

FEMA Public Assistance Staff | October 2023



Opening Remarks

Agenda

- Overview of Public Assistance and Low-Carbon Materials
- External Resources
 - Carbon Leadership Forum
 - Building Transparency
- Frequently Asked Questions



Key Messages

- The Inflation Reduction Act (IRA) authorizes the <u>Robert T. Stafford Disaster Recovery</u> and <u>Emergency Act</u> to provide financial assistance for costs associated with low-carbon building or construction materials.
- The use of low-carbon materials is voluntary and based on Applicant discretion.
- Terminology around climate resilience may be new to FEMA staff. There are many resources available to support learning about this topic.
- These authorities are applicable to disasters declared on or after May 22, 2023.
- Inclusion of low-carbon materials in projects does not affect the federal cost share percentage for the project.
- FEMA PA staff are not expected to be technical experts in low-carbon materials





Inflation Reduction Act (IRA) Overview

- Signed into law on August 16, 2022, the <u>Inflation Reduction Act (IRA)</u> provides a total of \$370 billion across Federal agencies to address clean energy and climate change.
- Section 70006 of the IRA provides FEMA the authority to fund low-carbon materials for three FEMA programs:
 - Public Assistance (PA)
 - Hazard Mitigation Grant Program (HMGP)
 - Building Resilient Infrastructure and Communities (BRIC)
- Authority to fund low-carbon material exists through September 30, 2026.



Inflation Reduction Act (IRA) Implementation Memo

- The <u>Implementation Memo for IRA Section 70006(1)</u> for Public Assistance and Hazard Mitigation Assistance programs was issued March 21, 2023
- Memo highlights include:
 - Identifying that the memo applies to disasters declared on or after May 22, 2023
 - Highlighting that the use of low-carbon materials is voluntary and based on Applicant discretion
 - Increased costs for low-carbon materials are deemed reasonable under cost principles
 - Identifying that FEMA will fund four low-carbon materials: concrete, asphalt, glass, steel





IRA Implementation Overview

- FEMA PDMGs and Field Leadership will provide Recipients and Applicants information on potential eligibility of low-carbon materials for use in their projects.
- Applicants may elect to use low-carbon materials in their permanent work projects.
- If an Applicant elects to use low-carbon materials, those materials will be identified in the project scope of work.
- CRC staff will validate costs or develop the scope of work and estimate costs that include low-carbon materials.

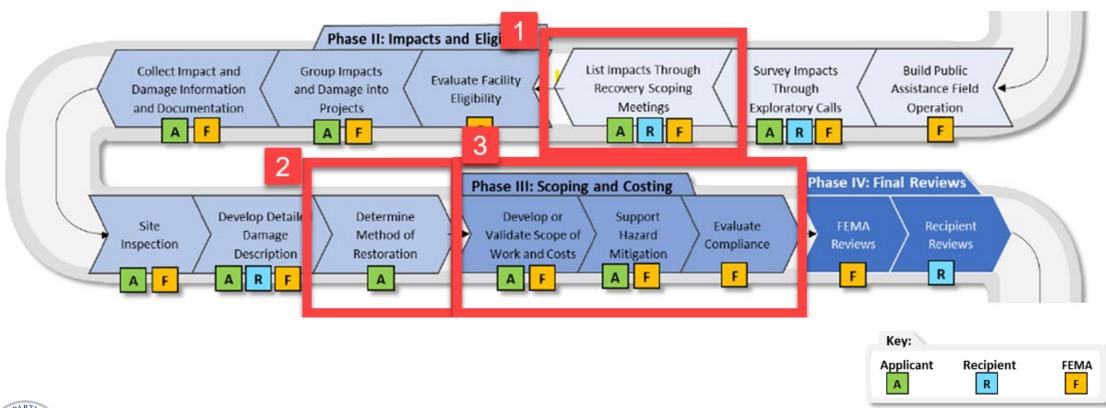


Field Leadership Responsibilities

- We need to support the recovery priorities of our SLTT partners. This includes encouraging them to utilize all available funding sources, including resilience funding, to achieve their priorities.
- Coordinate with Recipients to provide content for the Applicant's Briefing, including information about the Inflation Reduction Act (IRA). This may include slides or a onepage hand out.
- Field Leadership need to establish consistent messaging regarding the low-carbon materials for their PDMGs to deliver to their Applicants.
 - Talking points will be provided by Field Leadership and passed down through chain of command to the PDMGs so there is consistent messaging being delivered to the Applicants.



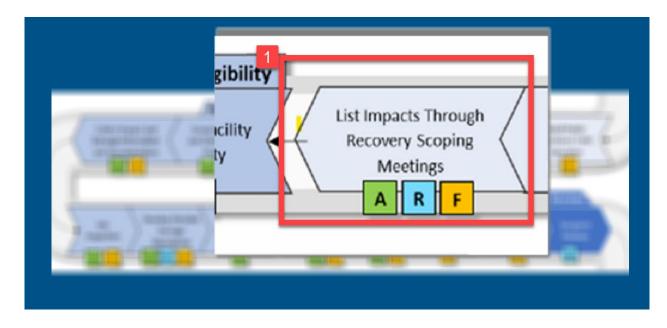
IRA Implementation by Phase





Program Delivery Manager Responsibilities (1 of 2)

List of Impacts Through Recovery Scoping Meeting (RSM)





During the RSM, the PDMG will:

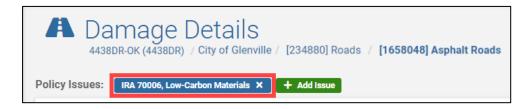
- Provide information on the IRA initiative
- Provide the Applicant with a hand-out detailing how the Applicant can learn more about and take advantage of eligible low-carbon materials (concrete, asphalt, glass, and steel) in their recovery efforts



Program Delivery Manager Responsibilities (2 of 2)

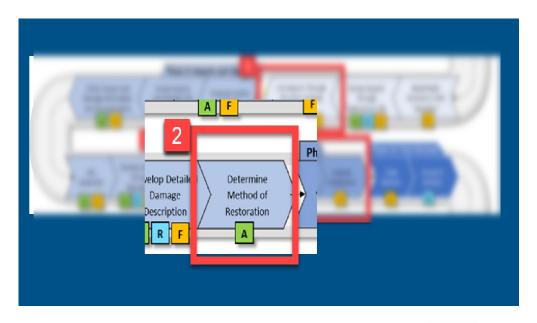
The PDMG will also:

- Ensure Applicant adds comment at the project level that indicates they will use lowcarbon materials or add the comment if the Applicant is unable to.
 - When adding a comment indicating that an Applicant is electing to use low-carbon materials include as much information as possible. (see examples on next slide)
- During regular weekly follow up meetings with the Applicant, address any questions or concerns with low-carbon materials
- PDMGs should follow normal procedures to formulate projects and continue to process them to the CRC for review.
- PDMGs will add the Policy Issue "IRA 70006, Low-Carbon Materials" at the damage line item where low-carbon materials are being claimed.





Applicant Responsibilities





- The Applicant should determine whether they will use low-carbon materials in their PA projects.
 - When determining the method of restoration, the Applicant can estimate the cost of the lowcarbon materials. This estimate will be used as part of their scope of work. If the Applicant prefers, CRC staff will develop scope of work and cost.
- The Applicant should add a comment at the project level that indicates they will use lowcarbon materials.

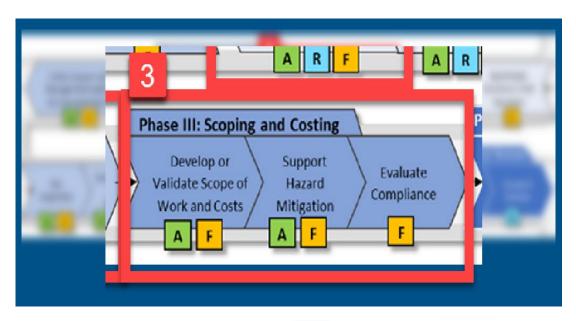


Recipient Responsibilities

- Coordinate with FEMA field leadership to establish priorities for low-carbon materials
- Consider adding low-carbon material content to Applicants Briefings
- Support applicants in decision making around low-carbon materials and in gathering documentation



CRC Responsibilities







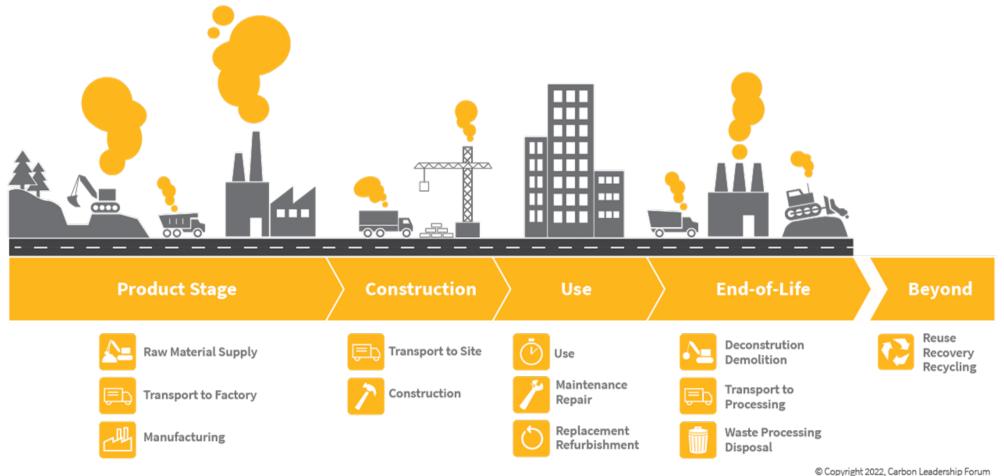
- There may be higher costs for low-carbon concrete, asphalt, glass, and steel, compared to traditional materials.
- CRCs should follow normal procedures for processing projects:
 - For work completed, CRC will validate scope, work, and cost, and reflect inclusion of lowcarbon materials.
 - For work to be completed, site inspection and DDD are complete, CRC will write the scope of work, cost, and reflect inclusion of low-carbon materials
 - Verify that a material is a low-carbon material based upon the Environmental Product Declaration (EPD) information using a tool such as the Building Transparency EC3 Tool.



What are low-carbon materials?



Emissions are released during the life cycle of construction materials





What makes manufacturing lower carbon?



Every construction material is made differently, so each requires different strategies to produce low carbon materials.

- Energy efficient manufacturing processes
- Switching to cleaner fuels and power sources
- Lower-carbon ingredients (e.g. recycled, waste byproducts, bio-based)

Carbon Leadership Forum

Environmental Product Declarations (EPDs) Disclose the Embodied Carbon of a Product

An Environmental Product Declaration for Asphalt Mixtures

PRODUCT DESCRIPTION

Gradation Type: dense

Mix Design Method: superpave

Nominal Maximum Aggregate Size: 12.5 mm Performance Grade of Asphalt Binder: PG 58-28

This mix producer categorizes this product as a Hot Mix Asphalt (HMA) asphalt mixture. This asphalt mixture was produced within a temperature range of 150 to 161°C.

IMPACT CATEGORY	POTENTIAL IMPACT PER METRIC TONNE ASPHALT MIXTURE (PER TON ASPHALT MIXTURE)	
Global warming potential (GWP-100)	71.05 (64.46) kg CO2 Equiv.	
Ozone depletion potential (ODP)	9.92e-08 (9.00e-08) kg CFC-11 Equiv.	
Eutrophication potential (EP)	1.24e-02 (1.13e-02) kg N Equiv.	
Acidification potential (AP)	1.72e-01 (1.56e-01) kg S02 Equiv.	
Photochemical ozone creation potential (POCP)	4.51 (4.09) kg 03 Equiv.	

DECLARED UNIT: The declared unit is 1 metric tonne (1 short ton) of an asphalt mixture

PRODUCT INGREDIENTS

Component	Material	Weight %
Aggregate	Natural Stone	15
Aggregate	Natural Stone	21
Aggregate	Natural Stone	13
Aggregate	Natural Stone	14
Aggregate	Natural Stone	8
RAP	Reclaimed Asphalt Pavement	24
Binder	Unmodified	4

ENVIRONMENTAL IMPACTS

Declared Product:

Description: Exterior 4000 PSI

Compressive strength: 4000 PSI at 28 days

Declared Unit: 1 m³ of concrete

Global Warming Potential (kg CO -eq)	318
Ozone Depletion Potential (kg CFC-11-eq)	7.15E-6
Acidification Potential (kg SO -eq)	0.95
Eutrophication Potential (kg N-eq)	0.24
Photochemical Ozone Creation Potential (kg 0 -eq)	20.7
Abiotic Depletion, non-fossil (kg Sb-eq)	5.82E-5
Abiotic Depletion, fossil (MJ)	658
Total Waste Disposed (kg)	94.2
Consumption of Freshwater (m³)	2.40

Product Components: natural aggregate (ASTM C33), Portland cement (ASTM C150), fly ash (ASTM C618), batch water (ASTM C1602), admixture (ASTM C494), admixture (ASTM C260)

Left: Sample information from Asphalt EPD.

Right: Sample information from Concrete EPD. Source: FHWA.dot.gov/everydaycounts



EPDs are used to demonstrate whether a product is low carbon

- Per the Environmental Protection Agency (EPA)'s definition, concrete, asphalt, glass, and steel products can qualify as low-carbon materials if they have a Global Warming Potential (GWP) lower than the estimated industry average for similar products in North America as demonstrated by their Environmental Product Declaration (EPD).
- This means that low-carbon concrete, asphalt, glass, and steel products used on FEMA projects will need an third-party verified EPD to prove that they are low carbon.

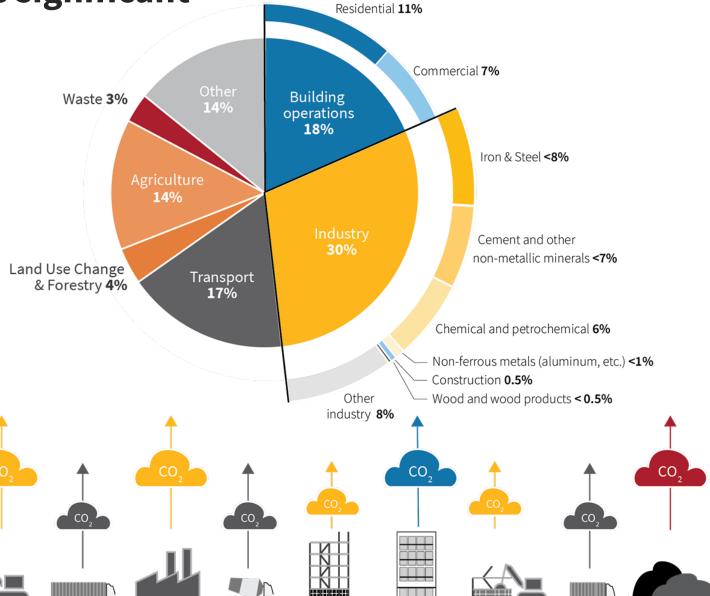


Why should you use low-carbon materials on your project?



Embodied carbon is significant

CO.





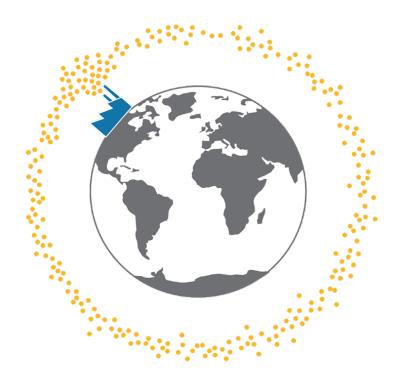
Global greenhouse

gas emissions and the life cycle of

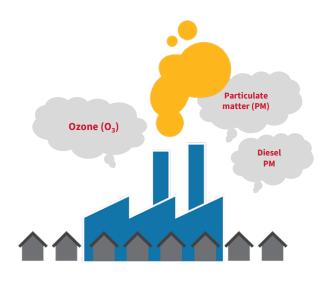
buildings

Emissions from the life cycle of materials have negative health and environmental impacts on communities

Global Impacts from Climate Change



Regional/Local Impacts on Health and Environment





Design and construction is the only chance we have to reduce embodied carbon



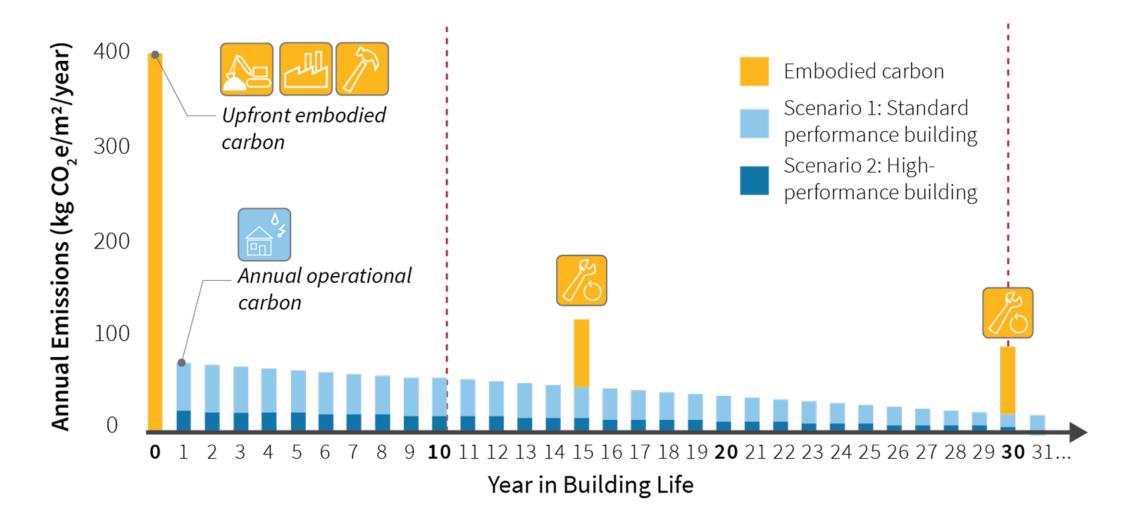




Image Sources: pexels.com



Sourcing low carbon materials is urgent





Low-Carbon Materials: Frequently Asked Questions



Q: What if a manufacturer doesn't have an EPD?

While there are thousands of environmental product declarations (EPDs) available already for construction products, availability is lower for some regions, and not all products with EPDs are low carbon.

- Manufacturers can get an EPD relatively quickly (i.e. months, not years). This varies by material. A growing number of tools are available to speed up this process.
- The EPA has announced the first \$100 million of Inflation Reduction Act funded grants aimed at funding development of more EPDs. Once these grant programs launch, project teams can encourage manufacturers to get EPDs for free through these IRA-funded programs.



Q: Are low-carbon materials new, untested materials?

- Many low carbon materials have been available for a long time, but may require
 manufacturers to invest in facility upgrades or keep more ingredients on-hand (like keeping
 many cement alternatives on-hand at a concrete supply facility).
- Some low carbon materials are already available, but without requiring transparency (via an environmental product declaration (EPD)), a purchaser won't be able to identify or request them.
- Some materials do include newer technologies or ingredients. However, they are required to meet the same performance standards / functional requirements as their more polluting competitors.



Q: Will low-carbon construction materials alter the construction schedule?

- Coordination between the contractor, engineer, and architect are crucial to limit any schedule impacts.
- Lower-carbon concrete and asphalt products may use a different mix design than a traditional product. Some of these may take longer to cure. Supplier, contractor, and engineer can coordinate on which components can allow for longer curing in the construction schedule.
- Performance-based specifications (e.g. specifying strength and other performance requirements, not ingredients) can help



Q: Are low-carbon construction materials more expensive?

- Savings or costs for reducing carbon vary by the material and by the size and complexity of the project, the geographic location (which can have a large impact on availability of products and feasibility of certain design strategies), and the experience of the architect, engineer, and contractor.
- Potential savings may come from dematerialization, meaning less material is used to achieve the same function, or from reducing the use of some of the higher cost ingredients for a product, such as Portland Cement.
- In some cases, lower carbon materials are cheaper. The table on the bottom shows an example of how three cement replacement options, all cheaper than cement, vary in price primarily due to transportation distance.



Source: RMI's <u>Concrete Solutions</u> <u>Guide</u>



RMI Case Study Analysis **Embodied Carbon Reductions**



Cradle-to-gate embodied carbon reductions:



Steel reinforced concrete slab



Wood-framing with concrete slab



Tilt-Up concrete



RMI Case Study Analysis **Embodied Carbon Reductions**





Key Findings:

- Optimizing the ready-mix concrete design can lead to significant embodied carbon reductions at no cost
- Rebar with high recycled content coming from efficient mills, electric arc furnaces, and clean electrical grids can have dramatic impacts at a small cost premium
- Glazing remains a critical challenge for reducing embodied carbon
- Insulation material selection can drive project-level embodied carbon, depending on baseline type and quantity
- Finish materials can serve as a key carbon-reduction or carbonstorage opportunity







About Building Transparency

Washington State 501c(3) nonprofit dedicated to sustainability in construction.

Building Transparency's core mission is to provide open access data and tools necessary to enable **broad and swift action** across the building industry in addressing embodied carbon's role in **climate change**.

Embodied Carbon in Construction Calculator

Free to use | Open access

Upfront Carbon Assessment Tool

tallyLCA

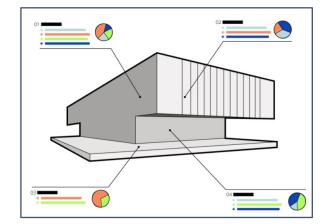
Revit plugin | Design-focused Whole-Building LCA Tool

tallyCAT

Revit plugin | Design-focused
Upfront Carbon Assessment Tool







Product Impacts Declared Unit: 1 m³ of 10,000 psi concrete at 28 days Amount Per Declared Unit Global Warming Potential 445 kgCO2eq 460 kgCO2ed Sequestered -15 kgCO2eq Ozone Depletion 0.000 kgCFC11eq Acidification 2.96 kgSO₂eq Eutrophication 0.09 kgNeq Smog Formation 0.61 kgO₃eq 3017 MJ Primary Energy Demand 3000 MJ Non-renewable 17 MJ



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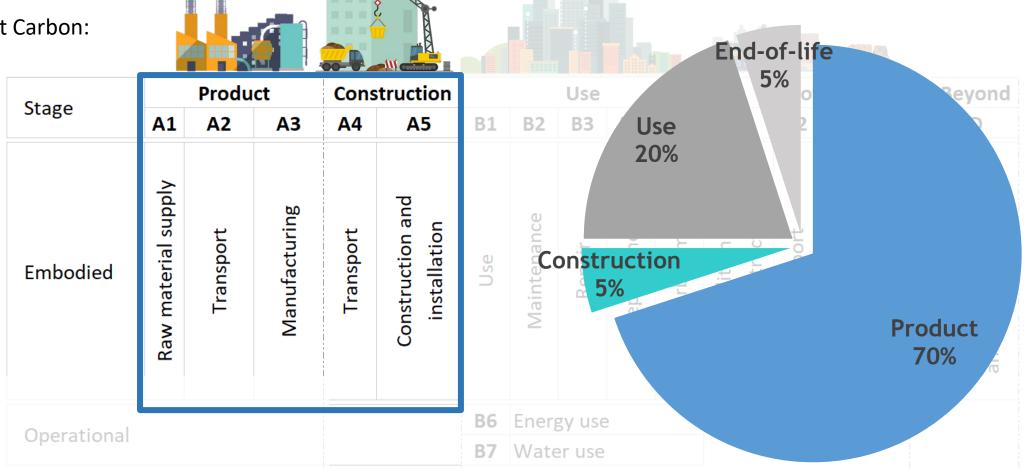


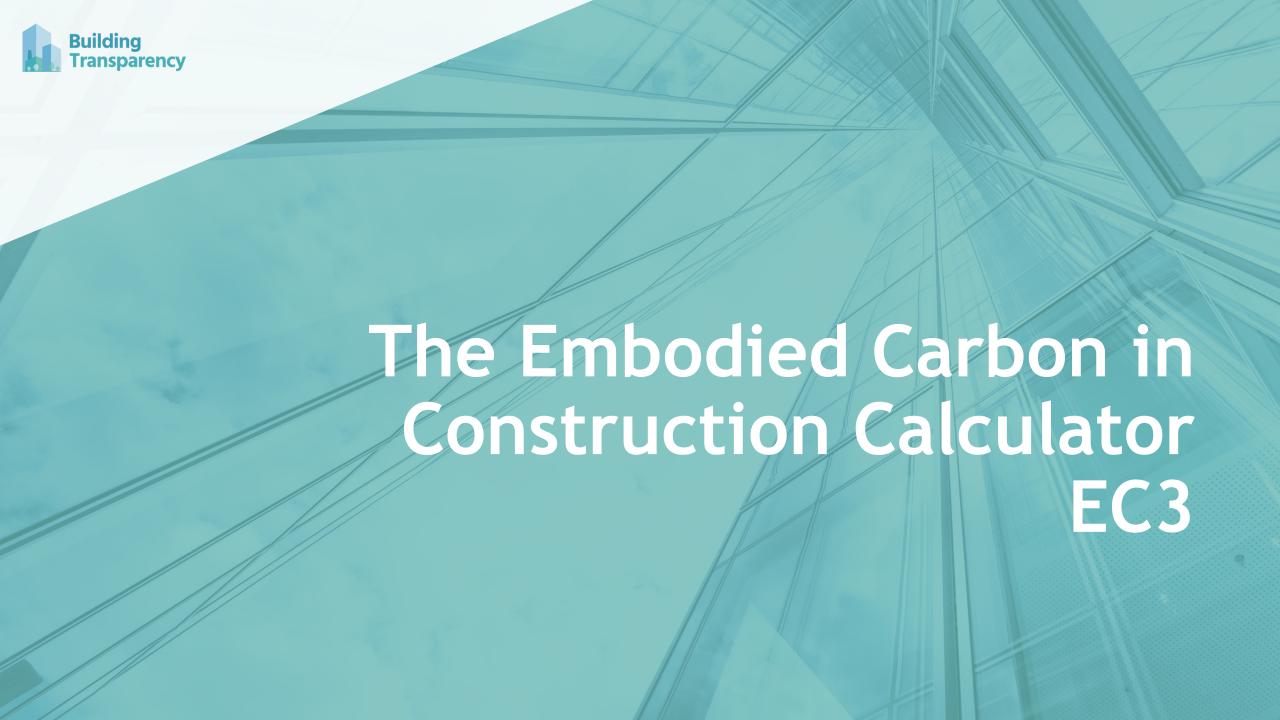




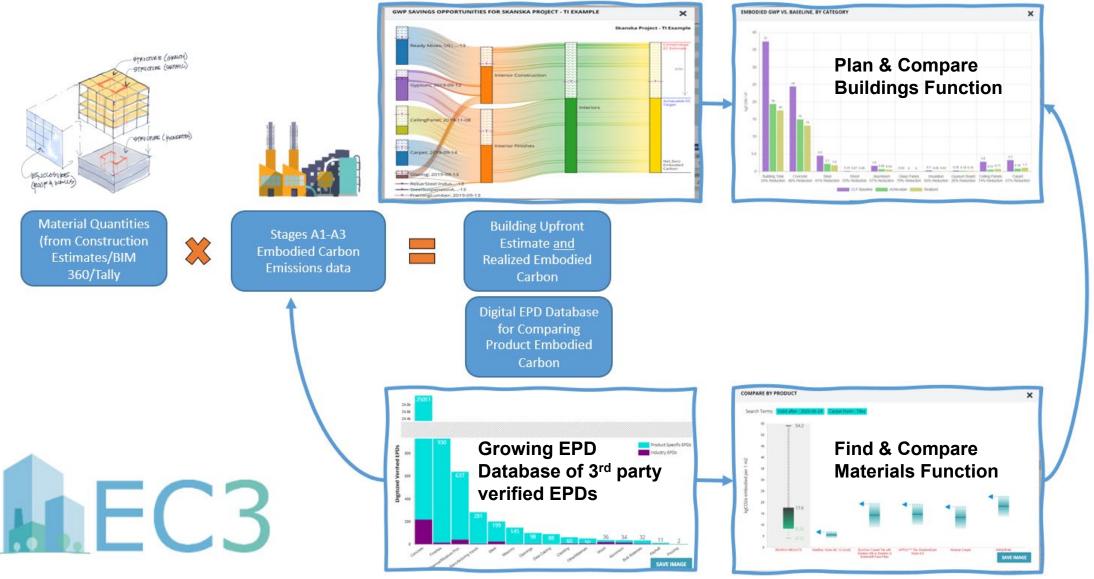
Life Cycle Stages







The EC3 tool = An open access database of digitized EPDs and a project planner

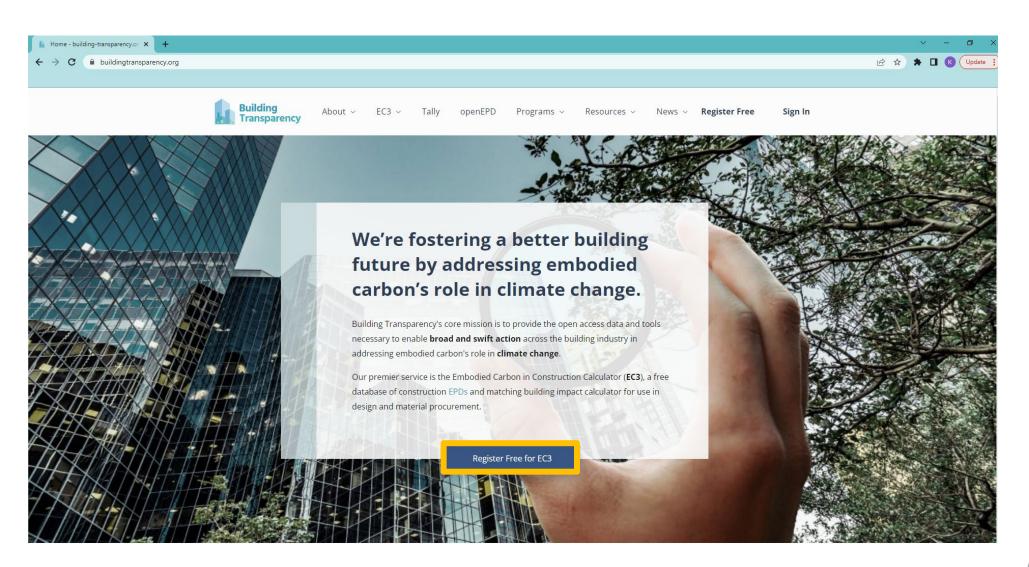






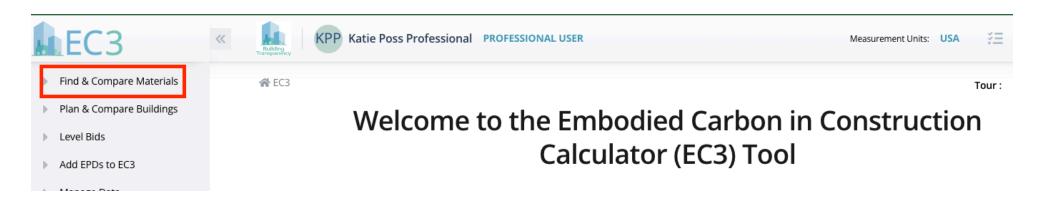


Register for a Free Account at buildingtransparency.org

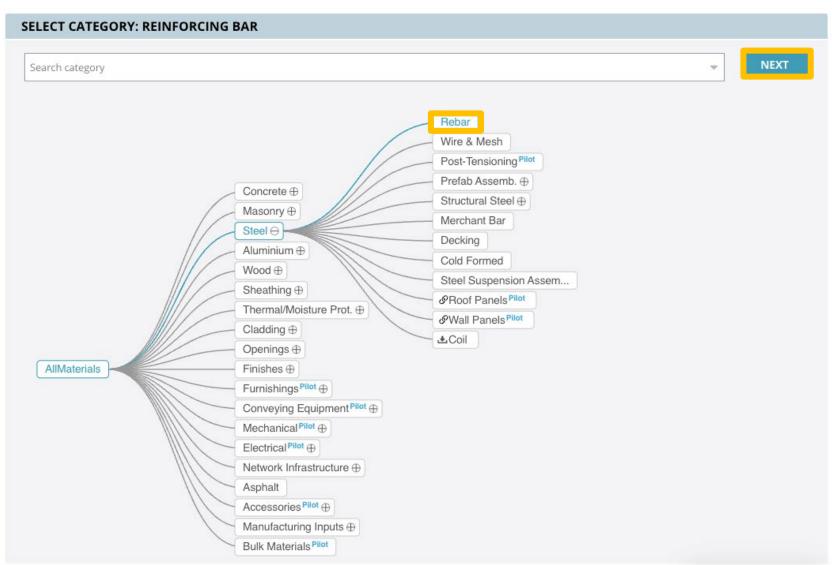




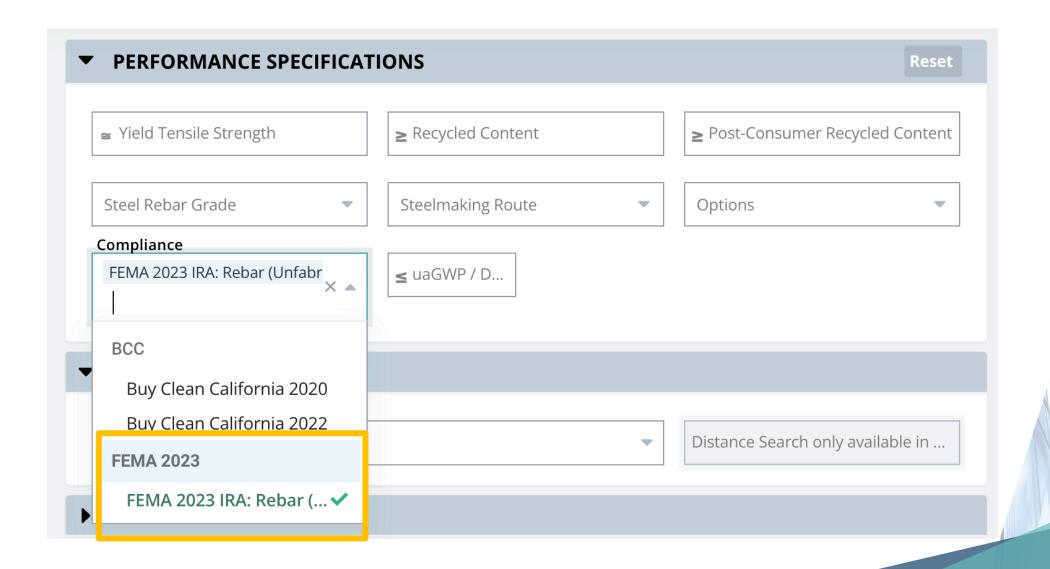
Once you are logged in to EC3, click "Find and Compare Materials" located in the top left corner of the screen, just below the EC3 logo.





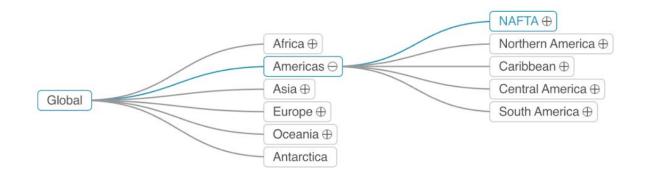




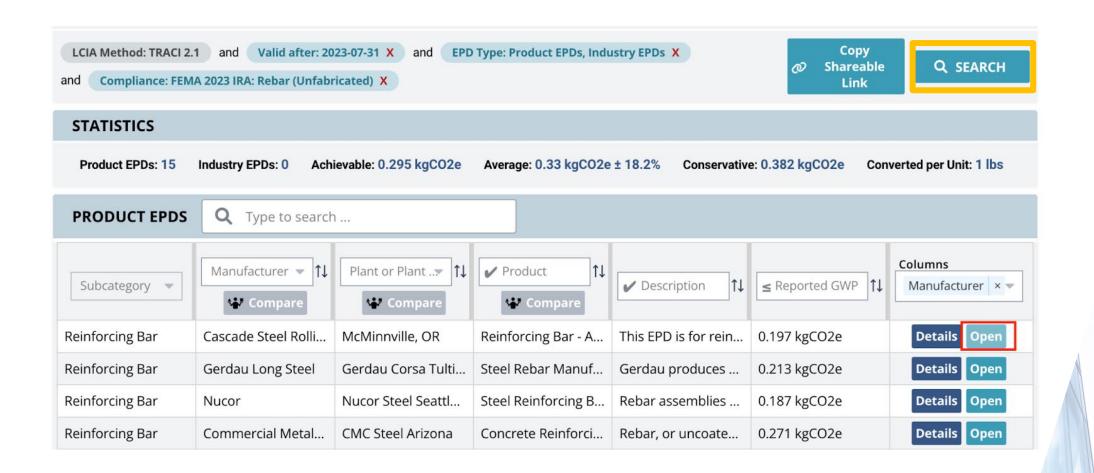






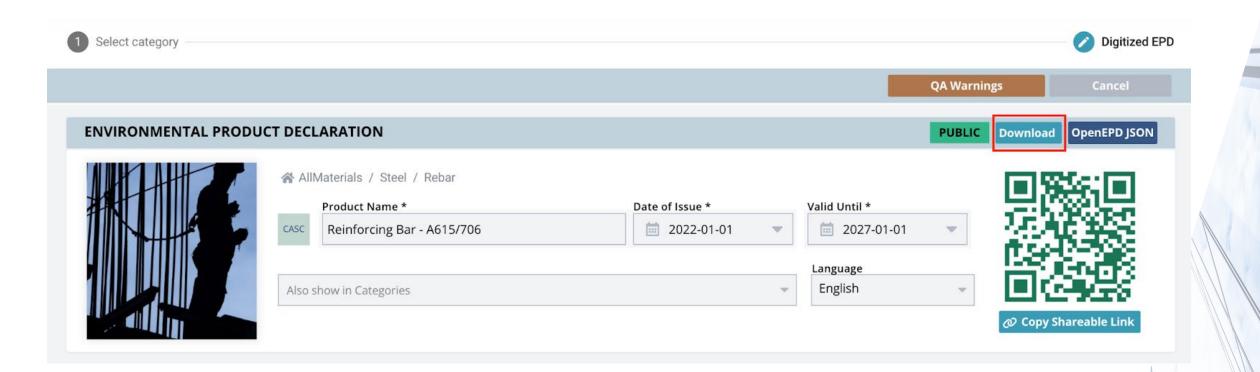






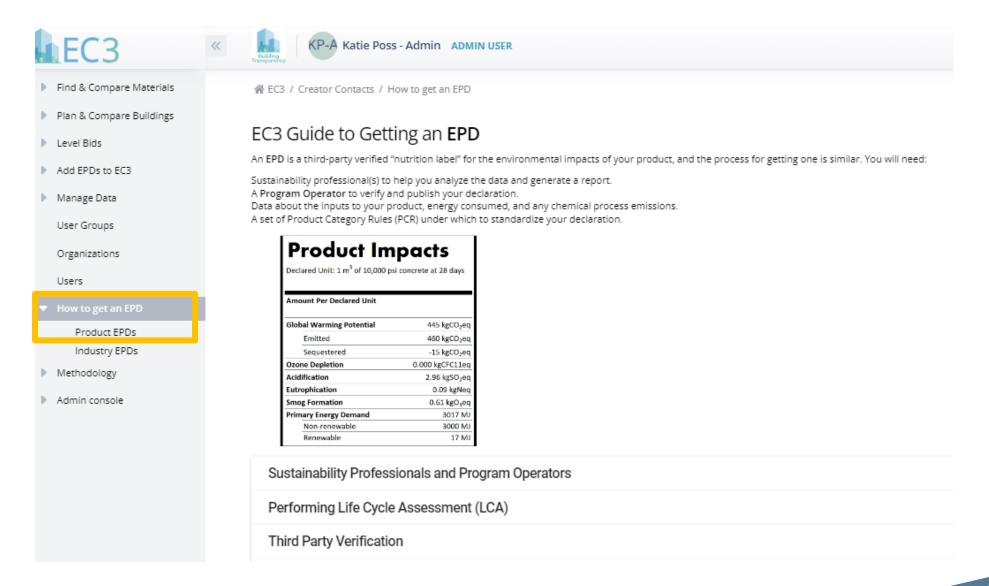


Download EPD



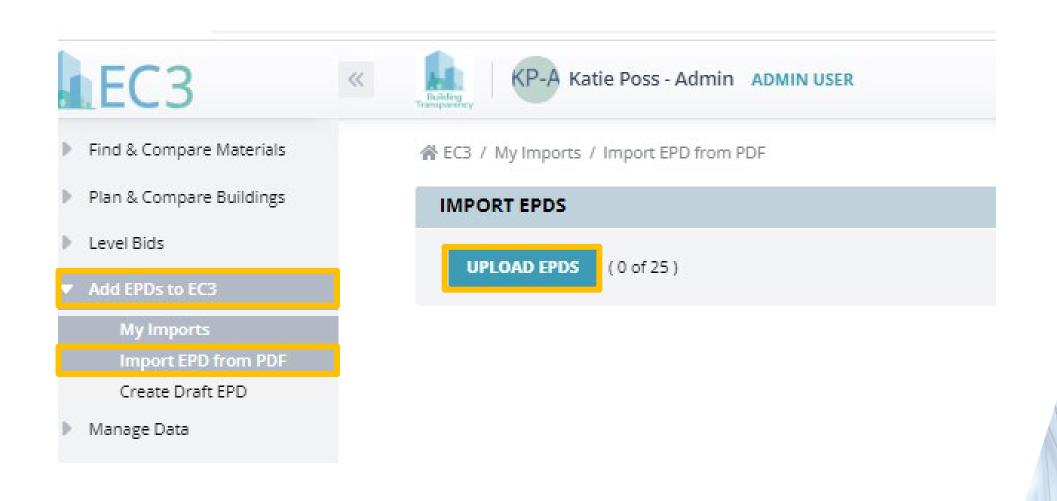


What if I can't find the EPD for a product used on my project?





How to add an EPD to EC3







Internal Resources (1 of 2)

- <u>Implementation Memo for IRA Section 70006(1)</u> The memo from Dr. Forbes announces FEMA's implementation of IRA Section 70006 under PA. The memo explains PA's responsibilities under the IRA and includes definitions that relate to the IRA.
- 2022-2026 FEMA Strategic Plan The Strategic Plan highlights FEMA's commitment to climate resiliency. Goal 2, Lead Whole of Community in Climate Resilience, focuses on this commitment and provides guidance for FEMA staff on climate issues being addressed by FEMA.
- <u>FEMA Resources for Climate Resilience</u> This document offers a description of available FEMA resources to be used in planning for, response to, recovery from, and mitigation against the adverse impacts of climate change.



Internal Resources (2 of 2)

- <u>FEMA and the Changing Climate</u> The enclosed messages are key to building a climate literate FEMA workforce. These foundational messages complement existing programmatic outreach and will inform FEMA staff of climate related talking points.
- <u>FEMA Climate Foundational Messaging</u> This fact sheet provides topline messaging on climate change from the unique FEMA emergency management perspective.
- 2022 National Preparedness Report This report presents preparedness data and underscores the challenges that emergency managers face in addressing a continuously expanding risk environment triggered by climate issues. Emergency managers can look to this report to help support decisions about program priorities, resource allocations and community actions.
- Building a Clean, Climate-Resilient Economy through FEMA's Grant Programs | FEMA.gov –
 Webpage which outlines FEMA's low-carbon materials funding initiatives under IRA Section 70006 and how they support the Federal Buy Clean Initiative.





Frequently Asked Questions (1 of 2)

Am I expected to become an expert on low-carbon materials?

No, FEMA PA staff are NOT technical experts on low-carbon materials, and we do not expect FEMA PA staff to become technical experts. In support of IRA Implementation, FEMA staff will provide information on services and materials available through the PA process to assist Applicants in their climate resiliency efforts. This includes ensuring applicants have access to all Low Carbon Materials Resources, links, and information (through the 1 pager). The terminology around climate may be new to FEMA staff. There are many resources available to support learning about this topic.

Will there be changes to GM due to the Inflation Reduction Act implementation?

A policy flag has been added to Grants Manager for the PDMG to add to the damage line item where low-carbon materials are being claimed.



Frequently Asked Questions (2 of 2)

Will we be receiving further training on IRA or low-carbon materials?

If there are any other changes or implementations to IRA Section 7006 that affect FEMA PA additional information will be provided at that time.

FEMA PA field leadership is looking into providing event specific IRA Section 7006 training opportunities, you will be notified by your leadership if and when these occur.

I still have questions about the IRA, low-carbon materials, or how this changes what I am supposed to do. Who can I ask?

If you still have additional questions after reviewing the materials, and additional resources that were provided ask your leadership as its possible others may have the same questions. Or you can email the mailbox on the next slide.



Contact Information for IRA Implementation

FEMA-IRA-Implementation@fema.dhs.gov



