Multifamily ASHP Conversions and the Law of Unintended Consequences

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Presenter Biographies and Experience:

Daniel Robb is an expert in providing data backed solutions to address client energy needs. He has led projects covering a wide variety of technologies including air sourced heat pumps (ASHP), ground sourced heat pumps (GSHP), energy storage, vehicle electrification, distributed generation, demand response, and low carbon fuels. Mr. Robb was the project lead for the Eversource ASHP M&V project and presented these findings at the 2024 American Council for an Energy-Efficient Economy (ACEEE) summer study.

Abstract:

In a recent 2022 demonstration project in central MA, two identical income-eligible multifamily buildings received weatherization and HVAC upgrades. One building received conventional natural gas condensing furnaces, replacing the existing end-of-life standard efficiency furnaces, and retained conventional through-the-wall PTAC units for cooling. The second building removed the conventional gas furnace system, eliminated the through-the-wall PTAC, and installed a combination of ducted and ductless Fujitsu cold-climate ASHP units. Performance data was captured on both configurations, and an analysis of the data showed large discrepancies between the realized COPh and the range of COPs presented in the manufacturer data. Both heat pump sizing and user operation influenced the overall efficiency downward. This presentation provides an overall summary of the project with a deep dive into how human influenced choices in both equipment selection and operation drove the ultimate performance, impacting space conditions, energy consumption, demand increases, and emissions reductions. Success and acceptance of tomorrow's electrification world starts with understanding the impacts of sizing and equipment selection today.