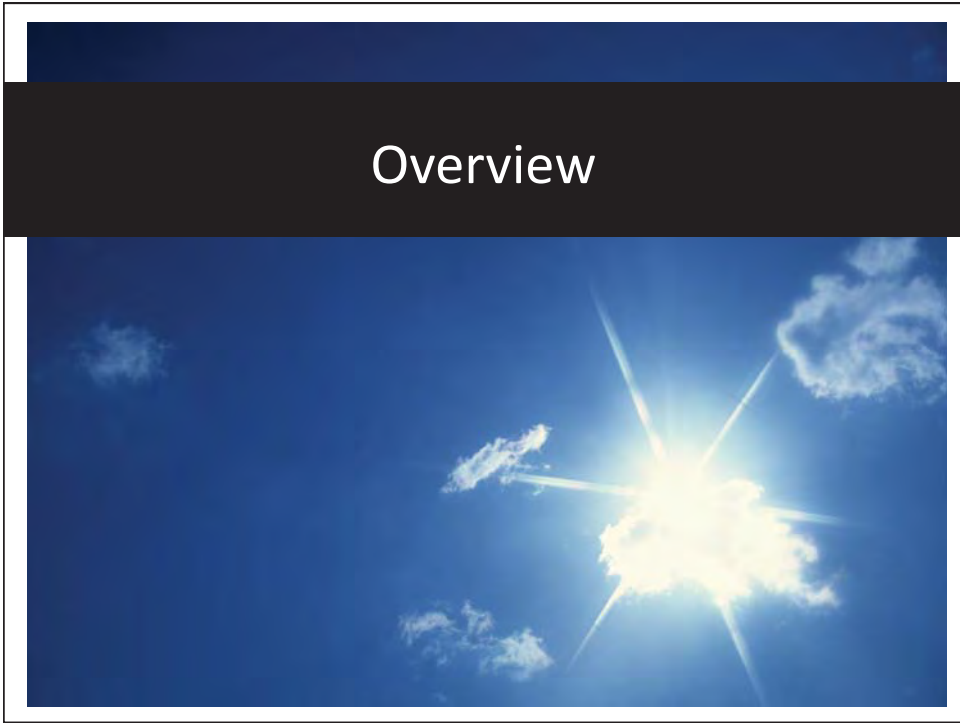


Today's Agenda

8:00	Scope and Application Building Envelope
	Mechanical Systems and Service Water
	Lighting Additional Efficiency Package Options
Noon	Adjourn



Commercial Compliance Options

1 ● 90.1-2010

OR

2 ● 2012 IECC

- C402 - Envelope
- C403 - Mechanical
- C404 - SWH
- C405 - Lighting

AND


● Pick One:

- C406.2 – Eff. HVAC Performance
- OR
- C406.3 – Eff. Lighting Systems
- OR
- C406.4 – On-site Renewable Energy

OR

3 ● 2012 IECC

- C407 – Total Building Performance
- C402.4 – Air Leakage
- C403.2 – Provisions applicable to all mechanical systems
- C404 - SWH
- Lighting Mandatory Sections
 - C405.2
 - C405.3
 - C405.4
 - C405.6
 - C405.7
- Building energy cost to be ≤ 85% of standard reference design building



Additional Efficiency Package Options

C406

- One additional efficiency feature must be selected to comply with the IECC
 - More efficient lighting system (consistent with 90.1-2010), **OR**
 - More efficient HVAC system, **OR**
 - Installation of onsite renewables
 - 3% of the regulated energy



High Efficiency HVAC



More Efficient Lighting System



Onsite Renewables

Additional Efficiency Package Options

C406

- Efficient HVAC performance per C406.2 **OR**
 - Per Tables C406.2(1) thru C406.2(7)
 - Only used when efficiencies in the above tables are greater than those in the efficiency tables in C403
- Efficient lighting system per C406.3 **OR**
 - Whole building LPD complies with C406.3.1
 - Determine total LPD of building using reduced whole building interior lighting power in Table 406.3 x floor area for the building types
- On-site supply of renewable energy per C406.4
 - Total minimum ratings to comply with
 - Provide ≥ 1.75 Btu or ≥ 0.50 watts per ft² of conditioned floor area OR
 - Provide $\geq 3\%$ of energy used for mechanical and SWH equipment and lighting

Individual tenant spaces to comply with either C406.2 or C406.3 unless documentation is provided that demonstrates compliance with C406.4 for the entire building



Structure of the IECC

- Chapter C1 Administrative
- Chapter C2 Definitions
- Chapter C3 Climate Zones
- Chapter C4 Commercial Energy Efficiency
- Chapter C5 Referenced Standards

Residential also has 5 Chapters



Overview of Commercial Code Requirements

Focus is on:

Section C402 – Building Envelope

Section C403 – Building Mechanical Systems

Section C404 – Service Water Heating

Section C405 – Electrical Power & Lighting Systems

Section C406 – Additional Efficiency Packages

Section C407 – Total Building Performance

Section C408 – System Commissioning

Equipment efficiency is established by NAECA not IECC.

Chapter 1 – Administration



Scope of IECC

Does my project need to comply with the commercial provisions in the IECC?

All buildings need to comply with commercial standards other than:

- ✓ R-3, One- and two-family residential
- ✓ R-2, R-4 three stories or less in height



What must Comply

Overall statement of what must comply

- ✓ New Buildings
- ✓ Additions to Existing Buildings
- ✓ Alterations of Existing Buildings
- ✓ Replacements of Portions of Existing Buildings
- ✓ Changes in Space Conditioning

Administrative Requirements

- ✓ Permits
- ✓ Enforcement
- ✓ Local

Scope



New buildings and their systems

Scope *(cont'd)*

New *portions* of buildings and their systems (*additions*)

addition: an extension or increase in floor area or height of a building outside of the existing building envelope.



Scope (cont'd)



New systems and equipment in *existing* buildings (alterations)

alteration: a replacement or addition to a building or its systems and equipment; routine maintenance, repair, and service or a change in the building's use classification or category shall not constitute an alteration.

Scope (cont'd)

- ✓ Envelope must comply if
 - heated or cooled with an output capacity ≥ 3.4 Btu/h-ft² or
- ✓ Virtually all mechanical, power, and lighting systems are covered
 - **Examples include**
 - heating, ventilating and air conditioning
 - service water heating
 - electric power distribution
 - metering provisions

Scope Exception

What does not apply

- ✓ Too little heating or cooling
- ✓ Single-family, multifamily of three stories or less, manufactured or modular homes
- ✓ Buildings that don't use electricity or fossil fuel
- ✓ Equipment and portions of building systems that use energy primarily for industrial, manufacturing, or commercial processes



Administration and Enforcement

Compliance

- ✓ New buildings
- ✓ Additions to existing buildings
 - Exceptions
 - Trade-offs will be allowed
- ✓ Alterations to existing buildings
 - Exceptions
 - Designated historically significant
 - Annual energy consumption



Exceptions for Alterations



Buildings that are specifically designated as historic

- ✓ by the adopting authority or
- ✓ on the National Register of Historic Places or
- ✓ eligible for listing by the U.S. Secretary of Interior

If the building's annual energy consumption is the same as a building that meets the requirements of Sections 5-10

- ✓ verified by a design professional using methods acceptable to the authority having jurisdiction

C101.4 Applicability

If there are different specifications in this code, the most restrictive requirement governs.

If there is a conflict between a general and a specific requirement, then the specific requirement governs.

Additions, Alterations, Renovations, Repairs *Exceptions*

Exception: The following need not comply provided the energy use of the building is not increased.

1. Storm windows over existing fenestration
2. Glass only replacements
3. Exposed, existing ceiling, wall or floor cavities if already filled with insulation
4. Where existing roof, wall or floor cavity isn't exposed
5. Reroofing for roofs where neither sheathing nor insulation is exposed

When exposed - Insulate above or below the sheathing

- Roofs without insulation in the cavity
 - Sheathing or insulation is expose
-
-

Additions, Alterations, Renovations, Repairs *Exceptions*

Exception: The following need not comply provided the energy use of the building is not increased.

6. Replacement of existing doors that separate conditioned space from the exterior shall not require installation of a vestibule . . .
 7. Alterations that replace less than 50% of the luminaires in a space . . .
 8. Alterations that replace only the bulb and ballast within existing luminaires . . .
-
-

C101.4.4 Change in Occupancy or Use

Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code.

Where the use in a space changes from one to another, the installed lighting wattage shall comply with Section C405.5.

101.4.5 Space Conditioning

Any non-conditioned space that is altered to become conditioned space shall be required to be brought into full compliance with this code.



101.4.6 Mixed Occupancy

Treat the residential occupancy under the applicable residential code.

Treat the commercial occupancy under the commercial code.

The residential and commercial occupancies fall under two different scopes. Thus, two compliance submittals must be prepared using the appropriate calculations and forms from the respective codes for each.

Helpful Information

Mixed Use – 3 Story



3rd Street, San Bernardino, California

Helpful Information

Mixed Use – 7 Story



Riverwood, Atlanta, Georgia

Multiple Dwelling Units



Summerhill, Idaho Falls

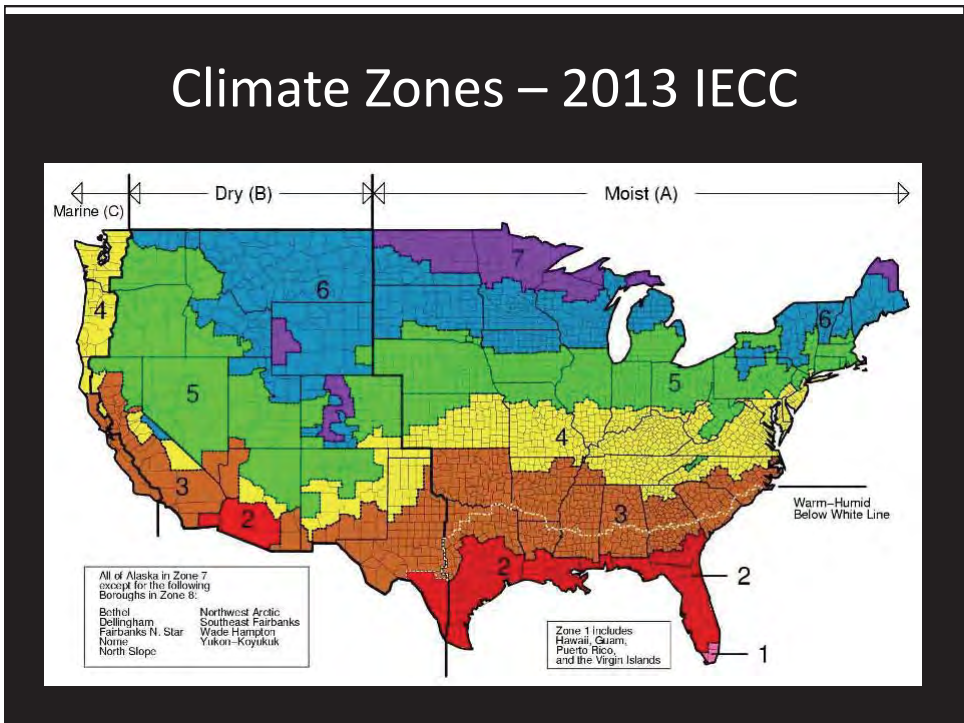
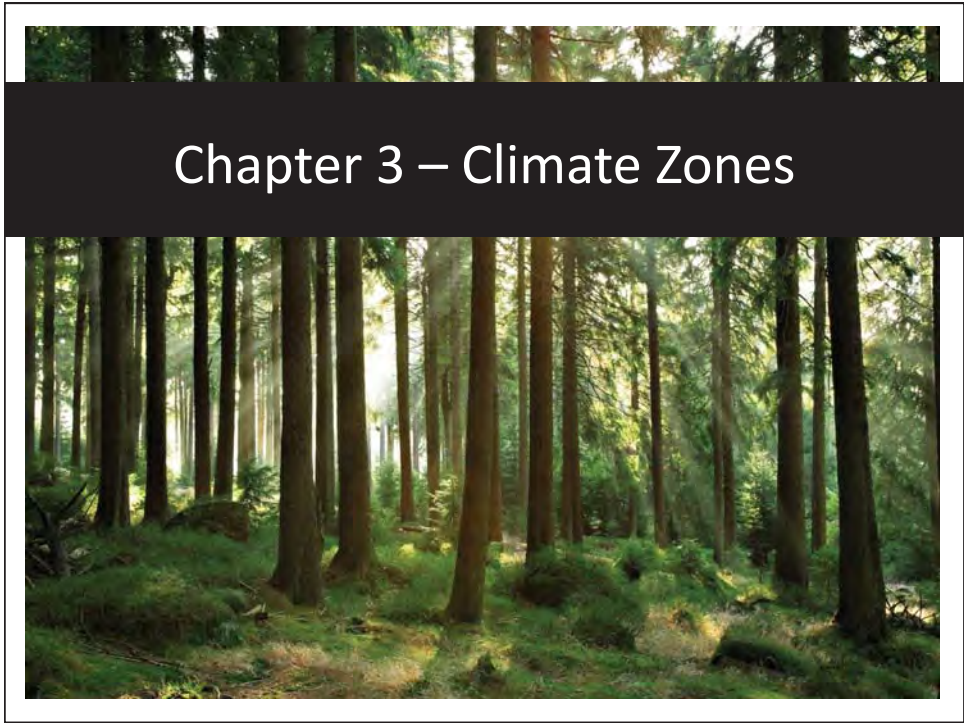
Systems serving multiple dwelling units shall comply with Sections 503 and 504 in lieu of Section 403.

Chapter 2 – Definitions



Critical Definitions Now separate from Residential and expanded

Air Barrier	R-Value
Building Thermal Envelope	SHGC
Conditioned Space	Storefront
Daylight Zone	U-Factor
DCV	Residential Building
Entrance Door	
ERV / HRV	



Section C302 Design Conditions

C302.1 Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a max of **72 degrees for heating** and minimum of **75 degrees for cooling**

Section C303 Materials, Systems and Equipment

C303.1 Identification

C303.1.1 Building thermal envelope insulation

C303.1.1.1 Blown or sprayed roof/ceiling insulation

C303.1.2 Insulation mark installation

C303.1.3 Fenestration product rating

C303.1.4 Insulation product rating

C303.2 Installation

C303.2.1 Protection of exposed foundation ins.

C303.3 Maintenance Information

Questions & Answers

