

BUILDING OTTAWA'S ENERGY REVOLUTION

How the City of Ottawa Can Encourage Greener Building Practices

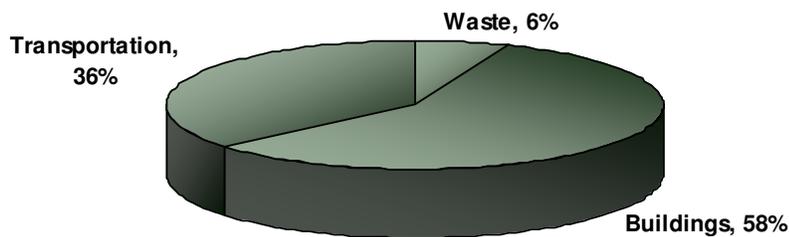


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EXECUTIVE SUMMARY

It may come as a surprise to learn that Ottawa's largest source of greenhouse gas emissions is not transportation, but rather buildings. In 2004, the energy used to heat, cool, light, and power Ottawa's buildings accounted for 58 percent of the city's total greenhouse gas (GHG) emissions.¹ In 2003, the City of Ottawa committed to reducing the city's GHG emissions to 20 percent below 1990 levels by 2012. Yet total emissions are still on the rise. If the city is to finally deliver on its promise to cut emissions, it must promptly and decisively target the energy inefficiency of our buildings.

Figure 1: Ottawa's GHG emissions by source, 2004



Improving building energy efficiency is one of the easiest and most cost-effective ways to reduce GHG emissions. The technologies and methods needed to improve the energy efficiency of existing buildings and to construct new buildings to higher standards are readily available. Unfortunately, barriers such as lack of information, force of habit, and split incentives have kept many “green” building practices from being widely adopted. Governments at all levels have an important role to play in ensuring that green building techniques are adopted more quickly and broadly. They need to create policies and legislation that encourage or require building developers, owners, and managers to:

- ❖ Retrofit existing buildings to make them more energy efficient
- ❖ Make greater use of renewable energy sources such as solar, wind, geothermal, and low-impact hydro
- ❖ Build new buildings to much higher environmental standards

This report focuses on one aspect of this three-point challenge, examining how the City of Ottawa can ensure that new buildings constructed in the city are built to higher standards of energy efficiency. Drawing on best practices from other municipalities, it makes three key policy recommendations:

- ✓ **The city should increase its standards for new municipal buildings from basic LEED certification to LEED Gold certification.**
- ✓ **The city should introduce incentives for private developers to build green, such as tax exemptions, conditional re-zoning, reduced permit fees and development charges, and a fast-track approvals process.**
- ✓ **The city should implement its proposed LEED promotion project as soon as possible.**

“Building energy efficiency measures are some of the cheapest and most cost-effective ways to reduce carbon emissions worldwide.”

- Commission for Environmental Cooperation, 2008

Dozens of municipalities across North America have already stepped up to the plate and adopted similar policies. If our city councillors follow their lead, it will help save Ottawans millions of dollars in wasted energy costs, improve air quality, and demonstrate that the city is serious about doing its part to fight climate change. If it they do not, and they fail to address energy inefficiency in buildings, then their promises to take action for a more sustainable city will ring hollow.

WHAT IS GREEN BUILDING?

Energy efficiency is one aspect of an approach widely referred to as “green building.” This term is used to describe various design, construction, operation, and maintenance practices that minimize the environmental impacts of buildings.

Green building practices that reduce energy consumption and greenhouse gas emissions include:

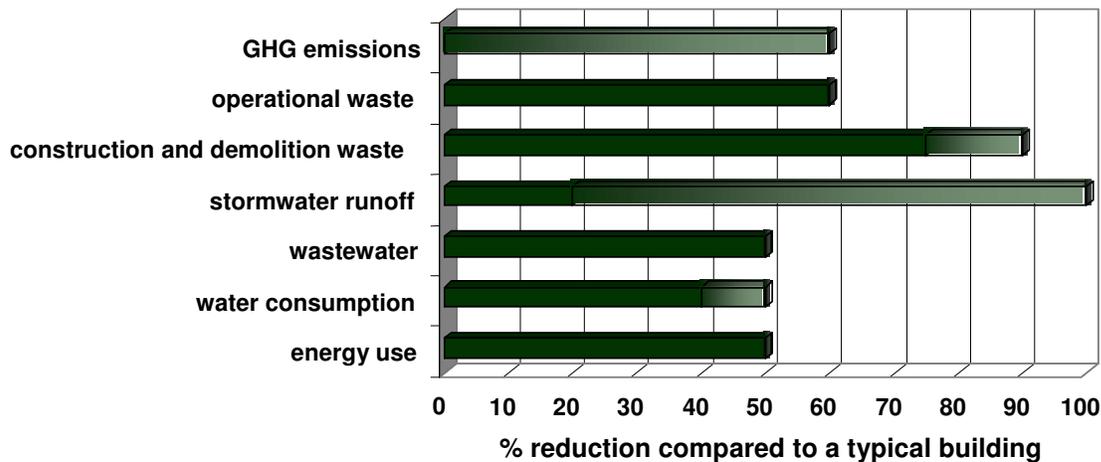
- ❖ Orientation and design of buildings to increase the use of natural lighting and take advantage of the natural heating benefits of sunlight in winter.
- ❖ The use of building materials with advanced insulation properties (including “green roofs”). In Canada, space heating accounts for over 50 percent of energy use in most buildings, so measures to minimize heat loss are particularly important.²
- ❖ District heating systems, in which multiple buildings are heated by a single energy source.
- ❖ High-efficiency water fixtures. (Next to space heating, water heating tends to be the biggest energy consumer in buildings.)
- ❖ Installation of renewable, emissions-free energy sources, such as solar electricity or heating, geothermal heating and cooling, or wind power.
- ❖ Sensor controlled and high-efficiency lighting.
- ❖ High-efficiency auxiliary motors and equipment.

WHY BUILD GREEN?

Energy consumption will likely skyrocket over the next few decades, if developers continue to build to the low standards set by current building codes. According to the North American Commission for Environmental Co-operation, this business-as-usual scenario would result in Canada's energy consumption increasing by 28 percent in the residential sector and 39 percent in the commercial sector by 2030.³ Given Ottawa's extremely cold winters, energy consumption – and, therefore, GHG emissions – would likely rise even more dramatically in this city.

The savings in energy and resources that can be obtained by building “green” are significant. For example, see Figure 2, on the following page, which shows the difference between a typical building and a building that meets the basic LEED green building standard.

Figure 2: Typical LEED savings over basic building standards⁴



Furthermore, the cost savings to be gained by owners and tenants of greener buildings are substantial. Studies indicate that a typical additional capital investment of 2% in construction costs for green features, for example, will result in overall lifecycle savings of about ten times the initial investment.⁵ Payback periods vary, but many green building measures will pay for themselves very quickly. For example, between 2001 and 2006, Adobe Systems Inc. completed several green building projects and saw an average return on investment of 121 percent, with an average payback time of nine and a half months. “That’s better than my 401(k) was doing even before the economy took this downturn,” points out Randy Knox, Adobe’s senior director of workplace solutions. “In fact, it’s probably the best investment out there.”⁶

It is also in the City of Ottawa’s financial interest to encourage more sustainable building practices because they will translate into savings in water, sewer, and waste management costs. In the words of the city’s own staff: “Green buildings can contribute to reduced demand on municipal infrastructure for servicing, transportation and energy. They can also make a major contribution to meeting city environmental objectives... improvements in energy use in existing and new buildings are one of the easiest and most cost effective ways to reduce GHG emissions.”⁷

Figure 3: Green building standards

Energy efficiency standards

- American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) 90.1-2004
- EnerGuide
- Energy Star (for homes)
- R-2000 (for homes)

Comprehensive green standards

- Leadership in Energy and Environmental Design (LEED)[®] (basic, Silver, Gold, and Platinum levels)
- Built Green[™] (Bronze, Silver, Gold levels)

GREEN BUILDING STANDARDS

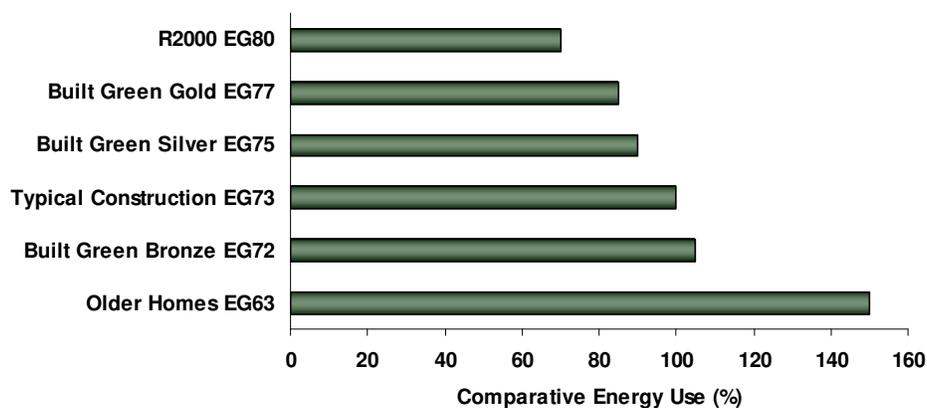
There exist in Canada several green building standards, which rate or certify buildings according to their performance on specific environmental criteria. The most common of these are listed in Figure 3, to the left.

Some of these standards, such as Energy Star and R-2000, are based primarily on energy efficiency criteria. EnerGuide (EG), developed by Natural Resources Canada, is an energy efficiency rating scale. A typical new building would have an EG rating of about 73 out of 100, so a building with a rating significantly higher than this could be considered highly energy efficient.

There are also several comprehensive green building standards that include energy efficiency as a significant area in which a building can receive points toward its total score. LEED, for example, awards points for energy efficiency along with site selection, building materials, water conservation, waste production, and indoor air quality. Since some of these factors directly impact city finances (i.e., through water, sewer, and waste management costs), cities often opt for LEED as the qualifying standard when developing policies to encourage greater use of green building techniques.

In terms of energy efficiency, some certification standards are better than others, although comparison can be difficult, since savings will vary depending on building size, type, etc. LEED appears to be a particularly strong standard, as it is estimated that LEED-certified buildings, on average, consume about 50 percent less energy and produce 60 percent lower greenhouse gas emissions than typical buildings.⁸ Among the standards used more commonly for residential construction, R-2000 delivers the biggest energy savings (see chart below); to be certified R-2000, a house must consume at least 30 percent less energy than one built to minimum Ontario building code standards. The bottom line is that a new building meeting any of the standards listed in Figure 3 – with the exception of Built Green Bronze⁹ – would be significantly more energy efficient than a typical building.

Figure 4: Average energy savings for residential construction built to different standards¹⁰



The adoption of these voluntary green building standards by the industry is growing quickly, but green building still only represents a small share of the market. It is estimated that less than 2 percent of buildings in Canada are certified by any green building standard.¹¹

BARRIERS TO GREEN BUILDING PRACTICES

There is no doubt that the overall life-cycle costs of a building are far lower when energy efficient design and building methods are used. Why, then, aren't all developers quickly adopting the greenest technologies and methods that exist? There are several reasons:

- **Length of time for payback:** Owners of investment property often evaluate construction and operating costs over a holding period of less than ten years, which is shorter than the payback period for some green building techniques.
- **Accounting practices:** Because most businesses have separate capital and operating budgets, the savings in operating costs that would result from investments made at the building stage are not always taken into account when decisions about construction are made.

- **Split incentives:** It is often building owners or tenants, not developers, who benefit from savings in operating costs (although this barrier is somewhat mitigated by the higher sale price developers can obtain for green buildings).
- **Convention and lack of information:** Developers often have conventional contractors, suppliers, and service providers that they are used to working with. Finding new, green suppliers and contractors requires extra time, effort, and expertise in order to evaluate the options.¹²

Because these barriers exist, green building techniques need supportive public policies if they are to become industry standards.

THE ROLE OF LOCAL GOVERNMENTS

Local and state governments across North America have developed policies to make green building practices more widespread within their jurisdictions. These actions tend to fall into one of two categories: leading by example, or encouraging private developers to build green.

Leading by example

Dozens of local governments have adopted a LEED-certification policy for their municipal buildings. The Canadian cities of Calgary, Edmonton, Vancouver, Victoria, Richmond (BC), and Saanich (BC) require all new municipal buildings to meet LEED Gold or Silver standards. In 2005, the City of Ottawa adopted a policy that requires all new city-owned buildings of 500 square metres or more be built to LEED basic certification standards. This standard is lower than those of many other Canadian cities adopting green building policies, and should be changed to at least the Gold level, and preferably Platinum. If the city wants to set an example for private developers and for other Canadian cities, it should adopt the highest standard that exists.

Encouraging private developers

Since the vast majority of buildings constructed in Ottawa every year are built by private developers, the city should devote significant attention and resources to making green building more attractive to developers. Local governments across North America are introducing policies to encourage or require greener building practices within their jurisdictions.

The following incentives can be offered to building projects meeting an objective green certification or energy efficiency standard:

- ❖ **Tax exemptions.** These are common across the United States. Cincinnati, for example, offers a 15-year, 100-percent tax exemption for LEED-certified buildings. In Canada, Maple Ridge (BC), offers a four-year property tax exemption for LEED-certified, high-rise residential buildings.¹³
- ❖ **Rebate on building permit fees.** Calgary, Victoria, and Saanich (BC), all offer rebates of up to 30 percent on building permit fees for building projects meeting various green certification standards. Permit fee rebates are also offered by Victoria, Seattle, Chicago, San Antonio (Texas), and the Florida counties of Gainsville and Sarasota.
- ❖ **Priority processing of applications and approvals.** Sustainable building projects can be given priority processing in the approvals process. In Victoria, Saanich (BC), Seattle, and Chicago, building permit fee rebates are coupled with a fast-track approvals process to maximize the incentives to developers to build green.

- ❖ **Conditional re-zoning or density bonuses.** Some cities allow developers to build to a higher density or height than zoning regulations normally permit if the developer provides a community benefit such as affordable housing units, park space, or other public amenities. Increasingly, energy efficiency or other green features are also being recognized as community benefits that should qualify developers for these “density bonuses.” Hailey, Idaho, allows a 10 percent density increase for buildings that are LEED-certified or that meet 50 percent of their energy needs using alternative, renewable energy sources.¹⁴ LEED Platinum certified buildings are eligible for a 50 percent density increase. In Canada, the municipality of Bowen Island (BC) has developed a policy whereby rezoning applicants are expected to achieve both an EnerGuide rating of 80 and Built Green Gold certification.¹⁵
- ❖ **Lower development charges.** Many cities set development charges at different levels for different areas of the city, based on the cost of servicing those developments. In Ottawa, developers building outside the greenbelt (which creates demand for new infrastructure) pay higher charges than those building inside the greenbelt, where infrastructure and services are already well developed. Because buildings meeting comprehensive green standards such as LEED will create lower water, sewer, and waste management costs than typical buildings, they should also pay lower development charges.

These are just some of the more common policy tools used by local governments to encourage green building. There are no doubt many other innovative policy approaches the city could take. Oakville (ON) and Vancouver, for example, have made the adoption of green building certification standards a condition of sale for certain municipal lands sold to developers in those cities. Ottawa could make this a condition of sale for all city-owned lands.

In January of 2008, Ottawa's city council agreed to consider introducing incentives such as density bonuses during the review of its official plan, taking place throughout 2008 and 2009. It is essential that Ottawa residents hold council accountable for this commitment, and urge the city to include these policies in its new official plan.

The City of Ottawa has also been considering a “Green Pathway” pilot project, whereby three developments seeking LEED Silver certification would be given priority processing along with funding of \$25,000 each to assist with design, registration, and certification costs. Unfortunately, city council voted in January 2008 to defer this program until stakeholders are consulted further. The city should move through this consultation process swiftly and implement the program as soon as possible.

It is important to note that, because green buildings tend to reduce overall operational costs for the city, much or perhaps all of the expense associated with adopting these policies and programs will likely be gained back in savings for the city on water, sewer, and waste management costs.

SUMMARY OF RECOMMENDATIONS

The City of Ottawa should immediately take the following first steps to ensure that new buildings in Ottawa are more energy efficient:

Ramp up standards for new municipal buildings

- ❖ Change the city's corporate green building policy to state that all new municipal buildings of 500 square metres or greater must meet the LEED Gold standard.

Create incentives for building developers to go green

Offer the following incentives to the developers or owners of buildings that are certified LEED or R-2000:

- ❖ Property tax exemptions of at least five years
- ❖ Building permit rebates of at least 30 percent
- ❖ Development charges set lower than those for buildings without green certification
- ❖ Priority processing, which would bump green-certified developments up to the front of the line in the development approvals process
- ❖ Conditional re-zoning, whereby developers are allowed to surpass zoning restrictions on height or density *only* if the building meets LEED or R-2000 standards

Implement the “Green Pathway” program

- ❖ Implement the “Green Pathway” LEED promotion pilot project as soon as possible, by beginning consultation activities immediately and completing them within a few months.

THE TIME TO ACT IS NOW

Every office tower, apartment building, and house that is built to merely the basic standards of the building code is committing us to decades of continued waste—wasted energy, wasted money, and a wasted opportunity to reduce our carbon footprint. The materials, technologies, and building techniques needed to make buildings more energy efficient are readily available today, but we need supportive public policies if they are to become industry standards.

Many municipalities across North America have stepped up to the plate and adopted policies to make green building practices more widespread within their jurisdictions. The City of Ottawa should follow their lead, by adopting the highest environmental standard for its own buildings while offering incentives such as tax exemptions, rebates, priority processing, and conditional re-zoning to private developments that meet green building standards.

There is no doubt that the City of Ottawa can take steps today to ensure that new buildings in the city will meet much higher standards of energy efficiency. In doing so, it would help save Ottawans millions of dollars in wasted energy costs, improve air quality, and cut greenhouse gas emissions. If the City of Ottawa is serious about doing its part to fight climate change, then it must promptly adopt policies that will effectively address the problem of energy inefficiency in buildings. The time to act is now.

FURTHER READING

For more information on green buildings and public policy, see:

- *Green Building in North America: Opportunities and Challenges*, a report by the Council for Environmental Cooperation, 2008:
http://www.cec.org/pubs_docs/documents/index.cfm?varlan=english&ID=2242
- A City of Ottawa staff report on recommended incentives for LEED buildings:
www.ottawa.ca/calendar/ottawa/citycouncil/occ/2008/01-23/pec/ACS2008-PTE-ECO-0005.htm
- A database of R-2000 & Energy Star home builders in Ottawa: <http://www2.nrcan.gc.ca/oeo/nh-mn/f-t/index.cfm?fuseaction=s.ssf&language=eng>

Sources

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- ¹ City of Ottawa. *Inventory of Air Contaminants and Greenhouse Gas Emissions*. Report to Planning and Environment Committee. Nov. 14, 2007. Ref N°: ACS2007-PTE-ECO-0015.
- ² “Measures of Sustainability.” *Canadian Architect*.
www.canadianarchitect.com/asf/perspectives_sustainability/measures_of_sustainability/measures_of_sustainability_operating.htm
- ³ Commission for Environmental Cooperation. *Green Building in North America: Opportunities and Challenges*. March 2008. p. 42. www.cec.org/pubs_docs/documents/index.cfm?varlan=english&ID=2242
- ⁴ Ibid.
- ⁵ Greg Kats et al. *The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force*. October 2003. <http://www.ciwmb.ca.gov/greenbuilding/Design/costissues.htm>
- ⁶ Adam Bruns. “Looking Through Adobe”. *Site Selection*, January 2009.
<http://www.siteselection.com/features/2009/jan/Green-Imperative/>
- ⁷ City of Ottawa. *Leadership in Energy and Environmental Design (LEED) Promotion Pilot Program*. Report to Planning and Environment Committee and Council. November 27, 2007.
www.ottawa.ca/calendar/ottawa/citycouncil/occ/2008/01-23/pec/ACS2008-PTE-ECO-0005.htm
- ⁸ City of Ottawa. *Leadership in Energy and Environmental Design (LEED) Promotion Pilot Program*.
- ⁹ Most houses built to typical construction standards in British Columbia would already meet the energy standards required for Built Green™ Bronze level certification; see Community Energy Association and Fraser Basin Council. *Energy Efficiency and Buildings: A Resource for BC's Local Governments*. 2007. p. 11.
http://www.bcclimateexchange.ca/doc/FBC_Manual_ONLINE.pdf
- ¹⁰ Ibid.
- ¹¹ Commission for Environmental Cooperation, p. 17.
- ¹² These barriers are identified by the Commission for Environmental Cooperation, p. 54-55. For a more detailed look at the barriers to market uptake of green building practices, see <http://www.nrtee-trnee.com/eng/publications/commercial-buildings/section3-commercial-buildings.php>.
- ¹³ District of Maple Ridge. *Revitalization Tax Exemption Bylaw*. 2006. Available at www.mapleridge.ca.
- ¹⁴ City of Hailey. *Zoning Ordinance, Article 10: Planned Unit Developments*.
www.haileycityhall.org/Codes_Plans/planning.asp#zoningOrd
- ¹⁵ Community Energy Association and Fraser Basin Council, p. 39.

About Ecology Ottawa

We are a not-for-profit organization working to make Ottawa the green capital of Canada. We believe that Ottawa residents are concerned about issues such as pollution, waste, and global warming, and that they want sustainable communities where clean air and water, public transit, renewable energy, recycling, and green space protection take priority. We are working with residents and community organizations to ensure that these concerns are heard at city hall. Together we can make a difference, but we need your active support to move our city in the right direction.

Get involved with Ecology Ottawa, and help make Ottawa a more sustainable city.

You can:

- ✓ Sign up for our e-mail updates at www.ecologyottawa.ca/take-action/sign-on/get-updates.php. We will send no more than two updates a month, which provide information on local events and actions you can take to help protect Ottawa's environment.
- ✓ Check out our calendar of events at www.ecologyottawa.ca/calendar to stay informed of outdoor activities, film screenings, workshops, public meetings, and other opportunities to get engaged on environmental issues.
- ✓ Volunteer your time with Ecology Ottawa. To find out more, send an email to volunteer@ecologyottawa.ca, or call 613-850-9101.
- ✓ Make a donation. Ecology Ottawa is a legally registered, not-for-profit organization that relies on the financial support of people like you. Please make cheques out to Ecology Ottawa, and send to:

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