

# Utilizing Building Energy Compliance Data to Improve Business Performance

by Thanh Luong

## Executive summary

Buildings need help. The growing demand by local governments for low energy consumption buildings is leading to mandates for better building energy efficiency performance. In some localities, building owners are faced with fines for failing to take action. This paper outlines how the building energy benchmarking initiatives work and reviews the steps that need to be taken in order for building owners to comply with the mandates.

## Introduction

The building sector is the single largest user of energy in the US, accounting for more than 40% of energy consumed.<sup>1</sup> As a result, county, city, and state governments now mandate the benchmarking and disclosure of building energy data for large commercial, public, institutional, and multifamily buildings. Building owners can benefit from the benchmarking information that gets generated because it aids them to make better cost-saving energy conservation investments enables better management of their properties.

## Building compliance programs

Building energy compliance program mandates include requirements to benchmark and disclose building energy consumption, water consumption, and/or greenhouse gas (GHG) emissions.

Benchmarking refers to the practice of evaluating a building's energy and resource efficiency while normalizing for factors such as gross square footage, local climate, and occupancy of the building. Benchmarking results are consolidated into a performance rating that is disclosed to external parties such as governmental agencies, prospective buyers, lessees, and lenders. In addition, the performance rating is disclosed publicly so that buildings in need of energy audits and efficiency upgrades are identified. The ratings also serve as a means to promote investment in building energy performance improvement.

Energy performance ratings, such as the energy use intensity (EUI) value, enable comparison of a building's energy performance against similar buildings. Other benchmarked metrics include water performance and greenhouse gas (GHG) emissions.

Benchmarking data and related building metrics can be gathered via online platforms, such as the U.S. Environmental Protection Agency's Portfolio Manager tool, which process a year's worth of energy consumption data. Real utility data can be automatically or manually uploaded into the benchmarking platform enabling users to generate an energy performance rating. The resulting data can also be leveraged to view year to year trending, and generate building performance reports. The information can easily be shared with relevant stakeholders. In addition, facility owners can utilize the platform to view their portfolio of properties in context to their peers and see how their building performance stacks up.

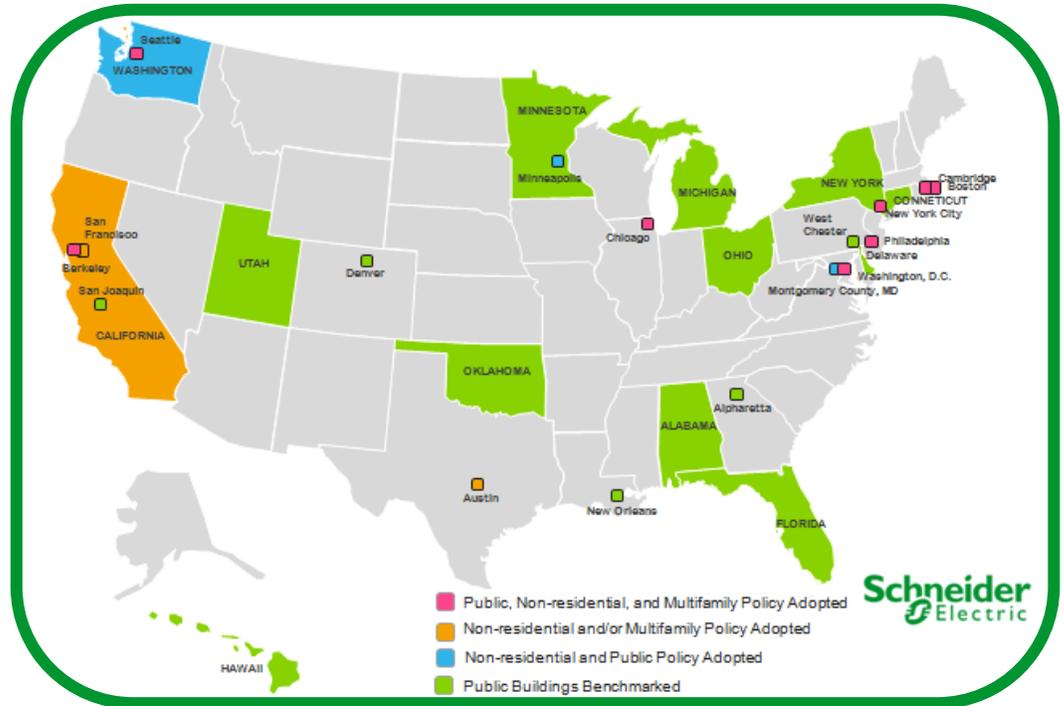
### Key Points:

- Compliance programs enable localities to track and summarize building metrics in their jurisdiction.
- Benchmarking requires property owners or managers to submit, usually on an annual basis, month by month cost and usage of energy data and water data for a full calendar year, or the most recent 12 months.
- Online platforms, such as the EPA's Portfolio Manager, are used to house benchmarking data that is then used to generate performance reports for disclosure.
- Energy use intensity (EUI) scores allow the comparison of a building's energy performance against buildings of the same type, expressed as energy per square foot per year.

<sup>1</sup> U.S. Energy Information Administration, <http://www.eia.gov/tools/faqs/faq.cfm?id=86&t=1>

## Affected regions

At this time, 14 region-specific ordinances mandate benchmarking and disclosure of affected building types depending on the minimum square footage of the building. An additional 16 cities and state governments require public-sector buildings to undergo energy benchmarking, but do not have specific annual reporting cycle or associated penalties. Each program has specific requirements such as building applicability (square footage and building type), type of data to benchmark, type of data to disclosure, types of compliance reports to generate, and additional actions that need to be taken such as third party data verification, energy audits and retro-commissioning measures. As time goes on, more and more localities are enacting building energy compliance programs.



**Figure 1**  
*Locales with building compliance mandates.*

## Building types affected

The energy and resource benchmarking and disclosure programs affect the following building types:

- Public/government buildings (those owned by the city or state government)
- Non-residential buildings (those used for commercial purposes)
- Multi-family buildings (those designed to have separate residential units)

Benchmarking and disclosure exemptions within the building types exist, depending on the locality. Exemptions exist for industrial/manufacturing facilities, buildings of new construction, buildings with less than 50% physical occupancy, and high performance buildings. **Table 1** on the following page illustrates specific examples of the building types in question.

**Table 1**

*Building types  
by locale and square  
footage (figures in ft<sup>2</sup>)*

| Jurisdiction          | Policy name  | Implementation | Building type (ft <sup>2</sup> ) |                 |                         |
|-----------------------|--|----------------|----------------------------------|-----------------|-------------------------|
|                       |  |                | Public / gov                     | Non-residential | Multi-family            |
| Berkeley, CA          | Berkeley Energy Saving Ordinance                                   | 10/1/2016      | 50,000+                          | 50,000+         | 50,000+                 |
|                       |  | 10/1/2017      | 25,000+                          | 25,000+         | 25,000+                 |
|                       |  | 10/1/2018      | 15,000+                          | 15,000+         | 15,000+                 |
|                       |  | 10/1/2019      | 5,000+                           | 5,000+          | 5,000+                  |
|                       |  | 10/1/2020      | 0+                               | 0+              | 0+                      |
| Cambridge, MA         | Cambridge Building Energy Use Disclosure Ordinance                 | 12/31/2014     | 10,000+                          |                 |                         |
|                       |  | 5/1/2015       |                                  | 50,000+         | 50+ Units               |
|                       |  | 5/1/2016       |                                  | 25,000+         |                         |
| Chicago, IL           | Chicago Energy Use Benchmarking Ordinance                          | 6/1/2015       | 50,000+                          | 50,000+         | 250,000+                |
|                       |  | 6/1/2016       |                                  |                 | 50,000+                 |
| Montgomery County, MD | Bill 2-14, Environmental Sustainability - Buildings - Benchmarking | 6/1/2015       | 0+                               |                 |                         |
|                       |  | 12/1/2016      |                                  | 250,000+        |                         |
|                       |  | 12/1/2017      |                                  | 50,000+         |                         |
| Boston, MA            | Building Energy Reporting and Disclosure Ordinance                 | 6/15/2013      | 0+                               |                 |                         |
|                       |  | 5/15/2014      |                                  | 50,000+         |                         |
|                       |  | 5/15/2015      |                                  |                 | 50,000+ SF or 50+ Units |
|                       |  | 5/15/2016      |                                  | 35,000+         |                         |
|                       |  | 5/15/2017      |                                  |                 | 35,000+ SF or 35+ Units |
| Minneapolis, MN       | Commercial Building Rating and Disclosure Ordinance                | 6/1/2013       | 0+                               |                 |                         |
|                       |  | 6/1/2015       |                                  | 50,000+         |                         |
| Philadelphia, PA      | Bill No. 120428-A  | 11/1/2013      | 0+                               | 50,000+         |                         |
|                       |  | TBD            |                                  |                 | 50,000+                 |
| San Francisco, CA     | Existing Commercial Buildings Energy Performance Ordinance         | 4/1/2014       |                                  | 10,000+         |                         |
| Washington            | Senate Bill 5854   | 7/1/2010       | 10,000+                          |                 |                         |
|                       |  | 1/1/2012       |                                  | 10,000+         |                         |
| Seattle, WA           | Ordinance 123226   | 4/1/2013       | 20,000+                          | 20,000+         | 20,000+                 |
| New York City, NY     | Local Law 84   | 5/1/2010       | 10,000+                          |                 |                         |
|                       | Local Law 84, Local Law 87   | 5/1/2011       |                                  | 50,000+         | 50,000+                 |
| Washington, D.C.      | Energy Performance Benchmarking of Privately-Owned Buildings       | 4/1/2010       | 10,000+                          |                 |                         |
|                       |  | 4/1/2014       |                                  | 50,000+         | 50,000+                 |
| Austin, TX            | Energy Conservation Audit and Disclosure Ordinance                 | 6/1/2011       |                                  |                 | 5+ Units                |
|                       |  | 6/1/2014       |                                  | 10,000+         |                         |
| California            | AB 1103 Non-residential Building Benchmarking and Disclosure       | 7/1/2015       |                                  | 5,000+          |                         |

## Program drivers

County, city, and state governments are enacting these compliance mandates for the following reasons:

- To meet internal sustainability goals
- To reduce energy and water consumption - thus saving money
- To participate in mandated environmental initiatives (federal and local)
- To increase energy efficiency through projects that supports the local economy

Buildings in local jurisdictions account for nearly 60% of all GHG emissions compared to other sources such as transportation, street lights, fugitive, industrial, waste, and wastewater treatment. Buildings also consume an average of 40% of all energy within a municipality.<sup>2</sup> This is the main reason governments are mandating better consumption measurement so that the carbon footprint of buildings can be reduced. Information obtained from benchmarking and disclosure provides key stakeholders with the information they need to make decisions on cost-saving investments. The information obtained from benchmarking enables government officials to analyze the data and gain an appreciation for their locality's building profile. This enables more progress towards achieving internal sustainability targets because resources can be better allocated and priorities can be set in a more strategic manner.

Studies have shown that building energy consumption benchmarking helps reduce consumption over time. In 2012, the Environmental Protection Agency (EPA) analyzed energy consumption rates from 35,000 buildings that received an ENERGY STAR score from 2008 – 2011. The agency observed that these buildings, on average, generated 2.4% in annual energy savings.<sup>3</sup> Measuring how much energy is being used is the first step to reducing energy use and associated costs. Only then can building owners verify whether energy saving initiatives are having any positive impact. Counties, cities, and states that mandate benchmarking and create opportunities for building owners to upgrade their buildings to be more energy efficient support their local economy by creating jobs for contractors, engineers, and other building professionals.

## Non-compliance consequences

In the 14 regions where mandatory ordinances for benchmarking energy performance of public, commercial, or non-residential buildings exist, monetary fines are levied on those buildings that are non-compliant in 12 of those localities. The level of severity of the fines differs from one locality to the other (see **Table 2**)

Penalties typically begin with a notice of violation being sent to the non-compliant entity, and can escalate to a monetary penalty of up to \$200 per violation, per day beyond the compliance deadline. For example, in Minneapolis, Minnesota, failure to comply not only results in a monetary fine but can also lead to the denial, suspension, revocation or refusal to issue the necessary Certificate of Commercial Building Registration.

<sup>2</sup> Us Department of Energy, <https://greenworksphila.wordpress.com/2015/01/21/using-the-benchmarking-tool-to-visualize-greenhouse-gas-emissions/>

<sup>3</sup> Environmental Protection Agency, <http://www.energystar.gov/buildings/about-us/research-and-reports/portfolio-manager-datatrends>

**Table 2**

Range of penalties for compliance violations

|                       | First violation  | Additional violations |
|-----------------------|--|-----------------------|
| Chicago, IL           | \$100  | \$25 per day          |
| Boston, MA            | \$200 (50k+ SF)  |                       |
|                       | \$75 (35k-49k SF)  |                       |
|                       | \$35 (non-residential tenants)   |                       |
| Minneapolis, MN       | Subjected to civil fines and the denial, suspension, revocation or refusal of certificate of commercial building registration (or any applicable business license) |                       |
| Philadelphia, PA      | \$300 (first 30 days)  | \$100 per day         |
| San Francisco, CA     | \$100 - \$2,500 (25k+ SF)  |                       |
|                       | \$50 - \$1,500 (<25k+ SF)  |                       |
| Seattle, WA           | \$1,000 per quarter (50k+ SF)  |                       |
|                       | \$500 per quarter (20k-49k SF)   |                       |
| New York City, NY     | \$500  | \$500 per quarter     |
| Washington, D.C.      | \$100 per day  |                       |
| Austin, TX            | \$500 - \$2,000  |                       |
| California            | \$500 - \$2,000  |                       |
| Montgomery County, MD | Up to \$250  |                       |
| Berkeley, CA          | Written warning  | Monetary fine         |

## Stakeholders affected by the mandates

The government mandates surrounding energy efficiency in building affects a number of stakeholders in different ways. Both primary and secondary stakeholders are impacted.

### Primary:

- Real estate owners and managers:** Owners and managers of affected buildings perform the mandatory reporting of a building's performance metrics. They are required to be up to date with their property's compliance mandates as well as ensuring disclosure of necessary documents to governmental agencies overseeing the benchmarking. Owners and managers also play a key role in controlling the operational efficiency of the building and having the ability to improve the market value of the asset through benchmarking and disclosure.
- Electric and gas utilities:** Energy suppliers provide the energy data that is necessary for benchmarking. In some localities, energy suppliers are required to provide an automatic feed of energy data to benchmarking customers. Building owners and managers can request utility companies to automatically provide a live feed of energy data into the online benchmarking platform if it is not already mandatory that the utility companies do so. Electric and gas utilities also participate in "Green Button", a federal initiative aimed at providing utility customers a transparent and easy-to-access view of

their building's energy consumption year-round.

- **Building, energy, or environmental agencies:** Agencies that mandate benchmarking requirements, such as governmental agencies, go through the process of reviewing and posting building performance data online either for internal purposes or for public disclosure.

### Secondary:

- **Energy services experts:** In addition to benchmarking and disclosing energy performance, several localities also require third party verification of the data as well as energy audits to be performed. Energy services experts such as engineers, consultants, contractors, and building service firms can provide third-party compliance support.

## Compliance steps

Each region-specific energy benchmarking and disclosure program has different steps to take in order to comply with the ordinance. The general steps include the following:

1. Determine if building type is applicable (building type and size)
2. Gather building information using tailored attribute templates, by building type and sector
3. Gather comprehensive and auditable utility data.
4. Set up organizational profile and building profiles in benchmarking platform
5. Review, audit, and upload all relevant consumption data
6. Generate necessary compliance reports, data verification statements, and other required documentation
7. Report to respective parties in compliance with each program's compliance date
8. Perform energy audits and energy action plans (if required)
9. Perform retro-commissioning study (if required)
10. Maintain physical records of the underlying data and report filings for required record retention periods and provide, as requested, access to these in support of audits
11. Maintain ongoing benchmarking data to support subsequent years' disclosures

## Conclusion

Building owners wishing to initiate a migration to a more high energy efficient building should consider the following actions plans:

**Within the next few weeks:** Begin to plan a roadmap. Assess which areas of the building in question represent the highest potential for energy efficiency improvement.

**Within the next 6 months:** Identify an initial project with low up-front investment that can result in positive results over a relatively short period of time (like an immediate opportunity to turn off unused building equipment or lights).

**Within the next year:** Work with experts to devise ways to improve energy consumption measurement so that the degree of success of energy savings initiatives can be quantified, documented and published.



### About the author

**Thanh Luong** is a Sustainability Associate on the Energy and Sustainability Services team at Schneider Electric. She is involved in the development and delivery of high-value services such as energy, water, waste, and GHG emissions management, third party data verification, corporate sustainability reporting, and other sustainability services with a focus on value chain initiatives within the apparel industry. She holds Bachelor of Science and Master of Engineering degrees in Chemical Engineering and an Environmental Engineering Certificate from the University of Louisville.