



ENERGY STAR®

Commercial Refrigerators and Freezers

Version 3.0 Discussion

November 15, 2012

Call-in Information



- Audio provided via conference call in:
 - Call in:** +1-877-423-6338 (in the US, Canada)
+1-571-281-2578 (outside the US, Canada)
 - Code:** 456417
- Phone lines will remain during the presentation to allow for open discussion
- Please keep phone lines on mute (*6) unless speaking

Introduction



- EPA thanks all stakeholders who have been participating in the ENERGY STAR program for Commercial Refrigerators and Freezers
- Stakeholder participation is critical to the specification development

Agenda



- Welcome and Introductions
- Background on Prior Commercial Refrigerator and Freezer Specification Revisions
- Specification Revision Rationale
- Review of Version 3.0 Focus Areas
- Revision Timeline and Next Steps

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V.1.0 Specification

- ENERGY STAR Commercial Refrigerators and Freezers V1.0 specification went into effect on September 1, 2001
 - Covered hinged, solid door refrigerators and freezers; including, reach-in cabinets, under-counter cabinets without a work top surface, and roll-in and pass-through cabinets
 - Referenced ASHRAE Standard 117-1992, “Method of Testing Closed Refrigerators”

V1.1 Specification

- ENERGY STAR Commercial Refrigerators and Freezers V1.1 specification modifications
 - Language added to include under-counter cabinets *with* or without a work top surface
 - Reference update to ASHRAE Standard 72-2005, “Method of Testing Commercial Refrigerators and Freezers”
- Congress passed new Federal minimum efficiency standards in 2005
 - Made the (then) current ENERGY STAR levels mandatory for all commercial refrigerators and freezers
 - The effective date was January 1, 2010 – Energy Policy Act of 2005 (EPAAct 2005)

V2.0: Specification



- ENERGY STAR Commercial Refrigerators and Freezers V2.0 specification went into effect on April 1, 2009 for glass and mixed door models, and on January 1, 2010 for solid door models
 - The AHAM Standard Household Refrigerators/Freezers (ANSI/AHAM HRF-1-2004) became the required test procedure standard for measuring interior volume of the cabinets
 - Scope expanded to include hinged and sliding solid, glass, and mixed solid/glass doors
 - Specific examples of eligible products for more explicit applications were listed in addition to reach-in, under-counter, roll-in, and pass-through cabinets; such as, merchandisers, milk coolers, bar back coolers, bottle coolers, glass frosters, deep-well units, direct-draw units, and bunker freezers
- Removed Laboratory Grade equipment as eligible products

V2.0: Specification *cont.*



- Applicable third-party certification to meet quality and safety standards became a requirement in order to qualify a product under V2.0
 - ANSI/NSF International Standard for Food Equipment – Commercial Refrigerators and Freezers (ANSI/NSF) 7-2007); and,
 - UL Standard for Commercial Refrigerators and Freezers (UL-471)
- Maximum Daily Energy Consumption (MDEC) requirements for ENERGY STAR qualification became door type and volume dependent
- Further guidance on testing conditions was provided; for example, total energy shall be reported including auxiliary energy and refrigeration energy consumption
- Test reports would only be accepted from a Commercial Refrigeration Laboratory that is approved by the CEC or provides data verified by a certification body, which is accredited by the Standards Council of Canada

V2.1: Specification

- Updated to align with program-wide third party certification (3PC) requirements for all newly qualified models effective January 1, 2011
- Specific language was added requiring that for the purposes of ENERGY STAR qualification, the set-point temperatures for both commercial refrigerator and freezers *must* represent as shipped conditions
- A product family definition was added to allow a variation of one model within a single product line with non-energy related differences to represent the entire product family for ENERGY STAR qualification testing

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Guiding Principles Reaffirmed



- Significant energy savings on a national basis
- Product performance maintained or enhanced with increased efficiency
- Consumers recover investment in efficiency within a reasonable period of time
- Efficiency can be achieved with one or more technologies – products are available from more than one manufacturer
- Energy consumption and performance can be measured and verified with testing
- Labeling would effectively differentiate products and be visible to purchasers

How Does ENERGY STAR Maintain Relevancy?



Specifications are updated in response to market changes:

- High market share
- Change in Federal minimum efficiency standards
- Availability, performance, or quality concerns
- Advancements in technology
- Changes in test procedures



Purpose of Revision



- ENERGY STAR estimated market penetration is 65%
 - EPA revisits specifications at 30%+ market penetration
- Align testing requirements with the latest U.S. Department of Energy's (DOE) final rule for commercial refrigeration equipment (CRE)
- Interest in additional commercial refrigerator and freezer input from stakeholders including:
 - Definitions
 - Scope
 - Additional equipment classes covered by DOE's regulatory program not included in previous ENERGY STAR versions

ENERGY STAR and DOE Test Procedure Alignment



- Accessories and Power Management Devices :
 - For purposes of ENERGY STAR qualification, all standard and/or factory-installed accessories (i.e., lighting and perimeter heaters) shall be activated and any power management device shall be disabled during DEC testing, if manually controllable by the operator
 - The updated DOE test procedure incorporates provisions starting January 1, 2016 that allow a choice to determine energy savings of lighting occupancy sensors and scheduled controls with a physical test or through a calculation method
- Manually controlled energy management devices may be deactivated in the field by the operator, thus increasing energy consumption

Test Procedure Alignment, *cont.*



- Testing Conditions:
 - For purposes of *current* ENERGY STAR qualification, set-point temperatures must represent “as shipped” conditions
 - DOE requires an integrated average temperature range determined by the referenced test method (i.e., AHRI Standard 1200 (I-P) 2010)
 - Refrigerators with solid or transparent door(s): $38 \pm 2^{\circ}\text{F}$
 - Freezer with solid or transparent door(s): $0 \pm 2^{\circ}\text{F}$
 - Ice cream freezer: $-15 \pm 2^{\circ}\text{F}$
 - If a model is not able to be tested at the specified average temperature, the unit may be tested at the lowest application product temperature
 - Manufacturers would be able to test using required conditions and ship at lower temperatures for safety considerations

Test Procedure Alignment, *cont.*



- ANSI/NSF 7 – 2007 (Commercial Refrigerators and Freezers)
 - The updated DOE test procedure contains provisions to allow use of NSF rating temperatures and ambient conditions when conducting the test
 - Internal cabinet temperature may be lower than the specified average temperature range
 - Ambient temperature and/or humidity levels may be higher than those specified
 - Reference ANSI/NSF 7 – 2007 to determine applicable requirements for a specific equipment type
 - Testing conditions under NSF requirements are more stringent and would result in greater DEC

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V3.0 Scope: Expansion

- Existing ENERGY STAR V2.0 Scope:
 - Commercial Food-Grade Hinged or Sliding; Solid, Glass, and Mixed Solid/Glass; Vertical or Chest Refrigerators and Freezers
- Other categories that EPA could consider:
 - Open display cases
 - Hybrid refrigerators and freezers
 - Dual temperature refrigerators
 - Drawer cabinets (test method)
 - Preparation tables
- EPA launched a separate ENERGY STAR Lab-Grade specification development effort
 - Relaunched on October 5, 2012

V3.0 Product Family: Door Type – Opening Orientation



- The ENERGY STAR product family definition allows variation of any given model offered within a single product line, but limits those differences to aesthetics only. Individual models represented by a product family must be based on the same basic engineering design and have the same energy consumption
 - Does the door type (i.e., sliding versus hinged) affect energy consumption and/or product internal volume?

Alternative Refrigerant Consideration



- What is the current natural refrigerant prevalence in the marketplace compared to hydrofluorocarbons (HFCs)?
- Is the market share of natural alternative refrigerants expected to increase?
- What impacts do alternative refrigerants have on energy performance?

Preliminary Data Analysis

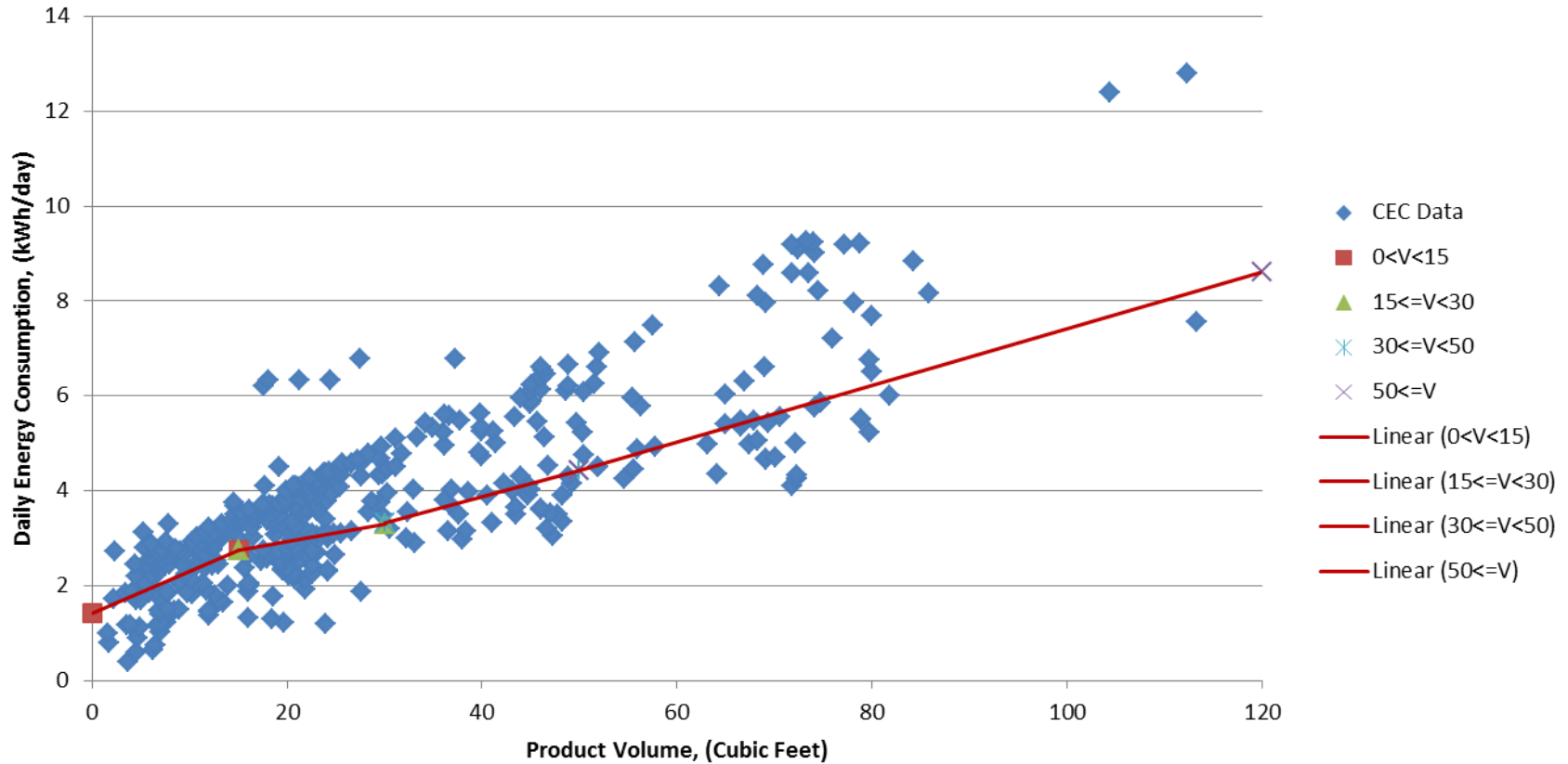


- Data extracted from the California Energy Commission (CEC) appliance database
 - After cross-checking the CEC database and the ENERGY STAR qualified products list, it became apparent that several manufacturers are not included in both databases
 - Data from the Consortium for Energy Efficiency (CEE) qualified list is not included in this analysis, but any additional models represented in the CEE database will be included for EPA's full analysis

CEC Refrigerator Performance Data



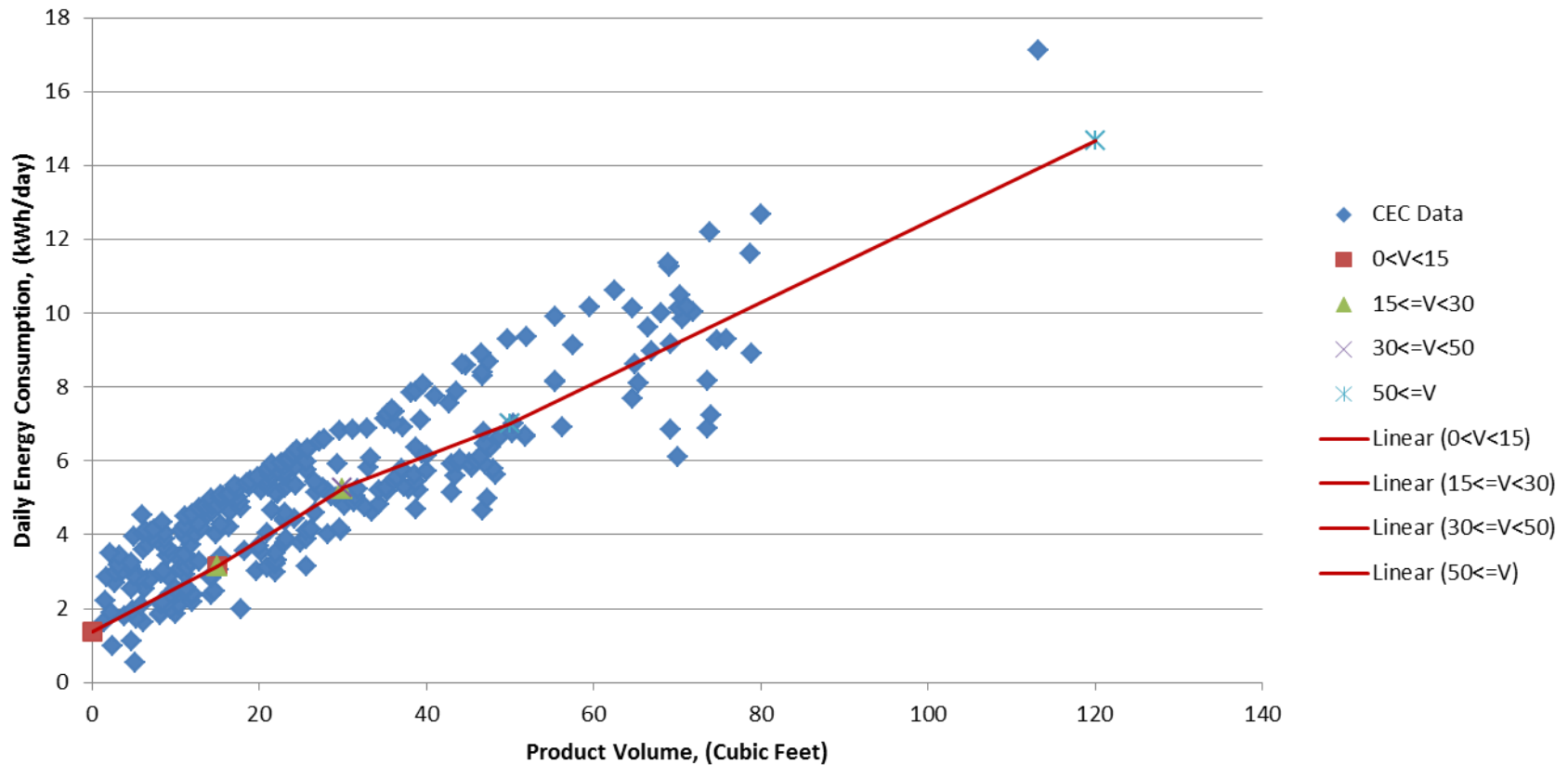
Solid Door Refrigerators



CEC Refrigerator Performance Data, cont.



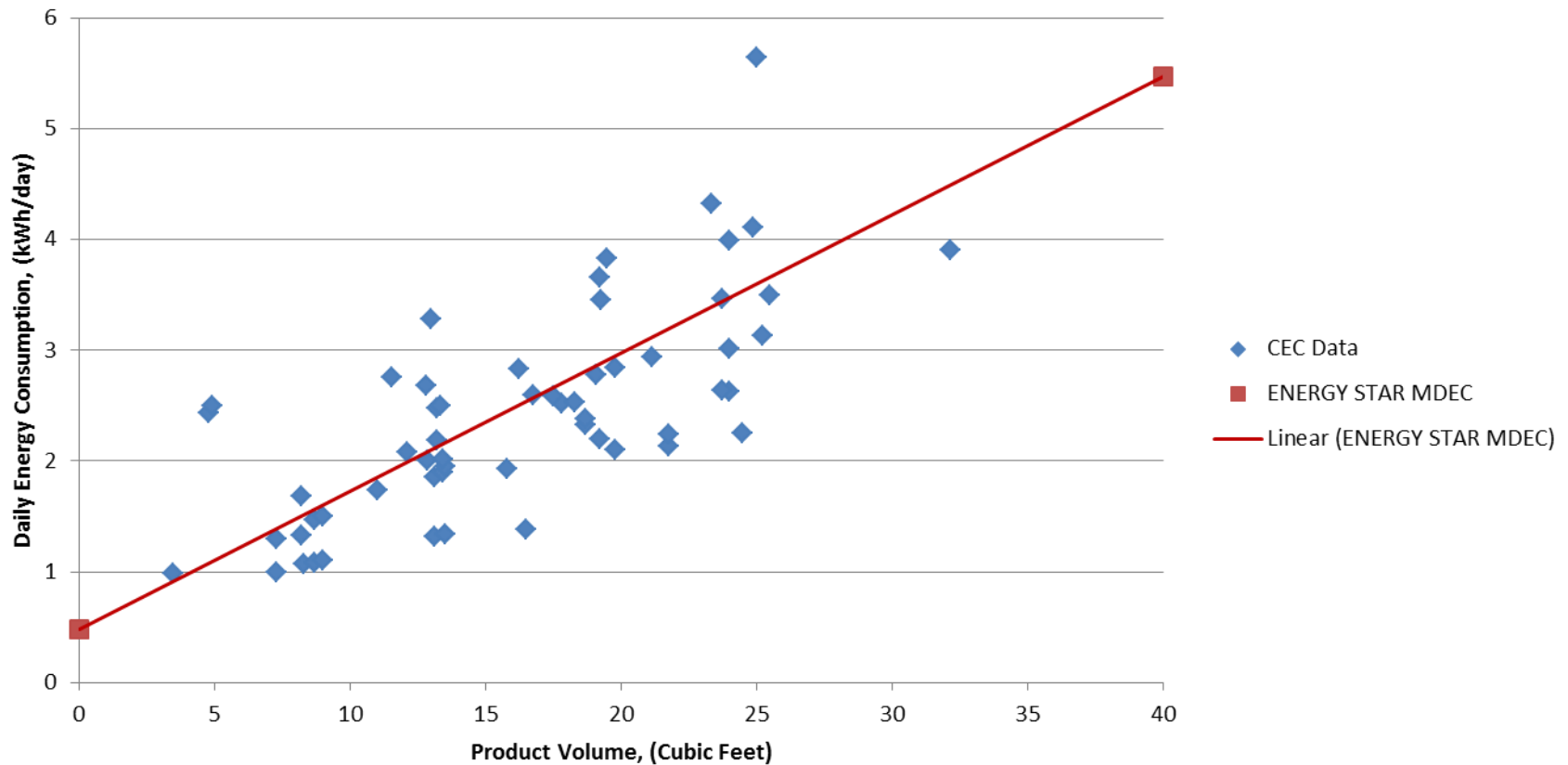
Transparent Door Refrigerators



CEC Refrigerator Performance Data, cont.



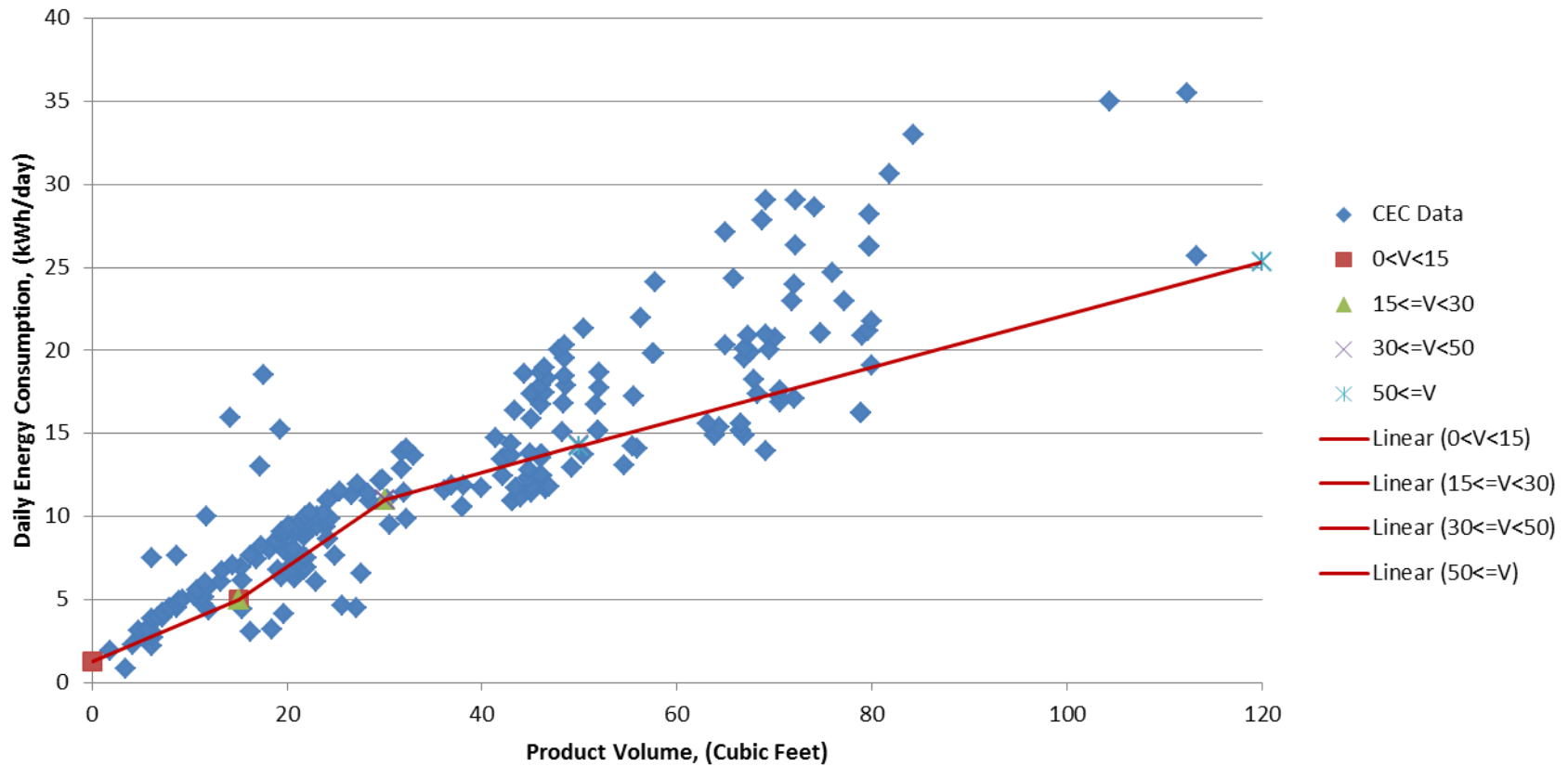
Chest, Solid and Transparent Door Refrigerators: All Sizes



CEC Freezer Performance Data



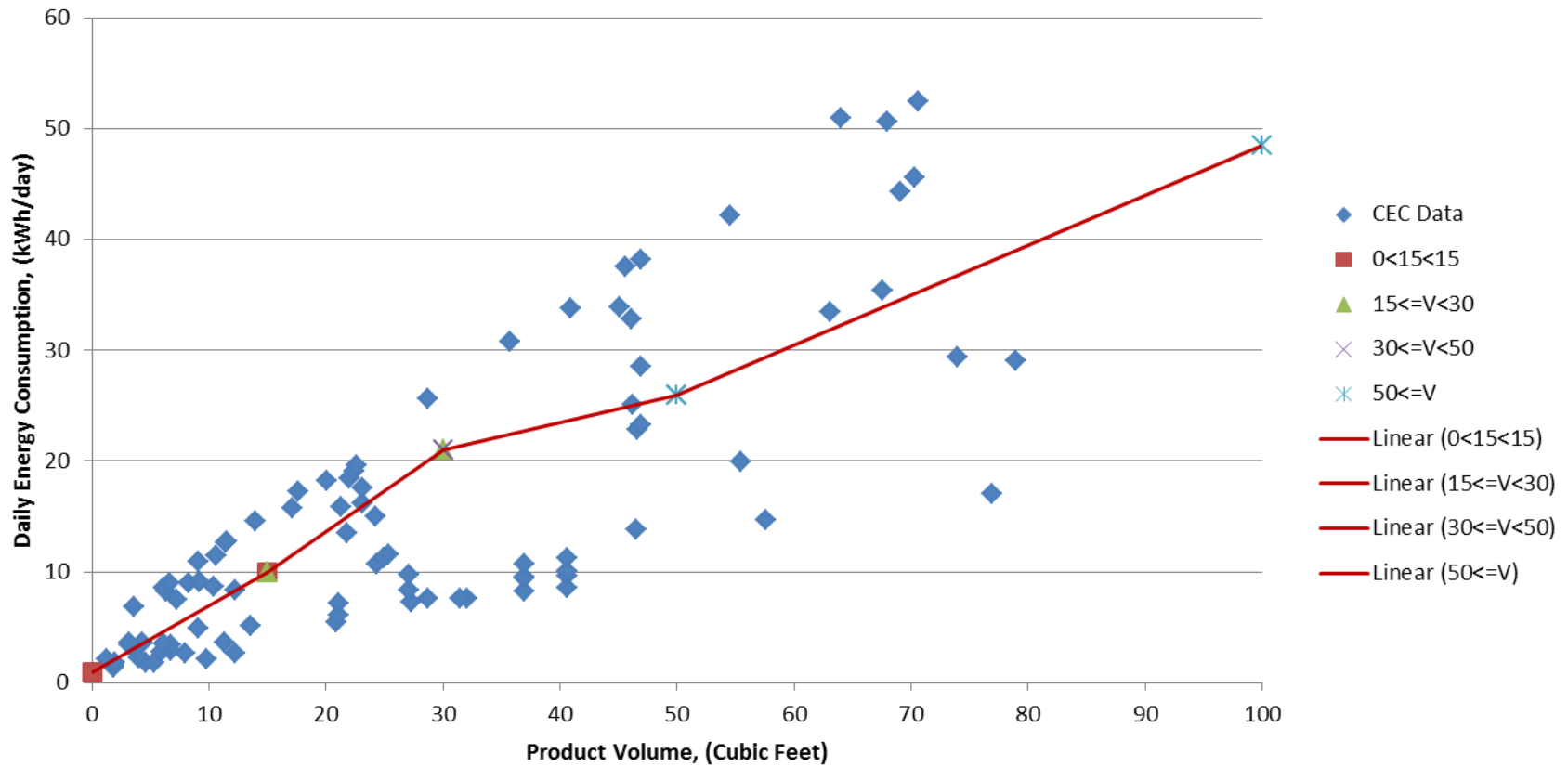
Solid Door Freezers



CEC Freezer Performance Data, *cont.*



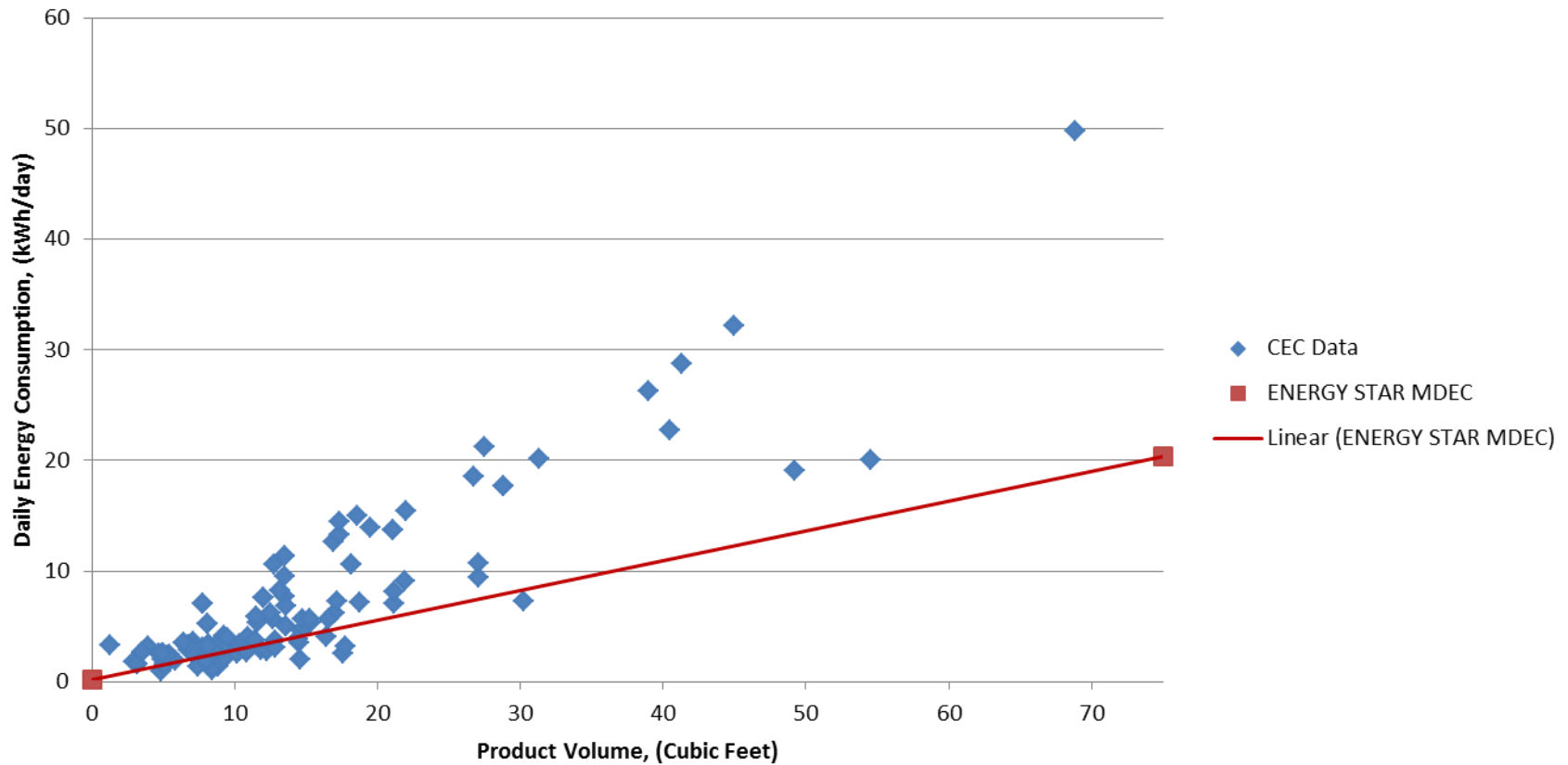
Transparent Door Freezers



CEC Freezer Performance Data, cont.



Chest, Solid and Transparent Door Freezers: All Sizes



Other Areas for V3.0 Consideration

- Stakeholders are encouraged to provide additional comments for discussion and consideration for the Draft 1 V3.0

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Revision Timeline

- **November 27, 2012** - Deadline to submit comments for Draft 1 consideration
- **January 2013** - Draft 1 of the revision released
 - February 2013 - Comments due to EPA
- **April 2013** - Draft 2 released
 - May 2013 - Comments due to EPA
 - May 2013 – Stakeholder meeting (NRA)
- **June 2013** - Draft Final released
- **July 2013** - Final V3.0 released
- **April 2014 – V3.0 Effective**

ENERGY STAR Contacts



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- ENERGY STAR Specification Development website
 - www.energystar.gov/revisedspecs
(scroll down to commercial refrigeration V3.0 specification development link)



Thank You