ENERGY STAR® Commercial Ovens

Version 3.0 Draft 1 Webinar

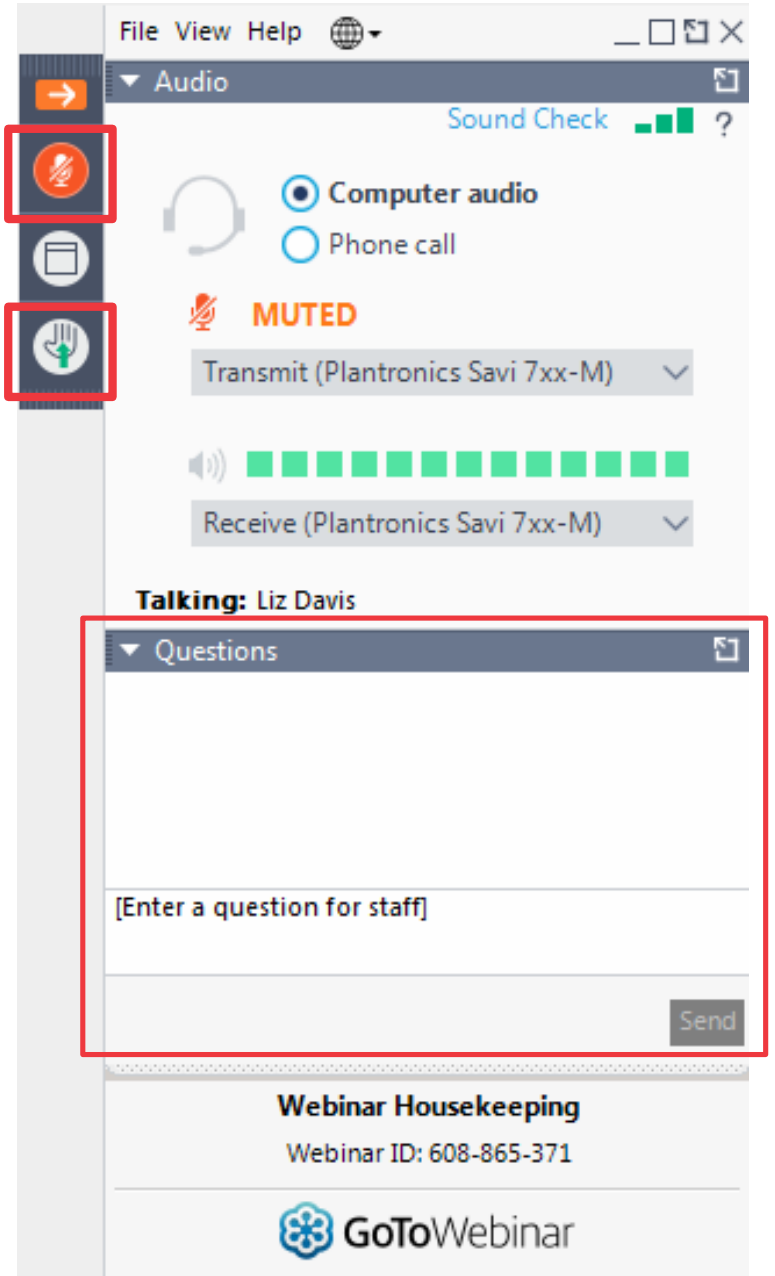
Stakeholder Meeting

April 21, 2021

Webinar Participation

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

Submit written comments to cfs@energystar.gov by **May 12, 2021**



Stakeholder Breakdown in Today's Webinar

Registrations for today' webinar include:

- 8 Product Brand Owners/Manufacturers
- 3 EEPS/Utilities
- 5 Consultants Restaurant or Commercial Operator
- 4 Associations

Meeting Agenda

1. **Introductions and Purpose of Revision**
2. Review of Proposed Changes
3. Test Methods
4. Definitions
5. Proposed Version 3.0 Scope
6. Criteria
7. Analysis and Results
8. Closing - Next Steps & Questions

Introductions

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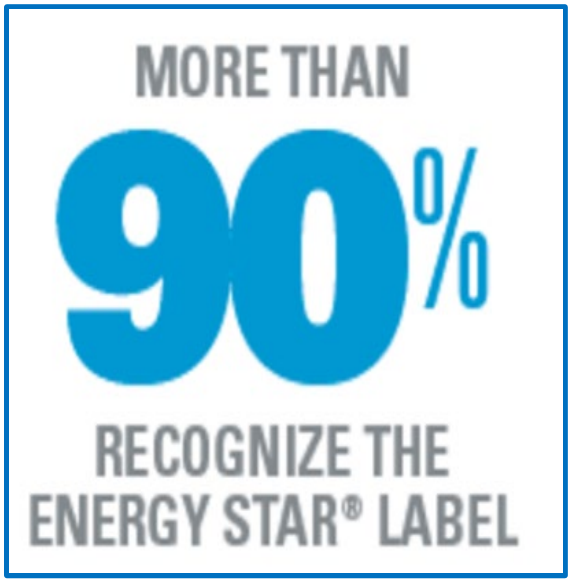
What is ENERGY STAR?

- Influential and trusted symbol of **energy efficiency**
- Available across **75+ product categories**
- Since 1992, a voluntary **partnership** among government, business, and consumers
- Products are independently certified to meet strict energy-efficiency guidelines set by the **U.S. EPA**
- **Utilities** offer **rebates** on ENERGY STAR certified equipment
- **Saves** end-users **energy**, **water**, and **money**
- Helps protect the **climate**

Benefits to joining ENERGY STAR



Source: CEE's 2019 Household Survey
https://www.energystar.gov/awareness

- Access a network of over 700 utilities
- Leverage the label recognition
- Access customer support teams at EPA
- Utilize co-brandable materials
- Participate in promotional events
- Get listed on publicly-available ENERGY STAR search tools
- Apply for the ENERGY STAR Partner of the Year Award
- Receive email notifications about program activities

ENERGY STAR Partnership Types

- Brand owner
- Retailer (*i.e.*, CFS dealer/distributor)
- Residential building
- Commercial building, service, product, or association
- Industrial plant, service, product, or association
- Energy Efficiency Program Sponsor

For more information on joining as an ENERGY STAR partner visit this webpage
https://www.energystar.gov/partner_resources/join-energy-star

Product Brand Owner Partnership Requirements

1. **Sign** partnership agreement. See partner resources page: https://www.energystar.gov/partner_resources/join-energy-star

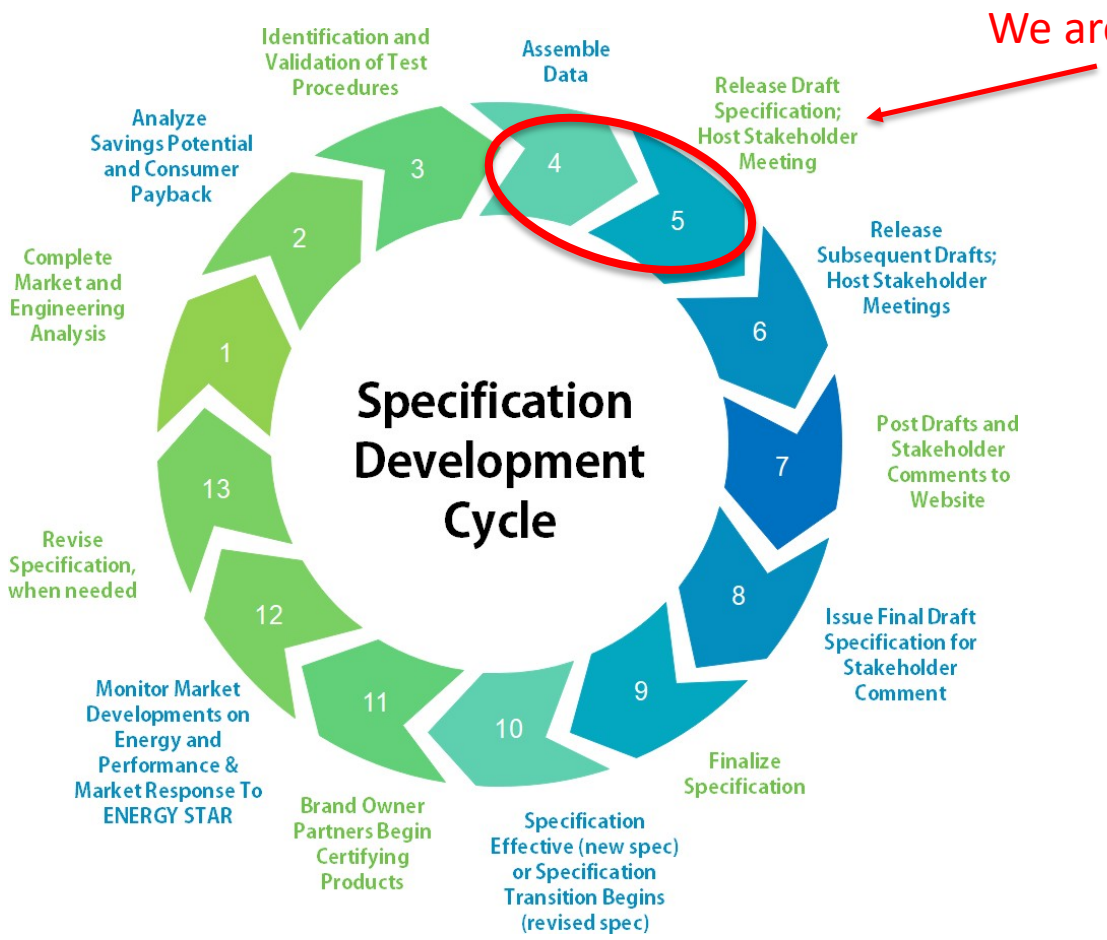
2. **Third-party certification** through an EPA-recognized certification body (CB): www.energystar.gov/3rdpartycert.

3. **Comply** with the ENERGY STAR **Brand Guidelines** for appropriate use of the logo: www.energystar.gov/logouse

4. **Participate** in **third-party verification** through an EPA-recognized certification body

5. **Provide** **annual unit shipment data** no later than **March 1** www.energystar.gov/unitshipmentdata

ENERGY STAR Specification Development Process



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

Guiding Principles That Drive Specification Revisions

- Revisions are driven by the need to continuously recognize and differentiate top performing products on the market:
  - New or revised test methods
  - Technological advancements (stakeholder interest)
  - Significant increase in ENERGY STAR market penetration, [**51%** as of 2019 USD Report]
  - Change in Federal minimum efficiency standards
  - Product performance or quality concerns

Oven Version History and Specification Timeline

Effective Date	Specification Version	Changes to Specification
2009 (May)	Version 1.0	**Convection Ovens**
2014 (Jan)	Version 2.0 Version 2.1	**Expansion to Combination Ovens** with conservative changes to convection oven criteria levels. ASTM F1496-13 was approved.
2015 (Oct)	Version 2.2	Expansion to **Gas Rack Ovens**

Timeline for V3.0:

- Draft 1 Published– March 31, 2021
- **Draft 1 Webinar– April 21, 2021**
- Comment Deadline- May 12, 2021

Product Development Website – Bookmark this page!

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Review of Proposed Revisions

- **Test Methods**
- **Terms, Definitions, and Proposed Reporting Requirements**
  - Additional oven type definitions for products out of scope (hearth, microwave, reel-type)
  - 2/3-size combination oven definition
  - Proposed preheating reporting requirement
- **Scope Expansion**
  - 2/3-size combination ovens
  - Smaller gas (≥5 pans) and electric (≥3) combination ovens
  - Larger electric combis ≤40 pans
- **Criteria levels**
- **Additional Proposed Reporting Requirement**
  - Preheat energy consumption
  - Preheat time

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Test Methods

Oven Types	Test Method Reference
Convection Ovens	**ASTM F1496-13(2019), Standard Test Method for Performance of Convection Ovens** F2092-14 Standard Specification for Convection Oven Gas or Electric
Combination Ovens	**ASTM F2861-20, Standard Test Method for Enhanced Performance of Combination Oven in Various Modes** F1495-20 Standard Specification for Combination Oven Electric or Gas Fired
Rack Ovens	**ASTM F2093-18, Standard Test Method for Performance of Rack Ovens** F2092-14 Standard Specification for Convection Oven Gas or Electric

NSF/ANSI 170-2019, Glossary of Food Equipment Terminology is also referenced

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Definitions

- **Additional Oven Types for Products Out of Scope**
  - Hearth Oven: An oven designed with an open doorway and dome-shaped interior, usually composed of high-temperature refractory ceramic or concrete. Hearth ovens do not include ovens designed to use interior walls as cooking surfaces.
  - Microwave Oven: An oven in which foods are heated and/or cooked when they absorb microwave energy (short electromagnetic waves) generated by a magnetron(s).
  - Reel-type Oven (revolving tray oven): An oven with a motor-driven Ferris wheel device.

- **2/3-Size Combi Ovens**
  - A combination oven capable of accommodating a single 13.8 x 12.7 x 2.5-inch steam table pan per rack position, loaded from front-to-back or lengthwise. The 2/3-Size Combination oven may also be referred to as a mini-size combination oven.

Preheat Definitions and Proposed Reporting Requirement

- **Preheat Values Definitions**
  - Preheat Energy: The amount of energy consumed by the convection, combination, or rack oven while preheating its cavity from ambient temperature to the specified thermostat set point. It is expressed in Btu or kWh.
  - Preheat Time: The time required for the oven cavity to preheat from ambient temperature to the specified thermostat set point. It is expressed in minutes (min).

- **Proposed Reporting Requirement**
  - Preheat energy consumption and time for all convection, combination, and rack ovens shall be reported in Btu or kWh for energy consumption and in minutes for preheat time.
  - For combination ovens, both steam and convection preheat energy consumption and time shall be reported.
  - For gas ovens, the auxiliary components (e.g., fan energy consumption) that use electrical energy shall also be reported.

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Proposed Version 3.0 Scope

- Full-size gas and half- and full-size electric convection ovens
- Half and full-size gas combination ovens with pan capacity **≥5**
- Half and full- size electric combination ovens with a pan capacity **≥3 and ≤ 40**
- **2/3 size electric combination ovens with pan capacity ≥3 and ≤ 5**
- Single and double gas rack ovens

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Approach to Criteria

- Separated electric combis based on similarities in production capacities and energy use
  - Combined 2/3-size with smaller half-size 3-4 steam pan capacity
- Changing or maintaining levels was based on market penetration rates, national savings potential, and stakeholder feedback
- Data assembled was from various sources to obtain 100% of the market
  - ENERGY STAR QPL (~40%), California Energy Wise QPLs, stakeholder submitted data (~35% between CA QPLs and stakeholder data), and California electronic Technical Reference Manual (eTRM- ~25%)

Commercial Ovens Proposed V3.0 Criteria

Oven Type	Fuel Type	Max Steam Mode Idle Energy Rate (Btu/hr or kW)	Max Convection Mode Idle Energy Rate (Btu/hr or kW)	Min Steam Mode Cooking Energy Efficiency (%)	Min Convection Mode Cooking Energy Efficiency (%)
Combi: Full and Half size (5-40 Pan Capacity)	Electric	0.133P+0.6400	0.0835P+0.36	59	78
Combi: 3-4 Pan Capacity and 2/3-size	Electric	0.6P	0.05P+0.55	51	70

Grey shading indicates no change in criteria level from v2.2

Darker blue shading indicates new subcategory for some products under the new scope expansion

Commercial Ovens Proposed V3.0 Criteria

Oven Type	Fuel Type	Max Steam Mode Idle Energy Rate (Btu/hr or kW)	Max Convection Mode Idle Energy Rate (Btu/hr or kW)	Min Steam Mode Cooking Energy Efficiency (%)	Min Convection Mode Cooking Energy Efficiency (%)
Combi: Full and Half size (5-40 Pan Capacity)	Electric	0.133P+0.6400	0.0835P+0.36	59	78
Combi: 3-4 Pan Capacity and 2/3-size	Electric	0.6P	0.05P+0.55	51	70
Combi: Full and Half size (≥5 Pan Capacity)	Gas	200P+6511	135P+4000	44	57
Convection: Full size	Electric		1.2		75
Convection: Half size	Electric		1		71
Convection: Full size	Gas		9,500		50
Single Rack	Gas		25,000		48
Double Rack	Gas		30,000		52

Grey shading indicates no change in criteria level from v2.2

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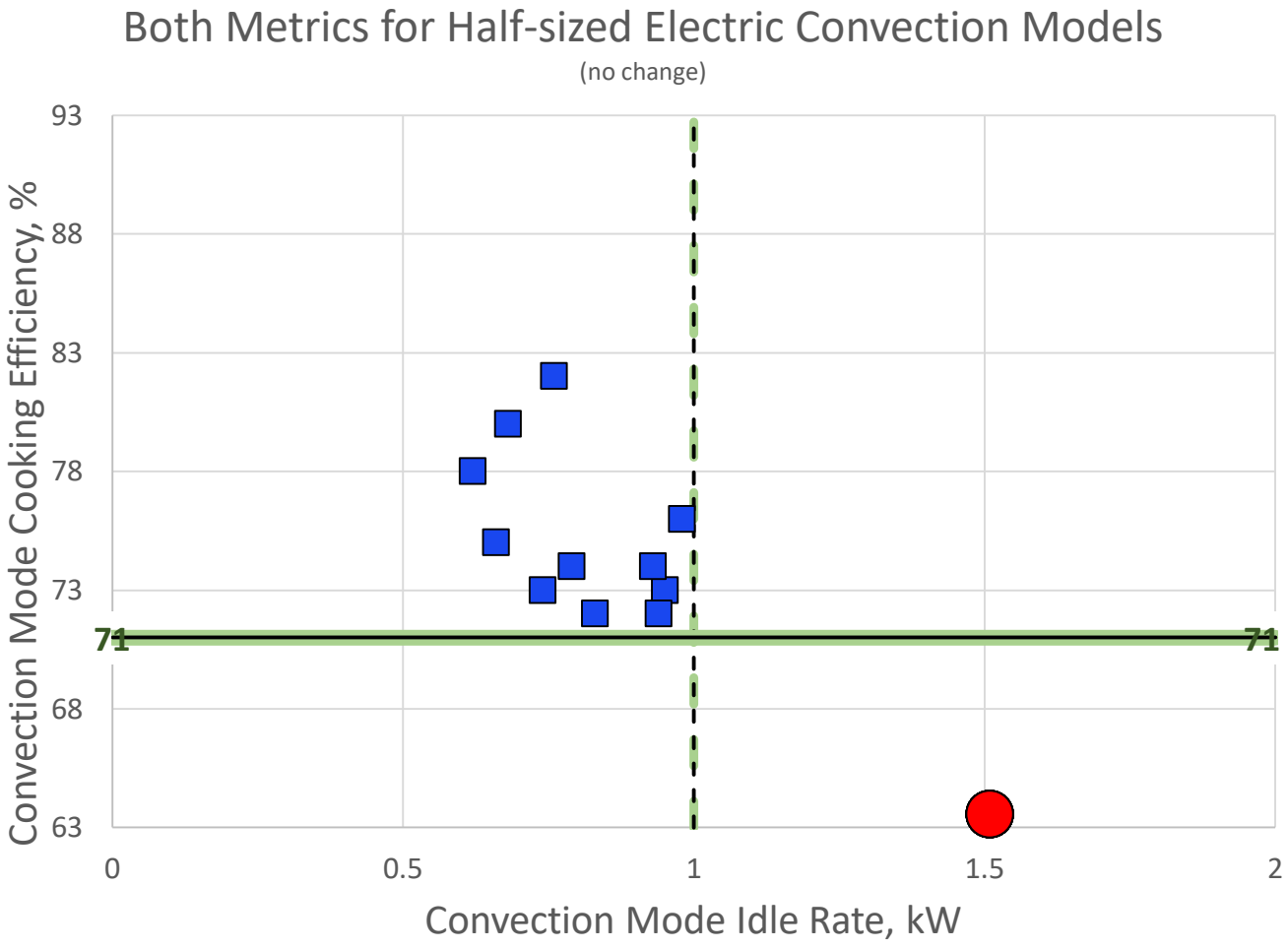
Electric Convection Ovens: Half-Size

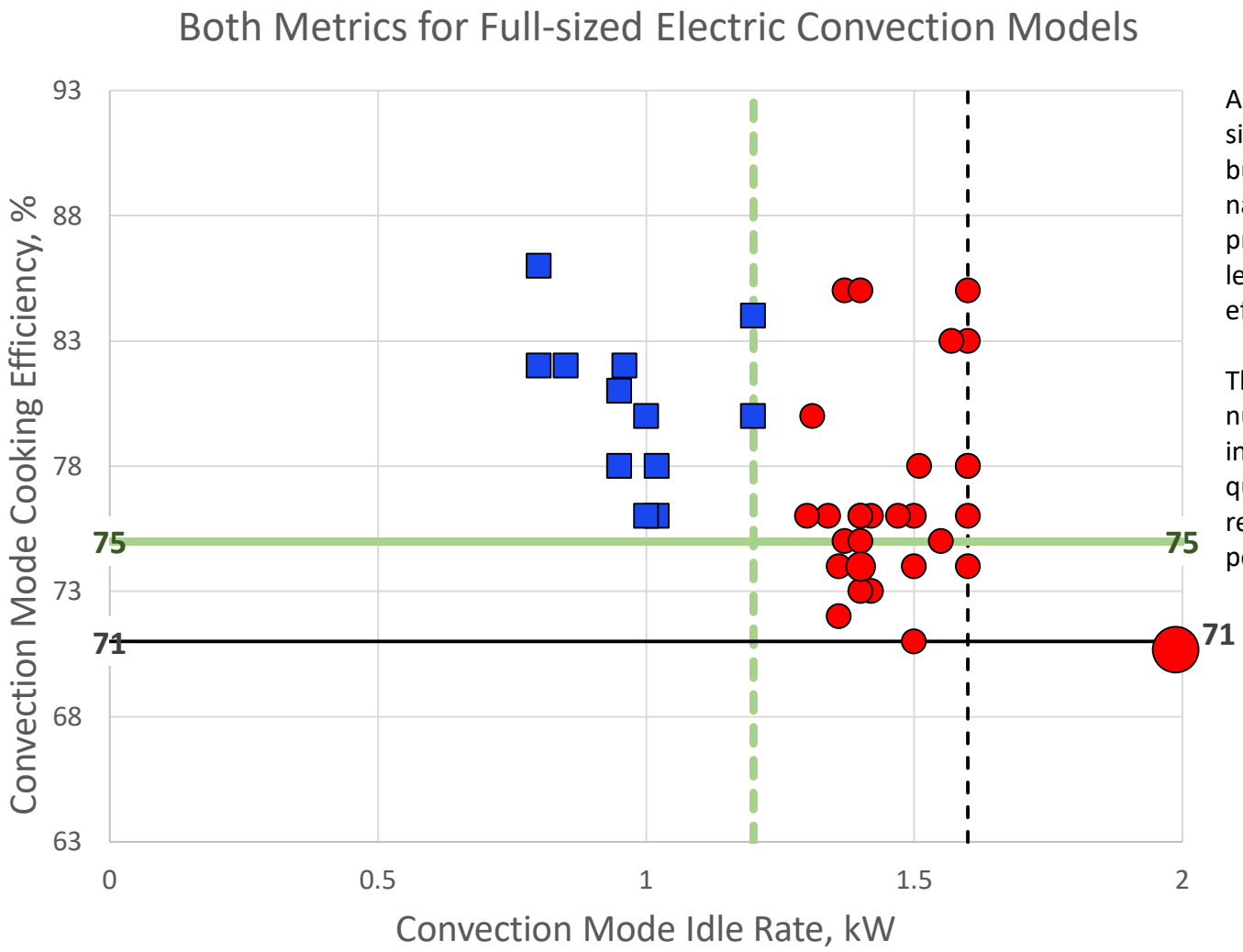


Adjusting v2.2 levels would have a relatively significant impact on product availability but limited impact to unit and national savings when compared to other product sub-categories. When market share is low, the program invests in marketing over revising criteria.

The data point size correlates to the number of models with the same values in the dataset, e.g., baseline non-qualifying ovens depicted by the largest red circle below represents 8 data points.

- Proposed Max Idle
- Current Max Idle
- Qualifrying ovens meeting both criteria
- Proposed Min Efficiency
- Current Min Efficiency
- Non-Qualifying Ovens

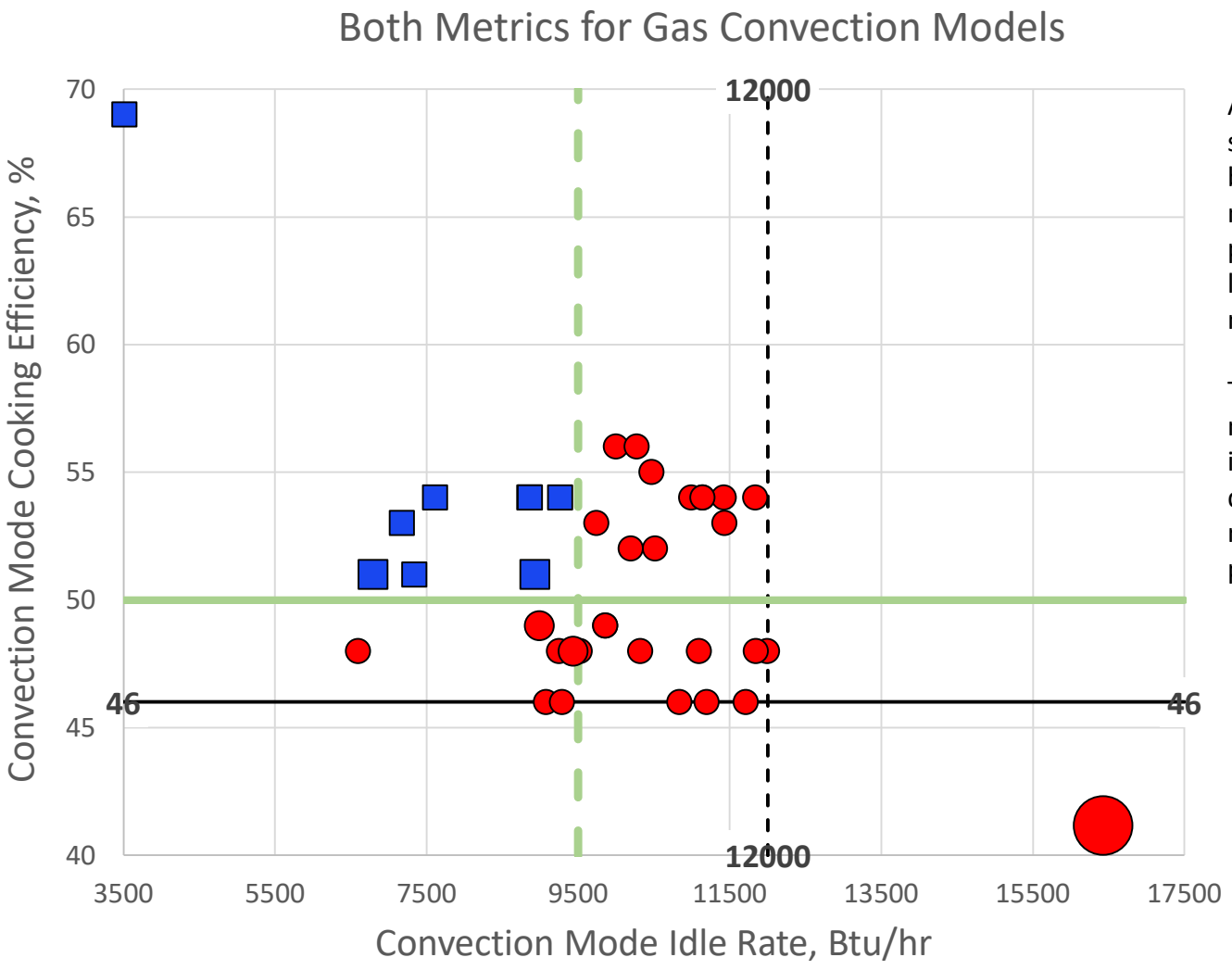
Electric Convection Ovens: Full-Size



Adjusting v2.2 levels did not have a significant impact on product availability but had a meaningful impact on unit and national savings when compared to other product sub-categories. These proposed levels recognize 24% of the most efficient models.

The data point size correlates to the number of models with the same values in the dataset, e.g., baseline non-qualifying ovens depicted by the largest red circle below represents 9 data points.

Gas Convection Ovens

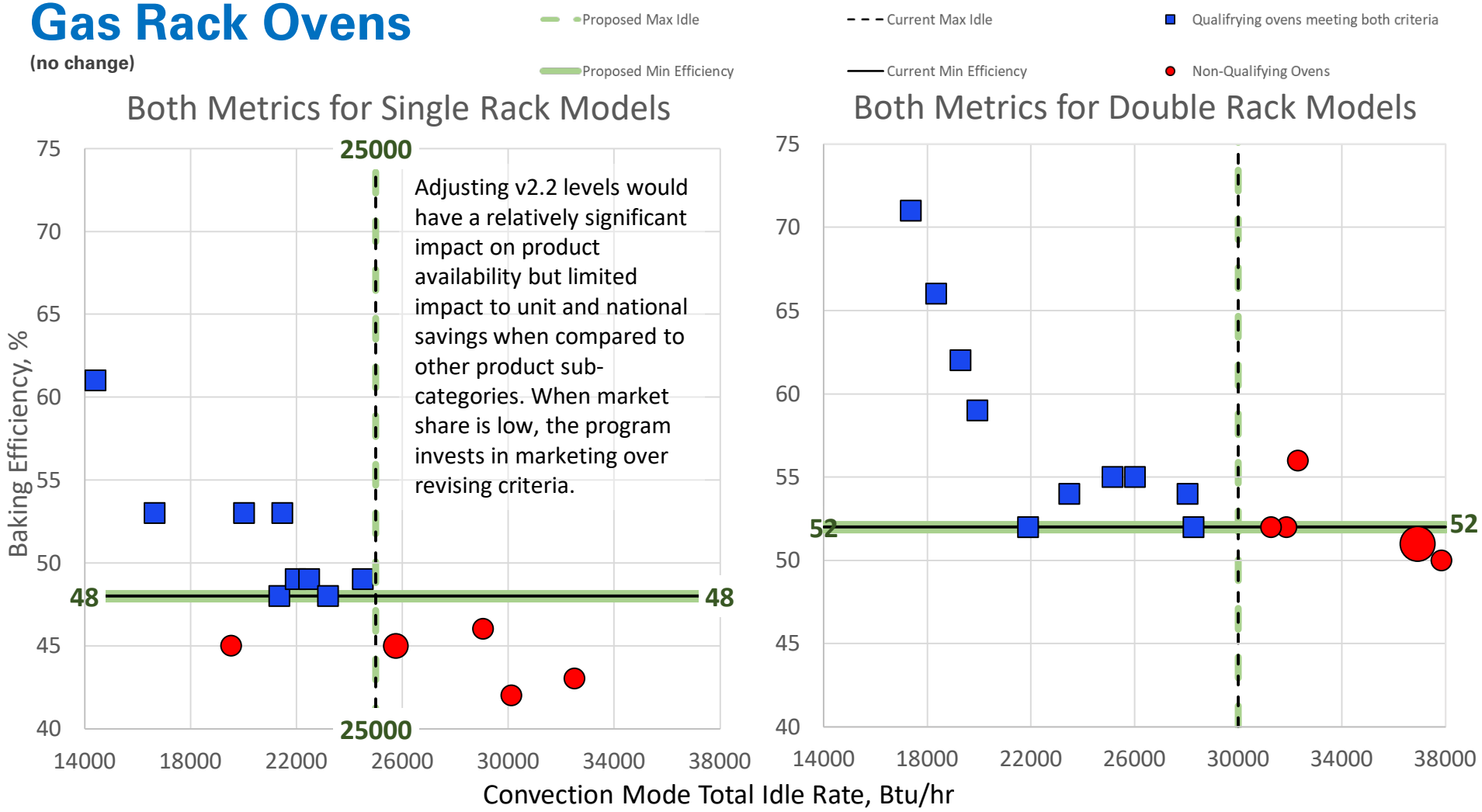


Adjusting v2.2 levels did not have a significant impact on product availability but had a meaningful impact on unit and national savings when compared to other product sub-categories. These proposed levels recognize 23% of the most efficient models.

The data point size correlates to the number of models with the same values in the dataset, i.e., baseline non-qualifying ovens depicted by the largest red circle below represents 14 data points.

Gas Rack Ovens

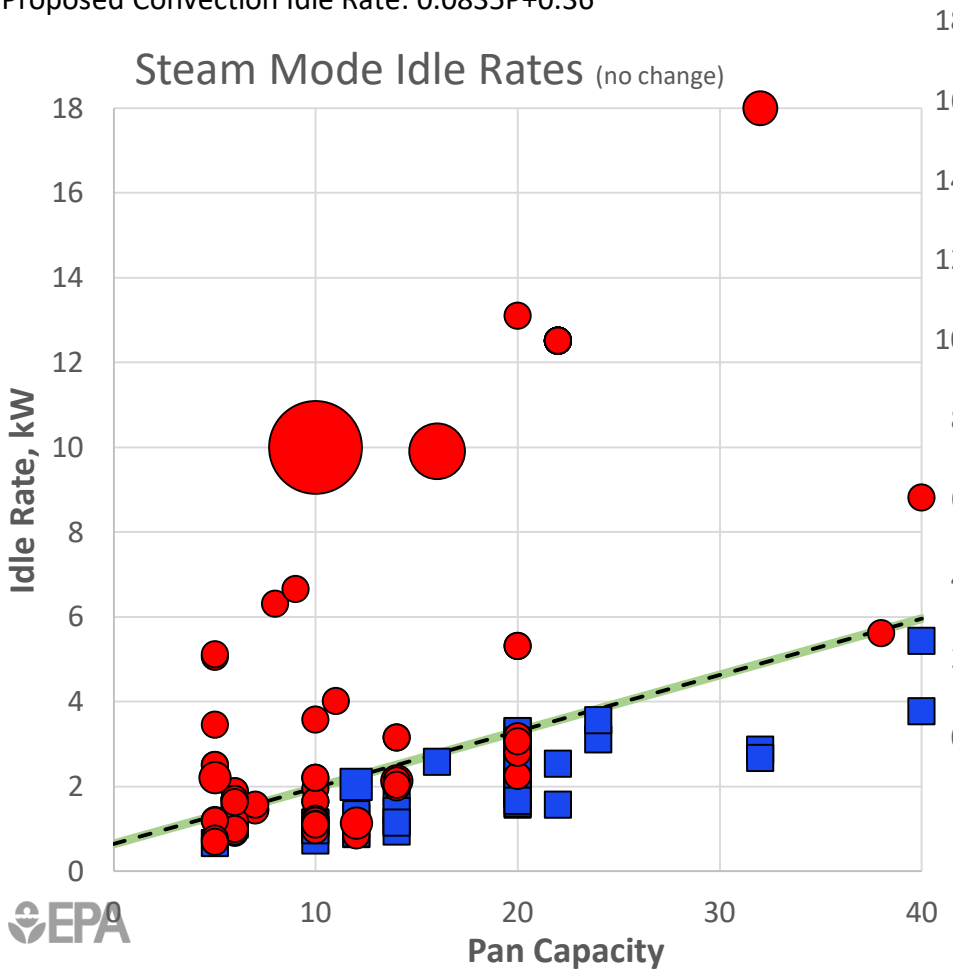
(no change)

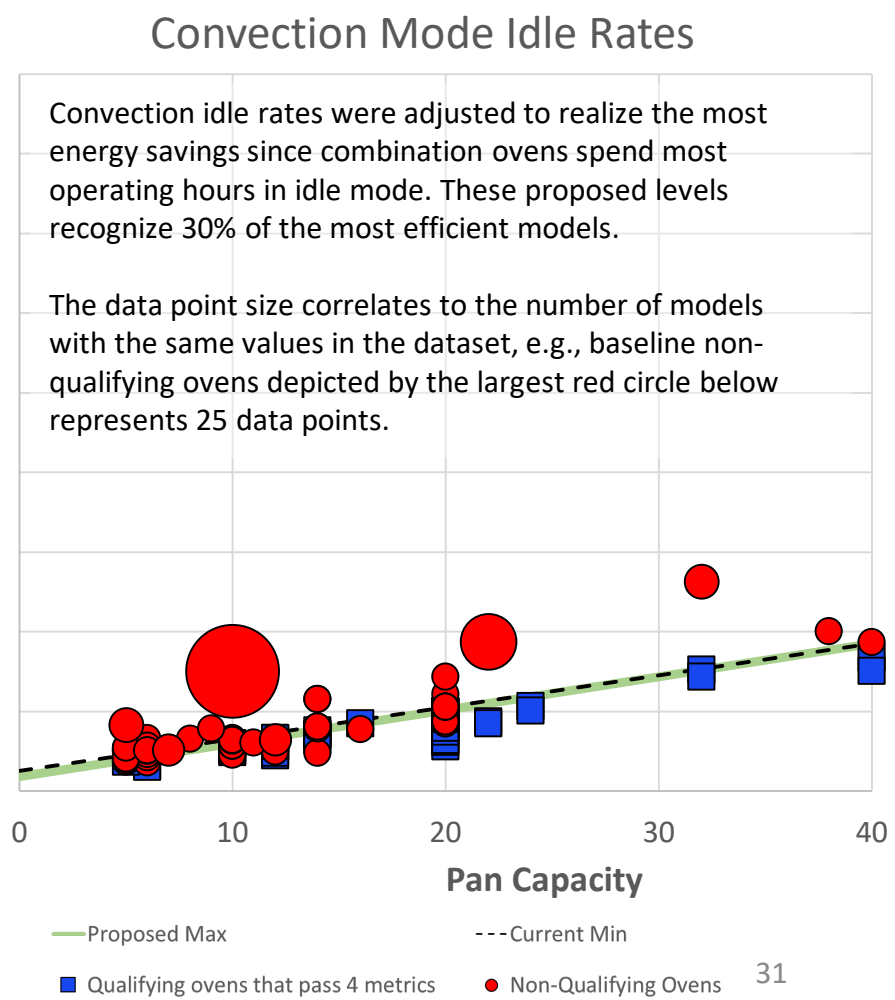


The data point size correlates to the number of models with the same values in the dataset: baseline non-qualifying single gas rack ovens depicted by the largest red circle represents 2 data points and the double gas rack ovens depicted by the largest red circle represents 7 data points.

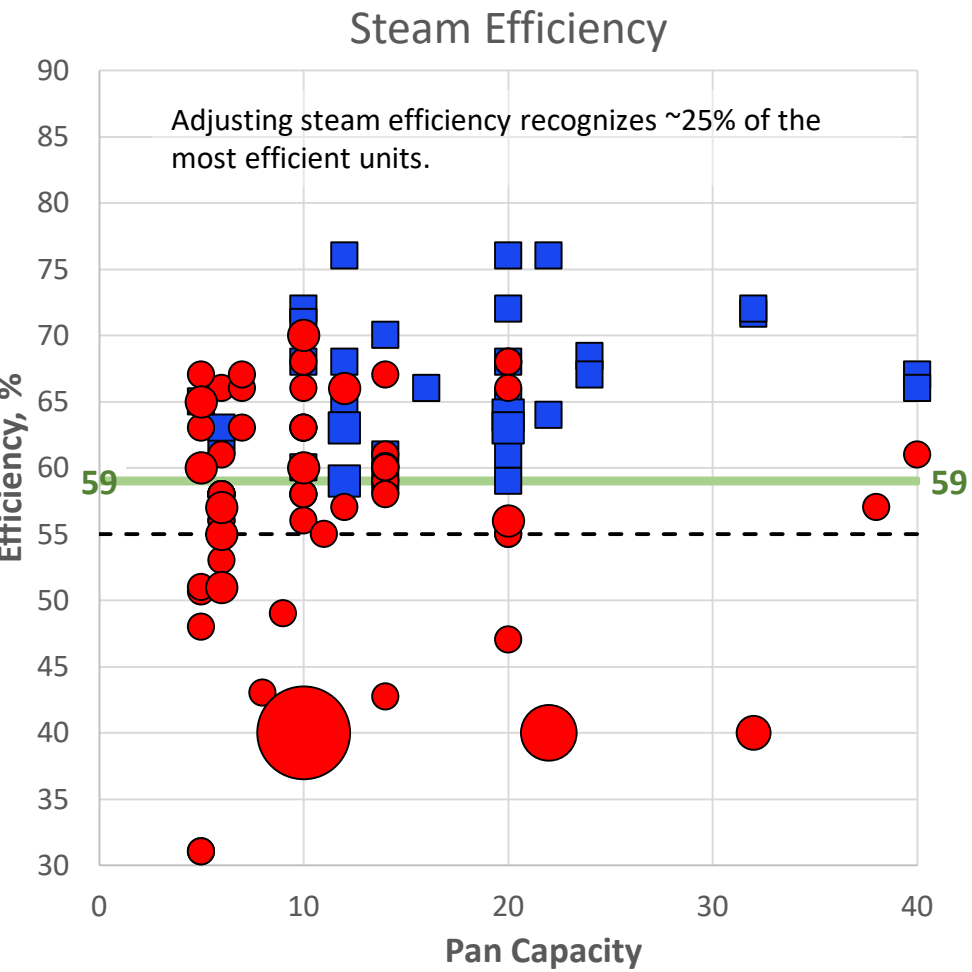
Electric Combi Ovens: Full and Half-Size (5-40 Pan Capacity) Idle Rates

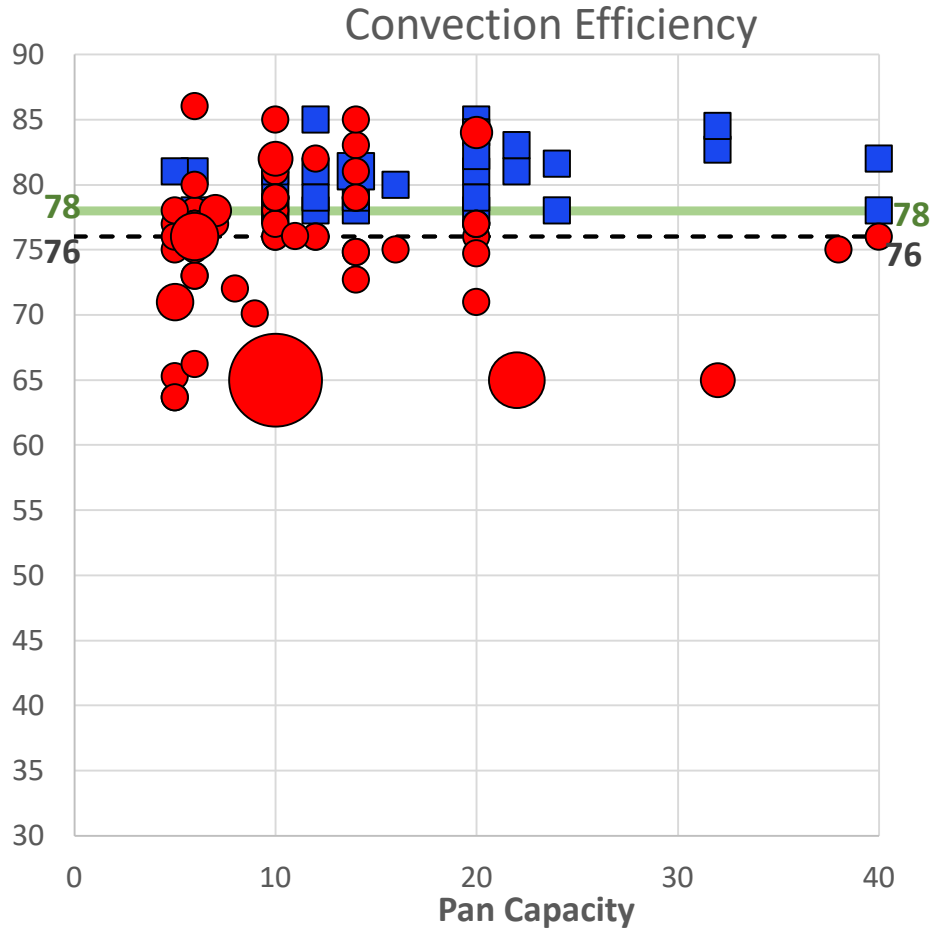
Steam mode idle rates were not adjusted due to stakeholder concerns regarding potential impacts to humidity.
Steam Idle Rate: 0.133P+0.6400
Proposed Convection Idle Rate: 0.0835P+0.36





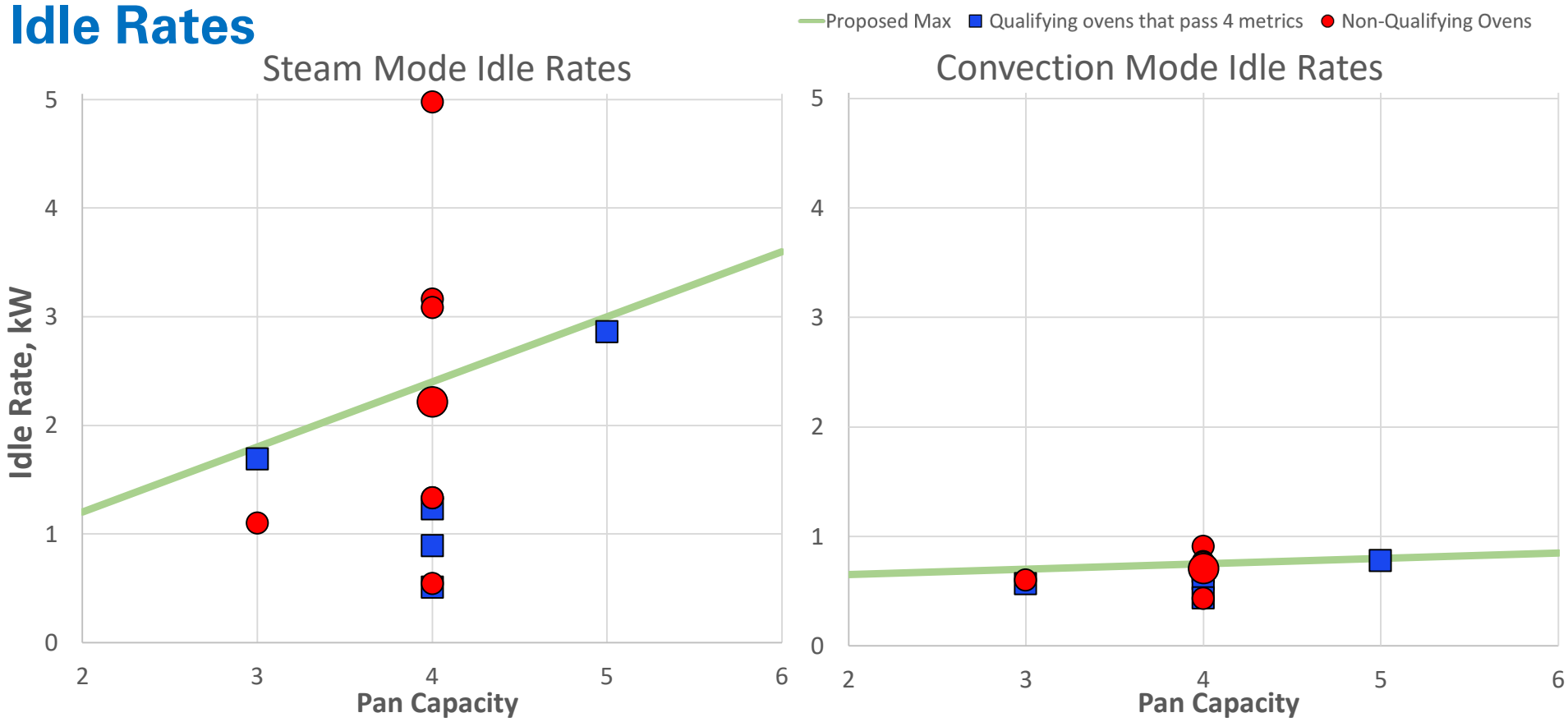
Electric Combi Ovens: Full and Half-Size (5-40 Pan Capacity) Efficiencies





Proposed Min
Current Min
Qualifying ovens that pass 4 metrics
Non-Qualifying Ovens

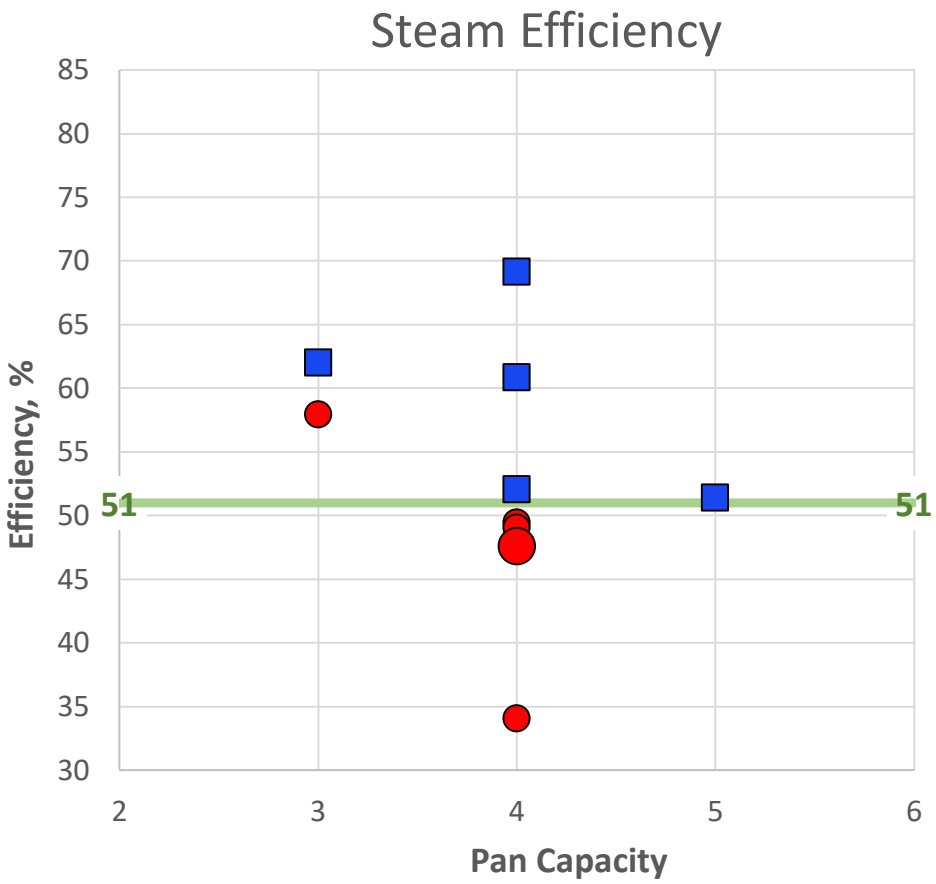
Electric Combi Ovens: Half-Size (3-4 Pan) and 2/3-Size Idle Rates

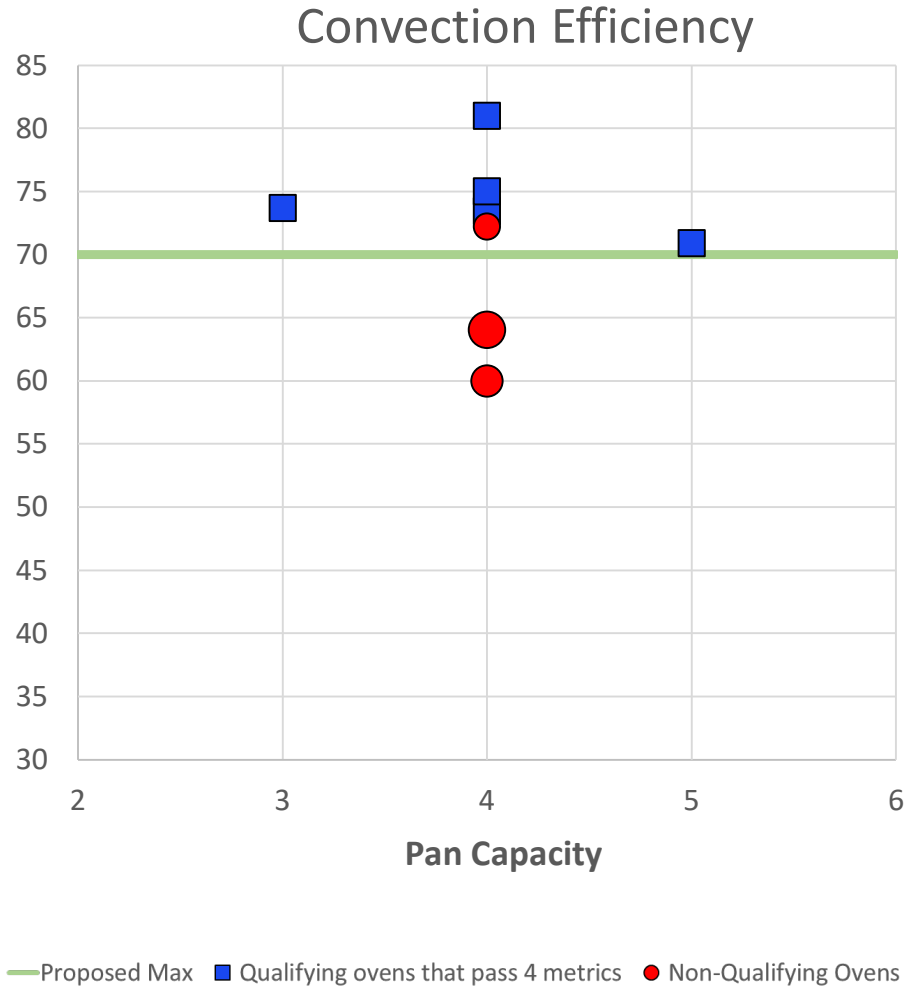


The new scope expansion of smaller electric combination ovens 3-4 pan capacity were binned with 2/3- size electric combination ovens based on similar performance, size, and production capacities.

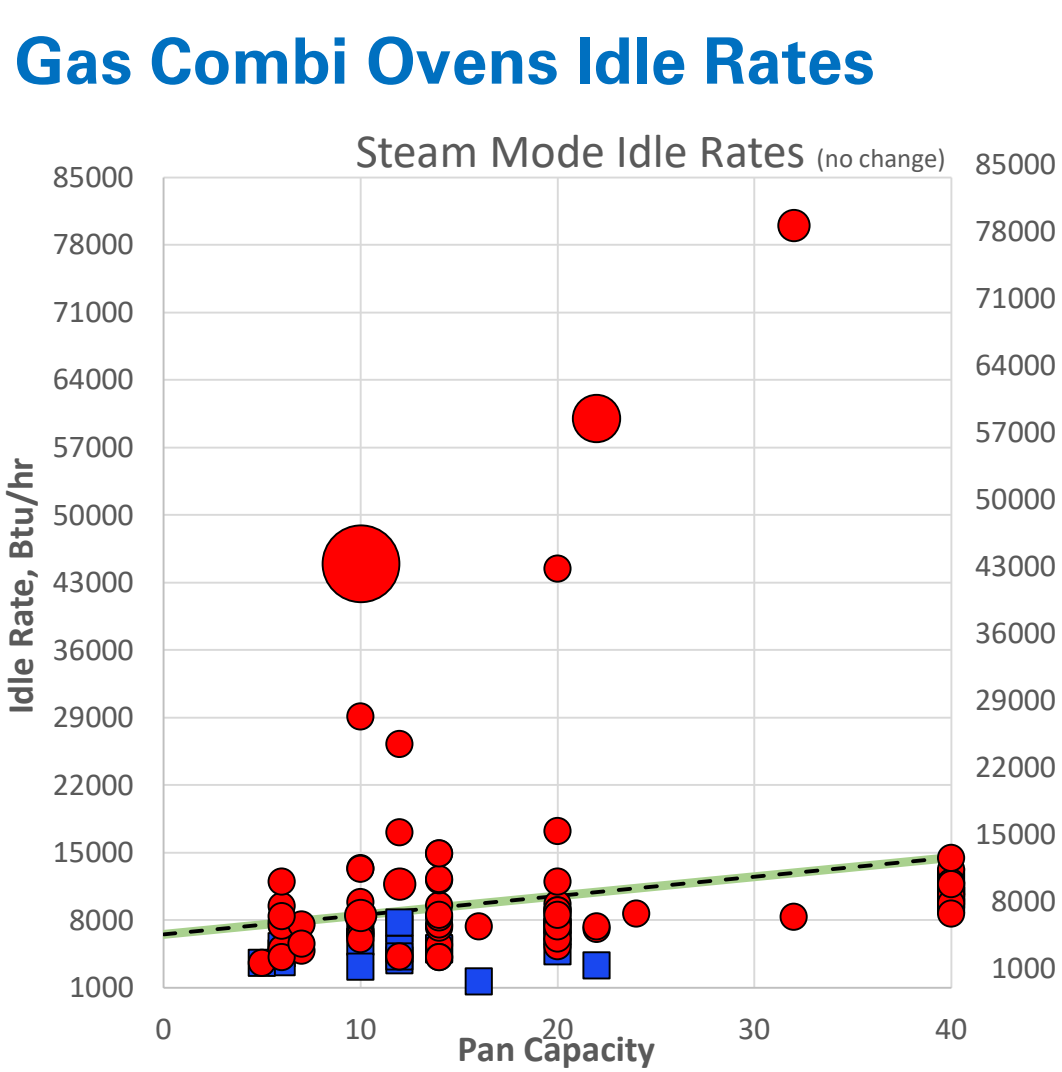
This binning allowed greater consumer choice in pan size and manufacturer brands rather than aggregating these models with the 5-40 pan capacity models. These proposed levels recognize 31% of the most efficient models.
Proposed Steam Idle Rate: 0.6P
Proposed Convection Idle Rate: 0.05P+0.55

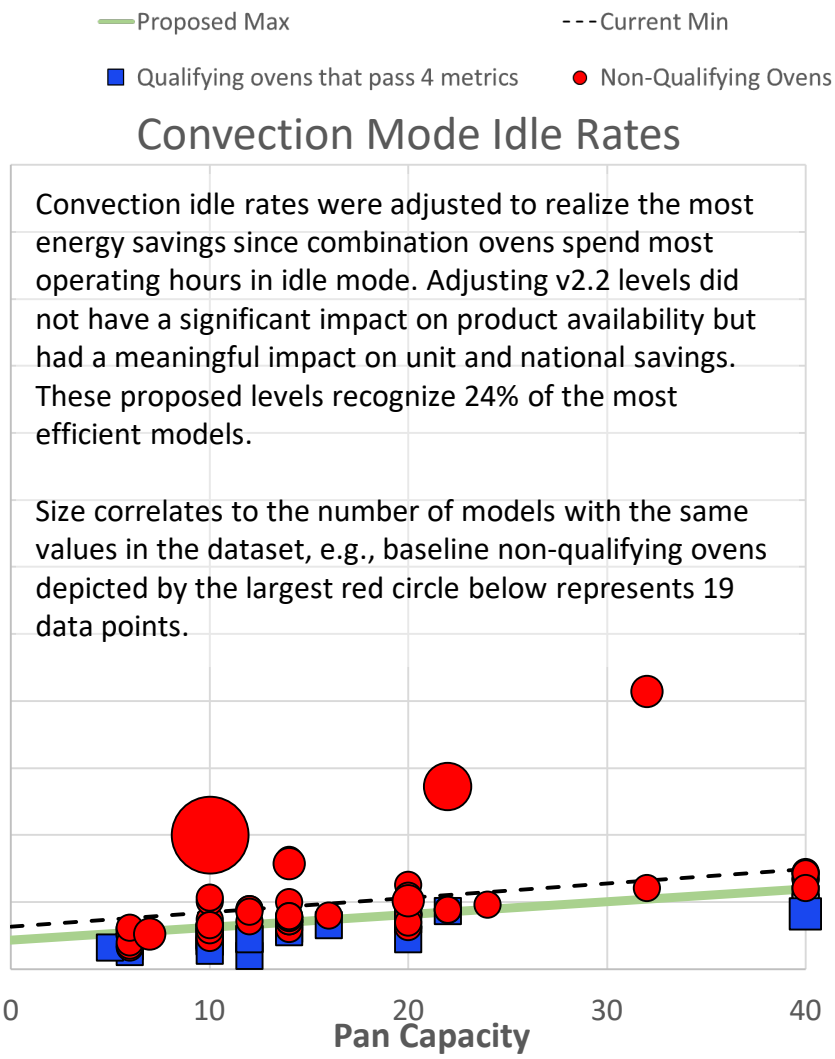
Electric Combi Ovens: Half-Size (3-4 Pan) and 2/3-Size Efficiencies





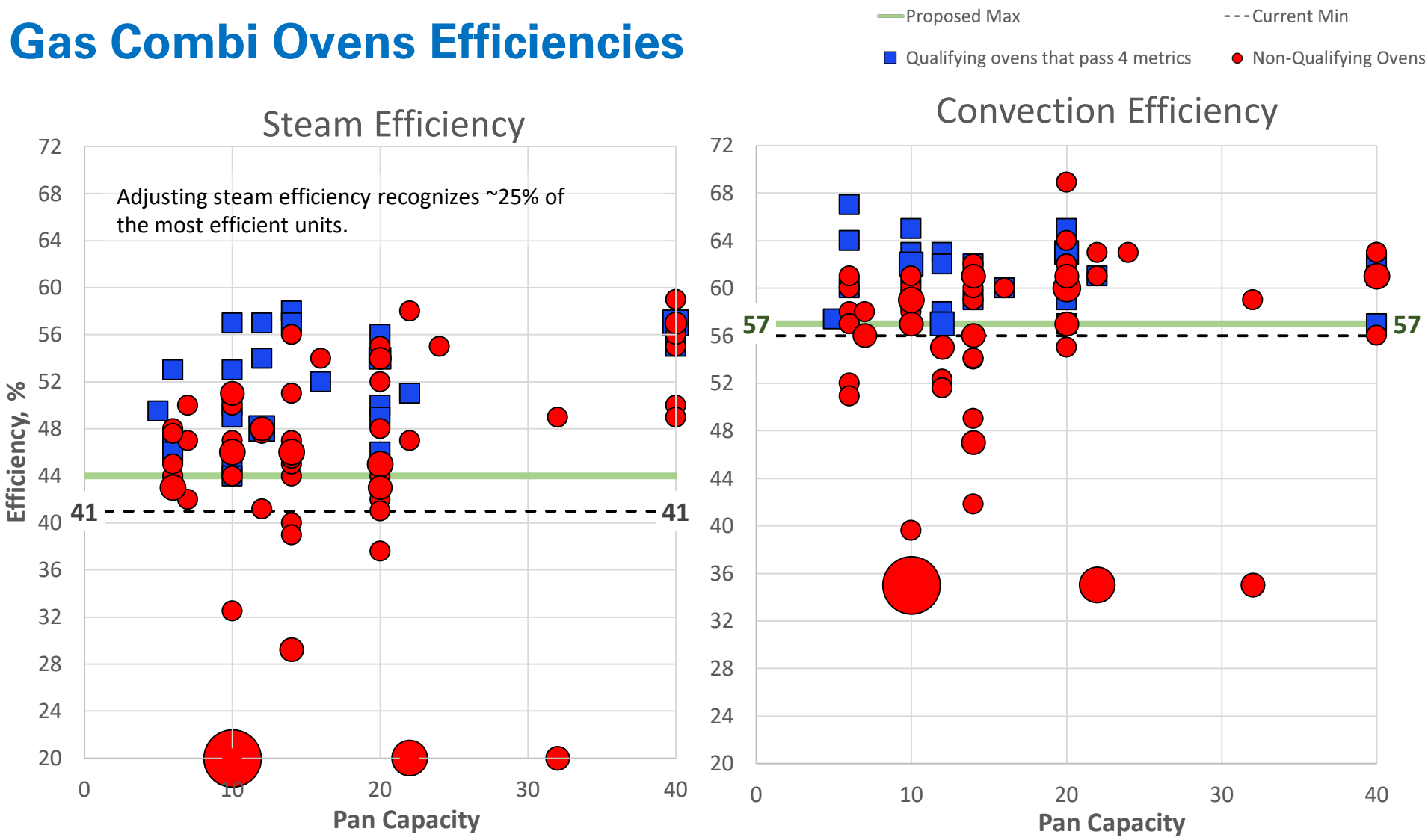
Gas Combi Ovens Idle Rates





Steam mode idle rates were not adjusted due to stakeholder concerns regarding potential impacts to humidity.
Steam Idle Rate: 200P+6511
Proposed Convection Idle Rate: 135P+4000

Gas Combi Ovens Efficiencies



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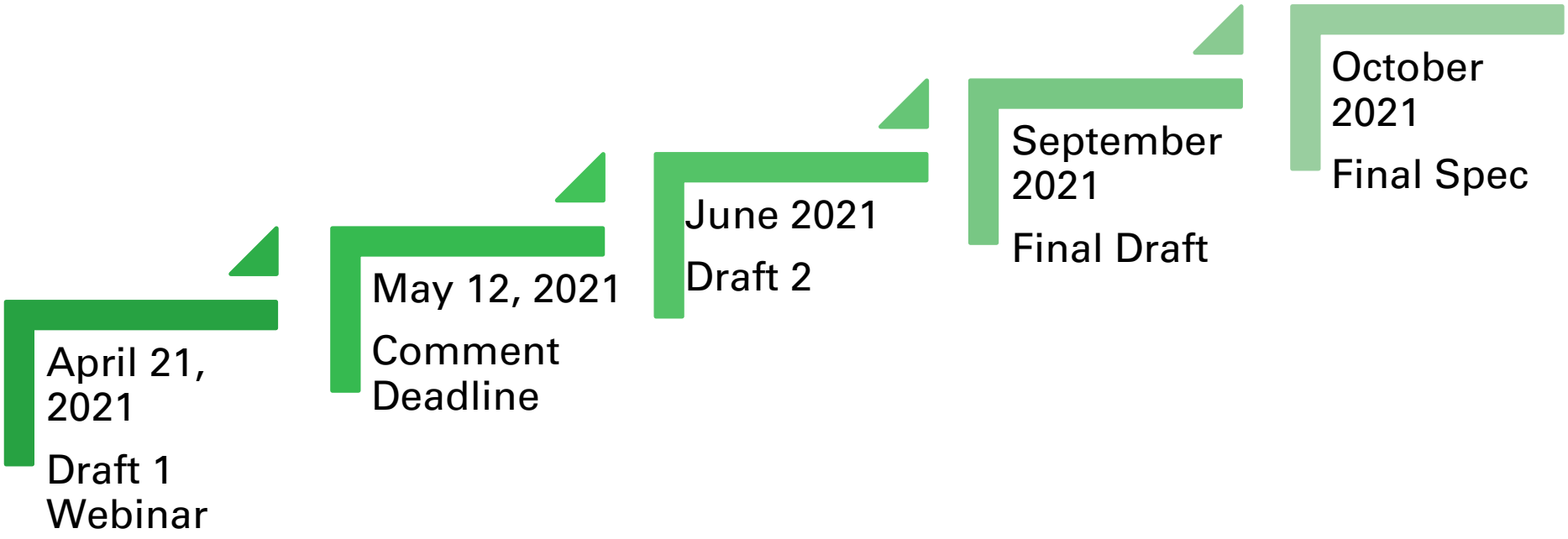
Next Steps



Follow the development process on the product development webpage

Questions

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Stakeholders are encouraged to provide written comments for consideration to cfs@energystar.gov by May 12, 2021.