



# Benchmarking, BOMA BEST and BBEER



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# BENCHMARKING – What and Why?

Ongoing review of energy consumption to answer the question:

***“Is my building’s energy performance better or worse than ...?”***

**Energy Use Intensity (EUI) =**

total energy consumed in one year (ekWh) / total floor space of the building (ft<sup>2</sup>)



## BENCHMARKING – Benefits

- reliable **information** on energy use and benefits of improvements;
- **prioritize** poorly performing facilities for immediate improvement;
- identify best practices that can be **replicated**;
- comprehensive **energy management action plan**;
- build the **business case** for capital investments (retrofits);
- **reference points** for measuring and rewarding good performance;
- increase **awareness** of energy efficiency among building occupants.

Source: NRCan



# ABOUT BOMA BEST – Program Description

## Building Environmental Standards (BEST)

- Environmental performance and management practices of existing buildings
- Five modules for existing buildings
- Healthcare Module to be launched in spring/summer 2014





# ABOUT BOMA BEST – Program Description

- Six areas of management and performance:



**BOMA BEST**  
ENERGY



**BOMA BEST**  
WATER



**BOMA BEST**  
WASTE REDUCTION &  
SITE ENHANCEMENT



**BOMA BEST**  
EMISSIONS  
& EFFLUENTS



**BOMA BEST**  
INDOOR  
ENVIRONMENT



**BOMA BEST**  
ENVIRONMENTAL  
MANAGEMENT SYSTEM

- Offered in both Official Languages
- Accessible: user friendly, affordable and inclusive

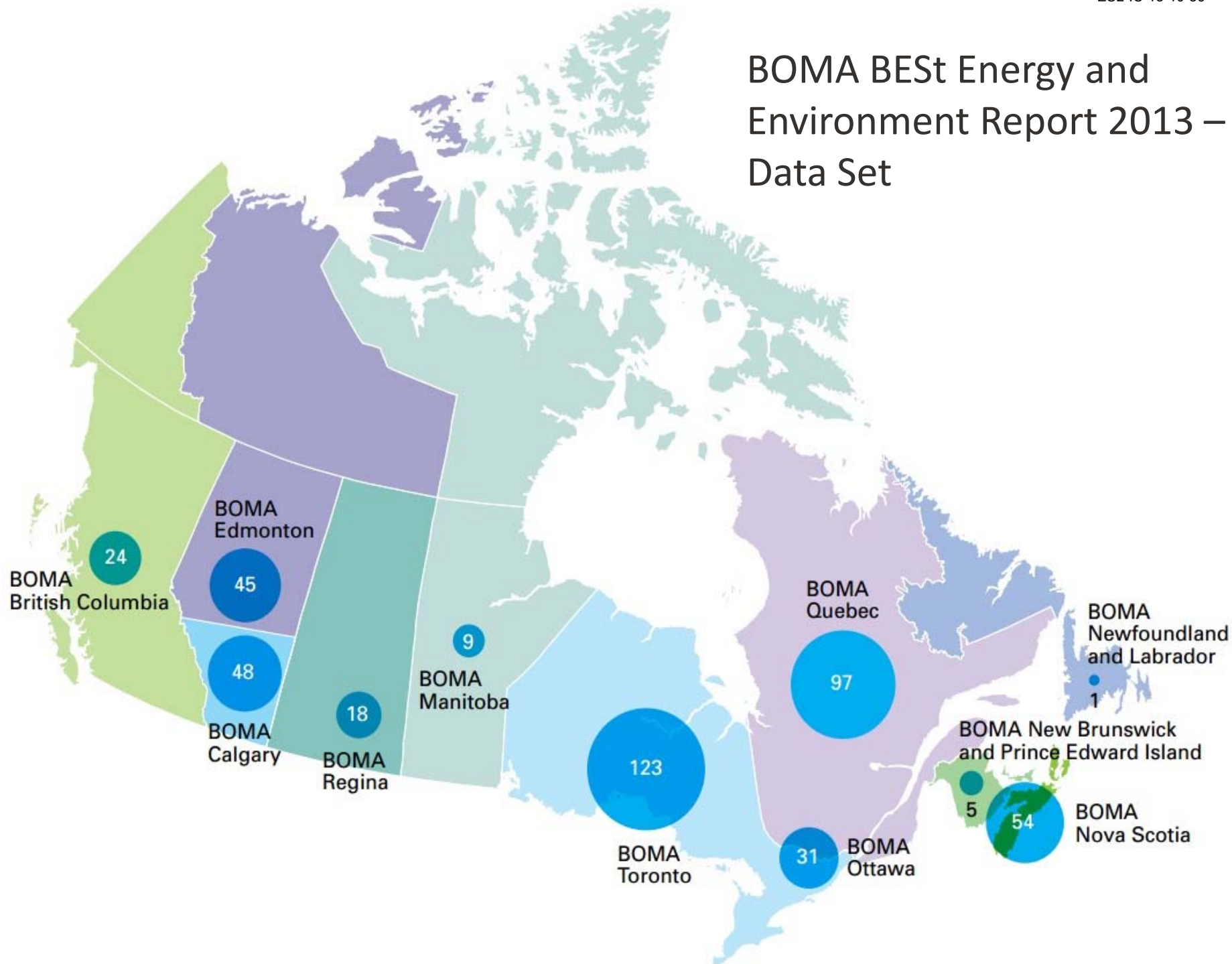
# BOMA BEST Energy and Environmental Report (BBEER)

- **Average energy intensity by:**
  - Region
  - Certification level
  - Sector (private / public) and age
  - Building size
- **Average natural gas use by region**
- **Average electricity use by region**
- **Carbon dioxide emissions by:**
  - Sector and region
  - Sector and age
- **Water consumption by:**
  - Sector and region
  - Building size
  - Sector and age



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# BOMA BEST Energy and Environment Report 2013 – Data Set







# BBEER 2013 – Rich in Case Studies

INDOOR ENVIRONMENT

**LEADER IN INDOOR ENVIRONMENT:**

## BAYVIEW @ COAL HARBOUR, VANCOUVER

**Achieved BOMA BEST Level 3 Indoor Environment score: 96**

Since it directly affects residents' comfort and quality of life, the indoor environment is a critical assessment area for Bayview @ Coal Harbour's multi-unit residential building management.

All 225 rental apartments and 14 townhouses are naturally ventilated with bright and spacious suites.

Minimal off-gassing is supported by the building design's inclusion of kitchen storage units, particularly effective on formaldehyde-containing materials, and use of safety zero-VOC paints. An environmental purchasing policy is followed and the use of environmentally friendly cleaning materials has been in place for over five years.

The site's cooling tower, located away from fresh air intakes and fan outlets, is equipped with drift eliminators. A maintenance program for cooling towers includes monthly inspection for evidence of mold or slime, which could indicate elevated levels of bacteria, as well as regular treatment of the cooling tower water and complete cleaning



**LEADER IN REDUCING SITE IMPACT:**

## HEAD-SMASHED-IN BUFFALO JUMP INTERPRETIVE CENTRE, FORT MACLEOD



Head-Smashed-In Buffalo Jump Interpretive Centre, Fort MacLeod, BOMA BEST Level 3 (Certified 2012)

Other design features to reduce water run-off and to allow the native vegetation to thrive without any irrigation.

The Head-Smashed-In Buffalo Jump Interpretive Centre has also been recognized for its contributions to Sustainable Tourism at the 2012 Alberta Tourism Awards. Sustainable Tourism at Head-Smashed-In Buffalo Jump is achieved by reducing energy and water consumption, increasing recycling programs and reusing materials. The centre supports the regional economy by strengthening site relationships with First Nation's communities and tourism industry partners and enhances the visitor experience by providing opportunities for visitors to more fully appreciate and respect the aboriginal culture.

**LEADER IN WATER CONSERVATION:**

## 25 YORK STREET, TORONTO

**Achieved BOMA BEST Level 4 Water Score: 96**

By installing state of the art water conservation technologies, as well as implementing a stringent Water Conservation Policy, 25 York Street has achieved water reduction targets that are 22% below those of a conventional building.

Regular inspections and a detailed preventative maintenance program allow building staff to efficiently identify and address any indication of water waste.

Examples of state of the art technologies used in the building include the Rainwater Reclaim system. Once rainwater is collected

from both the roof and plaza, it is routed to an underground rainwater collection which subsequently dispenses a filtered water supply to various points of use throughout the facility. The system is automated, controlled by the main Building Automation System. The collected water is supplied to flushing fixtures up to the 10<sup>th</sup> floor, as well as the irrigation system. Steam condensate is collected and water droplets are deposited into the cistern system to be used as non-potable water.

Low-flow fixtures include: dual flush toilets (6/4.2 Litres per flush), faucet aerators (1.3 Litres per minute) and urinals (1.9 Litres per flush). Annual water audits and monitoring allows for ongoing consumption assessment.



25 York Street, Toronto, BOMA BEST Level 4 (Certified 2012)

**LEADER IN ONGOING COMMISSIONING:**

## LE WINDSOR, MONTRÉAL

**Achieved BOMA BEST Level 4 Energy Score: 82**

Energy is a priority for Le Windsor. Building management is working closely with occupants and the operational and maintenance team to successfully implement an energy and environmental performance contract.

Le Windsor is operated in an integrated way, building systems and procedures are reviewed and optimized every day, ensuring occupant well-being. Ongoing commissioning is performed by an energy analyst committed

to reducing energy consumption and CO<sub>2</sub> emissions. While improvements in performance can typically be achieved through the implementation of no-to-low cost projects, occasionally larger investments are required for achieving targets. When this occurs, a team composed of building management and operations staff will meet to thoroughly review all options.

Altogether, these practices enable the building to reduce its energy consumption by at least 2% each year.



Le Windsor, Montreal, BOMA BEST Level 4 (Certified 2012)

was designed to blend in to the surrounding landscape and is covered in grasses and shrubs that are native to the area. Mechanical vents are painted to blend in with the native grasses which camouflages the building so effectively that it is hard to see until you enter the plaza area. The site also has swales and

**LEADER IN REDUCING EMISSIONS AND EFFLUENTS:**

## YALETOWN 939, VANCOUVER

**Achieved BOMA BEST Level 3 Emissions & Effluents score: 94**

Yaletown 939, a property consisting of 175 rent 14 townhomes, achieved a total score of 94% for effluents and pollution controls and for having practices in place for hazardous products, waste safety, and WHMIS.

Successful performance in the Emissions and E area was achieved thanks to the following actions:

- Site technicians are hired through a reputable mechanical maintenance contractor and the operational staff is highly qualified.
- Strategies have been developed to measure and reduce GHG emissions. The building adheres to a documented management plan for Ozone Depleting Substances that includes: inventory of refrigerants and records, maintenance reports, loss reports, an leak test results. There is a maintenance contract with a certified contractor for the site's cooling system and a phase-out plan for ozone-depleting refrigerants is in place.
- Documented policies for snow and ice management aim to minimize damage to the environment by minimizing contaminated runoff. Certified environmentally friendly de-icers are used and snow is conducted manually using snow shovels and brooms.
- Adequate measures are in place to ensure that food or food waste is well contained and that there are no unprotected openings, see minimal rodent access.
- A licensed contractor conducts pest-control inspections month Integrated pesticide management methods are in place.
- Landscaping practices minimize the use of pesticides, herbicide



Yaletown 939, Vancouver, BOMA BEST Level 3 (Certified 2012)

**EXISTING BUILDING COMMISSIONING AT COMMERCE COURT**



Commerce Court is a timeless, 3 million square foot commercial office and retail complex located in the heart of Toronto's Financial District.

significantly improving tenant comfort, as well as building and utility performance while ensuring occupant safety. In fact, based on its consistent success, New York City recently mandated "that all existing commercial buildings over 50,000 ft<sup>2</sup> be commissioned every 10 years.

Energy@Work was engaged to assemble an EB Cx team—which included engineers specializing in commissioning, representatives from the management and operations teams, relevant contractors, and utility representatives—and to guide the project through the four phases of the EB Cx process.

**PHASE 1 – PLANNING:** This phase is the least intensive, but is essential to the success of the rest of the project. In this phase, the objectives, scope, and EB Cx team roles and responsibilities are

## COLLABORATION FOR ENERGY CONSERVATION AT BELL TRINITY SQUARE, TORONTO



Bell Trinity Square, Toronto, BOMA BEST Level 4 (Certified 2011)

Originally performed within the context of "Race to Reduce", objectives soon reached beyond the program's scope. It was at these first meetings that an energy reduction goal was discussed and adopted with all tenants: a 6% reduction in energy consumption over the course of one year (2011 to 2012).

By December 2012, the building was consuming approximately 14.2 ekWh/ft<sup>2</sup>/yr. This has resulted in over 1 million dollars of avoided costs per year – savings which Mr. Braun is quick to point out can now be used towards offering tenants an even higher level of service.

Below are the five key ingredients critical to Mr. Braun and his tenants' success:

Sharing information on why this particular goal is achievable will make the objective real for tenants. Additionally, by setting a goal together, tenants are sharing the responsibility for achieving it. Identifying a shared goal gets everyone on the same page, speaking the same language, and allows tenants to more effectively plan their own strategies.

**2. Provide meaningful data, regularly** Every month tenants are provided with individual energy reports – identifying individual consumption patterns. This data is based on tenant feedback regarding what information is necessary to encourage internal decision-making around energy conservation.

Final data can also raise one's curiosity

**LEADER IN WASTE REDUCTION:**

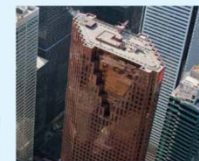
## SCOTIA PLAZA, TORONTO

**Achieved BOMA BEST Level 3 Waste reduction & Site score: 99**

Recycling is important, but it doesn't have to be difficult.

When Scotia Plaza first started its recycling program in January of 1996, the diversion rate was lacking at 51%. Thanks to building management and tenant commitment and passion, as of March 2013, the diversion rate has risen to 84%.

At Scotia Plaza, recycling is made easy with a single-stream system. For convenience, a desktop recycling container is provided to each employee on all 68 floors. Waste management and reduction efforts extend beyond recycling typical items such as cans, bottles, paper and cardboard; electronic and hazardous waste items (such as batteries, electric bulbs, paint, etc.) can also be safely disposed. Scrap metal and wooden skids are recycled accordingly.



Scotia Plaza, Toronto, BOMA BEST Level 3 (Certified 2012)

A rigorous organics recycling program is available to both office and retail tenants. Depending on volume, various sizes of organic bins are provided to all tenant kitchen areas. Scotia Plaza provides for the recycling of cooking grease and cooking oils generated by the food services tenants.

To encourage awareness and a sense of ownership amongst tenants, the recycling program requires that each tenant nominate one representative per floor to act as a liaison, ensuring participation and compliance with recycling program guidelines. Many tenants have their own green committees, and proactively find ways to go above and beyond program guidelines. Ensuring the program remains consistent and effective also means a combined effort amongst building staff. Housekeeping takes an active role in updating compliance and the building's recycling manager maintains an open dialogue with tenants to foster a community committed to ensuring a thriving recycling program.

"We have all worked together to make our program a success and we look forward to finding new and creative opportunities to reduce our carbon footprint."  
– Frank Mazzone, General Manager, Scotia Plaza Management Office.



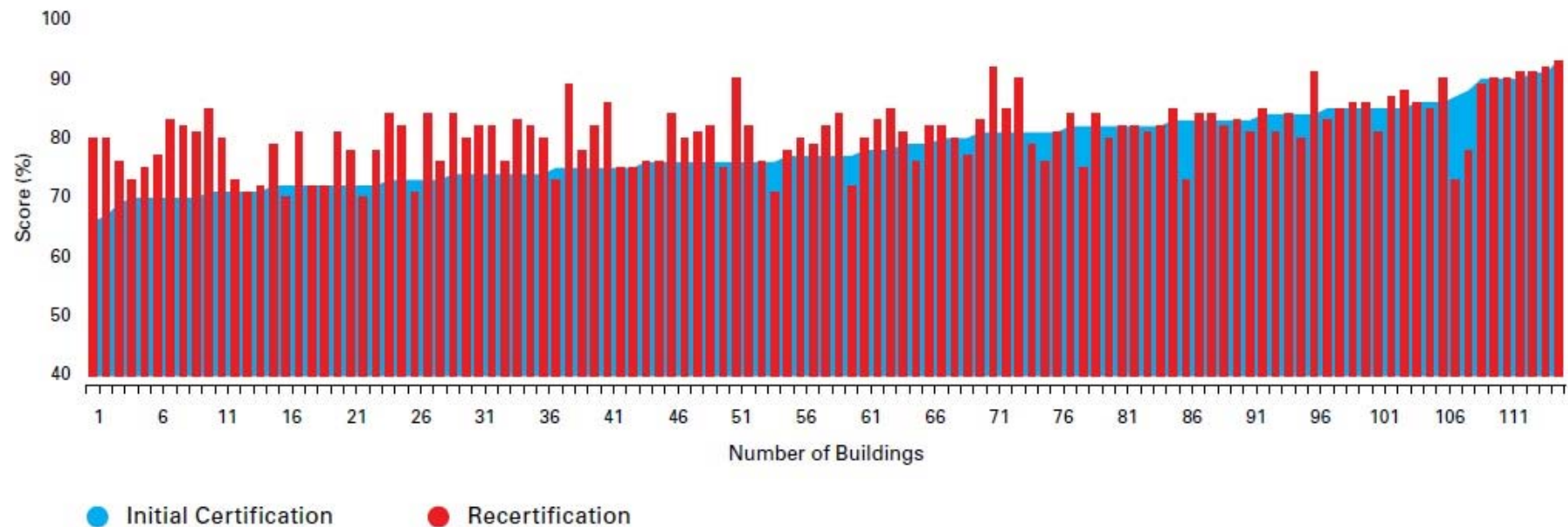




# BBEER 2013 - Results

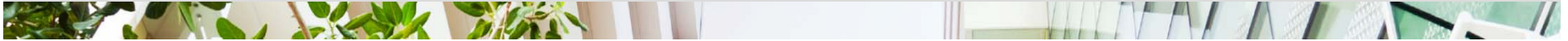
Buildings are improving their score at recertification  
from Level 2 (78.3%) to Level 3 (81%)

FIGURE 2: BOMA BEST SCORES – CERTIFICATION VS. RECERTIFICATION





# BBEER 2013 RESULTS: ENERGY (Office)



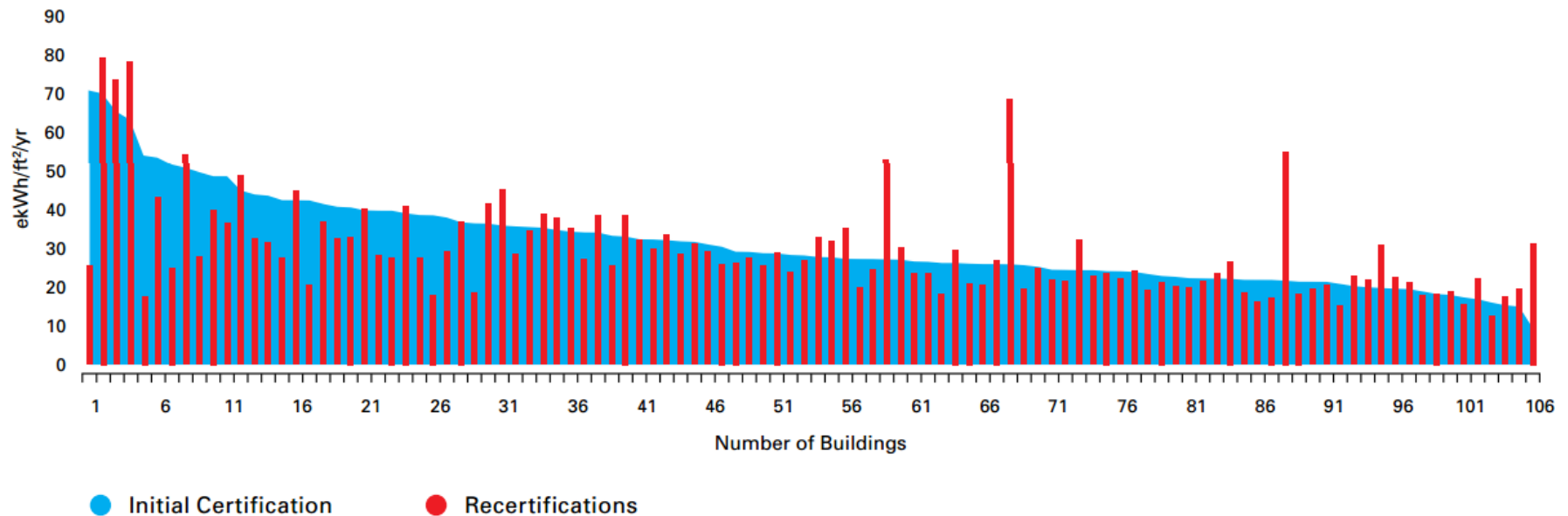
- Forty-six percent (46%) of BOMA BEST certified office buildings in the sample have energy use intensities between 23 and 33 ekWh/ft<sup>2</sup>/yr
- Energy efficiency features are not the only indicators of good energy performance; effective management practices must also be present
- BOMA BEST buildings have avoided emitting 160,240 Mt of CO<sub>2</sub> . This represents the equivalent of removing 33,383 cars from the road for one year, or the capacity of 82,090 square city blocks of pine forest to store CO<sub>2</sub> for one year



# BBEER 2013 RESULTS: ENERGY (Office)

BOMA BEST buildings are reducing their EUI at recertification

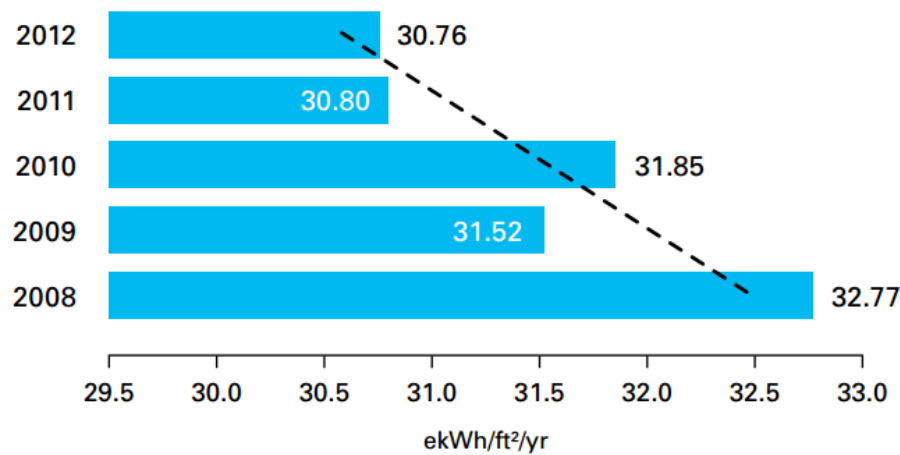
**FIGURE 3: BOMA BEST EUI – CERTIFICATION VS. RECERTIFICATION**



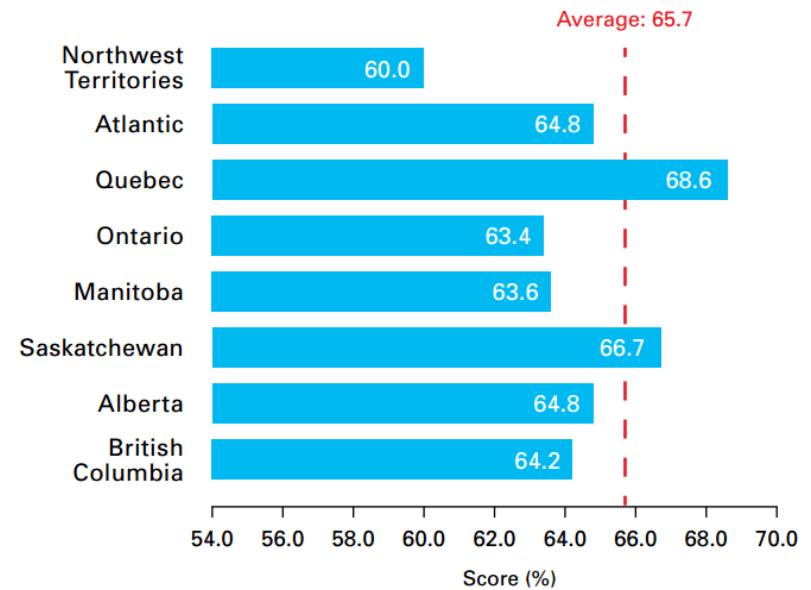


# BBEER 2013 RESULTS: ENERGY (Office)

**FIGURE 21: AVERAGE ENERGY CONSUMPTION FOR OFFICE BUILDINGS, BY YEAR**



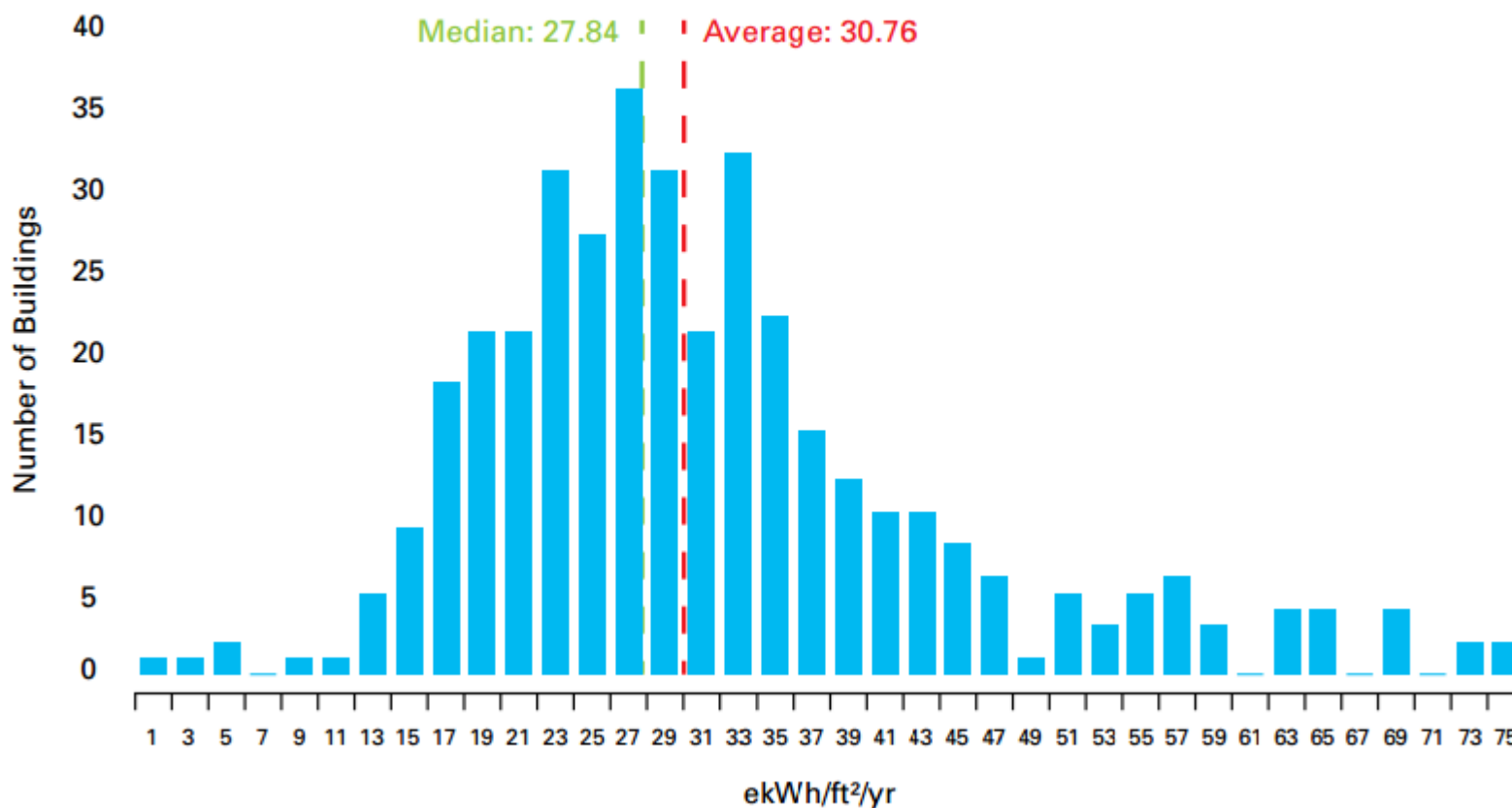
**FIGURE 19: AVERAGE ENERGY SCORE FOR OFFICE BUILDINGS, BY REGION**





# BBEER 2013 RESULTS: ENERGY (Office)

**FIGURE 23: EUI DISTRIBUTION OF CERTIFIED OFFICE BUILDINGS**



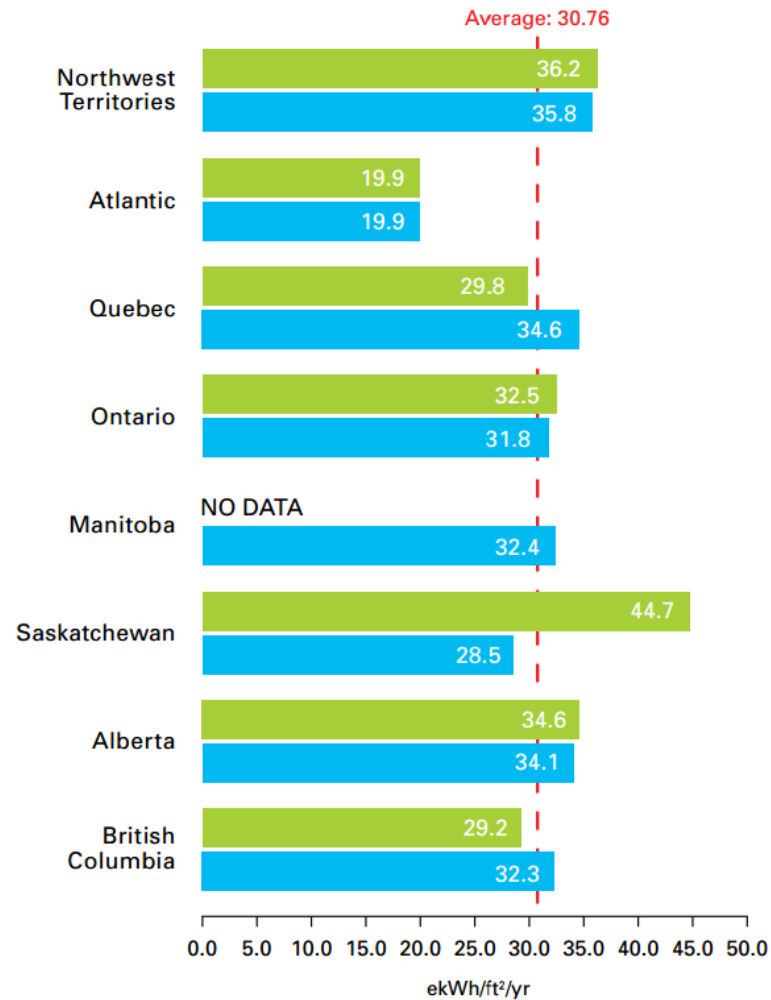




# BBEER 2013 RESULTS: ENERGY (Office)

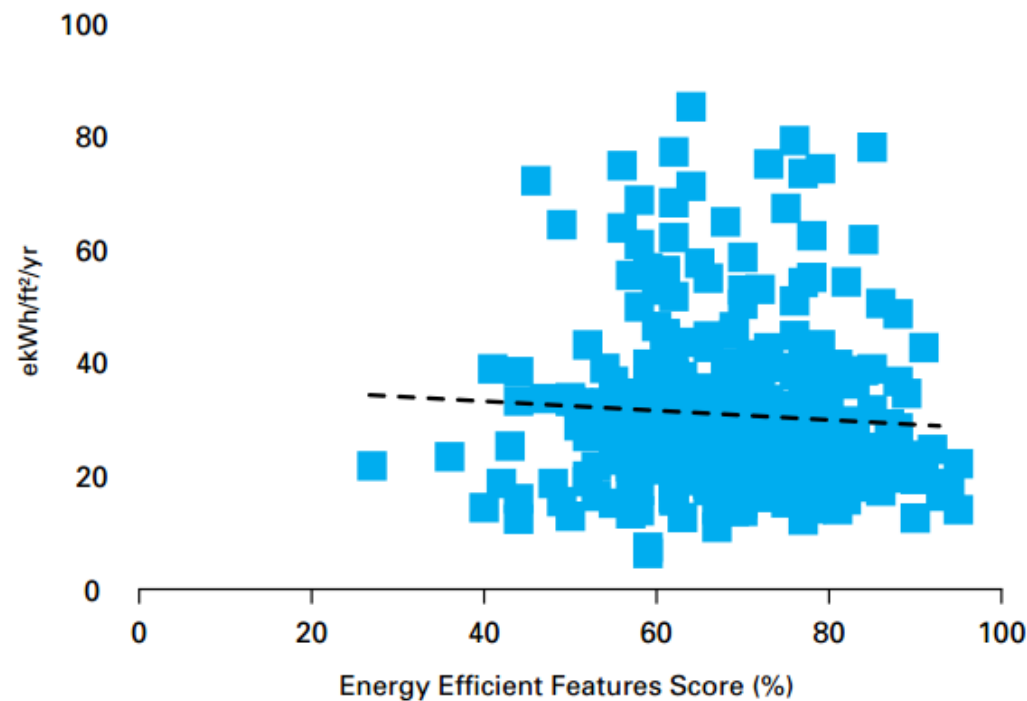
EUI vary significantly across each region.

**FIGURE 26: AVERAGE EUI OF CERTIFIED OFFICE BUILDINGS, BY REGION AND SECTOR**



*Energy efficiency features are not the only variable critical to good building performance*

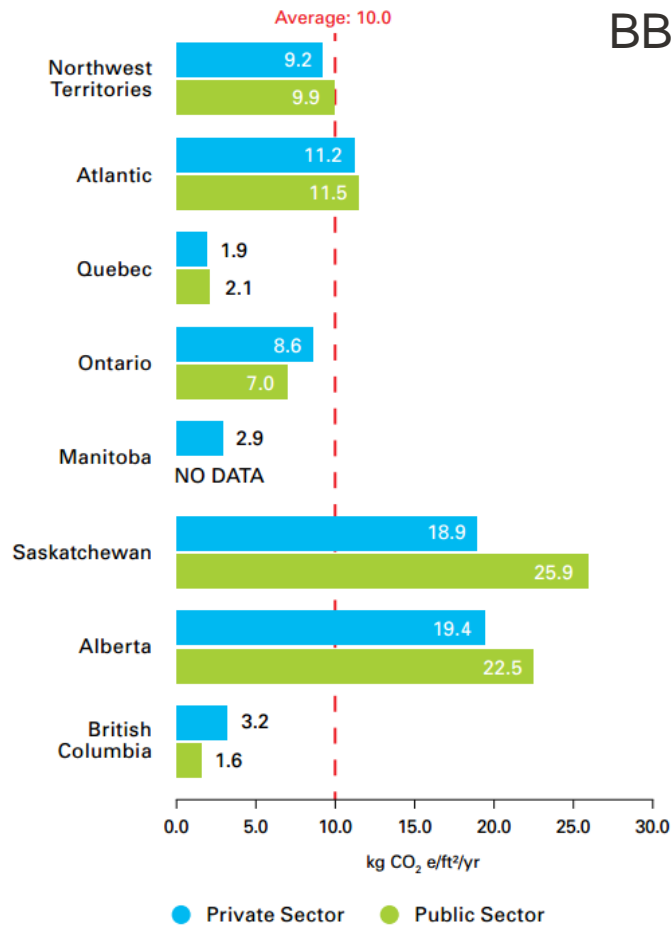
**FIGURE 33: EEF SCORE AND EUI OF CERTIFIED OFFICE BUILDINGS**





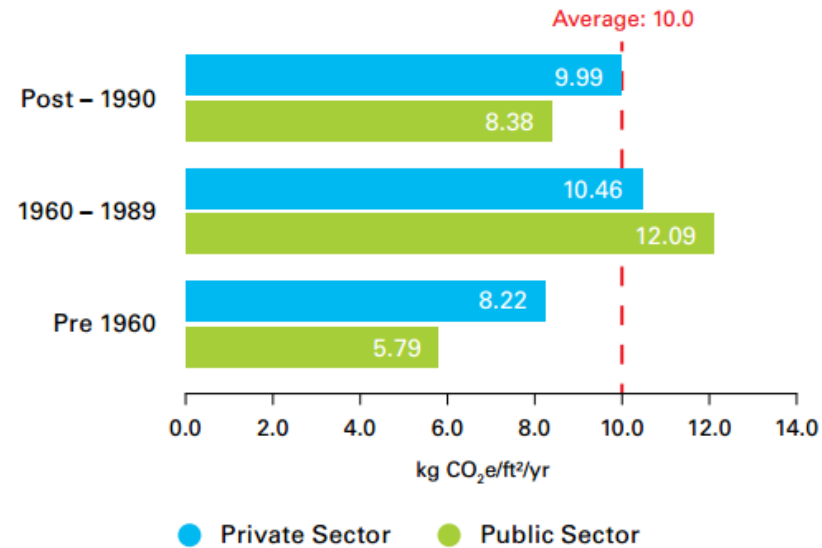
# BBEER 2013 RESULTS: ENERGY (Office)

**FIGURE 49: CO<sub>2</sub> EMISSIONS OF CERTIFIED OFFICE BUILDINGS, BY REGION AND SECTOR**



Total carbon dioxide from all buildings in the 2013 BBEER is 597,025 Mt

**FIGURE 51: CO<sub>2</sub> EMISSIONS OF CERTIFIED OFFICE BUILDINGS, BY AGE AND SECTOR**



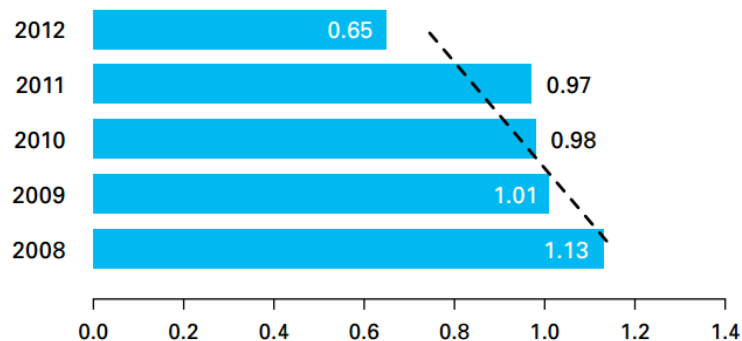


# BBEER 2013 RESULTS: WATER (Office)

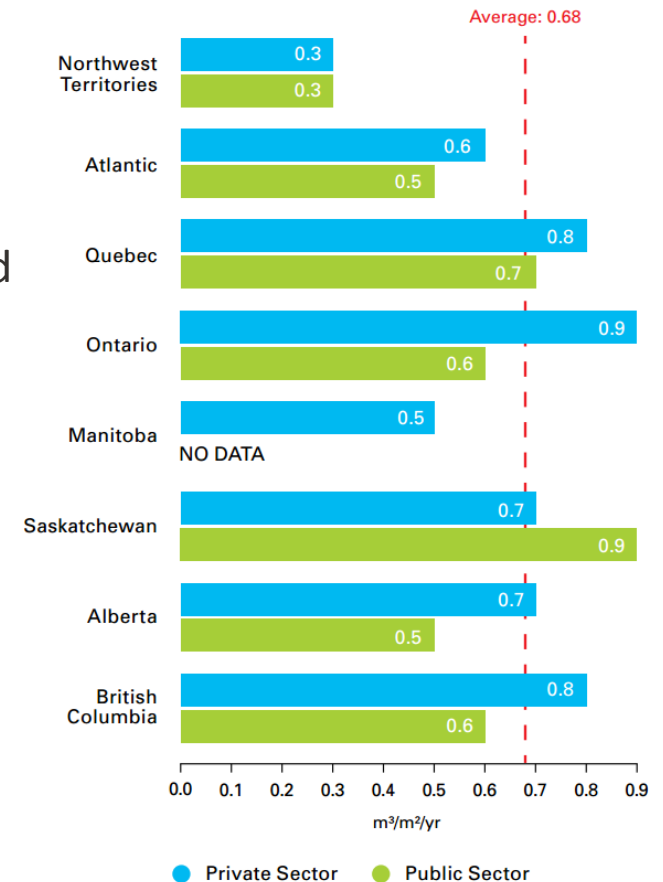


- Overall average water consumption intensity for BOMA BEST certified office buildings is 0.6 m<sup>3</sup>/m<sup>2</sup> – a 70% improvement on the national average of 2.03 m<sup>3</sup>/m<sup>2</sup>
- The majority of BOMA BEST buildings have implemented management practices and technologies which achieve water use reduction.

**FIGURE 54: AVERAGE WATER USE OF CERTIFIED OFFICE BUILDINGS, BY YEAR**



**FIGURE 56: AVERAGE WATER USE OF CERTIFIED OFFICE BUILDINGS, BY REGION AND SECTOR**





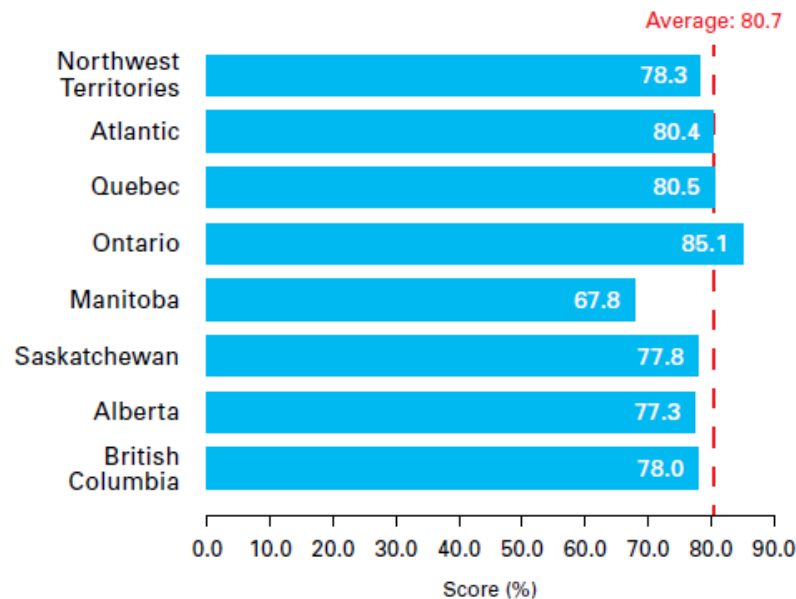
# BBEER 2013 RESULTS: Waste Reduction (Office)



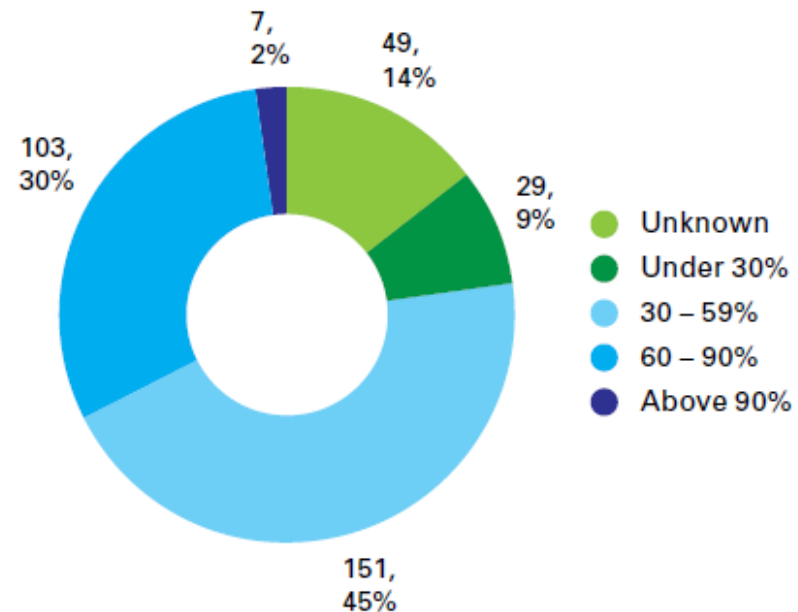
## BOMA BEST WASTE REDUCTION & SITE ENHANCEMENT

- Average section score for this section is 80.7%.
- Forty five percent (45%) of buildings divert between 30 – 59% of their waste from landfill while a smaller percentage diverts between 60 – 90%.

**FIGURE 60: WASTE REDUCTION & SITE SCORE OF CERTIFIED OFFICE BUILDINGS, BY REGION**



**FIGURE 61: WASTE DIVERSION RATES OF CERTIFIED OFFICE BUILDINGS**







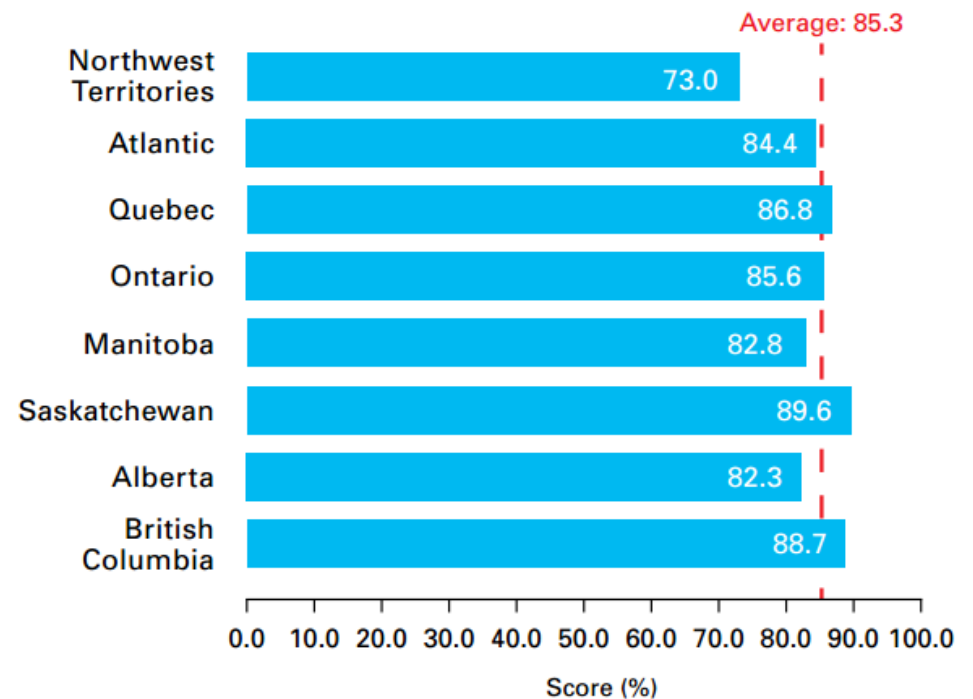
# BBEER 2013 RESULTS: EMISSIONS & EFFLUENTS (Office)



## BOMA BEST EMISSIONS & EFFLUENTS

- Scores for reducing emissions and effluent remain high cross the country which suggests that managers of BOMA BEST certified buildings have a strong commitment to implementing effective management practices for hazardous materials and products.

**FIGURE 62: EMISSIONS & EFFLUENTS SCORE OF CERTIFIED OFFICE BUILDINGS, BY REGION**

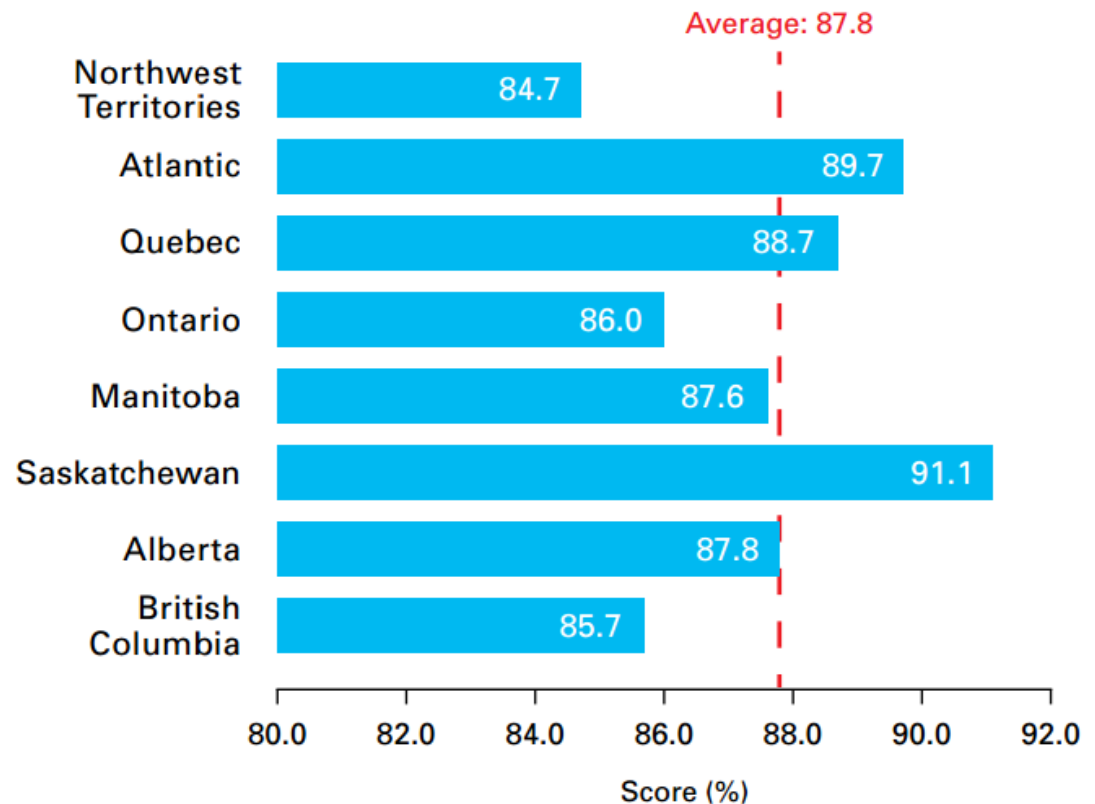


# BBEER 2013 RESULTS: INDOOR ENVIRONMENT (Office)



- BOMA BEST certified buildings across the country achieve consistently high scores (mid 80s) for indoor environment management and practices.

**FIGURE 63: INDOOR ENVIRONMENT SCORES OF CERTIFIED OFFICE BUILDINGS, BY REGION**





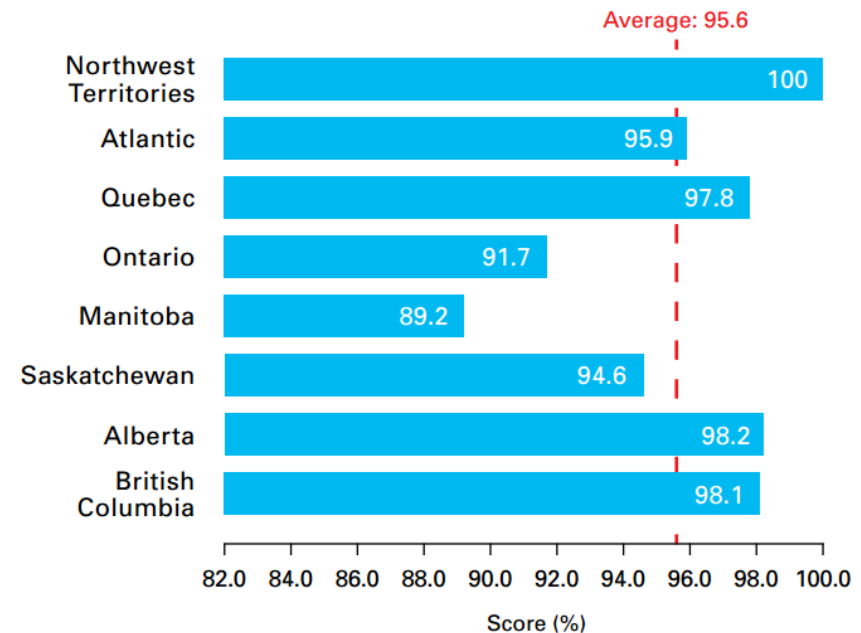
# BBEER 2013 RESULTS: EMS (Office)

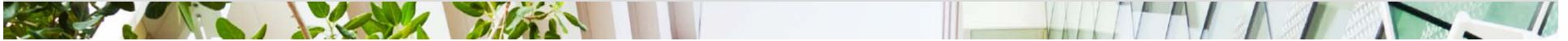


## BOMA BEST ENVIRONMENTAL MANAGEMENT SYSTEM

- BOMA BEST certified buildings achieved consistently high scores (high 90s) on the Environmental Management System section: most buildings have documented environmental policies and tenant communications strategies.

**FIGURE 64: EMS SCORES OF CERTIFIED OFFICE BUILDINGS, BY REGION**





# Questions?

# Thank you.

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