ENERGY STAR® Lab Grade RF

Version 2.0 Draft 2 Specification

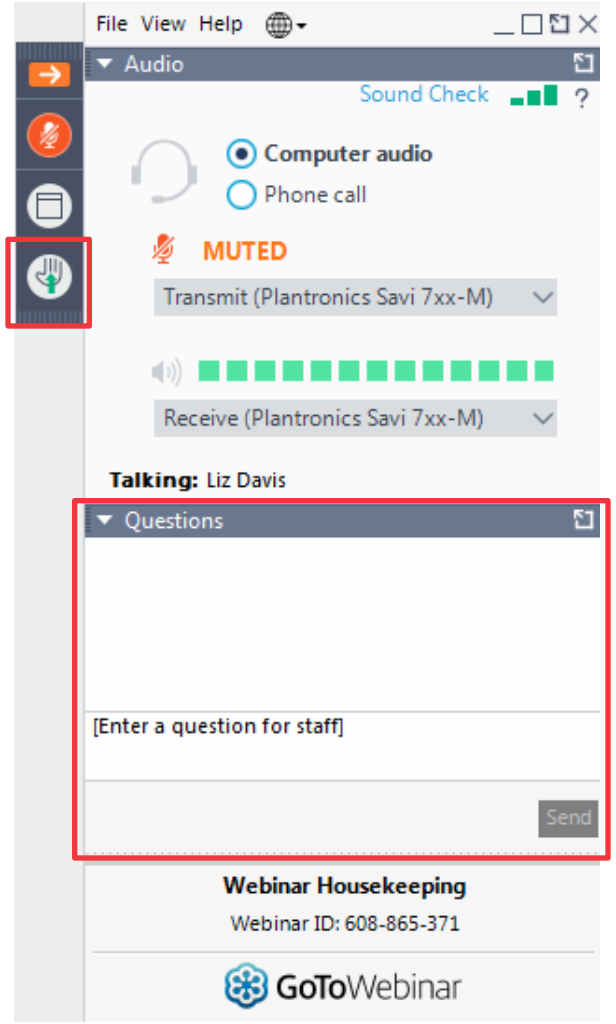
Stakeholder Meeting

March 7, 2024

Webinar Participation

- Please mute yourself when you are not speaking (use local mute or dial *6)
- Feel free to ask questions at any time.

Submit written comments to
labgraderefrigeration@energystar.gov
by **March 19, 2024**.



Meeting Agenda

1. Introductions
2. Definitions
   - Set Point Temperatures (SPTs) and Operating Ranges
   - Peak Variation Requirements
3. High Performance Refrigerator Criteria
4. High Performance Freezer Criteria
5. ULT Freezer Criteria
6. NSF/ANSI 456-2021a Model Allowance
7. Testing Considerations - Freezer SPT
8. Timeline and Next Steps
9. Questions

Introductions

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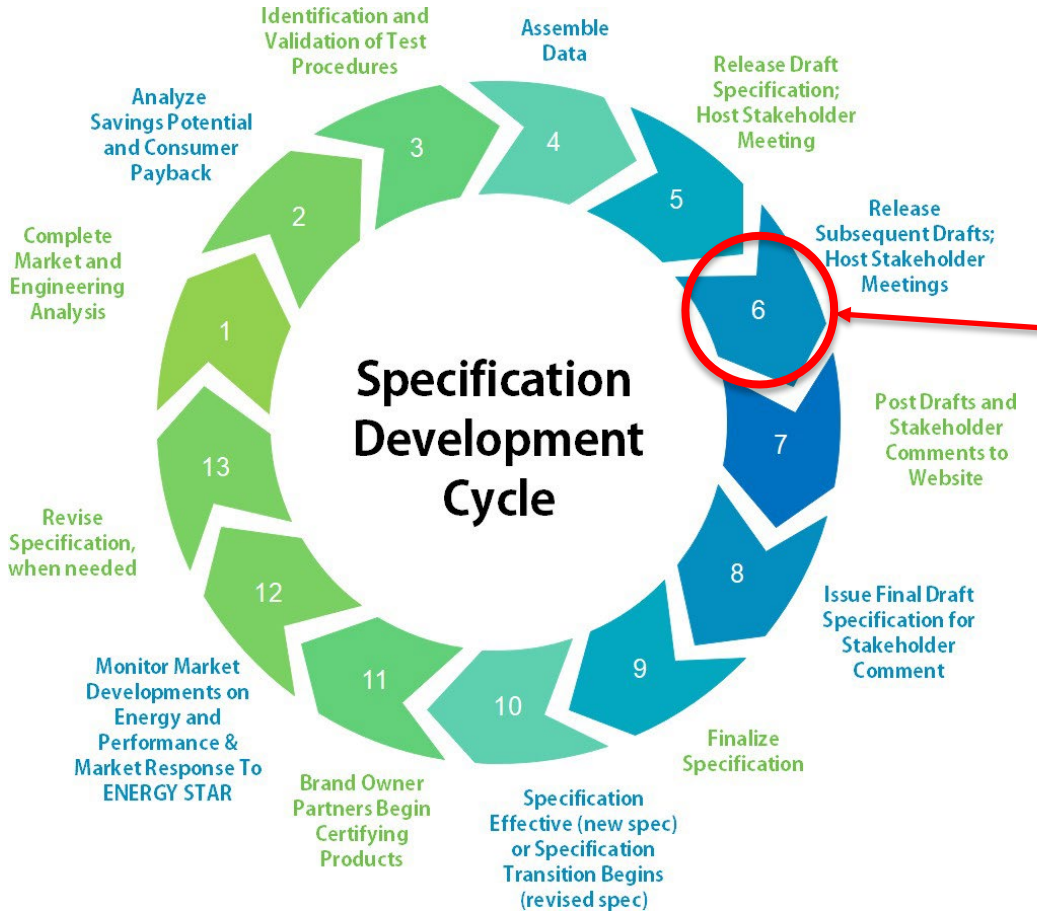
ENERGY STAR Specification Development Process



We are here.

https://www.energystar.gov/partner_resources/product_specification_development_process

Definitions – Set Point Temperatures and Operating Ranges

- To align with industry terminology, EPA is clarifying the following definitions:
  - A “Set Point” or “Set Point Temperature” is the actual temperature to be achieved by a laboratory grade model.
  - The “Operating Range” or “Set Point Temperature Range” is the boundary prescribed to the set point and peak variance.

Definitions – Peak Variation Requirements

- EPA is proposing to tighten the maximum peak variation in temperature for General Purpose and High Performance Refrigerators.
  - In doing so, EPA is ensuring that temperature performance is maintained per end-user expectations.

	High Performance	General Purpose
Refrigerators	**< 4 °C**	**≥ 4 °C**
Freezers	< 10 °C	≥ 10 °C

- Specialty products: EPA is aware that for certain specialty laboratory grade equipment, testing outside of ENERGY STAR's proposed 2 - 6°C operating range may be required.
  - EPA recommends that partners and certification bodies continue testing using the proposed 2 - 6 °C operating range.

High Performance Refrigerator Criteria

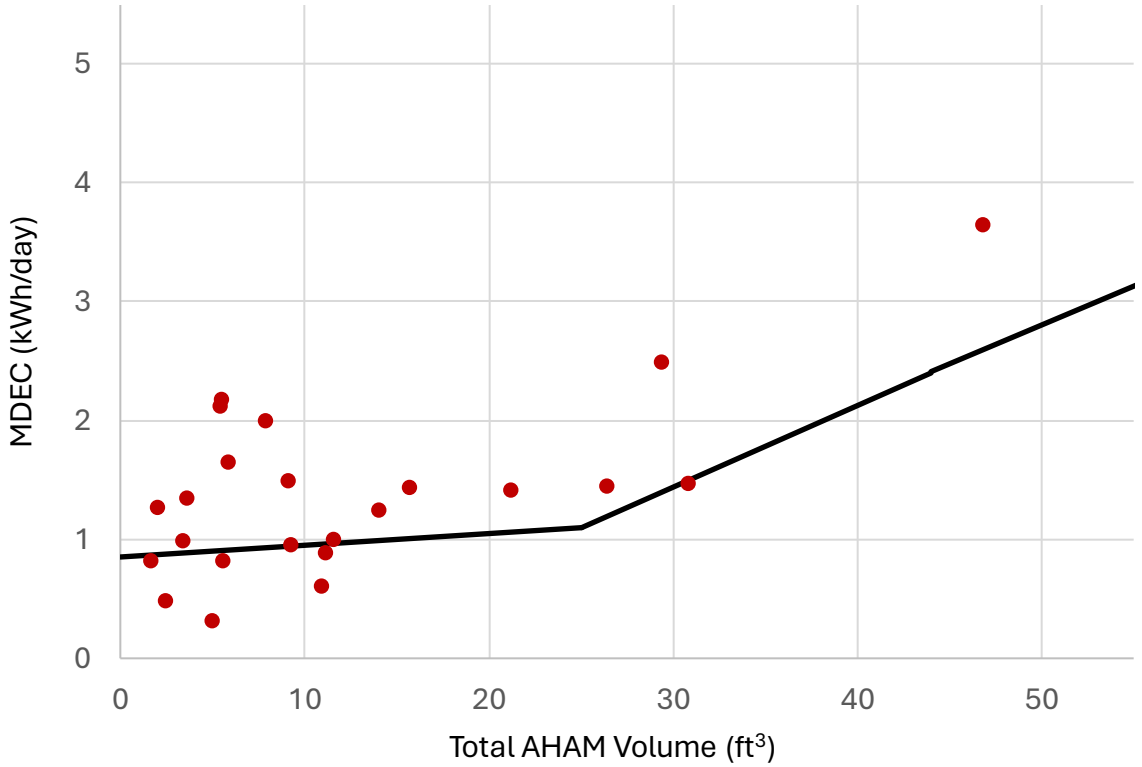
- EPA received stakeholder feedback indicating the need to segment some Laboratory Grade products by their door type.
- An analysis was completed to determined the influence of door type (i.e., transparent/ glass door versus solid doors) on a model's energy consumption.
  - The energy consumption of High Performance Refrigerators is impacted by door type.

High Performance Refrigerators	MDEC
Solid Door	
0 < V < 25	≤ 0.01V + 0.85
25 ≤ V < 44	≤ 0.07V - 0.68
44 ≤ V	≤ 0.06V - 0.03
Transparent Door	
0 < V < 10	≤ 0.1V + 0.55
10 ≤ V < 44	≤ 0.06V + 1.08
44 ≤ V	≤ 0.14V - 2.48

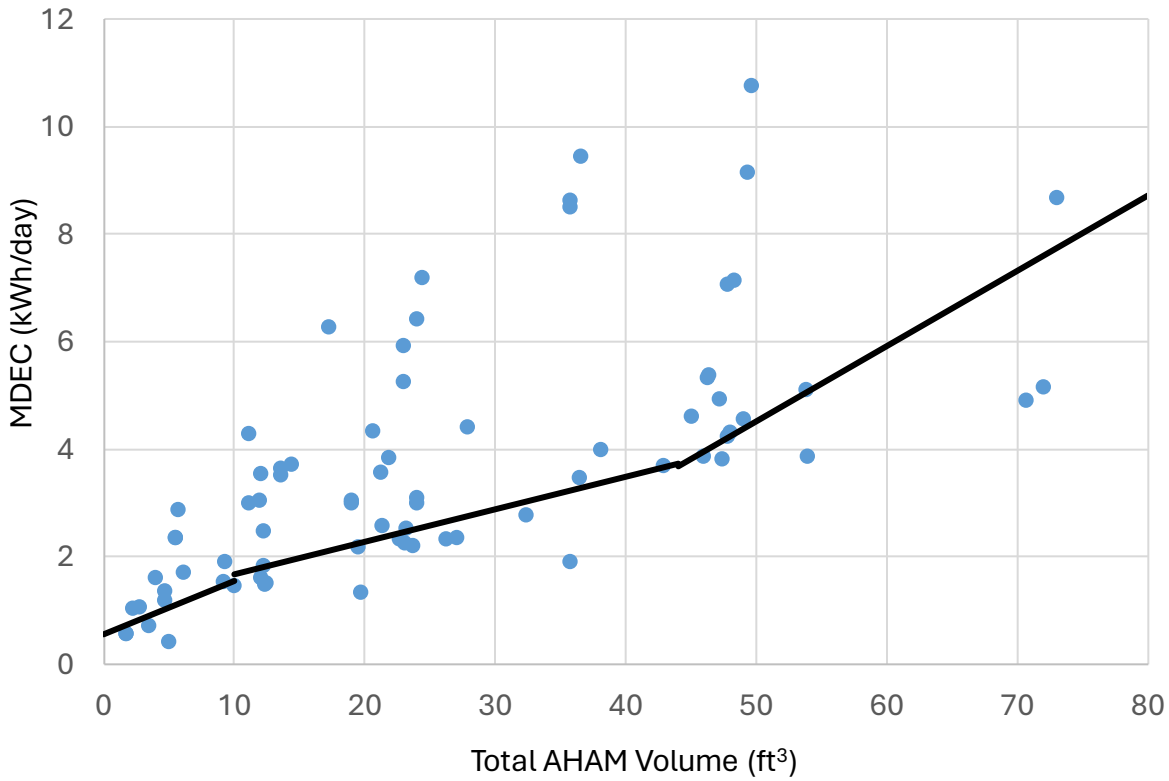
- Updated criteria produces an average pass rate of 29%.

High Performance Refrigerator Criteria (cont'd.)

Proposed Levels & Volume Bins – Solid Door



Proposed Levels & Volume Bins – Transparent Door



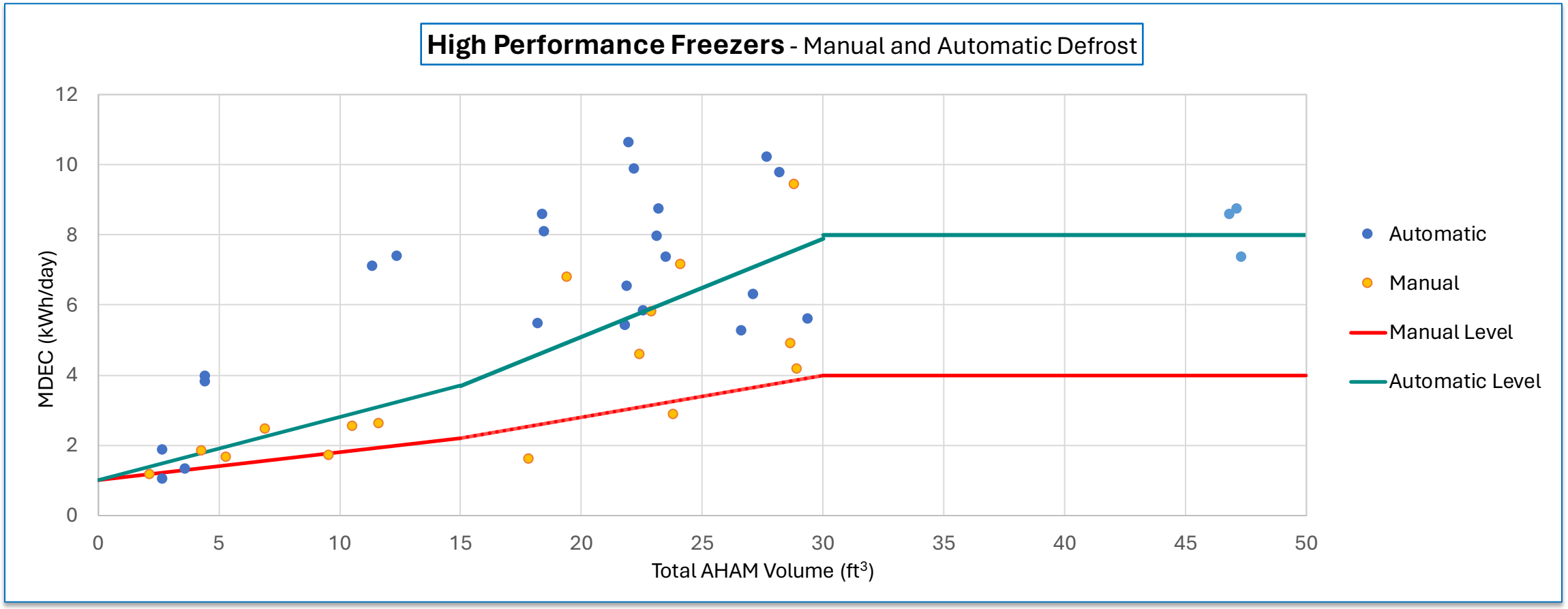
High Performance Freezer Criteria

- EPA received stakeholder feedback indicating the need to segment some Laboratory Grade products by their defrost type.
- Analysis showed that Defrost Type holds influence over a High Performance Freezer's Maximum Daily Energy Consumption (MDEC) value.
  - EPA has categorized High Performance Freezers by their defrost system, creating separate criteria for manual defrost and automatic defrost products.

High Performance Freezers	MDEC
Manual Defrost	
0 < V < 15	≤ 0.08V + 1.0
15 ≤ V < 30	≤ 0.12V + 0.4
30 ≤ V	≤ 4.0
Automatic Defrost	
0 < V < 15	≤ 0.18V + 1.0
15 ≤ V < 30	≤ 0.28V - 0.5
30 ≤ V	≤ 8.0

- Roughly 25% of High Performance Freezers meet the updated criteria.

High Performance Freezer Criteria (cont'd.)



ULT Freezer Criteria

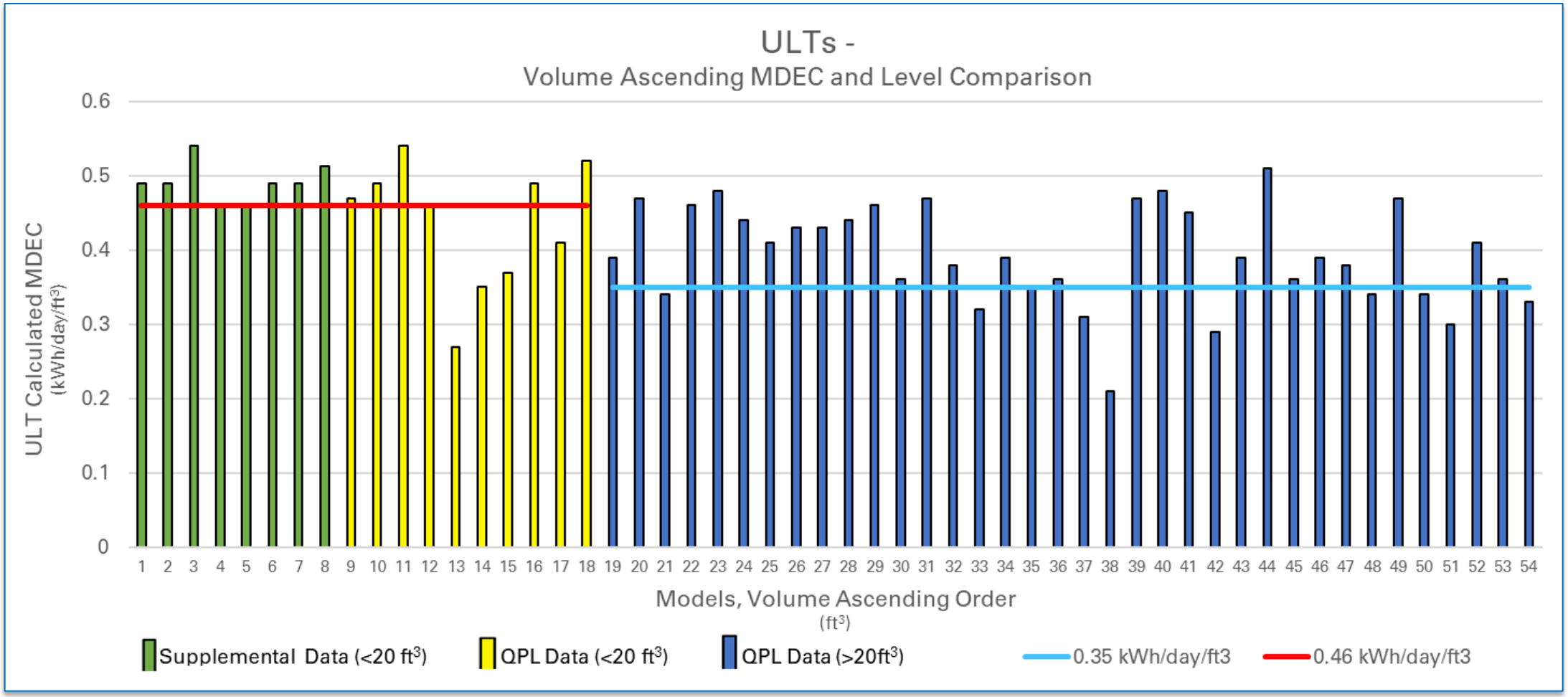
- EPA has developed new volume bins with less stringent criteria for ULT products < 20 ft^3.
  - EPA received data on 8 additional models between 0 ft^3 and 20 ft^3 that were tested to the ENERGY STAR test method and included those in the Anonymized Data Set.

MDEC Requirements (kWh/day/ft^3) for ENERGY STAR Certified Ultra-Low Temperature Freezers @ -75 °C

0 < V < 20	≤ 0.46
20 ≤ V	≤ 0.35

- Proposed levels will recognize 31% of ENERGY STAR certified ULT products.

ULT Freezer Criteria (cont'd.)



NSF/ANSI 456-2021a Model Allowance

- A supplemental data set was provided to EPA identifying NSF/ANSI 456-2021a certified products within the ENERGY STAR LGRF Qualified Products List.
- EPA determined that the Draft 1 MDEC equations limited the number and variation of models eligible for both ENERGY STAR and NSF/ANSI 456-2021a certification.

	Allowance	Units
High Performance Refrigerators		
Solid Door	+ 2.4	kWh/day
Transparent (or Glass) Door	+ 1.0	kWh/day
High Performance Freezers		
Automatic Defrost	+ 3.0	kWh/day
Manual Defrost	N/A	N/A

NOTE:

No General Purpose or manual defrost, High Performance Freezer models held NSF certification.

Additional allowances were not proposed for those subcategories.

- Of those models with NSF certification, 41% of High Performance Refrigerators and 33% of High Performance Freezers met the criteria with the new allowance.

Testing Considerations - Freezer SPT

- EPA is now requiring that a standardized set point of -20 °C be mandated for Laboratory Grade Freezers during certification testing.
  - The manufacturer's intended operational set point temperature (e.g., -30 °C, -40 °C, etc.) shall be reported if it differs from the mandated -20 °C test point.

Timeline and Next Steps

- EPA intends to finalize the Version 2.0 specification in Q2 of 2024, with a TBD effective date.
  - Effective date will be in Q1 2025 – nine months following the finalization of the specification.

Questions

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