

DOCKETED	
Docket Number:	19-BSTD-02
Project Title:	Residential Alternative Calculation Method Variable Capacity Heat Pump Modeling Approach
TN #:	230240
Document Title:	Sean Armstrong Comments - 19- BSTD-02 and Residential Alternative Calculation Method Variable Capacity Heat Pump Modeling Approach
Description:	N/A
Filer:	System
Organization:	Sean Armstrong
Submitter Role:	Public
Submission Date:	10/17/2019 8:42:43 AM
Docketed Date:	10/17/2019

Comment Received From: Sean Armstrong
Submitted On: 10/17/2019
Docket Number: 19-BSTD-02

19- BSTD-02 and Residential Alternative Calculation Method Variable Capacity Heat Pump Modeling Approach

Additional submitted attachment is included below.

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To: [Energy - Docket Optical System](#)
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Subject: 19- BSTD-02 and Residential Alternative Calculation Method Variable Capacity Heat Pump Modeling Approach
Date: Thursday, October 17, 2019 1:55:04 AM

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Honorable Commissioners and Staff,

In this context of the world's most efficient Code-mandated shell measures in 2019, it is time to stop the scientifically unjustified derating of factory-sealed, lab-tested Packaged Terminal Heat Pumps (PTHP), particularly the Variable Capacity (inverter controlled) PTHPs offered by companies like LG, Mitsubishi/Arama and Panasonic/Innova.

The derating of PTHPs doesn't affect the wealthy homes that the CEC studies as base cases--they would never consider using a PTHP. But it affects senior housing, veteran housing and homeless housing, dramatically overestimating HVAC energy use, triggering more shell improvements and encouraging the developer to save costs and switch to gas Heating.

Packaged Terminal Heat Pumps, both horizontal and vertical, should be modeled at their AHRI rated efficiencies in the 2019 software. They have every possible feature that would allow them to meet their lab-tested efficiencies in the field:

1. They have no in-field refrigerant line-sets that could be mis-charged, and instead are factory sealed and inspected
2. They come with a factory-tested, right-sized, integral blower fan
3. They have no connected ductwork
4. The entire packaged heat pump assembly is built in a regulated factory with standardized machining, with a standard UL listed set of components (no field substitutions), lab tested to the DOE testing procedures, and additionally Title 20 compliant.

Packaged Terminal Heat Pumps are a key tool for decarbonizing new low-income multifamily buildings, particularly studio and one bedroom apartments. Not only does this PTHP derating policy *increase fossil fuel Heating in multifamily buildings*, the underlying protective caution the derating policy represents is misapplied to apartments--Redwood Energy's EPIC-funded monitoring of Energy Star for Homes certified Atascadero Family Apartments revealed that over a year, *apartments only used their HVAC one in seven days*. Apartments have 1/4th, or less, as much exposed wall to the outdoors as the standard large house the CEC designs the Code for.

This blind spot to the impact on low-income housing of a non-science based policy decision to derate factory-sealed, packaged heat pumps Code is inappropriate during a formally declared Housing Crisis. High performance PTHPs are versatile, easily maintained, and the least-cost, right-sized HVAC system for most low-income housing. The CEC should halt the derating policy for packaged heat pumps in the 2019 Code, and allow AHRI values to be used.

Sincerely,
Sean Armstrong

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