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DRAFT

Reference proposed new section 403.7 of the International Energy Conservation Code and proposed new section N1103.2 of the International Residential Code.

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The proposal to eliminate electric resistance heat in residential construction (EC 123) should be disapproved for a number of reasons. The following are four points that the electric heating industry and other interested parties have agreed are serious flaws to the logic, validity and methodology of that proposal.

1. DOE2 Cost based analysis. Comparing savings as a cost measure is not appropriate for the following reasons:

- a. If the cost of a particular state's power mix and/or local utility rates is the driver for this justification as submitted, then this proposal favors site fueled equipment over electrical resistance heating. Therefore, this proposal has failed to take into account the extreme variability of the cost of site based fuels or alternative generation used for heating. A few examples are:

gas furnace -the cost of gas has increased nearly 200% in recent years while the cost of electricity has fallen slightly or stayed largely the same on the average for the nation,

fuel oil furnaces - some areas have seen a 250% increase in recent years in the cost of fuels. This comparison highlights the complex issue of site generation versus source generation, and

alternative energy – while the cost of wind, solar thermal and geothermal generation has fallen, they are still far above the cost of electricity from the grid.

- b. It is impossible to tell what parameters were used to set up the DOE2 for predicting savings and as such the table submitted is not a complete record of what the proponents' base case and target case were.
- c. The basic premise of this proposal focuses on cost and generation, not efficient use of the resource. The IECC is a code intended to ensure the optimum

efficiency of a building's energy use, not the workings of an entire generation infrastructure. The proponents did not submit the total energy and environmental costs of importing, drilling, refining oil, or of delivering natural gas or propane to the home. If the entire cycle is fair game for scrutiny, then all proposals need to look at the entire cycle of every energy source from creation to delivery. This will set an unprecedented standard that is far outside the scope of the IECC and can only be relevant to a defined, limited, geographical area.

2. Heat pump exemption. The proposal favors heat pumps by exempting them from the requirement. The estimated savings from heat pumps is not proving to be as accurate as the modeling softwares such as DOE2 predict for the following reasons:

- a. Standard heat pumps work well in temperatures between around 30 deg F and 90 deg F. At all other temperatures the technology does not perform very well unless a high efficiency heat pump is used – these are somewhat more expensive than the standard models and thus not purchased often. These temperature boundaries and the fact that nearly all residential construction does not use high efficiency heat pumps would suggest that only very few climate zones where conditions don't routinely exceed those temperatures are using standard heat pumps as efficiently as modeling software predicts. The result is added plug-in units or overheating of residential spaces because smaller residential units are almost never multi-zoned.
- b. Heat pumps do not consistently save the predicted amount of energy because of the overwhelming trend to undersize the units to save costs in home building. This forces the supplemental electric resistance heating element to work overtime to warm up the spaces in colder weather after night and day setbacks.
- c. The maintenance and subsequent operation of the exterior heat exchanger degrade over a relatively short amount of time and can significantly increase the cost of their operation and decrease the predicted life cycle savings.

3. Barriers to new technologies. This proposal negates years of research and product development that are finally paying off and allowing designers and contractors to make use of affordable, green alternatives to electricity generation and storage components for large and small scale applications. Furthermore, the following issues have been completely ignored in the preparation of this proposal:

- a. These technologies are going to be crucial to achieving the drastic green house gas reduction targets currently legislated or pledged by most federal, state and larger municipalities.
- b. It is a fact that many renewable sources are located at or close to the end user, reducing or eliminating the argument of inefficient generation and distribution. Clean, renewable power from wind, solar, and other emerging technologies will increase exponentially in the foreseeable future, making electric resistance

heating a more, not less, desirable option.

- c. Punishing the most efficient heating technology there is at a time when the source generation problems are receiving unprecedented funding is uninformed at best, simplistically naïve and could restrict trade unnecessarily. Alternative energy creation and distribution is finally contributing a viable percentage to the electric power mix on a local, regional and global scale. This proposal is a dangerously short-sighted approach and will cut off a viable source of quiet, non-forced-air heat that can be applied effectively and efficiently regardless of the source of electricity.
- d. This essentially guarantees that forced-air systems continue to be the norm while research is showing that Indoor Air Quality is quite often negatively affected by forced air. Furthermore, standard ductwork in residential and commercial buildings wastes up to 30-40% of the total energy in actual practice thereby reducing the anticipated savings from heating equipment that relies on forced air for its distribution.

4. Code language. This is not good code development language and as such is not enforceable for the following reasons:

- a. The proposal doesn't use a standard for efficiency approach for specific equipment as do other portions of the code and doesn't reference the associated design standards. Furthermore, it does not offer design engineers any flexibility in remodel, new technology application or product selection in projects that have site or infrastructure challenges that may prohibit ductwork or gas use.
- b. The phrase "but is not limited to..." in this application is detrimentally open-ended and could be interpreted to mean thin-film carbon-based heating, electric resistance heat as generated by renewable sources, electricity-based thermal storage used in off-peak hours or building integrated heating technologies.
- c. The wording of the threshold exemption for BTU's or Watts per square foot is meaningless in most residential applications as those units are sized by thumbnail calculations of tons per square foot. This will make the usability and enforceability of this exception virtually non-existent.
- d. Regional conditions may force areas that have limited or no natural gas into a situation that eliminates choices and causes restriction of trade.
- e. Exclusion of plug-in equipment is meaningless as this code doesn't regulate plug-in heaters in any form.

5. Specific economic factors. This proposal has extremely significant and far ranging

implications that may pose unintended local, regional, national and international economic and trade impacts.

- a. Need input by coalition on the magnitude of trade and industry impacts.
- b. Volume of business per year in ER heat
- c. Percentage of ER heaters that are imported
- d. Number of units installed annually by region is possible