

September 6, 2006  
TO: Rebecca M. Duff, ICF International

Thank you for giving Natural Resources Canada the opportunity to comment on the ENERGY STAR Draft 1, Furnace V2.0 specification. Our comments are the following:

**Proposal for Gas fired furnaces:**

Natural Resources Canada's view is that for Canada especially, the AFUE levels for gas furnaces should be increased from 90% to 92%. We base our proposal on furnace shipment data supplied by the Heating, Refrigeration and Air Conditioning Institute (HRAI) which indicate that roughly 61% of the furnaces shipped in Canada are at the condensing level, which meet or exceed AFUE 90%. Considerable effort by the gas utilities across Canada, and support from the federal government have helped move the market to higher levels of efficiency for residential gas fired space heating equipment.

Canadian shipment data contrasts sharply with shipment data published by GAMA, which indicate that 28% of shipments to the US meet the minimum 90% AFUE criteria, and 21% of the shipments are of furnaces with an AFUE of 92% or higher. Though the percentages are smaller in the U.S., it is our belief that increasing the ENERGY STAR levels would provide a significant benefit in areas with higher heating degree days such as Northeastern US states.

It should also be noted that:

- Canada has launched a study and held a workshop regarding a proposal to increase the federally regulated minimum energy efficiency standard for gas furnaces from 78% to a condensing level.
- The Province of British Columbia has passed legislation under its Energy Efficiency Act, implementing a minimum standard of AFUE 90% for all furnaces installed in new construction as of 2008.
- The Ontario Building Code (provincial building code) will be requiring, as of December 31, 2006, that the minimum rating for gas furnaces installed in new construction be 90% or higher.

Establishing a minimum AFUE of 92% for ENERGY STAR qualified gas fired furnaces would be technically and economically feasible to achieve in Canada, where the market is moving towards higher efficiency.

**Maximum Eae criteria for furnaces:**

In the letter dated July 28, 2006, it is stated that the Tier II furnace fan efficiency should be a *minimum* of 800 kWh/yr. Perhaps this was an oversight, however, we are recommending that the wording of the specification always be stated as a 'maximum' and not a minimum.

For this criteria, there are two issues that we would like to address:

1. the disadvantage that one level could have on certain sizes of furnaces
  2. the timing of an EAE criteria
1. NRCan is concerned that one threshold value for all sizes of furnaces could put larger furnaces at a disadvantage. We believe that a maximum Eae of 800kW-h/year could place larger furnaces at a disadvantage, since they require more flow, thus more power to run. As a result, it would not be necessary for manufacturers of smaller units to change the blower motors to meet the requirement, whereas manufacturers of larger furnaces with greater flow requirements would need to improve their technology. NRCan is therefore recommending that EPA revise its proposal of one threshold value for all sizes, and consider an Eae proportionate to the furnace size. For example, it could be a maximum of 6.4 kWh/year/1000 btu input, based on 800kw-h/year for a 125,000 Btu input furnace.
  2. NRCan is recommending that the maximum Eae criteria should be introduced in Tier I for gas fired furnaces, especially for two-stage furnaces, and not Tier II. Gas fired two-stage furnaces should have high-efficiency motors, given that they typically run at two speeds during the heating mode. The LBNL May 2006 study entitled: "*The Residential Two-Stage Furnaces: Do they Save Energy?*" demonstrates that although two-stage technology by itself does not save site energy, the combination of two-stage furnaces with brushless permanent motors (BPM) (also known as ECM) provides overall energy savings, which are confirmed by field studies.

Lastly, NRCan is requesting a clarification in the specification document, on page 4, Tier I – "*Consider using high efficiency electric blower motors with its qualified furnace models.*" – this statement should be more specific such as always consider DC variable speed, electrically commutated motors, and propose a cut off.

### **Oil Furnaces**

NRCan is recommending a multi-tiered approach to an oil fired furnace level and specification for ENERGY STAR. As mentioned on page 6 of the Program Requirements for Furnaces, Version 2.0, EPA's intention in proposing a Tier 1 effective date is to allow manufacturers to qualify and promote oil fired furnaces for the upcoming heating season.

Currently in Canada, the weighted average AFUE of oil furnace shipments is 82.43%, which indicates that AFUE 83% is technically feasible for the first year of the specification. However, to differentiate higher efficiency oil fired furnaces in the Canadian market place, an increase to the efficiency level will need to increase if ENERGY STAR is to meet its objective.

NRCan is proposing that in 2007, the oil furnace level be upgraded to 84% for Tier II, and that a third tier, proposed for 2008, be at the 85% in order to work

towards increasing the availability of more efficient models in the North American market place. In Canada, an 84% level would reduce oil consumption by 7% (compared to 8% for models at 85), and will double the number of available units in Canada.

Data from Canada's Energy Efficiency Regulations data base, which lists the models of all furnaces shipped into Canada or interprovincially, indicate product availability at the proposed levels. There are 440 model unit numbers, representing 23% of the models reported, that have an AFUE of 83% or more; and 194 model numbers, representing 10% of the models in the data base, that have an AFUE 84% or more.

Canada has also had some success in promoting higher efficiency oil-fired space heating equipment. Over the past year, the EnerGuide for Houses program has been offering a \$100 top up to consumers claiming a higher efficiency oil fired furnace or ENERGY STAR qualified furnace or boiler, along with with their home energy rebate application. To date, 62 claims have been processed for oil furnaces with an efficiency rating of 85% or more.

Regarding the maximum Eae criteria for oil furnaces, it should be established in Tier I. This requirement does not necessarily require a high efficiency motor, but rather a better sized blower with more efficient components.

Please let me know if you need additional information on the above.

Sincerely,

Anne P.-R. Wilkins  
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