



**One Click LCA  
præsenteret af:**



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Business Developer  
Danmark

## Hvad skal vi gennemgå?

- Kort introduktion til **One Click LCA**
- Tidlig fase design: **Carbon designer 3D**
- Bygnings LCA med one click: **BR18 værktøjet**
- Find og vurder materialevalg hurtigt: **Materials Compass**

# VERDENS FØRENDE LCA-SOFTWARE TIL BYGGERI OG PRODUKTION



## BYGGERI



LCA, Carbon, LCC

## INFRASTRUKTUR



LCA, Carbon

## PRODUKTION



LCA & EPDs



## OPERATIONS



#1 WORLDWIDE 140+ COUNTRIES ALL GLOBAL DATA 20+ INTEGRATIONS 200+ STAFF 20+ YEARS

# STØTTER DEN GLOBALE AEC SEKTOR I DEKARBONISERING

## Ingeniører

AECOM RANBOLL Foster + Partners GRIMSHAW

Stantec ARUP Integral KPF SOM BDP.

ARCADIS SWECO MVRDV BIG WPP

ATKINS HOK AREP white TENGBOOM

Turner & Townsend 3XN GXN JJ&W STANTON WILLIAMS KROOK & TJÄDER

TRACTEBEL ENGIE dar group David Morley Architects Cobe sinto

ELAN ARTELIA BUROHAPPOLD ENGINEERING SNØHETTA DESIGN CUNDALL

bopro elioth. WARREN AND MAHONEY MOTT MACDONALD HGA COWI

AFRY LDN Architects Holmes Consulting

MAX FORDHAM wsp IBI GROUP Paladino

## Arkitekter

## Konsulenter

pwc

ISG

JLL

CBRE

ARGH

Cobe

CUNDALL

COWI

CONSELLIEN IMMOBILIEN

SOBOTEC

## Byggeherre

SKANSKA

VINCI

Turner

Aveco de Bondt ingenieursbedrijf

CUSHMAN & WAKEFIELD

HENT

NCC

mace

EIFFAGE

VEIDEKKE

## Investorer

GROSVENOR

VASAKRONAN

HENT

STRABAG

YIT

LAING O'Rourke

VELUX

EllisDon

KIER

STANHOPE

## Institusjoner

wbcd

bre cen

European Bank for Reconstruction and Development

JRC EUROPEAN COMMISSION

BONAVA VÄYLÄ

CASTELLUM

CONFEDERATION OF FINNISH CONSTRUCTION INDUSTRIES

SEGRE

Ympäristöministeriö Ministry of the Environment

CNCA SYKE

# STØTTER PRODDUCENTER I DEKARBONISERING



**One Click LCA's** filosofi bygger på data, gennemsigtighed og at fremme omstillingen til bæredygtighed.

Vi tilbyder certificerede, compliant, **automatiserede og skalerbare digitale værktøjer**, der skaber en stærk forbindelse mellem bygge- og produktionsindustrien..

# Hvad er de nye klimakrav i danmark?

## Ny aftale – Maj 2024

Tabel med grænseværdier:

Klimakrav for bygninger	2025	2027	2029
Feriebolig under 150 kvm.	4,0	3,6	3,2
Enfamiliehuse, rækkehuse, tinyhouses og ferieboliger over 150 kvm.	6,7	6,0	5,4
Etageboliger	7,5	6,8	6,1
Kontorbygninger	7,5	6,8	6,1
Institutioner	8,0	7,2	6,4
Andet nybyggeri, f.eks. butikker, lagerhaller og parkeringshuse	8,0	7,2	6,4

## Udvidet Omfang

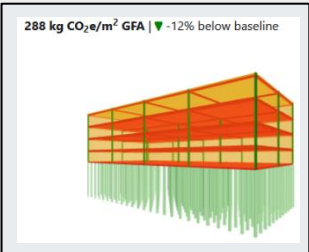
Uopvarmede bygninger over 50 m<sup>2</sup>, fx parkeringshuse og lagerbygninger, og ferieboliger vil også skulle leve op til en grænseværdi for CO<sub>2</sub>e-udslip.

Tilbygninger til bl.a. etageboliger, kontorbygninger og institutioner vil være omfattet af grænseværdien. For enfamiliehuse, rækkehuse, tiny houses og feriboliger omfattes tilbygninger over 250 m<sup>2</sup>.

## Separat grænseværdi for byggepladsen

Der fastsættes en grænseværdi på 1,5 kg CO<sub>2</sub>e/m<sup>2</sup>/år for den klimapåvirkning, der opstår fra transport til, fra og på byggepladsen samt fra energi- og brændselsforbrug og materialespild på byggepladsen.

# Optimer og lever pålidelige klimadata gennem hele processen



**Carbon Designer 3D**

Identify the most optimal approach for your project and set a carbon budget

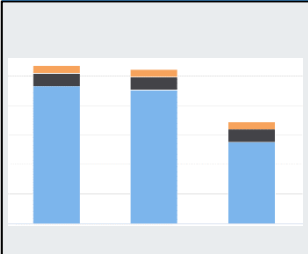
**Parametric / energy**

Incorporate LCA seamlessly into energy optimization or parametric design tools

**BIM / BoQ / web**

Automate LCAs using your digital tools, or using our web interface

**Specify and compare**



Compare and choose any manufacturer's products, or leverage generic datasets

**Carbon Strategy**

Deliver reliable data to support your clients' reporting requirements

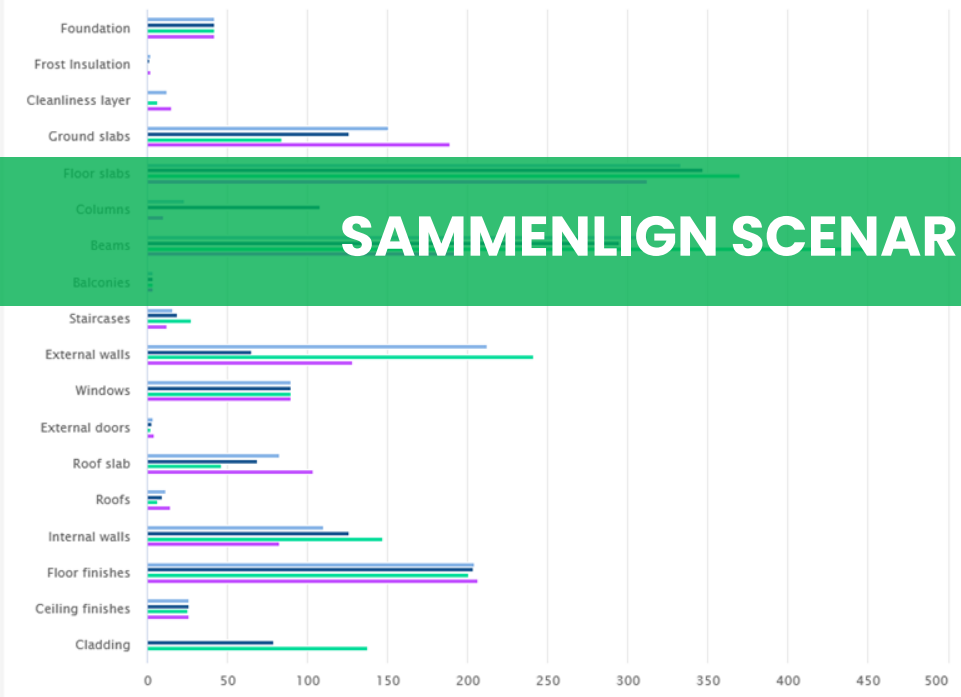


# Carbon footprint, Tn CO<sub>2</sub>e

By Element | By Material | By Classification | Total

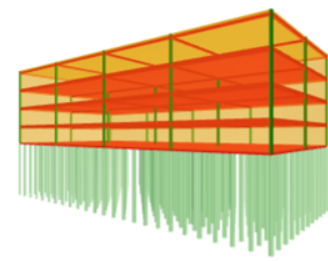
- ✓ Design A **Baseline**  
327 kg CO<sub>2</sub>e/m<sup>2</sup> GFA
- ✓ Design B | ▼ -1% below baseline  
323 kg CO<sub>2</sub>e/m<sup>2</sup> GFA
- ✓ Design C | ▲ +15% above baseline  
377 kg CO<sub>2</sub>e/m<sup>2</sup> GFA
- ✓ Design D | ▼ -12% below baseline  
288 kg CO<sub>2</sub>e/m<sup>2</sup> GFA

### Carbon footprint Tn CO<sub>2</sub>e – By Element

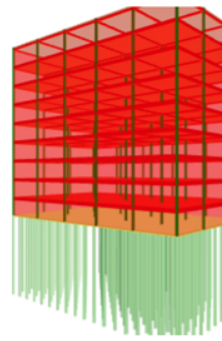


# 3D View

Design D  
288 kg CO<sub>2</sub>e/m<sup>2</sup> GFA | ▼ -12% below baseline



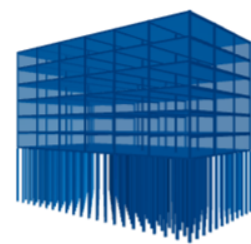
Design C  
377 kg CO<sub>2</sub>e/m<sup>2</sup> GFA | ▲ +15% above baseline



# SAMMENLIGN SCENARIER INDEN DU TEGNER

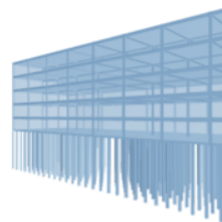
Transparency  Carbon view

Design B  
323 kg CO<sub>2</sub>e/m<sup>2</sup> GFA | ▼ -1% below baseline



Transparency

Design A  
327 kg CO<sub>2</sub>e/m<sup>2</sup> GFA **Baseline**



Transparency  Carbon view

Transparency

# CARBON DESIGNER 3D

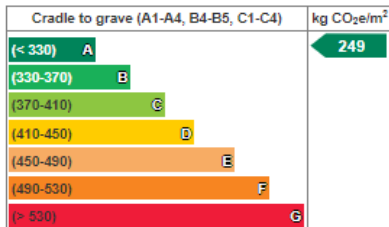


## General information

### Results and benchmarking - Design: 2 - Demo Apartment

Select design ▾

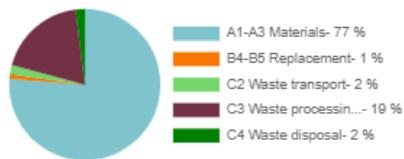
#### Embodied carbon benchmark



Nordics apartment building - 2023 Q3

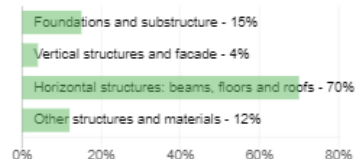
Download as image

#### Embodied carbon by life-cycle stage



Download as image

#### Embodied carbon by structure - A1-A3



Download as image

### Design phase: 9 designs (8 hidden designs)

Parameters ▾

+ Add a design

Compare data (17)

Carbon Designer 3D ▾

Tools ▾

Tool

Unit

LCA according to Byggningsreglementet  
z - Demo Apartment ▾

LCA according to Byggningsreglementet

kg CO<sub>2</sub>e

5,08

Carbon Heroes Benchmark

kg CO<sub>2</sub>e/m<sup>2</sup>

249



## Graphs LCA according to Byggningsreglementet, Global warmi...

# CARBON DESIGNER 3D



Carbon Designer 3D LCA according to Bygningsreglementet - Building LCA Demo - Jakob



## 1 - Create a design

### Building information

Enter the general building information

Design name	<input type="text" value="BIM Forum 2024"/>
Reference building	<input type="text" value="Danish (Bygningsreglementet) reference building v2024.1"/> ▼
Building type	<input type="text" value="Apartment building"/> ▼
Gross floor area (GFA) ▼	<input type="text" value="1500"/> m <sup>2</sup>
Calculation period ▼	<input type="text" value="50"/> years

# CARBON DESIGNER 3D



1

Create a design

2

Define the scope

## 2 - Define the scope

### Building parts

Select the building parts you want to work with

- Foundations ^  
Includes Foundations, Frost Insulation, Cleanliness layer
- Ground slab ^  
Includes Ground slabs
- Structure ^  
Includes Floor slabs, Columns, Shear walls, Diagonal wind bracings, Connecting parts, Beams, Secondary beams, Load bearing internal walls, Balconies, Staircases
- Enclosure ^  
Includes Underground walls, External walls, Cladding, Windows, External doors, Roof slab, Roofs
- Finishes ^  
Includes Internal walls, Floor finishes, Ceiling finishes, Internal wall finishes
- Services ^  
Includes Elevators

Number of above ground floors

Number of underground heated floors

Number of underground unheated floors

### Building structure

Define the structural frame and foundation options for your building

Structural frame

# CARBON DESIGNER 3D

1

Create a design

2

Define the scope

3

Calculate the geometry

4

Apply a template

## 3 - Calculate the geometry

3D model

Step 3 of 4

Previous

Calculate areas

### Building dimensions

Verify and edit the building dimensions

Height (above ground) ▾

12 m

Width ▾

26,9 m

Depth ▾

12,2 m

Internal floor height ▾

2,7 m

Maximum column spacing distance ▾

7,5 m

Number of staircases ▾

1

Total number of floors ▾

5

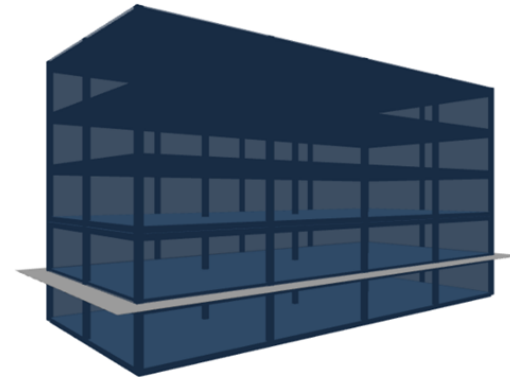
Gross internal floor area (GIFA) ▾

1362,8 m<sup>2</sup>

### Additional building dimensions

Verify and edit additional building dimensions ▾

BIM Forum 2024



# CARBON DESIGNER 3D



BIM Forum 2024 **Baseline** x BIM Forum 2024 Design 2 x

### Carbon footprint, Tn CO<sub>2</sub>e

By building part | By Material | Total

BIM Forum 2024 **Baseline** 259 kg CO<sub>2</sub>e/m<sup>2</sup> GFA  
BIM Forum 2024 Design 2 224 kg CO<sub>2</sub>e/m<sup>2</sup> GFA | ▼ -14% below baseline

#### Carbon footprint Tn CO<sub>2</sub>e - By building part

Building Part	Carbon Footprint (kg CO <sub>2</sub> e/m <sup>2</sup> GFA)
Foundations	12
Frost insulation	1
Cleanliness layer	1
Ground slabs	45
Floor slabs	88
Columns	1
Connecting parts	1
Beams	8
Balconies	1
Staircases	1
Underground walls	28
External walls	22
Cladding	5
Windows	15
External doors	1
Roof slab	15
Roofs	1
Internal walls	48
Floor finishes	40
Ceiling finishes	5
Internal wall finishes	25
Elevators	12

### 3D View

3D model(s)

BIM Forum 2024 **Baseline** 259 kg CO<sub>2</sub>e/m<sup>2</sup> GFA  
BIM Forum 2024 Design 2 224 kg CO<sub>2</sub>e/m<sup>2</sup> GFA | ▼ -14% below baseline

Transparency 40% | Carbon impact (%) | Transparency 40% | Carbon impact (%)

# BR18 VÆRKTØJ

▼ Graphs LCA according to Bygningsreglementet, Global warmi...

Showing: 2 / 2 Designs

Classification

Change tool and impact category

All impact categories

**Life-cycle stages**

Elements

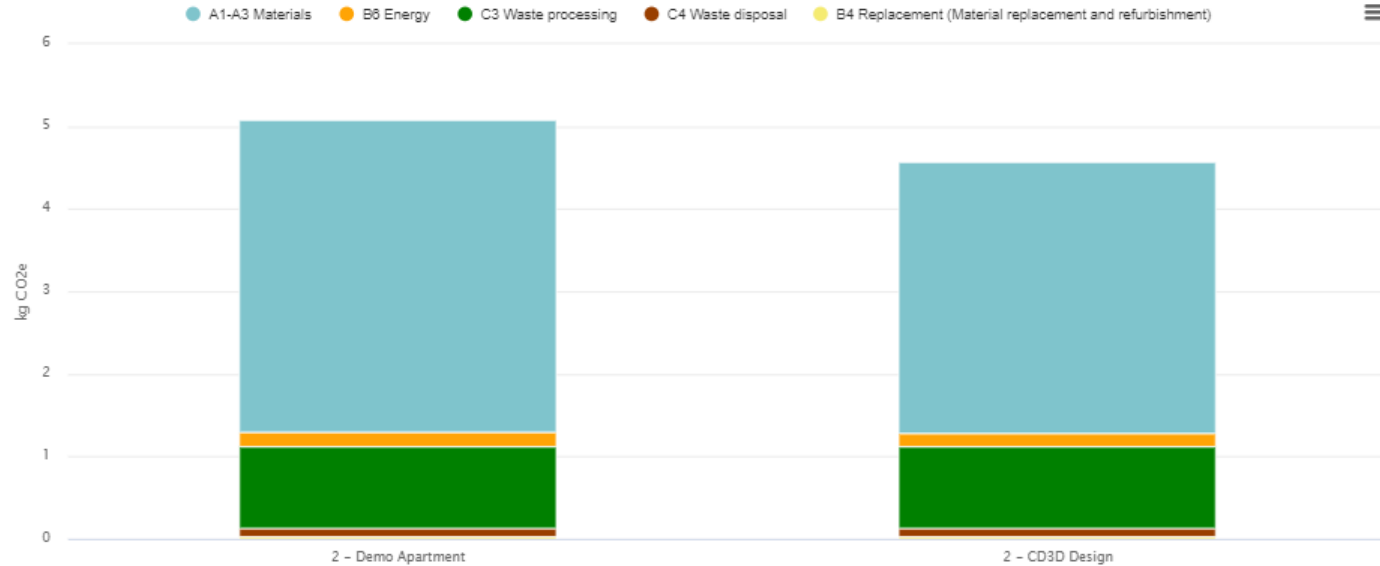
Compare elements

Elements and life-cycle stages

All graphs



## LCA according to Bygningsreglementet - Global warming, kg CO<sub>2</sub>e - Life-cycle stages



# BR18 VÆRKTØJ

Main > Building LCA Demo - Jakob > CD3D Design > LCA according to Bygningsreglementet > Input data : Building materials

Cancel Save

## CD3D Design

Building materials ✓ Energy consumption, annual ✓ Calculation period ✓ Building area

Clear Material  Country  Filter:  Data source  Filter:  Type  Filter:  Upstream  Filter:  CO2e  Unit  Filter:

- Asphalt
- Bricks and ceramics
- Cement, binders and additives
- Coatings and pastes
- Construction site operations
- Constructions
- Doors, windows and partitioning systems
- Earth, masses and stones
- Flooring
- Glass
- Gypsum and plaster
- Installations and systems
- Insulation
- Plastics, membranes and roofing
- Precast concrete

### Completeness

### 1. Foundations and

Materials in the foundations will

### Foundation, sub-surface, b

Start typing or click the arrow

### Resource

all materials lumped together, or on separate rows for example by type of structure. Unless instructed otherwise, use gross amounts (incl. losses). Materials can be added in any section.

cker (-)

g CO<sub>2</sub>e - 14 %

nt period length (except for RE2020 and FEC tools). For BREEAM UK Mat 1 IMPACT equivalent provide the data for site excavation fuel use here, choose resource Excavation works.

Compare answers Create a group Move materials Add to compare

- Very low
- Low
- Average
- High
- Very high

	CO <sub>2</sub> e	Comment	Company Classification	SfB system	Service life	EOL Process	Reused material	
Frost insulation	60.0 m	0.02kg - 0.4%	Frost insulation	No classification	Fundamenter (12)	Data by constituent	Data by constituent	<input type="checkbox"/> change
Concrete sandwich element	173.0 m <sup>2</sup>	0.41kg - 0%		No classification	Fundamenter (12)	Data by constituent	Data by constituent	<input type="checkbox"/> change
Tagpap, bitumen undermembran	173 m <sup>2</sup>	-0kg - 0.2%	Waterproofing for underground	No classification	Fundamenter (12)	20	Use EOL defined in EPD	<input type="checkbox"/>
Fabriksbeton C45/55	15.57 m <sup>3</sup>	0.14kg - 3%		No classification	Fundamenter (12)	As building	Use EOL defined in EPD	<input type="checkbox"/>
Ameringsnet	1223.45 kg	0.02kg - 0.4%	Estimated that walls have 85 (70-	No classification	Fundamenter (12)	As building	Use EOL defined in EPD	<input type="checkbox"/>
EPS isolering til lofter / gulve og	32.87 m <sup>3</sup>	0.11kg - 2%	Lambda = 0.031 W/mK, 16	No classification	Fundamenter (12)	As building	Use EOL defined in EPD	<input type="checkbox"/>
Fabriksbeton C45/55	13.84 m <sup>3</sup>	0.12kg - 3%		No classification	Fundamenter (12)	As building	Use EOL defined in EPD	<input type="checkbox"/>
Ameringsnet	1176.4 kg	0.02kg - 0.4%	Estimated that walls have 85 (70-	No classification	Fundamenter (12)	As building	Use EOL defined in EPD	<input type="checkbox"/>
Footing foundation	1000.0 m <sup>2</sup>	0.18kg - 4%		No classification	Fundamenter (12)	Data by constituent	Data by constituent	<input type="checkbox"/> change



# BR18 VÆRKTØJ

Main > Building LCA Demo - Jakob > CD3D Design > LCA according to Bygningsreglementet > Input data : Building materials

Cancel Save

## CD3D Design

### Building materials

Energy consumption, annual ✓ Calculation period ✓ Building area ✓



Material

Filter: [v]

Country

Filter: [v]

Fill in the material consumptions by material type. You may fill in all materials lumped together, or on separate rows.

### Completeness (%) and plausibility checker (-)

#### 1. Foundations and substructure 0.64 kg CO<sub>2</sub>e - 14 %

Materials in the foundations will never be replaced, no matter assessment period length (except for RE2020 and FEC tools). For more information, see the help page.

Foundation, sub-surface, basement and retaining walls Compare answers Create a group

concrete facade

LOCAL MANUFACTURER SPECIFIC DATA (6) - Use for specific local product or for the closest alternative

- Precast concrete facade element with EPS insulation, 510 mm, 536 kg/m<sup>2</sup> (Dan-Element A/S) - EPD Danm...
- Precast concrete sandwich wall element with EPS insulation, insulation 250 mm, wall 200 mm, facade pan...
- Precast concrete sandwich wall elements with EPS insulation, insulation 225 mm, wall 185 mm, facade pa...
- Precast concrete sandwich wall elements with EPS insulation and facade panel, Insulation: 225 mm, wall: ...
- Precast concrete sandwich wall elements with mineral wool insulation, insulation 225 mm, wall 185 mm, fa...
- Precast concrete sandwich wall elements with mineral wool insulation and facade panel, Insulation: 225 m...

Material	Volume	Weight	Percentage	Properties
EPS isolering til lofter / gulve og ?	32.87 m <sup>3</sup>	0,11kg	- 2%	Lambda = 0,031 W/mK, 16
Fabrikabeton C45/55 ?	13,84 m <sup>3</sup>	0,12kg	- 3%	
Ameringsnet ?	1176,4 kg	0,02kg	- 0,4%	Estimated that walls have 85 (70-
Footing foundation ?	1000,0 m <sup>2</sup>	0,18kg	- 4%	

EPD



Precast concrete facade element with EPS insulation, 510 mm, 536 kg/m<sup>2</sup> (Dan-Element A/S) ☆

Add to input Add to compare Download EPD

Show empty rows

#### General information

Country Denmark

Manufacturer Dan-Element A/S

Material type Concrete wall elements

#### Datapoint background information

#### Description

Deklareret produkt er 1 m<sup>2</sup> sandwichelement/facadeelement, bestående af bagmur, isolering, og facadeplade, med 14,4% udsparinger. Yderligere information om produktet: Facadeelement med EPS

#### Technical characteristics

#### Environmental profile

#### Default scenarios and assumptions

#### Other

Upstream Filter: [v]

CO<sub>2</sub>e Filt... [v]

Unit Filt... [v]

Materials can be added in any section. Material selection help.

Excavation works.

#### EOL Process

Data by constituent  change

Data by constituent  change

Use EOL defined in EPD

Use EOL defined in EPD

Use EOL defined in EPD

Use EOL defined in EPD

#### Reused material

change

change

change

## CD3D Design - LCA according to Bygningsreglementet [Project basic information](#)

### ▼ Results

#### Life-cycle assessment results according to Bygningsreglementet [Download Results Summary](#)

Result category	Global warming kg CO2e ⓘ
A1-A3 ⓘ Construction Materials	3,25 <a href="#">Details</a>
B4 ⓘ Material replacement and refurbishment	0,04 <a href="#">Details</a>
B6 ⓘ Energy consumption	0,17 <a href="#">Details</a>
C3 ⓘ Waste processing	1 <a href="#">Details</a>
C4 ⓘ Waste disposal	0,09 <a href="#">Details</a>
D1 ⓘ Benefits from reuse and recycling (module D)	-1 <a href="#">Details</a>
<b>Total</b>	<b>4,54</b>

All results are displayed per year per area of the building.

#### › Completeness (-) and plausibility checker (grade: B)

#### › Most contributing materials (Global warming)

#### ▼ Graphs

Classifications: [Company Classification](#)

# MATERIAL COMPASS

### Filters

Category

Search for materials

- Asphalt
- Bricks and ceramics
- Installations and systems
- Cement, binders and additives
- Coatings and pastes
- Precast concrete
- Ready-mix concrete
- Constructions
- [+ See all \(15\)](#)

Country

Search for countries

- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua and Barbuda
- Argentina
- Armenia
- [+ See all \(210\)](#)

Region

Clear


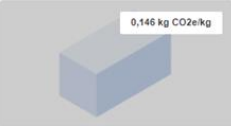
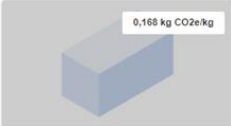
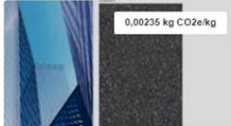



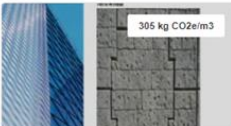
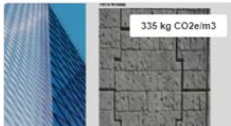

- Europe
- North America
- Asia
- Oceania
- South America
- Africa

Home > Search >

## Find materials

concrete

135 search results

 <p>19,7 kg CO2e/m2</p> <p>Semi-prefabricated reinforced concrete element, 150.28 ... bwb Betonwerk Ludwigslust GmbH... Germany</p>	 <p>0,146 kg CO2e/kg</p> <p>Precast concrete wall element, insulated, e3 Sandwich W... Heidelberg Materials Precast A... Sweden</p>	 <p>0,168 kg CO2e/kg</p> <p>Precast concrete wall element, insulated, e3 Insulated ... Heidelberg Materials Precast A... Sweden</p>	 <p>0,00235 kg CO2e/kg</p> <p>Aggregates for ready mix concrete and road construction... Steypustoðin Iceland</p>	 <p>19,2 kg CO2e/m2</p> <p>Insulated concrete block, 78.1 kg/m2, UKK KK400 split ... Lammin Betoni Oy Finland</p>
 <p>337 kg CO2e/m3</p> <p>Precast rectangular shaped concrete panel with steel re... Tierra Armada Spain</p>	 <p>302 kg CO2e/m3</p> <p>Precast rectangular shaped concrete panel with no reinf... Tierra Armada Spain</p>	 <p>305 kg CO2e/m3</p> <p>Precast cruciform shaped concrete panel with no reinfor... Tierra Armada Spain</p>	 <p>335 kg CO2e/m3</p> <p>Precast cruciform shaped concrete panel with steel rein... Tierra Armada Spain</p>	 <p>2,53 kg CO2e/kg</p> <p>Steel fibres for concrete reinforcement (SPAJIC doo) SPAJIC doo Serbia</p>

# MATERIAL COMPASS

Home > Search >

Settings My lists My bookmarks

## Find materials

114

search results

concrete

Actions (3) -

Filters (9)

- Save as bookmark
- Add to list
- Share by email
- Add to LCA project
- Compare (3/5)
- Delete bookmark

302 kg CO2e/m3

Precast rectangular shaped concrete panel with no reinf...

Tierra Armada

Spain

306 kg CO2e/m3

Precast cruciform shaped concrete panel with steel rein...

Tierra Armada

Spain

335 kg CO2e/m3

Precast cruciform shaped concrete panel with steel rein...

Tierra Armada

Spain

0,168 kg CO2e/kg

Solid wall element, C30/37 (Hedareds Sand & Betong AB)

Hedareds Sand & Betong AB

Sweden

0,144 kg CO2e/kg

Precast concrete wall element, uninsulated, ECO (Bender...

Benders Byggsystem AB

Sweden

0,144 kg CO2e/kg

0,137 kg CO2e/kg

0,141 kg CO2e/kg

0,135 kg CO2e/kg

0,105 kg CO2e/kg

## Settings

Cancel

Download Excel

Send data to another user

Continue

Choose the project, design and calculation tool that you want to use for import. If you are unsure on what to do next, please visit our [Customer Support Center](#).

Choose the project or entity

Building LCA Demo - Jakob



Choose or create a design

CD3D Design



Choose the tool


LCA according to Bygnings



Filtering settings

All data




Existing data preservation 

Replace existing data with impo



Remove empty data 

Convert all to metric unit system 

# BR18 VÆRKTØJ

Building materials
  Energy consumption, annual
  Calculation period
  Building area

---

Clear
 Material 
 Country 
 Data source 
 Type 
 Upstream 
 CO2e 
 Unit

Floor slabs, ceilings, roofing decks, beams and roof ⓘ [⇌ Compare answers](#) [📁 Create a group](#) [➕ Move materials](#) [🔗 Add to compare](#)

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#### 4. Other structures and materials ⓘ ☁️ 0.02 kg CO<sub>2</sub>e - 10 %

Other structures and materials ⓘ [⇌ Compare answers](#) [📁 Create a group](#) [➕ Move materials](#) [🔗 Add to compare](#)

Resource ⚡	Quantity ⚡	CO <sub>2</sub> e ⚡	Comment ⚡	Company Classification	SfB system	Service life ⓘ ⚡	EOL Process ⓘ	Reused material
Precast cruciform shaped concrete p ?	<input type="text" value="1.0"/> <input type="text" value="m3"/>	~0kg - 4%	<input type="text"/>	No classification	Not defined	As building	Use EOL defined in EPD	<input type="checkbox"/>
Precast cruciform shaped concrete p ?	<input type="text" value="1.0"/> <input type="text" value="m3"/>	~0kg - 3%	<input type="text"/>	No classification	Not defined	As building	Use EOL defined in EPD	<input type="checkbox"/>
Precast rectangular shaped concrete ?	<input type="text" value="1.0"/> <input type="text" value="m3"/>	~0kg - 3%	<input type="text"/>	No classification	Not defined	As building	Use EOL defined in EPD	<input type="checkbox"/>

# Tak for at se med

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