

Q&A from Minnesota Potential Study Webinar on 12/17/2018

Q: What was the price per carbon used in your societal cost test?

A: \$25.76. A PUC order dated 1/3/18 determined that the Federal Social Cost of Carbon (with adjustments for certain economic assumptions) is the best representation of the costs associated with the emissions of carbon dioxide. The project team took the midpoint of the range for 2020 (\$9.05 - \$42.46).

Q: Is the agriculture market included in the commercial/industrial sector or was it not looked at?

A: The agricultural sector was modeled as a segment within the commercial sector.

Q: How did you assess lifetime savings of measures, especially in regard to home energy report savings? Are all these values given in first year or lifetime savings?

A: Measure lifetimes are predominantly taken from the Minnesota TRM. Measure lives are used in this report to determine lifetime (cumulative) savings, which we report in addition to first-year savings. For home energy reports, as well as with the other residential behavioral savings measures, first-year savings are adjusted for the average savings method. This method has been approved by the Department of Commerce, Division of Energy Resources as the methodology that should be used to report first-year savings in MN.

Q: I would be interested in seeing the measure grouping contributions to overall potential (combining residential and commercial). Seems that residential electric heating would contribute approximately 7% to the total potential, which seems surprising.

A: Detailed results by measure will be available through the reporting tool that will be posted on the [project website](#). Residential space heating constitutes approximately 7% of total space heating potential. This is a result of large savings that can be achieved by switching from electric resistance heating to cold-climate air-source heat pumps, and also because the space heating end use includes efficiency measures such as insulation and air sealing.

Q: On the gas potential slide, why wasn't behavioral modeled the way it was for electric?

A: Behavioral measures were modeled the same way for both gas and electric.

Q: Would a single family home that has an old, low efficiency gas furnace be better off switching to an air source heat pump or a high efficiency gas furnace?

A: This study did not include analysis of fuel switching in the scope of work. For an in-depth analysis of the energy and cost savings achievable with cold climate air-source heat pumps, see the Conservation Applied Research and Development (CARD) report, [Cold Climate Air Source Heat Pump](#) (<https://www.cards.commerce.state.mn.us/CARDS/security/search.do?documentId={339B1EA5-AA5C-422E-AEC5-CA58A8EE10CA}>), published in 2017. At current fuel prices (electricity, propane, and natural gas), displacing a propane fueled furnace with a cold climate air-source heat pump (CC ASHP) would generally result in cost savings. However, displacing a natural gas fueled furnace with a CC ASHP would generally not result in gas savings due to the relatively low cost of natural gas.

Q: How much per year might one expect to pay to heat a home in MN using a higher efficiency ASHP vs natural gas heating? Is it less expensive at this time? (\$ per square foot or for the average SFH or whatever measures you have for relative cost is fine)

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Q: In addition to considering the upcoming lighting standard that was mentioned, were impacts from future appliance standard levels considered for other end-use technologies?

Yes, we included all known federal standards (i.e. a Final Rule has been passed), when they exceeded local codes.

Q: For gas, the large potential for residential space heating indicates a large percentage of current customers don't have high efficiency furnaces. What is the percentage of current customers who don't have a high efficiency gas furnace?

The study assumes that 49% of single family homes in Minnesota could be retrofitted with a high efficiency gas furnace (i.e. they currently have a gas furnace and have not already upgraded to a high efficiency version). It should also be noted that the space heating end use includes other efficiency measures such as insulation and air sealing.

Q) How did the study model the likelihood that the federal government will implement the higher efficiency standards (since that has been stalled)?

We only included known federal standards (i.e. a Final Rule has been passed). For new construction or replace on fail situations, the baseline against which the savings from efficient furnaces were calculated was 85%, which was chosen to account for market transformation in which more and more customers are purchasing high efficiency furnaces even without program incentives.