



Green Building Retrofit Team and Eco-Efficiency Team Meeting

Minutes – Friday Nov 20, 2009

GTAA Admin Building, 3111 Convair Drive

In attendance:

Chris Rickett (TRCA), Dennis Braun (TRCA), Brian Denney (TRCA), Adele Freeman (TRCA), Bill Chihata (Enbridge), Harold Hayashi (Enbridge), Craig Rock (GTAA), Allison Barrett (GTAA), Henry Oberholster (GTAA), Cher Brethour (GFTC), Ian Jarvis (CaGBC), Fred Granek (OCETA), David Wawrychuk (Orlando Corporation), Domenic Natale (Polaris), Phil Dick (OMAFRA), Ken MacDonald (GWL), Larry Brydon (Reliance Home Comfort), Laura Zizzo (Zizzo Climate Change Law), Robert Wakulat (Zizzo Climate Change Law), David Arkell (360 Energy), Kimberly Wright-Caraballo (Toronto), Patty Hargreaves (Greening Greater Toronto), Randy Hansuld (RBC), Richard Janecky (NRCan), Stephen Dixon (Know Energy)

1. Introductions
2. 2010 Eco-Efficiency Workshops
 - 2009 workshops and events were recapped.
 - Planned 2010 workshops and events briefly described: ISO 14001 Workshop, SME GHG Workshop, Feed-in Tariff Workshop, Wal-Mart Supplier Session, Sustainability Tour, The Great Exchange, Tree Planting, AGM and Product Showcase. Descriptions in attached report.
Stephen Dixon (Know Energy) recommended a workshop on the RETScreen energy efficiency module. The team decided to incorporate RET Screen into an Energy Efficiency Workshop and the Feed-In Tariff Workshop.

Action Item:

- ***TRCA staff to finalize list of events and undertake planning and implementation.***

3. Virtual Energy Efficiency Equipment Lending Library
 - Lending Library was briefly explained. Partner in Project Green would purchase equipment to rent out to businesses as needed to help them measure and undertake energy efficiency projects. More details in attached report.
 - Phil Dick (OMAFRA) suggested adding an ultrasonic detector to the list of equipment available in the library.

- Ian Jarvis (CaGBC) recommended creating an agreement with an existing equipment rental outfit to manage this because maintenance and calibration requirements would be difficult for Partners in Project Green to administer.

Action Items:

- **TRCA to conduct a survey of attendees to past energy workshops to identify tools they require for projects.**
- **Based on this input, TRCA to develop framework for the Lending Library and release a request for proposals to equipment providers interested in partnering.**

4. Best Practices Map

- The web-based best practices database was highlighted, showing how local businesses can find out about the environmental initiatives of their neighbours.
- The web-based green business database was discussed, which will allow providers of green products or services to post information and link to projects they have done with clients in the Pearson Eco-Business Zone.
 - i. Graig Rock (GTAA) – Clients need to be able to validate or delete reference to their companies.
 - ii. Chris Rickett (TRCA) – TRCA will set the system up so companies referenced can validate their connections to the company.
 - iii. Ian Jarvis (CaGBC) – The tool has a big value add to synergize activities of the Pearson Eco-Business Zone community.

5. Rooftop Solar Market Push Program

- TRCA issued a Request for Proposals to look at hurdles to rooftop solar adoption and how Partners in Project Green can help lower them. Zizzo Climate Law was selected to complete the work. More details in attached report.
- Presentation by Laura Zizzo (Zizzo Climate Law). Currently completing research and interviews with an interim report due in December 2009, stakeholder workshop in February 2010, and final report due at the end of February 2010.. Some early hurdles identified included: Economic/Cost, Technical, Capacity (significant challenge – not people’s core business, learning something new), and Legal (nuts and bolts of leasing, approvals, right to light).
- Comments and questions from team members were noted by Zizzo Climate Law. Orlando, Polaris, and GWL to have follow-up discussions to provide more input.
 - i. Ken MacDonald (GWL) - No one has defined what the roof is worth. People don’t realize that every roof installation cost will be different depending on location of electrical, etc.
 - ii. David Wawrychuk (Orlando Corporation) – If property owners rent out roofs, what’s in it for tenants? They’re more likely to leak, damage roof. Location of panels important for needs of future clients.
 - iii. Brian Denney (TRCA) – TRCA can give group access to evaluation of roof performance for Horse Palace.

- iv. Larry Brydon (Reliance Home Comfort) – Once identified we can knock down hurdles quickly.
- v. Henry Oberholster (GTAA) – With FIT the OPA owns GHG credits. They can't be double counted.

Action Items:

- **Zizzo Climate Law to arrange follow-up discussions with Orlando, Polaris, and GWL**

6. Energy Efficiency Financing

- Description of existing financing options (Enersource on-bill financing, Canada Small Business Financing Program, and energy performance contracting), along with the potential for a revolving loan fund for the Pearson Eco-Business Zone. TRCA staff recommended promoting existing financing options and working with utility partners to expand on-bill financing. More details in attached report.
- Larry Brydon (Reliance Home Comfort) – Reliance has access to about \$30M/month for on-bill financing. It is mostly for small to medium residential and light industrial and for mechanical and hot water projects.
- Ian Jarvis (CaGBC) – To flush out who assumes the risk, and whose balance sheet the debt lies on, get a deal done with Enersource and see how the chips fall.
- Ken MacDonald (GWL) – the ownership of assets needs to be clear.
- Craig Rock (GTAA) – Carbon credits are important to many companies. The GTAA opted out of FIT because the tariff they would receive now is offset by the credits they will need to buy in the future.

Action Item:

- **Chris Rickett (TRCA) to set up meeting with Enersource and Randy Hansuld (RBC) to move forward a partnership with Enersource to expand and promote on-bill financing.**

7. CaGBC Green Up Program

- Ian Jarvis presented the Green Up program, an initiative led by CaGBC that is parallel and complementary to LEED to spur wide-spread action in improving the energy performance of buildings. It encourages improving building operations and re-commissioning equipment to achieve gains before undertaking retrofits. The presentation slides are attached.
- Stephen Dixon (Know Energy) added that the Green Up standard building performance audit is an improvement over a building audit.
- Brian Denney (TRCA) moved that the team name be changed from the Green Building Retrofit Team to the Green Building Performance Team. The motion was adopted.
- Suggestions: Consider providing workshops on Green Up and applying the program to offices in the Pearson Eco-Business Zone. It could be tied into the logistics and hospitality consortiums that are in development.

Action Item:

- ***TRCA to set-up meeting with CaGBC and members of the Eco-Efficiency Team to discuss joint workshops utilizing the Green Up tool.***

8. Reporting

- Aggregate data on eco-efficiency activities will be included in the Annual Report to be released in April 2010. More details in attached report.

Attached Reports to Team:

- 2010 Workshops
- Virtual Energy Efficiency Equipment Lending Library
- Partners in Project Green Rooftop Solar Market Push
- Energy Efficiency Financing
- Pearson Eco-Business Zone 2009 Report

Attached Presentation Slides:

- Zizzo Climate Law – Rooftop Solar
- Canadian Green Building Council – GREEN UP

TO: Members of the Partners in Project Green - Eco-Efficiency & Green Building Team

FROM: Chris Rickett, Senior Project Manager, Partners in Project Green

RE: **2010 WORKSHOPS**

KEY ISSUE

To review and identify 2010 eco-efficiency events for Partners in Project Green.

OVERVIEW

Over the course of 2009, Partners in Project hosted a number of events, including:

- NRCan Food Processor CIPEC Meeting – March 26th, 2009
- Sustainable Energy Plan Workshop – April 23rd, 2009
- Earth Day Tree Planting Event – April 25th, 2009
- Energy Management Workshop for Food Processors – May 13th, 2009
- Partners in Project Green Sustainable Business Tour – June 25th, 2009
- CME Lean Manufacturing Consortium – October 1st, 2009
- Energy Management Workshop for Logistics – October 6th, 2009
- Sustainable Business Networking Event – October 15th, 2009
- Partners in Project Green – Green Roof Tour – October 21st, 2009
- Fall Tree Planting Event – October 24th, 2009
- Partners in Project Green Energy 2009 Tour – November 24th, 2009

Overall these events with both well received and well attended. The feedback received from the energy management workshops, networking session and the sustainable business tours were good.

2010 EVENT OPPORTUNITIES

In 2010, Partners in Project Green plans to build on these successes and continue to offer interesting and engaging opportunities for businesses in the area to learn about sustainability. A final listing of potential events has not yet been determined, but the following is a list of potential events that are being considered:

- ISO 14001 Workshop – a workshop to help businesses develop their own environmental management system. This would be delivered in partnership with Green Enterprise Toronto.
- SME GHG Reduction Strategies Workshop – this workshop will be to assist companies in developing their GHG baselines and reduction strategies.
- AGM and Product Showcase – this will be an all day event with the afternoon being a green product showcase with vendors having the ability to pitch their product, followed by the first Partners in Project Green AGM with a speaker on sustainability during an evening reception.
- Sustainability Tour – building on the success of the spring and fall sustainability tour, there will be two Partners in Project Green Sustainable Business Tours.
- Wal-Mart Supplier Session – a workshop on Wal-Mart's Packaging Scorecard and Sustainability Questions to educate businesses on doing business with Wal-Mart.

- Feed-In-Tariff Workshop – a session to educate businesses on the opportunities from the Green Energy Act.
- The Great Exchange – a facilitated networking session that will provide participants with a forum to re-direct excess inventory or a reusable waste stream, obtain materials used daily at low or no cost, find a partner to reduce employee training costs, and networking with others.
- Tree Planting Event – a spring and fall tree employee tree planting event.

In addition to these events, a number of eco-efficiency workshops will be delivered; however, in addition to input on the above workshops, staff would like input on potential energy and water conservation workshops that could be delivered.

Report prepared by: Chris Rickett, extension 5316

For more information contact: Chris Rickett, extension 5316

Date: November 13th, 2009

TO: Members of the Partners in Project Green - Eco-Efficiency & Green Building Team

FROM: Chris Rickett, Senior Project Manager, Partners in Project Green

RE: **VIRTUAL ENERGY EFFICIENCY EQUIPMENT LENDING LIBRARY**

KEY ISSUE

Development of a virtual energy efficiency lending library to provide tools and education materials to companies in the Pearson Eco-Business Zone.

RECOMMENDATION

THAT a virtual energy efficiency lending library be developed for the Pearson Eco-Business Zone.

BACKGROUND

The delivery of Partners in Project Green energy management workshops have been successful throughout 2009. However, in order to increase the ability for energy management staff to implement projects, the development of an online lending library for energy management tools could assist in driving energy savings.

OVERVIEW OF LIBRARY

The development of a virtual energy efficiency equipment lending library on the Partners in Project Green website would provide a resource for companies looking to utilize tools that can assist them in quantifying and implementing energy efficiency projects.

In discussions with a number of attendees at Partners in Project Green workshops, the following tools were identified as of interest:

- Power Analyzer to log KWH, KW, KVA, KVAR, PF, etc.
- Temperature/Humidity/pressure loggers
- Light meters and loggers to measure light levels
- Noise/vibration level meters and loggers
- Air Quality Monitors
- Infrared monitors and loggers

Partners in Project Green members would be able to sign-on to the project website, sign-out the required tools, and return them once they had developed their respective projects. In addition to making tools available, the energy efficiency library would also act as a repository for information and tools for energy projects, including spreadsheets and calculators made available by partners.

NEXT STEPS

To better understand the potential interest in the development of a virtual energy efficiency lending library, TRCA staff will undertake a survey of business partners that will determine the types of tools and information that should be made available. Given this input, staff will then work with the Eco-Efficiency Team to identify resources to build the virtual energy efficiency lending library.

Report prepared by: Chris Rickett, extension 5316
For more information contact: Chris Rickett, extension 5316
Date: November 13th, 2009

TO: Members of the Partners in Project Green - Eco-Efficiency & Green Building Team

FROM: Chris Rickett, Senior Project Manager, Partners in Project Green

RE: PARTNERS IN PROJECT GREEN ROOFTOP SOLAR MARKET PUSH PROGRAM

KEY ISSUE

Provide an on the Partners in Project Green Rooftop Solar Market Push Program to the respective teams and gather their input on the project.

BACKGROUND

In order to achieve Partner's in Project Green's goal of sourcing 10% of energy required in the Pearson Eco-Business Zone from renewables by 2015, new modes of energy generation need to be explored. To that end, TRCA identified rooftop solar projects as a possible avenue for partner companies. It has been noted that there are barriers to rooftop solar implementation and in order to achieve project goals, it is advisable that data be gathered pertaining to these barriers, as well as their solutions, before proceeding.

To assist in identifying and addressing these issues, TRCA issued a request for proposals (RFP) for a report to identify and provide recommended solutions to drive greater adoption of rooftop solar on buildings in the Pearson Eco-business Zone. The RFP outlined the following work:

- Rooftop Solar Research - conduct research on local, national and international case studies of rooftop solar installations, review and report on rooftop leases, review and report on the related legislation and policy frameworks in the municipalities, Province of Ontario and Government of Canada.
- Interviews – through one-on-one interviews, identify relevant individuals from the following stakeholders - tenants, owners, practitioners, utilities, sector associations, and governments (municipal and provincial) to identify the core issues and barriers that limit the implementation of roof top solar projects, including technological understanding, building suitability, land-use policies, regulatory, capital and leasing requirements, financing, insurance and access issues, as well as any others identified through the interviews.
- Draft Report – develop a draft report that highlights the results of the focus group interviews that includes, but is not limited to, the issues and barriers that impede the installations of rooftop solar projects, and provide recommendations to address those barriers, including, but not limited to, required marketing and communications materials, agreement and leasing templates, policy/regulatory changes, technological specifications, and other requirements identified through the consultation process.
- Stakeholder Workshop – utilizing the rooftop solar research and case studies, along with the draft report of recommendations, develop and host a stakeholder workshop with no more than fifty (50) key stakeholders from the five stakeholder areas identified. The purposed of the stakeholder workshop is to highlight the possibilities of roof top solar gleaned from the background research and to ground truth the recommendations with stakeholders. TRCA will provide the facility and send invitations, but the consultant selected will be responsible for preparing, facilitating and reporting on the workshop.

- Final Report – Based on the input received at the stakeholder workshop, finalize the report and its recommendations for implementation by TRCA and its partners.

CURRENT STATUS

The proponent selected to complete the work was Zizzo Climate Law. They are currently undertaking the work and are completing the research and interview phase of the project. A draft report is expected in early December, with the workshop to take place in January 2010 with everything being finalized by early February 2010.

Zizzo Climate Law will be present at the November 20th, 2009 meeting to provide an overview of their findings thus far and will be looking for input from the Eco-Efficiency and Green Building Teams.

Report prepared by: Chris Rickett, extension 5316

For more information contact: Chris Rickett, extension 5316

Date: November 13th, 2009

TO: Members of the Partners in Project Green - Eco-Efficiency & Green Building Team

FROM: Chris Rickett, Senior Project Manager, Partners in Project Green

RE: ENERGY EFFICIENCY FINANCING

KEY ISSUE

Investigation of the development of a revolving loan and/or on-bill financing mechanism for energy efficiency projects in the Pearson Eco-Business Zone.

BACKGROUND

Through discussions with some Partners in Project Green companies and partners, the issue of financing has been discovered as an issue to the implementation of energy efficiency projects. This has either been the result of internal competition for capital or projects that do not meet internal hurdle rates. In order to better understand the issue, TRCA has had limited discussions with some of its partners to further scope the need and identify potential financing solutions to help companies implement their energy efficiency projects.

EXISTING PROGRAMMING

It is recognized that all of the utilities through their conservation programming offer financial incentives for energy efficiency projects; however, what the development of a financing program recognizes is that not all businesses can identify the financing to cover the remainder of the purchase price for their chosen energy efficiency projects. This slows down implementation or cancels it outright. The development of a financing mechanism to assist in these situations is one way to speed up the implementation of energy conservation measures.

Enersource Hydro Mississauga, has an existing financing program. The program allows businesses to apply for an on-the-bill payment plan that provides a company with the financing for their energy efficiency projects and then allows repayment through the hydro bill, essentially allowing the capital project to be operationalized. The program involves Enersource reviewing the proposed energy efficiency projects and then connecting the client with Citicapital, who then reviews and approves the financing. Repayment then takes place through the month hydro bill on term of either 36, 48 or 60 months.

In addition to this program, there is the Canada Small Business Financing Program. The program is open to businesses with gross revenues of \$5 million or less and will provide up to \$500,000 for numerous projects, including energy efficiency and building improvements. This financing is accessed through a company's existing financial institution and a portion of the loan is guaranteed by the federal government in order to bring down the interest rate paid by the company. This program is helpful for small businesses, but would not help the majority of manufacturers in the Pearson Eco-Business Zone.

Another option available to companies is energy performance contracting. Partners in Project Green has been working with the Clinton Climate Initiative and has access to their best practices for energy performance contractors and list of their approved providers. Under energy performance contracting, a business partners with an energy performance contractor to undertake energy efficiency retrofits, the contractor finances the projects and, the savings are used to pay back the financing. Partners in Project Green has been promoting the use of

energy performance contracting, but at this point the market has been resistant due to past experiences.

PEARSON ECO-BUSINESS ZONE MARKET

To better understand the number of businesses that may be interested in an energy efficiency financing program, TRCA staff characterized the market within the Pearson Eco-Business Zone. While there are over 12,500 businesses operating within the Pearson Eco-Business Zone, there are 3,869 within the manufacturing and logistics/warehouse sectors in the Pearson Eco-Business Zone. Table 1 provides an overview of the number of companies and their respective size by employees. The table provides a good analysis of the typology of businesses in the area, indicating that over 92 per cent of operations have 100 or less employees.

Table 1 – Sector Employment Ranges

Employment ranges	Manufacturing	Transportation & Logistics
0-10	1943	704
11-50	426	144
51-100	265	94
101-500	199	77
>500	11	6
Total # of records	2844	1025

Judging a business solely by the number of employees though is misleading, so to better understand the amount of economic activity within these sectors, Table 2 highlights the revenues of these companies.

Table 2 – Revenue Levels

Revenue Level	# Businesses
# Businesses With < \$5M Revenue	0
# Businesses With > \$5M Revenue	881
# Businesses With > \$10M Revenue	257
# Businesses With > \$20M Revenue	27
# Businesses With > \$30M Revenue	23
# Businesses With > \$40M Revenue	0
Total	1,188

Revenues for all of the companies within these sectors were not available and only 200 of them had revenue data associated with their operations. In order to develop this breakdown, estimates were developed utilizing either employee size comparisons to those with data, or facility size as comparisons to those with data. This allowed for 1,188 records to be developed with revenue data estimations. The R2 value for the employment data was .48 and for the building size was .27, which highlights that these are very rough estimates at best.

Despite these rough estimations we can draw a number of preliminary conclusions from the data, including:

- There are a large number of small businesses operating with the Pearson Eco-Business Zone; and,

- A potentially large portion of the businesses have in excess of \$5M in revenue.

Given these findings, within the manufacturing and logistics/warehouse sectors, the Canada Small Business Financing Program would not be an option for most operations. This means that unless a company can finance the energy efficiency project itself, could qualify for Enersource Hydro Mississauga's on-the-bill financing program, or was interested in energy performance contracting, an energy conservation project could go unimplemented due to limited financing options.

OPTIONS FOR PARTNERS IN PROJECT GREEN

A number of options are available for Partners in Project Green, including promoting the existing financing mechanisms available, working with its utility partners to expand on-the-bill financing, or developing its own revolving loan fund to assist companies in financing their projects. The first two options are felt by TRCA staff to be the most ideal use of existing resources.

NEXT STEPS

In order to better understand the potential and interest in financing programs, TRCA staff plan to undertake the following steps:

1. Undertake further discussions with Enersource Hydro Mississauga to learn more about how their program operates, its level of success and other issues of consideration.
2. Undertake further discussion with other utility partners to gauge their interest in developing similar on-the-bill financing mechanisms.
3. Further segment the market within the Pearson Eco-Business Zone to identify sectors, types of owners and square footage.
4. Consult with utility partners to identify types and size of energy efficiency projects being implemented.
5. Consult with energy performance contractors on the types of retrofit projects they've done in the commercial and industrial building sector to determine how these were financed and the types of projects.
6. Consult the business community in the Pearson Eco-Business Zone to identify a number of issues, including:
 - Knowledge of existing energy efficiency financing options;
 - Interest in potential energy efficiency financing options;
 - Identification of past or existing projects that have not been implemented due to financing issues;
 - Identify from landlords and tenants current financing rates and structures (i.e. term loans, mortgage refinancing, lines of credit, equipment leases, etc.); and,
 - Energy efficiency projects of most interest (lighting, HVAC or holistic projects).

Following the completion of these next steps, a report on how to proceed will be brought back to the Eco-Efficiency Team and Green Building Retrofit Team for further input and consultation.

Report prepared by: Chris Rickett, extension 5316

For more information contact: Chris Rickett, extension 5316

Date: November 16th, 2009

TO: Members of the Partners in Project Green - Eco-Efficiency & Green Building Team

FROM: Chris Rickett, Senior Project Manager, Partners in Project Green

RE: **PEARSON ECO-BUSINESS ZONE 2009 REPORT**

KEY ISSUE

Identify timelines, process and marketing of partner 2009 eco-efficiency achievements in the Pearson Eco-Business Zone.

BACKGROUND

At the April 8th, 2009 meeting of the Eco-Efficiency Team, partners agreed that it would be advantageous to all of the partners to aggregate the results of their various programs together into a report that could highlight the number of eco-efficiency projects and resulting savings realized by companies in the Pearson Eco-Business Zone.

Within the Eco-Efficiency Team's Terms of Reference, the following reporting outline is provided:

- Eco-Efficiency Team members, depending on their programming and services, will aggregate the following information annually for the businesses within the Pearson Eco-Business Zone:
 - Number of businesses engaged
 - Quantity of electricity savings
 - Quantity of natural gas savings
 - Quantity of potable water savings
 - Quantity of environment/waste savings
 - Quantity of greenhouse gas reductions
 - Estimated dollar value of investments
- Data will be provided to Partners in Project Green in aggregate form with no personal information.

TRCA staff will begin working on the Partners in Project Green Annual Report in January of 2010 for an April 2010 release. The intent would be to gather the aggregated data highlighted above and include this in the report. The results of these eco-efficiency measures would then be released at a public event in April 2010 that would recognize the contributions of the various partners in assisting companies in the Pearson Eco-Business Zone.

NEXT STEPS

In order to start quantifying and collecting this data, TRCA staff will be contacting all Eco-Efficiency Team partners to establish how this data can be collected. A deadline for submission of the data is proposed to be the end of February 2010 for inclusion in the Partners in Project Green Annual Report.

Report prepared by: Chris Rickett, extension 5316

For more information contact: Chris Rickett, extension 5316

Date: November 13th, 2009



Identifying Challenges To
Implementing Rooftop Solar In the
Pearson Eco-Business Zone:
Status Update and Discussion

Friday November 20, 2009





Project Stages

- Research and Interviews (Current)
- Interim Report (December 2009)
- Stakeholder Workshop (January)
- Final Report (February)



Identified Challenges

- Economic/Cost
- Technical
- Capacity
- Legal



Economic/Cost

- Capital Costs
- Return on Investment concerns
- Ownership vs Outsource?
- Rooftop leases - what's "market"?



Technical

- Implementation / Construction / Retrofit
- Structural Challenges
- Operation and Maintenance
- Quality Performance



Capacity

- Education about the Feed In Tariff
- Internal training/staffing vs Outsourcing
- Market Development
- Limited resources and moving away from Core Business



Legal

- Ownership of Asset/Electricity/Environmental Credit
- Leases
- Municipal Approval
- Power Purchase Agreement
- Green Energy Act/Feed in Tariff Rules
- Right to Light



Thank You

Feedback Please

For the report to have the most value please provide your insights

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laura@zizzoclimate.com



GREEN UP: Canada's Building Performance Program Enabling Every Building To Be Green

Ian Jarvis, President, Enerlife Consulting

November 2009



Canada's Building Performance Program

A Buildings-Centric Climate Change Strategy

A Buildings-Centric Climate Change Strategy



- Large Impact
 - 1/3 of Canada's 2020 emissions reduction goal by 2015
- No Regrets
 - pro-investment, net positive economic growth
 - jobs in the green economy
 - infrastructure renewal
 - operating cost savings
- Enabling Canadians
 - momentum and confidence to achieve a low carbon economy

Canada Green Building Council Goals



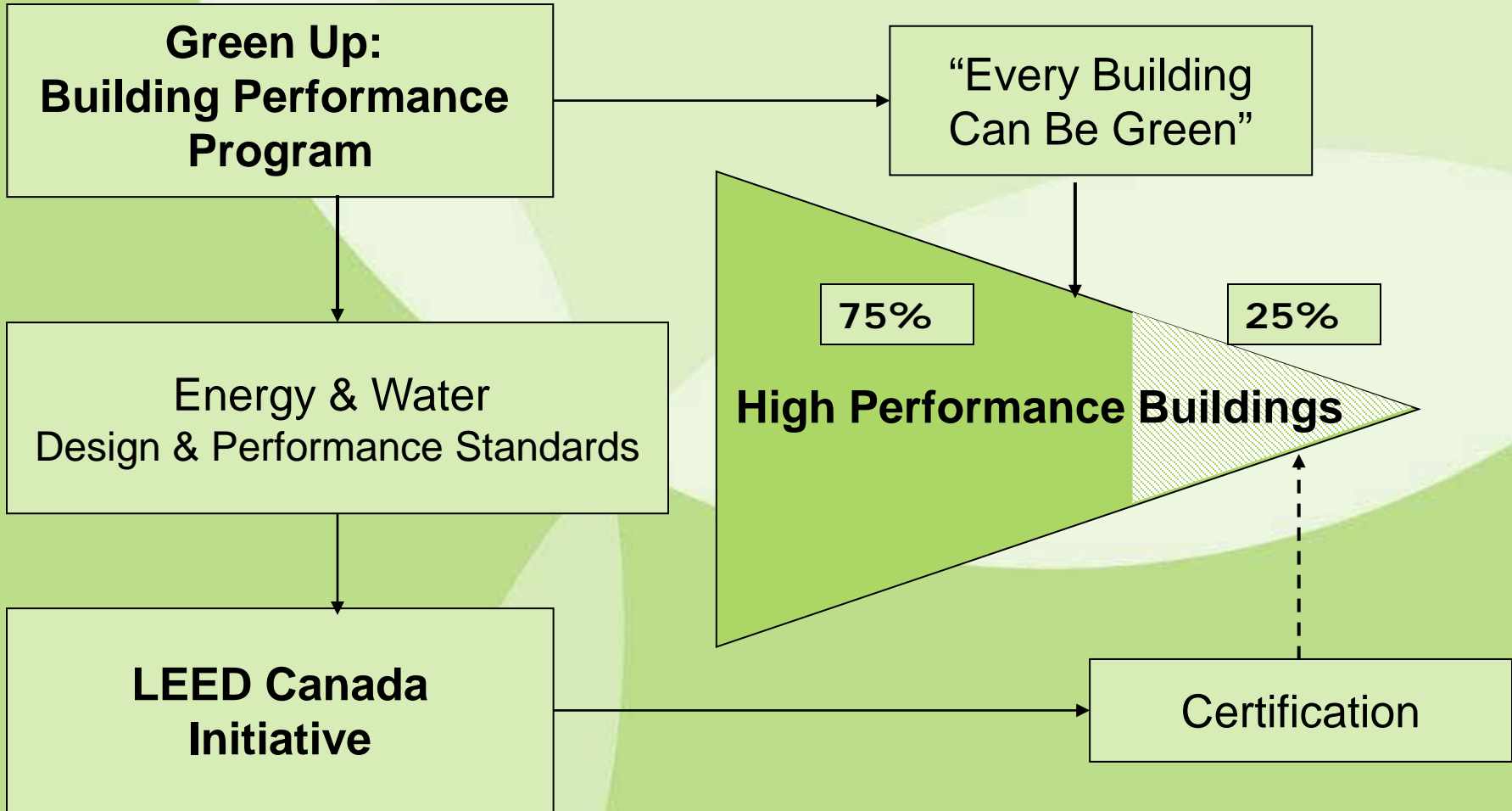
- Engaging 100,000 buildings & 1,000,000 homes in Canada by 2015
 - 50% measured reduction in median energy and water use from 2005 baseline
 - 50 MT/year reduction in GHG emissions by 2015
- Carbon-neutral buildings and communities by 2030

Canada Green Building Council Strategies



- LEED Canada building rating system
 - full set of LEED rating tools for the buildings sector
 - streamlined certification for new and existing buildings, homes and neighborhoods
- GREEN UP: Building Performance Program
 - tools, performance standards, resources and information for designers, owners and developers
 - aggregation and reporting of performance data, trends and standards for building portfolios and sectors
 - distributed, on-line, market-based delivery
 - large-scale national pilot projects

Canada Green Building Council Initiatives



Pilot Projects: Participation



- Commercial Pilot: 14 commercial landlords, with 64 commercial office buildings totaling over 3 million m² (32 million sq ft)
- Schools Pilot: 27 school boards, with 270 schools totaling over 1.5 million m² (16 million sq ft)

Pilot Projects: Participation



Public Administration Pilot:

- 31 governments and utility companies with 80 buildings totaling over 1.4 million m² (15 million sq ft)
- Government of Canada, Canada Post, 5 provinces, 20 cities, and 4 utility companies



Pilot Projects: Third-Party Engagement



- BC Hydro – Power Smart Program
- Ontario Municipal Eco Challenge Fund (MECF)
- Saskatchewan Ministry of Education,
- Newfoundland and Labrador Ministry of Education,
- Yukon Territory Department of Education
- Union of BC Municipalities



Pilot Projects: Third-Party Engagement



- Real Property Association of Canada (REALpac)
- NAIOP Real Estate Association
- Federation of Canadian Municipalities
- Enbridge Gas Distribution
- Canadian Electricity Association
- Canadian Gas Association
- National Research Council (NRC)



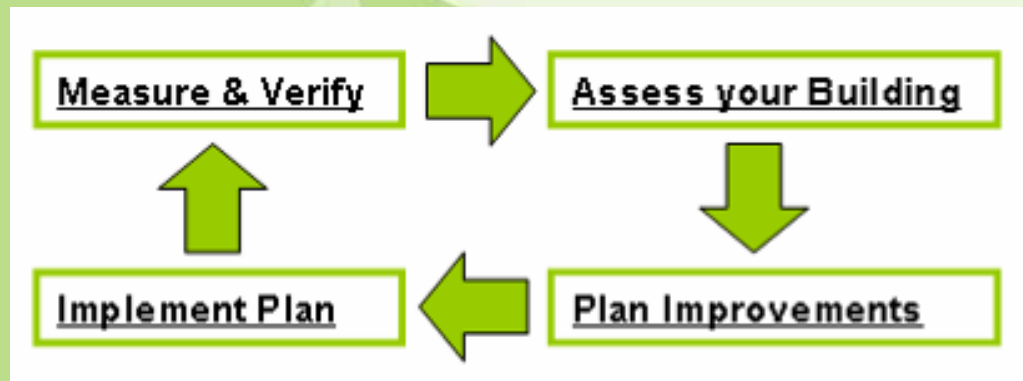
Building Performance Program

**Changing the Way We Think
About Buildings**



Green Building Performance System

- Enables building owners to assess, improve and verify the energy and environmental performance of individual buildings and building portfolios
- Suite of tools, templates, performance standards and best practices
- Largest dynamic building performance database in Canada



Online Access



Greening Canada's Commercial Office Buildings



Français

As a program participant, you can:

- Use the online Green Building Performance System to help maximize energy, water and emissions savings in your buildings
- Benchmark actual energy and water use against comparable commercial office buildings
- Engage your employees and stakeholders in the performance and progress of your buildings
- Assess the potential for LEED EB:OM certification for your buildings
- Access and contribute to performance standards, baselines and best practices for office buildings
- Make use of the Building Performance Audit to uncover conservation opportunities

For more information on CaGBC's initiatives, pilot projects and programs, please visit www.cagbc.org.



User name:

Password:

Remember me

Login

[Forgot password?](#)

For information on joining or sponsorship, please contact Monique Goguen at mgoguen@cagbc.org

Making Savings

Results as of December 31, 2008

numbers in () are increases

	Savings 2008 (vs. 2007)	Savings Percent	Savings 2008 (vs. 2006)	Savings Percent
Electricity	7,684 MWh	1.2 %	15,995 MWh	2.5 %
Demand	(6) MW	(0.7) %	(1) MW	(0.1) %
Thermal	1,697 eMWh	0.6 %	12,098 eMWh	4.2 %

Participants

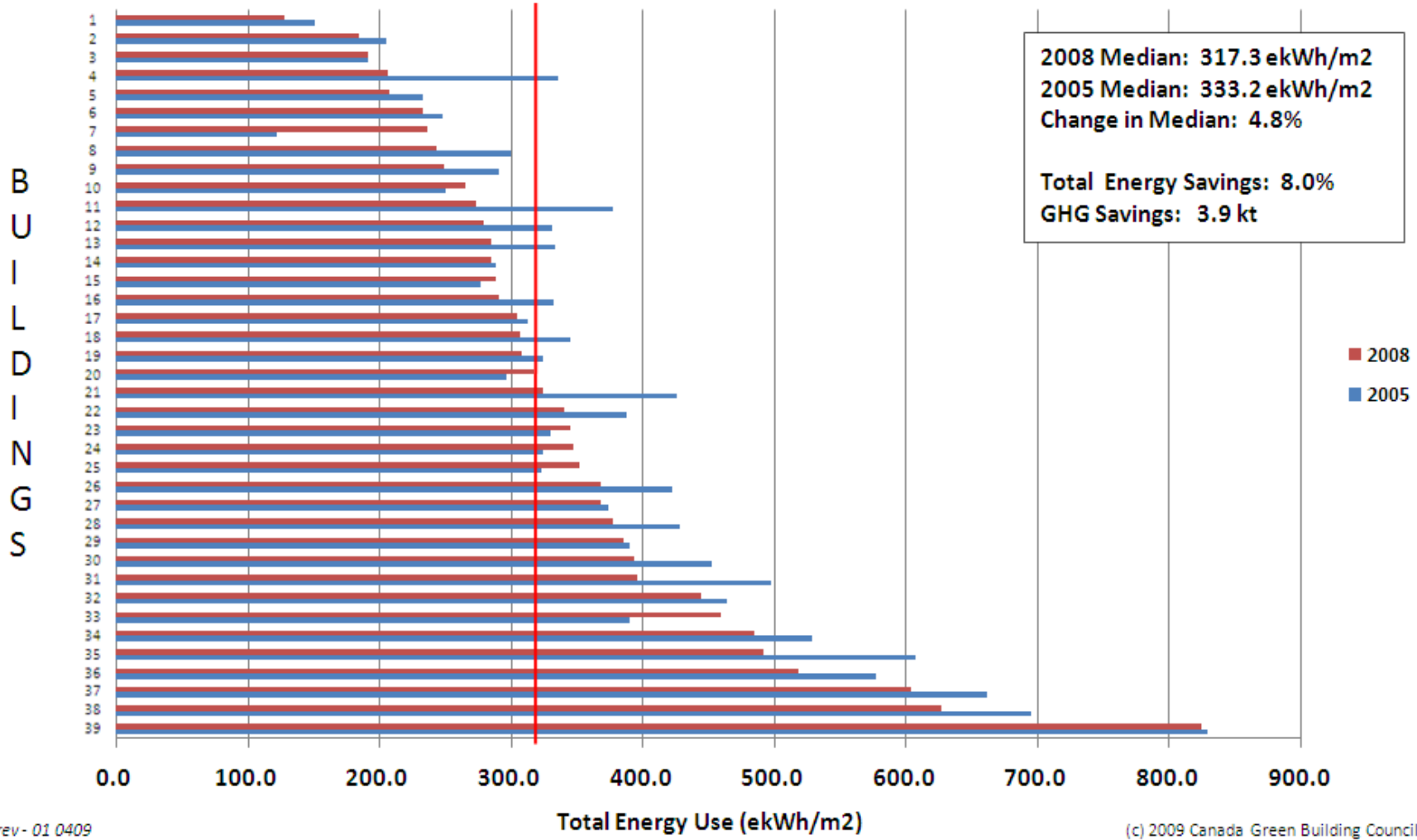
- 20 VIC Property Management
- Brookfield Properties
- Cadillac Fairview
- CIBC
- Crown Property Management
- Dundee REIT.
- Epic Realty Partners Inc
- GreenCorp
- KingSett Capital Inc.
- LaSalle Investment Management
- Manulife Financial
- Oxford Properties Group
- Scotia Bank
- SITQ inc
- Sun Life Financial/Bentall Real Estate Services

Total number of buildings: **65** Total area: **3,121,772 m²**

Benchmarking Results



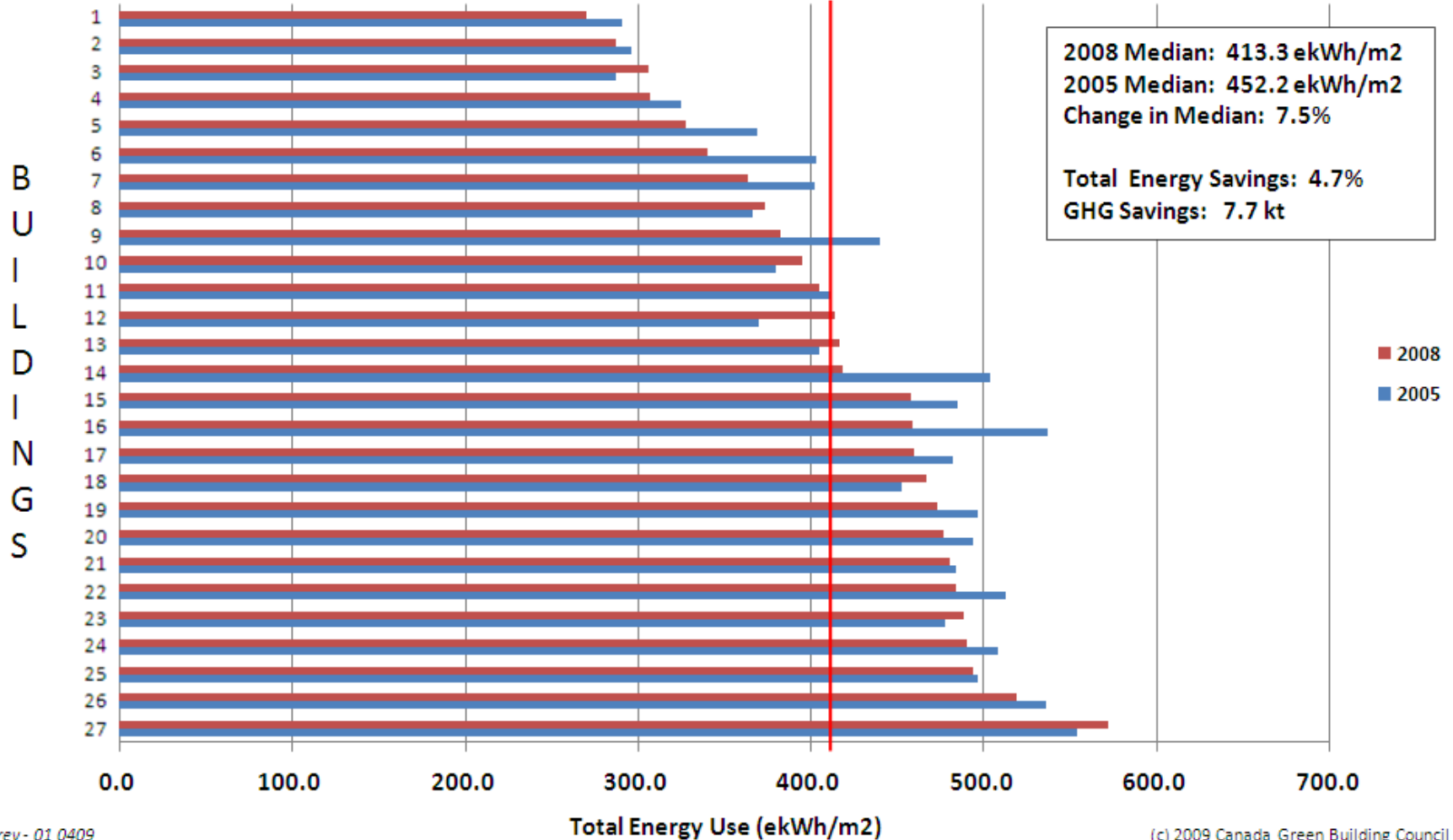
Public Administration Office Buildings 2005-2008 Weather Normalized Benchmark
 39 Buildings (701,938 m²)



Benchmarking Results



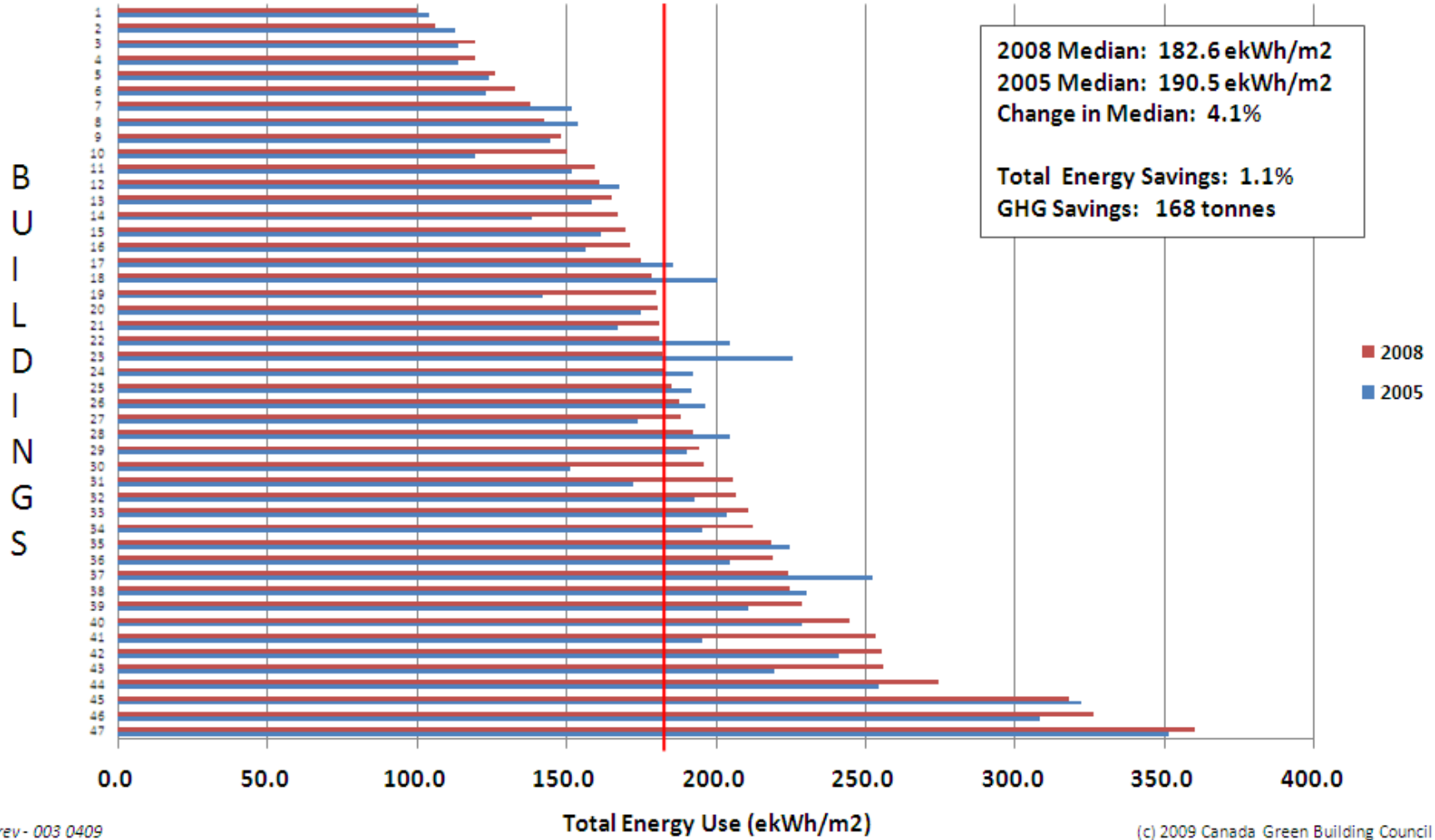
Commercial Office Buildings 2005-2008 Weather Normalized Benchmark
 27 Buildings (1,625,131 m²)



Benchmarking Results



K - 12 Schools 2005-2008 Weather Normalized Benchmark
 47 Buildings (252,734 m²)





Benchmark Normalization

- Weather normalization through the online system
- Additional normalization parameters developed to assess buildings on a “level playing field”
- Normalization template maintained by users
- Templates aligned with Energy Star Portfolio Manager



Benchmark Normalization

Adjustment factors:

- non-standard space types (such as data centre, retail, restaurant, enclosed parking)
- non-standard equipment
- occupancy (number of occupants, percent of building in use)
- core and extra-curricular hours of use
- energy sources (electric heat, off-site heat, off-site cooling)
- non-standard services (such as regulated potable water pipe flushing)

Top Performers – Office Buildings



2007 TOP BENCHMARK PERFORMERS (Weather Normalized to Lester B Pearson Int) - rev Nov 12, 2008

Building Characteristics				Total Energy		Electricity			Thermal Consumption (ekWh/m ²)
						Consumption	Demand	Load Factor	
Type	Location	Size Range (m ²)	Construction Decade	Normalized (ekWh/m ²)	Actual (ekWh/m ²)	kWh/m ²	W/m ²	Annual (hrs/day)	
PROV	ON	20,000 - 20,000	1980's	162.8	187.7	187.7	48.5	10.6	0.0
FED	ON	30,000 - 40,000	1930's	177.9	177.9	101.3	27.2	10.2	76.6
MUNI	QC	< 10,000	1980's	186.7	186.7	186.7	46.2	11.1	0.0
COMM	SK	10,000 - 20,000	1970's	195.9	231.4	181.9	-	-	49.5
FED	ON	30,000 - 40,000	1950's	198.7	198.7	125.3	21.4	16.0	73.4
FED	NT	< 10,000	1990's	202.5	202.5	99.0	24.6	11.0	103.5
FED	NL	10,000 - 20,000	1980's	210.1	210.1	210.1	48.7	11.8	0.0
COMM	ON	20,000 - 30,000	1970's	250.8	282.0	201.3	47.4	11.6	80.7
COMM	ON	20,000 - 30,000	1980's	251.9	280.9	208.8	47.4	12.1	72.1
COMM	BC	50,000 - 60,000	2000's	276.6	268.0	231.4	40.9	15.5	36.6
COMM	BC	30,000 - 40,000	1980's	286.3	301.4	217.4	49.5	12.0	84.0
COMM	BC	20,000 - 30,000	1970's	266.9	314.3	155.0	33.4	12.7	159.3

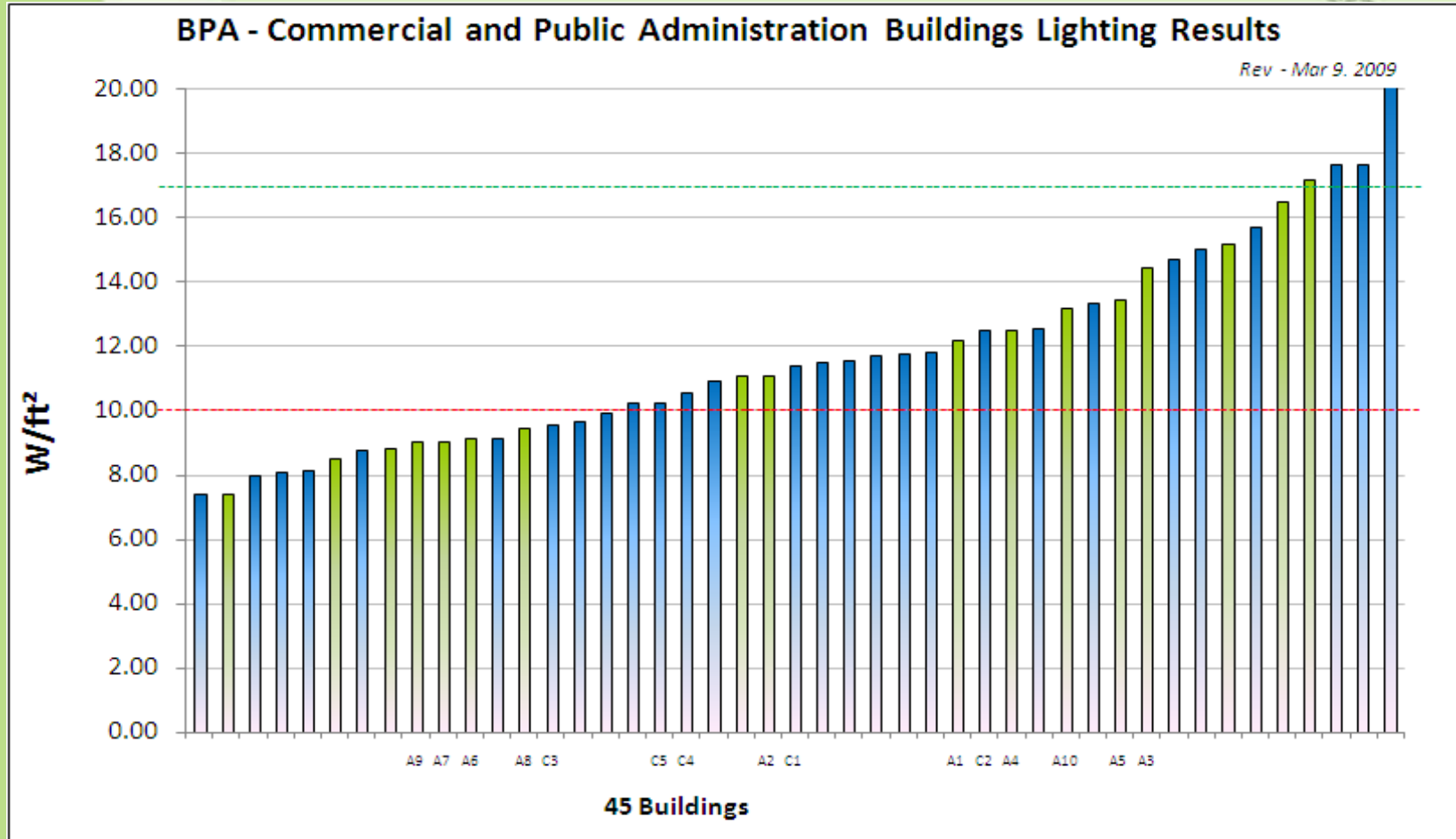


Building Performance Audits

- Standardized tool for identifying retrofit opportunities
- Compiled results establish best practice standards for new building design and retrofits
- Measured power densities (Watts/sq m), installed plant capacity, and other metrics highlight potential for improvement
- Even top-performing buildings have room to improve



Building Performance Audits



Public Administrative Buildings
 Commercial Office Buildings
 BPA Buildings listed by Code

The MNECB lighting power density for buildings is 17 W/m²
 The ASHRAE 90 lighting power density for buildings is 10 W/m²

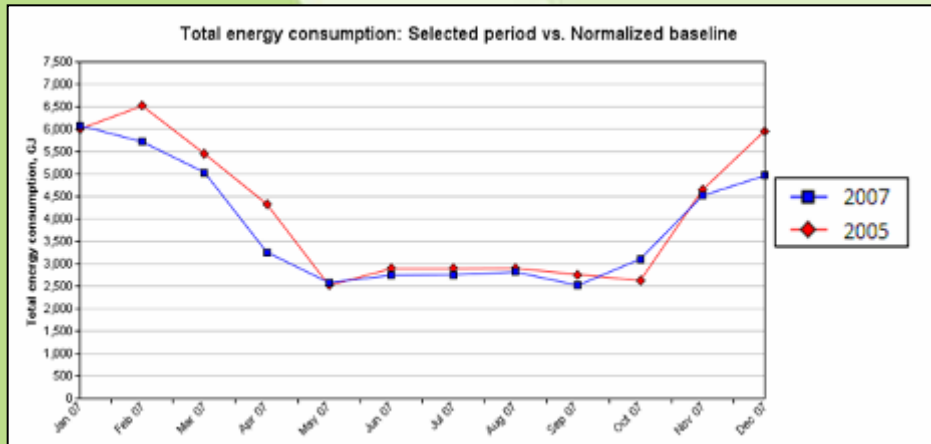
Building Performance Audit



BUILDING SUMMARY

BASE ELECTRICAL DEMAND				kW/Ton kW/Ton	VENTILATION		Design Air Flow	Balance Report Air Flow		
Demand W/ft2	Percent of Winter Base Demand	Percent of Summer Base Demand	Total Supply (CFM/ft2)		0.00	0.00				
Lighting - Typical Floor	0.00	0.0%	0.0%		Outside Air (Supply - Return) (CFM/ft2)	0.00	0.00			
Lighting - Parking Garage	0.00	0.0%	0.0%		Net Air (Outside - Exhaust) (CFM/ft2)	0.00	0.00			
Equipment - Typical Floor	0.00	0.0%	0.0%		MOTORS					
Pumps - Heating	0.00	0.0%				kW/HP	W/CFM			
Pumps - Cooling	0.00		0.0%		Pumps - Heating	0.00				
Ventilation	0.00	0.0%	0.0%		Pumps - Cooling	0.00				
Normalization - Winter	0.00	0.0%			Ventilation	0.00	0.00			
Normalization - Summer	0.00		0.0%		WATER					
Total - Winter	0.00	0.0%			Weighted Average					
Total - Summer	0.00		0.0%	Water Closets (LPF)	0.0					
CENTRAL PLANT					Urinals (LPF)	0.0				
Rated Capacity	Capacity per 1000 ft2	Efficiency %		Faucets (L/min)	0.0					
Boilers (kBTU/hr)	0	0.0	0.0%	Showerheads (L/min)	0.0					
DHWs (kBTU/hr)	0	0.0	0.0%	ENVELOPE						
Cooling Towers (kBTU/hr)	0	0.0	0.0%	ft2 per ft2 of building	Thermal Rating (U-Value)	Heat Loss Factor				
Chillers (Tons)	0	0.0	0.0	per ft2 of Building Area	% of Total	Windows	0.00	0.00	0.00	0.0%
Condensing Units (Tons)	0	0.0	0.0	Walls	0.00	0.00	0.00	0.00	0.0%	
Heat Pumps - Heating (kBTU/hr)	0	0.0	0.0%	Roof	0.00	0.00	0.00	0.00	0.0%	
Heat Pumps - Cooling (kBTU/hr)	0	0.0	0.0%	Area of Exposed Floor	0.00	0.00	0.00	0.00	0.0%	
Humidifiers - gas,oil,steam (kBTU/hr)	0	0.0	0.0%	Totals:	0.00		0.00	0.00	0%	
Electric Humidifiers (kW)	0	0.0								

Monthly Savings Reporting

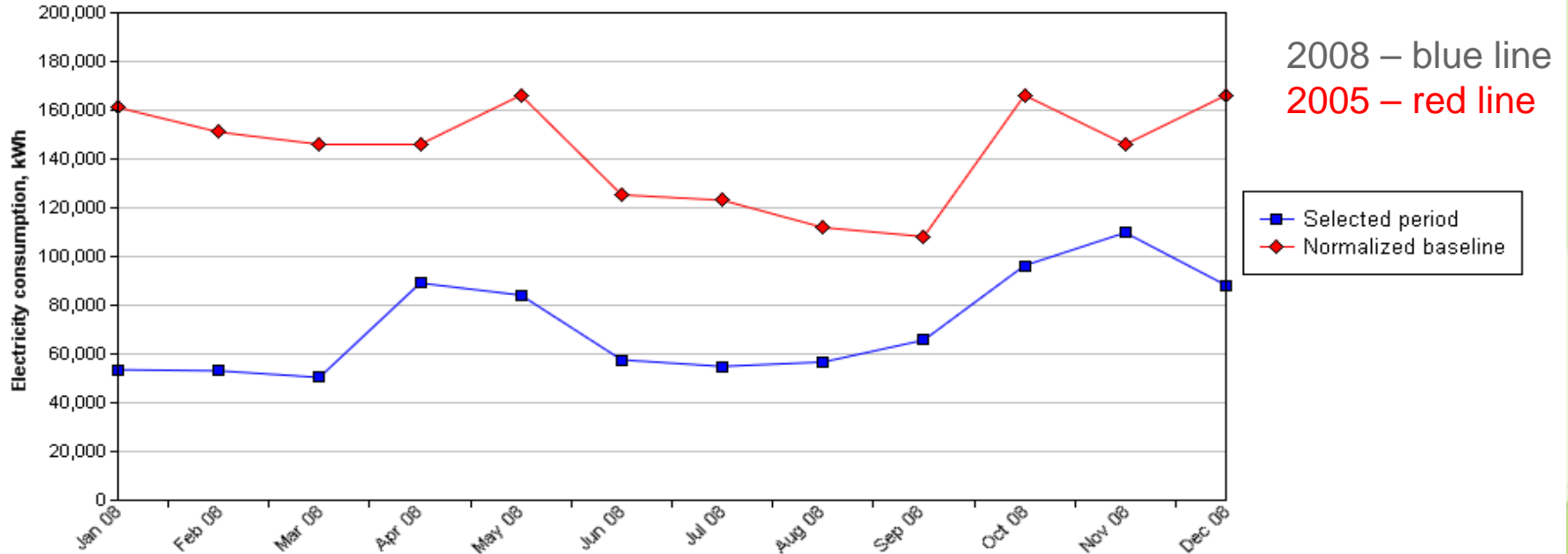


- Data management and verification
- Track monthly savings for each building
- Aggregate energy, water and carbon savings
- Normalize for weather variations



Provincial Building – 2008 vs. 2005

Electricity consumption: Selected period vs. Normalized baseline



Electricity: Consumption

Savings (increases), kWh

857,696

Savings (increases), \$

\$34,768

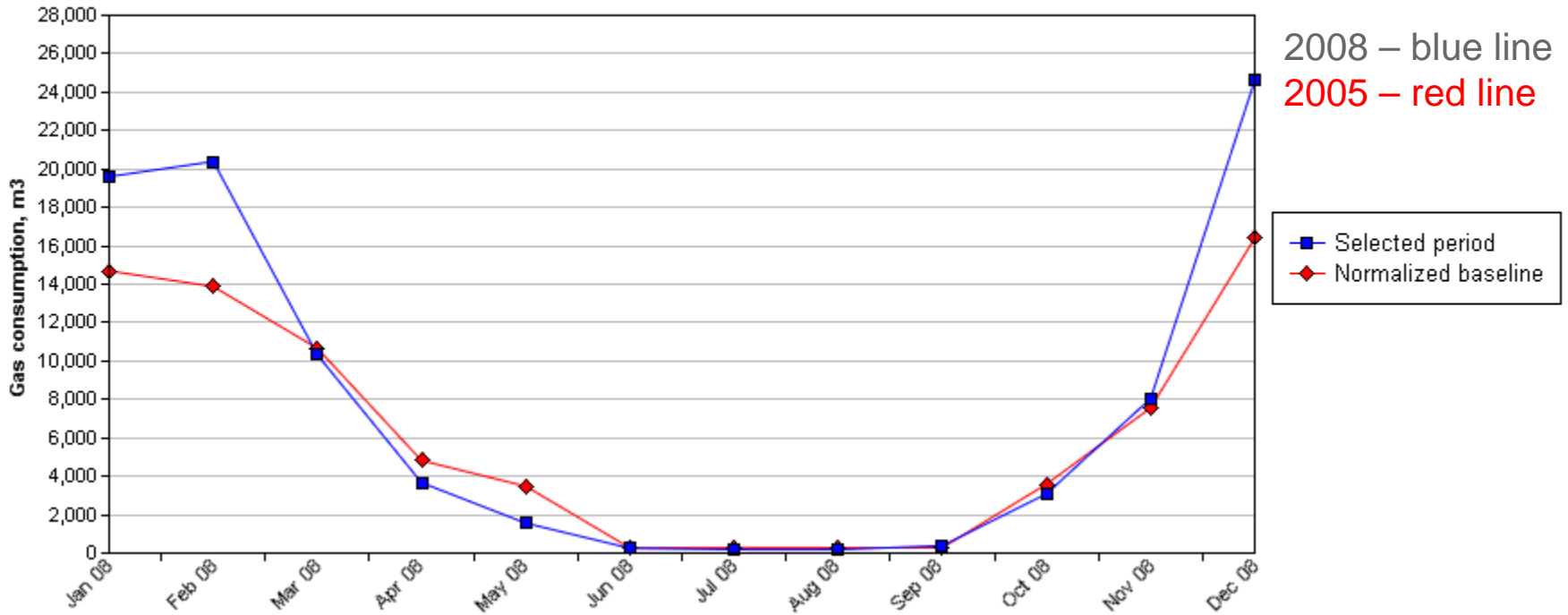
%

50.0%



Provincial Building – 2008 vs. 2005

Gas consumption: Selected period vs. Normalized baseline



Gas

Savings (increases), m3

(16,074)

Savings (increases), \$

(\$5,595)

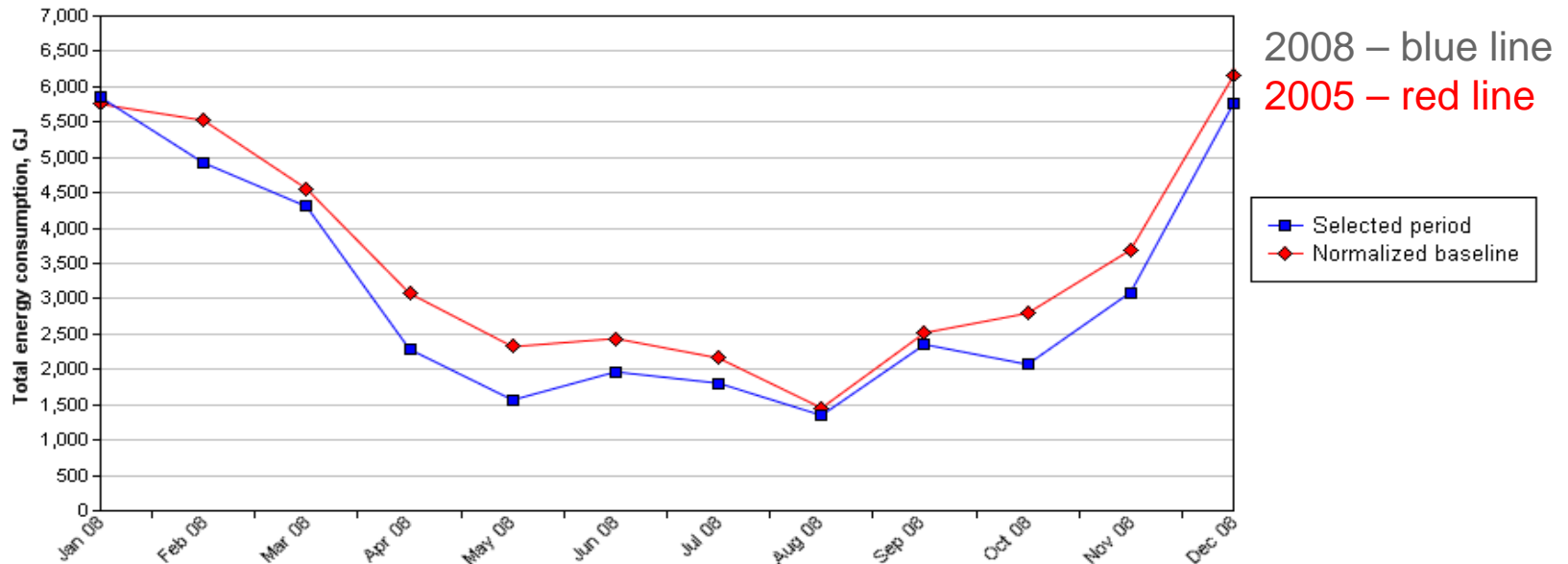
%

(21.1)

Aggregated Report 4 Pilot Buildings 2008 vs. 2005



Total energy consumption: Selected period vs. Normalized baseline



Total energy

Savings (increases), GJ

5,114

Savings (increases), \$

\$60,793

%

12.1

GHG savings, tonnes

122



Building Performance Program

Guiding Deep Reductions in Energy and Emissions



Working Towards the 50% Goal

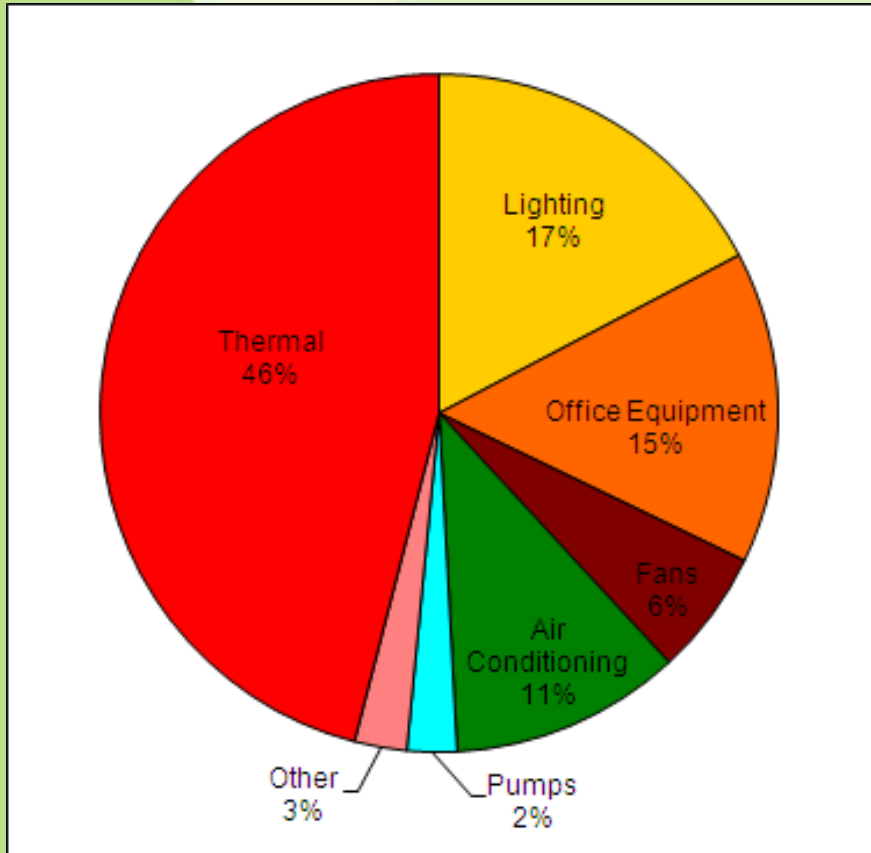
- Several buildings are already at or close to 50% of the 2005 median
- Even top-performing buildings have significant room for improvement
 - operations
 - system re-commissioning and optimization
 - retrofits and redesigns
- Building age does not materially limit potential performance
- Consistent application of system design and operational best practices yields better than the 50% goal

We already know how to do this!



REALpac Leading the Way

Commercial Office < 20 ekWh/ft² total annual energy consumption



Requirements:

- best practice design standards & equipment selection
- systems controlled to match occupancy
- optimized controls based on ambient conditions
- thermal energy based on top-performing buildings



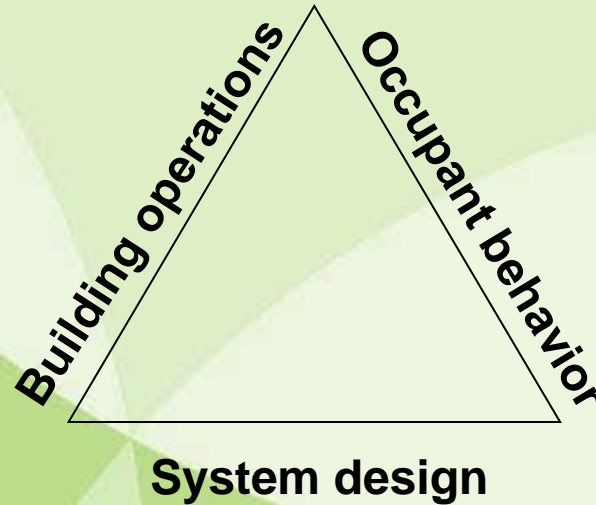
Achieving High Performance

Operations

- benchmarking
- training in operational best practice
- targets and feedback

Occupants

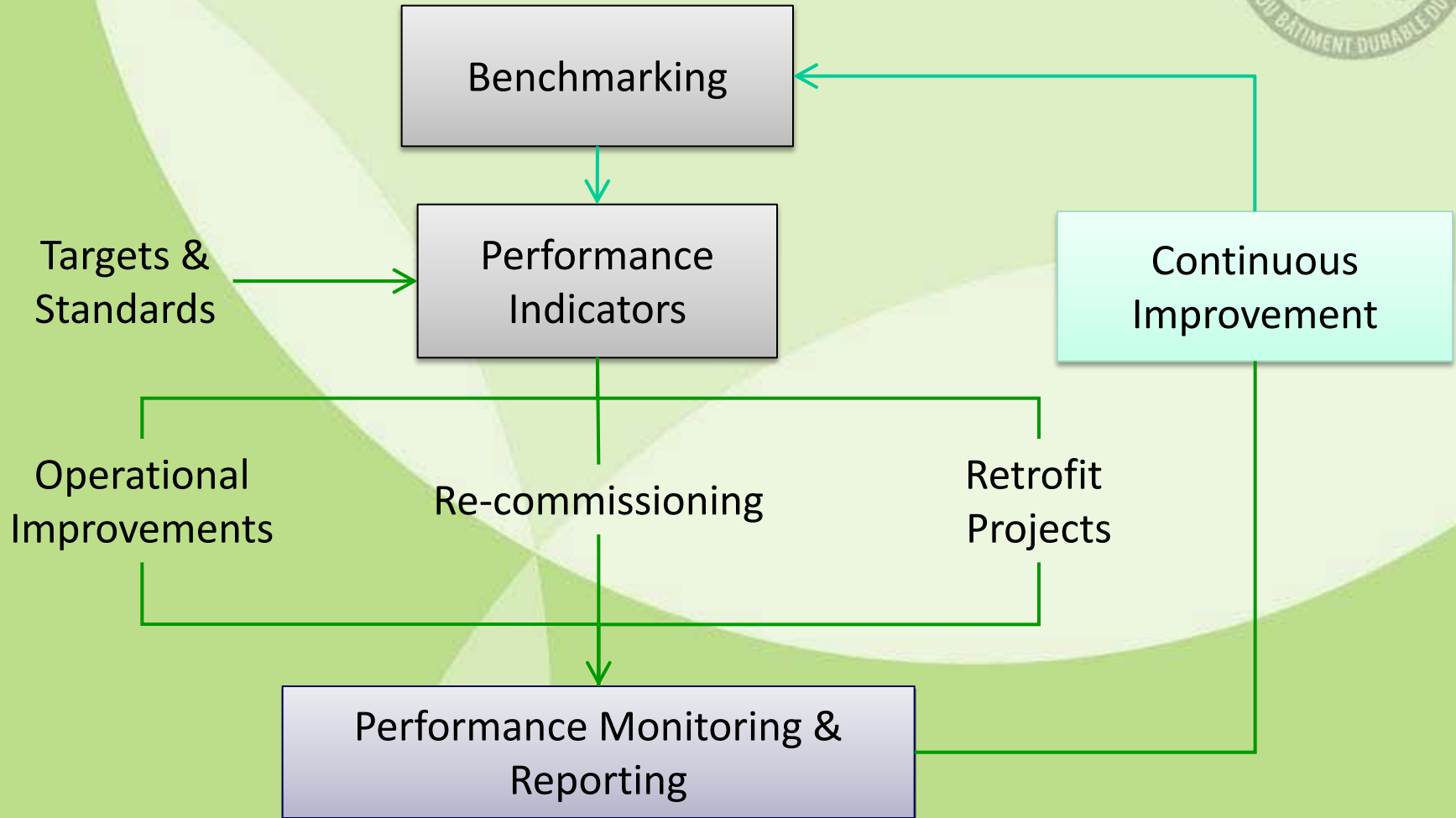
- engagement and recognition
- education and support
- measurement and feedback



Design

- retrofit, redesign, and re-commissioning
- standardized building systems testing (Building Performance Audit)

Integrated Building Performance Process



A New Model for Energy Conservation



- Community-Level Benchmarking
 - engagement
 - recognition for top-performers
- Conservation Targets
 - targets for each building type
 - aggregated conservation potential
- Community-Level Reporting
 - energy and emissions
 - aggregated savings by building type
 - continuous improvement



Building Performance Program

Every Building CAN be Green



The Proof of the Pudding

- We have seen a decade of global market transformation towards *green building design*
- The next phase will be driven by *green building performance* requiring:
 - new metrics and standards
 - new skills, tools and methodologies
 - new approaches to business
- The promise:
 - scaling up of markets for green products and services
 - competitive advantage for green buildings and homes
 - substantial, buildings industry-led response to energy efficiency and climate change

Green Up Building Performance Program



- Strong market engagement and industry response
- Streamlined process for defining, implementing and verifying energy efficiency projects and programs
- Best current source of benchmarking data in Canada
- New source of best practices, tools and building design and performance standards

Green Up Building Performance Program



- National forum for sharing performance information & best practices
- Supporting policy, programs, research & better design
- Unique insight into:
 - magnitude of conservation potential
 - trends of building performance and system design
 - characteristics of top performing buildings





Thank You!

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