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Incorporating Hot Water Use Efficiency into Ratings and Codes

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International Code Council (ICC)

- 2012 IECC Residential and IRC
  - R-3 pipe insulation with a table to determine allowable lengths not requiring insulation. NAHB did not support
- 2015 IECC Residential and IRC
  - R-3 pipe insulation on all piping ¾ inch and larger. No table. NAHB support
  - Efficient circulation and heat trace controls
  - Demand controls for circulation when cold water pipe is the return
  - Drain water heat recovery to follow standards
  - HERS can be used as part of compliance path

International Code Council (ICC)

- 2012 IECC Commercial and IPC
  - 1 inch wall thickness on all circulation loops and heat traced pipe
- 2015 IECC Commercial and IPC
  - Follow rules in the HVAC table
  - Efficient circulation and heat trace controls
  - Demand controls for circulation when cold water pipe is the return
  - Drain water heat recovery to follow standards. Trade offs in the performance path
  - 0.5 gallons (64 ounces) or 50 feet from nearest source of heated water to plumbing fixtures and appliances
    - 2 ounces when connecting to public lavatory faucets

International Association of Plumbing and Mechanical Officials (IAPMO)

- 2012 UPC-nothing
- 2012 Green Plumbing and Mechanical Code Supplement (GPMCS)
  - Reduced volume from the source of hot water to the use
  - Pipe Insulation: Wall thickness shall be at least equal to the nominal pipe diameter up to 2 inch pipe. 2 inch wall thickness thereafter.
  - More water efficient plumbing fixtures and appliances
- 2015 UPC is likely to require that all hot water piping be insulated
  - Pipe insulation (See above)

National Green Building Standard (NGBS)

- 2012 version gives credit for water use efficiency including hot water distribution
- 2015 version is working to ensure that the energy and water chapters are in sync

LEED

- Currently only included in LEED-H V.4

RESNET-HERS

- Accounting for water use efficiency measures separately from the energy it takes to heat the water
  - Hot water distribution (type and length)
  - Operational efficiency (at start of shower, during use at a sink)
  - Fixture water use efficiency
  - Appliance water use efficiency
  - Pipe Insulation
  - Drain water heat recovery
- Accounting for energy before heating efficiency
  - Circulation loop control strategies
  - Pipe insulation
  - Drain water heat recovery

California Utility Allowance Calculator

- Initial purpose was to improve the method of estimating utility bills for affordable multi-family housing
- Build-it-Green plans to adopt the method for its Green Point Rated program, both single and multi-family
- Method is similar to that being developed for RESNET-HERS

DOE Challenge Home

- Meet EPA WaterSense requirements
  - Maximum of 0.5 gallons in the piping from the nearest source of hot water to the plumbing fixture or appliance
  - Maximum of 0.6 gallons to come out by the time the water temperature is 10F above ambient starting temperature