BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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Order Instituting Rulemaking Regarding Policies, Procedures and Rules for the California Solar Initiative, the Self-Generation Incentive Program and Other Distributed Generation Issues.	Rulemaking 12-11-005 (Filed November 8, 2012)

COMMENTS OF SOLARCITY CORPORATION AND THE CALIFORNIA SOLAR ENERGY INDUSTRIES ASSOCIATION ON THE PROPOSED DECISION REVISING THE GREENHOUSE GAS EMISSION FACTOR TO DETERMINE ELIGIBILITY TO PARTICIPATE IN THE SELF-GENERATION INCENTIVE PROGRAM

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July 30, 2015

SUBJECT INDEX

Pursuant to Rule 14.3 of the Rules of Practice and Procedure of the California Public Utilities Commission, SolarCity Corporation (SolarCity) and the California Solar Energy Industries Association (CalSEIA) provide the following index of recommended changes to the *Proposed Decision Revising the Greenhouse Gas Emission Factor to Determine Eligibility to Participate in the Self-Generation Incentive Program Pursuant to Public Utilities Code Section 379.6(b)(2) as Amended by Senate Bill 861*, issued on July 10, 2015. SolarCity and CalSEIA also recommend changes to Conclusions of Law 11 and 12, which are provided in Appendix A.

Page 2

The emission factor for generation technologies is updated from 379 kilograms carbon dioxide per megawatt hours ($kgCO_2/MWh$) to **~~360~~295** $kgCO_2/MWh$.

Page 9

The inclusion of renewable facilities among the portfolio**s** of plants used to set **both** the build margin rate **and the operating margin rate** decreases the avoided emissions rate **~~compared to the operating margin~~**.

Page 9

In D.11-09-015, the Commission assumed SGIP projects would avoid the need for new generation, meaning that the Commission found that**, in addition to affecting existing generation,** SGIP projects affect the build margin and avoid the need for utilities to procure new renewable capacity as well as new fossil-fired capacity. This finding was based, in part, on the fact that the Pub. Util. Code, specifically the statutorily based RPS program, obligates the utilities and other load serving entities to meet their retail loads with a certain percentage of renewable energy.

Pages 9-10

Under an operating margin approach, SGIP resources would be assumed to offset only the emissions of **~~a generator~~ the generation** that operates on the margin at the time the SGIP resource operates**~~; SGIP technologies would not be assumed to offset any zero-emission resources unless the marginal generator in California happened to be a zero-emission resource~~**.

Page 12

The methodology adopted in D.11-09-015 and incorporated into the SGIP Handbook assumes SGIP projects displace renewable energy generation in proportion to the statutorily-mandated amount of RPS procurement required at the time. ~~**As described earlier, this method implicitly assumes a build margin effect from the first year of operations.**~~

Page 12

SCE~~**, which supports an assumption of a predominately short-term grid impact, nevertheless**~~ argues that the SGIP eligibility should start with the GHG emission rates of gas-fired power plants from the CEC's Quarterly Fuel and Energy Report (also referred to as QFER) data, reduced by the required RPS percentage for each of the first five years of the project's operations.

Page 13

While AB 327 permits the Commission to require utilities to procure more than the minimum amounts prescribed by the RPS statute, the Commission has not exercised that authority. Moreover, the parties making this argument fail to explain why this would fundamentally change the interaction between the renewable energy requirements and the build margin **or operating margin**. As long as any future renewable energy requirements are based on a percentage of retail sales, the rationale underlying D.11-09-015 still applies: the utilities would forecast their loads, taking into account SGIP and other demand side measures, and submit compliance plans demonstrating sufficient procurement of renewable capacity to meet the higher standard set by the Commission.

Page 13

Therefore, we find it reasonable to adopt a methodology that assumes 33% avoided renewable capacity for the ~~**long-term share of the**~~ GHG emission rate threshold, with an adjustment to reflect line losses.

Page 22

GHG EF = **[1-RPS%*(1-LLF)]** * **[**(0.5(ER$_{OLF}$ * (1- WFP) + ER$_{OP}$ * WFP) + 0.5 ~~*** (1-RPS% * (1-LLF))**~~ * (ER$_{BLF}$ * (1 – WFP) + ER$_{BP}$ * WFP))**]** / (1 – LLF)

Page 23

GHG EF = **[1-RPS%*(1-0.084)] * [**(0.5 (382 kgCO_2/MWh * (1 - 0.08) + 544 kgCO_2/MWh * 0.08) + 0.5 ~~**(1-0.33 * (1 – 0.084)**~~ * (368 kgCO_2/MWh * (1 – 0.08) + 524 kgCO_2/MWh * 0.08))**]**/(1 – 0.084)

GHG EF = ~~**360**~~ **295** kgCO_2/MWh

Pages 37-38

1. Within 30 days of the effective date of this decision, the Center for Sustainable Energy, Pacific Gas and Electric Company, Southern California Edison Company, and Southern California Gas Company shall jointly file a Tier 1 Advice Letter revising the Self-Generation Incentive Program Handbook to modify the greenhouse gas emissions standard to ~~**360**~~**295** kilograms carbon dioxide per megawatt hour and to modify the minimum average round-trip efficiency for energy storage projects to 66.5%.

TABLE OF AUTHORITIES

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies, Procedures and Rules for the California Solar Initiative, the Self-Generation Incentive Program and Other Distributed Generation Issues.	Rulemaking 12-11-005 (Filed November 8, 2012)

COMMENTS OF SOLARCITY CORPORATION AND THE CALIFORNIA SOLAR ENERGY INDUSTRIES ASSOCIATION ON THE PROPOSED DECISION REVISING THE GREENHOUSE GAS EMISSION FACTOR TO DETERMINE ELIGIBILITY TO PARTICIPATE IN THE SELF-GENERATION INCENTIVE PROGRAM

Pursuant to Rule 14.3 of the Rules of Practice and Procedure of the California Public Utilities Commission (Commission), SolarCity Corporation (SolarCity) and the California Solar Energy Industries Association (CalSEIA) submit the following comments on the *Proposed Decision Revising the Greenhouse Gas Emission Factor to Determine Eligibility to Participate in the Self-Generation Incentive Program Pursuant to Public Utilities Code Section 379.6(b)(2) as Amended by Senate Bill 861* (PD) issued on July 10, 2015.

1. Introduction

SolarCity is California's leading full service solar power provider for homeowners and businesses, a single source for engineering, design, financing, installation, monitoring and support. At present, the company has more than 6,000 California employees based at more than 30 facilities around the state and has contracted to provide clean energy services to more than 260,000 customers nationwide. SolarCity offers paired solar and energy storage services to customers in California.

CalSEIA is a 501(C)(6) not-for-profit trade association with 280 company members involved in the solar energy and energy storage markets in California. Members include battery manufacturers and distributors, companies financing storage deployment, and providers of energy storage solutions to end use customers. CalSEIA represents member companies on policy issues, aids in market development, and facilitates business relations.

SolarCity and CalSEIA's advocacy in this docket has focused on supporting the continuation of the Self-Generation Incentive Program (SGIP) under SB 861. SGIP has successfully helped achieve California's goals by promoting the deployment of advanced energy storage and distributed renewable generation. We therefore strongly support updating the eligibility requirements in order to ensure SGIP appropriately incentivizes technologies that reduce greenhouse gas (GHG) emissions and support California's clean energy goals.

We are concerned, however, that the PD contains a flawed methodology for calculating the final GHG Emissions Eligibility Threshold for SGIP resources, and that this methodology represents a significant and inappropriate departure from the previous SGIP decision. While SolarCity and CalSEIA support the effort to improve the accuracy of the marginal grid emissions component of the overall GHG emissions eligibility threshold, we are concerned that the PD's proposed methodology does not appropriately apply the 33% Renewable Portfolio Standard (RPS) adjustment and will ultimately allow SGIP funds to be spent on resources that will increase, potentially significantly, GHG emissions in California. Allowing SGIP resources to be spent in this way is inconsistent with SB 861.

The methodology in the PD only marginally reduces the current SGIP emission eligibility threshold a mere 5% from 379 $kgCO_2/MWh$ (2011) to 360 $kgCO_2/MWh$ (not including the degradation factor). Appropriately applying a 33% RPS should be a minimum requirement of

SGIP to ensure SGIP is meeting the intent of SB 861. Applying the 33% RPS correctly would result in a SGIP GHG eligibility threshold of 295 $kgCO_2$/MWh. Including the 1% degradation factor, as proposed in the PD, a starting rate of 282 $kgCO_2$/MWh or lower would be needed in order to meet this threshold over the course of ten years. We therefore request that the PD be revised to accurately apply the RPS adjustment and ensure compliance with the fundamental objective of this program.

2. The PD's rationale regarding the RPS adjustment is flawed

At a high level, the role of the GHG emissions eligibility factor is to ensure that technologies participating in SGIP do not result in increased emissions relative to what would occur absent their deployment. Given the fundamental importance California has placed on reducing greenhouse gas emissions, it is essential that policies like SGIP are consistent with and advance that objective. SGIP technologies that receive incentives under SB 861 will be operational until approximately 2030 and the Commission should ensure the program is robustly achieving emission reduction. Intuitively this means setting the GHG emissions eligibility threshold at a rate that is equivalent to the emissions rate of the resources that would be relied upon but for the deployment of SGIP generation. This can be roughly boiled down into two factors – the emissions of the marginal generation that would be dispatched in lieu of getting energy from SGIP generation, and the reduced RPS procurement that behind the meter (BTM) generation results in by reducing the utilities' retail sales.

At a high level, the prior decision on this issue reflected this approach by applying the RPS factor to the entire underlying emission rate,[1] and SolarCity and CalSEIA contend that the

[1] *See* D.11-09-015 at pp. 14-15, 68.

basic methodology established in that earlier decision remains sound. However, an update to the formula to update the marginal emissions factor and the higher RPS is appropriate given that both of these factors are now out of date. Unfortunately, in making these changes, as described below in more detail, the PD inappropriately applies the RPS factor to a sub-component of the underlying formula used to calculate the marginal emissions factor. This results in a significantly higher emissions eligibility threshold that will result in SGIP supporting the deployment of technologies that actually increase GHG emissions.

More technically, the PD conflates installed RPS capacity with the volume of RPS generation and, in doing so, misconstrues the intent of the RPS adjustment by applying it exclusively to the build margin component of the marginal emissions rate. The RPS adjustment should, instead, be applied to the entire marginal emissions rate. In order to result in a net reduction in GHG emissions, an SGIP resource needs to have a lower emissions rate than the emissions of the generation it is displacing. Before accounting for losses, the avoided emissions can be thought of in the following way:

*Avoided Emissions per MWh of Load = 33% * 0 kgCO_2/MWh + 67% * marginal grid emissions rate*

The 33% RPS adjustment is meant to account for the fact that BTM resources reduce the volume of the RPS obligation by reducing the MWhs of retail load. As the PD acknowledges, the SGIP is explicitly included in the California Energy Commission's (CEC) energy demand forecasts, meaning RPS procurement is based on a retail energy demand forecast with the SGIP in mind.[2] In other words, in the absence of the SGIP, the CEC forecasts would have been higher

[2] PD at p. 10.

and therefore the utilities would have been compelled to procure a larger volume of renewable generation.

The PD incorrectly assumes that a MWh of SGIP generation this year means a MWh less generation from the marginal resource. In reality, that MWh of SGIP generation was assumed in the CEC forecasts, so the utilities did not have to procure the 330 kWh (33% RPS) of renewable generation corresponding to that MWh of reduced retail load. BTM generation, by reducing retail load, reduces the volume of generation needed to comply with the RPS. Because each MWh of RPS generation has zero emissions, recognition within the formula of the forgone RPS procurement results in a lower emissions eligibility threshold. In other words, while the deployment of BTM generation results in less dispatch of gas fired generation on the margin, it also means less renewable generation will be procured by the utility. This effect is what the RPS adjustment is meant to capture.

3. The PD inaccurately characterizes previous Commission statements regarding SGIP projects' displacement of new generation

SolarCity and CalSEIA disagree with the PD's assertion that D.11-09-015 "assumed SGIP projects would avoid the need for new generation, meaning the Commission found that SGIP projects affect the build margin and avoid the need for utilities to procure new renewable capacity as well as new fossil-fired capacity."[3] This is an inaccurate reading of the previous decision and represents a significant and inappropriate deviation from the previously approved methodology.

The second conclusion of law in D.11-09-015 states that, "It is reasonable to adjust the CARB's GHG factor by 20% [the RPS level in effect at the time] to reflect the fact that DG

[3] PD at p. 9.

displaces a mix of resources, including renewable resources as required by the RPS statute."[4] That conclusion of law did not imply that the Commission was only considering what would not get built in the future and ignoring the operating margin. Rather, presumably the Commission was acknowledging that the SGIP had impacted what generation was already in place. Knowing that the SGIP existed, the utilities procured a mix of fossil and renewable generation based on the RPS obligation to meet the anticipated loads. We assume that D.11-09-015 did not address operating margins separately because the Commission correctly recognized that the RPS impact was as much a part of the operating margin as it is a part of the build margin. To find otherwise appears to contradict prior Commission positions regarding the impacts of BTM distributed generation on the renewable procurement of the utilities where the Commission found that the deployment of BTM generation resulted in reduced RPS procurement. Specifically, in D.11-12-052, the Commission stated, "In considering the role of such unbundled RECs, it is also important to recognize that the on-site consumption of the electricity from the DG system has already produced an RPS benefit: it reduces the total retail sales of the interconnected utility, and thus reduces the amount of RPS-eligible procurement the utility requires." This impact is true in each and every year where the utility has an RPS obligation.[5]

We appreciate that there are different emissions rates for natural gas plants currently in operation versus natural gas plants yet to be built, and agree that these different rates should be part of the calculation. However, the SGIP impacts how much RPS generation accompanies existing natural gas plant generation just as the SGIP impacts how much RPS generation will accompany generation from natural gas plants in the future.

[4] D.11-09-015 at p. 68.
[5] D.11-12-052 at p. 35.

4. The PD's flawed reasoning results in an excessively high GHG Emissions Factor, which will lead to higher statewide GHG emissions

The excessively high GHG Emissions Eligibility Threshold that results from the PD's approach will lead to higher statewide emissions when non-renewable resources reduce BTM retail load. For fossil-fueled SGIP generators to provide net emissions reductions, their emissions rates need to be lower than the combined 67% marginal fossil resources and 33% RPS resources they displace. The build margin and operating margin concepts apply only to the estimation of that marginal fossil emissions rate. The 33% RPS adjustment factor must be applied to the whole factor to account for the fact that the BTM generation is displacing RPS generation by reducing the retail load on which the RPS obligation is set.

5. Example of appropriate use of the 33% RPS

a. Scenario

Suppose a 2 MW SGIP generator with an emissions rate of 360 $kgCO_2/MWh$ (the threshold set in the PD) operates 5,000 hours per year. That generation offsets 10,000 MWh of retail load at the customer's site per year, and therefore reduces the utility generation required to serve that load by 10,000 MWh times the line loss factor (or 10,840 MWh).

b. Baseline Scenario Emissions

In the absence of the SGIP generator, the 10,000 MWh of retail load would be met with 3,300 MWh of RPS resources (i.e. 33% RPS), and the remainder of the 10,840 MWh total required generation (7,540 MWh) will be met with marginal grid resources. The marginal grid emissions rate for the non-RPS resources would be 388 $kgCO_2/MWh$, using the values on page

22 of the PD.[6] That is, using the formula on page 22, but without the RPS factors or line loss factors.[7]

> ***Marginal Grid Emissions Rate*** =
> $0.5(ER_{OLF} * (1\text{-}WFP) + ER_{OP} * WFP) + 0.5 * (ER_{BLF} * (1\text{-}WFP) + ER_{BP} * WFP)$
> $= 388\ kgCO_2/MWh$

This would lead to emissions of $3{,}300\ MWh * 0\ kgCO_2/MWh + 7{,}540\ MWh * 388\ kgCO_2/MWh = 2{,}925{,}520\ kgCO_2$

c. Project Scenario Emissions:

With the SGIP resource producing the 10,000 MWh of generation at an assumed emission rate of 360 $kgCO_2$/MWh, the emissions from that facility would be 3,600,000 $kgCO_2$. Under this example, using the same emissions factors for natural gas generation used in the PD, the PD's threshold level would ***increase emissions by 674,480 $kgCO_2$*** in the first year alone as compared to simply purchasing the electricity from the grid. As the resource degrades through time, the increase in emissions attributable to the SGIP resource would continue to grow. Given that the SGIP is supposed to reduce overall emissions, it is unacceptable to have a net effect of increasing CO_2 emissions by millions of kilograms over the life of these systems.

d. Proposed Alternative Calculation Including Adjustment for RPS and Losses

Applying the RPS adjustment to both operating and build margins, using the values provided in the PD at page 22, and applying the line loss factors in the same way as the PD

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[6] We have plugged in the values from page 22 of the PD:
ER_{OLF} = operating margin emission rate of load-following plants = 382 $kgCO_2$/MWh
WFP = weighting factor for peaker plants = 8%
ER_{OP} = operating margin emission rate of peaking plants = 544 $kgCO_2$/MWh
ER_{BLF} = build margin emission rate of load-following plants = 368 $kgCO_2$/MWh
ER_{BP} = build margin emission rate of peaking plants = 524 $kgCO_2$/MWh
LLF = line loss factor = 8.4%

[7] The following formula provides emissions from a mix of natural gas generators, with half the emissions from existing plants and half from future plants, and 92% in each group from load-following plants and 8% from peaker plants.

results in the following final GHG threshold of 295 $kgCO_2$/MWh not including the degradation factor:

GHG Emissions Eligibility Threshold =
[1-RPS%*(1-LLF)] ** [(0.5(ER$_{OLF}$ * (1- WFP) + ER$_{OP}$ * WFP) + 0.5* ~~* (1-RPS% * (1-LLF))~~ ** (ER$_{BLF}$ * (1 – WFP) + ER$_{BP}$ * WFP))] / (1 – LLF)*
= (1 – RPS%*(1-LLF)) * Marginal Grid Emissions Rate/(1 – LLF) *= (.697) * (388)/(.916) = 295* $kgCO_2$/MWh

6. The 1% degradation factor implies that the starting emission rate of a SGIP generator must be lower than the average over ten years

Taking into account the 1% degradation factor, one would need to start with a rate of 282 $kgCO_2$/MWh to meet a threshold of 295 $kgCO_2$/MWh over the course of 10 years. To establish this starting threshold, solve for X in the equation summing emissions over ten years with starting emissions of X and a 1% annual increase in emissions, divided by ten years, and set equal to the average threshold of 295 $kgCO_2$/MWh. The following table provides the solution:

1	2	3	4	5	6	7	8	9	10
282.3	285.1	288.0	290.9	293.8	296.7	299.7	302.7	305.7	308.7
10-yr Average:		295.3							

Note that the PD does not include such a calculation, but it should. Given the PD's threshold of 360 $kgCO_2$/MWh, a qualifying generator with 1% degradation would have to start at 344 $kgCO_2$/MWh to achieve the threshold on average over the ten year period, which is currently not illustrated in the PD.

7. Recommended Changes to the PD

In conformance with Rule 14.3, these comments include a Subject Index listing the recommended changes to the PD and an Appendix A setting forth proposed findings of fact and conclusions of law.

SolarCity and CalSEIA suggest that the Commission can make these revisions expeditiously. While application of the RPS factor to the operating margin leads to a substantial change in the emissions threshold, the parties were given the opportunity to comment on the PD's approach already; the change proposed here is the obvious alternative, so further comments would simply repeat parties' positions. The proposal to average emissions over ten years to account for the 1% degradation factor is a modest fix that does not require comment, in our opinion.

8. Conclusion

The approach provided here will assure that the SGIP complies with the requirement to reduce GHG emissions in California, while SGIP generators at the threshold currently prescribed by the PD would increase emissions. This would conflict with statewide policy objectives to reduce GHG emissions and the clear intent of SB 861. Based on the foregoing, SolarCity and CalSEIA respectfully request the Commission adopt the PD with the revisions suggested in the Subject Index and Appendix A of these comments.

Respectfully submitted,

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July 30, 2015

APPENDIX A

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SolarCity Corporation (SolarCity) and the California Solar Energy Industries Association (CalSEIA) provide the following recommended changes to the conclusions of law in the *Proposed Decision Revising the Greenhouse Gas Emission Factor to Determine Eligibility to Participate in the Self-Generation Incentive Program Pursuant to Public Utilities Code Section 379.6(b)(2) as Amended by Senate Bill 861* (PD), issued July 10, 2015. At this time, SolarCity and CalSEIA do not recommend any changes to the PD's findings of fact.

Conclusions of Law

11. It is reasonable to revise the SGIP GHG emissions eligibility threshold under § 379.6(b)(2) for generation technologies to ~~**360**~~**295** kgCO2/MWh.

12. Under § 379.6(b)(2), it is reasonable for GHG-emitting technologies to demonstrate they will emit GHG emissions at a rate no higher than ~~**360**~~**295** kgCO2/MWh during their first ten years of operations, accounting for performance degradation, in order to receive SGIP incentives.