This presentation premiered at WaterSmart Innovations

watersmartinnovations.com
Incorporating Hot Water Use Efficiency into Ratings and Codes

2014 Water Smart Innovations
October 8-10 2014

Gary Klein
Gary Klein and Associates
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678

Tel: 916-549-7080
Email: Gary@GaryKleinAssociates.com

Copyright 2014, Gary Klein
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