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Comments for the Docket on Title-24 2013 updated regulations

Additional submitted attachment is included below.

April 8, 2015

GHP Manufacturer Representative

Comments for the Docket on Title-24 2013 updated regulations

California Energy Commission Docket #15-MISC-02

Issue - 2013 T-24 Updates - Title 24 is the primary barrier to the widespread Use of Geothermal Heat Pumps

The California Energy efficiency Strategic Plan - Research and Technology Action Plan - 2012-2015, was a very nice report prepared by staff of the Energy Division, California Public Utilities Commission (CPUC) and the Energy Research and Development Division of the California Energy Commission.

The report states that “In theory, ratepayer funded efficiency programs over time have been designed to encourage suppliers, manufacturers, designers, researchers, and others, to provide efficiency products or services to “push” the market, or to encourage consumers and end-users to buy or use these products or services to “pull” the market. These rebates and other energy efficiency programs should aim to increase the market penetration of energy efficiency products and practices so that they become sustainable in the market without the need for further incentives or ratepayer subsidies. When appropriate, such measures and practices could then be incorporated into building codes and appliance standards.”

The report goes on to say: “Emerging technology programs are recognized as part of key market transformation activities that rely on RDD&D to move energy-efficient products and developments from the laboratory into the commercial marketplace. These programs help technologies to overcome the technical and economic “valleys of death” through demonstrations in actual facilities to monitor and verify energy savings and benefits. As part of the Plan’s efforts to achieve the BBEES, innovations in a range of technologies, services and even philosophies in program design are required. Equipment advances have come in the area of **Climate Responsive HVAC** Technologies—that is, *technologies that are optimized to reduce energy consumption and peak demand in the hot-dry and mild climates represented in California.*”

My Employer, ClimateMaster, a U.S. manufacturer of ground source heat pumps has diligently worked to develop the type of HVAC equipment outlined as needed by California in this report. Our latest generation of product eliminates the need for evaporative cooling – a primitive technology that uses up to ½ the volume of Lake Folsom every year to cool California buildings- while delivering super-efficient (400% +) space conditioning and water heating by incorporating variable capacity compressor, fan and pump technology with “smart appliance” capability. We have developed the technology needed by California to meet its carbon reduction and water savings goals in the conditioned space market while supporting True Net Zero and breaking the peak demand neck of the dreaded “duck curve”. Just this week I was at 2 different developments in California building True Net Zero residential housing based on ground source heat pumps. There are only 2.

The Technology Action plan recognized that “market acceptance of these technologies has been slow”. The authors suggested that the State needs to follow some strategies to increase this market acceptance including (taken from the report):

“Expand R&D activities to enhance the performance characteristics and operational attributes of Advanced HVAC Technologies.” Our industry has done that for you.

“Develop, demonstrate and deploy advanced HVAC technologies.” Our dedicated California customer’s dealers and distributors are trying to do that for you now.

“Coordinated effort by multiple stakeholders to create market demand for advanced energy efficient technologies and practices.” Our industry is begging you the CEC to come to the table.

The report wisely counseled that “Multiple barriers influence the consumer adoption of advanced energy-efficient technologies. Consumers have certain needs (energy and non-energy) and have varied decision-making processes (in residential and non-residential sectors)”. The report also states early on that “It does not necessarily represent the views of the CPUC, the Energy Commission, its employees, or the State of California.”

This, unfortunately is an understatement. The single biggest barrier to the rapid (or any) adoption of super-efficient technologies in California is the rigid framework of Title 24 as it relates to new, emerging efficiency technologies, including ground source heat pumps. Despite their potential contribution to California’s energy efficiency goals, geothermal heat pumps have not been widely adopted in the state and in fact California has the lowest per-capita market penetration of GHPs of the lower 48 states. I want to clearly state for the record that after 20 years of developing GHP programs across the US (after starting in California) I am convinced that the rigid structure of Title 24 is the primary reason for this lack of market adoption of Geothermal Heat Pumps in California.

A primary challenge for the geothermal heat pump industry is how buildings are modeled in California’s Building Energy Efficiency Standards. The “approved” California residential and nonresidential compliance software does not accurately model geothermal heat pump systems, which is creating a bias in the building industry against the use of geothermal heat pumps. In addition, utility rebate programs generally require a prospective building owner to demonstrate that a building can qualify for the program and accept the efficiency measure prescribed by the program. This is most often done by modeling the building with the Energy Commission’s approved compliance models. Since these models do not adequately represent the true operating efficiency of geothermal heat pump systems, they favor the more common (and high carbon fossil fuel based) applications of heating and water heating, while over weighing the true peak demand performance of high SEER air conditioning (which loose capacity and efficiency at high, peak load conditions).

This long standing barrier affects the GHP industry in several ways. Building owners proposing to install a geothermal heat pump may not qualify for a utility rebate simply because the model does not represent geothermal heat pumps well (or at all). Furthermore, the currently existing compliance models make it difficult for installation in the planning phase to demonstrate compliance with the Building Energy Efficiency Standards as well as to what extent the geothermal heat pump (and the rest of the building) might exceed the standards. Also, the verification of a Home Energy Rating System (HERS) rater may be required to show that an energy efficiency measure exceeds the standards, but

without an Alternative Calculation Method (ACM) for geothermal heat pumps, a verification system for HERS raters cannot be developed. Local jurisdictions with permitting authority have allowed geothermal heat pump advocates to use parallel building energy models (which are not approved compliance models for purposes of the state's standards) that do a better job of predicting geothermal heat pump efficiencies, and coupling those results with the Energy Commission's approved compliance models.

In simple terms, California citizens who have researched the market for energy efficiency and chose to install super-efficient geothermal heat pump systems have to jump through massive regulatory hoops before they can install their carbon emission and water saving renewable thermal energy loops. Even though In 2012, Governor Brown signed Assembly Bill 2339 (Williams, Chapter 608, Statutes of 2012) which requires the Energy Commission to evaluate policies to help overcome barriers to geothermal heat pump and ground loop technologies. In order to support the State of California's carbon, energy, and water saving goals our industry needs a simple, uniform mechanism to operate under the Current and future versions of title 24 until the point in time when the state can recognize our technologies superior efficiency and energy and water savings in the Title 24 compliance software.

Sincerely,

Paul Bony

California Geothermal Association

Board Member -