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HEAT PUMPS FOR WISCONSIN RESEARCH PROJECT

AIR TO WATER HEAT PUMP (AWHPS) AND GAS-ABSORPTION HEAT PUMP (GHPS) MEMO SUMMARY

As two emerging heat pump categories for space and domestic water heating, AWHPs and GHPs show promise in different building applications and each have diverse form factors, product classes, and levels of commercialization. While field monitoring studies in cold-climates like Wisconsin would be valuable and some are ongoing in other states, in terms of heating efficiency, GHPs can operate at a coefficient of performance (COP) of 1.4 whereas AWHPs tend to perform more efficiently than air-air heat pumps and can achieve seasonal COPs above 3. For GHPs, sorption products are commercially available and most ready to serve the commercial and multifamily market in Wisconsin which are more difficult market segments to cost-effectively electrify. Due to the lack of market familiarity, before offering any rebates, a prudent next step for Focus on Energy could be to fund demonstration projects for these two applications to evaluate customer experience, energy, and cost savings. For residential buildings, AWHPs are a promising technology for new construction and retrofits where the residence is weatherized and has a hydronic distribution system for space heating where radiators and piping have not reached the end of their useful life. For residential buildings, Focus on Energy could elevate and encourage air-water heat pumps as an option for equipment selection in the new construction program and build contractor familiarity and identify recommended contractors. In residential retrofit AWHP applications, field studies may be most valuable for newer residential buildings which are best positioned to incorporate the technology. Air-water equipment in commercial settings is more common and a transition to AWHPs presents less barriers in this market segment. Further market research would be needed to better understand the state of technology of commercial-grade AWHP equipment and potential for commercial AWHP applications when applied to Wisconsin's commercial building stock.