MCE SPECIAL MEETING
Friday, September 28, 2018
9:00 A.M.

City of Richmond Memorial Auditorium
403 Civic Center Plaza, Richmond, CA

Agenda Page 1 of 2

New Board Member Meet and Greet (8:30-9:00)

Swearing in of New Board Member

1. Roll Call/Quorum 9:00

2. Public Open Time (Discussion) 9:05

3. Strategic Plan Update, Accomplishments and Goals (Discussion) 9:15

4. FY 2017/18 Financial Statement Presentation (Discussion) 10:15

5. Positioning MCE for the Future (Discussion) 10:30

Break: 11:00-11:10

6. Addressing External Challenges and Opportunities (Discussion) 11:10
   Emily Pappas, Niemela Pappas & Associates, Partner

Agenda material can be inspected at 1125 Tamalpais Avenue, San Rafael, CA 94901 on the Mission Avenue side of the building and at One Concord Center, 2300 Clayton Road, Concord, CA 94520 at the Clayton Road entrance. The meeting facilities are in accessible locations. If you are a person with a disability and require this document in an alternate format (example: Braille, Large Print, Audiotape, CD-ROM), you may request it by using the contact information below. If you require accommodation (example: ASL Interpreter, reader, note taker) to participate in any MCE program, service or activity, you may request an accommodation by calling (415) 464-6032 (voice) or 711 for the California Relay Service or by e-mail at djackson@mceCleanEnergy.org not less than four work days in advance of the event.
MCE SPECIAL MEETING
Friday, September 28, 2018
9:00 A.M.

City of Richmond Memorial Auditorium
403 Civic Center Plaza, Richmond, CA

Agenda Page 2 of 2

Lunch: 12:00-1:15

7. Board Meeting Logistics (Discussion) 1:15

8. CCA Across the State: Challenges and Opportunities (Discussion) 1:30
   Beth Vaughan, California Community Choice Association, Executive Director

9. Regionalization of the Electric Grid CAISO (Discussion) 2:10
   Mark Rothleder, California Independent System Operator, Vice President,
   Market Quality & Renewable Integration

10. Board Member & Staff Matters (Discussion) 3:00

11. Adjourn
MCE Board Retreat

Mark Rothleder
Vice President
Market Quality and Renewable Integration

September 28, 2018
The balancing of supply and demand

- Sales
- Inter-Regional Interchange
- Purchases
- Load
- Frequency (60 Hz)
- Power Generated
- Decrease
- Increase
- Demand
- Losses
- Supply
Actual net-load and 3-hour ramps are approximately four years ahead of the ISO’s original estimate.

Typical Spring Day

- Actual 3-hour ramp of 14,777 MW on 3/4/18 (This was 12,960 MW on 12/18/16.)
- Net load of 7,149 MW on 2/18/18 (last year this was 9,187 MW on 4/23/17)
CAISO GHG emissions reduced by 23% since 2014

<table>
<thead>
<tr>
<th>YTD (January - July) million mTCO2</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHG Emission to serve ISO load</td>
<td>36.35</td>
<td>32.18</td>
<td>27.88</td>
<td>28.73</td>
</tr>
</tbody>
</table>

![Graph showing GHG emission trends from 2015 to 2018](image-url)
In 2017, the CAISO peak load was 50,116 MW and occurred at 15:58:24 on Friday, September 1, 2017.

15:58 to 18:44

- Net Load peaked 2 hours and 46 minutes after peak demand
- Peak load decreased by 2,148 MW
- Solar production decreased by 7,199 MW
- Net Load increased by 5,258 MW
On July 24, 2018, the CAISO peak load was 46,500 MW.
EIM provides an easily-scalable extension of real-time market to the broader region

- Builds on existing market: automated dispatch minimizes cost, facilitates renewables, resolves imbalance & avoids congestion
- Situational awareness enhances reliability
- Easily scalable, low-cost, low risk, no exit fees, voluntary option for new participants
- Preserves BAA autonomy, including compliance, balancing, and reserve obligations
Western EIM serves 2/3 of the western load and has gross economic benefits of over $400M

- Nine western states – Arizona, California, Idaho, Oregon, Nevada, New Mexico, Utah, Washington & Wyoming
- Canada – southern portion of British Columbia
- Mexico – Baja California (under consideration)

<table>
<thead>
<tr>
<th>BAA</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>APS</td>
<td></td>
<td></td>
<td>5.98</td>
<td>34.56</td>
<td>14.49</td>
<td>55.03</td>
</tr>
<tr>
<td>IPCO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.75</td>
<td>7.75</td>
</tr>
<tr>
<td>ISO</td>
<td>1.23</td>
<td>12.66</td>
<td>28.34</td>
<td>36.96</td>
<td>42.78</td>
<td>121.97</td>
</tr>
<tr>
<td>NVE</td>
<td>0.84</td>
<td>15.57</td>
<td>15.72</td>
<td>9.51</td>
<td>17.19</td>
<td>50.12</td>
</tr>
<tr>
<td>PAC</td>
<td>4.73</td>
<td>26.23</td>
<td>45.47</td>
<td>37.41</td>
<td>22.18</td>
<td>136.02</td>
</tr>
<tr>
<td>PGE</td>
<td></td>
<td></td>
<td>2.83</td>
<td>8.98</td>
<td>11.81</td>
<td></td>
</tr>
<tr>
<td>PSE</td>
<td>1.56</td>
<td>9.86</td>
<td>5.33</td>
<td></td>
<td>16.75</td>
<td></td>
</tr>
<tr>
<td>PWRX</td>
<td></td>
<td></td>
<td>2.27</td>
<td></td>
<td>2.27</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5.96</td>
<td>39.73</td>
<td>96.92</td>
<td>145.82</td>
<td>113.29</td>
<td>401.73</td>
</tr>
</tbody>
</table>
Regional coordination will evolve to meet the needs as the system transforms

• Expanded renewable and clean energy targets
  – California SB100 – 60% by 2030, 100% by 2045

• Western Energy Imbalance Market
  – Continues to grow, 2/3 of WECC load will participate by 2020
  – Explore extending success of EIM into Day-Ahead Market

• Reliability Coordinator
  – ISO will be RC of record by July 1, 2019 for CA BAA and other BAAs by November 2019.
  – ISO will be the RC of 80% - 90% of the load area in the west

• Western RTO?
  – Where there’s a will, there may be a way
## A suite of solutions are necessary

| Storage – increase the effective participation by energy storage resources. |
| Western EIM expansion – expand the western Energy Imbalance Market. |
| Demand response – enable adjustments in consumer demand, both up and down, when warranted by grid conditions. |
| Regional coordination – offers more diversified set of clean energy resources through a cost effective and reliable regional market. |
| Time-of-use rates – implement time-of-use rates that match consumption with efficient use of clean energy supplies. |
| Electric vehicles – incorporate electric vehicle charging systems that are responsive to changing grid conditions. |
| Renewable portfolio diversity – explore procurement strategies to achieve a more diverse renewable portfolio. |
| Flexible resources – invest in fast-responding resources that can follow sudden increases and decreases in demand. |
Comparison of average consumption, system load and net load for all days in April, 2018
Comparison of average consumption, system load and net load for all days in August, 2018