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Title 24 ACM Needs to Address Nonresidential Electric Heating Systems

Additional submitted attachment is included below.

Memorandum

To: California Energy Commission

From: Neil Bulger, Red Car Analytics

Date: 03/05/2019

Project: Draft 2019 Alternative Calculation method Reference Manuals and Compliance Software Tools Docket Number 19-BSTD-01

Subject: Title 24 ACM Needs to Address Nonresidential Electric Heating Systems

For nonresidential buildings to reduce carbon emissions buildings need pathways for compliance with California's energy code which fairly represents those technologies being used. The current proposed changes to the compliance software and Alternative Compliance Manual for Title 24 lacks any progress regarding electric heating systems and provides only the bare minimum of changes to meet mandatory requirements and changes. The lack of definition or addressment of key electric heating systems is one of the largest barriers to nonresidential buildings utilizing these technologies, despite their abilities to save operational cost and in some cases achieve lower annual TDV energy than conventional gas baseline equivalent systems.

Currently, the ACM lacks any definition of equipment for centralized and larger heat pump systems for space heating and domestic hot water use. All forms of 'heat pumps' as defined in the ACM today are for small heat pumps used for single rooms, houses or dedicated building areas. Centralized forms of heat recovery chillers and air to water heat pumps are now commercially being used as means to reduce natural gas boiler use or to fully eliminate them in some new construction nonresidential instances.

Modern heat pumps and heat recovery chillers are able to achieve higher levels of thermal efficiency in moderate heating climate which govern a majority of the heating needs in California. These components are often configured in low ambient or low exergy HVAC configurations, combined with fan coils, radiant panels, radiant in-slab, chilled beams, displacement ventilation and others. In some commercial buildings, centralized heat pump equipment can be shown to both reduce operational costs and be lower TDV annual energy compared with gas based alternatives. While this may not be possible for all heat pumps under the current TDV metric, it is achievable.

Should the CEC choose to address the gaps specific to nonresidential electric heating systems we recommend the following:

1. Define centralized components for heat pumps (air to water systems), heat recovery chillers, and heat recovery heat pumps (simultaneous heating and cooling).
2. Establish criteria of software capabilities as is defined for other equipment used for the same applications (boilers, water cooled chillers).
3. Establish performance specifications information necessary in the absence of any AHRI or DOE test procedures or ratings required for systems.

While all three forms of heat pumps defined here are similar technologies, they meet different needs in nonresidential buildings in California of both size and application. None of

these technologies are recognized in the ACM or Title 24 despite having been available and used for quite some time in commercial markets

Should the Energy Commission decide to encourage lower energy buildings in future rounds of compliance additional pathways for alternate compliance for these key technologies should be created and published as soon as January 2020.

Sincerely,

Neil Bulger, PE

Co-Founder, Principal

Red Car Analytics