



# Minnesota TRM 5.0 Update

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Lauren will be the primary point of contact for the below items. In an ideal world however, you would also copy Jenna on TRM inquiries.

- TRM Suggestions/Questions
- CARD research inquiries/results
- Modifications to the TRMAC distribution list

- Housekeeping
- TRM Schedule and Process
- MN Conservation Applied Research and Development (CARD) Projects
- ECO and EFS Considerations
- TRM v5.0 Updates – Preliminary List

# Housekeeping – TRMAC Members

Name	Organization	Name	Organization	Name	Organization
Anthony Fryer	MN Department of Commerce	Gary Swanson	Energy Management Solutions	Katie O'Rourke	Minnesota Energy Resources - ICF
Adam Zoet		Sam Friesen	Fresh Energy	Katy Koon	
Laura Silver		Dean Laube	Franklin Energy Services	Zach Froio	
Lindsay Anderson		George Roemer		Cassie Theisen	Minnesota Power
Catherine Fair		Doug Eli	Frontier Energy	Chad Trebilcock	
Lauren Sweeney		Janhavi Datar		Wyatt Miller	
Jenna Lipscomb	Cadmus	Matt Haley		Lisa Severson	Minnkota Power Cooperative
Amalia Hicks		Tanuj Gulati		Darlene Weber-Scott	Missouri River Energy Services
Kim Lillyblad	Avant Energy	Tom Vagts	GDS Associates, Inc.	Jesse Robertson	
Lauren Runyan		Travis Hinck		Kurt Hauser	
Andy Baeten	Center for Energy and Environment	Kathy Baerlocher	Great Plains Natural Gas Company	Lisa Fischer	Otter Tail Power Company
Ben Schoenbauer		Larry Oswald		Betty Balegana	
Carl Nelson		Zach Klabo		Cristina Zuniga	
Isaac Smith		Amelinda Hendrickx	Great River Energy	Jason Grenier	
Kristen Funk		Jamie Stallman		Jon Fabre	
Ranal Tudawe		Jeff Haase		Luke Meech	
Ritika Kumbharkar		Kelsey Kopp		Allegra Steenson	Pacific Northwest National Laboratory
Will Nissen		Rodney De Fouw	ICF	Annie Hu	
Eric Johansen		Victoria Browning		Sam Rosenberg	
Ethan Warner	CenterPoint Energy	Dan Cooper	Lake Country Power	Josh Mason	Rochester Public Utilities
Marty Kapsch		Chris Trembley	Madelia Municipal Light & Power	Andy Lick	Slipstream
Tyler Glewwe		Grey Staples	Mendota Group	John O'Neil	Southern Minnesota Municipal Power Agency
Chris Droske	City of Minneapolis	Joel Pertzsch	Michaels Energy	Chris Baker	VEIC
Isaac Evans		Jen Kimmen	Minnesota Energy Resources	Eric Flower	Xcel Energy
Cory Hetchler	Connexus Energy	Huei Wong	Minnesota Energy Resources - ICF	Erin Kern	
David Reinke	Dakota Electric Association	Julian Graybill Brubaker		Karl Shlanta	
Patrick Mathwig					

# TRM Schedule and Process

Date	Event Description	Description
5/30/2025	Meeting 1 - Kickoff Meeting	Priority List for TRM v5.0 Introduced
June	Meeting 2	Discussion on M&V Protocols & Weather Normalization Methodology to Determine ECO Goal
July	Meeting 3	Measure Workpapers Introduction and Discussion
August	Meeting 4	Measure Workpapers Discussion Continued
September	Meeting 5	Measure Workpapers Discussion Conclusion
Early October	Review Period Concludes	TRMAC Non-Regulatory Comments Due on TRM v5.0
Mid October	Letter + TRM v5.0 posted on eDockets	TRM v5.0 Regulatory Process
Early November	Written Comments	
Late November	Reply Comments	
Late December	Deputy Commissioner Decision	

# TRM Schedule and Process

## MN TRM SharePoint (Internal)

- Direct Link: [MN TRMAC Collaboration Site – Documents](#)
- Find information on:
  - Measure Priority List
  - Measure Workpapers
  - Measure Workbooks
  - Measure Resources
  - Recordings and slide decks from related presentations
- You should all have access to this site. Please let Lauren know if you don't have access.

## MN TRM Webpage (External)

- Direct Link: [Technical Reference Manual / Minnesota Department of Commerce – Energy](#)
- Find information on:
  - Previous TRM Releases
  - Recordings and slide decks from past meetings and TRMAC meetings related to TRM v5.0
- This should be maintained during the next couple of months as we develop TRM v5.0. We will let you know if that is not the case.

# TRMAC Collaboration SharePoint Site



## MN TRMAC Collaboration Site

[Home](#)

[Notebook](#)

[Documents](#)

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[Documents](#) > **MN TRM v5.0**

[○](#) [📄](#) [Name](#) ▾

[📁](#) Draft Measure Workpapers

[📁](#) Draft TRM 5.0

[📁](#) Final Excel Workbooks by Measure

[📁](#) Resources and Meetings

[📁](#) z. archive

[📄](#) TRM v5.0 Priority List - MN TRMAC.xlsx

- Full measure updates will have workpapers
- Minor updates tracked changes in full Draft TRM
- Excel workbooks for each full measure update – when completed
- Meeting recordings
- Priority List – updated periodically

[Return to classic SharePoint](#)

# CARD Research

## New General Topics RFP

Perform Field study or Demonstration, Conduct Market or Saturation Study, Produce a White Paper, or Research Data Centers

This Request for Proposals (RFP) process consists of two stages:

- Stage 1: Notice of Intent (NOI) to propose for CARD Grant project **(due 5:00pm CT 06/24/2025)**, and
- Stage 2: Submission of full proposal application for CARD Grant **(due 5:00pm CT 10/29/2025)**.

Only Responders who have submitted an NOI (Stage 1) will be eligible to submit a full proposal application (Stage 2).

The Request for Proposals (RFP) is available for download on the Department's RFP website at [Request for Proposals \(RFP\) / Minnesota Department of Commerce - Business \(mn.gov\)](#).



# CARD Research

## Existing CARD Projects

### Completed or Soon To Be Completed CARD Projects

These final reports and webinars are within the TRMAC SharePoint Site and on the [CARD Website \(under “Research Since 2020”\)](#)

**Red** text identifies new research that can be used during v5.0, if applicable.

Grantee	Title	Project Expiration Date
MN CEE	Overcoming the Market Barriers for RTU Retrofit Enhancements	12/29/2023
MN CEE	Air-to-Water Heat Pumps	12/31/2023
EcoMetric Consulting	HVAC Contractor Decision Research	12/31/2023
MN CEE	Residential Fan Controls	3/1/2024
LHB, Inc.	Field study of phase change material (PCM) use for passive thermal regulation	4/30/2024
MN CEE	Optimizing the New Generation of Grocery Refrigeration Equipment	4/30/2024
MN CEE	Ductless cold climate heat pumps for multifamily applications	5/31/2024
MN CEE	Optimized Installations of Air Source Heat Pumps for Single Family Homes	5/31/2024
MN CEE	Intelligent Buildings	6/30/2024
Synapse	Advancing and Optimizing Electric Vehicle Adoption in Minnesota through Utility Energy Conservation and Optimization (ECO) Programs	9/30/2024
Slipstream	VRF Demonstration	1/31/2025

# CARD Research

## Existing CARD Projects

### Existing CARD Projects

Red text identifies new research that can be used during v5.1, if applicable.

Grantee	Title	Project Expiration Date
MN CEE	Industrial Electrification Through Heat Pump Adoption for Process Loads	10/31/2025
Cadmus Group	Consistent Load Shapes for Fuel-Switching Tests and Assessing Flexible Load Potential	12/21/2025
Michael's Energy	Ground Source Tech in Urban Buildings	12/23/2025
Slipstream	Refrigeration Thermal Storage for Energy Efficiency	12/31/2025
2050 Partners	Right-Sizing Water Distribution Pipes and Water Heating Systems to Save Energy and Reduce Building Costs	12/31/2025
Slipstream	Strategic Decarbonization for Larger Utility Customers	12/31/2025
Slipstream	Field Demonstration of ASHRAE Guideline 36-2018 High-Performance Sequences of Operation for HVAC Systems	1/6/2026
U of MN - CSBR	The Market for Passive House Multifamily Projects in Minnesota	1/19/2026
Slipstream	Advanced Connected Diagnostics for Commissioning Residential Heat Pumps and Central Air Conditioners	4/15/2026
Slipstream	Indigenous Communities and Residential Electrification Pathway Demonstration	8/31/2026
MN CEE	Continuous Exterior Insulation: A cold climate solution for deep savings and a pathway to cost-effective decarbonization	10/31/2026
Michael's Energy	Ventilation Control Using Occupancy Counters	11/30/2026
Frontier Energy	District Geothermal Site Selection & Feasibility Study	11/30/2026
MN CEE	CO2 Heat Pump Water Heaters for Multifamily Buildings	12/31/2026
MN CEE	Establishing Protocols for a Commercial Energy Recovery Ventilation (ERV) Tune-Up Service	12/31/2026
MN CEE	Packaged Terminal Air Conditioner Replacement Field Study	12/31/2026
MN CEE	Floating Suction Pressure Control in Minnesota's Existing Grocery Stores	12/31/2026
MN CEE	Heat pumps with thermal storage: Efficient and resilient electric space heating	12/31/2026
U of MN - CSBR	Unlocking the Potential for Safe Energy Retrofits Over Inaccessible Crawlspace	1/30/2027
Slipstream	Mapping Electrical Barriers, Motivations, and Perceptions about Efficient Fuel Switching	1/31/2027

# TRM v5.0 Updates – ECO & EFS Considerations

- ECO related priority needs this year:
  - Support ECO EFS Guidance when finalized:
    - Clarity around how output metric savings are claimed, by fuel
    - Clarity around how EFS eligibility is determined
    - Examples for each measure
    - Revisit Appendix F for alignment
  - Modifications or clarifications needed to the existing EFS measures needed?
    - Tracking some minor reference updates, input definitions, example clarifications
  - New EFS measures:
    - Res Induction cooktops, Res Air to Water HP, C/I Electric Forklifts
- CARD tie ins:
  - Load shapes Study – CFs, load shape references
  - C/I Grocery Refrigeration Equipment Optimization Study – new measure
  - Res – Air to Water HP

# TRM v5.0 Updates – Full Measure Updates and Adds

- Res

- Air to Water HP
- Induction Cooktops
- GSHP - Desuperheater, methodology, ICCs
- Storm Windows Air Sealing
- ERV/HRV - check code first

- C/I

- HVLS Fans – destrat add
- Grain Dryers
- ERV/HRV
- Grocery Refrigeration Equipment Op – CARD
- Switched Reluctance Motors
- Steam Traps – revisit deemed metrics and algorithm inputs
- ECM measures – revisit the 1 HP motor limit upward
- Electric forklifts

# TRM v5.0 Updates – General Updates and Revisions

- Stakeholder Clarification Requests / Additions:
  - Commercial Food Service – Electric Oven and Range – Review table values against standard
  - C/I Refrigeration – Demand Defrost Controls – Review definitions for additional clarity needed
  - C/I HVAC – ECM Circulators, C/I HVAC - ECM Fan Motors – Review references for updates, consider revising upper limit HP to 3HP (from 1 HP)
  - HP WH measures – Consider addition definition or consolidation of V versus G references
  - Res ASHP – Review input variable list for deletions and changes to references
  - Demand Defrost Controls – Review example for additional clarity
  - Res Appliances – Compact Refrig/Freezer - Review example for additional clarity
  - Res Envelope – Storm Window replacement/ air sealing – new measure from recent research
  - C/I Envelope - Air Sealing and Insulation – Consider prescriptive measures – Revisit in v5.1
  - Water Savings – MnTAP CARD study – Consider how/where water savings might be quantified and claimed

# TRM v5.0 Updates – General Updates and Revisions

- Review recent criteria updates for performance requirements:
  - Energy Star - Res AC specification sunset date - Tracking, no action right now
  - Res/Com Lighting - Mercury Emissions 2024 Leg Session: MN Statute 116.92 Subd. 7b and ENERGY STAR Lamps and Luminaires Phase out
- M&V Protocols for large custom ECO projects – updates to guidance, may live in TRM, TRMAC stakeholders to review
- Weather Normalization method to determine ECO goals – may live in TRM, TRMAC stakeholders to review
- Incremental Costs
  - ASHP – all the permutations not just ASHP to ASHP
  - HVAC equipment in particular. Data from Triennial plans? Utility provided?
  - Other areas? Data available?
- In Service Rates

# TRM v5.0 Updates – Format Updates

- Unique Measure IDs
- Web Link Updates
  - Updates needed given Commerce Department website revamp
  - Ensure CARD research links to presentation material if published papers not yet available
  - Check through all reference links for function
- Excel format
  - *working toward this on longer time horizon*
  - Undertaking this pdf -> Excel Format transition on (28) measures in TRM v5.0
  - Every algorithm has a dynamic calculation
  - Aids QC when inputs change, hopefully aids utility groups with Triennial support calculations
- Consolidated Reference Tables
  - Values used by multiple measures (EFLH, HOU, HDD, etc) appear in a deemed values section in addition to within each measure
- List SEER2/EER2/HSPF2 metrics where specified in reference baseline/performance criteria

# Updates for Future TRM Versions Pending Additional Research

- Weather dataset standardization
  - Moving away TMY3, TMY4 does not yet exist, what is the dataset we want to use and how is it derived. Standardize across all measures
- Incorporate measure baselines for dual fuel home
  - i.e. ASHP and gas furnace as a baseline, in addition to the 100% gas or 100% electric assumption in place now
  - Applies to EFS measures in addition to traditional ones
- EFLH – Continued research, working toward v5.1 update – heating equipment in particular



# Coordination with TRMAC

- MN HOMES and HEAR coordination
  - Including alignment on the minimum efficiency requirements for overlapping measures including but not limited to:
    - Heat Pump Water Heater
    - Heat Pump for Space Heating or Cooling
    - Induction Stove
    - Heat Pump Clothes Dryer
  - MN's HEAR Program is expected to launch in August 2025
- MN Efficient Technology Accelerator (MN ETA) Initiative Per Unit Measures
  - Additional initiatives as they are defined within the MN ETA Emerging Technology Committee

# Discussion and Next Steps

## General Discussion Points:

- What are measures/topics that you would like to see included within the TRM?
- Current pain points or interest areas TRM can help to flesh out or explore?
- Do you have questions or concerns regarding this list?

## Next Steps:

- Please reach out to Lauren if you do not have access to the SharePoint Site.
- You'll receive a follow up email soon with the
  - Slide deck
  - Updated TRM v5.0 Priority List, and
  - Another When2Meet Survey to schedule TRMAC meetings for the rest of this v5.0 effort
- Today's slide deck and recording will be posted on the [MN TRM Webpage](#)

# Thank You



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