



# Unveiling the New, Improved Labs2Zero Energy Score for Buildings

**Alison Farmer**, Labs2Zero Program Director

**I2SL Annual Conference - Session G1 - Oct 2025**



International Institute for  
Sustainable Laboratories

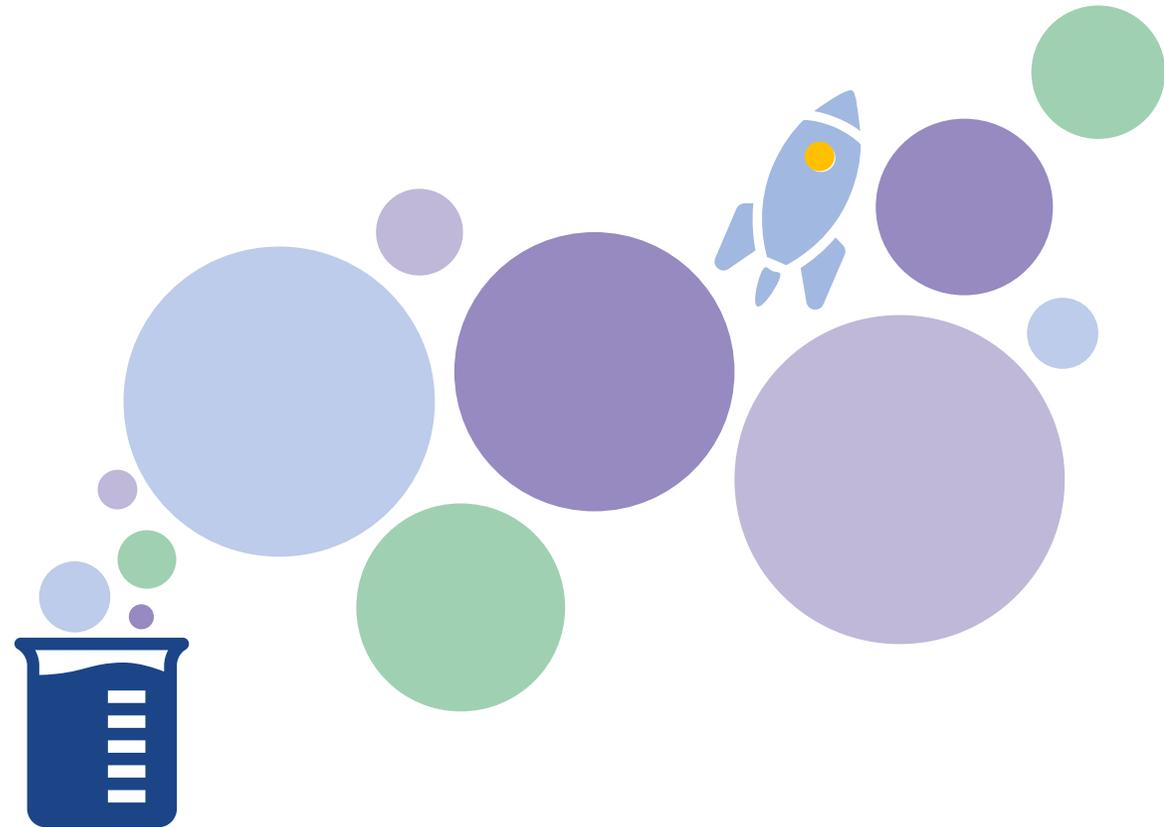
# Learning Objectives



- Explain why the release of the Labs2Zero Energy Score made benchmarking energy performance easier for the majority of lab buildings.
- List some of the major constituent building types in the LBT's database of lab buildings.
- Outline the rollout process and timeline for the new Energy and Operational Emissions Scores.
- Convey the advantages of the new, updated scoring system over the pilot scoring systems.



- **Labs2Zero Scorecard** review
  - How the scores work
  - How they are being used
  - Why reanalyze?
- Growth of the **LBT's dataset**
- **Updating** the scores
  - Score changes
  - Rollout plans
- **Future plans** for scores



# Labs2Zero: Our Biggest Program Yet

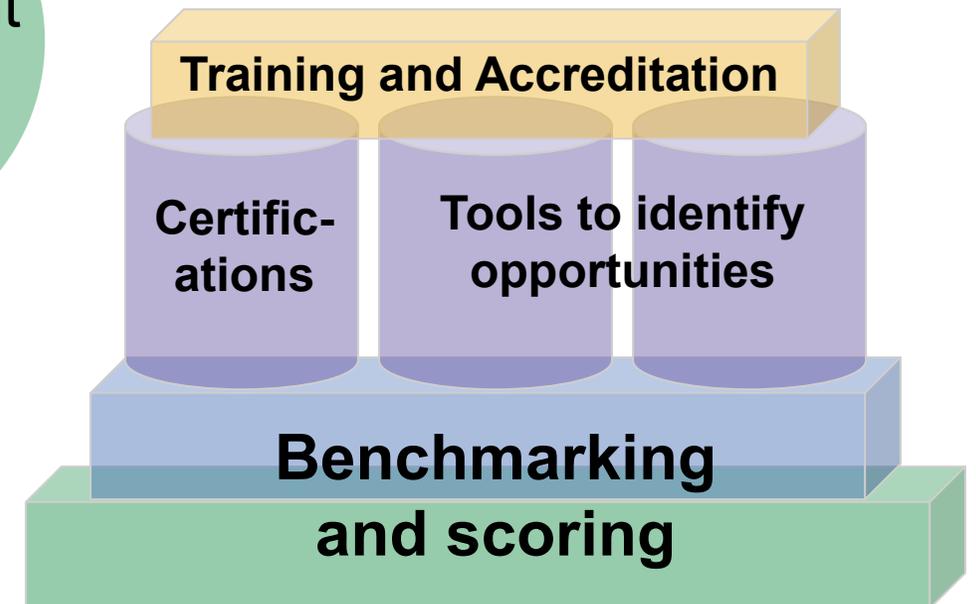


- Designed to **save energy** and reduce emissions in **lab buildings**
- Close some of the **gaps** in resources for labs
- Developed in **collaboration** with:

Volunteer  
experts

Industry  
sponsors

Development  
partners





- 8 Technical Advisory Councils
- 100 TAC members
- 3 development partners

Thank you for  
making  
**Labs2Zero**  
**possible**

# Thanks to our Labs2Zero Sponsors!



## Diamond Sponsors



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## International Partner



## Gold Sponsors



## Silver Sponsors



# Labs2Zero: What You Can Do Today

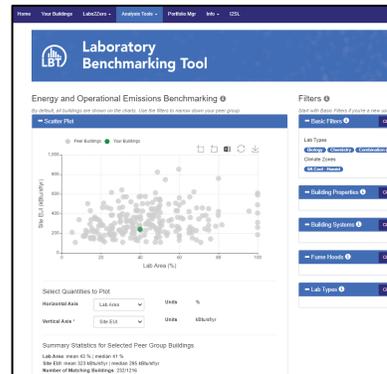


- **Tools in the program now:**

- Lab Benchmarking Tool

➔ Labs2Zero Scorecard, including Energy and Emissions Scores ➔

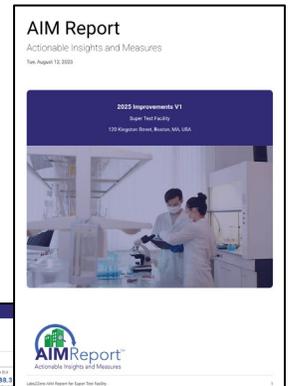
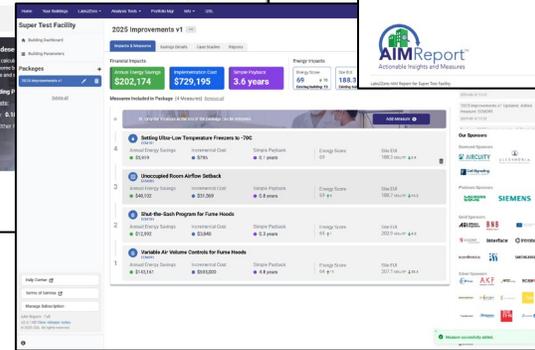
- The AIM Report – **NEW!**



Chemistry Center (Rename)	Building Details	Delete Building	Add Data Year		
2021	17	9	485	N/A	Go to AIM Report
2022	63	38	285	N/A	Go to AIM Report
2024	30	16	448	N/A	Go to AIM Report

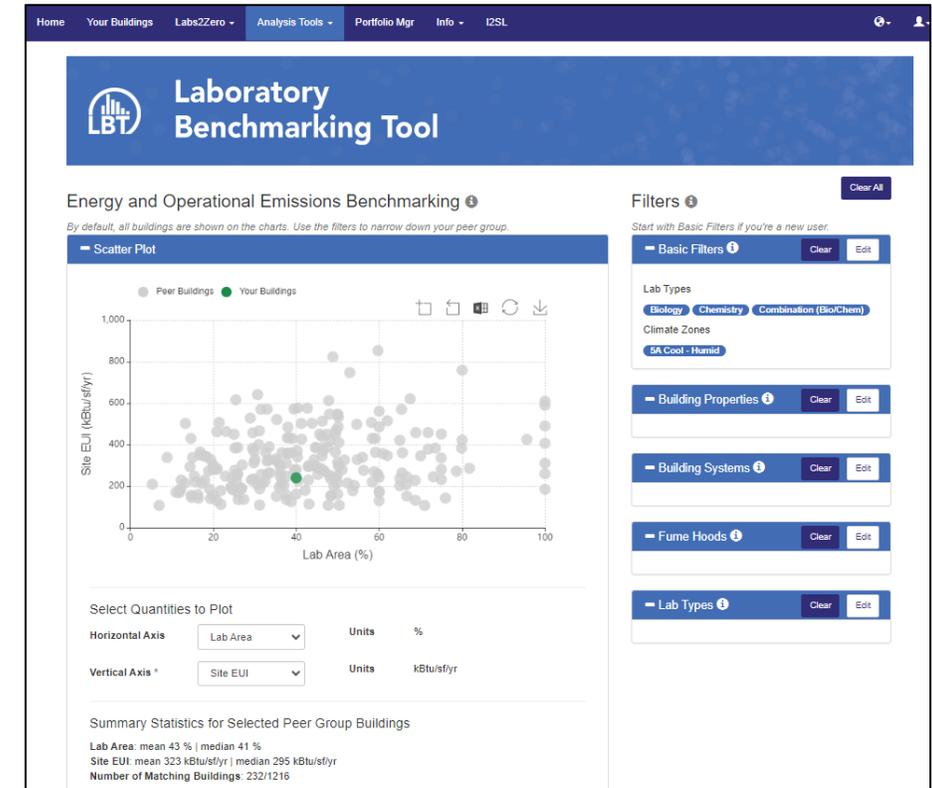
Materials Research (Rename)	Building Details	Delete Building	Add Data Year		
2025	83	79	227	N/A	Go to AIM Report



# Reintroducing the LBT



- Analytics tool & **rich database** of lab building attributes, energy use, and emissions
  - Large database
  - Fully internationalized
  - Free to use
- Now hosts **all Labs2Zero scores and tools**



> 1,400 lab buildings

> 250 million sf

LBT is free to use



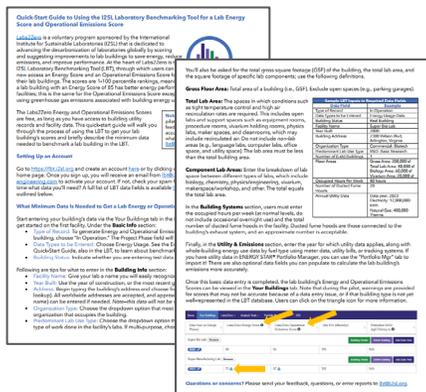
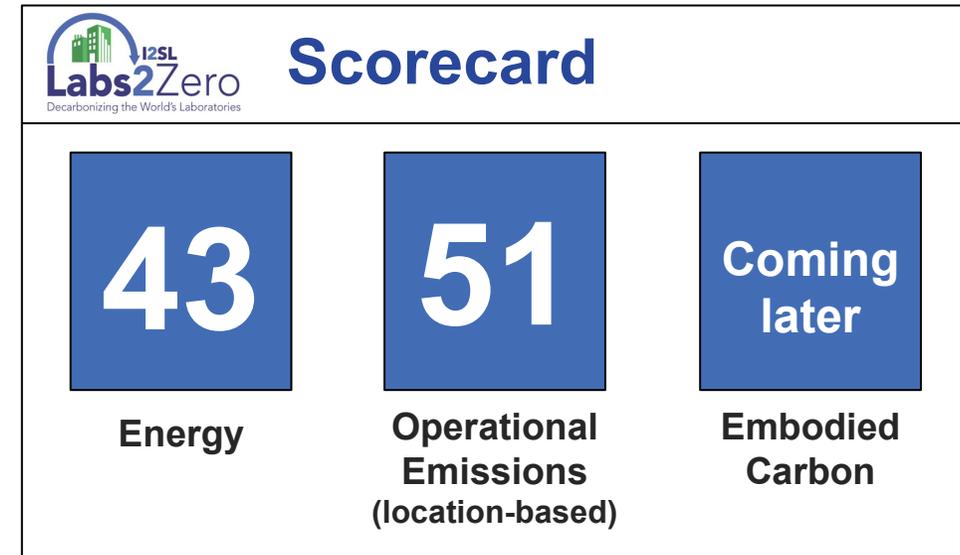
[lbt.i2sl.org](http://lbt.i2sl.org)



# The Labs2Zero Scorecard



- Every building entered in LBT receives **two scores**
  - Energy and Operational Emissions
  - Both released as pilot scores
  - 1-100 scores, where 100 is best
  - Modeled after ENERGY STAR® scores



- Data entry required is fairly minimal
- Scores are free to obtain



# How the Scores Are Being Used



- Scores **automate** the benchmarking process
  - No iterative filtering, and interpolates across data gaps
- More than **1100 buildings** have received energy scores
  - Plus more that were already in the database
- Scores are being used for:

**Sustainability reporting**

**Consultants' reports**

**GRESB reporting**

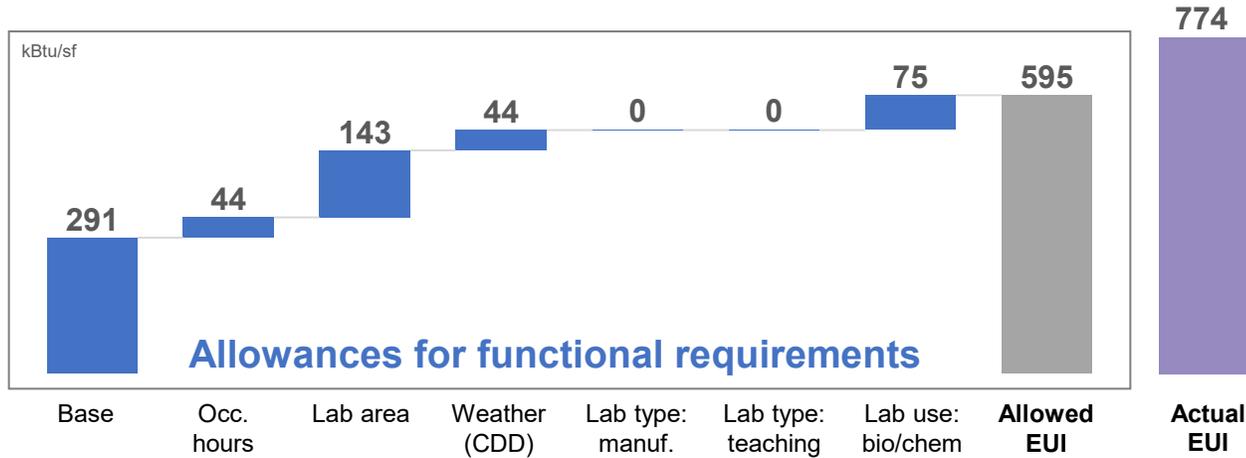
**Internal reporting and tracking**

**And more...**

# How The Energy Score Works



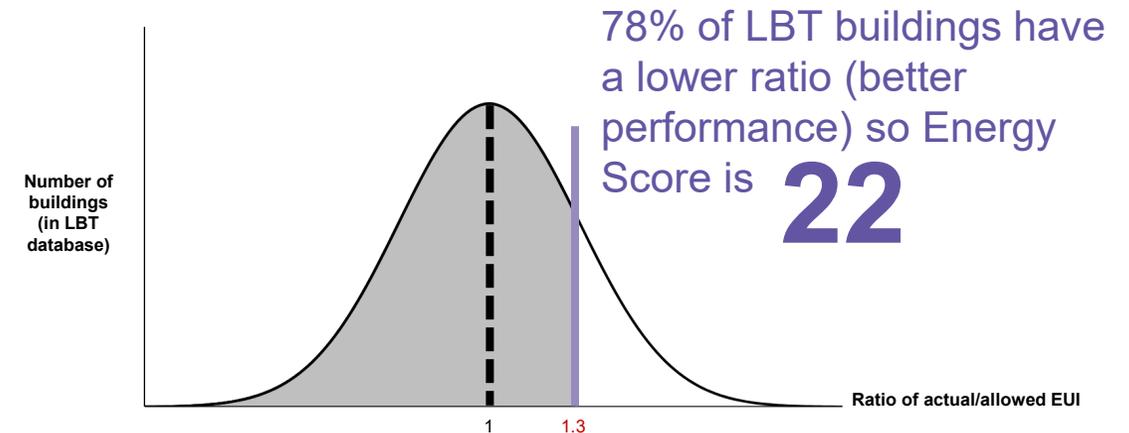
1. Calculate the **allowed EUI** based on building requirements



2. **Compare** the actual EUI to the allowed EUI

Ratio of actual : allowed EUI is **1.3**

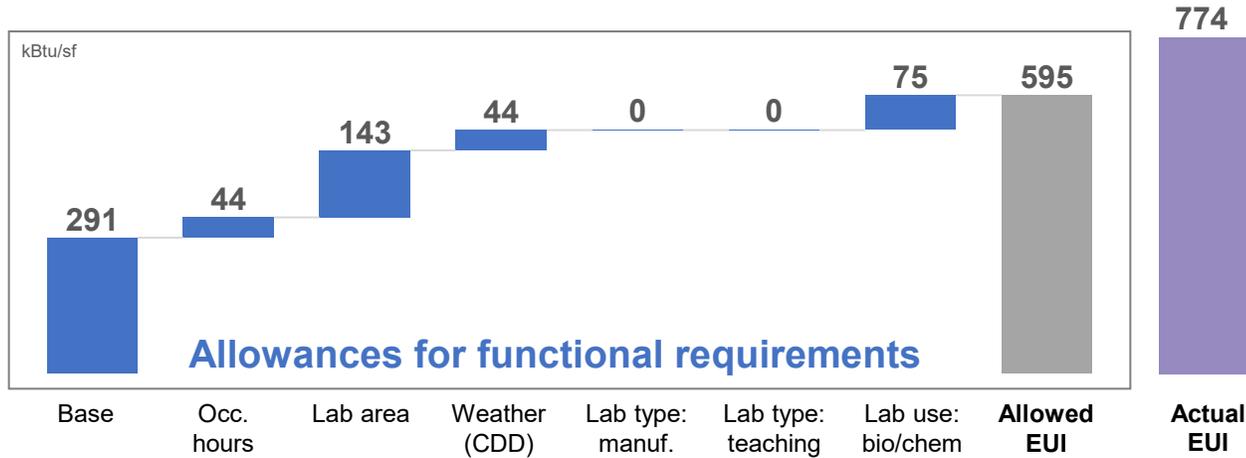
3. Convert ratio to a **1-100 score**



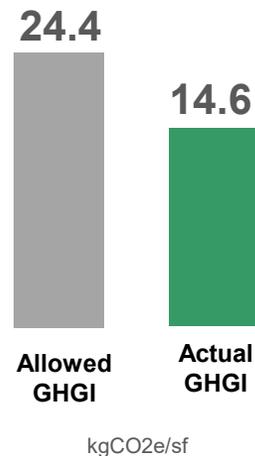
# How The Op. Emissions Score Works



1. Calculate the **allowed EUI** based on building requirements



2. Convert **allowed EUI** into **allowed location-based GHGI**:



3. Convert ratio into a **1-100 score**:

Ratio is 0.60, which is better than 76% of LBT buildings.

The Operational Emissions Score is

**76**

# Why Reanalyze?



- Scores released as pilots
  - To be updated following **feedback** and after more data collection
  - **Known areas** where scores are not representative

## Some areas of concern:

- Vivarium facilities
- Manufacturing
- Cold weather (no HDD correlation)
- High fume hood density
- Bio/Chem at low lab %
- Some specialty lab types (crime labs, clean rooms...)

### Pilot Score Warning Messages

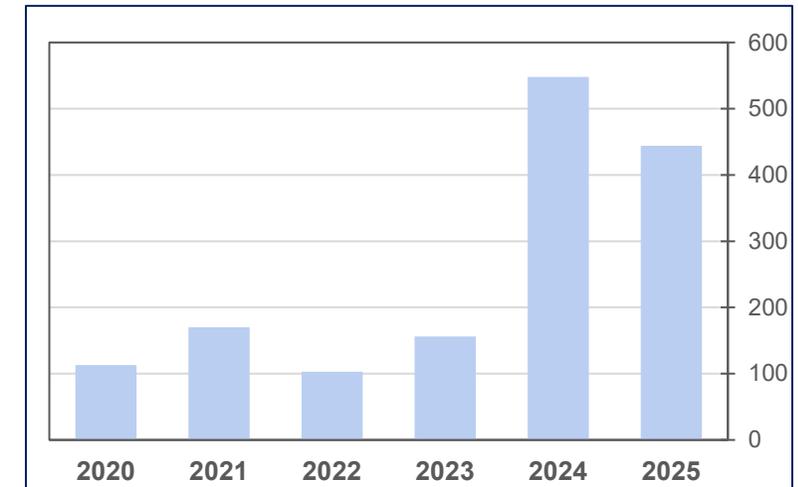
Years	Type	Message
2023	⚠	Pilot Scores have been assigned to this building, but the current scoring system does not accurately reflect the energy performance of most vivarium-dominated facilities. You can help I2SL to address this issue by entering more vivarium facilities' data into the LBT during the pilot phase. We will be reviewing the scoring methodology at the conclusion of the pilot phase, and will be incorporating new data received. Thank you.

# Data Collected via the LBT

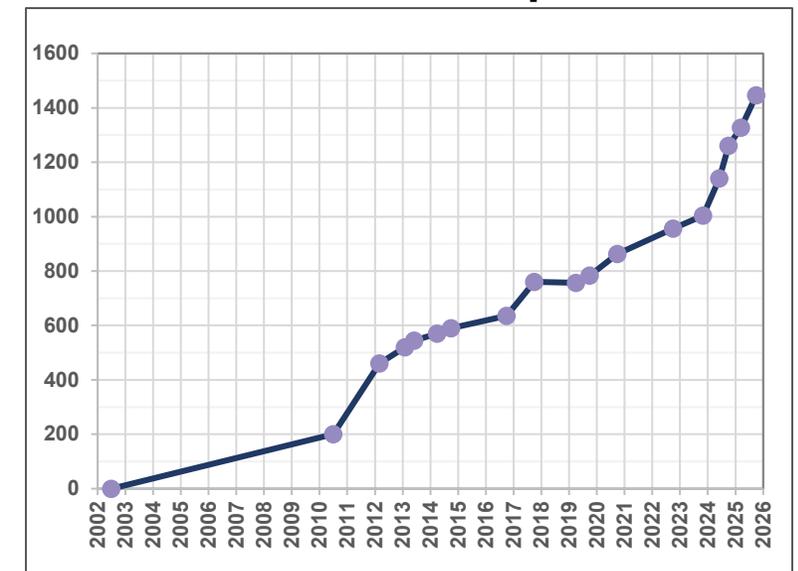


- **Lab Benchmarking Tool** use increased
  - Submissions jumped 400% following release of Energy Score
- Some highlights:
  - Now 46 bldgs in **Climate Zone 6+**
  - Now 142 bldgs with lab space more than 10% **vivarium**
  - Larger quantity of **recent data** (especially data that came through LBT data validation)
- Worked with **LBNL** again on the score analyses
  - Travis Walter led the effort

## LBT Data Submissions



## LBT Peer Group Size



# New Quality Standards



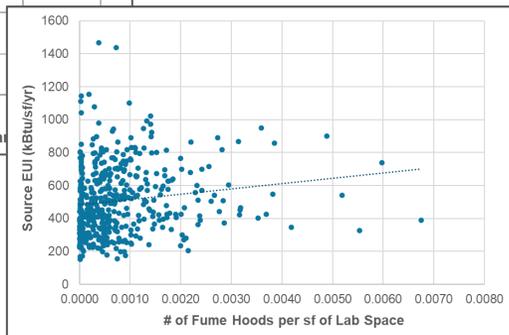
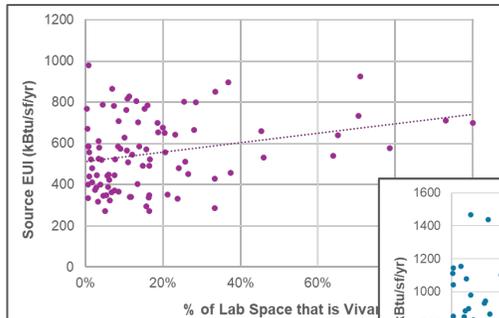
- Started with **1327 peers**
- Removed 783 records:
  - Embodied carbon data: **59** records
  - Data older than 2014: **511** records
  - Lab area <15% or >95%: **46** records
  - Number of buildings > 3: **22** records
  - Estimated lab area: **77** records
  - Estimated or missing EUI: **62** records
  - Other: **6** records
- High-quality dataset: **544 records**



# Results of the New Analysis (Energy)



- **New factors in score:**
  - Fume hood density
  - Heating Degree Days
  - Vivarium Area
- **Factors no longer used:**
  - Lab use = Bio/Chem



Predictor	Coefficient	Unit
Offset	290	kBtu/sqft
Operating Hours	0.447	(kBtu/sqft) / (hours/week)
Lab Area	298	(kBtu/sqft) / 100%
CDD	42.8	(kBtu/sqft) / (1000 degree-days)
Lab Type = Manufacturing	138	kBtu/sqft
Lab Type = Teaching	-83.0	kBtu/sqft
Lab Use = Bio/Chem	74.5	kBtu/sqft



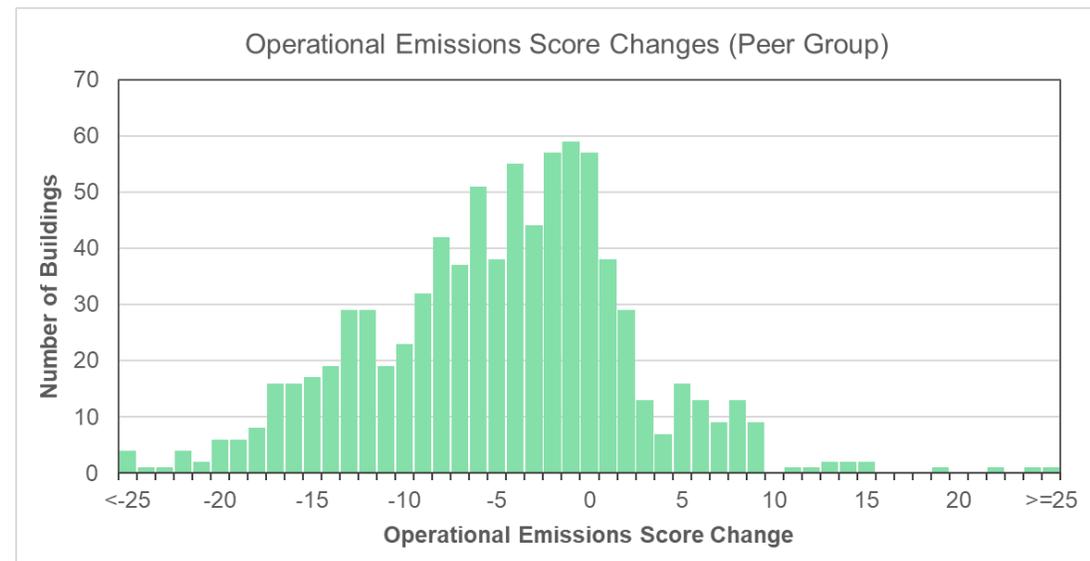
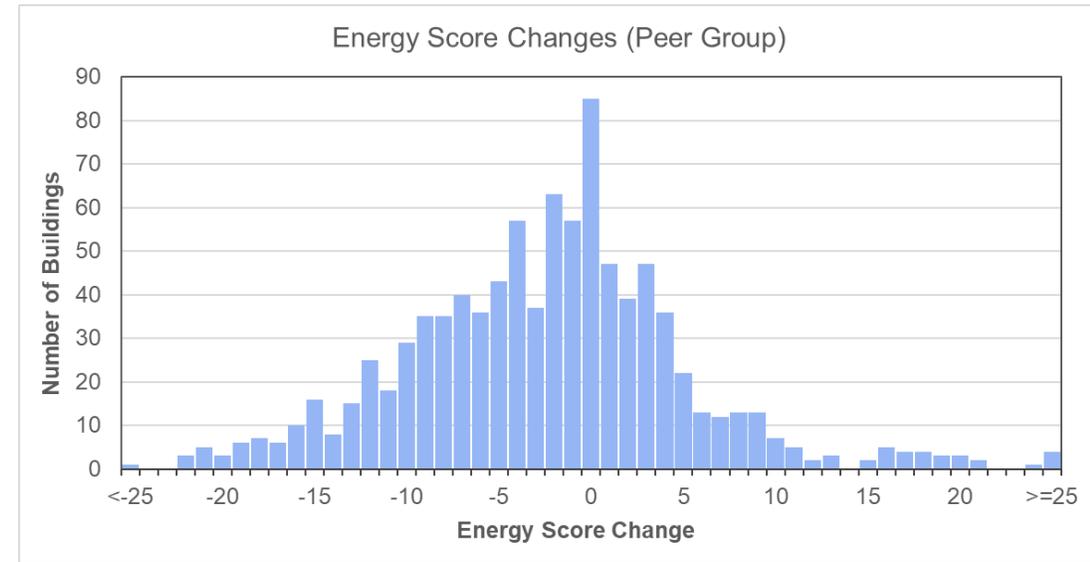
Predictor	Coefficient	Unit
Offset	227	kBtu/sqft
Fume Hoods	35.0	(kBtu/sqft) / (number/1000 sqft)
Operating Hours	0.447	(kBtu/sqft) / (hours/week)
Lab Area	280	(kBtu/sqft) / 100%
HDD	12.0	(kBtu/sqft) / (1000 degree-days)
CDD	54.4	(kBtu/sqft) / (1000 degree-days)
Lab Type = Manufacturing	107	kBtu/sqft
Lab Type = Teaching	-127	kBtu/sqft
Vivarium Area	165	(kBtu/sqft) / 100%



# How will the Scores Change?



- Changes in Energy and Operational Emissions Scores are **similar**
  - Also updated emissions factors (most changes were small)
- **Score increases:** More fume hoods, more vivarium area
  - **Climate Zone 7:** median 12-point increase
- **Score decreases:** Bio/Chem, low HDD, fewer fume hoods
- **Overall:**
  - Median 2-point decrease in Energy Score
  - 43% of peers within  $\pm 5$
  - 85% of peers within  $\pm 15$



# Are There Any Remaining Gaps?



- The new scores address most of the target gaps:

## Some areas of concern:

- Vivarium facilities
- Manufacturing
- Cold weather (no HDD correlation)
- High fume hood density
- Bio/Chem at low lab %
- Some less-common lab types (crime labs, clean rooms...)

- Some gaps remain:

- Manufacturing (not asking all the relevant questions)
- Specialty lab types (crime labs, clean rooms, pilot plants...)
- Scores based on mostly US data



# Rolling out the Updated Scores



- Consultations
  - Contacted **10 biggest users** of LBT in last few years
  - Asked each for feedback; some questions and requests
- Rollout plan
  - Announce in advance on **website** and **email**
  - **Reference document** on score changes
  - Preserve static version of **pilot score** on website
  - **Support** for organizations needing pilot scores after switch

Your Buildings

You have Full AIM Access!

Data Year (or Design Phase)	Labs2Zero Energy Score	Labs2Zero Operational Emissions Score	Site EUI (kBtu/sf/yr)	Embodied GHGI (kgCO <sub>2</sub> e/sq m)	AIM Report
2024	35	39	358	N/A	Go to AIM Report
Test 1.6					Building Details Delete Building Add Data Year
2022	75				
Test 2.1					Building Details Delete Building Add Data Year
2024	18				

Laboratory Benchmarking Tool

Building Details: Test 1.6

Please Select a Dataset (Year or Design Phase): 2022

Labs2Zero Scorecard

Labs2Zero Pilot Scores for: 2022

75 Energy Score

44 Operational Emissions Score (Location-Based)

Performance Over Time

Vertical Axis: Energy Score

Horizontal Axis: 2022

Energy Summary

All information is for the selected dataset (year or design phase) only. However, if applicable, Pilot Score warning messages will display for all data years.

Site Energy Use Intensity: 206 kBtu/sf/yr

Cooling Degree Days (CDD65): 1327.3

Labs2Zero Pilot Energy Score: 75

Emissions Summary

GHG Intensity: 24.2 kgCO<sub>2</sub>e/sf

Operational Emissions Score: 44

Electric Grid Were 100% Clean: 100

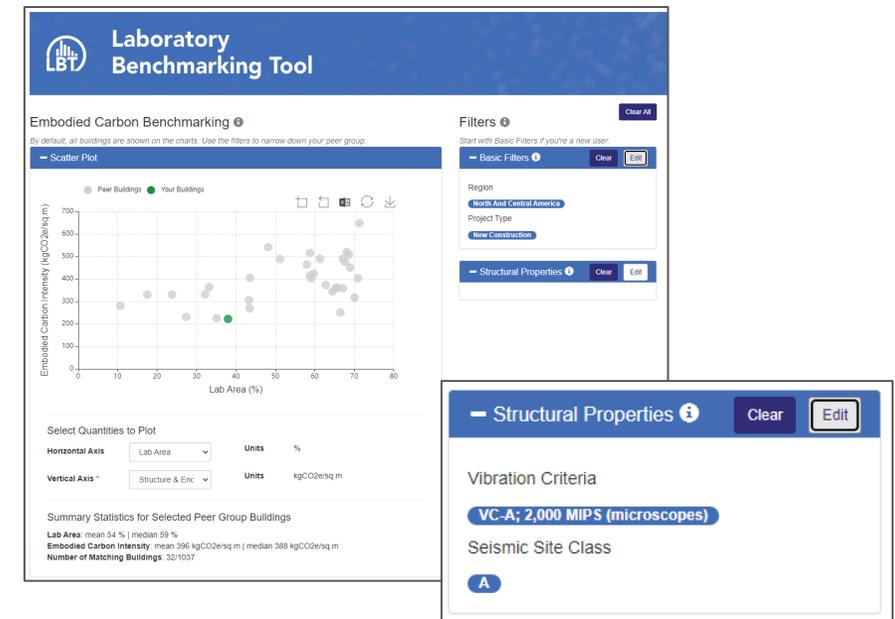
Measures Included in Package (3 Measures)

- Obtaining a My Green Lab Certification** (ECM191)
  - Annual Energy Savings: \$14,958
  - Incremental Cost: \$17,277
  - Simple Payback: 1.2 years
  - Energy Score: 86 ↑ 1
  - Site EUI: 159.3 kBtu/sf ↓ 4.4
- Unoccupied Room Temperature Setback** (ECM201)
  - Annual Energy Savings: \$7,468
  - Incremental Cost: \$10,690
  - Simple Payback: 1.4 years
  - Energy Score: 85 ↑ 1
  - Site EUI: 163.6 kBtu/sf ↓ 4.8
- Reduced Fume Hood Face Velocity** (ECM097)
  - Annual Energy Savings: \$100,815
  - Incremental Cost: \$194,600
  - Simple Payback: 1.9 years
  - Energy Score: 84 ↑ 9
  - Site EUI: 168.5 kBtu/sf ↓ 37.9

# What's Next for the Scores?



- **Updated** Energy and Operational Emissions Scores in Dec/Jan
  - No more updates to those for a few years
- **Market-based Operational Emissions Scores**
  - TAC is working on plans
  - May not be a 1-100 score
- **Embodied Carbon Scores**
  - TAC is reviewing data collected so far (60 records)
  - More data needed, but first reviewing fields





**Questions?**

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