



Electrification in Minnesota

Stakeholder Meeting
February 4, 2021

Webinar Logistics

- Webinar will be recorded
- Please keep yourself on mute (moderator will be muting all attendees)
- Use the chat function to ask questions during the presentations.
- During final Q&A, attendees can raise their hand to speak, or use chat.
- Slides with additional content are available (link in chat)

www.michaelsenergy.com/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.

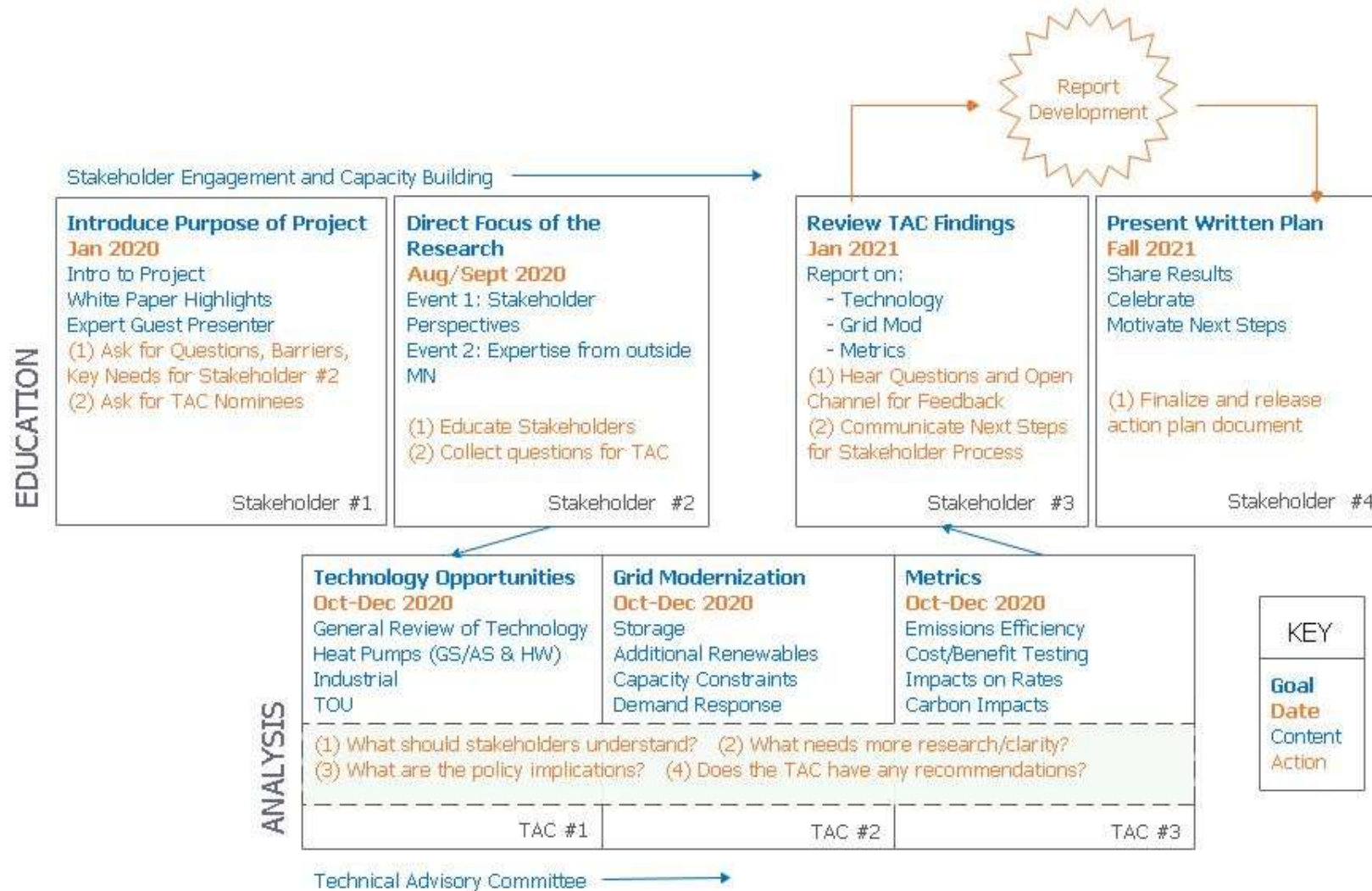
Agenda

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|------------------|--|
| 10:00 - 10:30 am | Overview of project goals, next steps |
| | - Anthony Fryer, Minnesota Department of Commerce |
| 10:30 – 11:30 am | Technical Advisory Committee Subgroup Reports |
| | - <i>Technology Sub TAC (Travis Hinck, GDS Associates)</i> |
| | - <i>Metrics Sub TAC (Grey Staples, Mendota Group)</i> |
| | - <i>Grid Impacts Sub TAC (Jenny Edwards, CEE)</i> |
| 11:30 – Noon | Q & A |

Project 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.

Stakeholder Engagement



Stakeholder Engagement by the Numbers

Over the past 13 months (since January 7, 2020)

- 4 Stakeholder meetings + 11 Technical Advisory Committee Meetings
- 350+ attendees at stakeholder meetings
- 500+ hours contributed to the Technical Advisory Committee process from stakeholders.
- 37 industry expert presentations to stakeholder and TAC groups

TAC Participants

CEE
Clean Energy Resource Teams
CenterPoint Energy
Citizens Utility Board of Minnesota
Ecolibrium3
Electrical Association
Fresh Energy
GDS
Great River Energy
Honor the Earth
ICF
MEEA
Minnesota Power
Missouri River Energy Services

Mitsubishi
MN Housing, MMAHEN
Otter Tail Power
Rochester Public Utilities
Slipstream
The Forward Curve, HourCar
The Mendota Group
Leech Lake Band of Ojibwe
Minnkota Power Cooperative
MN Geothermal Heat Pump Association
Willdan
Xcel Energy
MN Attorney General's Office (observer)

Electrification Related CARD Research

1. Air-to-Water Heat Pumps: The cold climate solution for high-efficiency cooling, space heating, and water heating (CEE)
2. A Field Study to Quantify Energy Efficiency Opportunity of Radio Wave Grain Drying Systems (GDS Associates)
3. A Field Study of Ground Source Technology in Retrofit Applications in Urban (space constrained) Commercial Buildings (Michaels Energy)
4. Cold-Climate Variable Refrigerant Flow Demonstration and Market Research (Slipstream)
5. Heat Pump for ACs: Energy Savings and Modernization of Single-Family Cooling Systems (CEE)

Next Steps for Stakeholder Process

- Comments and feedback welcome
 - Email Carl at cwsamuelson@michaelsenergy.com
 - Aim to collect any additional input by March 1, 2021
- Plans underway to work with a few stakeholders on white papers
 - Explore some specific under-emphasized facets/perspectives
- Work on writing a summary report
 - Expected publication: July 2021
- Hold Final Stakeholder Event

- Technology Sub-group
 - Travis Hinck – GDS Associates
- Metrics Sub-group
 - Grey Staples – Mendota Group
- Grid Impacts Sub-group
 - Jenny Edwards – Center for Energy and Environment