

October 26, 2004  
Tyler, Texas

Ms. Rachel Schmeltz,  
ENERGY STAR, Product Manager  
Office of Air and Radiation  
U.S. Environmental Protection Agency  
Ariel Rios Building  
1200 Pennsylvania Avenue, N.W.  
Washington, DC 20460  
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Dear Ms. Schmeltz,

Trane Residential Systems, a division of American Standard Inc., (hereinafter referred to as "Trane"), submits the following comments on the proposed 2006 Energy Star Specification for Residential Air-Source Heat Pumps and Central Air Conditioners.

We appreciate the opportunity to provide input to the Energy Star program.

In Summary, we support:

1. The efficiencies for split systems listed in the Equipment Criteria – Table 1., but a slightly variation for packaged units, as the current draft will limit the packaged unit offerings in the program.
2. The separation of Equipment Energy Star Criteria from the Installation and Verification requirements.
3. Allowing the HVAC manufacturers the design freedom to develop products to meet the energy requirements vs. specific design requirements.
4. Encouragement of modulating or "staged" systems which save total energy.
5. Labeling of Energy Star based on system combinations and not a combination of equipment, installation and verification requirements.

Trane and American Standard Heating and Air Conditioning have participated in the Energy Star programs for many years. We strive to develop highly reliable and efficient comfort systems, of which our customers can be proud.

We encourage Energy Star and the Energy Star utility partners to identify a set of energy standards and maintain them for a number of years, thus allowing manufacturers to recoup unique design expenses incurred in the development of these highly efficient products.

## I. Equipment Criteria

### Equipment v. Process

We encourage Energy Star to separate the Installation and Verification requirements from the Equipment Criteria. To our knowledge, this is the only product category in Energy Star where the product is being tied to installation.

We applaud the efforts of Energy Star to enhance the long term, quality installation emphasis by the manufacturers of equipment, but tying the two together will increase the complexity of the program and could limit participation.

What incentive is there for manufacturers to participate in and promote the Energy Star program through equipment design if there is no guarantee that the equipment will meet the criteria of Energy Star due to additional installation and verification requirements? The manufacturer may not benefit, and thus loses interest in promoting the Energy Star program itself.

In the last few years, when Energy Star added the EER component to the standard, the process became cumbersome for all participants in the program – for the EPA team, for utilities and for manufacturers. This complexity eventually caused EPA to remove the EER component for approximately 1 year, as a process was revised to simplify the ratings reports.

To tie Energy Star equipment labeling to installation and verification will make the program much too complex and difficult to enforce and maintain. It was difficult enough for utilities to identify qualifying system combinations, but to add to that burden to the requirement for installation standards and verification of those standards as a prerequisite to allowing equipment to bear Energy Star labeling is prohibitively cumbersome and potentially counter-productive. Trane recommends that Energy Star separate Energy Star systems (equipment) from Installation and Verification processes.

### Efficiency Criteria

While the proposed efficiency levels are challenging, we support the efforts of Energy Star in establishing these 2006 levels. A 14+ SEER, 12+ EER and 8.5+ HSPF for split systems requires highly focused energy efficient design and limits qualifying products, yet supports the goals of Energy Star to encourage energy savings. Despite the challenges, Trane and American Standard still supports the efficiency levels.

The packaged unit efficiency levels are the most challenging, as most manufacturers cannot meet the 14+ SEER, 11+ EER and 8.0+ HSPF standard. Trane and American Standard will offer some products that do meet the criteria – but many manufacturers will not. Because the size of the packaged unit market is relatively small, fewer options will be available. For packaged units, a 13.5+ SEER (13.5 SEER or higher), 11+ EER and a 7.6+ HSPF will get additional product coverage, otherwise there may not be a full family of Energy Star packaged heat pumps available.

It should be recognized that the higher the Energy Star requirements, the fewer product options from which the consumer will be able to choose. There is a point at which the Energy Star system offerings are so limited, that the program becomes obscure and potentially irrelevant.

As a solution to the challenges of higher efficiency products, modulating systems offer substantial energy savings. Achieved through the use of two compressors, a single, two-stage compressor or a two-speed compressor, these systems are more complex, but provide significant improvements in energy savings. Energy Star should promote these highly efficient products.

### **Design Freedom**

Trane has been designing HVAC products since 1913 and many of our competitors have designed HVAC equipment for decades. The industry understands how to design equipment and we object to feature criteria.

We encourage Energy Star to allow its participants the freedom to design products to meet the market's varying needs and not have designs commoditized or compromised by its specifications. We recommend that the subjective requirements be removed from the standard.

The commoditization of products would likely prompt redirection of financial, capital and engineering resources away from developing higher efficiency, innovative products toward designing the lowest cost system to meet the requirements. We oppose requirements like "air-tight inspection/cleaning door/panel" or an "On-board diagnostic indicator that provides the installing or service technician with an indication of improper airflow...".

Trane currently offers an air handler family called Air-Tite™ that meet Florida's "air tight" requirements. We use thermal expansion valves (TXV's) on high efficiency products. Our Comfort Coils™ feature access for ease of service – so that the coil can be cleaned while still installed. In addition, we have avoided the "lancing or enhancing" of our indoor fin material in order to differentiate our products – the benefit is that these coils are easier to clean and avoid clogging. These product innovations were borne out of a profit motivated desire for differentiation and should not be mandated by Energy Star.

Define what efficiency you would like the manufacturers to meet, and let manufacturers design systems to comply with Energy Star performance criteria.

### **Product Test Criteria**

ARI stands for Air Conditioning, Refrigeration Institute.

## **II. Installation Criteria & III. Verification Criteria**

As stated earlier, Trane strongly recommends that the Product requirement and the Installation/Verification section be separate.

The installers of Trane and American Standard residential equipment are independent business people who are provided the finest equipment/system installation and service training. We support the technical needs of these businesses with our Field Service Representatives (FSR's) and Dealer Support Specialists (DSS's).

A properly applied, installed and charged system should perform better than a system which has not met one of the criteria listed. We encourage dealers to run Manual J load calculations on all prospective installations. Our FSR's and DSS's teach the installers the appropriate procedures to properly apply, install and charge a system. However, to expect dealers to perform items 4 and 5 on the proposed Installation Criteria places an unreasonable burden on the dealers and will substantially increase installation costs to the consumer. In an environment in which the consumer is already paying higher equipment costs due to a 13 SEER minimum efficiency standard, this will further limit participation.

If the process is too complex, you will limit participation by dealers – even the best of dealers! We have observed some very good dealers who will not participate in programs due to the complexity of filling out ONE form. Items 4 and 5, while great information, need to be simplified and the burden on dealers reduced.

In addressing Installation and Verification, the consumer will ultimately pay for the added cost to provide all of that information and checking. It would not be surprising if the additional cost to install/verify (filling out items 4 & 5 plus verification) would be \$3-500!

## **IV. Labeling**

Trane's supports shipment of Energy Star equipment with the Energy Star Label affixed to the equipment from the factory. This way, we can assure that the customer is likely to get Energy Star rated combinations. It also simplifies the process, which is key to a successful program.

If Energy Star would like to develop a separate Energy Star Installation decal/plaque, to be fixed to the unit or close to the unit, that would be a better solution. That way, the verification entity can apply this "installation" label and show the customer that they have the best of all – Energy Star Equipment and Energy Star Installation (two separate but complementary pieces). Importantly, the consumer would be given the

economic freedom of choice between Energy Star rated equipment and Energy Star rated installation.

Energy Star could offer Energy Star Operation Verification on existing installations, the result should be additional energy savings on existing equipment – which, according to the Appendices should save on average 10-20%.

## **V. Phase In of New Specification**

Since utility incentives help make this program perform; we should ask the utilities what fits their schedules best, provided that the date is after January 23, 2006.

## **VI. Other Criteria to Consider**

Trane recognizes and welcomes opportunities to improve energy efficiency and designs. If cost effective, higher efficiency motors, improved fan blades or fan housings were available, they would be designed into the equipment. Backward Inclined (BI) blowers have been well known for a century or so and do not find application in residential and most commercial because they must run at higher speed, for a given air flow, at a given pressure. In addition, they are noisier. Since Trane makes BI blowers in very large sizes [ca 8 ft. dia.], we are very familiar with their characteristics. For approximately 20 years, in the residential market, we have offered high efficiency, variable speed motors for our premium products, at a premium price.

To require “advanced diagnostics” or additional sensors (pressure or temperature) will add to the complexity of the system, could hurt reliability and will drive up product cost. We suggest that continued refrigerant handling courses be offered – perhaps financially supported by EPA funds. Service or installation of products with R-22 and R-410A, requires a refrigerant handling license. It is a violation of Federal Law to knowingly vent refrigerant into the atmosphere (fines up to \$25,000 per instance).

If a product feature is important to the consumer, they will vote in favor of the feature by purchasing it.

We need to spend more time encouraging the consumer to perform routine service on an HVAC system every 6 months. This would assure that the consumer continues to see the energy benefit of the Energy Star equipment – and all equipment.

We appreciate the opportunity to support the 2006 Energy Star process.

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Please feel free to contact me should you have any questions.

Respectfully,

Mike Ray,  
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Trane and American Standard Residential Systems

CC:  
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