

Net Energy Metering 3.0 Tariff Proposals, A-E



Tyson Siegele, Energy Analyst
The Protect Our Communities Foundation

Climate Change infuses urgency into
our clean energy transition.

California must lead.



Crucial to count every benefit - including Societal Benefits

Quantifying Societal Costs or Benefits

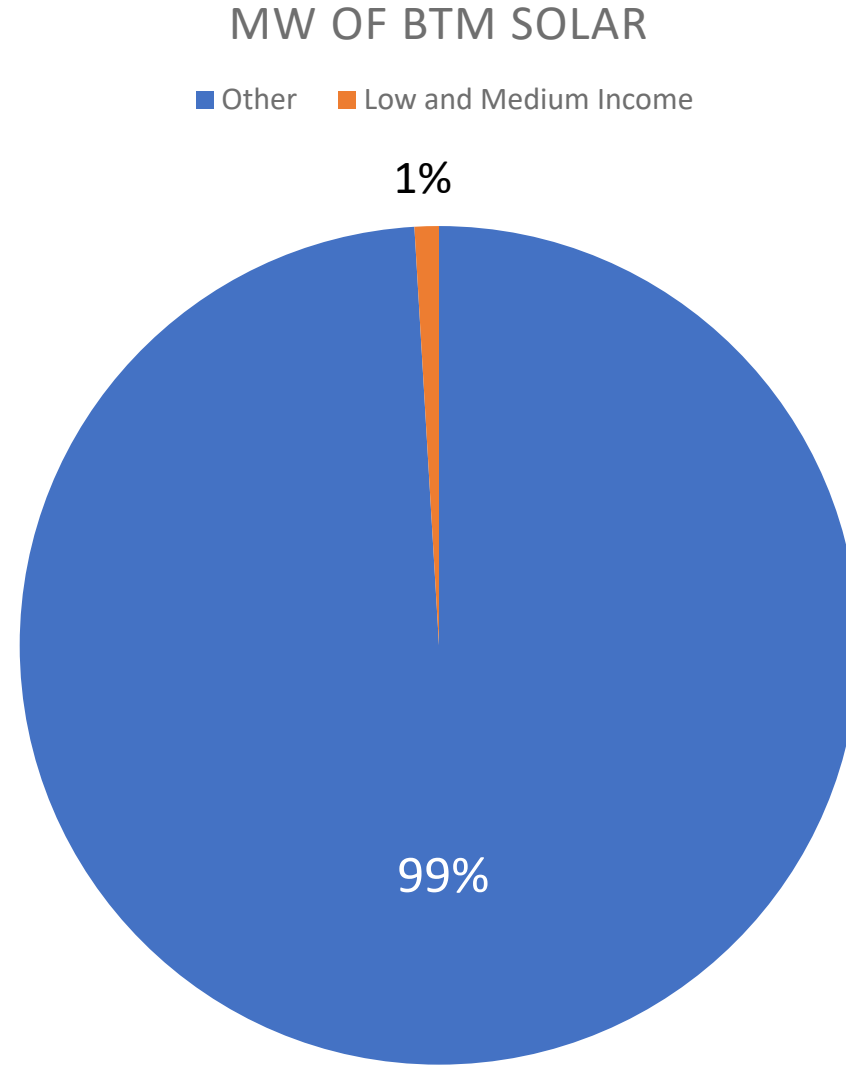
- Health Benefits from Reduced Criteria Air Pollution... \$6/MWh
- Social Cost of Carbon... \$417 per metric tonne
- Out-of-state methane Leakage ... 11.5 times [instate leakage quantities]
- Land use benefits... \$2.20 per MWh
- Reliability and Resiliency ... \$104 per kW-year.

California - Climate Change Costs

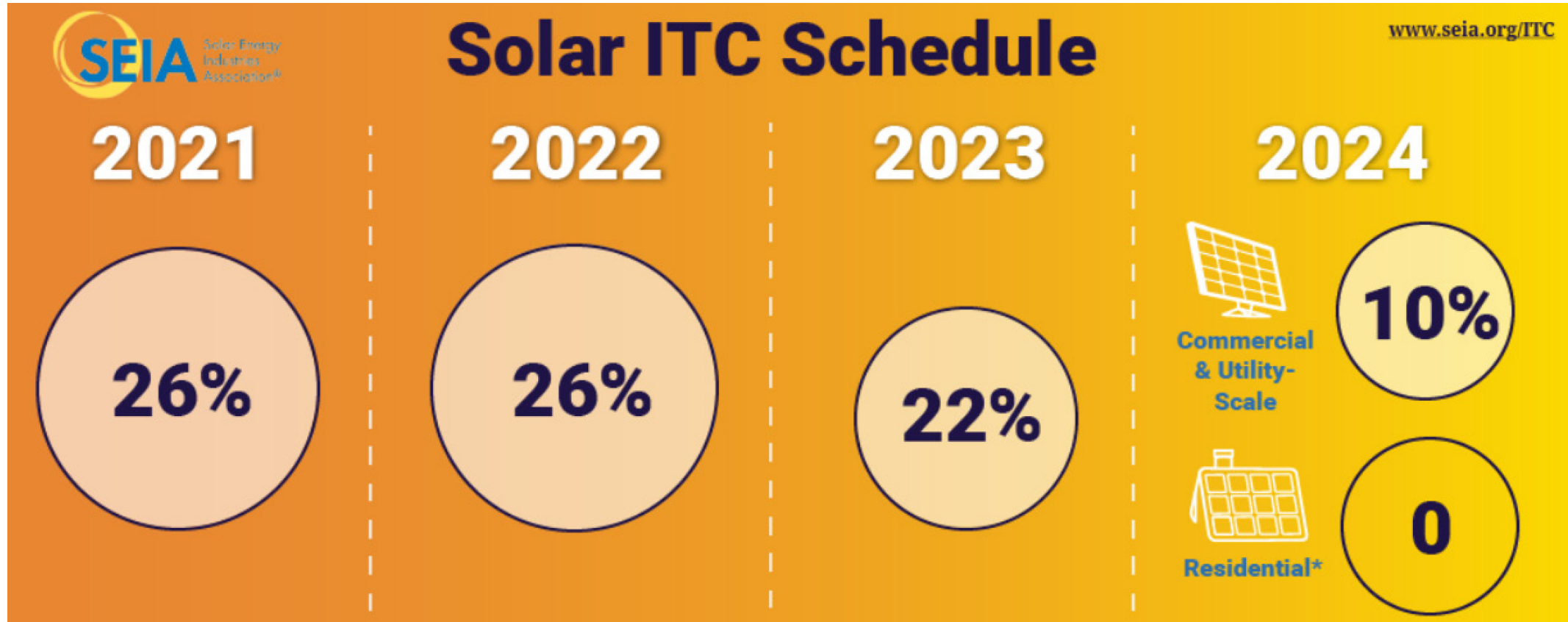
- 110 billion per year x 10 years = 1.1 trillion per decade
(joint CA agency assessment excludes wildfire costs)



NEM needs an equitable transition from 2.0 to 3.0



California should maximize the federal Investment Tax Credit



California needs a lot of renewables. Period.

Los Angeles Times

Boiling Point: How rooftop solar could save Americans \$473 billion

By SAMMY ROTH | STAFF WRITER

JAN. 7, 2021 6 AM PT

This is the Jan. 7, 2021, edition of Boiling Point, a weekly newsletter about climate change and the environment in California and the American West. [Sign up here](#) to get it in your inbox.

With less than two weeks until Joe Biden takes office — and with [Democrats taking control of the Senate](#) — the growth of clean energy is poised to accelerate. Even if Congress doesn't fully embrace the president-elect's \$2-trillion climate plan, there will be plenty of actions his administration can take to support renewable power and put pressure on fossil fuels.

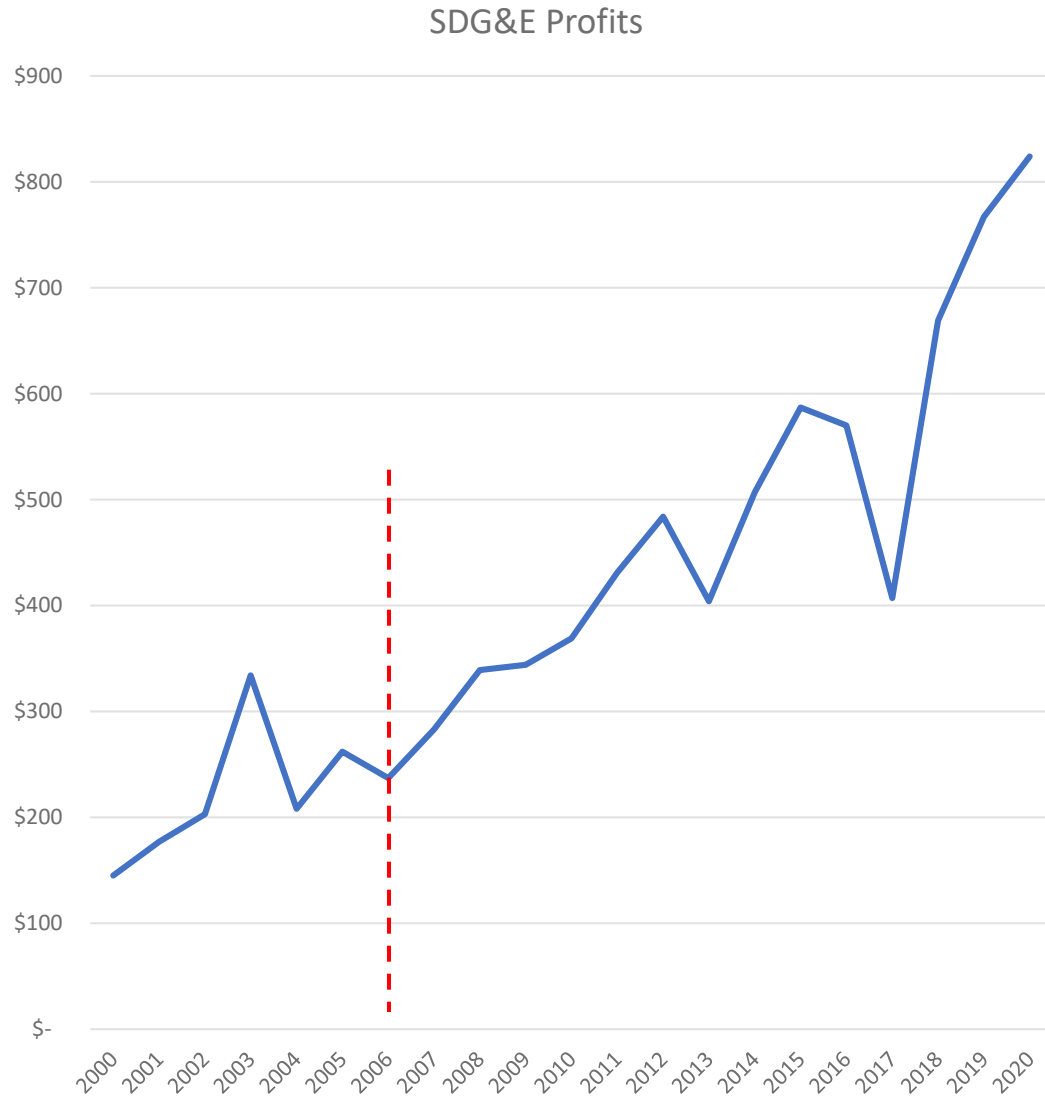
So here's some food for thought: If Biden's appointees want to help consumers save money, they might consider devoting a big chunk of their efforts to solar panels and batteries that can be installed at homes across the country.

Critics have long dismissed rooftop solar as a niche product for wealthy homeowners who want to feel good about going green or are looking for security against blackouts. And it's conventional wisdom among utilities and regulators that large solar farms have an inherent cost advantage over the rooftop alternative because they benefit



Sunrun employees Aaron Newsom, left, and Tim McKibben install solar panels on a Granada Hills home on Jan. 4. (Mel Melcon / Los Angeles Times)

Maximizing value means minimizing T&D investment



News Release

For immediate release | March 23, 2018

Media Hotline | 888.516.6397

For more information, contact:

Steven Greenlee | sgreenlee@caiso.com

Anne Gonzales | agonzales@caiso.com

Board approves 2017-18 Transmission Plan, CRR rule changes Plan calls for canceling, modifying projects to avoid \$2.6 billion in costs

FOLSOM, Calif. – The California Independent System Operator (ISO) Board of Governors yesterday approved the 2017-2018 Transmission Plan to support electric system reliability while canceling or modifying previously approved projects to avoid \$2.6 billion in future costs.

The board on Thursday also approved improvements to the ISO's congestion revenue rights (CRR) auction design, and made a rule change to enhance natural gas cost recovery by suppliers.

The 2017-2018 Transmission Plan, which outlines the proposed design and construction of transmission networks for the next decade, identified 17 new transmission projects at a combined cost of nearly \$271.3 million. The plan also recommends the cancellation of 18 transmission projects and revisions of 21 other projects in Pacific Gas & Electric (PG&E) area and two in the San Diego Gas & Electric area, avoiding an estimated \$2.6 billion in future costs. The changes were mainly due to changes in local area load forecasts, and strongly influenced by energy efficiency programs and increasing levels of residential, rooftop solar generation.

Source Data: <https://investor.sempa.com/sec-filings>

CAISO: http://www.caiso.com/documents/boardapproves2017-18transmissionplan_crrrulechanges.pdf

The Protect Our Communities Foundation's Proposals

Proposal A: NEM 3.0 Community Storage

Proposal B: NEM 3.0 Minimum Generation

Proposal C: NEM 2.0 Carve-Out for Low-Income Customers and Renters

Proposal D: NEM 2.0 Community Solar, an Equitable Transition

Proposal E: NEM 3.0 Time of Use Rates

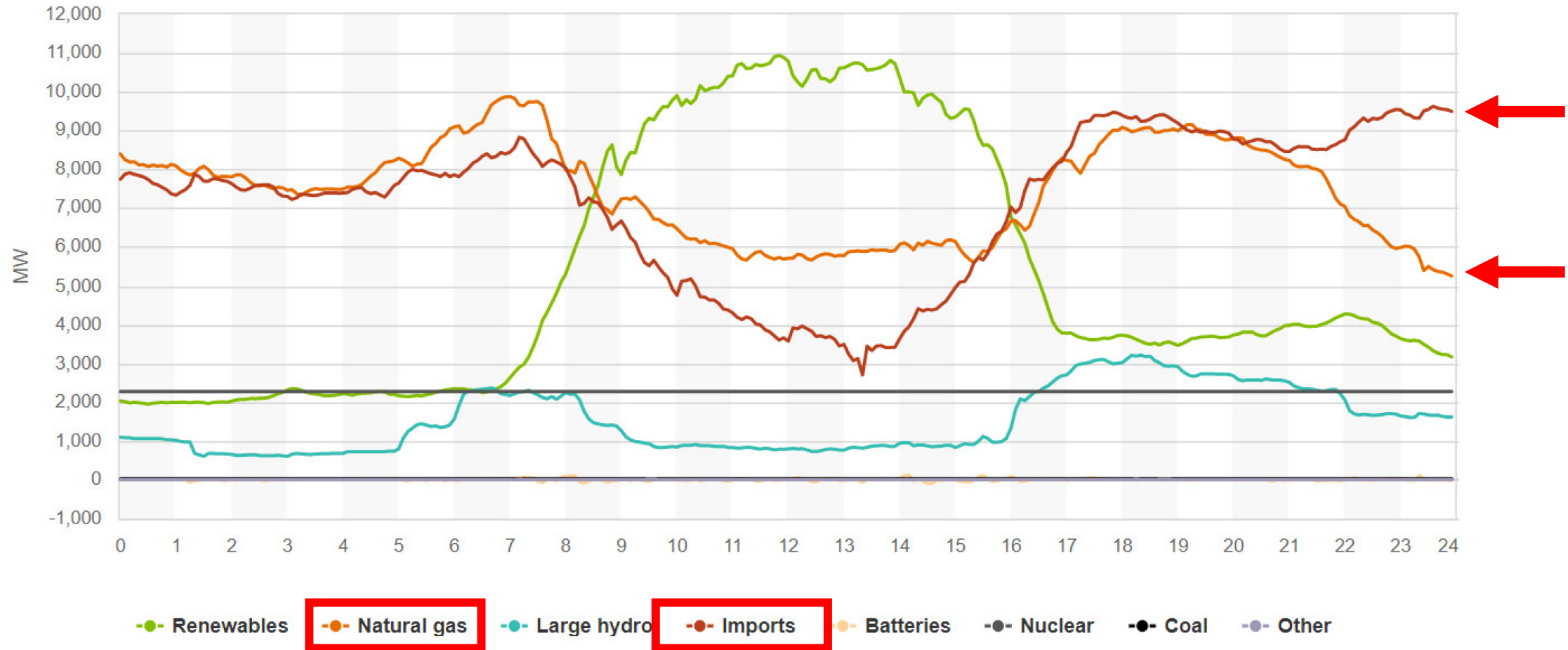


Proposal A: NEM 3.0 Community Storage



Proposal A: NEM 3.0 Community Storage

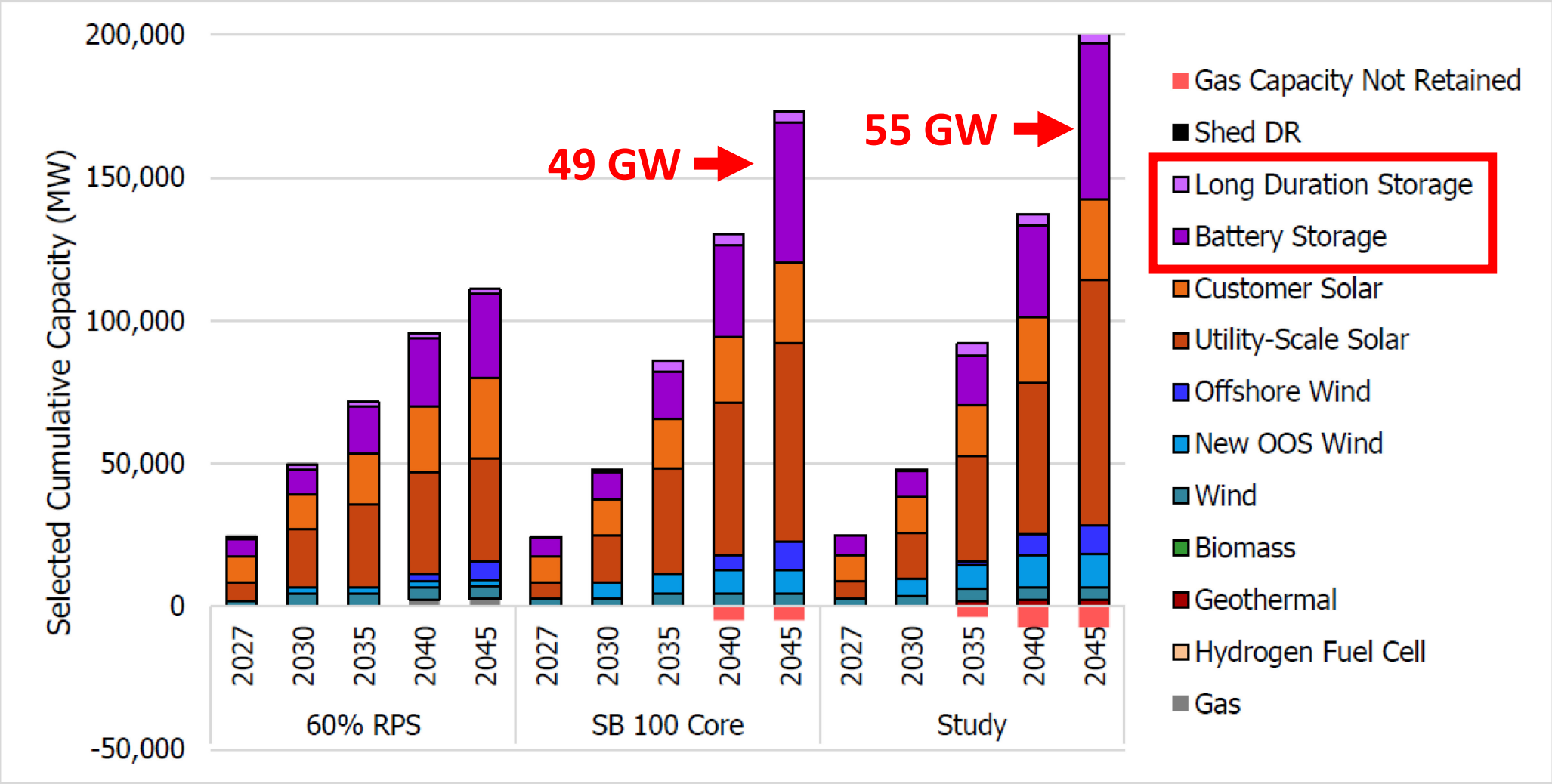
Reprint: CAISO's Daily Supply Trend (January 24, 2020)



Proposal A: NEM 3.0 Community Storage

Reprint: From SB 100 Report, March 15, 2021, PCF markups in red

Figure 28: Cumulative Capacity Additions for the 60 Percent RPS, SB 100 Core, and Study Scenarios



Proposal A: NEM 3.0 Community Storage

Solar Array Cost				Community Storage Configurations		
Solar Size (kW)	Est. Price \$/watt	Solar array total cost	Annual Output, kWh (PV Watts)	Total System after 26% tax credit	Community Storage Contribution (20%)	Total System + Community Storage Contribution
1	\$2.50	\$2,500	\$1,670	\$1,850	\$500	\$2,350
4	\$2.50	\$10,000	\$6,680	\$7,400	\$2,000	\$9,400
6	\$2.50	\$15,000	\$10,020	\$11,100	\$3,000	\$14,100
8	\$2.50	\$20,000	\$13,360	\$14,800	\$4,000	\$18,800
10	\$2.50	\$25,000	\$16,700	\$18,500	\$5,000	\$23,500
12	\$2.50	\$30,000	\$20,040	\$22,200	\$6,000	\$28,200
14	\$2.50	\$35,000	\$23,380	\$25,900	\$7,000	\$32,900
16	\$2.50	\$40,000	\$26,720	\$29,600	\$8,000	\$37,600

Proposal A: NEM 3.0 Community Storage

NEM 3.0 Community Solar Requirements:

- The solar installer shall assess the owner of a NEM system an additional 20% fee based on the total NEM system cost. The NEM system installer will pay the fee to the utility as part of the interconnection cost. The utility then passes 100% of the fee onto the Community Storage program manager (the local CCA).
- The Community Storage fund will be used to build Community Storage within the local distribution grids no more than 5 miles away from the census track where the NEM system is located.
- Each Community Storage system shall be no smaller than 3 MWh.
- Each utility shall make space available for Community Storage of up to 20 MWh at each substation within the distribution grid and substations connecting the transmission grid to the distribution grid.

NEM - Lithium Ion Battery Contribution Total		
BTM solar growth (MW)	Battery Contribution (\$, assuming \$2.50/watt solar)	kW of storage purchased with community storage funding*
5,000	\$2,500,000,000	11,312,217
10,000	\$5,000,000,000	22,624,434
15,000	\$7,500,000,000	33,936,652
20,000	\$10,000,000,000	45,248,869
*Calculation uses IRP battery cost assumptions for 2022 equal \$221/kWh. This includes both the power and energy capital cost (low/low).		

Proposal B: NEM 3.0 Minimum Generation



Proposal B: NEM 3.0 Minimum Generation

NEM 3.0 Minimum Generation Requirements:

- All NEM 3.0 solar arrays must be sized for a transition of the building to 100% electric power (the array sizing calculation must assume zero gas appliances and zero gasoline vehicles).
- For the first 5 years of system true-up after the system starts producing electricity, the NEM 3.0 customer receives twice the wholesale rate for excess generation.
- After the first 5 years, the compensation rate paid for excess generation will be reduced to the current wholesale rate compensation received by NEM 2.0 customers or a revised value the Commission determines more accurately reflects the value of excess BTM solar production.



Proposal B: NEM 3.0 Minimum Generation

Proposal benefits:

- Provide a benefit to the electrical system
- Minimize the cost of NEM solar arrays for the NEM customer
- Increase California solar capacity
- Incentivize building electrification
- Lead to increased federal tax credits for the state
- Result in more local generation that will accelerate the transition away from community-based gas-fired generators. Less gas-fired generation means less pollution for communities.

Proposed Capacity Addition by Gas-Fired Equipment Type		
Existing Gas Equipment in the Building	Annual average energy use for new electrical equipment (kWh)	System capacity requirement above existing load addition (kW)
Clothing Dryer	150	0.09
Range + Oven	540	0.32
Furnace (to Heat Pump)	4000	2.40
Water Heater (to Heat Pump)	1300	0.78
per Vehicle	3250	1.95

The Commission should adopt a single annual energy use per appliance.

Proposal C: NEM 2.0 Carve-Out for Low- Income Customers and Renters



Proposal C: NEM 2.0 Carve-Out for Low-Income and Renters

NEM 2.0 Low-Income Customers and Renters Carve-Out

- By the end of 2021, NEM solar projects will exceed 10,000 MW of capacity.
- Propose to extend NEM 2.0 benefits to low-income customers and renters.
- As a minimum requirement, low-income customers and renters should retain access to NEM 2.0 until those customers reach 10,000 MW of installed solar capacity.
- This proposal paired with Proposal D, LMI Community Solar, will result in rapid buildout that can access the ITC. If proposal C is adopted with a storage contribution requirement as set in Proposal A, then community solar will make large contributions to local storage as well.



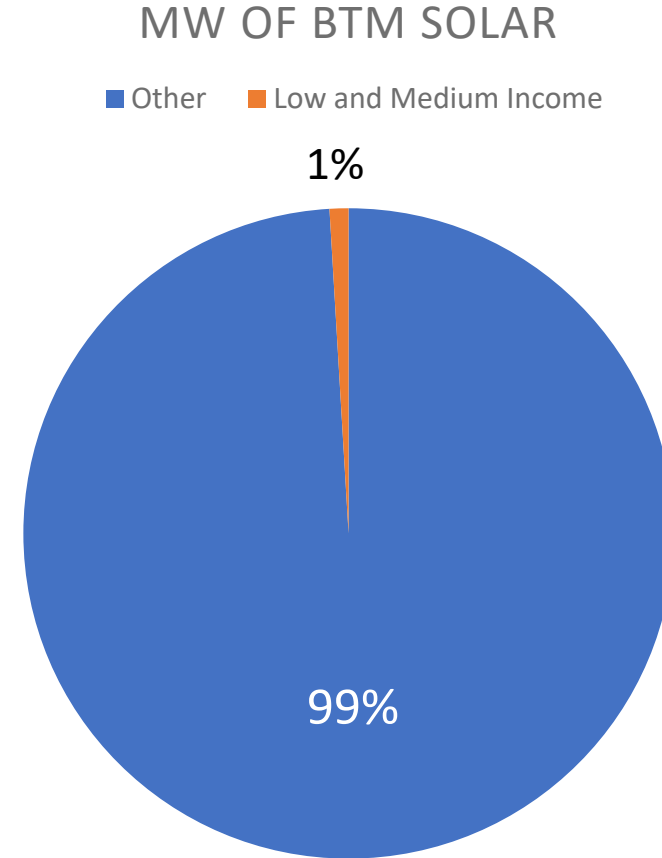
Proposal D: NEM 2.0 Community Solar, an Equitable Transition



Proposal D: NEM 2.0 Community Solar - an Equitable Transition

Community Solar is Needed to Achieve Equity

- Through 2019, only 1.3% of NEM installations benefitted low-income customers or renters
- Only building owners have had access to the NEM program thus far
- According to the Lookback Study NEM participation levels have been decreasing in disadvantaged communities since 2017, which violates Pub. Util. Code §2827.1(c)



Proposal D: NEM 2.0 Community Solar - an Equitable Transition

General NEM 2.0 Community Solar Requirements:

- Shall serve only CARE customers and multi-unit dwelling residential customers/renters
- Solar arrays shall be sized from 50 kW and 5MW in capacity and shall be developed on existing rooftops and parking lots.
- Shall use the NEM 2.0 tariff as though the arrays were producing the electricity behind the meter at the renter or CARE customer's residence



Array Location:

- Each IOU shall provide the total CARE customer load in each census tract in its service territory.
- Each IOU shall provide the total residential customer load in each census tract in its service territory.
- Each IOU shall provide updated load figures every 5 years.
- Each array that is built shall have its capacity assigned by the PA to a census tract until the full demand in each tract has been fully served.
- The PA shall post the open capacity by census tract for the use of developers.

Ownership and Organization:

- PA's shall be required to give first priority to projects proposed for sites at multi-unit dwellings
- Arrays shall be owned and operated by the local CCA; the owner and operator shall be the "program administrator."

Proposal D: NEM 2.0 Community Solar - an Equitable Transition

Developer Requirements:

- The PA may accept any solar project by any developer that meets the program requirements
- The PA shall approve the project after the PA has secured financing for the project.
- The PA may set additional requirements for the projects.
- The developer must warranty its projects' labor and materials for 25 years
- The developer is required to propose a rooftop or parking lot solar array within a 5-mile radius of a census tract that still has open CARE or rental customer capacity
- The developer is required to have received approval from the site owner that construction of the solar array is allowed and shall provide an unlimited lease term in exchange for monthly lease payments
- The developer must agree to build the project for the cost of the "non-residential" project price reported in the most recent SEIA
- Before the project qualifies as a NEM 2.0 Community Solar project and qualifies for the NEM 2.0 tariff, the developer must sell the project to the PA.

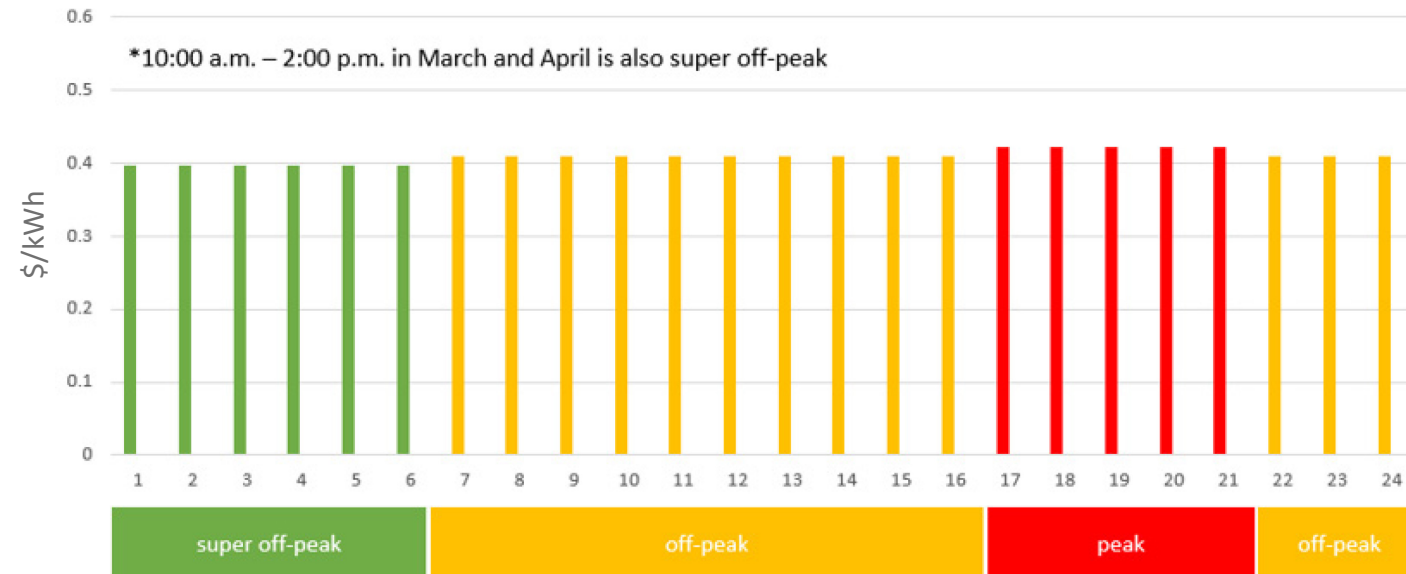
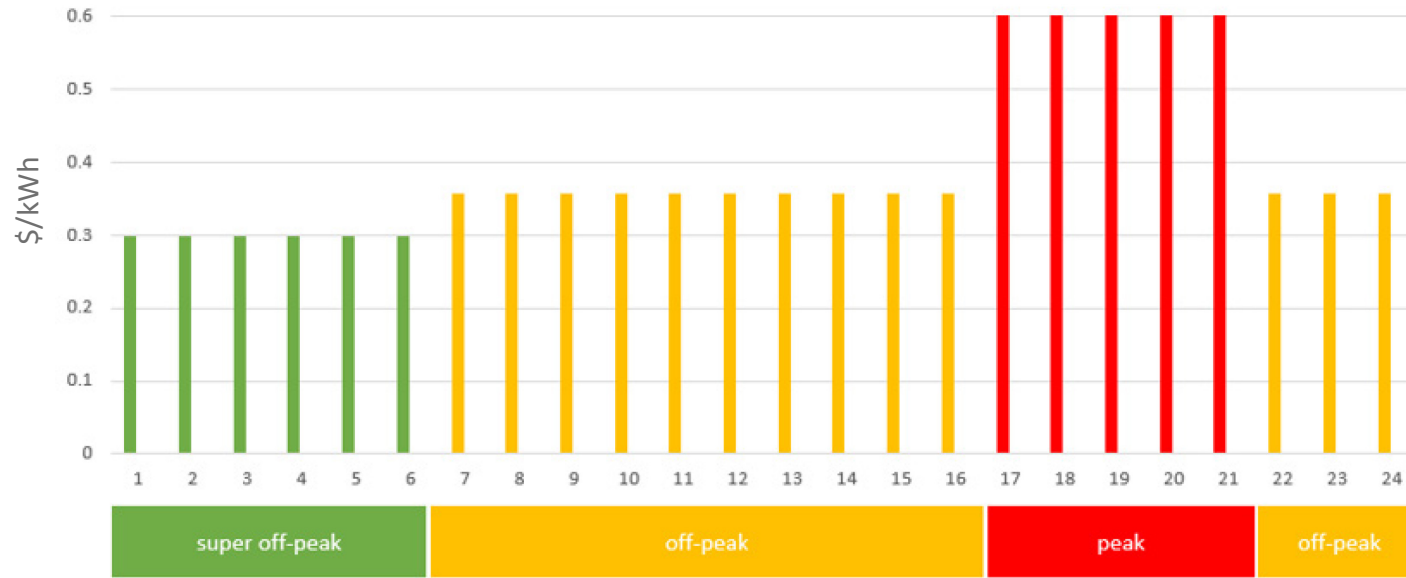
Tariff Payment Process:

- Monthly, the PA shall be paid by the territories' IOU the full TOU retail rate based on the NEM 2.0 tariff for electricity produced by the array based on the time the electricity is produced by the array based on the time the electricity is produced.
- The PA distributes the payment:
 - Pays the site owner 5%.
 - Retains 10% of the payment for administrative purposes; retained value shall be capped at \$2 million.
 - Pays the remainder of the value to the financier until the project loan has been paid in full.
- After the array's loan has been paid in full, the incoming funds shall be used to pay any remaining loan amounts on any arrays under the PA.
- When all CARE and rental customers' annual load has been offset by community solar arrays within the PA's service territory, the PA must use the incoming program funds to provide a 20\$ discount on all renters' bills and an additional 20% on CARE customers' bills.
- The remaining 80% of funds that continue to flow to the PA shall be used to build additional community-based infrastructure to lower the communities' electricity costs.

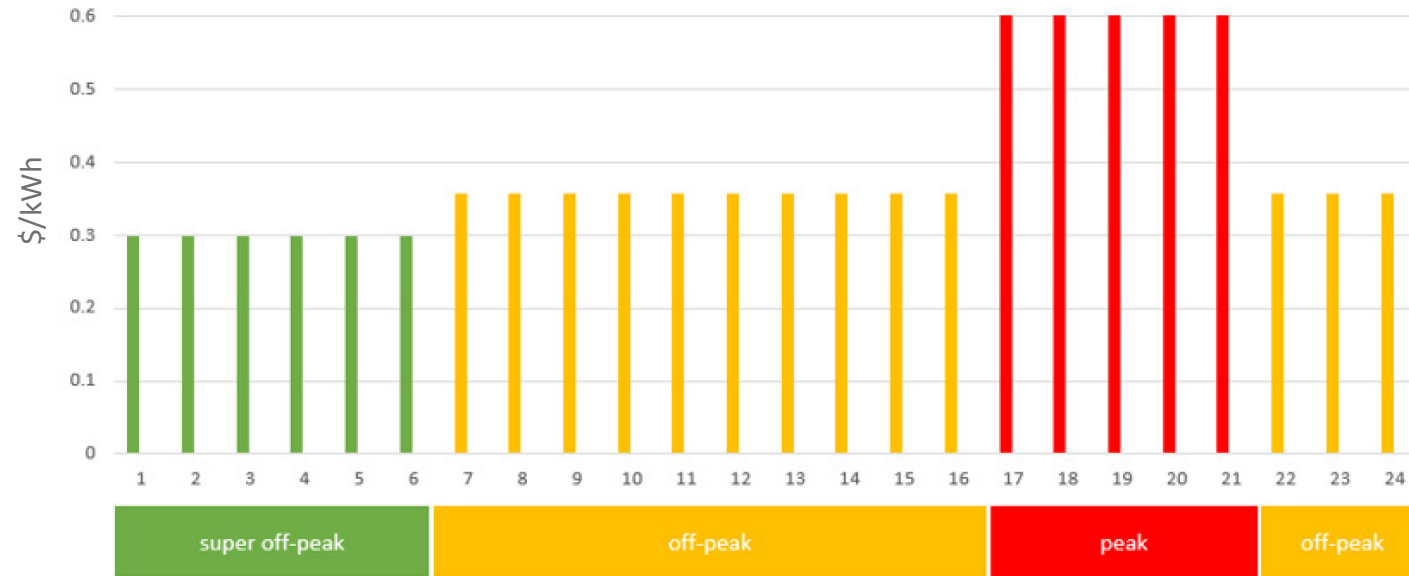
Proposal E: NEM 3.0 Time of Use Rates



Proposal E: NEM 3.0 Time of Use Rates



Proposal E: NEM 3.0 Time of Use Rates



CAISO:

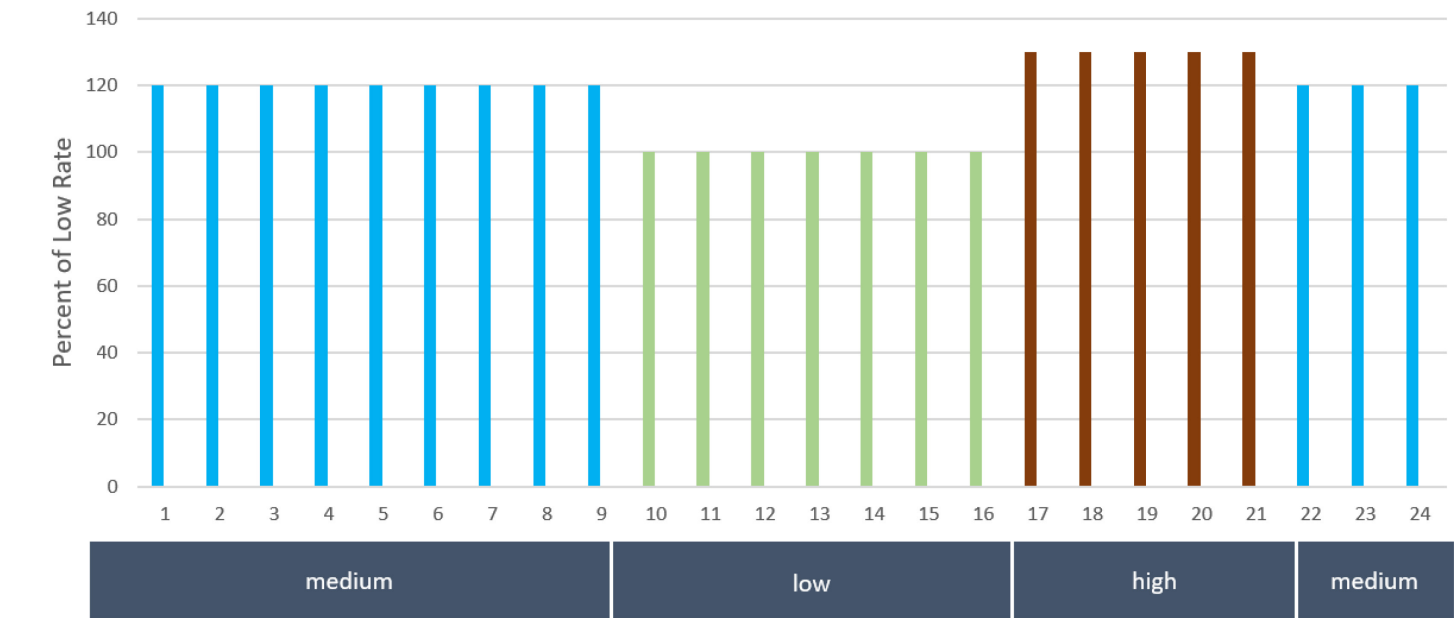
2019 hourly comparison of average system-wide prices across the CAISO market, 24 hours

CAISO Energy Markets Price Performance Report, p. 23

<http://www.caiso.com/Documents/FinalReport-PricePerformanceAnalysis.pdf>

PCF markups in red

Proposal E: NEM 3.0 Time of Use Rates



PCF Proposed TOU hours

TOU pricing *all 12 months* of the year



CAISO:
2019 hourly comparison of average system-wide prices across the CAISO market, 24 hours

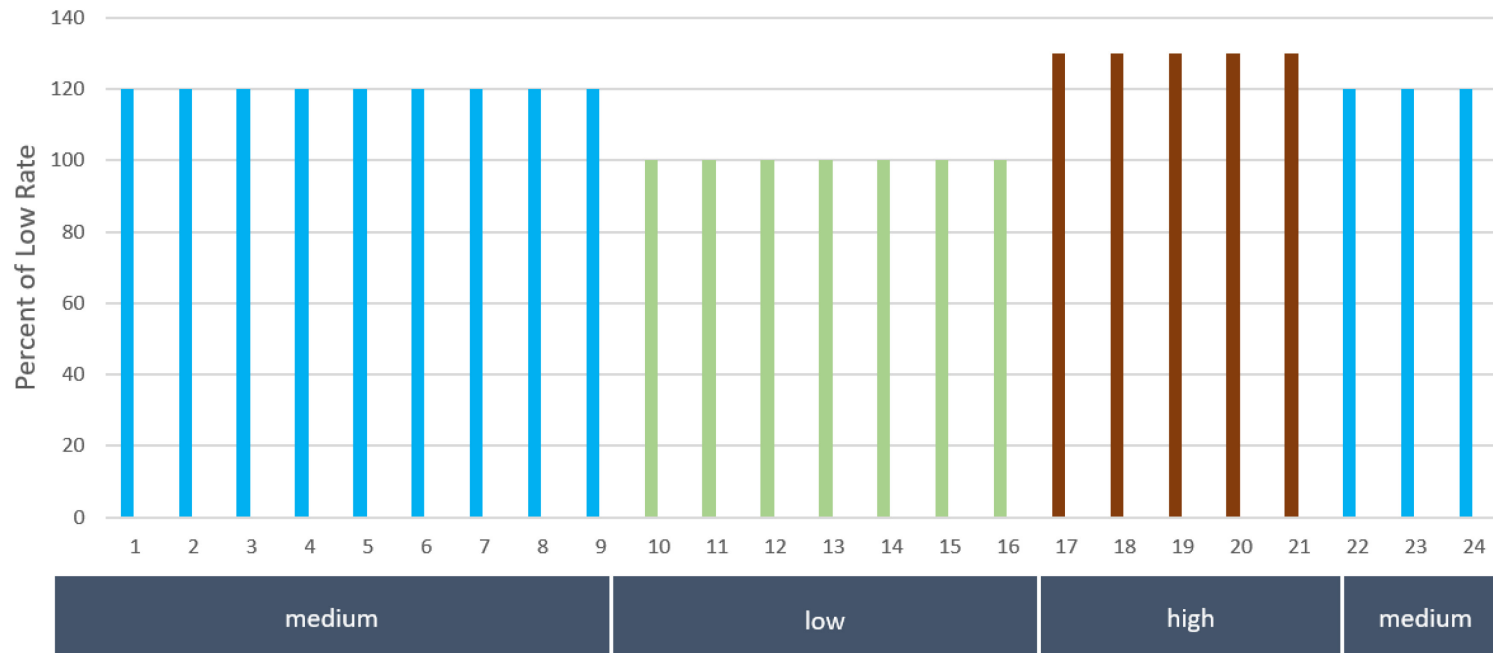
CAISO Energy Markets Price Performance Report, p. 23
<http://www.caiso.com/Documents/FinalReport-PricePerformanceAnalysis.pdf>

PCF markups in red

Proposal E: NEM 3.0 Time of Use Rates

TOU rates shall:

- Generally align with wholesale rates for electricity unit pricing
- Minimize retail prices during the highest renewable energy production hours
- Be consistent year-round to simplify the rate structure and increase rate transparency.
- Maintain a structure with three different prices for three different blocks of the day (high, medium, and low).
- The price block times shall be set based on renewable energy usage.
- There shall be only one TOU rate structure for all utilities.
- Continue to be the mandatory rate structure for NEM customers.
- Become mandatory for all customers to align TOU use with California clean energy policy across all customer classes.



Q&A

