2016-2020 Draft LCR Study Results
Sierra and Stockton Local Areas

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Stakeholder Meeting
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## Sierra Area Load and Resources (MW)

<table>
<thead>
<tr>
<th>Description</th>
<th>2016</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load</td>
<td>1837</td>
<td>1977</td>
</tr>
<tr>
<td>AAEE</td>
<td>-27</td>
<td>-72</td>
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<tr>
<td>Transmission Losses</td>
<td>96</td>
<td>89</td>
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<tr>
<td>Total Load</td>
<td>1906</td>
<td>1994</td>
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<tr>
<td>Market Generation</td>
<td>769</td>
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<tr>
<td>Muni Generation</td>
<td>1134</td>
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<td>QF Generation</td>
<td>218</td>
<td>218</td>
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<tr>
<td>Total Qualifying Capacity</td>
<td>2121</td>
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</tbody>
</table>
New transmission projects modeled:

1. Palermo-Rio Oso 115 kV Reconductoring
2. Gold Hill-Missouri Flat #1 and #2 115 kV line Reconductoring (2020 only)
3. Rio Oso #1 and #2 230/115 kV Transformer Replacement (2020 only)
4. South of Palermo 115 kV Reinforcement (2020 only)
5. New Atlantic-Placer 115 kV Line (2020 only)
6. Pease 115/60 kV Transformer Addition (2020 only)
South of Table Mountain Sub-area – Category C

2016 LCR need: 1765 MW (includes 192 MW of QF and 1107 MW of Muni generation)

2020 LCR need: 1688 MW (includes 192 MW of QF and 1107 MW of Muni generation)

Contingency: Table Mountain-Rio Oso 230 kV and Table Mountain-Palermo 230 kV DCTL outage

Limiting component: Thermal overload on the Caribou-Palermo 115 kV line

South of Table Mountain Sub-area – Category B

2016 LCR need: No additional category B requirement. Units required for South of Palermo satisfy the category B requirement for this sub-area.

2020 LCR need: 1632 MW (includes 192 MW of QF and 1107 MW of Muni generation)

Contingency: Table Mountain-Palermo 230 kV line and Belden Unit

Limiting component: Thermal overload on the Table Mountain-Rio Oso 230 kV line
Critical Sierra Area Contingencies
South of Palermo

South of Palermo Sub-area – Category C

2016 LCR need: 1571 MW (includes 61 MW of QF and 639 MW of Muni generation as well as 189 MW of deficiency)

Contingency: Double Circuit Tower Line Table Mountain-Rio Oso and Colgate-Rio Oso 230 kV lines

Limiting component: Thermal overload on the Pease-Rio Oso 115 kV line

2020 LCR need: 586 MW (includes 61 MW of QF and 639 MW of Muni generation)

Contingency: Table Mountain-Rio Oso 230 kV and Palermo-Nicolaus 115 kV lines

Limiting component: Thermal overload on the Colgate-Rio Oso 230 kV line

South of Palermo Sub-area – Category B

2016 LCR need: 1139 MW (includes 61 MW of QF and 639 MW of Muni generation)

Contingency: Palermo-E. Nicolaus 115 kV line with Belden unit out of service

Limiting component: Thermal overload on the Pease-Rio Oso 115 kV line

2020 LCR need: 280 MW (includes 61 MW of QF and 639 MW of Muni generation)

Contingency: Table Mountain-Rio Oso 230 kV line with Belden unit out of service

Limiting component: Thermal overload on the Colgate-Rio Oso 230 kV line
Critical Sierra Area Contingencies
Drum-Rio Oso

Drum-Rio Oso Sub-area – Category C
2016 LCR need: 677 MW (includes 192 MW of QF and 197 MW of Muni generation)
2020 LCR need: 73 MW (includes 192 MW of QF and 197 MW of Muni generation)
Contingency: Rio Oso #2 230/115 kV transformer and Rio Oso-Brighton 230 kV line
Limiting component: Thermal overload on the Rio Oso #1 230/115 kV transformer

Drum-Rio Oso Sub-area – Category B
2016 LCR need: 259 MW (includes 192 MW of QF and 197 MW of Muni generation)
Contingency: Rio Oso #2 230/115 kV transformer
Limiting component: Thermal overload on the Rio Oso #1 230/115 kV transformer
2020 LCR need: No requirement due to Rio Oso Transformers Replacement project.
Critical Sierra Area Contingencies
South of Rio Oso

South of Rio Oso Sub-area – Category C

- 2016 LCR need: 750 MW (includes 31 MW of QF and 593 MW of Muni generation as well as 46 MW of deficiency)
- 2020 LCR need: 742 MW (includes 31 MW of QF and 593 MW of Muni generation as well as 32 MW of deficiency)
- Contingency: Rio Oso-Gold Hill 230 kV and Rio Oso-Lincoln 115 kV lines
- Limiting component: Thermal overload on the Rio Oso-Atlantic 230 kV line

South of Rio Oso Sub-area – Category B

- 2016 LCR need: 508 MW (includes 31 MW of QF and 593 MW of Muni generation)
- 2020 LCR need: 480 MW (includes 31 MW of QF and 593 MW of Muni generation)
- Contingency: Rio Oso-Gold Hill 230 kV line and Ralston unit
- Limiting component: Thermal overload on the Rio Oso-Atlantic 230 kV line
Critical Sierra Area Contingencies

Pease

**Pease Sub-area – Category C**

- 2016 LCR need: Same as Category B.
- 2020 LCR need: 105 MW (includes 70 MW of QF generation)
- Contingency: Palermo-Pease and Pease-Rio Oso 115 kV lines
- Limiting component: Thermal overload on the Table Mountain-Pease 60 kV line

**Pease Sub-area – Category B**

- 2016 LCR need: 105 MW (includes 70 MW of QF generation)
- Contingency: Palermo-East Nicolaus 115 kV line and YCEC unit
- Limiting component: Thermal overload on the Palermo-Pease 115 kV line
- 2020 LCR need: 63 MW (includes 70 MW of QF generation)
- Contingency: Palermo-Pease 115 kV line and YCEC unit
- Limiting component: Thermal overload on the Table Mountain-Pease 60 kV line
**Critical Sierra Area Contingencies Placer**

**Placer Sub-area – Category C**

2016 LCR need: 94 MW (includes 38 MW of QF and Muni generation as well as 12 MW of deficiency)

Contingency: Gold Hill-Placer #1 and #2 115 kV lines
Limiting component: Thermal overload on the Drum-Higgins 115 kV line

2020 LCR need: 43 MW (includes 38 MW of QF and Muni generation)
Contingency: New Atlantic-Placer and Gold Hill-Placer #1 115 kV lines
Limiting component: Thermal overload on the Drum-Higgins 115 kV line

**Placer Sub-area – Category B**

2016 LCR need: 54 MW (includes 38 MW of QF and Muni)
Contingency: Gold Hill-Placer #1 115 kV line and Chicago Park unit
Limiting component: Thermal overload on the Drum-Higgins 115 kV line

2020 LCR need: 55 MW (includes 38 MW of QF and Muni generation)
Contingency: New Atlantic-Placer 115 kV line and Chicago Park unit
Limiting component: Thermal overload on the Drum-Higgins 115 kV line
Placerville Sub-area – Category C

2016 LCR need: 106 MW (includes 0 MW of QF and Muni generation as well as 80 MW of deficiency)

Contingency: Gold Hill-Clarksville and Gold Hill-Missouri Flat #2 115 kV lines
Limiting component: Thermal overload on the Gold Hill-Missouri Flat #1 115 kV line

2020 LCR need: No requirements

Placerville Sub-area – Category B

2016 LCR need: No requirements
2020 LCR need: No requirements
Each unit is only counted once, regardless in how many sub-areas it is needed.

In order to come up with an aggregate deficiency, where applicable the deficiencies in each smaller sub-area has been accounted for (based on their effectiveness factors) toward the deficiency of a much larger sub-area.
Changes

2016 LCR compared to 2015:

- Load forecast went down by 55 MW.
- Overall LCR need has decreased by 188 MW.
- The decrease in LCR is due to decrease in load forecast.

2020 LCR compared to 2019:

- Load forecast went down by 82 MW.
- Overall LCR need has increased by 618 MW.
- The increase in LCR is due to delay in transmission projects implementation.

Your comments and questions are welcome.
For written comments, please send to: RegionalTransmission@caiso.com
<table>
<thead>
<tr>
<th>Description</th>
<th>2016</th>
<th>2020</th>
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<tbody>
<tr>
<td>Load</td>
<td>1181</td>
<td>1251</td>
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<tr>
<td>AAEE</td>
<td>-16</td>
<td>-41</td>
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<tr>
<td>Transmission Losses</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Total Load</td>
<td>1186</td>
<td>1230</td>
</tr>
<tr>
<td>QF Generation</td>
<td>36</td>
<td>117</td>
</tr>
<tr>
<td>Muni Generation</td>
<td>142</td>
<td>142</td>
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<td>Market Generation</td>
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<td>464</td>
</tr>
<tr>
<td>Total Qualifying Capacity</td>
<td>644</td>
<td>732</td>
</tr>
</tbody>
</table>
New transmission projects modeled:

1. Weber-Stockton A #1 & #2 60 kV lines Reconductored
2. Weber 230/60 kV Transformer Replacement
3. Ripon 115 kV line (2020 only)
4. Vierra 115 kV loop-in (2020 only)
Critical Stockton Area Contingencies
Tesla-Bellota Sub-area

Tesla-Bellota Sub-area – Category C

TOTAL 2016 LCR need: 681 MW (30 MW of QF and 114 MW of Muni and 311 MW of deficiency)

Contingency 1: Schulte-Lammers and Schulte-Kasson-Manteca 115 kV lines.
Limiting component 1: Thermal overload on the Tesla-Tracy 115 kV line.
LCR Need: 561 MW (30 MW of QF and 114 MW of Muni and 311 MW of deficiency).

Contingency 2: Tesla-Tracy 115 kV line and Tesla-Schulte #2 115 kV line.
Limiting component 2: Thermal overload on the Tesla-Schulte #1 115 kV line.
LCR Need: 370 MW (includes 30 MW of QF and 114 MW of Muni generation).

2020 LCR need: 284 MW (129 MW of QF and 114 MW of Muni generation)
Contingency: Tesla-Schulte #2 115 kV lines and Tesla-Vierra.
Limiting component: Thermal overload on the Tesla-Schulte #1 115 kV line.
Tesla-Bellota Sub-area – Category B

2016 LCR Need: 357 MW (includes 30 MW of QF and 114 MW of Muni generation).
2020 LCR Need: 246 MW (includes 129 MW of QF and 114 MW of Muni generation).

Contingency: Tesla-Schulte #2 115 kV line and the loss of GWF Tracy #3.
Limiting component: Thermal overload on the Tesla-Schulte #1 115 kV line.
Critical Stockton Area Contingencies
Stanislaus Sub-area

Stanislaus Sub-area – Category C
2016 LCR need: Same as Category B.
2020 LCR need: Same as Category B.

Stanislaus Sub-area – Category B
2016 LCR need: 151 MW (includes 19 MW of QF and 94 MW of Muni generation)
2020 LCR need: 141 MW (includes 19 MW of QF and 94 MW of Muni generation)
Contingency: Bellota-Riverbank-Melones 115 kV line and Stanislaus PH
Limiting component: Thermal overload on the River Bank Jct.-Manteca 115 kV line
Critical Stockton Area Contingencies
Lockeford Sub-area

Lockeford Sub-area – Category C

- 2016 LCR need: 86 MW (includes 25 MW of QF and Muni generation as well as 61 MW of deficiency)
- 2020 LCR need: 88 MW (includes 25 MW of QF and Muni generation as well as 63 MW of deficiency)

Contingency: Lockeford-Industrial and Lockeford-Lodi #2 60 kV lines

Limiting component: Thermal overload on the Lockeford-Lodi Jct. section of the Lockeford-Lodi #3 60 kV line

Lockeford Sub-area – Category B

- 2016 LCR need: No category B requirement.
- 2020 LCR need: No category B requirement.
**Weber Sub-area – Category C**

- 2016 LCR need: 31 MW (includes 27 MW of QF generation)
- 2020 LCR need: 29 MW (includes 27 MW of QF generation)

Contingency: Stockton A-Weber #1 and #2 60 kV lines

Limiting component: Thermal overload on the Stockton A-Weber #3 60 kV line

**Weber Sub-area – Category B**

- 2016 LCR need: No Category B requirement
- 2020 LCR need: No Category B requirement.
Each unit is only counted once, regardless in how many sub-areas it is needed.

In order to come up with an aggregate deficiency, where applicable the deficiencies in each smaller sub-area has been accounted for (based on their effectiveness factors) toward the deficiency of a much larger sub-area.
2016 LCR compared to 2015:
- Load forecast went up by 81 MW.
- Overall LCR need has increased by 91 MW due to increase in load forecast.

2020 LCR compared to 2019:
- Load forecast went up by 94 MW.
- Overall LCR need has increased by 50 MW due to increase in load forecast.

Your comments and questions are welcome. For written comments, please send to: RegionalTransmission@caiso.com