



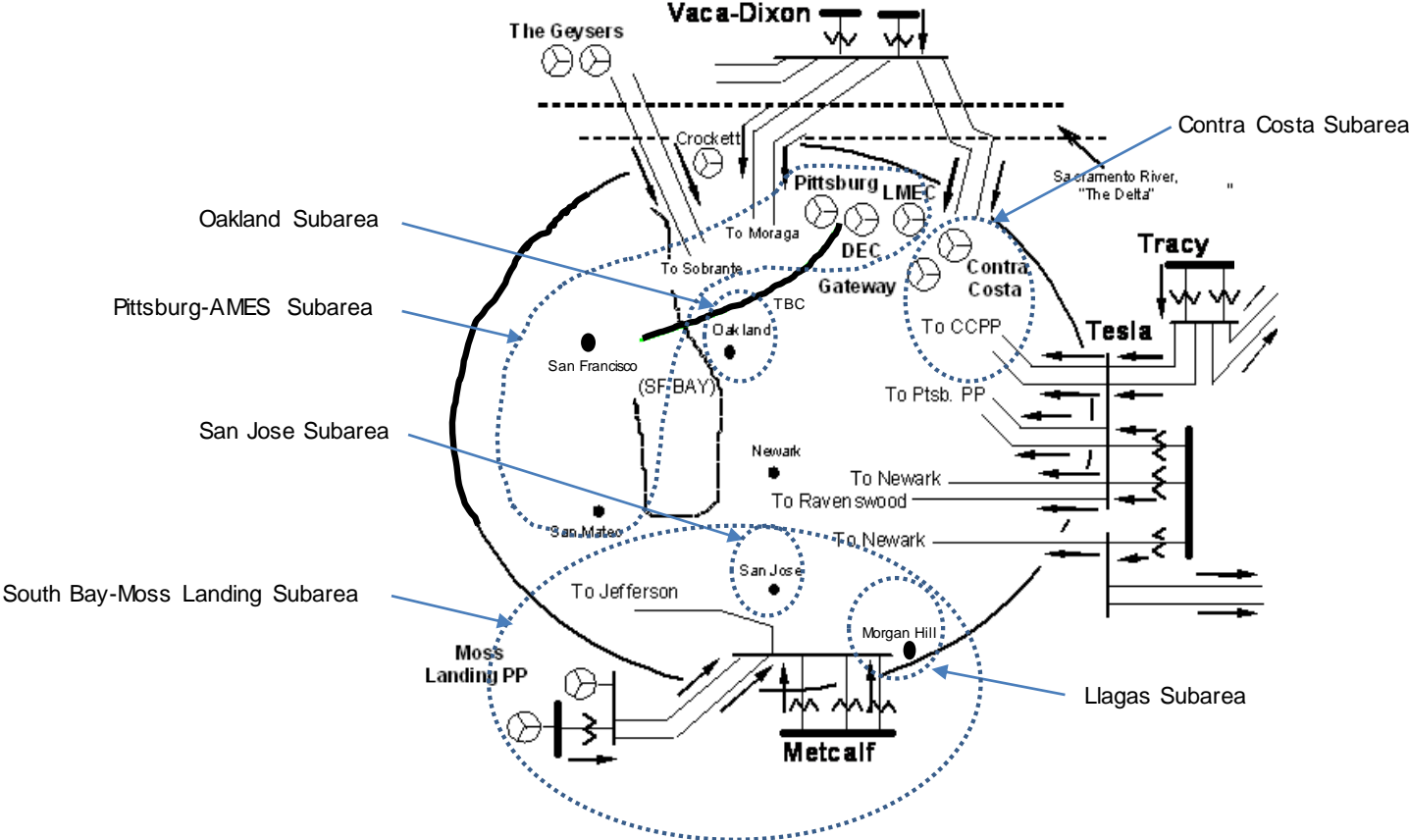
2023 & 2027 Final LCR Study Results Greater Bay Area

Sara Larson & Binaya Shrestha

Stakeholder Call

April 12, 2022

Greater Bay Area Transmission System & LCR Subareas



New major transmission projects

Project Name	Expected ISD
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">• Morgan Hill-Green Valley 115 kV line, normally closed• Morgan Hill 115 kV bus convert to a BAAH	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

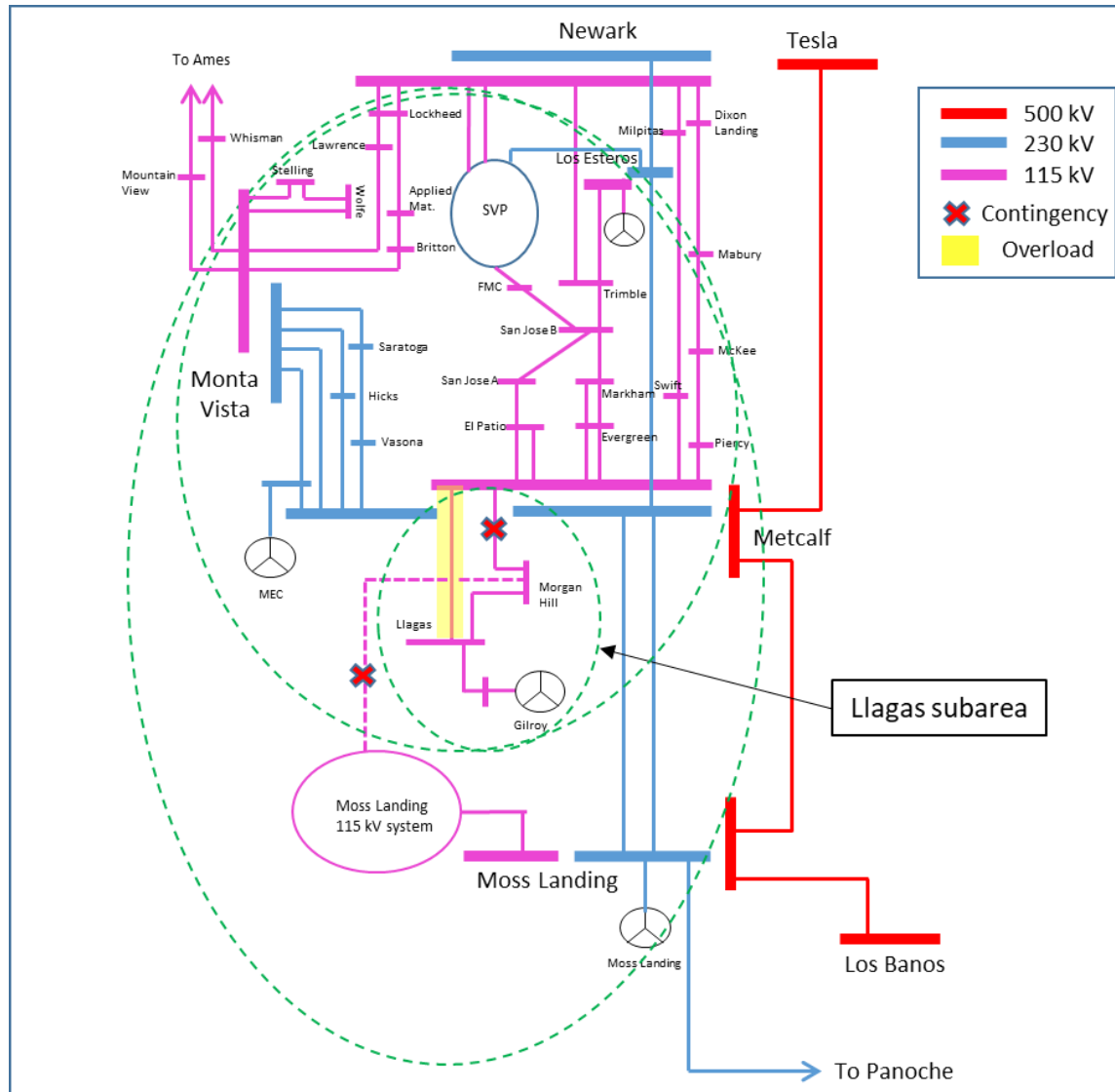
Retirements:

- All Oakland CTs considered offline in 2023 & 2027

Llagas Sub-area: Load and Resources

Load (MW)	2023	2027	Generation (MW)	Aug NQC
Gross Load	255	260	Market, Net Seller, Battery, Solar	276
AAEE	-1	-1	MUNI	0
Behind the meter DG	-8	-1	QF	0
Net Load	246	258	LTPP Preferred Resources	0
Transmission Losses	1	1	Existing 20-minute Demand Response	0
Pumps	0	0	Mothballed	0
Load + Losses + Pumps	247	259	Total	276

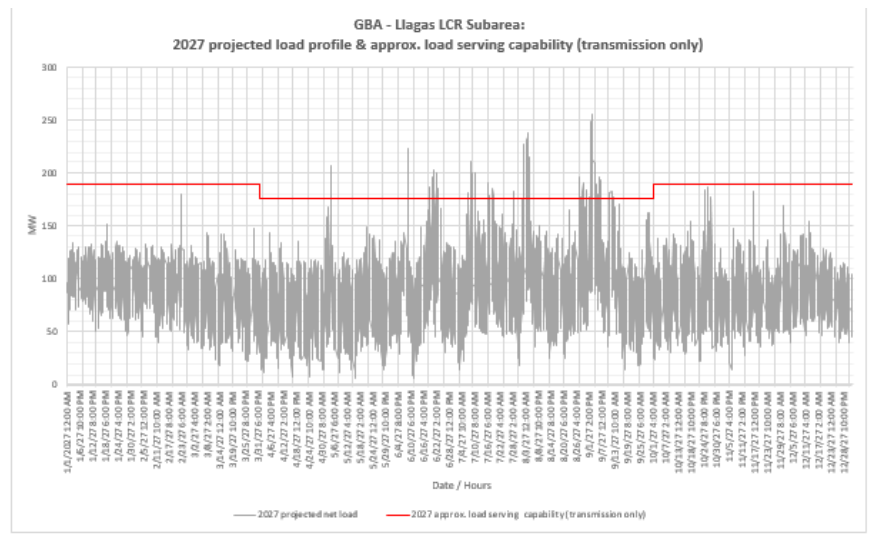
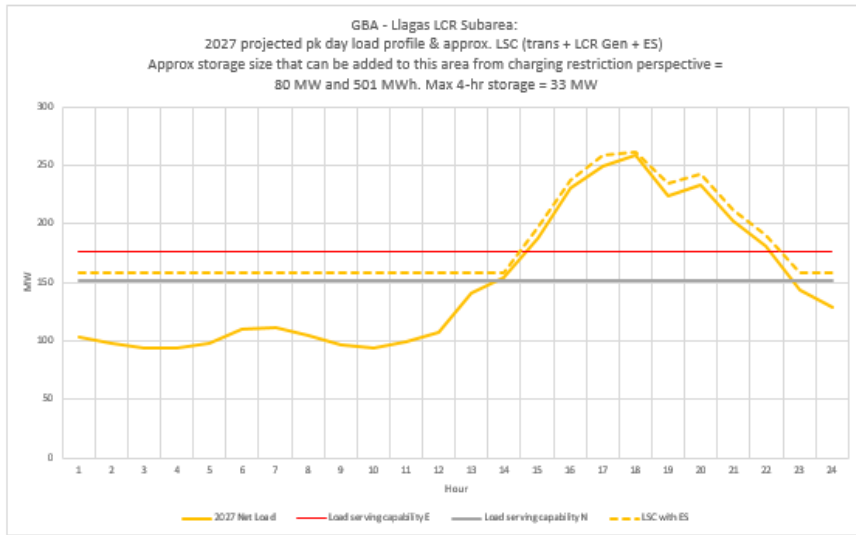
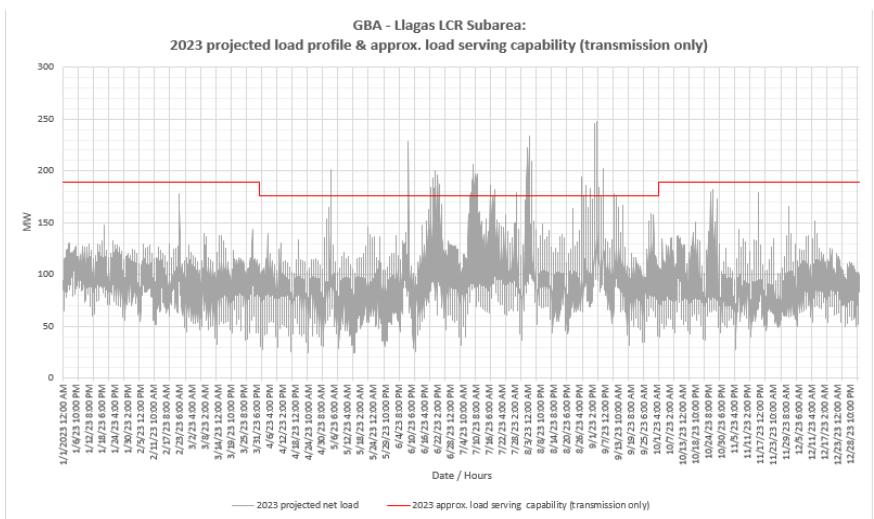
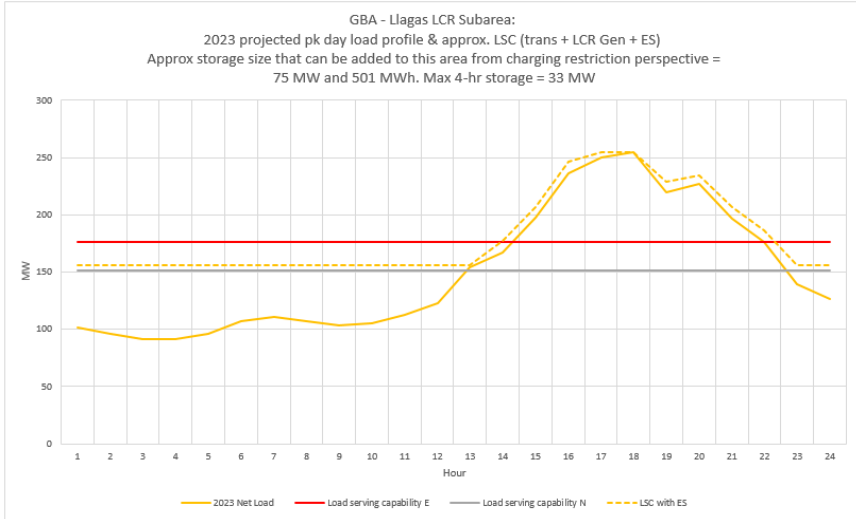
Llagas Sub-area: One-line diagram



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

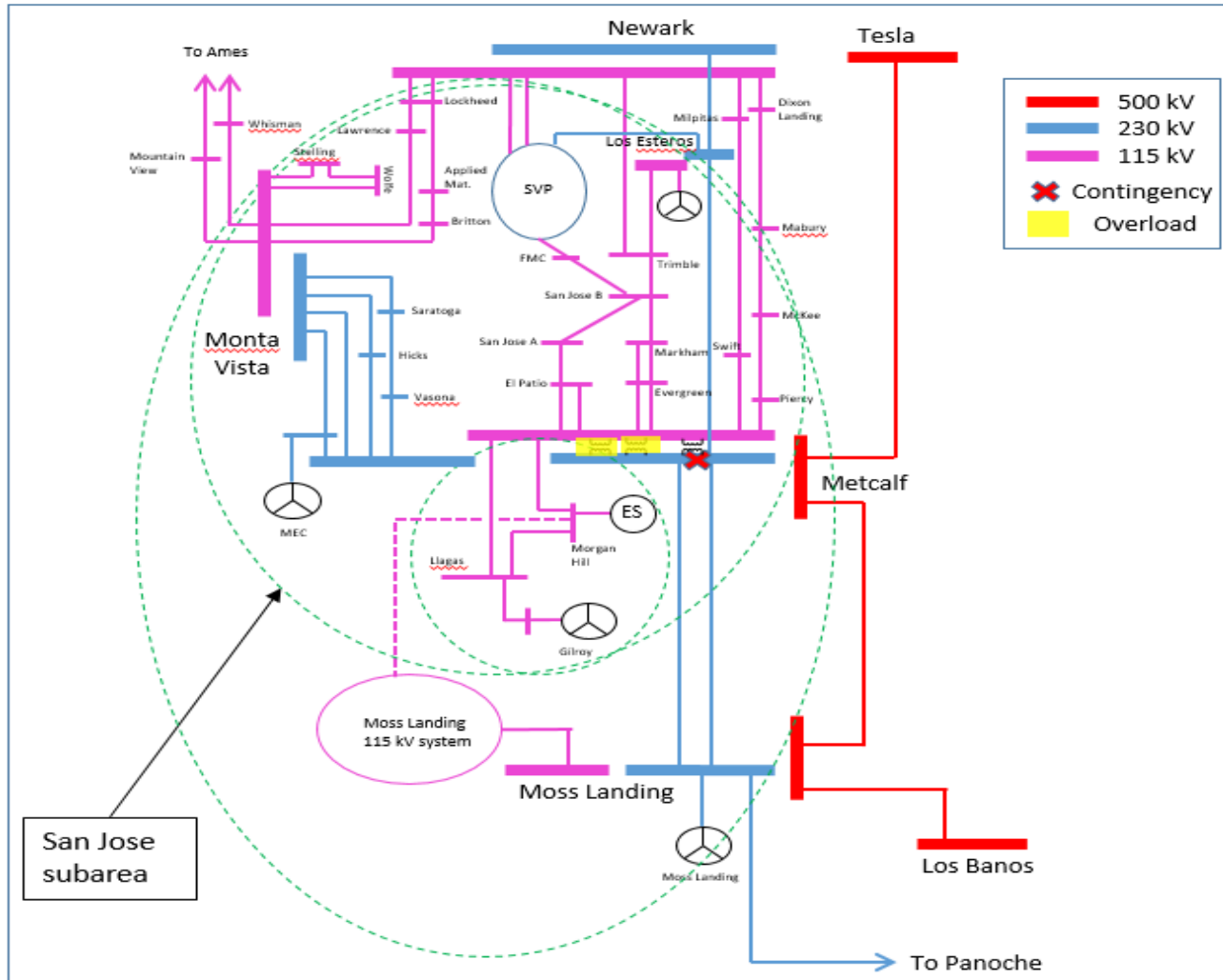
Llagas Sub-area: Load Profiles



San Jose Sub-area: Load and Resources

Load (MW)	2023	2027	Generation (MW)	Aug NQC
Gross Load	2,737	3,025	Market, Net Seller, Battery, Solar	681
AAEE	-13	-15	MUNI	198
Behind the meter DG	-38	-2	QF	0
Net Load	2,686	3,008	LTPP Preferred Resources	0
Transmission Losses	97	113	Existing 20-minute Demand Response	0
Pumps	0	0	Mothballed	0
Load + Losses + Pumps	2,783	3,121	Total	879

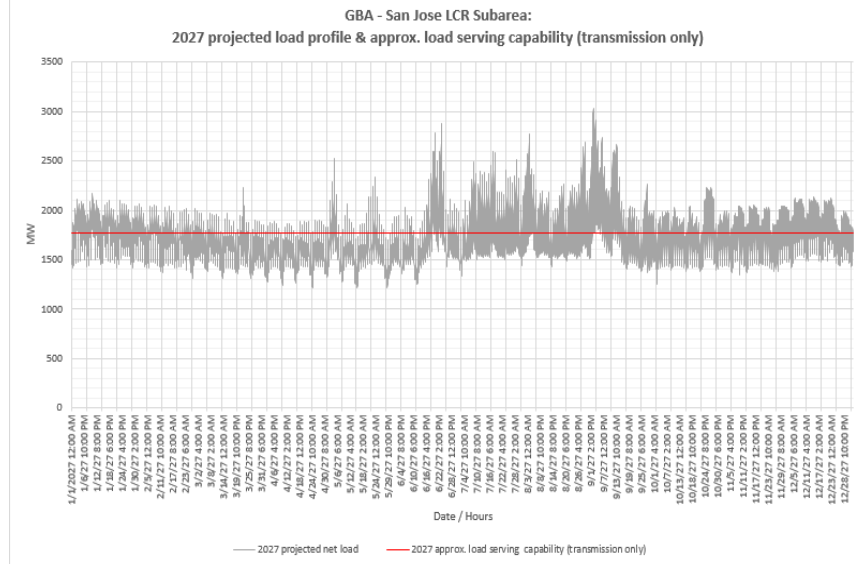
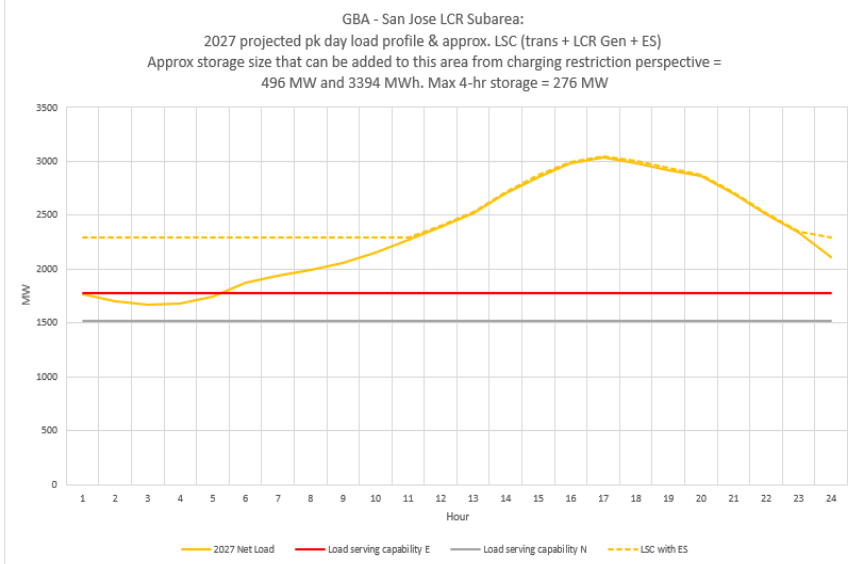
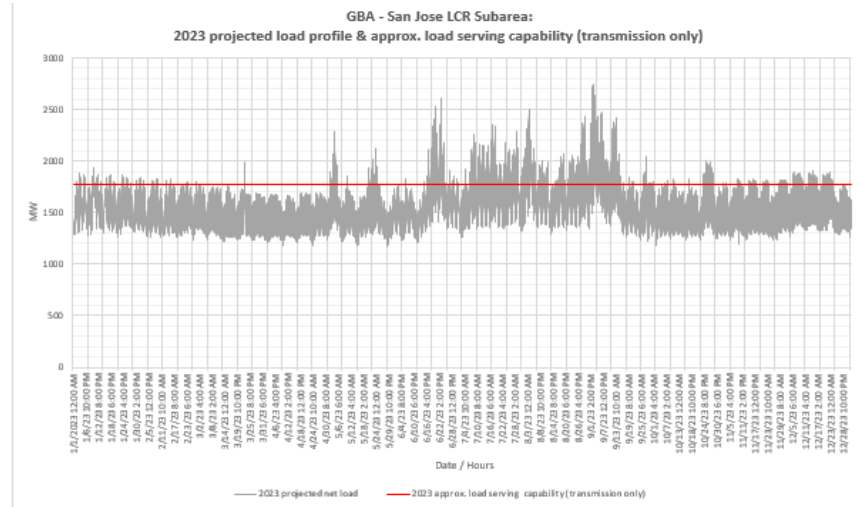
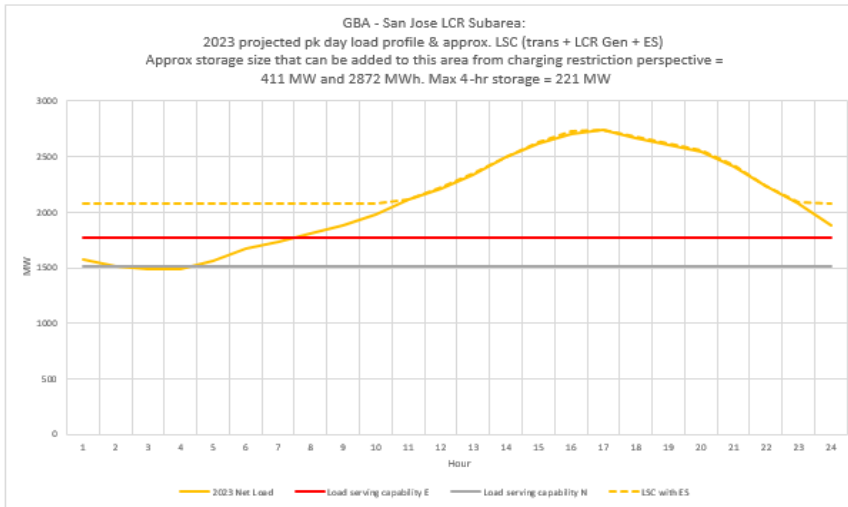
San Jose Sub-area: One-line diagram



San Jose Sub-area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (deficiency)
2023	P2	Metcalf 230/115 kV transformer # 1 or # 3	Metcalf 230 kV Bus Section 2D & 2E	1,058 (179)
2027	P2	Metcalf 230/115 kV transformer # 1 or # 3	METCALF 230kV - Section 2D & 2E	1,103 (224)

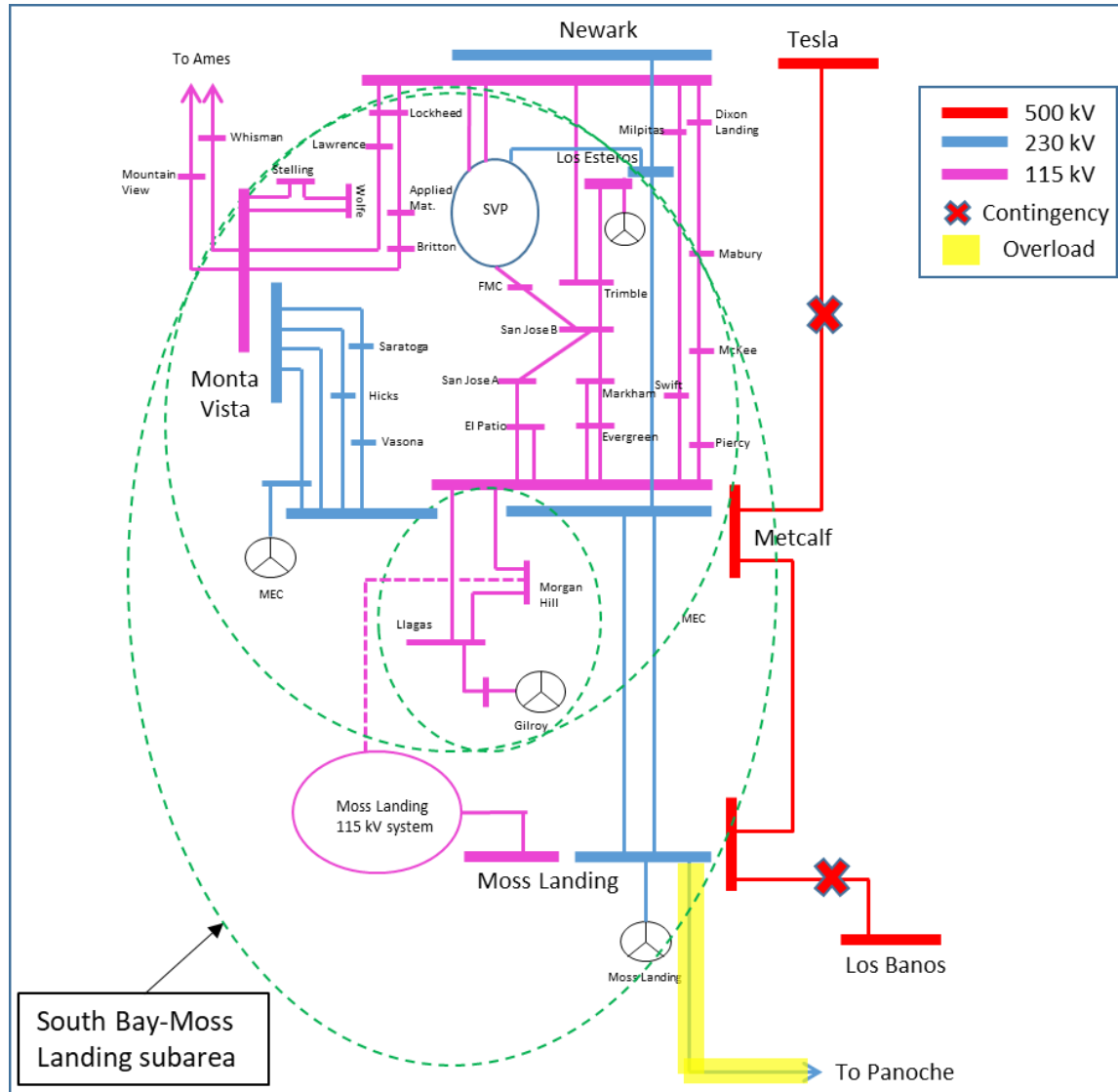
San Jose Sub-area: Load Profiles



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

Load (MW)	2023	2027	Generation (MW)	Aug NQC
Gross Load	4,398	4,712	Market, Net Seller, Battery, Solar	2,877
AAEE	-24	-34	MUNI	198
Behind the meter DG	-73	-2	QF	0
Net Load	4,301	4,676	LTPP Preferred Resources	0
Transmission Losses	126	154	Existing 20-minute Demand Response	0
Pumps	0	0	Mothballed	0
Load + Losses + Pumps	4,427	4,830	Total	3,075

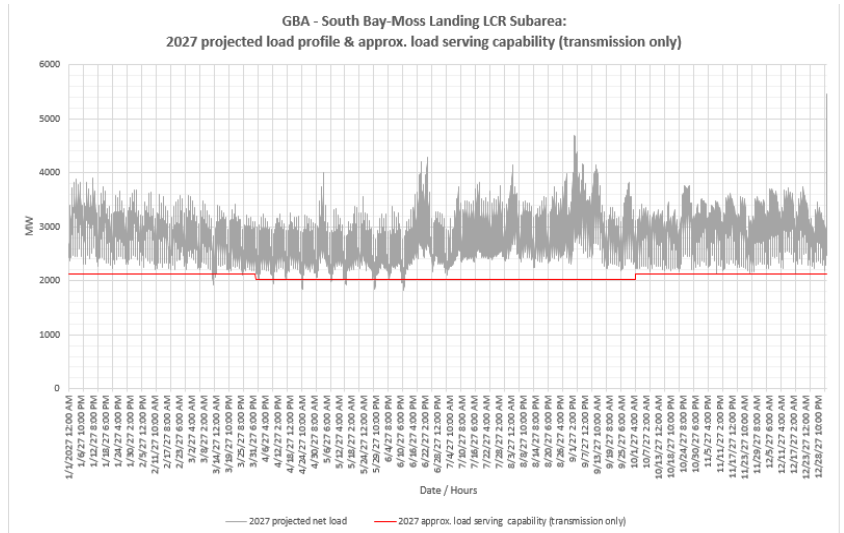
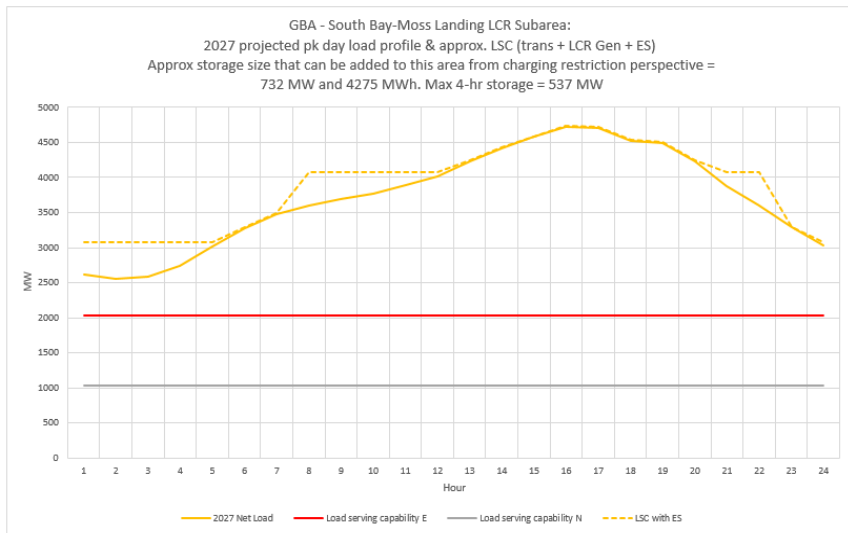
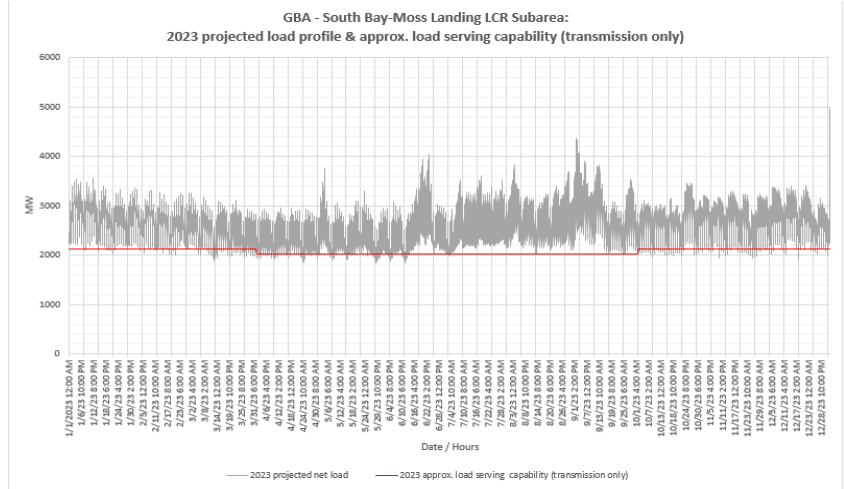
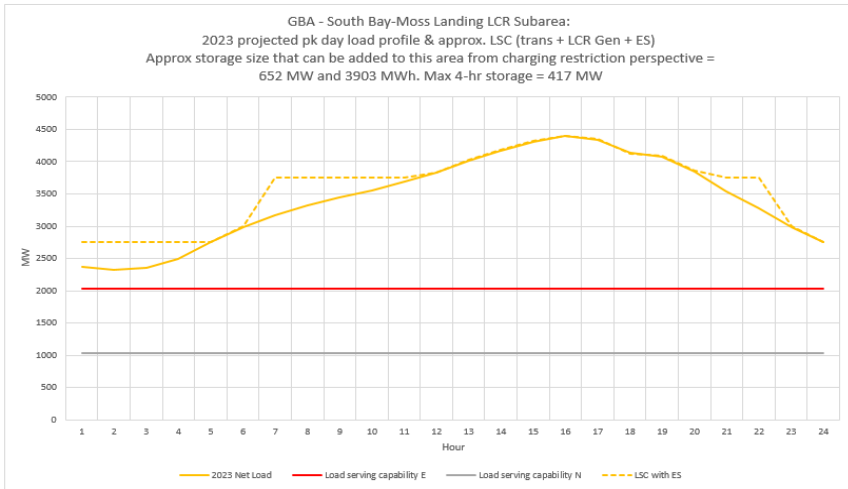
South Bay-Moss Landing Sub-area: One-line diagram



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	2,543

South Bay-Moss Landing Sub-area: Load Profiles



Oakland Sub-area: Load and Resources

Load (MW)	2023	2027	Generation (MW)	Aug NQC
Gross Load	194	195	Market, Net Seller, Solar	0
AAEE	-1	-2	MUNI	49
Behind the meter DG	-1	0	QF	0
Net Load	192	193	LTPP Preferred Resources	0
Transmission Losses	0	0	Existing 20-minute Demand Response	0
Pumps	0	0	Battery	55
Load + Losses + Pumps	192	193	Total	104

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	39*

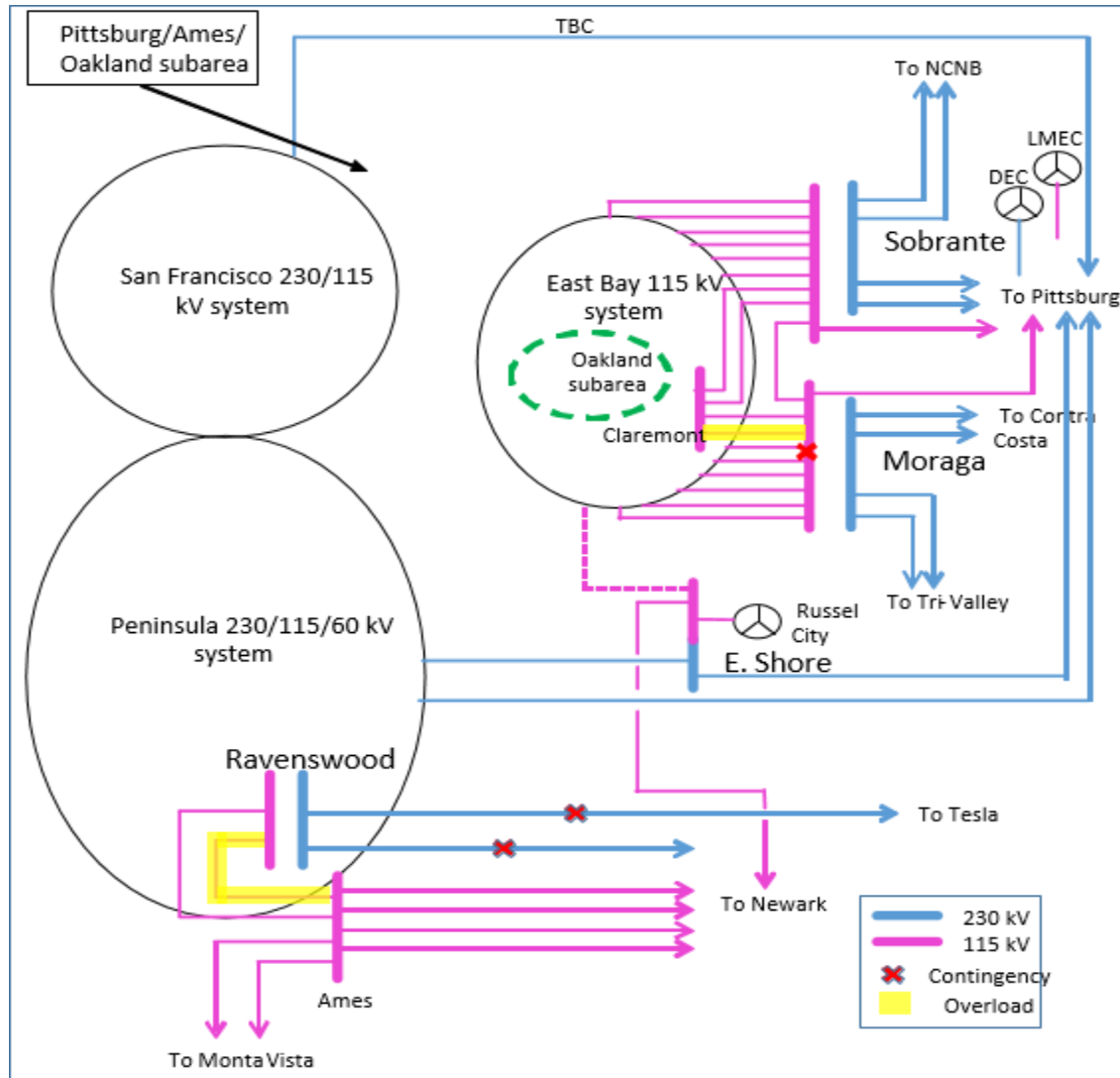
Note:

*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)	Aug NQC
Gross Load	NA – Flow through area.		Market, Net Seller, Wind	2,048
AAEE			MUNI	49
Behind the meter DG			QF	231
Net Load			Solar	5
Transmission Losses			Existing 20-minute Demand Response	0
Pumps			Battery	255
Load + Losses + Pumps			Total Qualifying Capacity	2,588

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



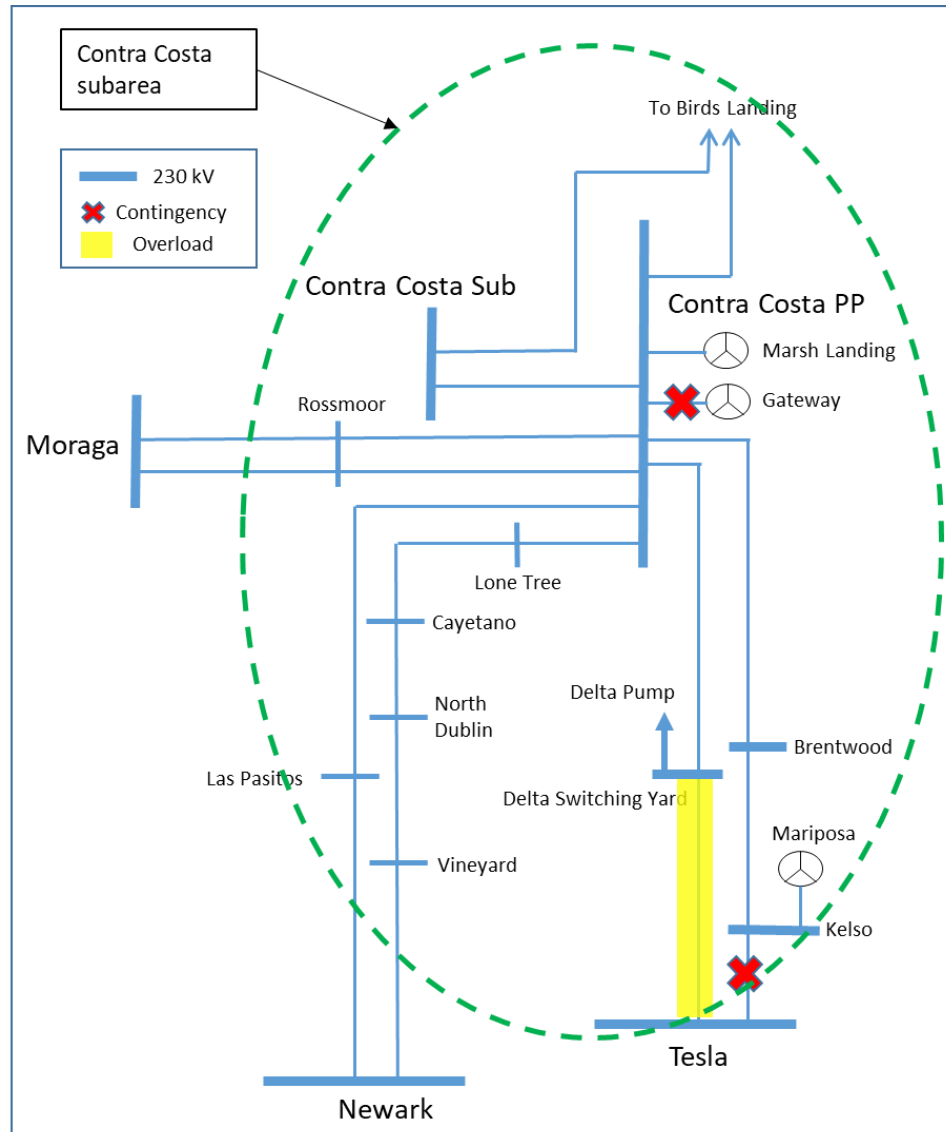
Ames/Pittsburg/Oakland Sub-area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW)
2023	P6	Ames-Ravenswood #1 115 kV line	Newark-Ravenswood & Tesla-Ravenswood 230 kV lines	1,898
	P2	Martinez-Sobrante 115 kV line	Pittsburg Section 1D & 1E 230 kV	
2027	P6	Ames-Ravenswood #1 115 kV line & Metcalf-Vasona 230 kV line	Newark-Ravenswood & Tesla-Ravenswood 230 kV lines	2,187
	P2	Martinez-Sobrante 115 kV line	Pittsburg Section 1D & 1E 230 kV	

Contra Costa Sub-area: Load and Resources

Load (MW)	2023	2027	Generation (MW)	Aug NQC
Gross Load	NA – Flow through area.		Market, Net Seller, Battery, Solar	1,661
AAEE			MUNI	127
Behind the meter DG			QF	0
Net Load			Wind	244
Transmission Losses			Existing 20-minute Demand Response	0
Pumps			Mothballed	0
Load + Losses + Pumps			Total	2,032

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

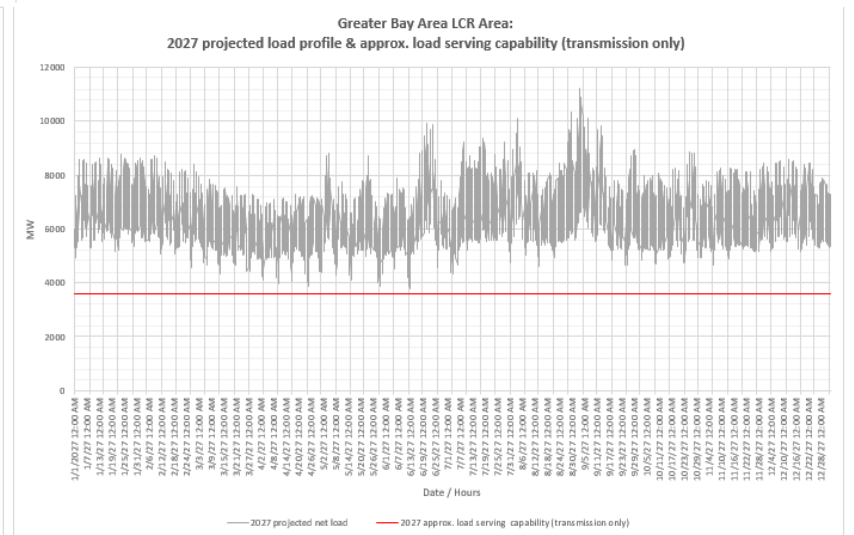
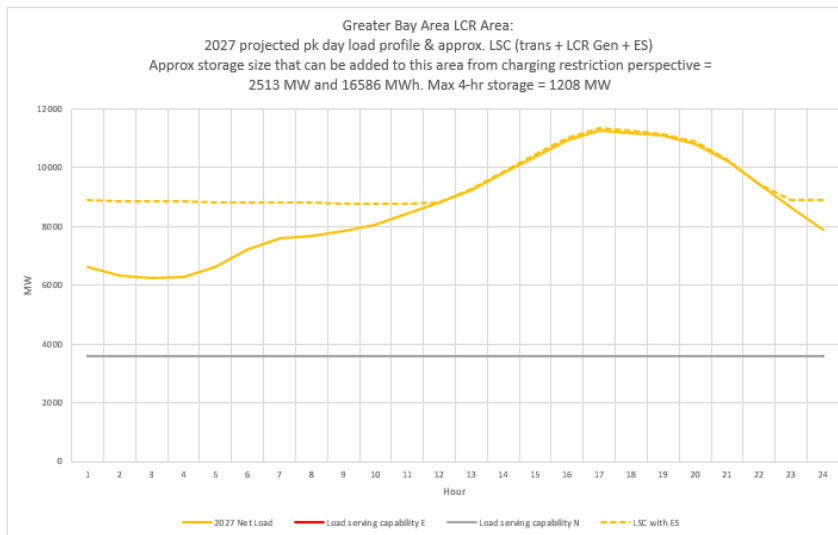
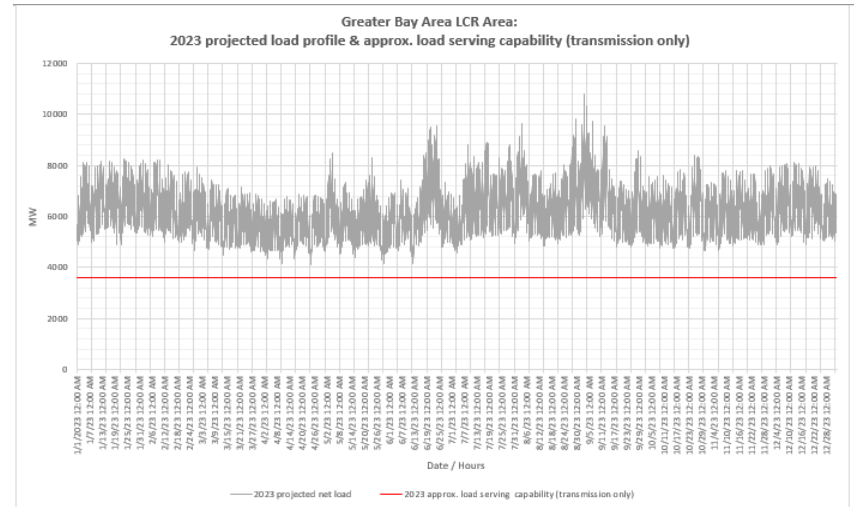
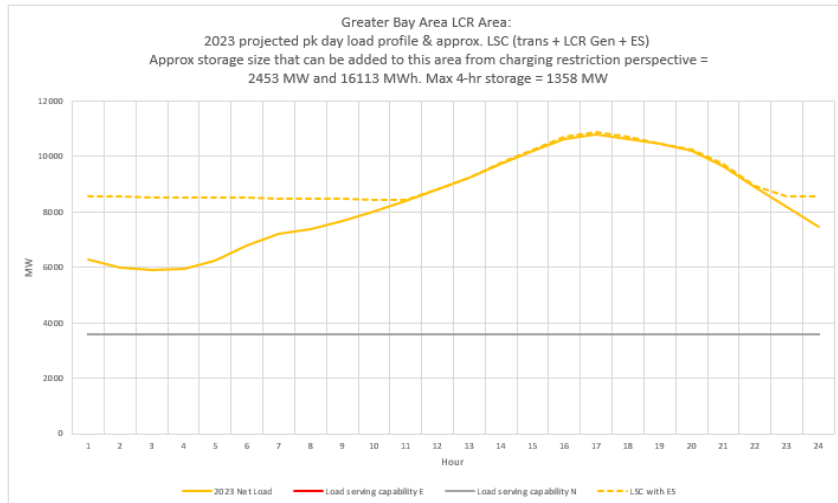
Greater Bay Area Overall: Load and Resources

Load (MW)	2023	2027	Generation (MW)	Aug NQC
Gross Load	10,823	11,229	Market, Net Seller, Wind	6,154
AAEE	-51	-72	MUNI	378
Behind the meter DG	-174	-3	QF	233
Net Load	10,598	11,154	Solar	8
Transmission Losses	274	315	Existing 20-minute Demand Response	65
Pumps	264	264	Battery	932
Load + Losses + Pumps	11,136	11,733	Total	7,770

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	7,312
2027	P6	Metcalf 500/230 kV #13 transformer	Metcalf 500/230 kV #11 & #12 transformers	7,540 (170)

Greater Bay Area Sub-area: Load Profiles



Greater Bay Area Total Generation & LCR Need

Generation	Market, Net Seller, Wind (MW)	MUNI (MW)	QF (MW)	Solar (MW)	Existing 20-minute Demand Response (MW)	Battery (MW)	Total MW
Aug NQC	6,154	378	233	8	65	932	7,770

Year	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Need
2023	7,312	0	7,312
2027	7,370	170	7,540

The overall LCR requirement has increased in 2023 mostly due to load growth. The overall LCR requirement has decreased in 2027 mostly due to resource dispatch outside the area (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	1,058 (179)	3,082	1,096 (248)	3,121	1,103 (224)
South Bay – Moss Landing	4,321	2,333	4,427	2,487	4,821	2,535	4,830	2,543
Oakland	181	101	192	35	178	31	194	39
Pittsburg – Ames – Oakland	NA*	1,791	NA*	1,898	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	7,312	11,551	7,979 (305)	11,733	7,540 (170)

Note:

* Flow-through area. No defined load pocket.