Implementing Smart Buildings Concepts Through Building Environmental Certification to Reduce Environmental Impact.

John Smiciklas
Director, Energy & Environment
BOMA Canada
February 2013

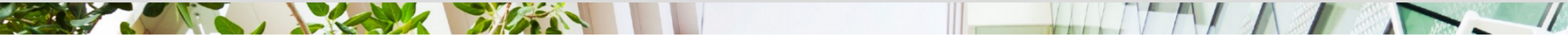
Sustainable Cities – What does it mean ?

Smart / Sustainable cities will depend on a number of factors:

- Use of ICT to enable the construction of smart buildings, smart transportation networks, smart grids, renewable energy etc.
- Urban planning to allow for a more sustainable lifestyle.
- The integration and optimization of buildings, transportation and energy systems to reduce emissions.

However there is already a significant built environment that contributes to climate change that needs to be addressed.

Environmental Certification for the Built Environment



- **Building Owners and Managers Association (BOMA) of Canada** is the voice of the Canadian commercial real estate industry with over 3,200 members who are product and service providers to over 2.1 billion square feet of commercial real estate in Canada.
- **B**uilding **E**nvironmental **St**andard (BESt)
- **Five assessment modules for the existing built environment :**
  - Offices
  - Open Air Retail
  - Light Industrial and
  - Enclosed Shopping Centers.
  - Multi Unit Residential Buildings
  - Health Care (in the works)
- Six areas of management and performance:
  - Energy, Water, Waste Reduction & Site, Emissions & Effluents, Indoor Environment and Environmental Management Systems .

Goal is to standardize best practices, drive innovation, reduce energy consumption and reward improved sustainability performance of the built environment.

Specific Areas of Assessment Related to ICT

- Energy
  - Temperature Set Back Controls
  - Full Building Automation
  - Green Electricity Purchasing
  - Energy Monitoring
- Water
  - Valve Controls and Proximity Sensors

Specific Areas of Assessment Related to ICT

Energy

- Temperature Set Back Controls
  - Implemented within approximately 97% of buildings surveyed
- Full Building Automation System (BAS)
  - Higher scoring buildings (lower energy users) had a much higher implementation rate (88%) than lower scoring buildings (71%)
  - **An indication that Building Automation is a key component leading to lower energy usage.**

Specific Areas of Assessment Related to ICT

Energy

- Green Electricity Purchasing
  - Higher scoring buildings (lower energy users) had a much higher implementation rate (36%) than lower scoring buildings (16%)
  - Certification is driving the implementation of renewable energy.
  - What are the implications ? (e.g. Smart Grid)

- Energy Monitoring
  - Implemented in 99% of buildings certified in 2011

Specific Areas of Assessment Related to ICT

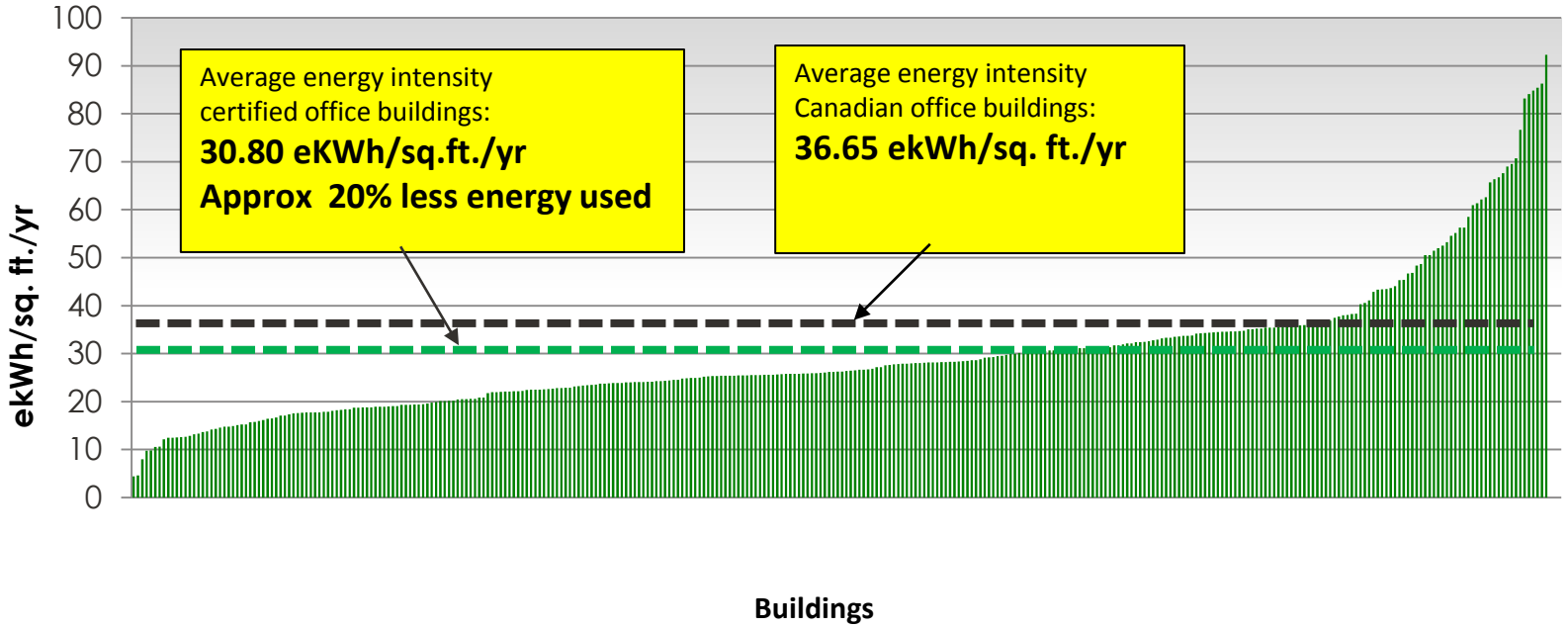
Water

- Valve Controls and Proximity Sensors
  - Implemented in approximately 65% of buildings certified in 2011

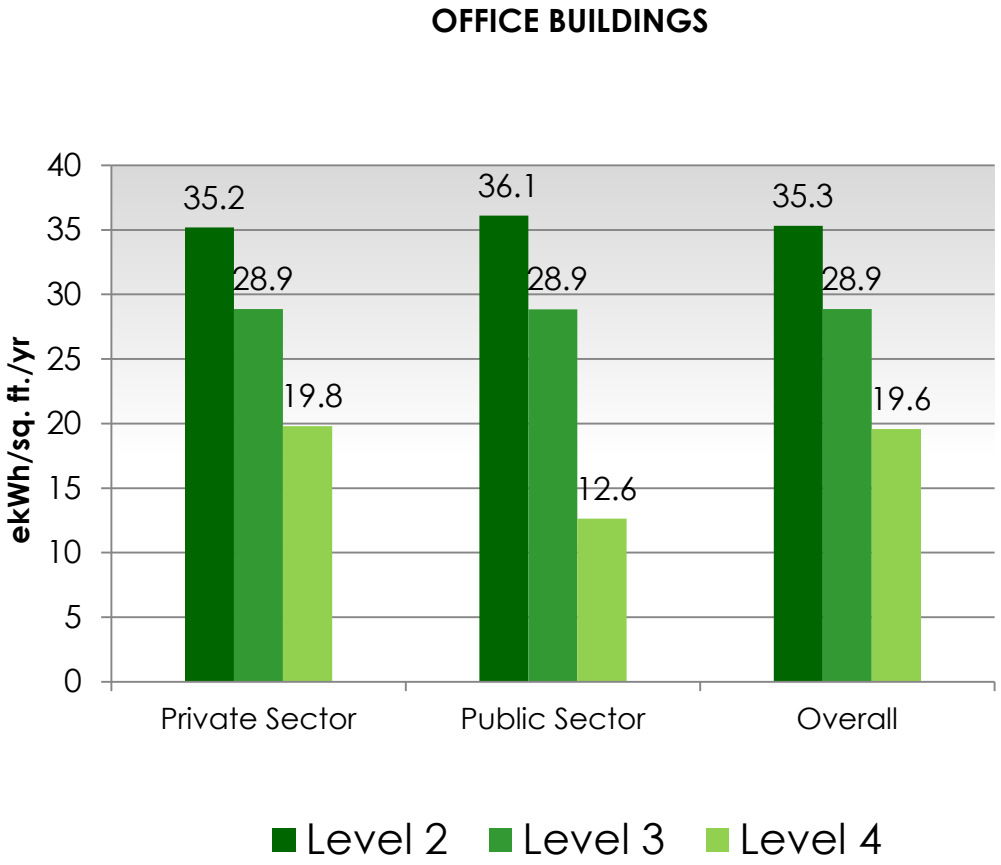
Overall for certified buildings (Levels 2 to 4)

- In 2008, the average water use intensity for was 1.13 m3/m2 which has decreased to 0.97 m3/m2 in 2011.
- These findings indicate that the various water consumption reduction programs and technologies in the marketplace are having an effect

Energy Intensity Improvement



Average Energy Intensities.



- As buildings certify to higher levels

(become smarter and more sustainable)

- Energy use is dramatically decreased.

Impact on Climate Change

BOMA BESt office buildings certified in 2011 **AVOIDED 106,518 METRIC TONNES OF CARBON DIOXIDE EMISSIONS** based on expected emissions at the Canadian national average.

This is equivalent to 20,886 cars NOT being driven for one year or 22,712 acres of pine forests storing carbon dioxide for a period of one year.

- *415 Office buildings rep 102.7 million sq. ft.*
- *For the period: Jan 1 to Dec 31, 2011*

Improving our Built Environment

Case Study:
The Royal Bank Building,
Winnipeg Canada

45-year old building was recognized with two prestigious awards in 2011:

BOMA Manitoba's *Earth Award* and *The Outstanding Building of the Year Award*.

Royal Bank Building, Winnipeg, BOMA BESt Level 3 (certified 2011)

Improving our Built Environment

Building upgrades for the Royal Bank Building include:

- High-efficiency boilers used to reduce fuel consumption;
- Carbon dioxide sensors installed to accurately gauge the amount of fresh air required;
- Motion and sound sensors installed to control area lighting;
- Compact fluorescent bulbs and other high-efficiency lighting designs installed to lower electricity costs;
- Variable speed drives installed on fan and pump systems to reduce energy consumption;
- Use of on-site renewable energy (e.g. active solar and photovoltaic);
- Low flow toilets, urinals, and faucets installed;
- Written policy intended to minimize water use and encourage water conservation.

Future Ares of Cooperation

ITU as a stakeholder in the ongoing sustainable building standardisation process to drive further improvements to environmental performance and decrease the impact on climate change.

Potential to cooperate on the development of a global standard on Smart Sustainable Buildings with a focus on ICT implementation.

Cooperative research on ICT in Smart Buildings and the impact on sustainability / climate change

Access to BOMA data on climate change impacts of commercial buildings

Continuing updates to JCA

Thank You!

www.bomabest.com

jsmiciklas@bomacanada.ca