



ENERGY STAR® Central Air Conditioners & Air-Source Heat Pumps

Draft 1 Version 6.0

Stakeholder Meeting

May 10, 2019





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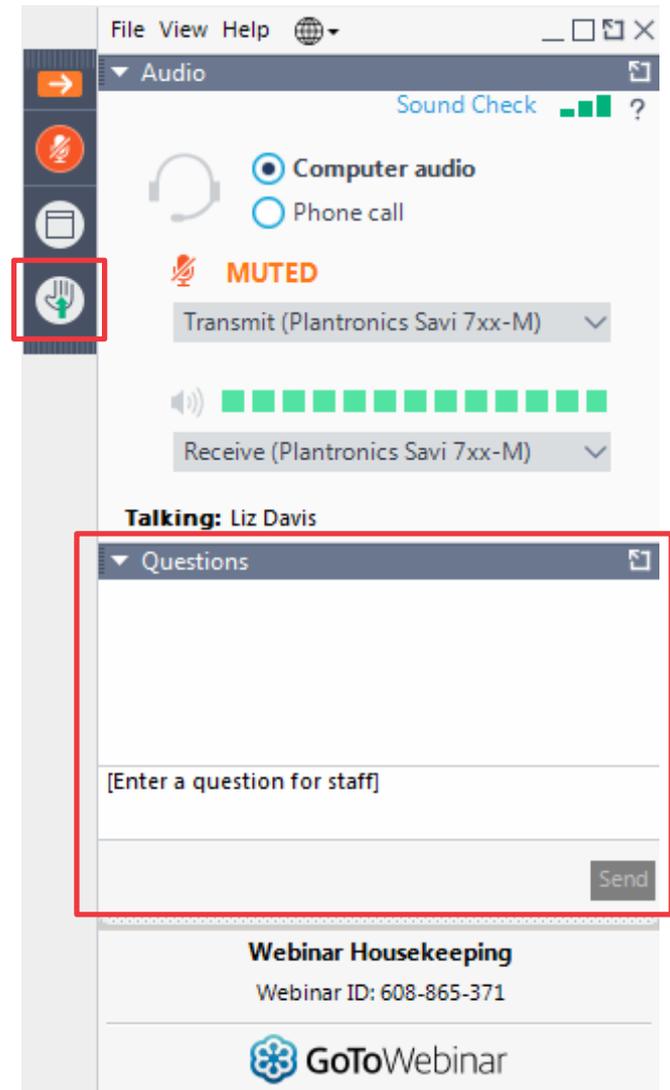
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- Please mute yourself when you are not speaking (use local mute or dial *6)
- Feel free to ask questions at any time
- Please be advised this webinar is being recorded

Please send written comments to CAC-ASHP@energystar.gov by **May 23, 2019**





Meeting Agenda

1. Introductions and Background
2. CAC/ASHP Revision Drivers and Goals
3. Staged or Variable Capacity Capability
4. Climate Differentiated Requirements and Labeling
5. Connected Capability
6. Closeout: Summary, Next Steps, Q&A



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Introductions

Abigail Daken

U.S. Environmental Protection Agency

Antonio M. Bouza

U.S. Department of Energy

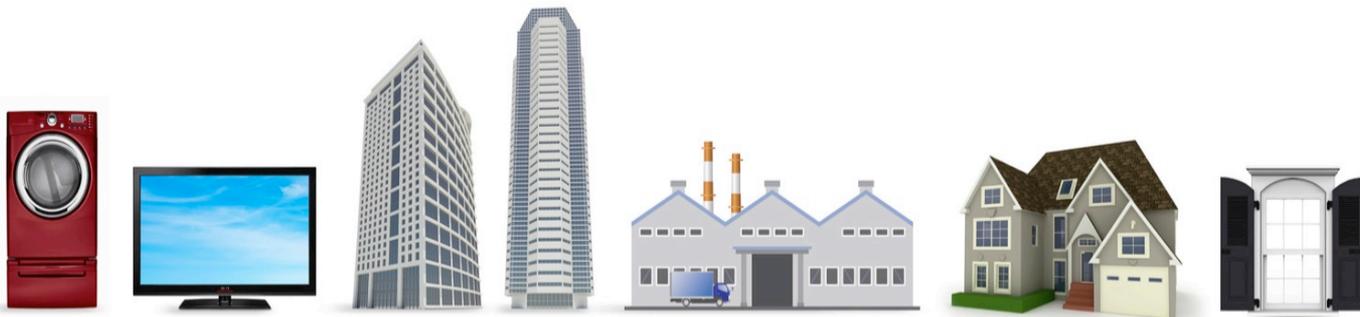
Meeting Attendees



ENERGY STAR is the simple choice for energy efficiency.

EPA's ENERGY STAR identifies the most energy-efficient **products**, **buildings**, **plants**, and **new homes** – all based on the latest government-backed standards.

Today, every ENERGY STAR label is verified by a rigorous third-party certification process.





Brand Preference and Loyalty



MORE THAN
90%
RECOGNIZE THE
ENERGY STAR® LABEL



NEARLY
85%
UNDERSTAND
WHAT IT MEANS

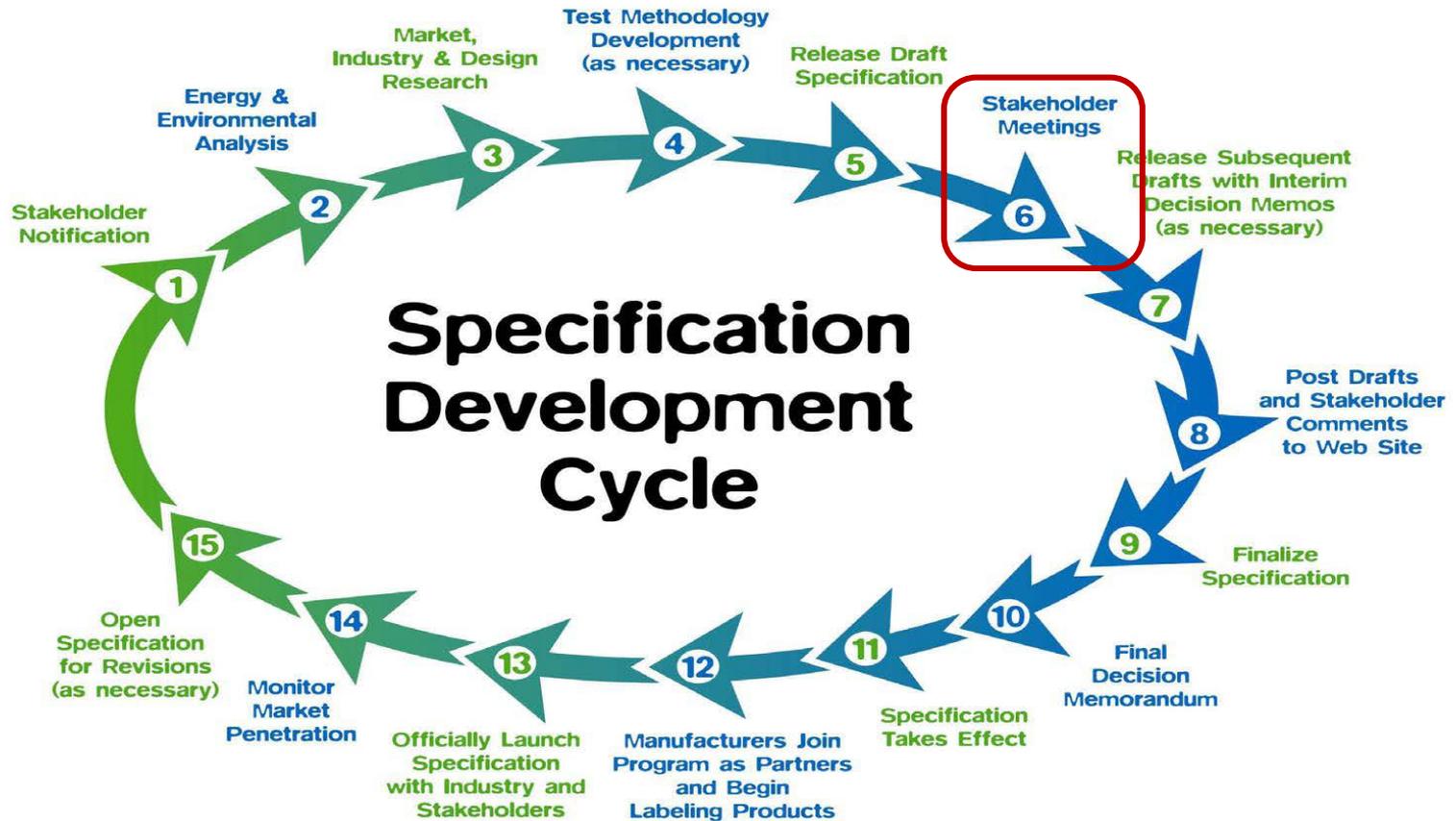


IN THE PAST YEAR,
45%
PURCHASED ENERGY
STAR-LABELED PRODUCTS





Specification Revision Process





ENERGY STAR Guiding Principles

- ✓ 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 and 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





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Revision Drivers

- Time to take another look – Version 5.0 effective 2015
- The usual design, installation, and maintenance problems – anything that can help?
- Market changes
 - Increased interest in electrification → interest in and availability of cold climate optimized heat pumps
 - Increased prevalence of dual capacity units for increased comfort
- Developing consensus around grid services through CAC/ASHP



Revision Goals

1. Address oversizing, increase consumer comfort and contractor excitement about label
2. Help programs and consumers identify heat pumps appropriate for their climate
3. Connected criteria



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Staged & Variable Capacity

“Units must be capable of operating at two or more capacities.”

- Intended to include all methods of providing more than one cooling capacity
- Staged capacity can compensate for oversizing of the equipment and provide better consumer comfort



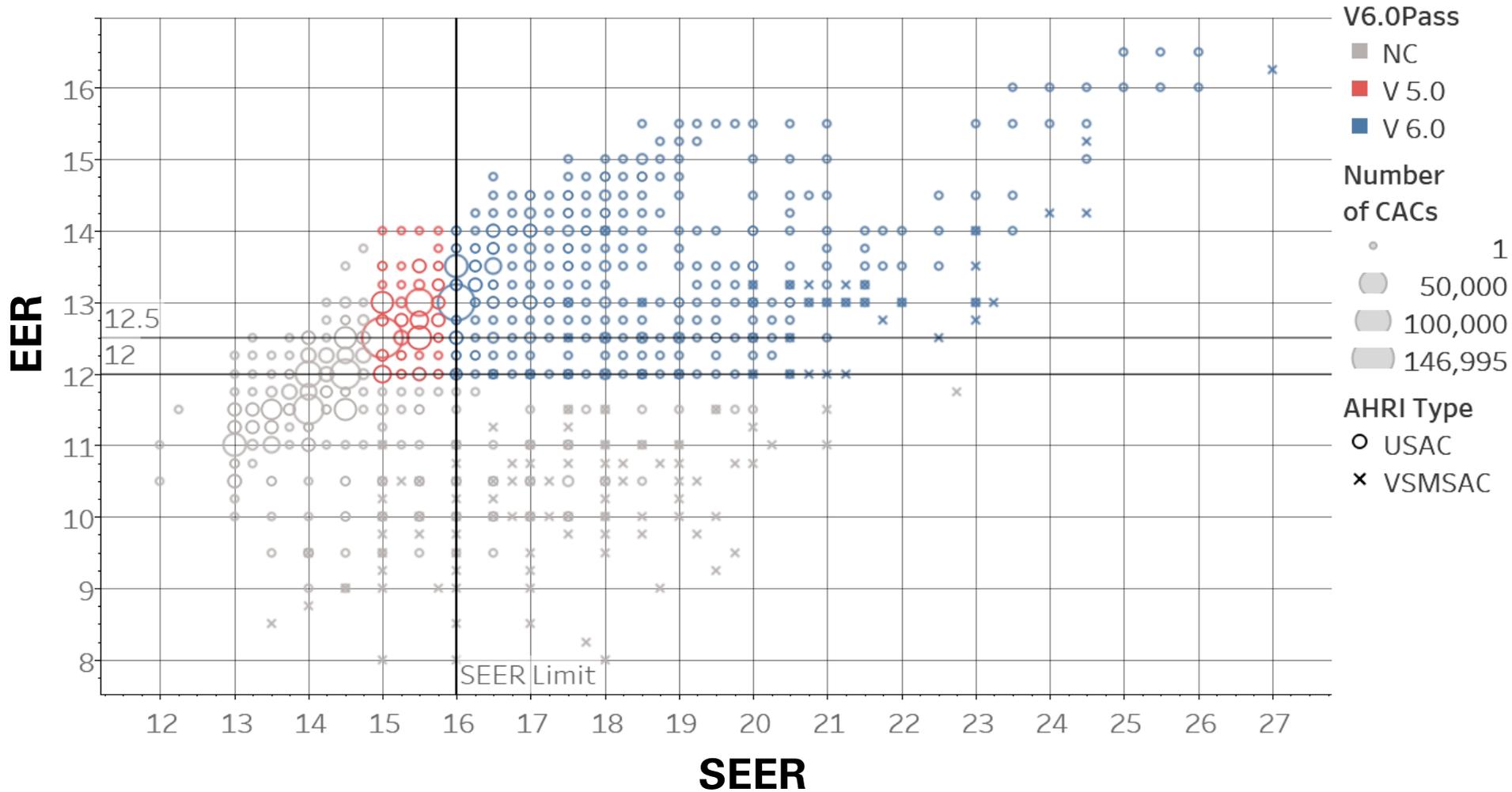
Staged & Variable Capacity

- SEER criteria raised to 16 across product types to reflect rating of two stage units
- No other changes proposed to CAC requirements

Product Type	SEER	EER
CAC Split Systems	≥ 16.00	≥ 12.50
CAC Single Package Equipment	≥ 16.00	≥ 12.00

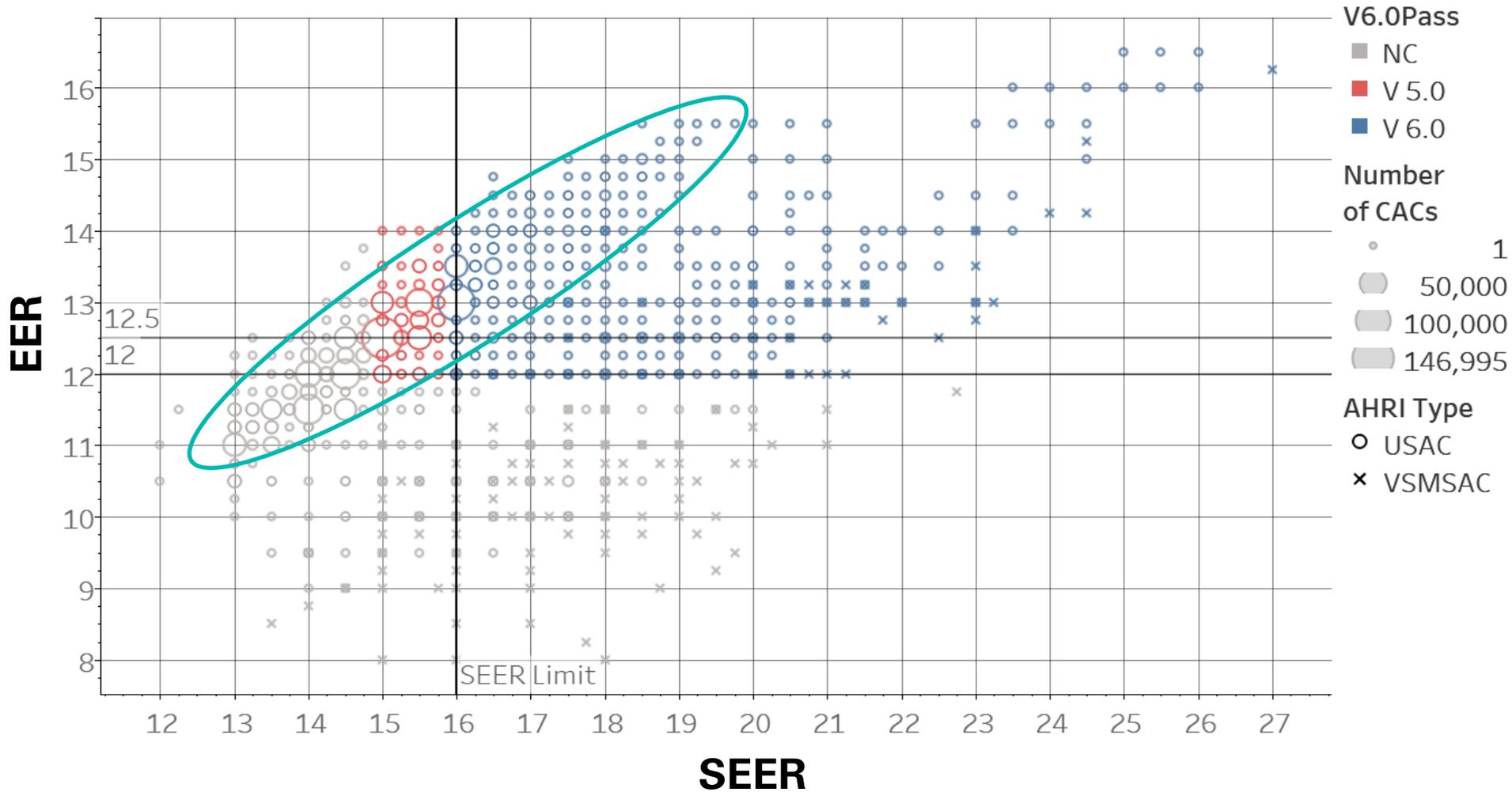


CAC Product Availability Based on SEER & EER





Estimating fixed capacity systems





Staged & Variable Capacity – Questions for Discussion

1. Are there specific use cases where a single capacity unit provides similar or better efficiency or comfort than a staged capacity unit? How prevalent are they?
2. Should the SEER, EER, and/or HSPF criteria be further modified to reflect this requirement?
3. What is the current market share of staged and variable capacity units?
4. Is it straightforward to determine whether units provide 2 or more capacity stages?
5. Is the requirement as written clear and without loopholes?



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Climate Differentiated ASHP Requirements

- Moderate and hot climate: 16 SEER is the only change, to reflect staged or variable capacity requirement

Product Type	Moderate & Hot Climate		
	SEER	EER	HSPF
ASHP Split Systems	≥ 16.00	≥ 12.50	≥ 8.50
ASHP Single Package Equipment	≥ 16.00	≥ 12.00	≥ 8.20



Climate Differentiated ASHP Requirements

- Cold climate: Higher HSPF and lower EER
- Additional criteria to confirm cold weather performance:
 - COP @ 5 °F: Harmonized with NEEP ccASHP Specification
 - Percentage of Heating Capacity: Minimize use of electric resistance backup

Product Type	Cold Climate				
	SEER	EER	HSPF	COP @ 5°F	Percentage of Heating Capacity @ 5°F
ASHP Split Systems	≥ 16.00	≥ 11.50	≥ 9.00	1.75	80%
ASHP Single Package Equipment	≥ 16.00	≥ 11.00	≥ 9.00	1.75	80%

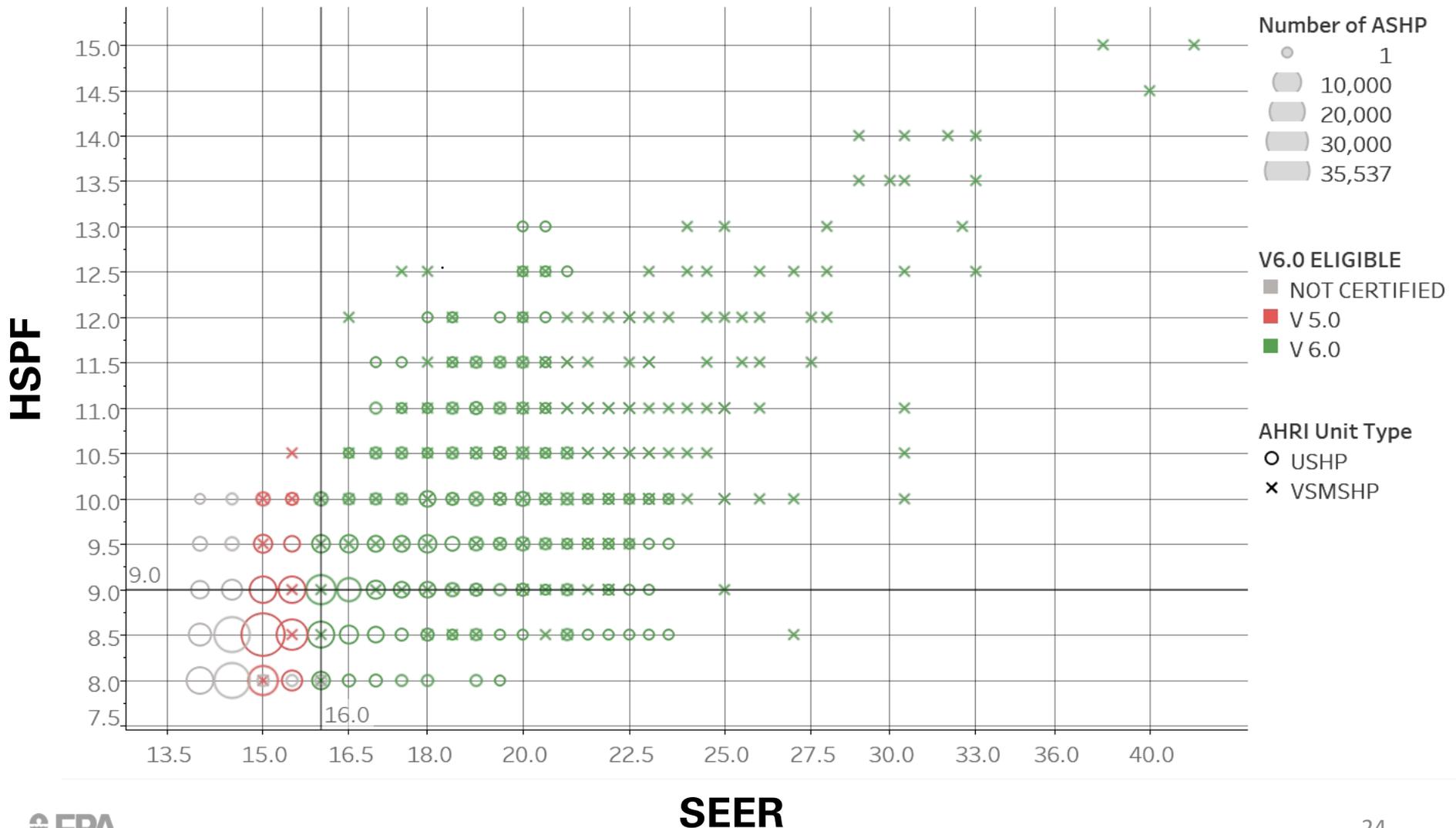


Cold Climate ASHP – Test Method/Definitions

- 5 degree test point conditions as described by Appendix M1
- Full compliance with Appendix M1 and SEER2, HSPF2, etc. metrics **will not be required** before 2023
- Definitions:
 - COP: definition per 10CFR
 - Percentage of Heating Capacity @ 5°F: The capacity of a given unit as measured under the conditions defined by Appendix M1 at 5°F, divided by the heating capacity as measured per Appendix M at 47°F, expressed as a percentage.

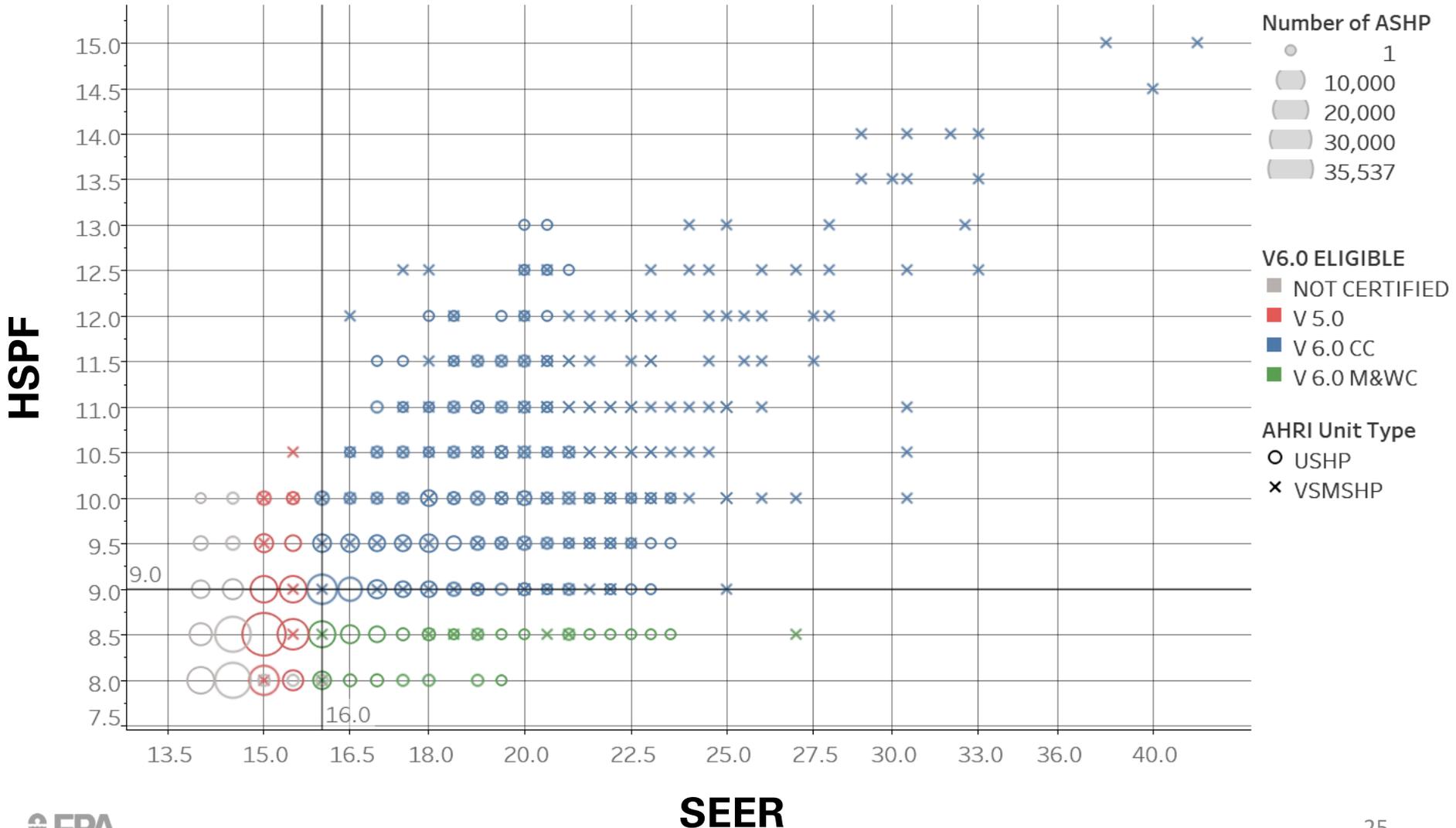


ASHP Availability based on SEER, HSPF, EER





ASHP Availability based on SEER, HSPF, EER





Climate Differentiated ASHP Labeling

- Proposed label: certification mark with the words “Cold Climate” or “Moderate and Hot Climate”
- Evolved from regional label for furnaces
- Manufacturers ensure the correct label is on the correct product, can sell product anywhere
- Advantages:
 - Refers to performance of the equipment, not the location of install
 - Very flexible: programs, contractors, and consumers decide which climate is most appropriate
- Could use state-based label more like the [furnace label](#), but implies that state is sole determinant of climate

ASHPs Climate Differentiated Requirements – Questions for Discussion

1. Is there an argument for a label more like the furnace label?
2. Are there additional regional concerns that could be addressed with this form of specification?
3. Is the DOE test condition at 5 degrees standardized and available in third party certification test labs?
4. Will the COP and Percentage Heating requirements be met by an adequate share of units on the market today?





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Connected Criteria: ENERGY STAR Practice

- Criteria are **optional** – units will be recognized as having “Connected” functionality
- In most ENERGY STAR specs: **connected criteria = user amenity + grid services**
 - Adjusted as appropriate to each product category
 - User amenity also includes supporting integration into a home energy management system, open standards, energy reporting
- Where possible, **DR responses are tested and certified**
 - DOE leads test method development



Connected Criteria: Specific to CAC/ASHP

- This slide reflects our *current thoughts* – stay tuned for an actual proposal with Draft 2
- At least for variable capacity equipment, controllers can be included in product evaluated for connected
- Communication requirements are intended to harmonize with AHRI 1380 (now published)
- More emphasis on grid services, but interested in user amenity too:
 - Energy reporting
 - Fault reporting (cognizant of ENERGY STAR Most Efficient Criteria)



Connected Criteria – Questions for Discussion

1. How can Connected units with third party controllers be characterized by ENERGY STAR?
 - What proportion of dual-capacity units are installed with proprietary controllers?
 - What are the consumer advantages of proprietary controllers for dual-capacity units? Data please!
2. What is the timeline for AHRI 1380 certification to be set up?
3. Are there metrics that should be highlighted in the QPL beyond recognition as “Connected”? (e.g. on-premise VEN or CTA-2045 port)
4. Are there any market actors using standards other than OpenADR or CTA-2045? Intending to use other standards?



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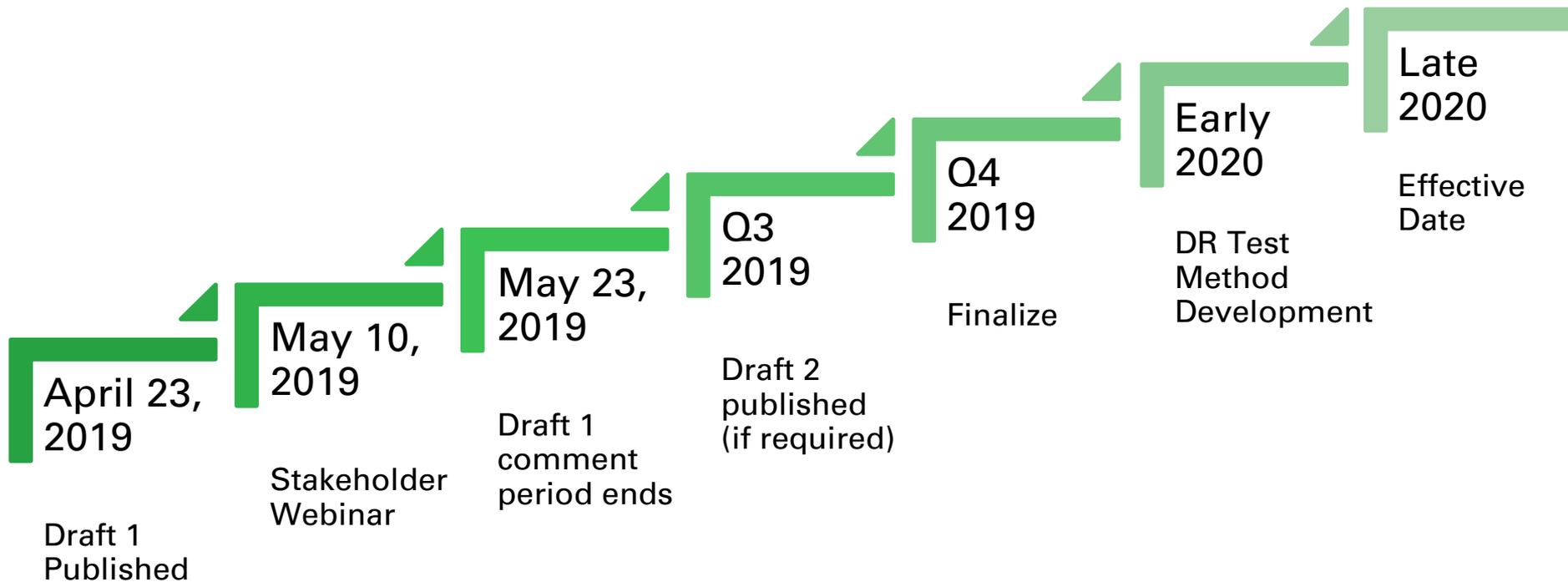


Summary of Proposed Changes

- Require 2 or more capacities
- Add two definitions, and refer to Appendix M1 for 5°F testing
- Climate differentiated labeling for ASHPs
- Updates to criteria to reflect capacity requirements and climate differentiation
- Coming soon...optional connected criteria



Anticipated timeline for revision





Questions

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Stakeholders are encouraged to provide written comments for EPA consideration to CAC-ASHP@energystar.gov by May 23rd, 2019.