

September 18, 2019



Emily Cushman, Program Manager
Efficiency Maine Trust
168 Capitol Street, Ste. 1
Augusta, ME 04330-6856

Dear Ms. Cushman:

Lockheed Martin Energy (LM Energy) is pleased to submit the following questions in response to Efficiency Maine Trust Request For Information (RFI) on Beneficial Electrification Study.

LM Energy is a leader in the design and implementation of beneficial electrification programs throughout the country as indicated by the following experience:

- In 2015, LM Energy designed and implemented the Non-Road Electric Vehicle (NREV) Program for TVA. Unlike the more traditional Prescriptive and Custom energy efficiency programs, the focus of the NREV Program was to reduce carbon and other greenhouse gas emission in the TVA service territory by providing incentives to convert fossil-fueled vehicle usage to electric-powered usage. The NREV Program, which was available from 2015 through 2017, provided incentives for electric forklifts, electrified ground support equipment at airports, truck stop electrification stations to reduce heavy duty vehicle idling, and electric truck refrigeration units with dock electrification. This program met all emissions reduction targets by late 2017 and served as a foundational pilot for the expansion of TVA's beneficial electrification efforts in later years.
- LM Energy also processes applications and incentives for L2 charging systems for residential and small commercial customers as the implementer of the PSEG-LI energy efficiency program.
- LM Energy's SEESuite software supports the integration of the Consumer Energy's PowerMIDrive program charging stations into the utility's demand response programs.
- In 2017, the Tennessee Valley Authority (TVA) began to evaluate a wide spectrum of beneficial electrification measures – energy efficient equipment that reduces net energy consumption relative to fossil-fueled equipment and emissions – for the Energy Right Solutions for Business and Industry (ERSB+I) program incentives. While beneficial electrification measures would not result in a net reduction to electricity use, they would provide customers with efficiency and environmental gains relative to non-electricity powered equipment. TVA added beneficial electrification measures to their energy efficiency programs in the fall of 2017 and transitioned from energy efficiency to solely beneficial electrification measures a year later. LM Energy will continue to provide outreach, technical review, program processing/tracking and Preferred Partner Network management for the ERSB+I program.
- Most recently, the California Public Utilities Commission (CPUC) authorized fuel substitution for regulated fuels through their modifications to the Three-Prong Fuel Substitution Test (D.1908009). LM Energy engineers are now reviewing emerging technologies and measures to determine how cost-effective beneficial electrification can and should be incorporated into the energy efficiency programs we currently implement on behalf of California utilities.

We hope that you find the following comments in response to the RFI questions useful. If you have questions on the enclosed, please contact Amelia Axtell at (646) 574-0095, or via email at Amelia.L.Axtell@lmco.com.

Sincerely,

Amelia Axtell
Lockheed Martin Energy



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Comments from LM Energy

Lockheed Martin Energy (LM Energy) is pleased to submit comments for the Efficiency Maine Request for Information Beneficial Electrification study. As the current implementer of multiple beneficial electrification programs, LM Energy is pleased to share some of the lessons learned in the design and implementation of these programs to help guide the development process of the Efficiency Maine Trust Beneficial Electrification Study, as required by LD 1464, An Act to Support Electrification of certain Technologies for the Benefit of Maine Consumers and Utility Systems and the Environment:

Identify barriers to beneficial electrification in the transportation and heating sectors of the State

There are multiple barriers to the implementation of beneficial electrification, including:

- a) Regulatory or legislative barriers preventing implementation of programs – This is the primary barrier to program development and design. In many states, utilities are prohibited from competing against one another including encouraging fuel switching by existing utility customers. This intrafuel barrier to competition is often cited as the number one reason for not implementing electrification programs that could deliver numerous benefits to utility customers. In other jurisdictions, intrafuel competition may be permitted but program cost recovery for fuel switching or active competition with other utility services is prohibited.
- b) Conversion may require significant investment by end-user – While beneficial electrification may provide significant reduction in end-use operating and maintenance costs, improve productivity or building comfort, and reduce emissions, the initial capital costs for conversion may be prohibitive. For this reason, electrification frequently requires incentives and/or financing vehicles to enable projects.
- c) Market is not familiar with new and emerging technologies -- There have been significant improvements in electrified systems and technologies. From heat pumps to car batteries, prices have declined as system performance has improved. Still, consumers are leery of investing in these technologies due to lack of familiarity. Educating the customer on what beneficial electrification is, why it is needed, and why it is beneficial for them is essential for the success of the program. Many consumers have never heard of beneficial electrification and are wary of anything that may impact their utility bill. We have found that a comprehensive and engaging outreach campaign would go a long way to getting people comfortable with the concept, the program mechanics, and why it is in their best interest to participate in the program
- d) Stress on the grid and no redundancy for heat supply: risks catastrophic outages and winter peak loads – While there are many benefits to electrification, there are concerns regarding system integrity in the face of added electric loads. In areas where capacity constraints exist, electrification can present an obstacle to reliable delivery. In end-use facilities with inadequate electric service supply, electrification may require an upgrade to building services. That being said, the benefits delivered by electrification generally compensate the cost of meeting system needs. Furthermore, smart grid technologies incorporating integrated DERs solutions, such as battery back-up and/or demand response assets can be implemented to ensure reliable and resilient electricity supplies.

Identify additional information that the trust may require to make additional recommendations or analyses

LM Energy believes beneficial electrification presents many benefits to customers, the electric grid and system operators. However, beneficial electrification is implemented in a dynamic environment with multiple – and occasionally competing – mandates and objectives. For this reason, we recommend that the design and development of beneficial electrification programs be considered within an integrated demand side management environment to optimize the use and application of all of the tools available in the smart grid delivery environment.

Additional information that Efficiency Maine would benefit from would be to evaluate successfully implemented programs throughout the United States. LM Energy has designed and implemented numerous beneficial electrification programs and would be happy to share our specific experiences and insights with Efficiency Maine within a less public forum.

Consider potential roles of utilities in supporting beneficial electrification

The utilities are essential to the development and implementation of beneficial electrification. As the leading energy authority in most residential and commercial end-users' consumption of power, they can support program outreach, education, and aid in the identification of capacity constrained areas that would benefit from beneficial electrification incentives, enabling early capture of savings through enhanced incentive offerings. Beginning the discussion with utilities early in the development process is essential as they will be able to provide guidance and resources to ensure the success of the program.

Identify areas or populations in the State less likely to benefit directly from beneficial electrification without additional policy development or utility intervention

The low to moderate income population face substantial barriers to participation in demand-side management programs, including beneficial electrification, including lack of access to capital to fund upgrades, lower rates of home ownership resulting in landlord/tenant disincentives, frequent residency in multifamily properties resulting in a reduction of benefits and/or access to a dedicated service to facilitate electrification, and lack of outreach/education from programs. This customer segment often gets the least amount of attention in outreach campaigns, but they are frequently the segment with older less efficient fossil fueled equipment or systems that would truly benefit the most from conversion. Dedicating specific resources to this population will result in higher overall participation and ensure that all consumers have a chance to participate in the program.

Recommend opportunities for beneficial electrification:

Generally, electrification opportunities generally fall into three categories: Building Systems/Zero Emissions Buildings (ZEB), Transportation Electrification, and Process Electrification. As you can see by the summary of beneficial electrification programs that we have worked with there are numerous measures that can be engaged in successful electrification programs including: Light Duty Electric Vehicles and EVSE, Nonroad Electric Vehicles, Medium and Heavy Duty Electric Vehicles, Commercial Food Service Equipment, HVAC Equipment/Systems, Domestic Water Heaters, Emerging Technologies, Environmentally Controlled Agriculture and Industrial Processes.