



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

September 18, 2019

RE: RFI on Beneficial Electrification Study

Dear Ms. Cushman:

Thank you for the opportunity to provide responses to the Trust on the proposed areas of study involving beneficial electrification.

As background, ReVision Energy is one of New England's leading full-service solar company and a certified B Corporation. Since 2003, ReVision has grown from two guys in a garage to over 270 employee-owners with nearly than 50 megawatts and 8,000 solar energy systems installed to-date across New Hampshire, Maine, Massachusetts, and Vermont. ReVision is ranked by Solar World as the #1 rooftop solar installer in New England and in the top 5 of all rooftop solar providers nationally. We are a 100% employee owned company with B Corp certification and sustainability baked into our corporate mission and DNA. We have branch offices with their own sales, marketing, design and install teams in MA, ME and NH. ReVision has a full contingent of engineers, electricians, installers and administrative support staff. In addition to being the most active Electric Vehicle Service Equipment ("EVSE") and heat pump installer in New Hampshire and Maine, ReVision's experience also includes over 8000 residential, commercial and utility solar projects throughout New England.

ReVision Energy is a certified Elite Diamond Contractor with Mitsubishi Electric. Our design and installation team has 10 years of experience with M and P- series mini split heat pumps with an exception record for implementing high quality projects. Our primary focus is coupling technologies with renewable energy systems for maximum economic and environmental return on investment

ReVision Energy has also been installing for Residential, Non-profit/Municipal and Commercial EVSE projects since 2011. To date ReVision Energy has installed hundreds of basic and smart charging units at a wide range of host sites- including colleges and secondary schools, large employers and commercial entities, municipalities, retailers, hospitality industry, malls and non-profit venues. ReVision has also been installation partner with major smart charging networks, including Greenlots, EVgo, Tesla and ChargePoint. ReVision has also performed many EVSE installations that are part of Electrify America's Cycle One spending.



Accordingly, we would like to add comments based on our collective experience with these technologies and using the insights of individuals involved in these areas, including Fortunat Mueller, Co-Founder, Barry Woods, Director of Electric Vehicle Innovation and Joe Maisonave, Heat Pump Design & Estimating.

We hope these add value to your deliberations on these matters.

Sincerely,

/s/ Barry Woods

Barry Woods
Director of Electric Vehicle Innovation
ReVision Energy

ReVision Energy's Responses to Beneficial Electrification ("BE") Issues Identified by EMT:

1. Identify barriers to beneficial electrification in the transportation and heating sectors of the State;
2. Identify additional information that the trust may require to make additional recommendations or analyses;
3. Consider potential roles of utilities in supporting beneficial electrification;
4. Identify areas or populations in the State less likely to benefit directly from beneficial electrification without additional policy development or utility intervention; and
5. Recommend opportunities for beneficial electrification.

As preface, one of the best resources we know of is at the Regulatory Assistance Project ("RAP"), where they have a whole series of reports on BE in various sectors. They can be found here: <https://www.raponline.org/knowledge-center/beneficial-electrification-ensuring-electrification-public-interest/>

We strongly believe that, wherever possible, BE should be thoughtfully paired with responsive load or 'demand dexterity'. In other words, as we add load to the grid, let's make sure that to the maximum extent possible it is load that adds flexibility, rather than the opposite. This is part of what puts the 'B' in BE as that flexibility enables deeper penetration of clean and low cost renewables which in turn makes BE a better deal, and so on, in a self-reinforcing cycle.

In the area of transportation electrification, aside from supporting public and workplace charging build out, we think other places EMT could do the most good include consumer awareness/engagement, fleet electrification and exploring grid benefits associated with residential load aggregation. Consumer awareness is wholly lacking in Maine (and elsewhere), creating many opportunities to be creative and engage consumers and auto dealers. EMT could provide the technical and financial expertise to help electrify transit fleets (buses and **school buses**, ferries). Pretty much every Maine town has school buses, but how many have a school bus expert who knows that E-buses are a viable option? Residential EV charging is a huge opportunity to create consumer awareness of the grid benefits of integrating these new types of smart appliances on the household grid, to achieve not only cost savings in response to price and load demand signals but also enhanced grid resiliency.

1- Barriers to BE:

- Lack of a price for environmental and public health externalities of fossil fuel combustion (obviously) making the alternatives too cheap
- Public Awareness
- Lack of engagement of critical industry players (e.g. auto dealers)

- Conflict of interests. Particularly among the HVAC and fuel delivery industry in Maine. Where the majority of the state is reliant on oil or propane for heating, fuel delivery businesses are not quick to “electrify.” The resulting misinformation around electric heating systems creates an uphill battle for adoption.
- Improper installation and minimal performance checks on ASHP. Systems installed and not operating optimally reduce the economic and environmental benefits, however there is little in terms of performance verification incentives.
- No incentives for air to water heat pumps (A2WHP). Solutions with hydronic distribution are forced to either pay a high cost for non-incentivized A2W or ground source HP systems or use fossil fuel boilers which have an incentive on top of a lower initial cost. Particularly for new construction where heat pump systems should be considered the most, A2WHP systems do not always make a strong economic case but might be the better solution.
- Bad electric rate design (and specifically demand charges and lack of meaningful TOU opportunities) are a barrier to adoption of BE for both EV charging and heating sectors because they punish customers with high individual peak loads regardless of the coincidence of those loads (which is what actually drives costs).
- Weak public charging infrastructure is a barrier to EV adoption
- Lack of technical expertise and low risk tolerance is a barrier to electrification of transit and school bus fleets.
- Financing: similar to lots of other EM programs, projects serving low income customers are difficult to finance and projects serving lots of commercial spaces are hard to finance given the landlord/tenant split incentive.

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

- <https://www.greentechmedia.com/articles/read/beneficial-electrification-make-it-work#gs.1gh3ge>
- http://eta-publications.lbl.gov/sites/default/files/electrification_of_buildings_and_industry_final_0.pdf
- <https://www.raponline.org/knowledge-center/beneficial-electrification-ensuring-electrification-public-interest/>
- <https://smartgridnw.org/>
- <https://www.masssave.com/en/learn/partners/become-an-ac-check-contractor/> AC system check and performance benchmarking method for mini splits.
- <https://pluginamerica.org/policy/policy-resources/>
- <https://www.ethree.com/projects/>

3- Consider roles for utilities:

- In general the utilities’ role should be limited to those things that lend themselves to a natural monopoly. The risks of allowing them to extend that monopoly franchise

include: demonstrated lack of efficiency and competence in executing on customer side of the meter, unfair economic advantage due to rate basing ability, which in turn chases off free market competition and inhibits innovation in any part of the market they occupy (because nobody in their right mind will compete with a regulated monopoly). We believe the utility role in BE should be significantly limited. However, some appropriate utility roles might include:

- Public Awareness
- Smarter rate design
- Enabling load flexibility, which is directly related to grid reliability and increases confidence in electric heating and vehicle adoption.
- Pilot projects that are limited in scope and contained to those parts of the market where free market actors are failing (for example low income customers may be one such option).

4- Identify areas or populations in the State less likely to benefit from BE without additional policy or utility intervention:

- Low income customers or others who lack access to project financing;
- Customers of Emera who have higher electric prices and thus the economics are often less attractive;
- Customers of the smaller muni and Consumer owned utilities, who in some cases have both higher electric costs and who is relatively unsophisticated and provides little help or resources to their customers;
- Rentals (both residential and commercial) where the investment incentives are split; and
- Rural locations where poor grid reliability erodes confidence in electrification.

5- Opportunities for BE:

- Electrify light duty vehicles in public and private fleets (opportunity is largely in supporting build out of public and workplace charging);
- Electrify transit (buses, school buses, ferries);
- Electrify other industrial vehicles (forklifts, airport vehicles, port vehicles);
- Electrify/hybridize marine fleet (hybrid electric retrofits for lobster fleet);
- Create “plug in” port infrastructure, particularly for cruise ship terminals;
- Incentivize improved control options for HVAC. Optional wireless thermostats and wifi enabling devices for off-site control. This allows more demand control options while providing a higher quality product to the customer for improved comfort and efficiency; and
- A2WHPs to help promote the technology and bring more attention from the large manufacturers already producing equipment only available in Europe or Japan (Daikin, Mitsubishi, etc.)