ENERGY STAR Multifamily Update

Rebecca Hudson

October 23, 2017

Agenda

- Specification update timeline
- Review of the 'One Multifamily' framework
  - Goals and concept
- Looking back on updates from last year
- Proposed key changes for HERS path
    - Reference Design
    - In-unit checklist items
    - Common area measures
- Next steps

Timeline

First Comment Period

- Webinar mid-November and comments through mid-December

Second Comment Period

- RESNET presentation and webinar late February/March

Goal

- Final specification available end of 2018
- Transition to new specification end of 2019

Recap from Last Year

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

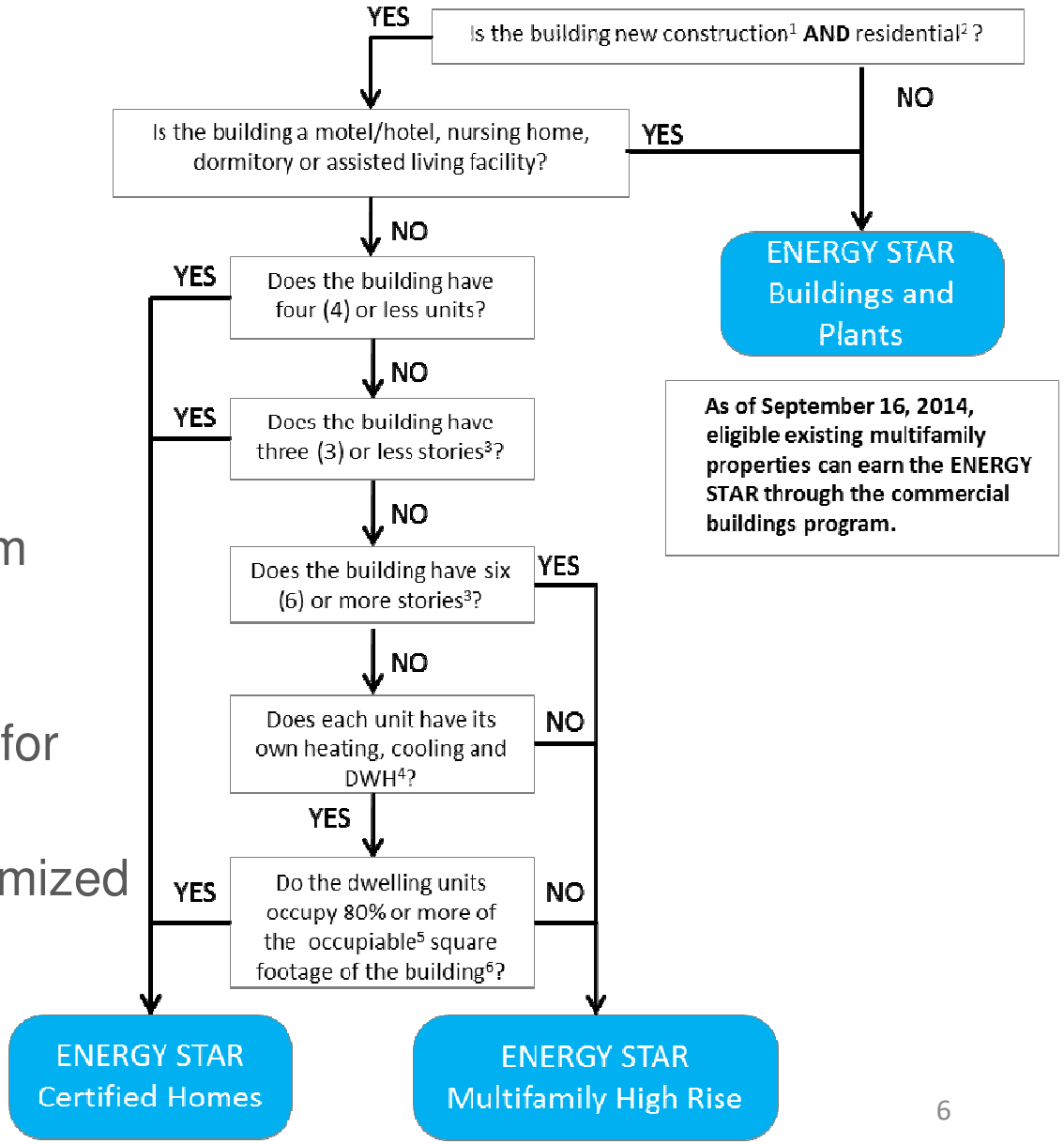
- Mid and High Rise Multifamily Residential Buildings
  - Covers buildings previously ineligible for ESCH
  - Launched in June 2011

MFHR

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
- Requirements not optimized for project



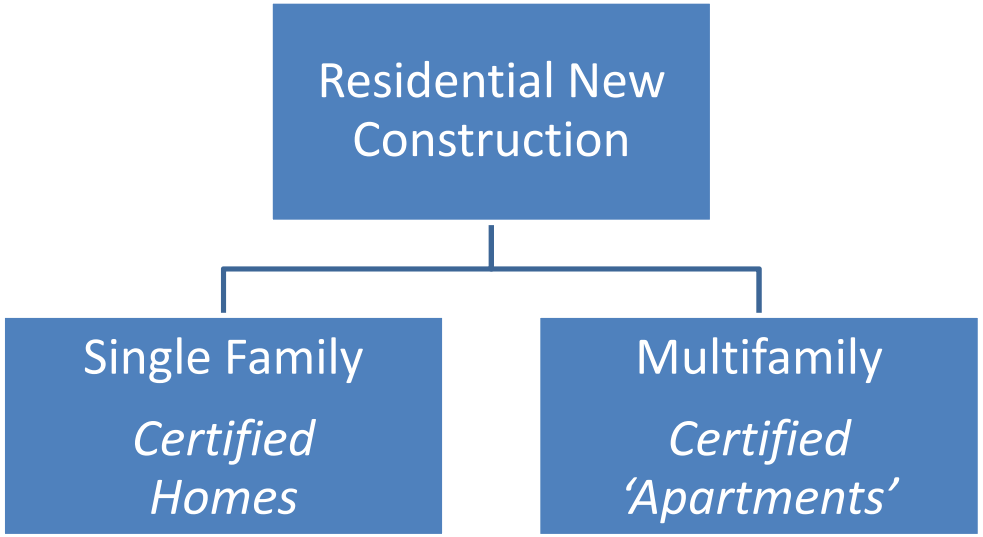
As of September 16, 2014, eligible existing multifamily properties can earn the ENERGY STAR through the commercial buildings program.

Goals for the New Concept

- Appropriate eligibility
- Technical requirements are governed by building features
- Common areas addressed
- Flexibility for participants and program administrators
- Well-defined verifier requirements
  - Including multifamily training
- Market-based oversight

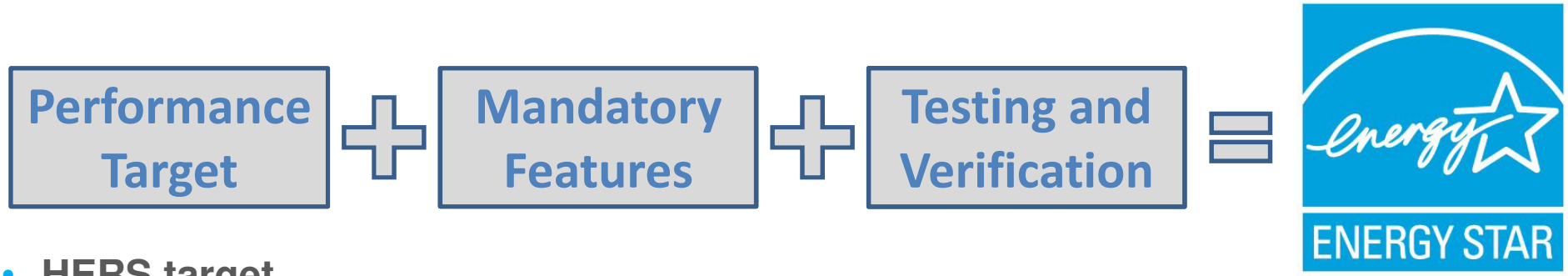
One Multifamily Framework

New Premise



- Delineation between SF and MF
- Consistent specification for multifamily (any height)

Key Components to Program Requirements

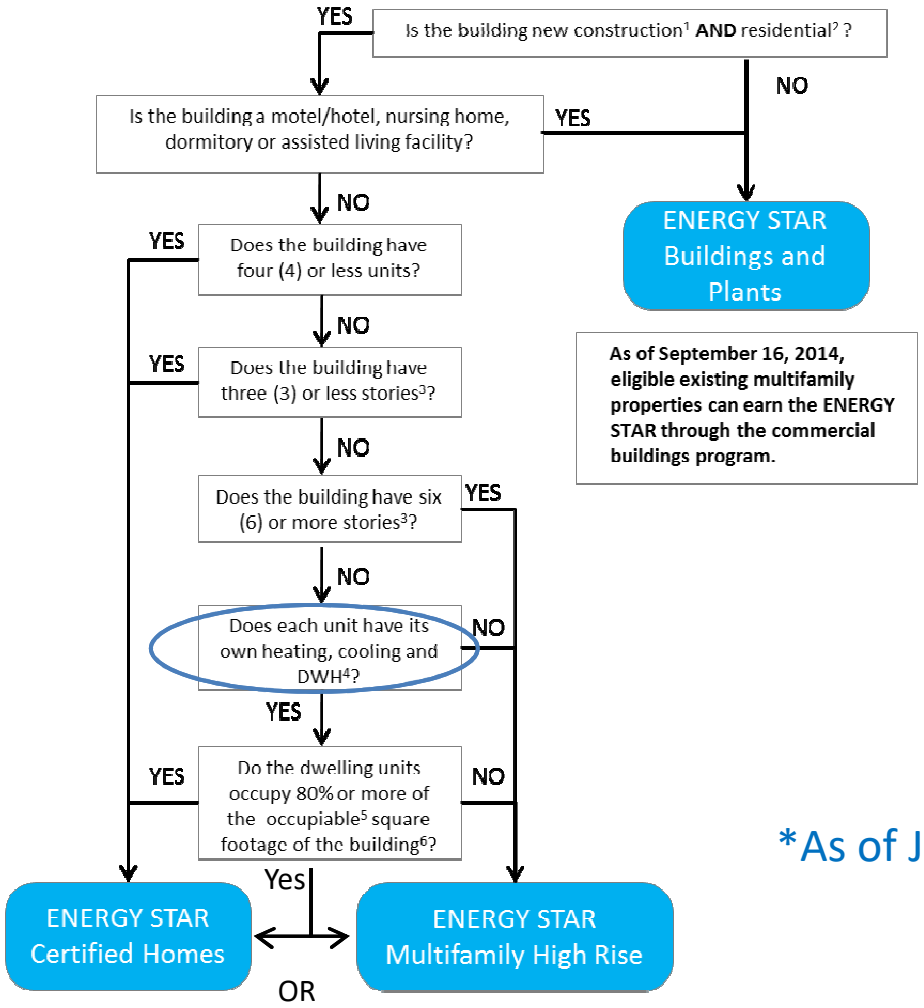


- HERS target
- ASHRAE model
- Prescriptive

Multifamily Updates

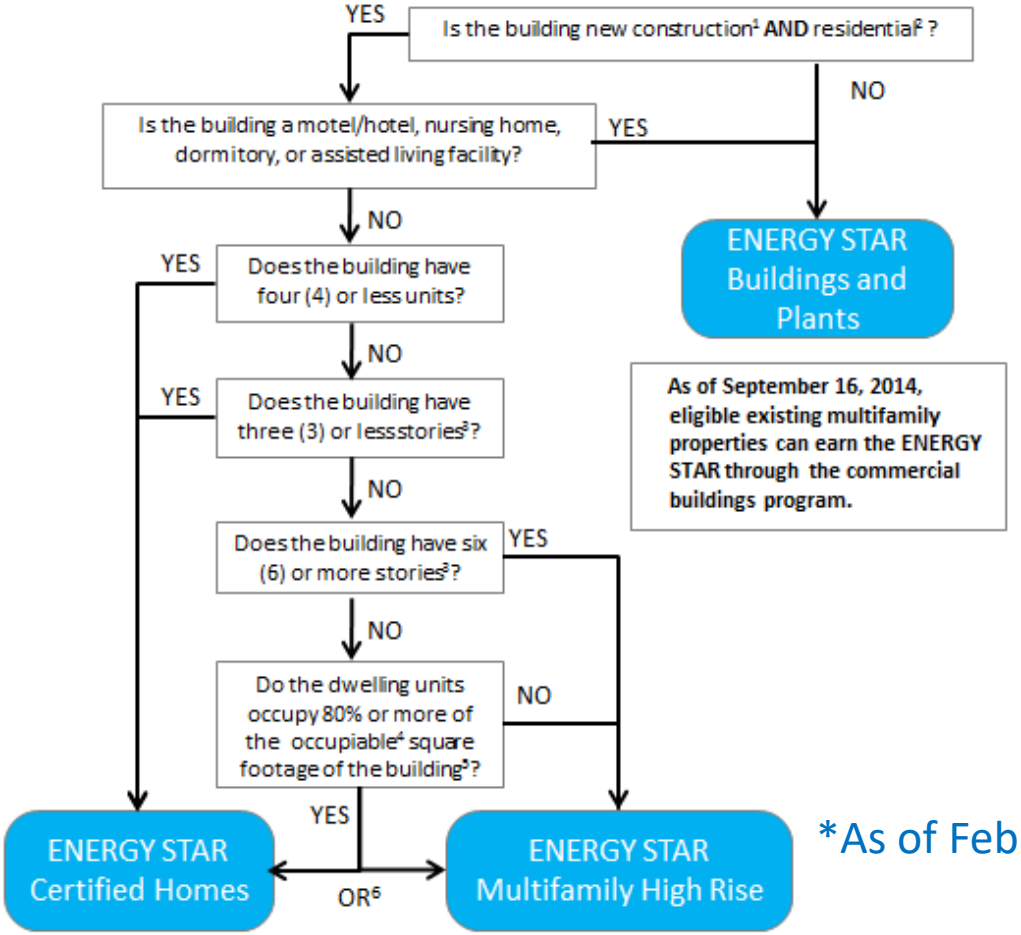
- Eligibility Update

ENERGY STAR Multifamily Program Decision Tree*



*As of January 2017

ENERGY STAR Multifamily Program Decision Tree*



*As of February 2017

www.energystar.gov/mfhr/eligibility

Multifamily Updates

- Eligibility Update
- RESNET Multifamily Sub-Committee
  - Goal: HERS ratings for all multifamily
  - Updated ANSI/RESNET/ICC 301 to apply to all dwelling units (and sleeping units) in any height building and to accommodate MF units/systems better
    - Currently under internal review by RESNET's SDC300
    - Out for public comment in January and will also be presented at RESNET Conference in February
    - Target: publication by January 2019
  - ANSI 380 will soon have a specific BD test section for attached units

Proposed Updates

Key Components Common to Both Programs

Performance Target + **Mandatory Features** + **Testing and Verification** = ENERGY STAR

- HERS target
- ASHRAE model
- Prescriptive Path

Reference Design Updates

Performance Target

- Based on 3.1
  - Still determining whether to create a 3.0 version
- Current modeling is similar or slightly more stringent than current 3.1
  - Multifamily modeling changes may alter score
  - Relax infiltration and use a compartmentalization metric
  - Focus on hot water energy use

Checklist Item Update Summary

Mandatory Features

- Adjust text and requirements to better fit MF
- Expand to include requirements related to central heating, cooling, ventilation, and hot water systems
- Adopt requirements from MFHR that focus on reducing hot water energy use
- Expand to common areas

Example: Section 4 Air Sealing

4. Air Sealing (Unless otherwise noted below, "sealed" indicates the use of caulk, foam, or equivalent material)				
4.1 Ducts, flues, shafts, plumbing, piping, wiring, exhaust fans, & other penetrations to unconditioned space sealed, with blocking / flashing as needed	☐	☐	☐	-
4.2 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and gasketed. Also, if in insulated ceiling without attic above, exterior surface of fixture insulated to ≥ R-10 in CZ 4-8.	☐	☐	☐	☐
4.3 Above-grade sill plates adjacent to conditioned space sealed to foundation or sub-floor. Gasket also placed beneath above-grade sill plate if resting atop concrete / masonry & adjacent to cond. space [25,26]	☐	☐	☐	☐
4.4 Continuous top plate or blocking is at top of walls adjoining unconditioned space, and sealed	☐	☐	☐	☐
4.5 Drywall sealed to top plate at all unconditioned attic / wall interfaces using caulk, foam, drywall adhesive (but not other construction adhesives), or equivalent material. Either apply sealant directly between drywall and top plate or to the seam between the two from the attic above.	☐	☐	☐	☐
4.6 Rough opening around windows & exterior doors sealed [27]	☐	☐	☐	-
4.7 Walls that separate attached garages from occupiable space sealed and, also, an air barrier installed and sealed at floor cavities aligned with these walls	☐	☐	☐	☐
4.8 In multifamily buildings, the gap between the common wall (e.g. the drywall shaft wall) and the structural framing between units sealed at all exterior boundaries	☐	☐	☐	☐
4.9 Doors adjacent to unconditioned space (e.g., attics, garages, basements) or ambient conditions made substantially air-tight with weatherstripping or equivalent gasket				
4.10 Attic access panels, drop-down stairs, & whole-house fans equipped with durable ≥ R-10 cover that is gasketed (i.e., not caulked). Fan covers either installed on house side or mechanically operated. [28]	☐	☐	☐	☐

Add doors to the corridor

Effective for homes permitted [29] starting 07/01/2016 Revised 09/15/2015 Page 3 of 9

Items Removed/Relaxed

HVAC

- Duct leakage to outdoors test not required
- Unit-level HVAC load allowed instead of room-by-room
- Manual D for duct design is not required
- Licensed professionals also allowed to fill out HVAC-C checklist, but then checklist must be collected

Example: Section 6 Duct Quality Installation

6. Duct Quality Installation - *Applies to Heating, Cooling, Ventilation, Exhaust, & Pressure Balancing Ducts, Unless Noted in Footnote*			
6.1 Ductwork installed without kinks, sharp bends, compressions, or excessive coiled flexible ductwork [33]	☐	☐	☐
6.2 Bedrooms pressure-balanced using any combination of transfer grills, jump ducts, dedicated return ducts, and / or undercut doors to achieve a Rater-measured pressure differential ≤ 3 Pa with respect to the main body of the house when all bedroom doors are closed and all air handlers are operating. See Footnote 34 for alternative.[34]	☐	☐	-
6.3 All supply and return ducts in unconditioned space, including connections to trunk ducts, are insulated to ≥ R-6 [35]	☐	☐	☐
6.4 Rater-measured total duct leakage meets one of the following two options. See Footnote 37 for alternative: [36, 37, 38]			
6.4.1 Rough-in: The greater of ≤ 4 CFM25 per 100 sq. ft. of CFA or ≤ 40 CFM, with air handler & all ducts, building cavities used as ducts, & duct boots installed. In addition, all duct boots sealed to finished surface, Rater-verified at final. [39]	☐	☐	☐
6.4.2 Final: The greater of ≤ 8 CFM25 per 100 sq. ft. of CFA or ≤ 80 CFM, with the air handler & all ducts, building cavities used as ducts, duct boots, & register grilles atop the finished surface (e.g., drywall, floor) installed [40]	☐	☐	☐
6.5 Rater-measured duct leakage to outdoors the greater of ≤ 4 CFM25 per 100 sq. ft. of CFA or ≤ 40 CFM25 [36, 38, 41]	☐	☐	☐
7. Whole House Mechanical Ventilation System			

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Envelope

- Additional multifamily slab edge exemption details
- Remove some field checklist air-sealing details

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4.3 Above-grade sill plates adjacent to conditioned space sealed to foundation or sub-floor. Gasket also placed beneath above-grade sill plate if resting atop concrete / masonry & adjacent to cond. space [illegible]	☐	☐	☐	☐
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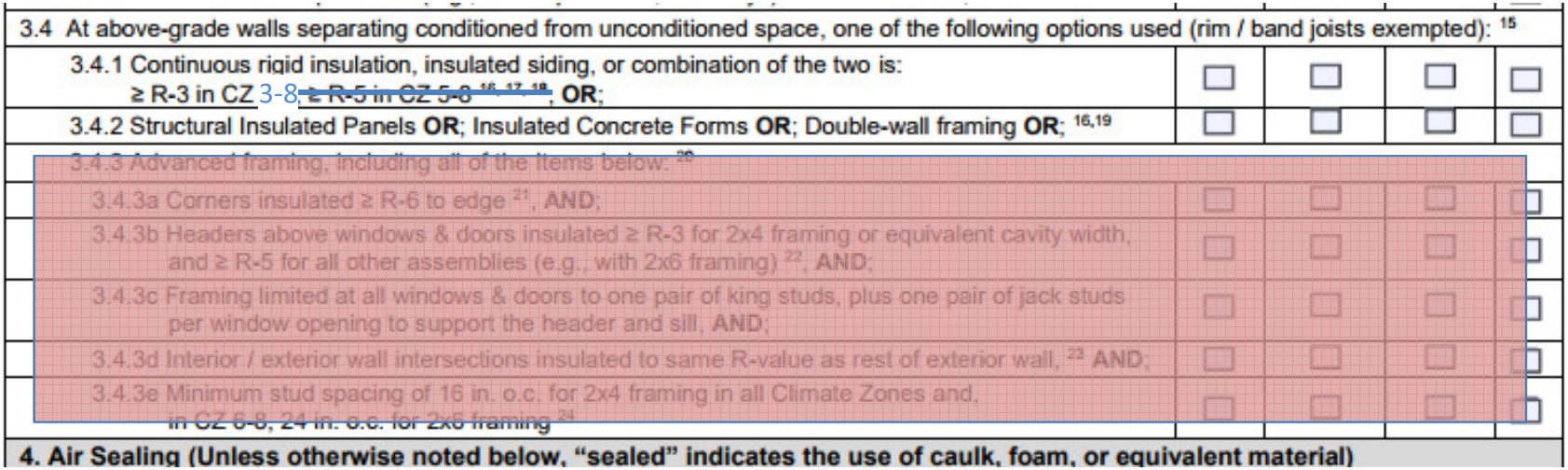
Items Adjusted

- Naturally drafted equipment no longer allowed inside pressure boundary in CZ 1-3
- Undercut doors cannot be the only method used for room pressure balancing, but allowance is increased to 5Pa
- Reduced duct leakage threshold for non-ducted returns
- R-3 continuous insulation or SIPs, ICFs etc. for CZ 3-8 (no advanced framing option)
  - No requirement for CZ 1-2

Example: Section 3.4 Thermal Bridging

- Remove 3.4.3 option
- 3.4.1 is ≥ R-3 for all climates
- CZ 1-2 is exempt



3.4 At above-grade walls separating conditioned from unconditioned space, one of the following options used (rim / band joists exempted): [15]				
3.4.1 Continuous rigid insulation, insulated siding, or combination of the two is: ≥ R-3 in CZ 3-8; ~~≥ R-5 in CZ 5-8 [16, 17, 18]~~; **OR**;	☐	☐	☐	☐
3.4.2 Structural Insulated Panels **OR**; Insulated Concrete Forms **OR**; Double-wall framing **OR**; [16,19]	☐	☐	☐	☐
3.4.3 Advanced framing, including all of the items below: [20]				
3.4.3a Corners insulated ≥ R-6 to edge [21], **AND**;	☐	☐	☐	☐
3.4.3b Headers above windows & doors insulated ≥ R-3 for 2x4 framing or equivalent cavity width, and ≥ R-5 for all other assemblies (e.g., with 2x6 framing) [22], **AND**;	☐	☐	☐	☐
3.4.3c Framing limited at all windows & doors to one pair of king studs, plus one pair of jack studs per window opening to support the header and sill, **AND**;	☐	☐	☐	☐
3.4.3d Interior / exterior wall intersections insulated to same R-value as rest of exterior wall, [23] **AND**;	☐	☐	☐	☐
3.4.3e Minimum stud spacing of 16 in. o.c. for 2x4 framing in all Climate Zones and, ~~in CZ 6-8, 24 in. o.c. for 2x6 framing~~ [24]	☐	☐	☐	☐
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Items Adopted from MFHR

- Compartmentalization test
- Central exhaust ventilation duct riser leakage test
- Hydronic distribution req’ts & visual inspection
- Test delivery temperature of faucets and showerheads
- Common area requirements (includes garages)

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4.X Compartmentalization				
Rater-measured compartmentalization is no greater than 0.30 CFM50 per square feet of dwelling unit enclosure area, following procedures in ANSI 380.				

Common Area Requirements – In-Field

- Visual Inspections - Pre-drywall
  - Same inspections as unit
- Visual Inspections - Final
  - Same inspections as unit
  - Lighting controls and lighting power density calc.
  - Freeze protection and snow-melt temp controls
- Performance Tests/Commissioning
  - Mostly same as unit, but blower door and duct leakage tests not req'd

Common Area Efficiency – Prescriptive/HERS

- Meets Reference Design
  - Insulation
  - Fenestration
  - Heating and cooling efficiency
  - Lighting
  - WaterSense bathroom faucets and showerheads
  - ENERGY STAR Appliances

Technical Issues Under Review

- Common area prescriptive efficiency levels
- Garage heating
- Central exhaust riser duct leakage metric

ASHRAE and Prescriptive Path Updates

Testing & Verification and Oversight

- Verifier and oversight requirements will be specified
  - Performance Testing
  - Visual Inspections
  - Modeling
  - HVAC commissioning
- New application for oversight organization

Policy Issues Under Review

- Process
  - Documentation
  - Reporting
  - Labeling
- Verification/Oversight
  - ASHRAE and Prescriptive Paths
- Training Requirements
- Program Alignment
  - ENERGY STAR Existing Buildings
  - Green Building Programs
- Designed to Earn the ENERGY STAR

Key Benefits

- Technical requirements governed by building features
  - More appropriate requirements
  - Option for consistent requirements for campus properties
  - Eligibility is less of a barrier
- Common areas are addressed for all MF projects increases savings
- Different performance target options provide more flexibility for participants and program administrators
  - Some paths may align better with other programs

Key Benefits

- Improved verification and oversight
  - Roles and requirements for verifiers more clearly defined than current MFHR program
  - Market-based oversight
- Opportunity for multifamily technical training
  - MF ENERGY STAR training for developers and raters
  - Additional market-based training
    - Rater training for new RESNET standard
    - Modeling training from new oversight organization

Next Steps

Feedback while in Chicago

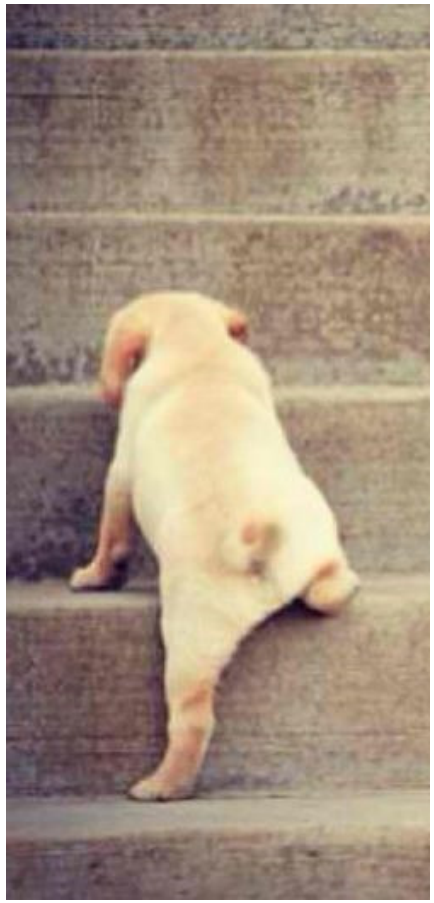
- Discussion now and during lunch
- MF meetup during reception Tuesday evening
- MFHR meeting Wednesday 9-12

Additional feedback opportunities

- Webinar mid-November
- Full specification ready for comment ~March

Specification adoption

- Final specification available end of 2018
- Transition to new specification end of 2019



Discussion

Rebecca Hudson
Hudson.Rebecca@epa.gov
mfhr@energystar.gov