

A large, light blue graphic on the left side of the slide, featuring a sunburst pattern of radiating lines emanating from a central point, set against a darker blue background.

CALSSA Response to E3 Value of Solar and Storage Report

SMUD Board Meeting
September 16, 2020



Highlights

- With GHG compliance value and environmental costs included, customer-sited solar and storage provides a net benefit
- Analysis should focus on exported electricity
- “Helps Meet Clean Energy Goals” does not reflect realistic utility procurement practices
- Values should include avoided GHG compliance cost
- Avoided methane should include all leakage
- Future benefits should be higher and costs lower than shown in VoSS report

Overarching Critiques

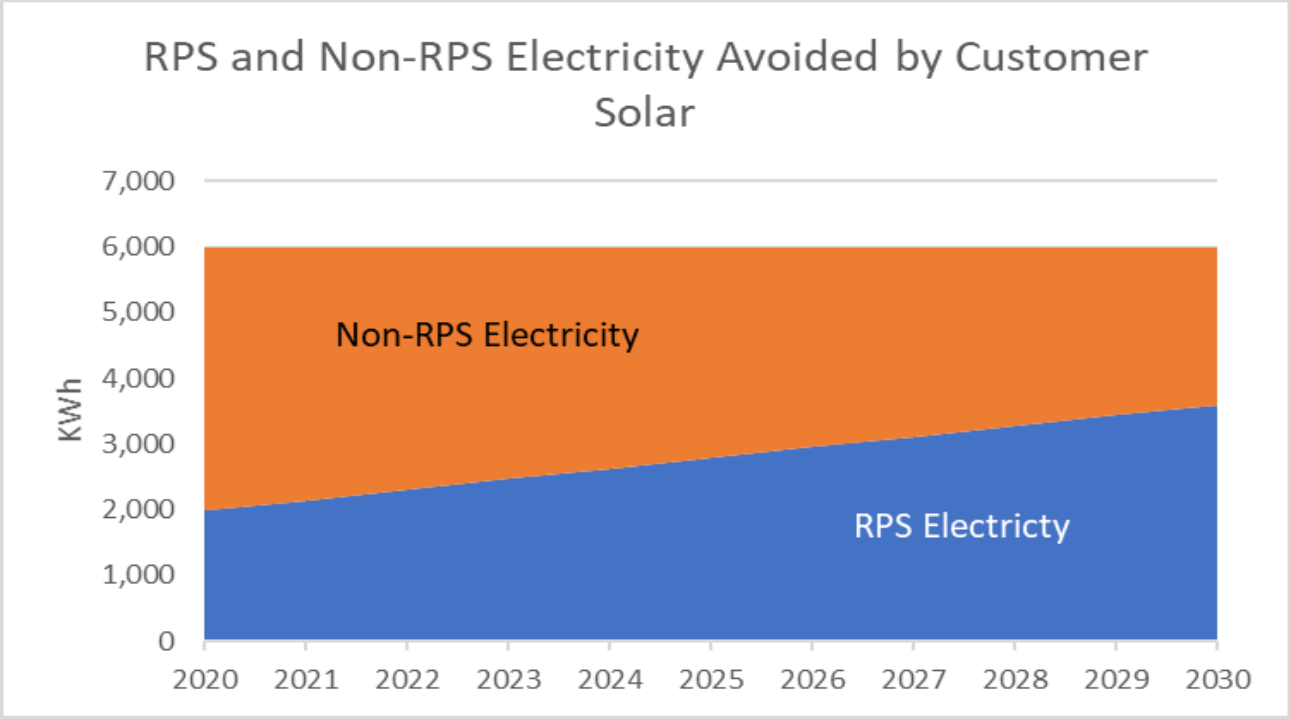
Analysis Should Be Based on Exports Only

- VoSS study considers electricity produced and used onsite as a cost to SMUD
- Under NEM, SMUD only pays solar customers for electricity exported to the grid
- Electricity used on site in real time should be treated like other energy efficiency investments

Board Should Focus on Incremental Clean Energy Scenario

- The “Helps Meet Clean Energy Goals” scenario assumes that rooftop solar replaces only utility-scale solar
- Not a realistic reflection of procurement process
 - SMUD staff do not forego a MW of utility-scale solar for every MW of rooftop solar installed
- RPS requires SMUD to serve a minimum percentage of power it *procures* for customers with renewable energy
- Adoption of rooftop solar reduces SMUD’s load, reducing SMUD’s procurement of a mix of renewable and fossil-based electricity

Illustrative Example of RPS Effect



Critiques of Near-Term Values

Value of Solar Should Include Non-Cap & Trade GHG Costs

- Two approaches to valuing avoided GHG emissions beyond cap & trade value
 - Social cost of carbon
 - Avoided cost of compliance to meet GHG goals

SMUD Study Includes Social Cost

- Study notes that including social cost of carbon increases solar value by up to 7.2 c/kWh
- The highest value in the literature reviewed by E3 adds 16.3 c/kWh
- These and other environmental costs are excluded from the cost shift analysis

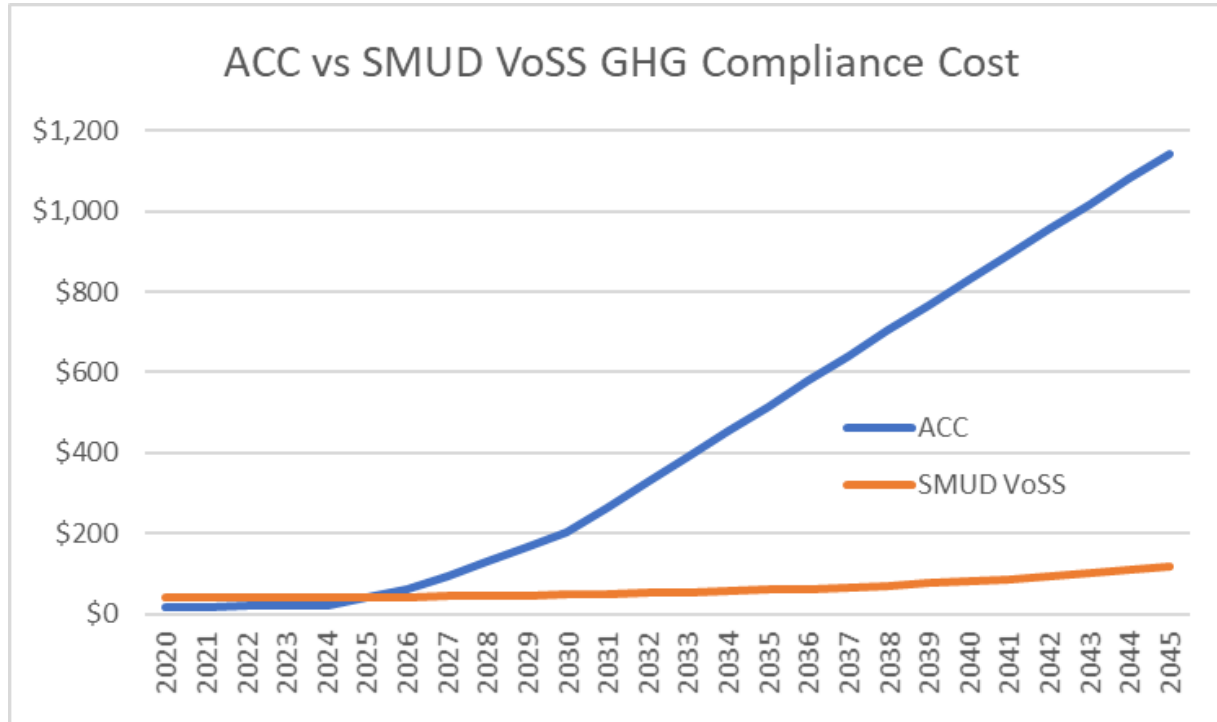
Background on Avoided Cost Calculator

- CPUC has used E3's calculator to evaluate the value of efficiency and other DERs since 2004
- The calculator includes most of the value categories assessed in the SMUD report

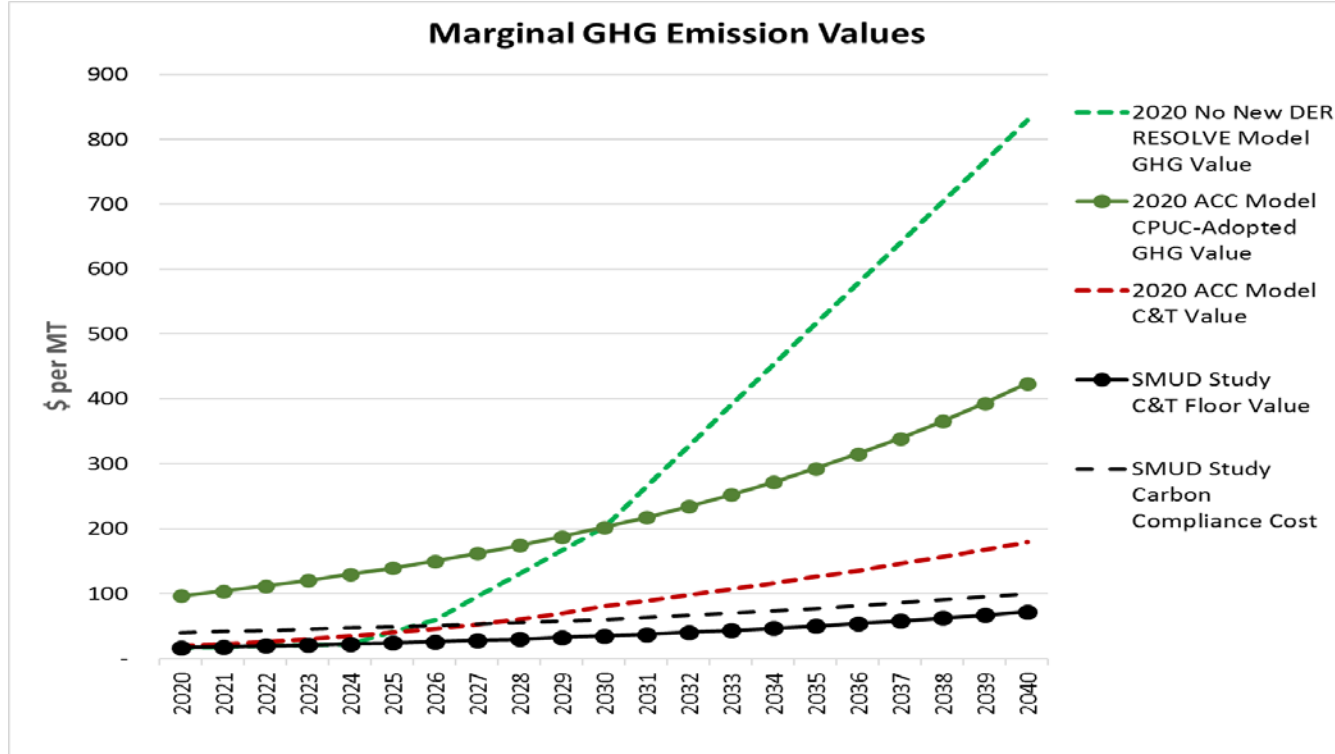
GHG Compliance Value of Avoided Emissions

- For the CPUC, E3 used another approach to calculating non-C&T value
- The ACC GHG adder is based on the cost to reduce an additional ton of CO₂ from the electricity sector
- This value is higher than C&T price because the electricity has more stringent targets

SMUD VoSS and ACC GHG Compliance Costs



Summary of SMUD VoSS and ACC GHG Costs



Fugitive Methane Emissions

- Methane leaks occur in production fields and pipelines across North America to supply California's natural gas
- VoSS study only includes leakage at SMUD's power plants, resulting in negligible value
- ACC included only upstream sources in California, yielding 0.7% leakage rate
- Because avoided GHG benefits are global, societal benefit should use the comprehensive 2.4% US leakage rate

Summary of Environmental Adders

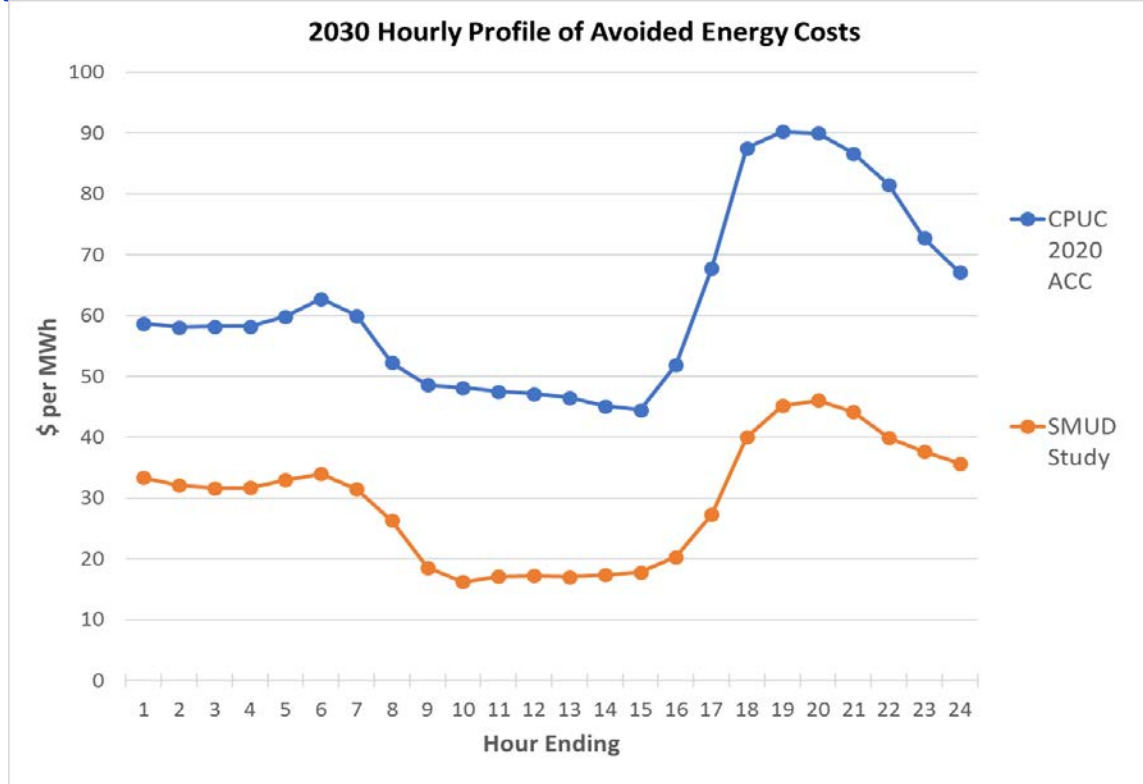
Category	\$/kWh
GHG Compliance Adder	\$0.030
Ecological Value of Land	\$0.004
Air Pollution Damages	\$0.008
Fugitive Methane, CA only	\$0.009
Fugitive Methane, all	\$0.031
Total	\$0.073

SMUD VoSS 2020 Results w/ and w/o Environmental Adders

	Solar Only	S+S Cust Dispatch	S+S Utility Partner
VoSS Reported Value	\$0.070	\$0.091	\$0.125
Value w/ Adders	\$0.143	\$0.164	\$0.198
Revenue Loss, All Gen	\$0.123	\$0.135	\$0.119
Revenue Loss, Exp Only	\$0.062	\$0.068	\$0.060
VoSS Net Cost/Ben	-\$0.053	-\$0.044	\$0.006
Net Ben w/ Adders, All Gen	\$0.020	\$0.029	\$0.079
Net Ben w/ Adders, Exp Only	\$0.082	\$0.097	\$0.139

Long-Run Considerations

Avoided Wholesale Energy Costs Are Low Compared to ACC



Cap & Trade GHG Price Forecast Should Be Much Higher

Source	2020	2025	2030	2035	2040
ACC (CEC IEPR forecast)	\$19.48	\$39.62	\$80.70	\$125.55	\$179.65
SMUD VoSS (C&T floor price)	\$16.68	\$24.04	\$34.75	\$50.04	\$72.08

Summary of ACC and VoSS Discrepancies

Category	SMUD VoSS	ACC
2030 Energy Cost, \$/MWh	\$30	\$62
2030 GHG Cap & Trade, \$/met ton	\$35	\$81
2030 GHG Compliance, \$/met ton	\$62	\$121
Fugitive Methane Adder	negligible	5.6%

Retail Rate Projections May Be Unrealistic

- Future retail rates are the “cost” to SMUD from customer generation
- Escalating NEM costs are based on assumed 3.5% per year rate increase to 2050
- From 2001 to 2018 SMUD’s annual rate increase averaged 2.3%
- Over 20 years equivalent to 100% rate increase vs 58% rate increase

T&D Impacts of Meeting SMUD's Climate Goals

- VoSS found small avoided transmission and distribution value
- Aggressive building and transportation electrification will likely require distribution upgrades
- SMUD should reassess T&D impacts in light of climate emergency declaration