

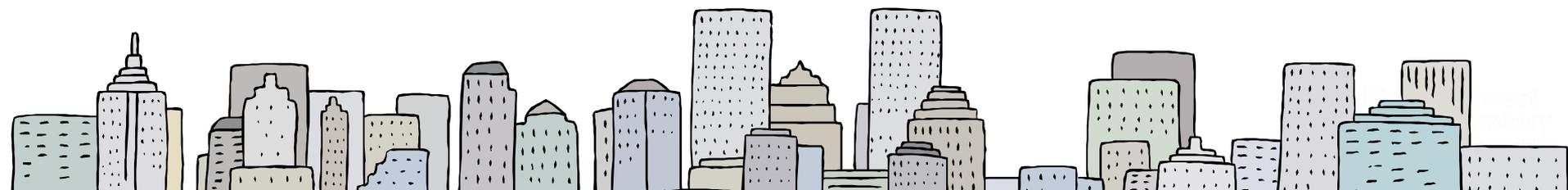


Codes 101

Understanding Building Energy Codes and Standards

Pam Cole

Pacific Northwest National Laboratory





DID YOU KNOW?
ONE IN FOUR "STRUCK BY VEHICLE" DEATHS INVOLVE CONSTRUCTION WORKERS, MORE THAN ANY OTHER OCCUPATION.



DID YOU KNOW?
FALLS FROM ELEVATION
ACCOUNT FOR ONE THIRD
OF ALL DEATHS
IN CONSTRUCTION.



Why Building Energy Codes & Standards





Codes, Standards, and Model Codes

➤ Code

- Specify how the building ***must*** be constructed
- Example: State Specific Code (GA)

➤ Standard

- Describe how the building ***should*** be constructed
- Example: ASHRAE

➤ Model Code

- A general code that may be adopted by state or local jurisdictions
- Often modified to reflect regional needs and practice
- Example: IECC



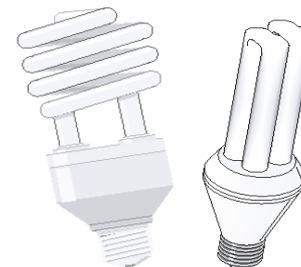
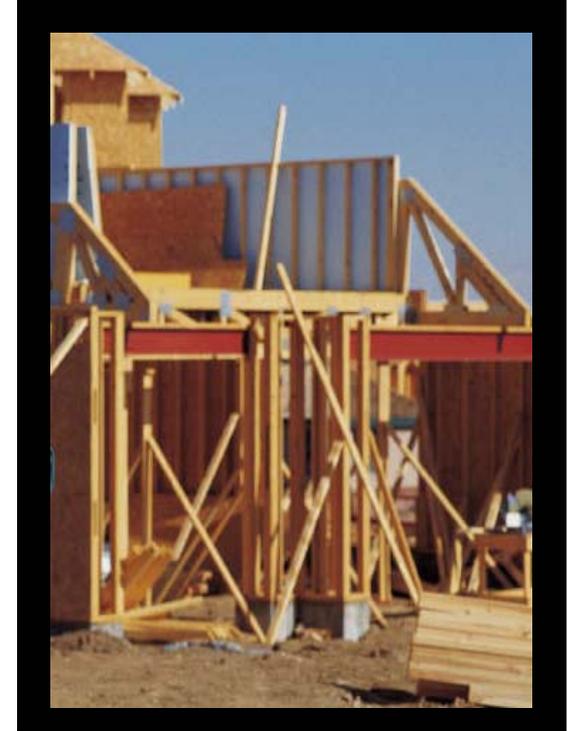
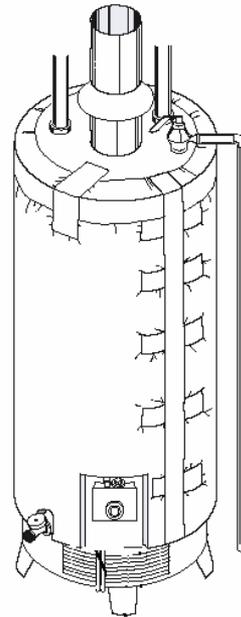
Energy Codes & Standards

➤ Residential

- Building Envelope
- Mechanical
- Service Water Heating
- Electrical Power & Lighting

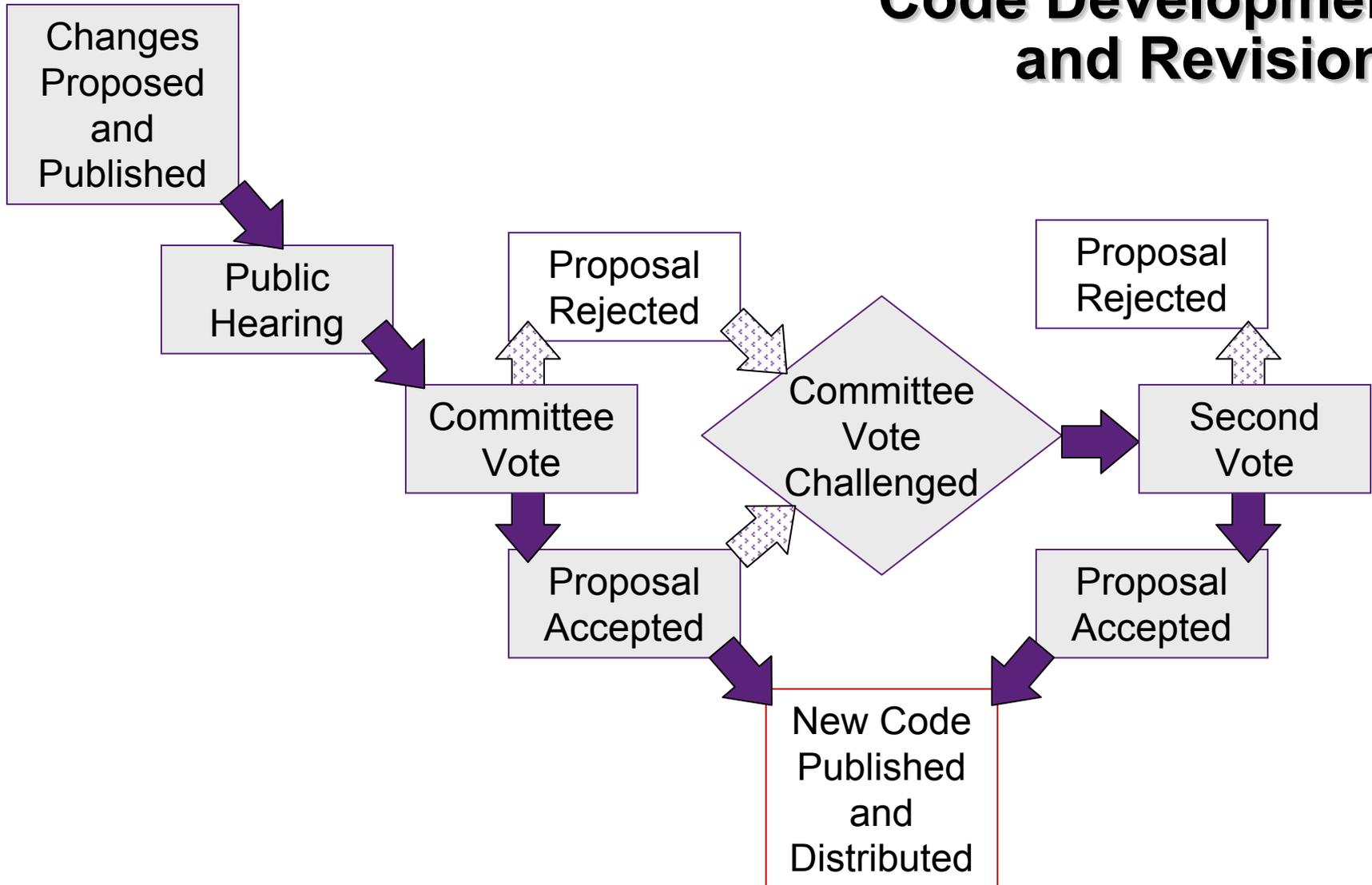
➤ Commercial

- Building Envelope
- Lighting
- Mechanical
- Service Water Heating





Code Development and Revisions

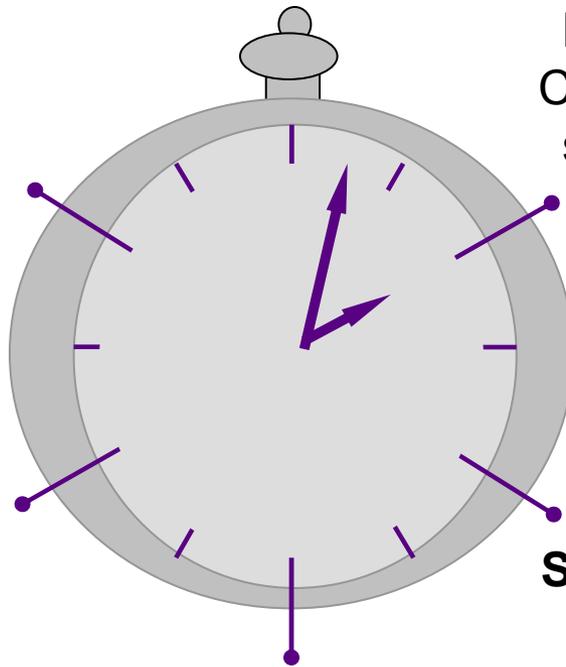




Current Code Development Cycle

August 2004

Code changes
submitted to IECC
(next cycle begins)



March 2003
Code changes
submitted to
IECC

September 2003
IECC public
hearings

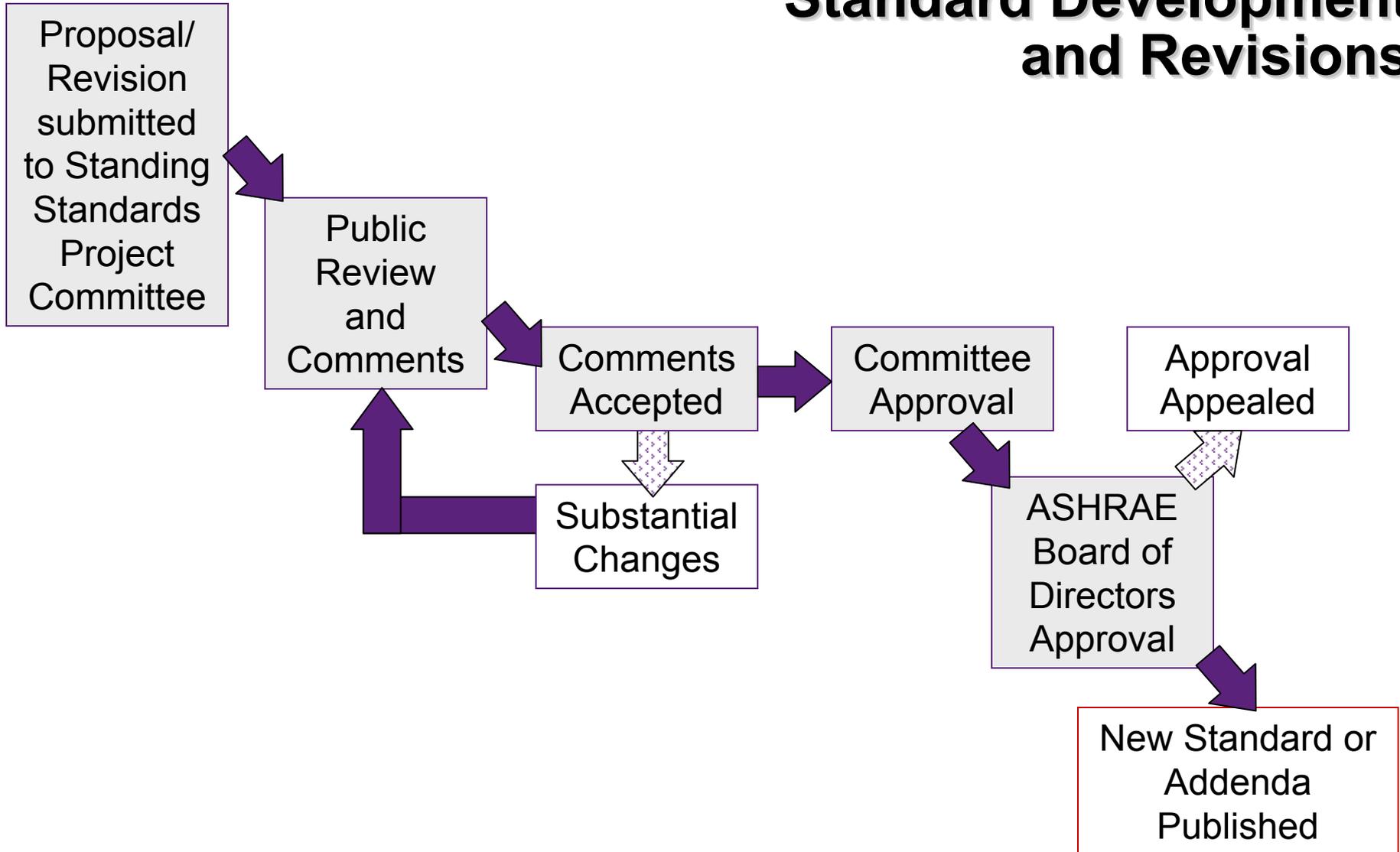
February 2004
Deadline for public
comments

May 2004
Final action
public
hearings

- Involves:
- Code officials
 - Industry
 - Builders
 - Advocacy Groups
 - Designers
 - DOE

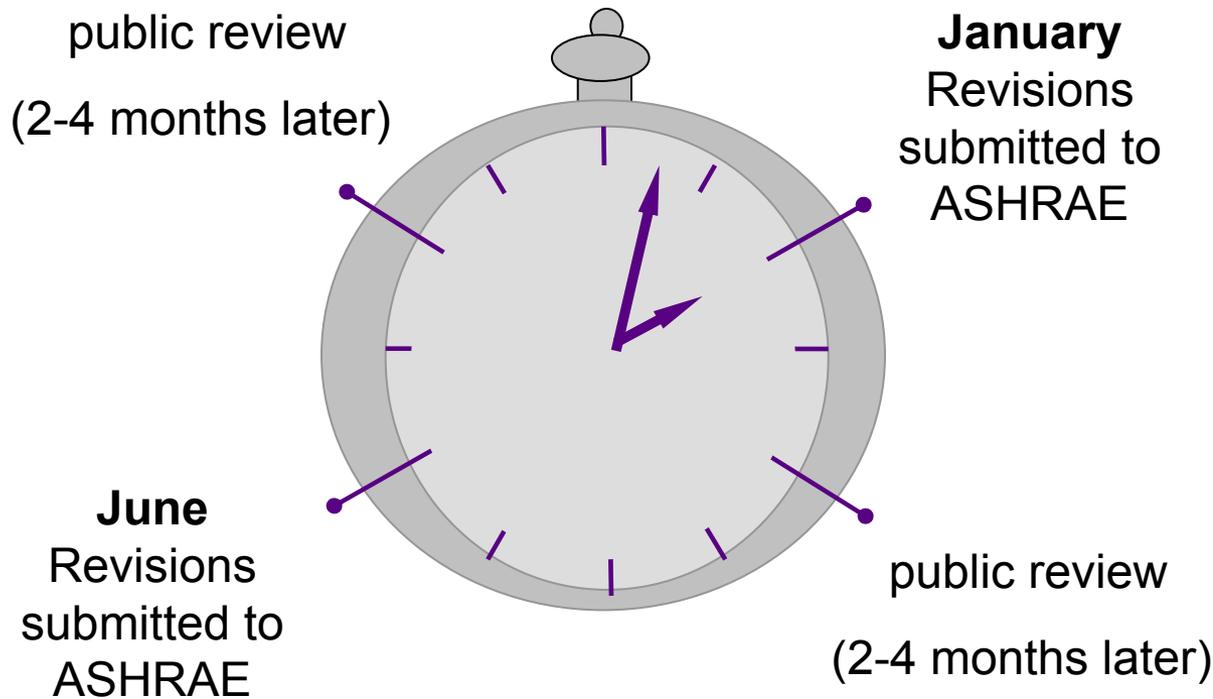


Standard Development and Revisions





Standard Development Cycle

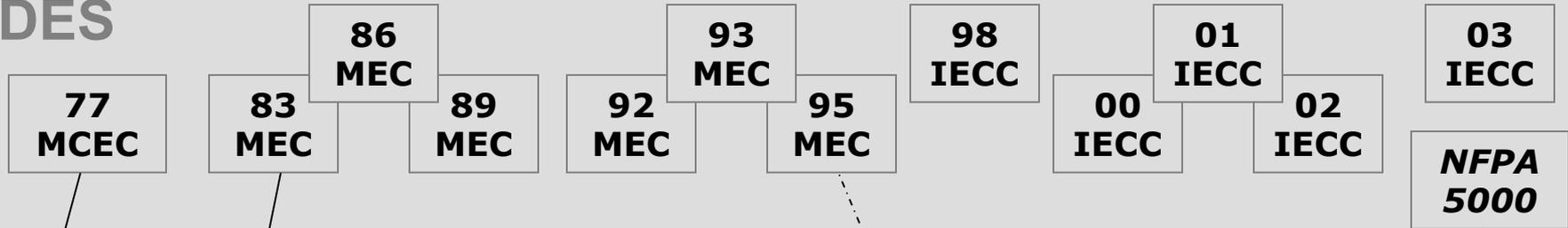


- Involves:
- ARI, ASTM, IESNA
 - NFPA
 - Industry
 - Builders
 - Advocacy Groups
 - Code Officials
 - Designers
 - DOE

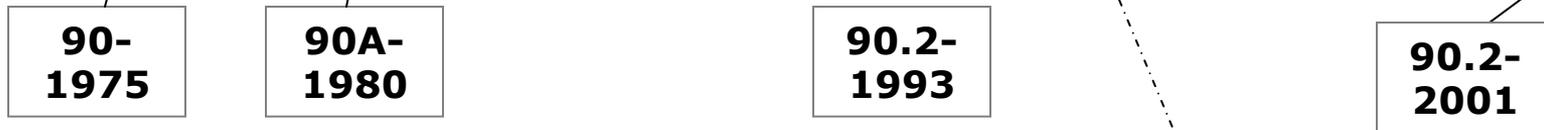


Residential Codes and Standards

CODES



STANDARDS



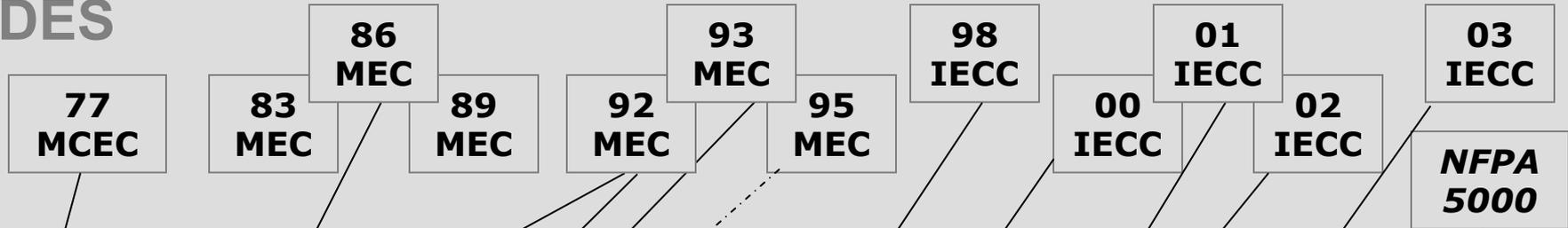
FEDERAL



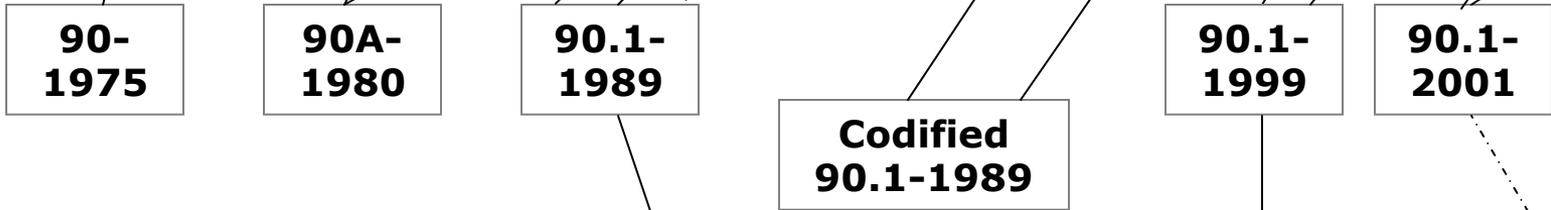


Commercial Codes and Standards

CODES



STANDARDS



FEDERAL





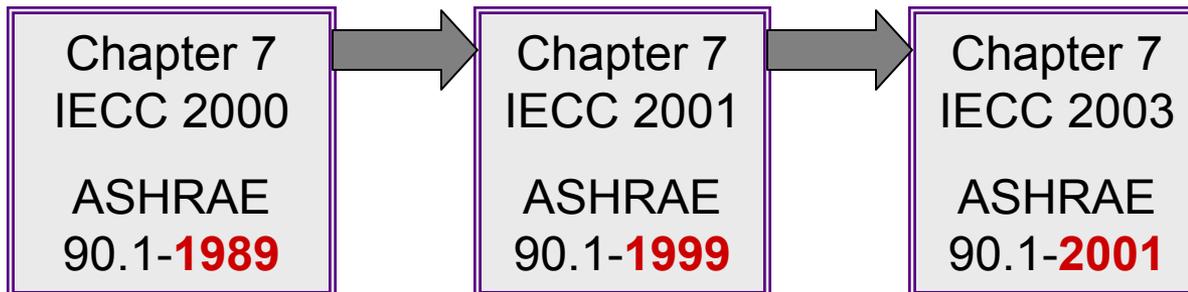
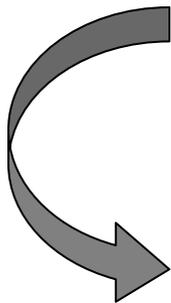
Standards and Model Codes

Title	Type	Description	Common Versions
International Energy Conservation Code (IECC)	Model Energy Code	Applies to residential and commercial buildings. Written in mandatory, enforceable language	1998 IECC 2000 IECC
ASHRAE Standard 90.1: Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings	Energy Standard	Applies to all buildings except residential buildings with three stories or less.	90.1-1989 90.1-1999
ASHRAE Standard 90.2 Energy-Efficient Design of New Low-rise Residential Buildings	Energy Standard	Applies to residential buildings with three stories or less.	90.2-1993 90.2-2001
National Fire Protection Agency Code (NFPA 5000)	Model Energy Code	Applies to residential and commercial buildings.	NFPA 5000



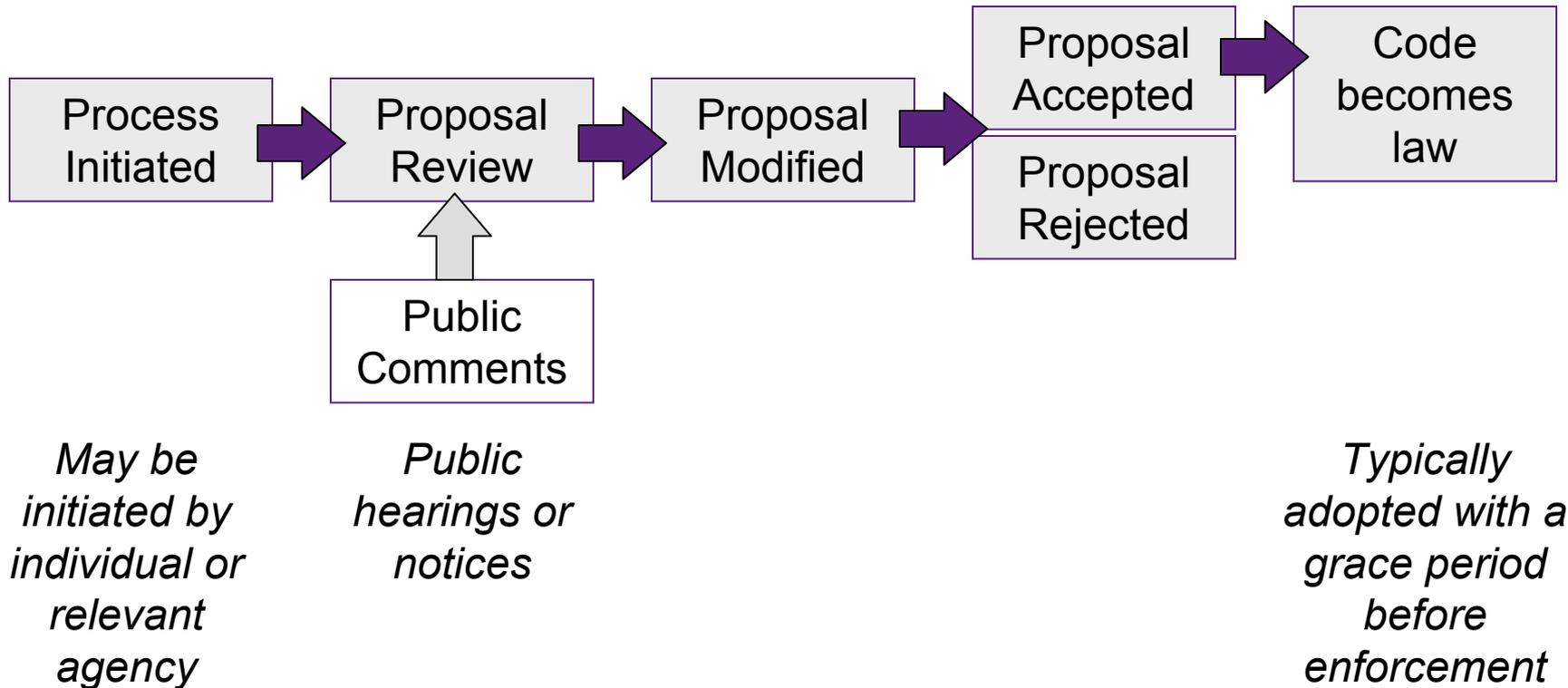
Overview of Code Compliance Structure of the IECC

- **Chapter 1** Administrative & Enforcement
- **Chapter 2** Definitions
- **Chapter 3** Design Conditions
- **Chapter 4** Residential - Systems Analysis
- **Chapter 5** Residential - Component Performance
- **Chapter 6** Simplified Prescriptive Requirements
- **Chapter 7** ASHRAE Energy Code Reference
- **Chapter 8** Design by Acceptable Practice for Commercial Buildings
- **Chapter 9** Referenced Standards





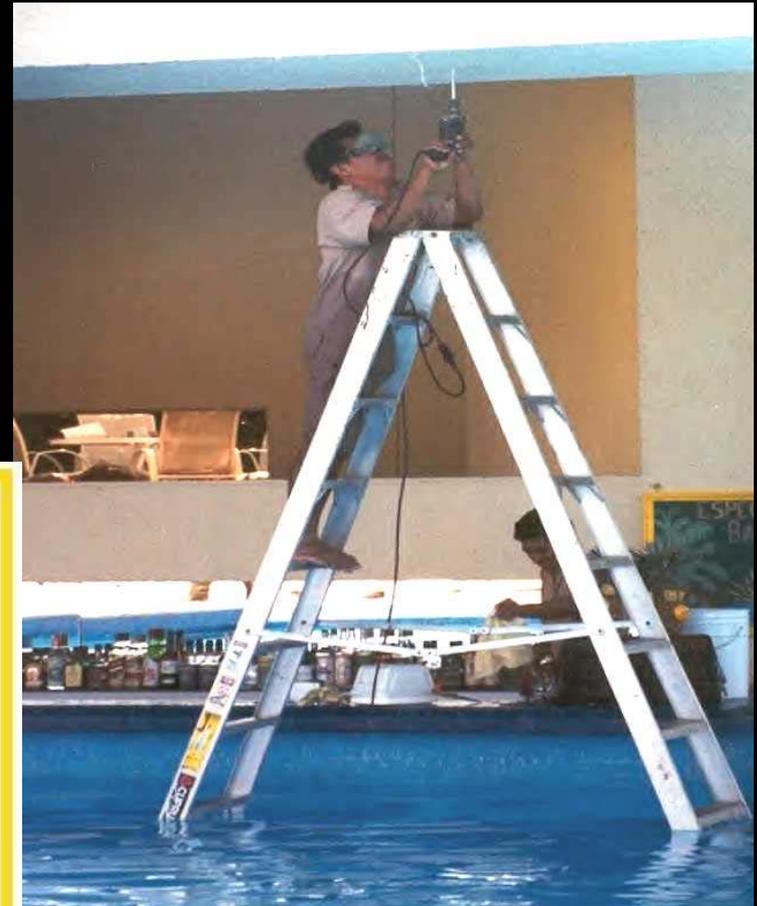
Code Adoption at State and Local Levels





Implementation of Energy Codes at State and Local Level

Communication is KEY!!!



DID YOU KNOW?
APPROXIMATELY 350
ELECTRICAL-RELATED
FATALITIES OCCUR
EACH YEAR.



Energy Code Compliance

➤ Prescriptive

- Tables within codes/standards
- Tri-folds, compliance forms

➤ Trade-offs

- Simple calculation
- Software approach (REScheck and COMcheck)

➤ Performance

- Software approach (DOE2, EnergyGauge, EnergyPlus, HERS program)





Code Enforcement

- Energy code enforcement typically includes
- Plan review
 - Product, equipment, material review
 - Testing and certification review
 - Calculation review
 - Building inspection during construction
 - Construction substitution review
 - Building inspection prior to occupancy



Code Enforcement

- Codes may be enforced at the state, local or jurisdiction level
 - Enforcement is often done with limited resources
- Voluntary Energy-Efficiency Programs may assist code enforcement
 - Home Energy Rating Systems (HERS)
 - Energy Star
 - Utility and Government Programs (LEED and Good Cents)



DOE's Support

- Provide financial and technical assistance to adopt, implement and enforce
- Participate in the development of codes and standards
- Provide information and resources, compliance products, training and energy code related news



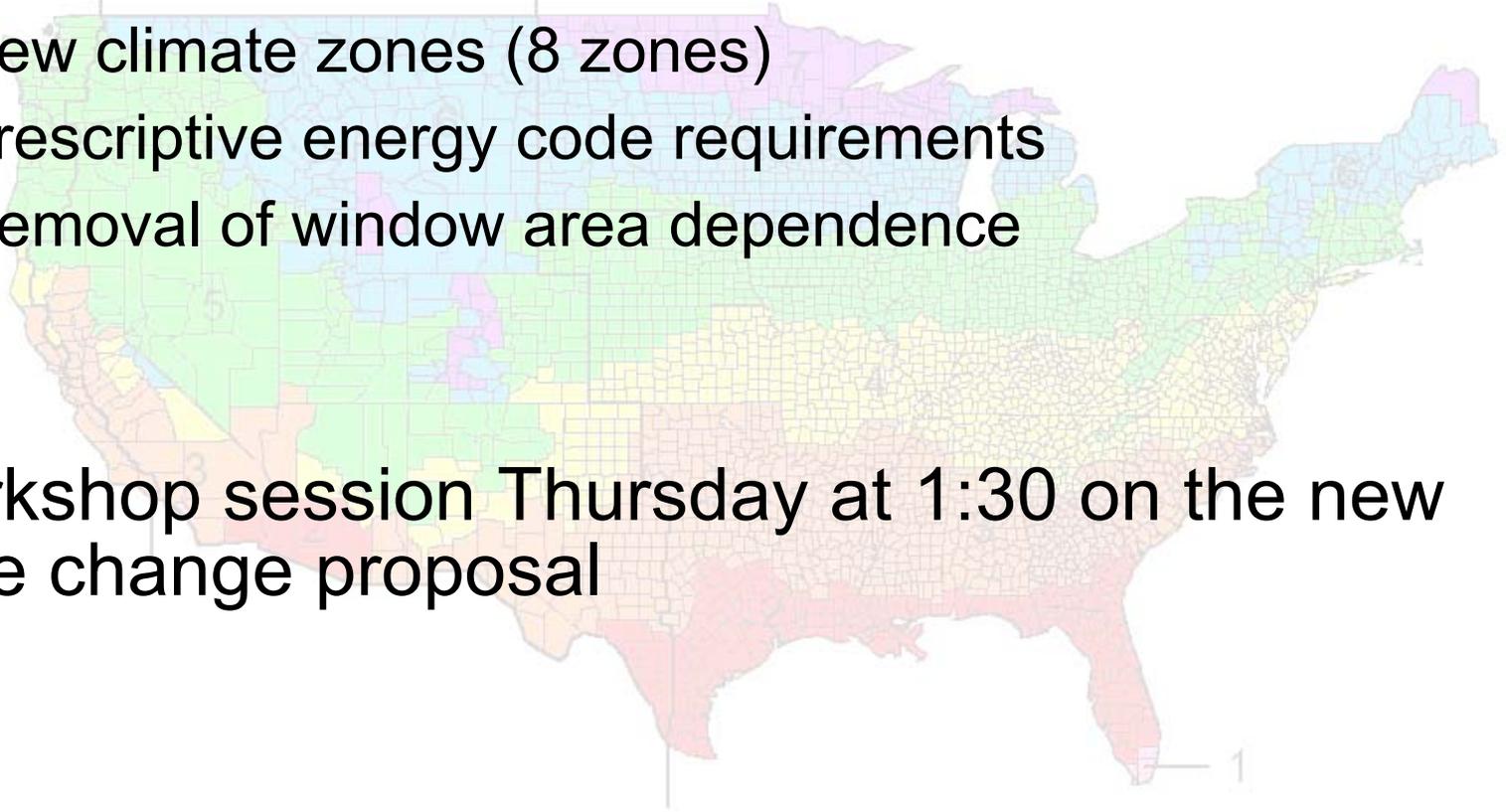


Future Codes?

➤ DOE proposed new IECC code change

- New climate zones (8 zones)
- Prescriptive energy code requirements
- Removal of window area dependence

➤ Workshop session Thursday at 1:30 on the new code change proposal





Energy Code Resources

- Our Website
 - www.energycodes.gov
- ICC Website
 - <http://www.intlcode.org/>
- ASHRAE Website
 - <http://www.ashrae.org/>
- NFPA Website
 - <http://www.nfpa.org>