

EBC



Energy in Buildings and
Communities Programme

Codes for Existing Buildings

June 8, 2020, 11:00 - 12:30 GMT

EBC Building Energy Codes Working
Group Webinar



Mr. Meli Stylianou
Natural Resources Canada

Some Administrative Notes



- We are recording this webinar so that we can make it available to EBC members in the future. Your participation indicates your consent.
- We would like everyone to mute themselves to minimize extraneous noise.
- Please feel free to put questions in the comment section (see the chat function at the bottom of the screen).
- Once we begin the discussion, you can use the “Raise Hand” feature in Zoom. You can find this by clicking on participants at the bottom of the screen, and then at the bottom of the participants pane, you will see a blue hand. As best we can, we will call on you in the order in which you raise your hand to let you know you can unmute.

Webinar Overview



- 65% of the 2060 building stock already exists today.
- The development and application of energy codes for existing buildings offer significant opportunities for reducing global energy consumption and greenhouse gas emissions.
- These codes are one significant manner of achieving our goals in the built environment.
- This webinar will review New York's efforts to address this issue and present the approach Canada is taking in tackling this challenging way forward.

Agenda



11:00 Welcome and Introduction

*Meli Stylianou, CanmetENERGY, Natural Resources Canada
David Nemetzow, U.S. Department of Energy*

11:05 Existing Building Energy and Carbon Reductions – the Path to Carbon Neutrality in New York City

Gina Bocra, New York City Department of Buildings

11:25 Developing a Framework for Alterations to Existing Buildings

Sarah Gibb and Greg Fairthorne, Codes Canada, National Research Council

11:45 Open Discussion

Moderator: Meredydd Evans, Pacific Northwest National Laboratory

12:00 Close

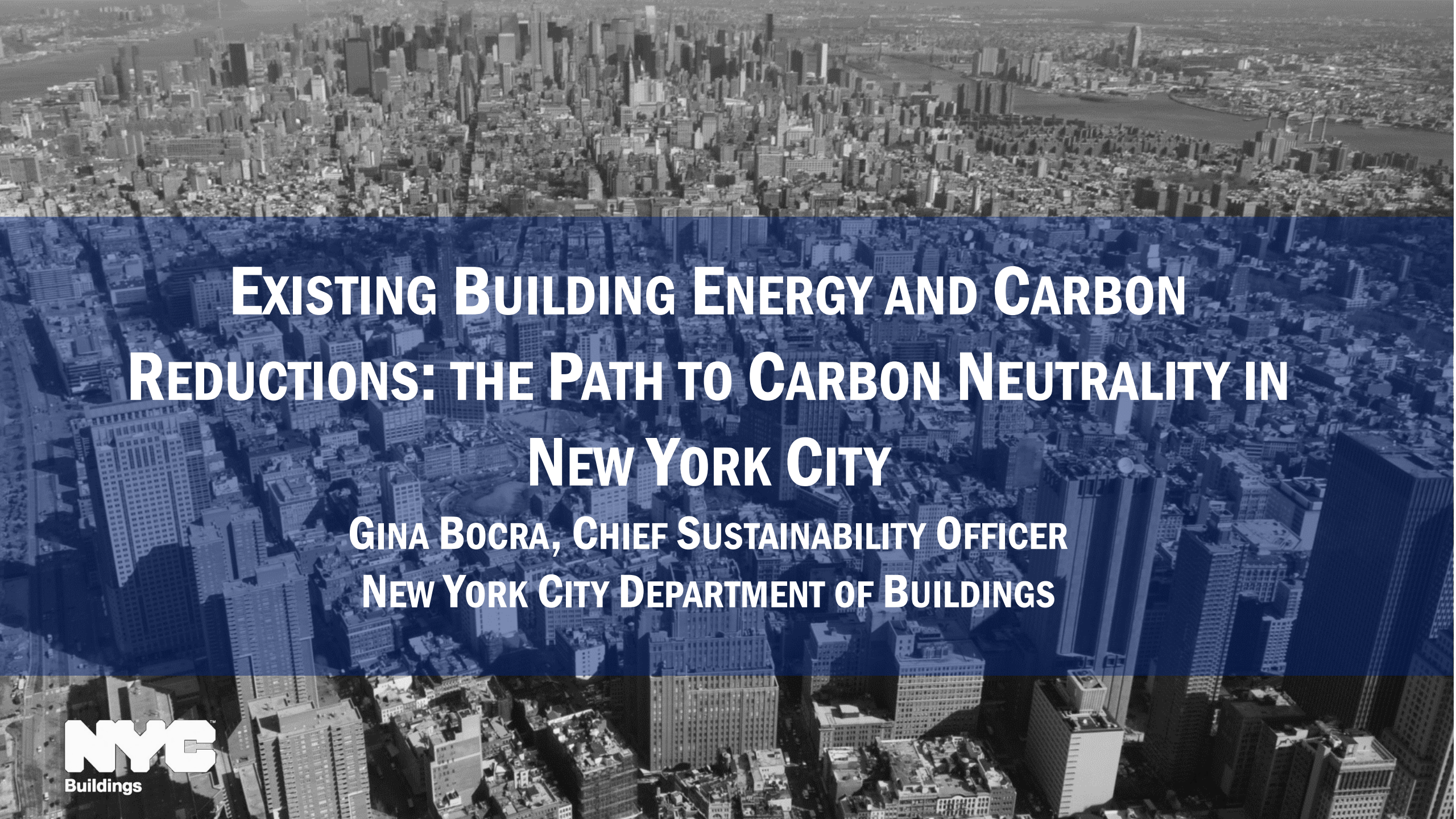
Meli Stylianou



Mr. David Nemptzow,
U.S. Department of Energy
(EBC BECWG Chair)



Ms. Gina Bocra
New York City Department of
Buildings



EXISTING BUILDING ENERGY AND CARBON REDUCTIONS: THE PATH TO CARBON NEUTRALITY IN NEW YORK CITY

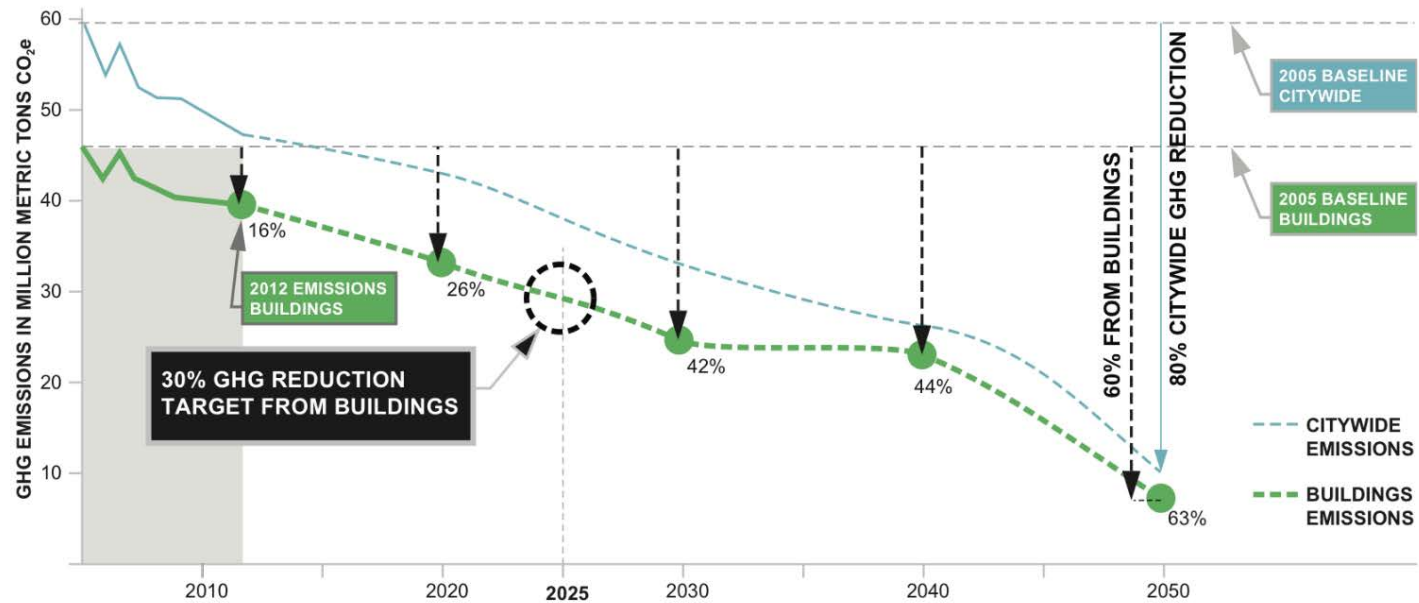
**GINA BOCRA, CHIEF SUSTAINABILITY OFFICER
NEW YORK CITY DEPARTMENT OF BUILDINGS**

NYC CLIMATE POLICY OVERVIEW

LOCAL LAW 66 OF 2014 (80X50)

A local law to amend the Administrative Code of the city of New York, in relation to reducing greenhouse gases by eighty percent by 2050.

Pathways for Reductions in Greenhouse Gas Emissions from Buildings



Source: New York City Mayor's Office of Long-Term Planning and Sustainability

NYC CLIMATE POLICY

LOCAL LAW 85 OF 2009- NYC ENERGY CONSERVATION CODE

NYC has had its own Energy Code since mandated by law in 2009, beginning with the 2010 NYC Energy Conservation Code

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annual energy and water benchmarking for large buildings

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LOCAL LAW 88 OF 2009

lighting upgrades and sub-metering in large buildings by 2025

NYC 2020 ENERGY CODE

NY STATE VOTED TO ADOPT IN SEPTEMBER 2019:

Based on the 2018 IECC and ASHRAE 90.1-2016

NYC ADOPTED IN FEBRUARY 2020:

- **The NYS Energy Conservation Construction Code**
- **Portions of the NYSERDA NYStretch Energy Code 2020**
- **Local changes from the DOB Energy Code Committee Process**
- **Legacy changes from previous NYCECC versions**

NYC 2020 ENERGY CODE

NET EFFECT OF ADOPTING THE 2018 IECC/ ASHRAE:

- Commercial building efficiency increases by about 8%
- Residential efficiency increases by about 2%

NET EFFECT OF ADOPTING THE NYSERDA NYSTRETCH ENERGY CODE:

- Commercial building efficiency increases by about 5% more than the NY State Code (approximately 13% more than ASHRAE 90.1)
- Residential building efficiency increases by about 19% more than the 2016 NYC Energy Conservation Code

NYC 2020 ENERGY CODE

FUTURE CHANGES TO THE NYC ENERGY CODE (LOCAL LAW 32 OF 2018):

2022 NYCECC will be based on the next NYStretch Energy Code

2025 NYCECC will require new buildings greater than 25,000 GSF to meet absolute energy performance metrics, yet to be determined- such as Energy Use Intensity (EUI) or Carbon Intensity (CO₂e per Square Foot)

NYC CLIMATE MOBILIZATION ACT

LOCAL LAWS 92 AND 94

requiring that the roofs of certain buildings be covered in green roofs and/or solar PV systems

LOCAL LAW 95

assigns a building energy efficiency grade

LOCAL LAW 96

establishing a sustainable energy loan program (ie. PACE)

LOCAL LAW 97

the commitment to achieve certain reductions in greenhouse gas emissions by 2050

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the commitment to achieve certain reductions in greenhouse gas emissions by 2050

**BUILDINGS LARGER THAN 25,000SF IN SIZE:
Greenhouse gas emissions limits must be met starting in 2024**



LOCAL LAW 97

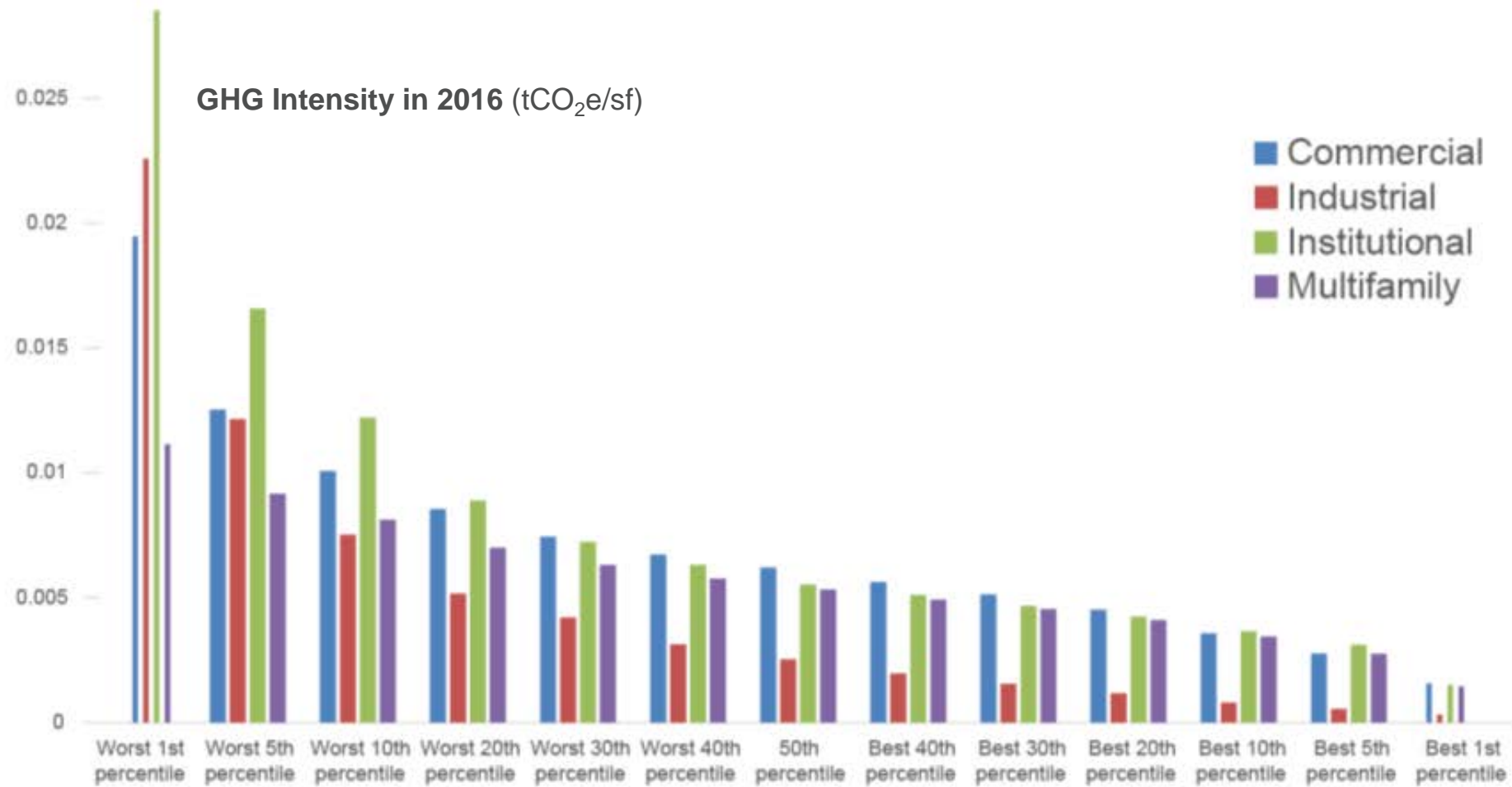
the commitment to achieve certain reductions in greenhouse gas emissions by 2050

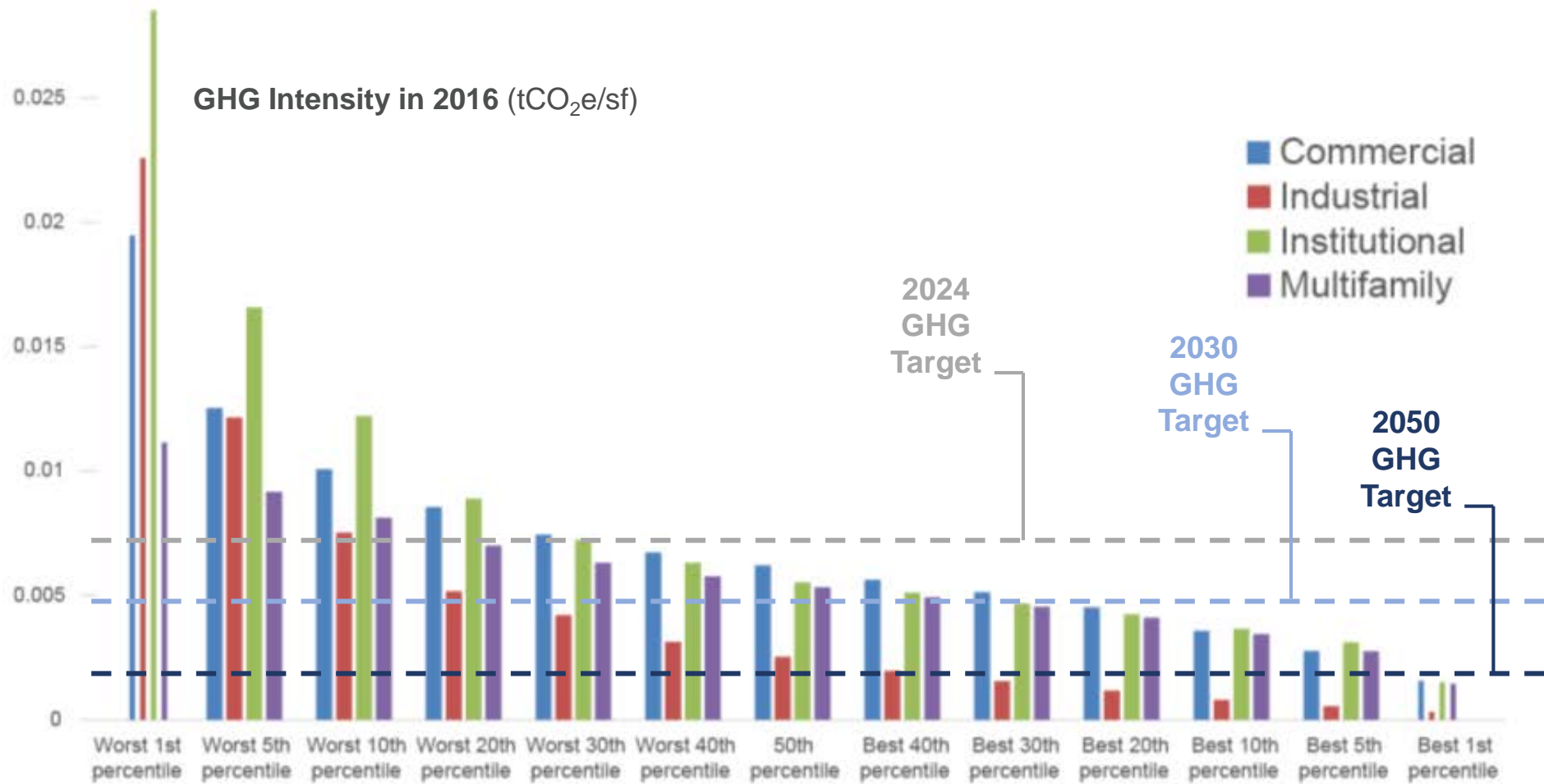
- GHG emissions limits for all buildings >25,000 square feet
- Convening of an advisory group on future limits
- Study for a building carbon trading scheme
- City operations GHG reductions of 40% by 2025 and 50% by 2030

LOCAL LAW 97

the commitment to achieve certain reductions in greenhouse gas emissions by 2050

- By May 1, 2025, building owners must report emissions from CY 2024
- Emissions are reported every year for each full calendar year
- The emissions target is more stringent beginning in CY 2030
- The 2030-2034 target aligns buildings with the City's 40X30 goal
- For 2035 and beyond, targets will be set by DOB rulemaking based on recommendations from an advisory committee
- Prescriptive energy conservation measures for rent regulated housing





LOCAL LAW 97

the commitment to achieve certain reductions in greenhouse gas emissions by 2050

PRESCRIPTIVE ENERGY CONSERVATION MEASURES

- Adjusting temperature set points for heat and hot water;
- Repairing all heating system leaks;
- Maintaining heating systems;
- Installing individual temperature controls or insulated radiator enclosures with temperature controls on all radiators;
- Insulating all pipes for heating and/or hot water;
- Insulating steam system condensate tank or water tank;
- Installing indoor and outdoor heating system sensors and boiler controls;
- Replacing or repairing all steam traps
- Installing or upgrading steam system master venting;
- Upgrading lighting;
- Weatherizing and air sealing;
- Installing timers on exhaust fans; and
- Installing radiant barriers behind all radiators.

LOCAL LAW 97

the commitment to achieve certain reductions in greenhouse gas emissions by 2050

GHG coefficients

Energy Source

2024-2029
(tons CO₂e/kBtu)

Utility electricity

0.0000847

Additional rules for campus-style electricity systems that share on-site generation, but make use of the utility distribution system and for buildings not connected to the utility distribution system to come

Natural gas combusted on-site

0.00005311

#2 fuel oil combusted on-site

0.00007421

#4 fuel oil combusted on-site

0.00007529

District steam

0.00004493

Other, including distributed energy resources

TBD



Thank you!

nyc.gov/buildings

GHGemissions@buildings.nyc.gov



Ms. Sarah Gibb
Codes Canada,
National Research Council



Mr. Graig Fairthorne
Codes Canada,
National Research Council



National Research
Council Canada

Conseil national de
recherches Canada

Canada



Alterations to Existing Buildings

A Policy Framework

June 8, 2020

Sarah Gibb and Greg Fairthorne



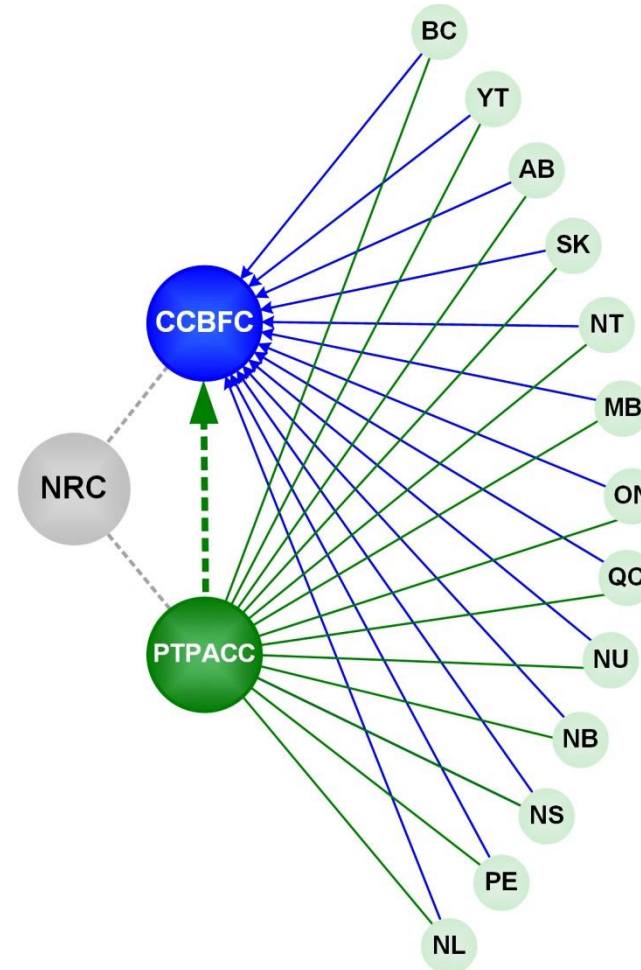
Outline

- **Code Development System**
- AEB Policy Drivers
- Background, Principles & Approach
- Next Steps



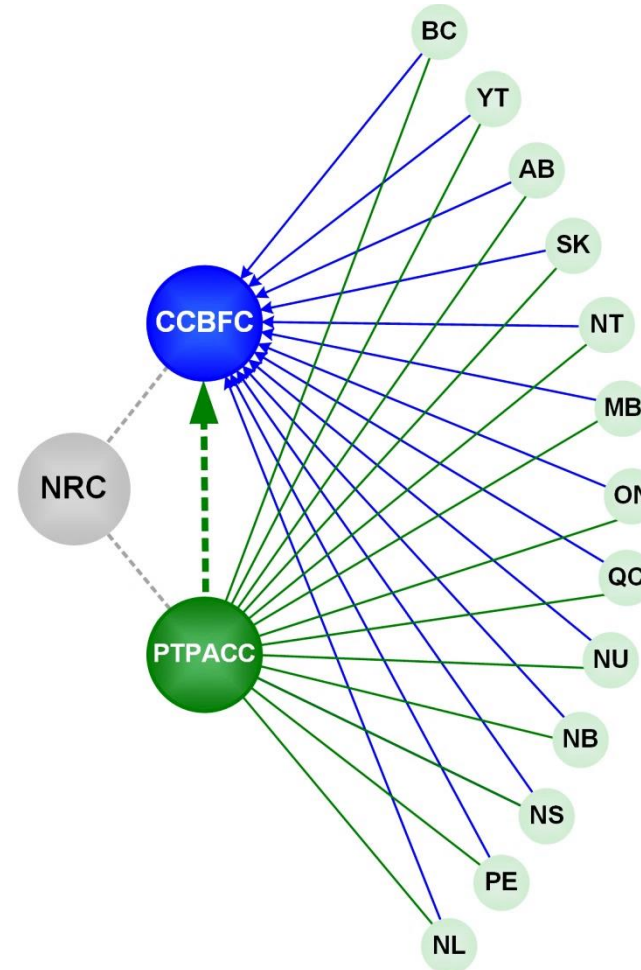
Codes & Guides Development System

- **Canadian Commission on Building and Fire Codes (the “Commission”)**
- **National Research Council Codes Canada**
- **Provinces and Territories &**
- **Provincial Territorial Policy Advisory Committee on Codes**

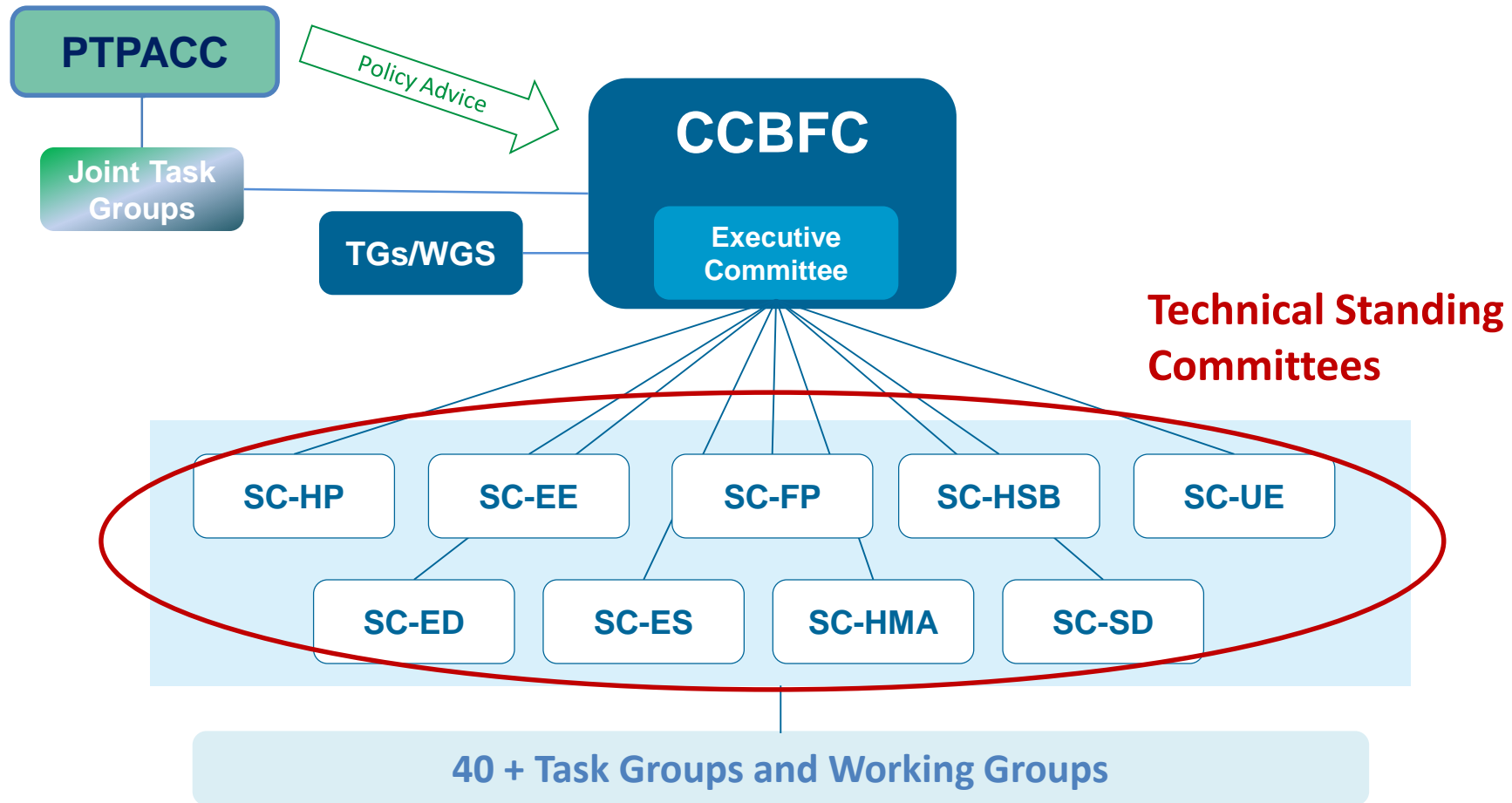


Codes & Guides Development System

- › Independence
- › Balance
- › Consensus
- › Expertise
- › Evidence
- › Neutrality
- › Legislative Authority
- › Policy Goals



CCBFC Committees & Interactions



Outline

- Code Development System
- **AEB Policy Drivers**
- AEB Principles and Approach
- Next Steps



Policy Drivers

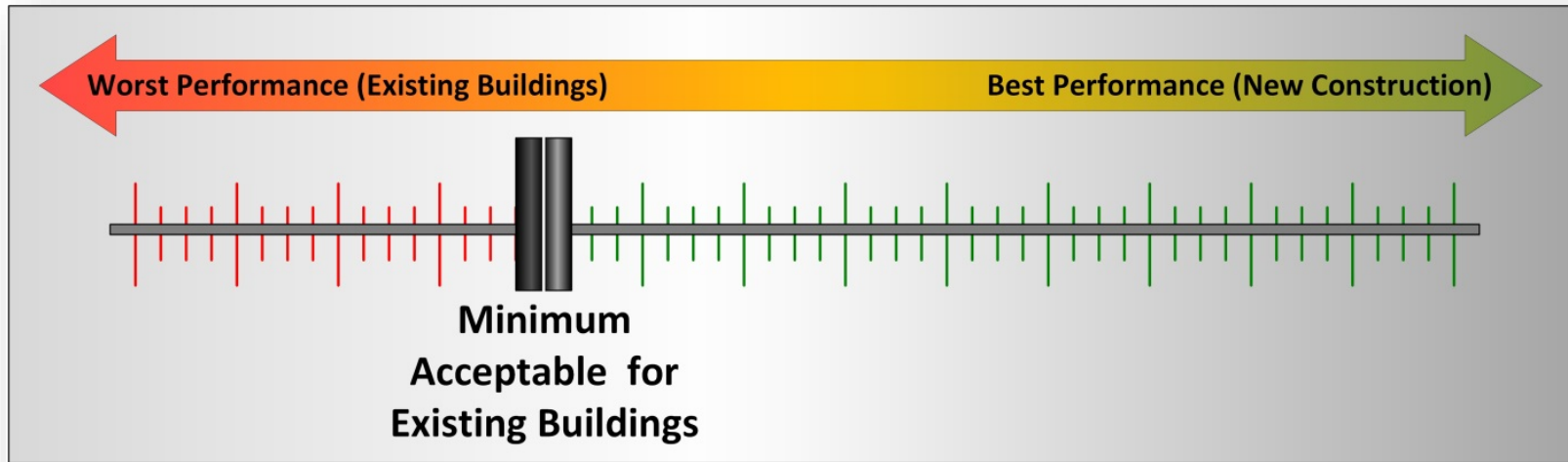
- › Pan Canadian Framework on Clean Growth and Climate Change
 - Canada's plan following COP 21 in Paris
- › Code Development System
 - Provinces and Territories have indicated that AEB is a priority
- › Regulatory Reconciliation and Cooperation (RCT)
 - Federal and Provincial/Territorial governments are working to reduce interprovincial trade barriers- including Construction Codes

Outline

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- AEB Policy Drivers
- **Background, Principles & Approach**
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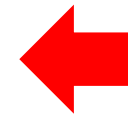
Goal



Improve
performance
of existing
stock

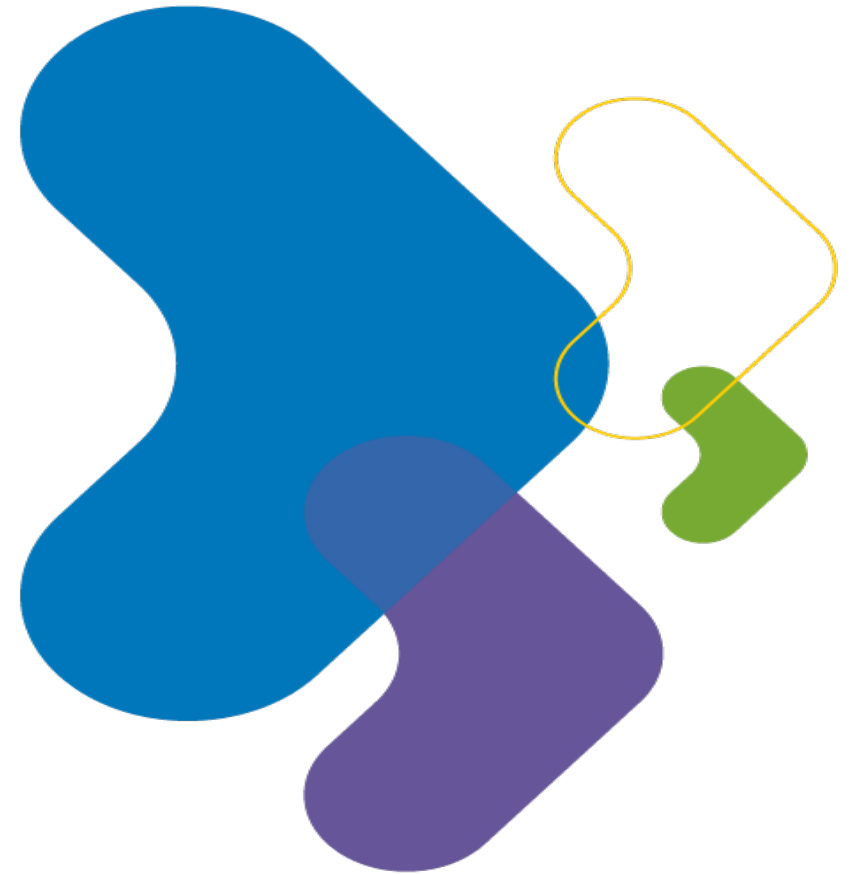


Create undue
burden and
unintended
consequences



Background

- Joint Task Group's mandate
 - location & scope of AEB requirements
 - scope
 - principles for technical requirements
 - triggers and terminology
 - AEB approach (concept)

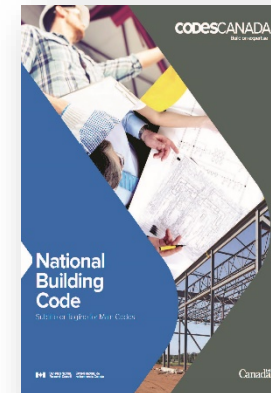


Background

- Questionnaire
 - regulations & bylaws, triggers, exemptions
- Scans & Surveys
 - Canadian and International
 - **regulations** or guidelines and handbooks
 - **non-regulatory tools** (voluntary programs, tax credits, grants to encourage AEB measures)

Location of requirements

- AEB measures are to be **in the Codes** (not guidelines)
- Proposed **new parts** in
 - NBC, NECB and NPC



Scope & Application

- Application
 - Houses and Small Buildings
 - Buildings
- Scope
 - All objectives need to be addressed to avoid unintended consequences



Development principles

- Requirements for existing buildings shall:
 1. **close the performance gap** between new buildings (current code) and the existing building stock.
 2. maintain or increase the life safety and overall building performance level (they **can't make the building worse**).
 3. avoid negative **unintended consequences** or **unrealistic expectations**.
 4. ensure that when a repair, maintenance or alteration is in progress, the building cannot be left in an **unsafe state**.

Development principles



- Requirements for existing buildings shall:
 5. be **reasonable, practical and effective** (applying SMART regulation principles).
 6. **be flexible** so as to encourage alterations to existing buildings rather than place an **undue burden** on the public.
 7. **be flexible** so as to preserve officially recognized (designated/registered) **heritage elements**.
 8. **complement voluntary programs** and other policy tools (e.g. tax credits).

Existing Buildings Intervention

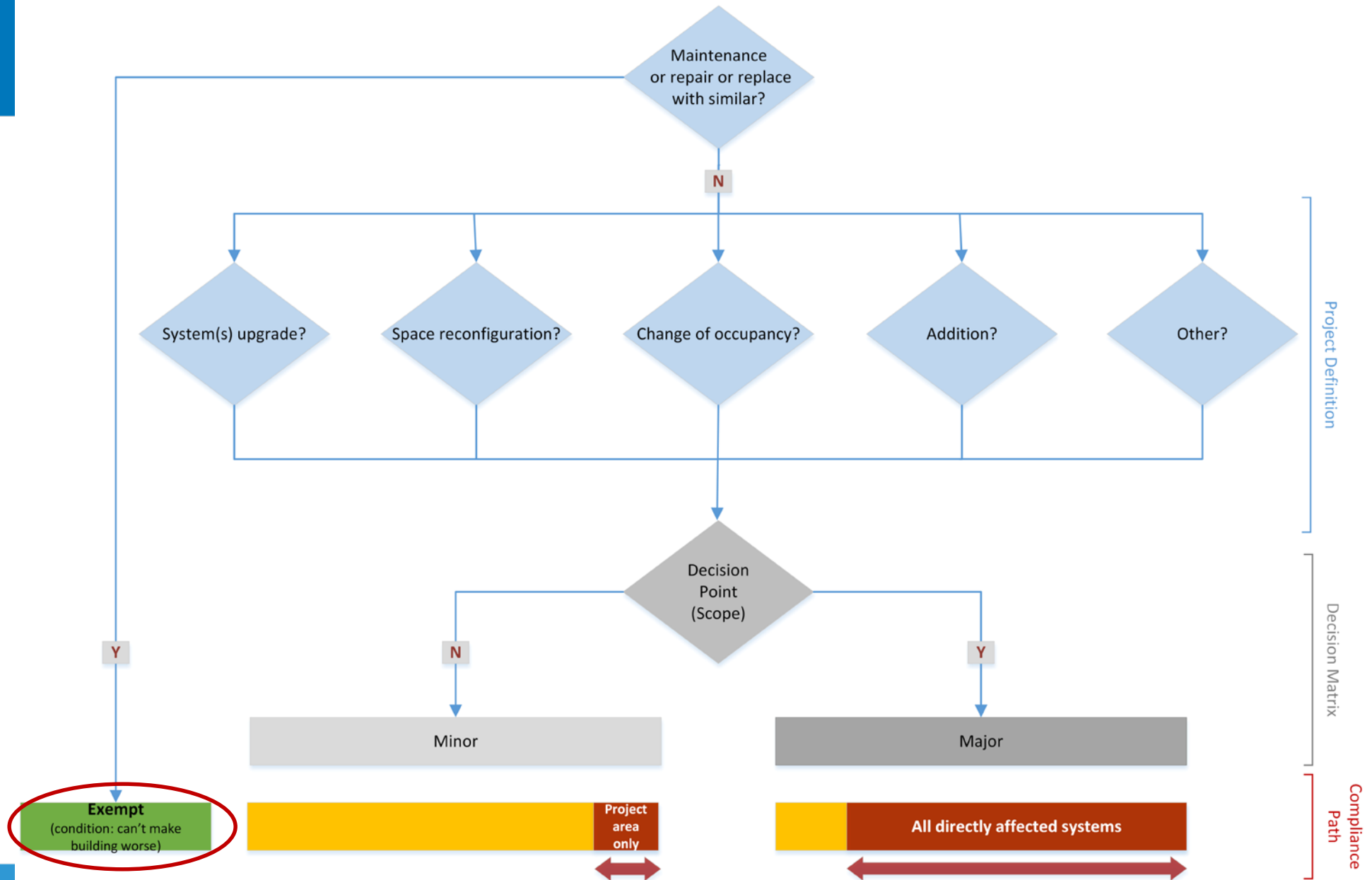


Figure 1. The conceptual diagram of the triggers, decision matrix and compliance paths that apply to alterations to existing buildings.

Maintenance or Repair or Replace with Similar

- The repair or replacement of any part or component of an existing building **for the purpose of its maintenance or to correct damage or failure**
- It includes the removal and replacement of any existing part, component, equipment or fixture with a new part, component, equipment or fixture that serves **the same purpose**



Existing Buildings Intervention

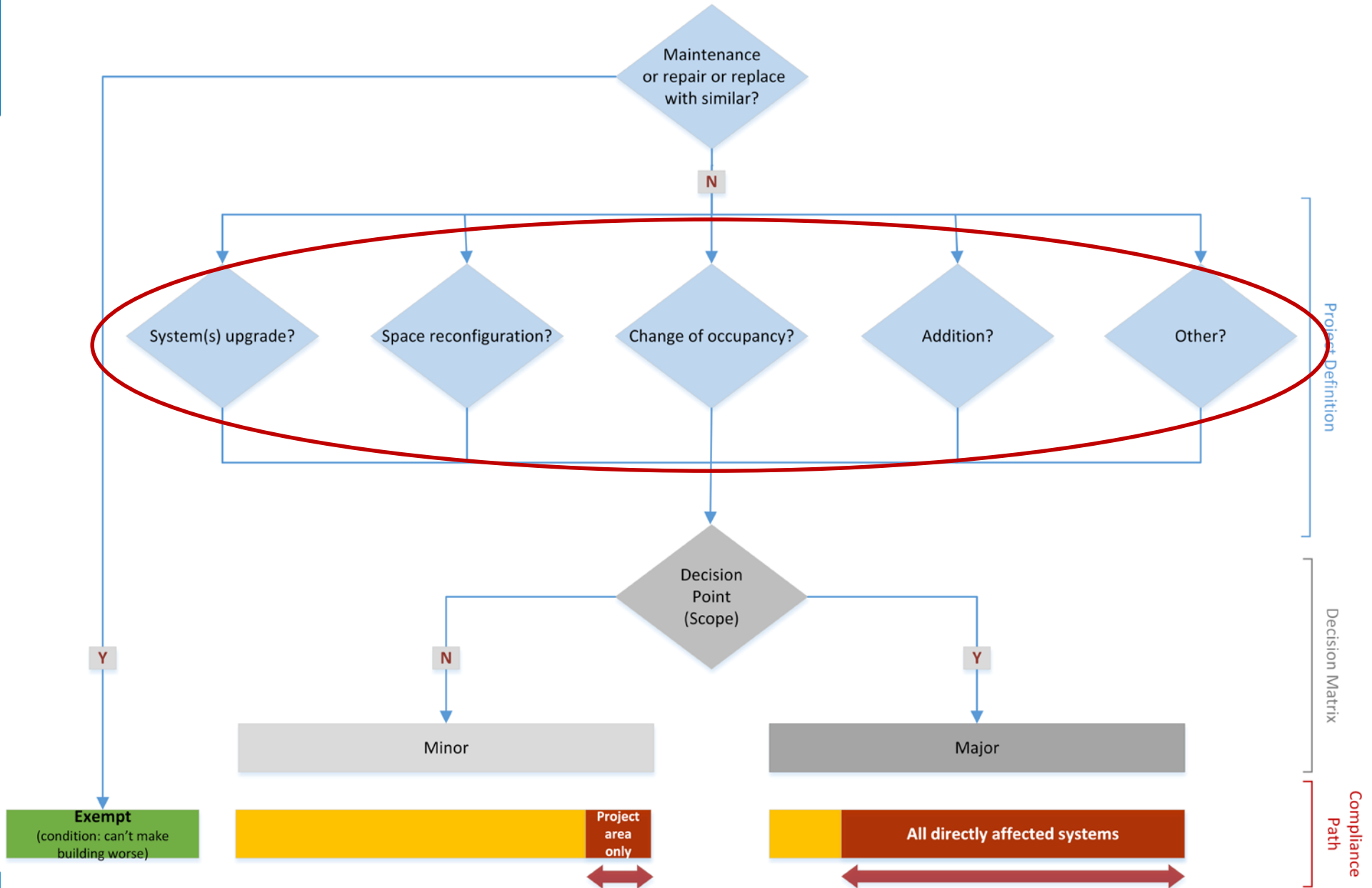
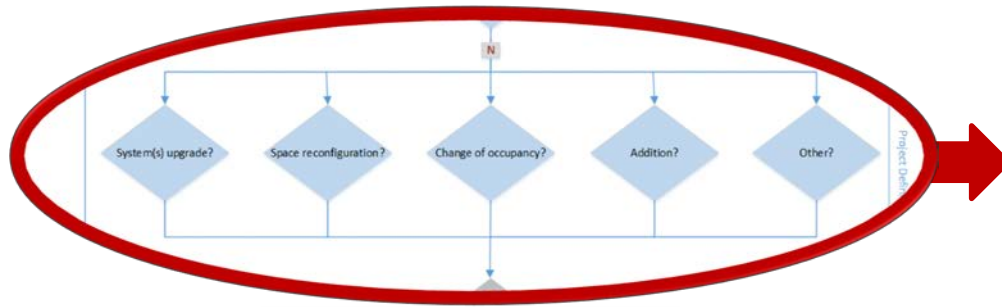


Figure 1. The conceptual diagram of the triggers, decision matrix and compliance paths that apply to alterations to existing buildings.

Code triggers: Project type



› Project scope for requirements:

- System Upgrade
- Space Re-configuration
- Change in Occupancy
- Addition
- Other ... ?

Existing Buildings Intervention

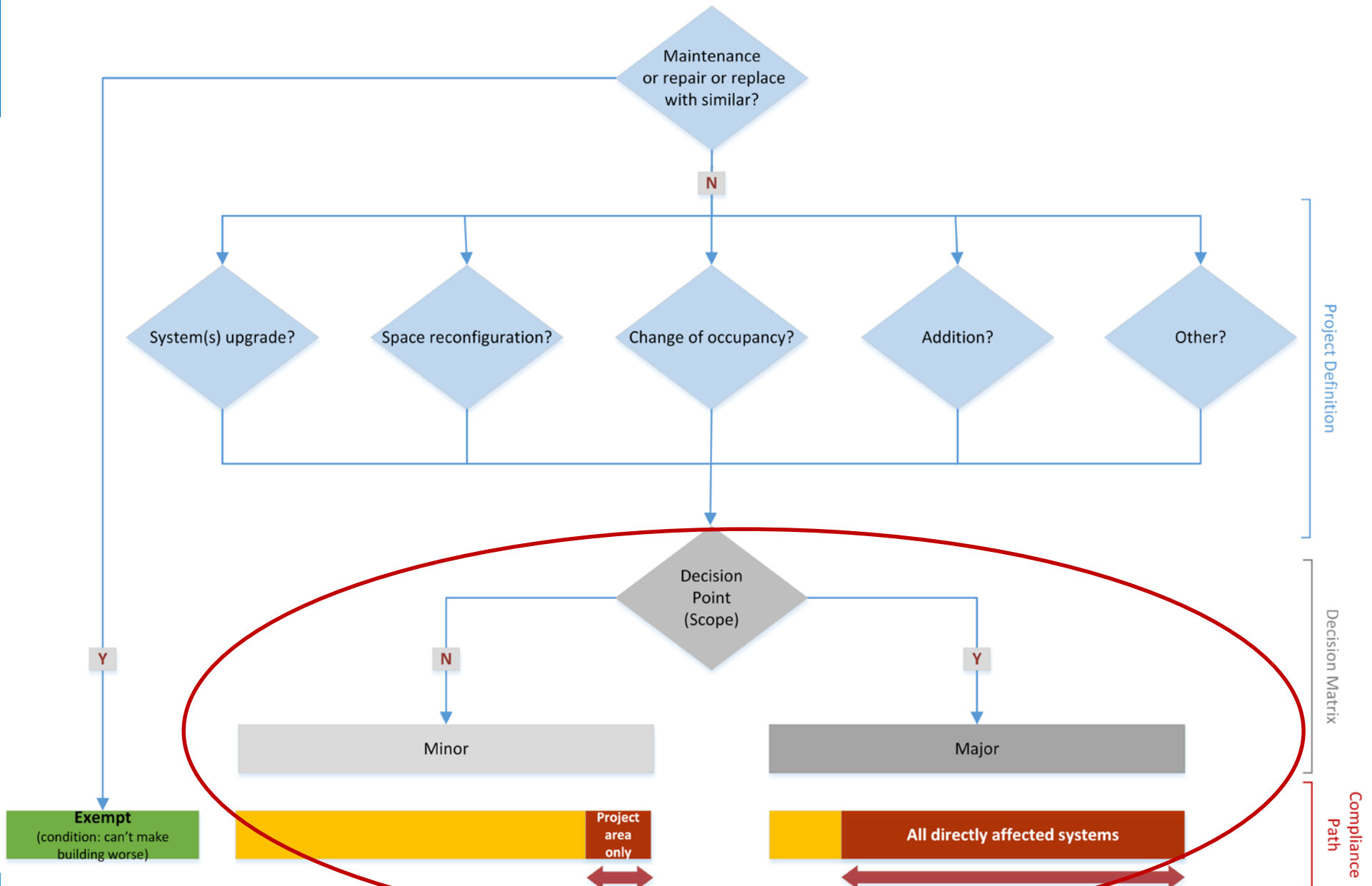
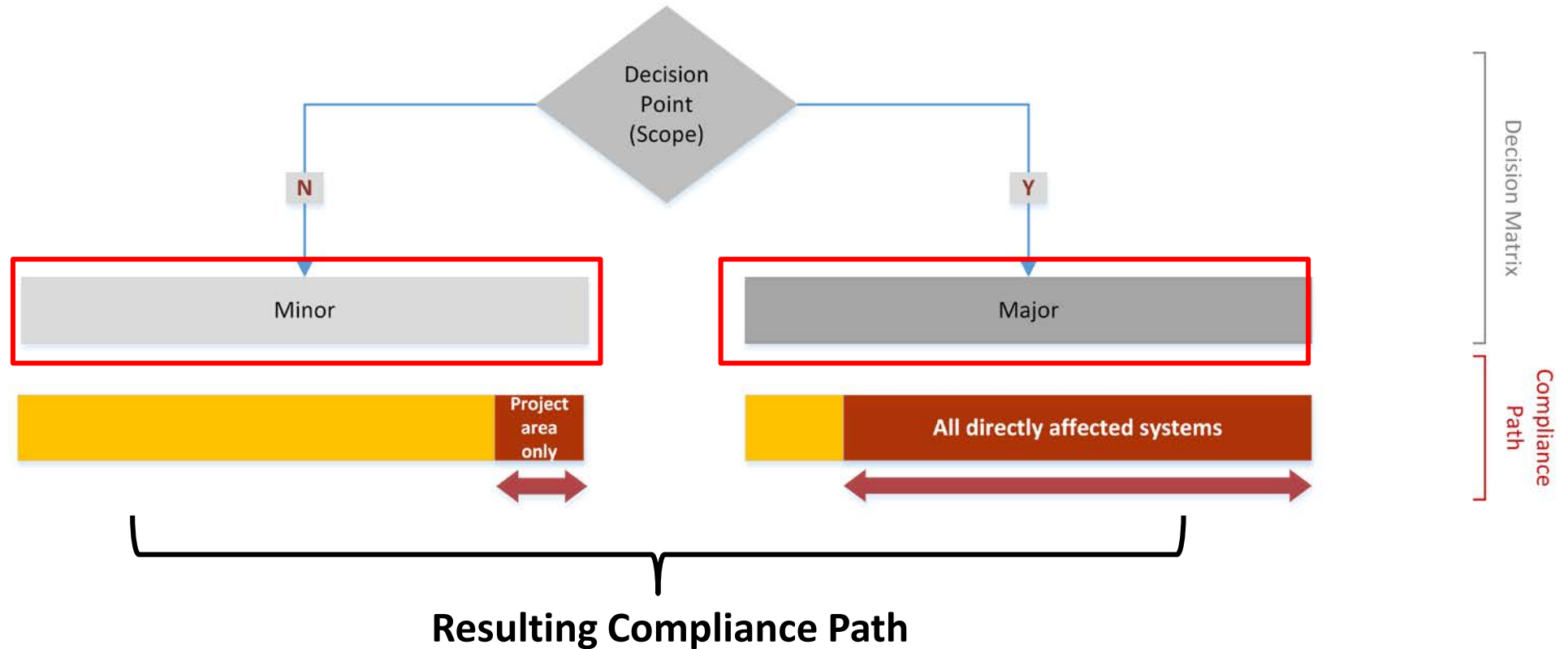


Figure 1. The conceptual diagram of the triggers, decision matrix and compliance paths that apply to alterations to existing buildings.

Minor vs Major



Minor alteration

Minor alteration:

- standalone project
- isolated project, small in scope;
- no structural elements;
- no impact on other systems in other areas of the building;
- no added risk to adjacent property;
- does not render active life safety systems inoperative;
- does not make means of egress unusable

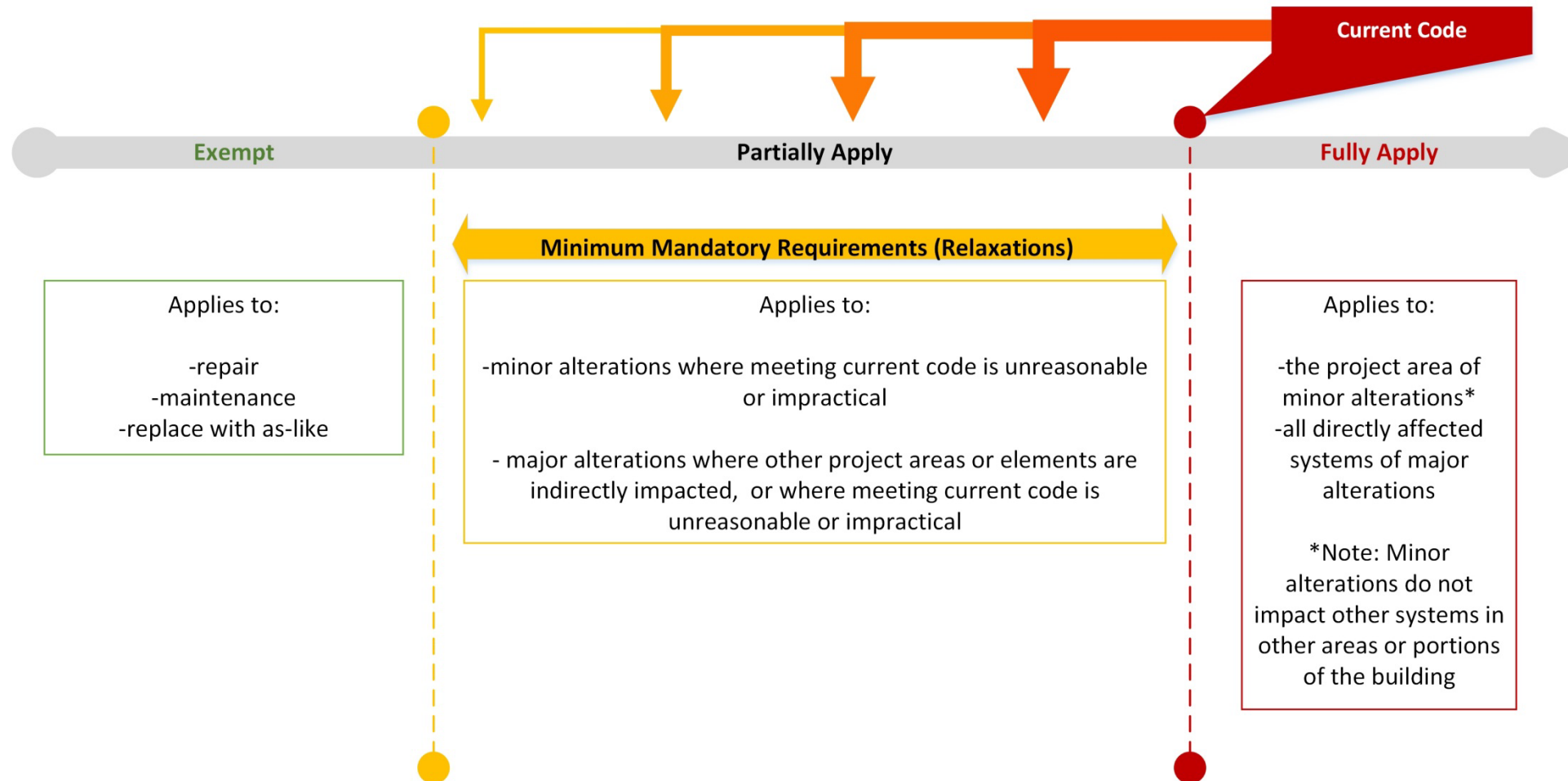


Major alteration

- › Everything that doesn't fall under the scope of a minor alteration



Compliance



Requirements

Minor Alteration

- › Code applies to
 - project area only
 - element(s) being altered

Major Alteration

- › Code applies to
 - project area
 - all directly impacted systems
 - some indirectly impacted systems

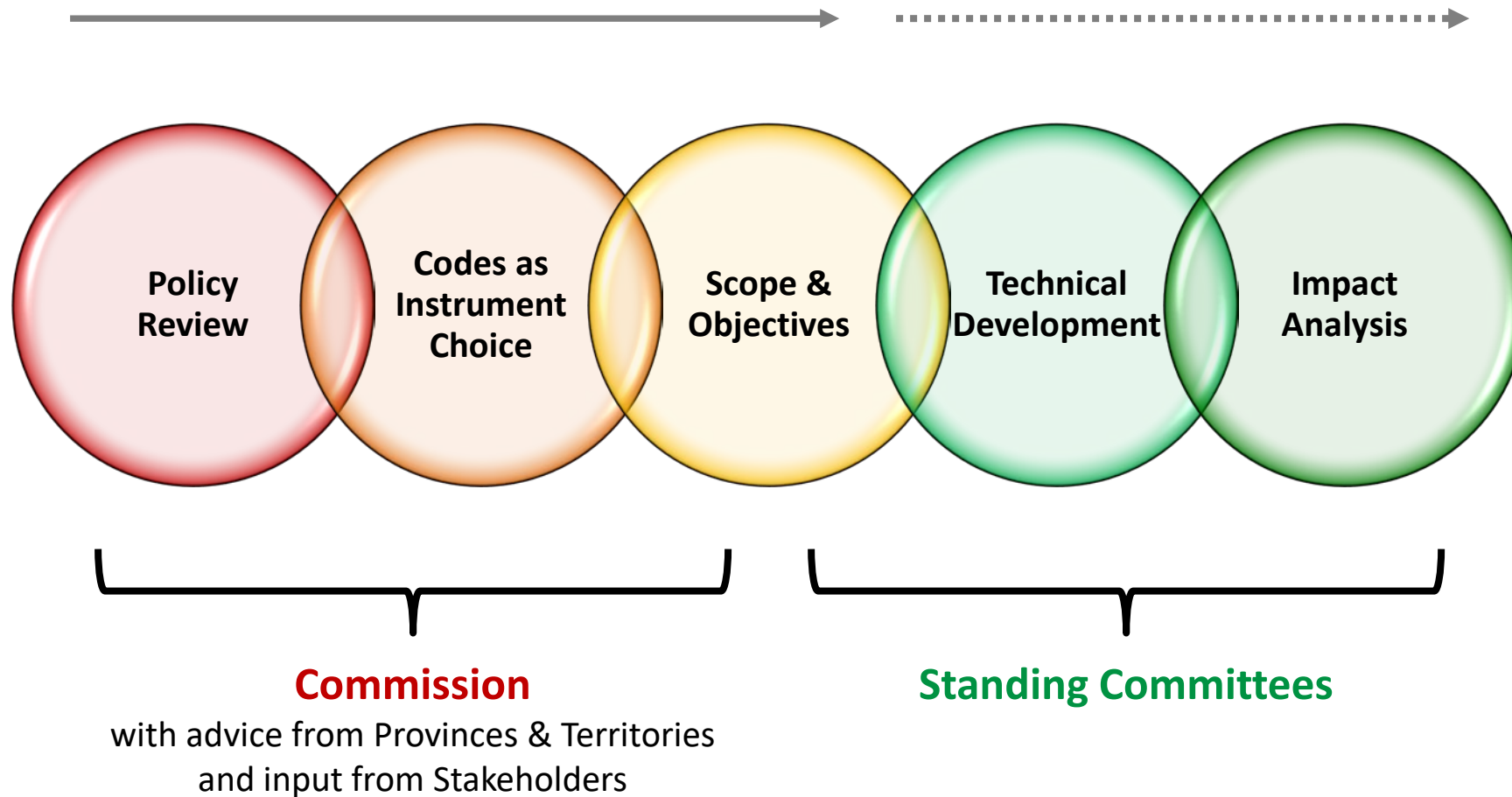
Relaxations and Exemptions apply in accordance with the principles.

Outline

- Code Development System
- AEB Policy Drivers
- AEB Principles and Approach
- **Next Steps**



Next Steps



Next Steps

- ❑ Standing Committees (SCs) need to
 - ❑ Consider AEB concept and principles within technical area
 - ❑ Develop work plan including effort and timeline
- ❑ CCBFC needs to approve work plan
- ❑ SCs develop technical requirements
- ❑ NRC publishes requirements for existing buildings

Questions?





Ms. Meredydd Evans
Pacific Northwest National
Laboratory

Discussion

1. What are the challenges posed by moving to codes for existing buildings?
2. What are the opportunities and challenges for the building energy efficiency community of the current situation?
3. What are the specific research questions that are emerging as countries are trying to develop and implement codes for existing buildings?