



# Labs2Zero Embodied Carbon Benchmarking Tool

Labs2Zero is a voluntary program sponsored by the International Institute for Sustainable Laboratories (I2SL) that is dedicated to advancing the decarbonization of laboratories globally. I2SL is developing a variety of tools to score lab building energy and emissions performance, suggest measures to improve that performance, and certify high-performing facilities. At the heart of Labs2Zero is the **I2SL Laboratory Benchmarking Tool (LBT)**, a free tool through which users who input energy use and building data can rate their buildings' energy and greenhouse gas emissions through pilot Energy and Operational Emissions Scores.



Embodied carbon in construction materials is a concern for building owners and designers. However, there has not been a way to compare embodied carbon among lab buildings, which have unique structural requirements. Based on lifecycle assessment (LCA) data submitted by volunteers, I2SL's LBT has been expanded to include LCA data related to the embodied carbon of materials used in lab building new construction and major renovations.

The current embodied carbon data in the LBT covers the "cradle-to-gate" lifecycle stages known as A1-A3 (i.e., raw material extraction, transportation of raw materials, and product manufacturing) for materials used in lab structure and enclosure/shell building components (e.g., concrete, steel, masonry, aluminum, wood, insulation, cladding, glass).

By entering their compiled structure and enclosure A1-A3 LCA data, lab owners, operators, designers, builders, and other consultants can now benchmark lab buildings in the design or construction stage (and existing buildings) against selected peer group buildings with similar characteristics in I2SL's LBT, including labs with unique functional and structural requirements. Not sure where to start with your lab building's life cycle analysis? Organizations such as the Carbon Leadership Forum (CLF) have resources available that demonstrate how project teams can measure and reduce embodied carbon in buildings. And if you haven't used the LBT before, a **Quick-Start Guide** on the LBT site can help you understand the minimum data needed for benchmarking.

I2SL's Embodied Carbon Benchmarking database was created with the help of Labs2Zero volunteers who provided dozens of buildings' LCA data. This effort is similar to a data call by CLF for the Whole Building LCA Benchmark Study, but with more lab-specific information about vibration, seismic requirements, and building mass. I2SL's Embodied Carbon Benchmarking methodology is based on standard LCA tools required by the LEED certification system and environmental, social and governance reporting such as Tally, OneClick, the EC3 database, and the Athena Impact Estimator.

## Looking Ahead

Once sufficient LCA data has been received to perform statistical analyses, I2SL plans to develop an Embodied Carbon Score as part of its Labs2Zero tools.

Please submit any feedback on the Embodied Carbon Benchmarking tool to [lbt@i2sl.org](mailto:lbt@i2sl.org).