



City of Dallas

Building Code Updates & Net-Zero Carbon Policy Recommendations

**Environment & Sustainability
Committee**

January 12, 2023

David Session, Assistant Building Official
Development Services Department

Susan Alvarez, Assistant Director
Office of Environmental Quality &
Sustainability

Presentation Overview

- Background
- Building Code Update Process
- Recommended Building Code Updates
- Net Zero Carbon Process
- Recommended Net Zero Carbon Policy



Vickery Park Branch Library achieves LEED Gold Certification & Carbon Neutral Design Designation (November 2, 2022)

<https://www.usgbc.org/projects/vickery-park-branch-library?view=scorecard>



Background: Existing “Green Policies”

- Environmental Policy (2005)
- ★ Green Building Policy (2003, 2008, 2012, 2015)
- Complete Streets (2016)
- Update to Tree & Landscape Ordinance (Article X), (2018)
- Green Energy Policy (2019)
- Updates to City Paving/ Drainage Criteria (2019).....
- CECAP (2020)
- Sustainable Procurement (2021)



Sustainable Procurement Policy



- Council Resolution # 21-0908 adopted May 26, 2021
- *“Comprehensive Sustainable Procurement Policy to guide procurement decisions to positively impact the City's social, economic, and environmental health”*
- Implemented through a Sustainable Procurement Working Group of affected departments, and AD 04-05;
- Sustainable Procurement Working Group charged with:
 - **Maintaining environmentally preferred products lists,**
 - **Identifying sustainability standards** for writing specifications;
 - **Analyzing citywide purchases for efficiency and waste reduction opportunities;** and
 - **Making recommendations** related to the social, economic, and environmental aspects of contracting.





GOAL 1: DALLAS' ***BUILDINGS*** ARE ENERGY EFFICIENT AND CLIMATE RESILIENT.

Objectives

- Increase energy efficiency of **existing buildings** or facilities.
- Ensure that **new buildings** are constructed sustainably and are carbon neutral.
- Increase **climate resilience** for new and existing buildings through structural and operational improvements.

Targets

Net zero energy new construction

- 100% starting in 2030

Energy use in existing residential buildings

- 10% of existing buildings reduce energy use 10% by 2030
- 10% of existing buildings reduce energy use 25% by 2030



US DOE Better Climate Challenge



Part of USDOE Better Buildings Challenge:

Dallas committed in 2022 for **140** Buildings in City Portfolio:

- 50% Scope 1 & 2 GHG reduction emissions within 10 years
- 20% reduction in Energy Intensity
- Fleet transition



Current Green Building Codes



- Adopted 2008; updated in 2012, 2015
- Chapter 52 Admin procedures for Construction Codes
- Chapter 53, Dallas Building Codes
- Chapter 57 Dallas One- and Two-Family Dwelling Codes (Water Conservation)
- Chapter 61 of the Dallas City Code
- Adopted in 2008; updated in 2012 and 2016
- Generally based on International Green Construction Code of the International Code Council (2012/ 2015)





Background: Building Code Update Process:

Update to International Construction Codes
(every 3 years) [2018 through 2020]

Update to Texas State Building Codes
(every 3 years) [*Same as ICC, Published
December 2020*]

Update to NCTCOG Regional Construction Codes
through Regional Codes Coordinating
Committee
[January 2021 through July 2021]

Draft Update to Dallas Construction Codes
*[Staff Process, August 2021 through September
2022]*

Public Process, October 2022 through March
2023, Pending adoption – April 10, 2023

Coordination with Building
Inspection Advisory, Examining
and Appeals Board

Community Meetings/ Public
Hearings
October 1- November 5, 2022

Draft Variance(s) from
Statewide Code- Notification &
Concurrence Letters



Recent Updates (in effect as of June 13, 2022):



CHAPTER 53: 2015 International Building Code with Dallas Amendments Code Update: Ordinance Number 32198

CHAPTER 56: 2020 National Electrical Code with Dallas Amendments

CHAPTER 57: 2015 International Residential Code with Dallas Amendments Code Update: Ordinance Number 32200

CHAPTER 58: 2021 International Existing Building Code with Dallas Amendments

CHAPTER 62: 2021 International Swimming Pool and Spa Code with Dallas Amendments



Planned Updates:

- **CHAPTER 54:** 2021 International Plumbing Code with Dallas Amendments
- **CHAPTER 55:** 2021 International Mechanical Code with Dallas Amendments
- **Chapter 59:** 2021 Proposed Revisions to the 2021 International Energy Conservation Code with Dallas Energy Conservation Code Amendments
- **CHAPTER 60:** 2021 International Fuel Gas Code with Dallas Amendments Code Update

City of Dallas		Schedule for Proposed Revisions to the 2021 Dallas Code Amendment	
OCT 1	Draft Amendments to 2021 International Codes shared to BSD website for public review		
OCT 25	Deadline for public comments on Draft Amendments due		
OCT 29	Public comments on Draft Amendments posted		
NOV 5	Deadline for rebuttal comments and visual presentations due		
NOV 7	Rebuttal comments on Draft Amendments posted		
NOV 18	Final draft ordinances and memos posted		
DEC 13	Tentative date of Building Inspection Advisory, Examining, and Appeals Board meeting		
FEB 27	Tentative date of City Council Committee Meeting		
MAR 8	City Council adoption date		



Significant Updates



- Wiring to allow Solar Photovoltaics: IRC Section R334.
- Wiring to allow EV Charging/charging readiness: IRC and IBC.
- Energy Efficiency: 2021 Edition, Energy Code



Significant Updates



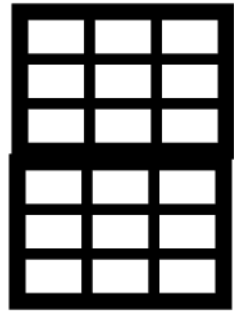
- IRC Appendix AW allows for 3-D Printed Buildings.
- IBC Section 307.1.1 to allow local brewing with simple compliance with fire code – no hazardous classification.
- IBC Section 903.2.10, Sprinklers required in all commercial parking garages exceeding specified conditions.
- Accessibility not required at certain Electrical Vehicle Charging stations associated with Group R-2, R-3, and R-4 occupancies.
- Intermodal Shipping Containers recognized as structural units.
- Replacements of exterior wall cladding beyond certain limits (area and stories) must comply with current code
- Recognition of need to lockdown Educational occupancies subject to Egress requirements.



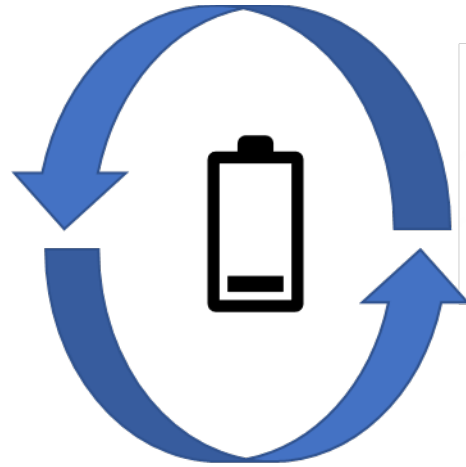
THE FIVE FOUNDATIONS OF ZERO CARBON BUILDING POLICIES



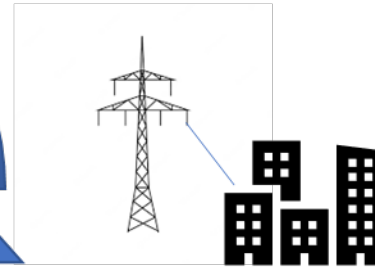
ENERGY
EFFICIENCY



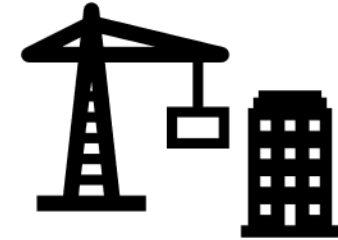
RENEWABLE
ENERGY



GRID INTEGRATION +
STORAGE



BUILDING
ELECTRIFICATION



EMBODIED
CARBON



=

NET ZERO
CARBON
BUILDING
POLICY

ADAPTED FROM NEW BUILDINGS INSTITUTE, 2020



Background – Net Zero Carbon Pathway



- **May 25, 2021:** OEQS invited to meet Office of Bond Construction to discuss sustainable building specifications relative to CECAP net-zero goals.
- **August 4, 2021:** OEQS invited to meet with Kay Bailey Hutchison Convention Center Design Team to discuss sustainable building specifications relative to CECAP net-zero goals.
- **January 14, 2022:** OEQS provided Green Building Code Update briefing to the Environmental Commission
- **February 7, 2022:** OEQS briefed ENVS Committee on Green Building Code Options;
- **April 12, 2022:** OEQS engaged the American Institute of Architects (AIA) – Committee on the Environment (COTE) to advise on considerations for the City to consider in updating Bond Program specifications to support CECAP Net Zero Emissions goals
- **July 7, 2022:** AIA-COTE provided several recommendations for the City to consider (in Appendix).
- **November 4, 2022:** Briefing Memo provided to Environmental Commission outlining recommended strategies for implementation.



Net Zero Design Opportunities Moving Forward



- LEED Net Zero (2020)
- International Green Building Construction Code (2021)
- Building Industry Design Challenges:
 - AIA Architecture 2030 Challenge (2006)
 - Structural Engineers 2040 Challenge (2020)
 - Mechanical-Electrical-Plumbing 2040 Challenge (2021)
- Institute of Living Building Initiatives (2020)
- WELL Building / Fitwel (2020) focused on indoor health
- Building Decarbonization Code(NBI/ US DOE – National Renewable Energy Laboratory) (2021)



US Cities with Net Zero Carbon Codes:

- **Boston, MS:** Established a **Building Emissions Performance Standard** for New Construction/ performance standards for existing large buildings (worked with City's Green Ribbon Commission to develop); **set Low Carbon Building Emission Targets, minimum renewable energy generation standards, and requires incorporating passive design standards** (Construction cost premium to meet new standard predicted to be less than 1%) <https://www.bostonplans.org/planning/planning-initiatives/zero-net-carbon-building-zoning-initiative>
- **New York, NY:** Adopted **carbon neutral road map** for all new residential construction and substantial re-development, including commercial and educational facilities. Plan updates every 2 to 3 years. <https://www.nyserda.ny.gov/all-programs/carbon-neutral-buildings>
- **Portland, OR:** Uses City of Portland Sustainable Procurement Policy to influence purchases related to building construction. <https://www.portlandoregon.gov/brrfs/article/695574>
- **Austin, TX:** in process, but not yet adopted.



AIA COTE Recommendations for Consideration:



1. **ZONING AND LAND USE** policies are a key instrument for embodied carbon reduction. This policy requires all construction for areas within a certain zoning designation to meet embodied carbon requirements, and constraints zoning in a way to ensure that it will be achieved.
2. **BUILDING REGULATIONS/ORDINANCES** exert influence over all private and public construction, making these policies effective carbon reduction instruments
3. **PUBLIC PROCUREMENT** policies uses sustainable procurement policy to set fixed maximum carbon limits for key construction materials, including concrete, steel, bricks, glass, gypsum board and insulation, and requiring all projects completed with city funding to use products meeting those carbon limits.
4. **WASTE AND CIRCULARITY** policies leverage a city's power to regulate permits and therefore attach requirements on waste handling to different types of projects to ensure that building elements and materials can be recovered via deconstruction and reused, not just recycled.
5. **FINANCIAL** policies govern taxation, fees and incentives such as using an Increased Property Tax for Unoccupied Properties. This policy will only work in cities where speculative investment or other conditions keep many properties unoccupied, by setting a direct and strong link to reducing embodied carbon by limiting unnecessary construction.
6. **MUNICIPAL** building policies specifically target municipal buildings, which typically account for a small percentage of total citywide building stock including using embodied carbon as a design contract selection criteria.
7. **INFRASTRUCTURE** development typically covers a significant portion of all city construction, and infrastructure projects use vast amounts of basic materials. In addition to covering built assets, this category also covers green areas such as parks. This recommendation includes setting specific carbon targets to be set for this type of construction as well.



Existing “Green” Building Policy

- “Certifiable” under LEED Programs, Green-Built Texas or an equivalent Green Building standard
- Energy efficiency per ASHRAE 189.1-2011/ 2014
- LEED silver or higher certification: expedited review
- Water Conservation measures of Green-built Texas, LEED NC, LEED CS, LEED CI
- Minimum requirements of ICC 700 (2015)
- Indoor Air Quality Testing
- Cool Roof for Commercial <50,000 sf (white, cool, or vegetated)



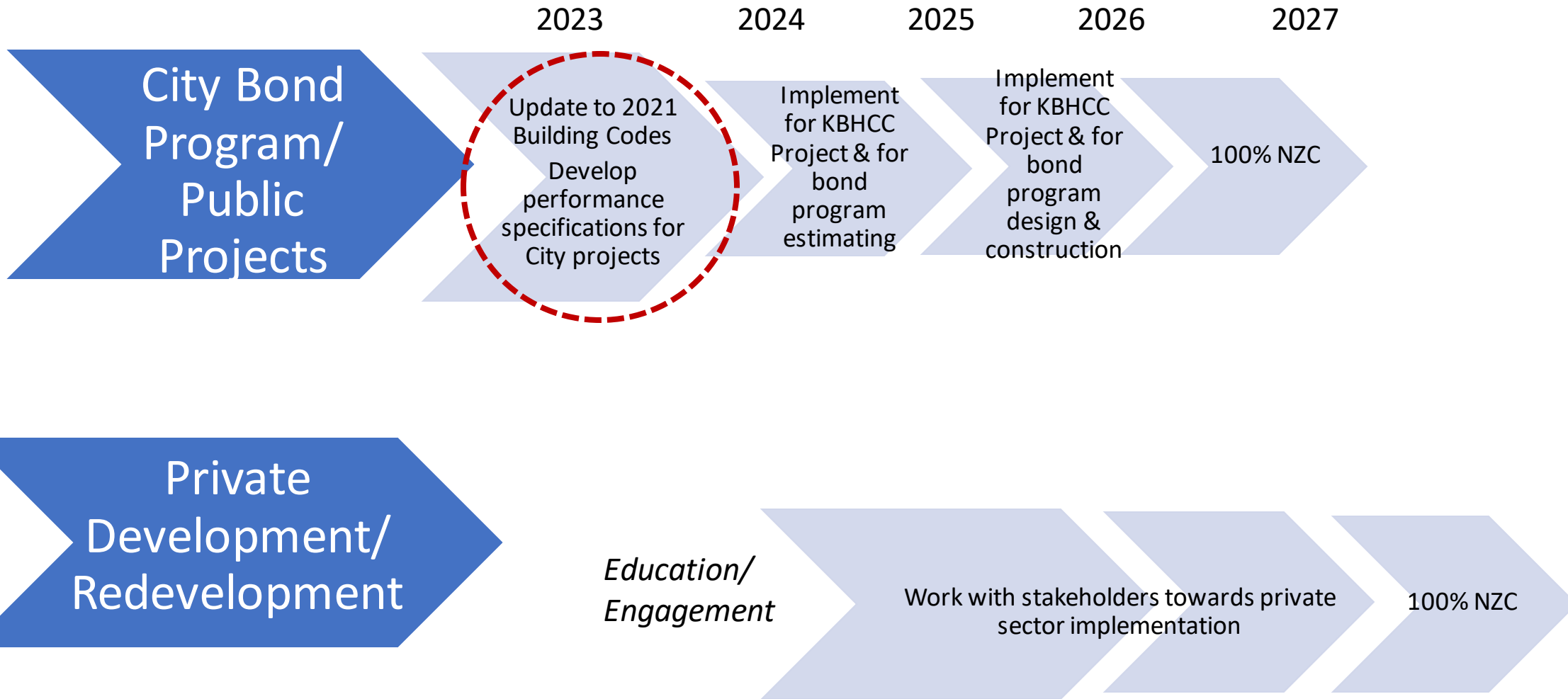
Recommended Net Zero Carbon Next Steps



- **Implement updates to Dallas Building Code to 2021 International Construction Code** - by Development Services, March, 2023;
- **Develop update to the 2003 Green Building Policy**, (now Green Building Code) to reflect desired Net Zero Carbon result (similar to New York City approach) (April, 2023);
- **Develop performance specs** for Net Zero Carbon-based design to be used in pending, now 2024 Bond Program (similar to recommendations towards implementing Life-Cycle Cost Analyses recommendation from the AIA, and those in use by Boston); (April, 2023 to meet May 2023 technical specification bond program deadline)
- **Developing working group with building industry** (AIA, CBCA, DBA, etc.) to develop specifications for any follow-on update to building code towards CECAP goal of all new construction and substantive redevelopment being Net Zero Carbon by 2030 (April 2027, deadline).



Net Zero Carbon Implementation Timeline:





Questions?



APPENDICES



Working Definitions



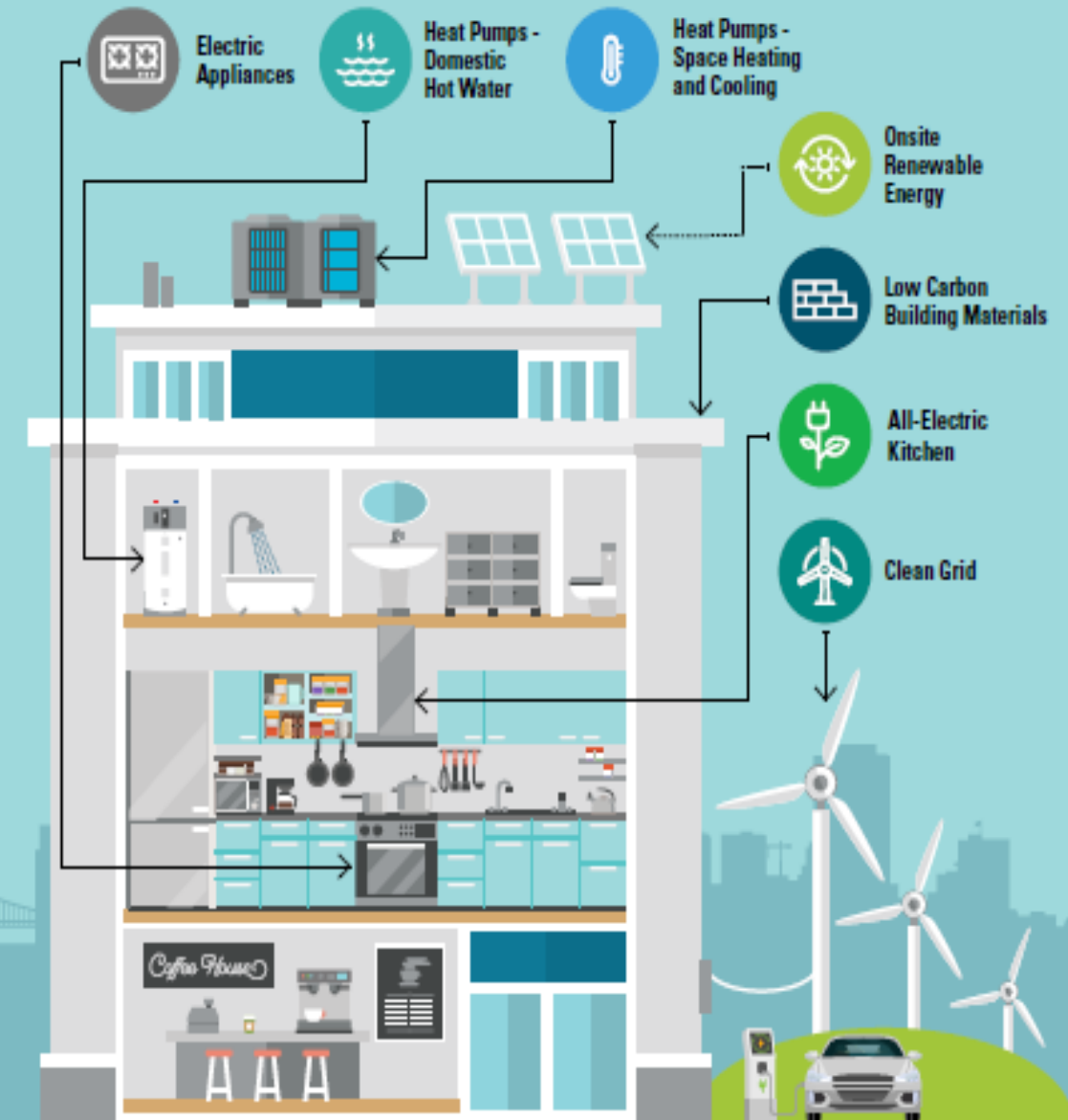
- **Net Zero Building**: “an energy-efficient building where the annual delivered energy is less than or equal to the on-site renewable energy exported.”
- Net Zero energy buildings typically combine energy efficiency and renewable energy to result in net zero energy consumption over the course of a year.”
 - U.S. Department of Energy



Working Definitions

- **Zero-Net Carbon:** “A ZNC building is defined as: a highly energy efficient building that produces on-site, or procures, enough carbon-free renewable energy to meet building operations energy consumption annually..”
- “Zero carbon buildings typically assess embodied carbon in building materials in addition to carbon associated with energy consumption over the course of a year.”
 - U.S. Department of Energy

COMMON ELEMENTS OF LOW CARBON CONSTRUCTION



<https://www.collaborativedesign.org/building-decarbonization-practice-guide>



LEED Net Zero Programs

- **LEED Zero Carbon** recognizes net zero carbon emissions from energy consumption through carbon emissions avoided or offset over a period of 12 months.
- **LEED Zero Energy** recognizes a source energy use balance of zero over a period of 12 months.
- **LEED Zero Water** recognizes a potable water use balance of zero over a period of 12 months.
- **LEED Zero Waste** recognizes buildings that achieve Green Business Certification Institute's TRUE certification at the Platinum level.



Bank of America Plaza, Dallas

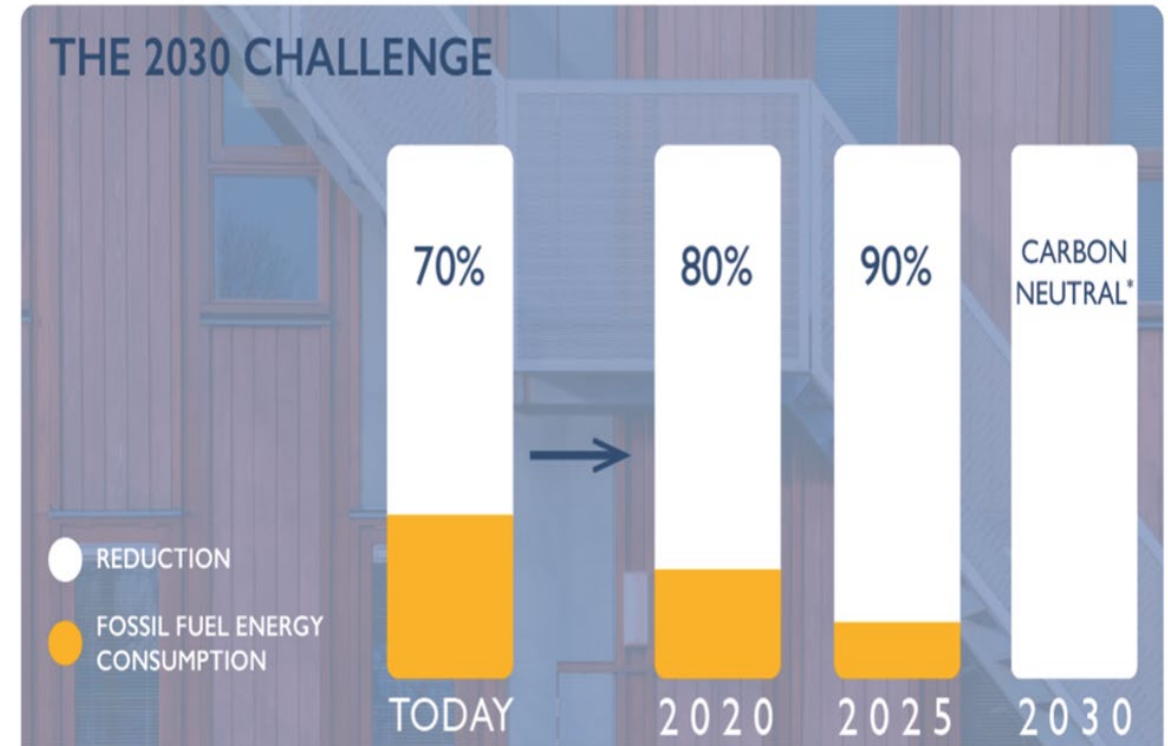


AIA Architecture 2030 Challenge



The American Institute of Architects created the [2030 Commitment Program](#) in 2006, basically challenging architects to holistically respond to the climate crisis. Over 400 A/E/P firms have adopted this Commitment.

- **Establishing an Energy Use Intensity (EUI) baseline and target.**
- **Applying low/no cost passive design strategies** to maximize energy efficiency
- **Integrating energy efficient technologies and systems.**
- **Incorporating on-site and/or off-site renewable energy** to meet the remaining energy demands.
- **Performing iterative energy modeling** throughout the design to assess progress towards meeting the EUI target.



©2019 2030, Inc./Architecture 2030. All Rights Reserved



REDUCING CARBON

Organized by the
AIA Dallas Committee on the Environment
for the
City of Dallas



TABLE OF CONTENTS

1. **Glossary**
2. Carbon
3. City Policy
4. Case Studies
5. Resources



GLOSSARY

- **Embodied carbon** refers to the total impact of all the greenhouse gases emitted by the supply chain of a construction material, including raw material extraction, transport to the manufacturing plant, the manufacturing process, the transport of finished goods to the construction site, construction site activities and material losses, materials use phase, repair, maintenance and replacement, as well as the end-of-life processing.
- **Operational carbon** refers to the total from all energy sources used to keep our buildings warm, cool, ventilated, lighted and powered. Typical energy sources for this purpose are electricity and natural gas, with occasional contributions from fuel oil, propane and wood.





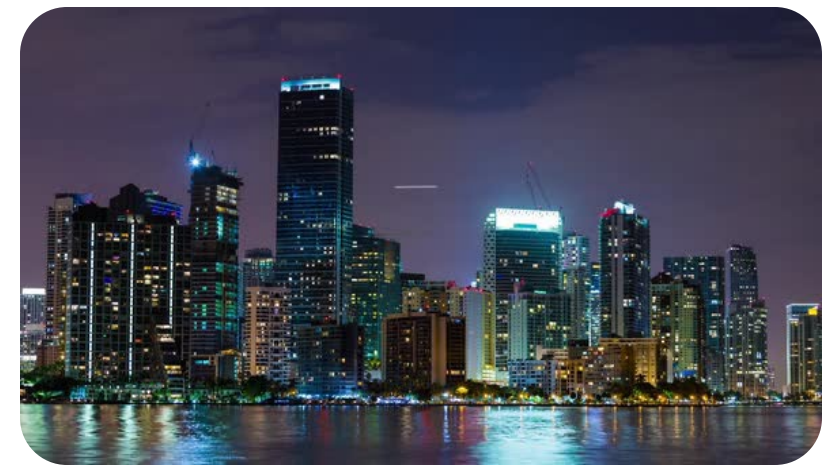
Embodied Carbon

Manufacturing, transportation and installation



Operational Carbon

Building energy consumption

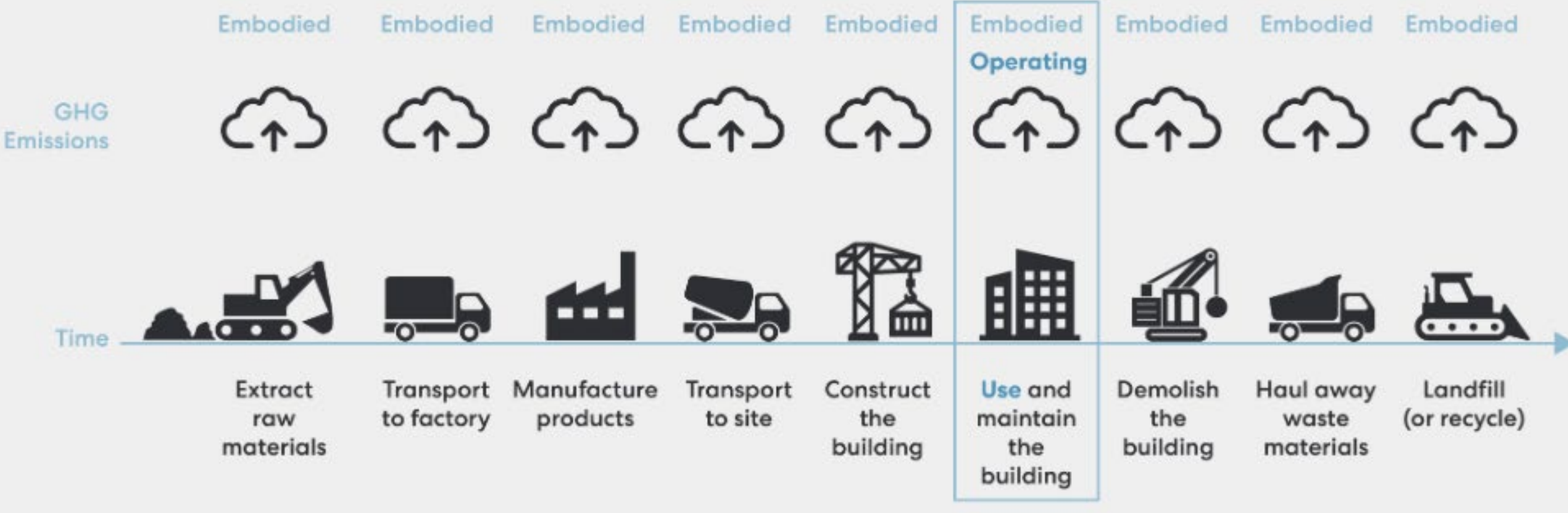




GLOSSARY

- **Life Cycle Assessment** (or LCA) is a method of assessing the environmental impacts associated to all stages of a product or building's life, from raw material extraction to its processing, manufacture, distribution, use, repair, maintenance, and end of life treatment.
- **Life Cycle Carbon** means the total impacts of all the greenhouses gases emitted for a built asset, including embodied carbon (see above) as well as operational carbon from use of energy and water, over its whole life-cycle from construction through use to end of life.
- **Environmental Product Declaration** (or EPD) is a third-party verified report of Life Cycle Assessment (LCA) results, relating here to a construction product or a material. It uses ISO and often also EN standards. It documents the actual environmental performance of a product.





LIFE CYCLE ASSESSMENT STAGES



TABLE OF CONTENTS

1. Glossary
2. **Carbon**
3. City Policy
4. Case Studies
5. Resources

Main sources of embodied carbon



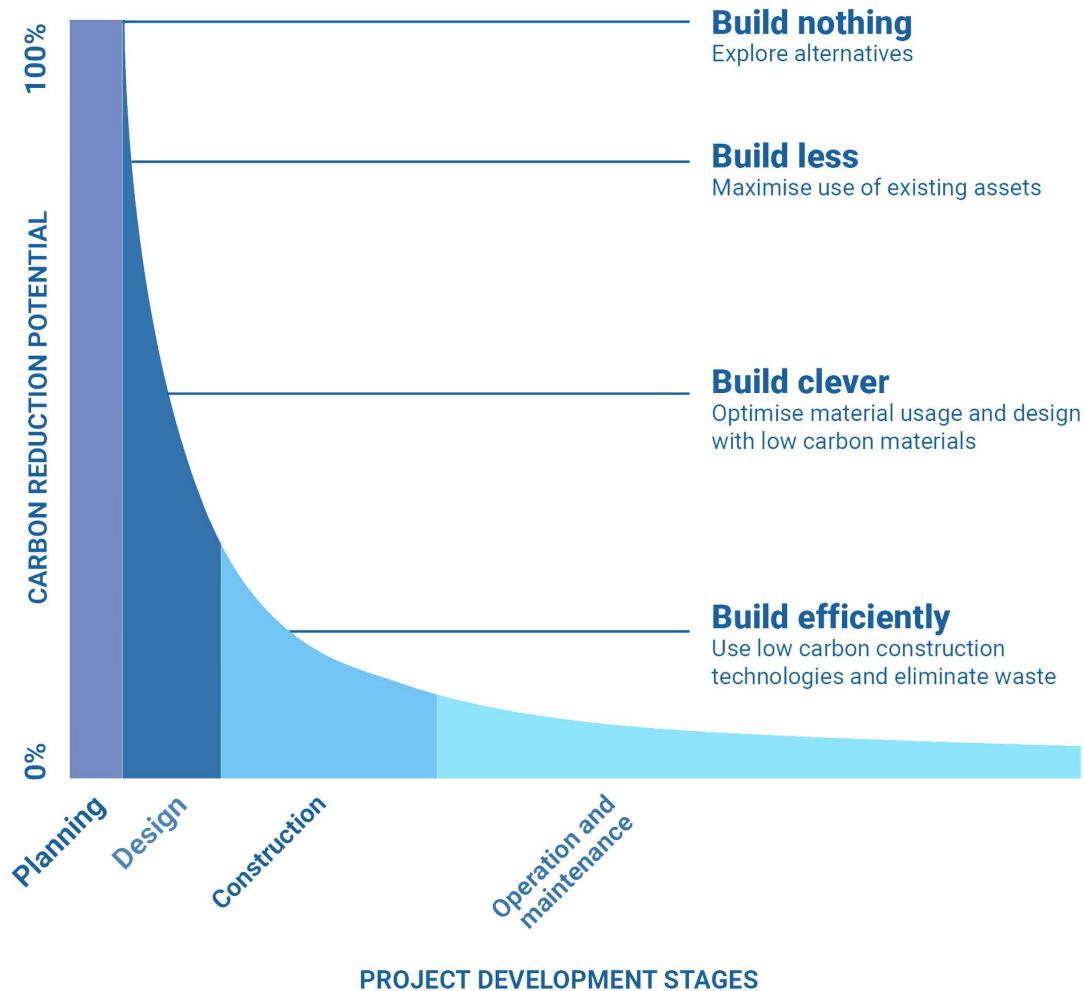
The main sources of embodied carbon emissions, in descending order of impact, are:

- **Fossil fuel** (e.g. coal, natural gas) **incineration in materials manufacturing**, and the whole life-cycle extraction emissions for those fuels
- **Fossil fuels for supply electricity** or other energy for materials manufacturing, and the whole life-cycle extraction emissions for those fuels
- **Carbon emissions from chemical reactions** in manufacturing of for example cement, aluminum and iron
- **Carbon emissions from fossil fuel combustion in transport** and site machinery, and the whole life-cycle extraction emissions for those fuels
- **Carbon emissions released at the end of life handling of materials**, including incineration of plastic based products or wood transforming to methane at landfill
- **Carbon emissions released from degradation of forestry and release of soil carbon** (often reported separately as land use and land use change emissions)
- **Carbon emissions released via leakages of refrigerants**





Carbon reduction potential



- **REUSE**

Renovating existing building
Using recycled materials
Designing for deconstruction

- **REDUCE**

Material optimization
Specification of low to zero carbon materials

- **SEQUESTER**

Design of carbon sequestering sites
Use of carbon sequestering materials

- **RESOURCES**

<https://materialpalette.org/>

What does net-zero carbon mean? Is it different from carbon neutral?



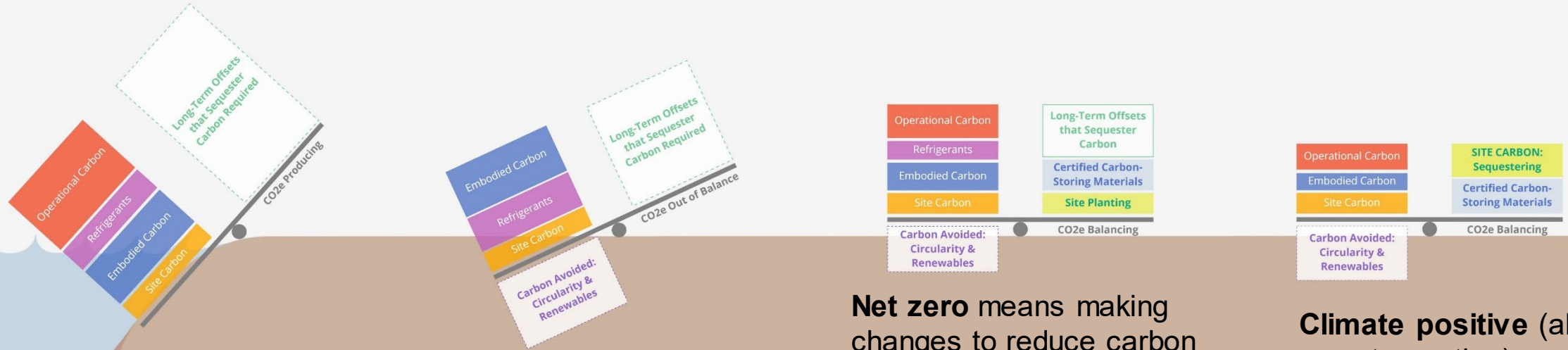
NET ZERO refers to a state in which the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere. The term net zero is important because—for CO₂ at least—this is the state at which global warming stops.

CARBON NEUTRAL means that any CO₂ released into the atmosphere from an activity or project is balanced by an equivalent amount being removed.

CLIMATE POSITIVE (also known as net negative) means that an activity's GHG removals exceed its emissions.



Carbon



Carbon neutral not increasing carbon emissions and of achieving carbon reduction through offsets

Net zero means making changes to reduce carbon emissions to the lowest amount – and offsetting as a last resort. The offsetting is used to counteract the essential emissions that remain after all available reduction initiatives have been implemented.

Climate positive (also known as net negative) means that an activity's GHG removals exceed its emissions.*

*The boundaries of the study need to be responsibly defined. There is not industry standard at the moment.

Current State

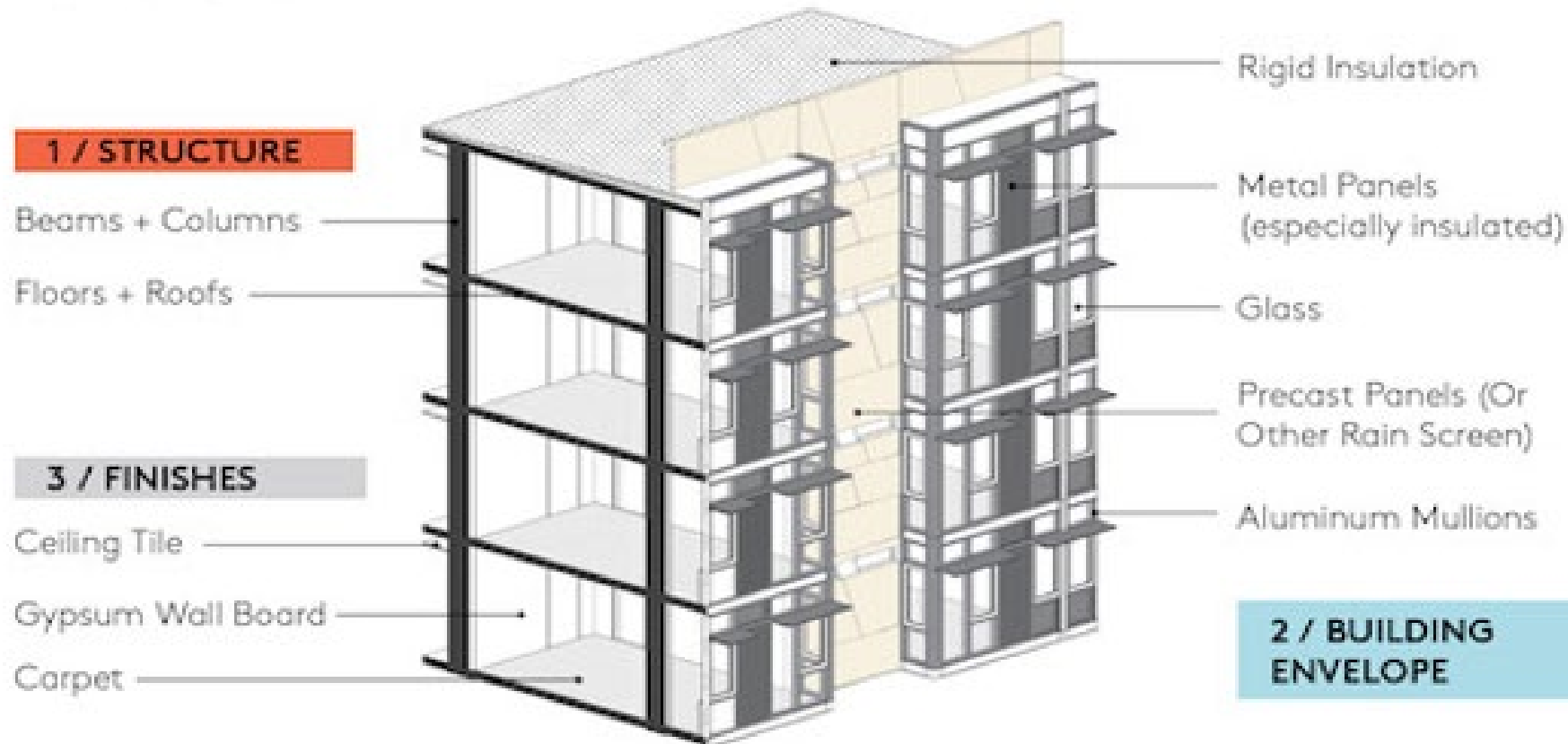
2030

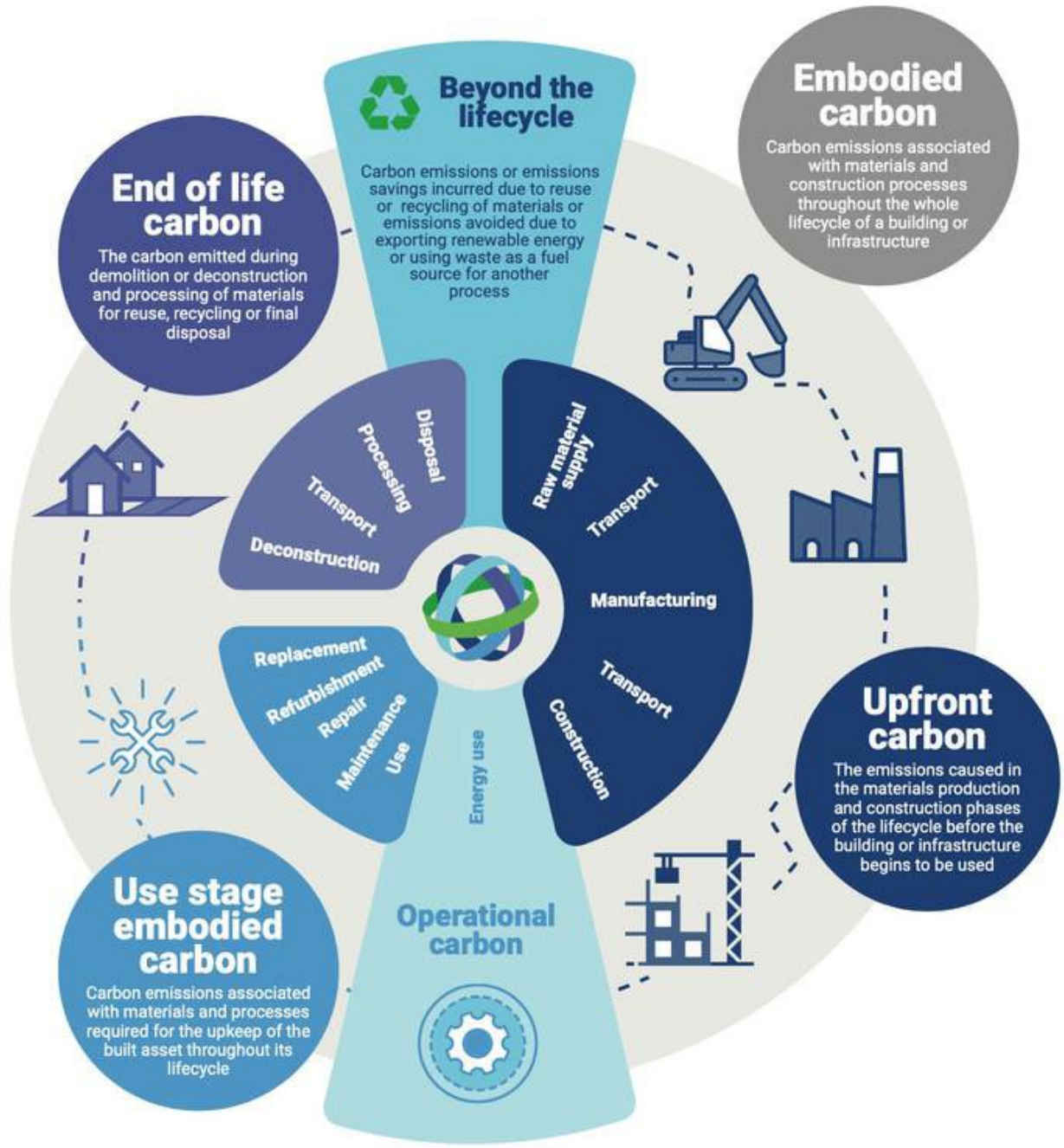
2050

MATERIAL SELECTION DURING DESIGN



TYPICAL HOT SPOTS





Beyond the lifecycle

Carbon emissions or emissions savings incurred due to reuse or recycling of materials or emissions avoided due to exporting renewable energy or using waste as a fuel source for another process

Embodied carbon

Carbon emissions associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure

End of life carbon

The carbon emitted during demolition or deconstruction and processing of materials for reuse, recycling or final disposal

Upfront carbon

The emissions caused in the materials production and construction phases of the lifecycle before the building or infrastructure begins to be used

Use stage embodied carbon

Carbon emissions associated with materials and processes required for the upkeep of the built asset throughout its lifecycle

Deconstruction
Transport
Processing
Disposal

Raw material supply
Transport
Manufacturing
Transport
Construction

Replacement
Refurbishment
Repair
Maintenance
Use

Operational carbon

Energy use

TABLE OF CONTENTS

1. Glossary
2. Carbon
3. **City Policy**
4. Case Studies
5. Resources



CITY POLICY FRAMEWORK FOR DRAMATICALLY REDUCING EMBODIED CARBON

- 1. ZONING AND LAND USE** policies are a key instrument for embodied carbon reduction. This report details eight effective policies that can reduce carbon across the entire construction sector, the most impactful of which was determined to be *Embodied Carbon Targets for Zoning Process*. This policy requires all construction with this zoning designation to meet embodied carbon requirements, and constraints zoning in a way to ensure that it will be achieved.
- 2. BUILDING REGULATIONS/ORDINANCES** exert influence over all private and public construction, making these policies effective carbon reduction instruments. This report details nine regulation/ordinance policies, the most impactful of which was determined to be *Life-Cycle Carbon Limits for New Buildings* which defines the maximum carbon impact a new project can have.
- 3. PUBLIC PROCUREMENT** policies allow for leveraging the use of taxpayer money towards embodied carbon reduction. This report details six procurement policies, the most impactful of which was determined to be *Carbon Limits for Building Materials Procurement*. It allows for setting fixed maximum carbon limits for key construction materials, including concrete, steel, bricks, glass, gypsum board and insulation, and requiring all projects completed with city funding to use products meeting those carbon limits. This can also be extended to infrastructure projects.



CITY POLICY FRAMEWORK FOR DRAMATICALLY REDUCING EMBODIED CARBON



- 4. WASTE AND CIRCULARITY** policies leverage a city's power to regulate permits and therefore attach requirements on waste handling to different types of projects. This report details nine such policies, the most impactful of which was determined to be Design for Disassembly and Adaptability Criteria. This policy ensures that building elements and materials can be recovered via deconstruction and reused, not just recycled.
- 5. FINANCIAL** policies govern taxation, fees and incentives. This report details eight financial policies. One of the most impactful policies in this area was determined to be Increased Property Tax for Unoccupied Properties. This policy will only work in cities where speculative investment or other conditions keep many properties unoccupied, but this example highlights the potential for policies not thought of as embodied carbon policies, but which still have a direct and strong link to reducing embodied carbon by limiting unnecessary construction.





City Policy Framework for Dramatically Reducing Embodied Carbon

- 6. MUNICIPAL** buildings policies specifically target municipal buildings, which typically account for a small percentage of total citywide building stock. This report details seven such policies. One of the most impactful policies in this area was determined to be *Use Carbon as a Criterion for Design Competitions*. This policy enables choosing competition winners using embodied carbon performance as one of the award criteria, thus making it a competitive element.
- 7. INFRASTRUCTURE** development typically covers a significant portion of all city construction, and infrastructure projects use vast amounts of basic materials. In addition to covering built assets, this category also covers green areas such as parks. This report details five infrastructure development policies. The most impactful infrastructure policy was determined to be *Early Design Carbon Targets for Infrastructure*. As most infrastructure projects are different from each other, they require project specific carbon targets to be set.



TABLE OF CONTENTS

1. Glossary
2. Carbon
3. City Policy
4. **Case Studies**
5. Resources



C40's Clean Construction Forum

C40 is a network of mayors of cities around the world whose mission is to halve the emissions of its member cities within a decade while improving equity and building resilience.

Clean Construction Forum helps cities working to achieve zero embodied emissions by focusing on construction materials and machinery.



EXAMPLE: BOSTON



ZERO NET CARBON STANDARD FOR NEW CONSTRUCTION

- Establish a Building Emissions Performance Standard for New Construction
- Prioritize Practices:
 - Establish Low Carbon Building Emission Targets – 40% carbon emissions reduction target compared to ASHRAE 90.1 baseline for all building typologies (few exceptions: healthcare 30%, Passive House)
 - On-site Renewable Energy – set minimum generation standards (and determine acceptable procurement) – require designs to maximize south facing opportunities, layout roof to maximize space free of obstructions, define minimum area for solar (exceptions: Historic Building, shade, etc)
 - Embodied Carbon – identify actions and introduce practice standards
- Construction cost premium to meet new standard predicted to be less than 1%

CARBON EMISSIONS PERFORMANCE STANDARD TO DECARBONIZE EXISTING LARGE BUILDINGS

- 20,000+ square feet or 15+ units
- Compliance Measures: retrofit for efficiency, fuel switch, install or purchase renewable energy

<https://www.bostonplans.org/planning/planning-initiatives/zero-net-carbon-building-zoning-initiative>



EXAMPLE: NEW YORK CITY

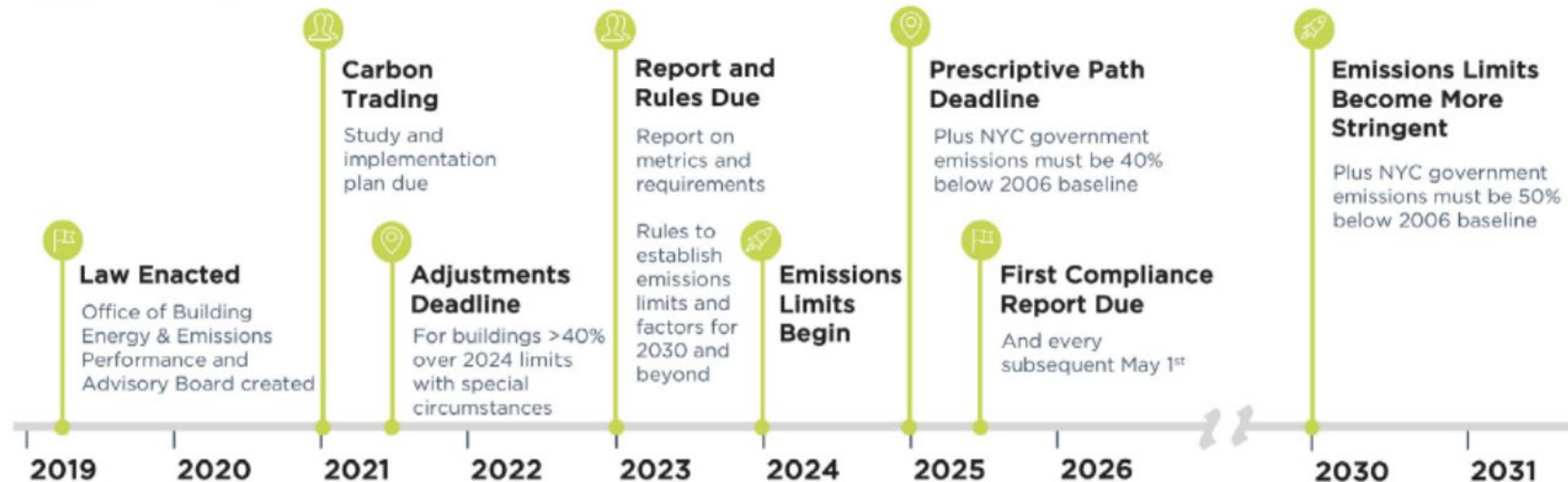


ZERO NET CARBON STANDARD FOR NEW CONSTRUCTION

CARBON EMISSIONS PERFORMANCE STANDARD TO DECARBONIZE EXISTING LARGE BUILDINGS

FIGURE 4

Implementation Timeline





BUY CLEAN POLICY

Buy Clean is a procurement policy approach that aims to fill a current gap in climate policy by incorporating low-carbon construction purchasing requirements that address the greenhouse gas emissions from construction materials into government purchasing.

Buy Clean policies use a combination of **disclosure**, **incentives**, and **standards** to leverage the significant purchasing power of public agencies to encourage a shift toward lower-carbon options in the broader construction materials market. Buy Clean is an approach that can be applied at the federal, state, or local level and can also be used by private building owners.

<https://carbonleadershipforum.org/download/13545/>

EXAMPLE: Portland



City of Portland Sustainable Procurement Policy

<https://www.portlandoregon.gov/brrs/article/695574>

Sustainable Procurement Guiding Principles

- Everything is Connected
- Conserve – Reuse First
- Think in 3D: environmental, social, economic
- Take a Life Cycle Perspective
- Provide Fair Opportunities
- Ensure Health and Safety
- Uphold Accountability
- Support Innovation
- Full Integration – Planning, Purchasing, contract Management Practices
- Lead the Way – Seek continuous improvement





RECOMMENDATIONS FOR CITY OF DALLAS

Ask Project Teams who are designing a new building or the renovation of an existing building to evaluate Embodied Carbon using one of two methods.

- **Whole Building Life Cycle Assessment**

This requires the Design and Construction Team to complete a Life Cycle Assessment (LCA) for the whole building, report the findings and then show a reduction of 10% compared to a base building of similar scope, size and orientation. LCA software and tools can be used to evaluate the project design.

- **Itemized Assessment**

In lieu of LCA, the Design and Construction Team would need to provide an itemized review of the primary materials used and their embodied carbon, then show optimization of the construction materials used on the project to achieve a reduction in embodied carbon. A form might be developed to standardize this review and document the reduction using EPDs.

TABLE OF CONTENTS

1. Glossary
2. Carbon
3. City Policy
4. Case Studies
5. **Resources**

RESOURCES



- **City Policy Framework for Dramatically Reducing Embodied Carbon** - 52 detailed policies to reduce embodied carbon.
https://www.embodiedcarbonpolicies.com/files/ugd/837f9c_dcdabb38b9a24573aec04f875ba00e39.pdf
- **CARE Tool (Carbon Avoided Retrofit Estimator)** - is used for calculating the embodied, operating, and avoided carbon impacts and benefits of reusing existing buildings, compared to replacing them
<https://architecture2030.org/caretool/>
- **The Zero Tool** - an Architecture 2030 project, was developed for building sector professionals to establish energy reduction baselines and targets, compare a building's energy performance with similar buildings and to codes, and understand how a building achieved its current energy performance
<https://zerotool.org/>
- **The Zero Code** - provides code-adaptable language defining the energy efficiency and renewable energy requirements (on-site generation and/or off-site procurement) for zero carbon new buildings
<http://www.zero-code.org/ZERO%20CODE/>





City of Dallas

Building Code Updates & Net-Zero Carbon Policy Recommendations

**Environment & Sustainability
Committee**

January 12, 2023

David Session, Assistant Building Official
Development Services Department

Susan Alvarez, Assistant Director
Office of Environmental Quality &
Sustainability