NRC Canadian Codes Centre

2011 National Energy Code for Buildings (NECB) – Overview

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Canada

Introduction

- Presentation is part of a series of seven
- Model Code developed by Canadian Commission on Building and Fire Codes
- NECB must be adopted by provincial/territorial authorities to become law

Terminology

- MNECB: 1997 Model National Energy Code for Buildings
- NECB: 2011 National Energy Code for Buildings
- SCEEB: Standing Committee on Energy Efficiency in Buildings
- CCBFC: Canadian Commission on Building and Fire Codes
- PTPACC: Provincial/Territorial Policy Advisory Committee on Codes

MNECB – use

- Referenced in Ontario Building Code
- Used in voluntary and incentive programs
  - Commercial Buildings Incentive Program
  - Utility and other programs
  - LEED®

MNECB – why low adoption rate?

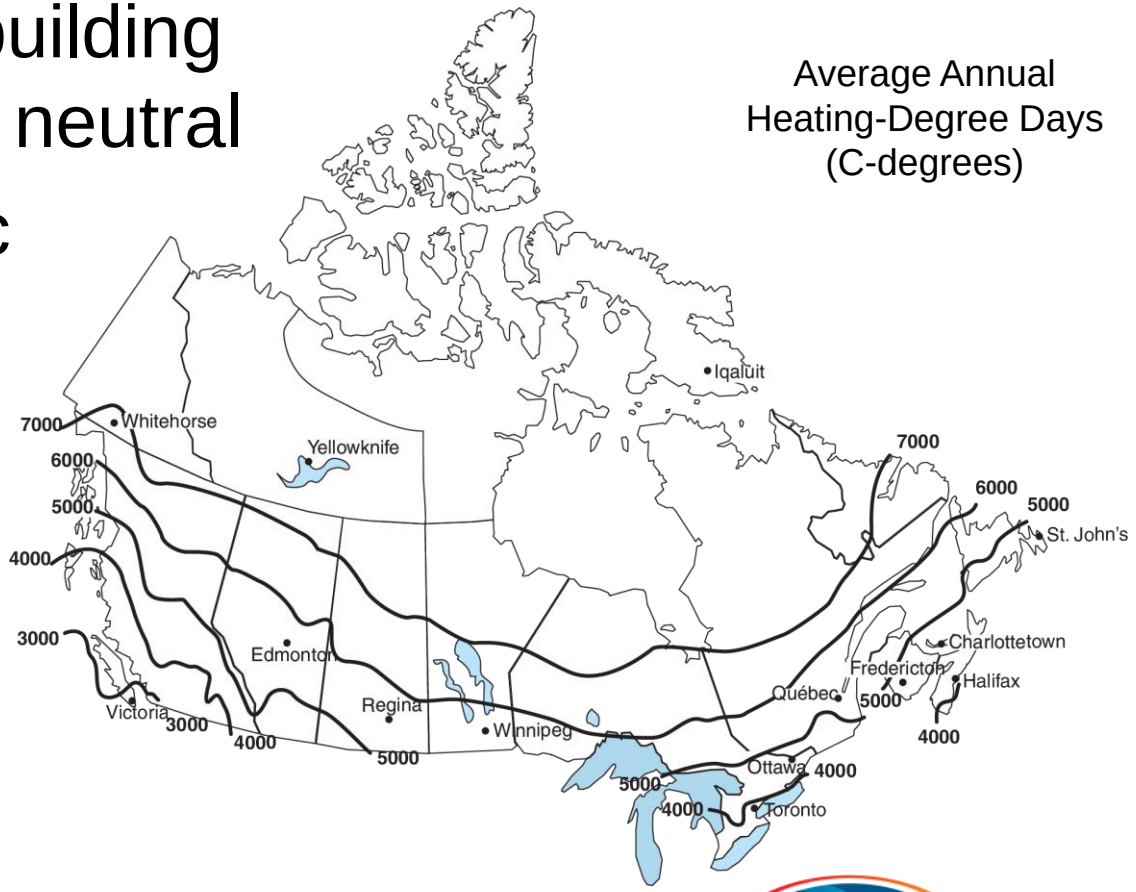
- Energy/economics code
  - Requirements and exemptions based on
    - Principal energy source
    - “Administrative region”
      - Climatic criteria (sometimes)
      - Energy distributor

MNECB – why low adoption rate?

- Energy/economics code
  - Requirements and exemptions for
    - U-values – windows, walls, roofs
    - HRVs in self-contained dwelling units
    - Solid masonry
  - Outdated very quickly
  - “Energy budget” code

NECB – approach

- Energy used by building → energy source neutral
- Based on climatic zone – heating degree-days (HDD)



NECB – approach

- Silent on renewable, waste and site-generated energy
  - Wide variety of technology
  - Not place barriers for their use
  - Reference standards for use, not efficiency

NECB – approach

- Silent on most process loads
  - Except pools and ice surfaces
  - Performance path includes:
    - Guidance
    - Flexibility

MNECB and NECB

- No differentiation based on occupancy
- Same structure
  - Part 3: Building Envelope
  - Part 4: Lighting
  - Part 5: Heating, Ventilating and Air-Conditioning Systems
  - Part 6: Service Water Heating Systems
  - Part 7: Electrical Power Systems and Motors
  - Part 8: Performance Path

MNECB and NECB compliance paths

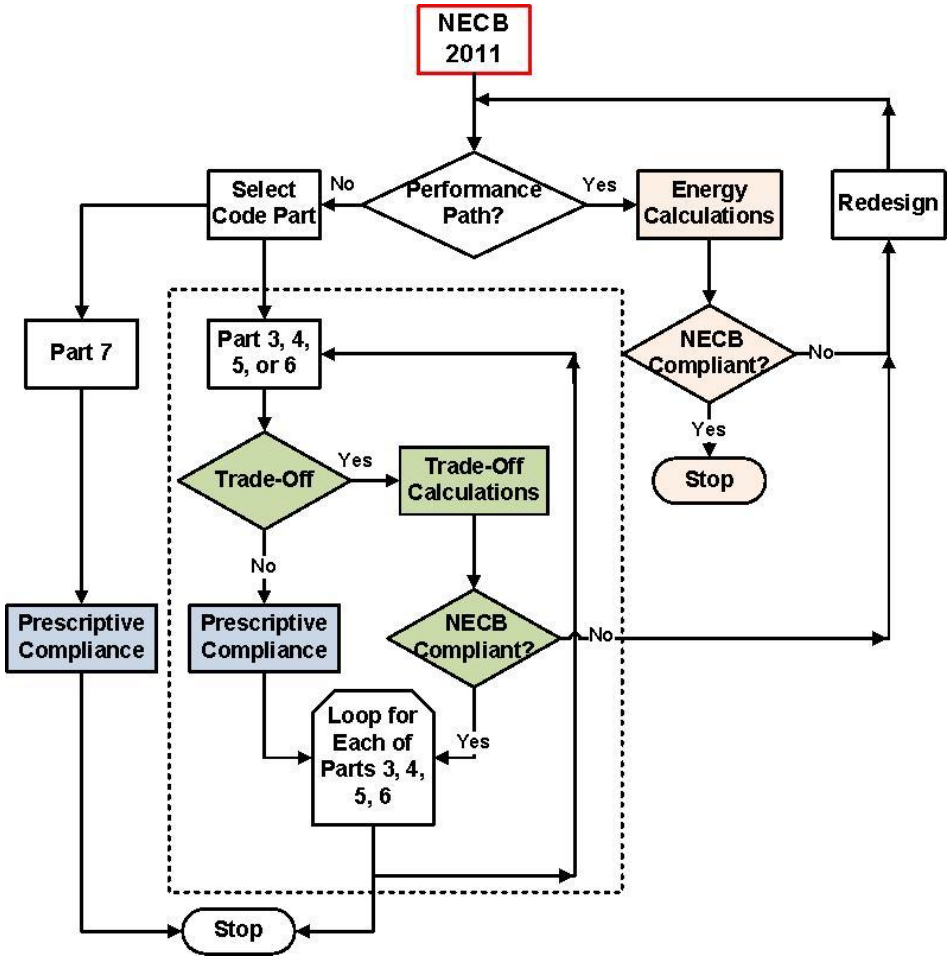
MNECB

- Simple prescriptive
- Building envelope trade-off
  - Simple
  - Computer-assisted
- Performance compliance
  - Whole-building modeling – engineering solution

NECB

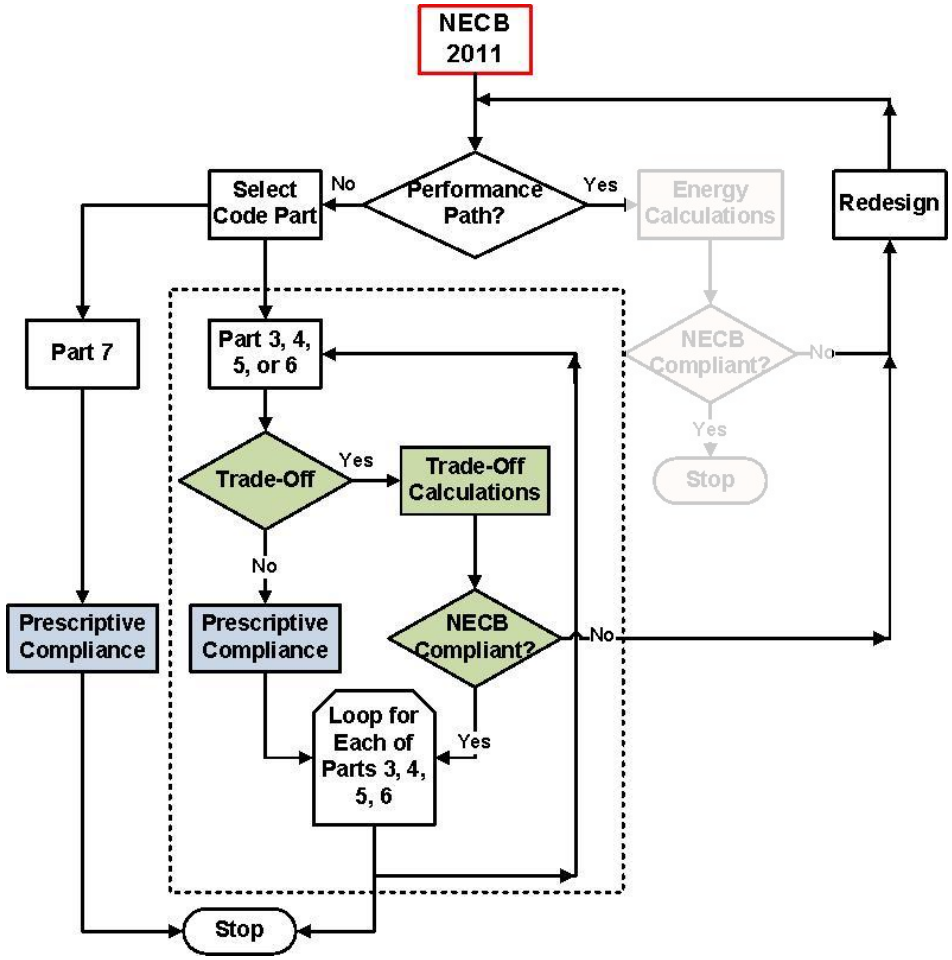
- Simple prescriptive
- Building envelope trade-off
  - Simple
  - Detailed
- Lighting, HVAC, service water trade-off
- Performance compliance
  - Whole-building modeling – engineering solution

NECB compliance paths



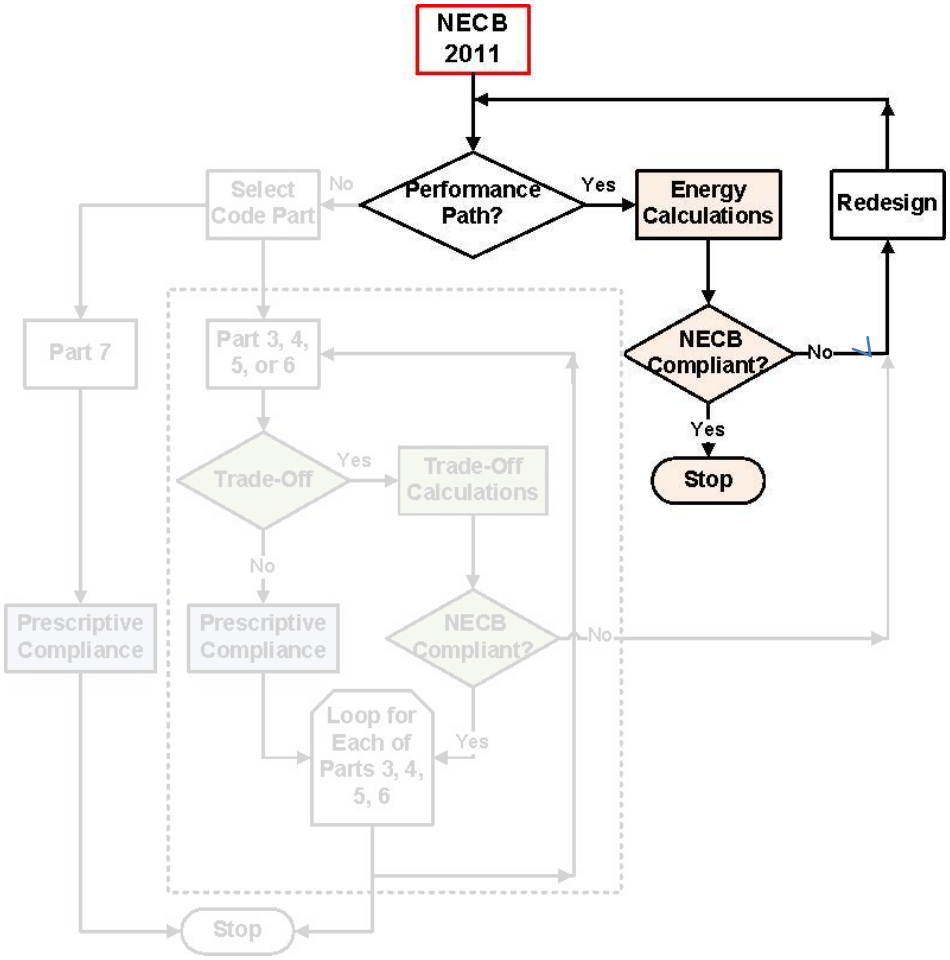
NECB compliance paths

- Mix and match simple prescriptive and trade-off paths
- Use trade-off within same Part only



NECB compliance paths

- Cannot mix any other path with performance path



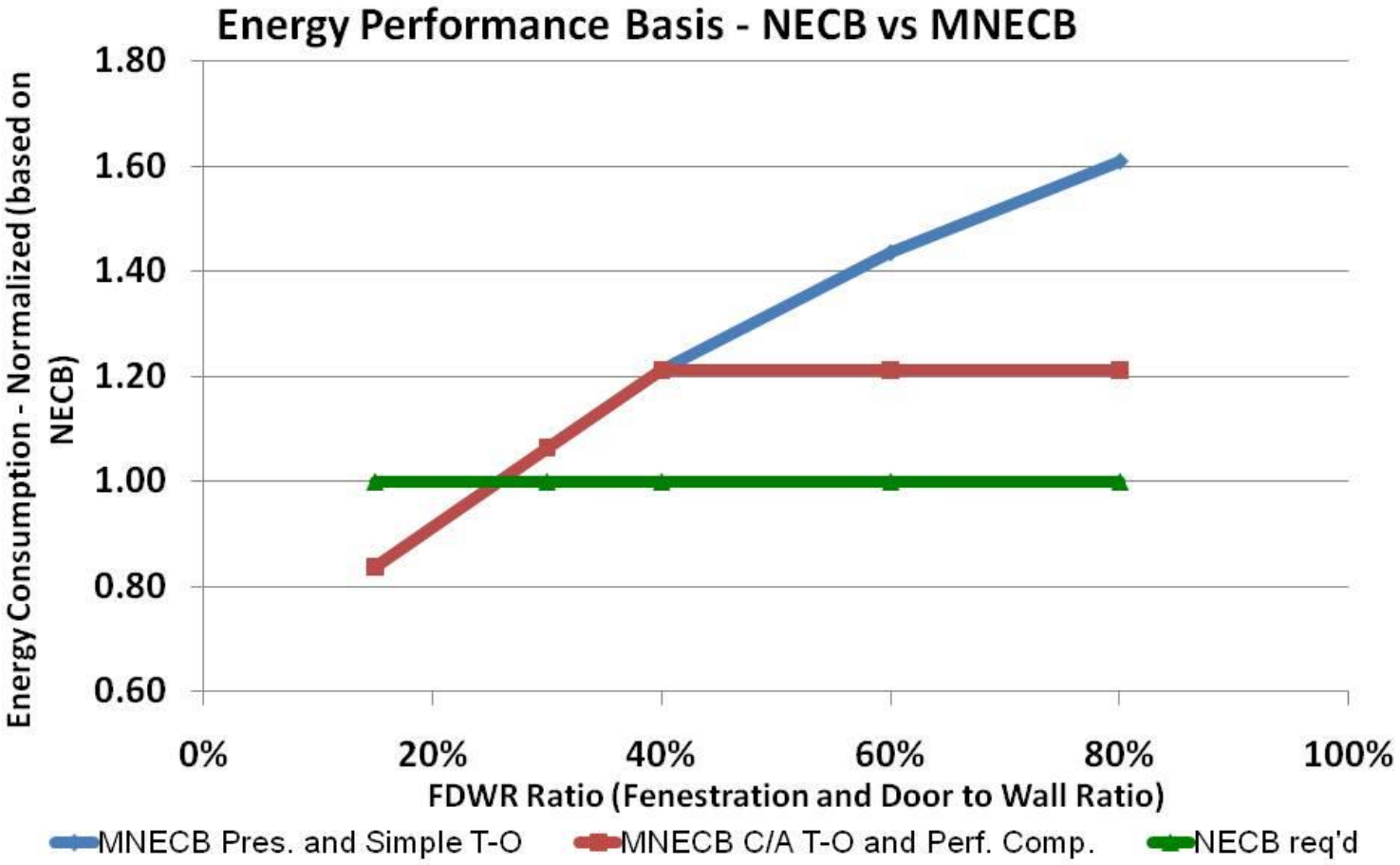
MNECB vs NECB performance levels

- MNECB – no consistent or minimum performance level
  - Simple prescriptive and simple building envelope trade-off → no set performance level
    - Varied with fenestration-to-wall ratio
  - Computer-assisted building envelope trade-off and performance compliance
    - Varied with fenestration-to-wall ratio to 40%, capped at 40% for fenestration to wall ratios above 40%

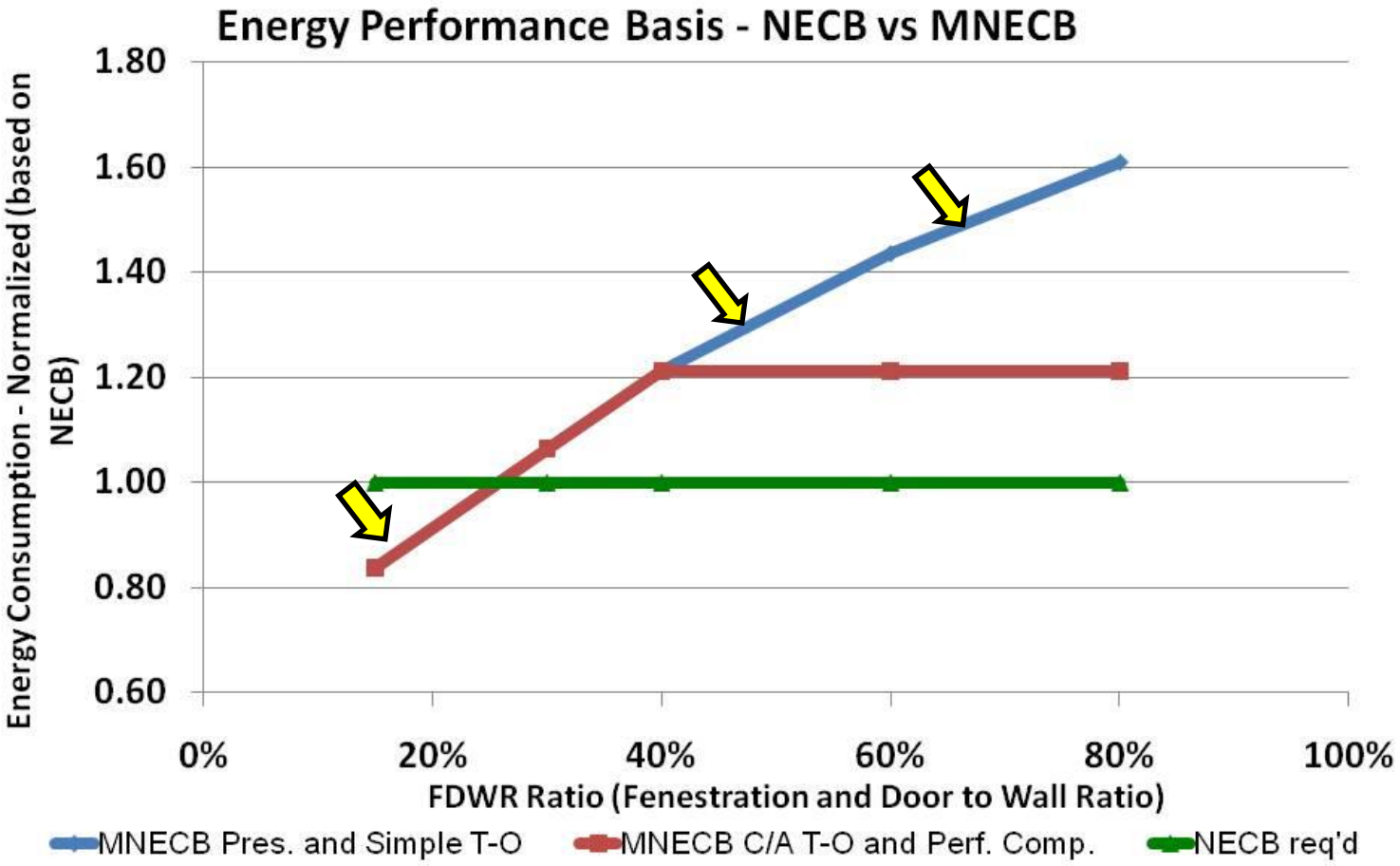
MNECB vs NECB performance levels

- NECB – one consistent minimum acceptable performance level for all paths
  - Established by required U-value and maximum fenestration-and-door-to-wall ratio (FDWR) for location's climatic conditions

MNECB vs NECB performance levels



MNECB vs NECB performance levels



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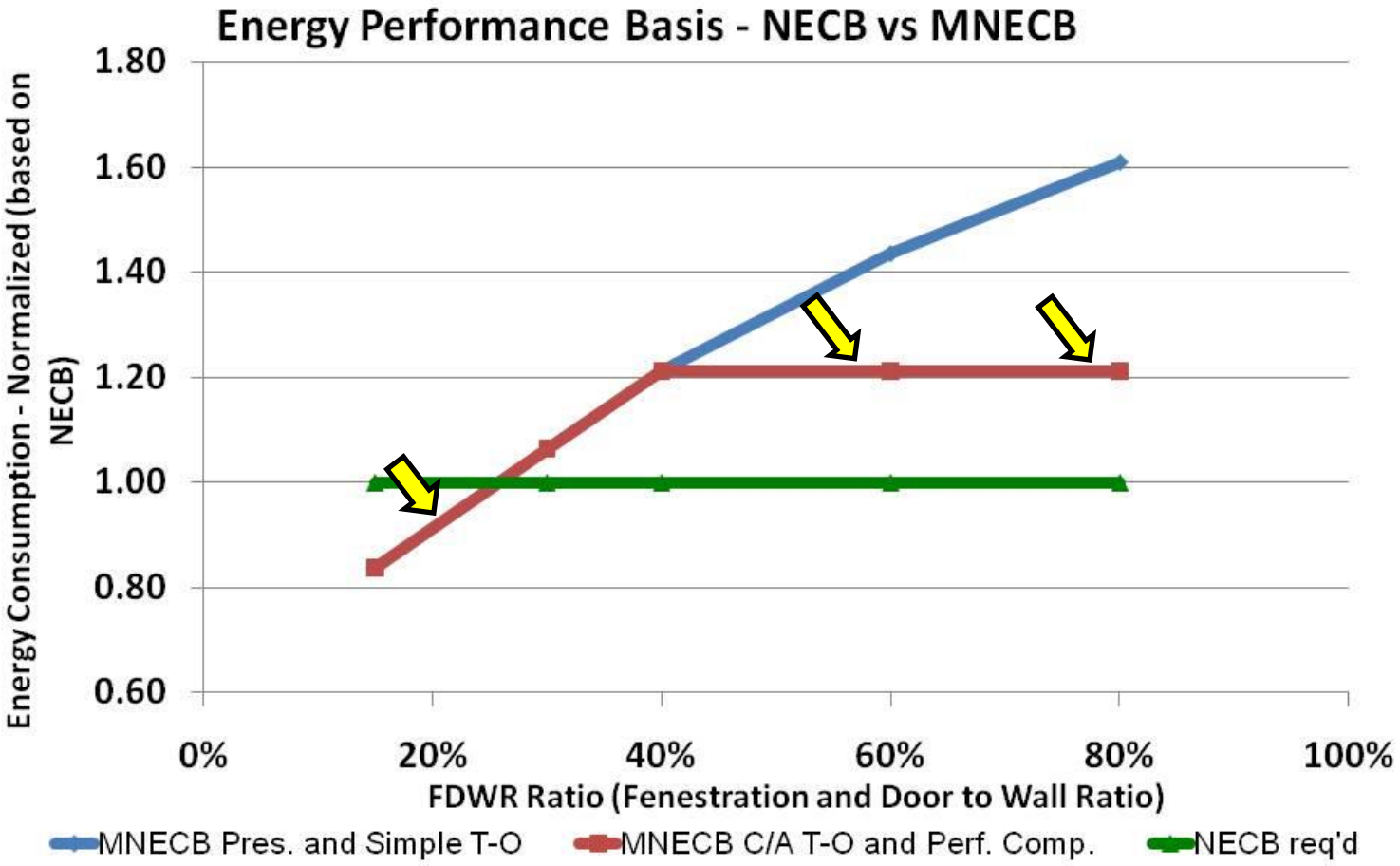
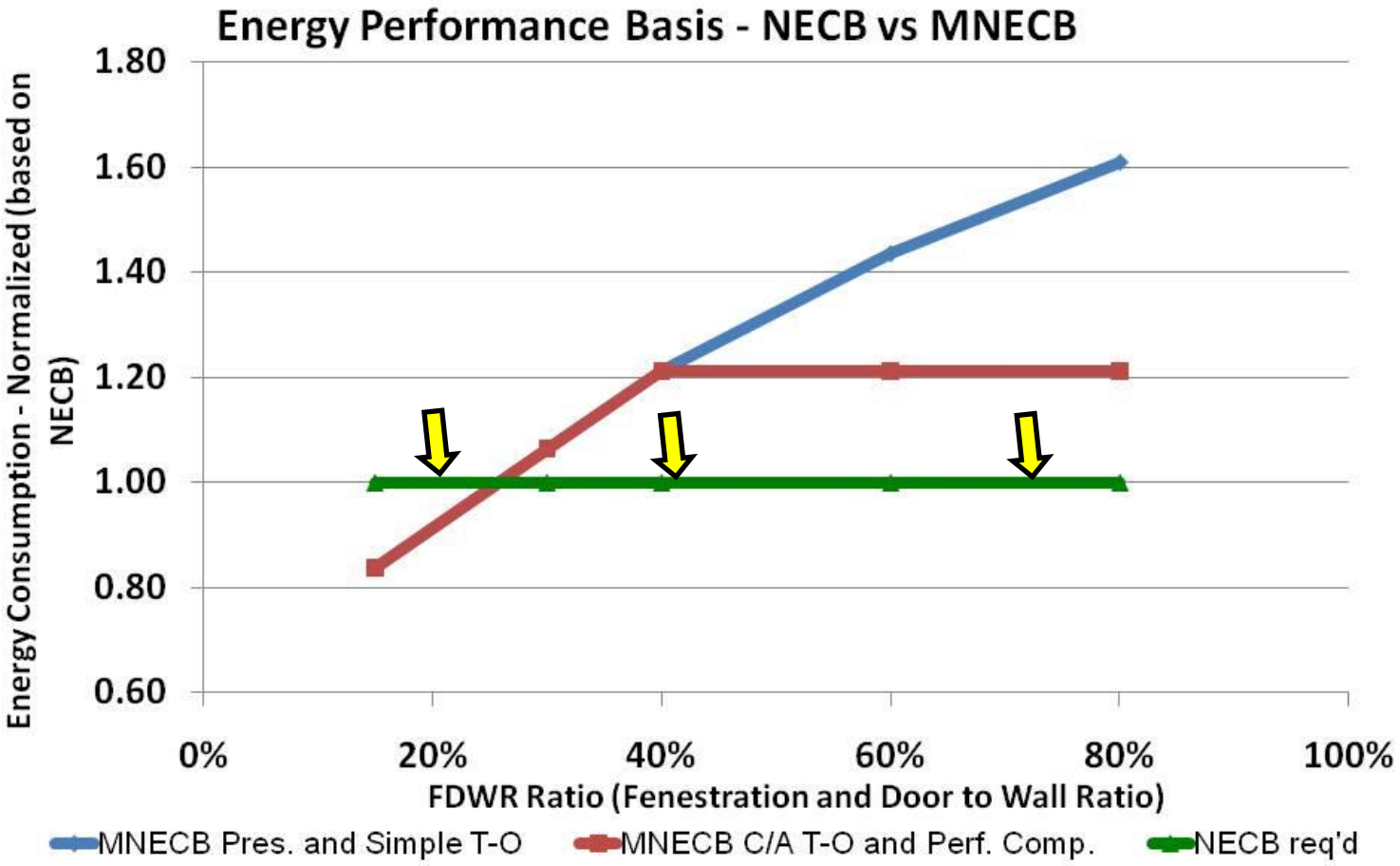
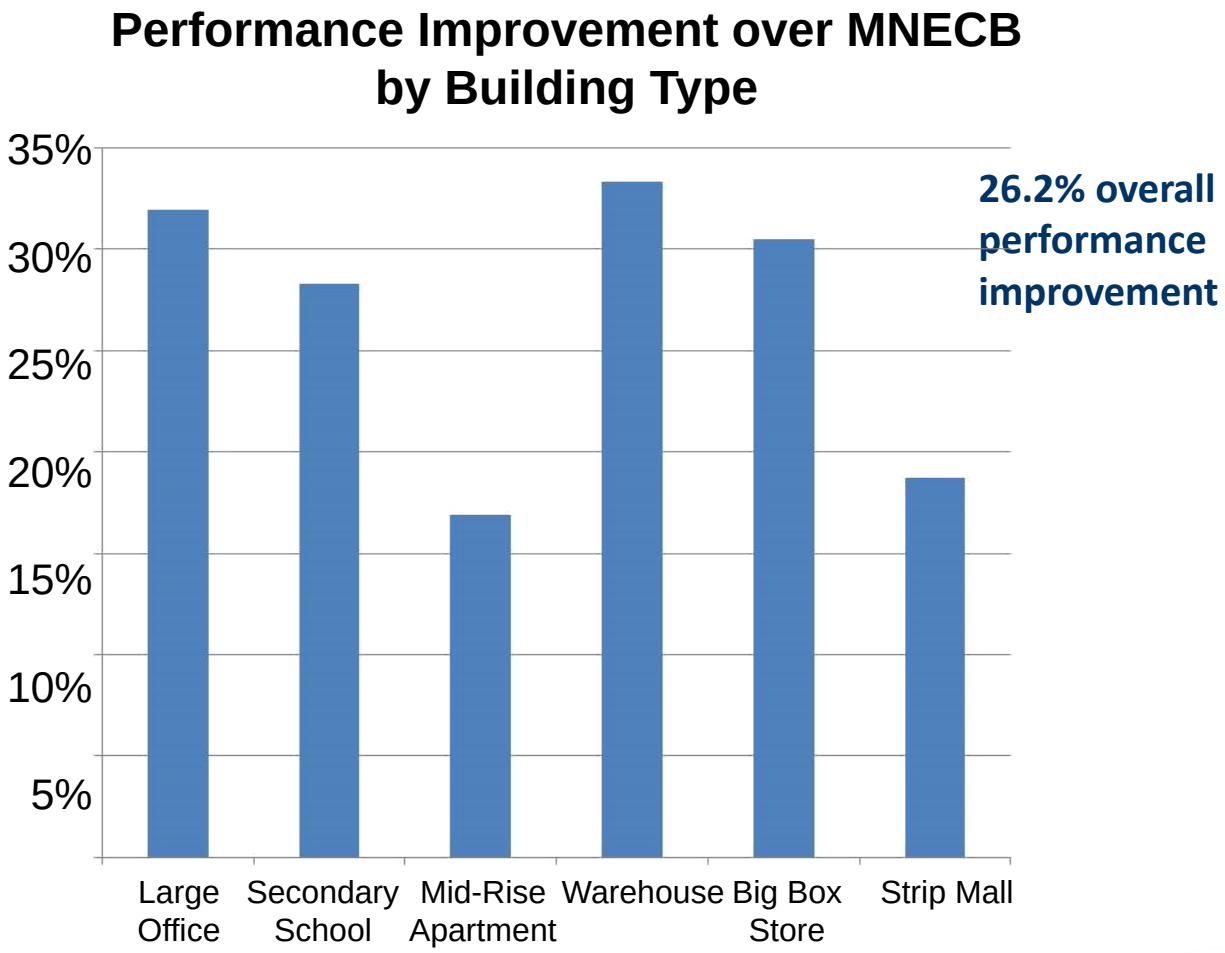


MNECB vs NECB performance levels



NECB performance results



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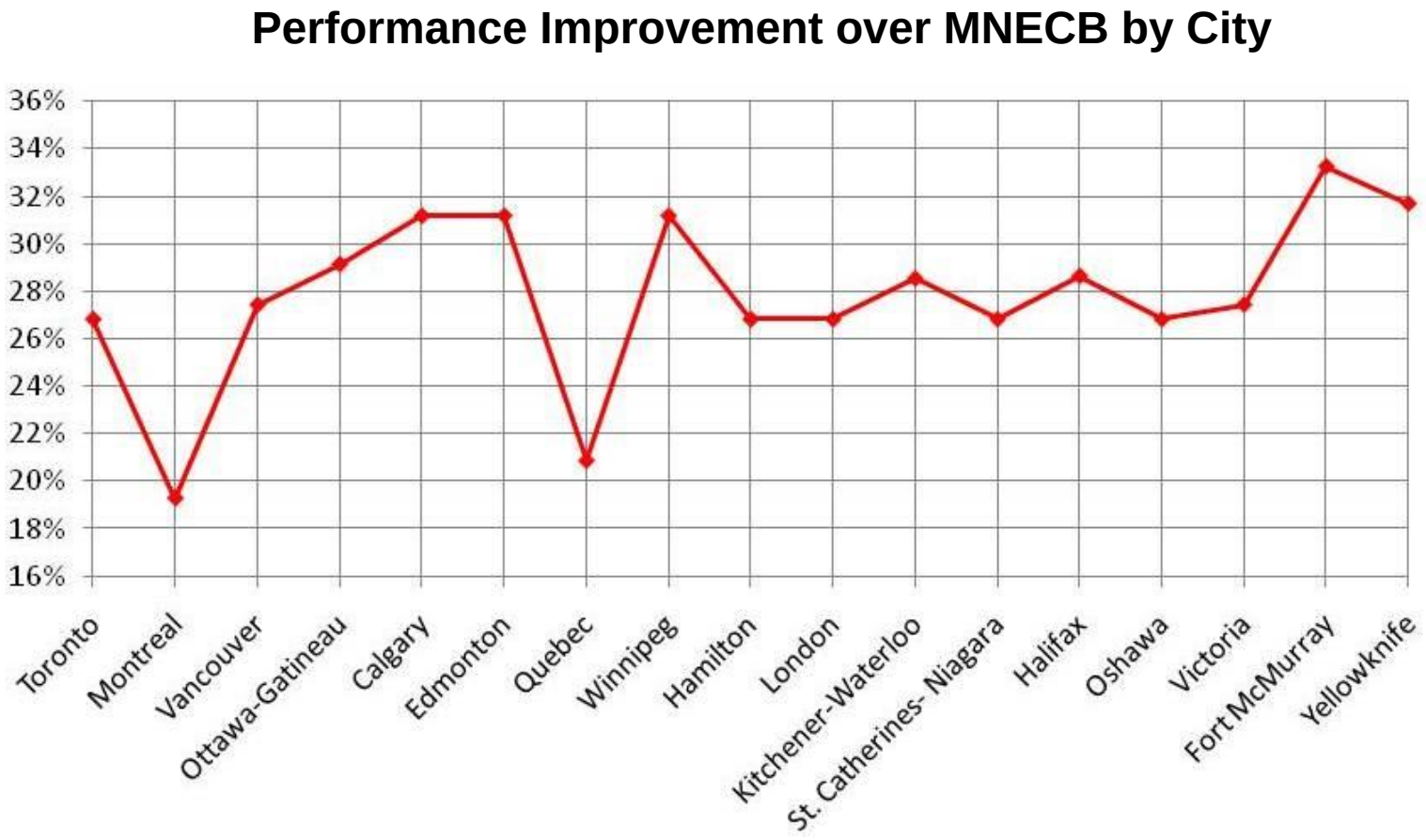

Objective-based code

OE Environment

An objective of this Code is to limit the probability that, as a result of the design or construction of the building, the environment will be affected in an unacceptable manner.

OE1 Resources

An objective of this Code is to limit the probability that, as a result of the design or construction of the building, resources will be used in a manner that will have an unacceptable effect on the environment. The risks of unacceptable effect on the environment due to use of resources addressed in this Code are those caused by –

OE1.1 excessive use of energy.

Questions?

www.nationalcodes.nrc.gc.ca

Thank you