GOVERNMENT OF PUERTO RICO
PUBLIC SERVICE REGULATORY BOARD
PUERTO RICO ENERGY BUREAU

IN RE: REGULATION FOR ENERGY EFFICIENCY AND DEMAND RESPONSE	**CASE NO.:** NEPR-MI-2019-0015 **SUBJECT:** Notice of Proposed Regulation & Request for Public Comments.

To the Honorable Energy Bureau:

Comes now Sunrun, to submit our comments regarding the above captioned matter.

Comments by Sunrun to Draft Energy Efficiency/Demand Response Regulation

I. Introduction

As per Act 17-2019, the Puerto Rico Energy Public Policy Act, electric power service shall be governed by several principles, including, *inter alia*, efficiency, quality, continuity and adaptability. The efficiency principle is clearly germane to others like demand response, demand-side management strategies. This Energy Efficiency/ Demand Response Regulation (hereinafter, the draft or proposed regulation), as this Honorable Bureau has stated, aims to 'consider short, medium-, and long-term goals and incentivize customers to become more efficient in their use of energy.' The main goal of these programs is to reduce costs associated with energy consumption and to provide a stable and reliable electric service in Puerto Rico.

Also, as per Act 57-2014, this Honorable Energy Bureau is tasked with ensuring that Puerto Rico reaches a goal of thirty percent (30%) of energy efficiency by 2040, as well as establishing the regulations and programs to administer and achieve these ends.

In general, the proposed regulation establishes a procurement process for this Honorable Energy Bureau to choose a Third Party Administrator for Demand Response & Energy Efficiency programs in Puerto Rico, as well as additional norms that are relevant to this main objective.

Sunrun formally entered the Puerto Rico market in 2018, in partnership with local solar and storage companies Maximo Solar Industries, Windmar Home, and New Energy. Sunrun is the leading residential solar, storage, and distributed energy services company in the United States, with over 1,760 MW deployed and more than 255,000 customers in 22 states, the District of

Columbia and the Commonwealth of Puerto Rico. Sunrun is founded on the firm belief that prosumers – and how they manage their energy consumption, where they live and where work – are the grid's greatest energy resources. We are already installing our residential solar plus storage systems, growing local jobs, and helping to rebuild the grid, one home at a time. And we deploy the same smart and advanced solar and battery systems in Puerto Rico as we do across leading market states like California, Hawai'i, Florida, New York and others.

Puerto Rico is advancing policies that enable the transition to a decentralized and democratized electricity system. Act 17-2019 created a goal of 100% renewable energy by 2050. In contrast to other renewable energy standards, our bipartisan legislation provides a very clear role for distributed generation to play in achieving this goal. Also, the Puerto Rico Electric Power Authority (PREPA), has in its Integrated Resource Plan (IRP) a goal of approximately one gigawatt of solar and a similar amount of energy storage by 2022 as part of a redesign of the island's energy generation. Note also that the Federal Energy Regulatory Commission (FERC) Order 745 has held that demand response (DR) resources, given their capability to balance supply and demand as an alternative to a generation resource, and given that dispatch of that demand response resource is cost-effective, must be compensated at the market price for energy, helping to ensure the competitiveness of markets and remove barriers to the participation of demand response resources.[1] FERC's Order 745 was upheld by the Supreme Court in *FERC v. EPSA*, 136 S. Ct. 760 (2016), and should be highly persuasive in Puerto Rico.[2]

The solar and battery systems that customers adopt can and should contribute towards our several legislated renewable energy and EE/DR targets. Prosumers must be helped to become more integrated with the grid, not be pushed out. One way to do this is by encouraging customers to adopt batteries and be prepared for a future hurricane or other critical event, while giving them the opportunity to earn value delivering clean energy and grid services from their batteries back to PREPA when it needs it.

Again, Sunrun congratulates the Energy Bureau for yet another concrete step that proves our regulator is a forward thinking leader, guiding Puerto Rico's energy ecosystem in the right direction.

II. General Comments

This Honorable Bureau is proposing an Energy Efficiency / Demand Response framework based on a Third Party Administrator (TPA) construct, which was generally borrowed from Hawai'i, as expressed in the public hearing for this docket. The independent energy efficiency TPA in that sister state is called Hawai'i Energy[3] (a Leidos company[4]). Since 2009, Leidos has

[1] <https://www.ferc.gov/EventCalendar/Files/20110315105757-RM10-17-000.pdf>.

[2] <https://www.supremecourt.gov/opinions/15pdf/14-840-%20new_o75q.pdf>.

[3] <https://hawaiienergy.com/>.

[4] Leidos, is a company that provides scientific, engineering, systems integration, and technical services, linked to defense. *See*,

administered the Hawaii Energy program, an electric ratepayer-funded energy conservation and efficiency program serving Hawai'i, Honolulu, and Maui counties under the direction of the Hawai'i Public Utilities Commission. Energy efficiency plays a key part in achieving Hawai'i's goal of achieving a 100% renewable energy portfolio standard by 2045. Leidos' programs are basically designed for residents to use less energy. Leidos administers Hawai's's "Public Benefits Fund", which collects roughly 1-2% of every bill for this program.

Theoretically, Leidos would get paid more for delivering more energy efficiency. It is our understanding that around every 5 years that energy efficiency contract is put out for a new RFP process, so theoretically that TPA can be replaced if they are underperforming. It is therefore very important that this Honorable Bureau, perhaps with stakeholder input, keep very close, independent oversight of such a TPA contract, once granted. Regular reporting demonstrating how said TPA is complying with strategic goals and and achieving set targets in their efforts.

Demand Response (DR), or better "Load/Demand Flexibility" is critical for both Hawai'i's and Puerto Rico's future; note, however, that DR is not a part of Hawai'i Energy duties. In Hawai'i, the DR program is run by HECO utilities, which are responsible for balancing power supply and demand. It is difficult to envisage a non-system operator managing DR. A TPA non-system-operator entity would need a clear delegation from the utility and/or PREB granting direct control of utility infrastructure and physical access to behind-the-meter systems, to respond to spikes in PREPA's demand (given fairly compensated access is granted either by a single client or a systems aggregator to the pertinent DR authority, of course). PREB must clarify the specific respective roles and legal obligations of PREPA (or its successor) and the TPA.

Aggregations of PV plus storage

In this connection, note that aggregated residential solar and energy storage systems operators are increasingly providing more energy and grid services, including DR, Load/Demand Flexibility, to the electrical grid. At the beginning of this year, Sunrun won a historic bid to provide 20 MW of distributed energy for the ISO New England capacity market.[5] Now a Sunrun project in Oahu, which will involve about 1,000 home battery systems, will establish one of the largest demand response virtual power plant projects in the world, bringing fast frequency response from distributed systems, and granting the utility leeway to bring other generation sources online, when required.[6] Solar-plus-storage behind-the-meter systems can be tapped to respond to grid needs faster than conventional generators, and it can be done in a more cost competitive way than adding utility-scale generation. The Hawai'i PUCs have approved more of these demand response projects within HECO's service territory, creating space and opportunity for more distributed solar-plus-storage partnerships.[7] Increasing the amount of distributed demand response is more economical than new plant buildout and current plant O & M. Sunrun

<https://www.leidos.com/competencies/integrated-systems>.

[5] <https://www.utilitydive.com/news/residential-solarstorage-breaks-new-ground-as-sunrun-wins-iso-ne-capacity/547966/>.

[6] <https://www.utilitydive.com/news/sunrun-partnership-enhances-hecos-ability-to-tap-into-der-systems-when-pow/562733/>.

[7] <https://www.utilitydive.com/news/hawaii-regulators-question-lack-of-non-wires-alternatives-in-hecos-integra/560470/>.

is ready today to help Puerto Rico move in this forward-thinking direction.

Programs over Procurements

We suggest that PREB make sure and encourage via regulation that any TPA EE/DR entity must think and act programmatically, not locked into a procurement mentality which can cause scoping issues and other problems and distortions. Programs should generally be open access (like tariffed programs), rather than RFP based to ensure anyone with a DER can participate in DR programs and help reduce costs for all ratepayers. These DR programs are a path for the utility to defer some infrastructure investments. They also reduce costs for the customers who participate and allow the aggregator to make a reasonable return.

Consumer-centered utilities know that engaging third-party innovators extends their capabilities in bringing new technologies to customers. It is well known that PREPA has been slow in the past to move in this customer-centric direction, although that has noticeably improved recently given the forward looking norms established in paradigm shifting laws like Act 57/2014 and Act 17/2019. All policies, programs and incentives must be aligned to strengthen a customer's connection to the grid, and contribute to make it better and cleaner, as technology quickly moves to enable customers to simply begin unplugging from it.[8] DR programs are one such policy tool.

Although the draft regulation mentions that "energy storage technologies, such as batteries…may provide DR services" PREB should reiterate that distributed battery storage programs are truly valuable to the grid and to customers. Distributed storage not only provides resilience to individual consumers and prosumers, but also provides capacity, frequency regulation, ramping and other energy services to the grid and its operator. Successful programs compensate prosumers for the benefits their devices provide to the grid, and, in a virtuous cycle, also make batteries progressively more affordable and accessible for those prosumers.

"Bring your own device" (BYOD) policies and programs are being adopted throughout the United States to achieve these ends. These programs create a more stable system, a more financially healthy utility, and prevents customers from abandoning the grid and relying solely on their own resources. BYOD refers to utility and non-utility programs that encourage customers to acquire pre-approved devices from a vendor of their choosing. Customers can enroll the devices into demand response or energy efficiency programs usually managed through the utility, an energy supplier or a third-party systems aggregator. BYOD broadens the range of consumer technologies eligible to participate in energy efficiency and demand response programs. Battery storage, smart thermostats, electric vehicles, smart appliances and smart solar

[8] In this sense, one can think of how irrational and counterproductive some policies can be. For example, the rate structure in the PREPA Bondholders Restructuring Agreement (RSA) targets interconnected solar prosumers from all walks of life with solar taxes, BTM solar generation charges. These prosumers are part of the rate base that actually creates grid benefits and also pays their fair share for the grid power they actually consume. Worse said RSA encourages total grid defection via an exemption on all charges and taxes to those that can afford to abandon the grid and that rate payer base. Nothe that, in specific relation to this current draft regulation, the "System Benefits Charge" cannot not be assessed on gross consumption. Perhaps move to an alternative flat fee. It would otherwise would be working against public policy goals.

inverters present great opportunities to manage energy usage, energy efficiency and load shifting applications.

PREB must not only clarify the specific respective roles and legal obligations of PREPA and the TPA in general, but also focus on their role(s) in supporting distributed battery storage for EE/DR. Consumer battery providers can make this seamless for both utilities and customers alike by managing battery charging and response. The positive impact can be huge; energy efficiency and demand response programs could significantly reduce the need for new generation capacity by about 38%.[9]

One very interesting and pertinent BYOD program is National Grid's "*ConnectedSolutions*" initiative in several states.[10] Batteries can be utilized year-round, enabling these programs to "peak shave" throughout the year and reduce the cost of generation and transmission capacity for all customers. Basically, by allowing utility companies to draw power stored in batteries such as LG Chems or Tesla Powerwalls (both in Sunrun's growing Puerto Rico fleet), among other brands, during times of peak demand, the utility is able to balance out the electric grid and avoid the use of energy from expensive, dirty, non-renewable peaker plants, and compensate that customer for that power. Customers with solar PV plus batteries get compensated as the utility gains the ability to tap the battery up to 60 times per summer and five times per winter, with each event lasting a maximum of three hours. This safeguard allows customers sufficient emergency energy source during power outages. Battery draws could be equally limited in Puerto Rico during hurricane season, as a resiliency guarantee. PREB should consider adopting these programmatic approaches as they have proven quite effective to achieve the stated policy ends.

III. Specific Comments

1. Energy storage should be added to any energy efficiency programs. EE should be rebranded and conceived as "Energy Optimization" programs, not just efficiency. In page 17, regarding the three year plan mandate, we suggest incorporating a reference regarding "best practices from US EE/DR plans".

2. The proposed regulation asks companies bidding for the TPA role to propose their own performance-based compensation structures, which entails some risks. PREB should instead establish clear priorities and norms for such compensation based on successful precedents such as the programs described in this comment. Prosumer incentives should be a combination of a rebate and performance payments, with added incentive and/or low/no-cost financing for low-income customers. The performance payments are important to provide a price signal which will ensure that customer batteries are dispatched on peak, thus providing the greatest benefit to ratepayers. Direct dispatch control by the utility is not necessary in that instance.

3. It is fundamental that third party developers/aggregators (solar and storage installers) be

[9] <https://www.edisonfoundation.net/iei/publications/Documents/Transforming_Americas_Power_Industry.pdf>.

[10] <https://www.nationalgridus.com/MA-Home/Connected-Solutions/BatteryProgram>.

allowed to participate by marketing batteries to customers and aggregating distributed systems. This will create a more competitive and diverse market for energy storage.

4. *Establish value.* Among the goals of this proceeding should be to increase the PREB's understanding of the value of behind-the-meter energy storage as a peak demand reduction measure. Traditionally, energy efficiency has been understood as a reduction in net consumption. However, there are other forms of efficiency. One key to the inclusion of energy storage in the MA EE program was the recognition that peak demand reduction is a form of efficiency that can deliver great economic savings.

5. *Explore incentive mechanisms.* Another goal of this proceeding should be to consider how best to incentivize behind-the-meter energy storage. It will be important that the incentive mechanism fairly compensates customers who install storage, and is inclusive of low-income communities. At the same time, it will be desirable to provide a price signal or other mechanism to ensure that behind-the-meter batteries are discharged on peak, in order to meet the Commonwealth's efficiency goals. Battery storage is unlike many other traditional efficiency measures in that mere installation of a battery does not guarantee it will be used in a way that delivers value to ratepayers. For this reason, offering a battery rebate alone is unlikely to result in significant peak demand reduction. Based on the experience in MA and other states, we suggest a hybrid approach, combining both an up-front rebate and seasonal or annual performance payments.

6. Consider how other states are integrating energy storage into their energy efficiency programs. Energy storage was included in the three-year MA energy efficiency plan, which began in January, 2019. The two main utilities in MA, Eversource and National Grid, have now proposed or are offering similar programs in Rhode Island, New Hampshire and Connecticut. Liberty Utilities is also offering a residential battery pilot in New Hampshire, and Cape Light Compact has proposed an alternate customer battery program in their service territory on Cape Cod. PREB should survey these programs, learn from them, and insert their elements in this draft regulation.

7. Consider how storage in the energy efficiency program would interact with other related programs in Puerto Rico. One important issue that was addressed in MA was how storage in the EE program would interact with other programs, such as the MA SMART solar rebate (which includes a storage adder) and the MA net metering program. Currently, customers installing solar and storage in MA are eligible to participate in all three programs (net metering, SMART rebate and EE storage performance payments). These three programs work in tandem: the SMART program provides a rebate for both the solar and the storage, the net metering program compensates customers for renewable electricity generated by their solar panels, and the EE performance payment compensates customers for discharging their batteries during peak demand hours.[11]

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[11] Generally and also specifically for comments 1 through 7, please *see*, "*Clean Energy Group and Clean Energy States Alliance Comments to Vermont Public Service Commission on Case No. 19-2956-INV; Recommendations on the goals, scope, structure, and schedule of this proceeding 10/10/2019*", Appendix 1.

8. Overall, Sunrun suggests that PREB utilize the more modern concepts of "Energy Optimization" instead of EE and "Load Flexibility / Demand Flexibility" rather than just DR. Also, at page 17, goals of programs should include focus on "increased storm resilience by encouraging more residential storage through market opportunities like peak DR programs and leveraging existing residential storage to perform functions other than backup power." Same resilience principles should be reflected in page 23 of this draft regulation.

9. Definition of Demand Response must clearly enable DG and exports. Replacing with "Demand Flexibility" could enable this. Definition must include grid injections when from a BTM load-serving resource (i.e., no baselining).

10. 2.1.c - Broaden to Demand Flexibility. Capability of Administrator is important.

11. 5.1.a - Resilience is included in the benefits test. This critical aspect must be maximized in terms of valuation.

12. 5.2.a - In this key section, Sunrun suggests PREB include a comprehensive reference of Demand Flexibility.

13. 5.2.d - TDP/SO has to provide all relevant cost data.

14. 7.2.a - "Contracted vendors" - Wording could be enhanced, perhaps change to "qualified" vendors.

15. 7.6.2 - Public sector participation is interesting and positive. PREB should be stronger in compelling public sector participation. PREB should clarify that ESPC structure includes a PPA model for delivering DG to public sector clients.

16. 8.1.a.1.e - Note interesting role of Administrator as Aggregator. Implies sophisticated functionality.

17. 8.1.b.2 - PREB should insert specific mention of exports, not just load reduction, for DR / Demand Flexibility.

18. 8.4.e - Article puts customer compensation in the hands of TDP/SO. Aggregators can flow value to customers/prosumers much more efficiently than a utility, given cumbersome billing systems.

19. 8.5.b - PREB should insert direct metering of batteries in this section that describes baselining load. Note that throughout Northeast, NY, and ISO-NE, it's inverter based metering with integrated revenue grade meters. No baselining.

20. 9.2.a - Aggregated access to customer data can facilitate deployment of DR, making provision for getting data in some way separate from customer consent to get data to serve as demand response provider.

21. 9.2.d.1 - RGM chip should suffice in place of a utility meter for direct metering of DG.

Net-metering also key.

22. 10.1.a.1 - TOU rates should be a "shall" not a "may". Rate design should be incorporated into this docket, EE and DR could layer on existing rates.

23. 11.1.c.1 - References that EE and DR resources "shall" be included in the IRP. This is an efficient way to mandate a specific IRP enhancement. IRP process seems quite lacking in relevant EE & DR targets. PREB should clearly define and quantify the goal of 30% energy efficiency by 2040. It is important to set a starting point and perhaps the total specific energy savings target, in MWh. PREB should also leverage this process to enhance that IRP, in regards specifically allowing independent market players to offer EE / DR services alongside their solar PV plus battery storage resources.

24. 12.1.a.1 - NWAs: PREB may focus more specifically on transmission infrastructure, on longer planning cycles. Distribution grid planning shall be very local, and with shorter timeframes, yet always ensuring good stakeholder participation. Again, open access programs like BYOD rather than RFP processes, which may be scoped incorrectly.

25. 12.2 - Geo-targeted program maximization would be positive; perhaps link to mini-grids in IRP, link to transmission spend, use additional tools like customer data, engaging municipalities and public sector entities, etc.

PREB is carrying out its statutory duties in a correct, responsible and forward-looking way by initiating this regulatory process. The proposed regulation is one of the critical initiatives, alongside the IRP, the Performance Incentives Regulation, pro-renewables Interconnection Regulations and others, to walk the path laid out by Act 17 and also reach its goals.

Again, Sunrun congratulates PREB for its continued leadership in Puerto Rico's energy pro-renewables paradigm shift and also thanks this Honorable Bureau for this valuable opportunity to comment.

In San Juan, Puerto Rico, on 11 October 2019.

Respectfully submitted,
[*signed/ Javier Rúa-Jovet*]

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Appendix 1

October 11, 2019

Comments to Vermont Public Service Commission on Case No. 19-2956-INV

Recommendations on the goals, scope, structure, and schedule of this proceeding

To the commissioners:

We submit these comments regarding potential inclusion of energy storage in the Vermont Energy Efficiency Program, as contemplated in Act 62 of the Vermont Legislature.

Clean Energy Group and Clean Energy States Alliance have extensive experience with this topic, notably in the state of Massachusetts, which this year became the first state to incorporate energy storage into its energy efficiency plan, as a peak reduction measure. CEG/CESA worked closely with the Massachusetts Department of Energy Resources, the Massachusetts Energy Efficiency Advisory Committee, and other clean energy NGOs on this issue. In particular, CEG contracted the Applied Economics Clinic (AEC) to conduct an independent cost/benefit analysis of behind-the-meter battery storage, which showed that storage passed the required Total Benefit Cost (TRC) test and was therefore eligible to be included in the energy efficiency plan. CEG further contracted with AEC to review the energy efficiency program administrators' own cost/benefit analysis, and to identify and calculate values for seven non-energy benefits of energy storage, which were not included in the PAs' TRC test. This work, along with an explanation of how peak demand reduction creates valuable efficiencies in the electric system, is included in our recent report, Energy Storage: The New Efficiency.

It is notable that in the few short months since Massachusetts included storage in its efficiency plan, a number of other New England states are contemplating doing the same. Proposals are being considered in New Hampshire and Connecticut, and storage has already been incorporated as part of National Grid's energy efficiency offerings in Rhode Island.

We would also note that CEG/CESA has a long history of energy storage work in Vermont, including work on the groundbreaking Stafford Hill Microgrid in Rutland (with GMP) and the McKnight Lane redevelopment project in Waltham (with GMP and VEIC). We also provided technical support to the VT DPS in writing the Vermont Energy Storage Study (Act 53 Report to the Vermont General Assembly). The McKnight Lane project was a precursor to GMP's larger Tesla and BYOD residential battery programs. I have twice been invited to provide expert testimony on energy storage to the VT House Energy & Technology Committee, most recently in April of this year on the topic of energy storage as an efficiency measure, following publication of our report (linked above).

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With regard to the question of whether to include battery storage in the Vermont energy efficiency program, we believe this can and should be achieved, with the following conditions:

1. Energy storage should be added to the existing energy efficiency program with no expansion of the program budget. Instead, storage would begin to displace some existing efficiency measures, such as lighting, that are of diminishing utility (due to federal lighting efficiency standards).
2. Customer incentives should be a combination of a rebate and performance payments, with added incentive and/or low/no-cost financing for low-income customers. The performance payments are important to provide a price signal, which will ensure that customer batteries are dispatched on peak, thus providing the greatest benefit to ratepayers. Direct dispatch control by the utility is not necessary.
3. We are agnostic as to whether Efficiency Vermont administers a single customer battery program in collaboration with the distribution utilities, or whether there are two or more parallel programs (utility programs and an energy efficiency program) for customers to choose from. What is important is that third party developers/aggregators (solar and storage installers) be allowed to participate by marketing batteries to customers and aggregating distributed systems. This will create a more competitive and diverse market for energy storage in Vermont.

We look forward to contributing to the consideration of energy storage in Vermont's energy efficiency program. In response to the PUC's request for comments on the goals, scope, structure, and schedule of this proceeding, we offer the following comments.

1. Goals

a. **Establish value.** Among the goals of this proceeding should be to **increase the commission's understanding of the value of behind-the-meter energy storage as a peak demand reduction measure in Vermont.** Traditionally, energy efficiency has been understood as a reduction in net consumption. However, there are other forms of efficiency. One key to the inclusion of energy storage in the MA EE program was the recognition that peak demand reduction is a form of efficiency that can deliver great economic savings. The State of Charge report concluded, based on data from ISO-New England, that 40% of the state's overall cost of electricity (paid by ratepayers) was attributable to just 10% of the hours each year. Because these occasional annual peak demand hours are so costly, a technology that can reduce peaks and flatten the demand curve can deliver significant cost savings to ratepayers, even though it may not reduce net consumption. This is why peak demand reduction was legislatively included among the goals of the MA EE plan (see the 2008 Green Communities Act, the

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2016 Act to Promote Energy Diversity, and the 2018 Act to Advance Clean Energy). For example, the Act to Advance Clean Energy specifically allows the use of energy efficiency funds to support the deployment of cost-effective energy storage "if the department determines that the energy storage system installed at a customer's premises provides sustainable peak load reductions."

These laws make it clear that the MA energy efficiency program is to achieve reductions both in electricity *consumption* and in electricity *demand,* and that both of these objectives provide value to ratepayers. Energy storage, installed behind a customer's meter, is a technology that can be used to reduce electricity demand. Peak load reduction clearly has value in Vermont as it does in Massachusetts. Because both states are within the ISO-New England wholesale market, and utilities in both states pay the same prices for capacity (based on the ISO's 3-year forward capacity market), the value of peak demand reduction in Vermont should be similar to what it is in Massachusetts. We know there is such a value because Green Mountain Power has demonstrated significant savings by aggregating and discharging thousands of customer-sited batteries during regional demand peaks. Specifically, GMP saved more than $750,000 last year by discharging batteries, many of which were located behind customer meters, during the 1-hour annual regional peak demand event.[1] Given this experience, testimony from GMP should be very useful in helping the Commission to assess the value of behind-the-meter battery deployment in Vermont.

We note that Vermont Title 30, Chapter 005, states that among the objectives of the Energy Efficiency Fund is "reducing Vermont's total energy demand, consumption, and expenditures," and further states that in order to achieve this, the Commission shall "Consider innovative approaches to delivering energy efficiency." Thus it may not be necessary to amend the existing law in order to include energy storage in the Vermont energy efficiency program. However, in considering battery storage as an "innovative approach," the Commission should seek to better characterize and quantify the value of peak load reduction in Vermont.

b. **Explore incentive mechanisms.** Another goal of this proceeding should be to consider **how best to incentivize behind-the-meter energy storage in Vermont.** It will be important that the incentive mechanism fairly compensates customers who install storage, and is inclusive of low-income communities. At the same time, it will be desirable to provide a price signal or other mechanism to ensure that behind-the-meter batteries are discharged on peak, in order to meet the state's

[1] https://greenmountainpower.com/wp-content/uploads/2018/11/2018-09-12-Rebuttal-Testimony-of-Joshua-Castonguay.pdf

efficiency goals.

Battery storage is unlike many other traditional efficiency measures in that mere installation of a battery does not guarantee it will be used in a way that delivers value to ratepayers. For this reason, offering a battery rebate alone is unlikely to result in significant peak demand reduction. A performance payment, such as was developed for the MA program, incentivizes on-peak battery discharge, but does little to assist the customer in defraying the initial cost of the storage system.[2] Based on our experience in MA and other states, we suggest a hybrid approach, combining both an up-front rebate and seasonal or annual performance payments. We also suggest low- or no-cost financing, as is provided in MA through the HEAT loan program. And we urge Vermont to provide both a carve-out and an adder to encourage the participation of low-income customers.

Again, GMP will be able to provide good data on incentive structures and rates based on its experience in its Tesla and BYOD programs. However, it will also be important to look as well at the programs proposed or under development in other New England states, especially from National Grid in MA and RI, Eversource in MA and CT, and Liberty Utilities in NH. Additionally, Cape Light Compact in MA proposed a very different program to the MA DPU, which is currently under discussion and should be considered as an alternative.

In considering incentives, it should not be necessary to increase the efficiency program budget. Incorporating new efficiency technologies into energy efficiency programs is a best practice, but this does not mean that program budgets expand every time a new efficiency measure is introduced.

2. Scope

a. **Consider how other states are integrating energy storage into their energy efficiency programs.** As noted above, CEG worked extensively with Massachusetts to get energy storage included in the three-year MA energy efficiency plan, which began in January, 2019. The two main utilities in MA, Eversource and National Grid, have now proposed or are offering similar programs in Rhode Island, New Hampshire and Connecticut. Liberty Utilities is also offering a residential battery pilot in New Hampshire, and Cape Light Compact has proposed an alternate customer battery program in their service

[2] Alternately, on-peak discharge can be accomplished by direct utility control of BTM batteries, similar to utility programs that remotely control customer water heaters or HVAC equipment. However, we think a price signal will provide more customer flexibility.

territory on Cape Cod. Vermont should survey these programs and learn from them. CEG would be happy to help with such an effort.

b. **Consider how storage in the energy efficiency program would interact with other related programs in Vermont.** One important issue that was addressed in MA was how storage in the EE program would interact with other programs, such as the MA SMART solar rebate (which includes a storage adder) and the MA net metering program. Currently, customers installing solar and storage in MA are eligible to participate in all three programs (net metering, SMART rebate and EE storage performance payments). These three programs work in tandem: the SMART program provides a rebate for both the solar and the storage, the net metering program compensates customers for renewable electricity generated by their solar panels, and the EE performance payment compensates customers for discharging their batteries during peak demand hours. However, there are some requirements to ensure that program rules are adhered to (for example, solar+storage customers with net metering contracts must install meters to show that they are not getting net metering credit for grid power exported from the battery). The Commission should consider how batteries and battery incentives, if incorporated into the Vermont energy efficiency program, would interact with other related programs, such as net metering.

c. **Consider how batteries could best be made available to customers in Vermont.** Currently, GMP customers have battery programs available to them through the distribution utility. However, other Vermonters who are not GMP customers do not have this option. This proceeding contemplates adding battery storage into the efficiency program, meaning all Vermonters could obtain batteries through Efficiency Vermont.
We encourage the Commission to consider creative solutions to the question of how batteries should be provided to customers. There seems to be no reason that GMP could not collaborate with Efficiency Vermont on battery offerings, nor does there seem to be any reason that batteries could not be offered in parallel both through the distribution utility and through the efficiency utility. Command and control (remote dispatch) is not necessary to ensure that batteries discharge on peak; the same can be achieved using price signals, as has been done in Massachusetts. So long as these price signals are aligned with regional peak demand, the results will be the same.

3. **Structure**
We have no comment on the structure of this proceeding, except to urge that stakeholder input be sought from a wide range of stakeholders, including solar and storage installers and representatives of the energy storage industry.

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Appendix 1

4. **Schedule**
   Given that battery storage is a relatively new technology, and that incorporating peak load reduction technologies like storage into energy efficiency programs is a new idea, we urge the Commission to **schedule consideration of storage early in the docket,** to allow sufficient time for learning, stakeholder input and discussion. CEG would also like to offer to speak to the Commission on this topic, to explain how the Massachusetts program is structured and how similar programs proposed in other states are structured.

We thank the Commission for this opportunity to provide comments and look forward to continuing to participate in this docket.

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