

Green Yesterday... Code Today

Code Overview

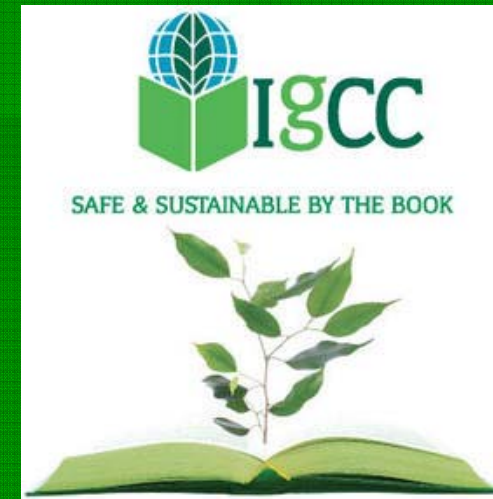
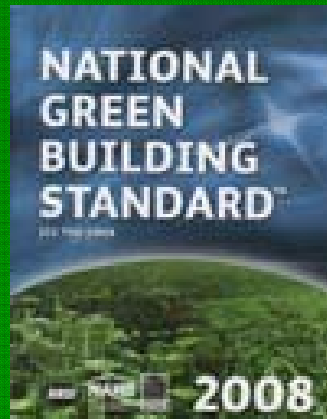
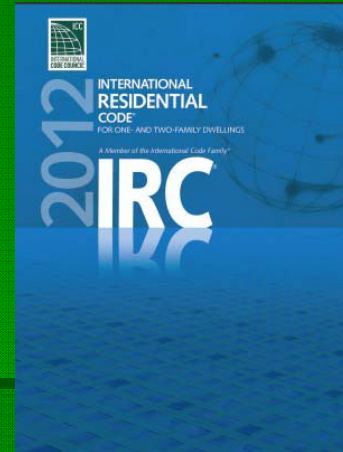
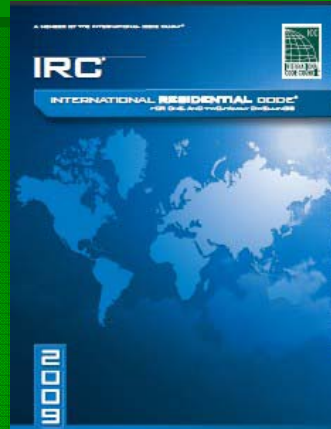
2009 IRC

2012 IRC

ICC 700

2012 IECC

2009 IGCC



Green Yesterday...

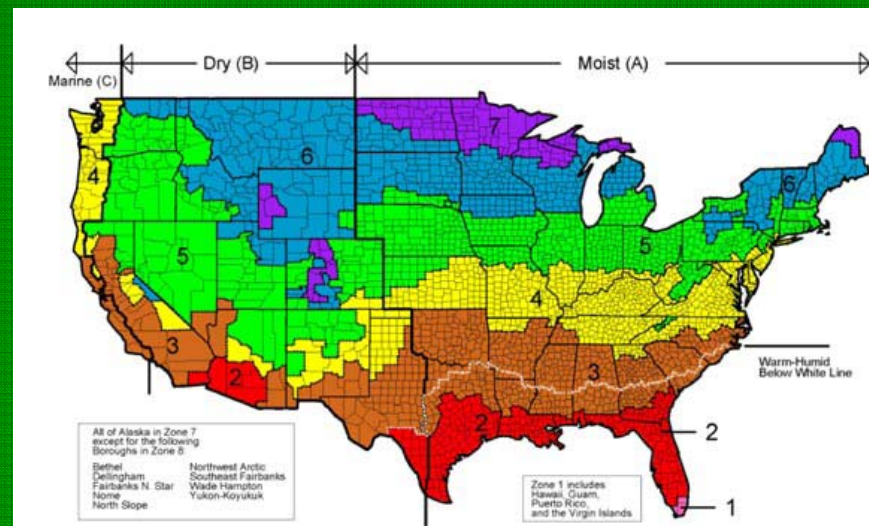
Code Today

IRC 2009 (Virginia)

- Blower door test OR
 - Air sealing measures inspection
- Duct tightness inspection
- Increased insulation
 - R-38 ceiling
 - R-13 walls
 - R-19 floors
 - μ .35 windows
- Vapor retarders interior of frame wall
- Mechanical pipe insulation
- Programmable thermostat
- 50% High-efficacy lamps
- Above code programs

Climate Zones

Virginia is Climate Zone 4



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Code Today

IRC 2012

- Air sealing measures
 - Air barrier
- Increased insulation
 - R-49 ceiling
 - R-20 walls
 - R-19 floors
 - μ .35 windows
- Low energy buildings
- Construction documents
- Default μ factors
 - Doors
 - Windows
 - Skylights
- μ A alternative
- Steel framing
- Fenestration
- Recessed lighting
- System efficiency
- Duct tightness testing or inspection (Virginia)
- Simulated performance alternative



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ICC 700

- ANSI approved
- ICC/NAHB joint project
- www.nahbbreen.org

Threshold Point Ratings for Green Buildings

Green Building Categories			Performance Point Levels (1) (2)			
			BRONZE	SILVER	GOLD	EMERALD
1.	Chapter 5	Lot Design, Preparation, and Development	39	66	93	119
2.	Chapter 6	Resource Efficiency	45	79	113	146
3.	Chapter 7	Energy Efficiency	30	60	100	120
4.	Chapter 8	Water Efficiency	14	26	41	60
5.	Chapter 9	Indoor Environmental Quality	36	65	100	140
6.	Chapter 10	Operation, Maintenance, and Building Owner Education	8	10	11	12
7.		Additional Points from any category	50	100	100	100
Total Points			222	406	558	697

(1) In addition to the threshold number of points in each category, all mandatory provisions of each category shall be implemented.

(2) For dwelling units greater than 4,000 square feet (372 square meters), the number of points in Category 7 (Additional Points from any category) shall be increased in accordance with Section 601.1. The "Total Points" shall be increased by the same number of points.

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IECC 2009

- Exempt buildings – Low energy
- Labeling and marking
- Fenestration rating (NFRC)
- Default glazing & doors
- Residential: Chapter 4
 - Prescriptive
 - Simulated Performance alternative
 - Total μA alternative
 - Reduction from R38 to R30 for 500 ft² Vaulted
 - Cold formed steel framing
 - Locations: basement wall, crawl, slab-on-grade, etc
 - Thermally isolated sunroom
 - Fenestration
 - area weighted average
 - Exempt amounts: windows 15 ft², doors 24 ft²
 - Air leakage inspection (mandatory)
 - Half of all lights are high efficacy type
 - Separate thermostats



1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating a garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Attic access openings.
11. Rim joist junction.
12. Other sources of infiltration.

Climate Zone for Virginia	Fenestration μ Factor b	Skylight μ Factor b	Glazed fenestration SHGC b, e	Ceiling R Value	Wood Frame Wall R-value	Mass Wall R-value i	Floor R-value	Basement Wall R-value c	Slab R-value and depth d	Crawl space R-value c
4	.35	.6	NR	38	13	5/10	19	10/13	10,2 feet	10/13
	.35	.6		.03	.082	.141	.047	.059		.065

Air barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material. Air-permeable insulation is inside of an air barrier.
Ceiling/Attic	Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed. Attic access (except unvented attic), knee wall door, or drop down stair is sealed. Corners and headers are insulated. Junction of foundation and sill plate is sealed.
Walls	Corners and headers are insulated. Junction of foundation and sill plate is sealed.
Windows and doors	Space between window/door jambs and framing is sealed.
Rim Joists	Rim joists are insulated and include an air barrier.
Floors	Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of insulation.
Crawl space walls	Insulation is permanently attached to walls. Exposed earth in unvented crawl spaces is covered with Class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.
Garage separation	Air sealing is provided between the garage and conditioned spaces.
Recess lighting	Recessed light fixtures are air tight, IC rated, and sealed to drywall. Exception—fixtures in conditioned space.
Plumbing and wiring	Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.
Shower/tub on exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical/phone box on exterior wall	Air barrier extends behind boxes or air sealed-type boxes are installed.
Common wall	Air barrier is installed in common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace	Fireplace walls include an air barrier.

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IECC 2009

Commercial:

- ASHRAE 90.1 or
- IECC Prescriptive
- IECC Total Building Performance



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2012 IECC

- Numerous changes that see a new baseline for IECC compliant homes and buildings.
- An estimate from the U.S. Department of Energy (DOE) suggest the 2012 IECC will result in a at least a 30% greater energy efficiency.

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- Background on the ICC's International Green Construction Code
 - Developed by the ICC in association with ASTM and AIA.
 - Supporting organizations: U.S Green Building Council (LEEDS), The Green Building Initiative (Green Globes rating system)
 - Allows jurisdictions to choose ASHRAE 189.1 as an alternative compliance path.
 - Is intended to reduce the negative impact on the natural environment.
 - Provides requirements that do not unnecessarily increase construction costs.
 - Does not restrict the use of new materials, products, methods of construction.
 - Use of the code inherently means less materials, water or energy use.- owners are likely to realize cost savings.

Code Development Cycle:

- IGCC Final Action Hearings- November 2011, Phoenix, AZ
- First Edition scheduled to be published March 2012
- Once published, it will be updated every three years along with other I-Codes.

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ICC's International Green Construction Code

The IGCC:

- Is applicable to new construction, as well as alterations and additions to existing buildings
- Is written in mandatory language which is coordinated with the family of codes produced by the International Code Council
- Is intended to be adopted by jurisdictions on a *mandatory* basis
- Is intended to be administered primarily by building officials
- Sets stringent minimum mandatory requirements and performance thresholds in many specific areas, some of which are determined by the jurisdiction
- Is intended to be useable by manufacturers, design professionals and contractors
- Is intended to be adopted by governmental units and administered by building departments
- Is applicable to all commercial occupancies
- References ICC 700 for residential occupancies, except that high-rise residential occupancies may be regulated by either ICC 700 or the IGCC
- Incorporates features which allow jurisdictions to customize requirements to suit local geographical conditions and environmental priorities and agendas
- Incorporates a relatively small number of “project electives”, a minimum number of which must be selected by the owner or design professional and implemented on each project, as a means to:
 - o Encourage practices which are difficult to mandate; and
 - o Encourage higher performance buildings (buildings with lower environmental impact which exceed the minimum requirements of the IGCC)
- Is *not* a rating system and is *not* intended to provide a single metric indicative of overall building performance
- In a single code or volume, is applicable to new construction, existing construction, building shells, multiple occupancy classifications, building shells and community development, etc.

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NEXT STEPS?

- Virginia adoption 2012 codes may include some version of green building.
- HBAV will be engaged in the process.
- Department of Housing and Code Development and Building Officials will be your partner.