Response to Participant Questions

Webinar: Energy Savings Opportunities in New and Renovated Minnesota Homes
Funded through the Minnesota Conservation Applied Research and Development Grant
September 10, 2020

Q: Are heat pump water heaters included under conventional electric? ...or were there none?

A: We did not encounter any heat pump water heaters in the study homes. We did include heat pump water heaters as a beyond-prescriptive-code savings measure in our analysis.

Q: We are looking into new construction project and considering solar panels or a solar roof. Was this a part of the study?

A: Sorry, renewable energy systems were not a part of the study.

Q: Will you be discussing incremental builder costs for the four scenarios of energy costs?

A: No, estimating incremental builder costs was beyond the scope of the study.

Q: What insight do you have about heat pumps in non-gas homes. Also, what was the representation of mini-splits and were any cold climate systems?

A: We encountered 20 heat pumps among the 87 new homes, all but three of which were in homes without natural gas service. Twelve of the 20 were central, ducted heat pumps backed up by a propane furnace and the remaining eight were ductless mini-splits. If we somewhat loosely define "cold-climate" heat pumps to be ducted systems with a heating season performance factor (HSPF) of 9 or higher or HSPF of 10 or higher for ductless systems, then about 40 percent of each type would be considered cold-climate.

Q: Is the final report available?

A: The report will be available soon. Go to the CARD program grant search at https://mn.gov/commerce/industries/energy/utilities/cip/card-grant-search/ and enter Contract number 156093 to check the status of the final report.

Q: What version of IECC does MN currently use?

A: Minnesota uses IECC 2012 with state-specific amendments.

Q: With all the problems with HRV/ERV's, what's the next best option for whole-house ventilation?

A: Minnesota energy code requires balanced ventilation (though does not require heat recovery), so Minnesota homes will almost certainly continue to be built with HRVs and ERVs and the best solution is to address the issues identified in the report. In other cold-climate states, continuous exhaust ventilation (typically with a bath fan) is a popular option for mechanical ventilation.

Q: Very few Builders, HVAC guys and/or Home Owners understand much about ventilation. What can we do about this? We've been chasing this for over 25 years, even in Minnesota with ALL their Statewide resources.

A: Stepped up education and training efforts could help here. The current COVID-19 pandemic has dramatically raised general awareness of the role of good ventilation in homes and businesses, and could perhaps serve as a useful springboard for making progress in addressing the issues identified in the study.

Q: Does Mechanical Ventilation include continuous bath fans?

A: Minnesota code requires *balanced* ventilation, so continuous bath exhaust fans would not satisfy the State code requirements for mechanical ventilation unless they were paired with supply fans providing the same flow. That would be an unusual strategy, and one that we did not encounter in the study. As a side note, most homes in the study had intermittent (ie. manually switched) bath fans and kitchen exhaust fans in addition to the code-required balanced ventilation system.

Q: Do you plan to host additional webinars on the two other portions of the research? (renovated homes and low-rise multifamily)

A: Unfortunately, no. But the details of those aspects of the project will be included in the final report.

Q: For those homes heated with electricity, how many have natural gas or propane back-up heating?

A: That is a little complicated because electricity was not always the dominant heating fuel in homes with some electric heat–and some homes had more than one type of electric heating system. If we consider only the 13 study homes where electricity provided more than 50% of the home's total heating needs, 10 were dual-fuel heat pumps backed-up by propane furnaces, two had electric-resistance boilers with no back-up (these also had ductless heat pumps, though used only for cooling) and one had an electric-resistance boiler serving 80 percent of the home's heating load and a natural gas furnace serving 20 percent.

Q: Could [the differences in air leakage rates across states] be attributed to building type? Typically row houses or other new construction with shared walls or slab on grade, builders argue are harder to achieve deep air sealing.

A: That is an interesting theory. Census data for homes built in 2010 or later show that among the states that we included in the study for comparative purposes, between 4% and 38% of single-family homes are "attached" (ie. townhomes). Minnesota sits near the middle of this range at 13 percent. Some of the states with a higher incidence of attached homes, such as Pennsylvania (28%) also show higher average air leakage, but other states that are on the higher end of air leakage, such as Missouri, have a lower proportion of attached housing (9%) than does Minnesota. About all we can say is that there are a number of factors in play here.