



MN ELECTRIFICATION STAKEHOLDER PROCESS

CARL SAMUELSON, MICHAELS ENERGY
FEBRUARY 19, 2021

Goals for Presentation

- ✓ Provide background on stakeholder process
 - > Model for other states?
- ✓ Key Questions
 - > EV specific questions
 - > Other key questions

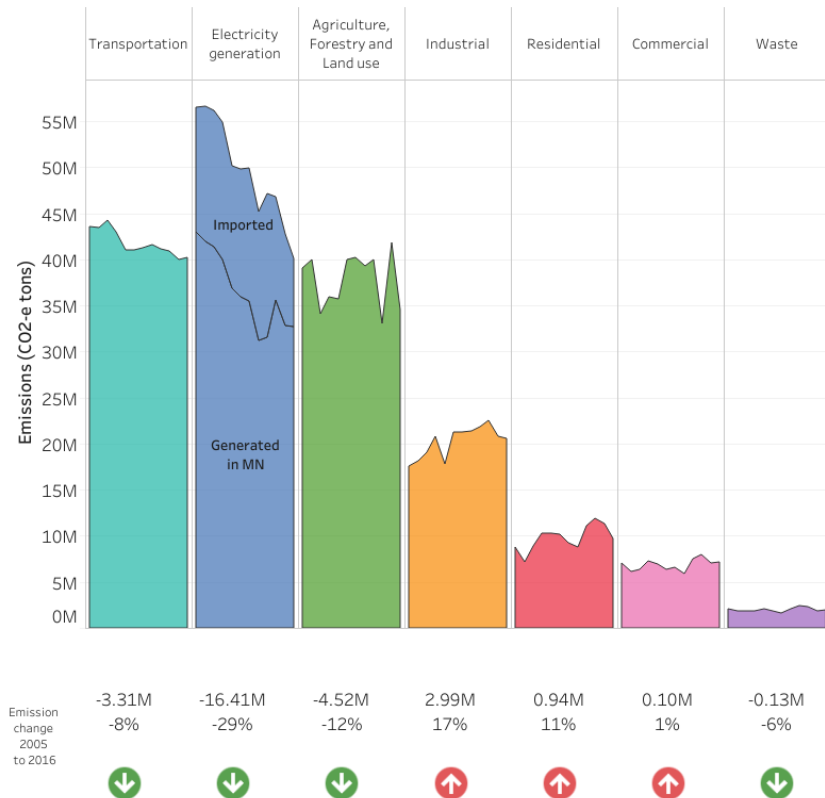


A wide-angle photograph of a two-lane asphalt road stretching straight into the distance. The road is flanked by dry, scrubby vegetation in a desert-like environment. The sky is a mix of blue and yellow, with wispy clouds and a bright, hazy sun on the right side. A faint rainbow is visible in the sky on the right. The overall mood is one of a long journey or path forward.

The Stakeholder Process

Minnesota is behind on reaching its

State GHG Reduction Goal



Stakeholder Engagement Goals



1. Examine benefits and concerns of increasing electrification as a tool for grid optimization, energy efficiency, and emissions reduction in Minnesota.
2. Convene series of stakeholder meetings to provide information, facilitate discussion and solicit recommendations on key electrification topics.

Project Website

www.michaelsenergy.com/electrification-action-plan

ELECTRIFICATION ACTION PLAN



This website houses the schedule and agendas for upcoming meetings, and post-meeting documentation for the project titled, "Energy Grid Optimization: Understanding the benefits and concerns of electrification in Minnesota."

Project Goal:

Examine the possible benefits and concerns of using electrification as a tool for grid optimization in Minnesota, informed by in-depth research, stakeholder engagement, and the development of an action plan.

EDUCATION



ANALYSIS	Technology Opportunities Oct-Dec 2020 General Review of Technology Heat Pumps (GS/AS & HW) Industrial TOU	Grid Modernization Oct-Dec 2020 Storage Additional Renewables Capacity Constraints Demand Response	Metrics Oct-Dec 2020 Emissions Efficiency Cost/Benefit Testing Impacts on Rates Carbon Impacts
	(1) What should stakeholders understand? (2) What needs more research/clarity? (3) What are the policy implications? (4) Does the TAC have any recommendations?		
	TAC #1	TAC #2	TAC #3

Technical Advisory Committee

KEY
Goal
Date
Content
Action

Stakeholder Engagement **by the numbers**



15

Meetings
(4 stakeholder
+ 11 TAC)



350+

Attendees at
Stakeholder
Meetings



500+

Hours
contributed
to TAC



37

Presentations
from industry
experts

The image features four light bulbs hanging from above against a solid grey background. The bulb in the center is illuminated, depicted with a warm orange-yellow glow and several thin black lines radiating outwards from its base to represent light. The other three bulbs, located at the top left, top center, and right, are unlit and shown in a simple black-and-white line-art style. The text "Interesting ideas and questions" is centered horizontally across the middle of the image, partially overlapping the glowing bulb.

Interesting ideas and questions

How we addressed EVs

- ✓ Department of Commerce focus on CIP (Energy Efficiency Programs)
- ✓ CIP focuses on built environment
- ✓ Questions re: EVs
 - > Chargers?
 - > Charging strategies?
 - > Who tracks benefits?
 - > Who funds the transition?



The problem isn't R&D its

Market Transformation

- ✓ Chicken and Egg
 - > Consumer Adoption
 - > Vendor Promotion
- ✓ Can't expect consumers to drive the whole change.
- ✓ Creative models need to reach under-resourced communities

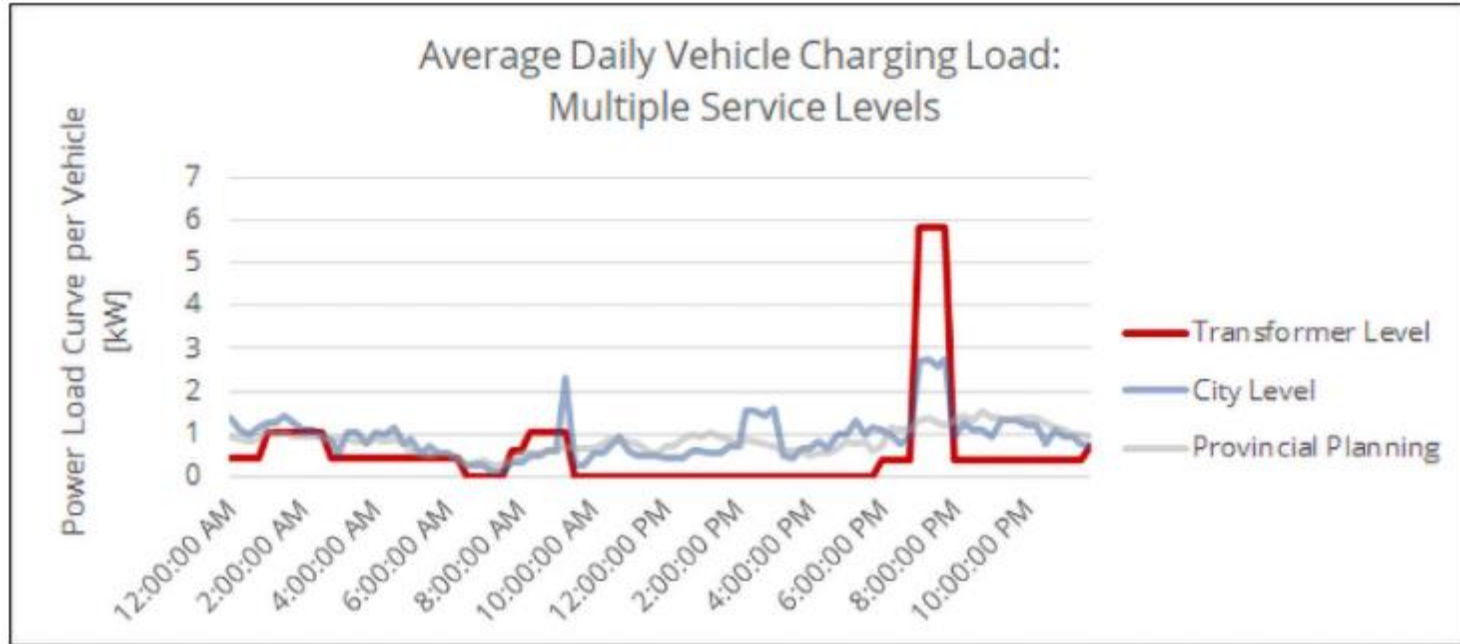


Addressing Equity:

Elimination of barriers to full participation in the *process*, and access to the full benefits of the *outcome*.

Ben Passer, Fresh Energy, presentation to the Metrics Sub-TAC

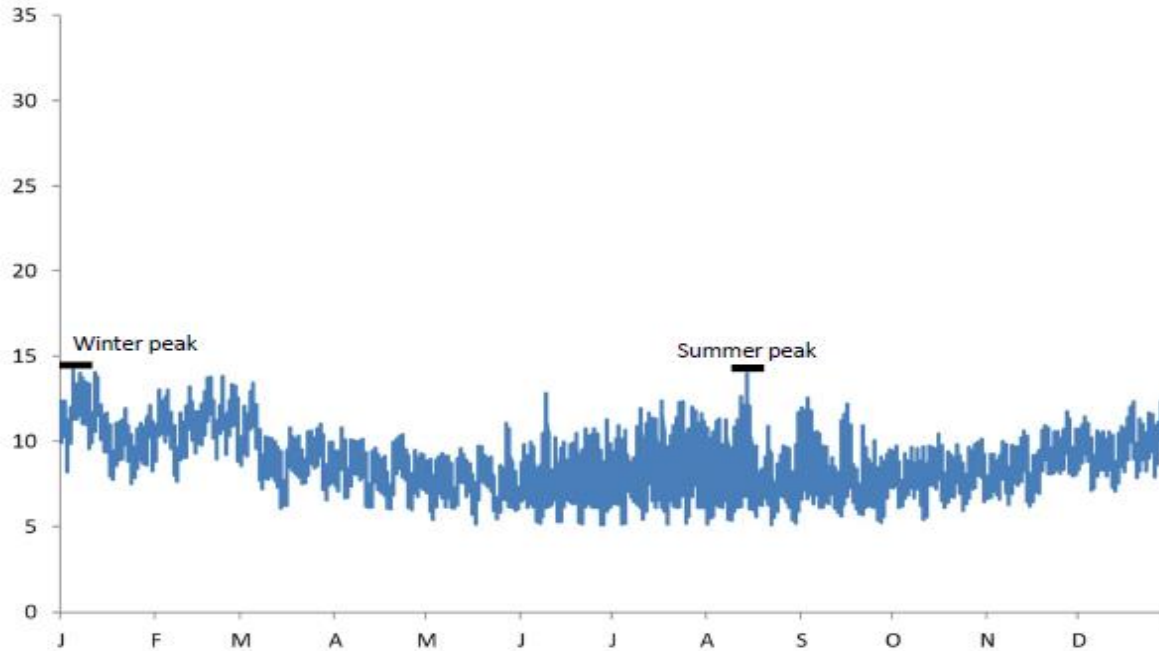
Equity considerations of the Distribution System



Source: Fleet Carma, Charge the North, <https://www.fleetcarma.com/charge-the-north-summary/> as presented to TAC by Patrick Dalton, ICF

Planning for a shift to winter peaking

Minnesota 2015 Electric Load

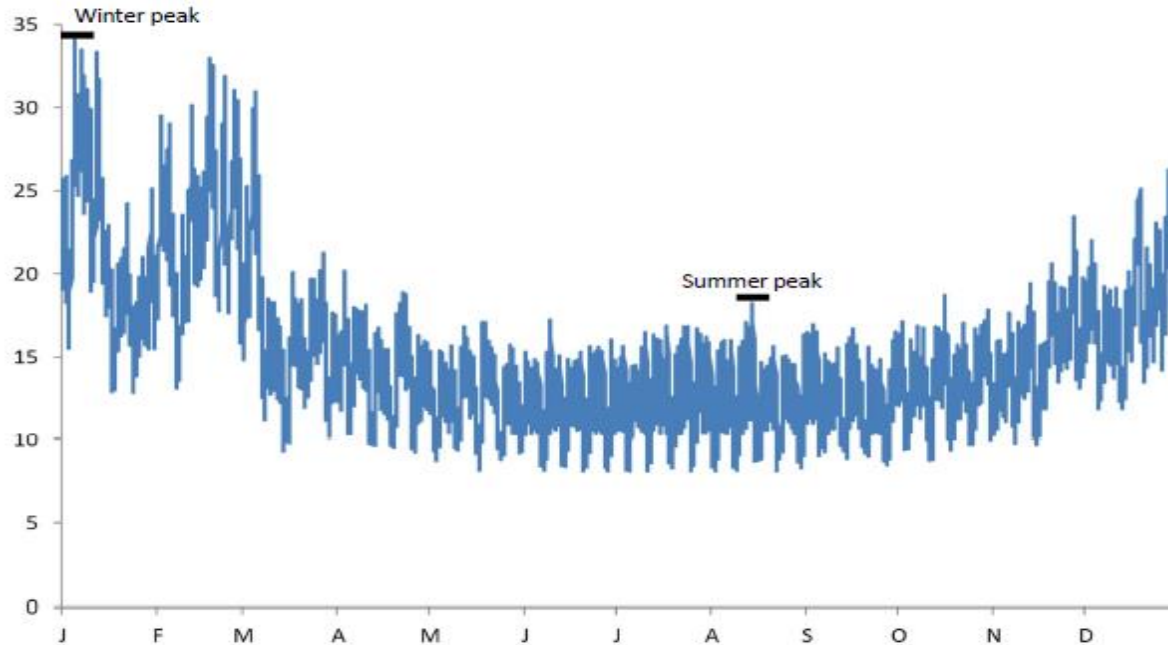


- Peak MN electricity load in 2015 was similar between summer and winter

Source: Opportunities for Decarbonizing Minnesota's Economy: Energy System Supply and Demand Assessment. EPRI, Palo Alto, CA: 2020. 3002019333

Planning for a shift to winter peaking

Minnesota 2050 Electric Load



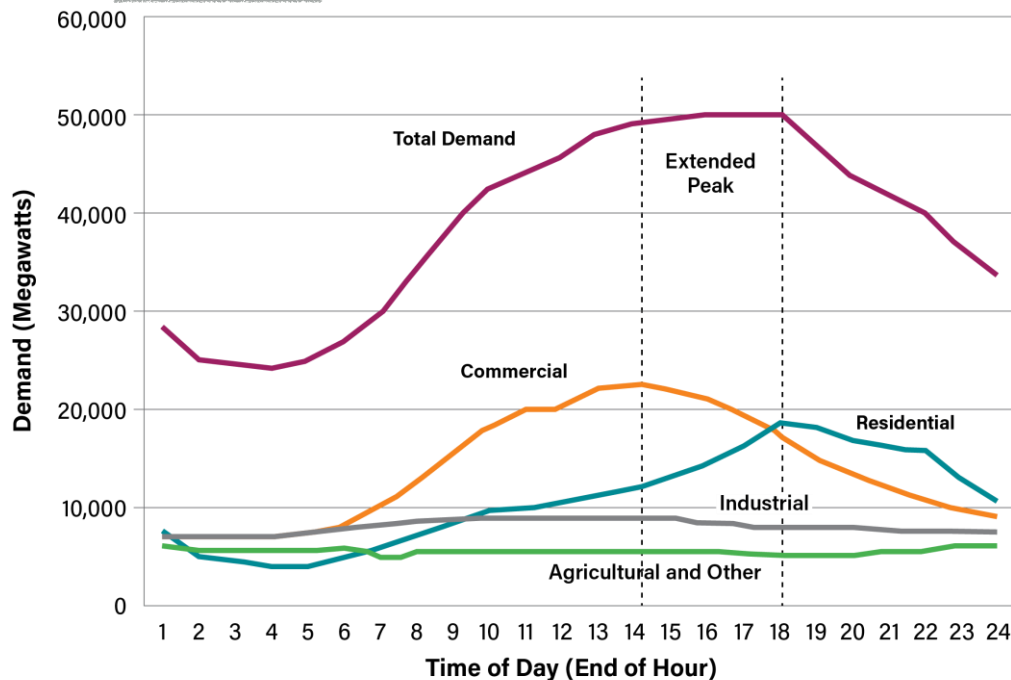
- With 80% Economy-wide policy, 2050 load throughout the year significantly higher than with the other policies
- System heavily dominated by winter peak

Source: Opportunities for Decarbonizing Minnesota's Economy: Energy System Supply and Demand Assessment. EPRI, Palo Alto, CA: 2020. 3002019333

EV role in improving system load factor

System Load Factor

ECO Legislation (HF 164) indicates that an efficient fuel switching measure is “installed or operated in a way that improves the utility’s system load factor”



Source: Gary Ambach, Slipstream, presentation to the TAC

Thank You

Carl Samuelson
Michaels Energy
cwsamuelson@michaelsenergy.com