



Energy Efficiency Update 2013

Energy Efficiency: Taking a Balanced Approach

Energy and Mines Ministers' Conference
Yellowknife, Northwest Territories
August 2013



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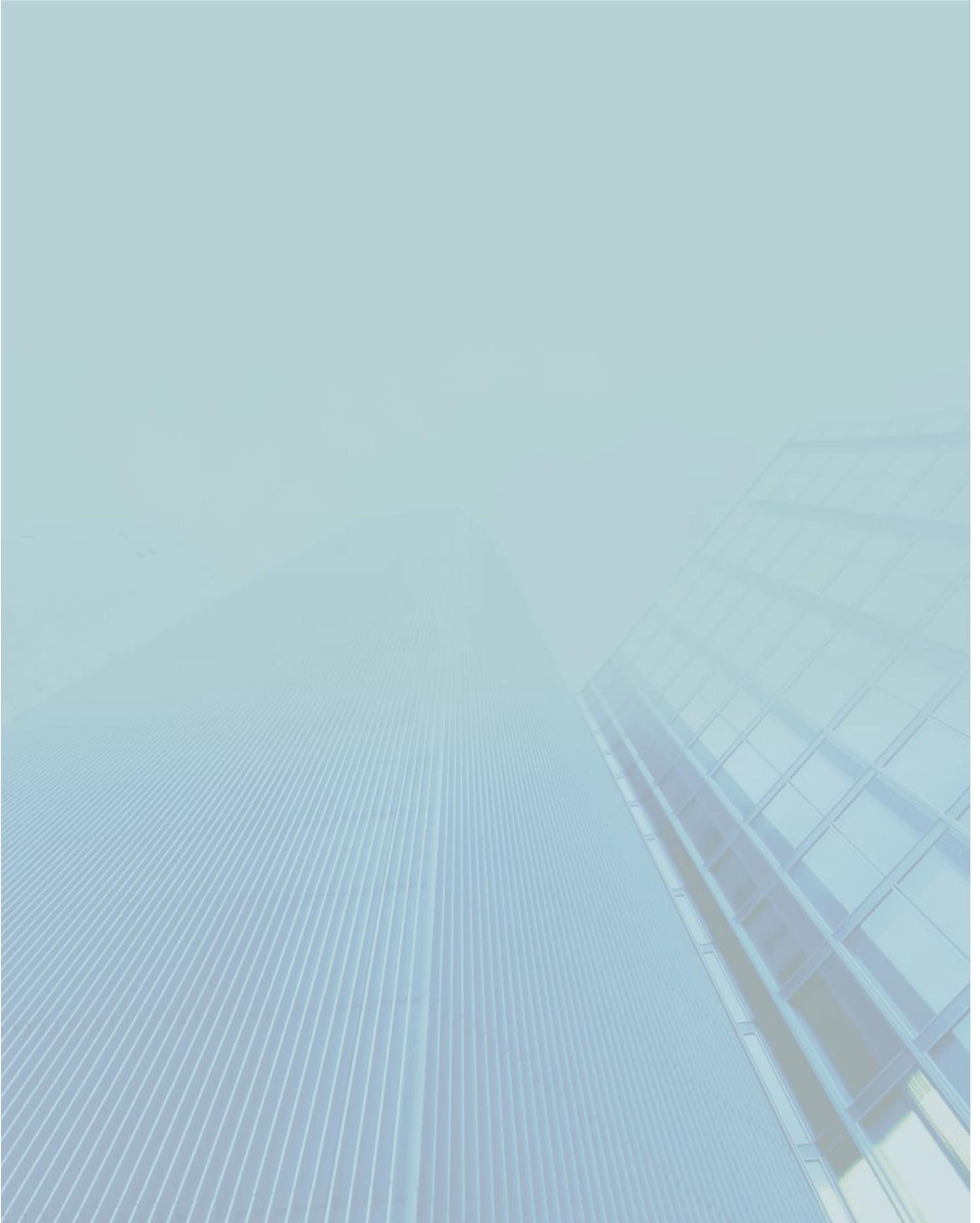
Mise à jour en efficacité énergétique 2013

Efficacité énergétique : élément essentiel d'une stratégie équilibrée



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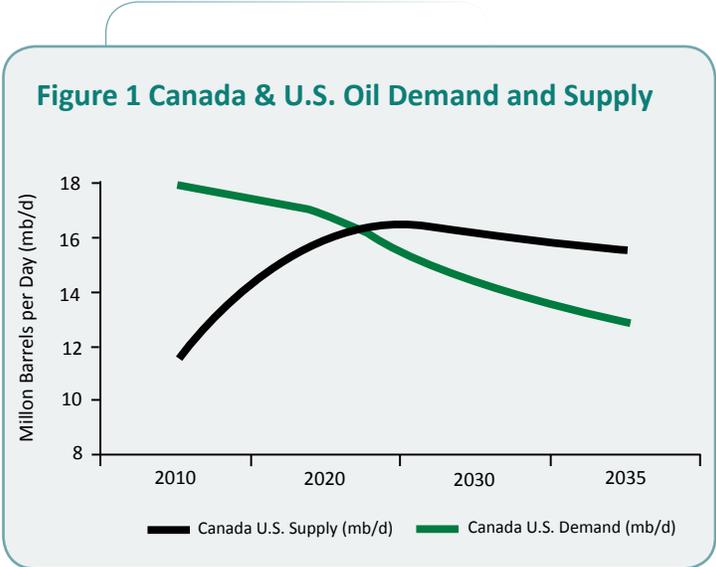
Introduction

Since 2007, federal, provincial and territorial partners have made tremendous strides toward further collaboration and shared best practices in energy efficiency. These successes were detailed in *Moving Forward on Energy Efficiency in Canada: Achieving Results to 2020 and Beyond*, endorsed at the Energy and Mines Ministers' Conference 2012.

The importance of energy efficiency is evident in the current work of the International Energy Agency (IEA). The IEA's 2012 World Energy Outlook emphasizes that, despite current efforts, there remains significant untapped potential for energy efficiency. The IEA reports that North America could achieve oil self-sufficiency before 2030 (Figure 1). It estimates that energy efficiency will contribute to almost half of this goal.

Globally, economic growth and energy savings worth US\$18 trillion will be available by 2035 using existing efficiency technologies – more than offsetting the US\$12-trillion investment required. Energy efficiency could also moderate emissions growth in the short term while other measures are developed.

To capture the opportunities offered by this untapped potential, the IEA has developed a series of recommendations for action. As demonstrated below, through our ongoing federal, provincial and territorial collaboration, we are making great strides toward these objectives.



Source: IEA World Energy Outlook 2012

IEA RECOMMENDATIONS	CANADIAN ACTION
Normalize higher efficiency in standards as technologies advance	National Energy Code for Buildings implementation underway in 12 jurisdictions; energy performance standards cover 47 products
Make energy efficiency affordable	640,000 households received grants and are now saving \$400 million/year on energy; seven projects in five jurisdictions are piloting ways to shift financing away from governments
Make energy performance visible to the market	Energy performance labels on homes, vehicles and equipment; home electricity audits; systems for tracking and reporting energy performance in buildings, industry and transportation
Monitoring and verification are essential to realizing savings	Portfolio Manager benchmarking tool provides concrete and quantifiable measurement for reduction in building energy use
Raise the profile and importance of energy efficiency	Energy and Mines Ministers reiterated the importance of energy efficiency in 2012

Canada has made significant progress in all sectors to improve the efficiency of energy use (Figure 2). Nationally, Canada realized a 25 percent improvement in energy efficiency between 1990 and 2010, which saved Canadians \$32 billion in 2010. In 2011, the IEA reported that, among 16 countries, Canada was second only to Germany in its rate of energy efficiency improvement (IEA Scorecard, 2011).

In Canada, as in the rest of the world, there is significant untapped energy efficiency potential (Figure 3). However, Canada faces a number of challenges that make improving energy use more difficult than for other countries. We have significant heating and cooling requirements, a very energy intensive industrial sector, and the need to ship goods and people long distances. Moreover, energy costs are lower in Canada than in most countries, eroding a strong motivation for energy efficiency. As a result of these combined factors, Canada has more potential relative to other countries. However, by continuing our successful federal, provincial and territorial collaboration, we are tapping into Canada’s unrealized potential.

Purpose of Report

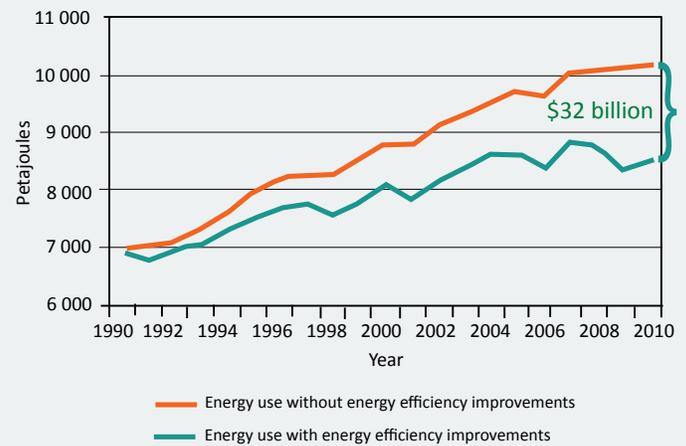
This report summarizes the actions taken over the last year since Energy Ministers agreed to continue collaboration on energy efficiency, including the implementation of the 2011 building code and continuing the momentum of home energy-retrofit programs. This report discusses these achievements in relation to specific IEA recommendations.

Continuous Building Energy Code Improvements

Canada’s work on improving the National Energy Code for Buildings (Code) demonstrates our commitment to **normalize higher efficiency in standards as technologies advance**.

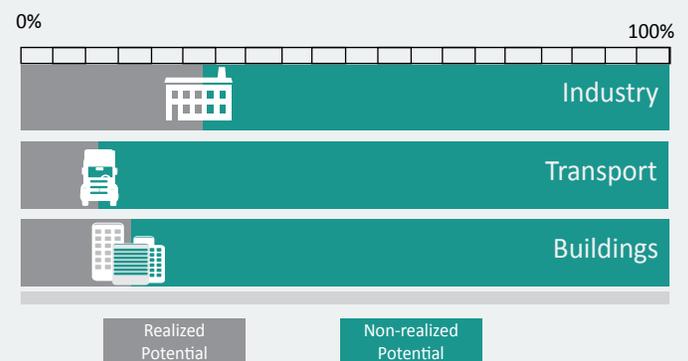
Adoption of Code 2011 is currently underway across 12 jurisdictions, with enforcement to follow within 12–24 months. In 2020, the savings from these efforts are estimated to be worth \$350 million. For context, projected energy savings in 2020 from Code 2011 could power all of Canada’s street lights for two years.

Figure 2 Energy Efficiency Improvements in Canada



Source: *Energy Efficiency Trends in Canada 1990–2010*

Figure 3 Potential for Canadian Energy Demand Reductions, 2011–2035



Source: *IEA World Energy Outlook 2012*

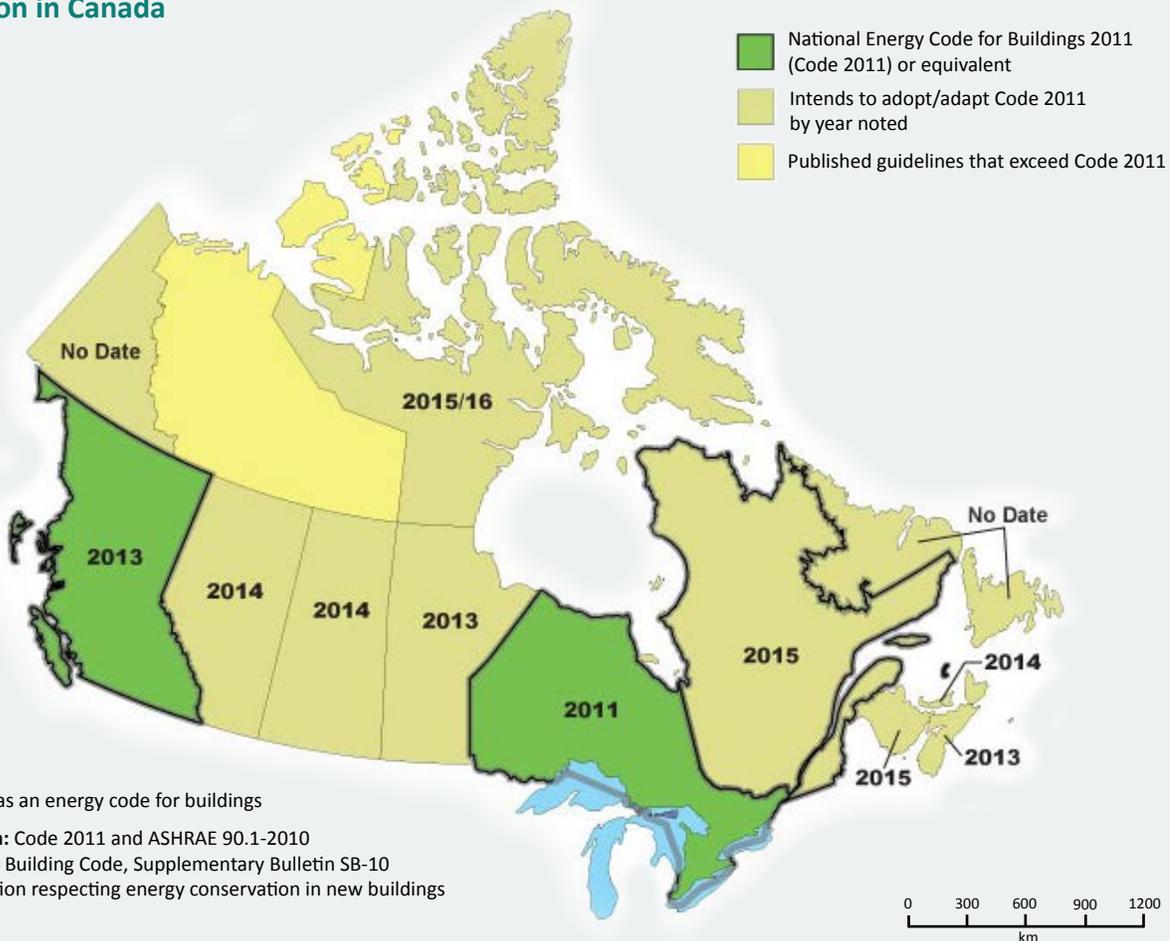
Efforts are already underway on the next iteration, Code 2015, which will include new equipment standards and regulations. Beyond 2015, future updates to the Code will include energy performance improvements that maintain our collective progress to net-zero energy buildings. The objective of net-zero buildings is to maximize energy efficiency and use renewable energy such that buildings generate as much energy as they would draw from electricity, gas and oil sources. The United States Department of Energy is aiming for marketable net-zero buildings by 2025.

In fact, Canada's Code efforts reflect well in comparison with the U.S. Currently, no U.S. state in a heating-dominated climate has a building code as stringent as Code 2011.

Status of Code 2011 Adoption / Adaptation in Canada

April 2013

- National Energy Code for Buildings 2011 (Code 2011) or equivalent
- Intends to adopt/adapt Code 2011 by year noted
- Published guidelines that exceed Code 2011



— Currently has an energy code for buildings
British-Columbia: Code 2011 and ASHRAE 90.1-2010
Ontario: Ontario Building Code, Supplementary Bulletin SB-10
Quebec: Regulation respecting energy conservation in new buildings

Source: Natural Resources Canada

Maintaining Home Energy Retrofit Momentum – Innovative Financing

Since 2007, federal, provincial and territorial funding has resulted in over 640,000 households improving their energy efficiency by an average of 20 percent. This improved efficiency has resulted in savings of more than \$400 million on Canadians' annual energy bills, while reducing greenhouse gas emissions by two megatonnes per year.

To continue this momentum, work on innovative financing is investigating how to **make energy efficiency affordable** by leveraging private capital to help Canadians. Innovative financing programs may allow homeowners to use savings from energy efficiency improvements to help pay back retrofit loans financed on their utility or municipal property tax bills. They may also allow loans to be transferred with the sale of the home, encouraging deeper retrofits.

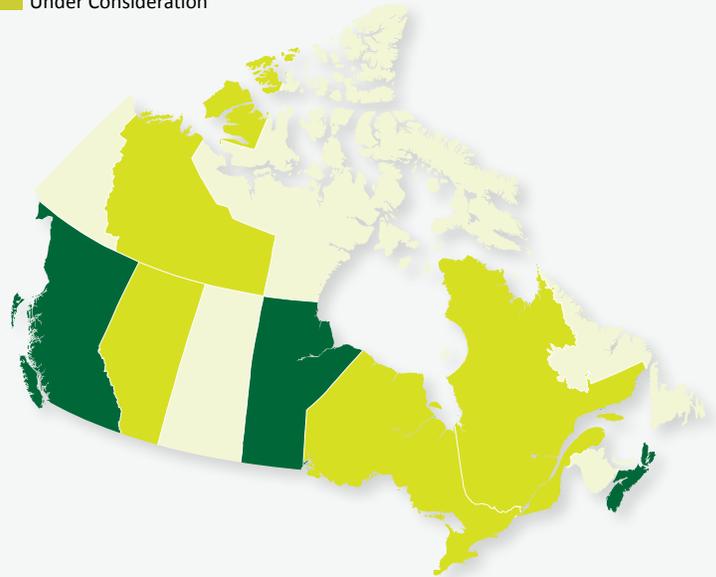
The EnerGuide Rating System provides an easy-to-use method to compare the energy performance of the home before and after retrofit projects. Because it offers a consistent way to value energy savings, the system becomes a key tool for establishing the terms of the loan.

Early results from pilot projects have demonstrated that homeowner interest and larger-scale participation are largely dependent upon two factors:

- Strong value proposition (e.g., competitive interest rate; simplified process; coordinated programs targeting the same homeowners); and
- Sustained marketing efforts (e.g., clear messages delivered by credible partners).

Innovative Financing Mechanisms in Canada

- Pilot or Program Underway
- Under Consideration



Innovative financing pilots planned or are already underway across Canada:

- **BRITISH COLUMBIA:** Four utility-led, on-bill financing pilots, including new models with multiple partners
- **NORTHWEST TERRITORIES, ALBERTA:** Regulation and pilots under consideration
- **MANITOBA:** Operating utility-led, on-bill financing program; in June 2012, enacted "Pay-As-You-Save" on-meter financing legislation for energy and water retrofits
- **ONTARIO:** New regulation enables municipalities to finance retrofits and renewables
- **QUEBEC:** Municipalities and stakeholders collaborating on pilot design
- **NOVA SCOTIA:** New regulation enables municipalities to finance retrofits and renewables; Halifax Solar City launched for solar hot water systems

Maintaining Home Energy Retrofit Momentum – Enhanced Electricity Evaluation

Collaborative work to enhance electricity evaluations is an important aspect of Canadian efforts to **make energy performance more visible to the market**.

Over one million Canadian homes have been evaluated to help homeowners identify the most cost-effective retrofit measures to save on energy bills. Surveys of homeowners who undertook energy-efficient retrofits show that, after receiving an evaluation, they completed twice as much renovation work as they had intended.

However, beyond the building structure, evaluations do not cover electrical plug loads, a major source of energy use inside the home. Electrical plug loads are any devices that receive electricity from a wall outlet, such as appliances, home entertainment systems, lights and computers.

Federal, provincial and territorial collaboration is addressing this gap in the evaluation process by introducing a new electrical evaluation for residential electrical devices. This evaluation will be incorporated into the EnerGuide Rating System, which provides a standard measure of a home's energy performance. The electrical evaluation will help Canadian homeowners find ways to save energy from over 100 pieces of electrical equipment that account for 20 percent of the electricity bill in the average home.

If such savings were applied to all households in Canada, the total amount saved would equal the annual value of diamond production in the Northwest Territories.

Savings Opportunities from the Evaluation of Household Electricity Consumption



Source: Residential Electricity Evaluation Protocol Survey of 720 Households, 2012

Unleashing The Power Of Benchmarking

Canada's commitment to benchmarking is an important aspect of our efforts in **monitoring and verification, which are essential to realize energy efficiency savings.**

Canada is adopting the U.S. Environmental Protection Agency's Portfolio Manager benchmarking tool in 2013 to provide a platform for benchmarking buildings in Canada. Building owners can use benchmarking results to compare their performance with other buildings – providing a rationale for improving the energy performance of their buildings (Figure 4). There are 4,000 Canadian buildings already using the U.S. version of Portfolio Manager.

Portfolio Manager can be used for certification in environmental programs such as Leadership in Energy and Environmental Design (LEED), a third-party building certification program.

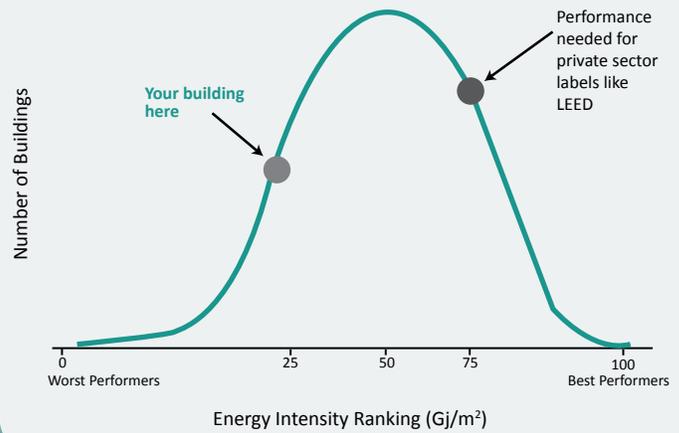
Finally, benchmarking scores can be used at a broader level. For instance, over 20 American states and cities require the use of the Portfolio Benchmarking tool either in their facilities or on an economy-wide basis as a means to manage energy. This helps potential tenants find the most efficient buildings in an area.

Purchasing Decisions Deliver Energy Savings

When considering the energy performance of a building, it is important to look at not only the building itself but also what is inside. The equipment and appliances within a building account for a significant portion of the building's energy use. Energy performance improves when building operators select the most-efficient servers, computers, fax machines and copiers.

While many Canadian governments have green procurement policies, which require the integration of environmental performance considerations into the procurement process, they lack mandatory ENERGY STAR purchasing requirements. The business case is compelling:

Figure 4 Comparing the Energy Performance of Office Buildings



Dalhousie University is the first ENERGY STAR university in Canada – saving \$15,000 annually on energy costs



by mandating ENERGY STAR into the procurement process, energy costs in government buildings can be reduced by up to 30 percent. Thousands of manufacturers and retailers offer ENERGY STAR-qualified products. Not only do these products perform the same as or better than their non-qualified counterparts, they also recoup their incremental purchasing cost, if any, through their energy savings.

Concerted action on government purchasing saves money for governments, creates critical mass for energy-efficient purchasing and benefits the entire economy.

Conclusion

As highlighted by the IEA, there is great opportunity for economic growth and energy savings by investing in energy efficiency. Capturing the full potential will require leveraging the continued cooperation and participation of all levels of government.

This report demonstrates the effectiveness of federal, provincial and territorial collaboration in implementing energy efficiency measures that, to date, have significantly enhanced Canadian competitiveness in the global economy and lowered energy costs for Canadians.

The initiatives described in this report can normalize energy efficiency and make it more affordable, visible, measurable and high-profile. But in order to be successful, these and other initiatives require widespread and sustained implementation across all sectors and jurisdictions. Ongoing collaboration and cooperation is therefore the key to unlocking Canada's energy savings potential.

