

---

AABC Commissioning Group

AIA Provider Number 50111116



## Benchmarking Made Easy with DOE's and EPA's BenchmarkMyBuilding.com

Course Number: CXENERGY1812



**Josh Wentz**

*Director of Product & Engineering*

*Lucid / BuildingOS.com*

April 25, 2018

---

# Course Description

---

The free BenchmarkMyBuilding.com service draws data from DOE's Building Performance Database (BPD) and EPA's ENERGY STAR Target Finder to present statistically meaningful benchmarks. This sessions provides service providers and building owners a tutorial on how to quickly engage with this valuable energy benchmark data. Attendees will also learn how, through energy benchmarking, an organization can establish energy reduction targets, identify savings opportunities and stay on budget throughout the year.

# Learning Objectives

---

At the end of the this course, participants will be able to:

1. Understand the practice of energy benchmarking, it's advantages and limitations.
2. Learn methods of benchmark data analytics and appropriate applications.
3. Learn to use DOE's "Benchmark My Building" database and how to integrate it into an operation.
4. Learn about the state of the art in building benchmarking and particularly with respect to how it is used in codes and ordinances.

# Demo

## Prep

---

Write down the following information about one of your buildings:

1. Building Address
2. Building Type
3. Building Area (square feet)



Lucid is the leading provider of  
**cloud-based building management**  
solutions for the enterprise.

**50** employees

**700+** customers

Startup backed by:

formation | 8

 **AUTODESK.**

 **GE VENTURES**

Acquired by:

 **AcuityBrands.**



**buildingOS<sub>+</sub>** is the cloud-based platform that  
integrates, organizes, and aggregates portfolio-wide  
building and metering systems.



**15,000+** buildings, **1B** ft<sup>2</sup>

Enterprise



CRE



Higher Ed



K-12



Local Government



**15,000+** buildings, **1B** ft<sup>2</sup>

**Vision:** Reduce the energy of buildings on a broad scale.

## Key Barriers:

WHY

WHY do I care about saving energy?

*Save money, lots of money.*

WHAT

WHAT can I do?

*Track your data.*

WHERE

WHERE should I focus?

*Compare across your portfolio. Submeter each building.*

HOW

HOW can I do it?

*Implement an ECM that works for your building profile.*

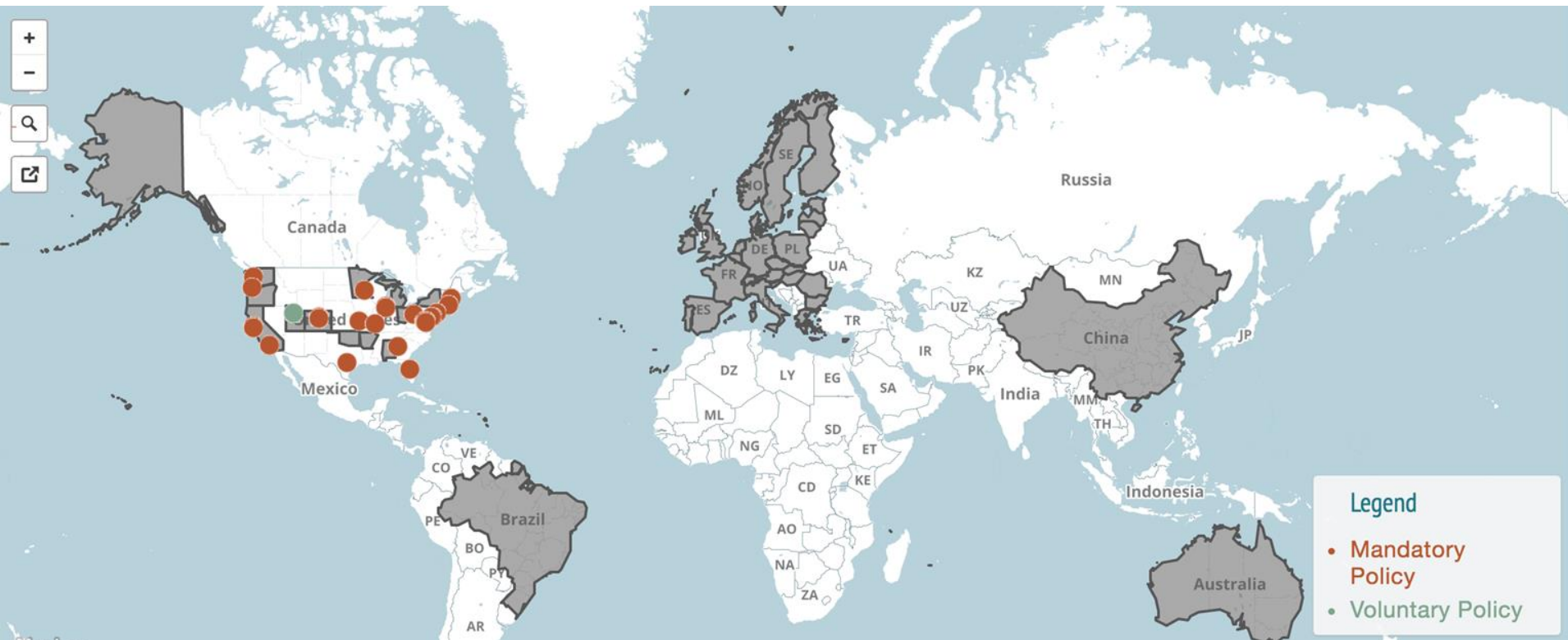




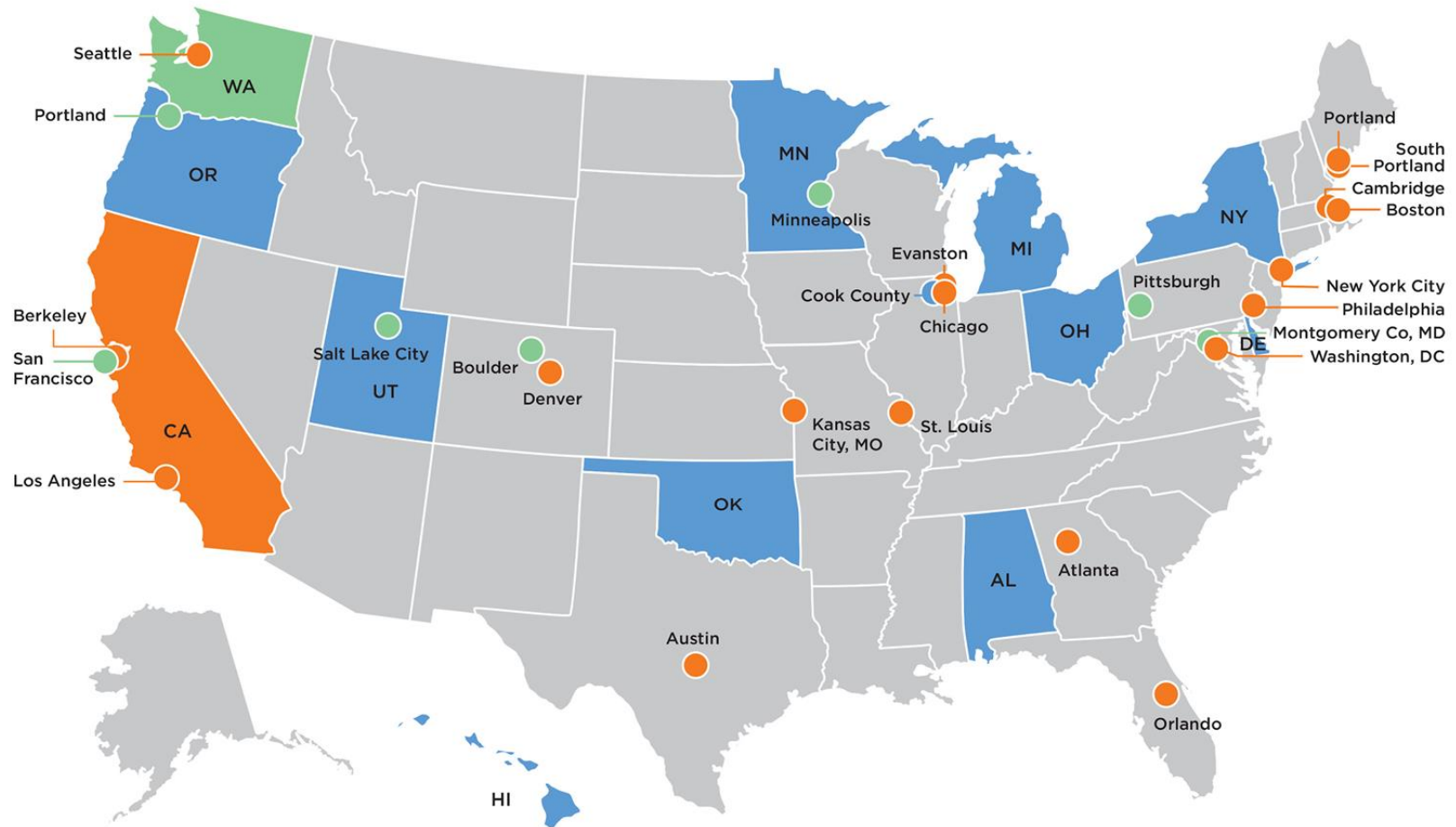
WHY

Why do I care about saving energy? Save money.

# International Building Benchmarking Policies 60+



# U.S. Building Benchmarking Policies 30+



- Public, commercial, and multifamily building benchmarking policy adopted
- Public and commercial building benchmarking policy adopted
- Public buildings benchmarked



© Copyright 2017 Institute for Market Transformation. Updated 2/2017

[www.imt.org/resources/detail/map-u.s.-building-benchmarking-policies](http://www.imt.org/resources/detail/map-u.s.-building-benchmarking-policies)

# U.S. Department of Energy

In 2016, the U.S. DOE Small Business Voucher program paired National Laboratories with small companies to bring technology to market faster. LBNL was paired with Lucid to transform building technology.



## Team

Lawrence Berkeley National Laboratory (LBNL)

focused on engines



Lucid, makers of BuildingOS.com

focused on user interface

## Software Tools

Commercial Building Energy Saver

Retrofit Analysis Software  
Energy Conservation Measure (ECM) Database



OpenStudio



BuildingOS.com

**buildingOS**

**15,000+** buildings, **1B+** ft<sup>2</sup>

across universities, corporations, real estate,  
government, cities, states

**160+** integrations

with building hardware & software systems

**700+** customers

primarily building owners & operators

# BenchmarkMyBuilding.com / free public tool

## 1 Enter your building's details

Building address ?

304 12th Street, Oakland, CA 94607

Building type ?

Office



Building size ?

35,000

square feet

## 2 Personalize your report (optional)

Include *all* energy sources for your building, such as electricity, natural gas, fuel oil, steam, chilled water, etc.

Annual building energy cost (optional)

\$ 78,650

USD

Annual building energy consumption (optional)

1,599,000

kBTU

3 INPUTS 1) Type, 2) Size, 3) Location

2 ENGINES

15+ OUTPUTS in REST JSON

Benchmarking API

Energy Star Target Finder

DOE Building Performance Database

+

Benchmarking API

## Median Benchmarks



Median annual energy cost is

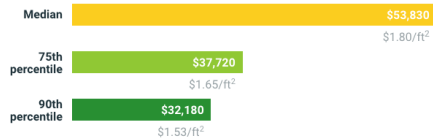
**\$53,830**

for similar office buildings of 30,000 ft<sup>2</sup> in Oakland, CA

Benchmarks for a 35,000 ft<sup>2</sup> office building in Oakland, CA 94607 provided by the U.S. Environmental Protection Agency's ENERGY STAR® Target Finder, a statistical model based on the Commercial Buildings Energy Consumption Survey (CBECS).

### Annual energy costs

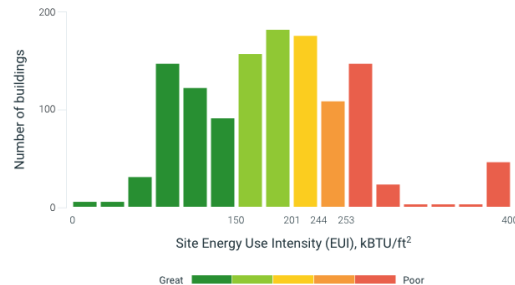
for a 35,000 ft<sup>2</sup> office building in Oakland, CA



Benchmarks for a 35,000 ft<sup>2</sup> office building in Oakland, CA 94607 provided by the U.S. Environmental Protection Agency's ENERGY STAR® Target Finder, a statistical model based on the Commercial Buildings Energy Consumption Survey (CBECS).

### We've found 2,345 buildings in your peer group

Here's how they rank in the U.S. Department of Energy's database



Peer group data for 50,000-100,000 ft<sup>2</sup> office buildings with Warm/Marine climate conditions provided by U.S. Department of Energy Building Performance Database, compiled by Lawrence Berkeley National Laboratory.

## Personalized Benchmarks



Similar buildings spend

**\$60,798 - \$93,500 less**

on energy annually compared to your building

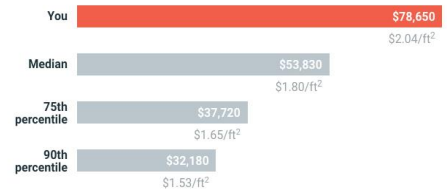
Benchmarks for a 35,000 ft<sup>2</sup> office building in Oakland, CA 94607 provided by the U.S. Environmental Protection Agency's ENERGY STAR® Target Finder, a statistical model based on the Commercial Buildings Energy Consumption Survey (CBECS).

### Your building's annual energy costs

compared to similar buildings in the 75th percentile



**↑ 13% higher**



Energy cost benchmarks for 35,000 ft<sup>2</sup> office buildings in Oakland, CA 94607 provided by U.S. Environmental Protection Agency Energy Star Target Finder®.

# BenchmarkMyBuilding.com / median benchmarks



Median annual energy cost is

**\$53,830**

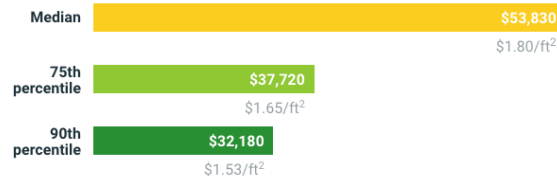
for similar office buildings of 30,000 ft<sup>2</sup> in Oakland, CA



Benchmarks for a 35,000 ft<sup>2</sup> office building in Oakland, CA 94607 provided by the U.S. Environmental Protection Agency's ENERGY STAR® Target Finder, a statistical model based on the Commercial Buildings Energy Consumption Survey (CBECS).

## Annual energy costs

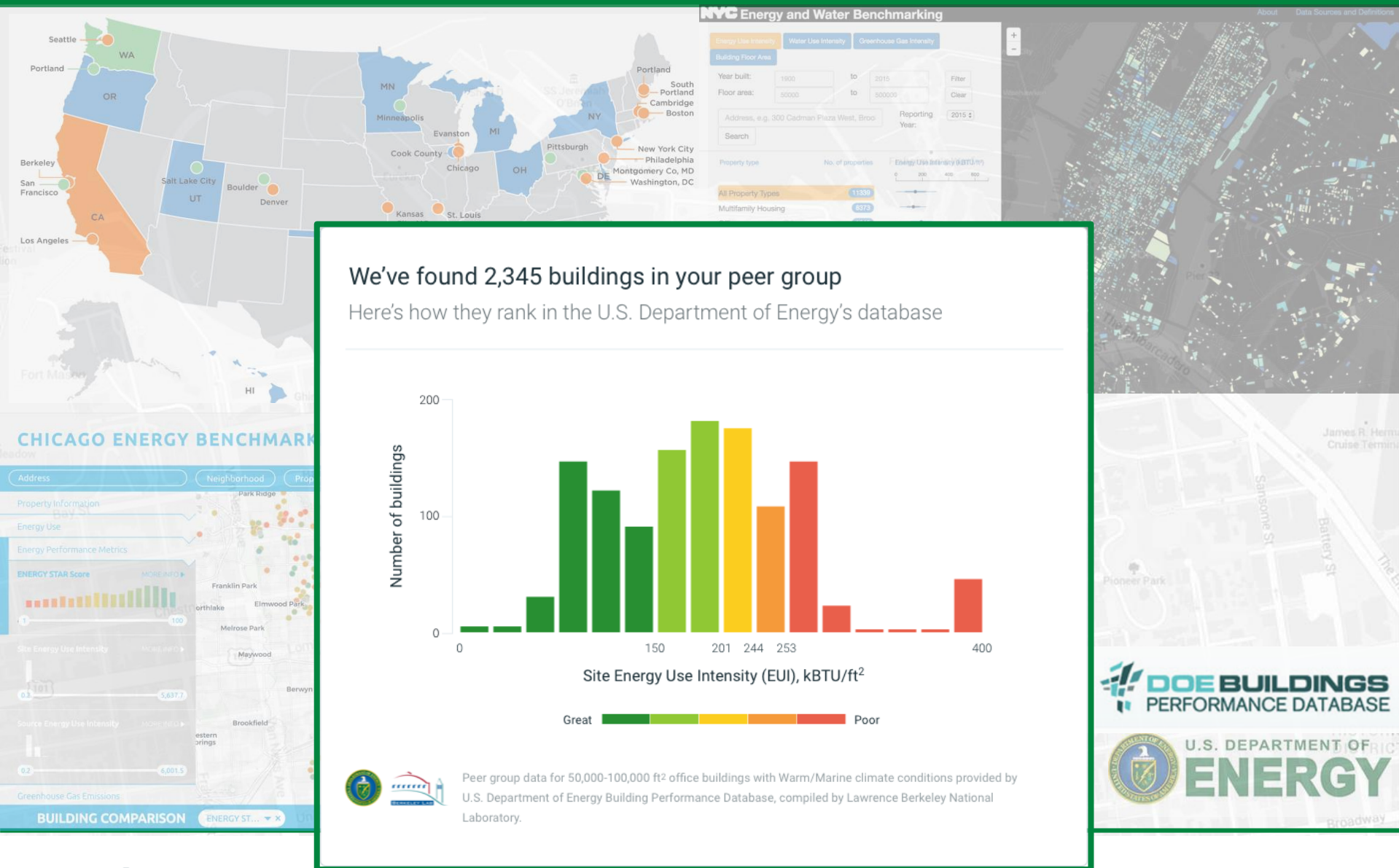
for a 35,000 ft<sup>2</sup> office building in Oakland, CA



Benchmarks for a 35,000 ft<sup>2</sup> office building in Oakland, CA 94607 provided by the U.S. Environmental Protection Agency's ENERGY STAR® Target Finder, a statistical model based on the Commercial Buildings Energy Consumption Survey (CBECS).



# BenchmarkMyBuilding.com / free public tool





# BenchmarkMyBuilding.com / Why do I care? Save money.



Similar buildings spend

## \$60,798 - \$93,500 less

on energy annually compared to your building

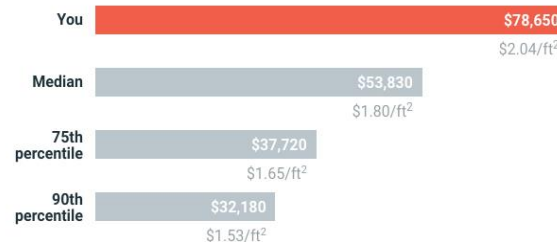


Benchmarks for a 35,000 ft<sup>2</sup> office building in Oakland, CA 94607 provided by the U.S. Environmental Protection Agency's ENERGY STAR® Target Finder, a statistical model based on the Commercial Buildings Energy Consumption Survey (CBECS).

Your building's annual energy costs  
compared to similar buildings in the 75th percentile



↑ 13% higher



Energy cost benchmarks for 35,000 ft<sup>2</sup> office buildings in Oakland, CA 94607 provided by U.S. Environmental Protection Agency Energy Star Target Finder®.



WHAT

What can I do? Track your data.

# buildingOS<sub>®</sub>





160+ integrations



**15,000+** buildings



WHERE

Where can I save? Compare across your portfolio & building.

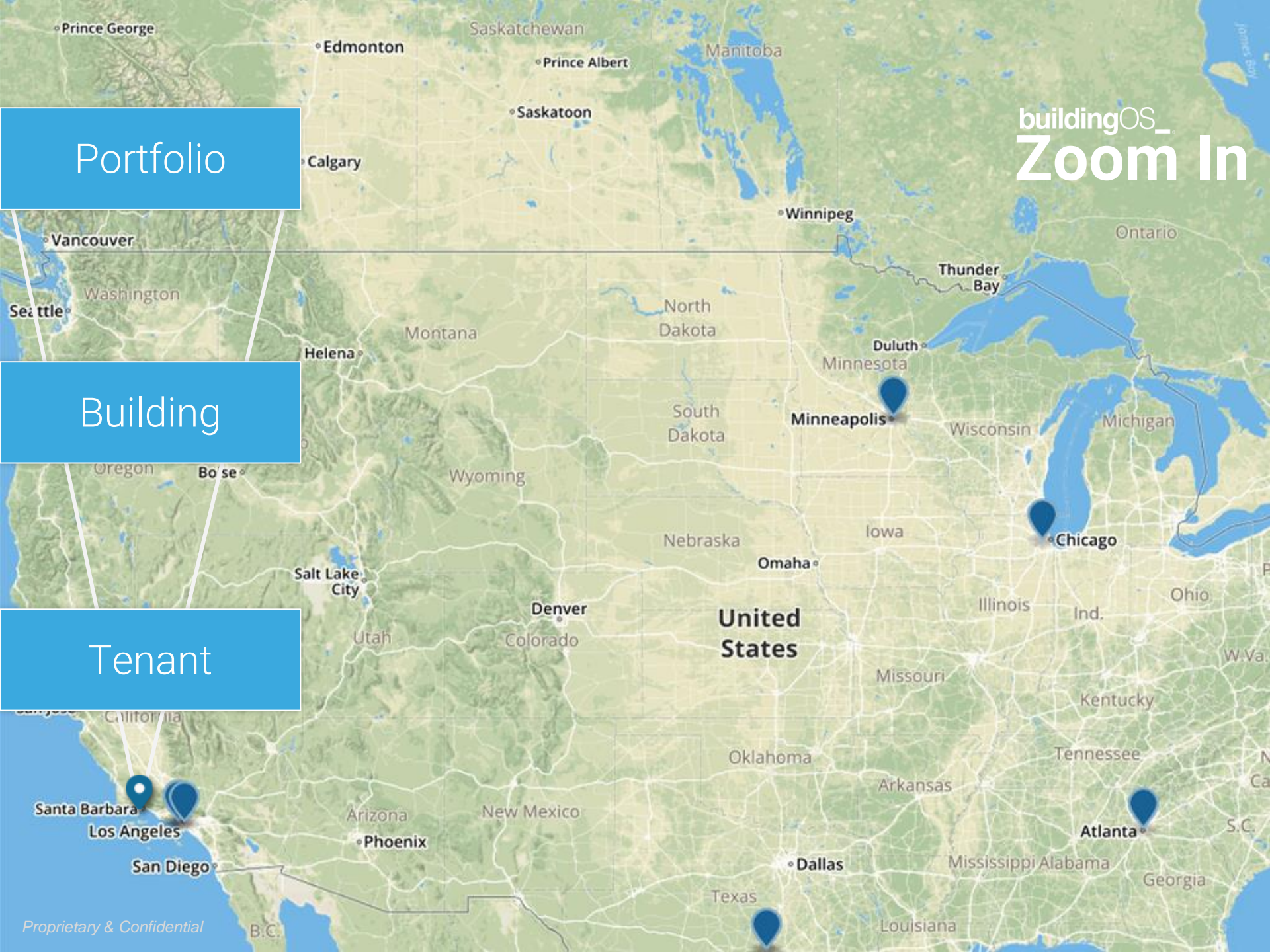


buildingOS\_  
**Zoom In**

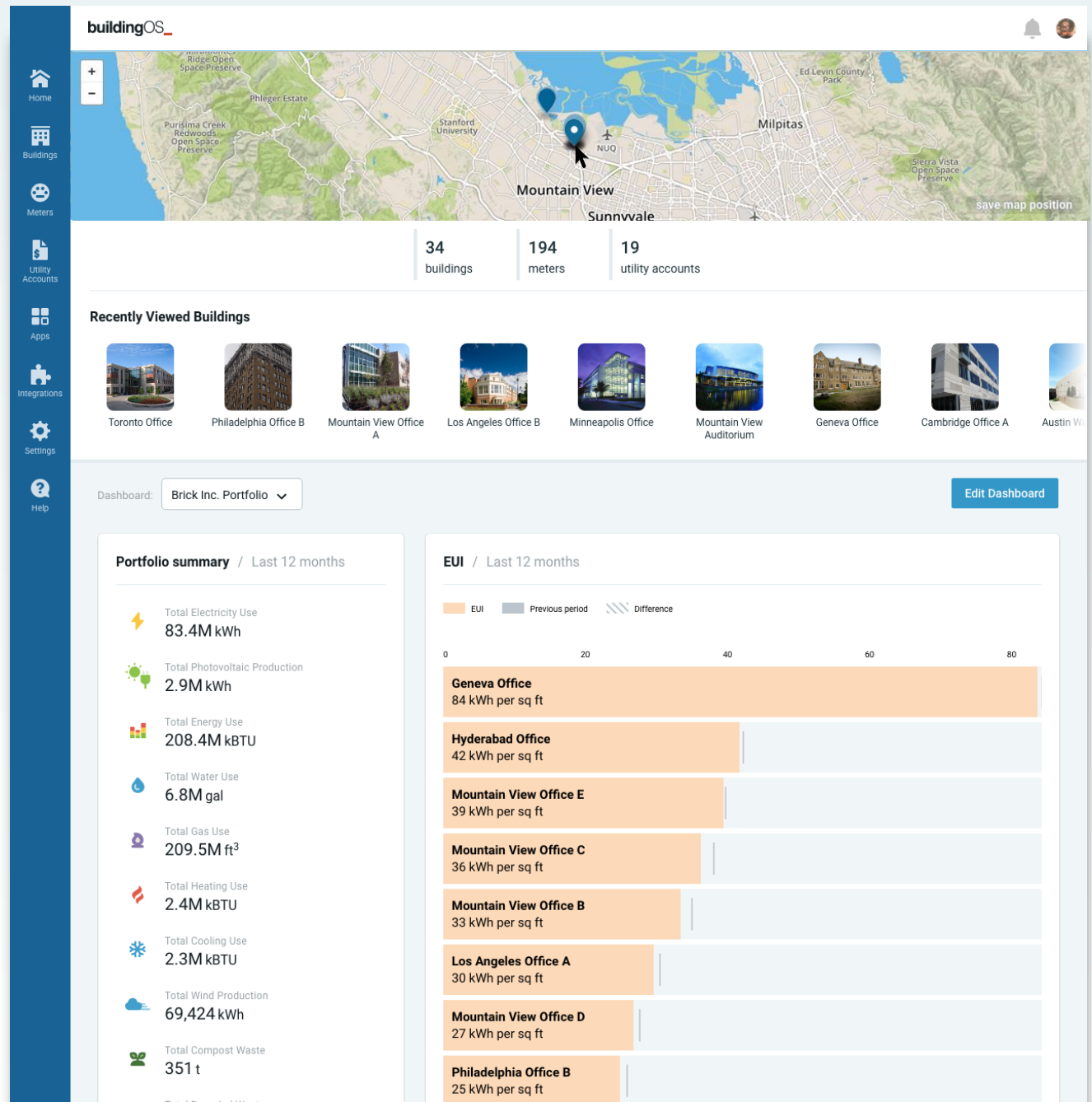
Portfolio

Building

Tenant



# Portfolio





# Building





Home



Buildings



Meters



Utility Accounts



Apps



Integrations



Settings

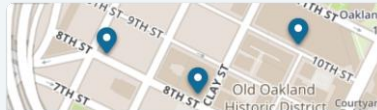


Help

## Initech Systems, Inc.

[Edit this tenant](#)

Dashboard Building Spaces Leases



📍 3 building locations

🏢 10 building spaces

📏 66,560 ft<sup>2</sup>

### Summary / 2015

💰 Total utility costs  
**\$2,325,780**

⚡ Total electricity use  
**7,361,800 kWh**

💧 Total water use  
**20,267,700 gallons**

☀️ Total photovoltaic production  
**435,710 kWh**

🏭 Total CO<sub>2</sub> emissions  
**3,825,710 lbs CO<sub>2</sub>**

💨 Total gas use  
**8,275,420 ft<sup>3</sup>**

❄️ Total CO<sub>2</sub> emissions  
**5,135,456 kBtu**

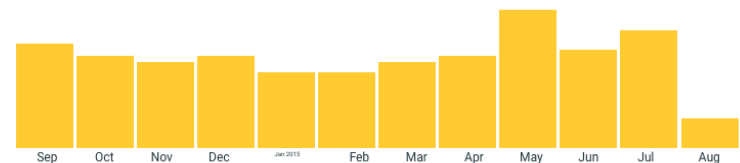
### Electricity Use Per Square Foot, 10 building spaces / This month

Webster Center, Everglades	75 kWh
Webster Center, Lassen	65 kWh
Clay Building, 2001	60 kWh
Webster Center, Pinnacles	59 kWh
Clay Building, Clockwork Orange	42 kWh
Harrison Building, Renoir	37 kWh
Webster Center, Yellowstone	32 kWh
Clay Building, Shining	31 kWh
Harrison Building, Magritte	29 kWh
Webster Center, Death Valley	29 kWh

10 of 10 building spaces

### Total Electricity Use, 3 building locations / Last 12 months

■ Total Electricity Use (kWh)



High  
**6.0M kWh (May)**

Median  
**3.09M kWh**

Low  
**906,644 kWh (Aug)**

Tenant



HOW

How can I save energy? Apps & support.



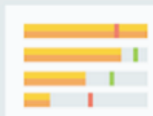
Trend Analysis



Heat Map



Load Profile Analysis



Comparisons



Portfolio Analysis



Bill Trends



Bill Breakdown



Measurement Verification



Currency Conversions



Competitions



Building Blocks



Dashboard Content



Building Scorecard



25+  
Apps

for building data

# Demo

Go to [BenchmarkMyBuilding.com](https://BenchmarkMyBuilding.com)

# BenchmarkMyBuilding.com

## 1 Enter your building's details

Building address ?

304 12th Street, Oakland, CA 94607

Building type ?

Office

Building size ?

35,000

square feet

## 2 Personalize your report (optional)

Include *all* energy sources for your building, such as electricity, natural gas, fuel oil, steam, chilled water, etc.

Annual building energy cost (optional)

\$ 78,650

USD

Annual building energy consumption (optional)

1,599,000

kBTU



Median annual energy cost is

**\$53,830**

for similar office buildings of 30,000 ft<sup>2</sup> in Oakland, CA

Benchmarks for a 35,000 ft<sup>2</sup> office building in Oakland, CA 94607 provided by the U.S. Environmental Protection Agency's ENERGY STAR® Target Finder, a statistical model based on the Commercial Buildings Energy Consumption Survey (CBECS).



Similar buildings spend

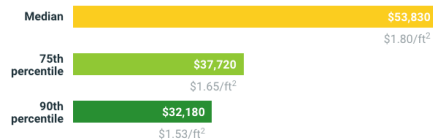
**\$60,798 - \$93,500 less**

on energy annually compared to your building

Benchmarks for a 35,000 ft<sup>2</sup> office building in Oakland, CA 94607 provided by the U.S. Environmental Protection Agency's ENERGY STAR® Target Finder, a statistical model based on the Commercial Buildings Energy Consumption Survey (CBECS).

### Annual energy costs

for a 35,000 ft<sup>2</sup> office building in Oakland, CA



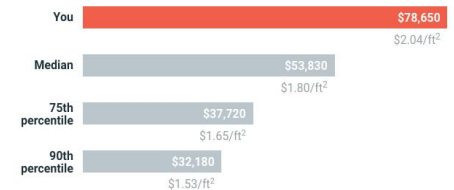
Benchmarks for a 35,000 ft<sup>2</sup> office building in Oakland, CA 94607 provided by the U.S. Environmental Protection Agency's ENERGY STAR® Target Finder, a statistical model based on the Commercial Buildings Energy Consumption Survey (CBECS).

### Your building's annual energy costs

compared to similar buildings in the 75th percentile



**↑ 13% higher**



Energy cost benchmarks for 35,000 ft<sup>2</sup> office buildings in Oakland, CA 94607 provided by U.S. Environmental Protection Agency Energy Star Target Finder®.

lucid.

Proprietary & Confidential

---

**Questions?**

---

# AABC Commissioning Group

AIA Provider Number 50111116



## Benchmarking Made Easy with DOE's and EPA's BenchmarkMyBuilding.com

Course Number: CXENERGY1812



**Josh Wentz**

*Director of Product & Engineering*  
*Lucid / BuildingOS.com*

April 25, 2018

josh@luciddg.com  
LinkedIn.com/in/joshwentz  
Twitter: @joshwentz  
www.joshwentz.net

---



# Appendix

Credit(s) earned on completion of this course will be reported to **AIA CES** for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with **AIA CES** for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

---

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



## Copyright Materials

This presentation is protected by US and International Copyright laws.  
Reproduction, distribution, display and use of the presentation without written  
permission of the speaker is prohibited.

Speaker

Josh Wentz

*Director of Product & Engineering*

Company



© Lucid / Acuity 2018

This concludes The American Institute of Architects  
Continuing Education Systems Course

---

**Contact Information**

Josh Wentz

[josh@luciddg.com](mailto:josh@luciddg.com)

[LinkedIn.com/in/joshwentz](https://www.linkedin.com/in/joshwentz)

Twitter: [@joshwentz](https://twitter.com/joshwentz)

[www.joshwentz.net](http://www.joshwentz.net)

