

EC3 Tool

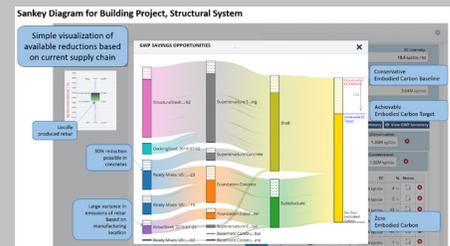
Embodied Carbon in Construction Calculator (EC3) Tool

Key Features of the EC3 Tool

1

Plan and Compare Buildings Feature

Simple visualization of your project's potential and realized embodied carbon emissions, with the ability to see conservative baselines and set achievable reduction targets.



2

Find and Compare Materials Feature

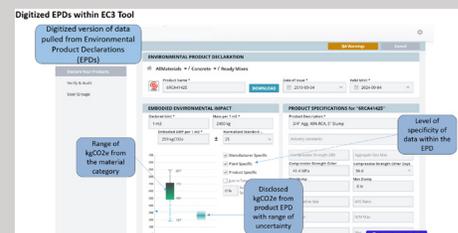
Simple sorting and visualization of material supply chain EPD and embodied carbon data, with the ability to see material category baselines and set material category reduction targets.



3

Declare Your Product Feature

Digitized EPD platform and EPD automation



Highlights:

The EC3 Tool Provides ...

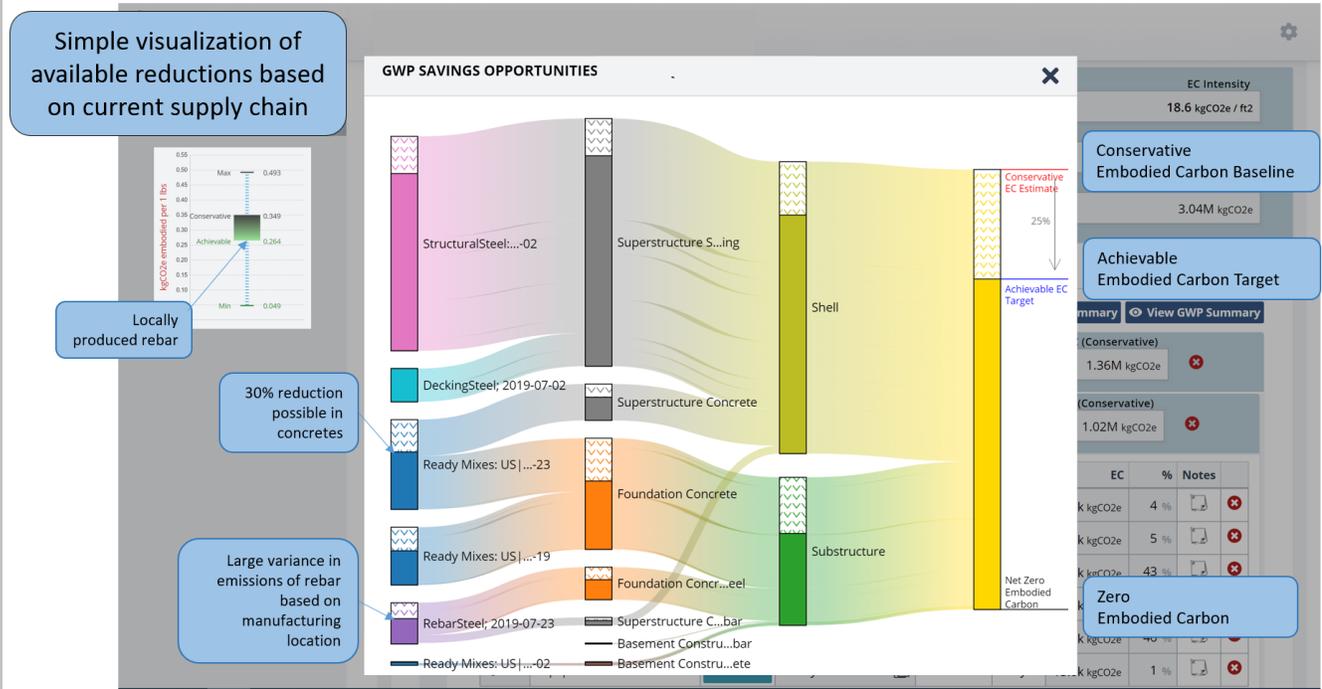
- » Actionable information about embodied carbon in construction
- » A free, easy-to-use database of construction materials and their environmental impacts
- » Achievable targets for embodied carbon based on your geography, performance requirements and material selections
- » Target specifications for low or zero added material cost
- » Transparency in methods and material data
- » Client-data confidentiality



Sign Up Today

Visit <https://buildingtransparency.org> and register to access the EC3 tool.

Sankey Diagram for Building Project, Structural System



1

Simple visualization of your project's potential and realized embodied carbon emissions, with the ability to see limits and set targets.

The Plan and Compare Buildings feature in the Building Planner, allows a user to create a project and input specific information about that project (Name, location, stage of development, square footage, and more). Additional user features include:

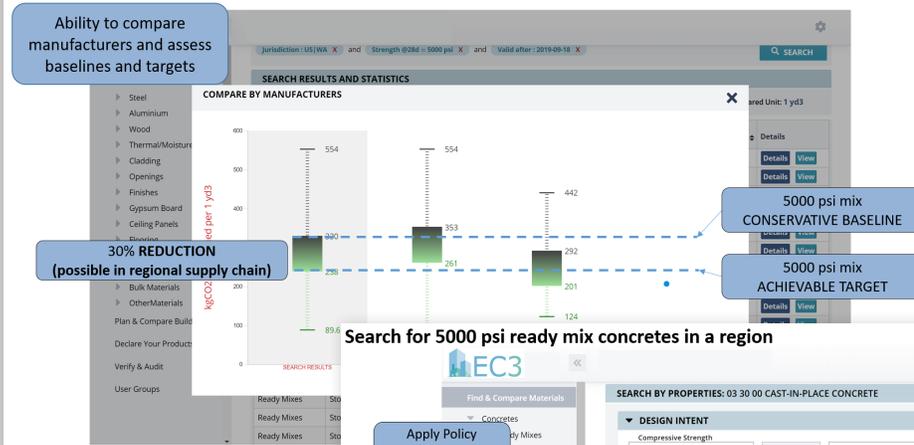
- » The user can input project material quantities by hand, utilizing construction estimates or via import of project BIM models. The tool currently works with Autodesk's BIM 360 modelling software and will be expanded to interface with others, such as Tally.
- » The user can then select "search" to enter into the Find and Compare Materials feature directly from the Building Planner to create the project's embodied carbon estimate.
- » Users can set project specific reduction targets, and after products have been procured, select utilized products to document the project's actual reductions against the targets set.

All of the above is visualized in the project's Sankey Diagram, a simple graphic representation of the project's embodied carbon baseline estimate, reduction target and as-built results. This visualization can be utilized as the mechanism for reporting to a project's Owner, the ILFI and LEED certification systems' embodied carbon imperatives and credit or as response to policies such as Buy Clean California.

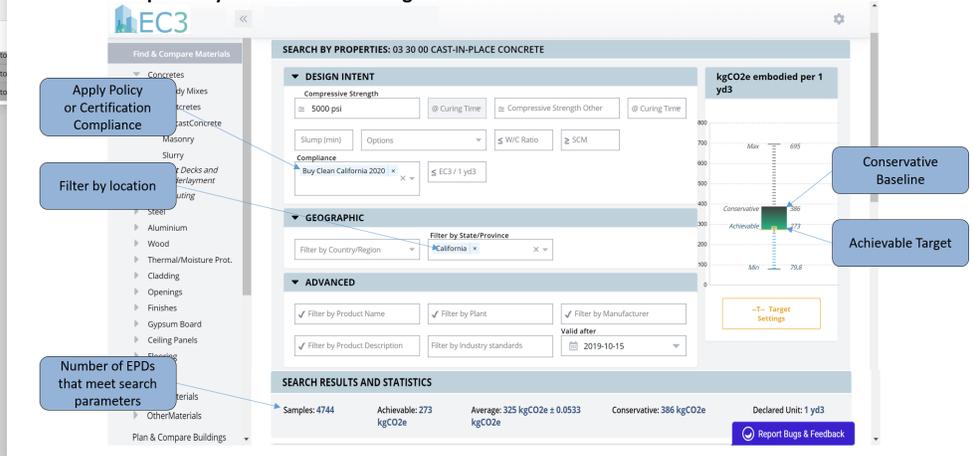
Also, from the Plan and Compare Buildings landing page, as well as within the Building Planner for a specific project, users can select multiple projects (up to four from the landing page and two within the Building Planner) to compare to each other. This can inform trends in a particular project type or show comparative changes across different milestones of one project.

EC3 Tool

Comparison of 5000 psi ready mix concretes in a region



Search for 5000 psi ready mix concretes in a region



2

Simple sorting and visualization of material supply chain EPD and embodied carbon data, with the ability to see material category baselines and set material category reduction targets.

Initially, the Find and Compare Materials feature allows a user to search within the nine material categories: Concrete, Steel, Wood, Glass, Aluminum, Insulation, Gypsum, Carpet and Ceiling Tiles. Within each material category, a user can search by material specific performance characteristics, location, and custom items such as manufacturer name, product description, etc. The tool will return all material EPDs that meet the user's search criteria. The list can then be filtered and sorted further by such criteria as manufacturer name, plant name, product description, kgCO₂e.

Additional user features include:

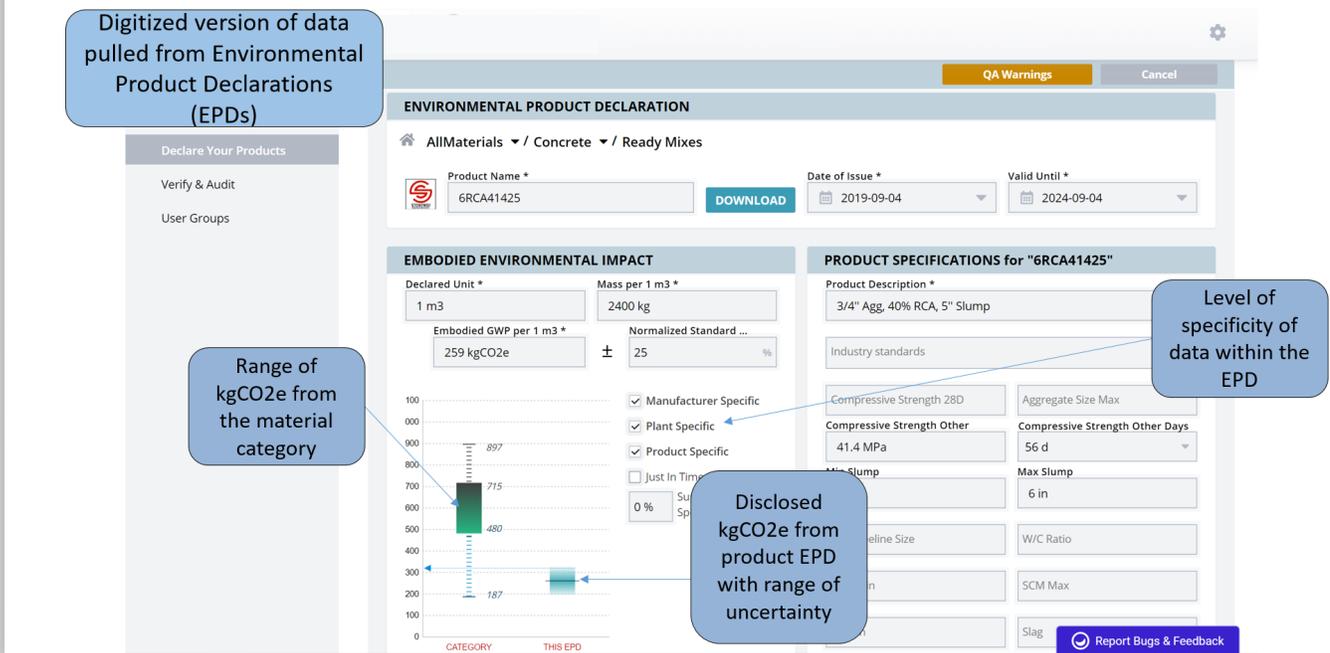
- » The tool presents the overall range of embodied carbon emissions to the user in a whisker plot, demonstrating the full range of low to high emissions reported in kgCO₂e per functional unit in the EPDs.
- » The EC3 tool demonstrates a material's baseline established by the Carbon Leadership Forum, along with a conservative search specific threshold at the 80th percentile (i.e. 20% of EPDs returned have a kgCO₂e higher than the conservative limit) and a 20th percentile achievable target (i.e. 20% of EPDs returned have a kgCO₂e lower than the achievable target).

- » There is a function to compare manufacturers in a chart that demonstrates each manufacturer's range of emissions in comparison to the baseline and target of the search as well as to each other. This allows users to understand which manufacturers or suppliers currently have the lowest embodied carbon options that meet their search criteria as well as which manufacturers currently have EPDs.
- » Users can click to view a specific product EPD to find out more details, as well as open the EC3 tool's digital version of the EPD in a separate browser window and select to download a pdf of the full EPD for their own reference and use.

When utilizing the Find and Compare Materials feature in the Building Planner, the user's search parameters are utilized to assign the range of emissions reduction potential for the project level embodied carbon estimate.

EC3 Tool

Digitized EPDs within EC3 Tool



ENVIRONMENTAL PRODUCT DECLARATION

AllMaterials ▾ / Concrete ▾ / Ready Mixes

Product Name * 6RCA41425 **DOWNLOAD** Date of Issue * 2019-09-04 Valid Until * 2024-09-04

EMBODIED ENVIRONMENTAL IMPACT

Declared Unit * 1 m3 Mass per 1 m3 * 2400 kg

Embodied GWP per 1 m3 * 259 kgCO2e Normalized Standard ... ± 25 %

PRODUCT SPECIFICATIONS for "6RCA41425"

Product Description * 3/4" Agg, 40% RCA, 5" Slump

Industry standards

Compressive Strength 28D Aggregate Size Max

Compressive Strength Other 41.4 MPa Compressive Strength Other Days 56 d

Max Slump 6 in

W/C Ratio

SCM Max

Slag

Range of kgCO2e from the material category

Disclosed kgCO2e from product EPD with range of uncertainty

Level of specificity of data within the EPD

3

Digitized EPD platform and EPD automation

The Declare Your Products feature enables EPDs to move from PDF documents to digitally stored data that can be optimized, automated and transferred via API's. Within this feature, the EC3 tool has created a standard format for EPD data to be documented.

Additional user features include:

- » Manufacturers and Program Operators can manually type in the data from the Declare Your Products page
- » Program Operators can verify that the data is accurate and modify it if necessary

- » Users can view the digital EPDs in lieu of downloading a multipage PDF and having to dig through pages of data to find the information they are looking for.
- » The digital EPD also displays the EC3 methodology documented in the published and public Material Category Reports to enable everyone to view and understand the level of potential variability within an EPD based on the sources and transparency of the data provided. For example: "is it average of facility specific data?"



This EC3 Tool *Key Features* document has been brought to you by the Carbon Leadership Forum. The Carbon Leadership Forum incubated the EC3 tool project to accelerate its development and provide optimal industry collaboration.

Who We Are

- The Carbon Leadership Forum is accelerating transformation of the building sector to radically reduce the embodied carbon in building materials and construction.
- We are pioneering research, creating resources, fostering cross-sector collaboration, and incubating member-led initiatives to bring embodied carbon emissions of buildings down to zero.
- We are architects, engineers, contractors, material suppliers, building owners, and policymakers who care about the future and are taking bold steps to eliminate embodied carbon from buildings and infrastructure.

Learn More

For more information on the Carbon Leadership Forum, its programs and initiatives, including the EC3 tool, visit www.carbonleadershipforum.org

Resources and links include:

Video: Bill Gates on manufacturing emissions

World Green Building Council report 'Bringing Embodied Carbon Upfront'

Embodied Carbon Facts and Figures

EC3 Tool: User Benefits

EC3 Tool: Key Features EC3 Tool: FAQ

EC3 Tool: Primer for AEC Professionals