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Vermont Energy Code Collaborative Cross-Cutting Meeting #1

May 4, 2021
11:00 – 1:00

ENERGY FUTURES GROUP

Cx associates LLC

Guidehouse

nbi new buildings institute

Meeting Agenda

1. Overview
2. Background and Goals of the Collaborative
   a. Introductions
   b. Cross-cutting topics
   c. Meeting schedule
   d. Ground rules, logistics, and use of chat
3. Results of survey
4. Compliance
5. Multifamily issues
6. Historic preservation
7. Embodied carbon
8. Wrap up/ next steps

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Background & Goals

- Not enough time to go into depth during the three-year energy code update cycle
- This is your opportunity to dive into critical topics in more depth
- Listening and gathering information to inform decisions
  - Hoping for diverse set of perspectives and opinions
- PSD is the ultimate decision-maker…
- But feedback and input are essential
- Discuss and provide multiple points of view, don't need to reach consensus

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Code Team: Who

- Lead State Agency
  - Public Service Department
    - Kelly Launder: Assistant Director
    - Keith Levenson: Energy Program Specialist
    - Barry Murphy: EM&V Program Manager
- Code Update Lead and Residential Code
  - Energy Futures Group
    - Richard Faesy, Gabrielle Stebbins & Liz Bourguet
- Commercial Code Update
  - Guidehouse Consulting
    - Keith Downes & Stu Slote
  - Cx Associates
    - Eveline Killian
- National Insights
  - New Building Institute
    - Jim Edelson & Mark Lyles

Introductions

- Name
- Business
- Town
- Building Sector

https://pointroadgroup.com/introduce-yourself-virtually-make-strong-impressions/

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Cross-Cutting Topics

- First meeting: **Practical aspects:**
  - Compliance
  - Multifamily issues
  - Historic preservation
  - Embodied carbon
- Second meeting: **Scope and pace to get to 2030:**
  - Definition of net zero
  - Strategic electrification
  - Performance targets

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Meeting Schedule

- Cross Cutting
  - #1 – May 4, 11:00 – 1:00
  - #2 – June– TBD
- C&I
  - #1 – May 11, 11:00 – 1:00
  - #2 – June– TBD
  - #3 – June– TBD
- Residential
  - #1 – May 13, 3:00 – 5:00
  - #2 – June– TBD
- Multifamily
  - #1 – June– TBD

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Ground Rules

- Respectful listening
- Limit comments to less than 2 or 3 minutes
- Give everyone a turn to say something before speaking up again
- Use the chat to ask questions/ clarifications –not for having separate discussions.
- Notes attributed or not?
  - Own what you say or hold back from making a comment
  - Notes out for review before posting

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Survey Results

Cross Cutting Survey Questions

- Definition of Multifamily
- Energy Rating Index (ERI) path for compliance

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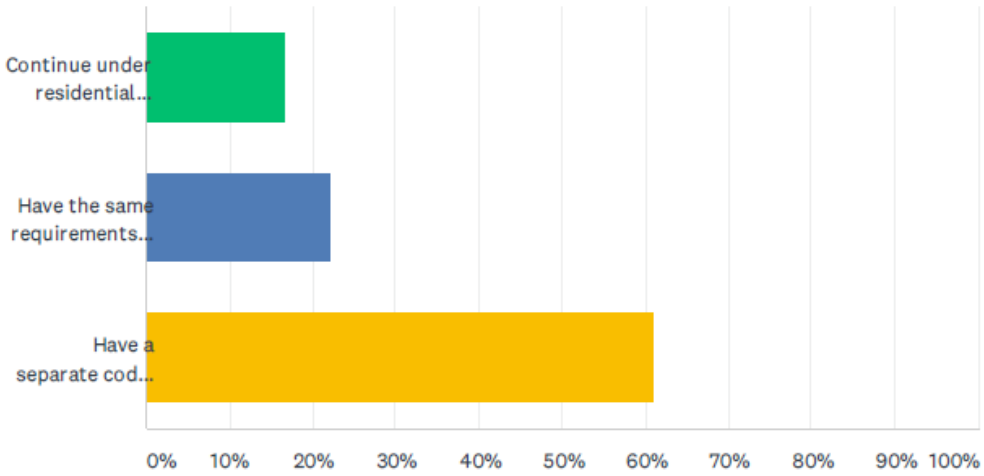
Q20 Currently multifamily buildings 3 stories or less are subject to residential code, while those 4 stories and above are subject to commercial code. The requirements are vastly different between the two. In future energy codes how should multifamily buildings with less than 4 stories be treated?

Answered: 18 Skipped: 30



ANSWER CHOICES	RESPONSES	
Continue under residential code	16.67%	3
Have the same requirements as commercial code	22.22%	4
Have a separate code compliance track for multifamily buildings	61.11%	11
TOTAL		18

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Comments on Multifamily

- Continue under Residential:
  - "They are residential buildings"
- Same as Commercial:
  - "No difference in use or intensity"
  - "This threshold discourages mixed use construction at a community scale. Over time the codes should both be simplified and be brought to align."
  - "Keep things simple"
- Two said whichever is more stringent

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Comments on Multifamily

- Separate Code Compliance track:
  - "Why stories? Area/volume? Occ rate?" "Total number of units?"
  - "MF has distinct energy use pattern/ different energy profile"
  - "Multifamily buildings are by nature more energy efficient, but individual systems for each unit can prevent the higher efficiency that commercial systems can achieve."
  - "3 or 4 stories is somewhat arbitrary. Multifamily is unique for other building science reasons which are more important for code development"

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For the design and construction of new buildings, how likely are you to use the Energy Rating Index (ERI) path for compliance with a low energy or net zero code? If likely, how would you encourage electrification using the ERI method?

- 7 people unsure of ERI methodology
- 6 said likely
  - "Better chance of achieving the intended outcomes of the code, especially in the continued absence of any oversight, enforcement, licensing, or accountability for residential construction…"
  - "As a consultant who works on residential energy conservation, I recommend the ERI path on a regular basis. It benefits all involved, but it is a SUPERIOR benefit when financial incentives (e.g., Energy Star) are implemented."
- 2 said unlikely
  - No rationale provided

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Future Surveys

- We will provide additional surveys on specific topics as warranted

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Code Compliance

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Compliance Plan Progress

- 2012 Study: "Vermont Energy Code Compliance Plan – Achieving 90% Compliance by 2017"
- Progress to date:
  - Municipal coordination and support (Act 89 of 2013 and Efficiency Vermont's "Municipal Guide")
  - Department of Public Safety has been asked to check for CBES certificate
  - Act 250 requires stretch code compliance
  - Efficiency Vermont provides code trainings and support
  - Some lenders, buyers, Realtors, closing attorneys, and towns with COOs require
  - Builder licensing/registration efforts considered

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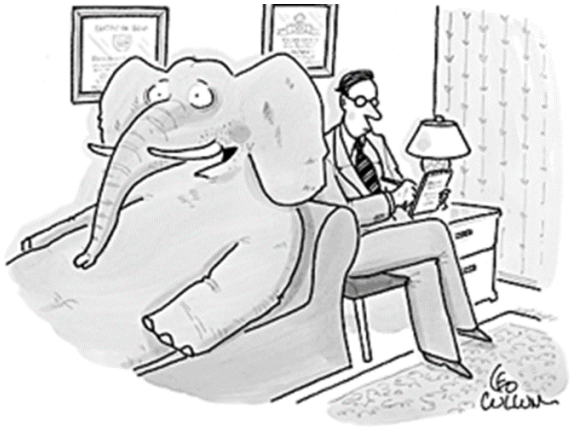
Energy Code Compliance

	2002 Study (n=158)	2008 Study (n=106)	2011 Study (n=97)	2015 Study (n=~100)
Compliance Rate	58%	72%	74%	66%

- Need to level the playing field for all builders
- H.157 Builder Registry
  - Passed VT House



"I'm right there in the room, and no one even acknowledges me."

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Compliance Questions

- If compliance is important, then how do you think we should do it?
- Will the builder Registry be effective?
- What are our options besides the builder Registry?
- Could builder certification be effective?
- What ideas besides code officials?
- What role could a HERS rater infrastructure play?
- What role should towns play in compliance?
- Are you for or against builder licensure?

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Multifamily

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Aldo Leopold Legacy Center | Baraboo, WI *Credit: The Kubala Washatko Architects, Inc.*

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Cross Cutting Topic: Multifamily Buildings

Residential or Commercial Code?

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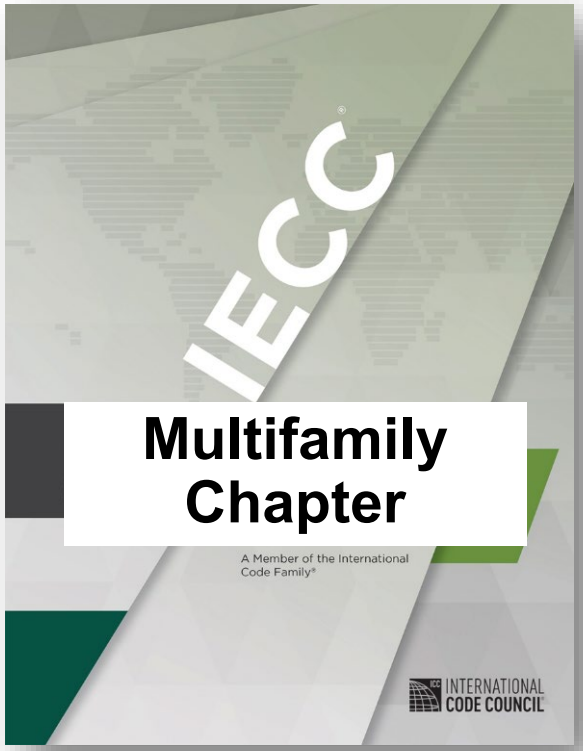
Energy Code's Only Split Building Type



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High-Rise Multifamily Energy Code

IECC—COMMERCIAL PROVISIONS C-1

CHAPTER 1 SCOPE AND ADMINISTRATION C-3

CHAPTER 2 DEFINITIONS C-7

CHAPTER 3 GENERAL REQUIREMENTS C-13

CHAPTER 4 COMMERCIAL ENERGY EFFICIENCY C-31

Ramona Apartments, Portland, OR

Requirements Crafted for:

- Commercial usage patterns
- Commercial loads
- Commercial occupancy densities
- Commercial hot water use

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Low-Rise Multifamily Energy Code

IECC—RESIDENTIAL PROVISIONS R-1

CHAPTER 1 SCOPE AND ADMINISTRATION R-3

CHAPTER 2 DEFINITIONS R-7

CHAPTER 3 GENERAL REQUIREMENTS R-11

CHAPTER 4 RESIDENTIAL ENERGY EFFICIENCY R-29

Requirements Crafted for:

- Single Family usage patterns
- Single Family loads
- Single Family occupancy densities
- Single Family hot water use

Twin Canal Village, Virginia Beach, VA

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2020 Vermont CBES

Commercial Building Energy St | 2020 Vermont Commercial Buil

https://codes.iccsafe.org/content/VTCES2020P1/chapter-1-ce-scope-and-administration

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All Codes | Codes

LOOK FOR TAGS TO ACCESS MORE CONTENT

ES View ICC-ES Reports Listing

Errata

Additional Premium Material

Legend Information

CODE SECTIONS | MY NOTES

- CHAPTER 1 [CE] SCOPE AND ADMINISTRATION
  - PART 1—SCOPE AND APPLICATION PART 1
  - PART 2—ADMINISTRATION AND ENFORCEMENT PART 2
- CHAPTER 2 [CE] DEFINITIONS
- CHAPTER 3 [CE] GENERAL REQUIREMENTS
- CHAPTER 4 [CE] COMMERCIAL ENERGY EFFICIENCY
- CHAPTER 5 [CE] EXISTING BUILDINGS

This code has been designed to minimize any conflict or difference between other adopted codes and standards. Where there is conflict between the codes or codes and standards, the Life Safety Code (NFPA 101), Fire Code (NFPA 1), and the *International Building Code*® (IBC®) shall apply. Where one code or standard has a requirement and another code or standard does not have a requirement, the code or standard with a requirement shall apply.

C101.4 Applicability.

Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

C101.4.1 Mixed occupancy.

Where a building includes both *residential* and *commercial* occupancies, the following shall apply:

1. With respect to a structure that is three stories or less in height,

1.1. The term "residential building" shall include the living spaces in the structure and the nonliving spaces in the structure that serve only the residential users such as common hallways, laundry facilities, residential management offices, community rooms, storage rooms, and foyers.

1.2 The term "commercial building" shall include all commercial uses within the structure and all common areas and facilities that serve both residential and commercial uses.

2. With respect to a structure that is four stories or more in height, the term "commercial building" shall include all uses and areas within the structure.

C101.4.2 Application to existing buildings.

Existing buildings shall follow the provisions of Chapter 5 of this code.

C101.5 Compliance.

Residential buildings shall meet the provisions of the 2020 *Vermont Residential Building Energy Standards* (RBES), and *Commercial buildings* shall meet the provisions of the 2020 *Vermont Commercial Building Energy Standards* (CBES).

FEEDBACK

LIVE CHAT

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Code Options for Multifamily Buildings

- Residential code for low-rise multifamily buildings
- Unified multifamily chapter for all R-2 occupancies
- Refer low-rise R2 occupancies to commercial code section
  - Boulder, CO – base code scope change
  - Washington – by reference
- Other ideas?

Multifamily Questions

- Should MF be included in residential, commercial or have its own separate code?
- Pros/cons of each approach?
- What issues would this raise?
- Would there be any issues with compliance or enforcement?

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Historic Preservation

Historic Preservation Background

- Individual measures can receive exemption from State Historic Preservation Office
- Windows have been an issue

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Historic Preservation Questions

- Do RBES and CBES address historic preservation appropriately?
- Are there any issues we should be aware of?
- How can we address weatherizing historic homes?
- What is the best approach to resolving windows?

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Embodied Carbon

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Embodied Carbon Background

- Some building materials require more carbon in their production than they help save in their implementation
- We have increasing information of the embodied carbon of most building materials
- There are more resources and tools to help quantify the life-cycle carbon intensity of materials

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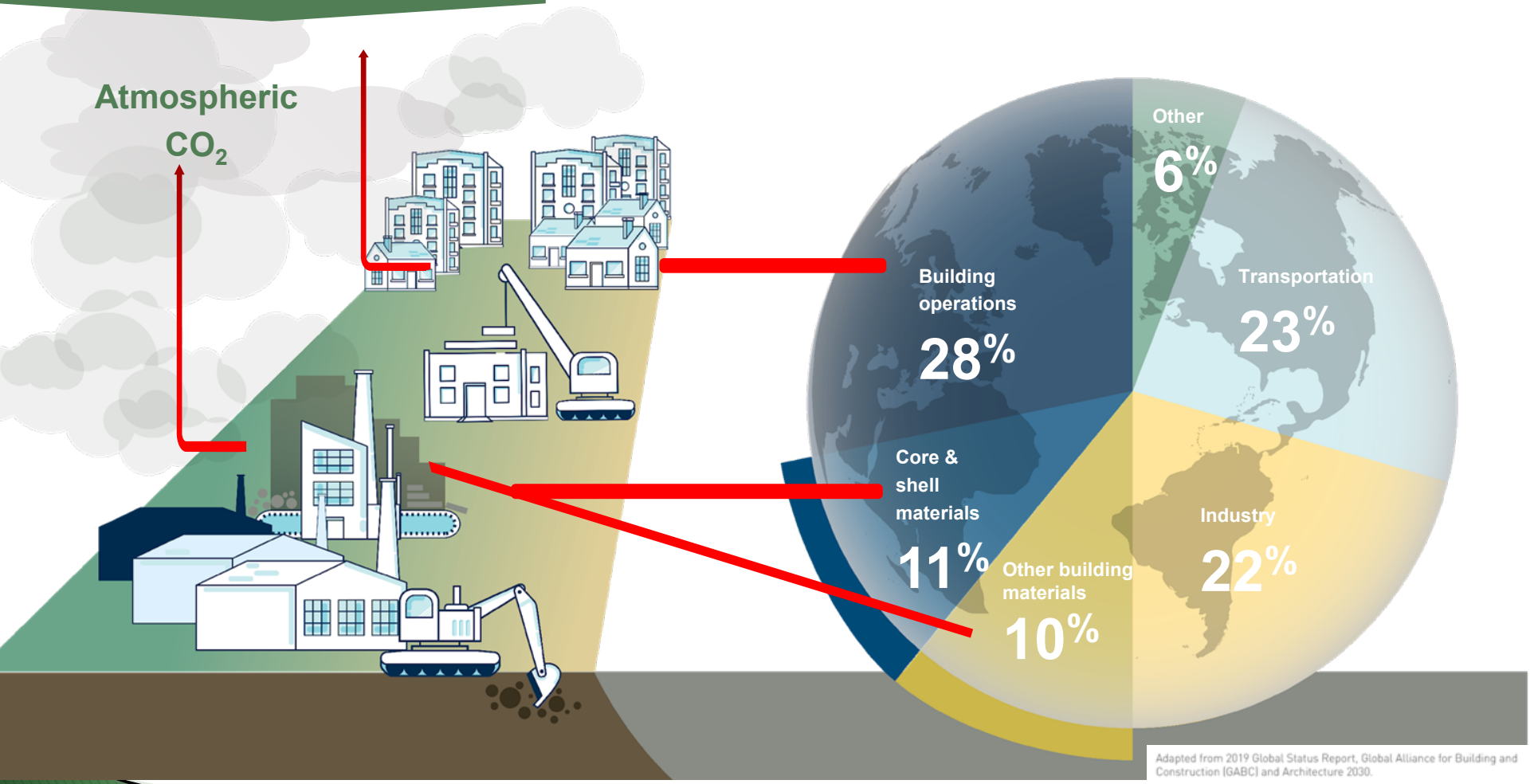
Building emissions



Adapted from 2019 Global Status Report, Global Alliance for Building and Construction (GABC) and Architecture 2030.

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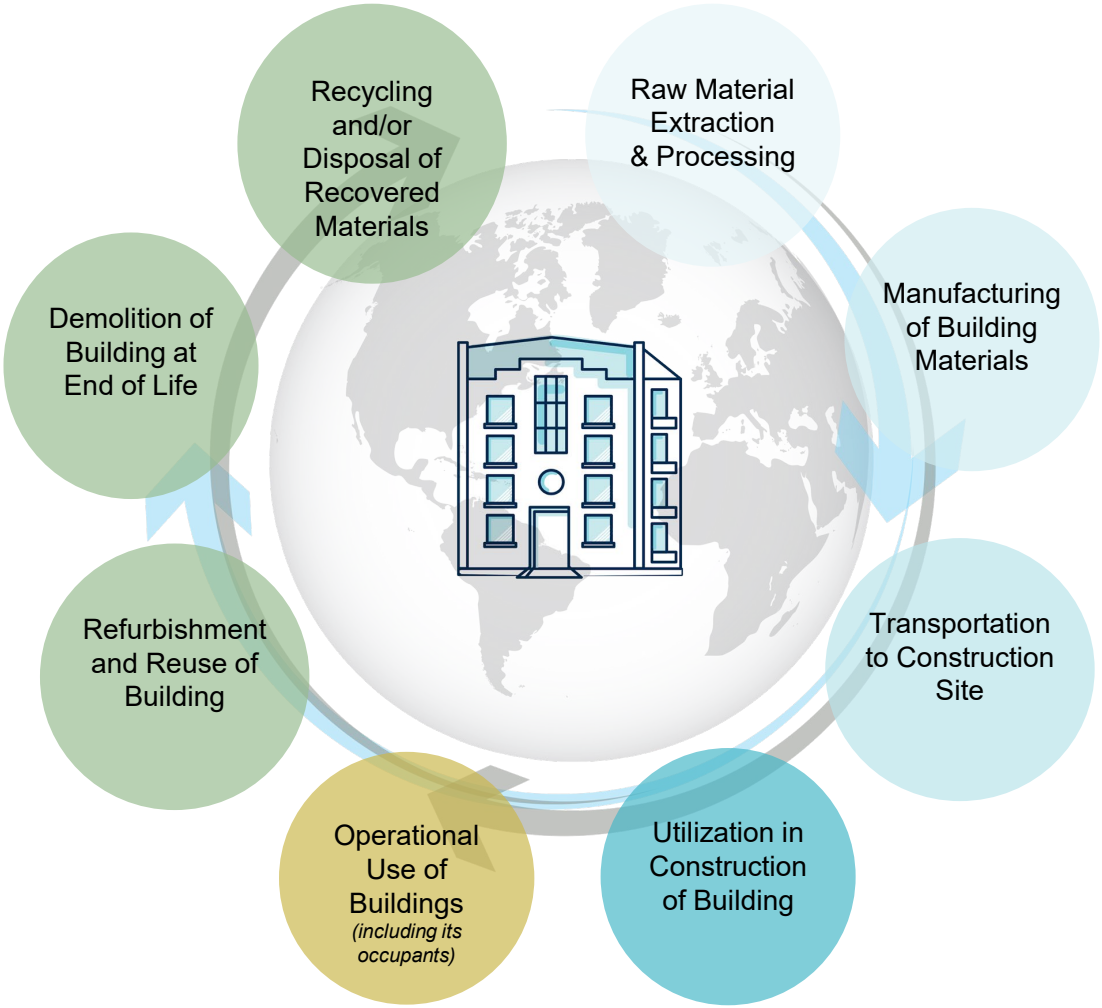
Life Cycle

Upfront Embodied Carbon: The emissions associated with the harvesting, transportation, manufacturing and installation of materials

Measured in kilograms of CO_2e



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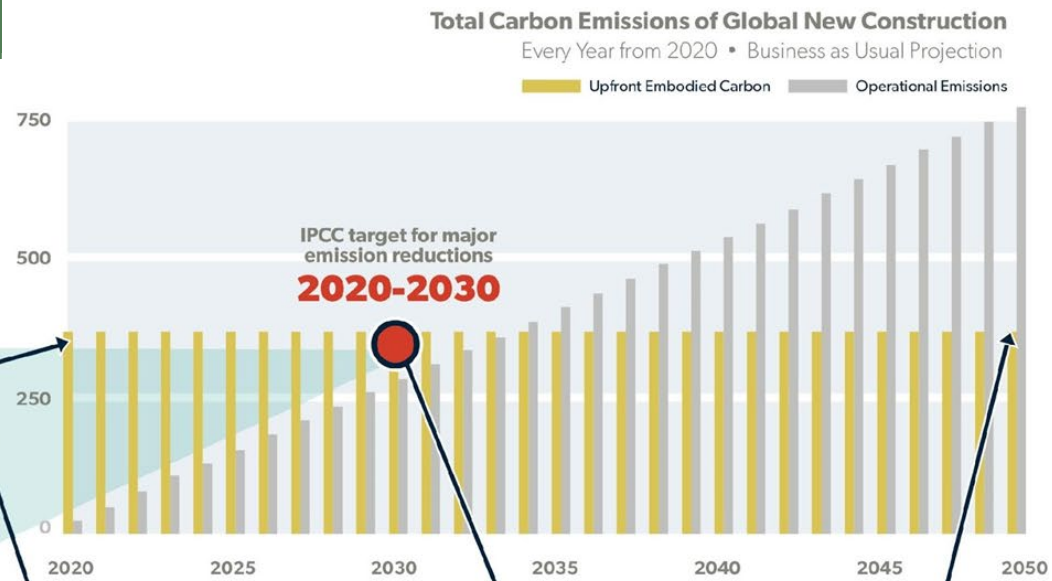
Time is a critical factor

Emissions averted today contribute more to slowing climate change than emissions averted in the future



DAY 1
A building will have emitted 100% of its embodied carbon the day it is built

TODAY to 2030
Embodied carbon is the largest contributor of GHGs

BY 2050
Embodied carbon can still be the majority of emissions

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Embodied Carbon Questions

- Should we be considering the life-cycle carbon intensity of materials in RBES and CBES?
- If so, which ones and how best to implement?
- What should be the compliance approach?
- Is there industry consensus on the carbon intensity of materials?
- Are there industry standards and available listings on most materials?

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Thank You for Participating!

- May 11 – Commercial & Industrial Committee Meeting 11am-1pm
- May 13 – Residential Committee Meeting 3-5pm

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Appendix

Are there topic areas other than the ones listed above that you would like to see discussed?

- Lifecycle/ payback analysis
- Code education, outreach, and accessibility.
- Definition of code compliance as it pertains to the CEP goals. Realistic targets for increased performance and compliance that are market-ready or adaptable
- Net Positive Building
- Retrofitting existing buildings through codes
- Energy code requirements vs. building materials and construction techniques
- Development of building science knowledge among professionals in this industry
- How this links into state climate plan or associated emission reduction targets
- Financial incentives toward net zero for moderate to low-income housing where its most needed

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Are there topic areas other than the ones listed above that you would like to see discussed?

- Relationship of energy code to permitting, ACT250 and local mandates.
- How screening occurs in an environment with no price on carbon and right way to structure EE incentives given the gap between code and higher levels of performance toward net zero will continue to shrink.
- GEB's; grid connected buildings appliances in codes
- Code compliance and enforcement are a key hot button issue. Need to keep a level playing field while improving the efficiency of our housing stock.
- Reducing energy consumption in existing buildings
- BioHeat
- Energy code application to multi building complexes with shared systems

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Do you have any other areas/issues you would like to see addressed?

- The state's relationship with ICC and the obstacles to accessibility inherent in the ICC system
- energy code and communication standards for interoperability with residential electric loads aggregated for flexible load management programs
- require solar on all new buildings – mirror CA
- How to be more responsible about health and safety issues along with structural durability.
- Interaction with Climate Council and their potential initiatives.
- How to better align Vermont codes to national standards with fewer state specific revisions.
- compliance is biggest issue
- The integration of renewables with code compliance.
- use of low GWP refrigerants and low total refrigerant charge HVAC/R systems
- Affordability
- Use of Rescheck/Comcheck and qualifcations necessary to prepare and review those
- My last code collaborative committee meeting were very short on collaboration as we when led where the State and its paid consultants wanted us to be, no matter what the collective and public thought.

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