The Efficient Technology Accelerator: Minnesota's New Market Transformation Program

MEEA Midwest Energy Solutions Conference
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Center for Energy and Environment

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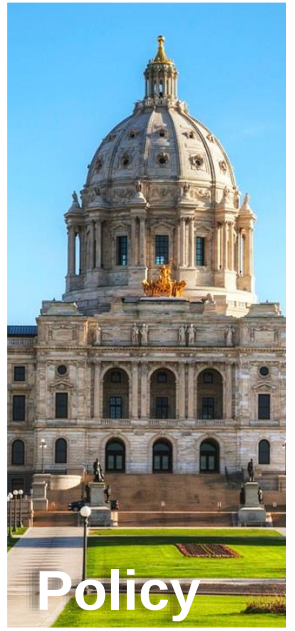
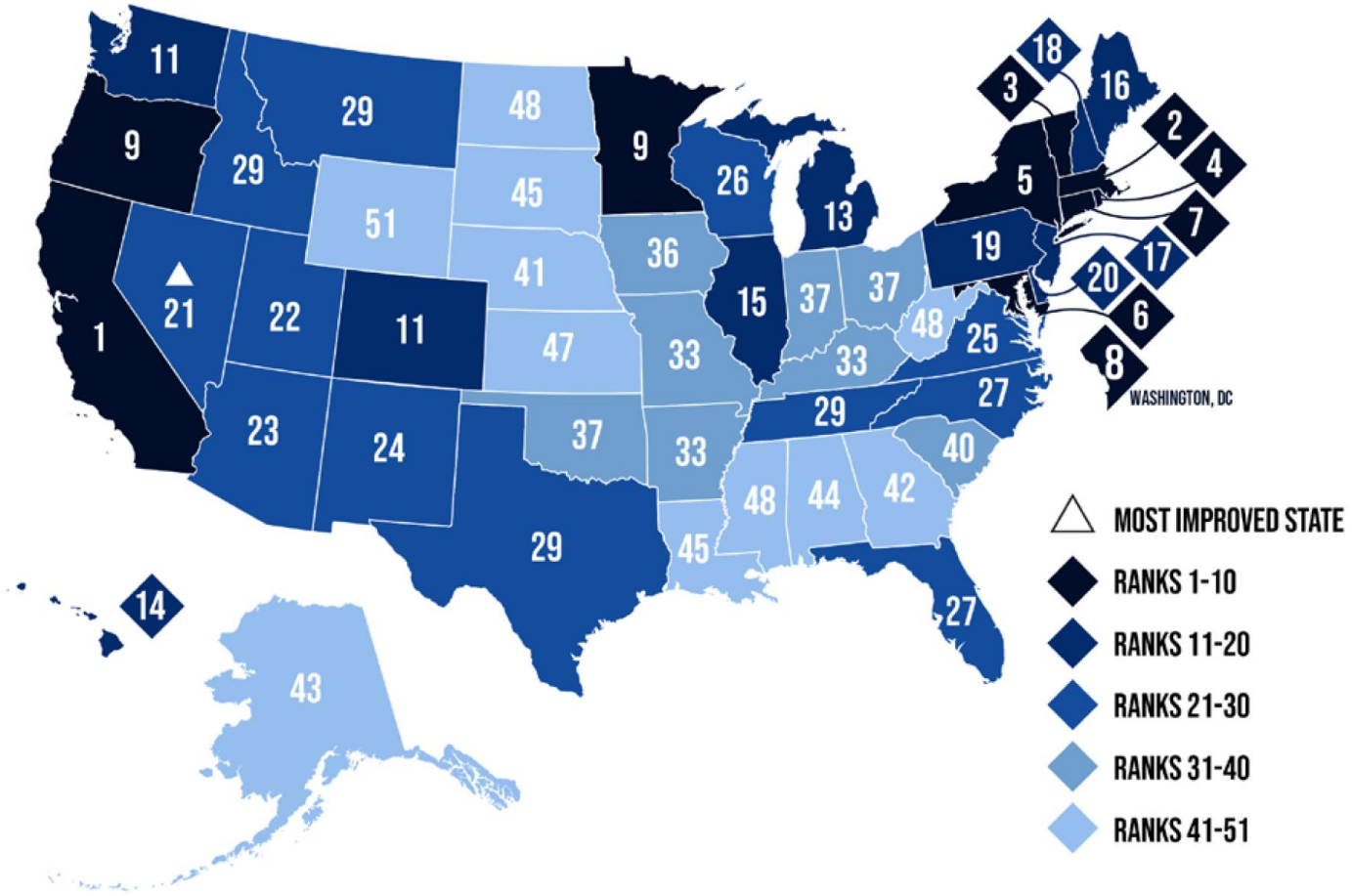


Agenda – MN Market Transformation

- Policy Context
- MN Efficiency Technology Accelerator
- Starter Portfolio

Policy Context

Minnesota has long history of progressive energy efficiency policy



Source: ACEEE State Rankings, 2022

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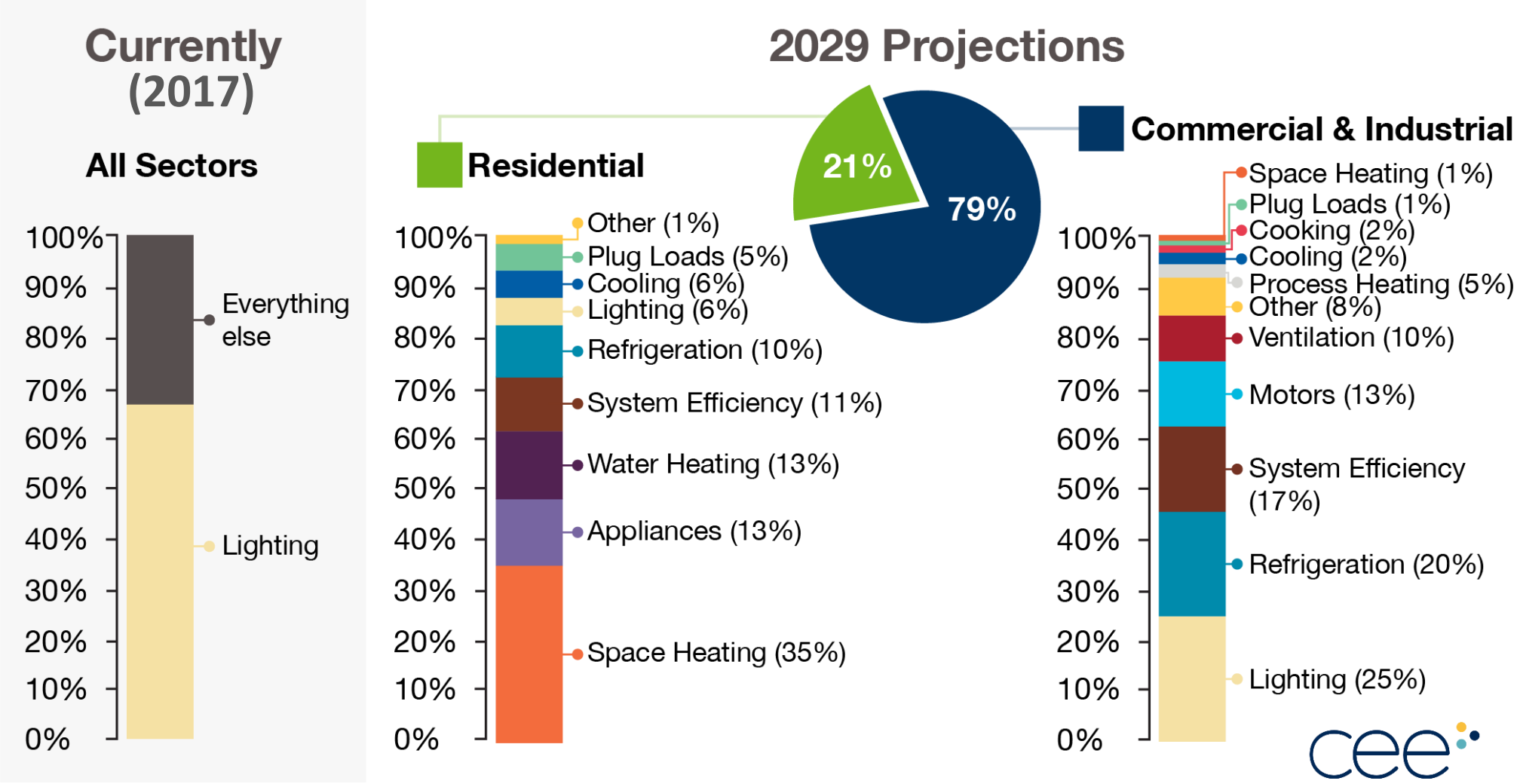
We've long known the need to accelerate non-LED savings



Source: Minnesota Statewide Energy Efficiency Potential Study, 2018

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Setting Stage for Next Generation of Energy Efficiency

Minnesota's 2021 Legislative Policy Wins

Energy Conservation and Optimization Act (ECO)

Enables "Efficient Fuel Switching"

Integrates Load Management with Energy Efficiency

Increases low-income spending

Natural Gas Innovation Act (NGIA)

Enables gas utilities to submit "Innovation Plans"

Can fund renewable natural gas, efficient fuel switching, or other innovative decarbonization projects

Must include deep energy retrofit + ASHP program

MN Efficient Technology Accelerator (ETA)

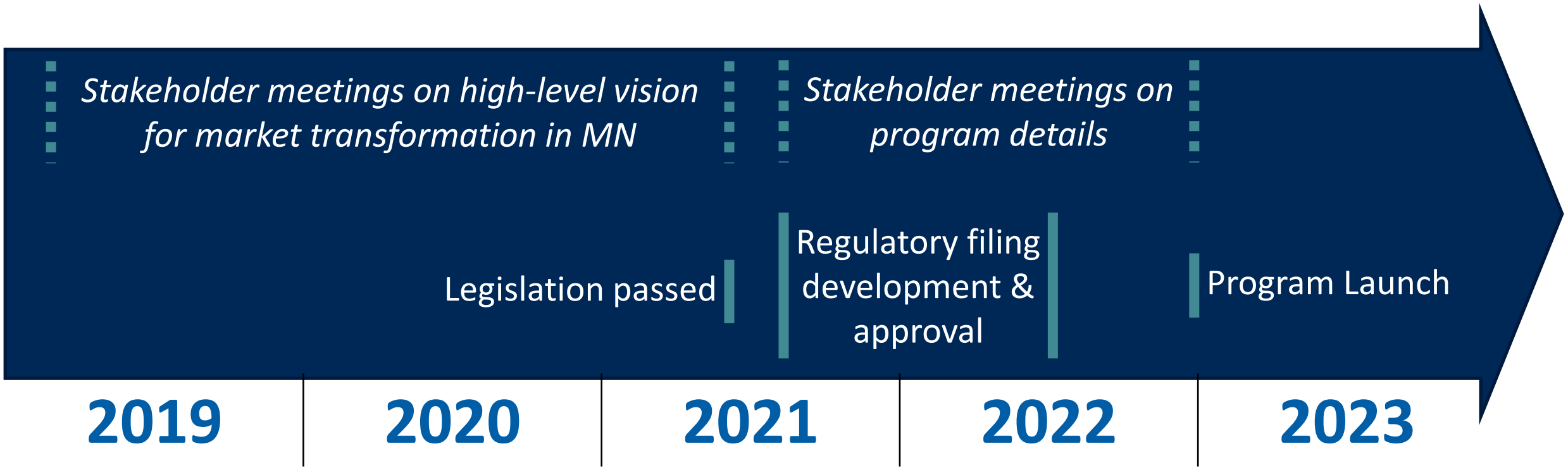
Creates a market transformation framework to advance emerging technologies

Statewide approach with central program administrator

Allows longer-term timeframe to consider cost-effectiveness

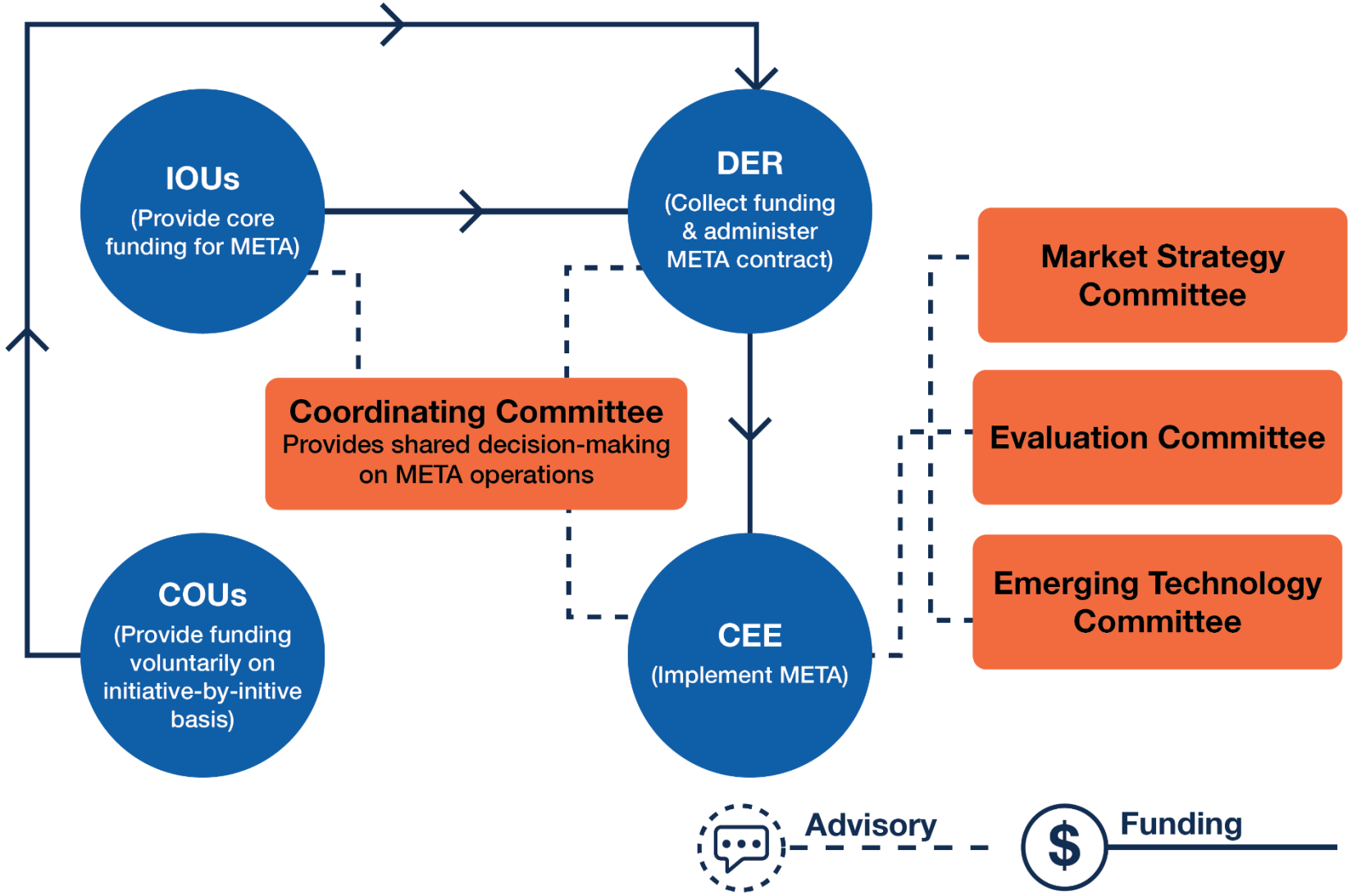
Stakeholder Involvement in ETA Program Design

from Utilities, Regulators, Supply Chain Actors and Others



MN Efficiency Technology Accelerator – Overall Approach

Ongoing Collaboration in ETA is Built into ETA Program Design



NEEA's Success Informed MN's Approach to MT

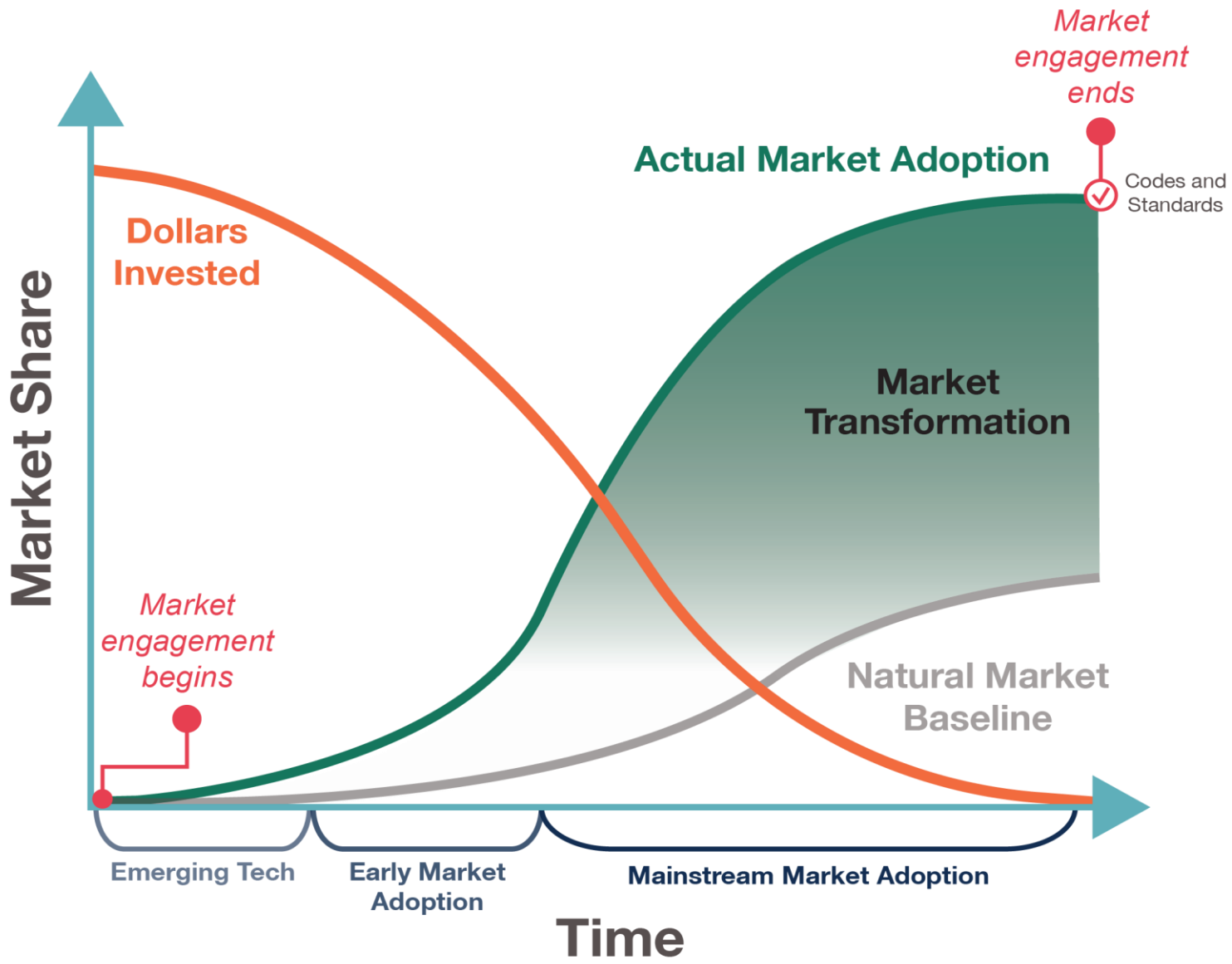
- ETA modeled on NEEA's approach to MT
  - Non-profit, utility-funded, collaborative approach
  - Proven model for MT implementation, cost-effective energy savings
  - NEEA aided in proposal development

- CEE will collaborate with NEEA in ETA implementation

Northwest Energy Efficiency Alliance Background

Non-profit organization
Funded by 145 utilities (~ $40M/yr)
4 states
13 million consumers
2019 energy cost savings of $574M
Over 7,183 GWh energy savings

Market Transformation Framework:
Investing Earlier in the Technology Lifecycle



MT is the "patient capital" of energy efficiency - has a longer-term timeframe for considering cost-effectiveness

Other Key Attributes of MN Approach

Statewide program with central administrator

- Department of Commerce collects funds and oversees program
- Mandated funding from electric & gas IOUs; Voluntary from consumer-owned utilities

Five-year funding cycles

- Matches the longer-term time horizon of market transformation
- Total program evaluation conducted at end of first cycle

Program will measure and claim savings

- This includes from codes and standards advancement
- Savings allocated to participating utilities in proportion to their funding

Portfolio approach

- ETA has a mix of different initiatives, across res and C&I sectors
- Four-stage lifecycle process from concept to market deployment for each intiative

Starter Portfolio

Starter Portfolio Initiatives

Initiative
✦ Air Source Heat Pumps
Luminaire-Level Lighting Controls
High Performance Windows
✦ High Performance RTUs
Gas-Fired Heat Pump Technologies

Total long-term savings potential from all five = 13% reduction in total state energy use

✦ *Electrification / efficient fuel switching technologies*

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Air Source Heat Pumps

- Initial focus: Dual-fuel, centrally ducted heat pumps replacing central air conditioners
- Goal is to phase out central AC, and only install ASHPs over time
- Build on work started by MN ASHP Collaborative in 2019

Luminaire-Level Lighting Controls

- A type of wireless networked lighting control (NLC) that integrates controls and sensors into the luminaire, enabling communication with each other and transmission of data

- Key benefits:
  - Simplified design and installation
  - Increased lighting quality and occupant comfort
  - Enhanced control of other building systems

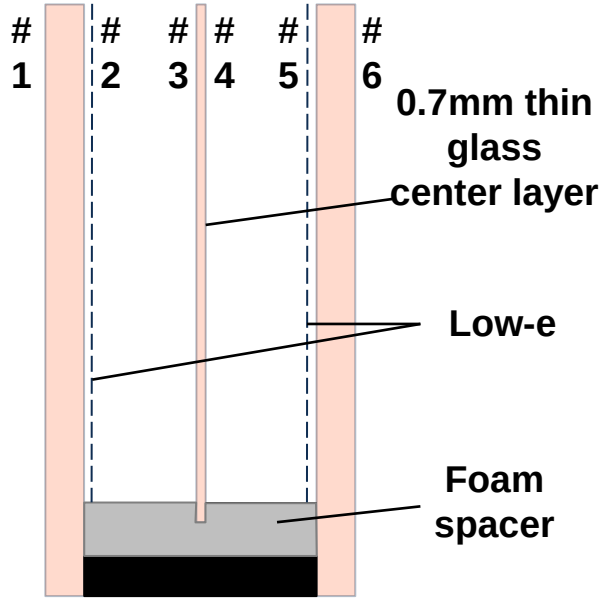
- Can bring advantages of networked lighting controls to new types of applications

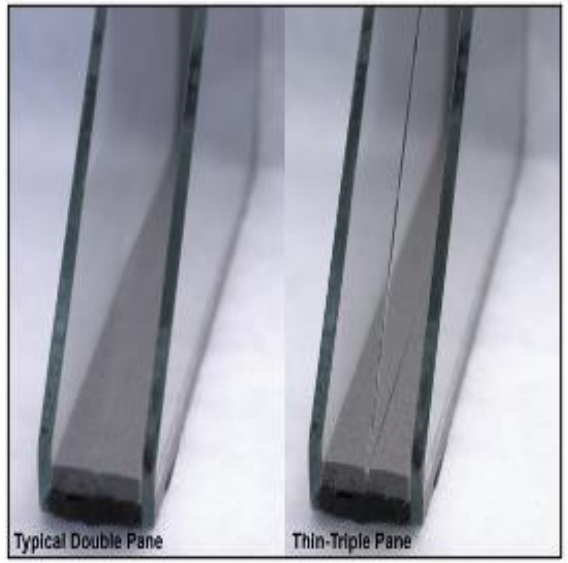
High Performance ASHP Rooftop Units (RTUs)

- Drop-in replacement for traditional packaged RTUs (same footprint and connection points)
- ASHP provides cooling *plus* heating down to a set switchover temperature
- Also work to increase efficient RTUs (eRTUs):
  - Cabinet insulation
  - Low leakage dampers
  - Heat Recovery
  - Condensing Furnace

High Performance Windows

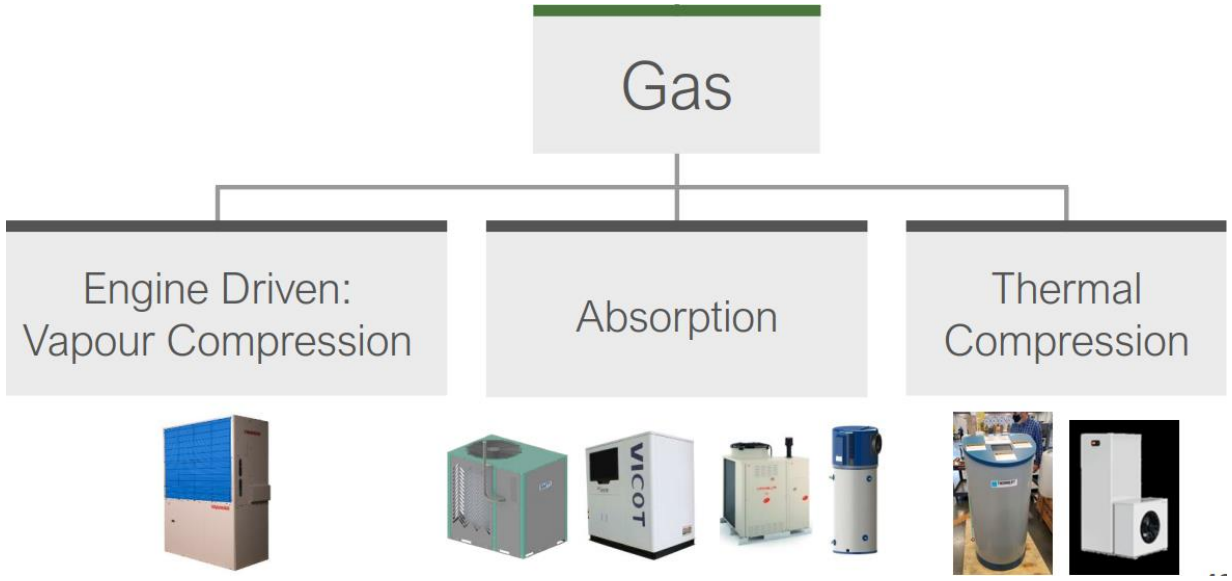
- U-value of 0.22 or better
- Thin-triple benefits
  - Glass unit has similar width to double
  - Fits into current window frames and designs
  - 16% savings compared to current ESTAR windows
- Window market is stagnant
  - > 80% market share for ESTAR windows for past 10 years
- Windows crucial shell measure in MN
  - 8% of area but 45% of heat transfer





Gas-Fired Heat Pump Technologies

- Residential and light commercial
- Current generation - ~1.3 UEF
- Next generation - ~1.7 UEF
- Commercialization planned for 2023



Key Takeaways

- Market transformation is key part of strategy for next generation of programs in Minnesota and beyond
- Collaboration among stakeholders is critical
- Heat pumps, lighting controls and windows have significant savings potential, and will be the initial focus of the program
- Markets are regional, and cooperation among states will be critical for long-term MT success (such as ASHP Collaborative pre-conference event)

THANK YOU!

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APPENDIX

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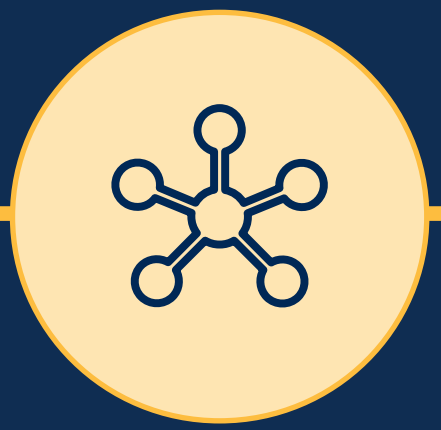
Four Stages of Individual ETA Initiatives

1. Concept Development

Scan and assess a broad range of technologies & approaches

2. Program Development



Conduct planning and testing to successfully launch a handful of MT initiatives

3. Market Development

Deploy market intervention strategies that result in measurable savings

4. Long Term Monitoring & Tracking

Engage in codes or standards process to lock in savings

2023 Focus on Planning for Starter Portfolio

Concept Development

Scan and assess a broad range of technologies & approaches

Program Development

Conduct planning and testing to successfully launch a handful of MT initiatives

Market Development

Deploy market intervention strategies that result in measurable savings

Long Term Monitoring & Tracking

Estimate savings and periodically assess need for market re-entry