ENERGY CODES INTRO

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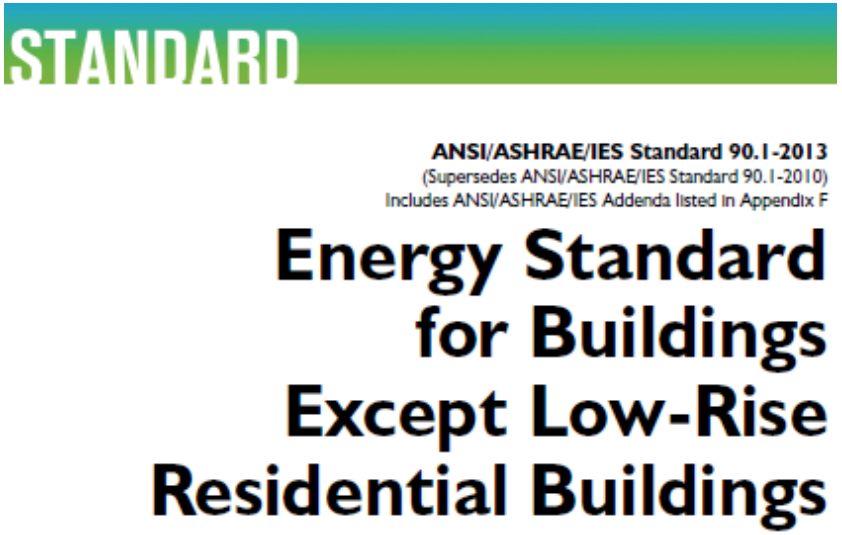
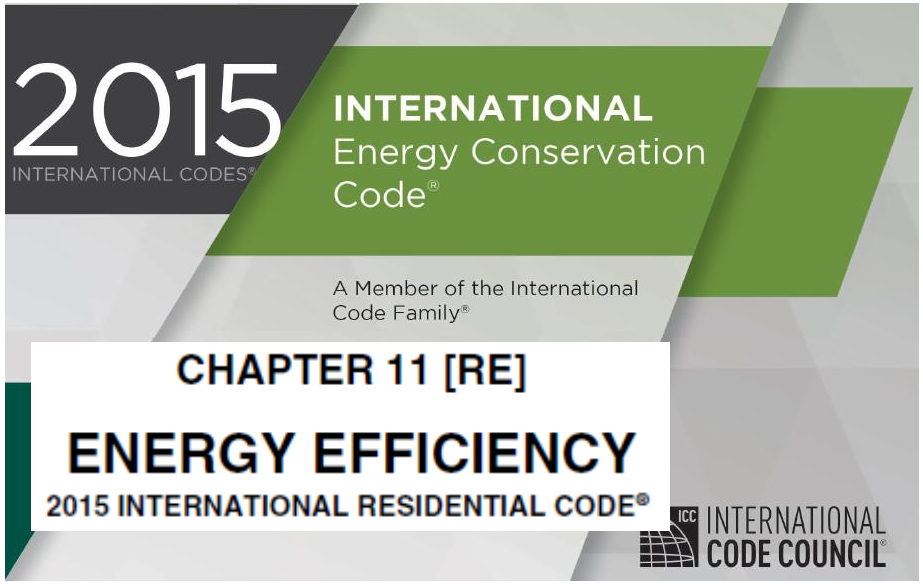
PART 2 – Energy Code Compliance

- Two primary sources for requirements plus IRC Chapter 11 for One-/Two-Family Dwellings.



www.ashrae.org

www.icc-safe.org



This presentation focuses on IECC provisions. Use of CI for compliance with ASHRAE 90.1 is similar.

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Why Energy Conservation?

- Even small improvements can have a big impact
  - Significant life-cycle cost savings over a 30-year period
  - Methodology considers energy savings, initial investment financed through increased mortgage costs, tax impacts, and residual values of energy efficiency measures

Table 1. Life-Cycle Cost Savings Compared to the 2006 and 2009 IECC

IECC Climate Zone	30-Year Life-Cycle Savings ($US)		
	IECC 2009 vs. 2006	IECC 2012 vs. 2009	IECC 2012 vs. 2006
1	$2,877	$5,347	$8,256
2	$2,443	$2,280	$4,763
3	$1,944	$3,613	$5,621
4	$2,259	$5,320	$7,625
5	$2,466	$6,717	$9,189
6	$3,094	$8,183	$11,307
7	$3,622	$9,502	$13,166
8	$9,147	$23,900	$33,105

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Energy Conservation and Environmental Value of CI

Even small improvements on a large scale can have a big impact on resources and environment:

- **Annual energy savings** for a single house using foam sheathings ranged from 3.5 (U.S.) to 11.0 (Canada) million BTU per year!
  - *If all households in the U.S were to apply foam sheathing having an R-value of ~R3, the annual energy savings is equivalent to:*
    - *70 large oil tankers per year, or*
    - *the total energy produced by 5 nuclear power plants per year (1,500 MW each)*
- **Annual greenhouse gas (GHG) savings** for a single house using foam sheathing ranged from 505 (U.S.) to 787 (Canada) lbs of CO_2
  - *If all households in the U.S were to apply foam sheathing having an R-value of ~R3, this GHG savings is equivalent to:*
    - *removal of 30 million tones of CO_2 emissions per year, or*
    - *elimination of emissions from 7 million vehicles (about 2.5 billion gallons of gasoline per year)*

Recent energy code improvements, including use of CI, can have a break-even mortgage cost in as few as 10 months; consumers can then use the savings to pay down their mortgages faster (ICF Int'l study for BCAP).

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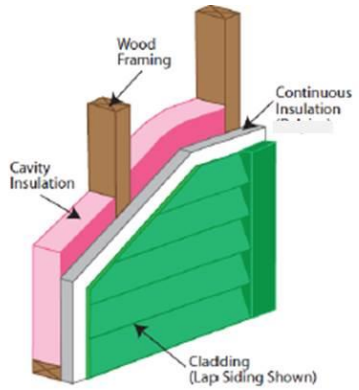
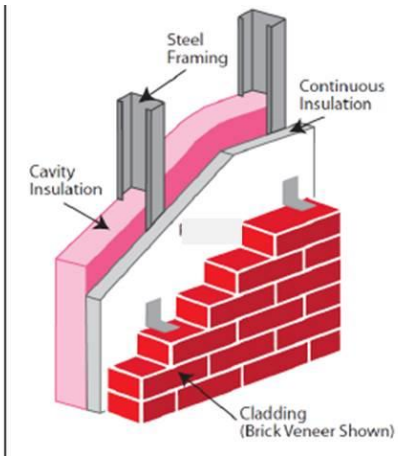
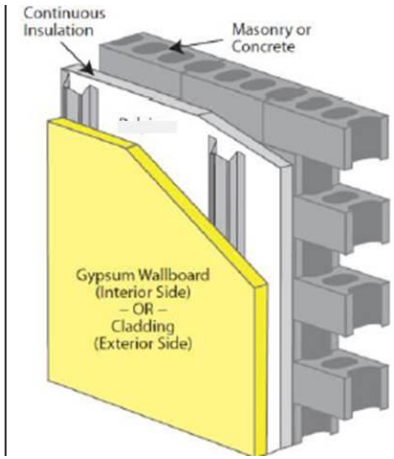
Three Basic Approaches for Insulating Light-Frame *Exterior Walls*

1. ***Cavity insulation only*** (traditional method)
2. ***Cavity insulation + continuous insulation*** (common choice for high-performance frame walls and minimum code in colder climates)
3. ***Continuous insulation (ci) only*** (common for masonry/concrete walls, provides "warm wall" approach to frame walls & minimizes thermal bridging)

In general, CI is most effectively located on the exterior side of an exterior wall to provide better protection of the building and avoid thermal bridging.







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