

Maximizing Your LEEDv5 Embodied Carbon Potential

The Contractor's Perspective



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Maximizing Your LEEDv5 Embodied Carbon Potential: The Contractor's Perspective

While LEED has always had “Construction Phase Credits,” the general contractor's (GC) role and sphere of influence has never been more important than now. LEED v5 brings new opportunity and demand for GC contributions both upfront and throughout project execution. For instance, the new focus on embodied carbon quantifications will require GC engagement for LEED v5 BD+C and ID+C MRp2: Quantify & Assess Embodied Carbon and MRc2: Reduce Embodied Carbon to both document installed products and tracking of construction phase emissions. This session will delve into strategic opportunities for GCs to actively contribute to maximize project LEED certification potential through:

- An overview of v5 construction phase credit requirements, highlighting how they have changed from v4, and opportunities to maximize impact.
- Examples from actual LEED v4 projects played, what one would have looked like under LEED v5 with respect to points requiring GC involvement, new v5 opportunities or add services that could be offered by the GC, and the degree of effort required from the GC to accomplish them.
- Review, through project examples, how LEED v5 construction phase credit criteria may help achieve the requirements of other initiatives (i.e. Contractor's Commitment and CDP), and/or are complimentary to regulatory requirements already implemented in some states and pending in others (i.e. California and Colorado).



Learning Objectives

1. Learn how and when you should be engaging your general contractor in LEED Scorecard strategy development and soliciting input for implementation.
2. If you are a GC, learn everything you need to know to be savvy about and responsive to embodied carbon opportunities in LEED v5.
3. Understand potential embodied carbon related points influenced by the GC, level of effort required to secure those and what that means for a LEED project budget.
4. Understand key points where v5 requirements have crosswalks with other frameworks to which companies may already be reporting

Learning Level: Intermediate

Rating System: v5 BD+C

Agenda



- v4 to v5 Evolution
 - New Focus Areas
 - New Opportunities for Contractor Engagement
- Embodied Carbon Reduction Strategies
 - Credit Intent/ Requirements Overview
 - v4 Delta
 - Process/Execution Considerations
 - Opportunities to Maximize Impact
- Conclusion

LEED v5 Impact Areas



- **Decarbonization (50%):** Zero emissions, all-electric design, renewable energy, reduced embodied carbon required to achieve Platinum
- **Quality of Life (25%):** Health, equity, occupant well-being focus
- **Ecological Conservation (25%):** Ecosystem protection, restoration



Integrative Process, Planning and Assessments (IP)

IPp1	Climate Resilience Assessment
IPp2	Human Impact Assessment
IPp3	Carbon Assessment
IPp4	Tenant Guidelines
IPc1	Integrative Design Process
IPc2	Green Leases



Location and Transportation (LT)

LTc1	Sensitive Land Protection
LTc2	Equitable Development
LTc3	Compact and Connected Development
LTc4	Transportation Demand Management
LTc5	Electric Vehicles



Sustainable Sites (SS)

SSp1	Minimized Site Disturbance
SSc1	Biodiverse Habitat
SSc2	Accessible Outdoor Space
SSc3	Rainwater Management
SSc4	Enhanced Resilient Site Design
SSc5	Heat Island Reduction
SSc6	Light Pollution Reduction



Water Efficiency (WE)

WEp1	Water Metering and Reporting
WEp2	Minimum Water Efficiency
WEc1	Water Metering and Leak Detection
WEc2	Enhanced Water Efficiency



Energy and Atmosphere (EA)

EAp1	Operational Carbon Projection and Decarbonization Plan
EAp2	Minimum Energy Efficiency
EAp3	Fundamental Commissioning
EAp4	Energy Metering and Reporting
EAp5	Fundamental Refrigerant Management
EAc1	Electrification
EAc2	Reduce Peak Thermal Loads
EAc3	Enhanced Energy Efficiency
EAc4	Renewable Energy
EAc5	Enhanced Commissioning
EAc6	Grid Interactive
EAc7	Enhanced Refrigerant Management



Materials and Resources (MR)

MRp1	Planning for Zero Waste Operations
MRp2	Quantify and Assess Embodied Carbon
MRC1	Building and Materials Reuse
MRC2	Reduce Embodied Carbon
MRC3	Low-Emitting Materials
MRC4	Building Product Selection and Procurement
MRC5	Construction and Demolition Waste Diversion



Indoor Environmental Quality (EQ)

EQp1	Construction Management
EQp2	Fundamental Air Quality
EQp3	No Smoking or Vehicle Idling
EQc1	Enhanced Air Quality
EQc2	Occupant Experience
EQc3	Accessibility and Inclusion
EQc4	Resilient Spaces
EQc5	Air Quality Testing and Monitoring



Project Priorities (PR)

PRc1	Project Priorities
PRc2	LEED AP



New Opportunities for Contractor Engagement

- **Integrative Design Process** – While similar in nature to the Integrative Design credit from V4, this creates a more holistic approach and includes contractors in all the decision making processes.
- **Building and Materials Reuse** – New Credit, where a contractor's expertise in the logistics and scheduling of building and materials reuse can provide key benefits to the team.
- **Reduce Embodied Carbon** – New Credit, enabling the project teams to work together to evaluate the GWP of selected materials. (Option 2 or 3 for NW/CS and Option 1 for IDC)

New Opportunities for Contractor Engagement



- **Building Product Selection and Procurement** – New Credit, validate specific products scoring each according to their impacts on Climate health, Human health, Ecosystem health, Social health & Equity and Circular Economy.
- **Project Priorities** - While not exactly a new credit, it combines Regional priority, Project type credits, Exemplary Performance, Pilot Credits and Innovation Strategies, giving a greater opportunities for Contractors to engage at a higher level.



IPp3 Carbon Assessment

Understand and reduce long-term direct and indirect emissions



Requirements Overview	V4 Delta
<p>No Team documentation required. USGBC creates the report for awareness.</p> <p>Use of data from:</p> <ul style="list-style-type: none"> • EAp1: Operational Carbon Projection and Decarbonization Plan (NEW) • EAp5: Fundamental Refrigerant Management OR EAc7 Enhanced Ref. Mgmt. • MRp2: Quantify and Assess Embodied Carbon (NEW) • LTc4: Transportation Demand Management (optional) (NEW) 	<p>NEW</p>

Level of Effort



Opportunities for Maximum Impact

- Use MRp2 and MRc2 to influence material and systems selections and reduce EC.
- EC thresholds in specifications
- Early involvement (i.e. Design Assist)



MRp2 Quantify and Assess Embodied Carbon

Quantify embodied carbon emissions and assess reduction opportunities



Requirements Overview	V4 Delta
<p>Embodied Carbon Quantification: Quantify embodied carbon (A1-A3) of:</p> <p>NC/CS: structure, enclosure and hardscape.</p> <p>CI: gypsum wallboard, flooring, insulation, wood and wood composites, wall framing, ceiling systems, concrete, metals, and paints and coatings</p> <p>High-Priority Sources:</p> <ul style="list-style-type: none"> - Identify top 3 sources. - Describe strategies implemented to reduce EC. 	<p>NEW</p> <p><i>Calculations can be similar to v4 pc132 (cradle-to-gate)</i></p>

Level of Effort
Opportunities for Maximum Impact
<ul style="list-style-type: none"> - Integral process with MRc2 - Early involvement (i.e. Design Assist) - Iterative design process. - EC thresholds in specifications

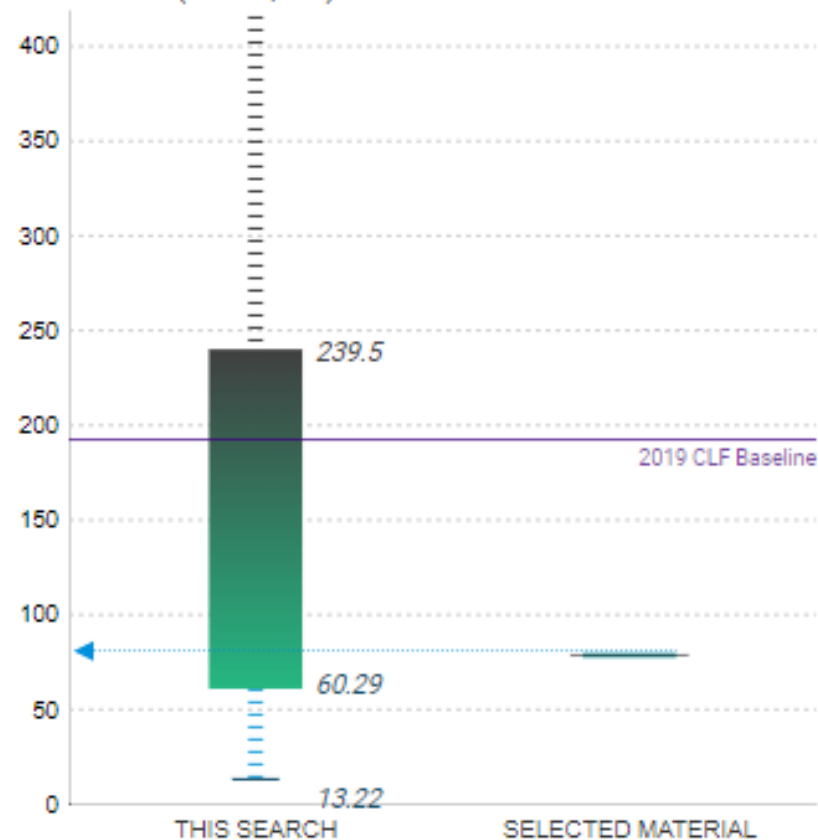


Embodied Carbon Analysis by Material

kgCO₂e embodied per 1 yd³

ABOUT THIS BOXPLOT DIAGRAM

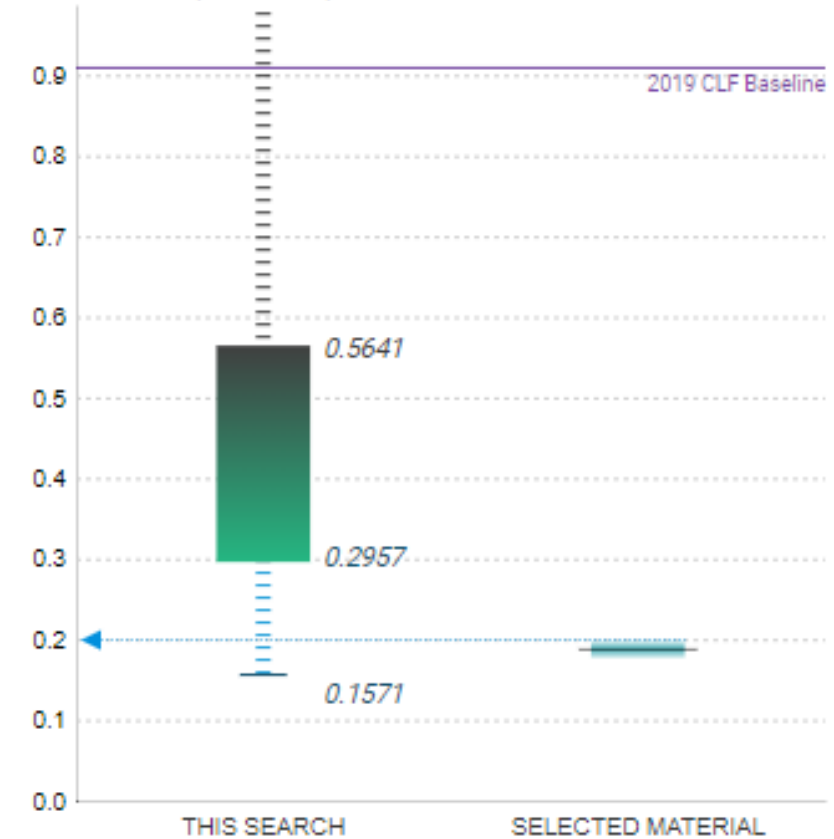
(Max: 1,100)



kgCO₂e embodied per 1 lbs

BOXPLOT DIAGRAM - SELECTED MATERIAL

(Max: 2.41)





MRc2 Reduce Embodied Carbon

Track and reduce embodied carbon emissions

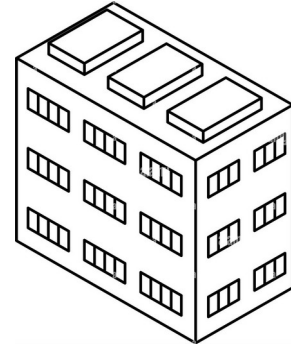
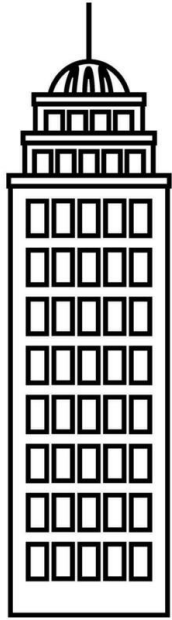


Requirements Overview	V4 Delta
<p>NC (1-6 pts) / CS (1-8 pts) / CI (1-4 pts)</p> <p>NC/CS Opt. 1 Whole-Building Life-Cycle Assessment (WBLCA) AND/OR Opt. 2 Env. Product Declaration (EPD) Analysis Path 1 Project-Average Approach Path 2 Materials-Type Approach AND/OR Opt. 3 Construction Activity Tracking (A5)</p> <p>CI Opt. 1 Reduce Embodied Carbon of New Materials AND/OR Opt. 2 Interiors Life-Cycle Assessment (LCA)</p>	<p>NEW</p> <p><i>NC/CS Option 2 & CI Option 1 calculations are similar to v4 pc132</i></p> <p>Platinum Prerequisite: <i>Minimum 20% EC reduction (4 points)</i></p> <p>Exemplary Performance Available</p>

Level of Effort
Opportunities for Maximum Impact
<ul style="list-style-type: none"> - GC input into specification development - Bid leveling criteria - Construction site tracking and electrification



Embodied Carbon Impact by Project Scope



Total: 83.3M kgCO₂e (100% of Building)



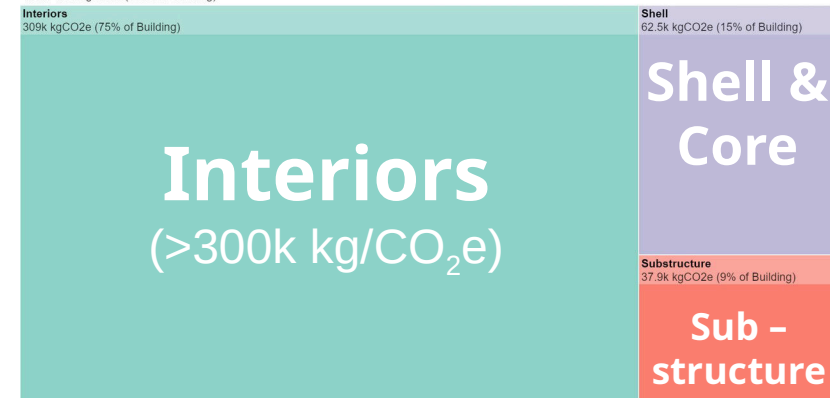
Hi-Rise Commercial Office Tower

Total: 11.8M kgCO₂e (100% of Building)



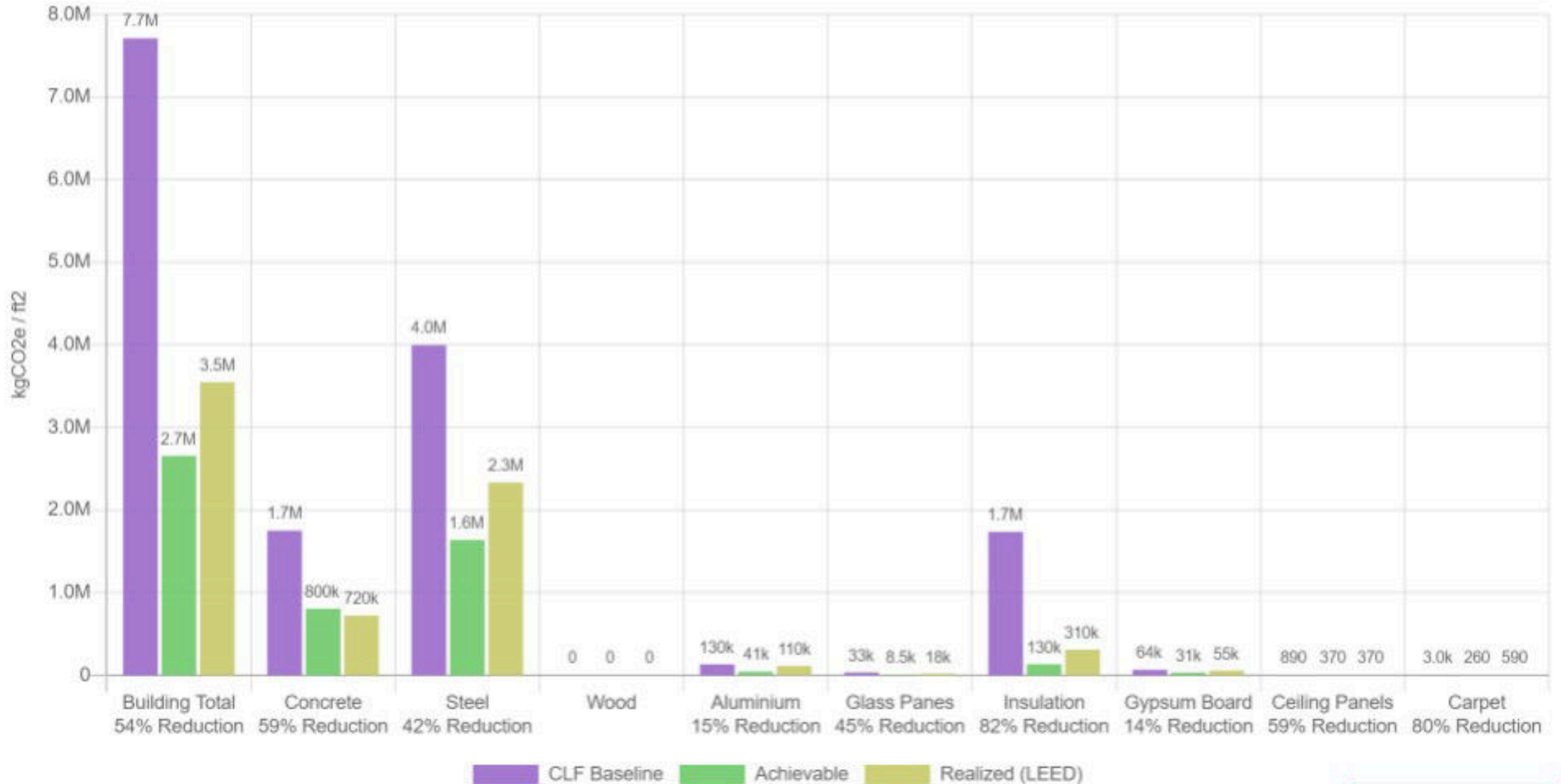
Mid-Rise Office Building

Total: 409k kgCO₂e (100% of Building)

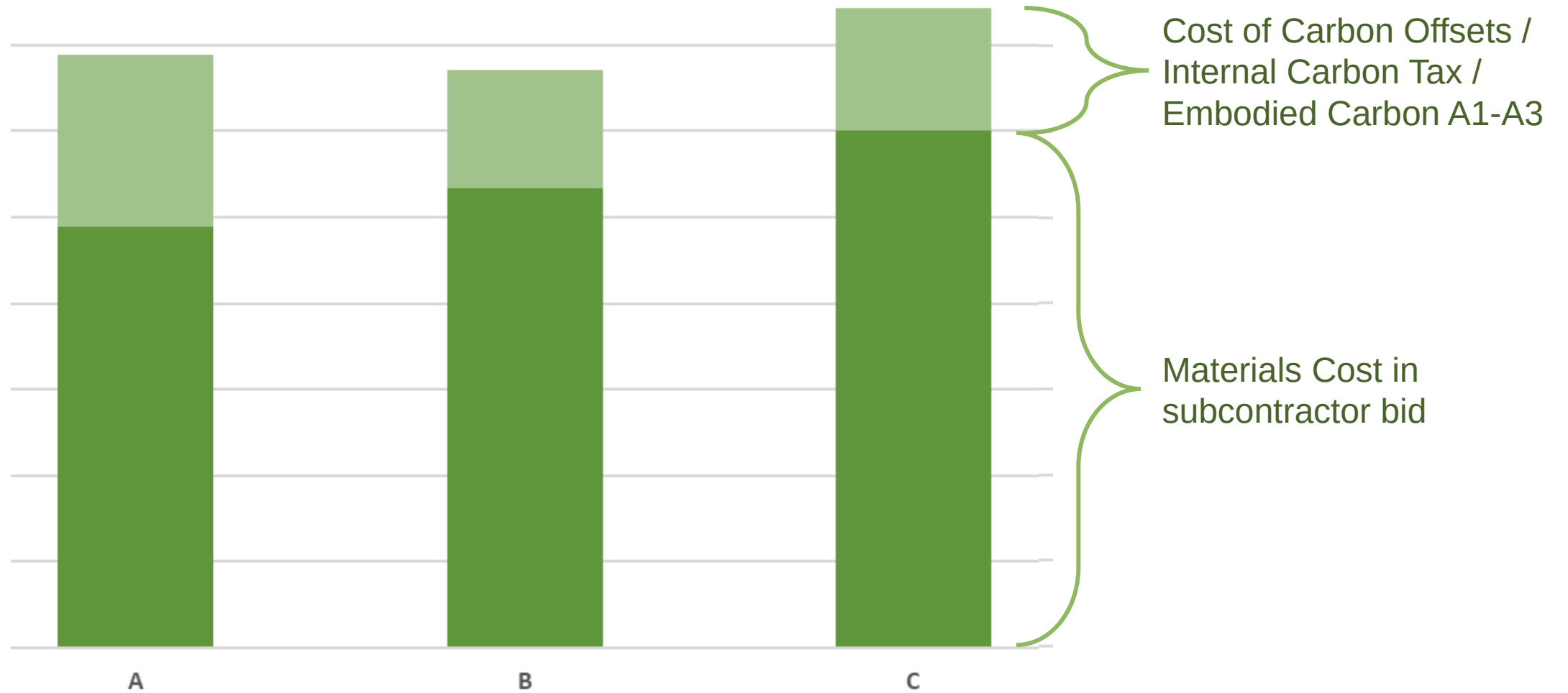


Commercial Office Interior

Embodied Carbon Actual vs. Baseline

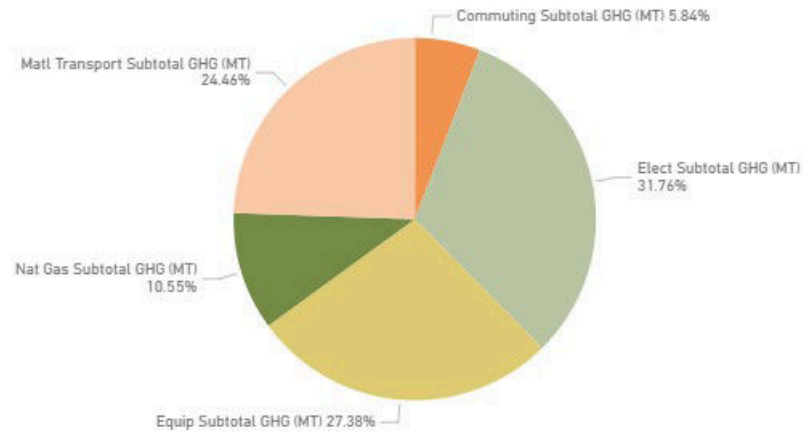


Bid Leveling

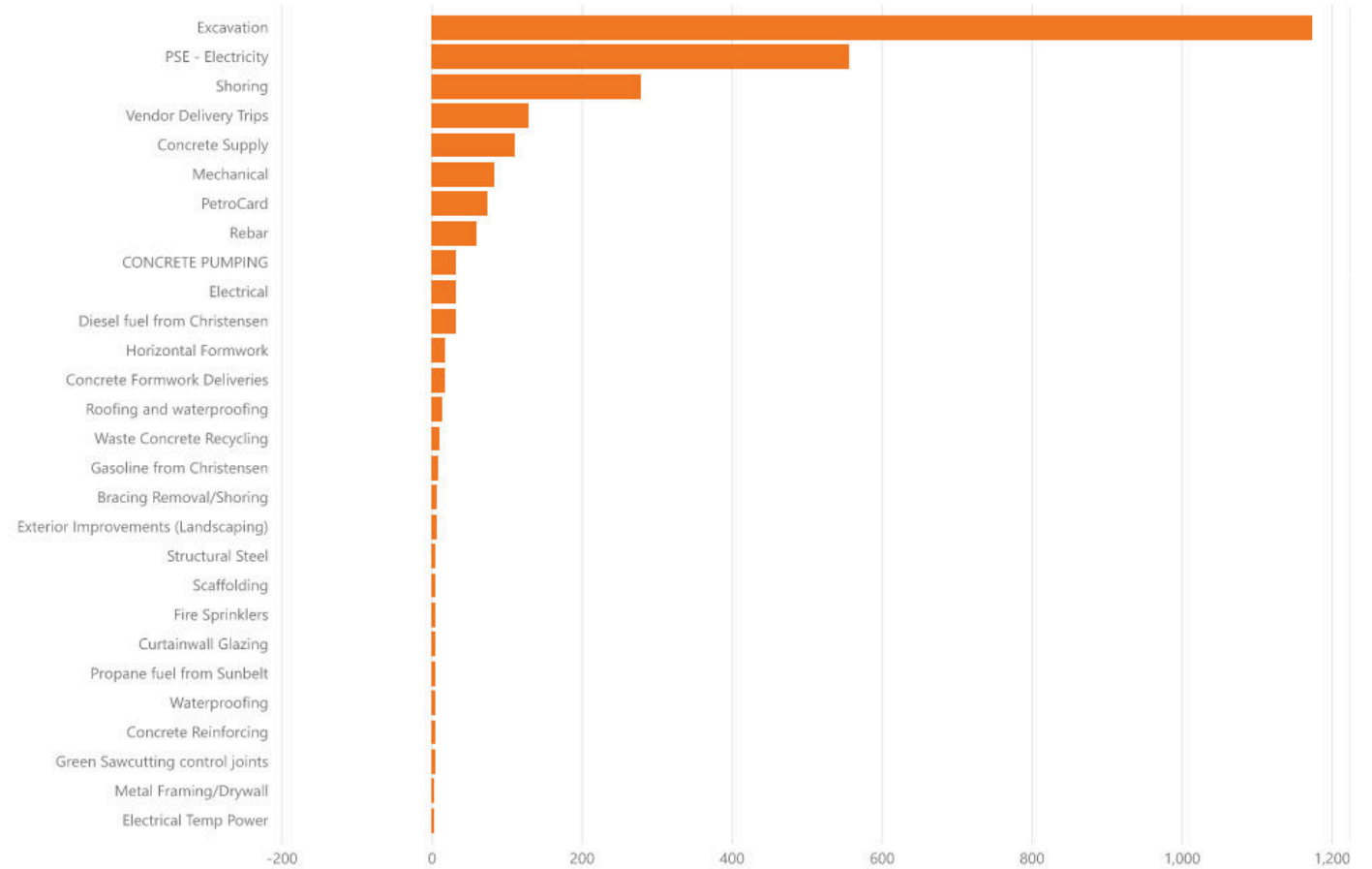


Construction Phase Tracking (A4/A5)

Total GHG Emissions JTD (MT)

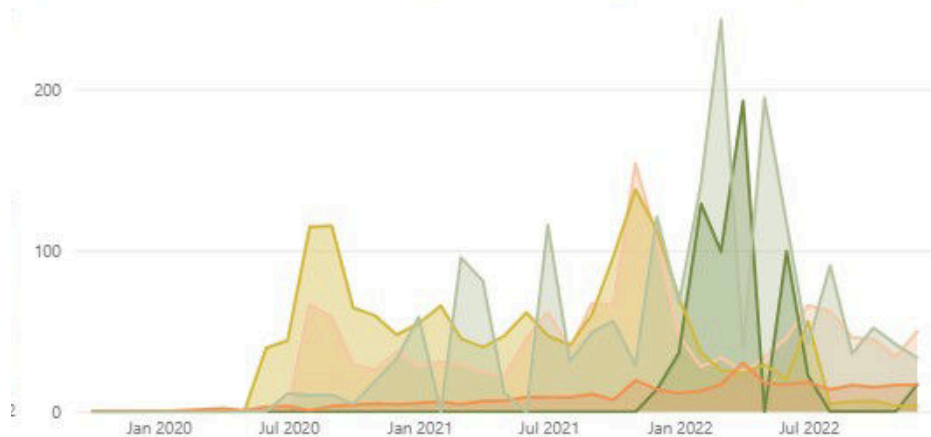


Total GHG Emissions for Sub (MT/mo) by Scope of Work



GHG Emissions JTD by Category (MT)

■ Matl Transport Subtotal ...
 ■ Nat Gas Subtotal G...
 ■ Equip Subtotal GH...
 ■ Commuting Subt...
 ■ Elect Subtotal ...





MRc1 Building & Materials Reuse

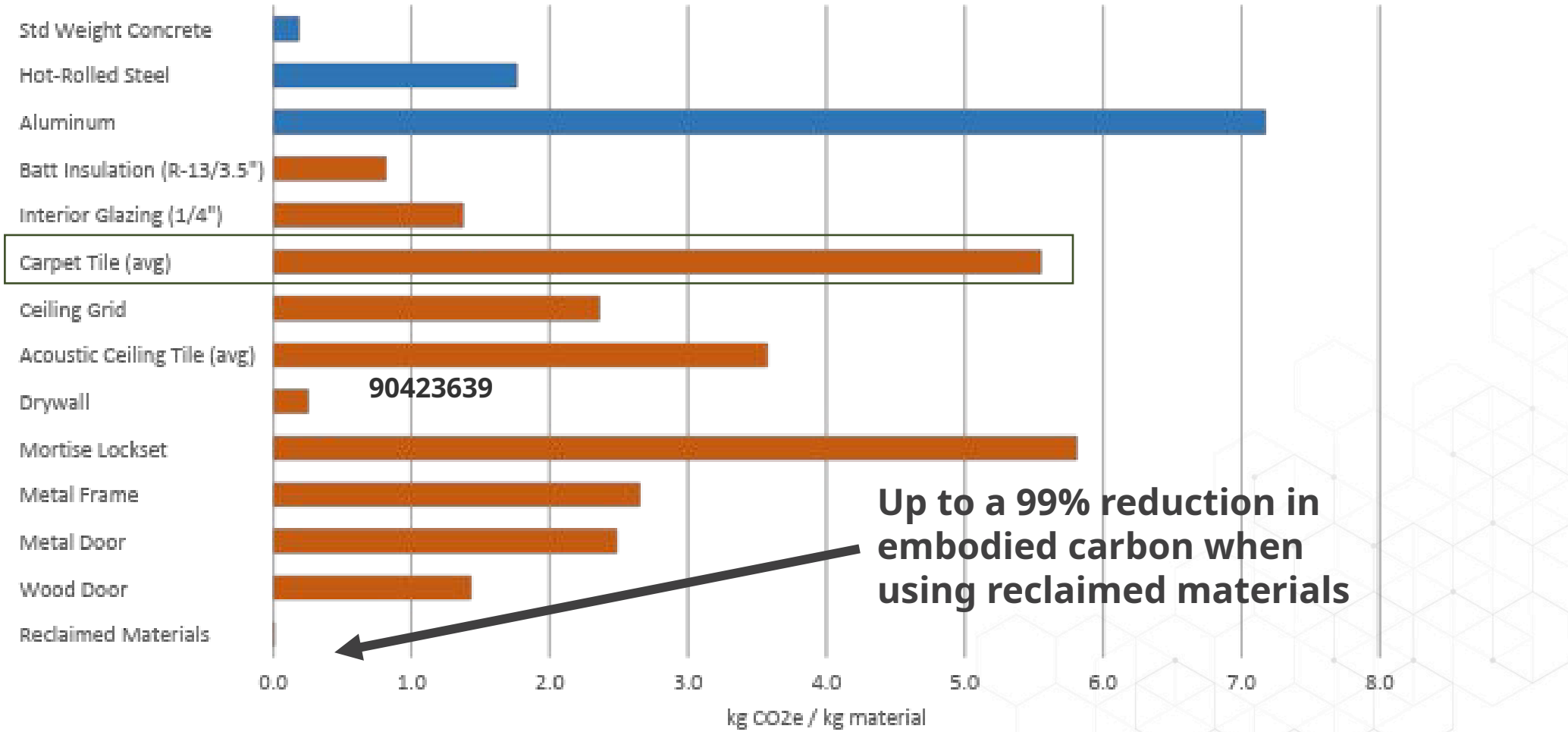
Incorporate reused materials into new building design – Increase product circularity



Requirements Overview	V4 Delta
<p>NC (1-3 pts) / CS (1-5 pts) / CI (1-4 pts)</p> <p>Opt. 1 Building Reuse BD+C: Quantify percent of structure/ enclosure reused by materials area. (NC=20%+ CS=10%+) ID+C: Quantify percent of interiors/furniture reused by materials cost.</p> <p>Opt. 2 Material Reuse Conduct a salvage assessment.</p> <p>Quantify percent 'targeted' or other material types reused or salvaged. BD+C: Thresholds start at 15%. ID+C: Thresholds start at 25%.</p>	<p>Now a standalone credit</p> <p><i>Combination of v4 LCA and Sourcing of Raw Materials credits</i></p> <p>Material reuse spotlighted</p> <p><i>“Targeted Materials” (carpeting, ceilings, furniture, interior wall systems)</i></p>

Level of Effort
Opportunities for Maximum Impact
<ul style="list-style-type: none"> - Salvage Assessment - Deconstruction - Actions here also rewarded in BPSP credit - Reused onsite does not count for waste diversion

New vs Reuse





MRc4 Building Product Selection & Procurement



Reward installation of products with sustainability disclosures and optimizations.



Requirements Overview	V4 Delta
<p>NC/CS (1-5 pts) / CI (1-10 pts) One point per category: Paints and coatings, Adhesives and sealants, Flooring, Walls, Ceilings, Insulation, Furniture, Composite wood, Plumbing fixtures.</p> <p>1 pt. for each category that exceeds 100%.</p> <p>CI 2 pts. for each category that exceeds 200%.</p>	<p><i>Non-structural building products only.</i></p> <p><i>Combines v4 BPD&O credits.</i></p>

Level of Effort



Opportunities for Maximum Impact

- GC input into specification development.
- Robust submittal process



Materials Scoring



Table 1: Product Documentation Scores in LEED v5

Eligible Product Documentation	Criteria Areas					LEED Multi-Attribute Score (max = 5)
	Human Health	Climate Health	Ecosystem Health	Social Health & Equity	Circular Economy	
Biobased Content, Non-Wood (% x verified biobased content %)	-	-	-	-	%	up to 1
Cradle to Cradle: Bronze (Version 4.1)	1	-	-	1	%	2+
Cradle to Cradle: Silver (Version 4.1)	2	1	1	1	1	5
Cradle to Cradle: Material Health Certificate, Bronze (v4.1)	1	-	-	-	-	1
Cradle to Cradle: Material Health Certificate, Silver (v4.1)	2	-	-	-	-	2
Declare (v2.0)	1	-	-	-	-	1
Declare: Third-party Verified and Red List Free or Red List Approved (v2.0)	2	-	-	-	-	2
EPD: Product-Specific, Type III	-	1	-	-	-	1
EPD: Optimized (>20% reduction in GWP)	-	2	1	-	-	3
EPD: Optimized (>40% reduction in GWP and >10% reduction in three additional impact categories)	-	3	2	-	-	5
Global Green TAG: Product Health Declaration	2	-	-	-	-	2
Green Seal GS-11 Certified	2	-	-	-	-	2
HPD: Pre-Checked for LEED, min 1000ppm	1	-	-	-	-	1
HPD: Third-Party Verified, 100ppm, Avoidance of Chemicals of High Concern	2	-	-	-	-	2
Materials Reuse (100% reused product)	-	2	1	-	2	5
Recycled Content (% x pre-consumer % + 1x post-consumer %)	-	-	-	-	%	up to 1
Wood Products: Legal Sourcing with Disclosure	-	-	1	-	-	1
USGBC-Approved Extended Producer Responsibility Program	-	-	-	-	1	1
Other USGBC Approved Programs	TBD					

Note: Products with more than one eligible document can combine scores across different criteria areas (horizontally) to get a total multi-attribute score for the product. However, scores from within a single criteria area (vertically) are not additive and the product will be assigned the highest achieved value in the criteria area only.

Materials Scoring

Eligible Product Documentation	Criteria Areas					LEED Multi-Attribute Score (max = 5)
	Human Health	Climate Health	Ecosystem Health	Social Health & Equity	Circular Economy	

Declare (v2.0) Benjamin Moore & Behr	@ ₁ #	-	-	-	-	1
Declare: Third-party Verified and Red List Free or Red List Approved (v2.0)	2	-	-	-	-	2
EPD: Product-Specific Type III Behr & Sherwin Williams	-	# 1 %	-	-	-	1
EPD: Optimized (>20% reduction in GWP)	-	2	1	-	-	3
EPD: Optimized (>40% reduction in GWP and >10% reduction in three additional impact categories)	-	3	2	-	-	5
Global Green TAG: Product Health Declaration	2	-	-	-	-	2
Green Seal GS-11 Certified Benjamin Moore	@ ₂	-	-	-	-	2
HPD: Pre-Checked for LEED, min 1000ppm Sherwin Williams	% ₁	-	-	-	-	1
HPD: Third-Party Verified, 100ppm, Avoidance of Chemicals of High Concern	2	-	-	-	-	2

Each Criteria Area is designated a multiplier.

While these products equal 200% in the Building Products calculator, the threshold for points is 100 – 200% for 1 point.

To get the 2nd point it would have to be at least 201%

Note: Calculators dropped yesterday – get yours today!



MRc4 Building Product Selection & Procurement

Reward installation of products with sustainability disclosures and optimizations.



Carpet Tile A

\$25,000 - no documentation



Carpet Tile B

\$50,000 - Product Specific
Type 3 EPD



Carpet Tile C

\$75,000 - Optimized EPD
(20% reduction in GWP)

Product category adjusted value for LEED

$$=100x \frac{(\$25,000 \times 0) + (\$50,000 \times 1) + (\$75,000 \times 3)}{(\$150,000)}$$

183%
earns 1 pt



MRc4 Building Product Selection & Procurement

Reward installation of products with sustainability disclosures and optimizations.



Carpet Tile A
\$25,000 - no documentation



Carpet Tile B
\$50,000 - Product Specific Type 3 EPD



Carpet Tile C
\$75,000 - Optimized EPD (20% reduction in GWP)

What if **Carpet Tile B**, and **Carpet Tile C** also contained 20% post-consumer recycled content?

Product category adjusted value for LEED

$$(\$25,000 \times 0) + ((\$50,000 \times 1) + (\$50,000 \times .20)) + ((\$75,000 \times 2) + (\$75,000 \times .20))$$

=100x

(\$150,000)

Exactly 200%
- still earns 1 pt



MRc4 Building Product Selection & Procurement

Reward installation of products with sustainability disclosures and optimizations.



Carpet Tile A
\$25,000 - no documentation



Carpet Tile B
\$50,000 - Product Specific Type 3 EPD



Carpet Tile C
\$75,000 - Optimized EPD (20% reduction in GWP)

What if **Carpet Tile B** was reused?

Product category adjusted value for LEED

$$(\$25,000 \times 0) + (\$50,000 \times 5) + (\$75,000 \times 3)$$

=100x

(\$150,000)

317%
earns 2 pts



MRc5 Construction & Demolition Waste Diversion



Reduce material disposal to landfills and incineration.



Requirements Overview	V4 Delta
<p>NC/CS (1-2 pts) / CI (1-4 pts)</p> <p>C&D Materials Management Plan</p> <p>AND</p> <p>NC/CS 50% diversion + 10% salvage or source separate (1 pt) 75% diversion + 25% salvage or source separate (2 pts)</p> <p>CI 35% diversion + 10% salvage or source separate (1 pt) 50% diversion + 20% salvage or source separate (2 pts) 65% diversion + 30% salvage or source separate (3 pts) Salvage or source separate clean gypsum, carpet, ceilings & furniture. Must be >10% C&D materials (4 pts)</p>	<p><i>35% comingled default diversion rate</i></p> <p><i>Minimum source separation requirement</i></p> <p><i>Salvaged materials weighted at 200%</i></p> <p>Exemplary Performance Available</p>

Level of Effort



Opportunities for Maximum Impact

- Increase source separation
- RCI certification advocacy
- Increase salvage & deconstruction



MRC5 Construction & Demolition Waste Diversion

Increasing source separation with segregated bins.



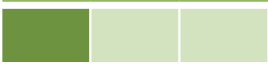
IPc1 Integrative Design Process

Reward early analysis and planning for decarbonization, quality of life and ecosystem conservation.



Requirements Overview	V4 Delta
<p>Facilitate an interdisciplinary charrette in pre- or early design.</p> <p>Establish measurable goals aligned with LEED v5's core impact areas:</p> <ul style="list-style-type: none"> - Decarbonization - Quality of life - Ecological conservation and restoration <p>Document goals in the OPR.</p>	<p><i>Includes Contractors</i></p> <p><i>Multi-disciplinary charrette required in early design.</i></p>

Level of Effort



Opportunities for Maximum Impact

- Design Assist collaboration
- Early EC models to inform design and procurement.



A Plea for Multi-Disciplinary Integration

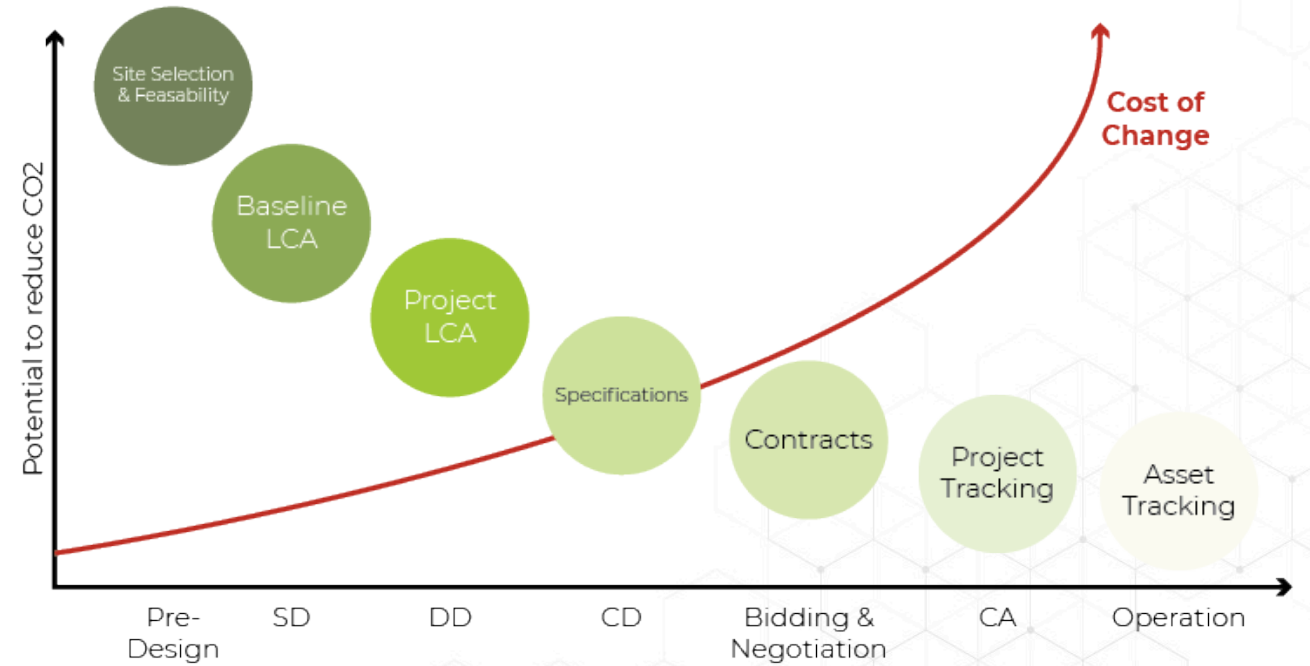
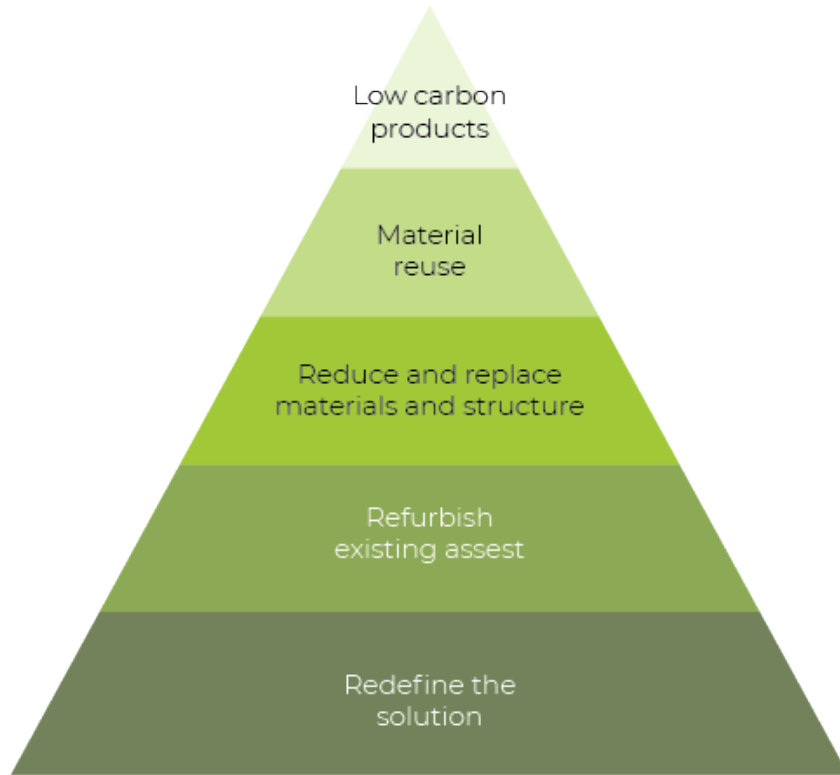
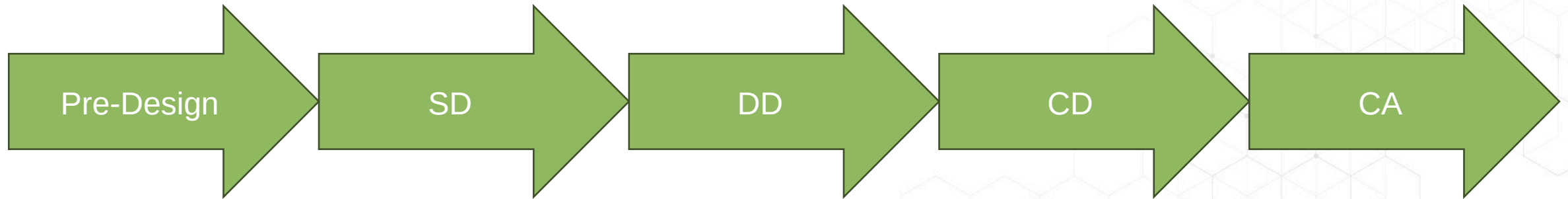


Image credit: OneClick LCA

Engaging Your GC

- Salvage Assessment
- MEP and Structural Systems Definition
- EC “budget” definition
- Sustainable Impact Prioritization
- Scorecard Strategy
- C&D Waste Strategy
- Design Assist OR Progressive DB Onboarding
- Embodied Carbon Baseline
- Specification Reviews
- Buildability Reviews
- Pricing for LEED-specific Scopes
- LEED v5 Bid Doc Requirements
- Material Review & Validation
- Documentation of Design Credits
- Definition of Materials Story Telling / Innovative Sustainability Efforts
- Submittal Data Tracking
- Embodied Carbon Confirmation
- Waste Tracking
- A5 Tracking



Project Delivery Methods:

- Design-Build
- Progressive Design-Build
- Negotiated (GMP)
- Integrated Project Delivery

Resources & References

- V4.1 to v5 Summary of Changes:
 - BD+C:
<https://www.usgbc.org/resources/summary-changes-lead-bdc-new-construction-and-core-shell-development-lead-v41-lead-v5>
 - ID+C:
<https://www.usgbc.org/resources/summary-changes-lead-idc-commercial-interiors-lead-v41-lead-v5>
 - O+M:
<https://www.usgbc.org/resources/summary-changes-lead-om-existing-buildings-lead-v41-lead-v5>
- Building Product Selection and Procurement (MRc4) from slides 22/23:
<https://www.usgbc.org/resources/lead-v5-bpsp-criteria-areas-and-achievement-levels>
- LEED v5 Calculators: <https://www.usgbc.org/resources>
- Contractor's Commitment: <https://www.contractorscommitment.org/>
- RCI: <https://www.recyclingcertification.org/>
- EC3: <https://www.buildingtransparency.org/>

Questions & Contact Information



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