Alliance to Save Energy
American Council for an Energy-Efficient Economy
Appliance Standards Awareness Project
Natural Resources Defense Council
Northeast Energy Efficiency Partnerships
Northwest Power and Conservation Council

May 30, 2006

Ms. Brenda Edwards-Jones
U.S. Department of Energy, Buildings Technology Program
Commercial Refrigeration Products Rulemaking
1000 Independence Ave. SW
Washington, DC 20585

RE: Docket number EE-2006-STD-0126

Dear Ms. Edwards-Jones,

We are writing to provide comments on DOE's April 25, 2006 Federal Register notice and Rulemaking Framework document on energy-efficiency standards for commercial refrigeration equipment. In general, we are pleased to see DOE begin this rulemaking and believe that DOE's proposed approach is generally on target. However, we do have some serious concerns and some suggestions on ways to improve the process and analyses. At the workshop, the Department expressed its intent to issue a final standard by January 1, 2009, as it is legally required to do. It is crucially important that the Department meet all statutory deadlines. It is also crucial that, in doing so, DOE fulfill its legal duty to conduct complete and unbiased analysis. We start with some general comments and then proceed to product-specific comments.

General Comments

1. *Design-options approach is very important and should be included in the analysis for all products.* At the workshop, DOE's contractor stated that the analysis would include evaluation of enough efficiency improvements using the design option approach so that DOE and participants in the proceeding can ascertain whether the efficiency level cost estimates provided by manufacturers are reasonable. We can accept this approach provided that a sufficient number of efficiency improvements are verified with design option data to provide confidence in the overall estimates used by the Department. A robust approach will require verifying multiple points per product. It will also require that if design option and efficiency level data are not in alignment, DOE will need to do additional design options analysis in order to identify the most reasonable costs to use.

As we have stated in other proceedings, the DOE's efficiency level approach, which relies on manufacturer cost estimates provided to DOE, has historically shown a bias toward over-estimating price impacts of efficiency improvement. DOE's efficiency level methodology does not account for market forces which will force prices to the lower end of various manufacturers' estimates (see our point #4 below). Another difficulty is that manufacturer estimates are a "black box" for most parties to this proceeding. The design options approach provides data that all parties can review and react to, adding transparency to the process.

2. *DOE should explore methods of making detailed manufacturer cost data publicly available.* Manufacturer cost estimates are a "black box" for other stakeholders. Even with the design option data as a check on manufacturer-supplied data, DOE could greatly improve the transparency of the rulemaking process by making public the data submitted by the manufacturers. We recognize this task will be difficult as DOE works to strike a balance between manufacturers' requirements for confidentiality to protect their competitive positions and the public's need for transparency in government decision making.

3. *Make clear to manufacturers that their cost estimates should assume mass production.* Efficiency standards will make today's niche products tomorrow's commodity products. Manufacturer cost estimates need to reflect the market difference between niche and commodity product manufacturing costs. From our review of past manufacturer cost estimates, many manufacturers appear to understand this assumption, but some do not. DOE needs to be especially careful to make this point clear in this proceeding since most of the manufacturers have not previously been participants in this sort of research for a standards rulemaking proceeding.

4. *Allow for market forces in computing typical costs using manufacturer cost estimates.* DOE will be collecting cost estimates from many manufacturers. Based on past experience, these estimates will vary significantly from manufacturer to manufacturer. DOE proposes to take a market-share weighted average of these costs. But given competition in the market, manufacturers with below average costs will determine prices in the market, since in order to compete, higher-priced manufacturers will need to reduce costs, or risk losing market share. To address these market considerations, we recommend that DOE use the simple average of the lowest cost estimate and the weighted average DOE proposes to use in the Framework Document.

5. *Plan on revising the economic analyses at the NOPR and final rule stages*. DOE indicates that it will be using EIA price forecasts in its analyses. EIA's current estimates of future electricity costs are absurdly low and are likely to be revised upwards in the next few years, just as EIA has recently significantly increased its estimates of long-term oil prices. If we are correct, the revised analysis will generally show that higher efficiency levels are cost-effective than if the present forecasts are used. DOE should be ready for such a change and not be caught flat-footed.

6. *Expand environmental impact analysis to include mercury and particulate emissions.* Mercury and particulate emissions have a significant impact on public health; the impact of standards in reducing these emissions should be considered along with other environmental impacts. NEMS includes these pollutants so these calculations should be a relatively simple addition to the analysis.

7. *Standards should be developed for all "covered products;" if products aren't included in standards, they should not be "covered."* Since NAECA's passage, federal precedent has established that federal law preempts state standards only when there is a national standard. At the workshop, ARI suggested that some products should not have federal standards (because savings are small) but still be listed as "covered" and hence preempt state standards. We strongly oppose this suggestion. If savings from standards are indeed small, then states will not bother setting standards. But, if a product grows in importance, due to market changes or exploitation of a loophole, then it is appropriate to let states set standards. This situation occurred with BR reflector lamps. They were not addressed by federal standards enacted in 1992 because they represented a very small market share. Subsequently, their market share grew dramatically, so states began to regulate them. Now, manufacturers and efficiency advocates are working toward a recommendation for a consensus national standard. This process, which in effect will preserve the expected energy savings of the original federal standards, could proceed because BR lamps were not a "covered" product. The same approach should be used for niche commercial refrigeration products.

8. *ARI's proposed product classes are reasonable if (a) operating temperatures are clarified and (b) definitions of "vertical" and "semi-vertical" modified.* At the workshop, ARI proposed a scheme for establishing product classes. In general the "product families" look reasonable, but the four "operating temperatures" listed need clarification and the definitions of Vertical and Semi-Vertical used to distinguish product families should be closer to the Department's proposal.

    a. *Operating temperatures:* First, we agree that "low" and "medium" temperatures are appropriate classes (i.e. 0 and 38 degrees F). Second, we agree with ARI's statements at the meeting that ice-cream freezers should be tested at 0 degrees F, and standards set at 0 degrees F. Therefore, testing at -5 degrees F is only to provide additional information to customers and will not be used for standards purposes. Third, "application temperature tests" for standards purposes should only be for products that cannot operate at 0 or 38 degrees F. In these cases, if sales are very small, products should not be included as "covered" products. If sales are significant, then standards should be developed based on ratings on an appropriate application temperature for that equipment.
    b. *Product families:* ARI proposed that "Vertical" equipment include equipment within 0 degrees and 10 degrees of vertical, whereas the department proposed a broader definition of 0 to 30 degrees of vertical. Because the vertical equipment will tend to be more efficient and, thus likely have a stronger

standard, if the product family definitions allow users to substitute "semi-vertical" for "vertical," they could unintentionally shift the market to the less efficient product family. Therefore, the Department should determine a break point between the product families which will not result in one type of equipment being substituted for the other.

9. *Use of building level modeling to estimate the savings from refrigeration system efficiency improvements to account for space conditioning interactions, while theoretically correct, complicates the analysis without necessarily increasing DOE's confidence in the estimates.* We agree with DOE that large systems can affect building heating and cooling loads and therefore modeling of the refrigeration system as part of the whole building is appropriate. However, in order to do this analysis correctly requires either the systems be modeled across a range of climatic conditions and the results weighted to a national average or that the systems be modeled using a "national average climate." In either case, "weights" would have to reflect the climates in locations where new equipment subject to the standards will be placed in service in the future. For the purposes of the LCC it would also have to reflect the power rates and gas prices associated with those locations. We are also concerned that in order to model the refrigeration savings whole building simulations will require assumptions about the type and efficiency of the space conditioning equipment and other building loads (e.g., lighting power density) which are known to vary significantly across the country and which will also be changing over time.

   We believe it may be simpler and more accurate to use the results of the test procedure to estimate savings and/or to do product-level modeling, perhaps using a version of the EPA refrigerator model used in residential refrigerator and freezer rulemakings. However, we recommend that DOE perform a limited set of sensitivity analysis to determine the magnitude of the impact that variations in climate, space conditioning system type and other building loads have on the savings prior to determining its final approach to estimating savings.

10. *Load shapes in NEMS should be checked*. The Framework document notes that peak loads will be determined with NEMS-BT. Based on past experience with the load shapes in this model for air conditioning equipment, we recommend that DOE's contractors gather available load shape data for commercial refrigeration to check and revise the NEMS-BT assumptions. ACEEE is starting a new project that will include collecting some of these data; sufficient data is expected to be gathered by early 2007 and will be provided to DOE at that time. In the interim, PG&E noted at the workshop that it may have some load shape data to provide DOE. We suggest that DOE follow up with PG&E to obtain this data.

11. *DOE should consider incorporating demand charges and seasonal and hourly rates into the economic analysis*. The Framework document proposes to use average commercial electricity prices. This proposed approach implicitly assumes that the load shape for commercial refrigeration equipment is very similar to that of the overall commercial sector. DOE needs to compare these two load shapes to verify that these load shapes are similar. If the commercial refrigeration load shape is

different, then DOE should use the same approach to establish electricity prices as it used in the commercial unitary air conditioner rulemaking, which involves analyzing load schedules for a sample of utilities and weighting these rate schedules into a national distribution.

12. *Baseline assumptions should be based on performance where appropriate*. In developing assumptions for baseline equipment, specifications should generally be in terms of performance, not equipment, so as to permit analysis of more efficient ways to provide the same performance. For example, for display cases, baseline lighting levels should be specified in terms of foot candles of light on the product, not the number of lamps. This will permit more efficient lighting systems to be modeled that may use fewer lamps to provide the same illumination levels.

Comments related to specific types of equipment:

13. *Secondary coolant equipment.* At the workshop, ARI suggested excluding secondary coolant equipment from the proceeding and a major manufacturer indicated that this equipment type accounts for no more than 5% of remote equipment sold. If the market share is this small, we do not object to excluding this equipment from the rulemaking by not listing it as a "covered" product.

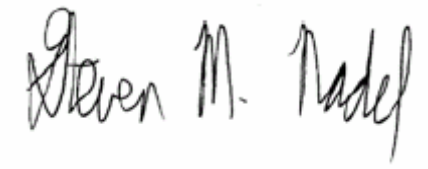
14. *Inclusion of remote compressors.* At the workshop, DOE suggested that for remote equipment, standards will only cover the cases and not the compressor racks that serve this equipment. We prefer that the entire system be covered by the standards (including compressor racks) as this will provide more opportunity for energy savings and for manufacturers to trade off performance between different parts of the system. However, if DOE determines that it is impractical to include entire systems in this rulemaking, then the balance of system (e.g. the compressor racks) should not be included under "covered" equipment for now, but instead, DOE should consider covering this equipment in a subsequent revision to the standard.

15. *Open cases and "no door" packaged units.* At the workshop, DOE indicated that for open cases and no-door packaged units it was planning to use display area as the variable to adjust for equipment size. We are troubled by this suggestion as this approach will tend to favor shallow equipment and high equipment, both of which can increase energy use relative to deeper or shorter equipment of equivalent volume. We prefer using either volume, case length, or perhaps an equation that considers both display area and volume (derived from regression equations using data on current models). Also these open and no door units use significantly more energy than closed cases and therefore we recommend that standards be set to discourage (but not prohibit) this type of equipment. For example, because they are inherently less energy-efficient, DOE could set a more stringent economic threshold for open case and no door unit standards than for closed case standards.

16. *Add high-efficiency glass to technology assessment for closed cases.* Improved u-values combined with high efficiency defogging technologies should be evaluated for transparent door cases. It may be cost-effective to cut u-values of glass doors to around 0.10 Btuh/ft2 * degrees F. DOE should evaluate this u-value level and other potentially cost-effective u-value levels.

If you have any questions about these comments, please contact Steven Nadel at ACEEE at 202-429-8873 or snadel@aceee.org. Thank you for considering our views.

Sincerely,



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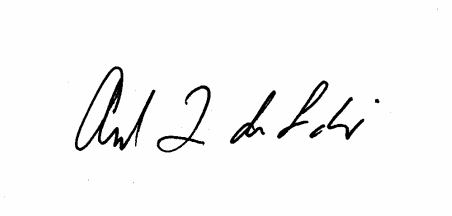

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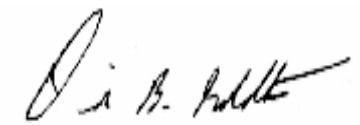

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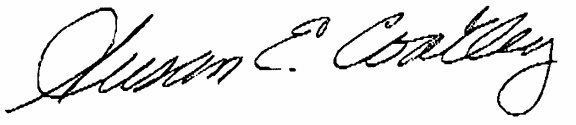

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