

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)

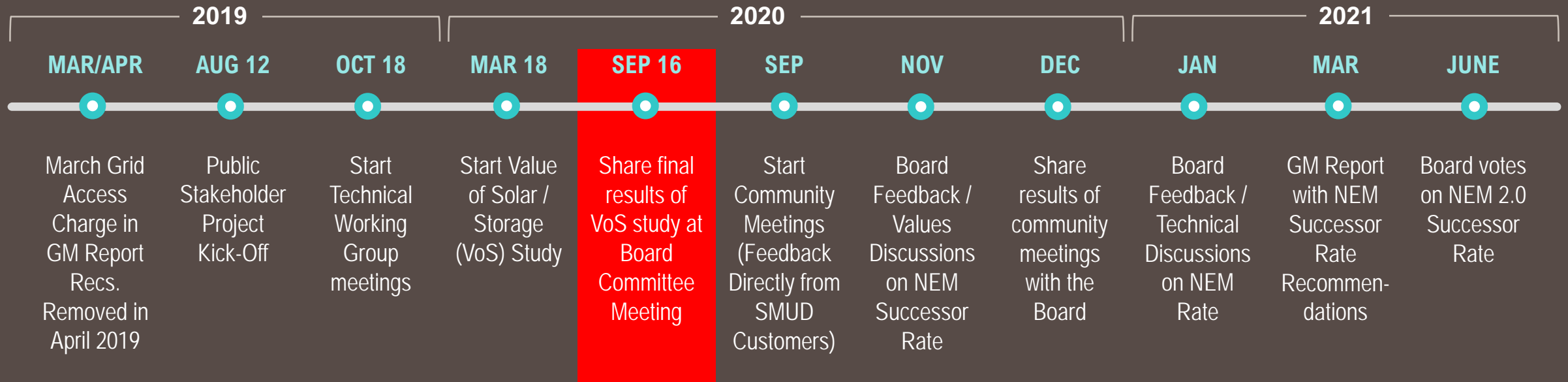
Successor Rate Process

- 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



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

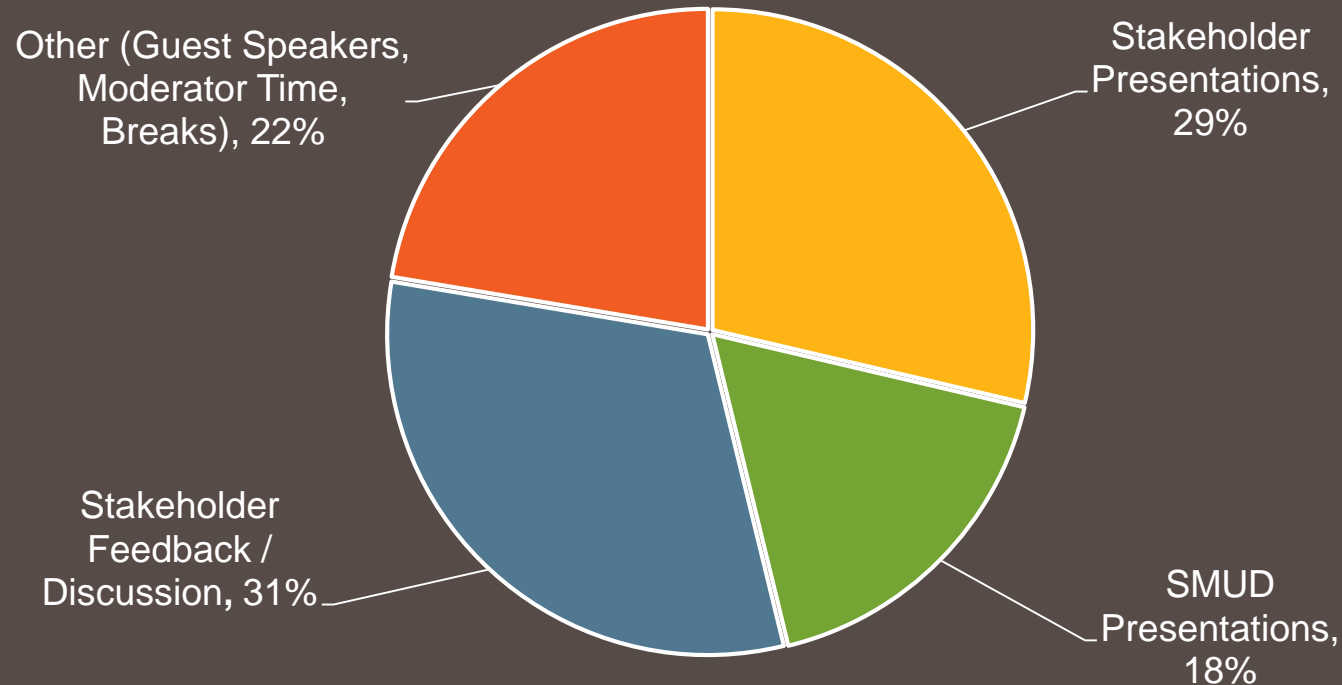
GUEST PRESENTERS

- 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



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



Final Report of the Sacramento Municipal Utility District's Technical Working Group on the Value of Solar + Storage

February 6, 2020

This Report summarizes the recommendations of SMUD's Value of Solar + Storage Technical Working Group. [Gridworks](http://www.gridworks.com) served as the Group's facilitator and prepared this report.

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<https://www.smud.org/-/media/Documents/Rate-Information/NEM-2/Report-SMUD-Technical-Working-Group-on-Value-of-SolarStorage-Fina.ashx>

Value of Solar Study Based on SMUD's Data

We analyzed the latest full year of SMUD's customer data... to put that in perspective our data collection algorithm looked through $(24 \times 365 \times 600,000) = 5,256,000,000$ 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!



Value Components Basis for the VOS Study

- 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)

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

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:



SC



- 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

