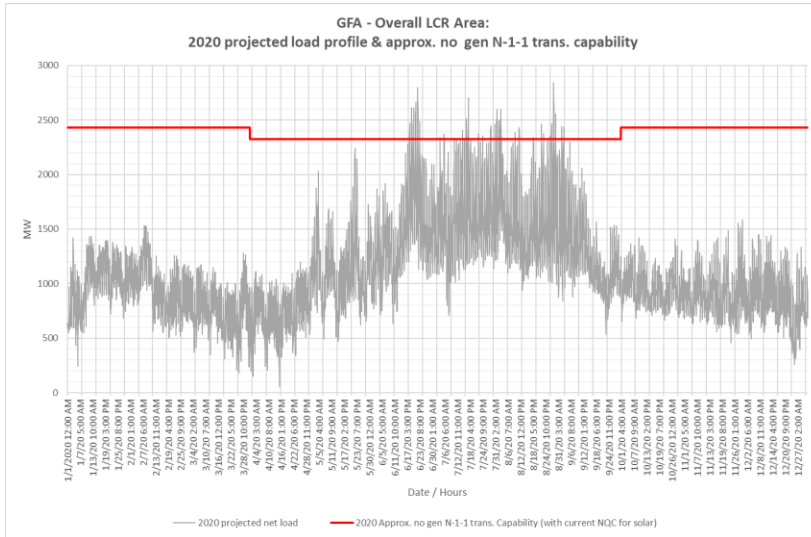
Overall Sub-Area Requirements



Overall Fresno Sub Area : Requirements

Limit	Category	Limiting Facility	Contingency	2020 LCR (MW)	2024 LCR (MW)
First limit	B	Remaining Gates-Mustang 230kV line	Gates-Mustang 230kV #1 or #2 line and one Helms unit out	1694	1711
First limit	C	Remaining Gates-Mustang 230kV line	Gates-Mustang 230kV #1 or #2 line and Helms Gregg #1 230kV Line	1694	1711

Overall Subarea: Load Profiles



Changes Compared to Previous LCR Requirements

Subarea	2019		2020		2023		2024	
	Load	LCR	Load	LCR	Load	LCR	Load	LCR
Hanford	171	56	226	82	186	107	231	93
Coalinga	86	19	91	35	85	16	89	33
Borden	133	1	143	19	137	8	148	19
Reedley	237	5	244	35	266	12	265	31
Herndon	1461	792	1569	436	1529	821	1594	465
Overall	3070	1670	3287	1694	3231	1688	3337	1711

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LCR increase is mostly due to load increase