



Program Update



*Molecular Foundry building at Lawrence Berkeley National Laboratory,
Source: Berkeley Lab—Roy Kaltschmidt*

Laboratories have an outsized impact on carbon emissions due to their energy-intensive nature, so it is vital that lab owners, managers, designers, and engineers understand how their facilities perform in terms of energy and emissions and realize the measures they can take to improve them. To create a roadmap to help decarbonize the world's high-tech research facilities, the International Institute for Sustainable Laboratories (I2SL) is developing the Labs2Zero program, comprised of a variety of information and tools that address both the complexity of laboratories and the need to make them more efficient, while reducing the emissions associated with their buildings and operations.

I2SL's Labs2Zero program will include the following aspects, phased in over the next few years and available to those who input energy and facility data into I2SL's Laboratory Benchmarking Tool (LBT):

- An **Energy and Emissions Scorecard for Labs** encompassing both operational and embodied emissions
- An **Actionable Insights and Measures (AIM) Report** suggesting ways to improve a lab's energy and emissions scores
- A **Design2Zero** tool to target emissions goals in new lab construction
- A **certification program** to independently verify lab energy and emissions performance
- **Training and accreditation** to support the certification program



*Alexandria
Real Estate Equities,
Cambridge, Massachusetts
Photo courtesy of NBBJ*



International Institute for
Sustainable Laboratories

Why Labs2Zero?

Laboratories are extremely energy- and resource-intensive by nature, representing about 5 percent of U.S. commercial building emissions. However, by reducing U.S. lab building emissions by 50 percent by 2030, we could save an estimated 20 million metric tons of CO₂e annually, as well as 75 billion kilowatt hours of energy per year and \$7.5 billion in lab energy costs per year. Labs2Zero is I2SL's most significant initiative to date, providing myriad benefits to labs across the United States and around the world:

- Addresses the complex nature of safely reducing laboratory energy use and emissions, while accelerating the decarbonization of the world's labs with needed metrics, analysis services, training, and recognition.

- Helps labs better understand their energy use and carbon footprint by providing comparisons to other labs of similar functional requirements.
- Provides a tangible report of customized and lab-specific actions and recommendations to help organizations reach their net-zero goals and meet their carbon emissions reduction targets.
- Aids organizational environmental, social, and governance (ESG) goals and climate risk analysis efforts with quantitative results demonstrating current and potential carbon footprints from laboratories.
- Allows designers and engineers to estimate energy use intensity (EUI) and greenhouse gas emissions and set targets based on planned design characteristics.





University of Washington Life Sciences Building, Seattle, Washington
Photo courtesy of Kevin Scott (@kscott)

Support Across the Labs Community

Over **80 experienced professionals** from the lab architecture, engineering, life science real estate, academic, lab supply, and pharmaceutical communities have volunteered their time and expertise to one or more of the Labs2Zero TACs. TACs supporting the development of the Labs2Zero Energy Score, Emissions Score, Assessment and Design Tools, and I2SL Lab Benchmarking Tool Enhancement are underway.

To help launch the program, more than 20 founding sponsors have contributed to help fund development of criteria and tools to support the Labs2Zero program components. These sponsors are recognized at the I2SL Annual Conference and on I2SL's social media, website, and network communications, as well as have the opportunity to submit case studies for the Labs2Zero Actionable Insights and Measures Report and serve on Labs2Zero Technical Advisory Councils (TACs).

The first component of the program, the Energy Score for labs is available as of late October 2023. The scorecard uses data from the LBT to provide quantitative, normalized scores based on EUI compared to other facilities'

data in the LBT. In the future, Labs2Zero will offer a scorecard comparing both operational and embodied emissions to other labs in the LBT database. The tool will also provide AIM reports with customized energy and carbon reduction measures to achieve energy savings and emissions reductions, as well as estimated implementation costs and calculated return on investment.

If your organization would like to get involved with I2SL in these essential efforts, email President@i2sl.org. Those who sign a [sponsorship commitment](#) by September 2023 are recognized as a Founding Labs2Zero Sponsor at the [2023 I2SL Annual Conference](#) in Anaheim, California, October 23-25.

Thank you to the Labs2Zero founding sponsors!

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