August 22, 2019

Michael Burr, Director
Burr Energy
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BY E-MAIL
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Dear Mr. Burr:

The following comments are offered on behalf of Rochester Public Utilities (RPU), an enterprise fund and department of the City of Rochester, MN. RPU provides electric utility service to 55,000 residential and commercial customers in the City of Rochester. RPU also provides water service to 40,000 customers. RPU has participated in the Conservation Improvement Program (CIP) from its inception and has a team of staff dedicated specifically to assisting customers with maximizing their energy efficiency.

The following comments respond to questions posed by Mr. Fryer in his July 30, 2019 e-mail to stakeholders, and are organized generally to correspond to his questions.

Introduction

Notwithstanding RPU's generally successful implementation of CIP requirements, RPU recognizes firsthand that a focus solely on kWh reduction produces diminishing marginal returns, and much of the "low-hanging fruit" has already been picked. Technology and regulation has changed a great deal since CIP was enacted; building and energy codes are resulting in more efficient buildings. As the City of Rochester continues to integrate the Destination Medical Center (DMC) into its comprehensive planning process, new buildings are now required to comply with B3 building efficiency benchmarks. Heating, ventilation, and air conditioning equipment is achieving greater efficiency, such that rebates are over time becoming less meaningful as energy-inefficient options become less available for purchase.

1. **Measures That May Result in Fuel-Switching**

The first set of questions request input on the positive and negative potentials of energy-saving measures that could result in fuel-switching, and topics appropriate to be addressed in state policy. Allowing utilities to incent efficient fuel switching would reward efficiency and emissions reductions while lowering costs to consumers. Cost effective efficient electrification by fuel switching would also advance Minnesota's energy policy priorities by recognizing carbon reduction and consumer cost savings.

As the electrical grid becomes greener, the next logical step in reducing greenhouse gases is to recognize the technologies that have significant benefits to Minnesotans, and incent them to switch. One of these

technologies is an air source or ground source heat pump (ASHP/GSHP). Nationwide, space heating accounts for approximately 10% of greenhouse gas emissions. In areas of Minnesota served by consumer-owned utilities, natural gas, propane and fuel oil continue to be the heating fuels of choice.

Based on data from a 2017 report on ASHPs produced by the Center for Energy and Environment, an analysis of four sites indicated that switching from propane heating to ASHPs would reduce annual propane use by 623 gallons, and increase electric use by 5,106 kWh. This shift, however, would *reduce* BTU consumption from 56.9 million to 17.4 million – a 327% decrease in sample site BTU use.

Heat pumps have proven themselves to work in cold climates. Even with the use of resistant backup heat for subzero temperatures, ASHPs are 2.5 times more efficient than gas over a heating season. This efficiency increase equates to a substantial reduction in the energy use intensity (EUI) for heating. With the current penetration of renewables this also decreases greenhouse gas emissions, and as the generation portfolio of renewables increase, reduces emissions even further. All of this can be done with an operational cost that is comparable, if not less, than traditional fuel sources. The significant hurdle to gain this efficiency is the up-front cost to move to the new technology. Utilities can help accelerate adoption of such technologies by offering incentives, giving consumers a more meaningful choice to install equipment that is more efficient and emits fewer greenhouse gases.

Along with space heating, water heating creates the potential for fuel-switching efficiencies through technologies such as heat pump water heaters (HPWH). Hybrid HPWHs use heat pump technology in the summer and resistant heat in the winter. They are not only extremely efficient when running in heat pump mode, they also provide ancillary benefits, such as cooling and dehumidifying air to reduce air conditioning load. Another ancillary benefit of HPWHs is greater building envelope efficiency, since an HPWH does not require multiple wall or roof penetrations that increase envelope leakage and increase building loads.

For the utility, the greatest benefit is that an HPWH can be remotely controlled, essentially acting as an additional load control resource for the utility to avoid capacity issues. While not all applications of HPWH are a good fit (*i.e.*, not enough room air volume), state policy should encourage appropriate applications as long as they are cost effective for the customer.

One of the unintended consequences of allowing fuel switching under the current CIP program is that increased kWh sales from efficient electrification results in a higher savings goal. This means that state policy must be aligned to encourage fuel-switching by utilities and their customers, without penalizing them for doing so. The energy savings achieved from fuel switching should be treated the same as savings achieved through conservation. Energy sold for efficient electrication should be exempt from the annual retail sales used to calculate the 1.5% savings goal since the newly added equipment is at the beginning of its useful life.

2. Fuel-Switching Measures Suitable for State Energy Policies

The second set of questions concern fuel-switching options as they relate to non-utility fuel sources such as propane and fuel oil. RPU would first note that we are not a gas utility; the services we provide are specifically electricity and potable water. We recognize that other municipally-owned utilities in Minnesota provide gas service to their customers as well, and any policy changes must take into account the needs of these utilities as well.

RPU has discussed above the suitability of space and water heating/cooling technologies for fuel-switching incentives. The costs of natural gas, propane and fuel oil have historically been more volatile than electricity; this can affect the operational cost of equipment, sometimes as frequently as daily. This is why state policy should accentuate flexibility and consumer education, because 1) justifications for fuel-switching for purely economic reasons can be difficult; and 2) it is critical that consumers be made aware of the cost savings from fuel switching as well as impacts to greenhouse gas emissions when comparing equipment.

RPU feels very strongly that it is difficult to discuss fuel switching without talking about the transportation industry. The biggest impact to state emission reductions would be to electrify the transportation sector. The Minnesota Pollution Control Agency has identified the transportation sector as the largest emitter in the state. Electricity generation used to be the largest generator, but with coal retirements and the increase in renewables, this is no longer the case.

An electric vehicle uses 3.5 times less energy and emits ¼ of the emissions as a gasoline powered vehicle driven the same distance using our current generation portfolio. The primary hurdle to customers wishing to drive electric is cost. But if incented correctly, the electrification of transportation can produce substantial consumer savings. For example, based on data provided by the U.S. Energy Information Administration, assume that a gas-powered vehicle uses 400 gallons of gasoline over the course of a year at a cost of $954.80, or $2.39 per gallon. An electric vehicle using an equivalent amount of energy over that time would use 4,000 kWh of electricity for $527.60, or $0.13 per kWh. Even without considering off-peak charging rates, switching from a gas-powered vehicle to all-electric would save the consumer about $400 per year, once the consumer has overcome the higher initial EV cost. By incenting customers we can accelerate adoption and recognize the emissions savings.

3. Prioritization of Fuel-Switching Measures

The third set of questions request what is, in effect, a priority ranking of fuel-switching measures that we believe may provide the greatest beneficial impact in Minnesota, considering the above factors.

As discussed above, RPU believes that the top priorities for fuel-switching measures are transportation, space heating, and water heating technologies.

Conclusion

In light of the foregoing comments, RPU believes that allowing fuel-switching under the CIP program for space heating, water heating, and transportation would most readily advance Minnesota's energy efficiency goals. Further, allowing such measures under the existing or modified CIP program would allow existing utility structures, particularly smaller systems in Greater Minnesota, to incorporate these measures on a flexible basis that works best for their local needs.

RPU would be happy to discuss any of these comments further with the Department. Inquiries may be directed to me at 507-280-1607, or Josh Mason at 507-280-1588. Thank you for the opportunity to provide these comments.

Regards,

Dru Larson
Energy & Environmental Advisor
Rochester Public Utilities

cc: Mark Kotschevar, General Manager, Rochester Public Utilities
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