BRITISH COLUMBIA

Office of Housing and Construction Standards

New Energy Efficiency Requirements in BC

Zachary May
Codes Administrator
Building and Safety Standards Branch

BCBEC - Sept 2013

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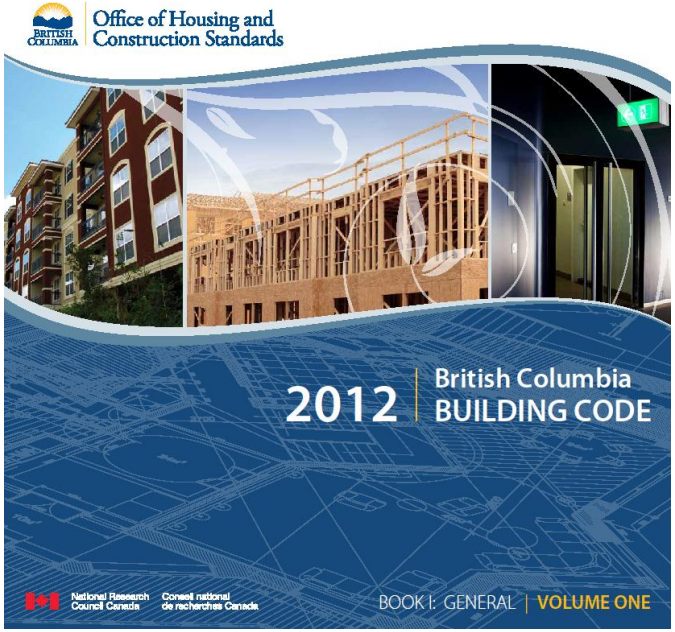
TODAY

Dec. 20 2013

Dec. 19 2014



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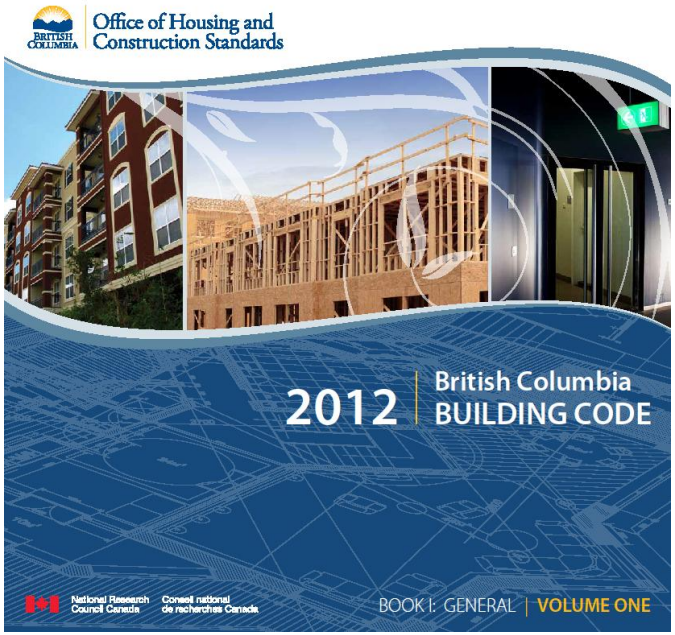
TODAY



Part 10 – Energy Efficiency

- **Part 3** (Large Buildings)
  - ASHRAE 90.1 (2004)
- **Part 9** (Small Buildings)
  - Insulation tables
- Water efficiency

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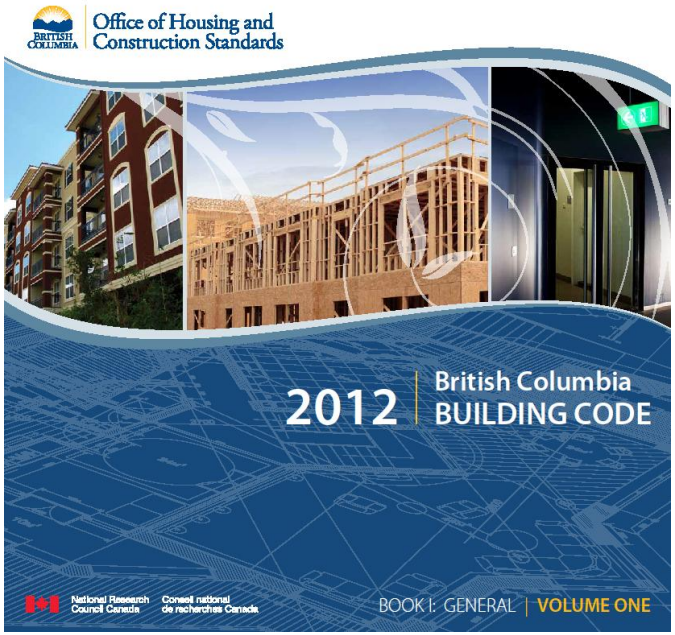
TODAY



Part 10 (Compliance)

- **Part 3** (Large Buildings)
  - Letters of Assurance
  - Single standard
  - Prescriptive / Trade-offs
- **Part 9** (Small Buildings)
  - “Stuff the gaps”

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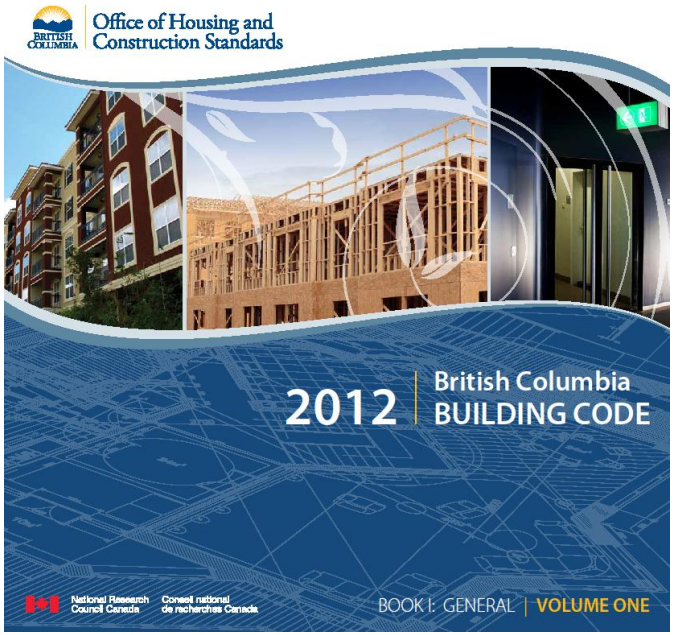
Dec. 20 2013



- **Part 3** (Large Buildings)
  - ~~ASHRAE 90.1 (2004)~~
  - ASHRAE 90.1 (2010) **updated**
  - National Energy Code for Buildings (NECB) **new**
  - Water efficiency

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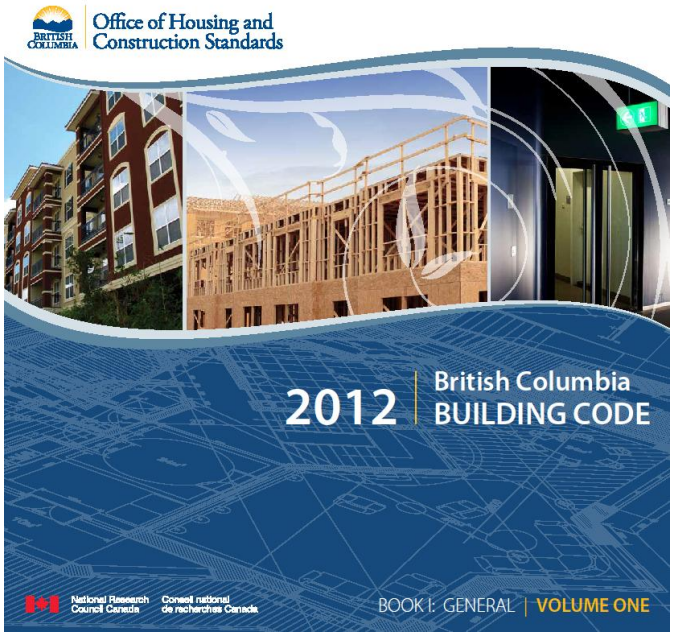
Dec. 20 2013



- **Part 3** (Compliance)
  - Letters of Assurance

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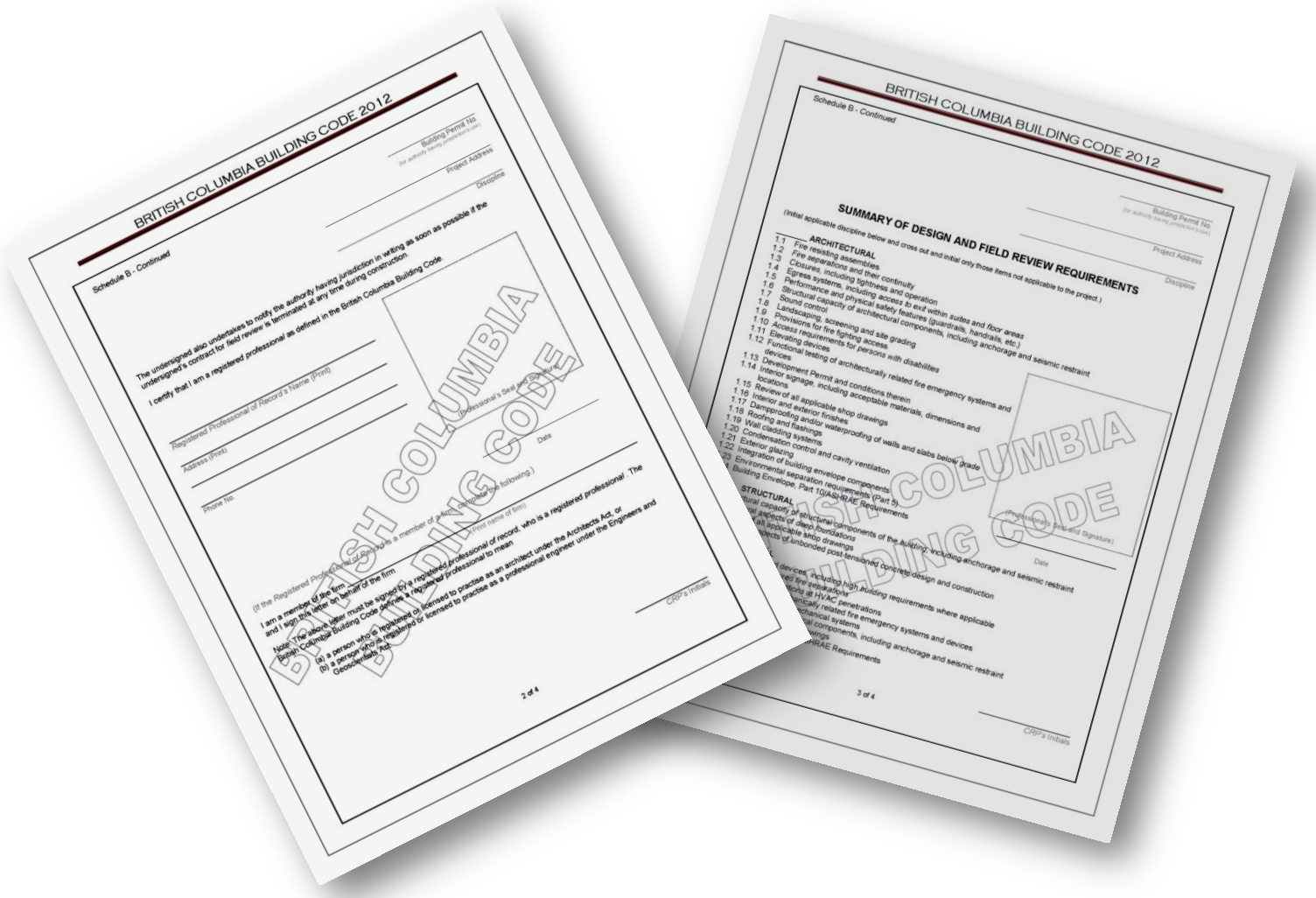
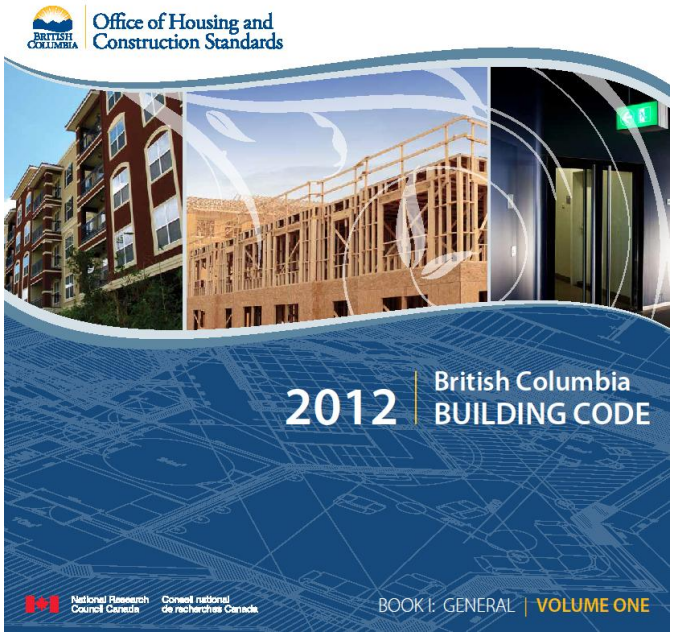


MECHANICAL

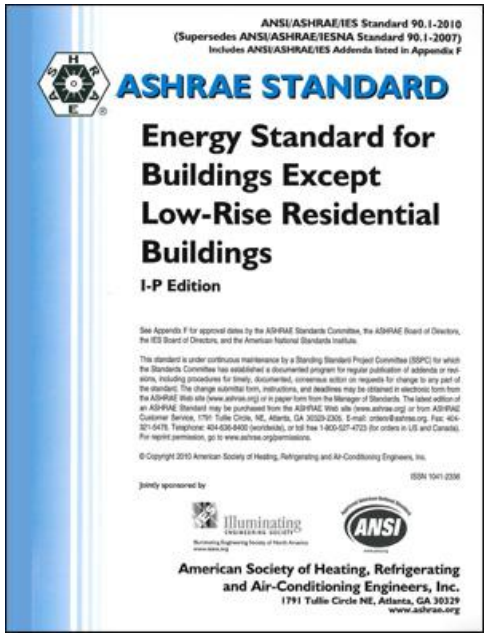
3.1 HVAC systems and devices, including high *building* requirements wher
3.2 *Fire dampers* at required *fire separations*
3.3 Continuity of *fire separations* at HVAC penetrations
3.4 Functional testing of mechanically related fire emergency systems and
3.5 Maintenance manuals for mechanical systems
3.6 Structural capacity of mechanical components, including anchorage an
3.7 Review of all applicable shop drawings
3.8 Mechanical Systems, Part 10/ASHRAE Requirements

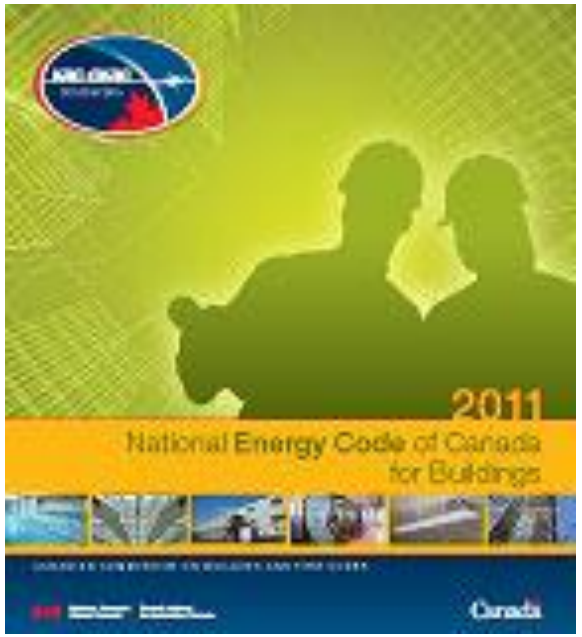
Dec. 20 2013



- **Part 3** (Compliance)
  - Letters of Assurance
  - Available at bccodes.ca

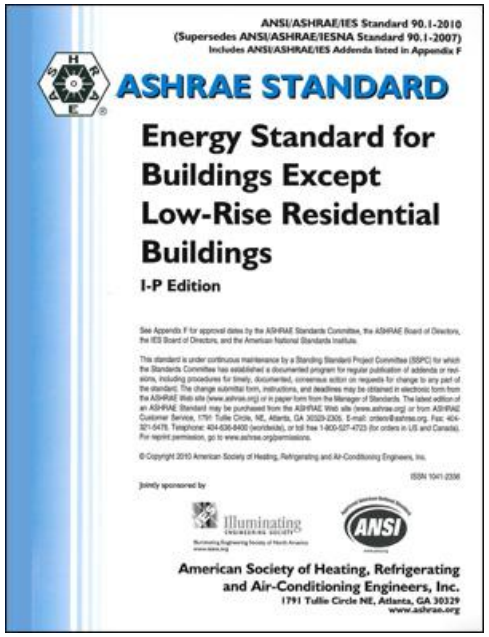
ASHRAE 90.1 (2010) & NECB (2011)





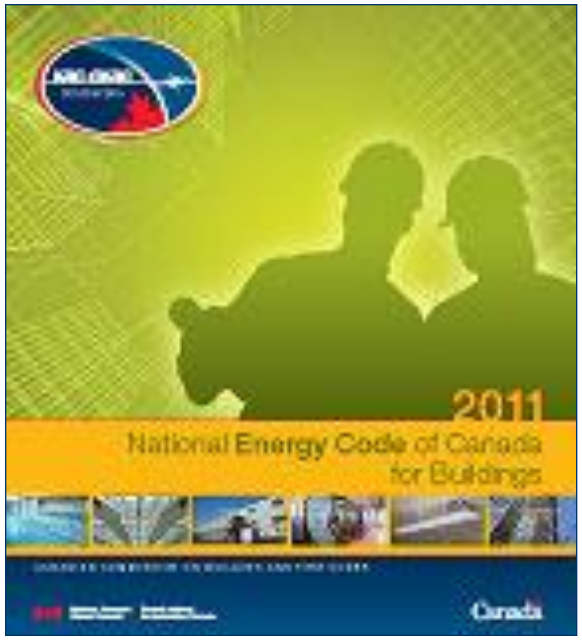
BCBC 2012	Vancouver BB
ASHRAE 90.1 (2004)	ASHRAE 90.1 (2007)
↓	↓
ASHRAE 90.1 (2010) & NECB (2011)	ASHRAE 90.1 (2010) & NECB (2011)

Where do they come from?



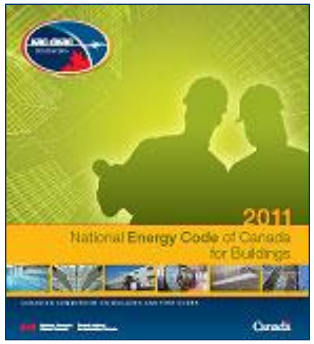
- American Society of Heating, Refrigerating and Air-Conditioning Engineers
- Now a global society with 50,000 members worldwide
- Industry standard

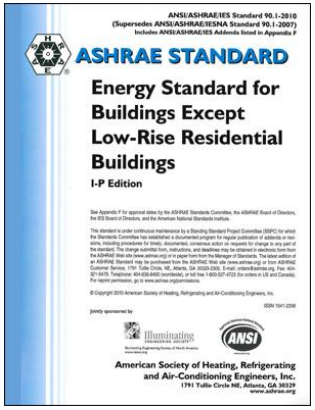
Where do they come from?



- National Energy Code for Buildings
- Canadian Commission on Building and Fire Codes (NRC)
- Canadian standard developed with input from NRCan and industry stakeholders

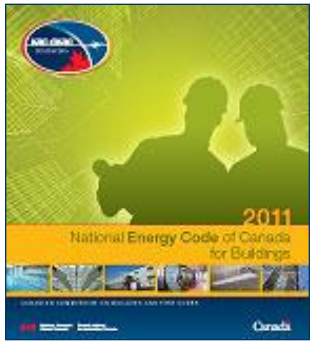
What's the difference?

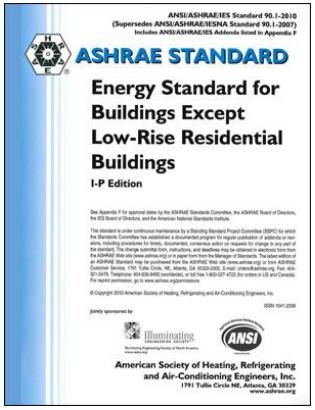




- Building construction materials
- Occupancy and building design
- Climate region
- Energy use vs. Cost of energy
- Industry familiarity
- New value opportunities

What's the difference?





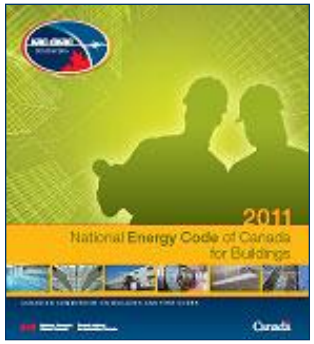
NECB

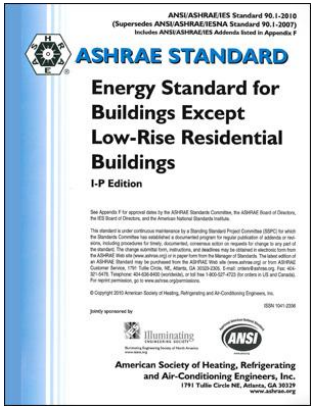
- Energy based
- Trade-offs throughout
- Reference to Canadian standards

ASHRAE

- Energy-cost based
- Trade-offs for envelope only
- Reference to performance requirements

What's the difference?



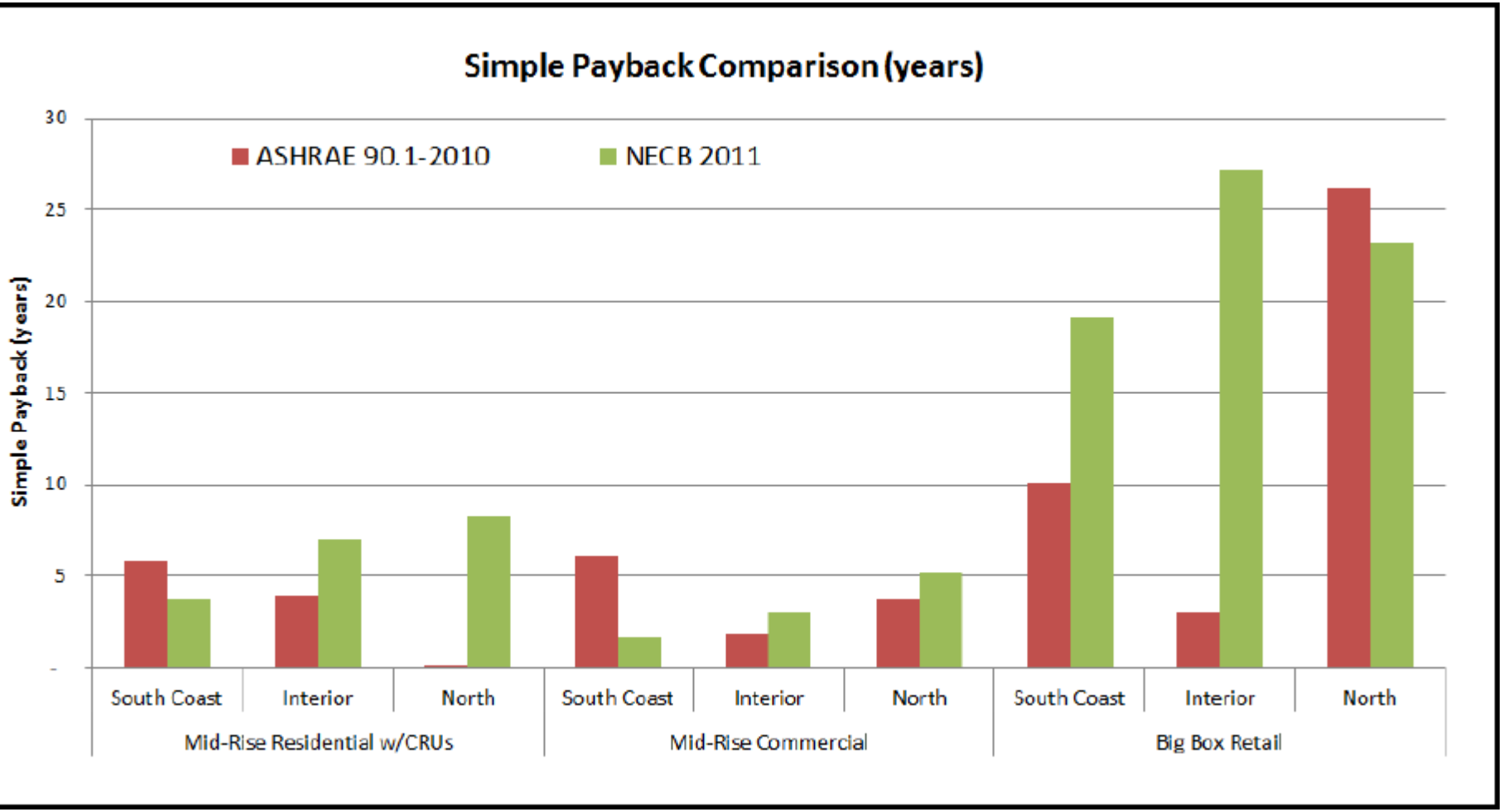


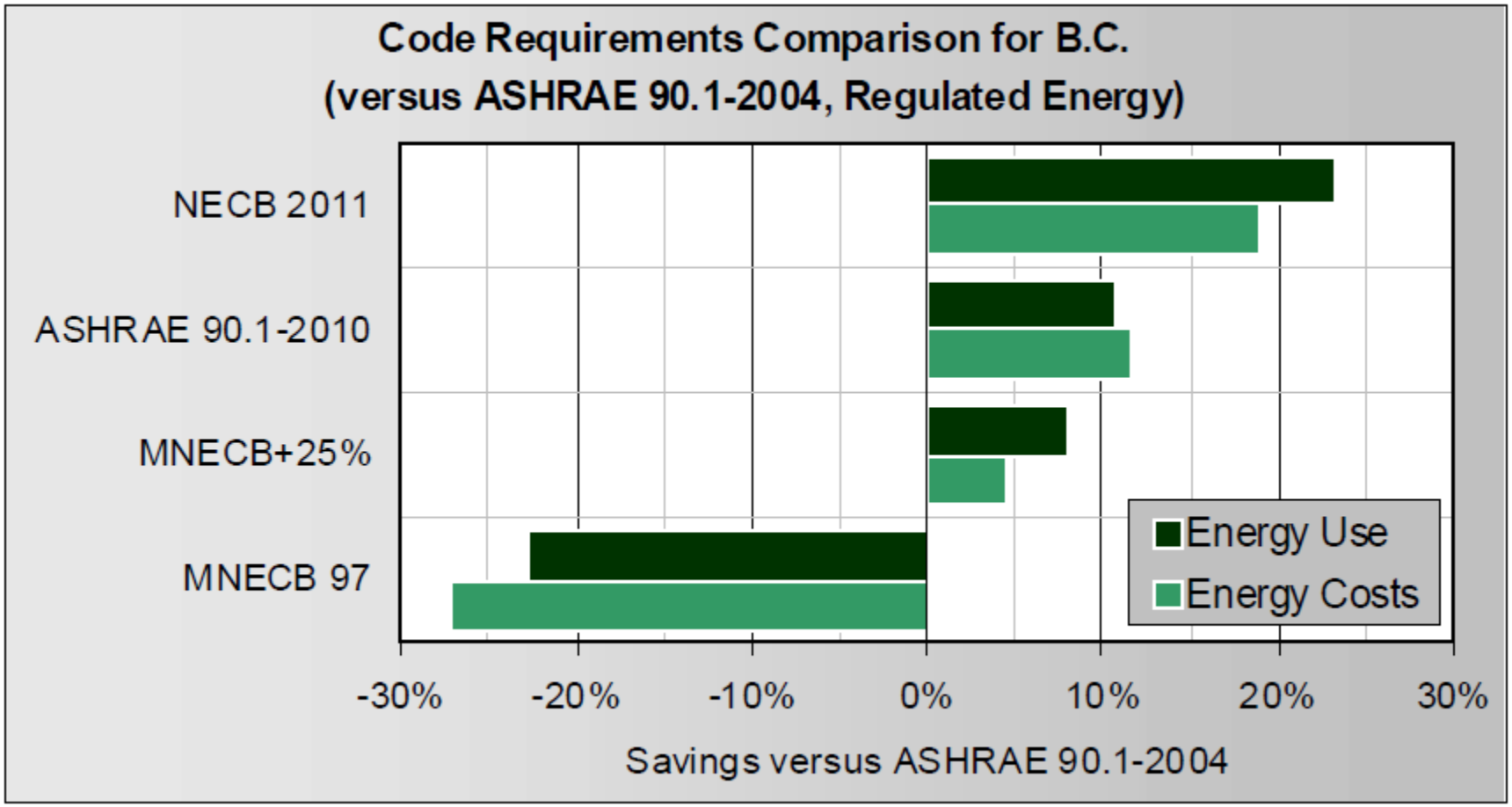
NECB

- Flexible
- Complex compliance
- Good - excellent performance

ASHRAE

- Prescriptive
- Less complex compliance
- Good - excellent performance


Simple Payback Comparison (years)
ASHRAE 90.1-2010
NECB 2011
Simple Payback (years)
30
25
20
15
10
5
-
South Coast
Interior
North
South Coast
Interior
North
South Coast
Interior
North
Mid-Rise Residential w/CRUs
Mid-Rise Commercial
Big Box Retail


Code Requirements Comparison for B.C.
(versus ASHRAE 90.1-2004, Regulated Energy)
NECB 2011
ASHRAE 90.1-2010
MNECB+25%
MNECB 97
Energy Use
Energy Costs
-30%
-20%
-10%
0%
10%
20%
30%
Savings versus ASHRAE 90.1-2004

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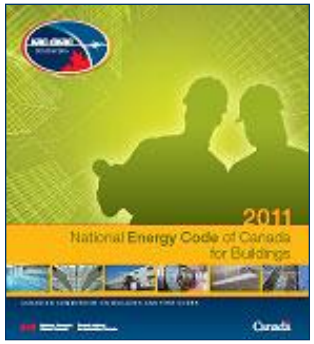
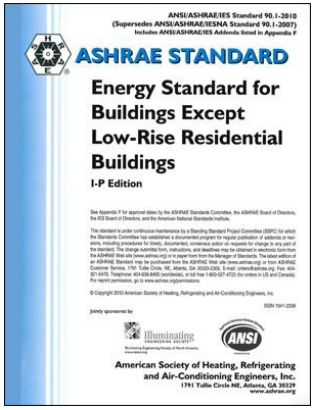
Key details:





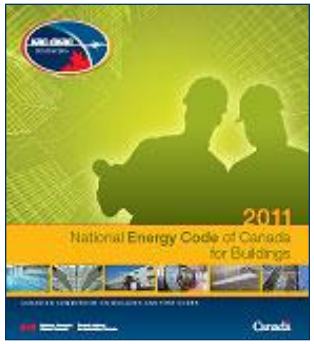
NECB

- Clear values for envelope components
- Stringent air-leakage rates

ASHRAE

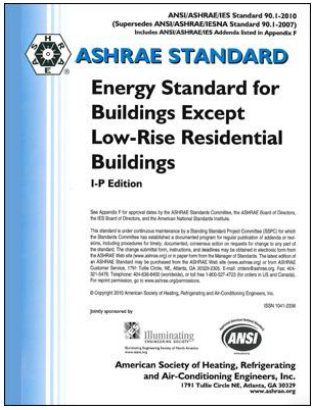
- Multiple values for envelope components
- Less stringent air-leakage rates

Key details:



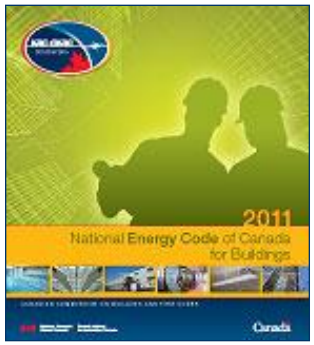
NECB

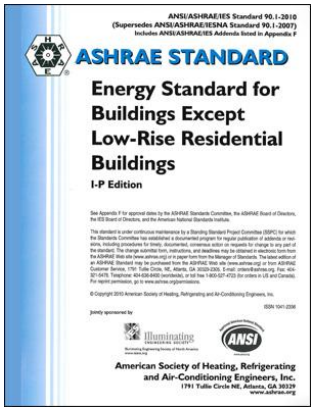
- 40 % FWR – few trade offs
- FWR indexed to heating degree days



ASHRAE

- 40% FWR across all regions
- Trade offs allow for up to 70% glazing
- Beyond 70% - ECB





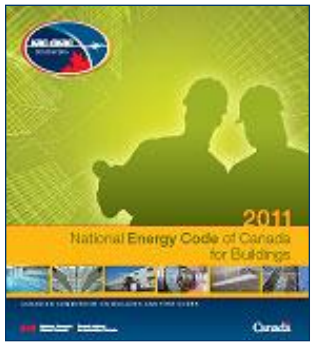
Key details:

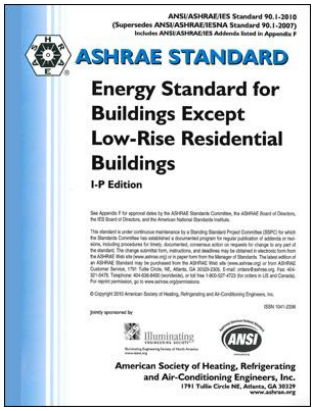
NECB

- Stringent insulation requirements
- Walls/roofs/slabs
- Required full slab insulation (unheated)

ASHRAE

- Generally less stringent insulation requirements
- Optional slab insulation in some areas





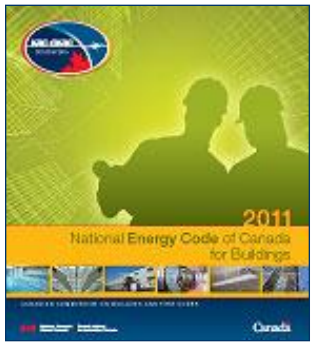
Key details:

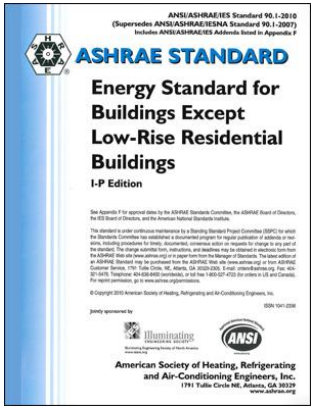
NECB

- Window requirements are generally more stringent
- Some curtain wall assemblies may not comply

ASHRAE

- Complex thermal performance consideration





Key details:

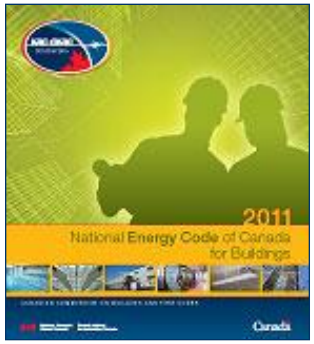
NECB

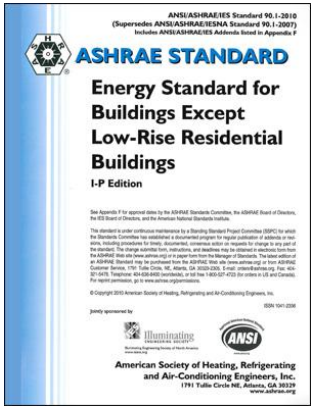
- Heat recovery in ice arena equipment

ASHRAE

- Pool covers
- Heat recovery from fume and kitchen exhaust equipment

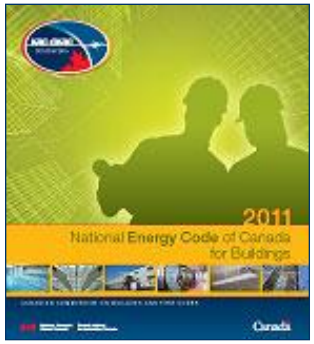
What's the impact?

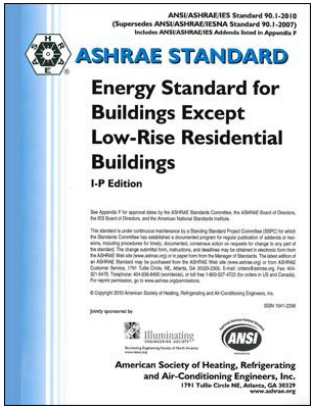




- Highly dependent on occupancy
- Possibly unfamiliar standards
- New approaches and designs
- Regional considerations

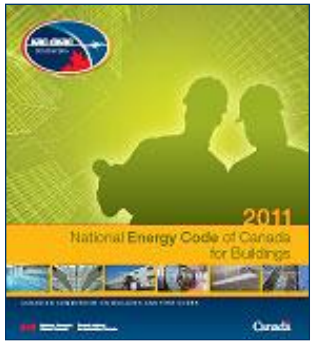
What's the impact?

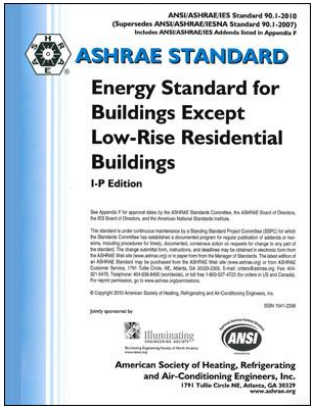




- Integrated design with trade-offs
- Controls and system maintenance vs. envelope design and thermal performance
- The tenant variable

Referenced studies:





- *BC Energy Code Comparison* – Stantec (2012)
- *ASHRAE 90.1 2010 and NECB 2011 Cross Canada Comparison* – Caneta Research (2012)
- *ASHRAE 90.1-2004, ASHRAE 90.1-2010 and NECB 2011 for British Columbia* – Enersys Analytics (2011)

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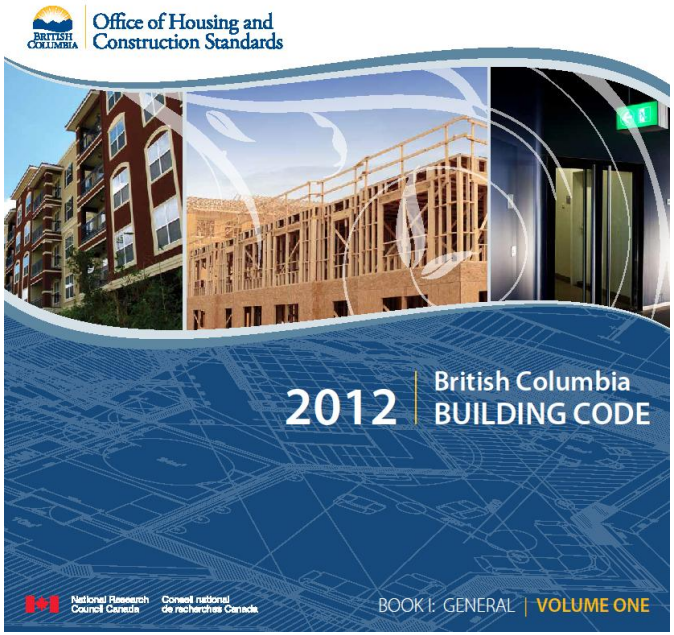

- **ASHRAE Checklist** very soon
- **NECB Checklist** soon
- **Education**

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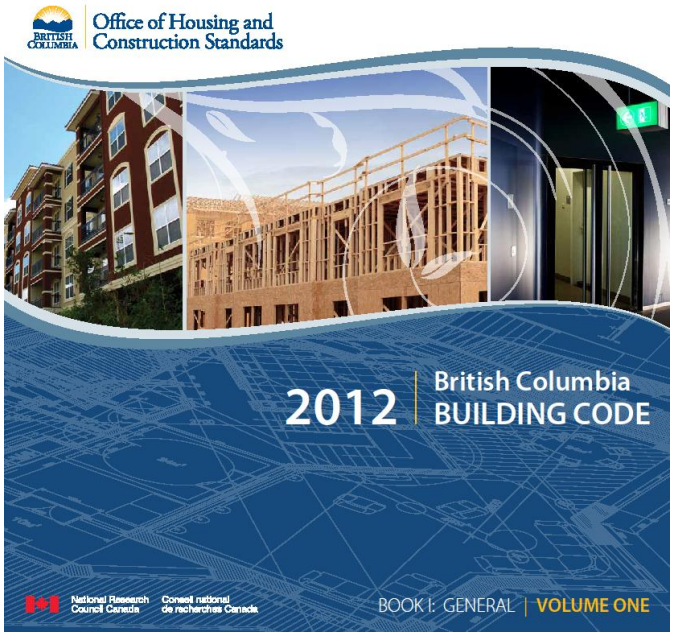

- **Part 9** (Small Buildings)
  - ~~Insulation tables~~
  - 9.36. – Energy Efficiency **new**
  - 9.32. – Ventilation **updated**

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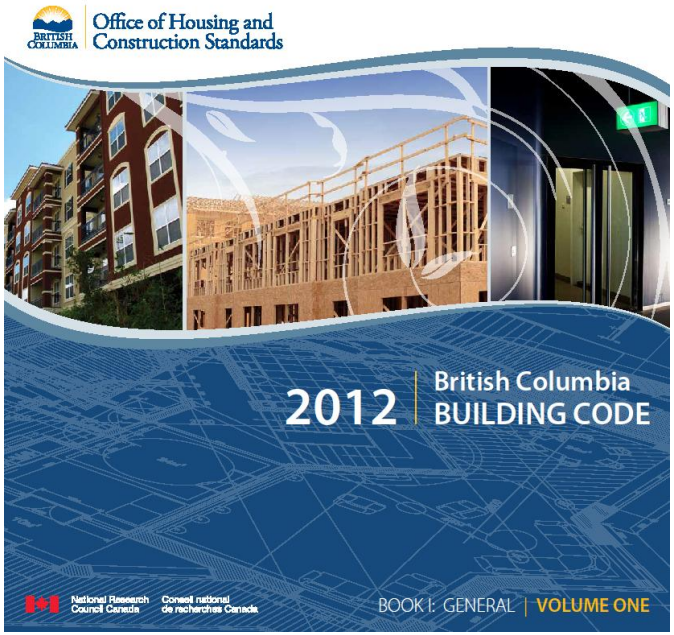

- **Part 9** (Small Buildings)
  - ~~Insulation tables~~
  - 9.32. – Ventilation

Public Review

housing.gov.bc.ca/building

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