



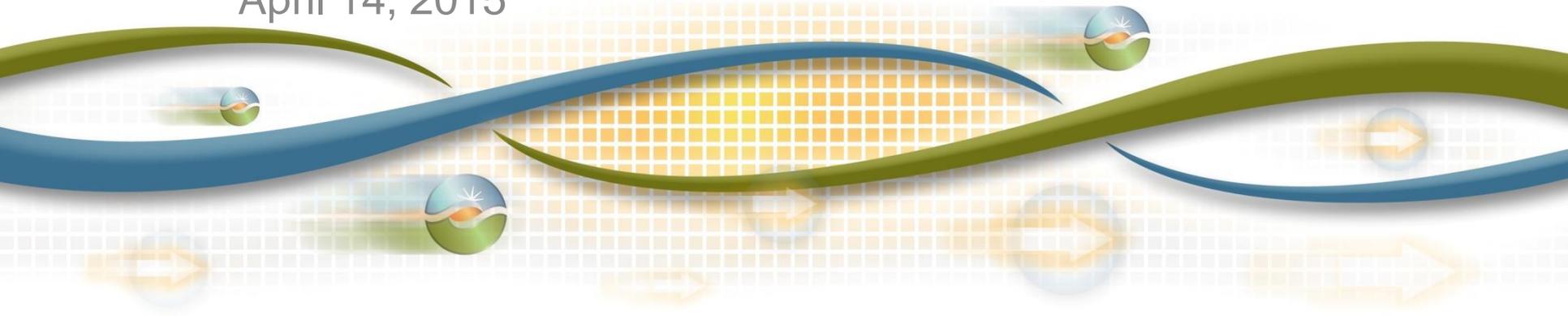
2016 and 2020 Final LCR Study Results - Greater Bay Area

Bryan Fong

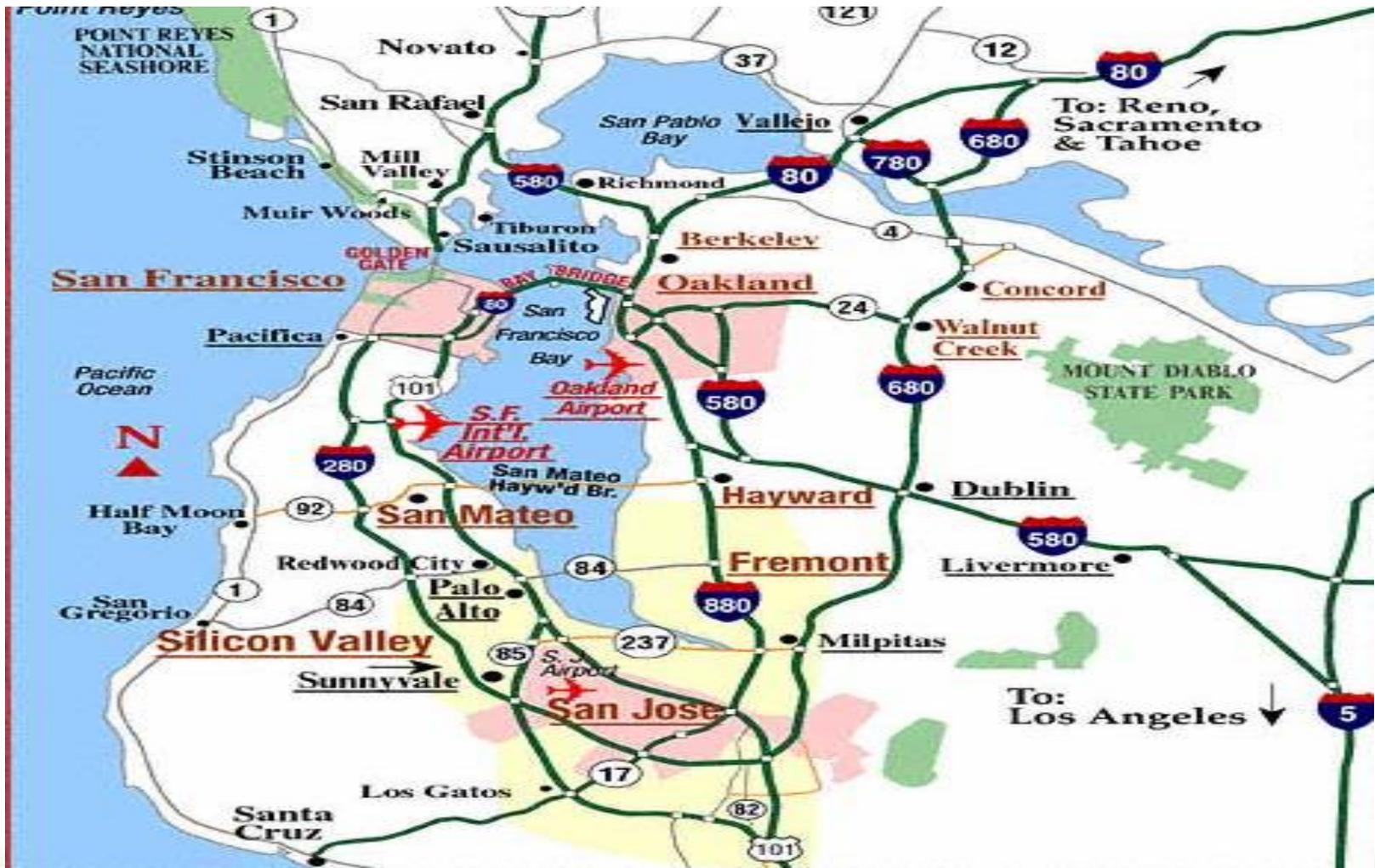
Senior Regional Transmission Engineer

Stakeholder Teleconference

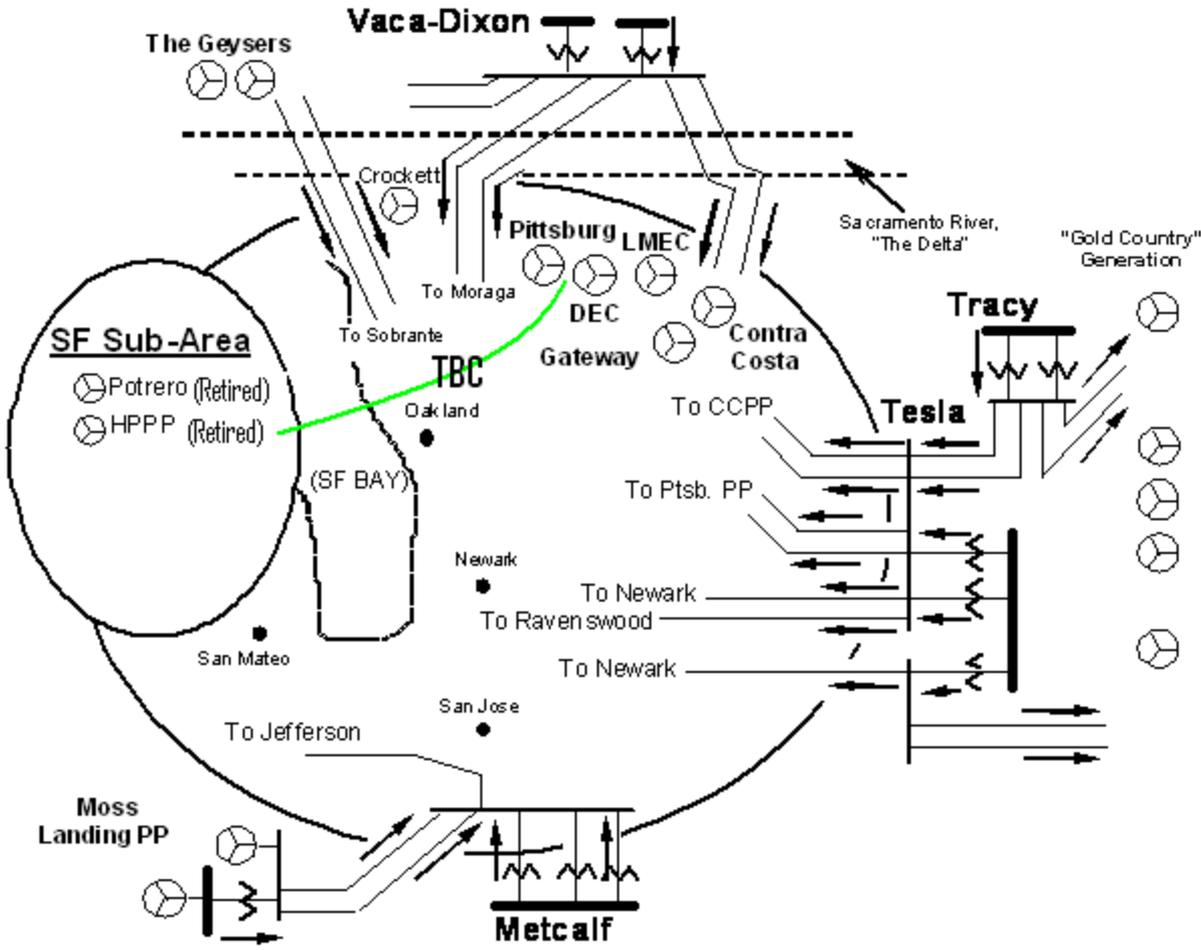
April 14, 2015



Greater Bay Area Map



Greater Bay Area Transmission System



New major transmission projects

- Contra Costa – Moraga 230 kV Line Reconductoring – 06/16
- East Shore-Oakland J 115 kV Reconductoring Project – 07/18
- Embarcadero-Potrero 230 kV Transmission Project – 04/16
- Evergreen-Mabury Conversion to 115 kV - 12/17
- Metcalf-Evergreen 115 kV Line Reconductoring – 05/19
- Metcalf-Piercy & Swift and Newark-Dixon Landing 115 kV Upgrade – 05/19
- Moraga Transformers Capacity Increase – 10/16
- Pittsburg – Tesla 230 kV Reconductoring – 10/15
- Tesla-Newark 230 kV Path Upgrade – 12/17
- Vaca Dixon-Lakeville 230 kV Reconductoring – 07/17

Power plant changes

Additions:

- A few small renewable resources
- Oakley (2020 only)

Retirements:

- Contra Costa units #6 and #7
- GWF #1-5
- United Co-gen
- Pittsburg Power Plant (by 2020)

Bay Area Load and Resources (MW)

		2016	2020
Load	=	9,790	10,048
AAEE	=	-144	-369
Transmission Losses	=	173	188
Pumps	=	264	264
Total Load	=	10,083	10,131
Market Generation	=	6,435	5,775
Wind Generation	=	278	278
Muni Generation	=	547	547
QF Generation	=	297	297
Total Qualifying Capacity	=	7,557	6,897



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

2016 LCR need: 265 MW (includes 5 MW of QF and 230 MW of generation)

2020 LCR need: no LCR need

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-Piercy 115 kV Line

2016 LCR need: 687 MW (includes 5 MW of QF and 230 MW of generation as well as 131 MW of deficiency)

2020 LCR need: 522 MW (includes 5 MW of QF and 230 MW of 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: 5% voltage drop at the Morgan Hill substation

2016 LCR need: 135 MW (includes 0 MW of QF/Muni generation)

2020 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

2016 LCR need: No requirement

2020 LCR need: 161 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 #2 230 kV Line.

2016 LCR need: 92 MW (includes 49 MW of QF/Muni generation)

2020 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

2016 LCR need: 1188 MW (includes 245 MW of QF and 49 MW of Muni generation)

2020 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)

2016 LCR need: 2001 MW (includes 245 MW of QF and 49 MW of Muni generation)

2020 LCR need: No requirement.



Pittsburg Sub Area

Pittsburg Sub-area – Category B

2016 LCR need: Yes - Part of Pittsburg/Oakland sub-area

2020 LCR need: No requirement.

Pittsburg Sub-area – Category C

2016 LCR need: Yes - Part of Pittsburg/Oakland sub-area

Contingency: Vaca-Dixon Lakeville & Vaca-Dixon Tulucay 230 kV lines

Limiting component: Thermal overload on Moraga-Sobrante 115 kV line

2020 LCR need: 1471 MW (includes 245 MW of QF generation)

Ames Sub Area

Ames Sub-area – Category B

2016 LCR need: No requirement.

2020 LCR need: No requirement.

Ames Sub-area – Category C

Contingency: Newark-Ravenswood & Tesla-Ravenswood 230 kV lines

Limiting component: Overload of Newark-Ames #1, #2, #3 and Newark-Ames Distribution 115 kV lines

2016 LCR need: 596 MW (beyond Pittsburg/Oakland sub-area) (includes 0 MW of QF generation)

2020 LCR need: No requirements due to South of San Mateo Capacity Increase transmission project

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

2016 LCR need: 930 MW (includes 275 MW of Wind generation and
264 MW of MUNI pumps)

2020 LCR need: 1354 MW (includes 275 MW of Wind generation
and 264 MW of MUNI pumps)

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

2016 LCR need: 3790 MW (includes 297 MW of QF, 547 MW of MUNI and 278 MW of wind generation)

2020 LCR need: 3820 MW (includes 297 MW of QF, 547 MW of MUNI and 278 MW of wind generation)

Greater Bay Area Overall

Bay Area Overall – Category C

2016 LCR need: Sum of Category C sub area requirements at 4349 MW (includes 297 MW of QF, 547 MW of MUNI and 278 MW of wind generation as well as 131 MW of deficiency)

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

Limiting component: Tesla-Delta Switching Yard 230 kV line

2020 LCR need: 4191 MW (includes 297 MW of QF, 547 MW of MUNI and 278 MW of wind generation)

Greater Bay Area

Available Generation

Year	QF (MW)	Muni (MW)	Wind (MW)	Market (MW)	Max. Qualifying Capacity (MW)
2016	297	547	278	6435	7557
2020	297	547	278	5775	6897

Total LCR need

	Existing Generation Capacity Needed (MW)		Deficiency (MW)		Total MW Need	
	2016	2020	2016	2020	2016	2020
Category B (Single)	3790	3820	0	0	3790	3820
Category C (Multiple)	4218	4191	131	0	4349	4191

Changes

Since last year:

- 1) 2016 load forecast is lower by 146 MW vs. 2015
- 2) Sum of sub-area LCR needs drive the Bay Area total requirement in 2016
- 3) LCR need has decreased by 18 MW vs. 2015 – due to a combination of load and new Ames sub-area requirements.
- 4) 2020 load forecast is lower by 199 MW vs. 2019
- 5) Long-term LCR need has decreased by 33 MW vs. 2019

Since last stakeholder meeting:

- 1) Updated NQC
- 2) Small change to the Ames sub-area LCR needs

Your comments and questions are welcome.

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