

NEW MARKETS FOR HEAT PUMPS?

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PAPERS:

The Next New Thing -- Is It Really that Good?

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A Ductless Heat Pump in Every Pot... or Home?

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SUMMARY

Abstract from John Proctor Paper:

What is the latest thing in HVAC? Variable Speed (VS) systems are causing quite a stir. The group is a mix of mini-split and multi-split heat pumps and air conditioners (M-Splits). Some of these units sport rated SEERs over 30, more than twice the Federal minimum standard -- generating EXCITEMENT. Is the enthusiasm warranted or should evaluators and policy makers be cautious of embracing the rated efficiencies of these units as real? This project reviews literature, laboratory data and the actual efficiencies of these units over entire heating and cooling seasons. The Central Valley Research Home (CVRH) project provides in-situ monitoring comparisons of three different brands of M-splits to more conventional (reference) systems. Using a flip/flop method, each M-Split was installed in an existing home and operated on the same thermostat schedule as the reference system. Occupant interactions can disturb the results so this study used robots (a standardized schedule of internal gains) in the unoccupied homes. The heating and cooling results for the reference and M-Split systems provide direct comparison between rated efficiencies and actual efficiencies of these machines. The potential improvement in efficiency was not realized in all but one of the cases in the three test homes when the units were tested as installed by the contractors. Rather than saving energy the three tested VS units used more than the reference units they were tested against. In one case the VS unit used over twice the cooling energy of the reference unit.

Abstract from Justin Spencer paper:

Ductless heat pumps (DHPs) offer high efficiency, winter and summer peak demand reductions, and increased comfort with very little noise. The authors have worked with energy efficiency program designers, policy makers, and evaluators in the Northwest and Northeast and present their findings about current DHP technology, in situ performance, and markets in this paper.

Policy makers and program designers should focus on cold-climate DHPs. Winter peak loads have become more important in power planning. The decisions homeowners make about their heating equipment could affect the utility's load for decades. States and utilities should incent the transition away from oil and propane heat and towards cold climate heat pumps.

Program designers should include participant education to maximize their energy savings behavior when they incent a DHP. Results of a metering study showed that DHPs experience higher usage (and savings) for cooling than might be expected, with lower than expected heating usage and savings. In some cases, homeowners are missing out on the opportunity for large cost savings because they are unaware of the heating savings that can be obtained by correctly setting up their DHPs.

The DHP market is evolving rapidly and programs need to regularly reassess their incentives and marketing to keep up. Cold climate heat pumps arrived on the market only recently and up until now have only been available with single indoor heads. New multi-head cold-climate systems will be available starting in 2015. Customer and contractor awareness of new technologies has been lagging.