Laboratories for the 21st Century

Technical Bulletin

Guidance on Using the Labs21 Benchmarking Tool for LEED-EB:O&M (DRAFT)

***** NOTE: This is a DRAFT. Labs 21 is working with USGBC to develop formal guidance and support tools for applying Labs 21 data in LEED EB: O&M applications. Although this guidance is not yet final, it is expected to become final by May/June 2010, at which time USGBC will release revised support tools. In the meantime feedback on this draft guidance is welcome. *****

This technical bulletin provides guidance on how to use the Labs21 benchmarking tool in the context of the LEED for Existing Buildings: Operations and Maintenance (LEED-EBOM) rating system, version 2009. This bulletin assumes that the reader is familiar with LEED-EBOM as well as the Labs21 benchmarking tool. Procedures described here also apply to LEED EB: O&M v2008, though some wording may differ slightly between the two programs.

1. Introduction: Benchmarking Requirements in LEED-EBOM

LEED-EBOM requires the use of energy benchmarking in EA prerequisite 2 and EA Credit 1. There are two cases:

Case 1: Buildings that are eligible for an Energy Star rating are required to use the Energy Star Portfolio Manager tool to obtain a rating.

Case 2: Buildings that are not eligible to receive an Energy Star rating have to use an off-line spreadsheet calculator provided by the USGBC. There are two options under case 2:

- Option 1: Obtain a score based on national average source energy intensity for similar buildings. The USGBC calculator provides national average source energy intensity for several building types not ratable by Energy Star.
- Option 2: Obtain a score based on historical data and/or comparable buildings.

Case 1 does not apply to laboratories because they are not eligible to receive an Energy Star rating. A Case 2, Option 2-Labs approach is available, which allows applicants to use Labs21 tool to find a set of comparable buildings most appropriate for benchmarking the applicant building. Labs21 analysis shows that the average source energy intensity can vary considerably based on parameters such as lab area ratio, type, schedule, and climate, which in turn impacts the number of points obtained under EA credit 1. Note that this option only applies to buildings with a net lab area that is at least 10% of gross area.

The USGBC previously issued a credit ruling allowing the use of the Labs21 tool for LEED-EB v2.0. However, that ruling was issued prior to the introduction of LEED EB: O&M, and does not apply to projects applying under the newer rating system.

2. Selecting a Peer Group in the Labs21 Tool

Projects using the Labs21 tool for Case 2 Option 2-Labs must register their building in the tool and then filter the dataset based on lab area ratio, lab type, occupancy hours, and climatic region, and thereby obtain the average source energy intensity for a subset of buildings that are more comparable to the subject building.

As of November 2009, the Labs21 database has just over 200 buildings in the core dataset. It continues to grow and is the largest publicly accessible dataset of benchmarking data for laboratories in the U.S. However, as with any dataset, if the filtering is too restrictive there may not be enough buildings to benchmark against. When selecting a subset, it is important to ensure that a) there are enough buildings in the subset; and b) that the filters have been applied appropriately. In order to provide a consistent approach to filtering the dataset for LEED-EBOM, Labs21 provides the following procedure, which starts with the whole dataset and sequentially applies filters to the extent that the data allow.

1. Start with all measured data, using the following filter settings:
    a. Lab Area Ratio = 0.0 to 1.0
    b. Occupancy hours category = Both
    c. Lab Type = all
    d. Lab Use = all
    e. Climate zones = all
    f. Measured data only
2. Lab Area Ratio (LAR): Based on the LAR of the subject building, set the LAR filter to be one of the following[1]:
    a. Greater than or equal to 0 and less than or equal to 0.3
    b. Greater than or equal to 0.3 and less than or equal to 0.6
    c. Greater than or equal to 0.6 and less than or equal to 1.0

    If the total number of buildings is less than 12, do not use this dataset. Use the data set from step 1. If the total number of buildings is greater than or equal to 12, go to step 3.
3. Lab type: In addition to the LAR filter from step 2, select lab type(s) as follows:

If the subject building is:	*Select the following:*
Chemical	Chemical, Biological, Chemical/Biological
Biological	Chemical, Biological, Chemical/Biological
Chemical/Biological	Chemical, Biological, Chemical/Biological
Physical	Physical
Combination/other	Combination/Other

    For types other than Physical, if the total number of buildings is less than 12, do not use this dataset. Use the data set from step 2. If the total number of buildings is greater than or equal to 12, go to step 4.

    For Physical labs, if the filter yields less than 12 data points, the user has the option to include "Combination/Other" to increase the size of the dataset to 12 or more buildings.
4. Occupancy hours: In addition to the filters from steps 2 and 3, select the occupancy hours category applicable to the subject building.

[1] There is slight overlap between the categories i.e. LAR 0.3 is included in both 'a' and 'b' and LAR 0.6 is included in 'b' and 'c'.

DRAFT

If the total number of buildings is less than 12, do not use this dataset. Use the data set from step 3. If the total number of buildings is greater than or equal to 12, go to step 4.

5. Climate zone. In addition to the filters from steps 2, 3, and 4, select the climate zone that the subject building is located in. If the total number of buildings is less than 12, do not use this dataset. Use the data set from step 4.

The above procedure is intentionally prescriptive to ease the process for both users and LEED reviewers. In a few cases, variations to the above procedure may yield a more optimal dataset for comparison. If a modified procedure is proposed, users should use the Project CIR process through GBCI (Green Building Certification Institute) to document the rationale for consideration.

For more information on the data sources and methodology in the Labs21 tool, see the list of frequently asked questions in the Labs21 tool.

For more information on this bulletin:

Paul Mathew, Ph.D.
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-3111
Berkeley CA 94720
510-486-5116
PAMathew@lbl.gov

Acknowledgements:

Cathy Turner, New Buildings Institute, reviewed and provided guidance for this bulletin.

For more information on Laboratories for the 21st Century:

Dan Amon, P.E.
National Energy Manager
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, DC 20460
202-564-7509
amon.dan@epa.gov

Will Lintner, P.E.
Federal Energy Management Program
U.S. Department of Energy
1000 Independence Ave., S.W.
Washington, D.C. 20585-0121
202.586.3120
william.lintner@ee.doe.gov

Laboratories for the 21st Century
U.S. Environmental Protection Agency
Office of Administration and Resource Management
www.labs21century.gov

In partnership with the
U.S. Department of Energy
Energy Efficiency and Renewable Energy
Bringing you a prosperous future where energy
Is clean, abundant, reliable, and affordable
www.eere.energy.gov

Prepared at Lawrence Berkeley National Laboratory
A DOE national laboratory

DRAFT