CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

September 30, 2010

Daikin AC (Americas), Inc.
1645 Wallace Drive, Suite 110
Carrollton, TX 75006 USA
Attn: Lee Smith
LETTER VIA E-MAIL

Dear Mr. Smith:

Thank you for meeting with us on August 24, 2010, to discuss the Daikin Altherma, air to water source heat pumps. Staff sees two feasible approaches for addressing compliance modeling of air to water source heat pumps. Our preference would be the approach that likely will be able to be done in the fastest time, which is listed below as option 'a)'.

a) Use existing compliance software and identify proper inputs for efficiency variables that exist in the current software. DOE has authorized Daikin to use the efficiency ratings that result from European test procedures in the marketplace instead of having to meet federal test procedures, so the direct use of those efficiencies would be proper. In determining the inputs to the compliance software those European test procedure inputs could be modified to reflect circumstances in actual building operation that are different than the test conditions. Such modification would have to be completely documented and justified with factual information and the modification would have to be directly calculable for any other manufacturer of air-to-water source heat pumps. These proposed calculations would need to stand up to scrutiny in a public process.

   The calculations should result in a clearly conservative estimate of energy savings to help make the energy savings credited in the compliance process highly reliable. Note that the Compliance Options Approval Manual requires eligibility criteria to be established and field verification and/or "acceptance testing" requirements to be established to ensure that the heat pump will be properly installed in the field to achieve the expected energy savings. Separate efficiencies should be established for when the product is used only for space heating, only for space cooling, only for domestic water heating and only for combined space and water heating. Eligibility criteria and field verification and acceptance testing should be established to ensure that the heat pump is used at the building for the energy functions that are assumed in the compliance analysis.

b) A second approach, which is likely to take far more time to conduct, review and approve, would be developing algorithms for modeling the heat pumps in a more sophisticated manner within compliance software. This approach may take up to

two years or longer to complete. If this approach were taken, the algorithms would have to be fully documented and justified based on laboratory and empirical testing, and would have to be implemented into currently approved compliance software so that Commission staff could investigate the interaction of the algorithm with other building features and efficiency measures.

Daikin would be responsible to create a report that meets the requirements of the Compliance Options Approval Manual for the Building Energy Efficiency Standards, located on the following URL:

http://www.energy.ca.gov/2005publications/CEC-400-2005-007/CEC-400-2005-007.PDF

Although the above linked document cites the 2001 Building Energy Efficiency Standards, the general information contained in the document remains correct for the current (2008) Standards.

In either of the above cases, during the legal review it was discovered that the application fee for Exceptional Methods is not $1,000, but is $2,000 per Section 10-109(b)4 and Section 10-109(b)3D. Therefore, an additional check of $1,000 payable to the California Energy Commission, will be needed.

Note that the Energy Commission is required by law to have a public meeting to scrutinize the information you provide. Therefore, it is imperative that we receive all requested material and have full disclosure of the facts as required in Section 10-109(b). Additionally, if this Exceptional Method is approved, it will be available for use for compliance by other manufacturers with similar systems. If you have any questions or concerns, please contact me by email at Amarshal@energy.state.ca.us or by phone at (916) 653-1584.

Sincerely,

Alan Marshall
High Performance Buildings and
Standards Development Office