

# **How the Minnesota Efficiency Technology Accelerator Will Advance Market Transformation**

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## **ABSTRACT**

Since the recognition of the lighting cliff, Minnesota has been seeking out ways to maintain its leading role in advancing energy efficiency in the Midwest. Creating a framework to advance market transformation has been a key strategy in that advancement since 2019 when the concept was first discussed in working groups with regulators and utilities. Recently, the Minnesota legislature enshrined this effort, along with a landmark beneficial electrification bill (the “ECO Act”), to create the biggest change in Minnesota efficiency law in over a decade. The lesser-known market transformation bill is known as META (Minnesota Efficiency Technology Accelerator) and specified a stakeholder development process for the creation of the Midwest’s first dedicated, statewide market transformation program. This process ran from the fall of 2021 through April 2022, culminating in a regulatory filing with a five-year plan for META’s launch and ongoing operations. The legislation authorizes funding of up to five percent of total statewide energy efficiency budgets. This paper reports on the key recommendations of this process, including how the program will be structured and plans for market transformation initiatives to be launched in 2023. The total technical potential of the selected initiatives over a 20-year timeframe is 13% of total annual state energy usage.

## **Introduction**

The Minnesota Efficient Technology Accelerator (META) program is a new, statewide market transformation program that will be funded by Minnesota’s investor-owned utilities (IOUs). This section provides context and background on META.

### **META was created to enhance Minnesota’s current efficiency framework**

Minnesota’s Conservation Improvement Program (CIP) has been a cornerstone of Minnesota energy policy for decades, requiring electric and natural gas utilities in the state to achieve energy savings goals. However, to continue its successful track record into the future, the efficiency programs under CIP will need to diversify their savings opportunities. For example, lighting savings have dominated electric utilities’ portfolios for many years due to the successful transition to LED technology, but savings will need to come from a much more diverse set of end uses over the next decade (Figure 1).

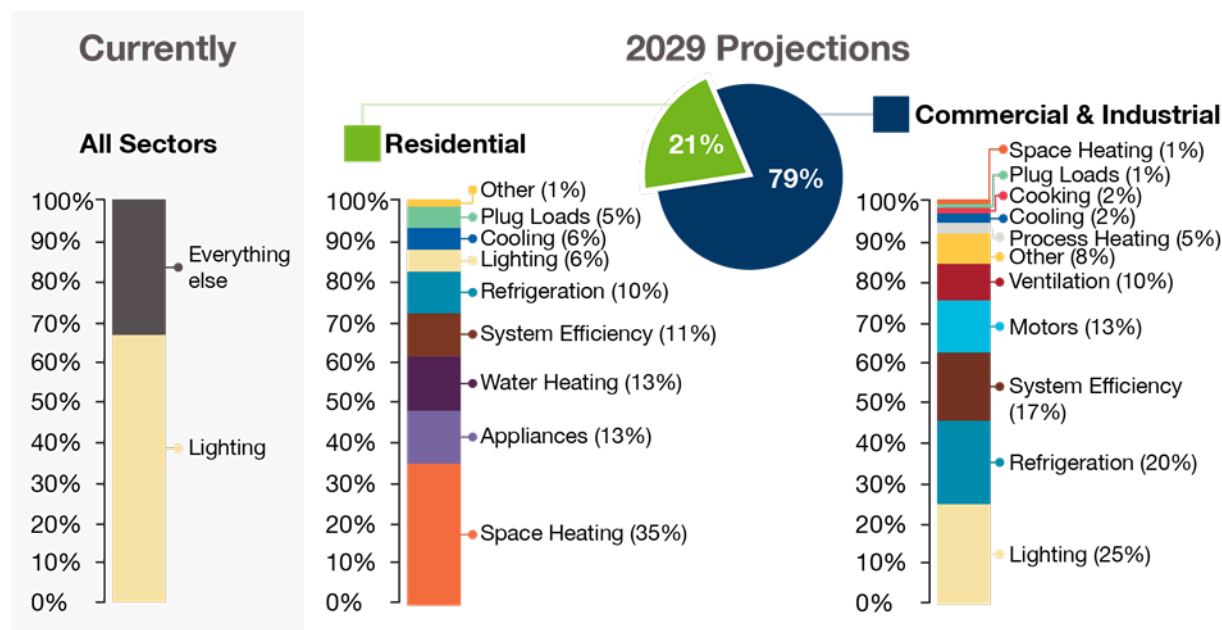


Figure 1: Sources of current CIP savings by major end use from electric utilities vs what is needed in 2029  
Source: Nelson, 2018.

Minnesota is at a critical moment where it needs to accelerate the adoption of new and innovative efficiency opportunities into the market to replenish the well of efficiency opportunities in the future and continue to achieve high levels of savings. Legislation was passed in 2021 to create a program that would help accomplish this – the Minnesota Efficient Technology Accelerator. This was part of a package of energy reforms, including the landmark Energy Conservation and Optimization (ECO) Act, which together represent the largest change in Minnesota energy policy in more than a decade. These energy reforms were the culmination of several years of discussion and deliberation among key stakeholders.

Together, the 2021 legislation modernized CIP policy for the coming decades. Some significant elements include:

- Enables efficient fuel switching/beneficial electrification.
- Creates a larger role for demand response.
- Increases low-income spending for both gas and electric utilities.
- Increases electric utilities' savings goal for IOUs to 1.75% from 1.5%.
- Provides an increased focus on carbon reduction.

In harmony with these changes, META will also expand the CIP framework, so that efficiency can continue to achieve savings goals and benefits for Minnesotans into the future.

## **META was created to accelerate the adoption of efficient technology**

META was conceived as a market transformation program, adapted specifically for Minnesota. Market transformation has been successfully deployed in a handful of other states to accelerate development of emerging technologies and approaches,<sup>1</sup> with the long-term goal of making installation of the targeted technologies or approaches the standard market practice (NEEA 2020; York 2017; Davis 2019). Some of the key features of market transformation include:

- A focus on long-term savings and long-term cost-effectiveness.
- Working with supply chains to leverage market forces.
- Engagement throughout the life cycle of a product, from its emergence until the targeted technology is adopted into energy codes or standards or otherwise becomes the standard market practice.

## **Market transformation is an investment in the future**

The commitment to a market transformation approach is a long-term endeavor, with a longer time horizon for engaging with specific technologies or approaches and a longer time horizon for realizing energy savings than traditional efficiency (or “resource acquisition”) programs. Thus META is designed to make long-term investments that will have long-term benefits. The process involves engaging with new technology or approach at a very early stage and working alongside the market until it becomes the standard practice. This can take a decade or more and requires a long-term outlook and commitment. Correspondingly, META will operate under five-year planning periods, as NEEA does, rather than Minnesota’s typical three years for CIP program planning.

Along with that commitment to a long-term outlook is a need for operational flexibility in order to respond to market changes. META will need to develop robust processes and decision-making structures for the various stages of the lifecycle of a market transformation initiative, tailored to the Minnesota market and conditions, from initial screening of potential technologies to the desired end-state, which is adoption as the standard market practice.<sup>2</sup> The timeframe to reach this end-state, from its starting point as a market transformation initiative, can be a decade or more.

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<sup>1</sup> Although we have focused on “technologies” in our discussion of specific market transformation initiatives, a market transformation initiative can also focus on advancing specific approaches, which may not be tied to a discrete technology. Strategic Energy Management is a classic example of a market transformation initiative, run by NEEA, that is more rightly an approach, rather than a specific technology (Waller: 2015). Of 12 initiatives considered in the META stakeholder process, one of them was an approach (time of sale residential energy disclosure), rather than a discrete technology; all five of the *selected* META starter portfolio initiatives were technologies rather than approaches.

<sup>2</sup> The META initiative lifecycle process in the META plan was closely mirrored off the current NEEA process, and includes four stages: 1) Scanning and Concept Development; 2) Program Development; 3) Market Development, and 4) Long-Term Monitoring and Tracking (CEE 2022). The Long-Term Monitoring and Tracking stage is critical for collecting market data to support code and standard advancement.

## Minnesota stakeholder process to develop META plan

The META legislation required a stakeholder process to inform the development of the META plan. This plan was developed by the Center for Energy and Environment (CEE), which would also be the entity to implement META. The stakeholder process included working collaboratively to develop key aspects of the META plan, including:

- The lifecycle process for META initiatives.
- Methods for calculating energy savings and new benefits.
- Governance and collaboration.
- Crafting a starter portfolio of five market transformation initiatives.

In crafting this plan, CEE worked closely with Northwest Energy Efficiency Alliance (NEEA), drawing on their decades of experience successfully implementing market transformation programs in the Northwest (NEEA 2020). The final plan draws heavily on NEEA's existing processes and programmatic activities, and plans for NEEA to be an ongoing partner with CEE in implementing META.

## META Program Goals

The stakeholder process established four overall goals for the program, consistent with a market transformation approach, detailed below.

### Create a Strategic Process to Accelerate Market Deployment

At its core, the successful implementation of market transformation programs is about establishing an effective process. NEEA defines market transformation as:

*The strategic process of intervening in a market to create lasting change in market behavior by removing identified barriers and/or exploiting opportunities to accelerate the adoption of all cost-effective energy efficiency as a matter of standard practice.*  
(NEEA 2022)

Further, this strategic process has several distinct characteristics, including the following.

- It is a structured and rigorous method for identifying and design program intervention strategies.
- It is an iterative process.
- It relies on data and market intelligence.
- The end goal is to become standard market practice.

Another feature of this market transformation approach is that it engages with nearly all product lifecycle stages, from pre-commercial and product design, to early market and mainstream adoption, and, finally, to incorporation into codes and standards (Figure 2).<sup>3</sup>

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<sup>3</sup> Most traditional market transformation will stop active market engagement once market barriers are removed and an inflection point is reached in market adoption; and then (other than monitoring and tracking activities during an

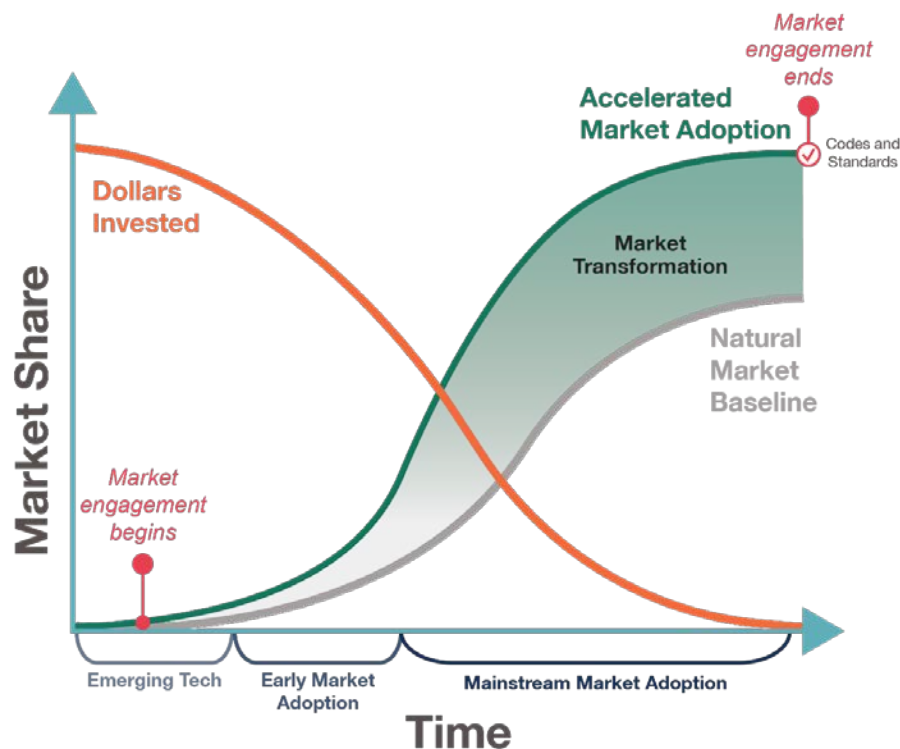


Figure 2: Product lifecycle, market adoption curve, and scope of META involvement<sup>4</sup>

This also illustrates the typical mismatch between the timing of savings and the timing of expenses in market transformation programs. Initial relatively large outlays of funding do not result in significant savings until many years later when there can be a large payoff at little to no program cost.

Therefore, a longer-term frame of reference for evaluating market transformation programs is essential to the META approach. When a technology is not cost-effective for standard efficiency programs, market transformation programs can be used to engage with the market to remove barriers and pave the way for cost-effective market growth.

### Employ Effective Strategies to Leverage Market Forces

An important premise of our approach to market transformation is that market forces can do a lot of heavy lifting to increase market adoption.<sup>5</sup> Thus, market transformation strategies and tactics focus on how to most effectively leverage market forces. This involves developing strong relationships with and a deep understanding of market actors throughout the supply chain,

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interim period), will re-engage when there is an opportunity to lock in the savings through codes and/or standards. Recently, practitioners of market transformation have been seeing a decrease in the time period it takes to move from emerging technology into codes or standards.

<sup>4</sup> This chart was developed from, and indebted to, NEEA-provided materials (e.g., NEEA 2020).

<sup>5</sup> The focus on leveraging market forces upstream of the customer, which is a quintessential market transformation strategy, can be contrasted with the creation of customer pull, which is often the target of traditional resource acquisition efficiency programs. In practice, customer demand and education is still an important consideration for most market transformation initiatives, although typically not a large budgetary focus.

including manufacturers, distributors, retailers, and contractors. Ongoing market intelligence efforts and the development of tools and platforms to facilitate continual data collection and understanding of business practices are standard market transformation practices.

Some common market transformation intervention strategies include:

- Develop product specifications or qualified product lists to differentiate premium efficiency products from standard efficiency products.
- Collaborate with manufacturers and distributors to develop product commercialization support, including pricing strategies, training, and marketing.
- Target incentives to encourage stocking efficient products at distributors and/or retailers.
- Support installers with resources such as training, engagement, and marketing.
- Coordinate manufacturer and distributor promotions and incentives with utility programs.
- Support and build customer awareness with messaging research and development.
- Develop reliable third-party data on product performance and energy savings that can give the market confidence that the product will perform as promised

As each market transformation technology is different, strategies are customized for that technology and the market in which it belongs.

### **Become a Hub for Collaboration Among Stakeholders**

Within the context of Minnesota's framework for CIP program implementation by individual utilities, the META approach is unique in that it seeks to take a statewide approach. Current CIP programs are utility-specific. However, markets are not contained neatly within utility borders, and an effective market transformation approach requires a unified voice to best engage with a national and even international supply chain. META will work to foster cooperation among the funding utilities on market transformation initiatives to achieve this unified voice.

In addition to utilities, other stakeholders that will be important for META to collaborate with include:

- Supply-chain actors.
- Other regional and national efforts.
- Existing research efforts.

### **Achieve Cost-Effective Energy Savings and Other Benefits for Utilities and Minnesotans**

In the long-run, META is designed to achieve cost-effective energy savings for Minnesota ratepayers, and cost-effectiveness is an important policy objective for regulators. Typically, market transformation programs involve a high investment of funds early in the lifecycle of an initiative, when market share (and thus savings) is low; over time, market share increases, savings correspondingly increases, and costs come down. It is thus mature market transformation programs that generate large, cost-effective savings. As it will take some ramp-up time for META to have mature programs in its portfolio, META is not expected to reach a cost-effective level of savings (generated on an annual basis) by the end of the initial five year

planning period. However, by the end of the five-year period, META will provide a roadmap to achieving positive cost-effectiveness.<sup>6</sup>

## Collaboration in META Implementation

The Minnesota Department of Commerce, Division of Energy Resources (DER) will collect the funding for META from participating utilities, and be the administrative state agency to contract for META implementation with CEE. Minnesota Investor-Owned Utilities (IOUs) collectively fund META, with the voluntary participation of Minnesota's Consumer-Owned Utilities (COUs) voluntary. A Coordinating Committee, comprised of funding utilities and the DER, will provide a forum for discussion of operational issues. The implementation of META will be further informed by three additional Advisory Committees. Figure 3 below shows the overall structure for governance and stakeholder engagement for META.

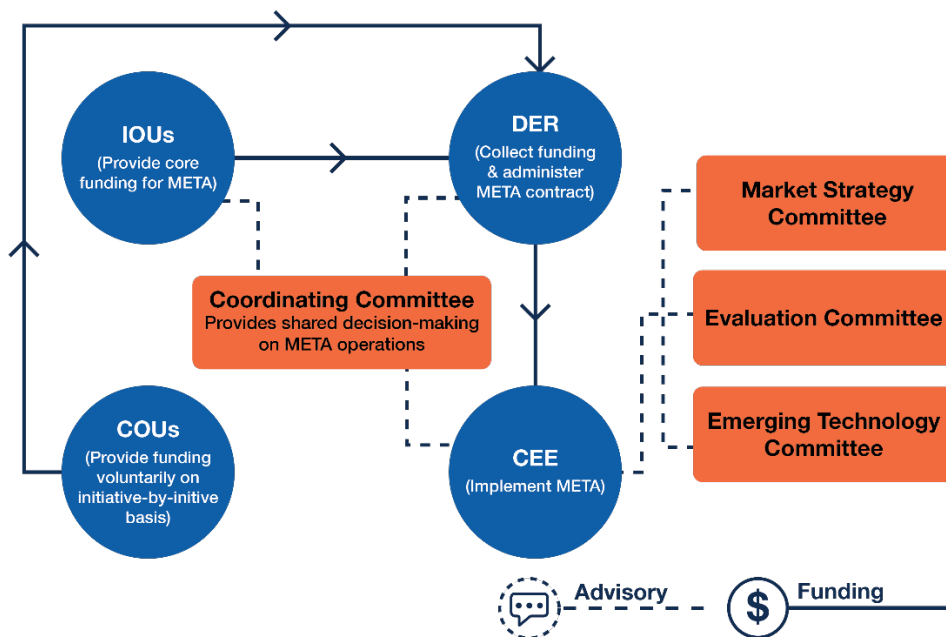


Figure 3: Overall META governance structure

### Market Strategy Advisory Committee

The Market Strategy Advisory Committee will have the broadest membership of any of the proposed committees. It will advise on META strategic issues and provide a conduit for collaboration among a broad range of interested stakeholders. We anticipate a membership composed of a range of organizations that would have an interest in the success of META, including leaders from IOU and COU utilities, consumer advocates, national labs, regulators,

<sup>6</sup> Although a full discussion of how META proposes to treat cost-effectiveness is beyond the scope of this paper, cost-effectiveness and the calculation of savings net benefits from META is a critical technical topic, and is covered extensively in the META proposal.

clean energy advocates, ratepayer advocates, business interests, and supply-chain representatives.

### **Evaluation Advisory Committee**

Market transformation programs require a different framework for evaluating and claiming savings compared to traditional resource acquisition programs. Applying a market transformation framework is a new approach for Minnesota. Given the importance of evaluation, we are proposing an advisory committee dedicated to this topic. The Evaluation Advisory Committee would advise on evaluation and cost-effectiveness issues and provide a forum for discussion of key issues related to evaluation and cost-effectiveness.

We envision that it will primarily be composed of DER and participating utilities, but also other interested stakeholders and evaluation experts, including experts that have implemented or evaluated market transformation programs in other states. We note that decisions related to how to evaluate and claim savings will ultimately be made by DER, but the evaluation advisory committee will help to inform those decisions.

### **Emerging Technology Advisory Committee**

A large part of META involves bringing emerging technologies to market more quickly than otherwise would happen. Thus, a clear line of sight into potential emerging technologies that META can focus on will both be an important activity on its own merit, as well as an important area for alignment of META activities with those of individual utilities and other stakeholders. The Emerging Technology Advisory Committee will help to inform the META pipeline and provide a forum for discussion and coordination among related efforts at individual utilities and other research entities. We envision this committee as composed primarily of more technical staff that would be in a good position to represent their organizations' overall views on and efforts related to specific emerging technologies.

### **Coordinating Committee**

The DER and funding utilities will coordinate on operational issues through the Coordinating Committee. It will also advise on key decisions such as the launch of new initiatives and input into META's annual work plan document.

## **Funding**

META's core funding comes from five Minnesota utilities: two electric (Minnesota Power and Otter Tail Power), two natural gas (CenterPoint Energy and Minnesota Energy Resources), and one dual-fuel utility (Xcel Energy). The funding is a part of each utilities' energy efficiency spending budget and is allocated according to total gross sales among the participating electric and natural gas IOUs. Figure 4 provides the breakdown of funding by utility.

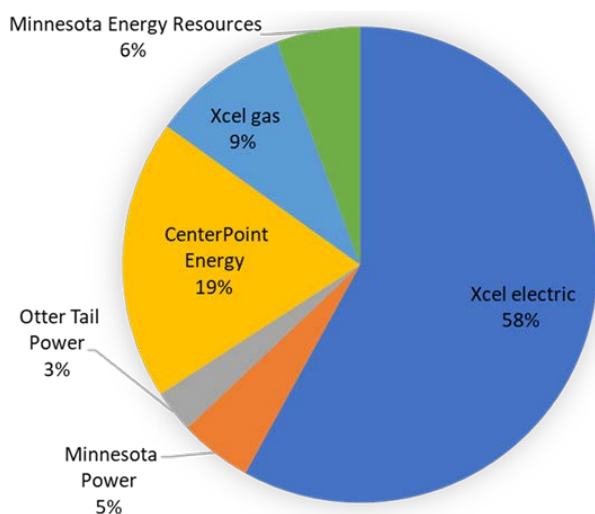


Figure 4: Proportion of META funding by participating utilities

The funding, by statute, is capped at no more than five percent of total CIP funding, to be ramped up over the first five years of the program. With approximately \$200 million per year in current CIP funding from the IOUs, this would result in a META budget of about \$10 million per year. We estimate, based on Minnesota conditions and evaluation of other market transformation programs, that this will allow META to operate approximately five to seven ongoing market transformation initiatives (CEE 2022).

## Starter Portfolio

The development of market transformation initiatives typically takes many years. However, we have taken advantage of NEEA's generosity in sharing their work so we can leverage what they have already accomplished to construct a starter portfolio. This represents both an efficient use of resources in the portfolio's development as well as a faster route to savings than if we had to develop each initiative from scratch.

After working closely with NEEA and soliciting feedback from the funding utilities and the DER, CEE is proposing to start META with five initiatives. All of these initiatives are ones that NEEA is currently implementing in some form and benefit from having gone through NEEA's extensive research and vetting process.

Further planning will be conducted, and further approvals will be needed prior to full market deployment. However, the starter initiatives would allow META to begin to work on a market transformation plan for each of the five initiatives when META launches in 2023. These starter initiatives are thus an important strategy to reach the goal of a pathway to cost-effective savings by the end of the first five-year period. Table 1 summarizes these starter initiatives.

Table 1: META Starter Initiatives

| Initiative                               | Description                                                                                                                                                                                                                                                      |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dual-Fuel Air Source Heat Pumps          | META will focus on dual fuel AC replacement applications for centrally ducted ASHPs in the residential market.                                                                                                                                                   |
| Luminaire-Level Lighting Controls (LLLC) | LLLC's are built-in controls on lighting fixtures and are applicable to a broad range of commercial sector applications.                                                                                                                                         |
| High Performance Windows                 | High performance window technology has made recent advancements, including the advent of thin-triples. This produces both gas and electric savings.                                                                                                              |
| High Performance RTUs                    | This initiative will build upon an initiative that NEEA has developed to provide three efficiency tiers for RTUs. META will add dual-fuel heat pump RTU's to implementation in Minnesota. Both gas and electric savings.                                         |
| Gas-Fired Heat Pump Technologies         | Similar to electric heat pumps, gas-fired heat pumps can provide higher efficiencies than standard gas water and space-heating technologies. This initiative would include water heaters, gas-fired heat pump combination heating, or both, and cooling systems. |

In addition to their individual attributes, these starter initiatives were considered for their overall contribution to creating a diverse and balanced portfolio using the considerations listed above. Thus, as a whole, the five proposed starter initiatives offer the following benefits:

- ***A balance of electric and gas savings measures.*** Our starter portfolio contains one electric-only initiative, one gas-only initiative, and three dual-fuel initiatives.
- ***A mixture of residential, commercial, and industrial technologies with statewide applicability.*** Our starter portfolio has two primarily residential initiatives and three primarily commercial/industrial initiatives.
- ***A balance of long-term and shorter-term energy savings opportunities.*** Several opportunities are fully commercialized but with almost no market share (luminaire level lighting controls and dual-fuel air source heat pumps) and thus are more near-term opportunities that could see significant market growth within five years, while others (gas-fired heat pump technologies) do not yet have commercialized products in the market and are likely longer-term opportunities.
- ***Large technical savings potential across several important market segments.*** In total, the technical potential of the selected measures over a 20-year time frame is 13 million MWh and 65 million Dth, which is 13% of total annual state energy usage (CEE 2022).
- ***Tie-in to equity issues.*** Air source heat pumps have several potential tie-ins to several equity issues that relate to META. First, research shows that fuel switching does not necessarily lead to lower customer costs, depending on how the units are installed and operated. Thus, there is the potential for already income-burdened households to increase their energy bills as an unforeseen consequence of switching to electric heating. We would work to address that issue through META implementation, including proper workforce training in installation best practices. Electric utility rates are also critical to air source heat pump adoption, and opportunities exist for better rate design specifically for

dual-fuel air source heat pumps (Tudawe 2022). Finally, there is significant potential to integrate ASHPs into weatherization programs. META could provide technical assistance to help with this process. In addition, the high-performance windows initiative would have applicability to affordable housing.

## Conclusion

Extensive stakeholder work and active collaboration with NEEA has resulted in a vision and plan for implementing META as a statewide market transformation program in Minnesota. The plan outlines five goals for the META program:

- Create a strategic process to accelerate market development.
- Employ effective strategies to leverage market forces.
- Become a hub of collaboration among stakeholders.
- Achieve cost-effective energy savings and other benefits for utilities and Minnesotans.

The plan is designed to actuate META's statutory purpose to accelerate deployment and reduce the cost of emerging and innovative, efficient technologies. This program will complement traditional CIP programs by focusing on technologies and approaches that have a longer time horizon to achieve cost-effectiveness. A collaborative governance structure was developed for META, including four advisory committees to provide input into the ongoing operation of the program. Funding is provided by the five largest investor-owned utilities in Minnesota, and administered by the State of Minnesota. Five "stater portfolio" market transformation initiatives have been selected for launch in 2023, pending final regulatory approval later this year. The technical potential of the selected initiatives over a 20-year time frame is 13% of total annual state energy usage.

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