



Building Owners and Managers Association of BC

Department of Energy and Environment



Best Practice: Building Energy Benchmarking & Reporting

Part 1: Building Owners and Managers

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Executive Summary

BOMA BC supports the concept of benchmarking the energy use intensity of buildings and using this information as a component of strategic energy management. By comparing a building's current performance to past performance and the performance of comparable buildings, an owner or manager will be better informed on how to manage and improve the energy efficiency of their real-estate portfolio. Governing bodies can also use reliable building energy intensity information in their decision making process to develop energy efficiency programs and policies (e.g., targeted incentives).

BOMA BC's preference is to use a holistic approach (e.g., energy, water, waste, occupant engagement) to create sustainable buildings. A convenient tool for achieving this is through building environmental certification programs, such as BOMA BEST® 3.0 which has a required verification component as well as direct integration with Energy Star Portfolio Manager (PM). BOMA BC believes that strategic energy management is a critical component in creating sustainable buildings, which includes benchmarking. Advanced energy management information systems (EMIS) like BOMA uTrack (powered by PUMA) are also a critical component in creating sustainable buildings as they offer in-depth information about utility usage and trends that goes beyond benchmarking information and enables users to make the best possible management decisions. By using these tools we not only promote a more holistic or advanced approach to energy and environmental sustainability in commercial real-estate buildings, but we also create a process of collecting and reporting highly useful information that is not cost prohibitive to owners and managers of these buildings.

The following best practice document outlines a number of options for benchmarking and reporting building energy use information which are flexible, pragmatic, and cost effective for building owners and managers, with the intent of promoting accurate and reliable data.

Key Points

1. Energy benchmarking and reporting is an important component in strategic energy management and should be flexible and cost effective for organizations to voluntarily implement. It is important that organizations integrate benchmarking into existing management practices and use the information collected to inform decisions making processes.
2. Environmental certification programs for buildings (e.g., BOMA BEST®) and advanced energy management information systems (EMIS) (e.g., BOMA uTrack) are the preferred method for benchmarking building energy use. Many of these professional systems have mandatory verification and/or quality assurance components to ensure data integrity, some systems also have integration capabilities with PM (e.g., BOMA BEST® 3.0). Building certification systems often go beyond benchmarking and take a more holistic approach to building sustainability (e.g., waste management, air quality, hazardous materials) which helps improve all aspects of the built environment. EMIS users are often provide with more detailed data that allows for more advanced monitoring and reporting capabilities, giving the user the ability to be make more sophisticated management decisions with regards to energy use.
3. In the event that governing bodies require the reporting of building energy use information the following options are recommended for compliance:
 - a. Submission of building energy use information directly from building certification programs (e.g., BOMA BEST® 3.0) or from advanced EMIS (e.g., BOMA uTrack) that are integrated with PM and are verified for data quality. The governing body would be encouraged to accept this information as reliable and should provide an appropriate incentive to organization`s that reported the

information. Random audits could be implemented at the discretion of the governing body to ensure data reliability; or

- b. In-house professional/employee benchmarks and formally reports building energy use information on-behalf of the organization to the appropriate governing body via PM. The governing body would be encouraged to accept this information as reliable and should provide an appropriate incentive to organization`s that reported the information. Random audits could be implemented at the discretion of the governing body to ensure data reliability; or
- c. External professional is hired to benchmark and formally report the building energy use information on-behalf of an organization to the appropriate governing body via PM. The governing body would be encouraged to accept this information as reliable and should provide an appropriate incentive to the organization that reported the information. Random audits could be implemented at the discretion of the governing body to ensure data reliability.

4. BOMA BC does not currently support public disclosure of building energy use information (i.e., “building labelling”), as there is no evidence this practice advances energy conservation. The concern is that, along with the threat of unreliable data (e.g., data manipulation may occur to avoid regulatory repercussions), an unfair business environment may be created through this practice, for example, buildings that have great difficulty improving energy performance (e.g., heritage buildings, lack of capital for upgrades) could be further disadvantaged by a label that doesn’t reflect all the efforts being done by a building to be more sustainable. Public disclosure of building energy use information is currently only supported when done in aggregate or anonymous format for use in policy or program development by governing bodies.

Overview

This building energy benchmarking and reporting best practice was developed in consultation with senior managers, sustainability professionals and building operators from over 20 member organizations. The building energy benchmarking and reporting best practice was created by combining common elements that are used by member organizations to ensure accuracy and cost efficiency when benchmarking and reporting the energy use intensity of their real-estate portfolios.

Benchmarking building energy use is a critical step in understanding the performance of buildings, how best to reduce a building's energy consumption and carbon emissions, and what the overall impact the building has on the environment. Benchmarking information highlights both low performing buildings that require attention and assistance, and high performing buildings that should be recognized and rewarded for their efforts. Benchmarking information can be used by governing bodies to develop policies and regulation that targets energy conservation effectively.

Many US cities and states have already implemented mandatory building energy benchmarking and reporting (e.g., New York, Seattle). However, an issue with data reliability has been identified in a number of these US cities which negatively impacts the ability of governing bodies to use reported benchmarking information reliably. Therefore, it is imperative that we ensure the reliability of the benchmarking information so it can be used with confidence in regulation and policy development.

To address the issue of building energy benchmarking information across Canada, BOMA BC developed the following best practice to provide a flexible, pragmatic, and cost effective approach to benchmarking and reporting building energy use information. The document outlines the different avenues that can be taken to benchmark a building's energy

intensity and is intended to help educate building owners, managers and service providers how to implement a benchmarking strategy that works for their organization.

Benefits of Building Energy Benchmarking

It is important to highlight the many benefits that are realized by benchmarking a building's energy use intensity. Below is a brief list of some of these benefits:

- Quality information to base management decisions
 - o Properly implemented energy management information systems save organizations an estimated 5-15% on annual energy costs – NRCan
 - o Organizations that consistently benchmark using Energy Star Portfolio Manager save 2.4% on annual energy costs – US EPA
 - o Manage risk when developing properties
 - o Hedge against future mandates
- Energy benchmark information leads to energy conservation actions
 - o Lower operating costs
 - o Increased marketability of rentable space
 - o Higher rental rates
 - o Reduced greenhouse gas emissions
 - o Increased asset value
- Free benchmarking tools
 - o Energy Star Portfolio Manager is a free tool available to the public to benchmark the energy use intensity of buildings

Information Required to Benchmark

The following is a general list of information which will enable an organization to benchmark a building's energy use intensity. Please note this list is not intended to be complete and depending on the building's type and use it may require different information to ensure an accurate benchmark.

1. Building Identifiers

- Building name
- Street address
- Postal code for weather normalization

2. Building Information

- Square footage
- Hours of operation
- Number of workers on main shift
- Number of personal computers
- Percent of gross floor area that is air conditioned/heated
- Specific information for space use (e.g., production numbers)

3. Energy Use

- Type of energy
- Amount of energy consumed (normalized for weather)
- Cost of energy consumed

Benchmarking Tools

Building Certification Tools and EMIS

BOMA BCs preferred tools for benchmarking building energy use information are building environmental certification programs (e.g., BOMA BEST® 3.0) and advanced EMIS software (e.g., BOMA uTrack) which have mandatory third-party verification or data quality assurance processes. These types of tools provide energy benchmarking and/or are integrated with PM, but they go beyond benchmarking and have been proven to help improve the energy efficiency and environmental responsibility of buildings (i.e., water, waste, air quality). As buildings certify under sustainability programs or use advanced EMIS tools they

will be better equipped to make strategic management decisions and ultimately improve the overall sustainability of their building portfolios.

BOMA BEST® - <http://bomacanada.ca/bomabest/>

BOMA uTrack - <https://www.boma.bc.ca/green-buildings/boma-utrack/>

Energy Star Portfolio Manager

PM is a free, easy-to-use, web-based benchmarking tool that building owners and managers may use to benchmark the energy and water use intensity of their facilities. With 40% of commercial building space in the U.S. and 20% of commercial building space in Canada using PM, it has emerged as the free benchmarking tool of choice. The tool applies to a number of building types and uses relevant building energy information (e.g., local weather) to provide a reliable and standardized energy use intensity benchmark for the building.

Energy Star Portfolio Manager - <https://portfoliomanager.energystar.gov/pm>

Notes on Public Disclosure

There is a trend throughout the USA and Europe for the public disclosure of building energy benchmark information. BOMA BC supports benchmarking building energy use for the purposes of informing management decisions around energy efficiency, however, because of privacy laws, data access limitations, and other unforeseen consequences, BOMA BC does not support public disclosure of building benchmarking information, also known as “building labelling”. BOMA BC would support the disclosure of building energy use information with the following caveats:

1. The information is disclosed in aggregate form by governing bodies and no individual owner or organization is identified (e.g., information is used to inform the development of energy efficiency policies or incentives).

2. The information is disclosed in such a way that an individual owner or organization will benefit from the disclosure (e.g., owners will be rewarded for energy efficiency efforts).
3. The information is not used in a way that will create an unfair business environment for an individual owner or organization (e.g., unfairly labeled as a poor performing building and thereby losing tenants).

Until such time that public disclosure or building labelling actually increases the energy performance of buildings, it is recommended that efforts by governing bodies be focussed on helping buildings improve their energy efficiency through appropriate policies and incentives that have been proven to help transform the built environment to become more efficient (e.g., direct energy management assistance and education).

Best Practice: Building Energy Benchmarking and Reporting

The following outlines a process which building owners, managers, operators and service providers can use to accurately and efficiently benchmark and report a building's energy use intensity. The focus of the best practice is to leverage a building's existing tools and resources to collect pertinent building energy information, benchmark the building's energy use intensity and then report the benchmark where appropriate. Allowing a flexible, pragmatic, and cost effective approach for benchmarking and reporting building energy use information will allow organizations to develop and implement a process that they are comfortable with and are capable of completing. This approach should encourage participation and ultimately lead to reliable benchmarking information that can be used to design or verify energy conservation policy directives.

There are a few caveats that should be considered when designing building energy benchmarking programs, they are listed below:

1. Total building energy information is not always available, making benchmarking some buildings impossible. For example, when a tenant pays for their own utility bills a building owner/manager may not have access to this information and is then unable to complete a full building benchmark.
2. A physical walk-through of the building should not be a mandatory requirement to benchmark a building's energy use intensity.
 - a. There may be cases where a walk-through is warranted, however it should not be mandatory
 - b. By keeping the walk-through optional the cost of benchmarking and reporting will be kept as low as possible for the building owner/manager

- c. Other means of identifying important building information could be used instead of a walk-through (e.g., real-estate websites, google street view)
- d. Random audits may be considered instead of walk-throughs to ensure reliability of data

Building Certification Option

With data reliability a major concern for benchmarking initiatives and to address broader sustainability goals for the buildings, it is recommended to use a holistic building environmental certification program that is integrated with PM, requires third-party verification (e.g., BOMA BEST® 3.0) and maintains a high quality of data integrity.

The following process is recommended for the submission of building energy benchmarking information from building certification tools that are integrated with PM.

1. Proof of valid certification provided directly by the certifying body (e.g., BOMA BC).
This proof of certification will indicate that an independent verifier has confirmed the reliability of data.
2. Generate and submit a report that has come directly from the certification tool to the appropriate body which confirms the building's energy use intensity (e.g., PM calculated energy use intensity or score).

EMIS Option

Using advanced EMIS not only enables the user to receive an accurate energy benchmark, they also provide a tool to manage energy in a deep and strategic way, which less advanced or free benchmarking tools may not allow.

The following process is recommended for the submission of building energy benchmarking information from EMIS tools that are integrated with PM.

1. Generate a report from the EMIS system proving that a data quality assurance process was performed on the information received. This report must be received directly from the EMIS system.
2. Generate and submit a report to the appropriate body that comes directly from the EMIS tool and confirms the building's energy use intensity (e.g., PM calculated energy use intensity).

Energy Star Portfolio Manager Option

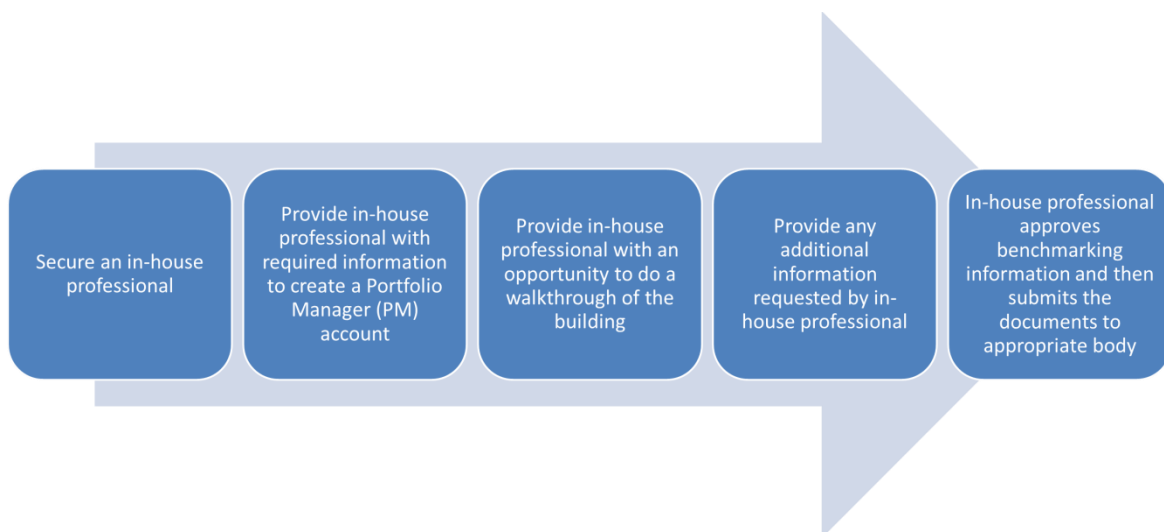
In the absence of a building certification program or EMIS, it is recommended that benchmarking a building's energy use intensity should be done via PM by an in-house or external professional. The professional that is selected to perform these duties should have full access to all utility billing information, as well as basic building information (e.g., type, age, number of occupants). They will need to understand and be proficient with the use of the PM system for entry of their benchmarking information. Lastly they will need to have, or be able to obtain organizational approval to formally submit the information.

In-house Professional Process

In-house employees often have extensive knowledge about the operation of a building and are well qualified to complete the benchmarking task. The following process is recommended for the submission of building energy benchmarking information via PM by an in-house professional.

1. Select the appropriate in-house professional to create a PM account for your building.
 - For information on how to create your buildings in PM see the "Enter data into Portfolio Manager" webpage: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/enter-data-portfolio-manager>

2. Give access to your in-house professional for all the information required to benchmark your building's energy use intensity
 - Most recent 12 months of utility bills for your building's energy information (e.g., utility bills)
 - Any required building information (e.g., building type, address)
3. Allow the in-house professional to do a physical walkthrough of the building to collect or confirm building information.
4. Once your in-house professional has collected all the required building energy benchmark information and they are confident with the reliability of this information, they can enter the information into PM and submit the Energy Star Data Verification Checklist, along with a signed letter confirming the reliability of the benchmarking information to the appropriate body



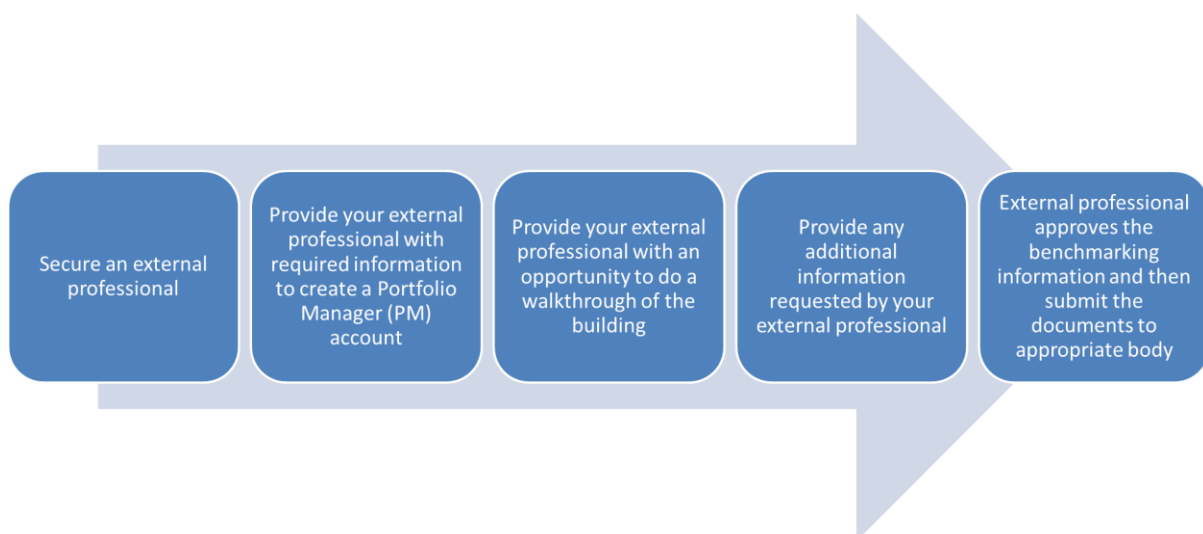
External Professionals Process

The following process is recommended for the submission of building energy benchmarking information via PM by an external professional.

1. Select the appropriate external professional to create your PM account for your building.
 - For information on how to create your buildings in PM see the “Enter data into Portfolio Manager” webpage: <https://www.energystar.gov/buildings/facility->

[owners-and-managers/existing-buildings/use-portfolio-manager/enter-data-portfolio-manager](#)

2. Provide your external professional with all the information required to benchmark your building's energy use intensity
 - Provide the most recent 12 months of utility bills for your building's energy information (e.g., utility bills)
 - Provide any required building information (e.g., building type, address)
3. Provide your external professional the opportunity to do a physical walkthrough of your building.
4. Provide your external professional with any additional information about your building they may require.
5. Once your external professional has entered all the required building energy benchmark information and they are confident with the reliability of this information, they can enter the information into PM and submit a signed copy of the Energy Star Data Verification Checklist to the appropriate body.
 - For information about the Energy Star Data Verification Checklist see the "Sample Energy Star data verification checklist" - https://www.energystar.gov/buildings/tools-and-resources/sample_energy_star_data_verification_checklist



Qualifications for External Professionals

Organizations that choose to use an external professional to complete the benchmarking process can reference the list below for qualifications that lend themselves to the task of building energy benchmarking. This list is not intended to be conclusive, but rather demonstrate the type of education or skillset that would enable an external professional to benchmark a building's energy use intensity.

- Possess a current license and is in good standing as a Professional Engineer (P.Eng) or a Registered Architect (RA) in any U.S. or Canadian state, province, or territory
- Hold one of the following degrees, diplomas, or certifications:
 - o Sustainable Energy Management Advanced Certificate, BCIT
 - o Building Energy and Resource Management, Douglas College Program
 - o Certified Energy Manager (CEM)
 - o Certified Measurement and Verification Professional (CMVP)
 - o Certified Energy Advisor (CEA)
 - o Certified Building Commissioning Professional (CBCP)
 - o Building Operator Certification (BOC)
 - o Chartered Professional Accountant (CPA)
 - o Masters designation with a focus on energy (e.g., Masters of Clean Energy Engineering - UBC)
- Have working knowledge of building systems, ASHRAE Standards 55 and 62.1, and the IESNA Lighting Handbook
- Understand the jurisdictions regulations as they are concerned with building and energy data

Typical Cost for Benchmarking and Reporting via PM

The cost of benchmarking and reporting will vary depending on the type of professional you select and the type and size of your building. The following are service costs as seen in jurisdictions that have already implemented mandatory building energy benchmarking and reporting:

- Flat rate fee \$300-600 per building
- Bulk rate fee (more than 5 buildings) \$200-300 per building

The benchmarking and reporting service should include the following:

1. Creation of PM account
2. Collection and entry of all required information to benchmark building energy use in PM
3. A site visit if required by the professional
4. The submission of energy benchmarking information to appropriate body

About BOMA BC

The Building Owners and Managers Association of British Columbia (BOMA BC) has over 300 corporate members that own or manage over 300 million square feet of commercial real-estate throughout BC. Founded in 1911, BOMA BC is the largest commercial real estate industry association in the province. BOMA BC is an affiliated member of BOMA Canada and BOMA International.

BOMA BC has been a leader and supporter of sustainability initiatives that assist the commercial real-estate industry reduce its energy consumption and environmental impact. To date BOMA BC has implemented a number of sustainability tools and resources, including BOMA BEST®, BOMA uTrack and e-Energy Training, to support our industries sustainability efforts. We have also been successful in the delivery of energy conservation assistance to our industry, helping everyone from small businesses to large commercial buildings reduce their operating costs and overall environmental impact. BOMA BC will continue to support our industry in transforming to a more sustainable and environmentally responsible which have resulted in improved affordability, tenant retention and satisfaction, as well as improved the overall impact of the built environment.

For more information about benchmarking or any of your sustainability or real-estate needs contact BOMA BC:

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