Existing Green Codes & Emerging Strategies

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Codes versus Standards

- Standards address the material and performance specification of a product (usually)
- Codes address how, when and where a product is installed (usually)

Codes and Standards Role

- Local and regional needs not always addressed in Federal regulations
- Local enforcement already exists; Federal enforcement sometimes politically charged
- Provides consensus based agreements from all willing stakeholders
- Adaptable by each local jurisdiction to the local conditions
- Can utilize existing EnergyStar and WaterSense specifications in requirements

The Big 3*

- ASHRAE 189.1 Standard for the Design of High Performance Green Except Low Rise Residential Buildings
- IAPMO Green Plumbing and Mechanical Code Supplement (GPMCS)
- ICC International Green Construction Code (IgCC)

* Those that directly address both water and energy use issues

ASHRAE 189.1

- First serious effort at code combining both water and energy conservation
- Not for low-rise residential
- More emphasis on energy and site development than water
- Includes and undefined water efficiency performance equivalency
- Popular alternative to LEED
- Engineer specification, not code
- Compatible with any code

IAPMO Green Plumbing & Mechanical Code Supplement

- Residential & Commercial
- Fixtures, appliances, building envelope, air quality, HVAC, commercial equipment
- Compatible with any base codes
- Emphasis on water and energy efficiency
- Robust alternative waters provisions
- 2nd Edition includes landscape irrigation
- Verifiable by local code officials
- Postponed performance requirements

ICC International Green Construction Code

- Commercial & high-rise residential only
- Fixtures, appliances, building envelope, air quality, HVAC, commercial equipment
- Intended to be compatible ICC Codes
- Very broad in scope of green, including construction materials, practices and location (LEED influence?)
- Verifiable by local code officials
- Postponed direct performance compliance
- ASHRAE 189.1 alternate compliance path

Emerging Strategies

Whacking At the Hornet Nests

- Life Cycle Assessments
- H_2O Performance Equivalency Compliance
- Exchanging Water for Energy
- Landscape Irrigation Equipment & Plants
- Meter Installations
- H_2O Meter Sensitivity
- Systems Commissioning
- Code & Standards Adoption

Life Cycle Assessments

- Carbon footprints
- Water footprints
- How far back do we assess?
- Not all water is the same
  - 3000 gals, per bushel of corn, but is it rainwater or irrigation
- Different models = different results

H_2O Performance Equivalency Compliance

- Plumbing fixture use depends on:
  - Person/fixture ratio
  - Type of occupancy
  - Duration of occupancy
- Insufficient non-residential data to model water use
- Building occupation and use changes
- Bad water use behavior hard to control

Exchanging Water for Energy & versa-vice

- Water cooled equipment
- Cooling towers
  - Questionable economics in some applications
- Hydro-electric generators
- Evaporative coolers
- Evaporatively cooled A-Cs
- Fracking
- Vegetative roofs

Landscape Irrigation Equipment

- 3 Biggest Factors:
  - Location, location, location
- Cannot codify post installation behavior
- Establishing plants versus maintaining
- Lack of product standards
- The "right" to grow an oasis in the desert

Meter Installations

"*That which is measured is improved*"

- How many meters is enough
- Who reads the meters and how
- Commercial spaces change types of tenants and rearrange borders
- Meters are vital tools of efficiency, but not solutions

H_2O Meter Sensitivity

- Most stringent AWWA Standard does not require sensitivity better than 0.25 GPM (360 gallons/day)
- Meters larger than ¾" are much less sensitive to measuring low-flows and leaks, many requiring more than 2 GPM to register water use.

HVAC System Commissioning

- Who is qualified and trusted to sign-off?
- When do you test?
- Other construction activities can harm HVAC performance.
- Who is liable for failures?

Codes & Standards Adoption

- Codes are like software - you can't find all the bugs until you get users; TIAs fix all
- Codes too stringent do not attract early adopters
- Codes too lenient encourage greenwashing
- Early adopters enact as "voluntary" codes.
- Many innovative codes and standards provisions "greatly influence" EnergyStar and WaterSense provisions; which influences Federal Minimum Standards (and vice-versa)

More Information

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