Reducing the Carbon Footprint of Every Building.
Over the next 35 years, two trillion ft$^2$ of new and rebuilt buildings will be constructed in cities worldwide.

An entire New York City every 35 days for 35 years!
Understanding Carbon

**Embodied Carbon**
Manufacture, transport and installation of construction materials

**Operational Carbon**
Building Energy Consumption
Total Carbon Emissions of **Single Building**

*Global Average Building Carbon Footprint: Business as Usual*

- **Embodied Carbon**: +/-50%
- **Operational Carbon**: +/-50%

Understanding Carbon

Your Project
Project Location

55,000 tons of CO2

16% operational
84% embodied
(over 30 year lifecycle)

= 

Or... a flying for 70 days
Or... 10,762 driving for 1 year
Or... 172,897 of crude oil
Understanding Carbon
Supply chain emissions reduction.

**Wish List**

- Available to Everyone
- Easy to Use
- Free to Use
- Open & Transparent Data Source
- Open API (willing/able to share data with other tools)
- Focused on Supply Chain Accountability

**Embodied Carbon Reduction Tool** (Supply Chain Specific)

**EC3**

Embodied Carbon in Construction Calculator
Kg CO2e from Environmental Product Declarations

*current database holds over 22,000 epds
Embodied Carbon Benchmarking Study

2019

MATERIAL QUANTITY ESTIMATE

EMBODIED CARBON PER MATERIAL EPDs

BUILDING EMBODIED CARBON (EC) ESTIMATE

_**Life Cycle Impact Results (per m²)**_
Declared Unit: 1 m² of 10,000 psi concrete at 28 days

**OPERATIONAL IMPACTS**
- Plant Operating Energy (MJ): 38.6
- On-Site Plant Fuel Consumption (MJ): 11.1
- Concrete Batch Water (m³): 1.68E-01
- Concrete Wash Water (m³): 1.91E-02
- On-Site Waste Disposal (kg): 0.0

**ENVIRONMENTAL IMPACTS**
- Total Primary Energy (MJ): 3,017
- Climate Change (kg CO₂-eq): 445
- Ozone Depletion (kg CFC-11 eq): 1.17E-08
- Acidification Air (kg SO₂-eq): 2.96
- Eutrophication (kg N eq): 0.09
- Photochemical Ozone Creation (kg O₃ eq): 0.61

**BUILDING EMBODIED CARBON (EC) ESTIMATE**

**CARBON SMART ESTIMATING**
Building Material Quantities from Construction Estimates, BIM models and Tally

Into EC3
Kg CO2e from Environmental Product Declarations

The EC3 tool version v-17.1.2_b-1161 is in Public Beta, and continues to be developed with a broad range of stakeholders. To learn about, discuss, help define, and improve the EC3 tool, visit our EC3 Community Forum.

The Carbon Query Database is Online and contains:

- 22,289 Product Specific EPDs
- 432 Industry EPDs
- 317
- 196
- 163
- 83
- 81
- 40
- 39
Sankey Diagram for Building Project, Structural System

Simple visualization of available reductions based on current supply chain

Locally produced rebar

30% reduction possible in concretes

Large variance in emissions of rebar based on manufacturing location

2019 CLF Baseline

Achievable Embodied Carbon Target

Zero Embodied Carbon

Key Features
Search for 5000 psi ready mix concretes in a region

**Design Intent**
- Compressive Strength: 5000 psi
- Curing Time
- Compressive Strength Other
- Slump (min)
- Options
- W/C Ratio
- SCM

**Geographic**
- Filter by State/Province: California

**Advanced**
- Filter by Product Name
- Filter by Plant
- Filter by Manufacturer
- Filter by Product Description
- Filter by Industry standards

**Search Results and Statistics**
- Samples: 4744
- Achievable: 273
- Average: 325 kgCO2e ± 0.0533
- Conservative: 386 kgCO2e
- Declared Unit: 1 yd3

**Policy or Certification Compliance**
- Apply Policy or Certification Compliance

**Filter by Location**
- Filter by location

**2019 CLF Baseline**
- Conservative 80% Benchmark
- Achievable 20% Target

**Number of EPDs that meet search parameters**
- Number of EPDs that meet search parameters
## Comparison of 5000 psi ready mix concretes in a region

### Key Features

- **Supplier A**
  - 2019 CLF BASELINE
  - 5000 psi mix
  - CONSERVATIVE BASELINE
- **Supplier B**
  - 5000 psi mix
  - ACHIEVABLE TARGET
- **Supplier C**
  - 5000 psi mix

### Ability to compare manufacturers and assess baselines and targets

| Supplier  | Jurisdiction | Strength @28d | Valid after | kgCO2e
|-----------|--------------|---------------|-------------|---------|
| Supplier A | US | 5000 psi | 2019-09-18 | 89.6
| Supplier B | WA | 5000 psi | 2019-09-18 | 261
| Supplier C | | 5000 psi | | 124

### 30-50% REDUCTION

(possible in regional supply chain)
Market Transformation

**Pilot Users**

- 3500 Active Users
- 3000 Waitlist
- 2500 Pilot Users
- 2000
- 1500
- 1000
- 500

**Waitlist**

Nov 2018 to Nov 2019 (1 year)

**Public Launch**

Nov 2019 to Jan 2020 (6 weeks)
Assess market for EPD adoption. Use EC3 data to inform procurement and selection.
30% reduction in CO2 emissions
JUST BY having data and ASKING.