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On Fan Power

Additional submitted attachment is included below.

September 5, 2017

Mr. Mark Alatorre, PE
Building Standards Development
California Energy Commission
1516 Ninth Street, MS37
Sacramento, CA 95814

RE: Docket Number 2017-BSTD-01; Fan Power (TN#-219862)

These comments are submitted by the Greenheck Group in response to the Fan Power workshop presentation (TN#219862) from June 23rd, 2017 by Ken Takhashi.

Comments on Fan System Power

In reviewing the proposed code changes for fan system power limitations to Title 24, footnote 2 to table 140.4 will only allow pressure credits for exhaust air energy recovery devices when required by code. We believe this requirement is too prescriptive given complexity of exhaust air energy recovery performance and may prevent buildings from incorporating exhaust air energy recovery where it provides reasonable paybacks and energy savings. ASHRAE 90.1-2016 allows for a pressure credit whenever exhaust air energy recovery is used. In our review of addendums to ASHRAE 90.1-2016 there are currently no proposed changes for this pressure credit. Please reference the Greenheck Group response to TN# 219857 for additional complexities related to exhaust air energy recovery requirements.

Generally speaking there are 3 categories of economics related to exhaust air energy recovery:

1. Designs where there is marketable payback and energy savings.
2. Designs where the payback is extended but the system will still experience energy savings.
3. Cases where there energy recovery provides no energy savings or increases energy costs.

Only allowing the energy recovery credit when it is required by code will likely eliminate installations where customers desire energy savings with exhaust air energy recovery, even with less marketable paybacks. There are also scenarios where installations that do not mandate energy recovery will still have marketable paybacks by using alternate system configurations and devices with higher effectiveness values.

Commenter Credentials:

Mike Wolf has over 31 years of experience with the Greenheck Group, a leading manufacturer of HVAC equipment. Mike has held positions in engineering, sales, marketing, software development and general management. As such, Mike has a solid foundation for understanding the impact regulations can have on a business and a market. Mike is active in the development

of test standards and codes with industry trade associations including ASHRAE, AMCA, AHRI, UL, NFPA, ICC and others. Mike participated on the U.S. Department of Energy's Working Group responsible for developing recommendations on Commercial and Industrial Fan Energy Regulation. Mike is also a member of the U.S. Department of Energy's Appliance Standards and Rulemaking Federal Advisory Committee (ASRAC).

Eric Erdman has over 11 years of experience designing and testing Makeup Air, Exhaust Air Energy Recovery and Dedicated Outdoor Air System equipment. Eric is an active member of the AHRI Energy Recovery committee and the ASHRAE and AHRI Mechanical Dehumidification committees.

The Greenheck Group is comprised of a number of brands including Greenheck, Unison Comfort Technologies, Innovent, Valent, Precision Coils, Accurex, and Airolite. Headquartered in Schofield, WI, Greenheck has offices and manufacturing facilities in California, Wisconsin, Kentucky, Tennessee, North Carolina, Mexico, and India. In the coming year we will be expanding our manufacturing footprint to include Oklahoma. Greenheck employs nearly 4,000 people worldwide, including over 3,500 in the United States. With over 70 years of family ownership, Greenheck is a worldwide leader in the manufacture of air-movement, conditioning and control equipment, systems and services. Greenheck's extensive product offering includes commercial fans and industrial blowers, laboratory exhaust systems, dedicated outdoor air systems, energy recovery ventilators, air handling equipment, make-up air equipment and kitchen ventilation systems. Related products include air-control dampers, fire and smoke control dampers, heating and cooling coils as well as architectural and mechanical louvers. Greenheck equipment is used in all types of commercial, institutional, and industrial buildings and applications ranging from comfort ventilation to industrial processes.

Industry Associations

Greenheck engineers are actively involved with many government and industry organizations working to establish performance standards and application guidance related to HVAC systems and products. Examples include:

- United States Department of Energy (DOE)
- International Standards Organization (ISO)
- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
- Air Movement & Control Association (AMCA)
- Air-Conditioning, Heating, & Refrigeration Institute (AHRI)
- International Code Council (ICC)
- California Energy Commission (CEC)

Greenheck's involvement with the aforementioned groups is largely focused on development of standards, regulations and programs that result in energy efficient HVAC systems as well as practical selection and application of energy efficient products manufactured for these systems. Greenheck is continuously working with these organizations and other industry members to provide constructive, consistent and substantial insight regarding industry standards and regulations.

In closing, Greenheck very much supports efforts to reduce energy consumption through practical and timely initiatives. This includes coordination and harmonization between appliance standards, energy codes and related compliance requirements.

Respectfully Submitted,

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