Draft 1 Versions 6.0 & 7.0 ENERGY STAR® Room Air Conditioners Specification

Stakeholder Webinar - December 16, 2024

United States Environmental Protection Agency

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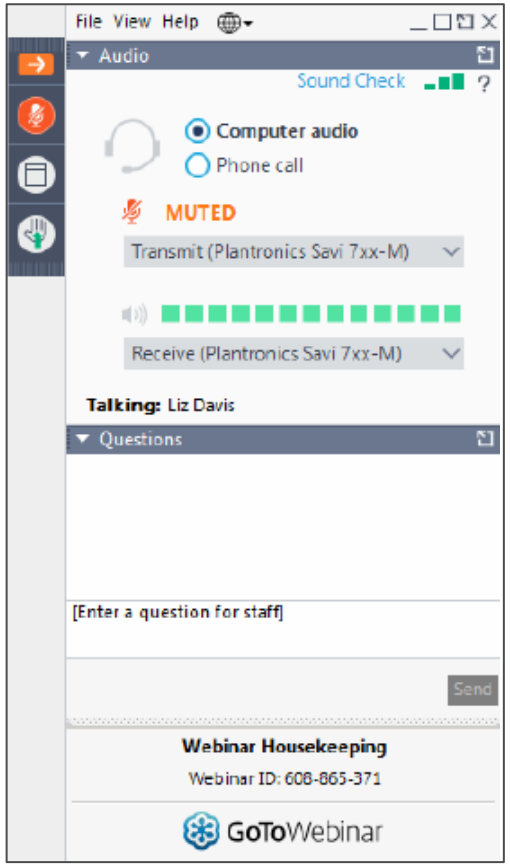

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Introductions

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What is ENERGY STAR?

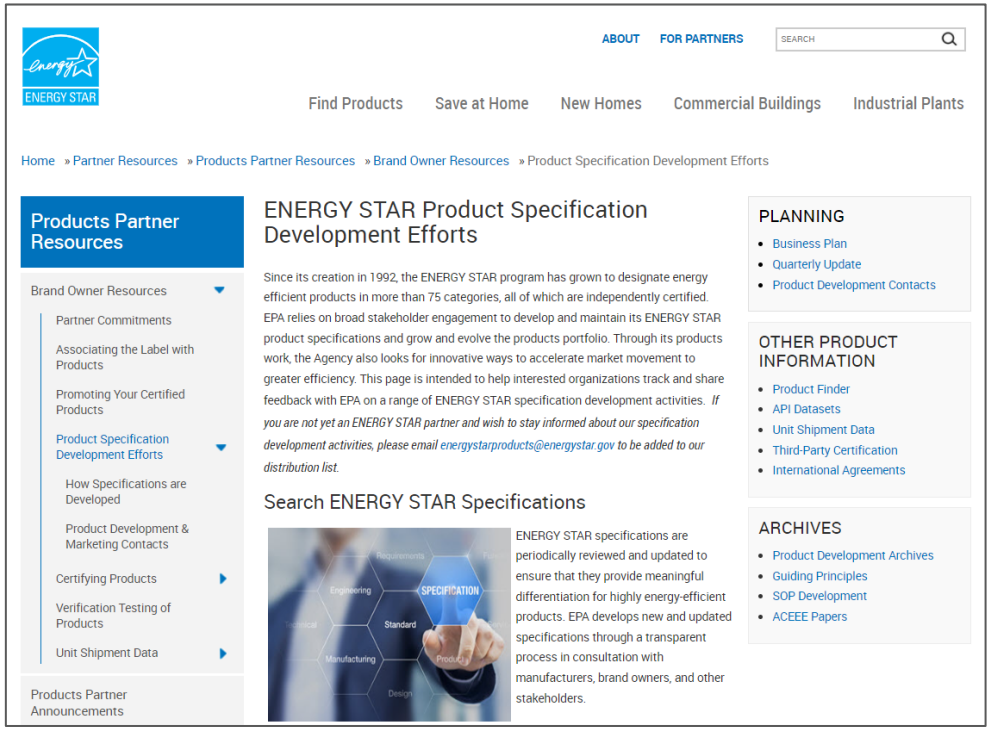
The simple choice for energy efficiency.

- 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**

Specification Development

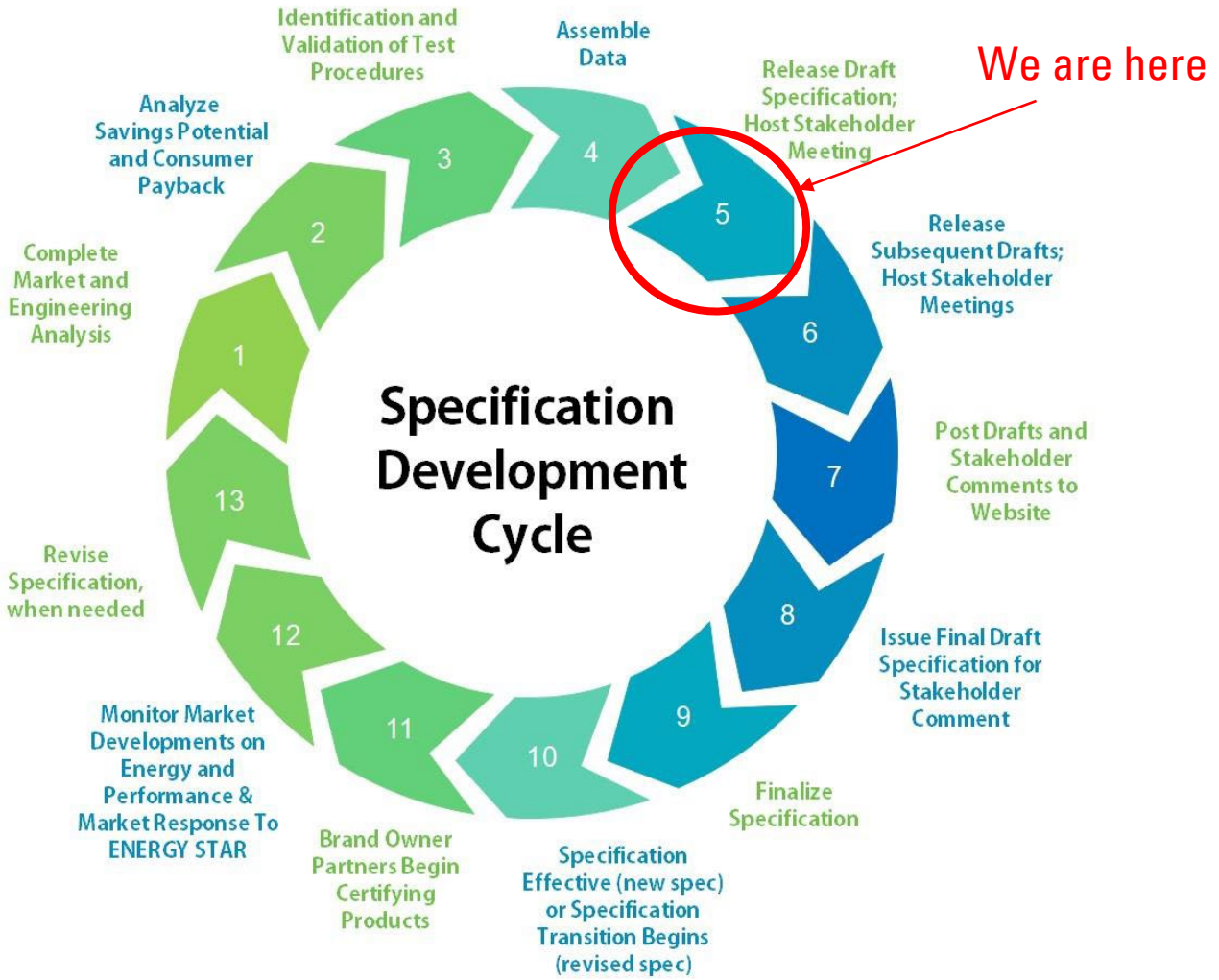
- ENERGY STAR follows EPA's Standard Operating Procedure through the specification development or revisions process, balancing:
  - The need to keep pace with evolution among leading products and continue to effectively differentiate for consumers
  - Production cycles, other factors important to the industry

- Key elements of the stakeholder process:
  - Consistency, transparency, inclusiveness, responsiveness, and clarity
  - Stakeholder engagement is a vital aspect to the success of the ENERGY STAR program



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

Specification Development Cycle



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Meeting Agenda

1. Background & Drivers
2. Market Assessment
3. Scope
4. Proposed Levels
5. Savings & Payback
6. Request for Feedback
7. Timeline & Open Discussion

Background

- ENERGY STAR Room Air Conditioners (RACs) V5.0 specification effective October 30, 2023
- New DOE MEPS effective in May 2026
  - Large increase in cooling efficiency requirements, greater than ES V5.0
  - Does not include heating efficiency requirements for room heat pumps (RHPs)
- The ENERGY STAR Test Method to Determine Room Air Conditioner Heating Mode Performance was finalized in July
  - Developed with the DOE in response to several new RHP models that can operate at cold temperatures
- Inflation Reduction Act (IRA) HER/HOMES rebates require ES-certified heating performance for RHPs to qualify
- The Consortium for Energy Efficiency (CEE) finalized their RHP initiative in early December
  - Will qualify eligible RHPs for IRA 25C tax credits
  - Specifies heating mode performance requirements using the new ENERGY STAR test method

ENERGY STAR Heating Mode Test Method

Established the following (July 2024):

- RHP Types
  - Type 1: RHP that does not have active defrost or for which the specified compressor cut-in and cut-out temperatures are not both less than 40°F
  - Type 2: RHP that has active defrost and for which the specified compressor cut-in and cut-out temperatures are both less than 40°F but not both less than 17°F
  - Type 3: RHP that has active defrost and for which the specified compressor cut-in and cut-out temperatures are both less than 17°F but not both less than 5°F
  - Type 4: RHP that has active defrost and for which the specified compressor cut-in and cut-out temperatures are both less 5°F
- Heating Energy Efficiency Ratio (HEER)
- Heating mode test conditions

Rationale

Version 6.0 Rationale:

- Establish heating mode criteria for RHPs to qualify certified products for IRA rebates
  - Reference new ENERGY STAR test method
  - Ensure acceptable cold climate performance for states with programs in the north
  - Provide clear targets for manufacturers developing new RHP models
- Developed based on the current/near-future market and current DOE standards
  - No change in cooling mode criteria, given the recent effective date of V5.0

Version 7.0 Rationale:

- Update cooling efficiency requirements to establish savings above the 2026 DOE standards
- Adjust heating mode performance requirements based on anticipated model redesign in response to increases in cooling criteria
- Provide long lead time for manufacturers to prepare for changes

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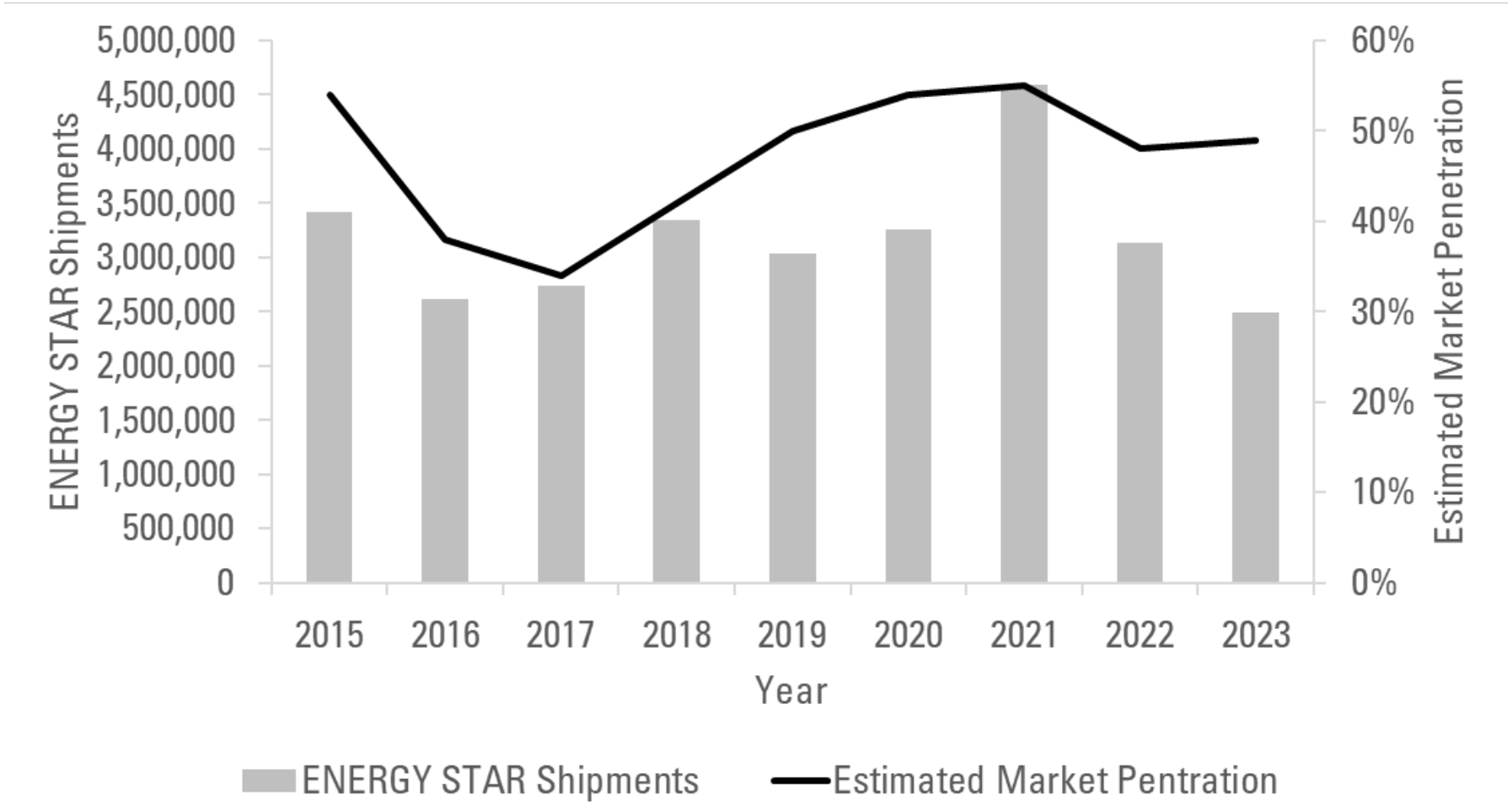

Scope

- Included Products
  - Products that meet the DOE definition of a RAC are eligible for ENERGY STAR certification under this specification, with the exception of products listed below.
- Excluded Products
  - Products that are covered under other ENERGY STAR product specifications are not eligible for certification under this specification. The list of specifications currently in effect can be found at www.energystar.gov/specifications.
  - Packaged terminal air conditioners and packaged terminal heat pumps
  - Portable air conditioners

V6.0 & V7.0 Heating Mode Requirements

*Heating mode requirements only apply to reverse-cycle RACs (RHPs) in product classes 11-14

Version 6.0

Room Heat Pump Type	V6 HEER (Btu/Wh)	COP at 5°F	COP at 17°F	Capacity at 5°F/47°F	Capacity at 17°F/47°F
1	5.1	-	-	-	-
2	5.1	-	-	-	-
3	6.8	-	1.5	-	70%
4	6.8	1.5	-	70%	-

Version 7.0

Room Heat Pump Type	V7 HEER (Btu/Wh)	COP at 5°F	COP at 17°F	Capacity at 5°F/47°F	Capacity at 17°F/47°F
1	5.8	-	-	-	-
2	5.8	-	-	-	-
3	8.3	-	1.75	-	70%
4	8.3	1.75	-	70%	-

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V7.0 Cooling Mode Requirements

Product Category	DOE Product Class	ES V7 CEER
Without Reverse Cycle	1	14.4
	2	15.1
	3	17.6
	4	17.6
	5a	15.2
	5b	14.5
	6	14.1
	7	14.1
	8a	15.5
	8b	15.3
	9	15.1
	10	15.2

Product Category	DOE Product Class	ES V7 CEER
With reverse cycle	11	15.1
	12	14.4
	13	14.4
	14	13.4
Casement Only	15	15.3
Casement Slider	16	16.8

Note: V7.0 proposes CEER requirements 10% greater than the 2026 DOE MEPS for non-reverse cycle RACs and 5% greater for reverse-cycle RACs (RHPs). V6.0 CEER requirements are unchanged from V5.0 for all RAC product classes.

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Assumptions

- Heating savings calculated from baseline electric resistance heating
  - 2020 Residential Energy Consumption Survey (RECS) data used to isolate homes with space heaters or built-in electric units as primary heating equipment
  - Baseline heating electricity use determined per unit for homes in climate zones corresponding to Types 1, 2, 3, and 4 room heat pump operating conditions
- Baseline equipment (minimum efficiency reverse cycle RAC) cost estimates from DOE TSD and ENERGY STAR RHP cost estimates from preliminary discussions with manufacturers
- 9-year product life

V6.0 Savings and Payback – Reverse Cycle RACs (RHPs)

V6.0 Heating Savings and Payback

Product Class 11	Heating Electricity Savings (kWh/yr)	Heating Annual Savings ($/yr)	Total Annual Savings ($/yr)	Baseline Installed Cost ($)	ENERGY STAR Installed Cost ($)	Average Payback (yrs)
Type 1 and 2	276	$40	$75	$514	$550	0.5
Type 3	624	$91	$125	$514	$750	1.9
Type 4	783	$114	$148	$514	$2,500	13.4

Note: V6.0 Total Annual Savings combines the V6.0 heating savings with the cooling savings determined in V5.0. The longer payback for Type 4 RHPs is due to the much lower price of a minimum efficiency reverse cycle RAC, assumed as the baseline equipment for all RHP types. In cold climates, the higher heating loads are typically met by larger centralized equipment that costs significantly more than a typical RAC, in which a comparison to a Type 4 RHP would show improved payback.

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V7.0 Savings and Payback – Non-Reverse Cycle RACs

V7.0 RAC Savings and Payback

Popular RAC Product Classes	DOE Product Class	Cooling Electricity Savings (kWh/yr)	Cooling Annual Savings ($/yr)	Baseline Installed Cost ($)	ENERGY STAR Installed Cost ($)	Average Payback (yrs)
Without Reverse Cycle	1	26	$4	$364	$324	10.5
	2	30	$4	$401	$349	11.7
	3	43	$6	$517	$508	1.5
	4	77	$11	$619	$612	0.6
	5a	120	$17	$700	$689	0.6
	5b	143	$21	$763	$753	0.5
	8a	38	$6	$566	$554	2.2
	8b	59	$9	$558	$540	2.1
	9	71	$10	$704	$682	2.2

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V7.0 Savings and Payback – Reverse Cycle RACs (RHPs)

V7.0 RHP Savings and Payback

Product Category 11	RHP Type	Cooling Electricity Savings (kWh/yr)	Heating Electricity Savings (kWh/yr)	Total Annual Savings ($/yr)	Baseline Installed Cost ($)	ENERGY STAR Installed Cost ($)	Average Payback (yrs)
With Reverse Cycle	Type 1 and 2	29	343	$54	$710	$634	1.4
	Type 3	29	737	$112	$968	$634	3.0
	Type 4	29	925	$139	$3,226	$634	18.7

Note: V7.0 unit costs are based on a combination of interpolated costs from the DOE TSD and V6.0 unit cost estimates; these are purely estimations, as no products currently available for purchase meet these criteria.

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Webinar Wrap-up and Comment Deadline

- EPA appreciates the opportunity to discuss the V6.0 and V7.0 Draft 1 proposals with stakeholders today
- Comments are due on **December 30, 2024**
  - Please send all comments to: HVAC@energystar.gov
  - Unless commenters indicate that written feedback is confidential, all comments will be posted to the Room Air Conditioners Version 6.0 and Version 7.0 product development pages.

Timeline

	Event	Date
V6/V7	Draft 1 Version 6.0/7.0 Specification	November 26, 2024
	Draft 1 Version 6.0/7.0 Webinar	**December 16, 2024**
	Draft 1 Comments Due	December 30, 2024
V6	*Publish Final Draft Version 6.0 Specification*	*January 2025*
	*Publish Final Version 6.0 Specification (Effective Date is 9 months after the published date)**	*January 2025*
V7	*Release Draft 2/Final Draft Version 7.0 Specification*	*Q1 2025*
	*Publish Final Version 7.0 Specification**	*Q2 2025 (Effective Date: May 26, 2026)*

*Manufacturers can early certify their products to the new version as soon as it is finalized

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Open Discussion

Thank you!