ATTACHMENT A

May 20, 2020March 27, 2020March 4, 2020July 11, 2019

Standardized Solar Energy System Electric Bill Savings Inputs and Assumptions: a Staff Proposal

Pursuant to Assembly Bill 1070 (2017, Gonzales Fletcher)

Energy Division, California Public Utilities Commission

Rulemaking 14-07-002

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Definitions and Acronyms

- AB — Assembly Bill
- AMI — advanced metering infrastructure
- CCA — Community Choice Aggregation
- CPUC — California Public Utilities Commission
- CSI — California Solar Initiative
- electricity provider — provider of electricity (e.g., IOU, POU, CCA, etc.)
- EIA — United States Energy Information Administration
- escalation rate — average rate at which electricity provider residential retail price per kWh increases annually
- IOU — investor-owned utility
- kW — kilowatt
- MASH — Multifamily Affordable Solar Housing
- MW — megawatt
- NBC — non-bypassable charge
- NREL — National Renewable Energy Laboratory
- POU — publicly-owned utility
- PU Code — California Public Utilities Code
- PV — photovoltaic
- solar provider — solar vendor, installer, or financing entity
- TOU — time of use electric rate

Executive Summary

Assembly Bill (AB) 1070 (Stats. 2017, Ch. 662) requires the California Public Utilities Commission (CPUC) to "develop standardized inputs and assumptions to be used in the calculation and presentation of electric utility bill savings" by solar providers to prospective residential solar energy system consumers.[1] In this document, the CPUC's Energy Division staff presents a proposal for the standardized inputs and assumptions to be used by solar providers to calculate estimated electric utility bill savings from a solar energy system that a residential consumer can reasonably expect during the first 20 years following interconnection of the system. CPUC Energy Division staff proposes that the result of this calculation must be presented to all prospective residential consumers prior to signing a contract, and that the estimated electric bill savings must be provided by the solar provider in the Contractors State License Board's Disclosure Document. Upon request by either the consumer or by CPUC staff, solar providers must provide consumers and the CPUC with a detailed accounting of how the calculation was performed.

[1] California Public Utilities Code Section § 2854.6 defines solar energy system as "a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code."

Background

On October 11, 2017, California Assembly Bill (AB) 1070[2] (Gonzales Fletcher) was signed into law by Governor Jerry Brown. Section 3 of the legislation added the following to Section 2854.6 of the California Public Utilities Code:

> *2854.6. (a) On or before July 1, 2019, the commission shall develop standardized inputs and assumptions to be used in the calculation and presentation of electric utility bill savings to a consumer that can be expected by using a solar energy system by vendors, installers, or financing entities, and the commission and each electrical corporation shall post these standardized inputs and assumptions on their Internet Web sites.*
>
> *(b) For purposes of this section, "solar energy system" means a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code.*

To contribute to the implementation of this statute, CPUC Energy Division Staff conducted a literature review and completed numerous interviews with industry professionals on the best practices for creating a standardized bill savings calculation. The recommendations included herein are based on this research.

Proposal Overview

To implement AB 1070, CPUC Energy Division staff proposes to require a solar energy system vendor, installer, or financing entity (herein referred to as "solar provider") to present an estimated range of expected electric utility bill savings that the residential consumer may reasonably expect during the first 20 years of the system's operation. This calculation must be based on the standardized inputs and assumptions outlined in the following sections (herein referred to as "electric utility bill savings estimate"). This statute applies to solar providers across all of California and is not limited to solar providers doing business in the investor-owned utilities (IOU) service territories.

Staff has identified three primary ways in which requiring solar providers to present electric bill savings estimates that use standardized inputs and assumptions will benefit consumers:

1. Residential consumers will be able to better compare competing quotes they have received for solar energy systems.
2. Residential consumers will be provided a verifiable forecast of their estimated long-term electric utility bill savings compared to a no-build alternative.

[2] See Appendix 1 for full text.

3. Residential consumers will have reasonable assurance that the bill savings estimate is not distorted by excessive or exaggerated assumptions.

Additionally, residential consumers may gain a greater understanding that various factors beyond expected generation by the solar energy system, such as electricity consumption and rate design, will impact their electric bill savings.

Due to the inherent uncertainty of predictive calculations, CPUC Energy Division Staff proposes a two-phase process for implementing AB 1070:

1. **Phase One**: Define standardized inputs and assumptions to be used in the calculation of bill savings for prospective solar consumers. This phase is articulated in this Staff Proposal.
2. **Phase Two**: The CPUC will execute a contract with a third -party to develop an online estimated electric bill savings calculator that can be used by solar providers, prospective residential consumers, and the public at-large to calculate estimated electric bill savings. The second phase will also include a revisit of the calculation and make necessary refinements (if necessary).

Proposal Organization

This proposal is organized into nine sections:

1. Summary of Standardized Inputs and Assumptions
2. Discussion
3. Duration of Cost Estimate
4. Transparency
5. Effective Date
6. Applicability
7. Enforcement
8. Remaining Questions for Stakeholders
9. Refinement

1. Summary of Standardized Inputs and Assumptions

A. **Estimated annual electricity consumption**: Assume that the consumer's electricity usage profile during the prior 12 months on the relevant interval basis (e.g., one-hour intervals for most residential IOU consumers) will be equivalent to the consumer's annual electricity consumption each year for 20 years following interconnection.

B. **Assumed solar electricity generation:** Use PVWatts® to calculate the future generation of photovoltaic (PV) panels.

C. **Assumed rate schedule:** When calculating a no-solar scenario, assume the consumer would stay on their current electricity provider rate. When calculating a scenario where the consumer installs and interconnects a solar energy system, assume the consumer will choose an applicablethe rate tariff that is most beneficial to them (e.g., the net energy metering (NEM) successor tariff requires customers take service on a time-of-use rate in large IOU service territories).

D. **Average escalation of electricity provider residential retail rates**: Assume that average electricity rates of the relevant electricity provider will increase at a rate equivalent to the average of its rate increases over the past five years based on the most recently available United States Energy Information Administration (EIA) data. If this rate is over 4 percent, use 4 percent as the escalation rate., and then select an escalation rate that is within 2.12 percent above or below this calculated average escalation rate.

E. **Assumed annual degradation rate**: Assume that the average rate at which the photovoltaic system (panels/inverter) generates less electricity per year based on the physical degradation of the system over time is equivalent to the degradation rate listed in the panel/inverter manufacturer's technical specifications.

Each of these proposals are is discussed in further detail below.

2. Proposal Specifics and Discussion

A. Estimated Annual Electricity Consumption

Proposal

To calculate the consumer's estimated annual electricity consumption for all years of the cost estimate calculation, assume that the consumption patterns during the previous 12 months before installing solar will be the same as the consumption patterns for each 12 months following interconnection. Use the consumer's one-hour interval electric consumption data from consumer's past 12 months of data (e.g., Green Button Data) for this calculation. For consumers that do not have 12 months of interval data, solar providers must explain, in writing, a) how the consumption estimate was derived and b) why the customer does not have 12 months of interval data.Staff acknowledges that this does not address consumers who do yet have 12 months of interval data (e.g., new residents, smart meter opt-out rate ratepayers, etc.). This is further addressed in Section 9, "Remaining Questions for Stakeholders."

Discussion

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

B. Assumed Annual Solar Electricity Generation

Proposal

To calculate the consumer's estimated annual electric generation with the proposed solar energy system, use the results of the National Renewable Energy Laboratory's (NREL) PVWatts®[3] tool to estimate one-hour interval generation.

Discussion

Many calculators exist to estimate the amount of energy a PV system will generate. PVWatts® is a web-based tool created and developed by a national laboratory, the National Renewable Energy Laboratory, 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.

C. Assumed Rate Schedule

Proposal

For a no-solar calculation, apply the rate schedule the consumer is currently on to the interval consumption of the previous year.

If the consumer's electric utility has announced publicly that the consumer will be defaulted to a new rate with published specifics (e.g., cost per kWh, time-of-use windows if any), present the customer with two final cost savings figures based on their interval consumption the previous year. The first cost savings estimate will assume the consumer's current rate schedule and second cost savings estimate will assume the rate schedule the consumer would have been defaulted to.

For a solar calculation, apply the default rate schedule for the consumer's applicable electricity provider that will be most beneficial to the consumer in order to determine hour-by-hour bill credit compensation for avoided electricity that is served by the PV system and for exports including any additional fixed/variable charges.

Discussion

It is impossible to perfectly predict both the rate schedule that the consumer would be on if they did not adopt solar and the rate schedule they will be on if they do adopt solar. However, the most reasonable solution to this is to assume that for the duration of the bill savingscost estimate, the consumer will stay on their current or default rate in a no-solar scenario. Likewise, it is reasonable to assume that the consumer will stay on the default most beneficial rate schedule for the solar customers for the duration of the cost estimate in a solar calculation.

[3] Available at https://pvwatts.nrel.gov/.

Staff notes that in large IOU territories, time of use rates may change over time. Historically, NEM customers have been allowed to retain their current TOU rate for five years after the expiration of the rate, which is far shorter than the duration of this cost estimate. However, this is the most accurate method currently available.

D. Assumed Average Electricity Provider Rate Inflation

Proposal

Solar providers should assume that the average annual escalation rate over the next 20 years will be equivalent to the average inflation rate over the past five years of average residential retail electricity prices in the applicable electricity provider's service territory, based on data sourced from the EIA,[4] and then select an escalation rate that is within 2.12 percent above or below this calculated average escalation rate. If the average electricity provider rate inflation is higher than 4 percent, the solar provider shall assume 4 percent will be the average rate inflation.

The data needed to complete this calculation is available in the EIA's "Annual Electric Power Industry Report, Form EIA-861 detailed data files," which is released annually in November. This is a reasonable resource and value to use because it provides the most accurate publicly available information about historical residential retail electricity prices of each electricity provider on a per year basis. The EIA is a national energy agency with expertise in this area and the report is publicly available for all parties that are interested, and is updated annually for consistency. Five years is a sufficient period of time to account for the most recent price trends, but long enough to reduce distortions from a significant rate change in any single year.

Following December 31 of a given year, the previous five full calendar years of data for the consumer's electric utility should be used. For example, for a calculation that would be completed in calendar year 2019, average price increases in calendar years 2013-2017 would be used to calculate the average escalation rate over the past five years.

The potential range of the escalation rate will be equivalent to the average escalation rate plus or minus 2.12 percent (please see Discussion section below for reasoning on how this number was derived). Solar providers may choose to use any escalation rate within this range.

For example, the average escalation rate of residential retail electricity prices among bundled customers in Southern California Edison Company's service territory over 2013-2017 was 0.79 percent. Consequentially, the potential range of the escalation rate that the solar provider may choose for the escalation rate will be 0.79 ± 2.12 percent, or -1.33 to 2.91 percent.

Discussion

For the calculation of electricity provider bill savings for years subsequent to the first year of operation, it is reasonable to assume that electricity provider rates will change over time due to a number of factors.

[4] The EIA Annual Electric Power Industry Report is available at https://www.eia.gov/electricity/data/eia861/

Staff considered several alternative methods to calculate the escalation rate. For example,

1. Using a standard escalation rate for the entire state. However, this fails to take into consideration the substantial differences across different electricity providers.
2. Incorporation of acceleration or deceleration trends into the escalation rate. However, this adds an unnecessary burden of complexity on solar developers.
3. Presentation of the full escalation range. However, this may convey more certainty about the inherent predictive nature of the estimate. For example, a consumer may assume that while the estimate is a range of possibilities, the actual number must certainly be the lower end of the estimate, at minimum.

These considerations will be essential to refining the escalation rate over time so that it matches real-world conditions as closely as possible.

A range of 2.12 percent in each direction was chosen because 2.12 percent is equal to the standard deviation of the absolute value of the spread between predicted (based on the average of the past five years of available average rate data) and actual inflation of average residential investor- and publicly-owned utility rates across California from 2007-2018.

E. Assumed Annual Degradation Rate

Proposal

The annual degradation rate of system panels should be assumed to be the rate that is stated by the manufacturer on the panel's technical specifications.

Discussion

Staff also considered several other options for degradation rates. For example:

1. Self-reporting of degradation rates. However, this could leave the calculation open for manipulation.
2. A standardized degradation rate for all panels and inverters based on industry averages. However, this would be unfair to manufacturers of high-quality panels and would lead to inaccuracies.
3. State government testing of degradation rates on a per panel model basis. However, the cost of such an exercise must be weighed against potentially minimal benefits.

Manufacturer's technical specifications provide the best available estimate of degradation rates at this time.

3. Duration of Bill Savings Estimate

Estimated electricity provider bill savings will be calculated for 20 years following the interconnection of the system. The CPUC has determined that 20 years is a reasonable assumption for the minimum expected life of a solar PV system. For example, a 20-year timeline is consistent with the NEM transition period articulated in CPUC Decisions (D.)14-03-041 and D.16-01-044 for the large investor-owned

utilities. D.14-03-041 reasons that 20 years is "consistent with record evidence on the minimum expected life of such systems" and represents "a reasonable payback period as contemplated in AB 327, in that existing analyses show that customers of all customer classes are likely to achieve full payback for system installation costs, and most will receive some additional return on investment within this period of time."[5]

4. Transparency

Upon request by the consumer, all steps and figures in the calculation process will be made available to the consumer prior to point of sale. CPUC staff may also request Each IOU shall collect all steps, figures, and backup documentation in the calculation process from the solar provider of 100 interconnection applications as part of the audit process established by D.18-09-044 to ensure customers have signed the Solar Consumer Protection Guide. and the solar provider must provide them within 10 days. This information shall be transmitted to the IOU under a non-disclosure agreement between the IOU and the solar provider.

5. Effective Date

Staff proposes that solar providers be required to provide to prospective customers the bill savings calculations using the inputs and assumptions adopted by the CPUC within 120 days of the effective date of the CPUC's decision adopting standardized inputs and assumptions. This timeline will balance expediency in providing the protections intended by statute with a reasonable period for the industry to adjust its sales practices to accommodate this mandate.

6. Applicability

Staff proposes that the requirement to use this proposal's standardized the inputs and assumptions to calculate estimated bill savings and present them to prospective solar consumers shall apply to every solar provider who intends to eventually have a consumer execute a contract to purchase, lease, or pay for the energy generated by a solar system in the State of California (see Section 7: Enforcement). If a solar provider presents a bill savings estimates to a customer prior to the point of sale, this standardized calculation must be presented to the customer at that time as well. This requirement does not apply to new housing construction when the solar system is installed prior to the residential unit's point of sale.

Solar providers may also present an electric bill savings estimate based on their own methodology (i.e. not necessarily identical to the standardized inputs and assumptions in this proposal). This estimate (herein referred to as "alternative calculation") must still use the assumed utility rate inflation assumption outlined in Section 2.d of this proposal.

Solar providers may also present customers with estimates based on alternative consumption scenarios (herein referred to as "alternative scenarios"). For example, a solar provider may choose to provide an

[5] D.14-03-041, Section 5.1.2 (page 22)

electric bill savings estimate based on the future purchase of an electric vehicle, future electrification of major appliances, etc. These alternative scenarios must be accompanied by a clear explanation that they are not based on the customer's historic consumption. If the solar provider also chooses to present an alternative calculation, both the CPUC-approved standardized calculation (with necessary changes to consumption assumptions) and the solar provider's alternative calculation must be presented side by side.

Understanding potential impacts to a consumer's electric costs is a critical component of the decision-making process for going solar and should be part of any transaction between a solar provider and prospective consumer.

7. Enforcement

Staff proposes that the result of the calculation that uses the inputs and assumptions identified in this document must be included in the CSLB Solar Energy System Disclosure Document, which state law requires be presented to all prospective solar consumers. CPUC is collaborating with CSLB and on how to include this calculation in the supporting information pages to the Solar Energy System Disclosure Document which are currently under development.

For solar consumers whose solar systems interconnect to any of the large electric IOUs' systems,[6] the CSLB Solar Energy System Disclosure Document is required by CPUC Decision (D.) 18-09-044 to be submitted as part of the interconnection application. The decision directs these utilities to audit at least 100 interconnection applications on a semi-annual basis to ensure compliance.[7] Staff proposes that the bill savings calculation presented in the disclosure also be spot-checked during this audit in a similar fashion (see Section 4: Transparency).

D.18-09-044 states that if a solar provider who sells or installs a solar system interconnected to any of the large IOUs' systems repeatedly fails to comply with California Public Utilities Code § 2854.6, the CPUC will consider a reasonable administrative penalty mechanism for the solar providerfailures to comply with D.18-09-044, including the required Solar Energy System Disclosure Document. This will be expanded to include all IOU service territory (including SMJUs) in California.

[6] Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company.
[7] "We also direct the utilities to perform spot audits of customer verification. Such audits should be performed at least semi-annually, involve at least 100 interconnection applications, and at minimum, (1) confirm whether a solar provider has a valid CSLB license and entered that license number for its interconnection application, and (2) verify that the customer had signed forms attesting that the customer received and read the information packet and Solar Energy Disclosure Document prior to signing a contract or agreement with the solar provider. Further, the utilities are directed to provide their findings to CSLB to support its enforcement and disciplinary actions against contractors that operate without a valid license or fail to ensure customer verification." D.18-09-044, page 34.

8. Future Revisions

The CPUC may in the future revisit and modify (if necessary) the inputs and assumptions articulated in this proposal on its own motion based on new information or changes in factors impacting the inputs and assumptions.

9. Remaining Questions for Stakeholders

1. Do you agree with the staff proposal that solar providers be mandated to present a 20 year bill savings estimate to consumers? If not, please explain why and specifically address why presenting a 20 year bill savings estimate would not be in the consumer's best interest.
2. Should solar providers be able to present their own bill savings calculation alongside the bill savings calculation that uses the inputs and assumptions outlined in this proposal? In your response, please explain the impact that this would have on consumer protections.
3. Do you agree or disagree with the inputs and assumptions proposed in the staff proposal? Please explain why. If you disagree, please provide an alternative proposal, and explain the rationale for them. To the extent you propose an alternate approach, please rely on publicly available data, if available.
4. Provide recommendations on how to clearly communicate to consumers that the bill savings estimate is only indicative of electricity bill savings, and is not indicative of the total cost of the system (e.g., purchase price, lease payments, power purchase agreement payments, etc.).
5. Customers may not have 12 months of one-hour interval consumption data due to a variety of factors (e.g., recently moved to their current house, are served by an electricity provider without 100 percent smart meter penetration, etc.). Different electricity providers have developed different methods to estimate this, however, no consensus on this estimate has emerged. Please provide a recommendation on an approach that could be used to estimate future consumption patterns for these consumers and explain why this approach is reasonable.
6. Should electricity provider rate escalation be a single number, or should it be based on a range? Which approach gives the customer a more accurate sense of potential bill savings and which best communicates the predictive nature of the calculation?
7. The electricity bill savings calculation in this staff proposal was developed to allow for battery storage "generation" to be overlaid on top of it. Does the inclusion of battery storage create any problems for this bill savings calculation?
8. Do you agree or disagree with the transparency, applicability, and enforcement approach included in the staff proposal? Please explain why. If you disagree, please provide an alternative proposal and explain why that proposal is reasonable.
9. The staff proposal assumes nominal dollars throughout. If you believe the calculation should attempt to adjust for inflation, please provide a rationale.

Appendix 1

Assembly Bill No. 1070[8]

Chapter 662

An act to add Sections 7169 and 7170 to the Business and Professions Code, and to add Section 2854.6 to the Public Utilities Code, relating to solar energy systems.

[Approved by Governor October 11, 2017. Filed with Secretary of State October 11, 2017.]

Legislative Counsel's Digest

AB 1070, Gonzalez Fletcher. Solar energy systems: contracts: disclosures.

Existing law provides for the licensure and regulation of various professions and vocations by boards within the Department of Consumer Affairs. Existing law, the Contractors' State License Law, provides for the licensure and regulation of contractors by the Contractors' State License Board. Existing law requires licensed contractors to be classified and authorizes them to be classified as, among other things, a solar contractor. Under existing law, a solar contractor installs, modifies, maintains, and repairs thermal and photovoltaic solar energy systems. Existing law prohibits a solar contractor from performing building or construction trades, crafts, or skills, except when required to install a thermal or photovoltaic solar energy system.

Existing law authorizes the legislative body of a public agency, as defined, to determine that it would be convenient, advantageous, and in the public interest to designate an area within which authorized public agency officials and property owners may enter into voluntary contractual assessments to finance certain improvements, and to utilize Property Assessed Clean Energy (PACE) financing for the installation of distributed generation renewable energy sources and energy or water efficiency improvements, as specified. Existing law requires a financing estimate and disclosure form to be completed and delivered to a property owner before the property owner consummates a voluntary contractual assessment pursuant to one of these programs.

This bill would require the board, in collaboration with the Public Utilities Commission, on or before July 1, 2018, to develop and make available on its Internet Web site a disclosure document that provides a consumer with accurate, clear, and concise information regarding the installation of a solar energy system, as specified. The bill would require this disclosure document to be provided by the solar energy systems company to the consumer prior to completion of a sale, financing, or lease of a solar energy system, as defined, and that it, and the contract, be written in the same language as was principally used in the sales presentation and marketing material. The bill would also require, for solar energy systems utilizing PACE financing, that the financing estimate and disclosure form satisfy these requirements with respect to the financing contract, as specified. The bill would also require the board to post the PACE Financing Estimate and Disclosure form on its Internet Web site.

The bill would require the Contractors' State License Board to receive and review complaints and consumer questions, and complaints received from state agencies, regarding solar energy systems

[8] Available at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB1070.

companies and solar contractors. The bill would, beginning on July 1, 2019, require the board annually to compile a report documenting complaints it received relating to solar contractors that it shall make available publicly on the board's and the Public Utilities Commission's Internet Web sites.

The California Constitution establishes the Public Utilities Commission and authorizes the commission to exercise ratemaking and rulemaking authority over all public utilities, as defined, subject to control by the Legislature.

This bill would require the Public Utilities Commission, on or before July 1, 2019, to develop standardized inputs and assumptions to be used in the calculation and presentation of electric utility bill savings to a consumer that can be expected by using a solar energy system by vendors, installers, or financing entities and to post them on its Internet Web site. The bill also would require electrical corporations to post the standardized inputs and assumptions.

Digest Key

Vote: MAJORITY Appropriation: NO Fiscal Committee: YES Local Program: NO

Bill Text

The people of the State of California do enact as follows:

SECTION 1.

Section 7169 is added to the Business and Professions Code, to read:

7169.

(a) The board, in collaboration with the Public Utilities Commission, shall develop and make available a "solar energy system disclosure document" or documents that provide a consumer, at a minimum, accurate, clear, and concise information regarding the installation of a solar energy system, total costs of installation, anticipated savings, the assumptions and inputs used to estimate the savings, and the implications of various financing options.

(b) On or before July 1, 2018, the board, in collaboration with the Public Utilities Commission, shall develop, and make available on its Internet Web site, the disclosure document described in subdivision (a) that a solar energy system company shall provide to a consumer prior to completion of a sale, financing, or lease of a solar energy system. The "solar energy system disclosure document" shall be printed on the front page or cover page of every solar energy contract. The "solar energy system disclosure document" shall be printed in boldface 16-point type and include the following types of primary information:

(1) The total cost and payments for the system, including financing costs.

(2) Information on how and to whom customers may provide complaints.

(3) The consumer's right to a cooling off period of three days pursuant to Section 7159 of the Business and Professions Code.

(c) At the board's discretion, other types of supporting information the board and the commission deem appropriate or useful in furthering the directive described in subdivision (a) may be included in the solar energy disclose document following the front page or cover page, including, but not limited to:

(1) The amounts and sources of financing obtained.

(2) The calculations used by the home improvement salesperson to determine how many panels the homeowner needs to install.

(3) The calculations used by the home improvement salesperson to determine how much energy the panels will generate.

(4) Any additional monthly fees the homeowner's electric company may bill, any turn-on charges, and any fees added for the use of an Internet monitoring system of the panels or inverters.

(5) The terms and conditions of any guaranteed rebate.

(6) The final contract price, without the inclusion of possible rebates.

(7) The solar energy system company's contractor's license number.

(8) The impacts of solar energy system installations not performed to code.

(9) Types of solar energy system malfunctions.

(10) Information about the difference between a solar energy system lease and a solar energy system purchase.

(11) The impacts that the financing options, lease agreement terms, or contract terms will have on the sale of the consumer's home, including any balloon payments or solar energy system relocation that may be required if the contract is not assigned to the new owner of the home.

(12) A calculator that calculates performance of solar projects to provide solar customers the solar power system's projected output, which may include an expected performance-based buydown calculator.

(d) A contract for sale, financing, or lease of a solar energy system and the solar energy system disclosure document shall be written in the same language as was principally used in the oral sales presentation made to the consumer or the print or digital marketing material given to the consumer.

(e) For solar energy systems utilizing Property Assessed Clean Energy (PACE) financing, the Financing Estimate and Disclosure form required by subdivision (b) of Section 5898.17 of the Streets and Highways Code shall satisfy the requirements of this section with respect to the financing contract only, but not, however, with respect to the underlying contract for installation of the solar energy system.

(f) The board shall post the PACE Financing Estimate and Disclosure form required by subdivision (b) of Section 5898.17 of the Streets and Highways Code on its Internet Web site.

(g) For purposes of this section, "solar energy system" means a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW,

alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code.

(h) This section does not apply to a solar energy system that is installed as a standard feature on new construction.

SEC. 2.

Section 7170 is added to the Business and Professions Code, to read:

7170.

(a) The Contractors' State License Board shall receive and review complaints and consumer questions regarding solar energy systems companies and solar contractors. The board shall also receive complaints received from state agencies regarding solar energy systems companies and solar contractors.

(b) Beginning on July 1, 2019, the board annually shall compile a report documenting consumer complaints relating to solar contractors. The report shall be made available publicly on the board's and the Public Utilities Commission's Internet Web sites. The report shall contain all of the following:

(1) The number and types of complaints.

(2) The ZIP Code where the consumer complaint originated.

(3) The disposition of all complaints received against a solar contractor.

(c) For purposes of this section, "solar energy system" means a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code.

SEC. 3.

Section 2854.6 is added to the Public Utilities Code, to read:

2854.6.

(a) On or before July 1, 2019, the commission shall develop standardized inputs and assumptions to be used in the calculation and presentation of electric utility bill savings to a consumer that can be expected by using a solar energy system by vendors, installers, or financing entities, and the commission and each electrical corporation shall post these standardized inputs and assumptions on their Internet Web sites.

(b) For purposes of this section, "solar energy system" means a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code.

(END OF ATTACHMENT A)

ATTACHMENT B

May 20, 2020

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Energy Division, California Public Utilities Commission

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Definitions and Acronyms

- AB — Assembly Bill
- AMI — advanced metering infrastructure
- CCA — Community Choice Aggregation
- CPUC — California Public Utilities Commission
- CSI — California Solar Initiative
- electricity provider — provider of electricity (e.g., IOU, POU, CCA, etc.)
- EIA — United States Energy Information Administration
- escalation rate — average rate at which electricity provider residential retail price per kWh increases annually
- IOU — investor-owned utility
- kW — kilowatt
- MASH — Multifamily Affordable Solar Housing
- MW — megawatt
- NBC — non-bypassable charge
- NREL — National Renewable Energy Laboratory
- POU — publicly-owned utility
- PU Code — California Public Utilities Code
- PV — photovoltaic
- solar provider — solar vendor, installer, or financing entity
- TOU — time of use electric rate

Executive Summary

Assembly Bill (AB) 1070 (Stats. 2017, Ch. 662) requires the California Public Utilities Commission (CPUC) to "develop standardized inputs and assumptions to be used in the calculation and presentation of electric utility bill savings" by solar providers to prospective residential solar energy system consumers.[1] In this document, the CPUC's Energy Division staff presents a proposal for the standardized inputs and assumptions to be used by solar providers to calculate estimated electric utility bill savings from a solar energy system that a residential consumer can reasonably expect during the first 20 years following interconnection of the system. CPUC Energy Division staff proposes that the result of this calculation must be presented to all prospective residential consumers prior to signing a contract, and that the estimated electric bill savings must be provided by the solar provider in the Contractors State License Board's Disclosure Document.

[1] California Public Utilities Code Section § 2854.6 defines solar energy system as "a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code."

Background

On October 11, 2017, California Assembly Bill (AB) 1070[2] (Gonzales Fletcher) was signed into law by Governor Jerry Brown. Section 3 of the legislation added the following to Section 2854.6 of the California Public Utilities Code:

> *2854.6. (a) On or before July 1, 2019, the commission shall develop standardized inputs and assumptions to be used in the calculation and presentation of electric utility bill savings to a consumer that can be expected by using a solar energy system by vendors, installers, or financing entities, and the commission and each electrical corporation shall post these standardized inputs and assumptions on their Internet Web sites.*
>
> *(b) For purposes of this section, "solar energy system" means a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code.*

To contribute to the implementation of this statute, CPUC Energy Division Staff conducted a literature review and completed numerous interviews with industry professionals on the best practices for creating a standardized bill savings calculation. The recommendations included herein are based on this research.

Proposal Overview

To implement AB 1070, CPUC Energy Division staff proposes to require a solar energy system vendor, installer, or financing entity (herein referred to as "solar provider") to present an estimate of expected electric utility bill savings that the residential consumer may reasonably expect during the first 20 years of the system's operation. This calculation must be based on the standardized inputs and assumptions outlined in the following sections (herein referred to as "electric utility bill savings estimate"). This statute applies to solar providers across all of California and is not limited to solar providers doing business in the investor-owned utilities (IOU) service territories.

Staff has identified three primary ways in which requiring solar providers to present electric bill savings estimates that use standardized inputs and assumptions will benefit consumers:

1. Residential consumers will be able to better compare competing quotes they have received for solar energy systems.
2. Residential consumers will be provided a verifiable forecast of their estimated long-term electric utility bill savings compared to a no-build alternative.

[2] See Appendix 1 for full text.

3. Residential consumers will have reasonable assurance that the bill savings estimate is not distorted by excessive or exaggerated assumptions.

Additionally, residential consumers may gain a greater understanding that various factors beyond expected generation by the solar energy system, such as electricity consumption and rate design, will impact their electric bill savings.

Due to the inherent uncertainty of predictive calculations, CPUC Energy Division Staff proposes a two-phase process for implementing AB 1070:

1. **Phase One**: Define standardized inputs and assumptions to be used in the calculation of bill savings for prospective solar consumers. This phase is articulated in this Staff Proposal.
2. **Phase Two**: The CPUC will execute a contract with a third party to develop an online estimated electric bill savings calculator that can be used by solar providers, prospective residential consumers, and the public at-large to calculate estimated electric bill savings. The second phase will also include a revisit of the calculation and make necessary refinements (if necessary).

Proposal Organization

This proposal is organized into nine sections:

1. Summary of Standardized Inputs and Assumptions
2. Discussion
3. Duration of Cost Estimate
4. Transparency
5. Effective Date
6. Applicability
7. Enforcement
8. Remaining Questions for Stakeholders
9. Refinement

1. Summary of Standardized Inputs and Assumptions

A. **Estimated annual electricity consumption**: Assume that the consumer's electricity usage profile during the prior 12 months on the relevant interval basis (e.g., one-hour intervals for most residential IOU consumers) will be equivalent to the consumer's annual electricity consumption each year for 20 years following interconnection.
B. **Assumed solar electricity generation:** Use PVWatts® to calculate the future generation of photovoltaic (PV) panels.
C. **Assumed rate schedule:** When calculating a no-solar scenario, assume the consumer would stay on their current electricity provider rate. When calculating a scenario where the consumer installs and interconnects a solar energy system, assume the consumer will choose the rate tariff that is most beneficial to them.
D. **Average escalation of electricity provider residential retail rates**: Assume that average electricity rates of the relevant electricity provider will increase at a rate equivalent to the average of its rate increases over the past five years based on the most recently available United

States Energy Information Administration (EIA) data. If this rate is over 4 percent, use 4 percent as the escalation rate.

E. **Assumed annual degradation rate**: Assume that the average rate at which the photovoltaic system (panels/inverter) generates less electricity per year based on the physical degradation of the system over time is equivalent to the degradation rate listed in the panel/inverter manufacturer's technical specifications.

Each of these proposals is discussed in further detail below.

2. Proposal Specifics and Discussion

A. Estimated Annual Electricity Consumption

Proposal

To calculate the consumer's estimated annual electricity consumption for all years of the cost estimate calculation, assume that the consumption patterns during the previous 12 months before installing solar will be the same as the consumption patterns for each 12 months following interconnection. Use the consumer's one-hour interval electric consumption data from consumer's past 12 months of data (e.g., Green Button Data) for this calculation. For consumers that do not have 12 months of interval data, solar providers must explain, in writing, a) how the consumption estimate was derived and b) why the customer does not have 12 months of interval data.

Discussion

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

B. Assumed Annual Solar Electricity Generation

Proposal

To calculate the consumer's estimated annual electric generation with the proposed solar energy system, use the results of the National Renewable Energy Laboratory's (NREL) PVWatts®[3] tool to estimate one-hour interval generation.

Discussion

Many calculators exist to estimate the amount of energy a PV system will generate. PVWatts® is a web-based tool created and developed by a national laboratory, the National Renewable

[3] Available at https://pvwatts.nrel.gov/.

Energy Laboratory, 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.

C. Assumed Rate Schedule

Proposal

For a no-solar calculation, apply the rate schedule the consumer is currently on to the interval consumption of the previous year.

For a solar calculation, apply the rate schedule that will be most beneficial to the consumer in order to determine hour-by-hour bill credit compensation for avoided electricity that is served by the PV system and for exports including any additional fixed/variable charges.

Discussion

It is impossible to perfectly predict both the rate schedule that the consumer would be on if they did not adopt solar and the rate schedule they will be on if they do adopt solar. However, the most reasonable solution to this is to assume that for the duration of the bill savings estimate, the consumer will stay on their current or default rate in a no-solar scenario. Likewise, it is reasonable to assume that the consumer will stay on the most beneficial rate schedule for the solar customer for the duration of the cost estimate in a solar calculation.

Staff notes that in large IOU territories, time of use rates may change over time. Historically, NEM customers have been allowed to retain their current TOU rate for five years after the expiration of the rate, which is far shorter than the duration of this cost estimate. However, this is the most accurate method currently available.

D. Assumed Average Electricity Provider Rate Inflation

Proposal

Solar providers should assume that the average annual escalation rate over the next 20 years will be equivalent to the average inflation rate over the past five years of average residential retail electricity prices in the applicable electricity provider's service territory, based on data sourced from the EIA[4]. If the average electricity provider rate inflation is higher than 4 percent, the solar provider shall assume 4 percent will be the average rate inflation.

The data needed to complete this calculation is available in the EIA's "Annual Electric Power Industry Report, Form EIA-861 detailed data files," which is released annually in November. This is a reasonable resource and value to use because it provides the most accurate publicly available information about historical residential retail electricity prices of each electricity provider on a per year basis. The EIA is a national energy agency with expertise in this area and

[4] The EIA Annual Electric Power Industry Report is available at https://www.eia.gov/electricity/data/eia861/

the report is publicly available for all parties that are interested, and is updated annually for consistency. Five years is a sufficient period of time to account for the most recent price trends, but long enough to reduce distortions from a significant rate change in any single year.

Following December 31 of a given year, the previous five full calendar years of data for the consumer's electric utility should be used. For example, for a calculation that would be completed in calendar year 2019, average price increases in calendar years 2013-2017 would be used to calculate the average escalation rate over the past five years.

Discussion

For the calculation of electricity provider bill savings for years subsequent to the first year of operation, it is reasonable to assume that electricity provider rates will change over time due to a number of factors.

Staff considered several alternative methods to calculate the escalation rate. For example,

1. Using a standard escalation rate for the entire state. However, this fails to take into consideration the substantial differences across different electricity providers.
2. Incorporation of acceleration or deceleration trends into the escalation rate. However, this adds an unnecessary burden of complexity on solar developers.
3. Presentation of the full escalation range. However, this may convey more certainty about the inherent predictive nature of the estimate. For example, a consumer may assume that while the estimate is a range of possibilities, the actual number must certainly be the lower end of the estimate, at minimum.

These considerations will be essential to refining the escalation rate over time so that it matches real-world conditions as closely as possible.

E. Assumed Annual Degradation Rate

Proposal

The annual degradation rate of system panels should be assumed to be the rate that is stated by the manufacturer on the panel's technical specifications.

Discussion

Staff also considered several other options for degradation rates. For example:

1. Self-reporting of degradation rates. However, this could leave the calculation open for manipulation.
2. A standardized degradation rate for all panels and inverters based on industry averages. However, this would be unfair to manufacturers of high-quality panels and would lead to inaccuracies.
3. State government testing of degradation rates on a per panel model basis. However, the cost of such an exercise must be weighed against potentially minimal benefits.

Manufacturer's technical specifications provide the best available estimate of degradation rates at this time.

3. Duration of Bill Savings Estimate

Estimated electricity provider bill savings will be calculated for 20 years following the interconnection of the system. The CPUC has determined that 20 years is a reasonable assumption for the minimum expected life of a solar PV system. For example, a 20-year timeline is consistent with the NEM transition period articulated in CPUC Decisions (D.)14-03-041 and D.16-01-044 for the large investor-owned utilities. D.14-03-041 reasons that 20 years is "consistent with record evidence on the minimum expected life of such systems" and represents "a reasonable payback period as contemplated in AB 327, in that existing analyses show that customers of all customer classes are likely to achieve full payback for system installation costs, and most will receive some additional return on investment within this period of time."[5]

4. Transparency

Each IOU shall collect all steps, figures, and backup documentation in the calculation process from the solar provider of 100 interconnection applications as part of the audit process established by D.18-09-044 to ensure customers have signed the Solar Consumer Protection Guide. This information shall be transmitted to the IOU under a non-disclosure agreement between the IOU and the solar provider.

5. Effective Date

Staff proposes that solar providers be required to provide to prospective customers the bill savings calculations using the inputs and assumptions adopted by the CPUC within 120 days of the effective date of the CPUC's decision adopting standardized inputs and assumptions. This timeline will balance expediency in providing the protections intended by statute with a reasonable period for the industry to adjust its sales practices to accommodate this mandate.

6. Applicability

Staff proposes that the requirement to use this proposal's standardized inputs and assumptions to calculate estimated bill savings and present them to prospective solar consumers shall apply to every solar provider who intends to eventually have a consumer execute a contract to purchase, lease, or pay for the energy generated by a solar system in the State of California (see Section 7: Enforcement). If a solar provider presents a bill savings estimates to a customer prior to the point of sale, this standardized calculation must be presented to the customer at that time as well. This requirement does not apply to new housing construction when the solar system is installed prior to the residential unit's point of sale.

[5] D.14-03-041, Section 5.1.2 (page 22)

Solar providers may also present an electric bill savings estimate based on their own methodology (i.e. not necessarily identical to the standardized inputs and assumptions in this proposal). This estimate (herein referred to as "alternative calculation") must still use the assumed utility rate inflation assumption outlined in Section 2.d of this proposal.

Solar providers may also present customers with estimates based on alternative consumption scenarios (herein referred to as "alternative scenarios"). For example, a solar provider may choose to provide an electric bill savings estimate based on the future purchase of an electric vehicle, future electrification of major appliances, etc. These alternative scenarios must be accompanied by a clear explanation that they are not based on the customer's historic consumption. If the solar provider also chooses to present an alternative calculation, both the CPUC-approved standardized calculation (with necessary changes to consumption assumptions) and the solar provider's alternative calculation must be presented side by side.

Understanding potential impacts to a consumer's electric costs is a critical component of the decision-making process for going solar and should be part of any transaction between a solar provider and prospective consumer.

7. Enforcement

Staff proposes that the result of the calculation that uses the inputs and assumptions identified in this document must be included in the CSLB Solar Energy System Disclosure Document, which state law requires be presented to all prospective solar consumers. CPUC is collaborating with CSLB on how to include this calculation in the supporting information pages to the Solar Energy System Disclosure Document which are currently under development.

For solar consumers whose solar systems interconnect to any of the large electric IOUs' systems,[6] the CSLB Solar Energy System Disclosure Document is required by CPUC Decision (D.) 18-09-044 to be submitted as part of the interconnection application. The decision directs these utilities to audit at least 100 interconnection applications on a semi-annual basis to ensure compliance.[7] Staff proposes that the bill savings calculation presented in the disclosure also be spot-checked during this audit in a similar fashion (see Section 4: Transparency).

D.18-09-044 states that the CPUC will consider a reasonable administrative penalty mechanism for failures to comply with D.18-09-044, including the required Solar Energy System Disclosure Document. This will be expanded to include all IOU service territory (including SMJUs) in California.

[6] Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company.
[7] "We also direct the utilities to perform spot audits of customer verification. Such audits should be performed at least semi-annually, involve at least 100 interconnection applications, and at minimum, (1) confirm whether a solar provider has a valid CSLB license and entered that license number for its interconnection application, and (2) verify that the customer had signed forms attesting that the customer received and read the information packet and Solar Energy Disclosure Document prior to signing a contract or agreement with the solar provider. Further, the utilities are directed to provide their findings to CSLB to support its enforcement and disciplinary actions against contractors that operate without a valid license or fail to ensure customer verification." D.18-09-044, page 34.

8. Future Revisions

The CPUC may in the future revisit and modify (if necessary) the inputs and assumptions articulated in this proposal on its own motion based on new information or changes in factors impacting the inputs and assumptions.

Appendix 1

Assembly Bill No. 1070[8]

Chapter 662

An act to add Sections 7169 and 7170 to the Business and Professions Code, and to add Section 2854.6 to the Public Utilities Code, relating to solar energy systems.

[Approved by Governor October 11, 2017. Filed with Secretary of State October 11, 2017.]

Legislative Counsel's Digest

AB 1070, Gonzalez Fletcher. Solar energy systems: contracts: disclosures.

Existing law provides for the licensure and regulation of various professions and vocations by boards within the Department of Consumer Affairs. Existing law, the Contractors' State License Law, provides for the licensure and regulation of contractors by the Contractors' State License Board. Existing law requires licensed contractors to be classified and authorizes them to be classified as, among other things, a solar contractor. Under existing law, a solar contractor installs, modifies, maintains, and repairs thermal and photovoltaic solar energy systems. Existing law prohibits a solar contractor from performing building or construction trades, crafts, or skills, except when required to install a thermal or photovoltaic solar energy system.

Existing law authorizes the legislative body of a public agency, as defined, to determine that it would be convenient, advantageous, and in the public interest to designate an area within which authorized public agency officials and property owners may enter into voluntary contractual assessments to finance certain improvements, and to utilize Property Assessed Clean Energy (PACE) financing for the installation of distributed generation renewable energy sources and energy or water efficiency improvements, as specified. Existing law requires a financing estimate and disclosure form to be completed and delivered to a property owner before the property owner consummates a voluntary contractual assessment pursuant to one of these programs.

This bill would require the board, in collaboration with the Public Utilities Commission, on or before July 1, 2018, to develop and make available on its Internet Web site a disclosure document that provides a consumer with accurate, clear, and concise information regarding the installation of a solar energy system, as specified. The bill would require this disclosure document to be provided by the solar energy systems company to the consumer prior to completion of a sale, financing, or lease of a solar energy system, as defined, and that it, and the contract, be written in the same language as was principally used in the sales presentation and marketing material. The bill would also require, for solar energy systems utilizing PACE financing, that the financing estimate and disclosure form satisfy these requirements with respect to the financing contract, as specified. The bill would also require the board to post the PACE Financing Estimate and Disclosure form on its Internet Web site.

The bill would require the Contractors' State License Board to receive and review complaints and consumer questions, and complaints received from state agencies, regarding solar energy systems

[8] Available at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB1070.

companies and solar contractors. The bill would, beginning on July 1, 2019, require the board annually to compile a report documenting complaints it received relating to solar contractors that it shall make available publicly on the board's and the Public Utilities Commission's Internet Web sites.

The California Constitution establishes the Public Utilities Commission and authorizes the commission to exercise ratemaking and rulemaking authority over all public utilities, as defined, subject to control by the Legislature.

This bill would require the Public Utilities Commission, on or before July 1, 2019, to develop standardized inputs and assumptions to be used in the calculation and presentation of electric utility bill savings to a consumer that can be expected by using a solar energy system by vendors, installers, or financing entities and to post them on its Internet Web site. The bill also would require electrical corporations to post the standardized inputs and assumptions.

Digest Key

Vote: MAJORITY Appropriation: NO Fiscal Committee: YES Local Program: NO

Bill Text

The people of the State of California do enact as follows:

SECTION 1.

Section 7169 is added to the Business and Professions Code, to read:

7169.

(a) The board, in collaboration with the Public Utilities Commission, shall develop and make available a "solar energy system disclosure document" or documents that provide a consumer, at a minimum, accurate, clear, and concise information regarding the installation of a solar energy system, total costs of installation, anticipated savings, the assumptions and inputs used to estimate the savings, and the implications of various financing options.

(b) On or before July 1, 2018, the board, in collaboration with the Public Utilities Commission, shall develop, and make available on its Internet Web site, the disclosure document described in subdivision (a) that a solar energy system company shall provide to a consumer prior to completion of a sale, financing, or lease of a solar energy system. The "solar energy system disclosure document" shall be printed on the front page or cover page of every solar energy contract. The "solar energy system disclosure document" shall be printed in boldface 16-point type and include the following types of primary information:

(1) The total cost and payments for the system, including financing costs.

(2) Information on how and to whom customers may provide complaints.

(3) The consumer's right to a cooling off period of three days pursuant to Section 7159 of the Business and Professions Code.

(c) At the board's discretion, other types of supporting information the board and the commission deem appropriate or useful in furthering the directive described in subdivision (a) may be included in the solar energy disclose document following the front page or cover page, including, but not limited to:

(1) The amounts and sources of financing obtained.

(2) The calculations used by the home improvement salesperson to determine how many panels the homeowner needs to install.

(3) The calculations used by the home improvement salesperson to determine how much energy the panels will generate.

(4) Any additional monthly fees the homeowner's electric company may bill, any turn-on charges, and any fees added for the use of an Internet monitoring system of the panels or inverters.

(5) The terms and conditions of any guaranteed rebate.

(6) The final contract price, without the inclusion of possible rebates.

(7) The solar energy system company's contractor's license number.

(8) The impacts of solar energy system installations not performed to code.

(9) Types of solar energy system malfunctions.

(10) Information about the difference between a solar energy system lease and a solar energy system purchase.

(11) The impacts that the financing options, lease agreement terms, or contract terms will have on the sale of the consumer's home, including any balloon payments or solar energy system relocation that may be required if the contract is not assigned to the new owner of the home.

(12) A calculator that calculates performance of solar projects to provide solar customers the solar power system's projected output, which may include an expected performance-based buydown calculator.

(d) A contract for sale, financing, or lease of a solar energy system and the solar energy system disclosure document shall be written in the same language as was principally used in the oral sales presentation made to the consumer or the print or digital marketing material given to the consumer.

(e) For solar energy systems utilizing Property Assessed Clean Energy (PACE) financing, the Financing Estimate and Disclosure form required by subdivision (b) of Section 5898.17 of the Streets and Highways Code shall satisfy the requirements of this section with respect to the financing contract only, but not, however, with respect to the underlying contract for installation of the solar energy system.

(f) The board shall post the PACE Financing Estimate and Disclosure form required by subdivision (b) of Section 5898.17 of the Streets and Highways Code on its Internet Web site.

(g) For purposes of this section, "solar energy system" means a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW,

alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code.

(h) This section does not apply to a solar energy system that is installed as a standard feature on new construction.

SEC. 2.

Section 7170 is added to the Business and Professions Code, to read:

7170.

(a) The Contractors' State License Board shall receive and review complaints and consumer questions regarding solar energy systems companies and solar contractors. The board shall also receive complaints received from state agencies regarding solar energy systems companies and solar contractors.

(b) Beginning on July 1, 2019, the board annually shall compile a report documenting consumer complaints relating to solar contractors. The report shall be made available publicly on the board's and the Public Utilities Commission's Internet Web sites. The report shall contain all of the following:

(1) The number and types of complaints.

(2) The ZIP Code where the consumer complaint originated.

(3) The disposition of all complaints received against a solar contractor.

(c) For purposes of this section, "solar energy system" means a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code.

SEC. 3.

Section 2854.6 is added to the Public Utilities Code, to read:

2854.6.

(a) On or before July 1, 2019, the commission shall develop standardized inputs and assumptions to be used in the calculation and presentation of electric utility bill savings to a consumer that can be expected by using a solar energy system by vendors, installers, or financing entities, and the commission and each electrical corporation shall post these standardized inputs and assumptions on their Internet Web sites.

(b) For purposes of this section, "solar energy system" means a solar energy device to be installed on a residential building that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kW, and not more than five MW, alternating current rated peak electricity, and that meets or exceeds the eligibility criteria established pursuant to Section 25782 of the Public Resources Code.

(END OF ATTACHMENT B)