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November 20, 2025

Sydnie Lieb
Assistant Commissioner of Regulatory Analysis
Minnesota Department of Commerce
Division of Energy Resources
85 7th Place East, Suite 500
St. Paul, Minnesota 55101-2198

Re: In the Matter of the Minnesota Technical Reference Manual Version 5.0
Docket No. E,G999/CIP-18-694

Dear Assistant Commissioner Lieb:

Fresh Energy submits these Comments in response to the Minnesota Department of Commerce, Division of Energy Resources Staff's October 29, 2025 Proposed Decision on the matter of the Minnesota Technical Reference Manual (TRM) Version 5.0. We appreciate the Department's analysis and work in engaging stakeholders in the Energy Conservation and Optimization (ECO) Technical Reference Advisory Committee (TRMAC) to address updates to Minnesota's ECO TRM.

Below, we recommend several improvements to be made to the TRM presented by the Department in their Proposed Decision. Our proposed modifications pertain to the following measures:

I. Baseline furnace efficiency
II. Air conditioning systems
III. Gas and heat pump water heaters
IV. Gas and heat pump clothes dryers
V. Gas hearths
VI. Measure life for insulation and air sealing and high performance windows
VII. Transportation measures

We recommend that the Department adopt the ECO TRM with these modifications for the 2027-2029 Triennial. The technical issues and concepts underlying our proposed updates to the ECO TRM have been addressed extensively in prior dockets and stakeholder processes. These represent established approaches that are well understood in the industry.

I. Baseline Furnace Efficiency

Fresh Energy strongly supports significantly increasing the baseline furnace efficiency from the current assumption of 80% AFUE. The current baseline no longer represents typical market conditions and therefore overstates savings attributed to utility programs.

Fresh Energy has consistently advocated for shifting utility program funding away from rebates for gas furnaces—particularly inefficient models—and toward efficient electric heating technologies. We reiterated this position in our 2023 comments on utilities' 2024-2026 ECO Triennial Plans[1] and in the ECO customer incentive prioritization stakeholder discussions in 2025, including our presentation at the May 20, 2025 meeting.

As detailed in Fresh Energy's June 20, 2025 Comments to the Department Regarding ECO Incentive Prioritization, phasing out incentives for less efficient gas furnaces is a "low-hanging fruit" of the phased transition away from ECO rebates for gas-fired appliances that have cost-effective and more efficient electric alternatives:

> Regarding gas furnace incentives for retrofits, the Colorado Commission started by restricting DSM incentives for high efficiency gas-fired space heating equipment to only those customers replacing lower efficiency units for the market rate, retrofit portion of Xcel's DSM activity in Colorado. Fresh Energy recommends that the Department start by adopting a similar requirement for utilities in ECO.
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> This would help address concerns raised during the May 20th stakeholder meeting about the potential for customer backsliding to less efficient furnace options in the absence of gas furnace rebates, even though there is reason to believe that this risk is minimal. As described in Fresh Energy's November 2023 comments, the "[Colorado] Commission notes that a material portion of customers with gas-fired space heating appliances may already utilize high efficiency units in their homes and businesses, since they have been widely available for at least 15 years, meeting or exceeding the typical life cycle of many residential heating units. The Commission finds it appropriate to assume those customers would likely replace their heating appliances with another high efficiency unit, even without utility incentives. Further, we have a good cause to believe the heat pump market will evolve rapidly over the next several years, including the manufacture, distribution, and installation segments of the market. We similarly expect customer comprehension and comfort with the technology to rapidly improve due to the availability of IRA incentives and other factors facilitating market adoption." The Colorado Commission found that without the phase out of these incentives, "we risk incentivizing behavior that would have occurred without incentives and over-counting savings and benefits by assuming lower efficiency units were

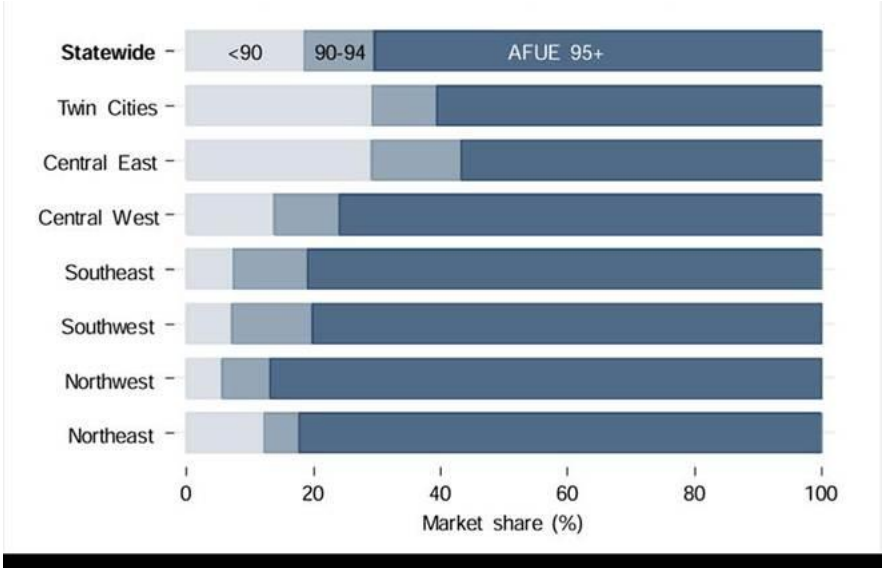
[1] Fresh Energy's November 2023 Reply Comments on Utility's 2024-2026 ECO Triennial Plans, https://efiling.web.commerce.state.mn.us/documents/%7B5020AA8B-0000-C911-B300-6EDC1272D9B4%7D/download?contentSequence=0&rowIndex=85.

being removed, even in situations where that is not the case, and no savings were actually caused by the Company's rebate."[2]

Utilities should instead prioritize funding efficient heat pumps to promote them as an increasingly affordable heating option for customers (especially when stacked with other local, state, and federal incentives) and to support the evolution of the heat pump market over the next several years.

Analysis of state market data from Minnesota's 2020-2029 Energy Efficiency Potential Study also underscores the need for an update to the baseline furnace efficiency. The Potential Study showed that high efficiency (95% AFUE) furnaces and condensing boilers already made up 70-78% of statewide sales throughout the 2013-2016 period.[3] The continued availability of utility incentives for these appliances 10+ years later suggests that today's market share could be even higher, and that there could be a significant degree of free ridership.

Figure 1: MN statewide and regional furnace market share by AFUE category (2013-2016)

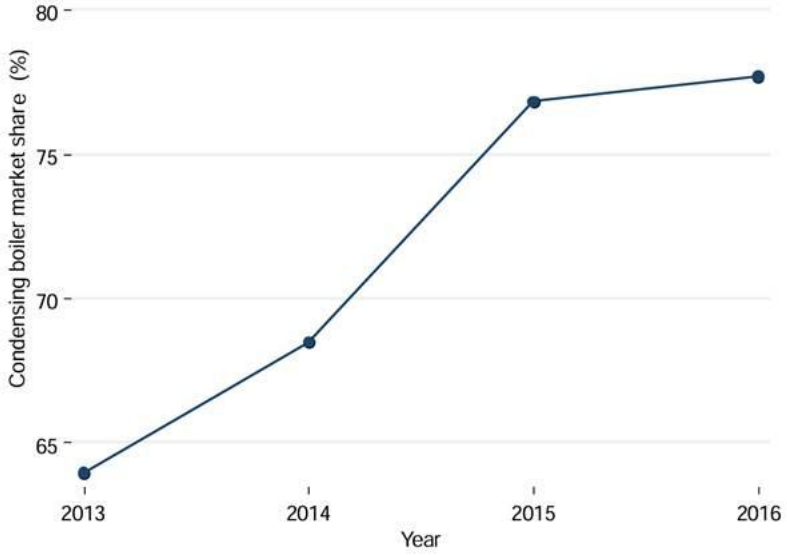


Source: 2020-2029 Energy Efficiency Potential Study, Appendix M

[2] Fresh Energy's November 2023 Reply Comments on Utility's 2024-2026 ECO Triennial Plans, page 3; Commission Decision, *In the Matter of the Application of Public Service Company of Colorado for Approval of a Number of Strategic Issues Relating to Its Electric and Gas Demand Side Management and Beneficial Electrification Plan*, Colorado Public Utilities Commission, Proceeding No. 22A-0309EG, Decision No. C23-0413, June 22, 2023 at ¶¶ 226.

[3] Center for Energy and Environment; Optimal Energy; Seventhwave. (2019, March 27). Appendix M: Minnesota HVAC Sales Data. Prepared for the Minnesota Department of Commerce, Division of Energy Resources. Available at https://www.mncee.org/sites/default/files/2021-06/Appendix-M_Minnesota-HVAC-Sales-Data_2019-03-27_FINAL.pdf.

Figure 2: MN statewide market share for condensing, residential-size boilers (2013-2016)



Source: 2020-2029 Energy Efficiency Potential Study, Appendix M

This data reinforces the need to update the TRM's baseline assumption for gas furnace replacements, currently set at 80% AFUE. Updating the baseline to more accurately reflect market conditions would result in substantially lower calculated savings and incremental costs for these measures—demonstrating that continued ratepayer funding for gas furnace rebates provides limited additional value. In contrast, efficient heat pumps continue to face higher upfront costs but deliver far greater long-term energy and emissions benefits. These technologies warrant prioritized funding and ongoing market support to accelerate customer adoption and achieve Minnesota's decarbonization goals.

These data also indicate that the risk of customers "backsliding," or choosing the least efficient option in the absence of gas furnace rebates going forward, is minimal. There are indications both within and beyond Minnesota that suggest that this risk is minimal, and not a substantial enough threat to justify maintaining gas appliance incentives when ratepayer funding could go to more strategically-aligned measures that still need substantial market support.

II. Air Conditioning Systems

Fresh Energy continues to support a proposal discussed during the TRMAC to sunset rebates for "Residential HVAC - Efficient Air Conditioning Systems". We strongly support phasing out rebates for central air conditioning (AC) systems beginning in 2027, in favor of incentivizing cold-climate air source heat pumps and other two-way heat pump systems that provide both heating and cooling. This approach aligns with Minnesota's greenhouse gas emissions reduction goals, maximizes the effectiveness of the ECO program, empowers consumers with multiple heating options for price arbitrage and resilience, and helps Minnesotans transition cost-effectively to a low-carbon future.

Heat pumps are a rapidly advancing, cost-effective technology that provides affordable solutions to alleviate summer peak electrical demand while simultaneously meeting Minnesota's winter heating need. Unlike traditional one-way ACs, heat pumps (essentially two-way ACs) provide efficient cooling in summer and significant heating capacity in winter, reducing both customer costs and emissions.[4] Installing an ASHP, cold-climate ASHP, or a ground-source heat pump instead of a traditional AC represents a significant opportunity to increase efficiency of overall heating and make progress towards building electrification. We acknowledge that heat pumps have traditionally had low temperature limitations, however, this is no longer the case as numerous systems operate reliably in Minnesota's low design temperatures at COP efficiencies of 150-160% or higher. Modern models are specifically designed to operate in subzero conditions, maintaining high performance even during the coldest stretches of winter.[5] Furthermore, many heat pumps now reach -20 to -31 degrees Fahrenheit with a COP of greater than 1.5.[6] This efficiency and fuel choice is a net positive benefit for the state of Minnesota. New equipment continues to outpace the performance of its recent predecessors, and these benefits are on track to improve.

The long service life of HVAC equipment further supports sunsetting AC rebates. Across the country, an estimated 16,000 traditional, one-way ACs are replaced every day.[7] Many of these systems have a lifespan of 15-25 years. Continuing to incentivize AC-only systems risks locking customers into technologies that hinder compliance with Minnesota's 2050 emissions targets and could leave customers bearing the cost of premature equipment replacement in order to meet those targets. By contrast, heat pumps provide customers with the dual benefit of heating and cooling, allowing them to operate their buildings in a way that optimizes energy use, cost savings, or emissions reductions. This would effectively shift incentives toward technologies that deliver broader benefits for customers and the grid.

For these reasons, Fresh Energy supports removing central ACs from the Minnesota TRM as an efficient measure beginning in 2027. This proposal aligns with recommendations from our August 2023 comments on utilities' proposed 2024-2026 ECO Triennial plans.[8] We view this as a pragmatic and necessary step toward aligning the ECO program with Minnesota's climate and energy goals

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[4] Fresh Energy's August 2023 Initial Comments on Utility's 2024-2026 ECO Triennial Plans, page 9. Available at https://efiling.web.commerce.state.mn.us/documents/%7BD056008A-0000-C93A-BB39-C6B6FDE29982%7D/download?contentSequence=0&rowIndex=7.

[5] Mitsubishi Electric, Heat Pumps for Extreme Cold Climates (September 2024), available at https://www.mitsubishicomfort.com/articles/mythbusters-heat-pumps-for-extreme-cold-climates; Carrier, Cold Climate Heat Pumps: Advanced Heating for Extreme Weather, available at https://www.carrier.com/residential/en/us/products/heat-pumps/cold-climate-heat-pump/; Washington Post, Heat pumps used to struggle in the cold. Not anymore. (November 2024), available at https://www.washingtonpost.com/climate-solutions/2024/11/14/cold-climate-heat-pump-winter/; Wired, Don't Believe the Biggest Myth About Heat Pumps (May 2024), available at https://www.wired.com/story/myth-heat-pumps-cold-weather-freezing-subzero/.

[6] GE, Submittals, Rev July 2025, available at https://products-salsify.geappliances.com/image/upload/s--r1EcyZJR--/uxc9cr2nwy6kddhges99.pdf.

[7] Stephen Pantano, Matt Malinowski, Alexander Gard-Murray, & Nate Adams, 3H "Hybrid Heat Homes" An Incentive Program to Electrify Space Heating and Reduce Energy Bills in American Homes, CLASP (2021) at 4.

[8] Fresh Energy's August 2023 Initial Comments on Utility's 2024-2026 ECO Triennial Plans, page 9.

while helping customers adopt technologies that lower costs, cut emissions, increase resilience, and provide long-term reliability.

III. Gas and Heat Pump Water Heaters

Fresh Energy recommends phasing out incentives for gas water heaters in favor of increased incentives for electric heat pump water heaters (HPWHs) and hot water heat recovery measures. ENERGY STAR certified HPWHs can save a household of four approximately $550 per year on its electric bills compared to a standard electric water heater and more than $5,610 over the HPWH's lifetime.[9]

HPWHs not only deliver highly efficient water heating but also provide 2,500–5,000 BTU of space cooling and modest dehumidification—reducing summer cooling loads.[10] They also enable thermal storage capabilities that pair effectively with air-source heat pumps, achieving high system efficiencies and offering flexible grid benefits.

IV. Gas and Heat Pump Clothes Dryers

Fresh Energy recommends ending incentives for gas clothes dryers in favor of increased incentives for electric heat pump clothes dryers.

Field research conducted by Slipstream under a 2021 Conservation Applied Research and Development (CARD) grant found that heat pump dryers reduce energy use by roughly 20% and are preferred by users for performance and convenience.[11] ENERGY STAR estimates even greater savings from heat-pump dryers—at least 28% compared to standard dryers—demonstrating strong and consistent performance benefits.[12]

In addition to energy use savings, heat pump dryers offer important grid and affordability advantages. Whereas a traditional electric dryer typically requires a 30-amp, 240-volt circuit and breaker, a heat pump dryer only requires a 15-amp, 120-volt circuit and breaker, not requiring additional wiring needed for a gas dryer.[13] This reduces the need for costly panel upgrades and lowers peak load impacts while still delivering substantial energy and emissions reductions.

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[9] ENERGY STAR. Save More with ENERGY STAR Certified Heat Pump Water Heaters. Available at https://www.energystar.gov/products/heat_pump_water_heaters/benefits-savings.
[10] ENERGY STAR. Heat Pump Water Heater Frequently Asked Questions. Available at https://www.energystar.gov/partner-resources/residential_new/educational_resources/sup_program_guidance/heat_pump_water_heater_guide/frequently_asked_questions.
[11] Center for Energy and Environment, Slipstream, & Evergreen Economics. (2021). *Field and Market Assessment of Heat Pump Clothes Dryers.* Available at https://slipstreaminc.org/sites/default/files/documents/publications/heat-pump-clothes-dryers-2021_0.pdf.
[12] ENERGY STAR. Heat Pump Clothes Dryers. https://www.energystar.gov/products/clothes_dryers/heat-pump-dryer.
[13] GE Profile ENERGY STAR 4.8 cu ft Capacity UltraFast Combo with Ventless Inverter Heat Pump Technology Washer/Dryer, Model PFQ97HSPVDS." GE Appliances, https://www.geappliances.com/appliance/GE-Profile-

Continued incentives for traditional ducted gas dryers may also work against weatherization efforts by creating negative pressure that increases the risk of back-drafting from vented gas appliances. Heat pump dryers eliminate this risk, are now widely available at most box stores and appliance supply centers, and represent a mature and proven technology deserving of program support.

V. Gas Hearth

Fresh Energy recommends ending incentives for gas hearths/fireplaces. While gas hearths have historically served as a supplemental heat source, they now function primarily as decorative appliances rather than essential home heating equipment. Given this shift, ratepayer-funded incentives to accelerate their adoption are no longer justified.

VI. Measure Life for Insulation, Air Sealing and High Performance Windows

Fresh Energy recommends that the Department use a 50-year measure life for insulation and air sealing and a 40-year measure life for high-performance windows in ECO. These lifetimes more accurately reflect the durability and long-term performance of building shell energy efficiency measures and align with prior recommendations from the Center for Energy and Environment (CEE) submitted to the Department in 2023 regarding 2024–2026 ECO cost-effectiveness methodologies.[14]

The Department has proposed updating the measure life for insulation and air sealing to 35 years, and current guidance reflects a 36-year measure life for high-performance windows. However, these values do not fully capture the effective useful life of these measures, which typically endure for the full life of the building and continue to deliver persistent energy savings over many decades. As noted in Order Point 6d of the Deputy Commissioner's 2023 Decision regarding 2024–2026 ECO cost-effectiveness methodologies, Staff were instructed to revisit measure lifetimes in the next TRM cycle to determine whether adjustments beyond the default 20-year cap are appropriate.[15]

CEE's 2023 comments provide extensive documentation supporting longer lifetimes for building shell measures. Insulation materials commonly used in Minnesota—cellulose, fiberglass, and foam—have demonstrated useful lives of 50 years or more, and field experience confirms that insulation installed many decades ago continues to perform effectively in Minnesota homes. Similarly, high-performance windows have documented lifetimes of 35–45 years, and several

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ENERGY-STAR-4-8-cu-ft-Capacity-UltraFast-Combo-with-Ventless-Inverter-Heat-Pump-Technology-Washer-Dryer-PFQ97HSPVDS.

[14] Center for Energy and Environment. *Comments on the Minnesota Department of Commerce Proposed Decision in the Matter of 2024–2026 CIP Cost-Effectiveness Methodologies for Electric and Natural Gas Investor-Owned Utilities*. Docket No. E,G999/CIP-23-046. Filed March 6, 2023. Available at https://efiling.web.commerce.state.mn.us/documents/%7B8033B986-0000-C617-BF10-9C3B67C8B6FA%7D/download?contentSequence=0&rowIndex=1.

[15] Minnesota Department of Commerce, Division of Energy Resources. *Deputy Commissioner's Decision: In the Matter of 2024–2026 CIP Cost-Effectiveness Methodologies for Electric and Gas Investor-Owned Utilities*. Docket No. E,G999/CIP-23-46 (Mar. 31, 2023), at p. 96. Available at: https://efiling.web.commerce.state.mn.us/documents/%7B00DF3887-0000-C719-B71B-0523B746A81D%7D/download?contentSequence=0&rowIndex=1.

neighboring jurisdictions already use lifetimes of 40–45 years for comparable window technologies. [16]

Given the central role of building shell measures in advancing Minnesota's energy and climate objectives—including energy efficiency, affordability, greenhouse gas emissions reductions, system reliability, and equitable access to long-lasting energy savings—it is essential that cost-effectiveness tests accurately reflect the full duration over which these measures deliver benefits. Underestimating measure life leads to undervaluation of these measures, potentially hindering utility investment in measures that reduce customer bills, support efficient electrification, and mitigate winter peak impacts as heat pump adoption accelerates.

VII. Transportation Measures

Electric vehicles and electric-assisted bicycles are important tools in helping achieve our state decarbonization goals as well as helping households affordably meet their transportation needs. Fresh Energy appreciates that these measures were included within the TRM.

When households first adopt an electric vehicle, it increases the household's average monthly electricity use by roughly 30-50%.[17] With this in mind, energy efficiency measures are important within this space. In future TRMs, Fresh Energy recommends that the Department explore options for increasing the efficiency of electric vehicles, including incentives for more efficient tires and analysis of the energy savings from upgrading from Level 1 charging to Level 2 chargers.

Affordability and equity considerations for the upcoming Triennial

Fresh Energy takes concerns around affordability very seriously and strongly recommends that any rebates provided to emitting appliances on the basis of affordability be limited to low-income or very low-income customers. While rebates can be an important tool, they may not effectively reach many low-income households because these customers often cannot afford the upfront costs even if a rebate is available. Additional design elements (such as point-of-sale discounts, no-cost direct install options, or on-bill credits) are needed to ensure that low-income customers are actually able to use and benefit from these incentives.

In addition, if affordability is the primary intent of the rebate, the charging language should clearly direct utilities to allocate funds and recover costs in ways that ensure equitable distribution across service areas and meaningful access for communities historically underserved by ECO programs.

Finally, we recommend that the Department require ongoing monitoring and public reporting of rebate uptake by income level and geography, with course corrections if low-income, high energy-burden, and environmental justice communities are not proportionately accessing these benefits.

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[16] CEE March 2023 Comments on 2024–2026 CIP Cost-Effectiveness Methodologies.

[17] USA TODAY. (2024, July 12). Fact check: Can an electric car power your house? https://www.usatoday.com/story/news/factcheck/2024/07/12/electric-cars-charging-houses-fact-check/74222238007/.

We recognize that the detailed design of these elements, as well as tracking and reporting requirements, are generally addressed in ECO program design and Triennial Plans rather than in the TRM itself. However, we believe it is important for the TRM to signal these affordability and equity considerations so that they are explicitly taken up in the next Triennial planning process.

RECOMMENDATIONS

In conclusion, Fresh Energy provides the following recommendations to the Department:

- For gas furnaces:
    - End incentives for gas furnaces in new construction beginning in 2027.
    - Increase the baseline efficiency for furnaces in existing homes from 80% AFUE to 90% AFUE or higher.
    - Limit furnace incentive offerings to high-efficiency furnaces (≥96% AFUE) when replacing furnaces rated below 90% AFUE.
    - Phase out all remaining gas furnace incentives by 2030 at the latest, to ensure that ratepayer funds are directed toward measures—such as electric heat pumps and weatherization—that are better aligned with Minnesota's greenhouse gas reduction and climate goals.
- For central air conditioning systems:
    - End incentives beginning in 2027.
- For gas water heaters:
    - End incentives beginning in 2027.
- For gas hearths:
    - End incentives beginning in 2027.
- For gas clothes dryers:
    - End incentives beginning in 2027.
- For gas boilers:
    - End incentives for gas boilers in new construction beginning in 2027.
    - Limit gas boiler incentive offerings in existing homes to high-efficiency boilers (≥95% AFUE).
- For the insulation and air sealing measures:
    - Adopt a 50-year measure life.
- For high performance windows:
    - Adopt a 40-year measure life.
- For electric vehicles:
    - In future TRMs, explore options for increasing the efficiency of electric vehicles, including incentives for more efficient tires and analysis of the energy savings from upgrading from Level 1 charging to Level 2 chargers.

Thank you for considering these comments.

Respectfully submitted,

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