Manufacturers of Commercial & Professional Refrigerators and Freezers

Date: September 26, 2008 - Amended

To: Rachel Schmeltz
ENERGY STAR Product Development
Environmental Protection Agency
schmeltz.rachel@epa.gov

Bijit Kundu
ICF International
bkundu@icfi.com

From: Joe Sanders, Senior Engineer
Traulsen & Co., Inc.
4401 Blue Mound Rd.
Fort worth, TX 76106

Subject: Comments, Energy Star specifications for Commercial Refrigerators and Freezers Version 2, Draft 2.

Please find below Traulsen's response or commentary to EPA's Energy Star "Version 2", "Draft 2" specification proposal. We have taken great care in its preparation and know it contains many insightful observations and suggestions. Traulsen believes the Energy Star Program has a meaningful purpose in providing Energy Efficiency Data for Commercial Refrigerators and Freezers to potential purchasers or end users, BUT ONLY IF the program requirements accurately represent the realistic capabilities of the industry as a whole. For the Energy Star program to succeed in the US, it must provide realistic buying options for consumers. The following is a brief summary of the main points addressed below.

1.) Natural Resources Canada (NRCan) product database contains a limited subset of models and does not adequately represent all products available for general consumption in the US. EPA is basing the top 25% of performers on a limited product or market representation.
2.) A high percentage of products cited as "Conforming" to the new Energy Star, "Version 2" specification are from small or obscure companies that have little or no presentation in the US market. Three models are from a now defunct manufacturer in Canada with no US presence.
3.) Several product classifications of NSF 7-2007 require no performance testing. Back bar coolers, bottle coolers, glass frosters, deep well units, beer-dispensing or direct drawer units, and bunker freezers are not required to meet a minimum performance level for food safety. They are also NOT suitable for the storage of potentially hazardous foods per NSF requirements.
4.) Qualifying glass door refrigerators and freezers continue to be tested with their internal lights off. The models cited as "Conforming" most likely have door actuated light switches. This construction arrangement is not practical for a display cabinet intended to market a product for public consumption.
5.) EPA appears to be unwilling to acknowledge serious existing errors in the "Version 1" standard, and indicates a further willingness to reduce the energy consumption expectations for solid door freezers, fifteen cube feet and below. To date, zero available models will qualify.
6.) In the past, (2-28-2008 Stakeholder Meeting) EPA claimed the Energy Star program was independent of any DOE activity, but now specifically relies upon the upcoming DOE standard for Commercial Food Service Refrigerators and Freezers 2010 as a rationalization for their maximum allowable energy consumption levels. EPA is developing future requirements on bad data, making poor judgments based on a flawed theory and ignoring the facts as they exist.

7.) It is important to understand the procedures for challenging the reported energy consumption rates claimed by other manufacturers. Several proxy agencies allowed by NRCan do not require verified witness testing for all models. Example, ARI requires only two verification tests per year, the rest go unchecked and are subject to erroneous reporting. It is not un-realistic to believe that most so-called conforming models when challenged, will fail to comply with the proposed "Version 2" standard.
8.) The collective data set of "Chest" style cabinets appears to be limited to such an extent, that an accurate representation of the industry is impossible.
9.) It should be noted that a number of models cited as conforming are not readily available in the US market. One model represents the only conforming freezer under twenty cubic feet.

Traulsen would again like to offer EPA the use "Free of Charge" of an Environment Test Chamber to perform energy audits on any number of commercial refrigerated products of their choosing. Traulsen is part of UL's Client Test Data Program, Certified by the State of California to perform energy consumption evaluations and the only US commercial refrigerated cabinet manufacturer certified by NSF International to conduct un-witnessed performance tests. Our laboratory is state of the art and staffed by a team of engineers and technicians with over eighty years of combined experience in the commercial refrigeration industry.

I hope you find the outline above and the comments that follow helpful in preparing the "Version 2" specification of the Energy Star standard for Commercial Food Service Refrigeration Equipment. Thanks, again for the opportunity to comment.

Sincerely,

Joe Sanders,
Senior Engineer

4401 Blue Mound Rd. * Fort Worth, TX 76106
(817) 625-9671 * (800) 825-8220 * Fax (817) 625-0611

Website: http://www.traulsen.com * E-Mail: webmaster@traulsen.com

Refrigerators and Freezers
Partner Commitments
Version 2.0 - DRAFT 2

Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified commercial refrigerators and freezers. The ENERGY STAR Partner must adhere to the following program requirements:

- comply with current ENERGY STAR Eligibility Criteria, defining the performance criteria that must be met for use of the ENERGY STAR certification mark on commercial refrigerators and freezers and specifying the testing criteria for commercial refrigerators and freezers. EPA may, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at EPA's request;

Traulsen has tested a fair number of competitive cabinet models listed in accordance with Energy Star "Version 1" and found a portion to be non-compliant and / or consuming 20% more than the claimed power rate. We would like to understand the formal procedure for challenging a manufacturer's data. Will there be a penalty for knowingly submitting bad data? What will the criteria be? Will there be a "Three Strikes You're Out" rule?

- comply with current ENERGY STAR Identity Guidelines, describing how the ENERGY STAR labels and name may be used. Partner is responsible for adhering to these guidelines and for ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance;

- qualify at least one ENERGY STAR labeled commercial refrigerator or freezer model within one year of activating the commercial refrigerators and freezers portion of the agreement. When Partner qualifies the product, it must meet the specification (e.g., Tier 1 or 2) in effect at that time;

- provide clear and consistent labeling of ENERGY STAR qualified commercial refrigerators and freezers. The ENERGY STAR label must be clearly displayed on the front/inside of the product, on the product packaging, in product literature (i.e., user manuals, spec sheets, etc.), and on the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed;

- provide to EPA, on an annual basis, an updated list of ENERGY STAR qualifying commercial refrigerators and freezers. Once the Partner submits its first list of ENERGY STAR labeled commercial refrigerator and freezer models, the Partner will be listed as an ENERGY STAR Partner. Partner must provide annual updates in order to remain on the list of participating product manufacturers;

If EPA adopts the Specification "As Is", very few models will end up complying with the Version 2 requirements. The consumer will have few or NO realistic buying options when purchasing products. In our professional opinion, the total number of Energy Star listed products sold each year will fall drastically, and that current, nor near future, available technologies will replenish the lost quantities.

4401 Blue Mound Rd. * Fort Worth, TX 76106
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Website: http://www.traulsen.com * E-Mail: webmaster@traulsen.com

- provide to EPA, on an annual basis, unit shipment data or other market indicators to assist in determining the market penetration of ENERGY STAR. Specifically, Partner must submit the total number of ENERGY STAR qualified commercial refrigerators and freezers shipped (in units by model) or an equivalent measurement as agreed to in advance by EPA and Partner. Partner is also encouraged to provide ENERGY STAR qualified unit shipment data segmented by meaningful product characteristics (e.g., capacity, size, speed, or other as relevant), total unit shipments for each model in its product line, and percent of total unit shipments that qualify as ENERGY STAR. The data for each calendar year should be submitted to EPA, preferably in electronic format, no later than the following March and may be provided directly from the Partner or through a third party. The data will be used by EPA only for program evaluation purposes and will be closely controlled. If requested under the Freedom of Information Act (FOIA), EPA will argue that the data is exempt. Any information used will be masked by EPA so as to protect the confidentiality of the Partner;

The total number of Energy Star listed products sold each year will decrease significantly if the specification is implemented as written. The highest volume models of key manufacturers ("the real market players") simply cannot comply with industry available components and maintain a competitive offering price to the consumer. The proposed efficiency increases are simply too great of a hurdle.

- notify EPA of a change in the designated responsible party or contacts for commercial refrigerators and freezers within 30 days.

Consumers look to the EPA Energy Star database when making buying decisions, and they use reported values to compare power consumption rates. If a majority of industry standard products fail to comply with the Version 2 specification, the consumer will lose the only realistic option they have for comparing performance levels between models. Also, many power companies and governmental agencies offer rebates for the purchase of an Energy Star qualified product. The number of rebates submitted will also decline as buying option decrease. When all is said and done, what will be the end perceived value of the Energy Star Logo?

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(817) 625-9671 * (800) 825-8220 * Fax (817) 625-0611

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ENERGY STAR® Program Requirements for Commercial Refrigerators and Freezers
Eligibility Criteria
Version 2.0 - DRAFT 2

Below is the **DRAFT 2** Version 2.0 product specification for ENERGY STAR qualified commercial refrigerators and freezers. A product must meet all of the identified criteria if it is to earn the ENERGY STAR.

1. Definitions: Provided below are definitions of the relevant terms in this document.

A. Commercial Food-Grade Refrigerator: A refrigeration cabinet designed for storing food products at temperatures above 32 degrees Fahrenheit (F) but no greater than 40 degrees F which is intended for commercial use.

The specification should clearly state that a cabinet meet the NSF 7-2007 performance criteria for the storage of potentially hazardous foods. Some models cited as complying with "Version 2" of the requirements, are suitable for the storage of prepackage or canned foods and drinks only and were not subject to any NSF 7-2007 performance test. Note: Glass door refrigerators have the option of NSF 7-2007 performance testing conducted at 75F, 80F or 100F. How will the Energy Star "Version 2" specification take the refrigeration system differences into account? Will only 75F models be Energy Star compliant? (100F, 33F<X<40F, 70% Run) Is there a need to increase the number of product categories to account for models requiring minimum performance levels and those that do not? We think there is.

B. Commercial Food-Grade Freezer: A refrigeration cabinet designed for storing food products at temperatures of 0 degrees F which is intended for commercial use.

The specification should clearly state that a cabinet meet the NSF 7-2007 performance criteria for the storage of potentially hazardous foods. Some models cited as complying with "Version 2" of the standard, are suitable for the storage of prepackage or frozen desert foods only and where not subject to any NSF 7-2007 performance test. (100F, <0F, 80% Run) Is there a need to increase the number of product categories to account for models requiring minimum performance levels and those that do not?

The energy consumption criteria for Refrigerator / Freezer cabinets might simply be composed of the summation of the requirements if each compartment where treated individually. (R + F = Total

Refrigeration Cabinet: A refrigerator or freezer used for storing food products at specified temperatures, with the condensing unit built into the cabinet, and designed for use by commercial or institutional facilities, other than laboratory settings. These units may be vertical or chest configurations and may contain a worktop surface.

Further, it should state, "For the Storage of Potentially Hazardous Food." (See "A" and "B" *above for more detail.) The NRCan database requires querying for this requirement. This will push the acceptance or specification rate / equation up. Multiple categories could be a solution.*

Traulsen supports the elimination of "Ice Cream Cabinets" as a separate and individual Energy Star category.

Traulsen believes the EPA should only collect data for "Chest" style cabinets. The current sample size of data associated with this category is limited and no where reflects the total breadth of products available in the marketplace. Without fully researching and segmenting the product offerings, numerous and serious errors are sure to arise in the establishment of a hastily constructed standard. (Be certain of the facts, "Do No Harm") As we know from the Energy Star "Version 1" specification, it becomes quite difficult to correct errors in judgment from past actions.

D. Closed Refrigerator: A display or holding refrigerator where product is accessible for removal by opening or moving doors or panels[1].

4401 Blue Mound Rd. * Fort Worth, TX 76106
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E. Solid Door Cabinet: A refrigeration cabinet in which 50% or greater of the total surface area of all outer doors is solid. These doors may be sliding or hinged.

F. Glass Door Cabinet: A refrigeration cabinet in which greater than 50% of the total surface area of all outer doors is glass. These doors may be sliding or hinged.

Many manufacturers' models incorporate a door activated internal cavity light switch, thus disabling or de-energizing interior lights for approximately 99.9% of the energy consumption test period. Glass door cabinets intended to merchandize a product are at a distinct disadvantage. Is a separate category needed for cabinets with interior lights that are on or energized throughout the entire length of the test?

G. Worktop Surface: A solid working surface and backsplash. The working surface may be a cutting board, a stainless steel work surface, or a stone slab. This surface may not add to the total energy consumption of the unit.

Test Procedure Requirements

H. AHAM Volume: The interior volume of a refrigerator as calculated by AHAM Standard Household Refrigerators/Household Freezers (ANSI/AHAM HRF-1-2004)

EPA is inaccurate in their comment concerning the calculation of internal cabinet volume. The volume or area occupied by non-movable features, such as drawer sides are subtracted. Also when the minimum distance between a feature and another feature or cabinet sidewall is less than a minimum distance, the total area or volume between those items is also subtracted. It was based upon this correct interpretation of the standard that specialty cabinets with internal features, such as drawers, not be considered, but to only use the base models when calculating internal volumes or areas.

I. Integrated Average Product Temperature: The integrated average of all test package temperatures, recorded at 15-minute intervals, as determined using the test method prescribed in Section 4, Test Criteria.

Testing/Standards Organizations

J. AHAM: Association of Home Appliance Manufacturers.

K. ANSI: American National Standards Institute.

L. ASHRAE: American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.

M. UL: Underwriters Laboratories, Inc.

N. NSF International, Inc. (organization is missing from the list of references)

2. Qualifying Products: For the purposes of ENERGY STAR, only those products that meet definitions 1.A through 1.G, above, are eligible for qualification. Examples of product types that may be eligible for qualification include: reach-in, roll-in, or pass-through units; merchandisers; undercounter units; milk coolers; back bar coolers; bottle coolers; glass frosters; deep well units; beer-dispensing or direct draw units; and bunker freezers.

Several of the product categories (back bar coolers, bottle coolers, glass frosters, deep well units, beer-dispensing or direct drawer units, and bunker freezers) listed require no minimum performance testing by NSF 7-2007. NSF 7-2007 requires this group or product class to display a label to the effect of, "NOT Suitable For The Storage Of Potentially Hazardous Foods". Clearly these model types are not suitable for the storage of open food in a commercial kitchen environment and should be placed in a category of their own. (Note: energy consumption rates between "milk coolers" and REAL food service grade "reach-in refrigerators are considerable, when normalized to constant volumes.) The public will be poorly served with a total Energy Star offering composed entirely of "milk coolers".

Drawer cabinets, prep tables, and open air units are **not** eligible for ENERGY STAR under this Version 2.0 specification.

Note: This specification is intended for commercial food-grade refrigeration equipment only. At this time, laboratory-grade refrigeration equipment cannot qualify for ENERGY STAR.

4401 Blue Mound Rd. * Fort Worth, TX 76106
(817) 625-9671 * (800) 825-8220 * Fax (817) 625-0611

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Will there be a different specification for equipment categorized by NSF 7-2007 as, "This equipment is intended for the storage and display of non-potentially hazardous foods"?

Solid and glass door refrigerators and freezers qualifying under this Version 2.0 specification must also meet the requirements set forth in the following quality and safety standards:

(1) ANSI/NSF International Standard for Food Equipment – Commercial Refrigerators and Freezers (ANSI/NSF 7-2007) and

Some NSF 7-2007 classifications / categories require NO minimum performance tests while others require specific levels for food safety. Please see the comment above.

(2) UL Standard for Commercial Refrigerators and Freezers (UL-471).

In reference to the exclusion of NFPA 70 as a requirement, I must restate Traulsen's position from our April 18th, 2008 letter to EPA. (UL requires in "General Information for Commercial Refrigerators and Freezers", SGKW, GuideInfo that the installation of a Listed appliance be in accordance with ANSI/NFPA 70. This requirement provides a level of assurance that the installation of a Listed appliance at the End Users location is safe and presents no known risk to the operator. Section 210.8 (B) (2) of the 2008 National Electric Code requires all 15 and 20 ampere, 125 volt receptacles in non-dwelling type kitchens to be GFCI protected. This requirement applies to all 15 and 20 ampere, 125 volt receptacles, whether or not the receptacle serves countertop areas.) One manufacturer clearly states that their equipment will not work when connected to this circuit type. If the only circuit type allowed by the electrical authority in a commercial kitchen environment is a GFCI type, how can EPA ignore this conflict and claim the equipment is suitable for the application and thus eligible for Energy Star listing?

3. Energy-Efficiency Specifications for Qualifying Products: Commercial food-grade refrigerators and freezers must meet the requirements provided in Table 1, below, to qualify as ENERGY STAR.

Table 1: Maximum Daily Energy Consumption Requirements (kWh/d) for ENERGY STAR Qualified Commercial Food-Grade Refrigerators and Freezers

Product Volume (in cubic feet)	Refrigerator	Freezer
Solid Door Cabinets		
$0 < V < 15$	$\leq 0.05V + 1.75$	$\leq 0.32V + 1.18$
$15 \leq V < 30$	$\leq 0.07V + 1.50$	$\leq 0.27V + 2.00$
$30 \leq V < 50$	$\leq 0.03V + 2.53$	$\leq 0.23V + 3.25$
$50 \leq V$	$\leq 0.08V + 0.07$	$\leq 0.15V + 7.00$
Glass Door Cabinets		
$0 < V < 15$	$\leq 0.14V + 1.06$	$\leq 0.36V + 0.64$
$15 \leq V < 30$	$\leq 0.13V + 1.10$	$\leq 0.60V - 3.00$
$30 \leq V < 50$	$\leq 0.10V + 2.25$	$\leq 0.50V$
$50 \leq V$	$\leq 0.11V + 1.50$	$\leq 0.83V - 16.67$
Solid or Glass Door Cabinets	$\leq 0.07V + 0.93$	$\leq 0.14V + 0.86$

Note: V = AHAM volume (see definition in Section 1) in cubic feet (ft^3). DRAFT 2: ENERGY STAR Version 2.0 Program Requirements for Commercial Refrigerators and Freezers 7

The NRCan database contains only a small subset of the products available for sale in the US and some serious questions exists with respect to those products. Of the products or models listed, many are not readily available for sale to the general public. One Canadian manufacturer with three "Version 2" complying models and representing two name brands is now defunct and out of business. There is no general availability of the only freezer, less than twenty cubic feet, complying with the "Version 2" specification. Also, there are some manufacturers submitting through ARI. ARI only requires two conformance tests per year and the remainder of cabinet models simply is passed without any confirmation. The freezer above is a product from one of these companies submitting through ARI without a substantiated confirmation test.

Traulsen would suggest that all manufactures re-submit their data to EPA with a signed statement. The statement would certify the models were tested in accordance to the new specifications outlined in this document. Further, we would suggest EPA outline the possible actions against manufacturers who are found to be submitting fraudulent data.

EPA is choosing to ignore market place facts when they elect to further reduce the energy consumption specifications for small volume refrigerators and freezers. Fact, the current Energy Star "Version 1" specification and database have NOT one commercial food service grade freezer below ten cubic feet listed that can be purchased by the general public. If over twenty manufactures are unable to comply with the current specification by producing a listed model, why would it reason one of those very same manufactures would provide a cabinet for sale to the public at an even lower energy consumption rate? It may not be the politically correct action, but the standard should be revised in accordance with the reality of the market and the technology readily available today. Speaking as a twenty plus year engineer who has focused his entire career on commercial refrigeration, we as manufacturers are exhausting all available technological avenues to achieve this goal and lowering the limit will make it no more attainable. What value is an empty Energy Star database to a potential customer?

Traulsen believes only a limited amount of data is available for determining a "chest" specification, and there is a high likely hook of error occurring in the development of this specification similar to the problems that now exist with small volume freezers as outlined above. Data should be collected from a larger and more representative segment of the market before a standard is set.

Traulsen is proposing a specification change to the Department Of Energy on its 2010 specification based on realistic market facts and data. We have enclosed a copy of our most recent letter for your review. We hope the DOE will research the necessary specification changes required for low capacity (cubic foot) refrigerators and freezers. When completed, we would suggest to EPA that the Energy Star specification by a "percentage" of the DOE maximum consumption rate as calculated by their new formula/s.

4. Test Criteria: Manufacturers are required to perform tests to self-certify those product models that meet the ENERGY STAR guidelines. The test results must be reported to EPA using the Commercial Refrigerator and Freezer Version 2.0 QPI form. In addition to test results, product specification sheets (i.e. cut sheets) are required to be submitted for each qualifying product model. In performing the tests, manufacturers must use ANSI/ASHRAE Standard 72-2005, "Method of Testing Commercial Refrigerators and Freezers", to measure the daily energy consumption of commercial refrigerators and freezers with the temperature specifications listed in Table 2.

Table 2: Temperature Specifications for Testing

Commercial food-grade refrigerator	38 degrees ± 2 degrees F
Commercial food-grade freezer	0 degrees ± 2 degrees F

Only those test procedures in ANSI/ASHRAE 72-2005 relevant to closed refrigerators are applicable to this specification. In addition, manufacturers **must** test equipment according to ANSI/ASHRAE 72-2005 with all optional accessories (lighting, perimeter heat, pan heater, etc.) in the "ON" position.

Traulsen is in total agreement with EPA that all cabinet accessories sold or included with the base cabinet, be energized throughout the length of the energy consumption test. (perimeter heaters, electric condensate pans, lights with on/off switches, etc.) Controls that have ONLY an automatic position should be allowed to cycle. (evaporator fans powered through the door switch.) Glass door cabinets with interior lights powered through a door switch pose a problem for rating. Most glass door cabinets are merchandisers and have interior lights energized throughout the tests. This product derivative will always fail to qualify as Energy Star compliant. A large portion of the market falls into this sub-category and some consideration should be given to it when establishing a specification.

5. Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR will be defined as the *effective date* of the agreement. Any previously executed agreement on the subject of ENERGY STAR qualified commercial refrigerators and freezers shall be terminated effective **August 31, 2009**.

    A. Qualifying and Labeling Products under Version 2.0: The ENERGY STAR for Commercial Refrigerators and Freezers Specification Version 2.0 shall go into effect on **September 1, 2009**. All products, including models originally qualified under the previous commercial refrigerator and freezer specification, with a date of manufacture on or after September 1, 2009, must meet the new Version 2.0 requirements in order to qualify for ENERGY STAR (including additional manufacturing runs of models originally qualified under the previous specification). The date of manufacture is specific to each unit and is the date (e.g., month and year) on which a unit is considered to be completely assembled. **Note:** glass door cabinets, as defined in Section 1 above, may begin qualifying for ENERGY STAR on January 1, 2009.

6. Future Specification Revisions: ENERGY STAR reserves the right to revise the specifications should technological and/or market changes affect its usefulness to purchasers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through discussions with industry. In the event of a specification revision, please note that the ENERGY STAR qualification is not automatically granted for the life of a product model. To qualify with the energy efficiency criteria of ENERGY STAR, a product model must meet the ENERGY STAR specification in the effect on the date of manufacture.

Drawer Cabinets: EPA will monitor industry efforts to develop a test procedure to measure and compare the energy performance of refrigerated drawer cabinets. Based on the availability of an industry accepted test procedure and performance data, EPA may consider adding this product category in future versions of this specification. DRAFT 2: ENERGY STAR Version 2.0 Program Requirements for Commercial Refrigerators and Freezers 9 **Note**: EPA is requiring that all accessories be turned to the "ON" position during testing for the following reasons: (1) the data used to derived the proposed levels in Table 1 was collected using this method; and (2) because these accessories may be enabled on-site, end users should be assured that their ENERGY STAR qualified unit meets Version 2.0 requirements even with these accessories enabled (i.e., the worst case scenario). The integrated average product temperature requirement specific to ice cream freezers has been removed. As previously noted, only those ice cream freezers that meet the definition of a commercial food-grade freezer in Section 1, and are tested/used at the appropriate integrated average product temperature (0 degrees ± 2 degrees F), can qualify for ENERGY STAR under this specification.

Laboratory Grade Refrigerators and Freezers: EPA is currently working with manufacturers of laboratory grade refrigerators and freezers to develop separate requirements for equipment designed for and used in laboratory environments. Once these requirements are finalized, EPA may amend this Version 2.0 specification to include laboratory grade refrigerators and freezers.