



Minnesota TRM 5.0 Update

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Contact Information



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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

Agenda

- MN TRM v5.0 TRMAC Members and Schedule
- Feedback from Meeting 3 and Discussion
 - Residential HVAC – Efficient Air Conditioning System measure
 - Residential HVAC – Furnaces and Boilers measure
 - Recent MN Legislation – Mercury Emissions in Lighting Measures and ECO
- Measures Completed, ready for TRMAC review
- Measures in Progress, discussion points for TRMAC
- Measures still in queue (Priority List)
- Next Steps

TRM v 5.0 TRMAC Members

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

MN TRM v5.0 Schedule

Date	Event	Description
5/30/2025	Meeting 1 - Kickoff Meeting	Priority List for TRM v5.0 Introduced
7/2/2025	Meeting 2	Discussion on M&V Protocols and Weather Normalization Methodology to Determine ECO Goal
7/25/2025	Meeting 3	Measure Workpapers Introduction and Discussion
8/27/2025	Optional Presentation	Discussion of the Model Affecting Measures: "Commercial HVAC – Energy Recovery Ventilator" and "C/I HVAC – Heat Pump RTU"
8/29/2025	Meeting 4	Measure Workpapers Discussion Continued
9/26/2025	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 + New Upload Edit in grid view

Notebook

Documents

Site contents

Recycle bin

[Return to classic SharePoint](#)

Documents > MN TRM v5.0

Name
Draft Measure Workbooks
Draft Measure Workpapers
Draft TRM 5.0
Final Excel Workbooks by Measure
Resources and Optional 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



Feedback from Meeting 3 and Discussion

Meeting 3 Feedback Discussion

- Feedback from Meeting 3 and Discussion

- Residential HVAC - Efficient Air Conditioning System measure

- “Within the “Residential HVAC - Efficient Air Conditioning System” measure, Department Staff propose removing central air conditioners as an efficient option. This update would end incentives within the ECO Programs for above-code central air conditioning units.”

- Residential HVAC – Furnaces and Boilers measure

- “Within the “Residential HVAC – Furnaces and Boilers” measure, Department Staff propose maintaining the current deemed efficiency baseline at an 80% AFUE furnace consistent with the existing federal standard. Department Staff propose characterizing the residential furnace market in MN prior to the 2030 IOU Triennial Filing.”

- Recent MN Legislation - Mercury Emissions in Lighting Measures and ECO

- “Related to recent MN Legislation on Mercury Emissions in Lighting Measures, Department Staff propose not pursuing changes to baselines of affected lighting measures at this time. Department Staff propose characterizing the lighting market in MN prior to the 2030 IOU Triennial Filing.”

- Received comments from: CenterPoint Energy, Minnesota Power, Otter Tail Power, Xcel Energy

[TRMAC Submitted Comments – Workbook on the TRMAC SharePoint Site](#)

Please let us know if you sent us comments and you’re not noted in the above list.



v5.0 Measure Updates - Completed for TRMAC Review

MN TRM v5.0

Measure Updates - Completed

- Commercial Measures:

Measure	Edit to Review	Workbook	Edit Made
HVAC – Mini Split Ductless Systems	Draft TRM	New	<i>Request to clarify if supplemental systems to central are part of scope. Have not modified measure description, the measure is meant to be replacement of like kind not additional HVAC install on existing central system. Would consider the potential for that scenario in future but would likely need to be modeled, gut feeling is that there would be net added consumption as that scenario is often driven by seeking to correct comfort issue or balancing issue rather than achieving energy savings. Small mods made within TRM, new workbook created for the measure</i>
Refrigeration – Gasket Replacements	Workpaper	New	New measure, broken out as new workpaper and workbook
HVAC – RTU Heat Pump	Draft TRM	Existing, modified	Added "other/unknown" category to the deemed savings tables of this existing measure based on team's expanded findings. Minor change to written measure (within TRM) and existing measure workbook

MN TRM v5.0

Measure Updates - Completed

- Commercial Measures:

Measure	Edit to Review	Workbook	Edit Made
HVAC – ECM Circulators	Workpaper	New	Request to review motor size upper limit from 1 HP to 3 HP. WI TRM appears to set a precedent for that, change made. This is an old measure and not updated; reviewed references and compared against other TRMs (workup at bottom of new workbook created). Made some modifications to algorithm for clarity. Updated a couple references with more current data, very limited change to outputs. Modified the deemed savings tables with different (larger) motor sizes. Have updated incremental costs, as the \$6/watt didn't seem to scale accurately with larger motor sizes, but the reference (from WI TRM) is also very old, so if there is more current utility data out there to use, happy to continue considering modifications

MN TRM v5.0

Measure Updates - Completed

- Residential Measures:

Measure	Edit to Review	Workbook	Edit Made
HVAC – ECM Circulators	Workpaper	New	<i>Identical measure as C&I, left the 1 HP upper limit in place, and left the \$6/watt incremental cost in place as that appeared to align with other TRMs for that motor size range. All other changes made to C&I also made to this measure regarding references and algorithm updates. Modified deemed savings table to reflect sizes commonly found in res applications.</i>
HVAC - Furnaces	Draft TRM	New	Minor updates to a few incremental costs given stakeholder presented market data on 92%, 96% and 97% - do we have data for 94% and 95% AFUE that would increase the current cost values as well? Mods made within draft TRM, not a workpaper. No change made to baseline efficiency assumption of 80%.

MN TRM v5.0

Measure Updates - Completed

- Residential Measures:

Measure	Edit to Review	Workbook	Edit Made
HVAC – Window Room AC / ASHP	Workpaper	Existing, modified	Request to look into adding window HPs to this (or new measure). Measure description already implied HPs would qualify, have added expanded scope definitions and modified title. Expanded algorithm to accommodate HPs and potential for heating savings – built on assumption that window HP would be replacing or offsetting electric resistance heating. Note measure description caveat that measure is meant for replacement of like kind existing system not newly added to a central system
HVAC – AC / ASHP Tune-Up	Workpaper	New	Request to shift focus to both ducted and unducted systems instead of just ducted, also to revisit EUL to potentially lower maintenance activities to 1 year. Measure name removes ‘central’ and description updated to be more inclusive of ducted and unducted systems, with actions applicable to each. Have broken out actions into ‘maintenance’ occurring every 1 year (filter changes, coil cleaning) and various ‘enhanced’ activities, maintaining the 3 year EUL. Reviewed references of MN TRM and others, made updates to reflect study findings, and clarified the summation of savings factors for activities undertaken in description and algorithm.

MN TRM v5.0 – HER Equipment/Measure Update

- Equipment:
 - Heat Pump Equipment (HEAR Program AND the State Run Heat Pump Program): [ENERGY STAR Version 6.2 Central Air Conditioner and Heat Pump Final Specification](#)
 - Heat Pump Clothes Dryer (HEAR Program)
 - stand alone heat pump clothes dryers;
 - stacked clothes washers and clothes dryers [(2) drums]; and
 - combination clothes washer and heat pump clothes dryer [(1) drum]
- Information on all affected measures can be found [here](#).
- We will have affected measures ready for TRMAC review by meeting 5.



v5.0 Measure Updates – Remaining Priority List

MN TRM v5.0

Measure Updates – In Progress

In development / Stakeholder requests:

- Res
 - Air to Water HP - DRAFT
 - Induction Cooktops - DRAFT
 - GSHP - Desuperheater, methodology, ICCs
 - Storm Windows Air Sealing - DRAFT
 - ERV/HRV - DRAFT
 - ASHP – clarifications and streamline?
- Appendix F
- EFS Guidance / Outputs updates
- C/I
 - ASHP splits in sm commercial
 - HVLS Fans – destrat add - DRAFT
 - Grain Dryers (Ag)
 - ERV/HRV - DRAFT
 - Grocery Refrigeration Equipment Op – CARD - DRAFT
 - Switched Reluctance Motors - DRAFT
 - Steam Traps – revisit deemed metrics and algorithm inputs
 - Electric forklifts - DRAFT
 - Com Lighting – Grow Lights
 - Networked Lighting Controls - DLC Papers

Priority List and Next Steps

Updated Priority List

Next Steps:

- Please reach out to if you:
 - Do not have access to the [TRMAC Collab SharePoint Site](#),
 - Don't see your feedback in the **Priority List – tab “MN TRM Items v5.0 – v250829”**
 - Did not receive the meeting invites to meeting 5
- You'll receive a follow up email soon with:
 - Today's slide deck, and
 - The updated TRM v5.0 Priority List inclusive of updates made in today's discussion
- Today's slide deck and recording will be posted on the [MN TRM Webpage](#)

Thank You



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