



Electric lift trucks like the one above reduce emissions and operating costs through electrification, regardless of the grid mix, as well as improve indoor air quality and occupant health. (Photo provided by Michaels Energy)

The Electrified Frontier: Exploring Stakeholder Views on the Emerging Intersection of Electrification, Efficiency, and De-carbonization

Electrification has garnered a lot of attention recently across the country. In 2018, dozens of research publications and thought-piece articles were published, almost every conference had a panel on electrification, and more than a few legislatures and regulatory commissions investigated what should be done in their states. A few utilities and organizations took bold action on the topic in 2018, but many more are collecting data and formulating their opinions and strategies. The same was true in Minnesota. Both nationally and locally, we can expect even more electrification fever in 2019.

The hotness of this topic stems from a focus on electrification as a potential tool for decarbonization and efficiency. The definition from the [Regulatory Assistance Project](#) proposes that there is a subset of electrification that offers societal benefits, termed “Beneficial Electrification.” Beneficial electrification would need to meet at least one of the following conditions without adversely affecting the other two:

- 1) Save consumers money over the long run;
- 2) Enable better grid management; and
- 3) Reduce negative environmental impacts.¹

¹ Farnsworth, David, Jessica Shipley, Jim Lazar, Nancy Seidman, June 19, 2018. “[Beneficial Electrification: Ensuring Electrification in the Public Interest](https://www.raponline.org/knowledge-center/beneficial-electrification-ensuring-electrification-public-interest/),” Regulatory Assistance Project, (<https://www.raponline.org/knowledge-center/beneficial-electrification-ensuring-electrification-public-interest/>).

In order to better understand how Minnesota's stakeholders are viewing the potential of electrification, [Michaels Energy](#) received CARD funding to gather stakeholder perspectives on electrification and fuel switching. The resulting white paper delivers a Minnesota-centric primer on electrification and fuel switching to help inform stakeholders and frame up key conversations for future stakeholder and regulator discernment.

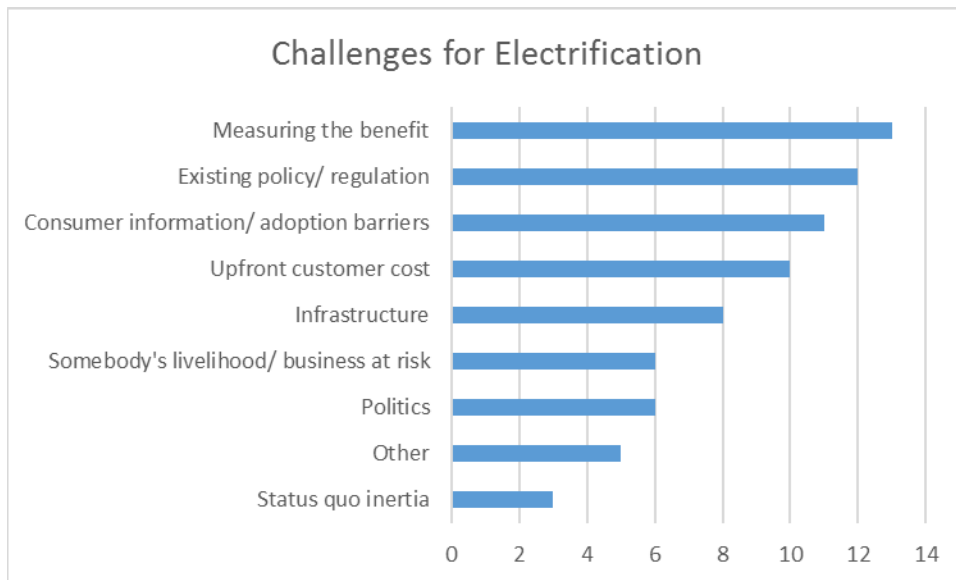
This white paper compiles the feedback from in-depth conversations with 24 stakeholder organizations and electrification experts. In addition, the paper provides foundational content on Minnesota's policy context, other states' policy efforts, technologies, metrics, and a literature review of electrification research.

Here are four key findings to whet your appetite for further reading:

- 1) Stakeholders broadly agree that electrification could reduce carbon emissions. In particular, there was unanimous consensus around the potential for electric vehicles to reduce emissions. Emissions from the transportation sector have dropped less than emissions from the electric generation sector in Minnesota.² As a result, many stakeholders saw vehicle electrification as an opportunity to leverage low-carbon electricity to support de-carbonization of the transportation sector. In addition, some stakeholders identified that evaluating the benefits of electrifying residential end uses requires some careful consideration. The high-level technical analysis done as part of this white paper supports that call for nuance. In some cases, there appear to be carbon and operating cost-savings benefits to switching to electric equipment, such as replacing a propane furnace with a high-efficiency geothermal heat pump. In other cases, the electric grid may need to further decarbonize or a marginal (instead of average) emissions profile will need to be used in evaluating the benefits. Benefits should also be evaluated over the lifetime of the equipment.
- 2) Stakeholders mostly agreed that the status quo needs to change. People also see a path to achieving an agreeable outcome. About 70% of the respondents shared that they felt the current prohibition on fuel switching within the Conservation Improvement Program (CIP) needed to change. In fact, existing policy/regulation was identified as one of the top two challenges for electrification among stakeholders interviewed (Figure 1). Stakeholders argue that the current fuel switching policy hampers utilities' ability to support market transformation that might lead to greater efficiency.
- 3) Whether or not electrification belongs within CIP remains undecided. About a third of participants felt that it should be included in CIP. They argued that we know CIP, it's successful, and it's the best vessel we have for utility-based market inventions. Another third of respondents said we should keep electrification separate from CIP. They argue that the goals of electrification are distinct from the goals of efficiency, and we will achieve better outcomes if they are separated. Furthermore, electrification efforts might erode savings and spending on efficiency in a combined portfolio. Finally, the remaining third of respondents felt both ways. They could see why specific measures, like residential heat pumps, ought to be included within CIP, but that overall the scope of electrification and carbon reduction was broader than CIP should contain.
- 4) The challenges stakeholders identified, in response to an open-ended question on the topic, reflect a wide variety of considerations. People mentioned programmatic, political, regulatory, cultural, economic, and technical challenges. Many respondents named multiple challenges. Figure 1 shows the diversity of challenges that stakeholders identified.

² Claflin, Anne, and Fawkes Steinwand, January 2019. "[Greenhouse gas emissions in Minnesota: 1990-2016](#)," Minnesota Pollution Control Agency and Minnesota Department of Commerce, (<https://www.pca.state.mn.us/sites/default/files/Iraq-2sy19.pdf>)

Figure 1. Challenges identified by stakeholders interviewed (n =24)



Electrification offers opportunities for de-carbonization, and despite the challenges and difference of opinion, stakeholders in Minnesota felt we can come to an agreement. They hope for a stakeholder engagement process that is transparent and formulated around clearly defined goals. Throughout the process, stakeholders hope to get more clarity around costs and who would pay for electrification programs, and more fundamentally around the questions of “if” and “why.” Stakeholders also expressed a keen interest in metrics and hoped for collaborative development of those metrics.

This white paper is only the beginning of the dialogue. In its recommendations, the white paper outlines several specific topics for further discussion and engagement. The Department is currently planning the next steps for stakeholder engagement on both the topic of fuel switching and of developing a beneficial electrification action plan. Stayed tuned to this CIP News for information about upcoming stakeholder events related to these topics.

In addition to conducting stakeholder interviews, Michaels Energy also performed Minnesota and national policy reviews and completed a high-level analysis of a variety of electrification technologies. For these results and more detailed results of the stakeholder interviews, see the white paper, [“The Electrified Frontier: Exploring Stakeholder Views on the Emerging Intersection of Electrification, Efficiency, and De-carbonization,”](#) and the webinar, [“The Electrified Frontier: Sharing Results from Stakeholder Interview.”](#) The contact for this project, and for any related stakeholder events, is [Anthony Fryer](#), CIP coordinator.