

Exercises

Saint-Gobain Student Contest 2022

Life Cycle Assessment lecture – Session 2

Marios Tsikos, One Click LCA

8th December 2021

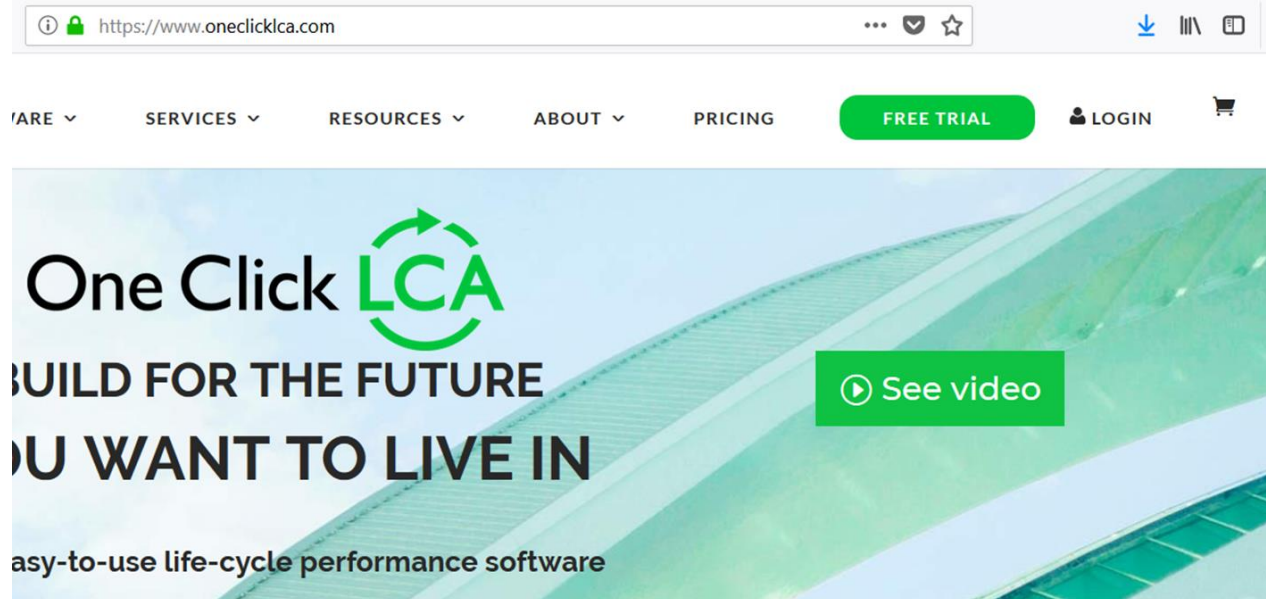


Steps to get started

1. Create a One Click LCA account
2. Create calculation project
3. Activate your licence using the license key provided

Create account

1. Go to oneclicklca.com
2. Choose “Login” from the right corner of the page
3. In the login form choose [“New user? Register here!”](#)
4. Fill in your information
5. Activate the account from the link in your email
6. Log in to One Click LCA using the same login form



Create project and activate licence

1. Select “Create a new project”
2. Select “Building”
3. Choose building and add basic information for your own building and save.
4. Activate your licence by typing the licence key provided by your teacher.
5. Press “Get started” and add the **Level(s)** tool.

Getting started – Inside the project

- 1/ Click on “Getting Started” button and
- 2/ name your 1st design

› General information



Create at least one design to start calculations. Click Get Started to continue.

▼ Design phase: 0 designs

Choose calculation tools and set up calculations **Get started**

Available calculation tools - Get more tools

Tools available in applied licences

☐ **Whole life carbon assessment, RICS** This tool meets the RICS professional standards and guidance, whole life carbon assessment for the b [See all](#)

☐ **Building Circularity** Material efficiency and circular economy - for BREEAM MAT 06 and GRI G4 reporting as well as other p [See all](#)

Toggle all **Next**

Create a design

Name, design stage and calculation tools

Name ⓘ

Additional information (e.g. description in portfolio)

Stage of construction process (RIBA / AIA stages) ⓘ

Choose the tools you want to use in this design ⓘ

☒ **Whole life carbon assessment, RICS**

☒ **Building Circularity**

Scope and type of analysis

Pre-defined scopes (if available)

Project type ⓘ

Frame type ⓘ

Included parts. Check all applicable. ⓘ

☒ Foundations and substructure

☒ Structure and enclosure

☒ Finishings and other materials

☐ External areas

☐ Services

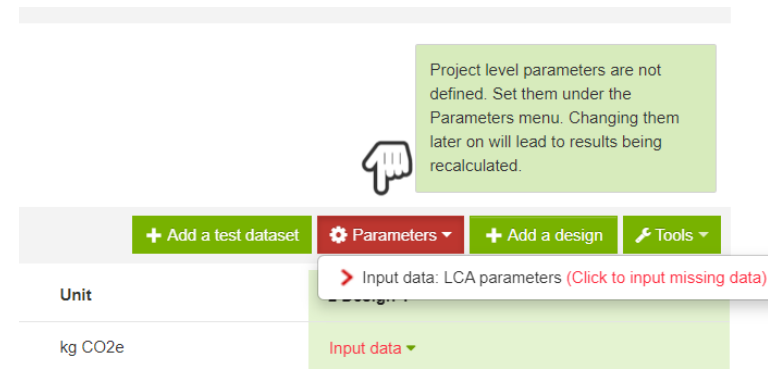
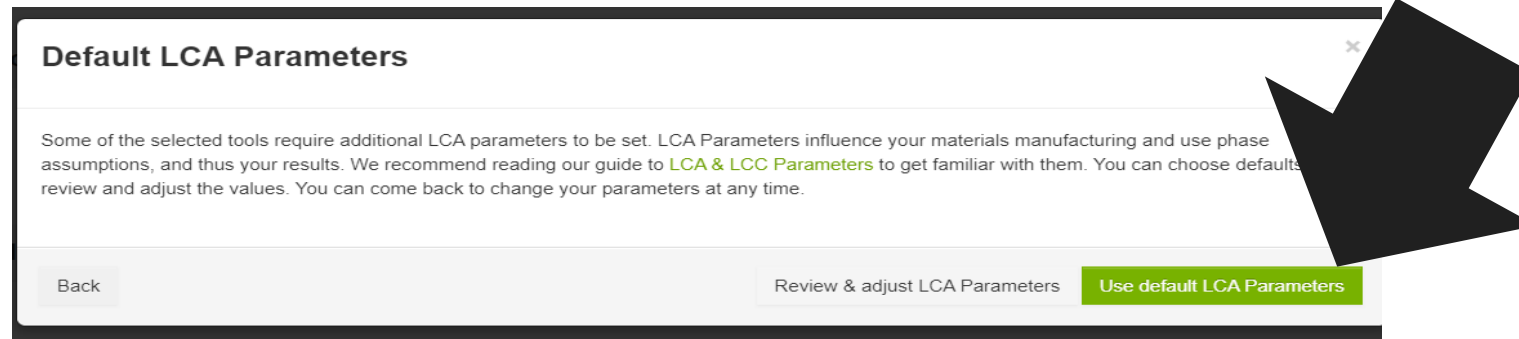
Back **Next**



Getting started – Approve or review parameters

3/ You can confirm “Use default LCA Parameters” or Review

- Default choices are almost always what you need
- Can always be edited and project is recalculated



All set to start adding data to your 1st DESIGN

Exercise 1: Creating & comparing substructure s



Inserting data – Manual entries row by row

There are 3 ways of importing data:

1/ Manually add resource row by row

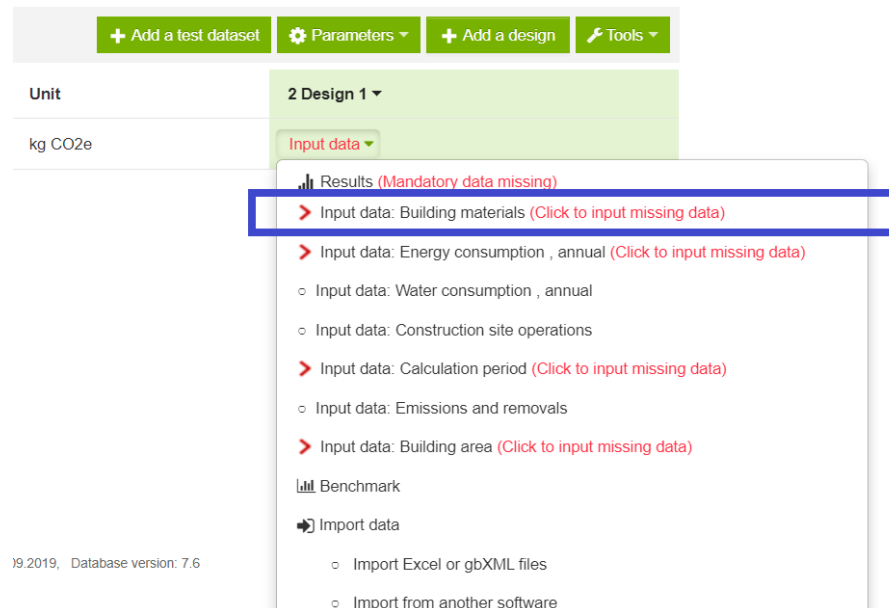
2/ Import Bill of Materials (BoM) from BIM (eg Revit), energy models (eg DesignBuilder or IES) or Excel and gbXML files

3/ Bring in typical quantities for different building parts or whole buildings with Carbon Designer

Let's start with **manual** entries:

1/ While you are on project main page click on “Input data” and you will see all these options:

2/ Click on “Input data: Building materials”



Inserting data – Finding and selecting materials

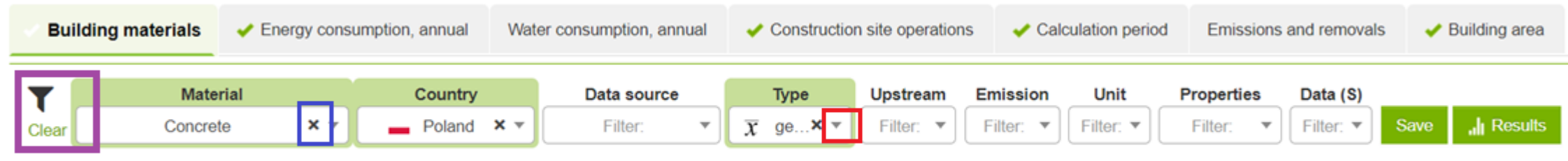
Now in order to find the materials you need, you can play around with the filters on the top of the page.

Select the following:

1/ Material: **Concrete**

2/ Country: **Ireland**

3/ Type: **Generic**



The screenshot shows the One Click LCA software interface. At the top, there are several tabs: 'Building materials' (active), 'Energy consumption, annual', 'Water consumption, annual', 'Construction site operations', 'Calculation period', 'Emissions and removals', and 'Building area'. Below these tabs is a filter bar with the following fields: 'Material' (set to 'Concrete'), 'Country' (set to 'Poland'), 'Data source' (set to 'Filter:'), 'Type' (set to 'Generic'), 'Upstream' (set to 'Filter:'), 'Emission' (set to 'Filter:'), 'Unit' (set to 'Filter:'), 'Properties' (set to 'Filter:'), and 'Data (\$)' (set to 'Filter:'). The 'Clear' button is highlighted with a purple box, and the 'Type' dropdown is highlighted with a red box.

i Fill in the material consumptions by material type. You may fill in 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, with exception of windows, doors and building technology and installations, which are only addable through their respective sections. [Material selection help](#).

When you activate the filters, remember to adjust / delete them later for other searches!!!

Inserting data – Manual entries row by row

Let's start with manual entries – Let's add some typical concrete for Foundation!

1/ While you are on project main page click on “Input data” and you will see all these options:

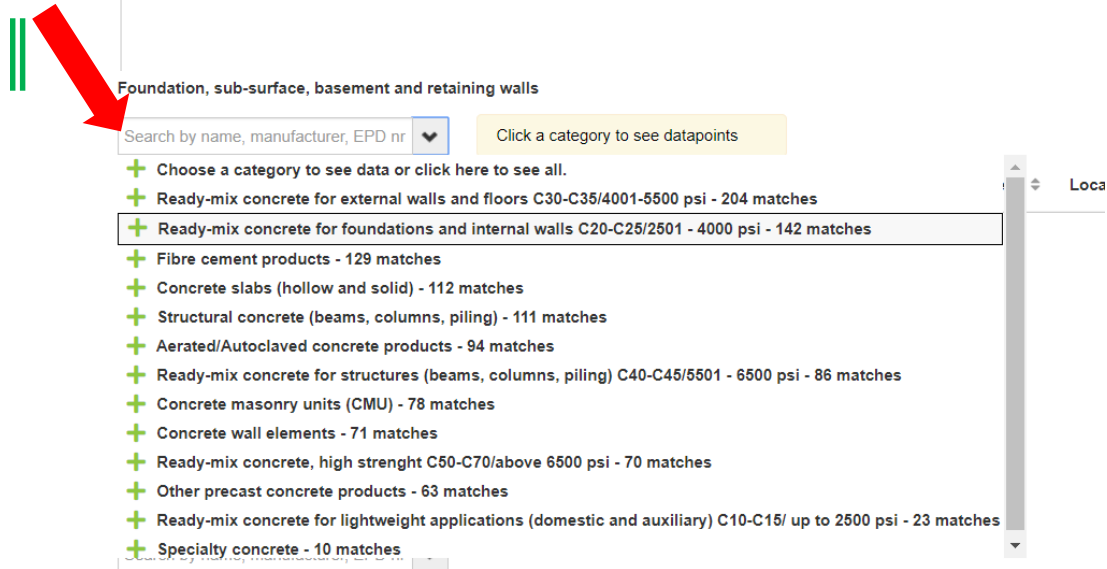
2/ Click on “Input data: Building materials”

3/ Go to “Foundations, sub-structure, basement and retaining walls” and click on the drop down list

4/ Click on “ready mix concrete for Foundations and internal walls”

5/ Select “**Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 0% recycled binders in cement (240 kg/m3)**”

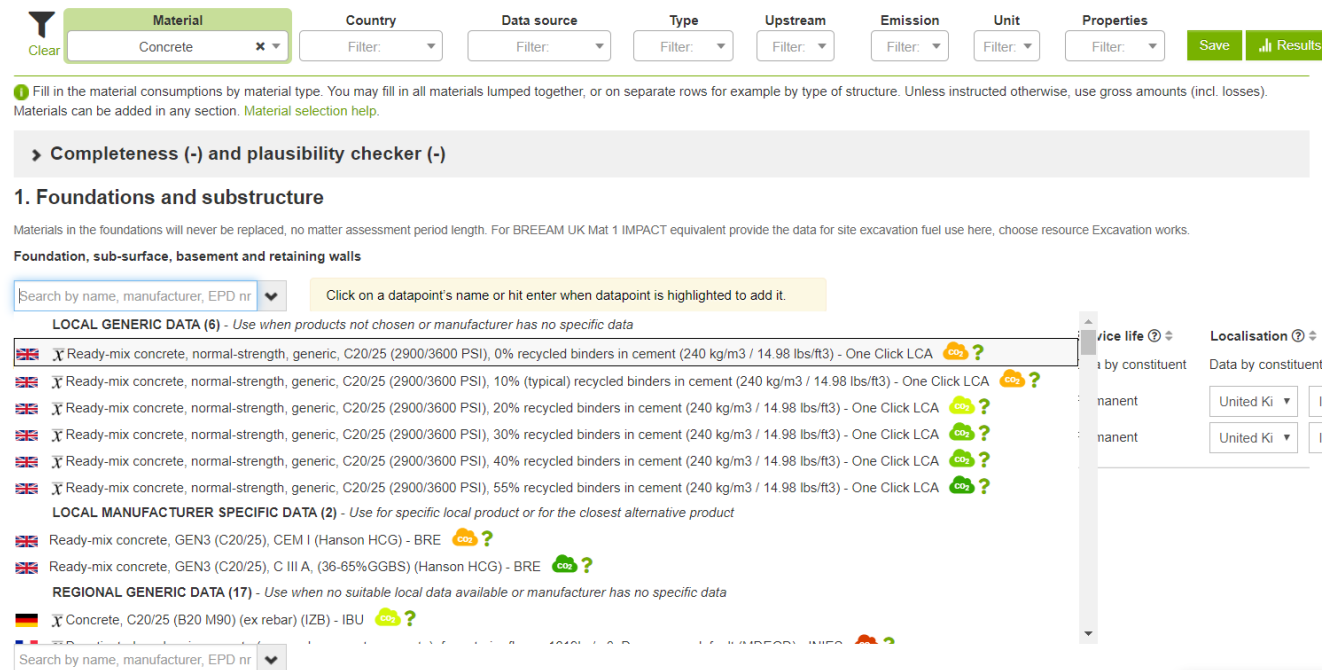
6/ add **500 m³** (then click SAVE and see results preview)



Foundations, sub-surface, basement and retaining walls

Search by name, manufacturer, EPD nr Click a category to see datapoints

- + Choose a category to see data or click here to see all.
- + Ready-mix concrete for external walls and floors C30-C35/4001-5500 psi - 204 matches
- + Ready-mix concrete for foundations and internal walls C20-C25/2501 - 4000 psi - 142 matches
- + Fibre cement products - 129 matches
- + Concrete slabs (hollow and solid) - 112 matches
- + Structural concrete (beams, columns, piling) - 111 matches
- + Aerated/Autoclaved concrete products - 94 matches
- + Ready-mix concrete for structures (beams, columns, piling) C40-C45/5501 - 6500 psi - 86 matches
- + Concrete masonry units (CMU) - 78 matches
- + Concrete wall elements - 71 matches
- + Ready-mix concrete, high strength C50-C70/above 6500 psi - 70 matches
- + Other precast concrete products - 63 matches
- + Ready-mix concrete for lightweight applications (domestic and auxiliary) C10-C15/ up to 2500 psi - 23 matches
- + Specialty concrete - 10 matches



Material: Concrete Country: Filter: Data source: Filter: Type: Filter: Upstream: Filter: Emission: Filter: Unit: Filter: Properties: Filter: Save Results

Fill in the material consumptions by material type. You may fill in 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. [Material selection help](#).

> Completeness (-) and plausibility checker (-)

1. Foundations and substructure

Materials in the foundations will never be replaced, no matter assessment period length. For BREEAM UK Mat 1 IMPACT equivalent provide the data for site excavation fuel use here, choose resource Excavation works.

Foundation, sub-surface, basement and retaining walls

Search by name, manufacturer, EPD nr Click on a datapoint's name or hit enter when datapoint is highlighted to add it.

LOCAL GENERIC DATA (6) - Use when products not chosen or manufacturer has no specific data

- Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 0% recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3) - One Click LCA
- Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 10% (typical) recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3) - One Click LCA
- Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 20% recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3) - One Click LCA
- Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 30% recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3) - One Click LCA
- Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 40% recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3) - One Click LCA
- Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 55% recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3) - One Click LCA

LOCAL MANUFACTURER SPECIFIC DATA (2) - Use for specific local product or for the closest alternative product

- Ready-mix concrete, GEN3 (C20/25), CEM I (Hanson HCG) - BRE
- Ready-mix concrete, GEN3 (C20/25), C III A, (36-65%GGBS) (Hanson HCG) - BRE

REGIONAL GENERIC DATA (17) - Use when no suitable local data available or manufacturer has no specific data

- Concrete, C20/25 (B20 M90) (ex rebar) (IZB) - IBU

Inserting data – Manual entries row by row

Let's add some Reinforcement to the foundation

1/ This time **Type**: Rebar (make sure your filters are reset!!!!)

2/ Select “**Reinforcement for concrete (rebar)**”

3/ And them “**Reinforcement steel (rebar), generic, 97% recycled content (typical)**”

4/ add **75,000 kg** (Click SAVE after see results carbon clouds)

Foundation, sub-surface, basement and retaining walls

Click a category to see datapoints

- + Choose a category to see data or click here to see all.
- + Ready-mix concrete for external walls and floors C30-C35/4001-5500 psi - 50 matches
- + **Reinforcement for concrete (rebar) - 44 matches**
- + Concrete slabs (hollow and solid) - 12 matches
- + Ready-mix concrete for structures (beams, columns, piling) C40-C45/5501 - 6500 psi - 8 matches
- + Ready-mix concrete for foundations and internal walls C20-C25/2501 - 4000 psi - 4 matches
- + Stainless steel - 3 matches
- + Structural concrete (beams, columns, piling) - 2 matches
- + Concrete wall elements - 2 matches
- + Ready-mix concrete, high strenght C50-C70/above 6500 psi - 2 matches
- + HVAC components and equipment - 1 matches
- + Specialty concrete - 1 matches
- + Other precast concrete products - 1 matches
- + Foundations - 1 matches

1. Foundations and substructure

Materials in the foundations will never be replaced, no matter assessment period length. For BREEAM UK Mat 1 IMPACT equivalent provide the data for site excavation fuel use here, choose resource Excavation works.

Foundation, sub-surface, basement and retaining walls

Click on a datapoint's name or hit enter when datapoint is highlighted to add it.

LOCAL GENERIC DATA (6) - Use when products not chosen or manufacturer has no specific data

- Reinforcement steel (rebar), generic, 0% recycled content (only virgin materials) - One Click LCA
- Reinforcement steel (rebar), generic, 60% recycled content - One Click LCA
- Reinforcement steel (rebar), generic, 80% recycled content - One Click LCA
- Reinforcement steel (rebar), generic, 90% recycled content - One Click LCA
- Reinforcement steel (rebar), generic, 100% recycled content - One Click LCA
- Reinforcement steel (rebar), generic, 97% recycled content (typical) - One Click LCA**

LOCAL MANUFACTURER SPECIFIC DATA (3) - Use for specific local product or for the closest alternative product

- Reinforcement steel (rebar), 10-40mm (BRC)
- Reinforcement steel (rebar), hot rolled, diameter applicable range : 10 - 50mm, length applicable range : 6 - 18m (Celsa Steel UK) - BRE
- Reinforcement steel mesh (rebar), 10-40mm (BRC)

REGIONAL GENERIC DATA (1) - Use when no suitable local data available or manufacturer has no specific data

- Rebar, hot rolled

Inserting data – Manual entries row by row

Summary of materials and quantities (Click SAVE after):

Materials	Quantities
Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 0% recycled binders in cement (240 kg/m3)	500 m3
Reinforcement steel (rebar), generic, 97% recycled content (typical)	75,000 kg

Remember to adjust / delete the filters when searching for materials !!!

You can see more info for each datapoint by clicking on the “?” next to its name

The screenshot displays the One Click LCA software interface. On the left, a sidebar shows a list of materials with a search filter. The main area shows detailed information for 'Reinforcement steel (rebar), generic, 97% recycled content (typical)'. This information includes: Country (United Kingdom), Density (7850 kg / m3), Year (2018), Environment Data Source (One Click LCA), Standard (EN15804), EPD program (One Click LCA), Product Category Rules (PCR): EN15804, Q Metadata (+/- 34.64 % variation in dataset), Technical specification: 97% recycled content (typical), Upstream database: ecoinvent, Global warming potential (before local compensation): 0.5 kg CO2e / kg, 3890.8 kg CO2e / m3, Performance in group: Reinforcement for concrete (rebar), Performance ranking: 13 / 109, CO2 CML: 13 / 109, and Available units: kg, ton, m3. A photo of corrugated steel bars is also shown. On the right, a table lists resources and their quantities: 'Ready-mix concrete, normal-strength, gen' with a quantity of 70000 kg, and 'Reinforcement steel (rebar), generic, 97' with a quantity of 4200 kg. A red arrow points to the CO2e values (11t - 83% and 2.1t - 17%) next to the resources.

In addition to the filters (or instead), you can also search materials directly using for example:

- 1/ EPD name or EPD number
- 2/ Manufacturer

Inserting data – Editing default values

For each data point default values are generated, based on project parameters, including:

- transportation to construction site distance & mean used
- Service Life (not adjustable in foundation level)
- Localisation options

Let's edit the following:

- Transportation distance for ready mix concrete to 250 km. Save and see the impact.



Resource ⇅	Quantity ⇅	CO ₂ e ⇅	Comment ⇅	RICS category ⓘ	Transport, kilometers ⓘ ⇅	Service life ⓘ ⇅	Localisation ⓘ ⇅	Repair/year % (B3) ⓘ	Reused material ⓘ
Ready-mix concrete, normal-strength ?	<input type="text" value="70000"/> kg ▾	11t - 83%	<input type="text"/>	2.5.1.External enclosing	<input type="text" value="250"/> Concrete mixer truck	As building	United Kingdom IEA2017 None	<input type="checkbox"/>	Change ▾
Reinforcement steel (rebar), generi ?	<input type="text" value="4200"/> kg ▾	2.1t - 17%	<input type="text"/>	2.5.1.External enclosing	110 Trailer combination, 40	As building	United Kingdom IEA2017 None	<input type="checkbox"/>	Change ▾

Inserting data – Add more info

Well done!

Now, let's add some more info in our project:

- Go to calculation Period Tab and set it to 60 years:

Main > 0 RICS Training Octo > Design 1 > Whole life carbon assessment, RICS > Input data : Calculation period

Design 1

✓ Building materials > Energy consumption, annual Water consumption, annual > Construction site operations > **Calculation period** Emissions and removals ✓ Building area

1 This query defines the service life (calculation period) of the building. See GUIDE here

1. Calculation period

Calculation period (mandatory)

Required service life of the building. If not otherwise defined, use technical service life of the asset. Product replacements and maintenance are calculated for this period. For IMPACT-compliant use allowed values between 0 and 80 years.

60 years

- Go to the Top and select Building area. From the dropdown list choose a suitable area definition.
CLICK SAVE

Design 1 BREEAM

✓ Building materials Energy consumption, annual Water consumption, annual Construction site operations Emissions and removals > **Building area**

1 Provide building area data for benchmarking and calculation purposes. See GUIDE here

1. Area definitions

Building area (mandatory)

Please always provide gross internal floor area to get benchmark feedback. These figures are always given excluding parkings and motor vehicle circulation areas, but including basements. You may also provide additional national area definitions. Using additional national definitions allows for national level benchmarking.

Start typing or click the arrow

Click on a datapoint's name or hit enter when datapoint is highlighted to add it.

Mandatory data missing. Click

🇬🇧 Gross Internal Floor Area (IPMS/RICS) ?

🇬🇧 Number of users ?

🇬🇧 User days ?

🇬🇧 User hours ?

🌐 Annual visitors ?

🇳🇱 Bruto vloeroppervlakte (BVO), the Netherlands ?

🇩🇪 Brutto-Rauminhalt, BRI (DIN 277), Germany ?

Inserting data – Add Energy use data

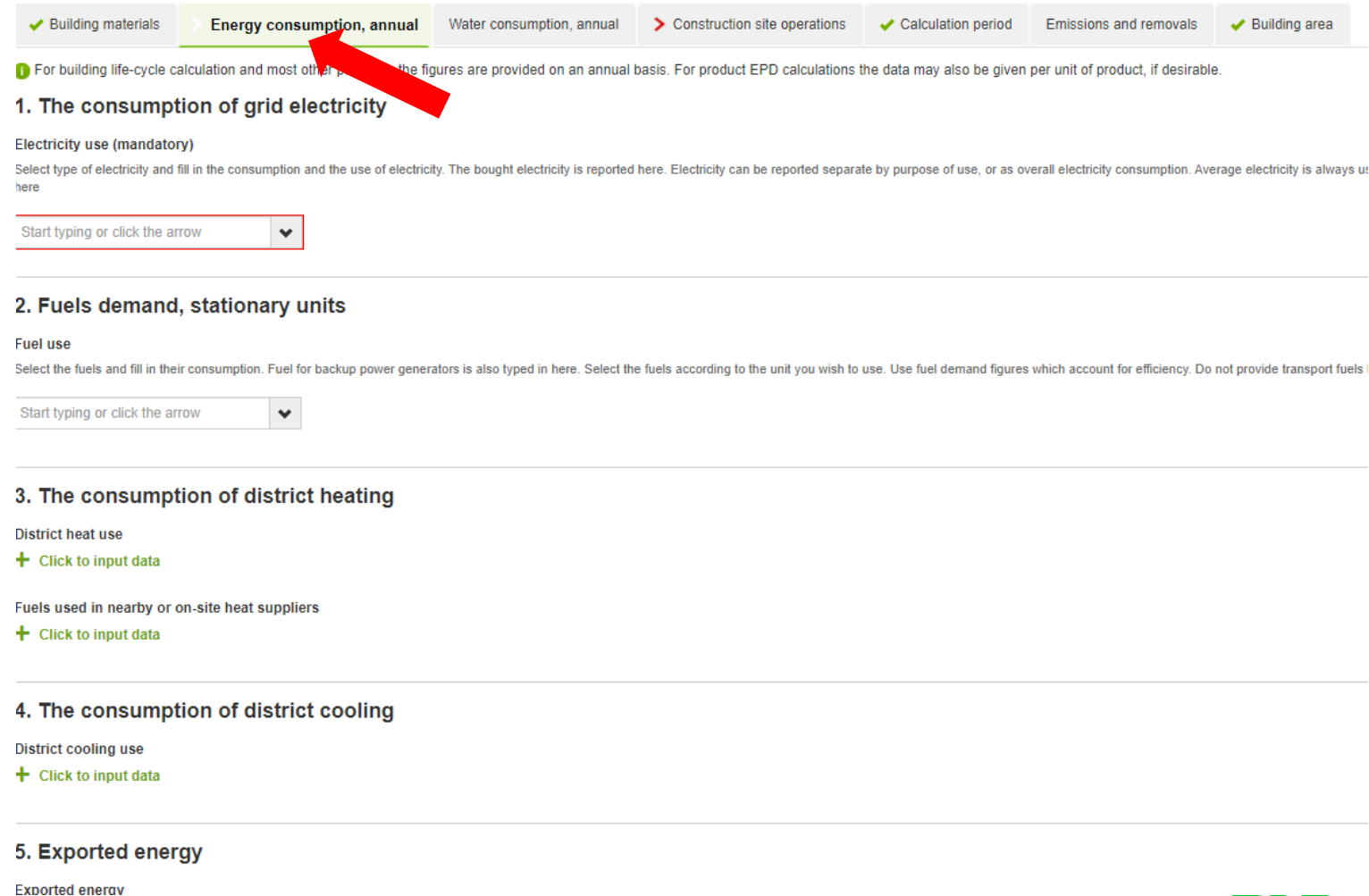
To include the Energy consumption data go to Energy consumption, annual tab:

The building has electricity consumption **50 kWh/m2** for total regulated energy consumption.

Assuming it is all electric.

The building has also PV that produces **20 kWh/m2** so deduct this from the figure.

Half of the generated energy is consumed on site and half of it is exported.



✓ Building materials > **Energy consumption, annual** Water consumption, annual > Construction site operations ✓ Calculation period Emissions and removals ✓ Building area

1. For building life-cycle calculation and most other purposes the figures are provided on an annual basis. For product EPD calculations the data may also be given per unit of product, if desirable.

1. The consumption of grid electricity

Electricity use (mandatory)
Select type of electricity and fill in the consumption and the use of electricity. The bought electricity is reported here. Electricity can be reported separate by purpose of use, or as overall electricity consumption. Average electricity is always used here

Start typing or click the arrow ▼

2. Fuels demand, stationary units

Fuel use
Select the fuels and fill in their consumption. Fuel for backup power generators is also typed in here. Select the fuels according to the unit you wish to use. Use fuel demand figures which account for efficiency. Do not provide transport fuels

Start typing or click the arrow ▼

3. The consumption of district heating

District heat use
+ Click to input data

Fuels used in nearby or on-site heat suppliers
+ Click to input data

4. The consumption of district cooling

District cooling use
+ Click to input data

5. Exported energy

Exported energy

Inserting data – Construction site operation data

Choose Site Scenario, select Average Site impacts - **Temperate Climate (North)** and add **the BUILDING AREA (m2)**

Note! During design you can use scenarios and post construction you can use actual data from the contractor.



[See GUIDE here](#)

1. Construction site scenarios

Construction site scenarios

[+ Click to input data](#)

2. Energy use on the site

Site electricity consumption

[+ Click to input data](#)

Site district heating consumption

[+ Click to input data](#)

Site fuel consumption

[+ Click to input data](#)

Machine hours

[+ Click to input data](#)

3. Water use on the site

Water consumption

[+ Click to input data](#)

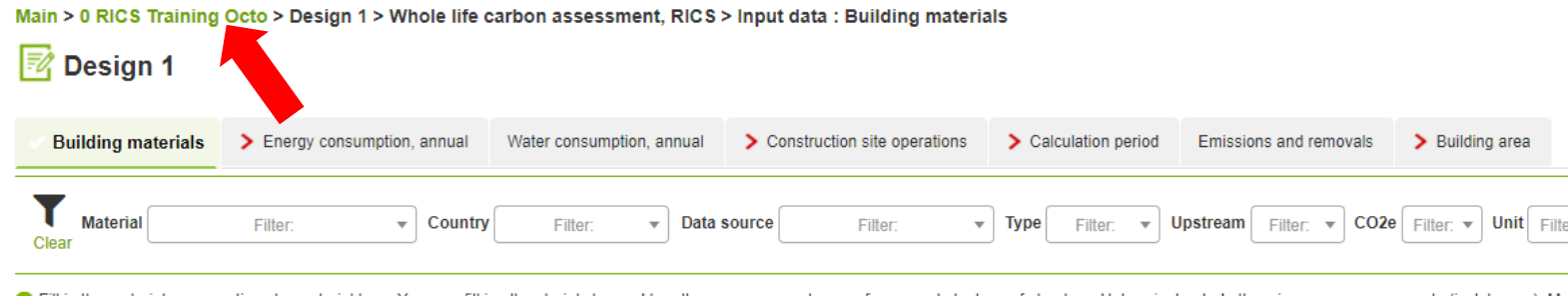
4. Waste generated on the site

Construction waste

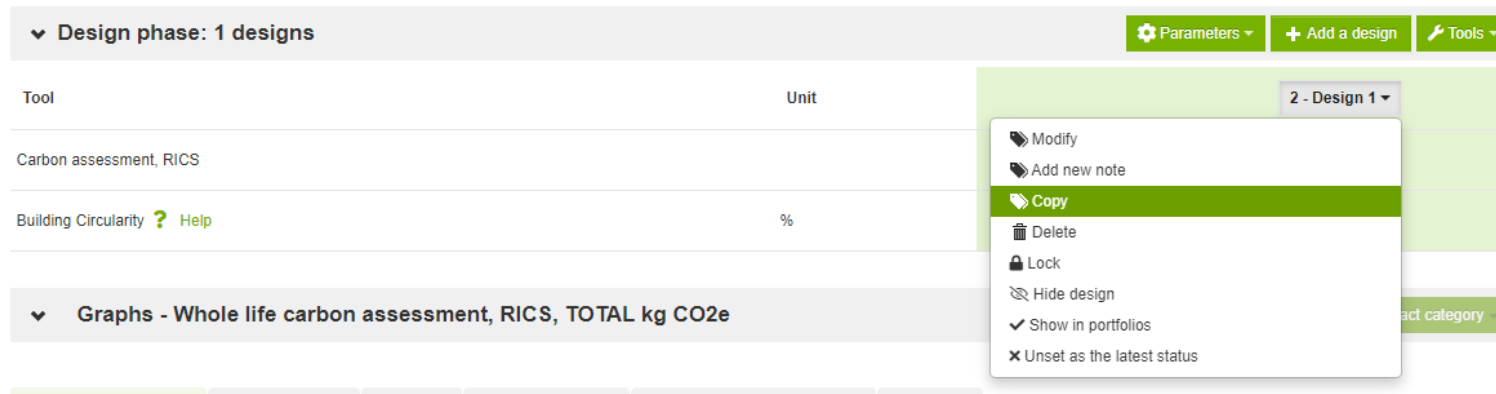
[+ Click to input data](#)

Now we are doing a comparison

1/ Click **Your Project name** on the top bar to get to the main project page



2/ On main page click the Design name and make a **copy**. Give the new design a name and click Add:



Edit data:

3/ Click the “input data” tab for your second (copied) design to edit the Building Materials.

4/ Replace the Concrete mix with another one with 20 % recycled binders. **CLICK SAVE!**

Building materials

Energy consumption, annual

Water consumption, annual

Construction site operations

Emissions and removals

Building area

Clear

Material

Filter:

Country

Filter:

Data source

Filter:

Type

Filter:

Upstream

Filter:

Emission

Filter:

Unit

Filter:

Properties

Filter:

Save

Results

1

Fill in the material consumptions by material type. You may fill in 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. [Material selection help](#).

> Completeness (-) and plausibility checker (grade: F)

1. Foundations and substructure

13 Tons CO₂e - 100 %

Materials in the foundations will never be replaced, no matter assessment period length. For BREEAM UK Mat 1 IMPACT equivalent provide the data for site excavation fuel use here, choose resource Excavation works.

Foundation, sub-surface, basement and retaining walls

Compare answers

Create a group

Search by name, manufacturer, EPD nr

Resource

Quantity

CO₂e

Comment

RICS category

Transport, kilometers

Service life

Localisation

Mat 02 EPD

Ready-mix concrete, normal-strength, gen

70000

kg

11t - 83%

1.1.1.Standard

250

Concrete mixer truck

Permanent

United Kingdom

IEA2017

Not applicable

Reinforcement steel (rebar), generic, 97

4200

kg

2.1t - 17%

1.1.1.Standard

110

Trailer combination, 40

Permanent

United Kingdom

IEA2017

Not applicable

Change

Copy

Delete

Split

Replace

Lock

2. Vertical structures and facade

External walls and facade

Compare answers

Search by name, manufacturer, EPD nr

Columns and load-bearing vertical structures

Compare answers

Design 2 BREEAM

Building materials

Energy consumption, annual

Water consumption, annual

Construction site operations

Emissions and removals

Building area

Replace: Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 0% recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3)

Material

Concrete

Country

Filter:

Data source

Filter:

Type

Filter:

Upstream

Filter:

Emission

Filter:

Unit

Filter:

Properties

Filter:

Clear

Original material:

Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 0% recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3)

Quantity

70000

kg

Full name: Ready-mix concrete, normal-strength, generic, C20/25 (2900/3600 PSI), 0% recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3) [Copy name](#)

Country: United Kingdom

Density: 2200 kg / m3

Year: 2018

Environment Data Source: One Click LCA

Standard: EN15804

EPD program: One Click LCA

Product Category Rules (PCR): EN15804

Q Metadata: +/- 34.64 % variation in dataset

Technical specification: C20/25 (2900/3600 PSI), 0% recycled binders in cement (240 kg/m3 / 14.98 lbs/ft3)

Upstream database: ecoinvent

Global warming potential (before local compensation): 0.11 kg CO₂e / kg

238.18 kg CO₂e / m3

47.64 kg CO₂e / m2

Performance in group: Ready-mix concrete for foundations and internal walls

Performance ranking: 1

New material:

Search by name, manufacturer, EPD nr

+ Choose a category to see data or click here to see all.

+ Ready-mix concrete for external walls and floors C30-C35/4001-5500 psi - 204 matches

+ Ready-mix concrete for foundations and internal walls C20-C25/2501 - 4000 psi - 142 matches

+ Fibre cement products - 129 matches

+ Concrete slabs (hollow and solid) - 112 matches

+ Structural concrete (beams, columns, piling) - 110 matches

+ Aerated/Autoclaved concrete products - 94 matches

+ Ready-mix concrete for structures (beams, columns, piling) C40-C45/5501 - 6500 psi - 86 matches

+ Concrete masonry units (CMU) - 78 matches

+ Concrete wall elements - 71 matches

+ Ready-mix concrete, high strength C50-C70/above 6500 psi - 70 matches

+ Other precast concrete products - 60 matches

+ Ready-mix concrete for lightweight applications (domestic and auxiliary) C10-C15/ up to 2500 psi - 23 matches

+ Groutable concrete - 40 matches

Save

Cancel

Workflow

Results

Guidance

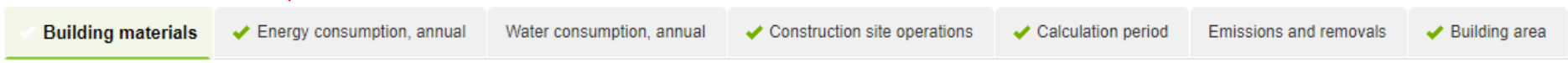
Compare Results!

5/ Go back to the main Project page by clicking your project name on the top bar.

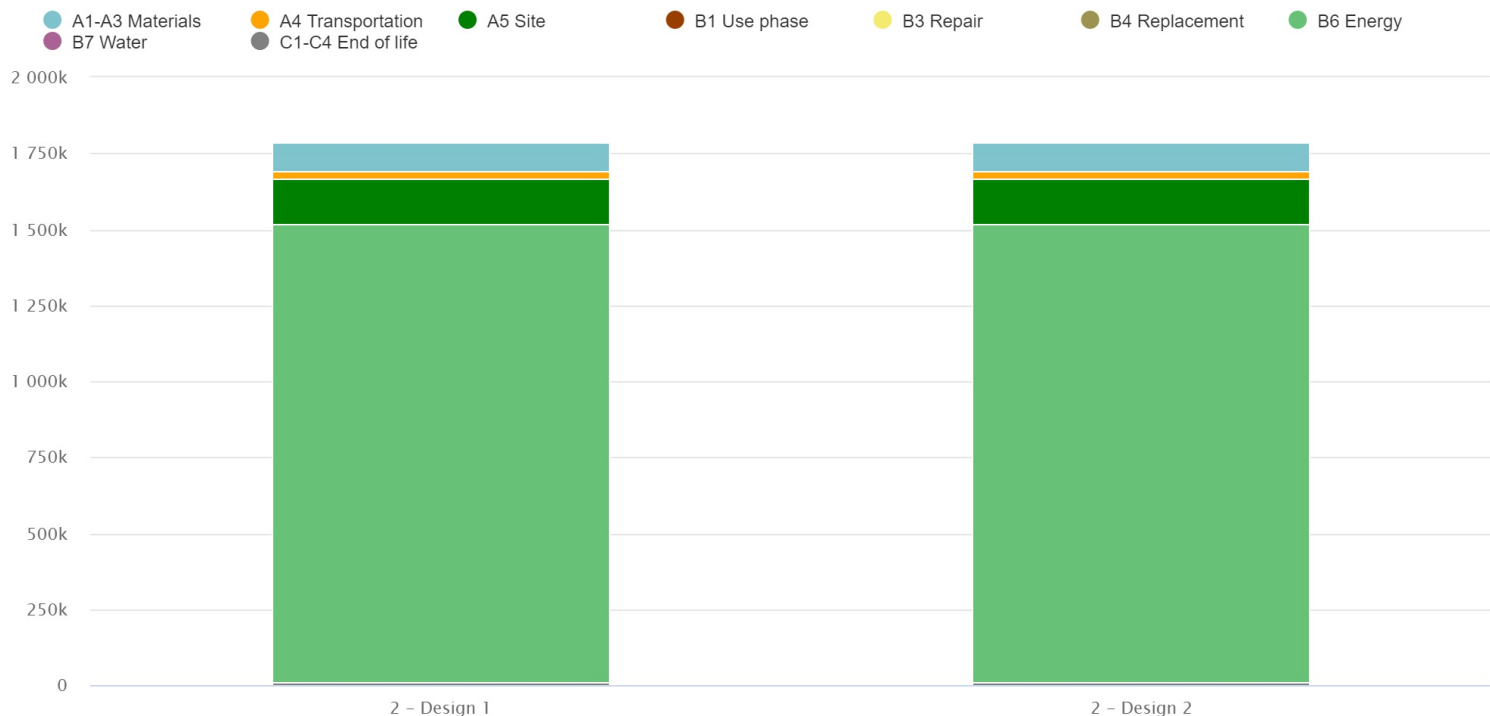
Main > 0 RICS Training Octo > Design 1 > Whole life carbon assessment, RICS > Input data : Building materials



Design 1



6/ Compare results. Which one is better? Check what graphs are available.



Exercise 2: External wall using constructions

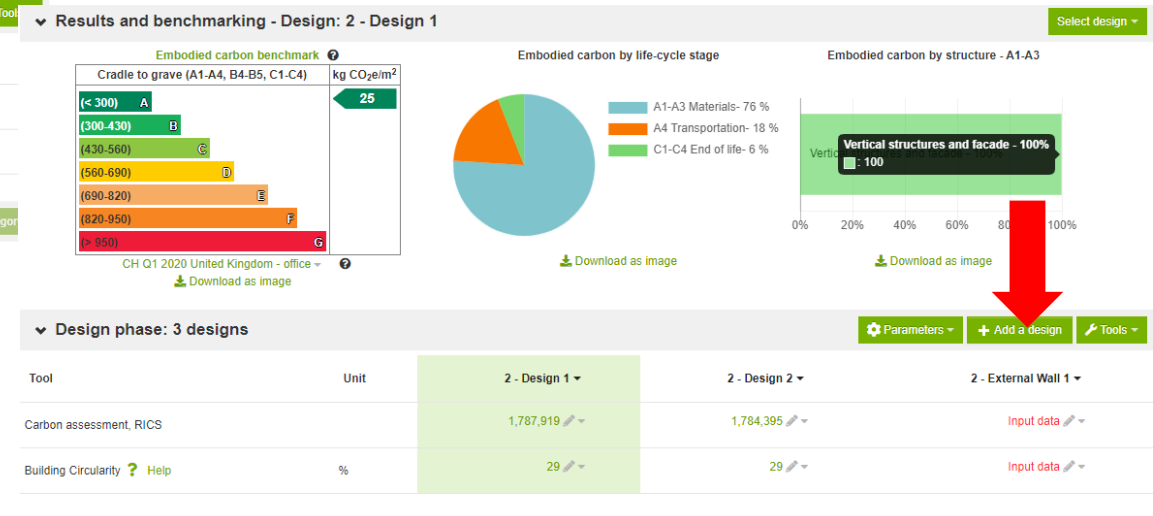
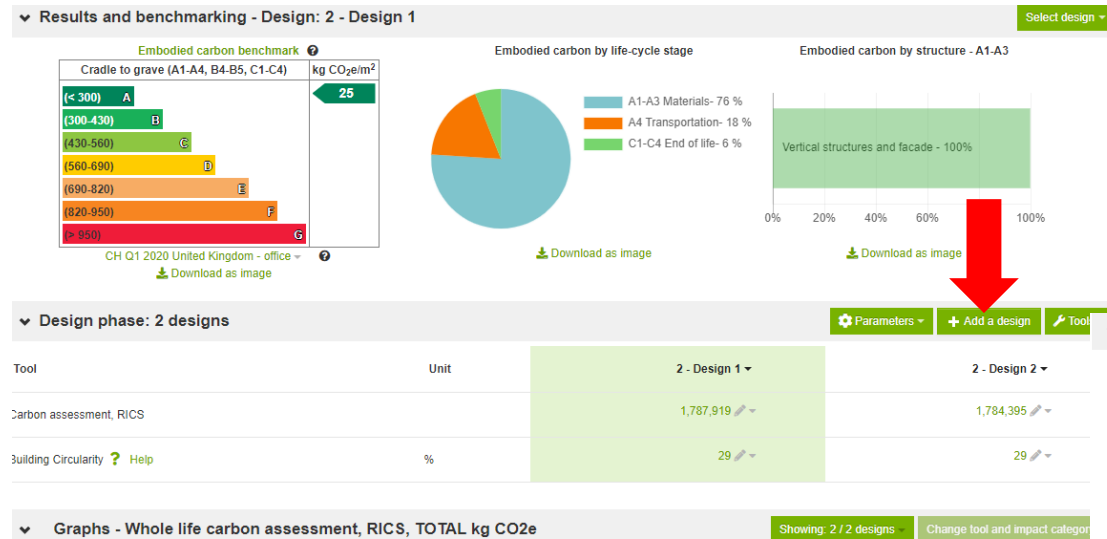


Inserting data – Using Constructions

Let's create another DESIGN and use CONSTRUCTIONS to create an external wall:

1/ From the main project page click “+Add a design” tab

2/Give design a name (for example External Wall 1)



Input External Wall construction:

3/ Click the “input data” tab for the External Wall to edit the Building Materials.

4/ Using filters find Constructions → External Wall constructions

The screenshot shows the 'Building materials' tab in the One Click LCA software. The breadcrumb trail at the top reads: 'Main > 0 London Training > External Wall 1 > LCA for BREEAM UK > Input data : Building materials'. Below this, there are tabs for 'Energy consumption, annual', 'Water consumption, annual', 'Construction site operations', 'Emissions and removals', and 'Building area'. The 'Building materials' tab is active. A search filter is applied to the 'Material' column, showing a dropdown menu with 'Constructions' selected. The search results list various materials, including 'Bricks and ceramics', 'Coatings and pastes', 'Concrete', 'Doors, windows and parts', 'Earth, masses and stones', 'Flooring', 'Glass', 'Gypsum, plaster and cement', 'Installations and systems', 'Insulation', 'Plastics, membranes and roofing', 'Steel and other metals', and 'Wood'. The 'Constructions' category is highlighted, showing a count of 666 items. The 'Foundations' category is also visible with a count of 42 items. The interface includes buttons for 'Cancel', 'Save', 'Results', and 'More actions'.

5/ Go to 2. vertical structures and Façade and select “Block and render finish masonry cavity wall with partial fill and aircrete block + plasterboard inner leaf (Part L 2016)” and add 1000 m2 as qty

2. Vertical structures and facade ②

External walls and facade [Compare answers](#)

Search by name, manufacturer, EPD nr Click on a datapoint's name or hit enter when datapoint is highlighted to add it. SHOWING 1 - 250 OUT OF 317 RESULTS

LOCAL GENERIC DATA (28) - Use when products not chosen or manufacturer has no specific data

		Block and render finish masonry cavity wall with partial fill and aircrete block + plasterboard inne, (Part L 2016) - One Click LCA ?
		Block and render finish masonry cavity wall with partial fill and aircrete block + plasterboard inne, (Part L 2016) - One Click LCA ?
		Block and render finish masonry cavity wall with partial fill and aircrete block + plasterboard inne, (Part L 2016) - One Click LCA ?
		Concrete assembly for stairs and elevator shafts per one metre height - One Click LCA ?
		Concrete balcony assembly, 200 mm - One Click LCA ?
		Concrete beam - for concrete buildings, L-beam/T-beam, B45 - One Click LCA ?
		Concrete column - for concrete buildings, Rectangular column, B45 - One Click LCA ?
		Electricity distribution system, cabling and central, for all building types - One Click LCA ?
		Fresh water distribution system - One Click LCA ?

Input External Wall construction:

6/ Also add another wall construction “Rainscreen on reinforced concrete, U-value 0.23, (Part L 2016)” add 1000 m2 as qty.

7/ Click SAVE and compare two types. Which one is better?

2. Vertical structures and facade ⓘ 250 Tons CO₂e - 100 %

External walls and facade Compare answers ▾

Create a group

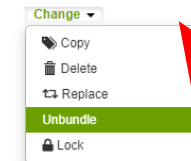
Search by name, manufacturer, EPD nr ▾

Resource ⚙	Quantity ⚙	CO ₂ e ⚙	Comment ⚙	RICS category ⓘ	Transport, kilometers ⓘ ⚙	Service life ⓘ ⚙	Localisation ⓘ ⚙	Repair/year % (B3) ⓘ	Reused material ⓘ
Block and render finish maso ?	1000 m2	140t - 56%		2.5.1.External enclosing	Data by constituent	Data by constituent	Data by constituent	Data by constituent	<input type="checkbox"/> Change ▾
Rainscreen on reinforced con ?	1000 m2	110t - 44%		2.5.1.External enclosing	Data by constituent	Data by constituent	Data by constituent	Data by constituent	<input type="checkbox"/> Change ▾

8/ Click the + signs to see the entire element. Which element has lower embodied carbon?
DELETE the worst one (Change tab on the end of the row)

9/ You can **unbundle** constructions and Replace items with better materials if you want from same place (repeat replace that was done for foundation exercise):

Rainscreen on reinforced con ?	1000 m2	110t - 44%		2.5.1.External enclosing	Data by constituent	Data by constituent	Data by constituent	Data by constituent	<input type="checkbox"/>
Olivine basalt facade stone, black ?	1000 m2 x 8 mm	0.85t - 0.3%		2.5.1.External enclosing	60 Trailer combination, 40	As building	United Kingdom IEA2017	None	<input type="checkbox"/>
Rock wool insulation panels, unface ?	1000 m2 x 250 mm	51t - 20%		2.5.1.External enclosing	60 Trailer combination, 40	As building	United Kingdom IEA2017	None	<input type="checkbox"/>
Ready-mix concrete, normal-strength ?	1000 m2 x 150 mm	42t - 17%		2.5.1.External enclosing	60 Concrete mixer truck	As building	United Kingdom IEA2017	None	<input type="checkbox"/>
Reinforcement steel (rebar), gener ?	24000 kg	12t - 5%		2.5.1.External enclosing	110 Trailer combination, 40	As building	United Kingdom IEA2017	None	<input type="checkbox"/>
Gypsum plaster board, regular, gene ?	1000 m2 x 12.5 mm	3.6t - 1%		2.5.1.External enclosing	60 Trailer combination, 40	As building	United Kingdom IEA2017	None	<input type="checkbox"/>
Gypsum plaster, 1100 kg/m3 (Bundesv ?	1000 m2 x 3 mm	0.46t - 0.2%		2.5.1.External enclosing	60 Trailer combination, 40	30	United Kingdom IEA2017	None	<input type="checkbox"/>



Exercise 3: Check the results



Review results

You can see simplified results and most contributing materials on the side bar when in the queries. You can turn it on and off from the small **Green arrow**.

Global warming
Change impact category ▾
CO₂ 13 Tons CO₂e

Results by life-cycle stage

● A1-A3 Materials - 75.7%
● A4 Transportation - 17.9%
● C1-C4 End of life - 6.3%

Most contributing data points

Resource	Share
Ready-mix concrete, normal-strength,	83.29

Workflow **Results** Guidance

Training > Design 1 > LCA for BREEAM UK > Input data : Building materials

Cancel Save Results More actions ▾ Hide filters

Building materials Energy consumption, annual Water consumption, annual Construction site operations Emissions and removals Building area

Material Country Data source Type Upstream Emission Unit Properties

Clear Filter: Filter: Filter: Filter: Filter: Filter: Filter: Save Results

1 Fill in the material consumptions by material type. You may fill in all materials lumped together, or on separate rows for example by type of structure. Unless instructed otherwise, use gross amounts. Materials can be added in any section. [Material selection help](#).

Completeness (-) and plausibility checker (grade: F)

1. Foundations and substructure 13 Tons CO₂e - 100 %

Materials in the foundations will never be replaced, no matter assessment period length. For BREEAM UK Mat 1 IMPACT equivalent provide the data for site excavation fuel use here, choose resource Excavation

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

Search by name, manufacturer, EPD nr ▾

Resource	Quantity	CO ₂ e	Comment	RICS category	Transport, kilometers
Ready-mix concrete, normal-strength, gen	70000 kg	11t - 83%		1.1.1.Standard	250 Concrete mixer truck
Reinforcement steel (rebar), generic, 97	4200 kg	2.1t - 17%		1.1.1.Standard	110 Trailer combination, 40

2. Vertical structures and facade

External walls and facade

Search by name, manufacturer, EPD nr ▾

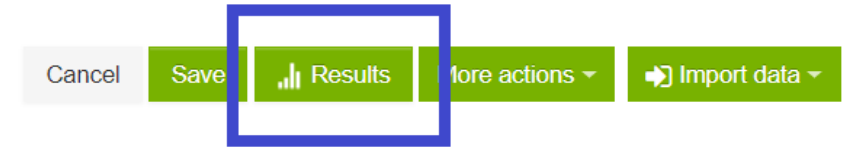
Click here to chat!
How may I help you today?

Review results

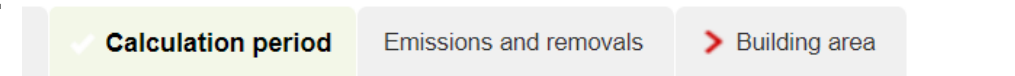
Now let's see all the results!

Click on “Results” button on the top right corner.

If any mandatory DATA is missing, go and add (Like area m2)

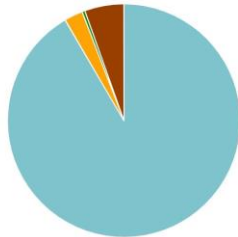


In the results page, you get a range of graphs and tables.



Global warming, kg CO2e - Life-cycle stages

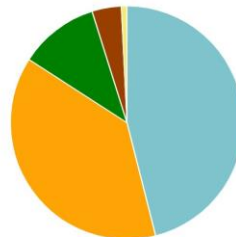
- A1-A3 Materials - 91.6%
- A4 Transportation - 2.6%
- B4-B5 Replacement - 0.4%
- C1-C4 End of life - 5.5%



Global warming, kg CO2e - Resource types

This is a drilldown chart. Click on the chart to view details

- Insulation - 46.1%
- Concrete - 38.1%
- Metals - 11.0%
- Gypsum, plaster & cement - 4.1%
- Masses - 0.8%



Whole life carbon assessment, RICS

This is the project whole life carbon assessment according to RICS methodology and EN 15978. To see the detailed results report, please click More actions > Detailed report

	A1-A3 Product Stage	A4 Transportation to site	A5 Site operations	B1 Use Phase	B3 Repair	B4 Replacement	B6 Operational Energy use	B7 Operational Water use	C1-C4 End of Life stage	Module D (not included in totals)	TOTAL kg CO2e
1 Substructure											
2.1-2.4 Superstructure											
2.5-2.6 Superstructure	93,287	22,927			0				8,089	-18,803	124,302
2.7-2.8 Superstructure											
3 Finishes											
4 Fittings, furnishings & equipments											
5 Services (MEP)											
6 Prefabricated buildings and building units											
7 Work to existing building											
8 External works											
Other materials - TOTAL											
Site, energy and water			151,717				1,508,376				1,660,093
TOTAL kg CO2e	93,287	22,927	151,717		0		1,508,376		8,089	-18,803	1,784,395

- Earth, masses and stones
- Insulation
- Concrete
- Steel and other metals
- Gypsum, plaster and cement

+ Project reporting information

Assessment of biogenic carbon and mass of materials, RICS

This table shows the impacts of construction materials for the biogenic carbon and mass categories

	A1-A3 Product Stage	B1 Use Phase
Mass of raw materials kg	742,000	
Biogenic carbon storage kg CO2e bio	0	

Many graphs can be adjusted, and all can be downloaded.



Exercise 4: Carbon Designer



Creating a baseline

1/ At the project page, click on “Input data” and then “Carbon Designer: Create baseline” .

2/ Define the materials scope, the building type, size, number of floors and structural material. (Office, 5,000m2, 5 floors, 60 years, 1 basement, concrete frame)

3/Click “Calculate areas”

The screenshot shows the software interface with a sidebar on the left containing navigation links like 'Main > 00 Levels' and '00 Levels'. The main area displays a table with columns for 'Tool', 'Unit', and '2 - Option 1'. A dropdown menu is open, showing options like 'View results (Mandatory data missing)', 'Data inputs', 'Import data', and 'Carbon Designer: Create baseline'. A red arrow points to the 'Carbon Designer: Create baseline' option.

Project materials scope

Building parameters

- ☒ Foundations and substructure
- ☒ Ground Slab
- ☒ Structure
- ☒ Enclosure
- ☒ Finishes
- ☐ Services

Building type, size and number of floors

UK buildings, Part L 2016

Office buildings

Total gross floor area (GFA) 5000 m²

Number of above ground floors 5

Calculation period 60 years

More options

Number of underground heated floors 0

Number of underground unheated floors 1

Required foundation type and depth

Show private constructions ☐

Scenarios

Baseline scenario Concrete - In-situ

Comparison scenario Not applied

Cancel Calculate areas Create Baseline



Creating a baseline

Building dimensions



Height	18	m
Width	50.9	m
Depth	18	m
Internal floor height	3.3	m
Maximum column spacing distance	9	m
Load bearing internal walls	0	%
Number of staircases	1	
Total number of floors	6	
Shape Efficiency Factor	1.1	
Gross internal floor area (GIFA)	4710.5	m ²
Heated area	3925.4	m ²
More parameters		
Floor thickness	0.3	m
Envelope thickness	0.3	m
Roof shape efficiency factor	1	%
Length to depth ratio	2	
Maximum building depth	18	m
Maximum staircase distance	50	m
External door ratio	0.02	
Window ratio	0.2	
Maximum window ratio	0.9	
Balcony ratio	0.01	
Internal wall ratio	1.7	
External paved areas ratio	0	%

Building structures

Edit areas if necessary.

Foundations and substructure

Foundation	5000	m ²
Frost Insulation	138	m
Cleanliness layer	833	m ²

Ground Slab

Ground slabs	833	m ²
--------------	-----	----------------

Structure

Floor slabs	4167	m ²
Columns	454	m
Beams	756	m
Load bearing internal walls	0	m ²
Balconies	42	m ²
Staircases	22	m

Enclosure

Underground walls	496	m ²
External walls	1631	m ²
Windows	833	m ²
External doors	17	m ²
Roof slab	833	m ²
Roofs	833	m ²

Finishes

Internal walls	4218	m ²
Floor finishes	3925	m ²
Ceiling finishes	3925	m ²

4/ Review the calculated areas.

5/ There is a requirement for the building to have a **net floor height of 4m**. Update the relevant parameter.

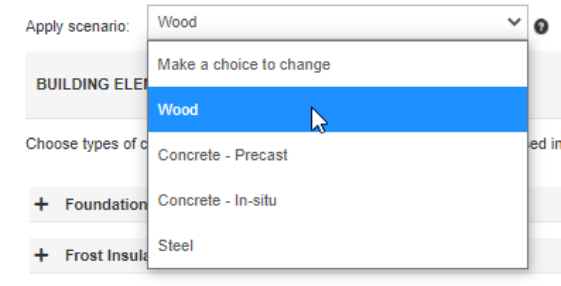
6/ The structural engineer has advised there will be several concrete cores resulting in **20%** of the internal walls being load bearing walls.

Optimize design

1/ Start changing the constructions in categories with high impact. Change windows to timber frame, internal walls to timber studs, external walls to brick slips and medium dense blocks, carpets to vinyl etc.

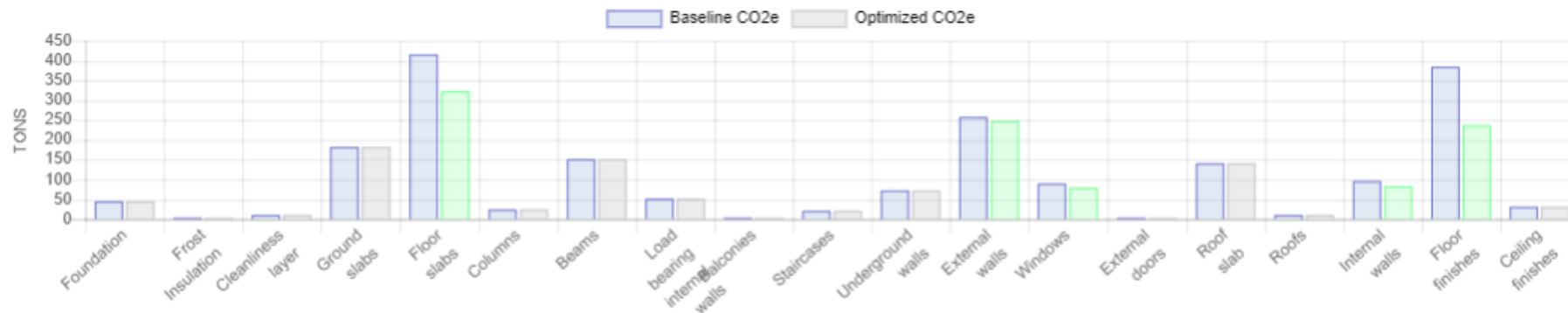
2/ **“Restart design”**. When results are ready, apply a wood scenario.

3/ **“Save design to query”**



Baseline CO₂e **400 kg/m² GFA** Optimized CO₂e **345 kg/m² GFA** Carbon change **-13.74% / -274.83 tonnes CO₂e** Assumptions

Select groupings



Exercise 5: EPD comparison



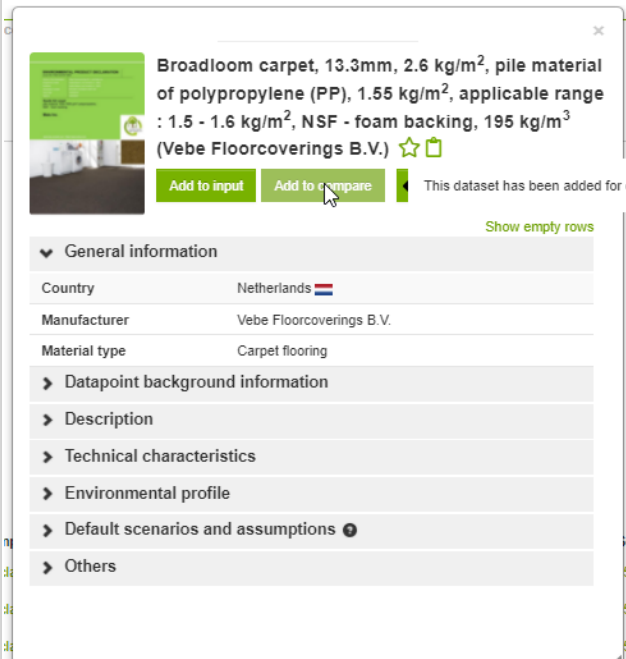
Compare data feature

1/ Add the following carpet products in your design

- Broadloom carpet, 9.6mm, 2.17 kg/m², pile material of polypropylene (PP), 1.15 kg/m², applicable range : 1.1 - 1.2 kg/m², NSF - foam backing, 225 kg/m³ (Vebe Floorcoverings B.V.)
- Broadloom carpet, 9.9mm, 2.47 kg/m², pile material of polypropylene (PP), 1.45 kg/m², applicable range : 1.4 - 1.5 kg/m², NSF - foam backing, 250 kg/m³ (Vebe Floorcoverings B.V.)
- Broadloom carpet, 13.3mm, 2.6 kg/m², pile material of polypropylene (PP), 1.55 kg/m², applicable range : 1.5 - 1.6 kg/m², NSF - foam backing, 195 kg/m³ (Vebe Floorcoverings B.V.)

2/ For each of them click on the “Add to compare” button within their data cards

3/ Click on the “Compare data” button at the top right of your screen



Broadloom carpet, 13.3mm, 2.6 kg/m², pile material of polypropylene (PP), 1.55 kg/m², applicable range : 1.5 - 1.6 kg/m², NSF - foam backing, 195 kg/m³ (Vebe Floorcoverings B.V.) ☆ 📄

Add to input **Add to compare** This dataset has been added for

[Show empty rows](#)

▼ General information

Country Netherlands 🇳🇱

Manufacturer Vebe Floorcoverings B.V.

Material type Carpet flooring

► Datapoint background information

► Description

► Technical characteristics

► Environmental profile

► Default scenarios and assumptions ⓘ

► Others

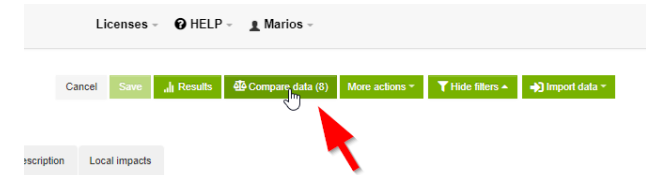
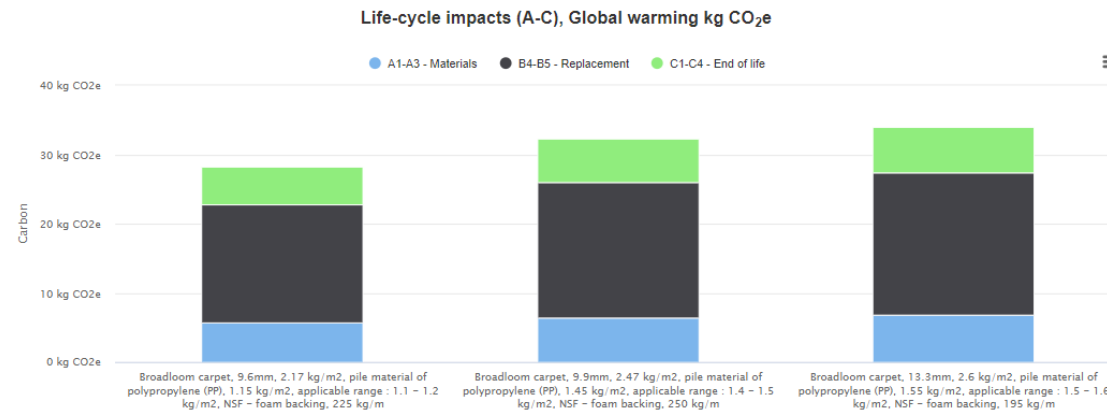
Carpet flooring

Life-cycle impacts (A-C)

Cost and carbon

See data

Go to top



Direct comparison within the model

1/ Add the following gypsum board products in your design

- Gypsum board, fire resistant, 15 mm, 12.4 kg/m², 823 kg/m³, 0.25 W/mK, Placoflam 15 (PPF 15) (Saint-Gobain Placo Ibérica)
- Gypsum board, fire resistant, 12.5 mm, 12.8 kg/m², 1024 kg/m³, Diamant 12.5 mm (Knauf)
- Gypsum plasterboard, high strength, fire resistant, 19 mm, 16.5 kg/m², GIB FYRELINE 19MM (GIB)

2/ Save your design

Note: Commercial products selected from different countries to avoid direct comparison during the training

3/ Check the previewed results in the same page

Gypsum board, fire resistant, 15 mm ?	1000	m2	x	15	mm	4,8t - 3%
Gypsum board, fire resistant, 12.5 ?	1000	m2	x	12,5	mm	6t - 4%
Gypsum plasterboard, high strength, ?	1000	m2				7,6t - 5%

**Make sure the compared products
are functionally equivalent**

Performance ranking feature

1/ Add a generic floor screed material e.g. “Modified mineral mortars, German average, Group 1, as grouting, 1600 kg/m³, EPD coverage: 800 - 1700 kg/m³ (DBC/IVK/VdL)”

2/ Assuming you used this as a baseline you are now looking for a product EPD that performs better. Open the data card by clicking on the ? icon, go to the “Environmental profile” section and click on the “performance ranking”.

Modified mineral mortars, German average, Group 1, as grouting, 1600 kg/m³,
EPD coverage: 800 - 1700 kg/m³ (DBC/IVK/VdL)

Show empty rows

▼ General information

Country Germany

Manufacturer DBC/IVK/VdL

Material type Mortar (masonry/bricklaying)

► Datapoint background information

► Description

► Technical characteristics

▼ Environmental profile

Global warming potential (A1-A3) before local compensation 0.47 kg CO₂e / kg
744.0 kg CO₂e / m³
11.16 kg CO₂e / m²

Impact categories (A1-A3) Show

Performance in group Mortar (masonry/bricklaying)

Performance ranking ⓘ CO₂ CML: 259 / 397 See full ranking

Q Metadata ⓘ +/- 34.64 % variation in dataset

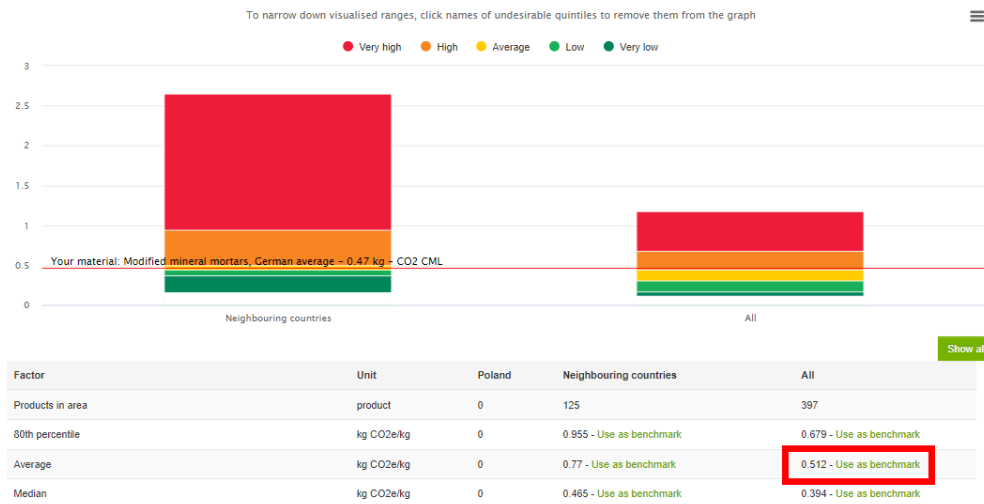
► Default scenarios and assumptions ⓘ

Performance ranking feature

3/ In the new window, select the average performance in All countries to use as a benchmark.

4/ Select to show the products that perform 50% better than the benchmark

5/ Scroll down until you find a suitable product



Benchmark for Mortar (masonry/bricklaying) set as 0.512 kg CO2e /kg

Products below benchmark	product	0	77 - Show products	285 - Show products
Products less than -20 % of benchmark	product	0	41 - Show products	215 - Show products
Products less than -30 % of benchmark	product	0	21 - Show products	176 - Show products
Products less than -40 % of benchmark	product	0	18 - Show products	159 - Show products
Products less than -50 % of benchmark	product	0	17 - Show products	144 - Show products

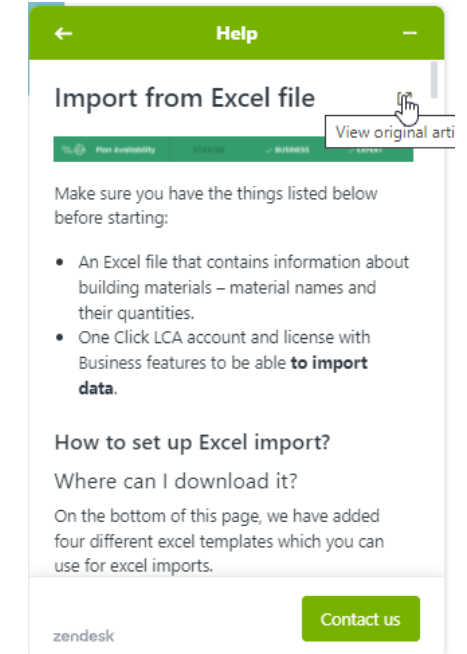
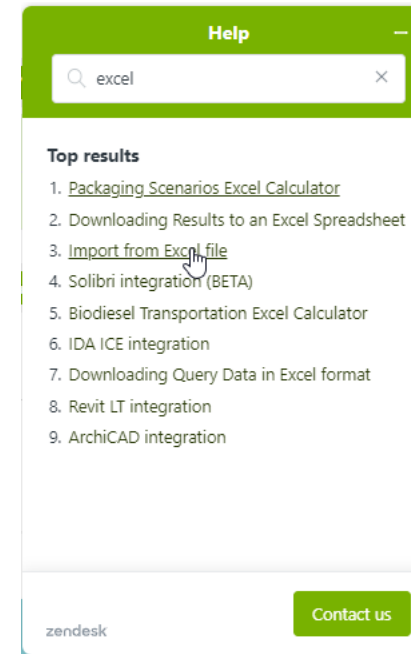
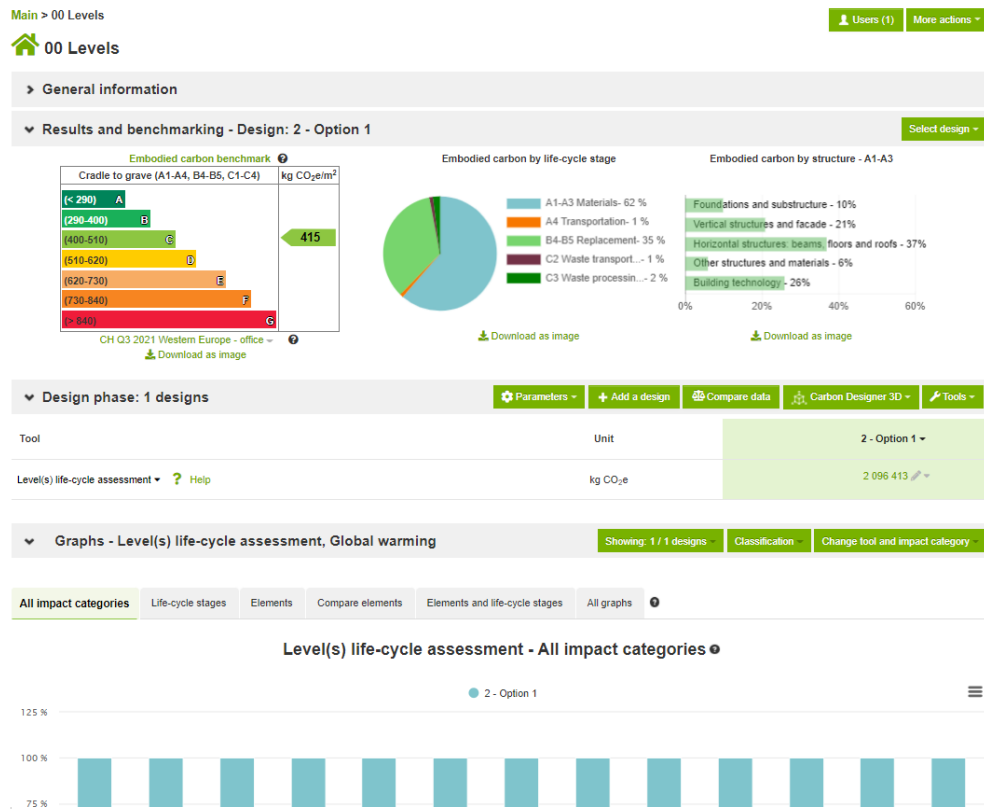
Make sure the compared products are functionally equivalent

Exercise 6: Excel Import Process



Preparing the excel import

- 1/ At any One Click LCA page, click on the **help** button at the bottom right corner.
- 2/ Type “**excel**” and click on the “**Import from excel file**” option.
- 3/ Open the article in a new tab and scroll to the bottom of the page. Download “**OCL_import_form_Building_Metric_v1_4-4.xlsx**”.



Preparing the excel import

1/ Open the template and delete all irrelevant columns e.g. I to X

2/ If any column for classification system is left in, then fill this information for all rows. E.g. Level(s) classification.

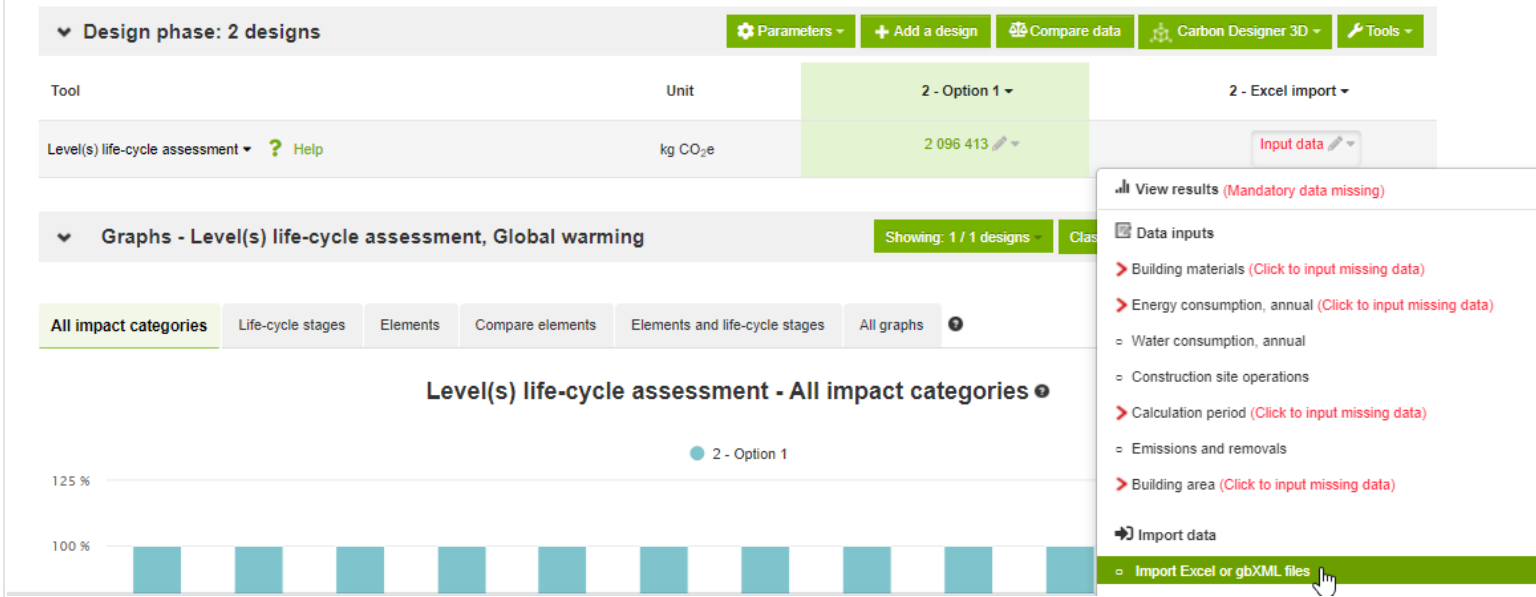
3/ Add any other materials if you wish in another row.

4/ Save the file

[illegible]

Importing the excel import

- 1/ At the input data drop down list, click on the “Import Excel or gbXML files” option.
- 2/ Choose the design to upload the data. You can choose to upload to a new design.
- 3/ Review the grouping rules and click continue.
- 4/ Review any identified materials and map any unidentified ones and click continue.
- 5/ Review the results



QUESTIONS?