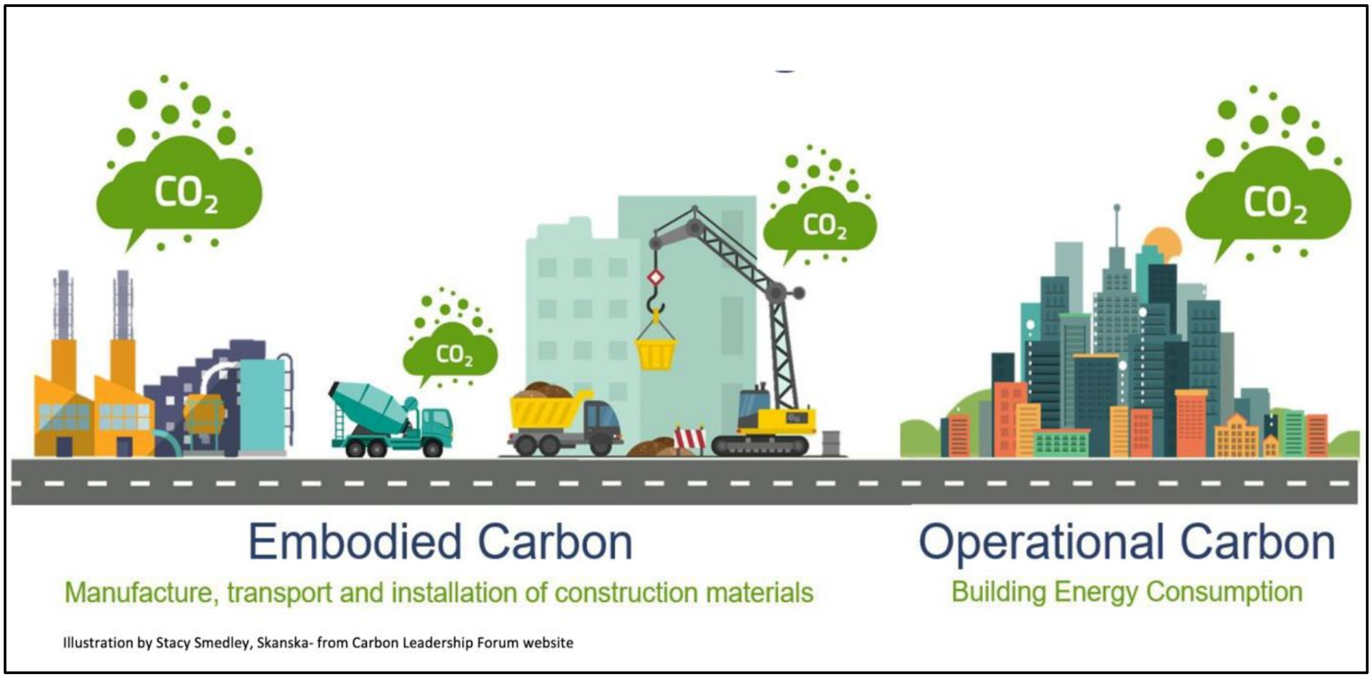
EMBODIED CARBON REDUCTION GUIDELINES

These guidelines are to be used as part of the Devens Enterprise Commission's Unified Permitting Process. ***All Level 2 Unified Permits shall review these guidelines and complete the attached "Embodied Carbon Checklist for Devens Projects****. Any questions can be directed to Devens Enterprise Commission staff at 978.772.8831 or neilangus@devensec.com*

What is Embodied Carbon?

Greenhouse gases are heat-trapping gasses in the atmosphere, such as CO_2, methane, and nitrogen that contribute to global warming. Carbon dioxide (CO_2) makes up roughly 76% of global greenhouse gasses. Building materials are one of the largest sources of industrial greenhouse gas emissions, which means that they are potential drivers to reducing carbon emissions. The top two industrial sectors alone—steel and cement—are each individually responsible for more emissions than all of commercial building energy use each year. Embodied Carbon refers to the carbon dioxide (CO_2) emissions associated with building materials throughout their whole lifecycle - from extraction of raw materials, processing and assembly of those raw materials, manufacturing, transportation, distribution, construction, use and maintenance, demolition, haul-away, and landfill or recycling.



Embodied Carbon is different from Operational Carbon, which is CO_2 generated from the energy used to operate and power buildings. Embodied Carbon + Operational Carbon= Whole Life Carbon:

https://worldgbc.org/advancing-net-zero/whole-life-carbon-vision/

Why Does Embodied Carbon Matter?
In order to avoid the catastrophic impacts of climate change and reach the decarbonization targets set by the Commonwealth of Massachusetts, CO_2 emissions have to decline by 50% from 1990 levels by 2035 and reach net zero by 2050. The good news is that we already have a number of strategies that developers and applicants can use, and Embodied Carbon reduction is a key impactful strategy.

Reducing the embodied carbon of a project involves four aspects:
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First, you can prioritize selection of the most impactful, low-carbon products like structural materials or high-churn interior products. Second, you can quantify your embodied carbon total, or reductions using analysis tools which are listed below. These tools can be used to inform decisions about which specific products are lowest in embodied carbon, or they can be used to look at your whole building (or whole site). Third, you can challenge your design team to be intentional about unnecessary waste. This can include reusing existing structures whenever feasible, right-sizing rooms and floor to floor heights, using fewer materials overall or specific targets like minimizing the footprint of concrete foundations by cantilevering upper floors, which is frequently done. Finally, you can make decisions about your landscape and planting to choose plants and trees that sequester as much carbon as possible.

<u>1. Top 10 Products</u>
Concrete (footings & slabs):
- Minimize the use of concrete
- Specify 40% minimum SCM content where appropriate
- Use 56 or later day strength wherever possible (rather than conventional 28 day)
- Utilize carbon sequestration (CO2 injection)
- Specify Portland Limestone Cement (PLC) instead of Portland cement
- Use non-fossil fuel-based SCMs
    - Glass Pozzolan
    - Rice Husk Ash Concrete
- Explore potential partnerships with alternative cement/concrete and carbon-storing aggregate and filler manufacturers
- For **perimeter walls** (not foundation/slab), consider using biogenic insulated concrete forms (e.g., IsoSpan, Nexcem IsoSpan)

DEVENS FORWARD
Embracing the Past, Transforming the Future

- Crush, spread, and/or reuse (or give to a reuse facility) at concrete's end of life
- New technologies such as biochar (replacement for sand) are emerging and will be more available in the next couple of years.

Structural Steel:

- Minimize the use of steel
- Use steel that comes from electric arc furnaces (EAFs)
    - Use shapes that come from electric arc furnaces
- Use recycled steel whenever possible
- Redesign the steel structural system to accommodate a glue-laminated (glulam) engineered wood structural system with appropriate fireproofing considerations
- Use braced frames instead of moment-resisting frames
- Use reinforcement only when needed

For structure, consider the use of Mass Timber to replace concrete or steel wherever possible.

Insulation:

- Avoid specifying HFC-containing rigid polyurethane spray foam, sealants, and XPS products
- Recommended products: Cellulose, mineral wool, and other nature/bio-based materials that reduce *both* operational *and* embodied carbon
    - Blanket & Batt insulation:
        - Certainteed Sustainable Insulation
        - Johns Manville Formaldehyde Free
        - Knauf Ecobatt
        - Owens Corning EcoTouch
        - Owens Corning Thermafiber SAFB and UltraBatt
        - Rockwool AFB evo
        - Bonded Logic (recycled cotton)
        - Havelock (wool)
    - Blown insulation:
        - Greenfiber Cellulose Insulation
        - Jet Stream Ultra Blowing Wool
        - Havelock Wool Loose Fill

Refrigerants:

- Select systems that use low-carbon refrigerants, adopt building management practices to mitigate refrigerant leakage and that ensure 100% refrigerant recovery.
- Recommended products:
    - Honeywell Solstice N15 (R-515B), N40 (R-448A), N41 (R-466A), ze (R-1234ze), zd (R-1233zd), L40X (R-455A), 513A (R-513A)
    - COMSTAR RS-51 (R-470B), R-53 (R-470A)
    - CHEMOURS Opteon™ XL20 (R-454C), XL41 (R-454B)
    - AKEMA R-1233zd(E)

Wood:

- Use reclaimed wood or wood from climate-smart forests that was manufactured without fossil fuels
- Mass Timber to substitute for concrete and steel where feasible
- Specify locally harvested and manufactured wood products
- Specify wood from energy-efficient manufacturers
- Specify air-dried lumber
- Specify wood products manufactured with carbon-free renewable energy (TimberHP is a good one for insulation/insulated panels)
- Specify wood that is not harvested from primary forests
- Design for longevity, durability, and end of life

OR

Engineered Wood:

- Specify products with no-added-formaldehyde resins
- Specify wood with FSC-certified content
- Recommended products:
    - Nordic Structures Engineered Wood

    - StructurLam Products CrossLam CLT
    - Redbuilt Certified Engineered Lumber

Gypsum Board:

- Specify lightweight gypsum board
- Use the thinnest gypsum board necessary
- Consider recycled gypsum board
- Consider lower embodied carbon panel products where appropriate
    - Gypsum board alternatives that utilize compressed agricultural fibers (CAF) may present a low-carbon alternative to standard gypsum board. Where code allows, look for products that utilize agricultural waste, such as wheat, rice, and straw byproduct, which sequester carbon during their growth and store that carbon as a building product
    - Clay and Magnesium Oxide boards can be healthier alternatives
- Recommended products:
    - USG EcoSmart

Carpet:

- Specify carpet tile rather than broadloom or sheet carpet to reduce installation and maintenance waste (especially the carpet tiles that do not need adhesive, which makes it easier to recycle them through take back programs)!
- Specify carpet with high recycled plastic content, especially in nylon face fiber
- Specify carpet with solution-dyed nylon yarn
- Balance embodied carbon with durability
- Recommended products:
    - Shaw EcoWorx / ShawPU
    - Bentley Mills High Performance PC Broadloom
    - Mohawk Unibond Plus Air
    - Tarkett/Tandus (Centiva ethos)

Resilient Flooring:

- Avoid specifying flooring materials that contain or are PVC/vinyl.
- Consider biobased content or natural rubber (not tire-derived) with Greenguard Gold certification
- Meet CDPH Standard Method emissions standards
- Recommended products:
    - Forbo Marmoleum (linoleum)
    - Tarkett Harmonium (linoleum)
    - Liquid Lino (linoleum)
    - Armstrong Migrations BBT
    - Kährs Upofloor Zero
    - Teknoflor CS Sheet and CS Tile
    - Mannington Mills Cirro
    - Artigo rubber flooring (natural rubber)
    - Nora rubber flooring (natural rubber)

Acoustic Wall & Ceiling Panels

- Specify products with FSC certified wood
- Specify products with high recycled content
- Avoid products with PVC, formaldehyde, etc.
- Recommended products:
    - Armstrong Tectum
    - FilzFelt Wool Design Felt
    - Unika Vaev Ecoustic panels and tiles
    - Hunter Douglas Heartfelt
    - WhisperTrack PVC-free
    - FabriTrak approved fabrics mounted on GeoTrak frame

Ceiling Systems:

- Use formaldehyde-free binders (acoustic ceiling tiles) or have third-party testing to verify compliance with CDPH Standard Method

- Are FSC certified (wood products)
- Have high recycled content and transparency documentation (metal ceiling panels)
- Recommended products:
    - Armstrong Cirrus/Cirrus High NRC, Dune, Mesa, Ultima
    - Certainteed Symphony f and m
    - Hunter Douglas Metal Linear
    - 9Wood

2. Tools for Analysis

CARE: *This tool is very specifically for evaluating whether to reuse an existing building, or building new is less embodied carbon - early planning scenarios, architecture 2030*
EC3 - *best used for individual product evaluation and comparing multiple products to see which has lower embodied carbon/GWP*
Tally - *individual product evaluation and whole building life cycle analysis, and Revit plugin*
OneClick - *individual product evaluation*
EPIC *(ehdd's new tool for early phase: https://www.ehdd.com/design/epic)…*
Carbon Conscience*: used for large scale planning, by Sasaki (https://www.sasaki.com/voices/introducing-the-carbon-conscience-app/)*
Cove.tool *launching new EC component soon*
Kaleidoscope: *(Payette's tool) https://www.payette.com/kaleidoscope/*

3. Strategic Design Moves – how to direct design teams:

- Prioritize firms who have some experience, and who set internal, firm-wide targets for embodied carbon.
- Address the materials that have the greatest impact, because of the sheer volume of them like concrete and steel, or because of the highest embodied carbon (if a TI retrofit doesn't include concrete/steel in the scope, then you look at which things have the greatest impact and target those). Steel studs (embossed studs use less steel for same strength), gyp-board and furniture are significant.
    - *"Just three materials – concrete, steel, and aluminum – are responsible for 23% of total global emissions (most of this used in the built environment)."* (Architecture 2030).
- Smaller footprint (whether whole building especially foundation 'footprint' in case of large buildings, room sizes, floor to floor heights)
- Design for deconstruction (this must be discussed very early on – regulations are popping up everywhere and MA DEP is looking at this).
- Reduce overall number of materials and finish materials: design for this from the start!
    - Include interior designers from day one
    - Holistic vision how to achieve design objectives with fewer overall materials
    - According to research conducted by CLF and LMN Architects, interior designers may be responsible for emissions at least equal to those associated with the structure and envelope of a building.

RESOURCES:
AIA-CLF Embodied Carbon Toolkit For Architects: Introduction to Embodied Carbon
AIA-CLF Embodied Carbon Toolkit For Architects: Measuring Embodied Carbon
AIA-CLF Embodied Carbon Toolkit For Architects: Carbon Reduction Strategies
Carbon Smart Materials Palette
CLF Report: Carbon Storing Materials
Why Interior Designers Must Fight Climate Change

Devens Project Checklist for Reducing Embodied Carbon

A Worksheet for Project Teams

DEC Version 1
Last Updated: March 20, 2023

Introduction

Embodied carbon refers to the greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials. There are many ways for project teams to collaborate to reduce embodied carbon on projects using siting, design, construction, or procurement strategies. This worksheet is meant to help design and construction teams learn about strategies and identify the best solutions for reducing embodied carbon on their projects.

To learn more about embodied carbon, measuring embodied carbon, or strategies to reduce embodied carbon, read more here

Strategies to Reduce Embodied Carbon

This worksheet provides a checklist for project teams to ensure they have considered strategies that may be relevant for their projects. The strategies are organized into types of strategies, beginning with process and tools and also including:

Using the Checklist

On the following sheet, there is a list of embodied carbon reduction strategies with a brief description, followed by two sets of checkboxes with empty rows.

At the Schematic Design phase (prior to submission of Unified Permit), complete the highlighted rows and identify which strategies you intend to use by checking the checkbox in Column E and insert a brief explanation in Column F about how the project may incorporate the strategy into the project and any necessary special considerations. If you feel that a strategy is already included on the project / integral to the project program and requirements, you can select 'Already included' instead of 'Will pursue'.

Upon construction completion (prior to CO), identify which strategies you used by checking the checkbox in Column H and insert a brief explanation in Column I about how the project incorporated this strategy. If the project aimed to use this strategy but was not able to, indicate which challenges prevented implementation.

Questions? Contact
Email the Devens Enterprise Commission (neilangus@devensec.com)

Project Checklist for Reducing Embodied Carbon in Devens

A Worksheet for Project Teams

Embodied Carbon Reduction Strategy	Checklist for Schematic Design			Checklist Based on As-Builts		Get Started on Learning More *(More to be added in v2!)*
0 Process and Tools	*Already included*	*Will pursue?*		*Achieved?*		
0 Identify Embodied Carbon as a Priority Communicate early in the design process that reducing embodied carbon is a design and procurement priority for the whole team (e.g., structural engineer, architect, contractor, sustainability consultants, mechanical engineers, etc.)	SELECT	SELECT	*Add a brief explanation here about how the project may incorporate this strategy into the project and any special considerations necessary*	SELECT	*Add a brief explanation as to whether and how the project incorporated this strategy. If the team intended to pursue this strategy but was not able to, provide insight as to why.*	WGBC Bringing Embodied Carbon Upfront
0 Set a Project Embodied Carbon Reduction Target Align the design and construction team around an embodied carbon reduction target. Consider targets from organizations around the globe (e.g., C40, Architecture 2030, WGBC, LETI) to understand what reductions we need now to reach 2030 and 2050 goals. Use life cycle assessment tools (see Sections 0.3 and 0.4 below) to track progress towards reduction goals. See Section "4.1 Integrate Carbon Intensity Limits into Specifications" for information about setting targets for multiple building products.	SELECT	SELECT		SELECT		C40 Cities Clean Construction Declaration LETI Embodied Carbon Primer: Best Practice Targets Architecture 2030 2030 Challenge for Embodied Carbon
0 Commit to Using Whole Building (Whole Project) Life Cycle Assessment Perform a whole building life cycle assessment (WBLCA) early in design development to identify the largest opportunities ("hot spots") for emissions reductions. Use the results from WBLCA(s) done throughout design to compare design choices and identify which reduction strategies will have the largest impact. WBLCA can be used to analyze the whole building, tenant improvement projects, or portions of a building.	SELECT	SELECT		SELECT		Carbon Leadership Forum LCA Practice Guide AIA-CLF Embodied Carbon Toolkit for Architects (particularly Part 2: Measuring Embodied Carbon)
0 Use Environmental Product Declarations (EPDs) During Procurement Once a product type has been selected, ask manufacturers (via specifications and the bidding and procurement processes) to provide environmental product declarations (EPDs) of their products to help select the lowest-carbon option.	SELECT	SELECT		SELECT		Embodied Carbon in Construction Calculator (EC3) AIA-CLF Embodied Carbon Toolkit for Architects (particularly Part 2: Measuring Embodied Carbon)
0 Discuss Whether to Integrate Carbon into the Bid Process Carbon can be evaluated alongside cost, schedule, and other criteria when selecting bids for materials to be used in construction. Alternatively, performance incentives can be provided to contractors who deliver low-embodied-carbon projects or suppliers that deliver materials below a certain carbon threshold. These strategies all require discussion early in the process between the owner, design team, and contractor.	SELECT	SELECT		SELECT		Steps to Develop a Low Carbon Procurement Policy (Incentives) OwnersCAN Embodied Carbon Action Plan Microsoft Case Study
1 Build Less, Reuse More	*Already included*	*Will pursue?*		*Achieved?*		**Learn More**
1 Reuse/Retrofit Existing Buildings Re-use or retrofit existing buildings instead of constructing a completely new building. Reductions in new square footage or new structure will translate directly to reductions in embodied carbon.	SELECT	SELECT	*Add a brief explanation here about how the project may incorporate this strategy into the project and any special considerations necessary*	SELECT	*Add a brief explanation as to whether and how the project incorporated this strategy. If the team intended to pursue this strategy but was not able to, provide insight as to why.*	
1 Design for Disassembly and Reuse Maximize the reuse potential of building components by detailing connections that can be easily disassembled and reused in future buildings. Avoid lamination and adhesion in assemblies (such as composite decks or hybrid mass timber/concrete assemblies) that prevent deconstruction and reuse. Avoid materials that are difficult to recycle, and avoid coatings that could prevent recycling.	SELECT	SELECT		SELECT		Zero Net Carbon Collaboration Resources AIA's Retrofitting Existing Buildings Guide
1 Select Salvaged or Refurbished Materials Reuse materials, such as those onsite or from other city properties, or purchase salvaged materials rather than new ones. Consider refurbishing items, such as furniture, instead of throwing them out and re-purchasing them.	SELECT	SELECT		SELECT		Where feasible, take advantage of past EC 'investments' by making use of previously-used building materials rather than newly-produced materials. (AIA, 2019; Carbon Leadership Forum Webinar Series, 2018)
2 Design Lighter and Smarter	*Already included*	*Will pursue?*		*Achieved?*		**Learn More**
2 Reduce [New] Floor Area Identify opportunities for design and programmatic flexibility to minimize the amount of new floor area. Similar to material and building reuse, reducing new floor area translates to material savings (as well as cost savings) and reduces embodied carbon.	SELECT	SELECT	*Add a brief explanation here about how the project may incorporate this strategy into the project and any special considerations necessary*	SELECT	*Add a brief explanation as to whether and how the project incorporated this strategy. If the team intended to pursue this strategy but was not able to, provide insight as to why.*	

	Strategy	Already included	Will pursue?	Explanation	Achieved?	Explanation	Learn More
2	**Reduce Below-Grade Construction** Reduce or eliminate below-grade parking or interior spaces. Subgrade construction requires a large amount of concrete (a carbon-intensive material) and releases soil carbon during excavation.	SELECT	SELECT		SELECT		Canadian Architect, 2021
2	**Select Lighter Materials and Assemblies** When possible, selecting lighter materials and assemblies for the structure and envelope systems can reduce the load on structural components (and therefore their size and embodied carbon). Consider lightening slabs through use of void systems, or using lighter structural materials like timber. In some cases, lighter structural loads may be decreased enough to allow for the preservation of an existing structure, unlocking additional carbon savings from building reuse.	SELECT	SELECT		SELECT		
2	**Design Structure for Material Efficiency** Using less of a material to do the same work results in large carbon and cost savings. Structural design choices -- such as bay sizing, column and beam spacing, and member cross sections, as well as avoiding structural gymnastics (like cantilevers and transfer beams) -- can all reduce carbon.	SELECT	SELECT		SELECT		SE2050 Structural Engineering Commitment case studies Additional strategies may include using braced frames instead of moment-resisting frames, using lighter shapes like joists/trusses, lightening concrete slabs by using void systems, and "right-sizing" each steel member.
3	**Choose Finishes Carefully** The total impact of interior finishes adds up significantly over time. Consider the expected turnover of the space you are designing and whether that matches up with the selected products. Architects and interior designers can collaborate to use salvaged materials and minimize the need for additional finishes where not required for functional performance, particularly in spaces with high occupant turnover and frequent interior fit-outs. These considerations should be included alongside toxicity, cost, and performance requirements when choosing finishes.	SELECT	SELECT		SELECT		Metropolis Magazine's Climate Toolkit for Interior Design CLF LCA of MEP Systems and Tenant Improvement
3	**Minimize Construction and Demolition Waste (Waste Prevention)** Before construction, design in modules to minimize waste. During construction, adopt sorting and waste diversion practices on-site to minimize construction waste.	SELECT	SELECT		SELECT		AIA 10 Steps to Reducing Embodied Carbon
3	**Use Low-Carbon Alternatives:** Substitute Low-Carbon Materials/Systems for High-Carbon Ones	*Already included*	*Will pursue?*		*Achieved?*		**Learn More**
3	**Consider Total Carbon when Selecting Envelope Systems** Use WBLCA (alongside energy modeling) to help assess the trade-offs in embodied and operational carbon for different envelope options. Typically, lightweight envelope systems are likely to have the lowest embodied carbon (in addition to reducing the embodied carbon of the supporting structure).	SELECT	SELECT	*Add a brief explanation here about how the project may incorporate this strategy into the project and any special considerations necessary*	SELECT	*Add a brief explanation as to whether and how the project incorporated this strategy. If the team intended to pursue this strategy but was not able to, provide insight as to why.*	
3	**Select Carbon-Storing Structural, Envelope, and Finish Materials** Bio-based materials typically have lower upfront carbon than non-bio-based products, with the added potential to store carbon over the life of the building. The availability of bio-based alternatives to conventional materials -- such as mass timber, laminated bamboo, wood fiberboard, straw, clay-straw, hempcrete, cork, wool, linoleum, cork, and more -- is increasing. Bio-based materials are also often significantly lighter than their alternatives, reducing the load and size of supporting structural members (and therefore reducing carbon).	SELECT	SELECT		SELECT		Builders for Climate Action's Zero Carbon Resources Buildings as Global Carbon Sinks WoodWorks Carbon Smart Materials Palette
3	**Select Lower-Carbon Refrigerants** Refrigerant leakage is one of the biggest contributors to climate change within the building industry. Architects can collaborate with engineers to use passive design strategies, select systems that use low-carbon refrigerants, and encourage clients to adopt building management practices to mitigate refrigerant leakage and ensure 100% refrigerant recovery.	SELECT	SELECT		SELECT		Integral Group's Refrigerants & Environmental Impacts: A Best Practice Guide
3	**Eliminate HFC-Containing Insulation and Select Lower-Carbon Insulation** Selecting an insulation that balances operational and embodied carbon trade-offs is key to achieving a total carbon balance for building. Generally, plastic- and chemical-based insulation will have a much higher embodied carbon than bio-based materials. In particular, avoid specifying HFC-containing rigid polyurethane spray foam, sealants, and XPS products that are being banned or significantly restricted in Canada and a growing number of states in the US (including California).	SELECT	SELECT		SELECT		HFC bans by region and end-use product (including foams and refrigerants) US EPA Substitutes in Foam Blowing Agents Building Enclosure: "New Climate Regulations Spell Changes for Building Products" (2020)
4	**Procure Low(er)-Carbon Products:** Specify and Source the Lowest Carbon Product Available	*Already included*	*Will pursue?*		*Achieved?*		**Learn More**
4	**Integrate Carbon Intensity Limits into Specifications** At a minimum, architects can use template language to incorporate requests for EPDs into their specifications as a part of bid proposal submittals. For products where EPDs are more widely available, architects can integrate carbon intensity limits into performance requirements, requiring an EPD to document compliance with a global warming potential limit (e.g. XX kg CO2e / unit of material).	SELECT	SELECT	*Add a brief explanation here about how the project may incorporate this strategy into the project and any special considerations necessary*	SELECT	*Add a brief explanation as to whether and how the project incorporated this strategy. If the team intended to pursue this strategy but was not able to, provide insight as to why.*	Carbon Leadership Forum Material Baselines ownersCAN Embodied Carbon Action Plan ownersCAN ECAP Specification Matrix and Language

4	**Use Performance-Based Concrete Specifications** Use performance-based (rather than prescriptive) requirements for concrete design that is appropriate for each component/mix. If CMU is used in construction, use a specified compressive stress method instead of a prescriptive method to proportion grout mix.	SELECT	SELECT		SELECT	
4	**Optimize Concrete Mix Design** Work with structural engineers to optimize concrete design with strategies such as reducing cement volume, allowing for longer cure times by specifying strength at 56 days instead of 28 days to allow more time for strength gain, looking at carbon implications of higher-quality aggregate, or reducing strength requirements where feasible/appropriate. Minimizing portland cement and/or replacing portland cement with other materials -- such as Type 1L Cement or supplemental cementitious materials (fly ash, slag, etc.) -- also reduces embodied carbon.	SELECT	SELECT		SELECT	RMI Concrete Solutions GuideNRMCA Guide to Specifying S
4	**Source from Lower-Carbon Facilities and Products** Manufacturers vary in the sustainability of their facilities and sourcing practices. Two materials with the same performance may differ in their embodied carbon as a result of energy source (fuel type/electricity grid mix), plant energy efficiency, product design and material efficiency, or lower-carbon ingredient sourcing (through using recycled, bio-based, or local ingredients). Due to how products are specificed and selected, EPDs are typically the best or only option for a project team to differentiate the carbon intensity of products from different facilities and manufacturers.	SELECT	SELECT		SELECT	Embodied Carbon in Construction Calculator (EC3) Energy Star Industrial Plant Efficiency Program Carbon Smart Materials Palette
5	**Source Climate-Smart Wood** The full life cycle embodied carbon impacts and benefits of wood are difficult to quantify (and therefore difficult to optimize) because of complex supply chains and differing methods for calculating carbon benefits. Current strategies for optimizing wood sourcing include using reclaimed/salvaged wood, asking for chain-of-custody certificates or other supply chain transparency information, asking for sustainable forest management certifications (such as FSC or SFI), and specifying wood that is locally-harvested or harvested from working (not primary) forests. *(Note: An agreed-upon definition for climate-smart wood that can be used in procurement is still in development and should be included once available).*	SELECT	SELECT		SELECT	Carbon Leadership Forum's Wood Carbon Seminars Climate-Smart Forestry.org
5	**Integrate Carbon into the Bid Process** Evaluate carbon -- in addition to cost, schedule, and other criteria -- as an awarding criteria when selecting bids for materials to be used in construction. If points are used to differentiate bids, award points for low-carbon procurement. When possible, provide performance incentives to contractors who deliver low-embodied-carbon projects.	SELECT	SELECT		SELECT	Steps to Develop a Low Carbon Procurement Policy (Incentives) OwnersCAN Embodied Carbon Action Plan Microsoft Case Study