



ENERGY STAR[®] Discussion on Laboratory Grade Refrigerators and Freezers

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ENERGY STAR Labeled Products Program

What is ENERGY STAR?



- ENERGY STAR is a national, government-backed symbol of energy efficiency, making it easy for customers to identify high-quality, energy-efficient products
- ENERGY STAR is a voluntary program managed by U.S EPA. and U.S. DOE
- ENERGY STAR represents the top performers in the marketplace
 - Differentiator, not a green seal of approval



Objectives

- To reduce greenhouse gas emissions, caused by the inefficient use of energy
- To make it easy for businesses and consumers to identify and purchase products with enhanced energy efficiency that offer savings on utility bills while maintaining performance, features, and comfort

Growth of ENERGY STAR



- First ENERGY STAR qualified products in 1992
 - Computers and monitors

Today

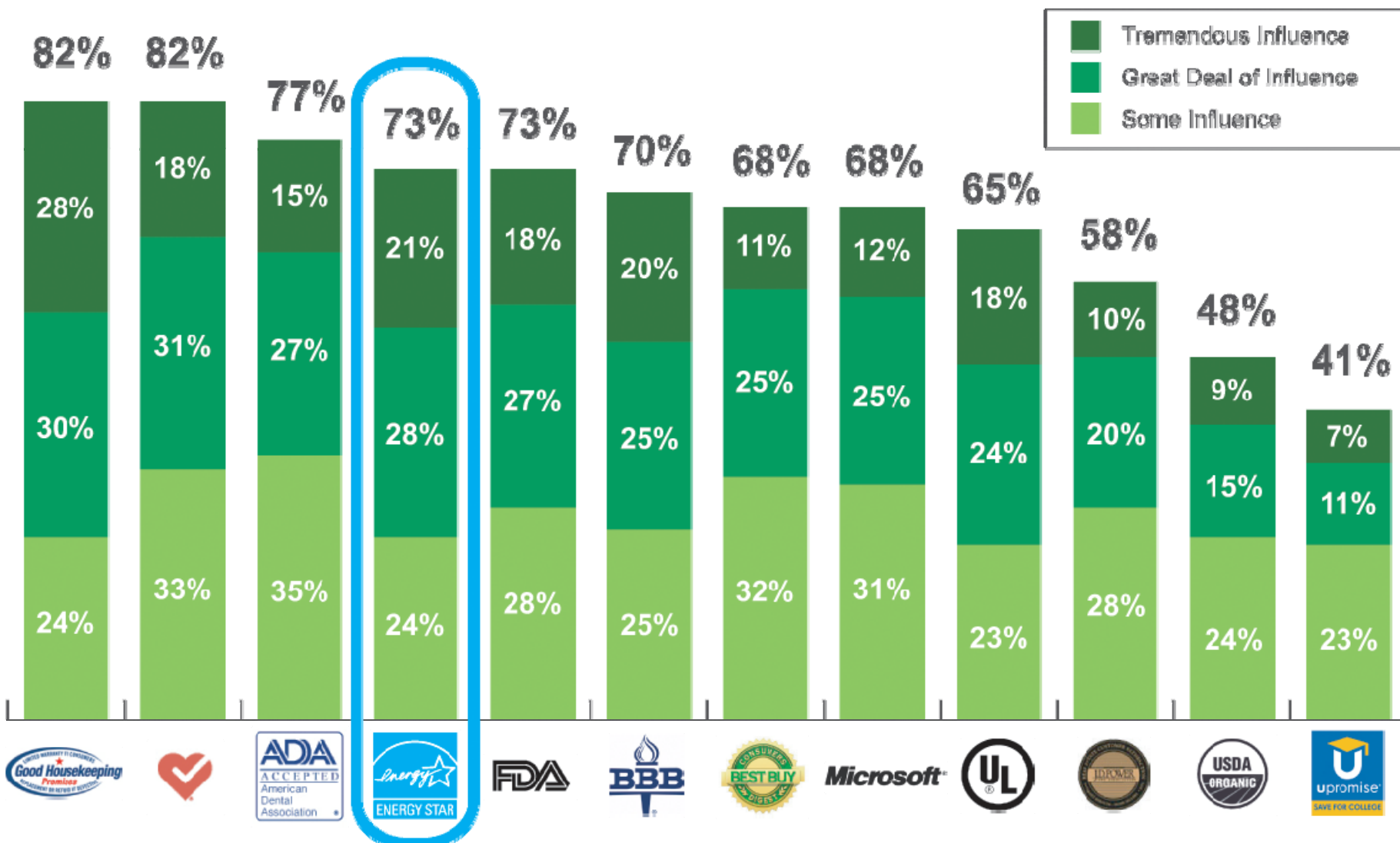
- More than **50 product categories** (heating and cooling, lighting, appliances for example)
- Over **2,000 manufacturers** labeling more than 40,000 product models
- Over **1,900** retail partners
- More than **500 utility partners** promoting ENERGY STAR
- Over **2.5 billion ENERGY STAR** products sold to date

Brand Awareness and Success



- ENERGY STAR awareness now more than 70% amongst U.S. consumers
 - Rising to nearly 80% in areas with strong utility programs
- In 2006 alone, Americans, with the help of ENERGY STAR saved 170 billion kilowatt hours (kWh) or 5% of total 2006 electricity demand
 - Saved consumers about **\$14 billion** on their energy bills
 - Prevented greenhouse gas emissions equivalent to the annual emissions of **25 million vehicles**
 - Helped to avoid over **35,000 megawatts (MW)** of peak power, equivalent to the generation capacity of more than 70 new power plants

ENERGY STAR Influence

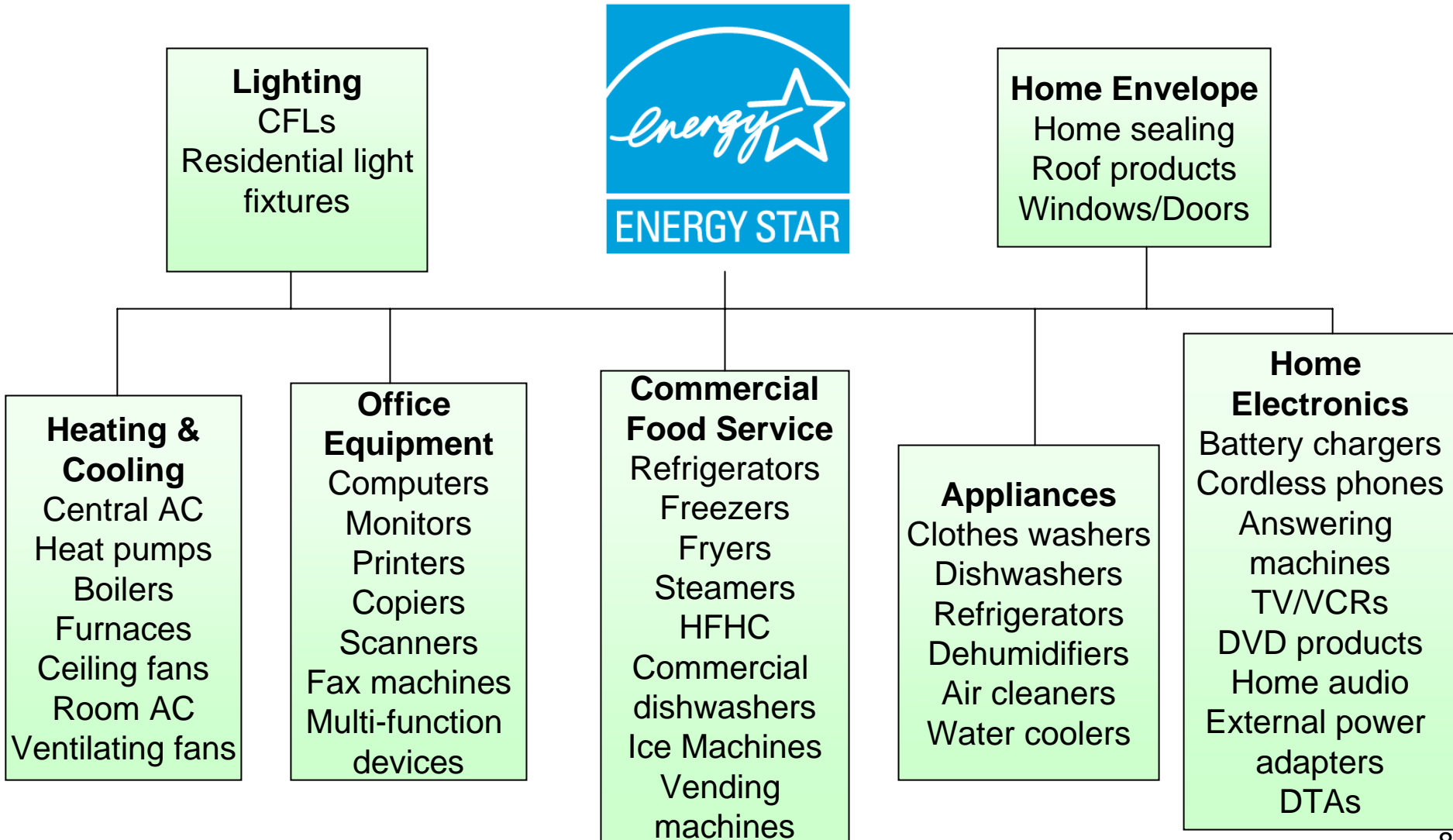


ENERGY STAR Qualified Products



- ENERGY STAR qualified products must meet strict energy efficiency guidelines
 - Guidelines usually include efficiency *and* quality requirements
 - Industry accepted test procedure used to consistently measure and compare efficiencies
- Manufacturers sign partnership agreements with EPA/DOE and then submit products for qualification
 - If qualified, the products can be labeled with the ENERGY STAR mark

50+ Product Categories Are Covered by ENERGY STAR in the US



Interest in Laboratory Grade Refrigerators and Freezers



- Commercial refrigerator and freezer specification launched in 2001
 - Lab grade allowed to qualify under current spec
- End user testing revealed discrepancies in performance under real world conditions
 - ENERGY STAR temperature settings intended for food grade units
- Revision to spec is underway
 - Lab grade will be excluded unless requirements are developed specific to this equipment
- Interest in these products from lab/university community
- Opportunity for significant energy savings

Guiding Principles for Specification Development



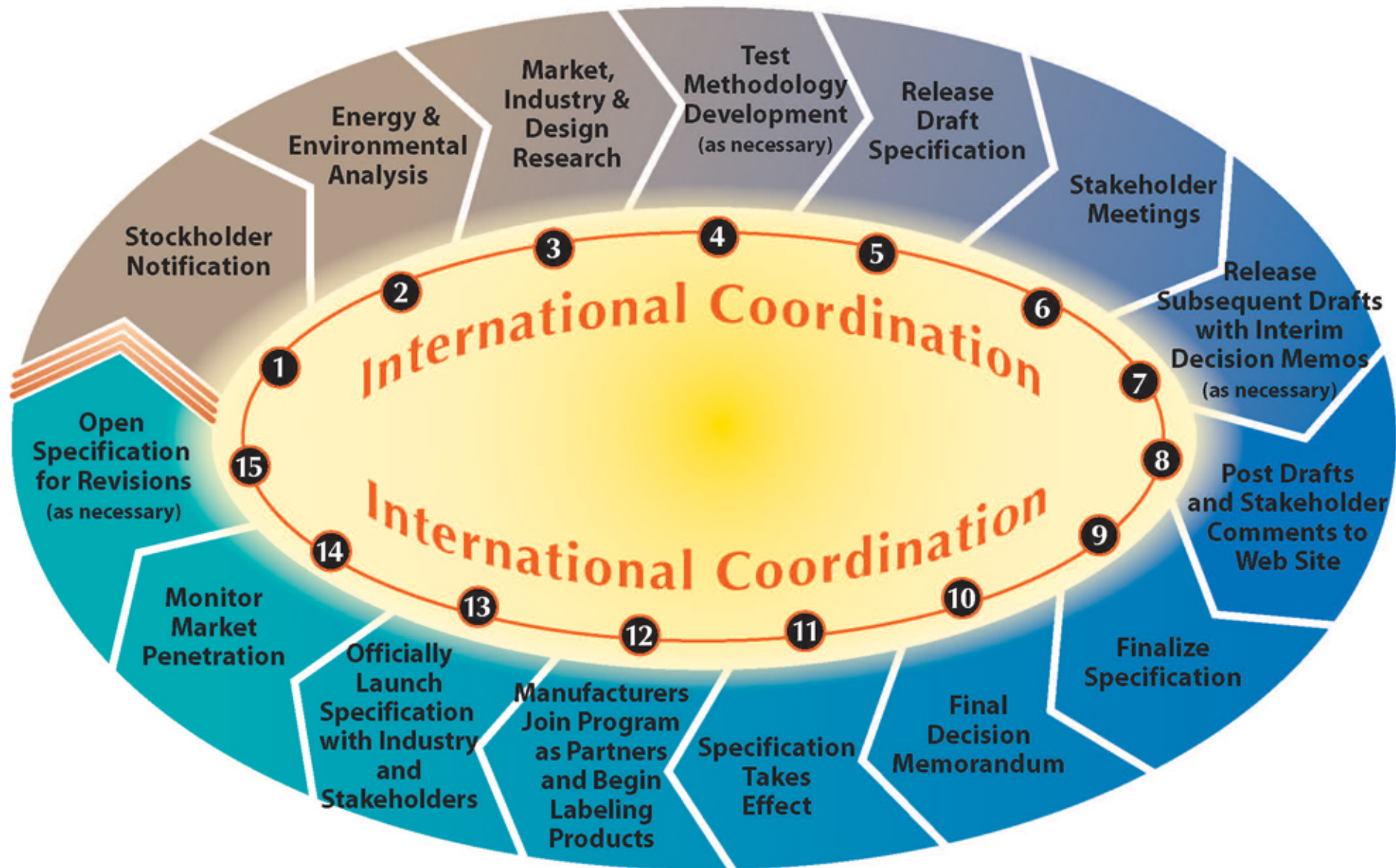
- Cost-effective efficiency
 - Maximum 5 years ROI
- Performance maintained or enhanced
- Significant energy savings & carbon emissions reduction potential
 - Unit and/or national basis
- Efficiency is achievable with several technologies
 - Focus on finished product performance
 - Technology neutral requirements

Guiding Principles, *cont.*



- Product differentiation and testing are feasible
 - Available, industry accepted test procedure
 - Several manufacturers and products represented
 - Target top 25% in terms of energy efficiency
- Labeling can be effective in the market
 - Lack of existing metric for energy efficiency
 - Significant end user demand for greater efficiencies

Specification Development Cycle



Important Process Elements



- Consistency
 - Steps added to make stakeholder involvement more consistent and frequent and to increase transparency of the process (e.g., Formal stakeholder notification of intent to develop or revise a specification sent via e-mail; approximate timeline developed and shared with stakeholders for specification revisions)
- Transparency
 - Post all documents and stakeholder comments (with permission) on web
 - Create and post a decision memo at the end of the specification development process explaining each decision point and documenting what happened and when
- Inclusiveness
 - Trade associations, manufacturers, retailers, end users, laboratories, utilities, NGOs and international governments

Process Elements, *cont.*



- Responsiveness
 - Acknowledge receipt of all comments, and respond promptly to questions and/or requests for meetings/conference calls
- Clarity
 - Provide comment boxes below any proposed changes on draft specifications that outline reason for edits/changes

Activities to Date for Lab Grade



- Memo sent to stakeholders Nov. 2007
 - Request to review ASHRAE 72 and submit data based on proposed temperature conditions
 - Limited initial response from stakeholders
- Spent last several months updating contact list and engaging manufacturers
- Conducted preliminary research on available products in marketplace

Understanding the Market



What We've Learned:

- House built versus conversion units
 - House built = manufactured for laboratory use
 - Conversion units = food grade + additional features
- Typical operating temperatures
 - +4°C, -20°C, -30°C, -80°C, -150°C
 - Dependent on product stored
- Test procedure available – ASHRAE 72
- Several manufacturers and models available

Understanding the Market *cont.*



Product Characteristics

- Refrigerator, freezer, combination
- Solid door and glass door (1, 2, 3 doors)
 - Sliding and hinged doors
- Upright, pass through, undercounter, chest
- Manual, automatic/programmable defrost
- Flammable, explosion proof
- General purpose, plasma, blood bank, enzyme, chromatography, ultra-low, cryogenic
- User feedback features (alarms, digital temp displays)

What We Would Like to Learn More About:

- Market size, sales and distribution channels
- Energy efficient technologies/design approaches
- Product lifetimes, maintenance, refurbishment
- Quality issues that may need to be considered
 - UL, AABB, etc. requirements?
 - Minimum warranty requirement?
- Price differential between standard and high efficiency units

Comments Received on Memo



- Proposed temperature set point ranges do not fall within allowable ranges of the federal standards for product storage (21 CFR 610.53)
- Need tighter tolerances: 1.1°C vs. 2°C as proposed
 - 3.3°C \pm 1.1°C, 17.8°C \pm 1.1°C (used in Canada)
- Eliminate electric heat condensate evaporators
- Require minimum insulation levels
- Hold glass and solid door units to same levels
- Interest in covering ultra low freezers and refrigerating incubators

Performance Data Needs



- Requirements will be based on performance data, testing to ASHRAE 72
- Data received from only 1 manufacturer to date
 - Several manufacturers in process of testing
- EPA interested in reviewing data on several product types
 - Proposed test parameters: +4°C, -20°C, -30°C
 - Additional test parameters: -80°C, -150°C
 - Need robust data set, manufacturers and products

Opportunities to Meet/View Products

- National Restaurant Association Show (conversion units)
 - May 18 – 20, Chicago, IL
- American Association of Clinical Chemistry (AACCC)
 - July 27 – 31, Washington, DC
- American Society for Microbiologists (AMS)
 - June 1-5, Boston, MA
- Labs 21 Conference
 - September 16-18, San Jose, CA
- Others?

Next Steps



- EPA to continue discussions with stakeholders at conferences and/or individual meetings
 - Contact Rebecca Duff to schedule: rduff@icfi.com
- Manufacturers encouraged to submit data
 - +4°C, -20°C, -30°C, -80°C, -150°C
 - Proposed new deadline: **June 27**
 - Submit data to Rebecca Duff: rduff@icfi.com
- Based on data and information collected, EPA will evaluate for potential Draft 1 specification

Contact Information



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- www.energystar.gov/productdevelopment