



Making it Simpler for Multifamily Projects to Earn the ENERGY STAR





Agenda

- Background/Goals
- New 'One Multifamily' Concept Introduction
- Short Term Eligibility Update
- Next Steps
- Further Discussion at 1:45pm

Mystery Solved



GG Green Senior Housing

Woodbury, New Jersey

RPM Development

MaGrann Associates

Who has participated in Multifamily?





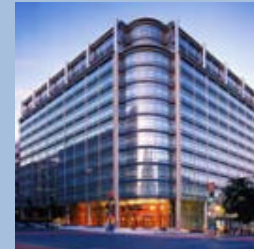
Background

ENERGY STAR Building Programs

Residential



Commercial



Multifamily





ENERGY STAR Multifamily Programs

Residential: Has guidelines that apply to new or gut rehab:

- Single Family Homes (detached and attached)
 - Factory Built Homes (manufactured and modular)
 - Low Rise Multifamily Residential Buildings
- } Certified Homes
-
- Mid and High Rise Multifamily Residential Buildings
 - Covers buildings previously ineligible for ESCH
 - Launched in June 2011
- } MFHR



ENERGY STAR Multifamily Programs

Commercial: Has guidelines for existing multifamily properties

- Launched in Sept 2014; requires a Portfolio Manager score 75 or higher
- Available only to properties with 20 units or more. There is also a 75% occupancy requirement for certification. Townhome-only communities are not eligible. If townhomes are less than 50% of the total units, the property is eligible.
- Based on whole property energy use (common areas, retail, parking lots/garages, etc)



Why Two Different Multifamily New Construction Programs?

SF/Low Rise Multifamily

- Residential Building Code
- Development time (6mo-2 years)
- ENERGY STAR products for residential applications
- ENERGY STAR HVAC available
- Existing verification oversight infrastructure in place
- HERS Index energy modeling
- Building science well understood
- 2-3 verification visits needed
- Common areas of multifamily not addressed

High Rise Multifamily

- Commercial Building Code
- Development time (2 - 5 years)
- ENERGY STAR products not always available
- Multiple HVAC configurations (central and in-unit)
- Currently no national 3rd party Verification Oversight Organization
- Commercial code modeling
- Building science is not as well understood
- Multiple verification visits needed
- Significant common areas



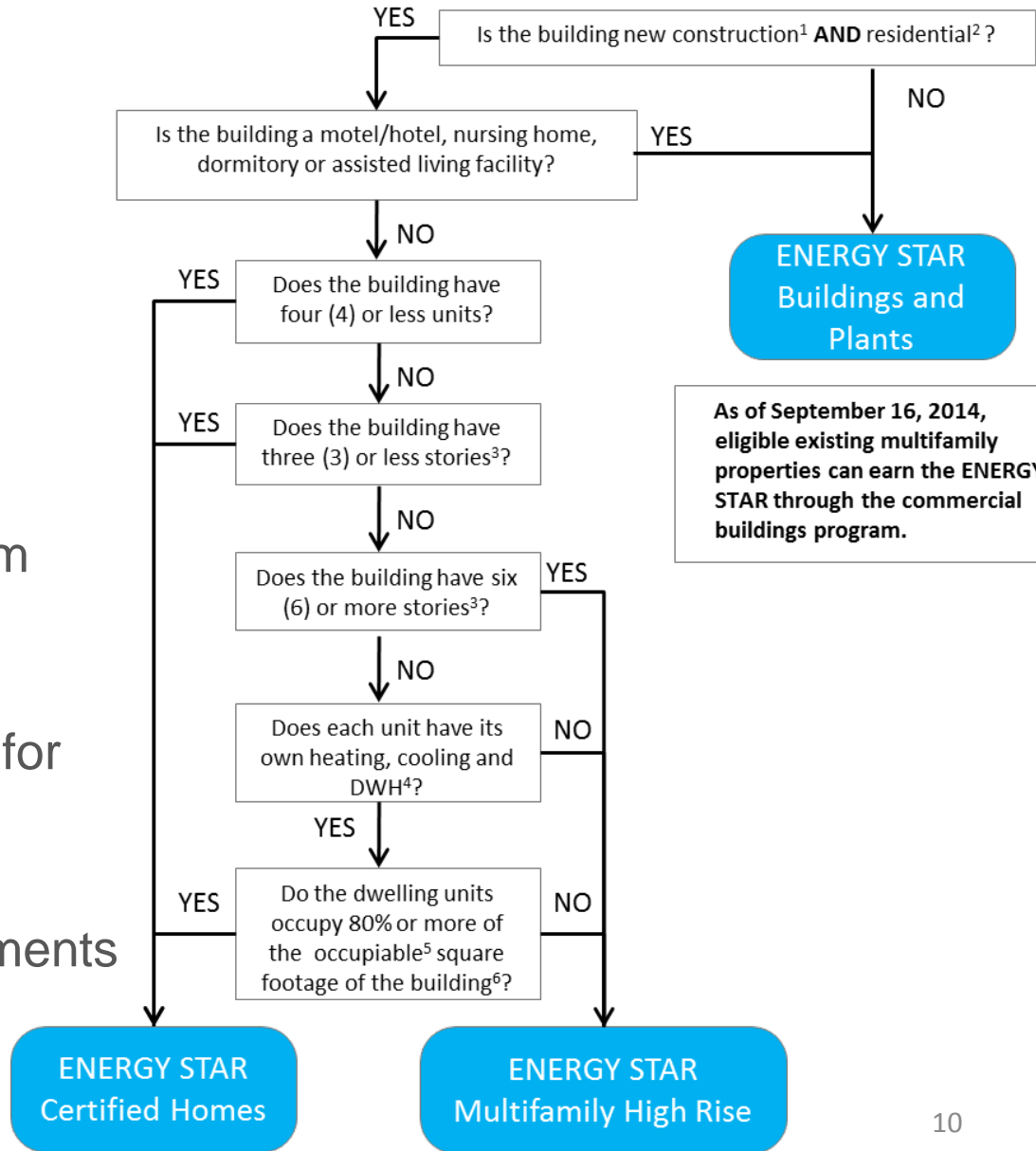
Eligibility

Complex, rigid line, with significant programmatic differences causes:

- Confusion/Frustration
- Inconsistency with code/incentive program eligibilities
- Designing to program, instead of what's best for the building

Programmatic line, not necessarily best requirements

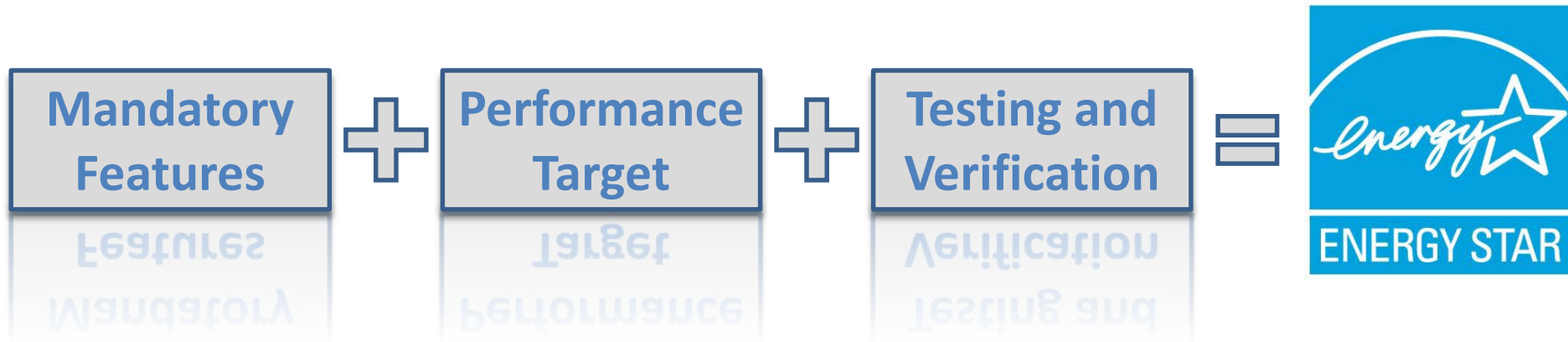
- 3 vs 4 story
- SF vs MF



As of September 16, 2014, eligible existing multifamily properties can earn the ENERGY STAR through the commercial buildings program.



Key Components Common to Both Programs





ENERGY STAR Program Entry

Certified Homes

- Builder becomes ENERGY STAR Partner
- HVAC Contractor is credentialed
- HERS Rater is verifier
- No direct project application/enrollment
- Requirements set by permit date

Multifamily High Rise

- Developer becomes Partner
- No HVAC credentialed contractor requirements
- Licensed Professional submits paper work, oversees process
- Project Application submitted to EPA and locks in requirements (Performance Target also impacted by permit date)



Mandatory Features

Certified Homes

- Units only: duct blaster/ventilation tests, 2009 IECC windows, Grade I insulation, reduced thermal bridging, etc.

Multifamily High Rise

- Units & common space: ES appliances & WaterSense fixtures, duct blaster/ventilation/compartmentalization tests; lighting density/sensors, Grade I insulation, reduced thermal bridging, etc



Performance Target

Certified Homes

- ES Reference Design Home
 - Approximately 15% savings above 2009 or 2012 IECC
 - Can be used as 'Prescriptive Path' option
- Performance Path
 - RESNET
 - HERS Index Target
- HERS rater performs preliminary ratings, Rater Design Review checklist, HVAC Design Report
- No submission to EPA

Multifamily High Rise

- 15% energy costs savings above ASHRAE 90.1-2007/2010/2013
- Prescriptive Path (not available for 2012/2015 IECC projects)
- Performance Path
 - ASHRAE 90.1 Appendix G
 - ENERGY STAR MFHR Simulation Guidelines
- Licensed Professional oversees design review and modeling
- EPA reviews Proposed Design



Key Modeling Differences

Certified Homes

- Uses RESNET HERS Ratings
- Modeling doesn't account for common area or parking garage energy use
- Underlying assumptions are based on single family homes
- HERS approach is integer based, but model can produce site/source savings or EUI for the units
- Baseline (Reference home) is based on characteristics of actual home:
 - Heating: same fuel /system type
 - DHW: same fuel /system type
 - Envelope: same wall /roof types
- Reference home efficiencies are based on ES Reference Design Home

Multifamily High Rise

- Uses ASHRAE 90.1 rating method
- Modeling can account for common area, parking & commercial energy use
- Assumptions are modeled as dictated by ES MFHR Simulation Guidelines
- ASHRAE approach is percent savings based on energy costs, but model can produce site/source savings or EUI for the building
- Baseline Building systems/envelope is dictated by ASHRAE 90.1 Appendix G. and can be very different from actual
- Baseline efficiencies are based on ASHRAE 90.1 minimums



Testing & Verification

Certified Homes

- ENERGY STAR Version 3 Inspection Checklists (PDF)
 - Rater Design Review and Field Checklist
 - HVAC Design Report & Commissioning Checklist
 - Water Management System Builder Requirements
- Verification performed by certified HERS Rater
- Photo documentation retained for potential Quality Assurance by Provider, but no mandated templates

Multifamily High Rise

- ENERGY STAR Testing & Verification Worksheets (Excel)
 - Thermal Enclosure System
 - HVAC & DHW System
 - Lighting, Motors, Pumps, Etc.
- Inspections include common areas and performance tests include ventilation riser duct leakage and DHW delivery temperature
- Verification overseen and validated by a Licensed Professional
- Use photo template to submit photo documentation to EPA



Project Completion & Certification

Certified Homes

- HERS Rater revises preliminary HERS ratings to match As-Built conditions
- Rater uploads HERS rating file to RESNET registry
- Retains supporting photos/documentation for potential QA by the Provider
- Provider reports certified units quarterly to EPA
- Provider conducts 10% file QA and 1% field QA.
- Rater provides certificate & label to each unit to adhere to electric panel

Multifamily High Rise

- Model and Excel based T&V Worksheets are revised to match As-Built conditions
- LP submits As-Built Submittal to EPA
- If approved, the units are certified.
- Developer receives an email with a certificate, but no labels are provided for the units.
- Certified units are listed in online directory
- A plaque template available for the developer to purchase and display
- Developer commits to benchmarking whole-building energy use for 2 yrs

RETHINK





Challenges with Current State

- Eligibility requirements
 - Overly complex
 - Sometimes force projects down a path the partner doesn't want to pursue
 - Because of differences in program design, eligibility of a project has big ramifications
 - Challenging for program implementers
- Program Requirements
 - ES Reference Design Home is not optimized for low-rise multifamily
 - Common areas in low-rise not addressed



Challenges with Current State

- Verification & Oversight
 - Lack of expertise/training available for MF testing and verification
 - Standardized approach to HVAC testing and verification not available in multifamily
 - EPA internal MFHR review process is not sustainable
 - EPA management of high-rise modeling, testing & verification protocols not sustainable
 - Learning curve for MFHR program leads to large variation in bids for work
 - MFHR T&V worksheets formatting make them look harder than reality
 - Confusion over ownership of MFHR T&V
- Marketing/Partner Support
 - Homes marketing currently geared to SF homes
 - Multifamily targeted messaging a challenge with separate programs, separate tracking, separate requirements



Anything Missing?



Meanwhile...



RESNET Multifamily Working Group Summary

Application & Scope of Guidelines (Published Aug 2014, but not enforced)

- Guidelines apply to units in all residential buildings except detached single family, and address some aspects of the residential-associated common spaces (i.e., excludes commercial space)
- Guidelines include definitions, energy modeling, testing, inspections, and sampling

Energy Modeling

- Prohibit whole building modeling to produce a HERS index, but can model just the unique unit types in the building (if Provider is a Sampling Provider)
- Specific guidance for how to model central systems (boilers, chillers, PV, DHW, ventilation) at a unit level; compartmentalization testing results; duct leakage results

Performance Testing

- Air Tightness test options; Heating/Cooling; DHW; Ventilation; Duct Leakage

Inspections

- Added common space (not as robust as ES MFHR but similar intent)

Sampling

- Provides specific requirements/exemptions as appropriate for MF



Multifamily Updates

- RESNET Subcommittee
 - BSR/RESNET/ICC 305-201x, Standard for the Calculation and Labeling of the Energy Performance of Multi-Family Dwellings using an Energy Rating Index (new standard)
 - Current scope matches the guidelines
 - Enforceable language
- NBI's Proposal for 2018/2021 Code
 - Create a multifamily section where all R2's (apartments/dorms) together
- Multifamily High Rise Review Process Updates



Goals for the New Concept

Eligibility Requirements

- Provide appropriate flexibility to meeting program requirements
- Provide more flexibility to Program Administrators
- Better align program design so that there are smaller ramifications based on eligibility

Program Requirements

- Requirements governed by building features
 - Optimize reference design for low-rise buildings
 - Testing and Verification using multifamily guidelines
 - Common areas are addressed in all projects



Goals for the New Concept

Verification & Oversight

- Leverage external parties to develop and manage standard protocol
- Oversight for verifiers is available in the market
- Technical expertise is more widely available for multifamily projects
 - Credential and/or training for verifiers

Marketing/Partner Support

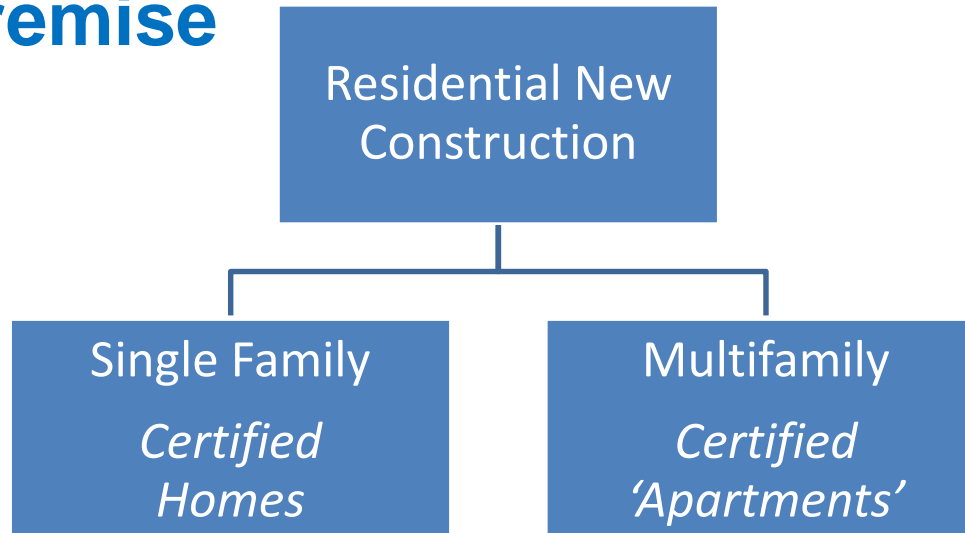
- Overall EPA programmatic support and resources are streamlined and inclusive of multifamily
- More consistent and targeted marketing is created for low-rise and high-rise sectors.



New Concept



New Premise



- Delineation between SF and MF
- Consistent specification for multifamily (any height)
 - Requirements that address all multifamily



Working Definition of 'Multifamily'

Single-Family: One- and two-family dwellings, and townhomes

Multifamily: All other residential buildings and mixed-use buildings with residential spaces



ENERGY STAR for Multifamily: Requirements Overview

Mandatory Features

Features
Mandatory

- To be developed (with stakeholder input) by evaluating requirements from ESCH and ESMFHR and combining/adjusting as appropriate (both more and less stringent)
- Requirements may vary based on building design (e.g., in-unit vs. central HVAC)
- Will include in-unit and common area requirements



ENERGY STAR for Multifamily: Requirements Overview



- Proposing that three options be available for all projects:
 - Whole Building Modeling (ASHRAE 90.1)
 - In-unit model + prescriptive common space (HERS model + Prescriptive)
 - Prescriptive Path (Prescriptive options for in-unit and common space)
- Still based on State Code (for states with codes beyond 2009 IECC, the performance target will be based on the advanced code)

Assumptions:

- RESNET references Multifamily Standards related to testing, HERS modeling, sampling and inspections specific to units and common areas, and scope includes all stories
- HERS vs ASHRAE approaches are evaluated and deemed comparable
- Market available ASHRAE oversight option
- Market available Prescriptive Path oversight option



Performance Target

ASHRAE

- Model residential space (including common areas) to 90.1 using Appendix G and Simulation Guidelines
- MFHR business as usual
- Low-rise also models to 90.1 Appendix G

HERS

- Model units in any height building using HERS with modified ES Reference Design 'Apartment' to address issues for MF
- Common space prescriptive requirements

Prescriptive

- In-unit prescriptive requirements (match modified ES Reference Design 'Apartment')
- Common space prescriptive requirements



ENERGY STAR for Multifamily: Requirements Overview

Testing & Verification and Oversight

- Process and documentation to be developed (with stakeholder input) by evaluating current ESCH and ESMFHR requirements and combining/adjusting as established as appropriate
- Verifier requirements and oversight will be specified
- Different “oversight organizations” for different pathways



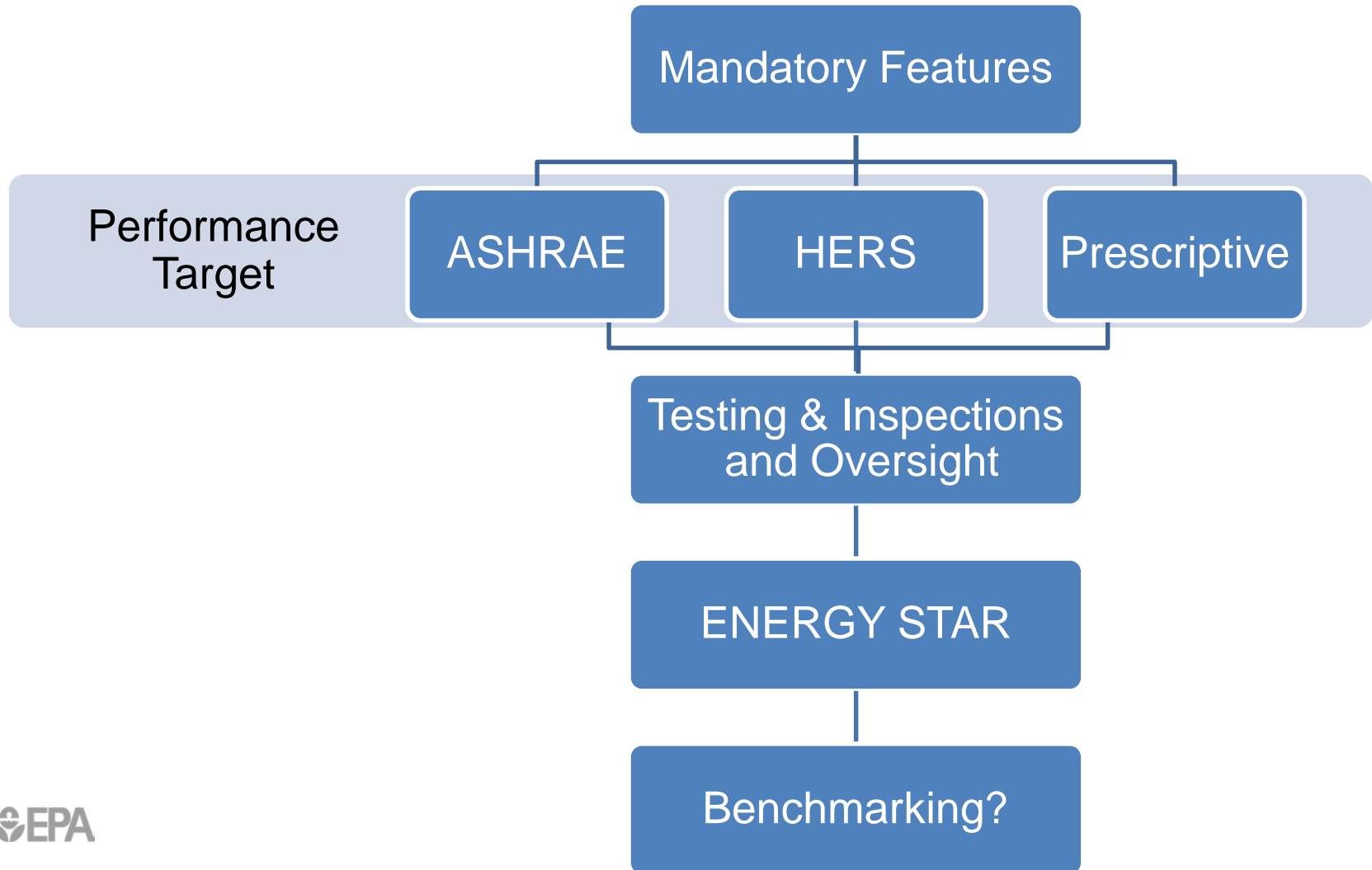
Certification Process

- Consistent process to be developed
- MFHR process requirements to be evaluated: Project Application, Design Approval and Pre-Approval before Certification, Benchmarking requirement
- Reporting process for ES Homes/Apartments should be consistent
- Consistent labeling mechanism needed (what is labeled, how is it distributed)





ENERGY STAR for Multifamily: Requirements Overview





What changes for HERS approach?

- Option to expand into more buildings
- Potential for adjustments to ECMs
- Addition of prescriptive common space requirements
- Under review:
 - Labeling
 - Benchmarking
 - Reporting process
 - HVAC T&V

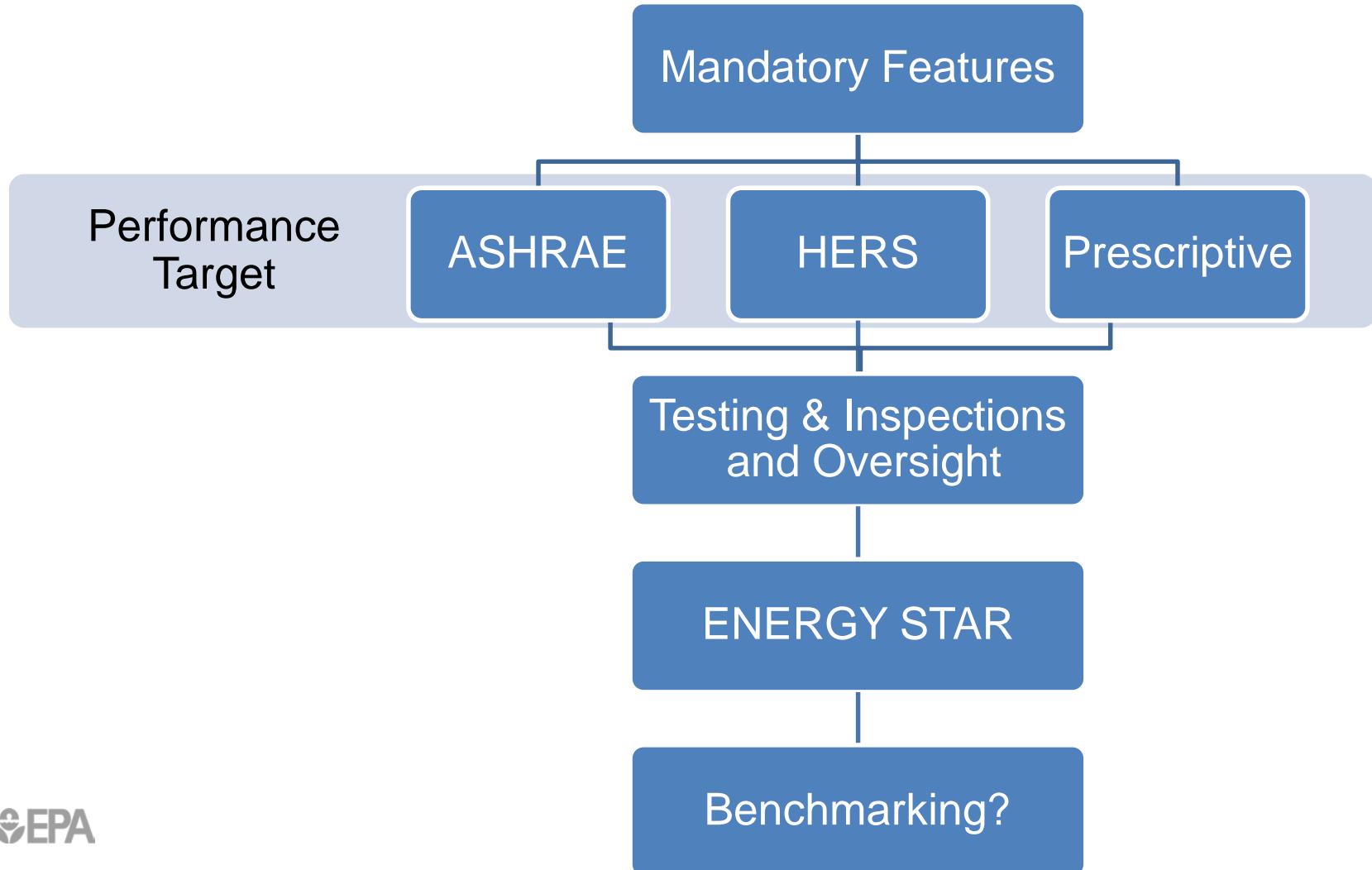


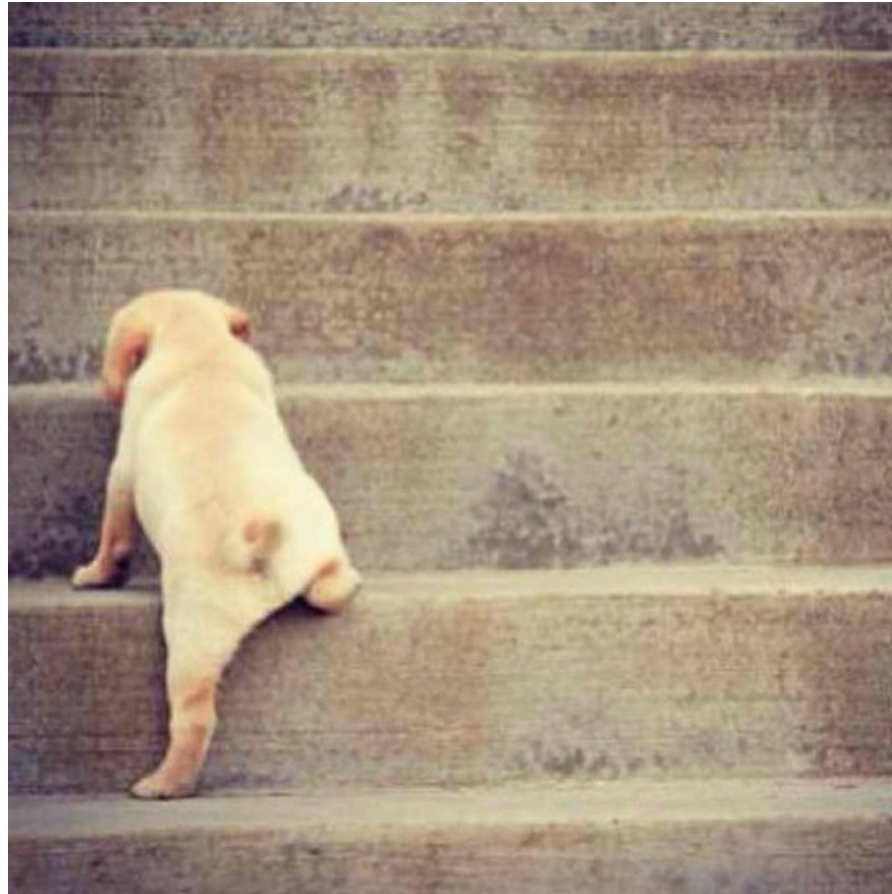
Common Space Requirements in MFHR

- ENERGY STAR appliances & WaterSense fixtures
- Common area ventilation designed and tested to ASHRAE 62.1-2007
- Lighting: efficiency, sensors, and max allowances
- Envelope requirements similar to in-unit
- Above code HVAC and DHW efficiencies



ENERGY STAR for Multifamily: Requirements Overview





Can we change anything now, to alleviate some stress?





Proposed 'Short Term' Change to Eligibility

Goal

- Add flexibility to the eligibility criteria for 4 and 5 story projects in the short term, in a manner that is in alignment with the long term goals.

Proposal

- 4 and 5 story buildings, where dwelling units are 80% or more of the occupiable square footage of the buildings, would be eligible to participate in either the ENERGY STAR Certified Homes program OR the ENERGY STAR Multifamily High Rise program.
 - Builders/Developers can decide on a project by project basis, which program to use.
 - Program Administrators can decide NOT to allow this flexibility in their programs as part of their program requirements



Proposed Changes to Homes Eligibility Text:

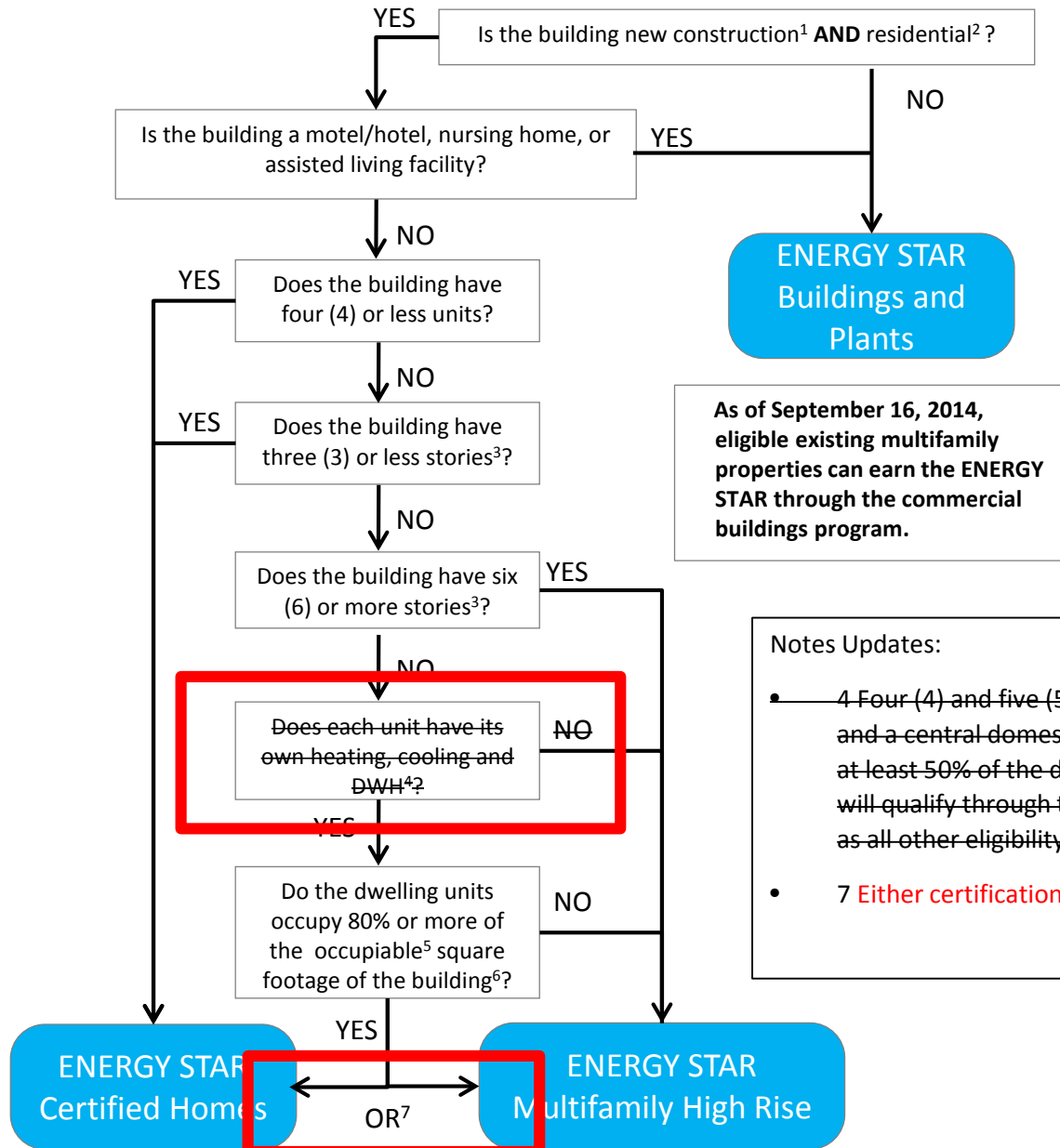
- Dwelling units in multifamily buildings with 4 or 5 stories above-grade that have their own heating, cooling, and hot water systems⁴, separate from other units, and where dwelling units occupy 80% or more of the occupiable square footage of the building.⁵ When evaluating mixed-use buildings for eligibility, exclude commercial / retail space when assessing whether the 80% threshold has been met.

Notes:

4 ~~Central domestic hot water systems are allowed if solar energy provides $\geq 50\%$ of the domestic hot water for the residential units.~~

Eligibility Tree Proposed Changes

EPA ENERGY STAR Multifamily New Construction Program Decision Tree, Version 1.3



As of September 16, 2014, eligible existing multifamily properties can earn the ENERGY STAR through the commercial buildings program.

Notes Updates:

- 4 Four (4) and five (5) story buildings with in-unit heating and cooling and a central domestic hot water system where solar energy provides at least 50% of the domestic hot water needs for the residential units, will qualify through the ENERGY STAR Certified Homes program as long as all other eligibility requirements of that program are met.
- 7 Either certification program may be used for this building type.



Possible Discussion Topics: Multifamily Action Lab 1:45pm

- Common spaces
- Labeling
- Multiple Modeling and Verification Pathways
- HVAC Inspections/Testing
- Benchmarking



Next Steps

- EPA to start evaluating options
- EPA update eligibility in short term
- Stakeholder Input
 - Winter/Spring: EPA will reach out for specific issues
 - Tentative: RESNET Conference follow-up stakeholder meeting



Thank You!

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Multifamily High Rise

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What would change from MFHR?

- Option to expand into more buildings
- Potential for adjustments to ECMs
- New requirements for verifier and QA/Reviews
- New reporting process
- Under Review:
 - Labeling changes
 - Benchmarking changes



Modeling and Verification Pathways

Proposed: Two Performance Paths to Certification, chosen by the Project Team (not dictated by # of stories or systems)

HERS + prescriptive common space requirements
(ESCH + common area req'ts)

ASHRAE whole building model approach (current MFHR).



HVAC Inspections/Testing

Proposed: Keep current HVAC in-unit requirements from Homes (adjust as needed for MF) & central/common requirements from MFHR

In-unit systems:

Credentialed contractor

HVAC checklist test/inspections (process & metrics may be adjusted for MF)

Central & Common Area systems:

No credential

Test: Central ventilation riser duct sealing, common area ventilation flow
Inspect: Nameplate, gauges, controls, pumps, motorized dampers, etc.