

# Memorandum

**To:** Lisa Skumatz and Bob Wirtshafter, Connecticut Energy Efficiency Board Evaluation Consultants  
**CC:** Craig Diamond, CT EEB Executive Secretary  
**From:** Glenn Reed, CT EEB Residential Technical Consultant  
**Date:** May 14, 2019  
**Re:** Residential Technical Consultant comments on the 4/9/19 Review Draft for Project R1617 –Ductless Heat Pumps Market Characterization Evaluation

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Provided below are summary and highlight comments on the April 9 review draft of the Ductless Heat Pump (DHP) Market Characterization Study (R1617). These comments supplement those contained in the marked-up draft report that was also submitted. Most of the comments below are included in the marked-up draft and are provided here as a high-level summary and for emphasis.

1. Do any of the report's recommendations change given the change in the program's incentive model, i.e., moving to a midstream model?
2. Statements are made regarding energy savings, customer benefits, and carbon reductions from fuel switching; for example:

*These customers have an average impact that includes load building accompanied by significant therm savings and carbon reductions*

but there are limited analyses or reported results to fully to support these claims.

At a minimum provide:

- Total and net site and source MMBtu impacts for each heating fuel/cooling scenario
- total and net annual customer operating costs for each heating fuel/cooling scenario
- total and net carbon site and source impacts for each heating fuel/cooling scenario

Consider noting that the use of electricity with an emissions mix other than the ISO average would substantially change these results; e.g., the customer purchased 100% green electricity.

3. Are what is being reported gross or net impacts? There is repeated discussion about removing free riders from the analysis, but it is not entirely clear that non-FR customers were moved to install a DHP entirely because of the program incentives. The program's non-electric resistance incentives were very modest.
4. The impact results are derived from the Cadmus MA and RI (not just MA) DHP report. There was a wide range in the savings/usage values observed in this study (driven by large observed differences in EFLHs), with the 75<sup>th</sup> percentile showing much higher savings than the median values. These savings were from programs that were then offering very modest incentives to promote more efficient DHPs with little or no attempt to address fuel switching, customer education, proper installation practices, proper control integration, etc. These caveats and limitations need to be explicitly noted in the CT report and addressed in any subsequent CT DHP metering efforts. The use of the MA/RI savings numbers needs to be discussed in more detail and note that some of the savings/usage values might be much higher in a well implemented program that optimizes savings.
5. Any recommendation regarding using the Planning Tool needs to be more carefully put forward noting the likely limitations of accurately modelling measure penetration as a function of only changing incentive levels and fuel prices.