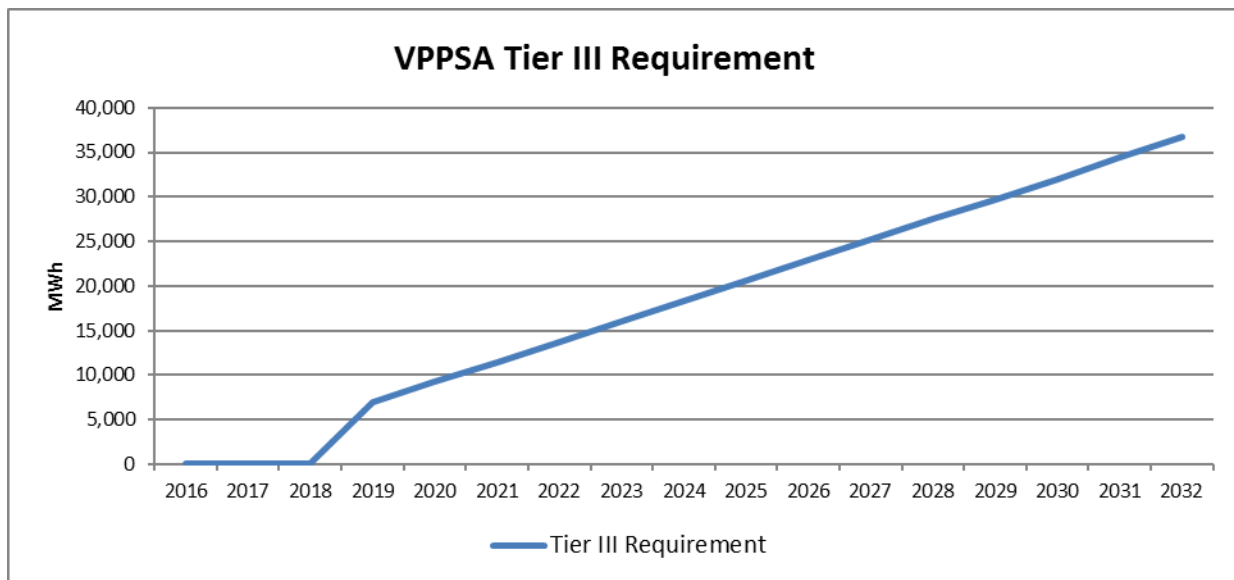


Vermont Public Power Supply Authority 2019 Tier 3 Annual Plan

In accordance with the Public Utility Commission’s (“PUC”) *Final Order in Docket 8550*, Vermont Public Power Supply Authority (“VPPSA”) is filing this Annual Plan describing its proposed 2019 Energy Transformation programs. Vermont’s Renewable Energy Standard (“RES”), enacted through Act 56 in 2015, requires electric distribution utilities to either generate fossil fuel savings by encouraging Energy Transformation projects or purchase additional Renewable Energy Credits from small, distributed renewable generators (“Tier 2”). Utilities’ Energy Transformation (“Tier 3”) requirements are established by 30 V.S.A. § 8005(a)(3)(B), which states that “in the case of a provider that is a municipal electric utility serving not more than 6,000 customers, the required amount shall be two percent of the provider’s annual retail sales beginning on January 1, 2019.”¹ The 12 municipal Members of VPPSA are each eligible to have their obligation begin in 2019 under this provision. In addition, under 30 V.S.A. § 8004 (e) “[i]n the case of members of the Vermont Public Power Supply Authority, the requirements of this chapter may be met in the aggregate.” The VPPSA Member utilities plan to meet Tier 3 requirements in aggregate in 2019.

VPPSA Tier 3 Obligation

In 2019, VPPSA’s aggregate requirement is estimated to be 6,917 MWh or MWh equivalent in savings. Obligations increase rapidly, doubling within three years.



¹ 30 V.S.A. § 8005(a)(3)(B)

Prescriptive Programs

VPPSA plans to meet these challenging requirements through a mix of programs and measures that meet each statutory goal for Tier 3 while mitigating costs that could put upward pressure on rates.

VPPSA Electric Vehicle Program

Despite lower operating and maintenance costs associated with Electric Vehicle (“EV”) and plug-in hybrid electric vehicles (“PHEVs”), the upfront cost continues to be a major barrier to greater EV penetration in the state. EVs and PHEVs remain a relatively low percentage of overall vehicle sales in the state. According to Drive Electric Vermont, the number of plug-in vehicles (EVs and PHEVs) in the state increased by 844 vehicles, or 48%, over the past year and these vehicles comprised 3.4% of new passenger vehicle registrations over the past quarter. Nonetheless, there were only 2,612 plug-in vehicles registered in Vermont as of July 2018. VPPSA and other utilities are working to raise awareness of the benefits of plug-in vehicles and help alleviate the financial barriers to EV and PHEV adoption. VPPSA will continue to offer customer rebates for the purchase or lease of EVs and PHEVs. The customer incentive for purchasing or leasing an electric vehicle will be \$800 and the customer incentive for purchasing or leasing a plug-in hybrid electric vehicle will be \$400. Low-income customers² will receive an additional \$200 towards the purchase or lease of an EV or PHEV.

The VPPSA utilities offered an EV Pilot Program on a voluntary basis in 2018. The Pilot enabled VPPSA to develop the necessary infrastructure to implement programs across utility service territories and determine how its Members can best benefit from Tier 3 aggregation. The structure put in place to track Tier 3 costs and benefits under the EV Pilot Program will be replicated as 2019 Tier 3 programs are rolled out. Savings accrued during the 2018 Pilot Program will be banked for use to meet 2019 or future compliance obligations, consistent with 30 V.S.A. § 8005(a)(3)(F)(iv).³

VPPSA Cold Climate Heat Pump Program

In 2019, VPPSA will offer customer rebates for the purchase of cold climate heat pumps (“CCHP”) in the amount of \$300. For customers that can demonstrate a defined level of building performance, the CCHP rebate will be increased to \$400. The additional incentive, even if it isn’t utilized, serves to highlight the importance of overall building performance. Because heat pumps in high-performing buildings will have less impact on peaks, this also serves to assist in

² According to the PUC’s *Order Implementing the Renewable Energy Standard* dated 6/28/2016, “A low-income customer shall be defined as a customer whose household income is at or below 80% of Vermont statewide median income.

³ Act 56 requires the Public Utility Commission to adopt rules: “... (iv) To allow a provider who has met its required amount under this subdivision (3) in a given year to apply excess net reduction in fossil fuel consumption, expressed as a MWH equivalent, from its energy transformation project or projects during that year toward the provider’s required amount in a future year.”

managing demand during those high cost times. In order to be eligible for the higher incentive amount, customers will need to demonstrate that their homes were “weatherized” according to a list of standards developed and circulated by the Department of Public Service (“DPS”) during the CCHP measure characterization by the Technical Advisory Group (“TAG”).

VPPSA Heat Pump Water Heater Program

VPPSA intends to provide rebates to customers that install heat pump water heaters (“HPWH”) to replace fossil-fuel fired water heaters. These incentives will be provided in conjunction with Efficiency Vermont (“EVT”) HPWH rebates. VPPSA and EVT are currently negotiating a Memorandum of Understanding (“MOU”) to implement this joint program and define the “savings split” between the VPPSA utilities and EVT.

Savings from Heat Pump Water Heaters, Cold Climate Heat Pumps, and Plug-in and Electric Vehicles will be estimated using measure characterizations created by the Tier 3 TAG. VPPSA’s budget and estimated savings for prescriptive Tier 3 Programs is summarized below.

VPPSA Tier 3 Prescriptive Program Expected Costs and Savings

<i>Measure</i>	<i>Savings/unit (MWH)</i>	<i>Incentive Amount</i>	<i>Admin Cost</i>	<i>Total Cost</i>	<i>Volume</i>	<i>Cost/MWH</i>	<i>Total Credit (MWH)</i>	<i>Budget</i>
EV	24.6	\$800	\$148	\$948	15	\$38.52	369	\$14,215
PHEV	13.7	\$400	\$148	\$548	30	\$39.98	411	\$16,431
CCHP	12.8	\$300	\$148	\$448	80	\$35.09	1021	\$35,815
CCHP (wz)	15.8	\$400	\$148	\$548	20	\$34.75	315	\$10,954
HPWH*	5.69	\$300	\$148	\$448	5	\$78.68	28	\$2,238
TOTAL					150	\$37.14	2144	\$79,653

**reflects expected savings split with EVT*

Other Tier 3 Measures

Incentives for Electric Vehicle Supply Equipment

Several VPPSA members have identified possible locations for the installation of electric vehicle charging stations within their territories. These utilities are working with potential charging station hosts to apply for funding from the Volkswagen Mitigation Trust Fund for public EV chargers. Should these installations move forward, VPPSA members may provide financial contributions and/or technical assistance in addition to that already provided in support of the application to facilitate the installation of electric vehicle charging infrastructure.

Fork Lifts and Golf Carts

In addition to the prescriptive rebate programs described above, VPPSA is actively seeking out opportunities for fuel switching golf carts and fork lifts to electricity. Both of these measures were recently characterized by the TAG and together provide substantial potential for fossil fuel savings. VPPSA anticipates working with businesses that may wish to replace fossil fuel equipment with electric-powered equipment and is exploring what level of incentive would be needed for these conversions.

Commercial and Industrial Customers

Commercial and industrial (“C&I”) customers will be served on an individual, custom basis in 2019. VPPSA continues to explore cost-effective Tier 3 custom projects, including converting utility customers from diesel generators to electric service. In addition, C&I customers that have potential Tier 3 projects are being identified by Efficiency Vermont through a joint arrangement with VPPSA to ensure that these customers receive comprehensive efficiency services. To date, opportunities have been identified at a ski resort, a furniture maker, a quarry, and a candy manufacturer. VPPSA has and will continue to work with the Department on custom projects to ensure savings claims are valid and able to be evaluated.

Equitable Opportunity

The Tier 3 incentives offered by VPPSA will be available to all of the VPPSA Members’ customers. Discussions with vehicle dealerships around the electric vehicle rebate program indicated that many low- to moderate-income customers take advantage of PHEV leases. By providing additional incentives for income-eligible customers, as well as by making the incentives available for both vehicle leases and vehicle purchases, VPPSA’s EV rebate program is designed to be accessible to low-income customers.

The ability to bring financial benefits to all customers, rather than just participating customers, makes electrification an attractive Tier 3 option from an equity perspective. All of a host utility’s customers have the potential to benefit from the increased electric sales that accompany electrification programs such as VPPSA’s electric vehicle, heat pump, and heat pump water heater programs. If additional kWh can be procured at costs at or below the costs embedded in a utility’s rates, increasing the number of kWh delivered through the utility’s system allows the fixed costs of operating the utility to be recovered over a larger number of units, driving the per kWh rate down. VPPSA’s analysis shows that the incentive dollars paid to customers in rebates for electrification measures are expected to be recovered through increased sales over the life of the measures, making these programs revenue neutral or, more likely, economically beneficial for non-participating ratepayers.

Collaboration/Exclusive Delivery

Strategic electrification of the transportation and heating sectors is an appropriate responsibility of the Vermont's distribution utilities, who are charged with procuring electric supply and managing the distribution grids across the state. Strategic electrification is outside of the purview of the state's energy efficiency utilities, whose mandate is to achieve cost-effective electric and thermal efficiency savings (where the presumption is that reductions in load do not have the possibility for adverse distribution/transmission system impacts/costs). Distribution utilities are uniquely positioned to promote heating and transportation electrification while assessing and mitigating grid impacts. If electrification is going to deliver its potential climate and economic benefits to Vermonters, it must be carried out in a way that does not disproportionately increase utility costs.

VPPSA and Efficiency Vermont are working together to define how the two entities can provide holistic efficiency services to residential, commercial, and industrial customers. A Memorandum of Understanding to govern this engagement and interaction is under development. In many cases, this partnership will involve VPPSA providing incentives for electrification measures, which can provide benefits to all utility ratepayers, while EVT provides incentives for thermal and electric efficiency measures.

Currently, VPPSA and EVT are engaged in a targeted community effort in Northfield that will continue through early 2019. This initiative involves enhanced outreach to customers regarding VPPSA and EVT incentives, in-person communication with small businesses, and educational workshops on a series of energy efficiency topics. VPPSA and EVT will evaluate whether such joint targeted efforts have the potential to generate greater savings and/or better align with a community's specific energy efficiency needs. If successful, this model may be adapted and deployed in other VPPSA municipalities.

VPPSA has also been working with NeighborWorks of Western Vermont, a comprehensive weatherization service provider that recently expanded its service territory to include the Northeast Kingdom. VPPSA has provided marketing support in the form of utility bill stuffers to NeighborWorks to promote awareness of this new service offering. NeighborWorks, in turn, will be making customers aware of VPPSA's incentives. The collaboration with NeighborWorks is ongoing, and VPPSA sees the thermal efficiency services offered by NeighborWorks as complementary to the electrification measures promoted by VPPSA.

Regarding VPPSA's EV program, the natural partners are vehicle dealers located throughout the VPPSA Members' service territories. VPPSA has done direct outreach to local dealers that sell EVs to ensure they are aware of the VPPSA rebate program. VPPSA is not aware of other energy service providers currently offering electric vehicle incentives in the VPPSA utilities' service territories, as transportation electrification is outside of the purview of Efficiency Vermont. Another partner in VPPSA's EV program is Drive Electric Vermont, who has been consulted regarding program design considerations and also engaged in helping develop customer educational materials.

Best Practices and Minimum Standards

Over the long-term, electric vehicles and heat pumps have the potential to significantly increase loads for Vermont utilities. Through ongoing distribution planning efforts, the VPPSA members have identified that their systems remain robust, and the expected growth in annual and local peak demand associated with proposed measures can generally be sustained if monitored and deployed carefully. According to the load forecast developed by VELCO and the Vermont System Planning Committee in conjunction with VELCO's Long-Range Transmission Plan, load growth associated with strategic electrification is not expected to impact the transmission grid for the next eight to ten years. In the short-term, VPPSA's strategy for managing increased load will rely largely on customer education. The VPPSA member utilities will continue to monitor load impacts of the electrification of home heating, water heating, and EV charging to determine when more active load management will be necessary.

With regards to EVs, it is expected that the majority of home charging will occur during overnight, off-peak hours. Through VPPSA's EV Pilot Program, informational materials about the ideal time to charge vehicles will be provided to customers that receive rebates.

Under VPPSA's heat pump program, customers that can demonstrate that their homes have been weatherized will receive a higher incentive for the installation of a heat pump. This increased incentive will encourage customers to improve the thermal performance of their homes, thus allowing heat pumps to operate more effectively. Customers will be informed of the benefits of weatherization and provided with resources for increasing the performance of their homes. Heat pumps installed in well-insulated homes have the potential to mitigate the grid impacts of heating electrification as compared with heat pumps installed in poorly insulated buildings.

Ultimately, in the long term VPPSA expects that active load control will be necessary to manage EV charging and, to some extent, heat pump usage. Managing when the increased load from strategic electrification occurs will enable utilities to collect added revenue from increased electric sales without significant increases in the costs associated with higher peak loads. Effective load control requires a combination of rate offerings and technology that either provide active control or verify customer adherence to desired goals. These technologies have historically been challenging to implement in rural areas of Vermont where communication systems are lacking and the cost of the required back-office systems is often prohibitive. Some form of interval metering is needed for most types of load control rate offerings. The VPPSA Members are currently exploring the viability of installing advanced metering ("AMI") technology within their territories and expect to have consultant recommendations on whether to move forward with AMI deployment by early 2019. In addition, VPPSA is in discussions with VELCO about the viability of extending VELCO's fiber optic network into VPPSA member distribution systems to both facilitate AMI technology and provide a platform for expanded broadband coverage in areas of the state that do not currently have access. AMI and/or broadband technology will facilitate the implementation of demand response and load control programs that will allow utilities to manage increased electrification load in the most cost-effective manner.

VPPSA Tier 3 Strategy

VPPSA intends to deploy Energy Transformation programs, with a focus on electrification measures, to residential and commercial and industrial customers to satisfy the VPPSA Members' Tier 3 obligations. VPPSA is ramping up Tier 3 programs at an aggressive yet considered pace in its first Tier 3 compliance year. To the extent that there is a shortfall in savings from Energy Transformation programs, VPPSA will employ alternative strategies for meeting Tier 3 requirements in a cost-effective manner. One component of VPPSA's Tier 3 strategy is to purchase Tier 2 RECs when prices are low as a hedge against a shortfall in savings from Tier 3 programs. To the extent that Tier 2 RECs are less expensive than implementing Tier 3 programs, VPPSA will exercise this strategy to benefit its Members. In addition, for VPPSA members that own Tier 2 eligible generating resources, Tier 2 RECs may be the primary strategy for Tier 3 compliance. VPPSA's Tier 3 strategy may also include providing incremental support to the state's Weatherization Assistance Program. Since the RES was enacted, VPPSA has explored developing a Tier 3 program focusing on weatherization but found that program to be cost-prohibitive. Given the PUC's August 24, 2018 Order in Case 17-4632 regarding Washington Electric Cooperative's Tier 3 savings claim for weatherization work, it may be prudent for VPPSA to implement the same type of Tier 3 program at a cost significantly lower than the Tier 3 Alternative Compliance Payment.