



ENERGY STAR® Stakeholder Meeting

September 1, 2016
Automatic Commercial Ice Makers V3.0





Meeting Agenda

- Welcome & Brief Introductions
- ENERGY STAR Commercial Ice Makers
 - Background on Equipment Classes
 - Landscape of Version 2.0
 - Intent of the Revision
 - Activities to Date
 - Discussion of Scope
- Additional Questions & Discussion
- Next Steps



Equipment Classes

- Ice makers are divided into equipment classes based on physical characteristics that affect commercial application, equipment utility, and equipment efficiency.
- **Ice Making Process**
 - Batch
 - Continuous
- **Equipment Configuration**
 - Ice-making Head
 - Remote Condensing (With remote compressor and without remote compressor)
 - Self-contained
- **Condenser Cooling**
 - Air-cooled
 - Water-cooled
- **Capacity Range**
 - Up to 4,000 lbs ice/24 hrs



Current Specification: ENERGY STAR Commercial Ice Makers Version 2.0

- **ENERGY STAR Version 2.0 Product Category**
 - Effective date: February 1, 2013
- **Scope of Included Products (Version 2.0)**
 - Air-cooled, batch and continuous type
 - Ice Making Head (IMH); Remote Condensing Unit (RCU) or Split System Unit; Self-Contained Unit (SCU)
- **Ongoing Data Assembly**
 - Sources include:
 - ENERGY STAR Qualified Products List (QPL)
 - Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Directory of Certified Product Performance



Guiding Principles That May Impact Timing of Specification Revisions

- Significant increase in ENERGY STAR market penetration
- Change in Federal minimum efficiency standards
- Technological advancements
- New or improved test procedure
- Concern about consumers not realizing expected energy savings
- Product performance or quality concerns



Objectives for V3.0 Specification

- **Increase Energy Performance Levels**
 - Reduce the maximum Energy Consumption Rate (kWh/100 lbs ice)
 - Evaluate the potential to amend Potable Water Use limits (gal/100 lbs ice)
- **Consideration of DOE Federal Minimum Standard**
 - Effective January 28, 2018
 - Align terms and definitions with DOE's final rule
 - Federal minimum standards meet or exceed Version 2.0 levels for most products and most sizes
 - Impacts near all equipment classes



Remote Condensing Unit (RCU) Terminology

- **DOE Definitions**
 - Remote compressor means a type of automatic commercial ice maker in which the ice-making mechanism and compressor are in separate sections.
 - Remote condensing means a type of automatic commercial ice maker in which the ice-making mechanism and condenser or condensing unit are in separate sections.
- **Proposed Changes to Version 3.0**
 - Align with DOE Equipment Class Definitions
 - For clarification, DOE determined that rack-only RCUs are not defined as ice makers under the statute and are not included in the rulemaking
 - EPA intends to use the same approach for determining scope of eligible products



Characterizing Scope of Products

- **ENERGY STAR Version 2.0**
 - Included Products: *“RCUs designed for connection to remote rack compressors that are alternately sold (with the same model number) with a dedicated remote condensing unit are also eligible”*
 - Excluded Products: *“RCU units that are designed only for connection to remote rack compressors are not eligible”*
- **Discussion Question:**
 - Given DOE definitions on previous slide, is there a way to update this and provide more clarity on the eligibility criteria?

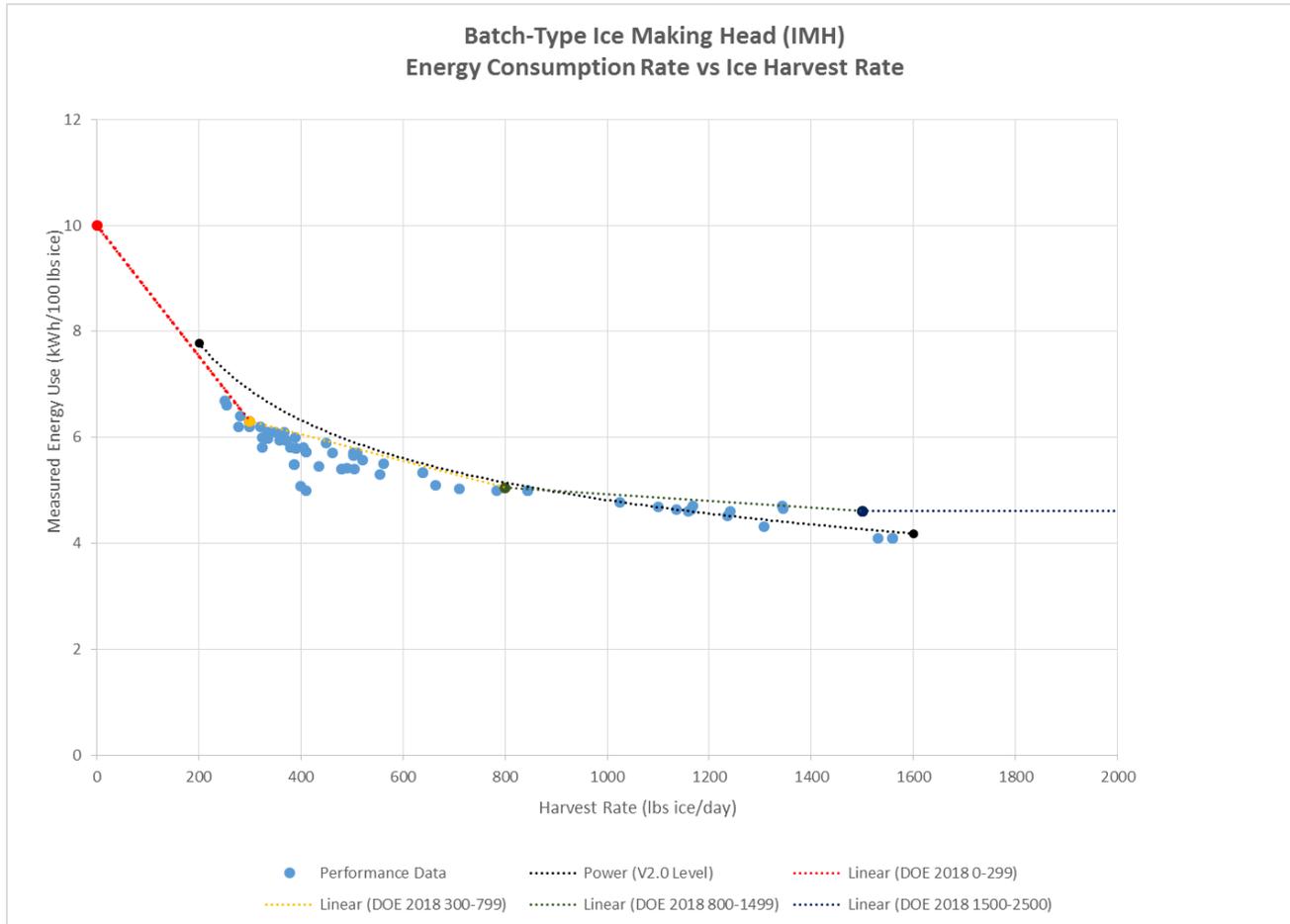


Proposed Approach for Determining V3.0 Levels

- **Building the Dataset**
 - EPA plans to develop a data set that is based on products that will meet DOE 2018 levels (all other products will be removed from consideration)
 - Based on information from the ENERGY STAR Qualified Products List & AHRI Directory of Certified Product Performance
- **Determining Performance Levels**
 - EPA plans to use a non-linear formula to show the relationship between energy use
 - Similar approach to V2.0
 - In contrast, DOE uses a piece-wise linear function with different formulas for different capacity ranges
- **Discussion Questions:**
 - Are there other sources we should be considering?
 - Does our dataset reflect the best of what will be available in 2018?

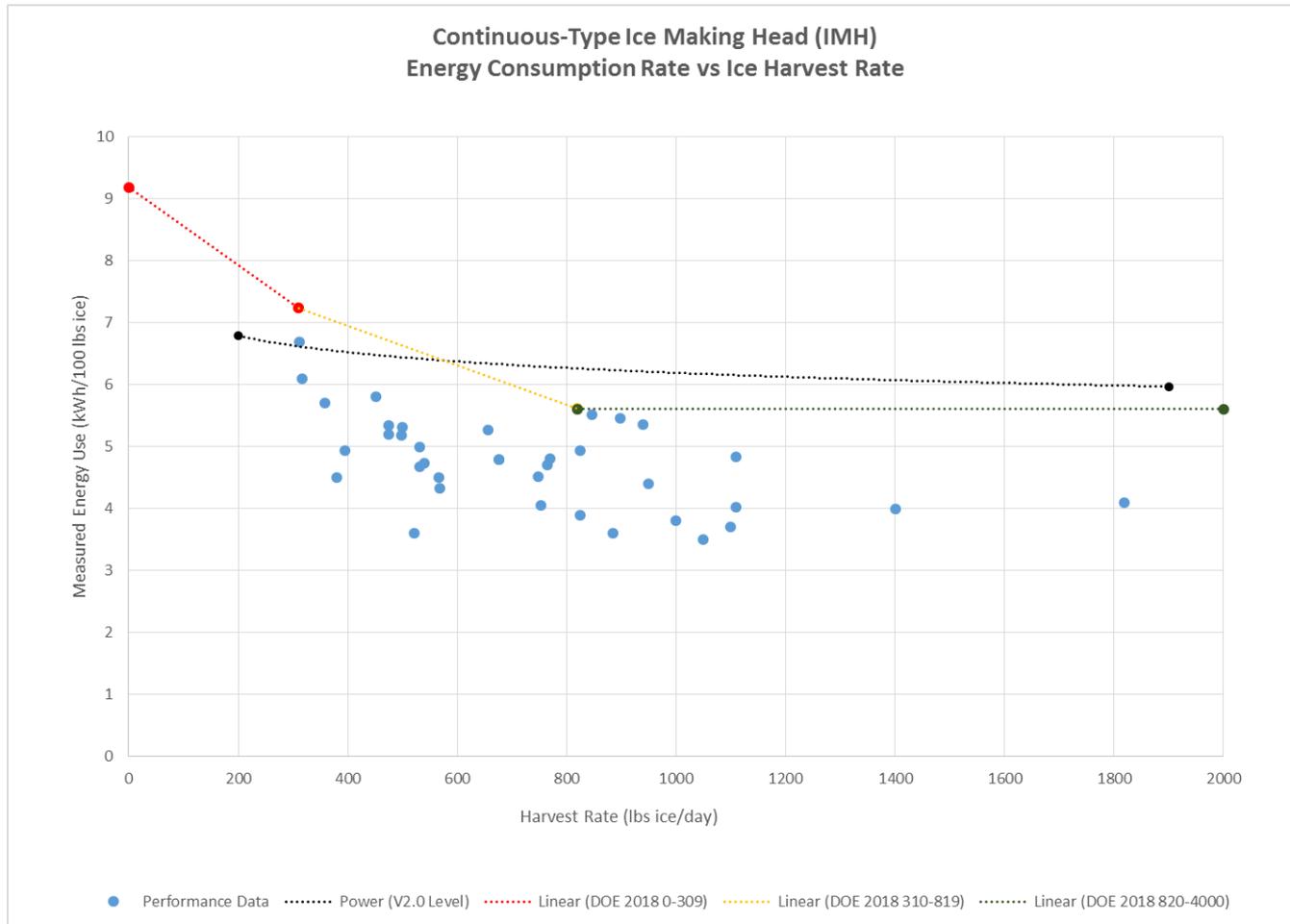


ENERGY STAR Automatic Commercial Ice Machines



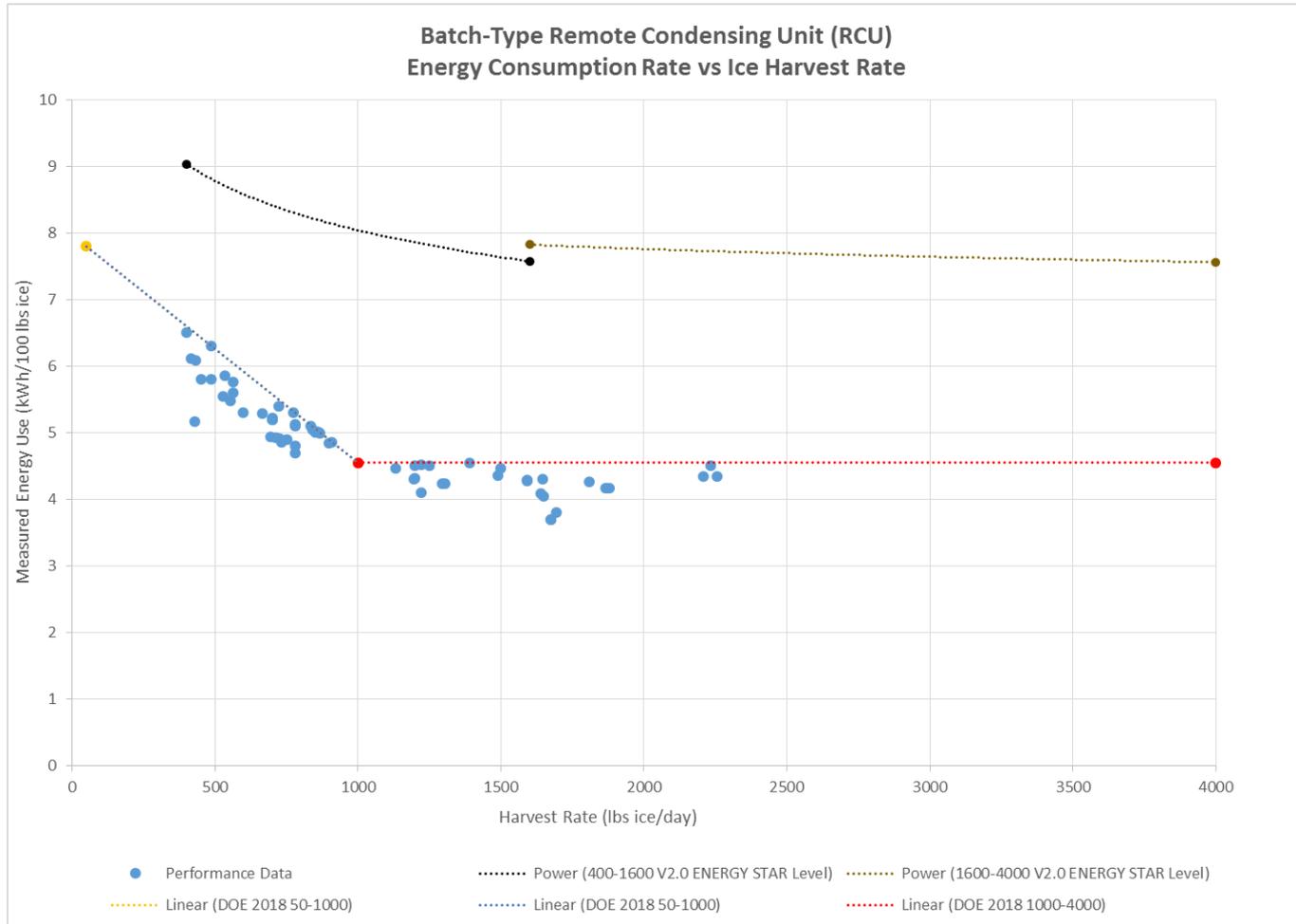


ENERGY STAR Automatic Commercial Ice Machines



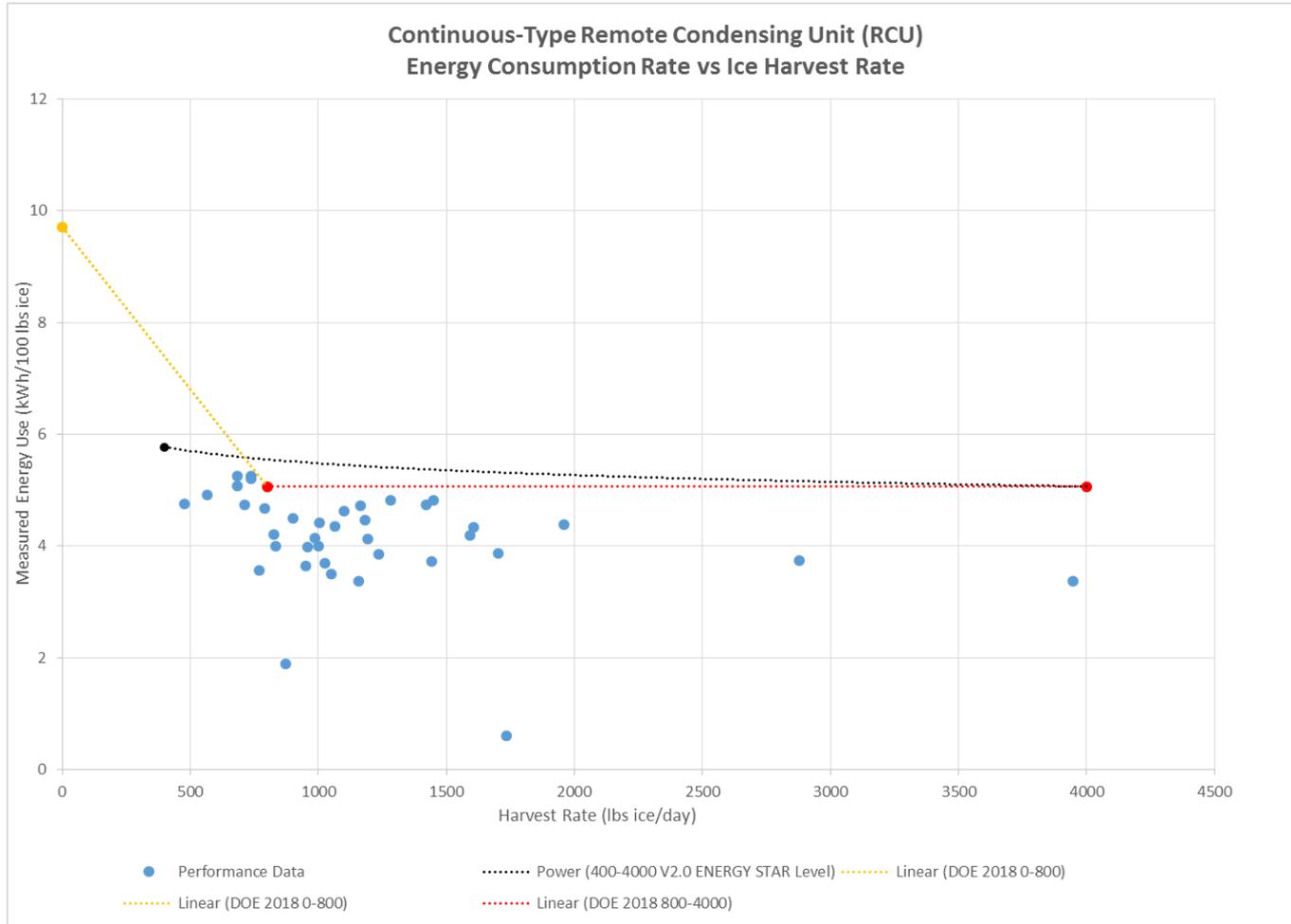


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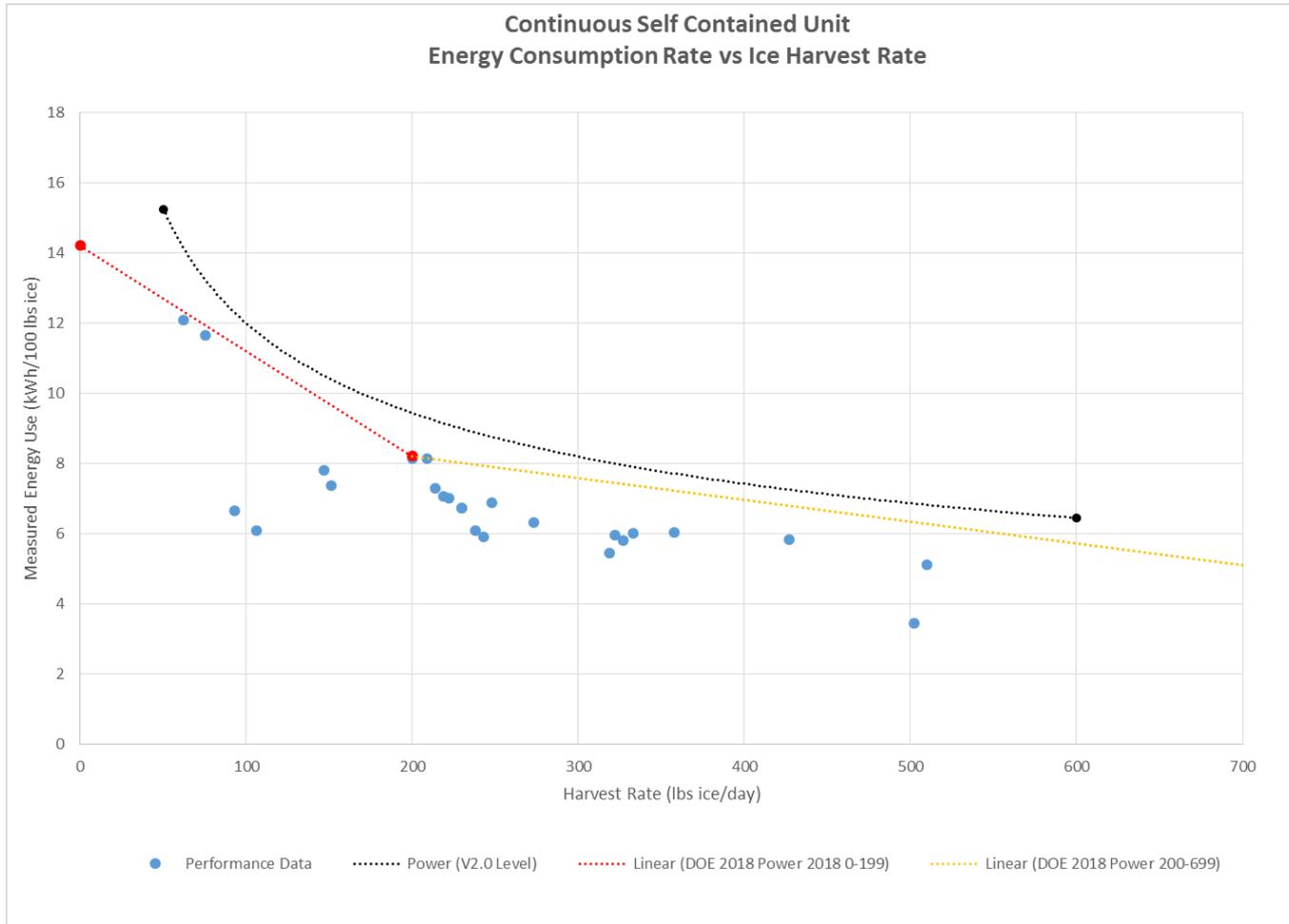


ENERGY STAR Automatic Commercial Ice Machines





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Version 2.0 Potable Water Use Metric

Table 1: ENERGY STAR Requirements for Air-Cooled Batch-Type Ice Makers

Equipment Type	Applicable Ice Harvest Rate Range (lbs. of ice/24 hours)	Potable Water Use (gal/100 lbs. ice)
IMH	$200 \leq H \leq 1600$	≤ 20.0
RCU	$400 \leq H \leq 1600$	≤ 20.0
	$1600 \leq H \leq 4000$	≤ 20.0
SCU	$50 \leq H \leq 450$	≤ 20.0

Table 2: ENERGY STAR Requirements for Air-Cooled Continuous-Type Ice Makers

Equipment Type	Potable Water Use (gal/100 lbs. ice)
IMH	≤ 15.0
RCU	≤ 15.0
SCU	≤ 15.0

- **Discussion Questions:**
 - Are there new technologies or advances in water efficiency that should be considered for Version 3.0?



Potential Scope Expansion for Version 3.0

- EPA is evaluating the feasibility and interest in expanding the scope to include additional commercial ice maker products
- Examples:
 - Water cooled ACIMs operating on a closed-loop system
 - Expand ice harvest ranges for batch-type ice makers
 - Test method availability
 - Performance data availability
 - Energy and water savings potential
 - Stakeholder interest
- **Discussion Questions:**
 - Are there specific product types or subcategories that we should consider for inclusion?
 - Is there anything else related to specific components or innovations that EPA should consider right now?



Consideration of New Requirements

- **Load Shifting Requirement or Recognition**
 - One important consideration for the energy consumption is the time of day and duration ice machines are on
 - EPA would like to add a requirement that ice machines be equipped with on-board controls that would allow operators to establish an ice making schedule during non-peak hours.
- **Discussion Questions:**
 - How should we write something like this into the specification to ensure energy savings are realized?
 - How to identify energy savings associated with producing ice during non-peak hours (i.e., cooler ambient conditions).
 - Will load shifting yield savings for all ACIM installation applications? (e.g., QSRs, full-service, cafeterias, banquet/hotel operations, etc.)
- **Refrigerant Type**
 - EPA would like to add refrigerant type as a reporting requirement
 - Information would be recorded during certification testing and made publicly available on the ENERGY STAR QPL
 - What information is currently available about performance of low-GWP refrigerants?



Additional Questions & Discussion



Next Steps & Timeline

- EPA to issue a Draft 1 Version 3.0 specification (September 2016)
- Pending stakeholder comments received in response to the Draft 1, EPA will determine if a subsequent Draft 2 will be issued; otherwise, Version 3.0 will go straight to a Final Draft
- Target: Finalize Version 3.0 before 2017
- Effective Date: On or before January 28, 2018



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