

RESNET HERS H2O: A New Standard for the Water/Energy Nexus



2019 ICC Global Connections Day

Mark Johnson, International Code Council

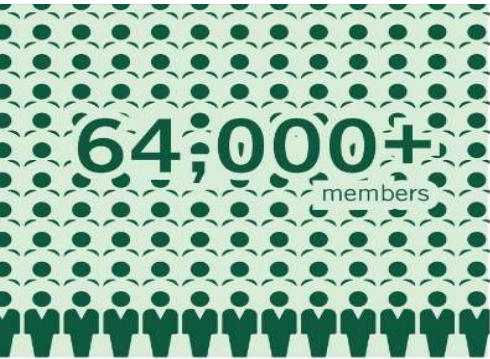
Steve Baden, RESNET



Introduction

HERS_{H2O}

- ICC and RESNET Introduction
- Urgent need for water efficiency and conservation
- RESNET/ICC Standard 850/ HERS_{H2O}
- Benefits - Value



377
chapters
worldwide



Over 55 countries in which our ICC Family of Companies are active



evaluates **85,000+** products to over **5,000+** codes/standards



I-Codes are most widely used and adopted set of building safety codes





RESNET – Residential Energy Home Network

- An industry-based, not for profit organization founded in 1995
- A national standards making body for building energy/water efficiency rating and certification systems
- ANSI Accredited Standards Development Organization
- Comprised of over 1,900 RESNET Home Energy Raters (HERS)
- Provided energy ratings for 236,000 homes in 2018 and over 2.6 million homes to date



Water-Why It Matters

The World *Runs* on Water!

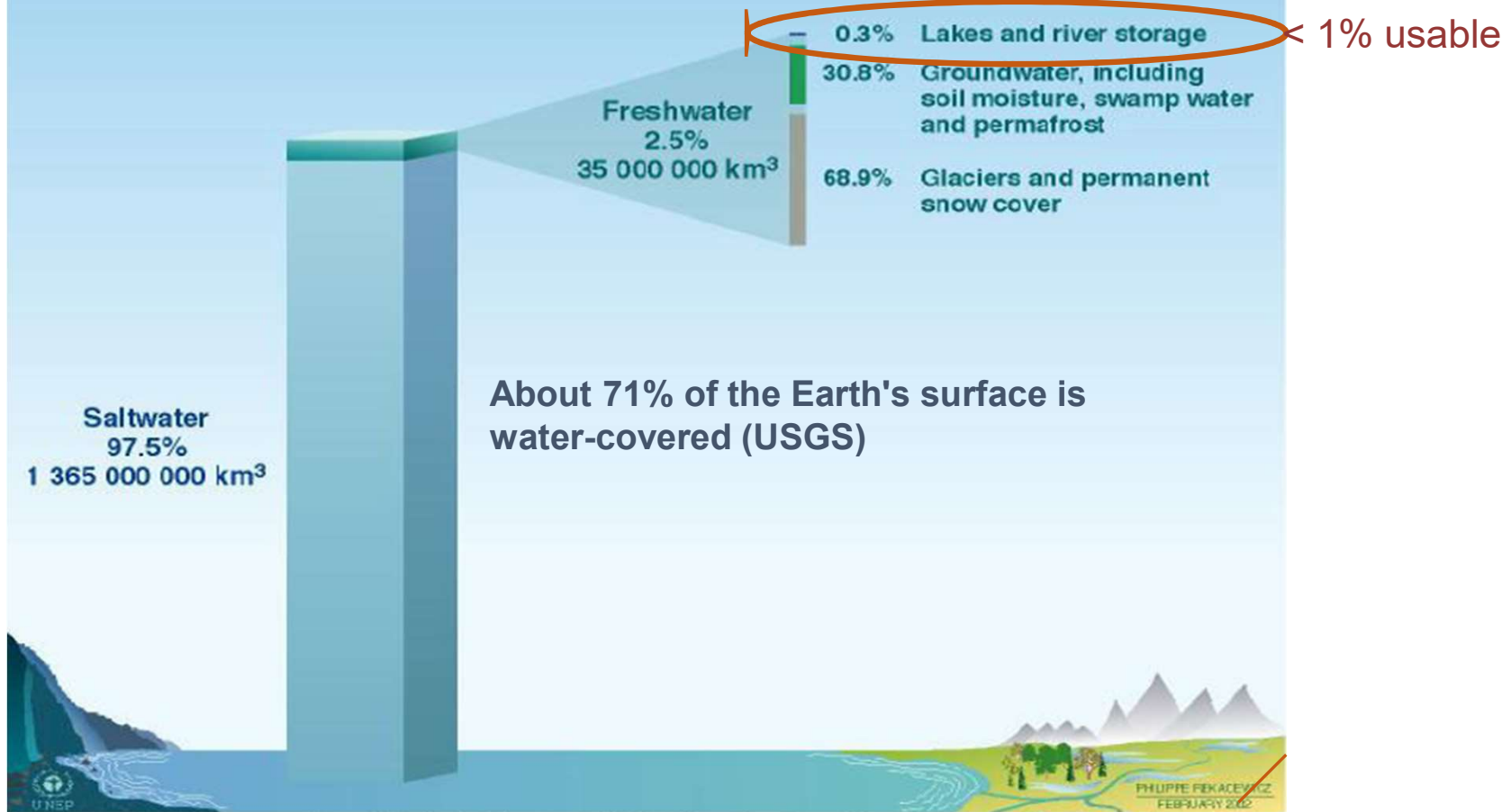
- Water is the most vital natural resource on the planet
- The average adult human body is 50-65% water
- Water is the second most essential resource needed for human survival following oxygen
- We are putting more stress on freshwater resources than ever
- Est. world population 7.6B (2018)

Challenges

- 2.1 billion people lack access to safe drinking water (WHO/UNICEF 2017)
- 4.5 billion people lack safely managed sanitation services. (WHO/UNICEF 2017)
- Water scarcity already affects four out of every 10 people (WHO)
- 90% of all natural disasters are water-related (UNISDR)
- 80% of wastewater flows back into the ecosystem without being treated or reused (UNESCO, 2017)

A World of Salt

Total Global Saltwater and Freshwater Estimates



About 71% of the Earth's surface is water-covered (USGS)

Increased Water Utility Bills

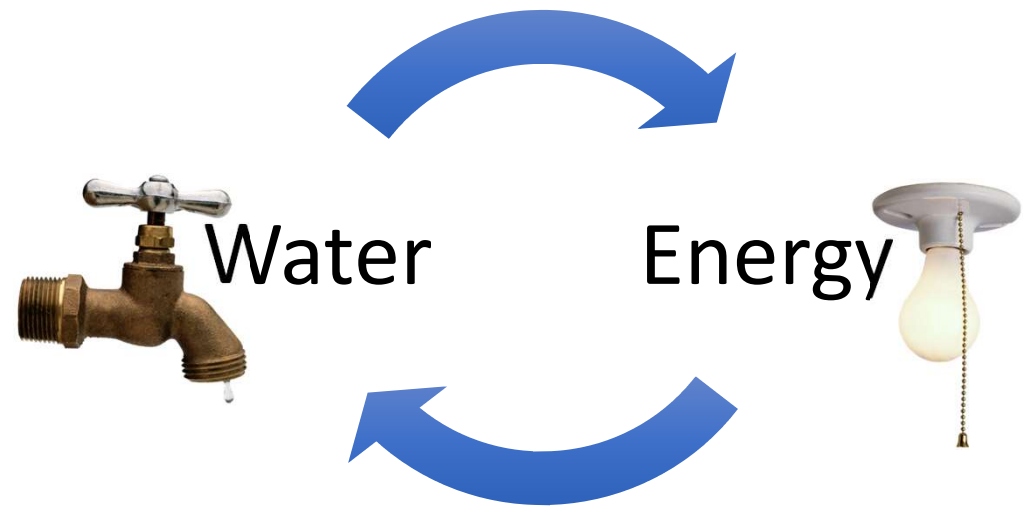
Water cost increases in major US cities from 2000-2012:

- Atlanta: 233%
- San Francisco: 211%
- Wilmington: 200%
- Philadelphia: 164%
- Portland: 161%
- Wichita: 153%
- New York: 151%
- Waterloo, IA: 145%
- Binghamton, NY: 143%
- San Diego and Augusta: 141%



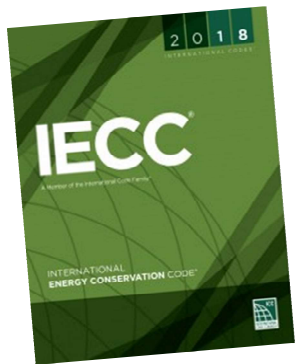
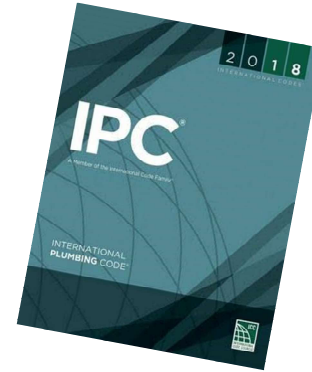
The Water Energy Nexus

- Water-related uses can account for nearly 20% of a state's electricity consumption and 30% of its natural gas
- Over 10% of all the water used for showering in a typical single-family home is wasted waiting for hot water to arrive
- Water-efficiency measures can reduce water and sewer costs by up to 30 percent



Water Efficiency and Model Codes

- **International Plumbing Code**
Non-Potable Water
Rainwater Harvesting Systems



- **International Energy Conservation Code**
Appliances; i.e. Dishwashers, Clothes Washers, Water Heating Systems

- **International Green Construction Code**
Appliances; i.e. Dishwashers, Clothes Washers, Water Heating Systems



STANDARDS

ASABE/ICC 802-2014
Landscape Irrigation Sprinkler and
Emitter Standard
American National Standard (ANSI)



CSA/ICC Rainwater Harvesting Standard (ANSI)
Alternate Water Systems

- Non-Potable Water
- Rainwater Harvesting Systems

RESNET/ICC 850-2019 Standard and HERS_{H2O}

- Water Efficiency Standard for residential construction
- Scheduled for release early in 2020
- Standard provides a uniform methodology for evaluating, rating and labeling the indoor and outdoor water use performance
- Supported by HERS_{H2O} program that establishes water efficiency ratings by Certified HERS Raters and Accredited Rating Providers
- Program is designed to be a voluntary system where builders and homeowners benefit from the water savings
- Similar in approach to existing HERS program for home energy ratings



RESNET/ICC 850-2019
Standard

How do Standard 850 and HERS_{H2O} Relate?

RESNET/ICC Standard 850:

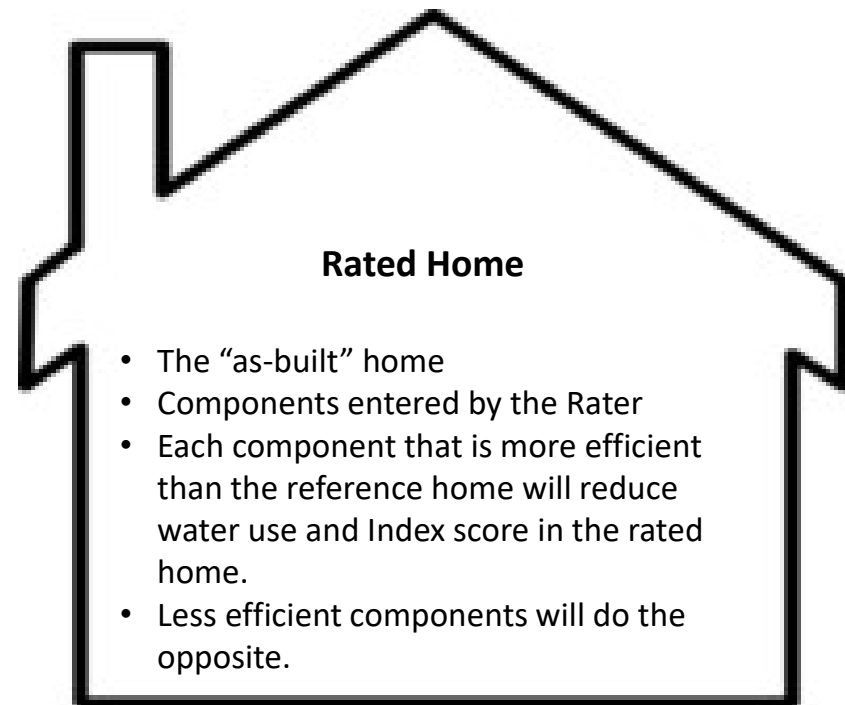
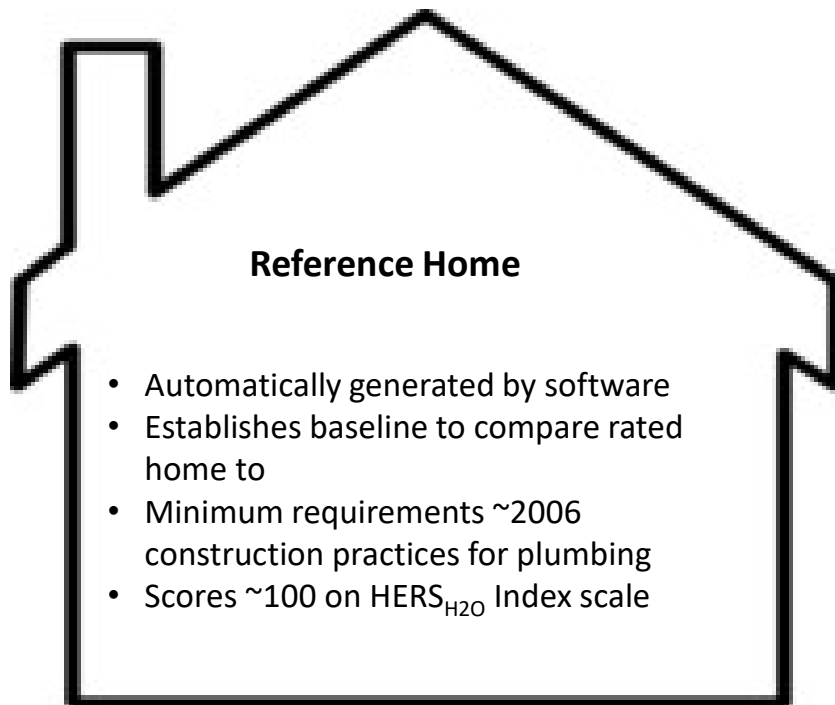
- Developed through an ANSI consensus-based process
- RESNET's Standard Development Committee 1100 is responsible for the development of this standard
- Technical subcommittee also provides recommendations
- Eligible to be adopted by code development and adopting entities

HERS_{H2O}:

- RESNET program that will be based on Standard 850
- Additional program requirements to include:
 - Certification of raters
 - Accreditation of rating providers
 - Quality Assurance oversight
 - Approval of software

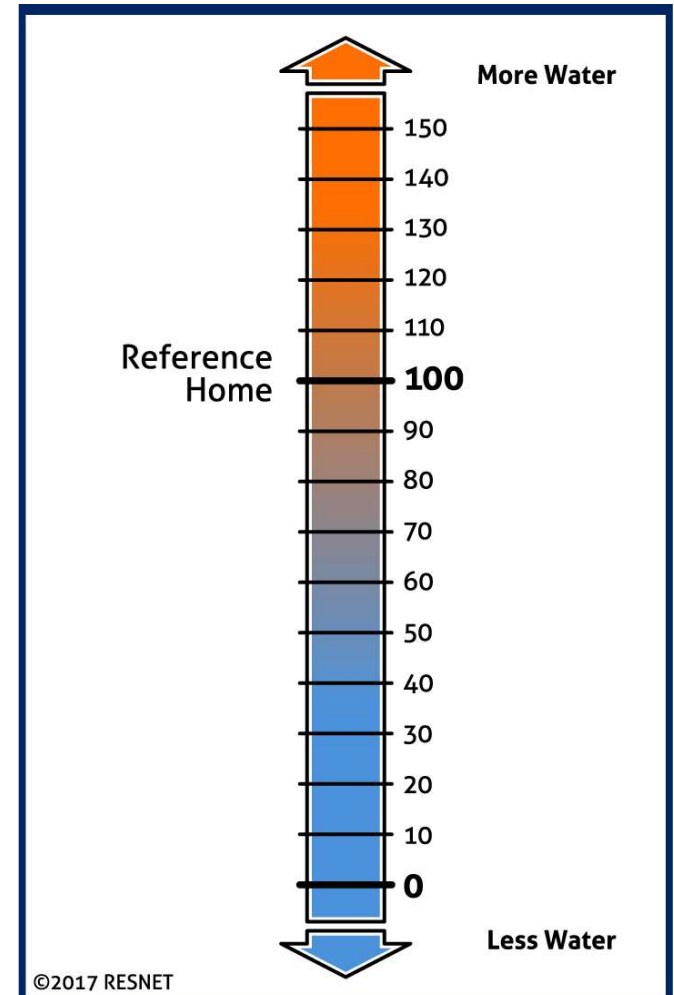
Introduction to HERS_{H2O}

Basic Concept of a Rating



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



Rating Calculation Methodology

- Grounded in water use data as much as possible
- Indoor reference home based primarily on HERS
- Outdoor reference home based on Residential End Uses of Water Study
- Number of bedrooms used as predictor of occupancy
- Built upon ANSI/RESNET/ICC Standard 301-2014 and Addendum A



Components of a Water Rating



Shower Heads



Kitchen Faucet



Lavatory
Faucets



Clothes Washer



Toilet Flush
Volume



Water Softener



Leaks/Other
Water Use



Excess Pressure



Irrigation



Pool or Spa

Other Factors Included in the Rating



House Size



Geographic Location



Number of Bedrooms



Lot & Landscape Size



Hot Water Distribution Layout

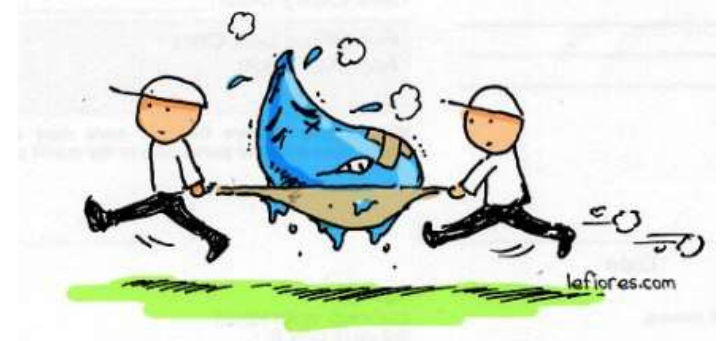


Hot Water Pipe Insulation

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)

A Win for All

- Environment
- Homeowners
- Builders
- Raters
- Water Utility Districts
- Municipalities / Government
- Suppliers / Innovators
- Green Building and Energy Programs



"We shall all know the value of water - when the well runs dry."

Interested Parties

Know someone interested in staying up to date on the water efficiency work of RESNET?

- Have them email ryan@resnet.us.
- Will receive periodic updates
- Notices of public comment periods and webinars
- Monthly “Water Update Newsletter”.

Thank you!

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