



California ISO
Shaping a Renewed Future

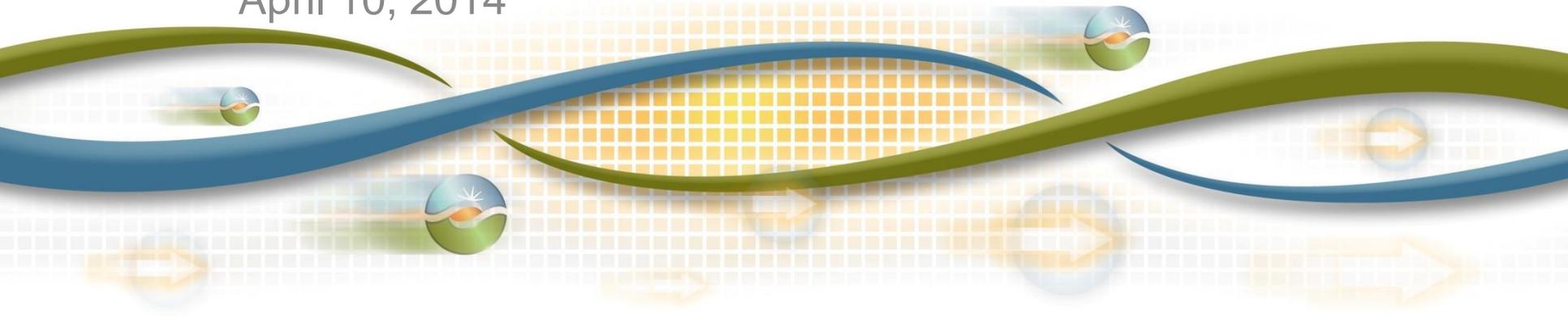
2015 and 2019 Final LCR Study Results - Greater Bay Area

Bryan Fong

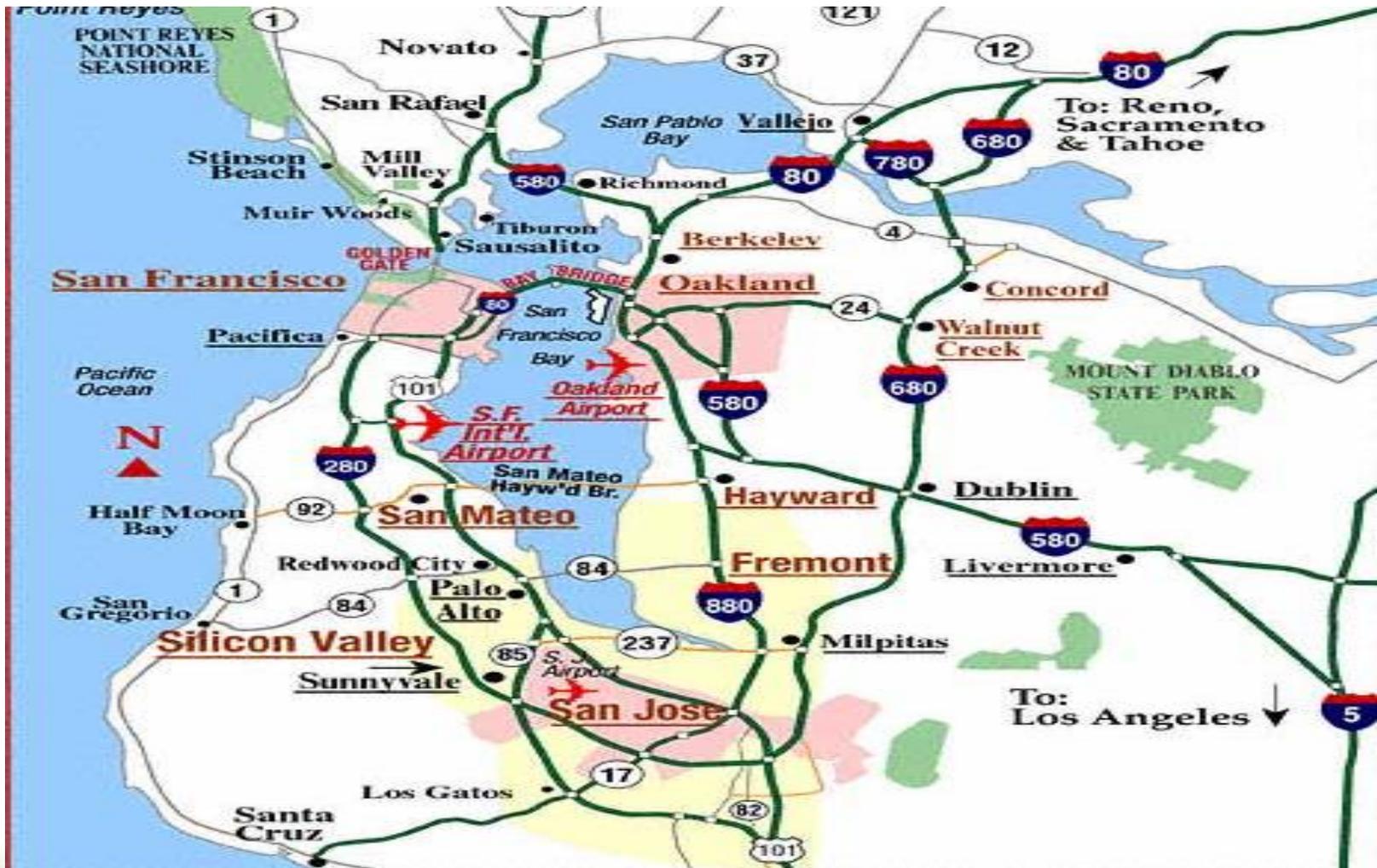
Senior Regional Transmission Engineer

Stakeholder Web Conference

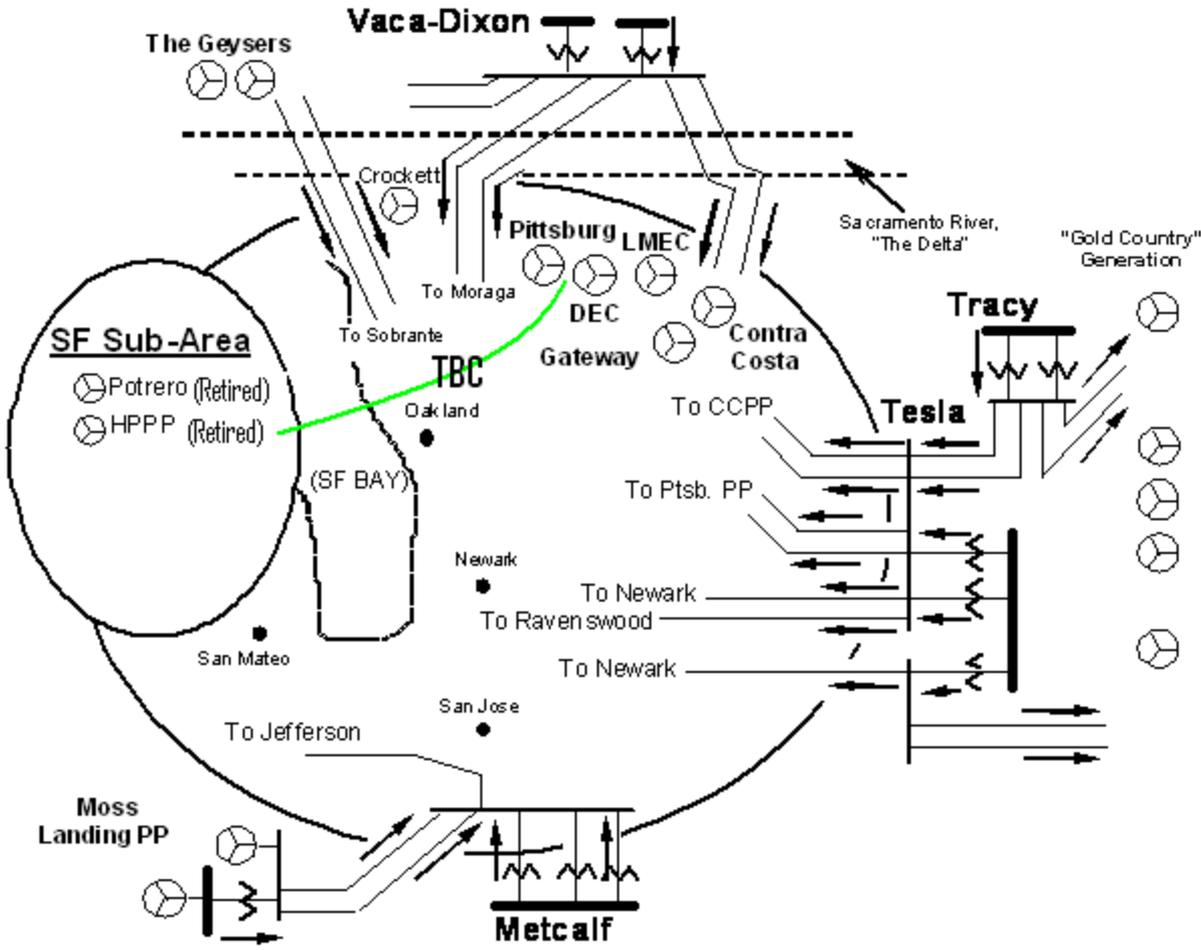
April 10, 2014



Greater Bay Area Map



Greater Bay Area Transmission System



New major transmission projects

- Contra Costa – Moraga 230 kV Line Reconductoring – 12/14
- East Shore-Oakland J 115 kV Reconductoring Project – 05/16
- Embarcadero-Potrero 230 kV Transmission Project – 12/15
- Evergreen-Mabury Conversion to 115 kV - 05/17
- Metcalf-Evergreen 115 kV Line Reconductoring – 05/18
- Metcalf-Piercy & Swift and Newark-Dixon Landing 115 kV Upgrade – 05/18
- Moraga Transformers Capacity Increase – 12/15
- Pittsburg – Tesla 230 kV Reconductoring – 10/15
- Tesla-Newark 230 kV Path Upgrade – 05/16
- Vaca Dixon-Lakeville 230 kV Reconductoring – 06/17

Power plant changes

Additions:

- Marsh Landing Generating Station
- Los Esteros Critical Energy Facility (LECEF) capacity increase
- Russel City
- Oakley (2019 only)

Retirements:

- Contra Costa units #6 and #7
- GWF #1-5

Greater Bay Area Load

2015 1-in-10 Year Load Representation

Total Load = 9,781 MW

Transmission Losses = 184 MW

Pumps = 264 MW

Total Load + Losses + Pumps = 10,229 MW

2019 1-in-10 Year Load Representation

Total Load = 9,868 MW

Transmission Losses = 200 MW

Pumps = 262 MW

Total Load + Losses + Pumps = 10,330 MW

San Jose Sub Area

San Jose Sub-area – Category B

Contingency: Metcalf-Evergreen #2 115 kV Line with Duane PP out of service

Limiting component: Thermal overload of Metcalf-Evergreen #1 115 kV Line

2015 LCR need: 265 MW (includes 61 MW of QF and 202 MW of generation)

2019 LCR need: 119 MW (includes 263 MW of QF/Muni generation)

San Jose Sub-area – Category C

Contingency: Metcalf El Patio #1 or #2 overlapped with the outage of Metcalf-Evergreen #2 115 kV

Limiting component: Thermal overload of Metcalf-Evergreen #1 115 kV Line

2015 LCR need: 692 MW (includes 61 MW of QF and 202 MW of generation as well as 136 MW of deficiency)

2019 LCR need: 385 MW (includes 263 MW of QF/Muni generation)

Llagas Sub Area

Llagas Sub-area – Category B

Contingency: Metcalf D-Morgan Hill 115 kV with one of the Gilroy peakers off line

Limiting component: Thermal overload on the Morgan Hill-Llagas 115 kV Line as well as 5% voltage drop at the Morgan Hill substation

2015 LCR need: 137 MW (includes 0 MW of QF/Muni generation)

2019 LCR need: 158 MW (includes 0 MW of QF/Muni generation)

Llagas Sub-area – Category C

Same as Category B

Oakland Sub Area

Oakland Sub-area – Category B

Contingency: Moraga – Claremont #1 or #2 230 kV line with one Oakland CT off-line

Limiting component: Remaining Moraga – Claremont 230 kV line

2015 LCR need: No requirement

2019 LCR need: 141 MW (includes 49 MW of QF/Muni generation)

Oakland Sub-area – Category C

Contingency: overlapping C-X #2 and C-X #3 115 kV cables

Limiting component: Thermal overload on the Moraga – Claremont #1 or #2 230kV Line.

2015 LCR need: 25 MW (includes 49 MW of QF/Muni generation)

2019 LCR need: Same as category B

**This requirement does not include the need for the Pittsburg/
Oakland sub-area**

Pittsburg/Oakland Sub Area

Pittsburg/Oakland Sub-area – Category B

Contingency: Moraga #3 230/115 kV Bank

Limiting component: Thermal overload on Moraga #1 230/115 kV Bank

2015 LCR need: 1688 MW (includes 369 MW of QF and 49 MW of Muni generation)

2019 LCR need: No requirement.

Pittsburg/Oakland Sub-area – Category C

Contingency: Moraga #3 230/115 kV Bank and Delta Energy Center

Limiting component: Thermal overload on Moraga #1 230/115 kV Bank
(400 MW of Trans Bay Cable run back has been used)

2015 LCR need: 2524 MW (includes 369 MW of QF and 49 MW of Muni generation)

2019 LCR need: No requirement.

Contra Costa Sub Area

Contra Costa Sub-area – Category B

Contingency: Kelso-Tesla 230 kV with the Gateway off line

Limiting component: Thermal overload on the Delta Switching Yard-
Tesla 230 kV Line

2015 LCR need: 1259 MW (includes 256 MW of Wind generation
and 264 MW of MUNI pumps)

2019 LCR need: 1629 MW (includes 264 MW of MUNI pumps and
256 MW of wind generation)

Contra Costa Sub-area – Category C

Same as Category B

Greater Bay Area Overall

Bay Area Overall – Category B

Contingency: Tesla-Metcalf 500 kV line with Delta Energy Center out of service

Limiting component: Reactive margin within the Bay Area

2015 LCR need: 3492 MW (including 485 MW of QF, 519 MW of MUNI and 258 MW of wind generation)

2019 LCR need: 3198 MW (including 485 MW of QF, 519 MW of MUNI and 258 MW of wind generation)

Greater Bay Area Overall (con't)

Bay Area Overall – Category C

Contingency: overlapping Tesla-Metcalf 500 kV line and Tesla-Newark #1 230 kV line

Limiting component: Thermal overload on the Tesla-Newark #1 230 or Lone Tree–Cayatano 230kv Line

2015 LCR need: 4231 MW (including 485 MW of QF, 519 MW of MUNI and 258 MW of wind generation)

2019 LCR need: 4224 MW (including 485 MW of QF, 519 MW of MUNI and 258 MW of wind generation)

Greater Bay Area Total

Bay Area Total – Category B

Limiting component: Overall Contingency

2015 LCR need: 3492 MW (includes 1262 MW of QF/Muni/Wind generation)

Limiting component: Overall Contingency

2019 LCR need: 3198 MW (includes 1262 MW of QF/Muni/Wind generation)

Bay Area Overall – Category C

Limiting component: Sum of sub-area requirements

2015 LCR need: 4231 MW (includes 1262 MW of QF/Muni/Wind generation as well as 136 MW of Deficiency)

Limiting component: Overall Contingency

2019 LCR need: 4224 MW (includes 1262 MW of QF/Muni/Wind generation)

Greater Bay Area

Available Generation

Year	QF (MW)	Muni (MW)	Wind (MW)	Market (MW)	Max. Qualifying Capacity (MW)
2015	485	519	258	6243	7505
2019	485	519	258	6900	8162

Total LCR need

	Existing Generation Capacity Needed (MW)		Deficiency (MW)		Total MW Need	
	2015	2019	2015	2019	2015	2019
Category B (Single)	3492	3198	0	0	3492	3198
Category C (Multiple)	4231	4224	136	0	4367	4224

Changes

Since last year:

- 1) 2015 load forecast is lower by 190 MW vs. 2014
- 2) LCR need has decreased by 271 MW vs. 2014
- 3) Sum of sub-area LCR needs drive the Bay Area total requirement in 2015
- 4) 2019 load forecast is lower by 594 MW vs. 2018
- 5) Added Generation: Oakley (2019 only)
- 6) Long-term LCR need has decreased by 262 MW vs. 2018
- 7) Sum of sub-area LCR needs is not enough to meet the Bay Area overall requirement in 2019

Since last stakeholder call:

- 1) Updated NQC

Your comments and questions are welcome.

For written comments, please send to: RegionalTransmission@caiso.com