Exhibit to Agenda Item #1

Review results of the SMUD Value of Solar and Storage Study.

Board Energy Resources & Customer Services Committee and Special SMUD Board of Directors Meeting

Wednesday, September 16, 2020, scheduled to begin at 5:30 p.m.

Virtual Meeting (online)
Agenda

• Net Energy Metering (NEM) Successor Rate Process and NEM 1.0 Compensation Recommendations
• Overview Technical Working Group Role and Process
• Recommendations from the Technical Working Group for the Value of Solar (VOS) and VOS + Storage Study
• Request for Proposal (RFP) Overview / Selection of E3
• E3’s Expertise in Performing VOS Studies
Net Energy Metering (NEM) Successor Rate Process

• Developing new rate for customers with rooftop solar and other self generation: Net Energy Metering (NEM) Successor Rate

• Collaborative process with customers and interested parties
  • Technical Working Group Role and Process
  • Recommendations from the Technical Working Group

• Independent Study to Determine Value of Energy from Rooftop Solar Systems
  • Selection of Consultant, Energy and Environmental Economics (E3)

  Study results to be presented tonight

• Presentation of Study results: important input to begin conversation with our customers and community
NEM 1.0 Compensation Recommendation to 2030

• To recognize and show our sincere appreciation for the early investment our NEM customers made in clean energy technology to help us achieve our clean energy goals we sent a letter to all residential NEM customers in early September.

• The letter stated that SMUD Staff will recommend that all existing residential NEM customers continue to receive NEM 1.0 compensation rate until 2030.

• This includes our “Pioneer PV” residential customers that interconnected in the 1990s.

• This also includes our residential customers that connected after 1/1/2018, after SMUD met its 5% solar adoption mandate.

• SMUD Board of Directors will make final decision.
Timeline of NEM Successor Rate Process

2019
- MAR/APR: March Grid Access Charge in GM Report Recs. Removed in April 2019
- AUG 12: Public Stakeholder Project Kick-Off
- OCT 18: Start Technical Working Group meetings
- MAR 18: Start Value of Solar / Storage (VoS) Study
- SEP 16: Share final results of VoS study at Board Committee Meeting

2020
- SEP: Start Community Meetings (Feedback directly from SMUD Customers)
- NOV: Board Feedback / Values Discussions on NEM Successor Rate
- DEC: Share results of community meetings with the Board
- JAN: Board Feedback / Technical Discussions on NEM Rate
- MAR: GM Report with NEM Successor Rate Recommendations
- JUNE: Board votes on NEM 2.0 Successor Rate

September 16, 2020 Board Energy Resources & Customer Services Committee and Special SMUD Board of Directors Meeting
### Technical Working Group (TWG) Members

#### SOLAR / ENVIRONMENTAL
- Al Rich, ACR Solar
- Alex J. Morris, California Energy Storage Alliance (CESA)
- Alex Jackson, NRDC
- Damon Franz, Tesla
- Dan Noran, Canadian Solar
- David Wright, 350 Sacramento
- Lauren Randall, Sunrun
- Lee Miller, NEM Customer
- Scott Murtishaw, California Solar & Storage Association (CalSSA)
- Steve Geiger, Grid Alternatives

#### UC DAVIS PROFESSORS
- Ben Finkelor, University of California (UC) Davis
- Dave Rapson, UC Davis

#### LOW INCOME ADVOCATES
- Luis Sanchez, Community Resource Project
- Stephanie Bray, United Way

#### NON-NEM CUSTOMERS, ENERGY INDUSTRY EXPERTS, FACILITATOR & SMUD STAFF
- John Briggs, Non-NEM Customer
- Patrick Mealoy, Non-NEM Customer
- Rick Codina, Non-NEM Customer
- Jan Smutny-Jones, Independent Energy Producers Association (IEPA)
- Rhys Davis, UC Davis Grad Student (Meeting Assistance)
- Matthew Tisdale, Gridworks (Facilitator)
- Eric Poff, Manager, Energy & Finance, SMUD
Technical Working Group Presenters

**TWG MEMBER PRESENTERS**

- Scott Murtishaw, CalSSA
- Jan Smutny-Jones, Independent Energy Producers Association (IEPA)
- Steve Geiger, Grid Alternatives
- Lee Miller, NEM Customer
- Al Rich, ACR Solar
- Damon Franz, Tesla
- Rick Codina; Non-NEM Customer

**GUEST PRESENTERS**

- Luis Amezcua, Sierra Club: *Environmental Benefits of Distributed Generation*
- Dr. Elena Krieger, PhD, PSE Health Energy: *Distributed Energy Resources Non-Energy Benefits: Emissions, Equity & Resilience*
- Paul De Martini, Executive Director, Pacific Energy Institute & Visiting Scholar, Caltech: *T&D Value of Solar + Storage*
- Various SMUD Staff Presenters

*NOTE: All Technical Working Group presentation materials are accessible at www.smud.org/nem*
TWG: How did we spend our time?

Technical Working Group Agenda Time

- Stakeholder Presentations, 29%
- SMUD Presentations, 18%
- Stakeholder Feedback / Discussion, 31%
- Other (Guest Speakers, Moderator Time, Breaks), 22%

Stakeholders had 60% of the time to present information & provide feedback
Technical Working Group Outcomes

After numerous technical presentations by group members and outside experts, the group agreed upon 24 Value Components that should be included in the VOS & VOS + Storage Study (outlined in Gridworks Final Report at www.smud.org/nem).

Key recommendation from the group: Evaluate the Study in three configurations:
- VOS Only
- VOS + Customer Only Operated Storage
- VOS + Storage with Utility Partnership

All Technical Working Group meeting minutes and presentation materials are all posted on www.smud.org/nem for public to understand and follow the process.
We analyzed the latest full year of SMUD’s customer data... to put that in perspective our data collection algorithm looked through (24*365*600,000) = 5,256,000,000 or 5.3 billion data points.

That equates to 5.3 gigabytes of SMUD data that was analyzed for the VOS + Storage Study.

1 gigabyte is equivalent to 711 1.44 Megabyte Floppy Disks. Stacked on top of each other that would be about 7.5ft tall.

5.3 gigabytes of SMUD customer data on floppy disks stacked on top of each other would be roughly the height of the HQ Building!
E3 took the 24 value components from the Technical Working Group and based their VOS + Storage Study on these components.

In addition, E3 looked at these value components in 3 different perspectives:
- Societal (Everyone benefits including people outside of SMUD’s district)
- Ratepayer (All SMUD Customers)
- Participant (NEM Customers)

<table>
<thead>
<tr>
<th>Category</th>
<th>Component</th>
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<tbody>
<tr>
<td>Energy</td>
<td>Avoided energy, including GHG / RPS requirements</td>
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<td></td>
<td>Integration costs</td>
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<td>Higher marginal cost of emissions (intermittency)</td>
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<td>Generation Capacity</td>
<td>Resource adequacy</td>
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<td>Resource flexibility (increased need for flexibility)</td>
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<td>Financial Risk</td>
<td>Fuel price risk reduction</td>
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<td>Increases in energy price volatility</td>
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<td>Sunk cost of Emission Reduction Credits</td>
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<td>Variable Operating</td>
<td>Decreased thermal operations</td>
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<td></td>
<td>Increased standby costs</td>
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<td>Criteria Emissions</td>
<td>Criteria emissions reductions</td>
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<td>Carbon Emissions</td>
<td>Carbon reductions beyond SMUD compliance requirements</td>
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<tr>
<td>Land &amp; Water Use</td>
<td>Reduced land and water usage</td>
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<td>Equity</td>
<td>Reduced energy burden for low income customers</td>
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<td>Resilience</td>
<td>Customerability to meet critical needs</td>
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<tr>
<td>Reliability</td>
<td>Restoring service or preventing outages in an emergency</td>
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<tr>
<td>Emotional / Political</td>
<td>Engaging customers through NEM, changing their relationship w/ energy</td>
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<td>Local Economy</td>
<td>Jobs and local economic growth resulting from rooftop solar</td>
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<td>Transmission</td>
<td>Transmission capacity</td>
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<td>Transmission line losses</td>
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<td>Distribution</td>
<td>Distribution capacity</td>
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<td>Distribution line losses</td>
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<td>Grid modernization</td>
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<td>Voltage / power quality</td>
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Transparent Public Process for Study on Value of Solar/Storage (VOS/S)

- Draft posting allowed for public review and comments (8/3 – 8/26)
  - 120+ comments received from the public
  - Rigorous and transparent public process including detailed comments from the following Solar Advocate Groups: Sunrun, Vote Solar, Solar Alliance, CalSSA, and SEIA
    - E3 met with TWG to review results and answer questions
    - E3 met with solar advocates to review and discuss study methodology

- E3 reviewed and considered all comments for potential adjustment to study

- E3 had independent authority for the final study results
How did we pick E3 for the VOS Study?

SMUD Staff issued a competitive Request for Proposal (RFP) with the Value Components and 3 Study Configurations as agreed to by the Technical Working Group.

SMUD Staff received five competitive proposals.
How did we pick E3 for the VOS Study?

E3 scored highest in the RFP process

- Highest technically rated proposer
- Lowest priced proposer
- Highest percentage of Supplier Education & Economic Development (SEED) subcontractor participation at 20%
- GridSME is local vendor that provided analytical support on two of the Value Components identified by the Technical Working Group (Distribution-Reliability and Distribution – Voltage /Power Quality)
- E3 also collaborated closely with GridSME on the “Distribution – Capacity” Value Component
E3 is a Recognized National Leader

- E3 has performed NEM cost-effectiveness studies for some of the largest and most heavily solar focused states, including:
  - CA
  - NY
  - HI
  - NV
  - SC
  - OR

- E3’s suite of NEM cost-effectiveness tools uses industry-standard methods, many of which E3 has developed to provide transparent, highly credible, and defensible analysis.

- Most NEM cost-effectiveness analyses E3 has conducted are for regulatory agencies in these states:
E3’s Upcoming Work at the California Public Utility Commission (CPUC)

On Going CPUC Work:

• Providing analytical support for the NEM 2.0 “Lookback” cost-effectiveness study led by Itron and Verdant Associates (draft report recently released)

Future CPUC Work:

• Completing a survey of NEM and alternative tariff designs in different jurisdictions to inform potential options for the CPUC
• Supporting CPUC staff in the selection of tariff designs for detailed analytical exploration
• Conducting a cost-effectiveness analysis of potential successor tariff options, from different cost test perspectives