



# 2023 & 2027 Draft LCR Study Results Greater Bay Area

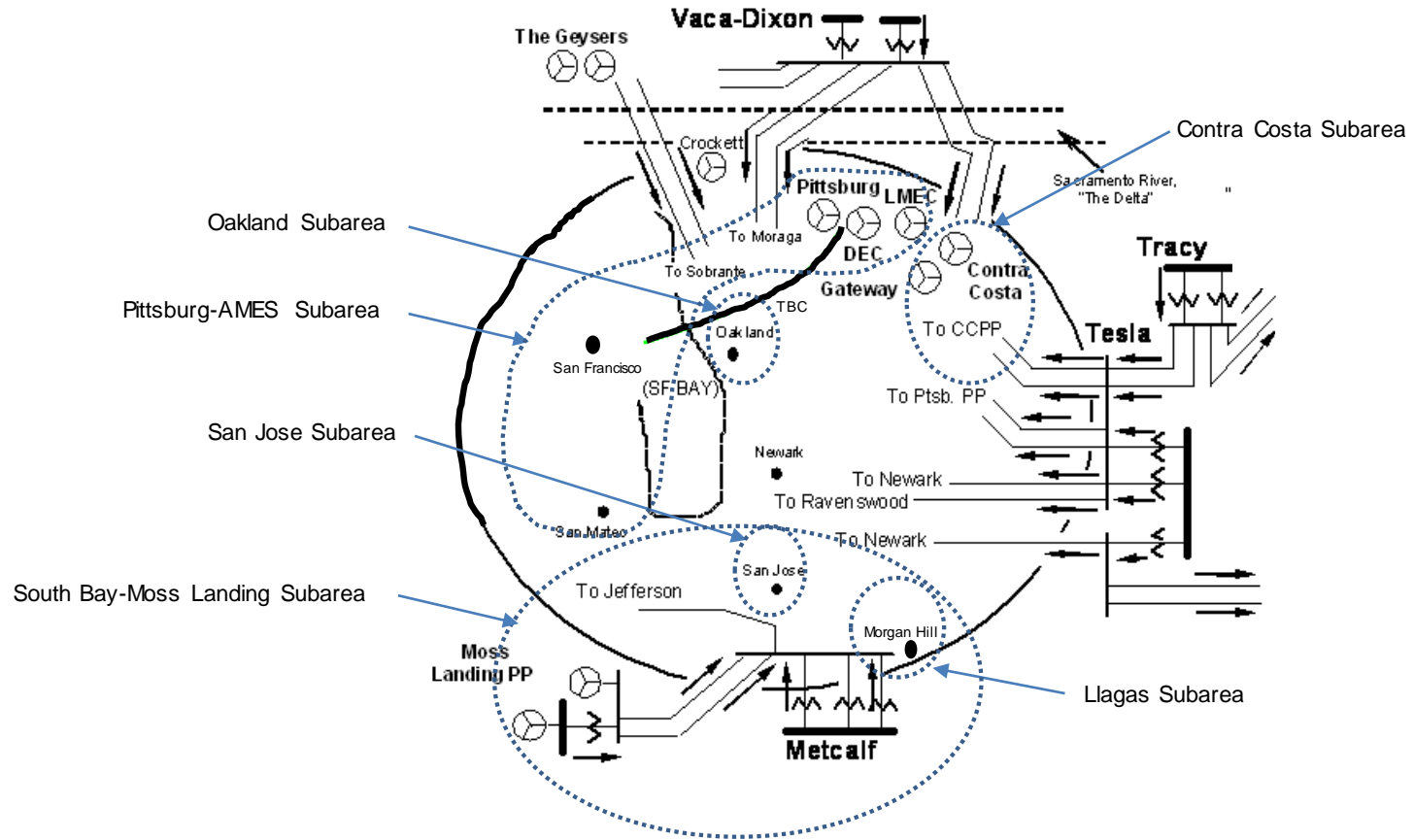
Sara Larson

Regional Transmission Engineer Lead

Stakeholder Call

March 9, 2022

# Greater Bay Area Transmission System & LCR Subareas



# New major transmission projects

<b>Project Name</b>	<b>Expected ISD</b>
Cooley Landing-Palo Alto and Ravenswood-Cooley Landing 115 kV Line Rerate	Nov-22
East Shore-Oakland J 115 kV Reconductoring Project	Dec-22
Oakland Clean Energy Initiative Project	Mar-23
Morgan Hill Area Reinforcement <ul style="list-style-type: none"><li>• Morgan Hill-Green Valley 115 kV line, normally closed</li><li>• Morgan Hill 115 kV bus convert to a BAAH</li></ul>	Apr-26
East Shore 230 kV Bus Terminals Reconfiguration	Dec-26

# Power Plant Changes

## Additions modeled in 2023 & 2027:

- Solar off Tassajara 230 kV substation
- Solar off Camp Evers 115 kV substation
- Solar off Belle Haven 60 kV substation
- Energy Storage off Llagas 115 kV substation
- OCEI Energy Storage

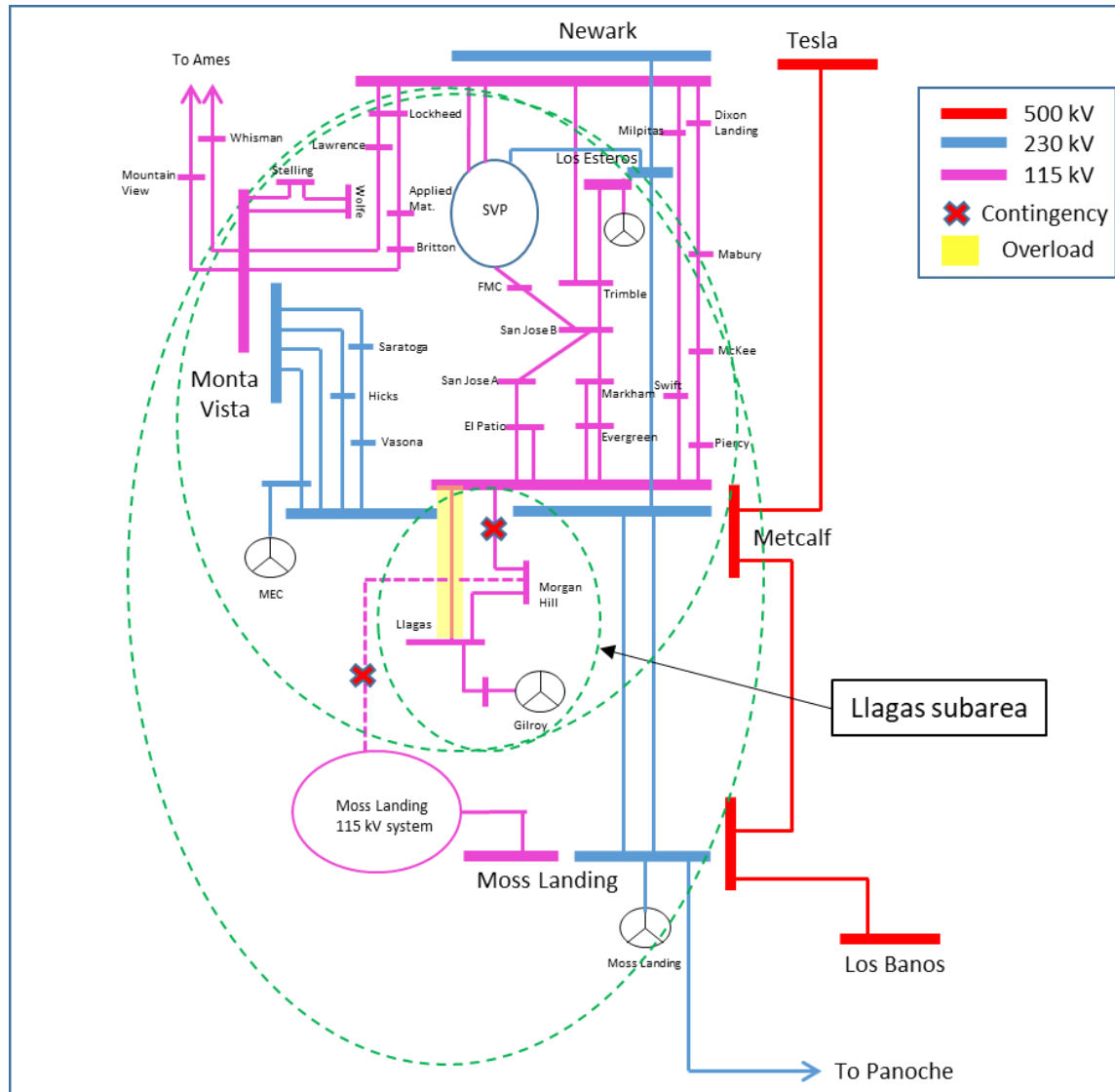
## Retirements:

- All Oakland CTs considered offline in 2023 & 2027

## Llagas Sub-area: Load and Resources

<b>Load (MW)</b>	<b>2023</b>	<b>2027</b>	<b>Generation (MW)</b>	<b>2023</b>	<b>2027</b>
Gross Load	255	260	Market/Net Seller/Battery	276	276
AAEE	-1	-1	Wind	0	0
Behind the meter DG	-8	-1	Muni	0	0
<b>Net Load</b>	<b>246</b>	<b>258</b>	QF	0	0
Transmission Losses	1	1	Future preferred resource	0	0
Pumps	0	0	<b>Total Qualifying Capacity</b>	<b>276</b>	<b>276</b>
<b>Load + Losses + Pumps</b>	<b>247</b>	<b>259</b>			

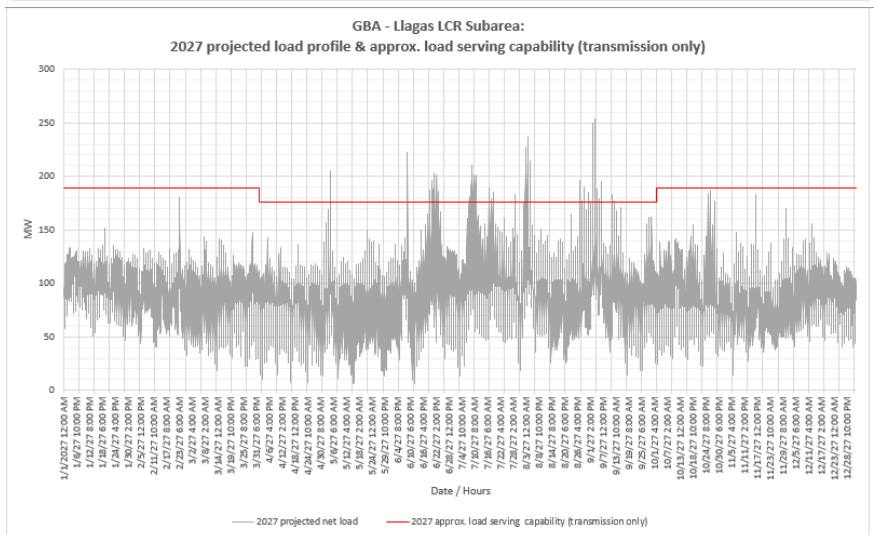
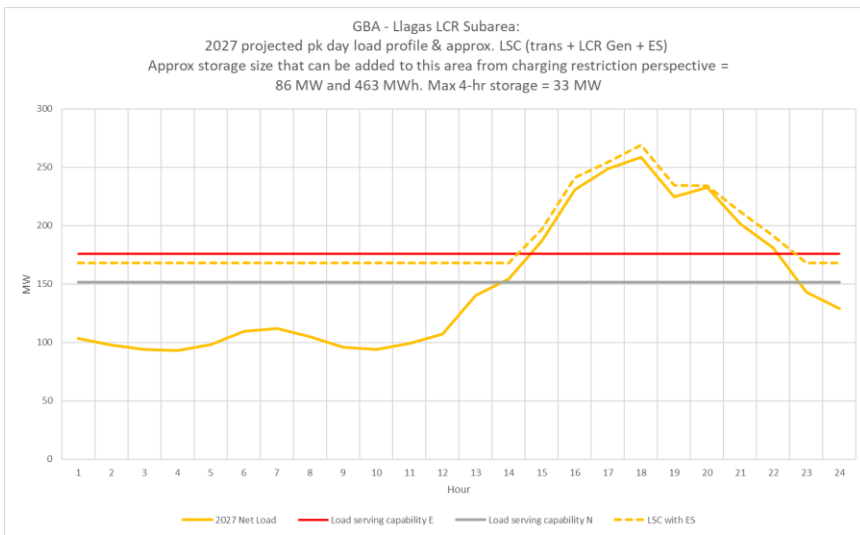
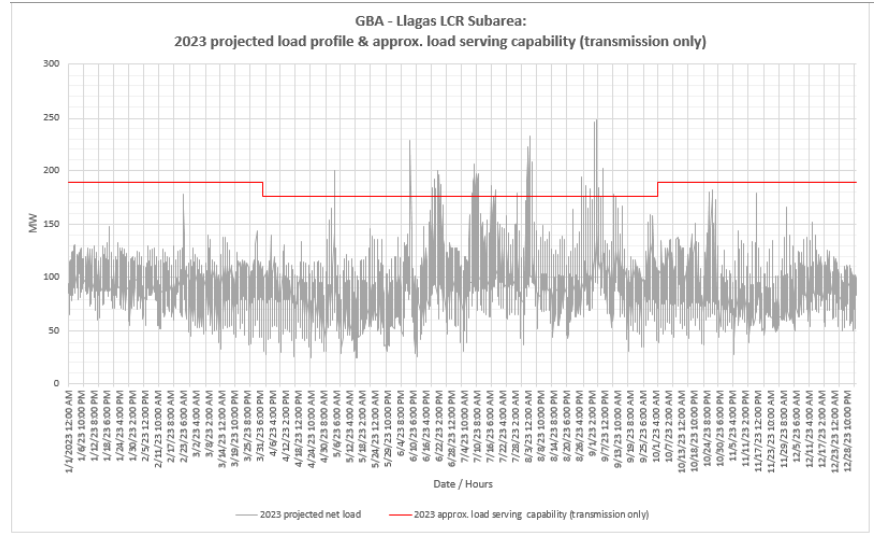
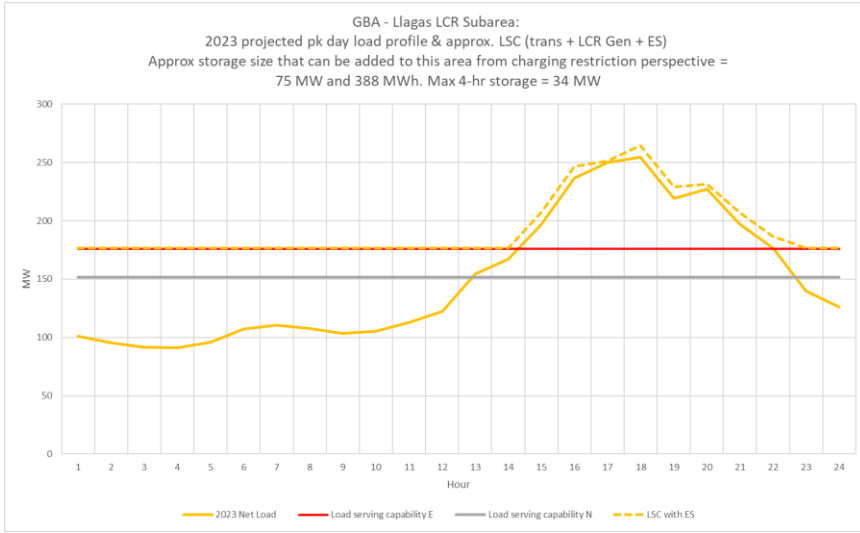
# Llagas Sub-area: One-line diagram



# Llagas Sub-area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW)
2023	P3	Metcalf-Llagas 115 kV line	Metcalf-Morgan Hill + Gilroy Cogen Unit 1	150
2027	P6	Metcalf-Llagas 115 kV line	Metcalf-Morgan Hill & Morgan Hill-Green Valley 115 kV lines	86

# Llagas Sub-area: Load Profiles

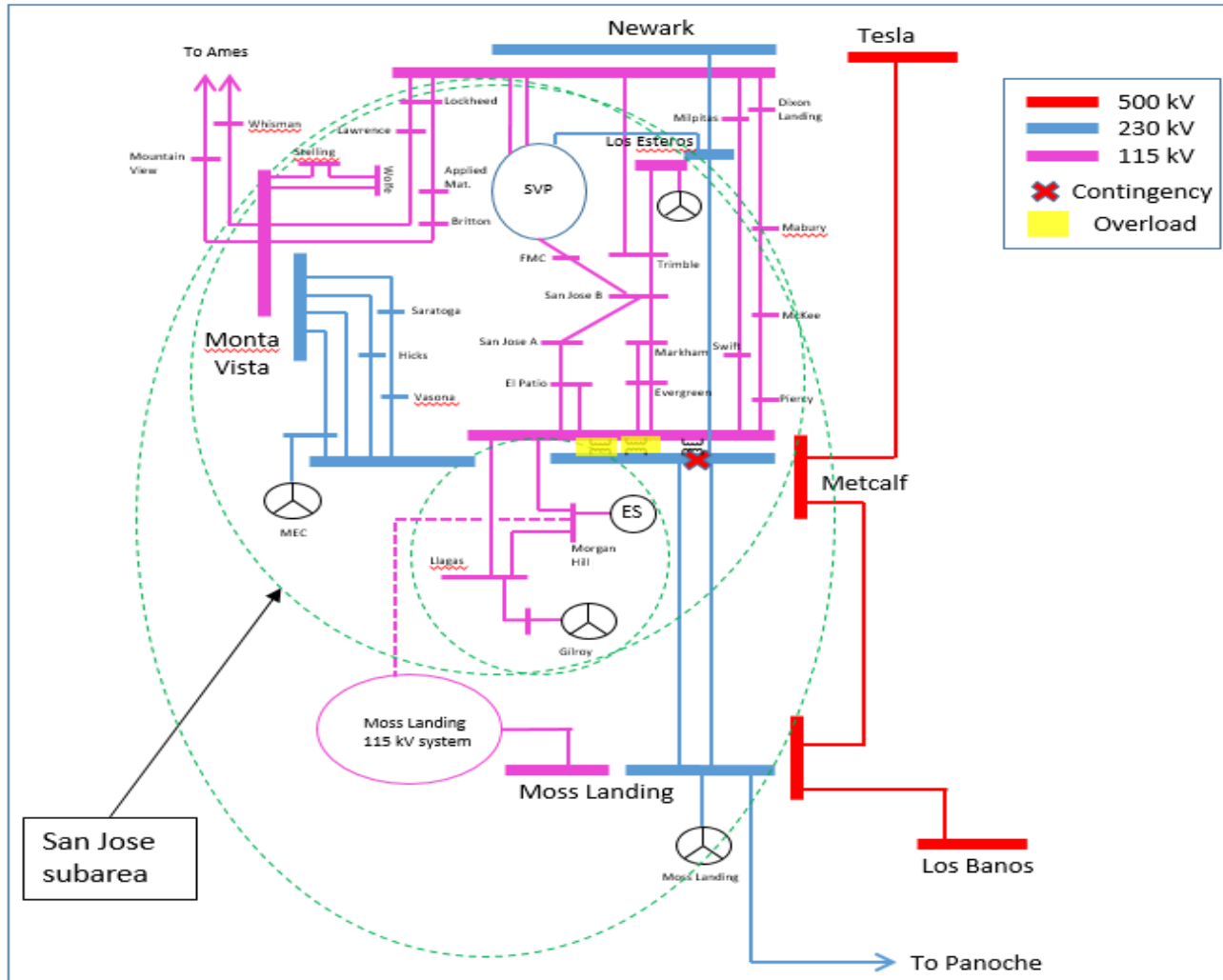




## San Jose Sub-area: Load and Resources

<b>Load (MW)</b>	<b>2023</b>	<b>2027</b>	<b>Generation (MW)</b>	<b>2023</b>	<b>2027</b>
Gross Load	2,737	3,025	Market/Net Seller/Battery	681	681
AAEE	-12	-15	Wind	0	0
Behind the meter DG	-38	-1	Muni	198	198
<b>Net Load</b>	<b>2,686</b>	<b>3,008</b>	QF	0	0
Transmission Losses	97	113	Future preferred resource	0	0
Pumps	0	0	<b>Total Qualifying Capacity</b>	<b>879</b>	<b>879</b>
<b>Load + Losses + Pumps</b>	<b>2,783</b>	<b>3,121</b>			

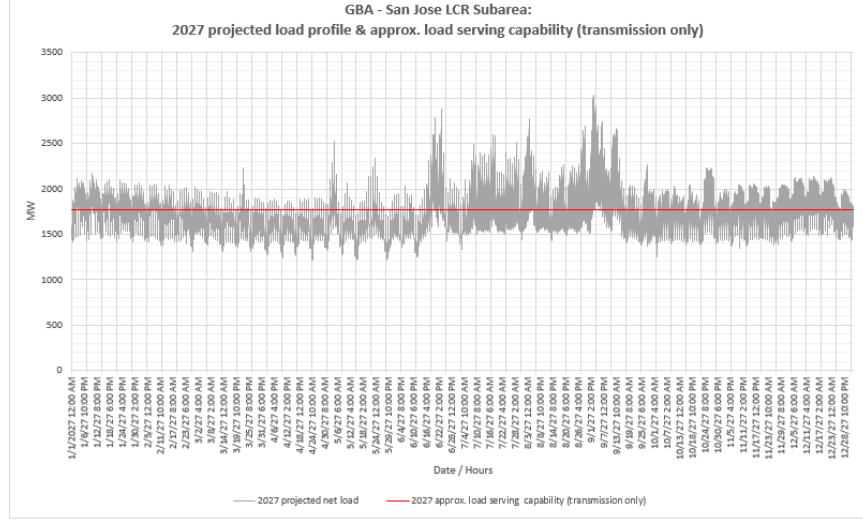
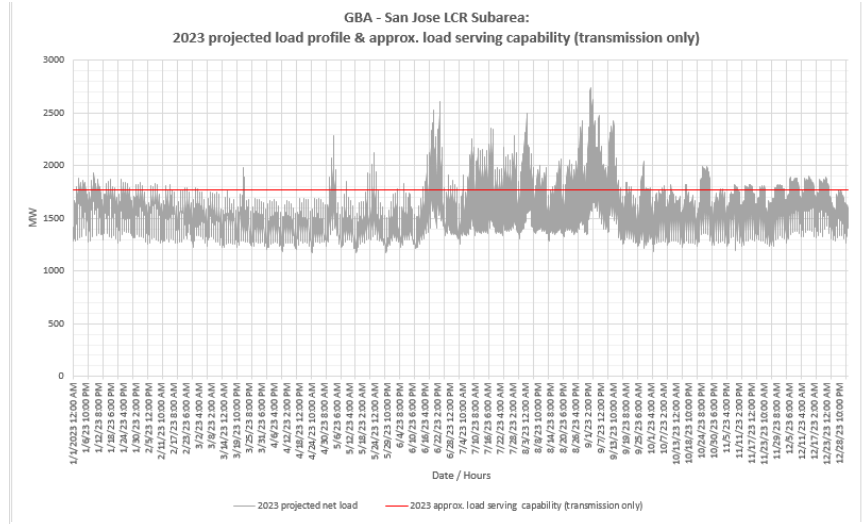
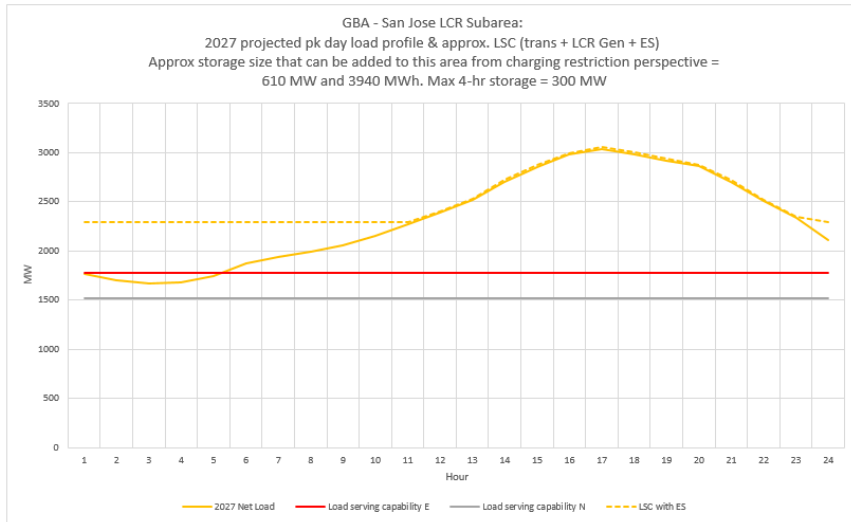
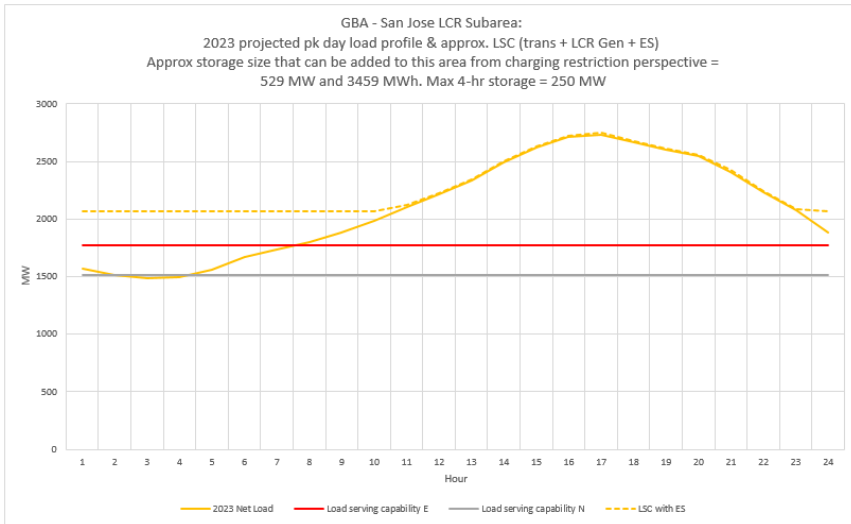
# San Jose Sub-area: One-line diagram



# San Jose Sub-area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (deficiency)
2023	P2-4	Metcalf 230/115 kV transformer # 1 or # 3	Metcalf 230 kV Bus Section 2D & 2E	1,088 (209)
2027	P2-4	Metcalf 230/115 kV transformer # 1 or # 3	METCALF 230kV - Section 2D & 2E	1,074 (195)

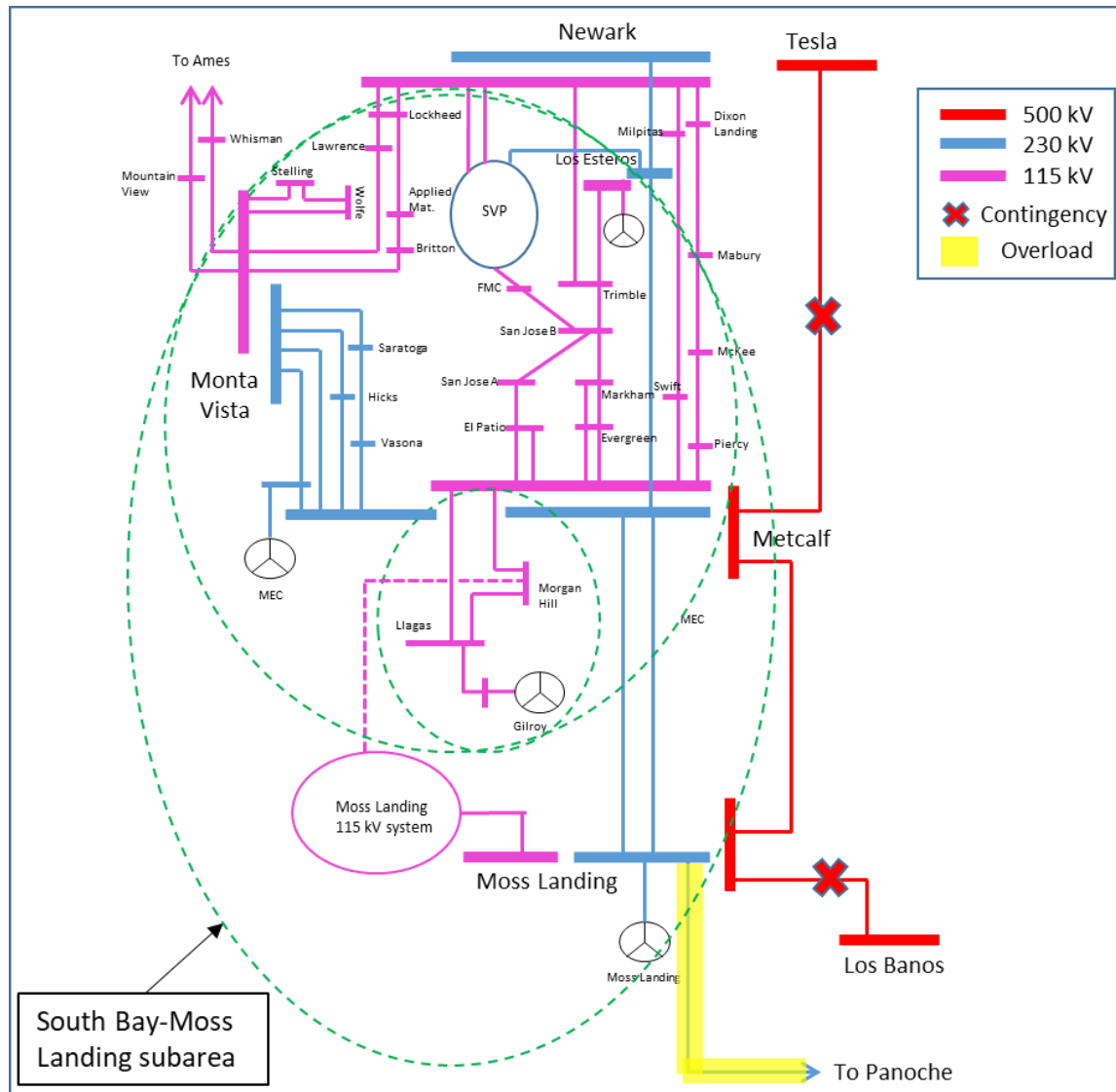
# San Jose Sub-area: Load Profiles



# South Bay-Moss Landing Sub-area: Load and Resources

Load (MW)	2023	2027	Generation (MW)	2023	2027
Gross Load	4,398	4,712	Market/Net Seller/Battery	2,977	2,977
AAEE	-24	-34	Solar	0	0
Behind the meter DG	-73	-2	Muni	198	198
<b>Net Load</b>	<b>4,301</b>	<b>4,676</b>	QF	0	0
Transmission Losses	126	154	Future preferred resource	0	0
Pumps	0	0	<b>Total Qualifying Capacity</b>	<b>3,175</b>	<b>3,175</b>
<b>Load + Losses + Pumps</b>	<b>4,427</b>	<b>4,830</b>			

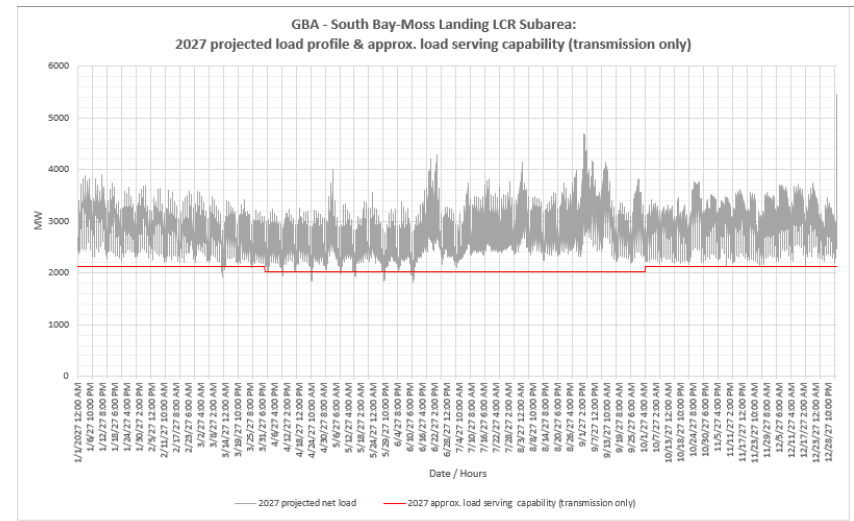
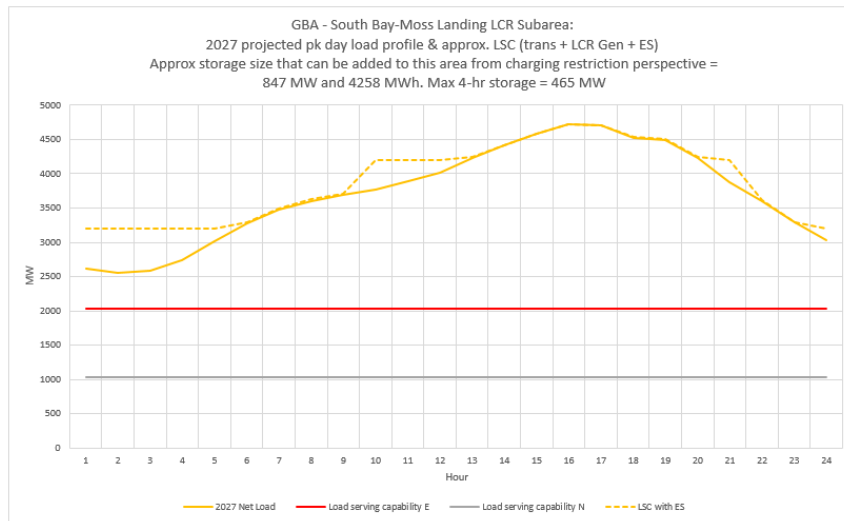
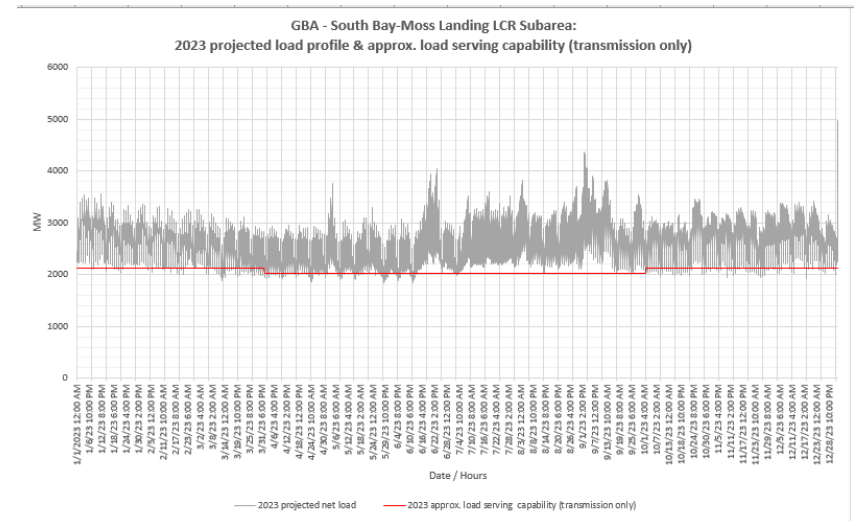
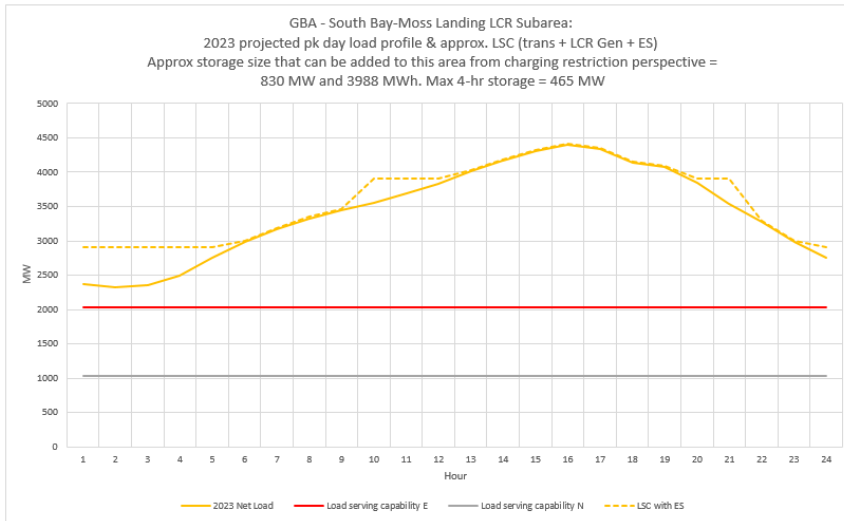
# South Bay-Moss Landing Sub-area: One-line diagram



# South Bay-Moss Landing Sub-area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (deficiency)
2023	P6	Moss Landing-Las Aguilas 230 kV	Tesla-Metcalf 500 kV and Moss Landing-Los Banos 500 kV	2,487
2027	P6	Moss Landing-Las Aguilas 230 kV	Tesla-Metcalf 500 kV and Moss Landing-Los Banos 500 kV	2,702

# South Bay-Moss Landing Sub-area: Load Profiles





# Oakland Sub-area: Load and Resources

Load (MW)	2023	2027	Generation (MW)	2023	2027
Gross Load	194	183	Market/Net Seller/Battery	43	43
AAEE	-1	-1	Wind	0	0
Behind the meter DG	-1	0	Muni	49	49
<b>Net Load</b>	<b>192</b>	<b>182</b>	QF	0	0
Transmission Losses	0	0	Future preferred resource	0	0
Pumps	0	0	<b>Total Qualifying Capacity</b>	<b>92</b>	<b>92</b>
<b>Load + Losses + Pumps</b>	<b>192</b>	<b>182</b>			

# Oakland Sub-area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW)
2023	P6	D-L #1 115 kV cable	Oakland C-X#2 & #3 115 kV cables	35*
2027	P6	D-L #1 115 kV cable	Oakland C-X#2 & #3 115 kV cables	27*

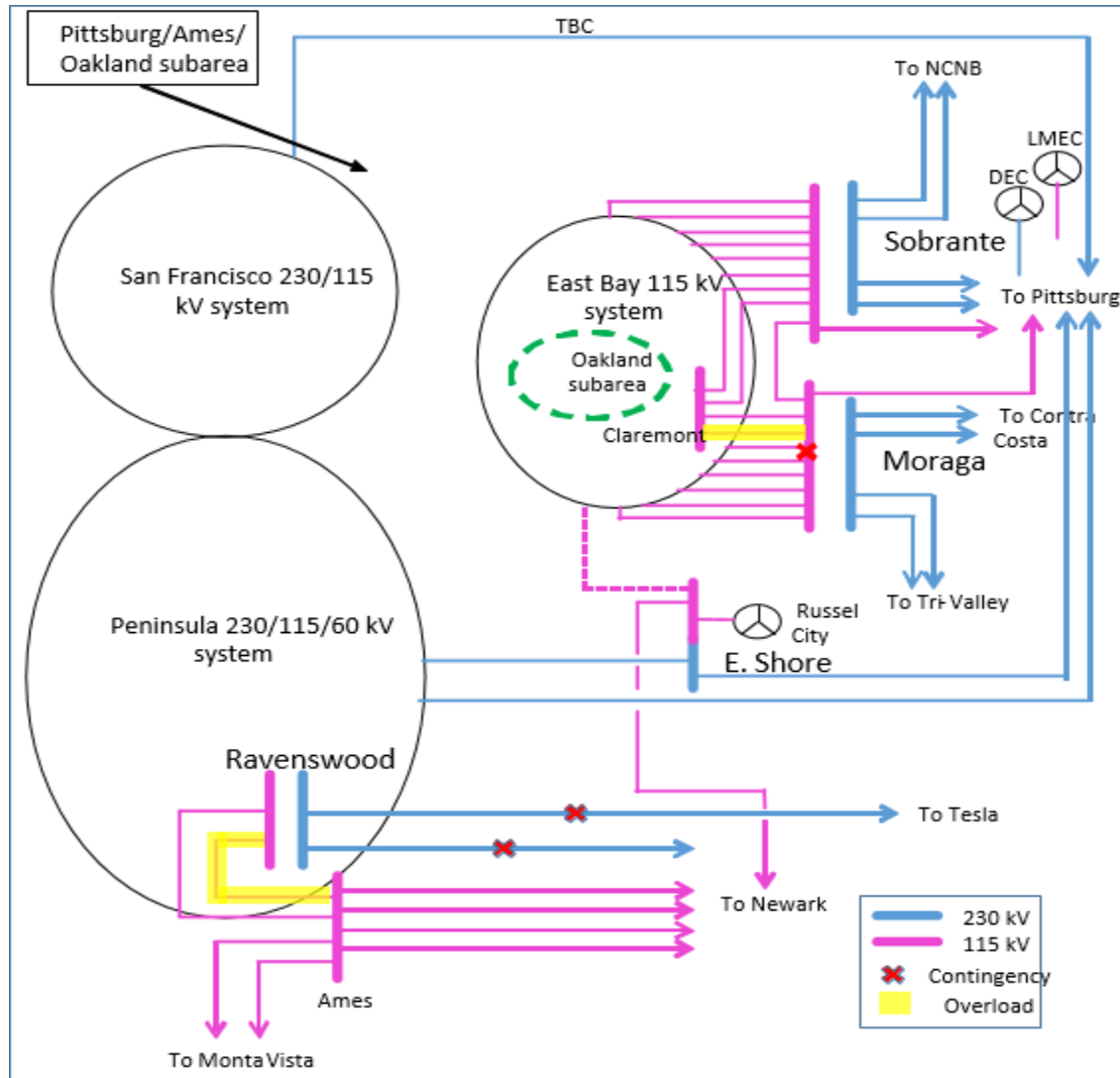
Note:

\*This requirement doesn't reflect potential load transfer that could occur following the first contingency. An approved operating procedure including this load transfer could reduce this requirement.

# Pittsburg-Ames-Oakland Sub-area: Load and Resources

Load (MW)	2023	2027	Generation (MW)	2023	2027
Gross Load	<b>NA – Flow through area.</b>		Market/ Net Seller/ Battery	2271	2271
AAEE			Solar	5	5
Behind the meter DG			Wind	0	0
<b>Net Load</b>			Muni	49	49
Transmission Losses			QF	231	231
Pumps			Future preferred resource	0	0
<b>Load + Losses + Pumps</b>			<b>Total Qualifying Capacity</b>	<b>2,556</b>	<b>2,556</b>

# Ames/Pittsburg/Oakland Sub-area: One-line diagram



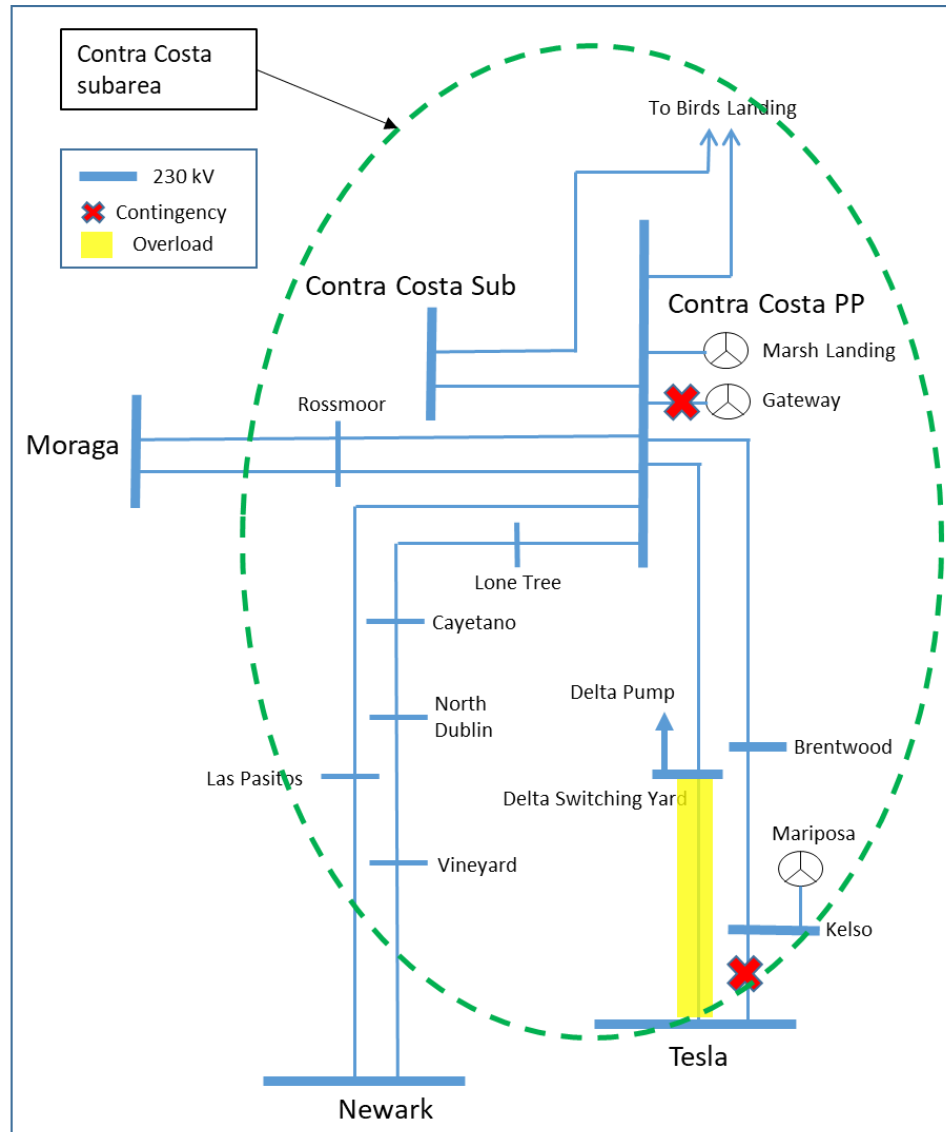
# Ames/Pittsburg/Oakland Sub-area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW)
2023	P7	Ames-Ravenswood #1 115 kV line	Newark-Ravenswood & Tesla-Ravenswood 230 kV lines	1,907
	P6	Martinez-Sobrante 115 kV line	Pittsburg Section 1D & 1E 230 kV	
2027	P7	Ames-Ravenswood #1 115 kV line & Metcalf-Vasona 230 kV line	Newark-Ravenswood & Tesla-Ravenswood 230 kV lines	2,187
	P6	Martinez-Sobrante 115 kV line	Pittsburg Section 1D & 1E 230 kV	

# Contra Costa Sub-area: Load and Resources

Load (MW)	2023	2027	Generation (MW)	2023	2027
Gross Load	<b>NA – Flow through area.</b>		Market/ Net Seller/ Battery	1,663	1,663
AAEE			Wind	244	244
Behind the meter DG			Muni	127	127
<b>Net Load</b>			QF	0	0
Transmission Losses			Future preferred resource	0	0
Pumps			<b>Total Qualifying Capacity</b>	<b>2,034</b>	<b>2,034</b>
<b>Load + Losses + Pumps</b>					

# Contra Costa Sub-area: One-line diagram



# Contra Costa Sub-area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW)
2023	P3	Delta Switching Yard-Tesla 230 kV Line	Kelso-Tesla 230 kV with the Gateway off line	1,177
2027	P3	Delta Switching Yard-Tesla 230 kV Line	Kelso-Tesla 230 kV with the Gateway off line	1,373



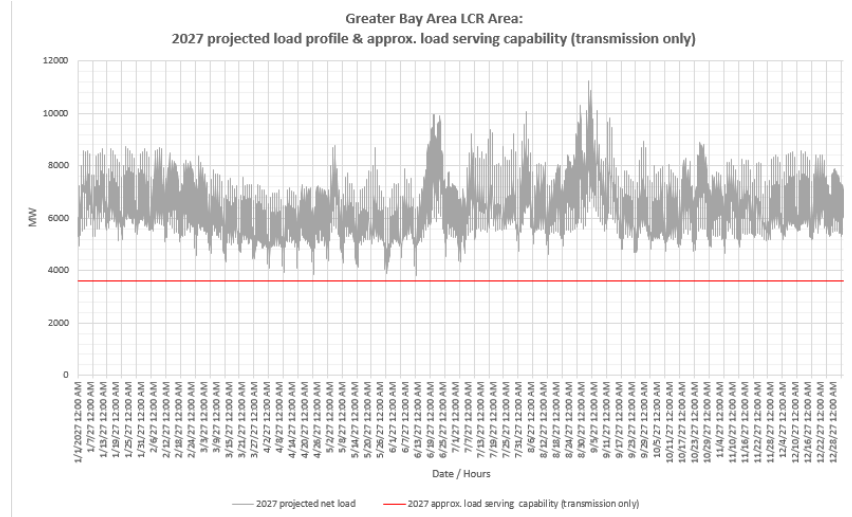
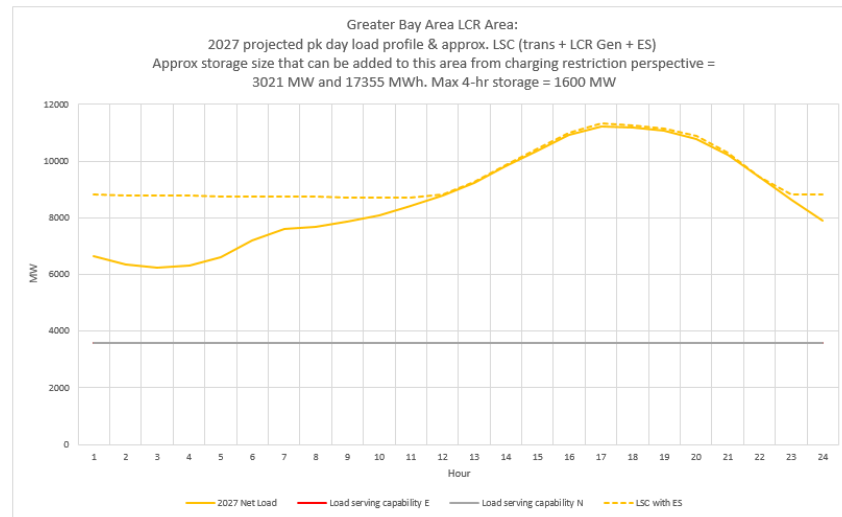
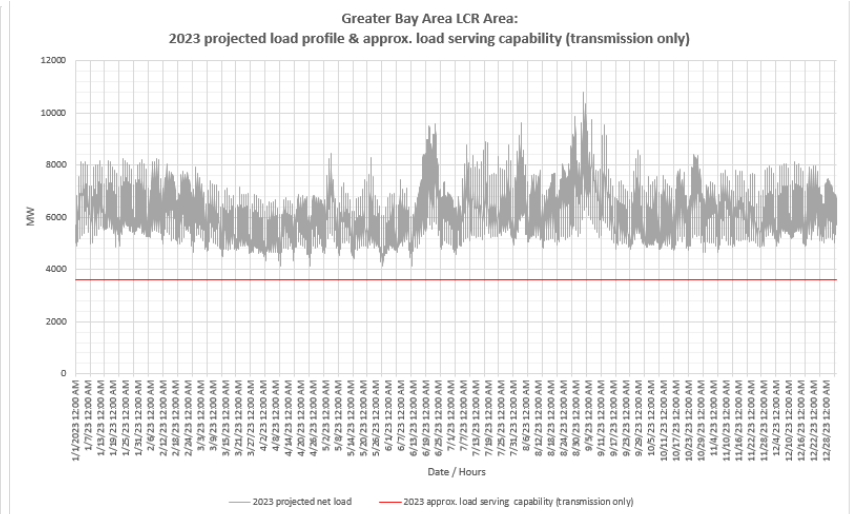
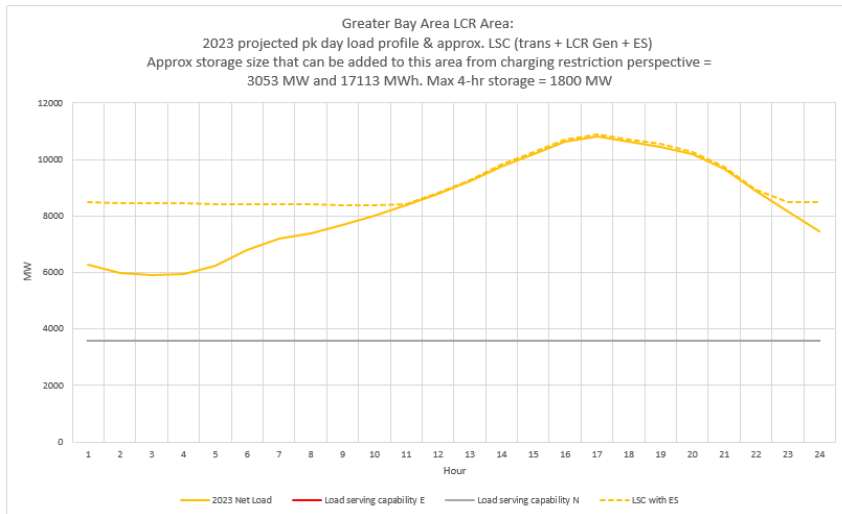
# Greater Bay Area Overall: Load and Resources

Load (MW)	2023	2027	Generation (MW)	2023	2027
Gross Load	10,823	11,229	Market/Net Seller/Wind/Battery	7156	7156
AAEE	-51	-72	Solar	8	8
Behind the meter DG	-175	-3	Existing 20-minute Demand Response	0	0
<b>Net Load</b>	<b>10,598</b>	<b>11,154</b>	Muni	378	378
Transmission Losses	274	315	QF	233	233
Pumps	264	264	Future preferred resource	0	0
<b>Load + Losses + Pumps</b>	<b>11,136</b>	<b>11,733</b>	<b>Total Qualifying Capacity</b>	<b>7,775</b>	<b>7,775</b>

# Greater Bay Area Overall: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (deficiency)
2023	P6	Metcalf 500/230 kV #13 transformer	Metcalf 500/230 kV #11 & #12 transformers	7,340
2027	P6	Metcalf 500/230 kV #13 transformer	Metcalf 500/230 kV #11 & #12 transformers	7,616 (258)

# Greater Bay Area Sub-area: Load Profiles



# Greater Bay Area Total Generation & LCR Need

Generation	Market Net Seller Wind (MW)	Solar (MW)	20 minute Demand Response	Muni (MW)	QF (MW)	Battery (MW)	Total MW
2023	6,156	8	0	378	233	1,000	7,775
2027	6,156	8	0	378	233	1,000	7,775

Year	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Need
2023	7,340	209	7,549
2027	7,616	258	7,874

The overall LCR requirement has increased in 2023 mostly due to load growth. The overall LCR requirement has decreased in 2027 mostly due to reduction in Path 15 flow S-N.

## Changes Compared to Previous Year's LCR Requirements

Sub-area	2022		2023		2026		2027	
	Load	LCR	Load	LCR	Load	LCR	Load	LCR
Llagas	188	20	247	150	196	25	259	86
San Jose	2,683	989 (141)	2,783	1,088 (209)	3,082	1,096 (248)	3,121	1,074 (195)
South Bay – Moss Landing	4,321	2,333	4,427	2,487	4,821	2,535	4,830	2,702
Oakland	181	101	192	35	178	31	194	39
Pittsburg – Ames – Oakland	NA*	1,791	NA*	1,907	NA*	1,763	NA*	2,187
Contra Costa	NA*	1,208	NA*	1,177	NA*	1,815	NA*	1,373
Overall	10,746	7,231	11,136	7,340	11,551	7,979 (305)	11,733	7,616 (258)

Note:

\* Flow-through area. No defined load pocket.