

Water Efficiency Innovations: How to get credit in the Water Rating Index and HERSH2O?

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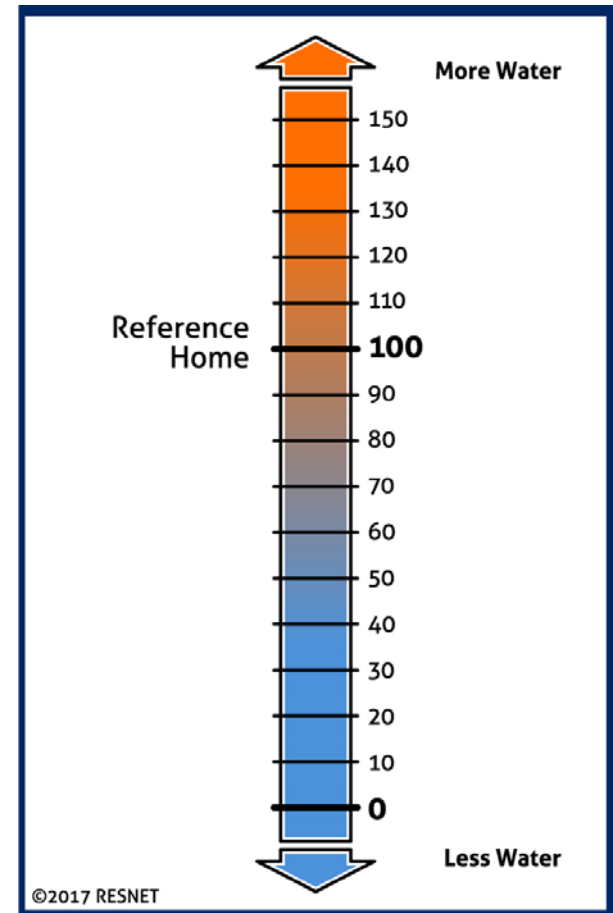


Agenda

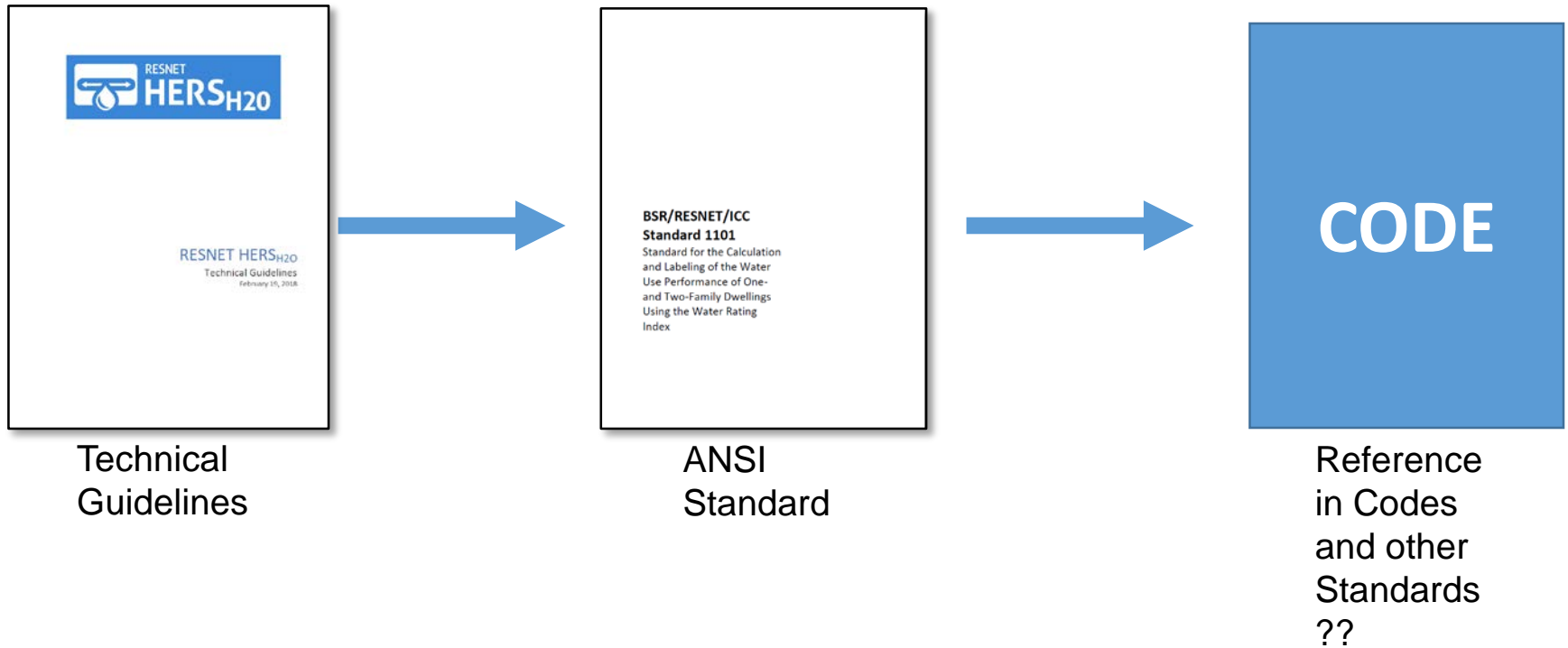
- Background on $HERS_{H2O}$
- Components of a water rating
- Need for innovative design requests
- Process for requests

Key Objectives for HERS_{H2O}

- Nationwide applicability
- Suitable for both new and existing homes
- Encompasses both indoor and outdoor water efficiency
- Practical and affordable to administer
- Scores usable for quantitative comparison



Development Process



Technical Guidelines serve as the basis for the Water Rating Index Standard (BSR/RESNET/ICC 1101-201x).

Scope of the Standard

This Standard will provide a uniform methodology for evaluating, rating and labeling the indoor and outdoor water use performance of one- and two-family dwellings.



Rating Calculation Methodology

- Grounded in water use data as much as possible
- Indoor reference home based primarily on HERS
 - Original analysis for Addendum A (Domestic Hot Water)
 - Residential Energy Consumption Survey (RECS)
 - DOE Engineering Analysis for Rulemakings
 - Some additional data from REUWS I & II
- Outdoor reference home based on REUWS II
 - Detailed landscape and outdoor use analysis for 838 homes

Components of a Water Rating



Shower
Heads



Kitchen
Faucet



Lavatory
Faucets



Toilet Flush
Volume



Irrigation



Pool or Spa

Components of a Water Rating



Clothes
Washer



Water
Softener



Leaks/Other
Water Use



Excess
Pressure



Dishwasher

Other Factors Included in the Rating



House Size



Geographic Location



Number of Bedrooms



Lot & Landscape Size



Hot Water Distribution Layout



Hot Water Pipe Insulation

Rated Home Credits

Indoor model will respond to:

- More efficient plumbing products
- Efficient Appliances
- More efficient plumbing distribution



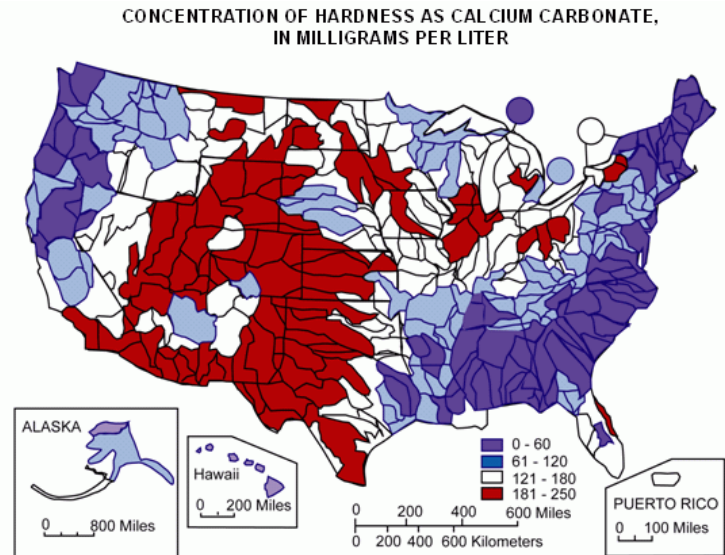
Outdoor model will respond to:

- Smaller landscapes (the reference landscape is fixed based on lot size)
- More efficient irrigation technology
 - Smart controllers
 - More efficient emitters, as expressed by the Residential Irrigation Capacity Index (RICI)

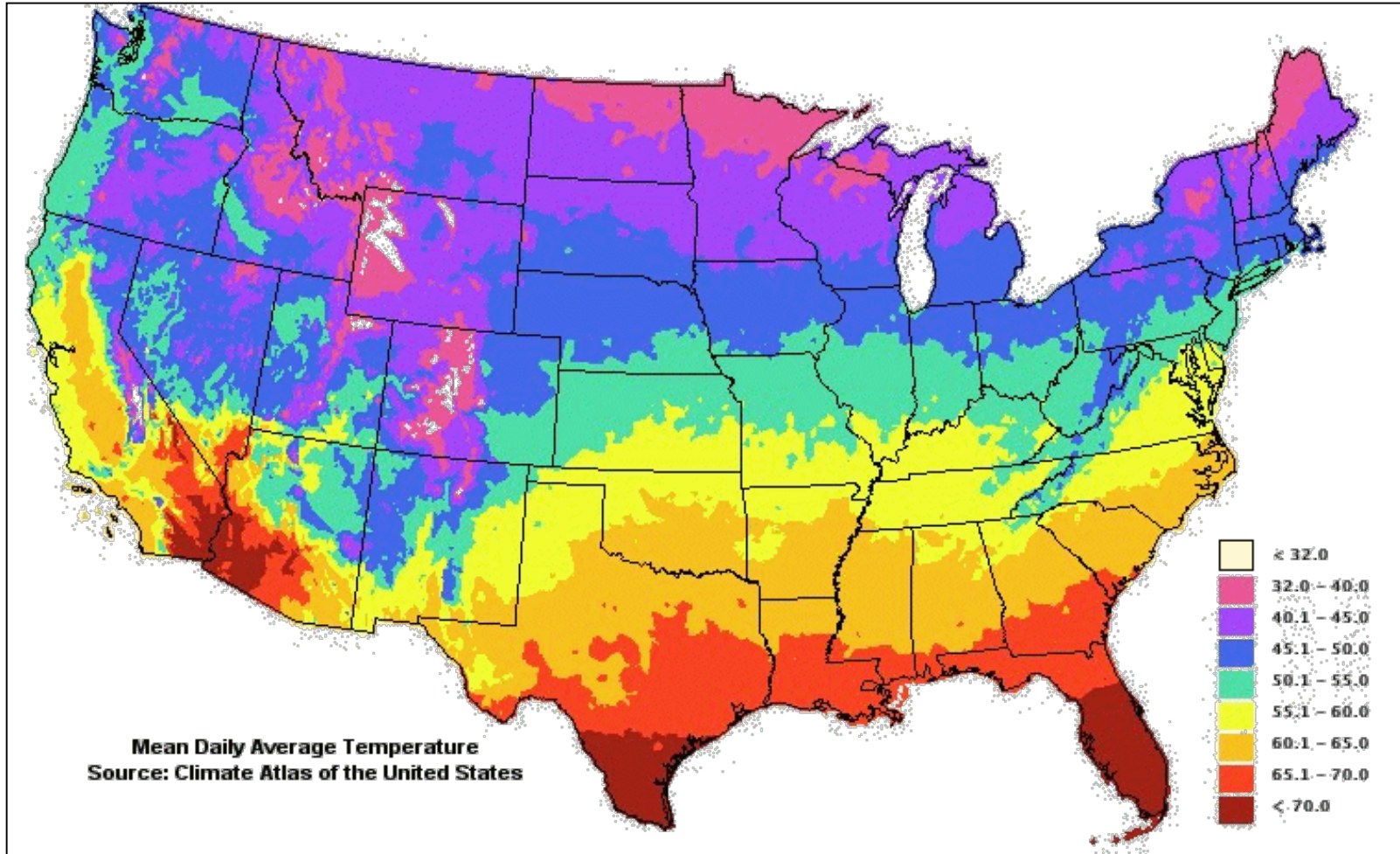
Calculation Spreadsheet-Local Climate

Local Data Used for the Following:

- Evapotranspiration (ET) for landscape irrigation
 - Based on Water and Climate Atlas dataset
 - Processed at the zip code level
- Hardness of water (Water softener water use)
 - USGS hardness map
 - Processed at the zip code level
- Mains water temperature (impacts hot water use wasted)



Variation of Mains Water Temperatures



- HERS_{H₂O} takes this into account at the city level.
- Variations as high as 13 gallons per day from warm to cold climates

Innovative Design Requests

Water Rating providers can petition for adjustment to the Water Rating Index for a Rated Home with features or technologies not addressed by Approved Software Rating Tools or the Standard.



Why Innovative Design Requests?

- Significant increases in water prices spurring investment in water efficiency technologies

Water cost increases from 2000-2012:

1. Atlanta: 233%
2. San Francisco: 211%
3. Wilmington: 200%
4. Philadelphia: 164%
5. Portland: 161%
6. Wichita: 153%
7. New York: 151%
8. Waterloo, IA: 145%
9. Binghamton, NY: 143%
10. San Diego and Augusta: 141%



Submitting an Innovative Design Request

Requests must include the following:

- A Rating generated from Approved Software Rating Tool for the Rated Home without feature(s) that cannot be modeled in the software tool.
- Written description of feature(s) not included in Rating generated from software.
- Manufacturer's technical and/or performance specifications for feature(s) not included in the Rating generated from the Approved Software Rating Tool.
- Estimated water use impact with documentation to support
- Estimated adjustment to the Water Rating Index. Calculations shall follow procedures of Sections 4.1 and 4.2.

Process for Approving Requests

Innovative Design Requests:

- Work with a provider
- Provider submits request to Calculations Subcommittee
- Subcommittee approves or denies request
- Subcommittee may request additional information
- Has been done for Drain Water Heat Recovery systems for HERS
- If approved, can be incorporated into approved software

Potential Areas for Innovation Credits



Alternative to traditional water softener systems

Potential Areas for Innovation Credits



Leak Detection

Potential Areas for Innovation Credits



Rainwater Harvesting

Potential Areas for Innovation Credits



Grey Water Re-use

Thank you!

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Setting the **Standards** for
Home Energy Efficiency