DOCKETED	
Docket Number:	19-BSTD-01
Project Title:	Draft 2019 Alternative Calculation Method Reference Manuals and Compliance Software Tools
TN #:	227224
Document Title:	SolarEdge Technologies Comments Residential and Nonresidential Alternative Calculation Method Reference Manuals and Compliance
Description:	N/A
Filer:	System
Organization:	SolarEdge Technologies
Submitter Role:	Public
Submission Date:	3/1/2019 2:54:11 PM
Docketed Date:	3/1/2019

Comment Received From: SolarEdge Technologies
Submitted On: 3/1/2019
Docket Number: 19-BSTD-01

'SolarEdge Technologies Comments: Residential and Nonresidential Alternative Calculation Method Reference Manuals and Compliance

Please find attached document with comments from SolarEdge Technologies. SolarEdge thanks California Energy Commission for your response.

Sincerely,
SolarEdge Technologies

Additional submitted attachment is included below.

2019 RESIDENTIAL ALTERNATIVE CALCULATION METHOD REFERENCE MANUAL AND COMPLIANCE SOFTWARE TOOLS

Comment number	Section	Comment
1	Table of Contents Appendix C – Photovoltaics and Battery Storage Appendix D – Plug Loads and Lighting Modeling Appendix E – Technical References Appendix F – 2019 Residential Alternative Calculation Method Algorithms	Only part of Appendix C is in the pdf available on the website Appendix D, E & F appear to be missing.
2	Appendix C Photovoltaic and Battery Storage Model	The Appendix appears substantially incomplete. Only what appears to be a drafting note "[from big ladder report] appears.
3	2.1.4.4 Battery Storage,	Appendix C does not contain detailed calculations for Battery Storage
4	2.1.4.5 Battery Controls	There are 4 battery control options specified in Residential Compliance Manual, and also in the Joint Appendix 12. This document only lists three. Alternative Control Approved by the Executive Director, is missing. This document, who's scope is to address addresses calculations and algorithms should reference the existence of this 4th control method, and clarify the language used in both the Joint Appendix 12.2.3.4, and 2019 Residential Compliance Manual Section 7.5.3, Alternative control section, that currently says "This alternative control option shall be accompanied with clear and easy to implement algorithms for incorporation into the compliance software for compliance credit calculations.

		Requiring "easy to implement algorithms for incorporation into the compliance software" by the compliance software developer, creates a substantial barrier to innovation for manufactures developing products that will deliver positive grid benefits, and appears to go against the intent and purpose of this section. It is also unreasonable to expect the compliance tool, a stand alone, software application to be capable of implementing algorithms that are capable of being implemented in an architecture such as the cloud, and that rely on dynamic, real time and historic inputs, which are not available to a stand alone software application. Additionally, the meaning of 'easy' is a matter of perception, which will vary significantly between algorithm developers so its use in this context is not meaningful. We propose that the commission should clarify the meaning of the phrase "This alternative control option shall be accompanied with clear and easy to implement algorithms for incorporation into the compliance software for compliance credit calculations used in 12.2.3.4 and 7.5.3 to mean "the alternative control options shall be capable of being modelled to a level sufficient to determine an energy design compliance credit rating for the Battery System in the compliance tool. Modelling for incorporation in the compliance tool, may be an approximate representation of the actual algorithms used, and it is acknowledge that the algorithms implemented by the battery system may change over time.
5	2.1.4.6 Self Utilization Credit	The section contains the following text. "The following table shows the self-utilization credits by building type and climate zone" Why is the Units in this table in percent, whereas in the remainder of the document, efficiency EDR is not in units of percent?

		Can you please provide a more clear explanation on the relative relationship between "The magnitude of the credit is equal to the 90 percent of the difference between the 2019 and 2016 Standards envelope improvements" and the values in the table (currently in percentages)
6	MPPT technology input in Software	Optimizers and microinverters make up to 90% of the residential market, that leverage SolarEdge requests that the 2019 Title 24 Alternative Calculation Method and Compliance Software Tools account for technologies that enable per module Maximum Power Point Tracking (MPPT), like DC to DC power optimizers, that mitigate transient and partial shading and benefit PV system's production compared to a PV system installed with a string inverter. The software must allow for optimizer or microinverter arrangement as an input.
7	EDR Tradeoff with Battery Storage System	When coupling PV with a battery storage system, the battery storage credit can be traded off with building's energy efficiency EDR. Requesting California Energy Commission (CEC) to please provide detailed guidance on amount of EDR points that can be traded off with each of the battery control strategies – Basic, TOU, Advanced Demand Response, Alternative control approved by Executive Director, in various climate zones. Please refer to slide shown in Figure 1 below that was shared at the Residential ACM workshop conducted by CEC on February 14, 2019. It was mentioned that roughly 3 EDR points could be traded off with Efficiency EDR, with 9.2 point difference between 28.1 (Prop. PV + Flexibility) and 18.9 (Std. PV). Can you please include more detailed example(s) explaining how many trade-able EDR points are equivalent to the difference between Prop. PV + Flexibility and Std. Design?
8	EDR Tradeoff with electric water heater	Requesting CEC to elaborate if diverting excess PV to electric water heater is acceptable. And elaborate on amount of EDR score that can be traded off with other efficiency features when electric water heater is installed.

CBECC Onscreen Reports: Energy Design Rating

Reports Proposed and Standard EDR scores for Efficiency, PV/Flexibility, and Total

Compliance Summary | CO2 Emissions | Energy Design Rating | Energy Use Details

EDR of Standard Efficiency: 44.0 - EDR of Standard Design PV: 18.9 = Total Std Design EDR: 25.1
Std Design PV: 3.24 kW
(not current)

EDR of Proposed Efficiency: 44.0 - EDR of Prop PV + Flexibility: 28.1 = Total Proposed EDR: **15.9**

End Use	Reference Design Site (kWh)	Reference Design Site (therms)	Reference Design (kTDV/ft²-yr)	Proposed Design Site (kWh)	Proposed Design Site (therms)	Proposed Design (kTDV/ft²-yr)	Design Rating Margin (kTDV/ft²-yr)
Space Heating	601	499.8	48.97	160	235.8	20.76	28.21
Space Cooling	1,769		61.13	409		20.91	40.22
IAQ Ventilation	243		2.49	243		2.49	0.00
Other HVAC			0.00			0.00	0.00
Water Heating		184.0	30.91	90	122.8	10.03	20.88
Self Utilization Credit						0.00	0.00
Photovoltaics				-5,179		-47.95	47.95
Battery				249		-17.38	17.38
Inside Lighting	2,615		30.42	616		6.98	23.44
Appl. & Cooking	989	73.4	19.70	1,041	45.1	14.48	5.22
Plug Loads	3,267		35.06	2,371		25.03	10.03
Exterior	328		3.54	152		1.61	1.93
TOTAL	9,811	757.2	232.22	151	403.8	36.96	195.26

24

Figure 1 – Energy Design Rating slide from Residential ACM Workshop Presentation