

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

ENERGY DIVISION

AGENDA ID# 23299
RESOLUTION E-5364
3/13/2025

R E S O L U T I O N

Resolution E-5364. Updates to the Inputs and Assumptions used in Bill Savings Estimates, to be included in California Contractors State License Board Solar Energy System Disclosure Document Provided to Solar Customers During the Interconnection Process, Pursuant to Decision (D.) 23-11-068.

PROPOSED OUTCOME:

- Modifies the inputs and assumptions used to calculate the required bill savings estimates, required by the California Public Utilities Commission, provided to potential residential solar customers by licensed solar providers. Following Commission adoption of this resolution and the stakeholder review process, the California Contractors State License Board will make any edits suggested by the Commission or stakeholders if they are consistent with the requirements of Business and Professions Code § 7169(c) and finalize the Solar Energy System Disclosure Document. Pursuant to Decisions D.23-11-068 and D.22-12-056, this disclosure document is incorporated into the required documentation necessary to interconnect residential solar and storage systems under the net energy metering and net billing tariffs.

SAFETY CONSIDERATIONS:

- There are no safety considerations associated with this resolution.

ESTIMATED COST:

- There are no costs associated with this resolution.

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SUMMARY

This Resolution updates the inputs and assumptions used in bill savings estimates provided to potential residential solar customers by solar providers to align with the net billing tariff, pursuant to D.23-11-068 and D.20-08-001.

BACKGROUND

Assembly Bill (AB) 1070 (Gonzalez Fletcher, Chapter 662, Statutes of 2017) required that the Commission “develop standardized inputs and assumptions to be used in the calculation and presentation of electricity utility bill savings to a consumer that can be expected by using a solar energy system by vendors, installers, or financing entities.”¹ The bill required the Contractors State License Board (CSLB) to collaborate with the Commission to develop a disclosure document to be provided to residential customers by solar providers which would include the anticipated bill savings coming from a solar installation, as well as the inputs and assumptions used to estimate the savings. The bill also required that the disclosure document include, at minimum, information regarding the installation of a solar energy system, total costs of the installation, and implications of various financing options.

In response to AB 1070, Commission staff and CSLB staff collaborated to develop the cover page of the solar disclosure document required by subdivision (b) Business and Professions Code section 7169. The Commission issued Resolution M-4836 on August 23, 2018, making those findings of fact, and the CSLB approved the cover page at its June 2018 Board Meeting. CSLB then published the resulting document and publicly noticed that it would begin enforcing it January 1, 2019. The single-page solar disclosure document has been in effect since that date, and CSLB and Commission staff resolved to continue work on developing the inputs and assumptions as well as the supporting information described for inclusion in the disclosure document in subdivision (c) of Section 7169.

Energy Division issued a staff proposal for comment on July 18, 2019. Subsequently, a workshop was held on August 13, 2019, and the proposal was incorporated into a proposed decision for additional party comment. On August 6, 2020, the Commission issued D.20-08-001 *Decision Adopting Standardized Inputs and Assumptions for Calculating*

¹ Public Utilities Code 2854.6 (a).

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Estimated Electric Utility Bill Savings from Residential Photovoltaic Solar Energy Systems. Among other determinations, this decision formally adopted the staff proposal for the standardized inputs and assumptions, including recommendations for the applicability and enforcement of such standardized inputs and assumptions.

In the meantime, the CSLB considered a draft of the supporting information pages for inclusion in the disclosure document described in the subdivision (c) of Business and Professions Code section 7169. On September 9, 2020, CSLB authorized staff to forward the draft to the Commission for review and sharing with stakeholders, and, following the stakeholder review process, authorize staff to finalize the document by making any edits suggested by the Commission or stakeholders if they are consistent with the requirements of subdivision (c) of Business and Professions Code section 7169.

On December 15, 2022, the Commission adopted D.22-12-056, establishing the net billing tariff (NBT) as a successor to the NEM 2.0 tariff. D.22-12-056 also defined the requirements of a complete interconnection application under the NBT as one which includes a signed contract, a single-line diagram, a complete CSLB Disclosure Document, a signed California Solar Consumer Protection Guide (Consumer Protection Guide), and an oversizing attestation (if applicable).²

On November 16, 2023, the Commission issued D.23-11-068, which among other findings, recognized that the bill savings estimate method approved in D.20-08-001 was incompatible with the newly adopted NBT and delayed implementation of standardized inputs and assumptions until they were updated to align with the new tariff design. In Ordering Paragraph (OP) 13, D.23-11-068 authorized Energy Division to review and update the standardized inputs and assumptions, to receive input from parties through the issuance of a draft resolution for public comment by July 1, 2024, and, through a public workshop, to solicit comments on the resolution and disclosure document. Energy Division issued draft resolution E-5330 on August 8, 2024, and held a public workshop on August 20, 2024. The Commission received substantive comments from stakeholders both at the workshop and in written form, and withdrew draft resolution E-5330 on October 15, 2024. On December 12, 2024, CSLB voted to approve a updates to the disclosure document. This draft resolution E-5364 puts forward an updated disclosure document from the version in circulation today (Appendix A).

² D.22-12-056, Ordering Paragraph 12.

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Energy Division will finalize the CSLB Disclosure Document in coordination with CSLB following the adoption of this resolution pursuant to OP 13 of D.23-11-068. Pursuant to D.22-12-056, the CSLB Disclosure Document will be integrated into electric utilities' list of required documents necessary for interconnection under the NBT.

Following the adoption of this resolution, Energy Division will make updates to the Consumer Protection Guide to further align with changes to the CSLB Disclosure Document. The Commission requires that the Consumer Protection Guide be given to customers to read, sign, and initial before a solar installation contract is signed, so that customers can understand their rights and make more informed decisions about their solar installation.

NOTICE

Notice of this proposed resolution was made by publication in the Commission's Daily Calendar.

DISCUSSION

This section includes a list of updated inputs and assumptions that a licensed solar provider should use to complete section 4 ("Energy Savings") of the CSLB Disclosure Document. As stated above, the CSLB Disclosure Document is required to interconnect under NBT tariffs offered by electric utilities. The newest disclosure document is attached to this Resolution as Appendix A.

1. Time duration of estimate calculation

Proposal

The time period included in the calculated bill savings estimate should be the 12 months after the customer installs solar.

Discussion

Staff recognizes that fluctuating electricity rates and changes in customer electricity consumption, such as from buying an electric vehicle, can each cause substantial divergence of actual bill savings from a bill savings estimate. Bill savings estimates are more uncertain the further one looks out into the future. The difficulty of estimating net electric bill savings for the 20 years following

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interconnection was pointed out by the Solar Energy Industries Association, as discussed in section 3.3.1.3. of D.23-11-068.

While recognizing that no estimate can be completely accurate, rather than offer a customer a longer-term calculation that is more likely to be inaccurate, the calculation should offer a more reliable estimate of bill savings for the 12 months immediately following the solar (and storage) installation. This updates the requirement for a 20-year calculation adopted in D.20-08-001.

2. Estimated electricity consumption

Proposal

The estimate should use one-hour interval electric consumption data from the customer’s past 12 months of data (e.g., Green Button Data³) to calculate the customer’s estimated annual electricity consumption for the cost estimate calculation. For customers that do not have 12 months of interval data, a solar provider may use estimated hourly consumption, and must explain, in writing: a) how the consumption estimate was derived, and b) why the customer does not have 12 months of interval data. Per D.20-08-001, the provider also must obtain customer attestation that the provider made reasonable effort to access the customer’s interval data, which must be signed by the customer. The written explanation shall be included in the CSLB Disclosure Document.

The assumed estimated electricity consumption should be recorded in the following line of the CSLB Disclosure Document:

<p>My Annual Electricity Usage (<i>past 12 months**</i>)</p>	<p><i>kWh</i></p>
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If 12 months of customer interval data is not used, the written explanation shall be recorded in the following section of the CSLB Disclosure Document:

³ Green Button is a mechanism through which utility customers can access or share energy usage data with third parties.

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****If 12 months of data not available, explain why and how usage was determined here**

Discussion

Future consumption is inherently speculative as a variety of factors can influence electricity use. For example, a customer may electrify appliances, purchase an electric vehicle, invest in energy efficiency measures, or their household size may change over time. While acknowledging these potential fluctuations, the best standardized indicator of a customer's usage is their hourly consumption patterns over the past 12 months. Staff acknowledges that this assumption does not account for behavior changes over time.

To reduce redundancies, it is reasonable that the customer's signature in the Consumer Protection Guide should fulfill D.20-08-001's requirement for the customer attestation and signature that is required when the data specified above is not used. This updates the estimated annual electricity consumption assumptions adopted in D.20-08-001.

3. Annual solar electricity generation of panels (for solar-only installations)

Proposal

To calculate the customer's estimated annual electric generation with the proposed solar-only energy system, use the results of the National Renewable Energy Laboratory's (NREL) PVWatts® tool to estimate one-hour interval generation.⁴ Installations that include storage may use other tools to generate this input. The assumed solar generation of panels should be recorded in the following line of the CSLB Disclosure Document:

⁴ Available at <https://pvwatts.nrel.gov/>.

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Annual Solar Electricity Generation
(*what my system will generate*) ***

kWh

Discussion

PVWatts® is a free online tool created and developed by a publicly funded national laboratory of the U.S. Department of Energy that calculates energy production of a theoretical PV system based on the proposed location, system size, module type, array type, system loss percentage, tilt, azimuth, and other variables. Versions of PVWatts® have formed the basis of many other calculators including the California Solar Initiative (CSI) Expected Performance Based Buydown (EPBB) Calculator and the CSI Multifamily Affordable Solar Housing (MASH) Calculator. Staff acknowledges that the lack of shading in PVWatts® as an input may affect accuracy, but finds that the benefits to a customer receiving a calculation done as uniformly across providers as possible outweighs the inaccuracies that may arise from PVWatts®’s lack of shading as an input. Usage of the PVWatts® tool was adopted in D.20-08-001.

4. Calculations involving storage (for paired solar and storage installations)

Proposal

For calculations involving energy storage installations, contractors may select a calculator of their choosing. The name of the calculator shall be listed in the Disclosure Document in the designated line:

Name of Calculator Used:

Discussion

Currently, there is no free, publicly available tool with a low learning curve that can account for bill savings estimates that can integrate energy storage into

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calculations. Should the Commission develop or adopt a calculator that fits this purpose and description, the Commission can update this requirement and require the use of said calculator.

5. Escalation of residential retail rates

Proposal

No rate escalation should be assumed for the duration of the calculated period (12 months). The most current rates at the time of estimate creation should be used for the duration of the 12 months. The Disclosure Document shall contain a statement clarifying that calculations were made with an assumption of no rate escalation.

The five-year historical average annual escalation rate is approximately 10 percent as of the publication of this resolution. This figure will be accessible on the Commission's webpage for the Solar Consumer Protection Guide. The average escalation rate may be updated annually as determined in D.20-08-001 Section 2.5. Energy Division may update the calculation process determined in D.20-08-001, if a more accurate way of determining the five-year historical average annual escalation rate is found, by way of resolution. As required in D.20-08-001, this average escalation rate shall be the maximum used for any bill savings estimates calculations, including alternative calculations. The Consumer Protection Guide will be updated to inform the customer of this requirement.

Discussion

Since bill savings will be calculated for the 12 months following solar installation, using the most current retail rates of the utility for the duration of the calculation is most reasonable. This removes the assumed average electricity provider rate escalation requirement adopted in D.20-08-001.

D.20-08-001 acknowledges the potential financial risk to the customer of solar providers overestimating future utility rate increases for calculations performed beyond the one required in the CSLB Disclosure Document. Capping the annual rate increase assumption to a maximum calculated by the Commission will curb overestimation, while still allowing for lower escalation rates that might be more

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accurate, for example, if a customer is part of a utility with lower historical escalation rates.

6. Assumed rate schedule

Proposal

For a pre-solar installation bill calculation, the customer’s current rate schedule to the interval consumption of the previous year should be used. For a post-solar installation calculation, apply the eligible rate schedule specified by the utility or community choice aggregator’s NBT. The base services charge, to be implemented beginning in late 2025 and early 2026, should be incorporated into calculations as appropriate.⁵

The assumed rate schedule of panels should be recorded in the following line of the CSLB Disclosure Document:

	<i>Before</i>	<i>After</i>
Before: Electricity provider’s rate schedule you are on now		
After: Electricity provider’s eligible rate schedule after installation		

Discussion

Per D.22-12-056 Ordering Paragraph 1(c), all residential NBT customers must be on a specific NBT-eligible rate. This updates the assumed rate scheduled adopted in D.20-08-001.

⁵ On May 9, 2024, the Commission approved, via Decision 24-05-028, a new flat rate billing structure as mandated by Assembly Bill 205, reducing the electricity usage rate by 5 to 7 cents per kilowatt-hour, and introducing a monthly flat rate at \$24.15, or a discounted rate of \$6 or \$12 for qualifying customers.

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7. Calculated scenarios

Proposal

For a customer interested in installing an energy storage system, the following bill savings calculation must be provided.

- a) **Optimization for maximizing bill savings.** A calculation should be provided for a scenario in which batteries are programmed to optimize a customer's bill savings by serving onsite load and/or exporting to the grid based on price signals.

The optional calculations outlined below may be provided to a customer installing solar plus storage, particularly if the customer expresses interest in using their solar and storage systems for reasons beyond bill savings. Each calculation, including the one above, should use the same minimum state of charge (for example, 20 percent), taking the needs of the customer into account.

- b) **Optional: optimization for customer self-consumption.** A calculation may be provided for a scenario in which customers want to rely on self-generated energy as much as possible.
- c) **Optional: optimization for home back-up.** A calculation may be provided for a scenario in which customers continue to fully rely on the grid for imports and keep their battery charged at 100 percent to prepare for power outages.

For a customer only interested in installing solar, a bill savings calculation for a solar-only installation must be provided.

Discussion

Bill savings estimates for solar and storage systems will vary greatly depending on how customers choose to use them. The scenarios listed above are grounded in common use cases of solar and storage systems as determined in the 2021-2022 Self-Generation Incentive Program Evaluation conducted by Verdant

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Associates.⁶ While these are simplified scenarios, providing separate calculations for each will show customers the variability that can exist in bill savings in different use cases for solar and storage systems under the net billing tariff. No scenarios were previously included in D.20-08-001.

8. Additional determinations regarding clarity and access

In addition to modifications to inputs and assumptions, staff recognizes that electric utilities should provide links on their websites to the newly updated CSLB Disclosure Document, Consumer Protection Guide, and oversizing attestation documents so solar providers may access them with ease. Utilities are further required to post the standardized inputs and assumptions on their relevant websites pursuant to AB 1070.

To ensure maximum clarity to customers, to reduce the likelihood of errors, and for data collection purposes, the CSLB Disclosure Document should not be handwritten. The Utilities shall not accept handwritten or non-machine-readable CSLB Disclosure Documents. Additionally, the information entered by solar providers within the CSLB Disclosure Document and other required interconnection forms should be consistent within and among all documents made as part of a complete interconnection application. The Utilities shall verify these documents are typewritten during the semiannual audits implemented pursuant to D.18-09-004. Commission staff also recommends that utilities review D.20-08-001 to ensure compliance with requirements to collect and retain all standardized and alternative inputs and assumptions.

Given the ministerial nature of this Resolution and the likelihood that the disclosure document and processes may require routine, but minor, changes to stay pertinent, the Director of Energy Division or their designee is authorized, via letter, to make changes so that the disclosure document and processes are kept up to date. Commission staff will continue to work with CSLB staff on any future changes to the document. To ensure opportunity for input from parties, Energy Division will present potential modifications to stakeholders prior to issuance of such a letter. If

⁶ Self-Generation Incentive Program: 2021-2022 SGIP Impact Evaluation, Verdant Associates, page 6, 94, 95. Available at <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/self-generation-incentive-program/self-generation-incentive-program-evaluation-reports>.

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the methodology to calculate the five-year historical average annual escalation rate, as documented in D.20-08-001, is to be updated, Energy Division shall issue a resolution.

COMMENTS

Public Utilities Code section 311(g)(1) provides that this Resolution must be served on all parties and subject to at least 30 days public review. Any comments are due within 20 days of the date of its mailing and publication on the Commission's website and in accordance with any instructions accompanying the notice. Section 311(g)(2) provides that this 30-day review period and 20-day comment period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day review and 20-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments, and will be placed on the Commission's agenda no earlier than 30 days from today.

FINDINGS

1. The Contractors State License Board Solar Energy System Disclosure Document (Appendix A) was approved by the Contractors State License Board on December 12, 2024.
2. D.20-08-001 adopted standardized inputs and assumptions for calculating estimated bill savings estimates from residential photovoltaic solar energy systems.
3. D.23-11-068 authorized Energy Division to update the standardized inputs and assumptions.
4. D.22-12-056 defined a complete interconnection application as one that is free of major deficiencies and includes a complete application, a signed contract, a single-line diagram, a complete California Contractors State License Board Solar Energy System Disclosure Document, a signed California Solar Consumer Protection Guide, and an oversizing attestation (if applicable).
5. Solar providers should ensure the required interconnection forms and the information contained within are aligned and consistent with one another.
6. For the completion of the CSLB Disclosure Document, it is reasonable to set the time duration of the calculated estimate to 12 months after solar installation.

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7. It is reasonable that the estimate use one-hour interval electric consumption data from the last 12 months of the customer's usage.
8. A customer's signature on the accompanying Consumer Protection Guide fulfills D.20-08-001's direction for a separate attestation and signature regarding lack of 12 months of one-hour interval data.
9. It is reasonable that, for solar-only installations, the amount of electricity generated by a proposed solar system be calculated using the National Renewable Energy Laboratory's PVWatts® tool.
10. It is reasonable that, for calculations where battery energy storage is involved, the solar provider may select a calculator of their choosing, and that the name of the calculator be listed for transparency on the CSLB Disclosure Document.
11. It is reasonable that, should the Commission develop or adopt a calculator for solar providers to use for storage calculations, the Commission require usage of such a calculator.
12. It is reasonable that no rate escalation is assumed for the duration of the calculated time period.
13. It is reasonable that all alternative calculations of bill savings estimates use an average rate escalation that is, at maximum, the average calculated by the Commission and posted on its website.
14. It is reasonable that the assumed rate schedule for any calculation regarding a customer's pre-installation be the customer's current rate schedule, and for post-installation calculations, the assumed rate schedule be the rate specified by the applicable utility or community choice aggregator's net billing tariff.
15. It is reasonable that each bill savings estimate for a customer interested in installing solar and storage includes a calculation for a scenario in which batteries are programmed to optimize bill savings by self-consuming and/or exporting based on price signals, as well as one or both of the optional calculations outlined above if the customer expresses interest in using their solar and storage systems for reasons beyond bill savings.
16. It is reasonable that each bill savings estimate for a customer interested in installing only solar panels includes a solar-only bill savings calculation.
17. Solar providers' inputs into the CSLB Disclosure Document should be typewritten to ensure maximum clarity to the customer and to reduce errors.
18. Future minor changes to the document and/or processes adopted here may be initiated through a letter from the Director of Energy Division or their designee.
19. The bill savings estimates calculations contained within the CSLB Disclosure Document are applicable to customers obtaining solar energy systems on residential buildings, with "solar energy systems" described in AB 1070.

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THEREFORE IT IS ORDERED THAT:

1. The standardized inputs and assumptions outlined in this Resolution for use in bill savings estimates contained in the California Contractors State License Board Solar Energy System Disclosure Document are approved.
2. The California Contractors State License Board Solar Energy System Disclosure Document, as attached in Appendix A, is approved.
3. Beginning July 1, 2025, Bear Valley Electric Service, Liberty Utilities LLC, PacifiCorp, Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric shall require collection of the updated California Contractors State License Board Solar Energy System Disclosure Document that includes the updated standardized inputs and assumptions for residential interconnection applications, as applicable under Assembly Bill 1070. Until then, both new and old versions of the Document may be accepted.
4. Bear Valley Electric Service, Liberty Utilities LLC, PacifiCorp, Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric will only accept typewritten California Contractors State License Board Solar Energy System Disclosure Documents for their interconnection application process.
5. Bear Valley Electric Service, Liberty Utilities LLC, PacifiCorp, Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric shall link to the California Contractors State License Board Solar Energy System Disclosure Document, the California Solar Consumer Protection Guide, and, if applicable, an oversizing attestation template, available and easily accessible for solar providers on their respective websites.
6. Bear Valley Electric Service, Liberty Utilities LLC, PacifiCorp, Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric shall post the standardized inputs and assumptions on their respective websites.

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This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed, and adopted at a conference of the Public Utilities Commission of the State of California held on March 13, 2025 the following Commissioners voting favorably thereon:

Rachel Peterson
Executive Director