

IBPSA PRESENTATION: ASHRAE 90.1

“Energy Standard for Buildings
Except Low-Rise Residential
Buildings”

State of the Energy Cost Budget
Method

Disclaimer

- These are the views of Keith Emerson, member of SSPC 90.1 and a former chair of the Energy Cost Budget Subcommittee.
- Presented August 6, 2004

History

- **90.1-1975**
- **Remember the Energy Crisis?**
 - **90.1-1980**
 - **90.1-1989**
- **Energy Policy Act of 1992**

History Continued

- 90.1-1999

- Certified by DOE
- Code language

- 90.1-2001

- Minor changes
- Not Certified to save energy
- USGBC adoption

- 90.1-2004

- Lighting wattage reductions
- Appendix G

Building Codes too!

- NFPA 900 - Building Energy Code

Direct reference to ASHRAE 90.1

International Codes

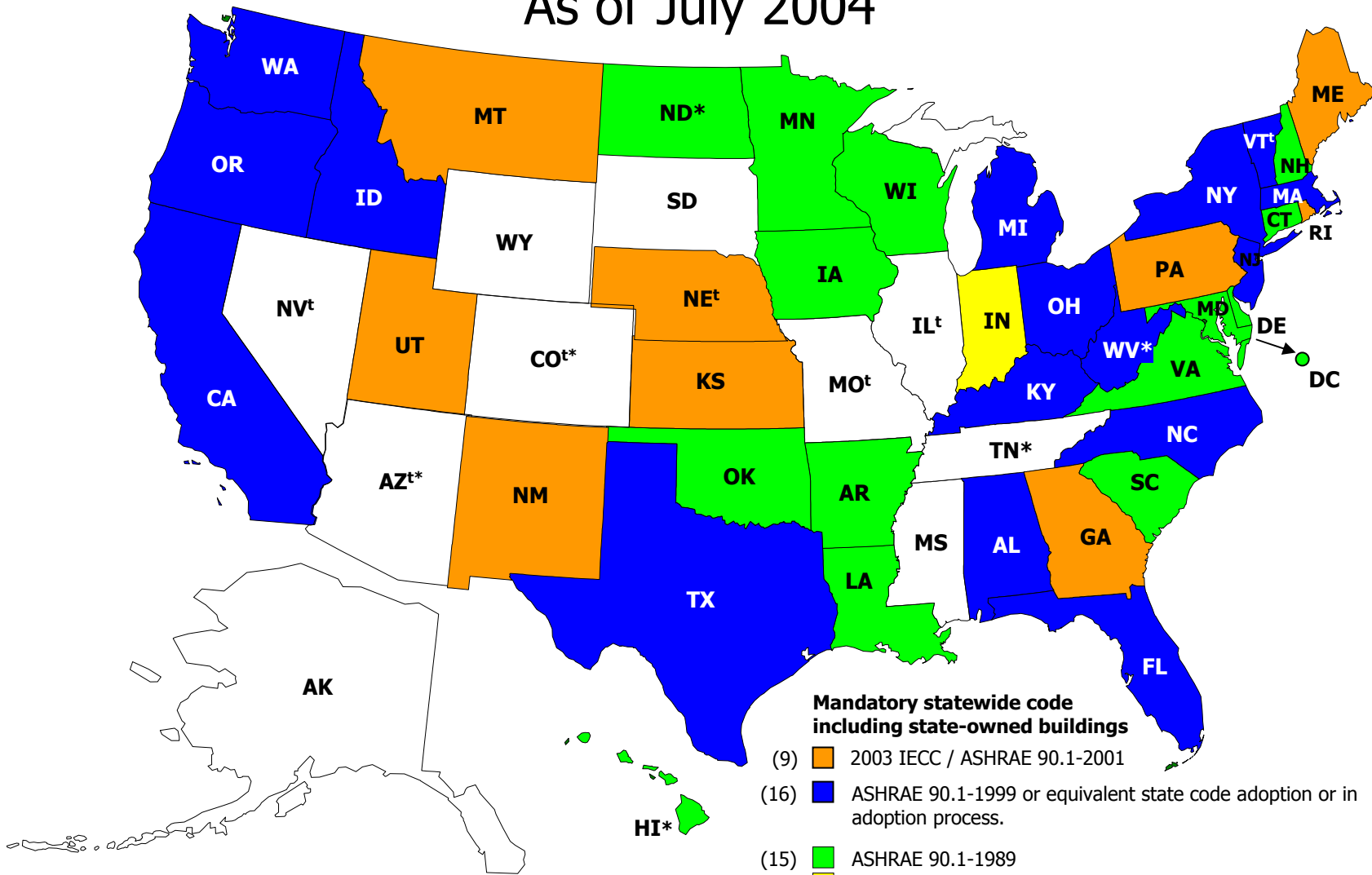
Section 1301.1.1 of the International Building Code

Criteria.

“Buildings shall be designed and constructed in accordance with the International Energy Conservation Code.”

Commercial Energy Codes Status

As of July 2004



Mandatory statewide code including state-owned buildings

- (9) Orange 2003 IECC / ASHRAE 90.1-2001
- (16) Blue ASHRAE 90.1-1999 or equivalent state code adoption or in adoption process.
- (15) Green ASHRAE 90.1-1989
- (1) Yellow State developed code does not meet 90.1-1989
- (10) White Weaker/None

**Building Codes Assistance Project
Commercial Map 7/7/04**

* Code implementation depends upon voluntary adoption by local jurisdictions.

† 90.1 Mandatory for state owned buildings

NOTE: This map should be used in conjunction with BCAP's Status of the State newsletter. Go to bcap-energy.org to view current newsletter.

Philosophy

- A building designed to “just meet” code is the worst building you can legally build!
- Cutting off the bottom, not encouraging the best.

Philosophical Implications for the Energy Cost Budget

- Minimize “gaming”
- Trade-off approach rather than how much better you are.
- Look to other sections for what can be traded (if it’s not regulated, can it be traded?).
- Encourage innovative approaches

Energy Cost Budget

- Compares Proposed Building to a Budget Building
- Mandatory (Section 2) versus Prescriptive (Section 3) Requirements
- Design Energy Cost versus Energy Cost Budget - the money versus energy debate
- Normative versus Informative Requirements

Evolutions

- 90.1-1989
 - Defined buildings /systems by occupancy and size
 - Schedules included
 - Energy costs at the building site rather than factors to take the relative cost back “to the ground”

90.1-1999

- Currently in most building codes
- Evolution
 - David Goldstein's vision
 - The Compliance Supplement
 - Consensus Document: reality strikes
 - Remove compliance supplement
 - Remove schedules

Quo Vadis, 90.1-2004?

Reorganized for easier use. Columns comparing the two model's requirements.

- Proposed Design
 - HVAC Systems.....
 - “Where a complete HVAC system exists, the model shall reflect the actual system type using actual component capacities and efficiencies.”
- Budget Building
 - “The HVAC system type and related performance parameters for the budget building design shall be determined from Figure 11.3.2, the system descriptions in Table 11.3.2A and accompanying notes.....”

Appendix G

- What to do if you want to find out how much better your building is rather than if it is at least the equal of the worst building?
- Encouraged by USGBC and other organizations for their use.

Schedules

- Section 11
- No change in schedules between buildings
- Appendix G
- Exception to permit changes in schedules when necessary for proper modeling of “non-standard” measures.

Example of difference

- 90.1 test only cares about the differences between traded off components
- More equipment added in to Appendix G calculation, even if same on both sides, to better reflect “true” percentage savings

What do you want to see in the
next evolution??

Now is the time!