Quick-Start Guide to Using the I2SL Laboratory Benchmarking Tool for Embodied Carbon Benchmarking

Labs2Zero is a voluntary program sponsored by the International Institute for Sustainable Laboratories (I2SL) that is dedicated to advancing the decarbonization of laboratories globally. At the heart of Labs2Zero is the I2SL Laboratory Benchmarking Tool (LBT), which allows users to benchmark lab building energy and operational emissions. I2SL launched an **Embodied Carbon Benchmarking Tool** in 2024. This new module allows users to input and benchmark lab buildings' embodied carbon emissions.

The Labs2Zero Embodied Carbon Benchmarking tool is free to use, you just need access to your building's life cycle assessment (LCA) and facility data. This quick-start guide will walk you through the process of using the LBT Embodied Carbon Benchmarking module and briefly describe the minimum data required. A quick-start guide is also available for the Energy Score and Operational Emissions Score in the LBT.

Note: To improve Embodied Carbon Benchmarking and scoring for lab buildings, I2SL is actively seeking embodied carbon data entered into the LBT and welcomes feedback on the new module from users to improve accuracy and usability. Let us know what you think by emailing lbt@i2sl.org!

Setting Up an Account

Go to https://lbt.i2sl.org and create an account here or by clicking on the "Sign up!" link. Once you sign up, you will receive an email from lbt@i2sl.org or lbtbeta@kw-engineering.com to activate your account. If not, check your spam folder! Want to know ahead of time what data you'll need? A full list of LBT data fields is available here; the basic data needs are outlined below.

What's the Minimum Data Entry Needed for Embodied Carbon Benchmarking?

Start entering your building's data via the Your Buildings tab. Click on "New Building" to get started on the first facility. The Basic Info section helps determine which fields are relevant to your building, as described below:

- Type of Record: Select whether your building record is "In Design or In Construction" or "In Operation."
- Project Phase: For "In Design or In Construction" record types, indicate the project phase for which you are providing data.
- Data Types to Be Entered: Indicate you will be entering embodied carbon data.
- Building Status: Indicate whether this is a real building or just test data.

The following are tips for what to enter in the **Building Info** section:

- Facility Name: Give your lab building a name you will easily recognize.
- Year Built: Use year of construction, most recent gut renovation, or future construction year.
- Building Address: Begin typing the address and choose from the dropdown (Google lookup). All worldwide addresses are accepted, and approximate locations (e.g., just the city name) can be entered if needed. *Note—this data will not be visible to others!*
- Organization Type: Choose the dropdown option that most closely matches the type of organization that occupies (or will occupy) the building.
- Predominant Lab Use Type: Choose the dropdown option that most closely represents the type of work that is (or will be) done in the labs. If multi-purpose, choose the most prevalent.

You'll also be asked for the total gross floor area of the building, the total lab area, and the area of specific lab components; use the following definitions.

Gross Floor Area: Total area of the building (i.e., GSF). Exclude open spaces (e.g., parking garages).

Total Lab Area: The spaces in which conditions such as tight temperature control and high air recirculation rates are required. This includes open labs and support spaces such as equipment rooms, procedure rooms, vivarium holding rooms, physics labs, maker spaces, and cleanrooms, which may include recirculated air. Do not include *non-lab areas* (e.g., language labs, computer labs, office space, and utility space). The lab area must be less than the total building area.

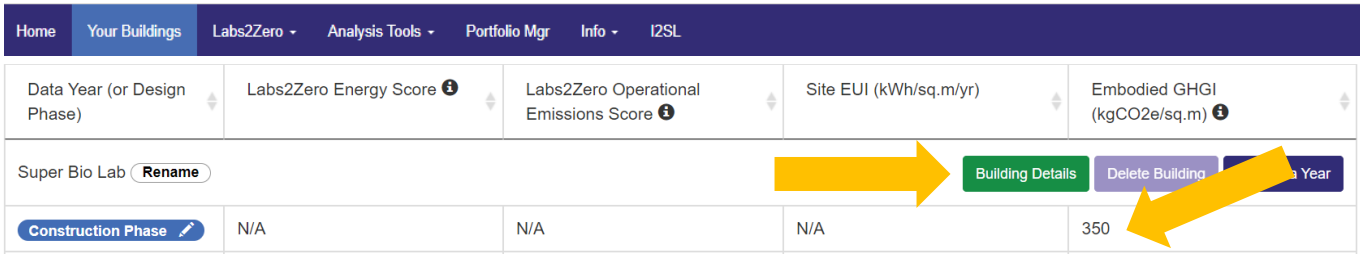
Component Lab Areas: Enter the breakdown of lab space by lab type, including biology, chemistry, physics/engineering, vivarium, makerspace/workshop, and other or not yet known. The total equals the total lab area.

Sample LBT Data Field Inputs	
Data Field	**Example**
Type of Record	In Design or In Construction
Project Phase	Construction Phase
Data Type to be Entered	Embodied Carbon Data
Building Status	Real Building
Facility Name	Super Bio Lab
Year Built	2024
Building Address	2300 Wilson Blvd, Arlington, Virginia
Organization Type	Commercial: Biotech
Predominant Lab Use Type	R&D: Basic Research
Number of (Lab) Buildings	1
Floor Areas	Gross Area: 200,000 sf Total Lab Area: 80,000 sf Biology Area: 60,000 sf Vivarium Area: 20,000 sf
Project Type	New Construction
Do LCA value reflect actual purchased and installed materials	YES
Life Cycle Duration	60 years
Structure & Enclosure - Product Stage, A1-A3	350 kgCO2e/sq.m

In the **LCA Data** section, users must enter:

- Project Type: "New Construction" or "Major Renovation."
- Do LCA values reflect actual purchased and installed materials: "Yes" or "No"
- Life Cycle Duration (years): Also known as building service life. This is often prescribed by the LCA methodology and is commonly 60 years
- Product Stage, A1-A3 (kgCO2e/sq.m): Embodied carbon intensity LCA results are only required for structure and enclosure (substructure, shell-superstructure, and exterior enclosure) for the product stage (cradle to gate, A1-A3). When calculating this quantity, make sure that the area you divide by is that of the entire assessed project, including any accessory spaces.

Once this basic data entry is completed, the lab building's embodied carbon intensity can be viewed in the **Your Buildings** tab or the Building Details view. Go to the Embodied Carbon Benchmarking page in the LBT to explore the anonymized peer-group data and use the filters to select a peer group for your facility and compare embodied carbon intensities.



Questions or concerns? Please send your feedback, questions, or error reports to lbt@i2sl.org.