2111 Wilson Boulevard, Suite 500
Arlington, VA 22201, USA
www.ahrinet.org
PH 703.524.8800
FX 703.528.3816

Air-Conditioning, Heating, and Refrigeration Institute

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Ms. Katherine Muncaster
Senior Policy Analyst,
Energy Efficiency Branch
Ministry of Energy, Mines and Petroleum Resources
1810 Blanshard St. 4th Floor
Victoria, British Columbia
L5N 6J7

RE: Proposed Energy Efficiency Requirements for Residential Water Heaters

Dear Ms. Muncaster

As a preface to our comments let me explain that at the beginning of 2008, the Gas Appliance Manufacturers Association (GAMA) and the Air-Conditioning, and Refrigeration Institute (ARI) merged to form the Air-Conditioning, Heating, and Refrigeration Institute (AHRI). We are a trade association representing manufacturers of space heating, water heating, air conditioning and refrigeration equipment and components. AHRI's water heater manufacturer members provide all of the residential gas and electric storage water heaters, and the vast majority of residential gas tankless water heaters, sold in Canada and the United States. We have several concerns regarding the proposed residential water heater efficiency regulations currently being considered in British Columbia. These concerns involve both the proposed near term Phase 1 regulations and the proposed regulations being discussed for Phases 2 and 3.

Phase 1 Proposal

The formula for the proposed gas water heater efficiency regulation appears to take the new, single number, residential gas water heater Energy Star criterion and properly transcribes it to cover all the volume sizes of residential gas storage water heaters. We support this aspect of the proposed regulation. We do not agree with making this minimum efficiency requirement effective in less than a year. This is both an insufficient lead time to develop new products and potentially, an unintended undermining of the Energy Star Program.

A 10 or 11 month lead time for implementing this proposed regulation is too short. It is not enough to look at the number of listings of complying models. Because of the nature of the water heater market, many models are listed multiple times with different brand or trade names. The relevant data that must be considered is the actual shipments of complying models. All manufacturers, whether they have some complying models or not, will have to develop new models to meet the full needs of the water heater market in British Columbia. As noted in "Regulatory Impact Statement", the U.S. Department of Energy (DOE) will be issuing some initial proposal efficiency requirements in early 2009. It is premature to

suppose that those DOE proposals will match the proposed British Columbia regulation. More significantly, the effective date for this current DOE rulemaking there provide a 5 year lead time for the new, increased water heater minimum efficiency requirements.
Also, with regard to the issue of effective dates, we wish to confirm that the effective date applies to the date of manufacture of the water heater. This has always been the case for water heater efficiency regulations in the U.S. both at the federal and state level and other appliance efficiency regulations in Canada. This provides both a clear reference point for implementation and allows for the orderly transition in the market as units legally built before the effective date work their way through the distribution chain.

As noted the Energy Star program for residential water heaters is new. It officially began on January 1, 2009. Given the now well established consumer recognition of the Energy Star logo and the experience of other Energy Star programs, there will be an increase of sales and installations of Energy Star gas water heaters. This will occur without the proposed regulation. This fact must be considered in the analysis of this proposed regulation in the sense that any energy savings resulting from consumers choosing to buy Energy Star models cannot be credited as a benefit of the regulation. Furthermore, in the Energy Star Program, higher efficiency models are available for those who chose to incur the higher cost of these models. If the Energy Star criterion becomes a minimum efficiency requirement with a shortened time for implementation, then consumers in British Columbia will be forced to purchase these lower production volume, higher cost, models regardless of the consumer's current economic situation.

We are aware of the proposal for the Phase 1 gas water heater efficiency requirements that has been submitted by the Canadian Institute of Plumbing & Heating. We believe that CIPH's proposal is a reasonable compromise of the issues involving new product development, the current water heater market in Canada and BC's desire to reduce water heater energy use. We support this proposal and urge BC to adopt it as its Phase 1 requirements.

We support the general concept of providing heat traps on the top inlet and outlet connections of electric storage water heaters. However, we suggest that this requirement be modified to required that heat traps and an appropriate length of pipe insulation be installed when the water heater is being installed. We recognize that issues have been raised regarding some types of heat traps. It should also be recognized that heat traps have been used effectively on many water heaters in the U.S. One option that can be used is to create a heat trap by appropriately configuring the connecting water piping. If flexible water lines are used, this simply requires forming a loop with the line as it goes from the house water line to the water heater inlet or outlet. This suggestion addresses the fact that some water heaters come equipped with heat traps and others do not, and provides the most flexible way to obtain the energy savings associated with a heat trap on a top inlet or outlet water connection

Also, with the use of heat traps and pipe insulation, the standby loss difference between bottom connect and top connect water heaters becomes minimal. Because of test procedure

related issues, the true significance of the comparative difference in stand by loss of these two configurations is uncertain. We discuss those issues further in our comments on Phase 2. Given this uncertainty, the proposed regulation for electric water heaters should not be design prescriptive nor promote one connection configuration over the other, but strive to maintain the existing plumbing connection and installation options.

Phase 2 Proposal

Whatever the criteria may be ultimately for this phase, the proposal to have these requirements go into effect only two years after the implementation of the phase 1 requirements is too short. A 2 year period between the imposition of new, more stringent efficiency requirements is not appropriate given the practical realities of the complete process of developing new water heater models from inception to full production. Furthermore, such a short period does not allow manufactures to recoup their investment for complying with Phase 1. Particularly in the current economic conditions, this is neither a trivial nor irrelevant concern.

In the case of electrical water heaters, a major goal of any Phase 2 regulation should be to specify a single efficiency criterion for all designs of electric storage water heaters. This will require the development of a test procedure that can account for the benefit of heat traps, other devices and design features that reduce electric water heater energy consumption. As noted currently there are two Canadian test procedures that could be applied to electric storage water heaters. If the U.S. DOE water heater efficiency test procedure is included in this discussion, there are then three options. More importantly, work has started to revise ASHRAE Standard 118.2, Method of Testing for Rating Residential Water Heaters. The project committee responsible for revising this standard includes 2 members from Canada. There is a good probability that the revised standard resulting from the ASHRAE activity may be the single appropriate test method for residential water heaters of all fuel types. This effort will take 2 to 3 years to complete. We urge BC to defer the implementation of any Phase 2 requirements for electric water heaters until that revised test procedure is finalized.

The proposed Phase 2 regulation for gas water heaters includes the introduction of a separate requirement for new homes. While this is an idea that may be considered, it must be done so within the context of other programs that will be promoting the installation of higher efficiency gas water heaters. It is already known that a second, more stringent tier of Energy Star will go into effect in 2010. The Consortium for Energy Efficiency is also getting ready to launch a campaign to promote higher efficiency gas water heaters. Any consideration of Phase 2 efficiency requirements must consider the impact of these programs. If these programs are successful in transforming the market, then the need for a revised regulation is reduced if not removed completely. But most importantly, that assessment cannot be made until these programs have been operating for some time; 1 to 2 years at least.

Phase 3 Proposal

This aggressive plan to require gas tankless or condensing storage water heaters and electric heat pump water heaters by 2013 requires significantly more research and detailed evaluation. There are several basic parameters that must be properly characterized. One overriding issue that has not been sufficiently researched is "What is the average daily hot water use for a residence in British Columbia." In the context of this regulation, estimates of the energy savings should be based on usage information specific to the citizens of British Columbia. When Phase 3 regulations are discussed, the importance of this increases because the technologies being mentioned have significantly higher installation costs.

The Super Efficiently Gas Water Heating Appliance Initiative (SEGWHAI) project sponsored by the California Energy Commission included data on the installation costs for tankless and condensing gas storage water heaters. Those amounts were $2,500 and $4,000 respectively. That same report listed a $900 installed cost for a typical atmospheric-burner, gas water heater and an estimated $1,100 installed cost for a design of storage water heater that might approach a .70 energy factor. These are U.S. estimates and they are significantly lower than the new construction installation cost shown in Table 19 of the "Canadian Residential Water Heater Market Assessment." Even though these costs differ significantly, the proper assumption in the absence of any other factual data would be that the differences in the installation cost shown in the SEGWHAI report would proportionally translate to the Canadian market.

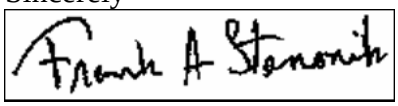
The energy savings benefit of these types of water heaters cannot be compared against the currently available models but can only be compared against the minimum requirements that will be in place several years from now. Under the current plan, that would be the Phase 2 regulation. A .80 energy factor water heater is about 14% more efficient than a .70 EF model. If a homeowner in British Columbia is only paying $300 a year to heat water, a 14% savings is about $42. This potential cost savings does not make up for a potential installation cost increase in the range of $1, 500 to $3,000.

In the case of condensing gas water heaters, there is the added concern of the vent gases exiting from a side wall vent system freezing in the winter. The Canadian Interprovincial Gas Advisory Council has already raised a concern regarding the situation where the vent terminal of a side wall vented, condensing gas furnace is close to a neighboring residence and the vent gases freeze. In some cases property damage occurs, in other cases, the icy build up may present an injury hazard.

There are similar product and installation cost issues regarding heat pump water heaters. These costs along with the impact that the heat pump will have on the heating or cooling of the space in which it is installed, must be considered in any analysis of the cost/benefit of a proposed heat pump water heater requirement.

As previously noted, we are aware (CIPH) is presently working with the province of British Columbia in addressing its desire to develop water heater efficiency requirements. We also understand that at this time phases two and three are indications of intent and are still under review and evaluation. AHRI recommends that the province of BC continue to work cooperatively with the water heater industry and we would welcome the opportunity to work jointly with CIPH and B.C. in developing the appropriate levels for Phases 2 and 3.
We thank you for the opportunity to comment on the proposed efficiency regulations for British Columbia and trust that you find our comments and recommendations constructive.

Sincerely



Frank A. Stanonik
Chief Technical Advisor