



Draft ENERGY STAR Caribbean Program Requirements, Version 3

July 15th, 2019





Agenda

- Current ENERGY STAR Tropics program requirements.
 - Overview.
 - Challenges.
 - Opportunities.
- Proposed ENERGY STAR Caribbean program requirements.
- Savings.
- Comment Period.
- Q&A.



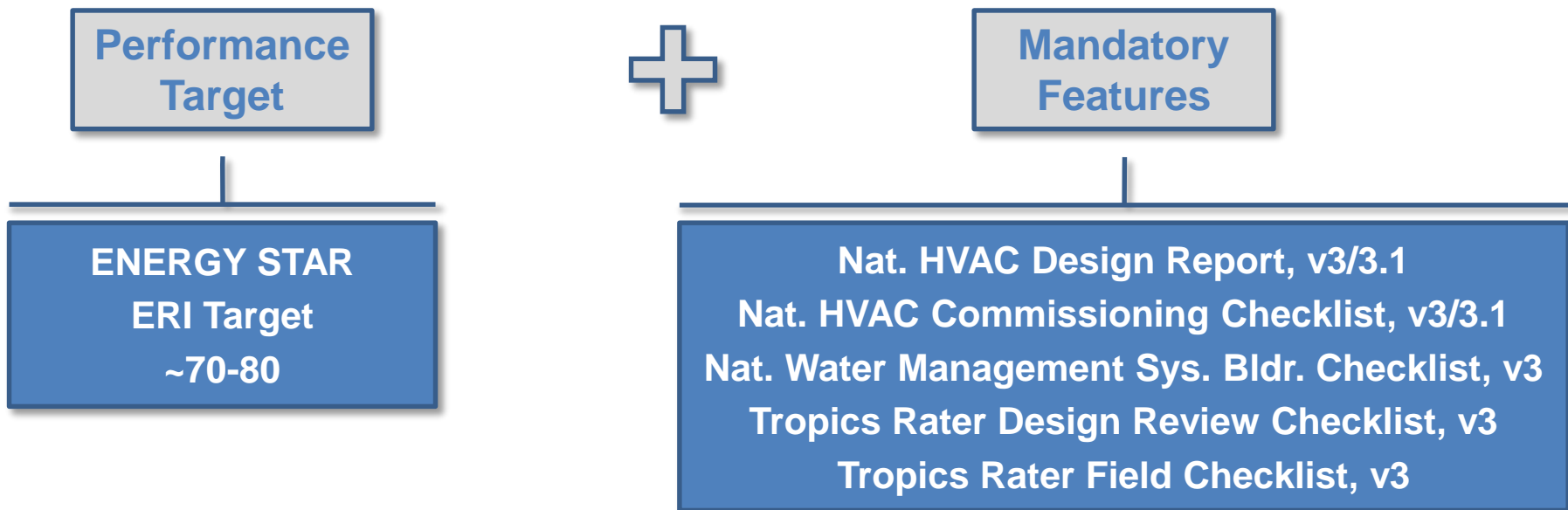
Current Requirements, Overview, Challenges & Opportunities





Current ENERGY STAR Tropics Program Requirements: Overview

- Currently implementing Tropics Version 3 in Hawaii, Puerto Rico, Guam, Northern Mariana Islands, & U.S. Virgin Islands.





Current ENERGY STAR Tropics Program Requirements: Challenges

- Low perceived value of blower door infiltration testing.
- Modeling software not reflective of building types (e.g., homes with living spaces that don't have AC).
- Unique bldg. products (e.g., non-NFRC-rated windows).



Current ENERGY STAR Tropics Program Requirements: Opportunities

- Disaster-relief funding for the islands tied, in part, to efficiency programs, which can drive the adoption of ENERGY STAR.
- A successful ENERGY STAR program would also create a robust rating infrastructure on the islands, enabling related services.
- Because of these opportunities, EPA is proposing revised program requirements that address stakeholder feedback.



Proposed Caribbean Program Requirements

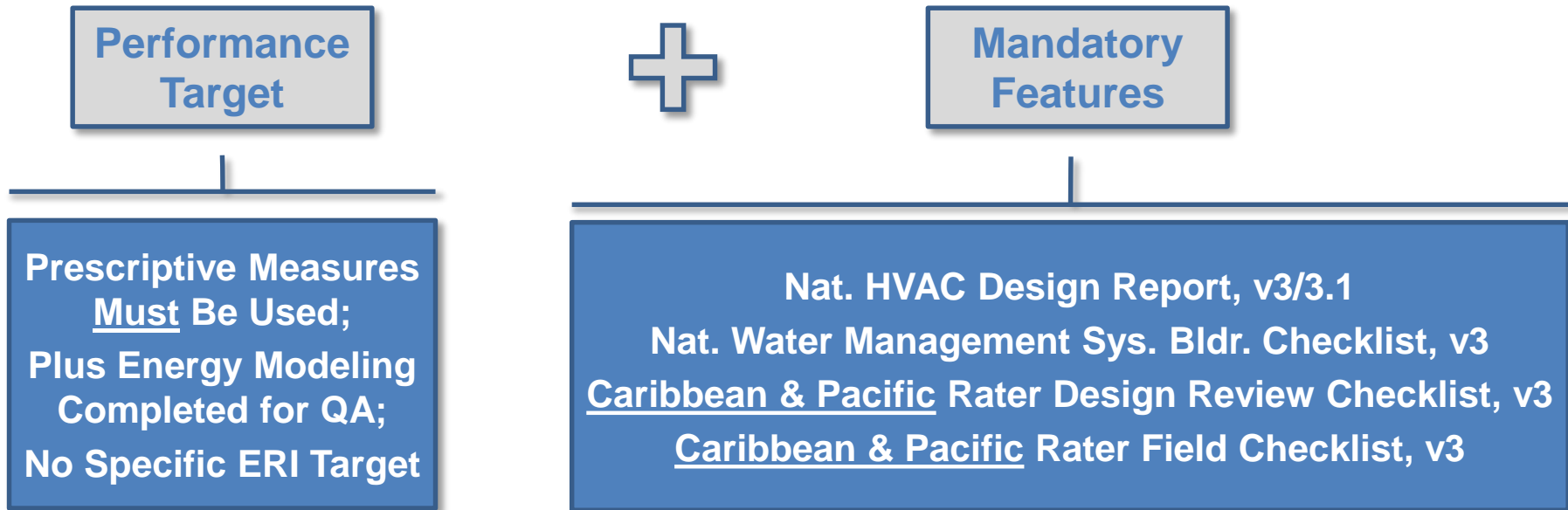


Program Requirements Terminology

- Tropics Program Requirements:
 - Currently applicable to Puerto Rico, U.S. Virgin Islands Hawaii, Guam, and the Northern Mariana Islands.
 - Will be rebranded as the Pacific program requirements and limited for use in Hawaii, Guam, and the Northern Mariana Islands.
 - No other changes made to these program requirements.
- Caribbean Program Requirements:
 - Newly proposed program requirements.
 - Applicable to Puerto Rico and the US Virgin Islands.
 - Standalone document.



ENERGY STAR Caribbean Program Requirements: Overview





Performance Target



ENERGY STAR Caribbean Program Requirements: Performance Target

- All homes must include these prescriptive measures:
 1. Wall Insulation: $\geq R-5$
 2. Windows in Bedrooms: U-value ≤ 1.2 / SHGC ≤ 0.35
 3. Ceiling Fans: ENERGY STAR certified and installed in all primary living areas > 75 sq. ft.
 4. Lighting: 100% LED
 5. Plus, at least one of the following two measures:
 - Measure A: Solar Water Heater - DHW equipment shall include a solar water heater system with a Solar Fraction $\geq 87\%$.
 - Measure B: Bedroom Mini-Split HVAC - Mini-split AC's or HP's ≥ 15 SEER, each with ≤ 10 ft. of ductwork, shall serve all bedrooms.



ENERGY STAR Caribbean Program Requirements: Performance Target (cont.)

- A note about Measures A & B – if any space cooling is provided above and beyond the prescriptive reqs., it must be efficient equipment:
 - If Measure A: Solar Water Heater is selected, then no space cooling is required, but if any space cooling is provided, it must be provided using mini-split AC's or HP's ≥ 15 SEER, each with ≤ 10 ft. of ductwork.
 - If Measure B: Bedroom Mini-Split HVAC is selected, then no space cooling is required outside of bedrooms, but if any space cooling is provided outside bedrooms, it must be provided using mini-split AC's or HP's ≥ 15 SEER, each with ≤ 10 ft. of ductwork.



ENERGY STAR Caribbean Program Requirements: Performance Target (cont.)

- Energy model requirements:
 - An accurate energy model must be created for each home, so that its ERI value can be calculated, including:
 - The prescriptive efficiency measures,
 - Any other efficiency measures selected,
 - The architectural attributes of the homes: house size, number of stories, foundation type, window area, etc.
 - No specific ERI target must be met, but all the prescriptive efficiency measures must be used.
 - The home must be registered with the Rater's Verification Oversight Organization (e.g. RESNET) so that quality assurance protocols are triggered, such as file and field reviews.



Mandatory Features



ENERGY STAR Caribbean Program Requirements: Mandatory Measures

- **National HVAC Design Report**
 - Same as current version.
 - However, only required to complete:
 - Section 1 – Design overview.
 - Section 2 – Whole-house mechanical ventilation design
 - Exempted from:
 - Section 3 – Room-by-room heating & cooling loads.
 - Section 4 – Heating & cooling equipment selection.
 - Section 5 – Duct design.
- **National HVAC Commissioning Checklist**
 - Exempted from this entire checklist.



ENERGY STAR Caribbean Program Requirements: Mandatory Measures (cont.)

- **National Water Management System Builder Reqs.**
 - Same as current version.
 - Builder is still required to comply with this.



ENERGY STAR Caribbean Program Requirements: Mandatory Measures (cont.)

- **Caribbean & Pacific Rater Design Review Checklist**
 - This version of the checklist will be used for both the Caribbean and the Pacific program requirements.
 - However, not all sections apply to both programs.
 - The Caribbean program requirements exempt:
 - Item 1.2 – HVAC contractor credentialing check.
 - Item 2.2 – HVAC design report review.
 - Item 4.2b contains overhang, window & skylight U-value and SHGC, and window area requirements customized for the Caribbean.
 - Item 4.3b requires ceiling fans to be ENERGY STAR certified and installed in all primary living areas > 75 sq. ft.



ENERGY STAR Caribbean Program Requirements: Mandatory Measures (cont.)

- **Caribbean & Pacific Rater Design Review Checklist**

- Section 5 requires pre-installation details to be included where mini-split is not installed at time of certification:
 1. An outdoor and indoor location must be designated on the plans for the future installation of a mini-split condensing unit and wall-mounted mini-split fan-coil units to serve the bedrooms.
 2. A wall-mounted junction box must be specified for the condensing unit along with electrical conduit from the junction box to the main electric panel board for the dwelling.
 3. A 3" pipe sleeve through the exterior wall must be specified for future power, communication, and refrigerant line connections between the area designated for the condensing unit and fan-coil units.
 4. If the designated location of the wall-mounted mini-split fan-coil units is on an interior wall, then an insulated condensate drain line must be specified with a point of connection at the fan-coil units and that terminates in storm water lines or outdoors.



ENERGY STAR Caribbean Program Requirements: Mandatory Measures (cont.)

- **Caribbean & Pacific Rater Field Checklist**

- This version of the checklist will be used for both the Caribbean and the Pacific program requirements.
- However, not all sections apply to both programs.
- The Caribbean program requirements exempt:
 - Section 1 – Heating & cooling equipment verification.
 - Item 2.2 – Bedroom pressure balancing.
 - Item 2.4 – Total duct leakage.
 - Item 2.5 – Duct leakage to outdoors.
 - Section 5 – Filtration requirements.



ENERGY STAR Caribbean Program Requirements: Mandatory Measures (cont.)

- **Caribbean & Pacific Rater Field Checklist**

- Section 8 requires four air sealing details:

1. Sealing at ducts, flues, shafts, plumbing, piping, wiring, exhaust fans, & other penetrations to unconditioned space.
2. Sealing at window and door rough openings.
3. Walls that separate attached garages from occupiable space sealed and, also, an air barrier installed and sealed at floor cavities aligned with these walls.
4. Doors adjacent to unconditioned space or ambient conditions made substantially air-tight with weatherstripping or equivalent gasket.



ENERGY STAR Caribbean Program Requirements: Mandatory Measures (cont.)

- **Caribbean & Pacific Rater Field Checklist**

- Item 4.2 provides an exemption from bathroom mechanical exhaust for bathrooms with operable window area totaling a minimum of 12% of the floor area specified for that bathroom.
- Section 9 requires the pre-installation details for homes without a mini-split to be verified in the field.



RESNET Standard Updates



RESNET Standards Updates

- The first temporarily exempts the infiltration test / blower door test:

“RESNET Home Energy Ratings conducted in Puerto Rico and the US Virgin Islands shall comply with the provisions of ANSI/RESNET/ICC 301, except that Ratings of homes with a permit date prior to January 1, 2022 are permitted to use a default infiltration rate of 10 ACH50 in lieu of conducting an airtightness test in accordance with Standard ANSI/RESNET/ICC 380.”



RESNET Standards Updates

- The second provides guidance on modeling homes without full AC:

“In addition, for a home in the Tropical Climate Zone for which its Living Space is not serviced by a space heating mechanical system and not more than one-half of its Living Space is serviced by a space cooling mechanical system, the Conditioned Space Volume shall be defined as the volume of its Living Space and the Conditioned Floor Area shall be defined as the floor area of its Living Space.”

Living Space - Any enclosed space inside the primary air enclosure boundary separating indoor and outdoor air and intended for continual human occupancy, including but not limited to living, sleeping, dining, and cooking; or intended for human activities, including but not limited to toilets, closets, halls, storage and utility areas, and laundry areas.”



RESNET Standard Updates



Proposed Caribbean Implementation Timeline

- Once the Caribbean Program Requirements, v3, are finalized, stakeholders would be allowed to use them immediately to certify homes.
- Homes permitted in Puerto Rico or USVI on or after January 1, 2020 would be required to be certified using the Caribbean Program Requirements, v3.





Proposed Caribbean v3 Cost-Effectiveness

- Cost-effectiveness results, REM Rate v15.7:

Bedroom Mini-Split Package:

Location	Found.	HVAC Equipment Type	Package	PR 2018 Code	Proposed Caribbean v3 Program Requirements						
				Annual Utility Costs	Annual Utility Costs	Annual Utility Savings	Total Upgrade Cost	Monthly Utility Savings	Monthly Mortgage Upgrade Cost	Net Cash Flow	
San Juan, PR	Slab	Baseline: Split AC / ES: Minisplit; 25% cond.	Mini-split		\$2,715	\$2,140	\$575 21%	\$2,373	\$48	\$13	\$35

Solar Water Heater Package:

Location	Found.	HVAC Equipment Type	Package	PR 2018 Code	Proposed Caribbean v3 Program Requirements						
				Annual Utility Costs	Annual Utility Costs	Annual Utility Savings	Total Upgrade Cost	Monthly Utility Savings	Monthly Mortgage Upgrade Cost	Net Cash Flow	
San Juan, PR	Slab	None	Solar WH		\$1,919	\$1,727	\$192 10%	\$2,719	\$16	\$15	\$1
San Juan, PR	Slab	Baseline: Split AC / ES: Split AC; 25% cond.	Solar WH		\$2,715	\$2,137	\$579 21%	\$2,747	\$48	\$15	\$33



Comment Period



Comment Period Timeline and Next Steps

- Draft program requirements have been posted to: www.energystar.gov/partner_resources/residential_new/program_reqs/program_reqs_archives
- Comment period began on July 9th and will end on Friday August 9th, 2019.
- Visit webpage to view draft program documents.
- Submit comments via email to energystarhomes@energystar.gov



Q&A





ENERGY STAR Certified Homes

Web:

Main: www.energystar.gov/newhomespartners
Technical: www.energystar.gov/newhomesguidelines
Training: www.energystar.gov/newhomestraining
HVAC: www.energystar.gov/newhomesHVAC

Email:

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