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To: Michael Burr, Burr Energy

RE: Fresh Energy comments on electric and gas utility fuel-switching programs and the Minnesota Conservation Improvement Program (CIP)

Fresh Energy appreciates the opportunity to provide comments in response to the Department of Commerce's ("Department") request for comments after its June 26, 2019 CIP Fuel-Switching Stakeholder Meeting on electric and gas utility fuel-switching programs and the Minnesota Conservation Improvement Program (CIP). Below we respond to each of the issues open for comment as noted by the Department in its July 30, 2019 email to stakeholders, as well as offer additional information we believe the Department should consider when addressing fuel-switching within CIP.

Key Issue 1: Appropriate Use Cases, Technology Solutions, and Considerations for Fuel-Switching

- 1) *During Meeting #1, several stakeholders discussed the need for a deeper analysis of various use cases and technology solutions that may result in utility fuel switching activity (between natural gas and electric utilities) that is prohibited for CIP incentives. Please describe:*
 - a. *Potential energy-saving measures that could result in fuel switching, and that you believe should be made eligible for CIP incentives;*
 - b. *Noteworthy benefits, factors, and considerations involving these use cases and technologies; and*
 - c. *Uncertainties and unintended consequences related to these use cases or technologies that should be addressed in the policy process.*

A. Potential energy-saving measures that should be made eligible for CIP incentives include:

Fresh Energy has found and agrees with other parties comments¹ in recent fuel-switching dockets that there are numerous examples and iterations of measures that could be considered fuel-switching and potentially be eligible for CIP incentives. Pertaining to the question posed above, we've found most of these natural gas-to-electric or electric-to-natural gas examples relate to building heating and cooling technologies, including space heating, water heating, cooking and laundry equipment.

At this time we encourage the Department to explore all possible fuel-switching measures in the residential and commercial building heating and cooling sector, with a priority given to heat pump technologies and induction cooktops, given they pass our eligibility criteria described below. Many

¹ See Xcel Energy fuel-switching examples in its July 20, 2018 comments in Docket 18-402 <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={0004B964-0000-CD11-88F4-8CFC636A7C96}&documentTitle=20187-145085-01>

recent studies and thought leaders have identified the buildings sector as ripe for electrification opportunities because of their cost savings and carbon reduction potential.²

At a more conceptual level, we believe a fuel-neutral approach based on a British thermal unit (Btu) energy savings level analysis may be the best approach going forward when identifying and prioritizing new potential fuel-switching energy savings measures. Our thinking is that prioritizing a fuel-neutral approach best preserves the function and integrity of CIP as an energy savings policy mechanism, regardless of fuel type. This approach may lead the Department to consider additional measures with benefits not yet clearly identified, including industrial and agricultural fuel-switching applications.

B. Noteworthy benefits, factors and consideration involving these use cases and technologies include:

I. Eligibility criteria

Because Minnesota CIP statute does not explicitly address fuel-switching, we believe it is important the Department develop a clear framework that incorporates eligibility criteria beyond just net energy reductions when determining what fuel-switching technologies should qualify for CIP incentives. At this time, we believe that any fuel-switching measure supported through the CIP regulatory framework should be limited to technologies that result in a reduction of at least one of the following criteria without adversely impacting another:

- a net reduction in fuel-neutral total source energy consumption over the lifetime of the project; and
- a net reduction in fuel-neutral customer energy costs over the lifetime of the project; and
- a net reduction in carbon emissions over the lifetime of the project.

Additionally, we believe the Department should consider adding an additional metric – whether the measure as installed and operated does not unjustifiably increase the utility's system peak demand or require significant new investment in utility infrastructure.

A. Source energy consumption

We encourage the Department to consider requiring that fuel-switching measures calculate total source energy consumption using measure specific hourly consumption estimates, if available. Hourly consumption (and emissions) estimates present measure-specific data by hour, and using these will result in increased accuracy in determining if a fuel-switching measure passes the total energy and carbon reduction metric.

This calculation should also take into account the lifecycle avoided energy consumption of the measure at its source of generation, rather than only the first-year energy consumption at the measure-end. Specifically, to be more accurate, we believe that electric energy savings calculation should use a forward forecast of hourly marginal heat rates of the grid over the

² The Economics of Electrifying Buildings, Rocky Mountain Institute; access at <https://rmi.org/insight/the-economics-of-electrifying-buildings/>

effective useful life of the measure. If this proves difficult a simplified approach of using the annual system average heat rate may be more practical.

At this time we believe more conversations are needed to determine best practices for calculating natural gas energy reductions, but we believe the calculations should include – similar to electric savings calculations – losses in the distribution systems.

B. Cost-effectiveness

The Department will also need to consider whether a fuel-switching measure should be required to adhere to the same cost-effectiveness requirements as other energy efficiency programs. For example, a recent California Public Utilities Commission decision³ updating its three-prong efficiency test related to fuel-substitution did not require that cost-effectiveness requirements be tied to the individual measure level and instead ruled to apply cost-effectiveness requirements at the portfolio level (like all other efficiency measures). The CPUC stated that applying a cost-effectiveness threshold at the measure level for fuel substitution measures “creates a barrier for their inclusion in the energy efficiency portfolios⁴.” The Commission supported this decision by stating that because fuel-switching measures are relatively new to the market, greater market adoption may be necessary before the measure costs are reduced and are able to pass cost-effectiveness thresholds.”

Fresh Energy supports this approach of applying cost-effectiveness testing relating to fuel-switching at the portfolio level. This will ensure that new clean electric technologies that are not yet cost effective can receive early support to increase their market share and bring costs down. However for reasons cited below, we believe a fuel-switching portfolio separate from traditional energy efficiency may be necessary.

C. Carbon emissions

Many of the comments summarized above related to calculating total source energy consumption are relevant to the carbon emissions reduction section, particularly the methodological suggestions addressing heat rates. We recommend that the long-run marginal emissions values as part of the avoided costs calculations be used to estimate the carbon impact of a fuel-switching measure.

I. Renewable energy/load-shifting preference

We encourage the Department to consider prioritizing and encouraging fuel-switching programs that facilitates the incorporation of renewable energy or load-shifting programs. Strategies to reduce economy-wide carbon emissions to levels required by Minnesota statute increasingly suggest that electrification of end-use technologies combined with increasing levels of renewables on the grid are

³ Decision Modifying the Energy Efficiency Three-Prong Test Related to Fuel Substitution; California Public Utilities Commission; accessed at <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M310/K058/310053527.PDF>

⁴ Id. at page 21

necessary to avoid the worst damages from climate change. A recent study from the Brattle group stated that “coupling electrification of heating and transport with significant decarbonization of the power sector and modest reductions in other energy sectors could lead to more than a 70 percent reduction in U.S. energy-related GHG emissions relative to 2015 levels, and represent an important step towards overall economy-wide emissions reductions targets.”⁵ Demand flexibility is increasing cited as an important component of a low-carbon energy systems and will becoming even more critical as more renewable energy is added to the grid. For these reasons, we believe combining some form of a renewable energy or load-shifting program with a fuel-switching measure could better assist the state in achieving its climate and energy goals.

II. Weatherization

The Department should also consider the benefits of requiring comprehensive building weatherization in conjunction with some or all of the potential fuel-switching activities. Optimizing the efficiency of a home or business is critical to right-sizing fuel-switching measures to ensure energy and dollar savings are maximized. An inefficient building with poor insulation could negate much of the energy and dollar savings achieved through increased efficiency in the heating or cooling unit itself, and leveraging the potential savings through both approaches will drive the cost effectiveness and scope of an expanded program. We recommend the Department consider promoting weatherization efforts in close conjunction with approving a customer for a fuel-switching incentive, or couple fuel-switching programs with existing or new programs aimed at improving the efficiency of customers’ homes and buildings.

III. Eligible sectors

We recommend all economic sectors, including residential, commercial, agricultural, and industrial, be eligible for fuel-switching programs, however careful consideration must be given to the program design of each sector. This ensures in the fairest and most equitable way that all customers are receiving the benefits of CIP.

C. Uncertainties and unintended consequences related to these use cases or technologies that should be addressed in the policy process include:

D. Technical Resource Manual considerations

In order to integrate fuel-switching into the existing CIP framework the Department will need to determine how energy savings resulting from fuel-switching technologies will be assigned to utilities and what avoided costs, if any, utilities may claim for those savings. Additionally, determining how to evaluate a measure for compliance with our proposed criteria will require new technical assumptions for comparing energy consumption across fuel and project types, determining lifecycle carbon emissions across fuel and project types, and evaluating measure-specific impacts on peak demand.

⁵ Weiss, Jurgen et al. Electrification: Emerging Opportunities for Utility Growth. Brattle Group, January 2017. Link here

To the extent that emission reductions due to fuel-switching are achieved through CIP, careful measurement and verification must also be made to ensure that dollar and/or energy savings are actually demonstrated and achieved to preserve the integrity of utility programs. Additionally, addressing who funds the proposed fuel-switching measures, and which utility is allowed to accrue energy savings is important. The above mentioned California PUC decision updating its fuel-substitution policies requires that the “new-fuel” customers fund the programs, and then make appropriate adjustments to utilities’ energy-savings goals⁶. For example, gas to electric heat pump conversions will be paid for by electric customers, and electric utilities will count the savings as part of their goals.

E. Uncertainties around dual-fuel systems

It is unclear to us how dual-fuel systems would be considered in the context of fuel-switching. If a backup gas heating system is required, we need to know more about how it is used and whether an integrated system would prohibit some customers from participating in fuel-switching programs. It is also unclear to us if installing an air-source heat pump as a duplicate system, such as in the case of installing a ductless mini-split heat pump in a home with existing central air conditioning and a natural gas-fired forced air furnace, would be considered fuel-switching. More information and conversations are needed to determine whether and how dual-fuel systems are considered within fuel-switching programs.

F. Potential for erosion of traditional energy efficiency programs

At a fundamental level, Fresh Energy believes that the Department has the authority to permit fuel switching through CIP, as Minnesota statute does not explicitly prohibit fuel switching. Under Minnesota Rule 7690.1200, subpart 1, the Department is granted authority to “determine whether a proposed program or modified program will result in reasonable investments in and expenditures for energy conservation improvements⁷.” In the past the Department has used this statute authority to prohibit “targeted fuel switching” in CIP as demonstrated by its 2005 policy guidance. Then again in 2012, under its own regulatory authority, the Department issued policy guidance⁸ permitting fuel switching under narrow, special circumstances. Presumably, this implies that the Department holds the authority to decide on fuel switching matters and could rescind the 2005 guidance using the same regulatory authority under which the Department issued it.

However we are concerned that without appropriate Department guidance that specifies a special designation for traditional energy efficiency within CIP, merely permitting fuel-switching does not offer enough explicit protections to ensure the preservation of traditional energy efficiency programs. Because Minnesota statute does not differentiate or prioritize different forms of energy savings, or what fuel sources those energy savings come from, there is an inherent risk and potential for utility programs to shift entirely from traditional energy efficiency programs to fuel-switching programs. We strongly

⁶ [Decision Modifying the Energy Efficiency Three-Prong Test Related to Fuel Substitution](#); California Public Utilities Commission; page 56

⁷ [Minnesota Rules 7690.1200](#)

⁸ [CIP Policy Guidelines: Energy Savings from Delivered](#) Fuels, Department of Commerce Policy Guidance, August 3, 2012.

believe that traditional energy conservation goals and achievements should not be diminished or replaced by fuel-switching, even as CIP evolves to embrace the benefits of these activities.

Instead, we believe that separate, but complementary, programs for efficient fuel-switching and energy efficiency could provide the most benefits for utility customers. This recommendation could offer a pathway for at least one form of fuel switching through the CIP regulatory framework. We believe CIP statute grants the Department authority to make such a program, and recommend that any fuel-switching activities allowed within the CIP regulatory framework be tracked and reported separately from the energy efficiency activities that are fundamental to CIP.

Key Issue 2:

- 2) *Not all fuel-switching use cases involve switching between utility energy supplies. For example, implementing some energy-conservation measures can lead to increased utility sales and decreased sales of non-utility delivered propane and fuel oil. Please describe:*
- a. *Use cases and technologies exemplifying potential energy-saving measures that you believe should be addressed in State energy policies (within CIP or otherwise);*
 - b. *Noteworthy factors and considerations involving these use cases and technologies; and*
 - c. *Uncertainties and unintended consequences related to these use cases or technologies that should be addressed in the policy process.*

A. *Use cases and technologies exemplifying potential energy-saving measures that you believe should be addressed in State energy policies (within CIP or otherwise):*

Fresh Energy supports the inclusion of fuel-switching measures between both regulated utility energy supplies and unregulated non-utility delivered fuels. Recent studies have found that replacing oil and propane furnaces, boilers, and water heaters with high-efficiency electric heat pumps can not only reduce total energy use and energy bills, but significantly reduce emissions as well.⁹ We encourage the Department to consider a fuel-switching policy within CIP that includes all potential energy saving measures, including those from unregulated fuels such as propane, wood, and fuel oil.

Another common examples used to describe fuel-switching between regulated and non-regulated fuels is switching to an electric vehicle (EV) from a gasoline-fueled vehicle. Personal EVs are already price-competitive with other new cars, typically cost the equivalent of less than \$1 per gallon to refuel, saves total energy consumption and result in fewer emissions even when the electricity comes from a coal-heavy fuel mix. At this time we are cautiously supportive of transportation fuel-switching programs, given that careful consideration is given to program design to ensure as little impact to other CIP programs.

⁹ Nadel, Steven; “Energy Savings, Consumer Economics, and Greenhouse Gas Emissions Reductions from Replacing Oil and Propane Furnaces, Boilers, and Water Heaters with Air-Source Heat Pumps”; ACEEE; accessed at <https://aceee.org/research-report/a1803>

One additional consideration for transportation measures are government/corporate fleets and transit measures. To some degree, we support the inclusion of fleet and transit bus fuel-switching measures within CIP, however again careful program design consideration is needed given the potential to bog down or adversely impact the rest of the CIP program. Meaning that, if appropriate safeguards are not enacted, utilities could propose that CIP funds predominately award large municipal or corporate projects instead of multiple smaller projects.

B. Noteworthy benefits, factors and consideration involving these use cases and technologies include:

We encourage the Department to consider and prioritize equity issues when considering fuel-switching in CIP. Low-income and under-resourced customers have the most to gain from deeper investments in energy efficiency and fuel-switching, since those families often spend up to five times more of their income on energy compared to the average household and are disproportionately impacted by poor indoor and outdoor air quality associated with the combustion of fossil fuels.¹⁰

C. Uncertainties and unintended consequences related to these use cases or technologies that should be addressed in the policy process include:

As mentioned above, it is unclear to us how dual-fuel systems would be considered in the context of fuel-switching.

Key Issue 3:

3) Criteria for allowing fuel-switching in CIP may be influenced by requirements and factors affecting specific high-impact use cases. Please comment on which fuel-switching use cases you believe will have the greatest beneficial impact on the State of Minnesota, and therefore should merit the highest priority in policymaking.

At this time, Fresh Energy believes that fuel-switching in the buildings sector offers the most significant near-term opportunity to reduce total energy consumption while equitably advancing the state's policy climate and energy goals. As stated above, electrification of space and water heating with high-efficiency air and ground-source heat pumps has the potential to significantly reduce a customer's total energy consumption and costs over the lifetime of the equipment when compared with performing the same functions with fossil fuels. These cost-effective opportunities already exist in the residential, commercial and industrial sectors, and encouraging the use of fuel-switching in these building sectors may help negate or reduce recent increases in carbon emissions¹¹.

However, we also believe transportation measures offer a significant opportunity in regards to fuel-switching within CIP. Switching to an electric vehicle produces large cost and energy savings and has a lower carbon footprint compared to gasoline-powered vehicles. However, as mentioned in these comments, we believe it

¹⁰ <https://neep.org/sites/default/files/resources/multifamily-housing-energy-efficiency-FS.pdf>

¹¹ According to the Minnesota Pollution Control Agency, from 2005 to 2016 the residential, commercial, and industrial sectors have seen GHG emission increases of 11%, 1%, and 17%, respectively; accessed via <https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data>

is important that CIP's overall reach and effectiveness not be diminished by offering large incentives to a few, over-sized transportation projects. Due to the potential impact and challenges associated with transportation fuel-switching, we encourage the Department to explore whether carving out a specific transportation program is possible.

III. Conclusion

In general, Fresh Energy believes that fuel-switching offers significant near-term opportunities to achieve Minnesota's public policy goals, including high levels of energy savings, saving customers money on their energy purchases, and driving reductions in total carbon and pollution emissions. We are supportive of enabling fuel-switching policies within CIP that advance these goals of CIP, however we believe careful consideration must be applied concerning program design and appropriate safeguards to ensure that traditional energy efficiency and conservation programs continue to function as intended.

As the state's CIP program matures and technology advances, and the state's electric generation resource mix becomes less carbon-intensive, we believe that it is time to carefully incorporate fuel-switching technologies into CIP in order to encourage and capture the benefits of those technologies. We believe that fuel-switching offers significant near-term opportunities to achieve Minnesota's public policy goals, including high levels of energy savings, saving customers money on their energy purchases, and driving reductions in total carbon and pollution emissions. While not perfect, we believe CIP provides an appropriate mechanism to achieve the desired outcomes of fuel-switching in Minnesota.

Fresh Energy appreciates the opportunity to comment, and we thank the Department for its commitment to convening stakeholders and thoughtfully addressing the important topic of fuel-switching within CIP. We look forward to continued dialogue and engagement in the coming months. Please contact Dylan Sievers at the information below with any questions.

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