

Carbon Designer for Ireland Full Guidance

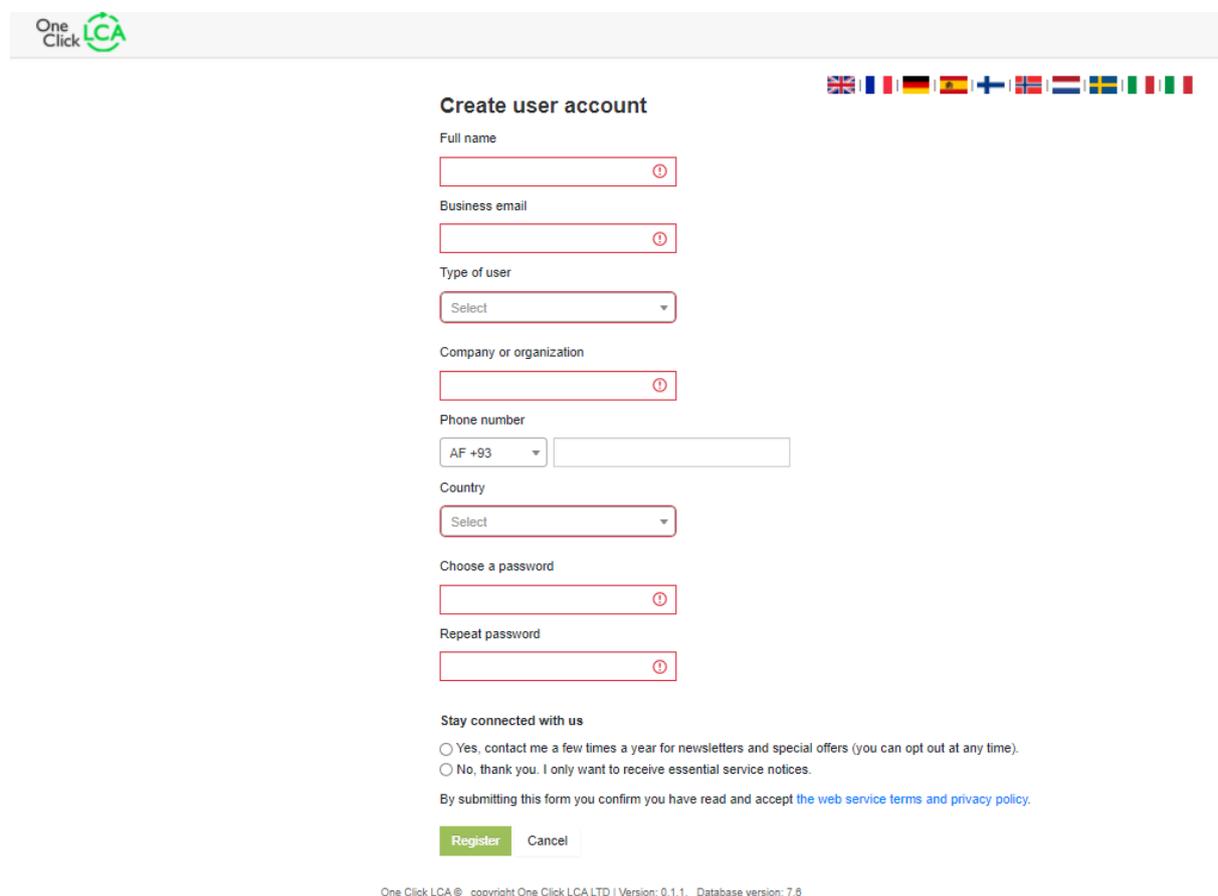
(Based on <https://oneclicklca.zendesk.com/hc/en-us/articles/360014985940>)

The Carbon Designer tool allows very quick baseline building creation with minimal knowledge about the project and shows the impacts of different optioneering choices quickly and clearly. You can make variants by changing between pre-defined building structures or adjusting individual material choices.

As only very limited background information is needed to start, the tool can be used in early design stages and target setting. The modelled building can also be saved to any of OneClickLCA's more advanced LCA calculation tools.

The first step is to create an account at OneClickLCA.

Go to www.oneclicklca.com/carbon-designer-tool-ireland/, scroll down and follow the link at Step 1 to register:



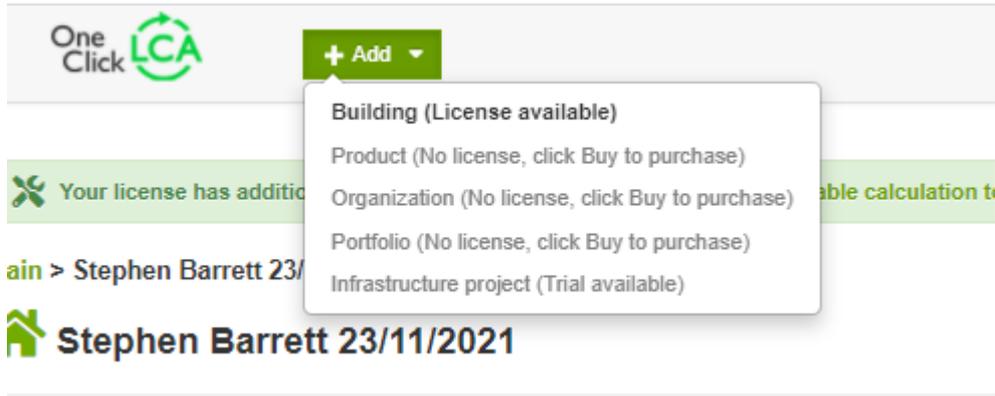
The screenshot shows the 'Create user account' registration form on the OneClickLCA website. The form includes the following fields and options:

- Full name:** Text input field with a red border and a red information icon.
- Business email:** Text input field with a red border and a red information icon.
- Type of user:** Dropdown menu with 'Select' as the current selection.
- Company or organization:** Text input field with a red border and a red information icon.
- Phone number:** A dropdown menu for the country code (currently set to 'AF +93') followed by a text input field.
- Country:** Dropdown menu with 'Select' as the current selection.
- Choose a password:** Text input field with a red border and a red information icon.
- Repeat password:** Text input field with a red border and a red information icon.
- Stay connected with us:** Two radio button options:
 - Yes, contact me a few times a year for newsletters and special offers (you can opt out at any time).
 - No, thank you. I only want to receive essential service notices.
- Disclaimer:** A line of text stating: 'By submitting this form you confirm you have read and accept the [web service terms](#) and [privacy policy](#).'
- Buttons:** A green 'Register' button and a grey 'Cancel' button.

At the top right of the form area, there is a row of small national flags representing different countries.

At the bottom of the page, the footer text reads: 'One Click LCA © copyright One Click LCA LTD | Version: 0.1.1, Database version: 7.6'

Once you have signed up to OneClick and verified your email, create a project by clicking on Add > Building:



Link the project to your Carbon Designer License by clicking the dropdown, and name your project whatever you wish:

The screenshot shows a 'New project' dialog box with a progress indicator at the top showing four steps: 1. Basic information (highlighted), 2. Optional information, 3. First design, and 4. Options. The 'Basic information' section includes: 'Link project to the following license' with a dropdown menu showing 'Carbon Designer for Ireland (free tool)'; 'Template' with a dropdown menu showing 'Irish Carbon Designer quick start template (... * * *)'; 'Name (mandatory)' with a text input field containing 'CarbonDesigner Demo Project'; 'Type (mandatory)' with a dropdown menu showing 'Office buildings'; 'Country (mandatory)' with a dropdown menu showing 'Ireland'; and 'Address' with an empty text input field. At the bottom are three buttons: 'Cancel', 'Back', and 'Next'.

Click 'Next' and add the optional information if you wish. It is not necessary at this stage.

The screenshot shows a 'New project' form with a progress bar at the top. The progress bar has four steps: 'Basic information' (completed, marked with a green checkmark), 'Optional inform...' (current step, marked with a green circle and the number 2), 'First design' (marked with a circle and the number 3), and 'Options' (marked with a circle and the number 4). Below the progress bar, the form contains several input fields: 'Gross Floor Area (m²)' with a text box and a unit selector 'm²'; 'Number of above ground floors' with a text box; 'Frame type' with a dropdown menu set to 'Not determined/not sure' and a note: 'If not new construction, please choose 'Existing frame/Not applicable'. If you will evaluate several different frame types you can choose 'Not determined.''; 'Image' with a 'Choose file' button, 'No file chosen', and '(jpeg, jpg, gif, png)(max. 1000 KB)'; and 'Certifications pursued' with a dropdown menu set to 'Start typing or click the arrow'. At the bottom, there are three buttons: 'Cancel', 'Back', and 'Next' (highlighted in green).

Click Next

You now have a project where you can save multiple design experiments. To create a baseline design model, choose a Building type from the dropdown menu on the left:



This tool allows creating and optimizing the constructions and materials used in a construction project. It can be used for a new construction project or a renovation project.

Project materials scope

Building parameters

- Foundations and substructure
- Ground Slab
- Structure
- Enclosure
- Finishes
- Services
- Default values

Building type, size and number of floors

Irish reference building 2021

Building type

- Office buildings
- One-dwelling buildings
 - Apartment buildings
 - Hotels and similar buildings
 - Office buildings**
 - Hospitals and healthcare centers
 - Social welfare buildings
 - Educational buildings
 - Industrial production buildings
 - Cultural buildings

Building dimensions



+ Import areas from Excel

Input the total floor area, the number of floors above ground and the calculation period in the red boxes. We recommend a period of 50 years in line with the EU Level(s) documents on building LCA.

You can leave the other boxes empty to adjust later.

One Click LCA + Add Licenses HELP Stephen

Main > CarbonDesigner Demo > My Design > Carbon Designer: Create baseline

Carbon Designer: Create baseline Create Baseline

This tool allows creating and optimizing the constructions and materials used in a construction project. It can be used for a new construction project or a renovation project.

Project materials scope

Building parameters

- Foundations and substructure
- Ground Slab
- Structure
- Enclosure
- Finishes
- Services
- Default values

Building type, size and number of floors

Irish reference building 2021

Building type
Office buildings

Total gross floor area (GFA) m²

Number of above ground floors

Calculation period years

[+ More options](#)

Scenarios

Baseline scenario
Not applied

Comparison scenario
Not applied

Cancel Calculate areas Create Baseline

Building dimensions



+ Import areas from Excel

Click **Calculate areas** in the bottom left corner.

The tool will estimate the dimensions of the building based on your floor area and number of floors and its own assumptions, and offer figures for you to adjust if you wish. Place your mouse on each question mark  to read the explanation of each calculation. You can make adjustments, for example floor heights can be adjusted under 'Building Dimensions' and the window to wall ratio can be adjusted under 'Enclosure':

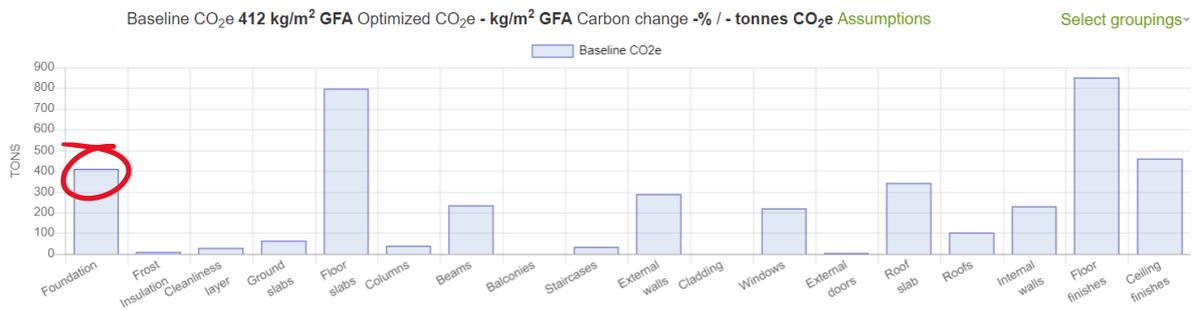
If this is your first time using the tool, this is a good point to stop and take a closer look at all the assumptions. This way you will have a better understanding of the results later, you can begin to relate the assumptions to your design, and you can adjust them now or in future to better reflect your plans.

When you are happy the assumptions relate to your early design thoughts, click **Create Baseline**.

Your initial result will look like this:



Carbon Designer: Project carbon breakdown



The tool has broken down the model into its main elements and allocated a carbon score to each element based on the calculated volume and assumed materials. Beneath the bar chart you will see a list containing the same elements in the same order, starting with Foundation, Frost Insulation etc.

Apply scenario: ?

| BUILDING ELEMENTS AND MATERIALS | Amount | Tons CO ₂ e | Carbon Share |
|---------------------------------|--------|------------------------|--------------|
|---------------------------------|--------|------------------------|--------------|

Choose types of constructions you wish to use, and adjust the materials used in them as desired. You can also save the adjusted data to a design.

| | | | |
|---------------------|----------------------|--------|-------|
| + Foundation | 10000 m ² | 411 tn | 10.0% |
| + Frost Insulation | 280 m | 8.2 tn | 0.2% |
| + Cleanliness layer | 2000 m ² | 29 tn | 0.71% |
| + Ground slabs | 2000 m ² | 63 tn | 1.5% |
| + Floor slabs | 8000 m ² | 799 tn | 19% |

As you can see above – the 411 tn CO₂e in the foundation is the same as in the bar chart. You can edit this list in three ways and the results will show in the bar charts.

1 - Scenarios: Edit the list by selecting a scenario from the dropdown at the top of the list;

Apply scenario: ?

This will apply a scenario to all elements at the same time. Below you can see how selecting the Wood scenario compares to the default. The bar chart elements in green show an improvement from the default, and the figures at the top show the overall improvement;



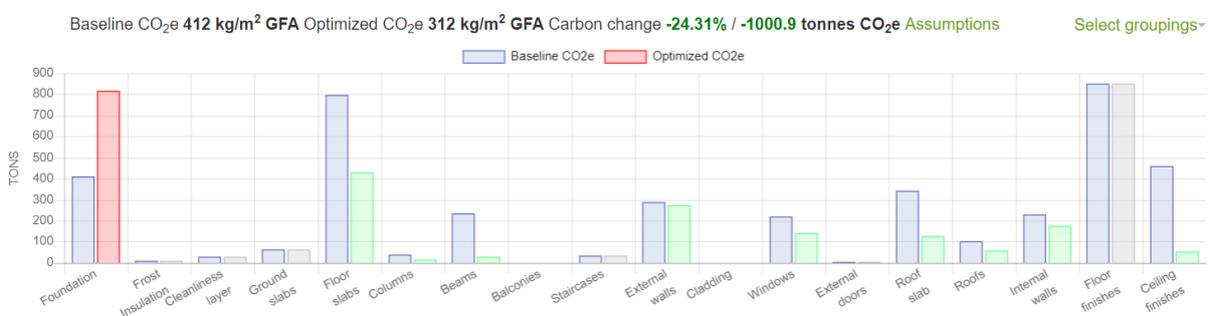
2 – Build-up types: Click on the ‘+’ beside an element. This will show a list of all the possible build ups for that element. Notice that one of them will have ‘100%’ in the third column. This means 100% of the element is allocated to that build-up type.

| Foundation | 10000 m ² | Share 100% | 411 tn | 15% | Carbon intensity | Comment |
|--|----------------------|----------------------------------|--------|------|------------------|---|
| Strip footing foundation assembly with solid masonry wall ? | 10000 m ² | <input type="text" value="100"/> | 411 tn | 100% | 41 kg | <input type="text"/> Edit |
| Raft foundation assembly ? | 0 m ² | <input type="text" value="0"/> | 0 tn | 0% | 0 kg | <input type="text"/> View |
| Passive raft foundation assembly, incl. insulation, Please set share to 0 for the following constructions when this is used: Frost insulation, Strip | 0 m ² | <input type="text" value="0"/> | 0 tn | 0% | 0 kg | <input type="text"/> View |

You can edit this and spread your 100% across different build up types. In this example the share is divided across two types of foundation. Note the other columns automatically update to show the totals for each build-up type selected:

| Foundation | 10000 m ² | Share 100% | 818 tn | 26% | Carbon intensity | Comment |
|--|----------------------|---------------------------------|--------|-----|------------------|---|
| Strip footing foundation assembly with solid masonry wall ? | 5000 m ² | <input type="text" value="50"/> | 205 tn | 25% | 41 kg | <input type="text"/> Edit |
| Raft foundation assembly ? | 5000 m ² | <input type="text" value="50"/> | 612 tn | 75% | 122 kg | <input type="text"/> Edit |
| Passive raft foundation assembly, incl. insulation, Please set share to 0 for the following constructions when this is used: Frost insulation, Strip | 0 m ² | <input type="text" value="0"/> | 0 tn | 0% | 0 kg | <input type="text"/> View |

The bar charts have automatically updated to show the impact of your choice too:



3 Build-up Components: To the right you will see a link that reads View or Edit. This link shows the detailed build-up of the element. If the line of data has a share in the % column this will read 'Edit', otherwise it will be 'View'. Click on this to make more detailed adjustment to the build-up.

| Foundation | 10000 m ² | Share 100% | 818 tn | 26% | Carbon intensity | Comment |
|--|----------------------|---------------------------------|--------|-----|------------------|---|
| Strip footing foundation assembly with solid masonry wall ? | 5000 m ² | <input type="text" value="50"/> | 205 tn | 25% | 41 kg | <input type="text"/> Edit |
| Raft foundation assembly ? | 5000 m ² | <input type="text" value="50"/> | 612 tn | 75% | 122 kg | <input type="text"/> Edit |
| Passive raft foundation assembly, incl. insulation, Please set share to 0 for the following constructions when this is used: Frost insulation, Strip | 0 m ² | <input type="text" value="0"/> | 0 tn | 0% | 0 kg | <input type="text"/> View |

Depending on the element, the choices will vary, but typically you can use it to experiment with different proportions of recycled content in cement or rebar, or try different insulation types in a wall cavity or roof build-up.

Strip footing foundation assembly with solid masonry wall
total CO₂e [186 tn]

| Component | CO ₂ e | Material | Amount | Thickness mm | Comment |
|--------------------|-------------------|--|------------|--------------|----------------------|
| Concrete block | 161 tn | Concrete block, masonry, B40, 200x500x200/250 r | 1000000 kg | | <input type="text"/> |
| Ready-mix concrete | 18 tn | Ready-mix concrete, generic (consultation), C30/3' | 242013 kg | | <input type="text"/> |
| Reinforcement | 7.7 tn | Reinforcement steel (rebar), generic, 100% recycle | 15750 kg | | <input type="text"/> |

- Reinforcement steel (rebar), generic, 90% recycled content, A615
- Reinforcement steel (rebar), generic, 0% recycled content (only virgin materials), A615
- Reinforcement steel (rebar), generic, 60% recycled content, A615
- Reinforcement steel (rebar), generic, 80% recycled content, A615
- Reinforcement steel (rebar), generic, 97% recycled content (typical), A615
- Reinforcement steel (rebar), generic, 100% recycled content, A615

Changes here will update the component's CO₂e on the same page, and update the overall figures and charts. Each element works exactly the same way as the above description.

The idea is to quickly understand which are the largest impact elements of your planned design, those with the highest bars in the chart. The example above is a five storey building, so unsurprisingly floor elements were most impactful. A one storey building of the same floor area would have a more impactful roof as there would be much more material required in that element. It will vary depending on your choices.

When you have identified the most impactful elements, you can then experiment with different (1) scenarios, (2) build-up types and (3) build-up components to see the impacts of different choices.

Once you have made all the changes you wish to see you can either set your new building type as the baseline, replacing the original baseline, or save the design to view more in depth results and generate a report.

At the bottom of the page, Click Save design to query to view results in more detail. You can ignore any warnings.

Your design is now saved in the project page created at the beginning, and an overall carbon figure displayed. Detailed results can be seen by clicking on the figure and selecting 'View results':

Main > Carbon Designer Demo Project

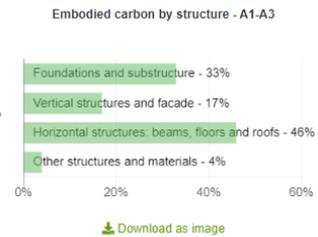
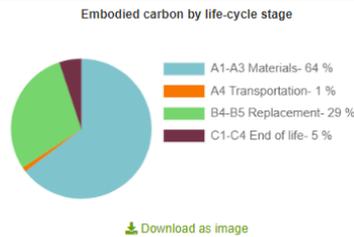
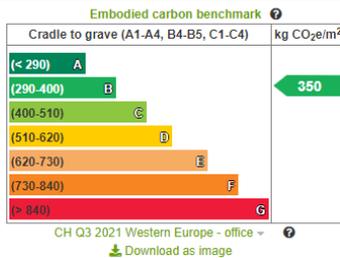
Users (1) More actions

Carbon Designer Demo Project

General information

Results and benchmarking - Design: 2 - My Design

Select design



Project level parameters are not defined. Set them under the Parameters menu. Changing them later on will lead to results being recalculated.

Design phase: 1 designs

Parameters

+ Add a design

Compare data

Tools

| Tool | Unit |
|---------------------------------|----------------------|
| Level(s) life-cycle carbon (IE) | kg CO ₂ e |

2 - My Design

3 097 090

View results

Carbon Designer: Optimize design

To compare multiple calculation

From here you can:

- View detailed results by clicking on the carbon figure and selecting 'View results' from the dropdown;
- Edit the design by clicking on the carbon figure and selecting 'Carbon Designer Optimize design';
- Copy the design by clicking its name and selecting 'Copy' from the dropdown menu. You can now make further material changes and compare them to your original;
- Create a new design by clicking **+ Add a design**. The new design will be saved in the same project alongside the current design.

Viewing results

Results are displayed in a table and a selection of charts. The table at the top of the results page outlines the totals for each stage of the building's lifecycle and provides the total per square meter Gross Internal Floor Area (GIFA) at the bottom. You can dig into the details in the links on the right.

▼ Results

Building life-cycle carbon footprint for Level(s) in compliancy with EN 15978 [Download Results Summary](#)

Incomplete lifecycle according to Level(s) definitions (Draft Beta v1.0)

| Result category | Global warming kg CO ₂ e ⓘ | Biogenic carbon storage kg CO ₂ e bio ⓘ |
|--|--|---|
| A1-A3 ⓘ Construction Materials | 2 154 655 | 877 610 Details |
| A4 ⓘ Transportation to site | 43 065 | Details |
| A5 ⓘ Construction/installation process | 160 641 | Details |
| B1 ⓘ Use Phase | | Hide empty |
| B3 ⓘ Repair | 0 | Details |
| B4-B5 ⓘ Material replacement and refurbishment | 569 143 | Details |
| B6 ⓘ Energy use | | Hide empty |
| B7 ⓘ Water use | | Hide empty |
| C1-C4 ⓘ End of life | 169 585 | Details |
| D ⓘ External impacts (not included in totals) | 543 546 | Details |
| Total | 3 097 090 | 877 610 |
| Results per denominator | | |
| Per gross internal floor area m2 / year | 7 | 2 |
| Per gross internal floor area m2 | 326 | 92 |

Create a report

You can create a report by selecting [More actions](#) in the top left and choosing 'Generate Word report'. The numerical details of the current design are copied into a report template which also includes the methodology of the analysis and the supporting background data. Please note though, there are generic statements in the report that will require the user to edit and amend in line with their own work. Charts can be downloaded from the results as PNG or JPG files and saved into the report to enhance appearance and understanding.