

Solar PV + Battery Energy Storage System Request for Information

Issued by: Cape Light Compact JPE

Issued: August 21, 2019

Revised: September 12, 2019

I. Introduction & Purpose

Cape Light Compact JPE (the Compact) is issuing this Request for Information (RFI) to solicit information regarding various financing and/or deployment models for solar photovoltaic (PV) systems paired with battery energy storage systems (BESS) on up to 250 single-family residential properties across Cape Cod and Martha's Vineyard. The Compact is seeking responses from solar and/or battery installers, financing entities, and any other interested parties. Two or more entities may submit a combined response if desired (e.g., solar installation company and financing company). The goal of this RFI is to determine what viable financing and/or deployment models exist in the market to achieve the project objectives while maximizing existing state and federal incentives and maintaining reasonable cost impacts to ratepayers. The Compact seeks to assess interest in and potential for such services and gather key information to inform a likely future Request for Proposals (RFP) for such services.

This is not an RFP or solicitation for formal proposals. This is a non-binding RFI. No award shall be made as a result of the RFI process and issuance of this RFI in no way constitutes a commitment by the Compact to issue an RFP.

II. About the Compact

The Compact is an intergovernmental regional energy services organization comprised of and serving its twenty-one member towns of Cape Cod and Martha's Vineyard. The Compact is a public joint powers entity and municipal aggregator pursuant to Massachusetts General Laws Chapter 40, §4A ½ and G.L. c. 164, §134. As authorized by each town and in accordance applicable law, the Compact administers the regional energy efficiency programs for its member towns on Cape Cod and Martha's Vineyard (i.e., is the Mass Save Program Administrator for member towns). More information on the Compact is available at <https://www.capelightcompact.org/>.

III. Background

In response to the Massachusetts Energy Act of 2018, the Compact sought approval from the Department of Public Utilities (DPU or Department) through its 2019-2021 Energy Efficiency Plan (D.P.U. 18-116) to incent the installation of solar PV systems, BESS, and cold climate air-source heat pumps as a package on up to 700 non-gas heated homes within the Compact's energy efficiency service territory (the towns on Cape Cod and Martha's Vineyard). The Compact called this proposal the Cape and Vineyard Electrification Offering (CVEO). As part of its CVEO proposal, the Compact planned to provide tiered incentives by participant income level for each technology.

While the Department did not approve the Compact’s CVEO proposal due to the desire for further stakeholder engagement, it did commend the Compact’s proposal and welcomed the Compact to submit a revised CVEO proposal after further stakeholder engagement.

In accordance with the DPU’s directives, the Compact plans to submit a revised CVEO proposal to the Energy Efficiency Advisory Council (EEAC) for review and feedback, and then to the DPU for approval. The Compact is currently in the process of reworking and refining the CVEO proposal, and the information solicited through this RFI is intended to assist the Compact in formulating its revised proposal in a way that achieves the objectives of the CVEO while minimizing costs to ratepayers.

IV. Project Summary and Objectives

The purpose of the CVEO is to provide cost-effective energy and demand savings by: 1) converting participants from electric baseboard, oil, or propane heat sources to cold climate air source heat pumps; 2) offsetting the resulting increased electrical usage and providing cost-effective grid energy use reductions by installing solar PV; and 3) installing battery energy storage as a cost-effective demand reduction resource and source of backup power for participants in the event of grid outages.

As part of the revised CVEO proposal, the Compact plans to reduce the size and the scope of the offering as compared to its original proposal. While the concept and technologies deployed will remain the same, the Compact plans to reduce the total number of homes to 250, and to only provide incentives for low-income (<60% SMI) and moderate-income (between 61% SMI and 80% AMI) customers, as follows:

Income Level & % State Median Income (SMI)		# Participants per Year			HP Incentive	Storage Incentive	Solar Incentive
		2020	2021	Total			
Low-Income	below 60%	50	100	150	100%	100%	100%
Moderate	61-80%	25	75	100	100%	100%	\$5,000

As laid out in the table above, the Compact’s current proposal is that low-income customers will receive all three technologies at no direct cost (shown in the table as a 100% incentive). Moderate-income customers will receive the heat pumps and BESS at no cost and will receive \$5,000 toward the cost of the solar PV system. Note that this proposal is subject to change.

Timeframe: The Compact seeks to begin implementation of the CVEO in Q1 2020 and have all installations complete by Q4 2021. This timeframe is subject to change and will be largely determined by if/when approval for the CVEO is granted.

V: RFI Objectives

The Compact’s two main objectives for this RFI are as follows:

1. Seek information on how to reduce CVEO costs and bill impacts

The Compact's energy efficiency programs, including its CVEO proposal, are funded primarily by electric ratepayers on Cape Cod and Martha's Vineyard through charges on their electric bills. The Compact is sensitive to program costs and their resulting bill impacts on ratepayers and seeks to minimize costs where possible. To that end, the Compact seeks information through this RFI that will help the Compact minimize costs and bill impacts to ratepayers by understanding the ability to monetize available state and federal incentives in the final design of the CVEO.

The Compact sees two primary financial models to deploy solar PV + BESS through its energy efficiency plan:

- a) providing an upfront incentive to the CVEO participant for all or a portion (depending on participant's income bracket) of the solar PV + BESS purchase price ("direct ownership model").
- b) allowing for a third party (or parties) to install, finance, operate, and own the system for a period of time and recoup the cost of the system over time through a power purchase agreement (PPA) or lease, federal and state tax benefits, and/or various federal and Massachusetts state incentives, with less or no money provided up front by the Compact or CVEO participants ("third-party ownership model").

As laid out in the RFI questions, the Compact is interested in information on the pros and cons of each of the above models and the feasibility of any alternative models presented by respondents that achieve the objectives of the CVEO and reduce costs to ratepayers.

2. Inform program design and implementation

The Compact does not have prior experience with the installation of solar PV and/or BESSs through its energy efficiency programs. The Compact is seeking information to inform the design and implementation of its proposal, including available technologies, scale, and installation timeline.

Note: While the Compact plans to incent solar PV, BESS, and air-source heat pumps as a package through the revised CVEO, the information requested through this RFI is limited to solar PV systems paired with BESS. The Compact is not seeking information related to the installation of air source heat pumps at this time, except as it relates to solar PV system sizing.

VI: Information Requested & Response Format

Responses should be submitted in narrative form as a PDF or Word document. All responses should include the following information on the first page:

- Name(s) of Firm(s)
- City and State of Firm(s)
- Firm Website(s)
- Contact Person Name & Title
- Contact Person Email

- Contact Person Phone

In your response, please answer each question you are responding to separately and indicate the number of the question you are responding to. Respondents do not need to respond to all RFI questions below. Respondents are welcome to limit their response to only those questions that they believe their experience and expertise can best inform.

Two or more entities may submit a combined response. Responses that include information on third-party ownership should assume that the direct cost paid to the participant is ultimately the same as laid out in the above table (e.g., if being financed through a lease or PPA, the lease or PPA cost for a low-income participant would be \$0).

Any Respondent that wishes to keep part of its submission as confidential should submit a redacted and an unredacted version of its response. The Compact will endeavor to keep the redacted material confidential to the extent permitted under the Massachusetts Public Records Law, as explained further below.

For questions that ask for an approximate value, Respondents may use the below example solar PV system to calculate answers. Respondents are welcome to use different system assumptions; however, the Compact asks that respondents provide all assumptions used. Please also provide assumptions used about losses.

- *Solar PV + BESS total installed cost: \$35,000*
 - *Solar PV cost: \$25,000*
 - *BESS cost: \$10,000*
- *Solar PV System Size: 8 kW DC*
- *Estimated annual production: 10,000 kWh AC*
- *Battery size: 5 kW/13.5 kWh DC*
- *Battery round-trip efficiency: 90%*
- *DC-coupled solar PV + BESS behind single inverter*
- *Inverter size: 13 kW DC*
- *Eversource East SMART Block 3*
- *Storage Adder Tranche 4*
- *Low-Income Property Tranche 1 (if applicable)*
- *Battery participating in Connected Solutions program, full discharge 60 times per year*
- *Tilt: 20 degrees*
- *Azimuth: 180 degrees*

For reference, the table below shows income thresholds by household size.

Household Size	Income Level	
	60%	80%
1	\$35,510	\$50,350
2	\$46,437	\$61,915
3	\$57,363	\$76,484
4	\$68,289	\$91,052

VII: RFI Questions

General:

1. Which model (third-party ownership or direct ownership) would achieve the Compact's low/no-cost deployment model at the lowest cost to ratepayers? Please explain in detail.
2. Is there a model other than the traditional direct ownership or third-party ownership options that may facilitate greater use of available incentives, particularly tax credits, while still minimizing program cost to ratepayers and achieving the no/low cost deployment proposed?
3. Which non-tax based Massachusetts state incentives (either existing or currently proposed) would solar PV + BESS likely be eligible for? For each listed incentive, please state whether the incentive changes based on customer income level and/or system requirements. For each listed incentive, please provide an approximate total value for the incentive, using the example solar PV + BESS provided above. For Clean Peak Energy Certificates, please utilize the MA Department of Energy Resources' [latest Clean Peak Standard straw proposal](#) when approximating value, and provide your estimate of both the expected number of CPECs and their outright and risk-adjusted value (note that you may submit a redacted version of this answer in accordance with Section X of the RFI).
4. Is there an accurate method for estimating changes in customer energy use due to the addition of heat pumps, in order to properly size a solar PV system to meet a customers' annual expected electricity use (without producing net excess electricity on an annual basis)?
5. Either on a percentage of system cost or a dollars-per-customer basis, please provide an approximation of industry-standard customer acquisition costs and/or an approximation of the savings achieved by eliminating the need to recruit customers. Also, please describe which customer acquisition and/or site assessment steps your company would not want a third party performing (e.g., accepting roof measurements from a third-party site assessor).
6. Are there any potential implementation challenges (including but not limited to installation, asset management, program operation, customer recruitment) that you anticipate the Compact will encounter in implementing this offering? If yes, please briefly describe, and explain possible adjustments to design or implementation to overcome or mitigate the challenges.
7. Please discuss the pros and cons of AC-coupled solar PV + BESS and DC-coupled solar PV + BESS. Please include the impact of the configuration on the ability to export energy from the BESS to the grid, either simultaneously or separately from solar PV system production and export. Please discuss if and how the DPU's Order in 17-146 regarding allowable solar PV + BESS configurations for net metering facilities impacts the selection of the optimal configuration.
8. Would solar installation firms or other firms be interested in installing batteries as new additions to existing solar PV systems? If so, please describe how the process of adding a battery to an existing solar PV system would take place, and the solar PV system information that would be necessary to determine site/system suitability.

9. Are you aware of any similar utility/energy efficiency programs in other states/jurisdictions, especially in the northeastern United States? If so, please provide a brief description and a web link to further information (if possible).
10. Do you consider the Compact's proposed installation timeframe to be feasible? If not, please explain.
11. What range of costs should the Compact expect for system interconnection and SMART qualification for each solar PV + BESS system? Please include costs that installers would normally pass through to customers (e.g., electrical inspection fees, SMART application fee, etc.) and not costs that are normally built into the price of the system (e.g., overhead costs associated with preparing and submitting applications, project management, etc.). Respondents are welcome to break out the cost/fee by each line item, or to provide one number (or a range) and list the costs/fees they've included.
12. Please provide any other information you believe to be pertinent to this proposal which you believe the Compact should be aware of. *Please DO NOT provide non-pertinent information, or further information on your company or why you believe your company would be an ideal vendor for this program. Any such information will not be considered.*

Third-party ownership:

13. Assuming the solar PV + BESS listed above, would a combination of federal and state tax incentives and Massachusetts solar and storage incentives be enough to recover the cost of the solar PV + BESS without requiring any upfront incentive from the Compact or any payment from the customer (i.e., a \$0 per kWh PPA or \$0 per year lease)? If so, please explain which incentives would be enough to recover the cost. If not, please provide the approximate amount that would be needed in addition to the available tax and non-tax incentives. Please state whether the answer varies by customer income level. Please include the PPA or lease term used in assumptions. Assume a \$0 system buyout at the end of the lease or PPA term.
14. Are there models in which one or more entities would finance the solar PV + BESS and a separate entity (or entities) would install, operate, and maintain the systems (as opposed to one entity both financing and installing the systems)? If so, please describe such a structure, and key considerations and/or advantages.
15. Please list which, if any, Massachusetts state and federal tax benefits a third-party owner would be able to monetize for a solar PV + BESS. For all listed benefits, please state whether they expire or change between now and the end of calendar year 2024, whether they are applicable to the solar PV or the BESS (or both), and whether there are any system hardware or configuration requirements that impact eligibility. For each listed benefit, please provide an approximate total value of the benefit, using the example solar PV + BESS provided above.
16. Given the Compact's proposal, please discuss whether a lease or PPA contract would be more appropriate, or the pros and cons of each.
17. Please describe the contract structure that you believe would be required between the Compact, the homeowner/participant, and the system vendor, in order to implement the

program, along with a brief description of the purpose of each contract. *Please DO NOT include any example form(s) of contract(s).*

18. Would it be possible for a third-party to own the solar PV but for the customer to own the paired BESS? If so, please explain key considerations (such as maintenance, operation, and/or warranty terms, etc.) for this approach. If not, please explain why this would not be feasible or practical.

Direct ownership:

19. Please describe your experience with the ability for customers in the CVEO’s target income range to take advantage of Massachusetts state and federal tax credits, given their limited tax liability, and how this may vary between low-income ($\leq 60\%$ SMI) and moderate income (between 60% SMI and 80% AMI). Please include an approximate average value of applicable tax credits for each income category, based on the example solar PV + BESS provided above. Please describe the expected impact of any applicable tax code changes between now and the end of calendar year 2024, and whether there are any system requirements that impact eligibility for any tax credits.
20. Please describe your experience with solar PV and/or solar PV + BESS installations for customers in CVEO’s target income range. Have you had many opportunities to serve these customers? Have you faced barriers to serving these customers? Please elaborate.

VIII: RFI Schedule

RFI Issued	Wednesday, August 21, 2019
Written Clarification Questions Due from Respondents	Thursday, September 5, 2019
Responses to Clarification Questions Posted	Thursday, September 12, 2019
Conference Call for Further Respondent Questions	Monday, September 16, 2019
Written Responses Based on Conference Call (if needed)	Wednesday, September 18, 2019
RFI Responses Due	Monday, September 23, 2019

IX: Communications

All substantive questions about the RFI and RFI responses should be submitted by **email only** to Austin Brandt, Senior Power Supply Planner, at austin.brandt@capelightcompact.org. All emails should include “Solar PV + BESS RFI” in the subject line.

X: Confidentiality

The Compact will not publicly disclose any redacted material in RFI responses unless is legally compelled to do so. The Compact shall have the right to disclose submissions, including all information therein and

otherwise submitted as part of the RFI process which is designated as confidential by the Respondent, to the Compact's employees, consultants, and representatives involved in the RFI review process. The Compact assumes no liability for the inadvertent disclosure of information disclosed by Respondents pursuant to this RFI.

Respondents should be aware that Compact and its members are subject to public records laws, including without limitation, the Massachusetts Public Records Law (M.G.L. c. 4, §7, cl. 26), as well as the Massachusetts Open Meeting Law (M.G.L. c. 30A §§18-25). There is an exemption to the Massachusetts Public Records Law that permits the Compact to withhold certain "trade secrets or confidential, competitively-sensitive or other proprietary information provided in the course of [its] activities" when the Compact "determines that such disclosure will adversely affect its ability to conduct business in relation to other entities making, selling or distributing electric power and energy" M.G.L. c. 4, §7, cl. 26 (s). If the Compact receives a records request for any redacted submission, the Compact will make a determination on a case by case basis whether the redacted material falls into this exemption (or another applicable exemption).

The Compact may disseminate a general summary of the RFI responses in the aggregate without attribution to individual Respondents.

XI: Cost of Responding to this RFI

All costs of responding to this RFI shall be borne solely by the Respondent.

XII: Future RFP(s)

Respondents to this RFI will be placed on the list of recipients to receive a copy of any RFP(s) arising out of this RFI process. However, a response to this RFI is not required to submit a proposal pursuant to any future RFP.

The Compact will review responses received for the purpose of gathering information and market research only. The Compact will not score or rate responses received.

The Compact reserves the right to communicate and/or schedule interviews/presentations with Respondents, if needed, to obtain clarification of information contained in the responses received and/or additional information to enhance market research efforts.