BUILDING FAST ACTION FOR CLIMATE CHANGE AND GREEN JOBS







This Green House

CENTRE FOR CIVIC GOVERNANCE

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Columbia Institute

MAY 2011

Acknowledgements

The authors would like to thank the many people who provided valuable input and reviews during the preparation of this report, including Claire Beckstead, Charley Beresford, Shelley Carroll, Charlie Clark, Norman Gludovatz, Thomas Hackney, Cindy Jefferies, Marc Lee, Emanuel Machado, Sean Meagher, Scott Pasternack, Sonja Persram, Andrea Reimer, Gaetan Royer, Keith Stewart, Dave Thompson, Scott Vokey and Sarah Winterton. The authors alone are responsible for content.

ISBN: 978-0-9784309-7-9

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Columbia INSTITUTE

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Executive Summary

To avoid catastrophic climate change, the UN Intergovernmental Panel on Climate Change names 2015 as the year green house gas emissions must peak and begin a downhill slide. The IPCC calls on developed countries to lower emissions from 1990 levels by 25% to 40% by the year 2020. Canada, the world's 9th largest economy, is failing spectacularly at this goal. Canada's current goal, adjusted to 1990, amounts to a 3% reduction. In fact we're not meeting that, emissions continue to rise in Canada.

Forward thinking municipal leaders are not waiting to take action. All across Canada early adopters are developing climate action plans, looking ahead to manage climate impacts like sea level rise and taking action on clean energy.

Energy use in buildings accounts for a significant portion of greenhouse gas (GHG) emissions in Canada. Energy-efficiency retrofits offer a fast and affordable way to cut GHG emissions, conserve energy and save consumers money on their utility bills. The bonus for individual homeowners, besides lower energy bills and increased comfort, is that their home increases in value with energy retrofitting.[1]

There are community bonuses too. Money invested in retrofitting stays in the local and regional economy and retrofit programs result in jobs and training opportunities.

In addition to direct cuts in emissions from energy conservation, retrofit jobs are green jobs. They perform well in environmental terms. As an example, construction jobs produce 180 times less in emissions per job than those in oil and gas extraction.[2]

Unlike some other measures, retrofits can be started right now, using existing skills and technologies

Municipalities can take action on climate change, stimulate their local economy and help homeowners save money on energy bills, live in increased comfort and add value to their homes all at the same time.

This Green House: Building Fast Action on Climate Change and Green Jobs examines a core idea: Municipalities providing low-cost financing to cover the upfront cost of energy-efficient retrofits and property owners repaying over time on their property taxes with their energy savings. The report identifies two promising models for municipal residential energy-efficiency financing programs in Canada: Local Improvement Charges for Energy Efficiency and on-utility bill financing (sometimes called "Pay as You Save").

Both models are essentially types of low-cost financing to help homeowners overcome barriers to home energy-efficiency retrofits, and both can be run as full cost-recovery programs, at no net cost to the municipality.

Drawing on Canadian policy research and case studies and lessons learned from existing US programs, this report provides a general overview and then province-by-province analysis of opportun-

ities, potential legislative and regulatory barriers (and solutions), useful policy precedents and other resources that can help local leaders get started on the development of municipally led energy-efficiency home-retrofit programs.

Report Highlights

Environmental Benefits of Energy-Efficiency Retrofitting

- A $7,000 retrofit in Canada can reduce the average detached home's energy use by 23% to 26%,[3] and cut the average household's GHG emissions by approximately 3.1 tonnes per year.
- Widespread investment in efficiency retrofits could cut GHG emissions in the buildings sector by 27%.[4]
- This means GHG reductions in the range of 19 megatonnes (mt) of CO_2e per year, slicing off about 2.6% of Canada's overall national total.

Community Benefits of Energy-Efficiency Retrofitting

- Retrofitting creates between 13 and 16 direct jobs for every $1 million of increased economic output —that's 50 to 60 times the job creation rate of oil and gas extraction.[5]
- Dollars invested in retrofitting stimulate the local and regional economy and stay in local and regional circulation several times over.
- Financing programs can be run at full cost-recovery for the municipality.
- Efficiency retrofits can help communities meet legislated GHG reduction targets and voluntary emissions reduction commitments.

Homeowner benefits

- Homeowners can save $700 a year on a $2,000 annual heating bill by implementing home retrofit recommendations from the existing federal home energy audit program.[6]
- Homeowners will increase the value of their homes
- Homeowners will live in increased comfort

Models for Municipal Financing Programs

Local Improvement Charges for energy efficiency and Utility On-Bill financing are promising models for Canadian municipalities. Both models are designed to help homeowners overcome the key financial barriers to energy retrofits: upfront costs, expensive consumer credit and home ownership lengths that are too short to realize cost savings from a retrofit.

Two Canadian cities (Halifax and Vancouver) are launching programs using variants of these models in 2011, and case studies of similar programs operating in the USA are analyzed in section 3 of this report.

1. Local Improvement Charges for Energy Efficiency (or "Property Assessed Payments for Energy Retrofits")

- Municipalities provide low-cost financing for homeowners to pay the upfront cost of approved energy-efficiency retrofits, and participating owners repay the city over time as a special assessment on their property taxes.
- The special assessment can be attached to the property rather than the owners upon resale of the property, responsibility for any remaining repayments are passed to the new owner.
- Repayments can be scheduled to balance out with energy bill savings, so that repayments are cash-flow neutral for participating homeowners during the financing period.
- The special assessment can be secured with a lien on the property in the event of default, similar to what happens in the case of failure to pay property taxes. Default rates have been very low in similar programs elsewhere.
- Program participation is entirely voluntary and does not affect the property taxes of nonparticipants.

2. On-Utility Bill Financing (or "Pay as You Save")

- Energy consumers borrow money to carry out retrofits and then pay back the loan as a charge on their energy utility bills.
- Repayment is usually designed so that monthly payments are approximately equal to (or even less than) the savings in energy costs resulting from energy-efficiency measures.
- At the municipal level, on-bill financing programs are most viable for municipalities that own their local energy utilities. Other municipalities could play a role through partnerships with provincial public utilities or even private energy companies.

What do Canadian municipalities need to move forward?

Legislative and regulatory changes

- Municipalities need clarification from provincial governments about the use of Local Improvement Charges (LICs) to finance energy-efficiency measures on private property. In some provinces, this may require changes to existing municipal legislation and regulations.
  - In provinces with ambiguous legislation or regulations governing the use and scope of LICs, clarification or official authorization from provincial municipal affairs ministries would open the door to municipal retrofit programs.
  - In provinces with explicitly restrictive legislation governing the use of LICs, legislative amendments will likely be necessary. Legislation enabling the use of LICs to finance residential renewable energy and efficiency retrofits was passed by the province of Nova Scotia in December 2010 and provides a precedent for similar changes in other provinces.

Potential capital sources

While the financing programs can be designed to be full cost-recovery and thus revenue-neutral, municipalities will nonetheless need sources of capital to back retrofit financing programs. Possibilities identified in this report include:

- Low-interest borrowing via provincial municipal finance pools (such as the Municipal Financing Authority in BC or Infrastructure Ontario's Loan Program).
- The establishment of a federal or provincial energy-efficiency loan fund.
- Municipal/community bonds.
- Credit-enhanced capital pools.
- Partnerships with credit unions or other financial institutions.
- Energy utilities as "banks "for municipally administered retrofit financing.
- Pilot-project funding from the FCM's Green Municipal Fund.

SECTION 1

Canadian municipalities and residential energy efficiency retrofit financing

Introduction

> "[B]uildings offer the largest share of cost-effective opportunities for GHG mitigation among the sectors examined in this report.[...] Over the whole building stock the largest portion of carbon savings by 2030 is in retrofitting existing buildings and replacing energy using equipment".
>
> *— Fourth Assessment Report of the UN Intergovernmental Panel on Climate Change, 2007*[7]

Globally, energy-efficiency retrofits in buildings offer some of the fastest and most affordable opportunities for reducing greenhouse gas emissions.[8] And unlike some other measures, retrofits can be started right now, using existing skills and technologies. As a 2008 report from the international commission governing the North American Agreement on Environmental Cooperation found, because "[e]normous energy improvements and greenhouse gas reductions in the building sector are possible using existing and emerging technologies&green building represents some of the ripest 'low-hanging fruit' for achieving significant reductions in climate change emissions."[9] The Commission further noted that within the building sector, "the majority of potential efficiency gains in Canada and the United States lie in renovating or retrofitting the existing building stock."[10]

Research within Canada comes to similar conclusions. For example, a 2009 C.D. Howe Institute study of Canadian federal government programs concluded that "energy retrofits appear to be a leading low-cost way to offer incentives to save energy and cut GHG emissions. Indeed, among current federal renewable energy incentives, renewable power, heat and energy retrofits are the least expensive programs to reduce GHG emissions."[11]

A large portion of GHG emissions from buildings in Canada come from energy used for home heating, cooling and hot water, all of which can be targeted through efficiency retrofits.[12] But encouraging residential energy-efficiency retrofits can be a big challenge. Relatively high upfront costs and relatively long pay-off time from energy savings act as a deterrent for many homeowners. While federal and provincial grant and rebate programs in Canada have met with some success, the federal government's primary residential retrofit incentive program was in hiatus at the time of writing, and most Canadian provinces are not in a position to fill the vacuum left by the cancellation of federal incentives.

Furthermore, grant and rebate programs can be relatively expensive for governments to operate and sometimes exclude lower-income Canadians, who are unable to pay for the portion of a retrofit not covered by a grant.

Local governments in Canada may be in a position to develop programs that overcome some of these obstacles at the federal and provincial level and to play a major role in getting the ball rolling again on residential efficiency retrofits. Municipalities in the United States are already leading the way in that country by developing and running innovative revenue-neutral energy retrofit financing programs (see US case studies on pages 63 - 83), and a number of Canadian municipalities are interested in introducing similar programs here. At least two Canadian municipalities — Halifax and Vancouver —are planning to roll out similar programs in 2011 (see pages 56 and 33 for details).

This report investigates roles Canadian municipalities can play in setting up energy-efficiency retrofit programs and the legislative, financial and administrative tools they could use (or need) to do it. The focus is on the two most promising models identified to date: Local Improvement Charges for Energy Efficiency (and/or Renewable Energy) and on-utility bill financing. There is a province-by-province breakdowns of opportunities, an outline of potential legislative and regulatory barriers (and solutions), a snapshot of useful precedents and other resources to help local leaders get started.

WHAT'S INCLUDED IN AN ENERGY EFFICIENCY RETROFIT?

While programs vary and certain measures are more effective in particular climates, typical improvements supported in efficiency retrofit financing programs include:

- **ceiling, wall and basement insulation;**
- **air sealing;**
- **furnace and heating system replacements and improvements;**
- **hot water tank replacement;**
- **digital thermostat installation;**
- **window and skylight replacement;**
- **Some retrofit programs also finance or provide grants for renewable energy improvements, such as solar hot water or geoexchange thermal systems.**

I. Environmental and economic benefits of energy-efficiency retrofits in Canada

Internationally, there's a lot of literature about the positive impacts of energy-efficiency programs in buildings. But what about here in Canada? What can we expect in terms of economic and environmental benefits?

Protecting our environment

ENERGY USE, BUILDINGS AND GHGS

Energy use is the main source of global GHG emissions, and much of this energy is used to heat, cool and provide electricity in buildings. In 2008, energy used for heating, cooling, hot water and electricity in Canadian residential, commercial and institutional buildings produced almost 140 Mt of CO_2e, and accounted for more than 28% of total GHG emissions from energy use in Canada.[13] Residential space heating, cooling and hot water heating – the primary focus of home energy efficiency retrofits — together accounted for almost 60 Mt of CO_2e in 2008. That's more than 12% of the GHG emissions from energy use in Canada, and over 8% of the national emissions total[14]. This percentage is even higher in provinces dependant on fossil fuels for electricity generation and home heating.

RETROFITS AND CANADA'S GHG EMISSIONS TARGETS

This of course raises the question of what kind of reductions we can expect from a large-scale implementation of building retrofits. More research needs to be done in the Canadian context, but a recent major study in the USA found that widespread investments in energy-efficiency retrofits in that country could cut energy use in that sector by 28% and GHG emissions by 27%, while saving billions of dollars annually.[15] Reductions on that scale in Canada's residential sector would mean GHG reduction in the range of 19 Mt of CO_2e per year — slicing off about 4% of Canada's emissions from energy use and 2.6% of Canada's overall total. That's about 8% of what Canada needs to cut right now to meet its Kyoto Accord targets.

RETROFITS AND HOUSEHOLD GHG EMISSION CUTS

Statistics from federal energy retrofit and audit grant programs in Canada give some sense of the potential at the household level.

Data collected from the federal EnerGuide for Houses (EGH) retrofit incentive program (which ran from1998 to 2006) showed that "the average energy saving per retrofitted house per year ranges from 35% of pre-retrofit energy consumption (in New Brunswick) to 22% (in Prince Edward Island and Quebec)" and the greatest energy saving per individual house amounted to 88.3% of pre-retrofit consumption. Nationally, the average energy savings represented approximately 26% of pre-retrofit consumption.[16] These savings were achieved with retrofits costing less than $7,000 per home, on average.[17]

A study of retrofits funded through the more recent federal ecoENERGY retrofit grants(cancelled in 2010) found that upgrades supported by that program on average reduced household energy consumption by about 23% and GHG emissions by approximately 3.1 tonnes per house per year, with significantly higher savings in older, less energy efficient houses.[18]

Recent case studies have shown that reductions of more than 50% are possible with higher investments in what are called "deep energy-efficiency retrofits.19 Research by the Canada Mortgage and

Housing Corporation (CMHC) has demonstrated the feasibility of "net zero energy" retrofits — i.e., homes that produce as much energy as they consume— by combining high performance energy-efficiency retrofits with solar electricity production, hot water heating and other measures.[20] While these more ambitious retrofits may at present be beyond the means of most homeowners, they do point the way to the massive potential in household energy efficiency and renewable energy measures and may ultimately become more affordable with time.

CANADA AND CLIMATE CHANGE: WHY WE NEED INCREASED ENERGY EFFICIENCY

To avoid potentially catastrophic changes to global weather systems, major reductions are needed in human-caused emissions of carbon dioxide (CO2) and other greenhouse gases (GHGs).

Climate change impacts

According to Natural Resources Canada[21], rapid climate change will pose major challenges for health, infrastructure, agriculture, economic activity, our natural environment and traditional ways of life in Canada, including:

- More forest fires and insect infestations because of warming and prolonged drought.
- Water shortages for agriculture, hydroelectric facilities, shipping, and municipal water supplies because of drying in the continental interior, reduced snow packs and shrinking glaciers.
- Serious health problems resulting from more frequent heat waves and smog episodes.
- More frequent and severe extreme weather events, floods and related natural disasters, with impacts on the economy, infrastructure and health.
- Erosion and infrastructure damage in coastal communities due to the combination of more frequent, intense storms, and higher sea levels.
- Damage to rivers, oceans, forests and other natural habitat, with serious impacts on Canada's fisheries, wildlife and natural systems.

Canada's record on climate action

According to the UN Intergovernmental Panel on Climate Change, to prevent the worst effects of climate change, global GHG emissions need to be cut by 25-40% by 2020, and by 80% before 2050. Under the Kyoto Accord, Canada agreed to reduce greenhouse-gas emissions by 6% below 1990 levels by 2012.

But Canada's climate change mitigation efforts are not where they need to be. In 2008, Canada's GHG emissions per person were the second highest among the G8 economies, and the current Canadian government plan translates into a target of only 3% below 1990 levels by 2020. And it's not even clear that federal government action at present is sufficient to meet even these reduced targets. Environment Canada figures for 2008 showed that Canada's emissions are heading the wrong direction, and are actually 24% above 1990 levels. Because of this inaction, Canada is facing growing international criticism for its record on addressing climate change.

Boosting the economy

SAVED ENERGY IS THE CHEAPEST ENERGY

> "Saving electricity needs about 1,000 times less capital, and repays it about 10 times faster, than supplying more electricity."
>
> *-Amory Lovins, Chairman and Chief Scientist of the Rocky Mountain Institute and energy efficiency advisor to US government* [22]

Energy efficiency through retrofits, improved technologies, and other measures is the cheapest way to increase the amount of energy available - much more so than building new electrical generation facilities or extracting more fossil fuels. As a leading physicist and advisor to the US government on energy efficiency has noted, "saving electricity needs about 1,000 times less capital, and repays it about 10 times faster, than supplying more electricity."[23] And because saving energy costs less than buying it, energy efficiency ultimately frees up money to be spent elsewhere in the economy, opening opportunities for businesses, governments and consumers. [24]

GREEN JOB CREATION

Energy-efficiency retrofit programs can produce a lot of jobs. A Federation of Canadian Municipalities report estimates that energy-efficiency retrofits generate up to 20 local jobs for every $1 million invested.[25] Research from University of Massachusetts economist Robert Pollin found that each $1 million spent on building retrofits in the USA produces 16.7 jobs, while simultaneously reducing

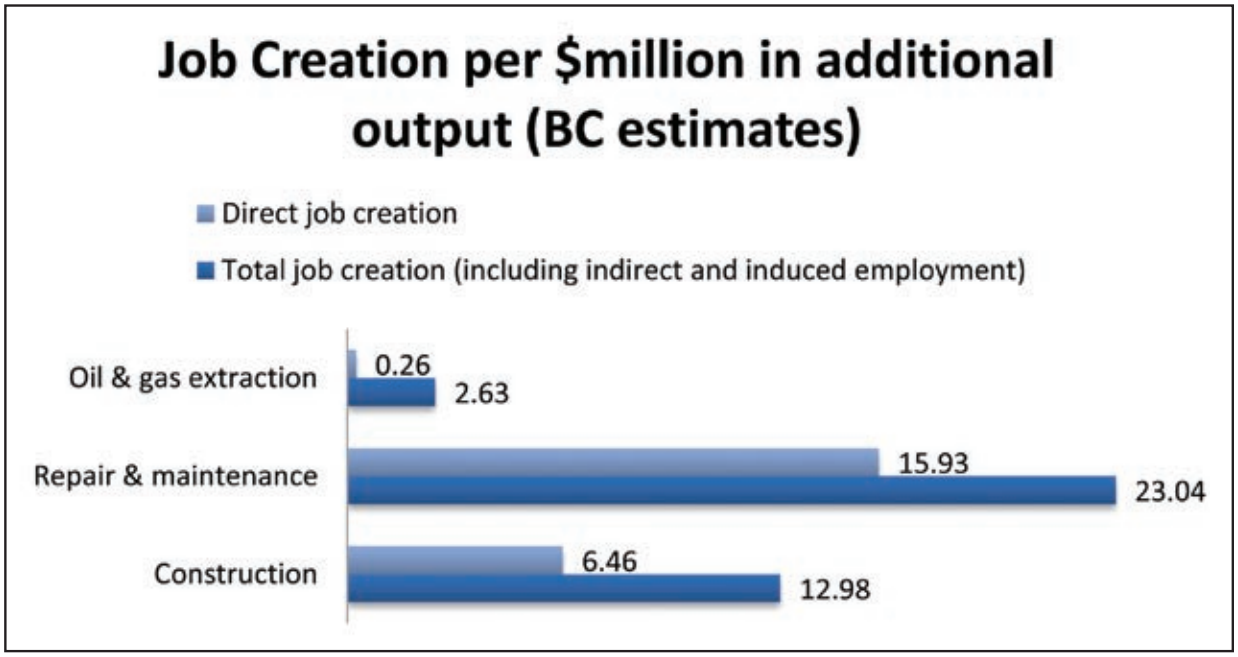

CHART 1

energy consumption and GHG emissions. In contrast, fossil fuel–oriented projects, such as with oil and natural gas, create only 5.2jobs per million of expenditures and generally increase GHG emissions significantly".[26]

Recent research on job creation and GHG emissions in BC identified similar patterns (see Chart 1 below).[27] While it takes almost $4 million in additional output in oil and gas extraction to create a single direct job, sectors involved in retrofitting (construction and repair and maintenance) create between 13 and16 direct jobs with only $1 million of increased output, or roughly 50 to 60 times the number of jobs!

Retrofit jobs also perform much better in environmental terms. While no numbers are currently available on GHG emissions saved per employee in green retrofitting, there are estimates comparing construction sector GHG emissions with oil and gas extraction in the Canadian context. As shown in Chart 2 below, each job in the oil and gas sector in BC results in about 180 times the tonnage of GHG emissions as a job in the construction sector.[28]

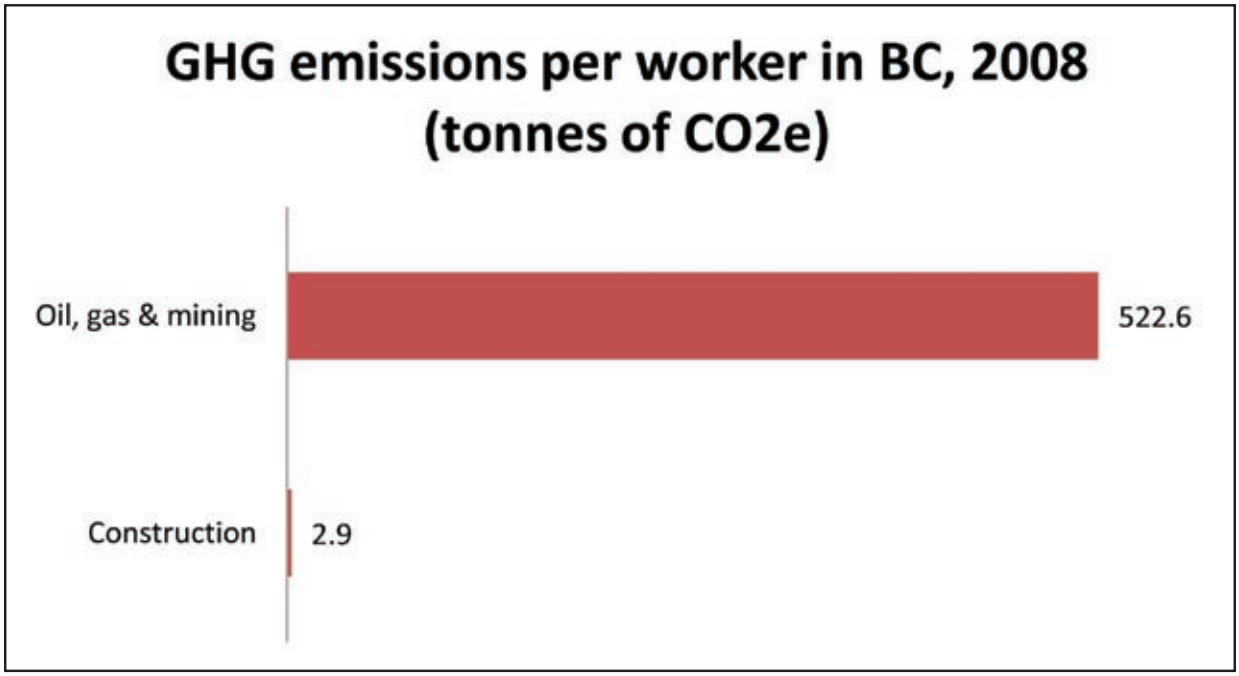

CHART 2

Retrofit financing programs in a number of US jurisdictions have also incorporated vocational and skills training programs to help the unemployed and other disadvantaged groups (see page 63 - 83 for details on US training programs).Energy retrofit training programs are already off the ground in Brandon, Manitoba and other Canadian cities.[29] Municipal financing for retrofits could boost these existing programs and provide impetus for new ones.

RETROFIT JOBS, TRAINING PROGRAMS & LOCAL ECONOMIC DEVELOPMENT

Warm Up Winnipeg and Brandon Energy-efficiency program (BEEP)

Winnipeg and Brandon, Manitoba are good Canadian examples of ways job creation, training and even poverty-alleviation measures can be built into residential retrofit programs.

Winnipeg's Building Urban Industries for Local Development (BUILD)[32] was established by Aboriginal community stakeholders to provide retrofits to private and public housing units. BUILD's Warm Up Winnipeg program focuses on improvements that increase energy efficiency and reduce heating costs for low-income households and the agencies that support them. At the same time, BUILD doubles as a training program for people with little or no experience in the formal labour market. Participants gain basic skills and training to prepare them for positions in the construction industry, and the program has solid success in moving its employees from welfare to work in family supporting jobs.

The Brandon Energy-efficiency program (BEEP), administered through the Brandon Neighbourhood Renewal Corporation, seeks to increase energy and water efficiency within low-income housing in Brandon and southwest Manitoba, while at the same time providing training in basic skills to prepare program participants for jobs in the construction industry.[33] Since 2007, the program has taken on 65 trainees and delivered more than 400 home energy-efficiency retrofits and close to 500 water efficiency retrofits.

In 2007 alone, retrofits from the program saved more than 50 million litres of water and saved participating homes an average of $300 in electricity costs, while reducing greenhouse gas emissions by about 1,200 tonnes annually. In addition to the economic boost to the local economy from wages and energy savings, the program also provided over $300,000 of direct stimulus to Brandon businesses in building material sales in 2007.

> "This program helped me be a better person and be able to support my family. I'm glad to be giving back to my community."
>
> —Graduate of Winnipeg's BUILD retrofit construction employment training program

RETROFIT JOBS, TRAINING PROGRAMS & LOCAL ECONOMIC DEVELOPMENT

Portland Clean Energy Works[30]

Portland, Oregon's Clean Energy Works program is a good example of how retrofit financing programs can incorporate employment, training and other measures aimed at achieving the greatest economic impact possible. Some key features of Portland's program include:

- Local/First-Source Hiring: 80% of employees in projects financed through the program are to be hired from Portland.
- High-Quality Training Programs: The program includes a process for setting up qualified training programs and requires that contractors hire 100% of their employees from one of these programs until 50% of positions are filled.
- Best-Value Contracting: Applications from contractors are scored on a range of desired attributes rather than relying on the race-to-the-bottom approach of "lowest-bidder" models. Portland's program gives points to interested contractors based on various criteria, such as:
  - experience with energy efficiency,
  - a good service record,
  - a track record of hiring from the local area,
  - a track record of hiring disadvantaged people,
  - a clean history in dealing with employees, the public and labour unions.

> "We feel very blessed that when everybody was laying off people, we were like 'Okay, let's prepare ourselves for the future and start hiring people.'"
>
> — Bernice Lopez-Dorsey, an energy retrofit contractor for Portland's Clean Energy Works retrofit program[31]

> "Ever since high school I've been interested in how homes work. A lot of these folks don't even have heaters. We're getting them up and running with a tight house that provides a comfortable living situation while causing less harm on the environment."
>
> —Marenda Chamberlin, retrofit worker/trainee with a contractor in Portland's Clean Energy Works retrofit program

Energy-efficiency retrofit programs can include specific measures aimed at creating good jobs, training opportunities and other benefits for the local economy.

Stimulating local and regional economies

"There is an individual impact to the comfort in our own home, but if you go outward, the community benefits, the environment benefits, and the contractors are providing jobs and benefits."

—Kouya and Sheela, homeowner participants in Clean Energy Works Portland retrofit program[34]

Money invested in EE retrofits tends to stay in the local and regional economy. Retrofits on buildings can't be shipped overseas and local businesses and workers are most often in the best position to carry out the work. A Green Communities Canada briefing in support of federal retrofit grants noted that each dollar of federal grants generates roughly $6 in local spending.[35]

Lower energy bills, increased home value and improved comfort for local residents

"My bills went down immediately. My house is more comfortable. The program works."

— Ria Muriello, homeowner participating in Long Island Green Homes retrofit loan program in Babylon, New York (see page 69)

Energy-efficiency retrofits offer significant savings in energy costs for consumers. The Canadian federal government estimated that by implementing retrofit recommendations from the federal energy audit program, a typical homeowner could save $700 a year on a $2,000 annual heating bill.[36]

Reducing energy consumption in buildings will become even more important as energy costs rise. Electricity prices in Ontario, for example, are forecast to rise 46% between 2011 and 2015[37]. Well planned efficiency retrofits generally pay for themselves even at today's energy prices, and will have even shorter payback times as electricity and natural gas rates climb.

Energy retrofits also add value to homes. A 2008 survey by the Appraisal Institute of Canada found that "Energy efficient upgrades are at the top of the list of home improvements that add value to the resale price of a home," and that on average owners recover 61% of the cost of energy-efficiency upgrades in the increased resale price of their home.[38]

Last but not least, energy efficiency improves residents' comfort and quality of life. Maintaining a comfortable temperature is easier and more affordable if your home is properly insulated and energy efficient. This is a particularly big issue for seniors and others on low and fixed incomes, who sometimes face tough times paying for enough energy to keep their homes sufficiently warm during cold Canadian winters.

II. Financing mechanisms for residential retrofits

Policy discussions point to two innovative financing mechanisms —Local Improvement Charges for Energy Efficiency and On-Utility Bill Financing— that Canadian municipalities could use to support and encourage retrofits by property owners in their communities. Versions of these programs are operating successfully in a number of US cities (see case studies on pp. 63 - 83).

LOCAL IMPROVEMENT CHARGES FOR ENERGY EFFICIENCY (LIC FOR EE)

Research and policy discussions in Canada going back to at least 2004 have identified the use of Local Improvement Charges (LICs) on private property as a way to securely finance energy-efficiency retrofits on private property. The core idea in LICs for EE programs is that municipalities provide low-cost

financing to cover the upfront cost of approved energy-efficiency retrofits, and participating property owners repay this amount over time as a special assessment on their property taxes. The assessment is generally attached to the property rather than the owner and thus stays with the property upon resale to any new owner. This is similar to the way municipalities incorporate charges for specific infrastructure improvements onto property taxes for residents in a benefitting area, but LICs for EE are charged only to the specific property owners who are voluntarily participating in the program.

ON-UTILITY BILL FINANCING ("PAY AS YOU SAVE" OR PAYS)

On-bill financing or "Pay as You Save" are financing models where consumers borrow money to carry out retrofits, and then pay back the loan as a charge on their energy utility bills. Generally, repayment is designed so that monthly repayments are approximately equal to (or even less than) the savings in energy costs resulting from energy-efficiency measures.

By mitigating high upfront capital and financing costs and also the sometimes relatively long break-even time of energy retrofits, on-bill financing addresses many of the same barriers as LICs for EE. Repaying "on-bill" is also helpful in directly highlighting the connection between efficiency improvements and energy cost savings. However, on-bill financing does not share with LICs the benefits arising from having repayment secured by a property lien, and potentially adds administrative complexities around transferring responsibility for repayment upon the sale of a property.

In addition, on-bill financing is most viable for municipalities that own their local energy utilities. While other municipalities could potentially form partnerships with public or privately owned utilities to deliver on-bill financing programs, such partnerships have the potential to add layers of administrative and legal complexity not present in LIC-based models (although economies of scale could nonetheless make this workable in larger municipalities).

In provinces with publically owned and/or highly concentrated energy utilities sectors, such as BC, Manitoba and Saskatchewan, on-bill financing would likely be best administered at the provincial level, either directly through utilities themselves or through provincial government programs.

HOW ENERGY-EFFICIENCY FINANCING CAN SAVE HOMEOWNERS MONEY

Energy-efficiency retrofits can save homeowners a lot of money over the long term. With the right financing model, they can be cash-flow neutral or even save energy consumers a few dollars during the repayment period.

Chart 3 below provides an example of how this could work. The average retrofit carried out under the cancelled federal EnerGuide Retrofit for Homes program cost about $6,000 and saved the owner of a typical detached home in Ontario about $771 per year on their energy bill. Repayments on retrofit financing of $6,000 at 5% interest over 10 years would amount to about $761 a year — meaning that even during the repayment period, homeowners would actually save a few dollars a year compared to their pre-retrofit energy bills. Once repayment is finished, the homeowner would have their expenses reduced by the full value of savings from the retrofit — in this case $771 per year.[39]

Over the 25-yearlifespan of a typical retrofit, this would mean a savings of more than $11,600. And this example assumes stable energy prices — savings could be much higher in cases where energy prices go up after a retrofit.

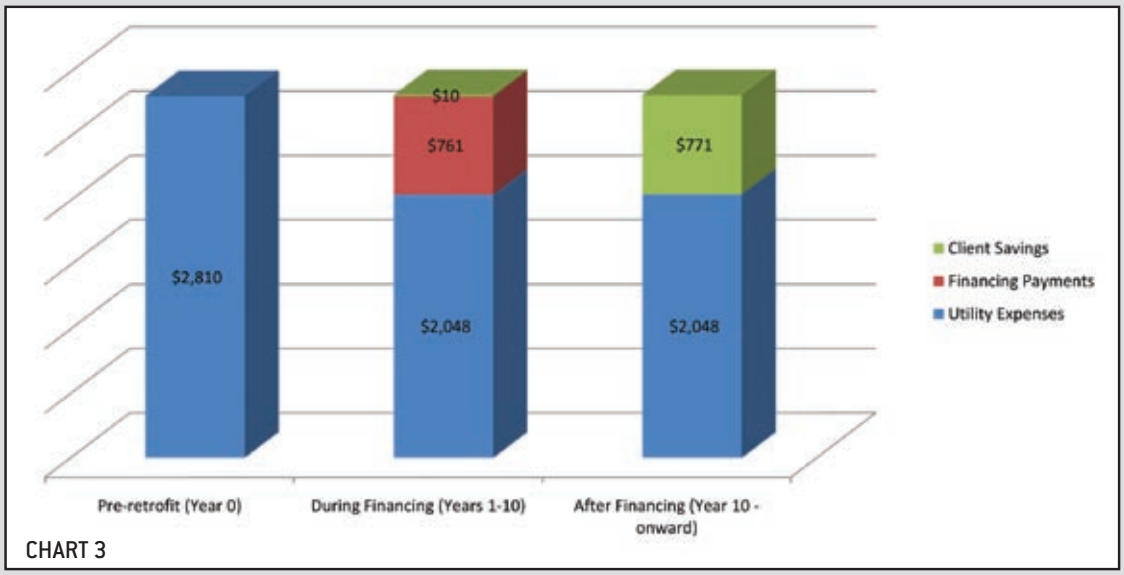

CHART 3

How LIC for EE and on-bill financing can help overcome barriers to energy efficiency retrofits

LIC-based and On-Bill Financing mechanisms can address some of the key barriers to energy-efficiency retrofitting.

BARRIER 1: UPFRONT COSTS OF ENERGY-EFFICIENCY RETROFITS

While the economic and environmental benefits of energy-efficiency retrofits are widely known by policymakers and much of the general public, research suggests that the relatively high upfront costs of retrofits and the relatively long time it takes to recoup retrofit expenses through energy savings are barriers for many homeowners.[40] When financial incentives that mitigate some of these upfront costs have been offered in Canada, for example the federal ecoENERGY home retrofit program, demand has often been higher than expected.

BARRIER 2: EXPENSIVE FINANCING

High upfront renovation costs are compounded by expensive private financing options. Homeowners often have to turn to credit cards or other types of higher-interest unsecured loans to finance retrofits, which can act as a deterrent to borrowing. LIC-based financing, offered on a not-for-profit basis and secured through a property tax–based lien, opens the door to much more affordable interest rates. In some provinces, it may also be possible to record the repayment as a "tax" rather than a loan, so that the loan would not affect the borrower's official debt levels and credit rating.[41] Energy utilities — especially large publically-owned ones with cash reserves — may also be in a position to offer favourable financing rates through on-bill financing programs.

BARRIER 3: LENGTH OF HOME OWNERSHIP

A potential disincentive for retrofits is the fact that homeowners often move before the end of the repayment period and feel that they are unlikely to realize the long-term benefits in energy savings and may even take a hit financially by having to carry the financing costs of a retrofit in a house they no longer own.

However, LIC-based financing is attached to a property rather than to a person, which means the owner only pays while they actually own the property and passes any remaining repayments to a subsequent owner upon resale of the property. In essence, the owner initiating an LIC-financed retrofit does not lose out if they sell their home before the full costs of the retrofit are recouped in energy savings after full repayment.

If designed properly, the retrofit repayment will be roughly revenue-neutral because of decreased energy bills during their occupancy, and any remaining repayments will be the responsibility of the next owner (who will likewise benefit from decreased energy costs during repayment and probably save money once the retrofit has been paid off). In fact, because EE retrofits in Canada typically recoup

much of their initial cost through increased home value at resale, homeowners initiating LIC-financed retrofits could even come out ahead financially when they resell.

On-Utility Bill Financing programs can be similarly structured, so that repayment obligations are attached to the meter and passed on to new owners at the time of resale.

III. Municipalities can lead the way

Retrofit financing programs can of course be implemented by various levels of government, energy utilities or even private financial institutions. However, there are a number of reasons for municipalities to take the lead.

- **Secure and proven financing mechanism:** Local Improvement Charges offer a proven and secure mechanism for financing improvements and ensuring repayment. Moreover, this mechanism is unique to local governments, and particularly well suited to addressing some of the barriers associated with retrofit financing for consumers. In most provinces, LICs could be extended to finance EE retrofits on private property with only minor legislative changes and/or regulatory clarifications.
- **Local leadership, community knowhow and initiative:** Communities with a strong consensus on the benefits of EE retrofits could move ahead on programs without waiting for support to build in regions that are less interested in the concept. Given wide variations in construction and climate across Canada, and even within individual provinces, local governments may also be in the best position to develop retrofit programs tailored to the specific needs and circumstances of their communities.
- **Municipal jurisdiction over construction and renovations:** Municipalities generally play a key role in the approval and administration of building permits and other issues related to retrofit construction and are thus well placed to run "one-stop shopping" retrofit programs that simplify the process for participants by bringing all of the administrative steps under one roof.
- **Access to affordable capital:** In most provinces, municipalities are able to access capital at below-market rates, allowing for lower-cost financing than would be available to most homeowners through private loans. Municipal provision of capital on a break-even basis, rather than seeking a financial return on investment, would likely reduce financing costs for homeowners in comparison with private loans.
- **Cost-recovery operations:** Well-designed municipal retrofit financing programs can operate at full cost recovery for the municipality or in some cases generate a small surplus for reinvestment in the program.
- **GHG reduction commitments:** Energy-efficiency retrofits can help municipalities meet legislated and voluntary GHG reduction commitments. In BC for example, municipalities have since 2010 been required to include community-wide emissions reductions targets in their Official Community Plans.
- **Revenue generation from carbon offsets:** While carbon credits resulting from individual residential retrofits are likely too small to be of direct benefit to homeowners, municipalities could take owner-

ship and pool these emissions reductions and market them as carbon offsets. Revenue generated this way could help subsidize administrative and other costs for local retrofit programs.

- **Lack of federal and provincial action:** Enabled with the right tools, municipalities are well placed to overcome inertia on residential energy-efficiency support at the federal and provincial levels. And where federal and provincial programs do exist, harmonized municipal financing programs could facilitate more extensive retrofits or help homeowners finance costs not covered by grants and rebates.

Federal grant programs such as EnerGuide for Homes and ecoENERGY home retrofits and energy audits were steps in the right direction, and their popularity demonstrated the depth of public interest in efficiency retrofits. Unfortunately, the federal government ended new applications for ecoENERGY retrofit grants in 2010; at the time of writing it is uncertain whether the program will be renewed. Even when they were available, federal grant programs have not covered the full capital costs of thorough retrofits and could have benefitted from harmonization with financing programs.

While some provinces are showing leadership through administering or supporting province-wide retrofit financing programs (see individual provincial breakdown sections for details), others have been slow to fully address barriers related to upfront costs. While grant and tax incentive programs available in a number of provinces seem to have increased interest in residential retrofits, they have not been sufficient to stimulate the kind of large-scale uptake needed to realize the full potential.

IV. What Do Municipalities Need to Move Forward?

A. Provincial legislation and regulatory changes

Over the past few years, a range of local governments, government associations, environmental organizations, utility companies, federal government agencies and policy researchers have shown interest in the use of LICs to finance energy-efficiency and clean-energy measures, but the first municipal programs are just getting off the ground. Vancouver is expecting to launch a property tax based retrofit pilot project in 2011, and the Nova Scotia government passed enabling legislation in December 2010 to allow Halifax to move ahead with a planned LIC-financed residential solar hot water installation program.[42] In some other cases, municipal interest in retrofit financing has been slowed down by provincial legislative and regulatory barriers.

THREE LEGISLATIVE AND REGULATORY BARRIERS THAT PROVINCES NEED TO ADDRESS

Our research found three main types of provincial legislative and regulatory challenges that will likely need to be addressed to facilitate widespread use of LIC-based financing in Canada:

1. Legislation and regulations specifying that LICs can't be used to fund projects on private property.

2. Legislation or regulations that are narrowly restrictive about what types of projects can be funded.
3. Legislation and regulations that are ambiguous about the application of LICs to this type of project.

SOLUTIONS TO LEGISLATIVE AND REGULATORY BARRIERS

1. **Enabling Legislation:** If LIC programs are going to be part of the solution to Canada's GHG reduction strategy, municipalities need their provincial governments to write clear enabling legislation and regulations into relevant provincial municipal government acts and regulations.

   In December 2010, the Nova Scotia provincial government showed that this can be done when it amended the Halifax municipal charter to allow that city to use LICs to finance renewable energy and energy-efficiency retrofits in homes. For the full text of this precedent-setting legislation (and perhaps a general template that could be adapted for other provinces), see Appendix A on page 84.

2. **Official Clarification/Permission from Ministries:** Ambiguous legislation can discourage municipalities from allocating time and resources to develop LIC financing proposals, and also opens the door to officials interpreting legislation and regulations in ways that preclude LIC financing for EE retrofits. Where legislation and regulations are ambiguous but not explicitly restrictive, clarification from relevant provincial ministries and government agencies may be sufficient for municipal programs to get off the ground.

STRATEGIES FOR WINNING LEGISLATIVE CHANGES

1. **Advocacy:** Advocacy by local government associations and individual municipalities, especially if combined with strong public support from environmental, industry and community organizations, is one way to move this issue forward at the provincial level. Advocacy efforts could focus both on staff at relevant ministries and government and opposition politicians
2. **"Pushing the Envelope":** Another possibility in jurisdictions with ambiguous legislation and noncommittal provincial authorities would be for a municipality to bring forward a pilot project for provincial approval as a 'test case' to push their province to clarify their interpretation of regulations. This approach could be made more effective if combined with an advocacy campaign to build public support for the concept.

B. Where will the money come from? Potential sources of capital

While both LIC for EE and on-bill financing programs should be able to operate on a full cost-recovery basis over the long term, municipalities nonetheless require sources of capital to provide retrofit financing. While the best options will vary between provinces and even individual communities, policy research and precedents show that a range of viable capital sources and financing options are possible.

- **Provincial municipal finance pools:** Many provinces have established municipal finance pools at the provincial level to facilitate low-cost borrowing. These pools generally offer very good rates of interest that could be passed on to participants in municipal EE retrofit programs. Provincial GHG emissions reductions targets give provincial governments a stake in supporting municipal action on climate change. Legislative and regulatory changes would likely be needed in many provinces to allow municipalities to borrow from these pools to capitalize residential retrofit programs. Streamlined approval and administrative processes for borrowing from these pools would be helpful in some provinces, as some municipalities find existing processes slow or unnecessarily complex.
- **Federal or provincial energy-efficiency loan fund:** An energy-efficiency loan fund capitalized by the federal government or even an individual province is another option. Neither the federal government nor many of the provinces are on track for meeting their GHG reduction targets, and support for effective municipal action could be an important step towards addressing the climate change commitments of senior levels of government.

  A 2009 report prepared for the Canada Mortgage and Housing Corporation outlines options for how a federal loan fund could work and even makes estimates of associated costs.[43]
  - In one of the options outlined, municipalities would borrow at low rates of interest from a federal fund, then repackage the capital as LIC-backed retrofit financing available to homeowners at below standard consumer interest rates.
  - According to the CMHC report, loans could be provided without adding to a municipality's credit risk (i.e., off balance and without increasing the municipality's debt) by a special provision through which the federal government (or the respective provincial government) carries the full default risk for municipal LIC programs (which would be very small, given that repayments are collected through participants' property taxes).[44]
- **Municipal/community bonds:** Raising capital through issuing municipal bonds has been a popular method of raising funds for the US equivalent of LIC for EE programs (Property Assessed Clean Energy or PACE). In many Canadian jurisdictions, however, this is outside of municipal authority or narrowly restricted. The BC Community Bond system, for example, allows local citizens to provide funding within the community by buying MFA-backed bonds in support of local government capital projects, with interest rates lower than those available in outside bond markets. Unfortunately, the local scale of community bonds tends to severely constrain the amount of capital that can be raised, making them unsuitable for funding a large retrofit program.[45]
- **Financial institutions:** Private capital could be used in municipally administered EE financing programs, either by a municipality borrowing from a private institution to capitalize a program or by a municipality playing an administrative role linking approved retrofit program participants directly with financial institutions. In general, private capital is likely to have higher interest rates than can be provided through public sector borrowing. Favourable financing terms may be more

likely provided by financial institutions with a defined social mission, with credit unions being the most obvious candidates in the Canadian context. A number of credit unions, including Vancity and Desjardins are already offering special financing programs for energy-efficiency retrofits and other green building measures. Partnerships between municipalities and progressive financial institutions on this issue warrant further exploration.

- **Direct borrowing by municipality:** Some municipalities have authority to borrow directly from private sector financial institutions and could finance EE retrofit program this way. Even where this is possible, however, the potential impact on a municipality's credit rating and debt ratio would likely rule this out as source of capital for anything larger scale than a pilot project. In addition, interest rates would likely be less favorable than available through provincial municipal finance pools.
- **Credit enhanced capital pool:** Under this model, a municipality would create a municipal corporation or similar entity to finance individual projects, which would be pooled together and financed through bond issues to capital markets. This option would allow for risk to be shared between the pooled projects, which would improve overall credit terms. A city could further protect the capital pool and further reduce financing costs by "over-collateralizing" the pool with a limited investment from city funds.[46]
- **Energy utilities:** Electric, natural gas and other utilities could provide capital for an LIC-based or On-Utility Bill Financing program. Publically owned utilities with healthy financial reserves are most likely to be amenable to this role. While utilities are often better suited to On-Utility Bill Financing or provincial loan programs (as in Manitoba), there may be circumstances where partnerships between utilities and municipal governments make sense for administrative or other reasons.
- **Local "green fund":** Municipalities could also raise start-up capital by launching a dedicated "green fund," capitalized with contributions from multiple sources, including utilities, financial institutions, charities, foundations, donations, etc. Properly administered, such a fund could be grown over time by generating a small surplus as financing is repaid. Raising sufficient capital for a large-scale program might be difficult with this model but it could be useful for funding smaller-scale LIC for EE/RE pilot projects.
- **Municipal reserves:** Municipalities with a surplus could of course use their own reserves to finance projects or pilots. Though not many municipalities are likely in a position to do this, it offers low financing costs for those who can and involves the fewest administrative, financial and legal/regulatory roadblocks.
- **FCM green municipal fund:** Another potential source for pilot project funding is the Federation of Canadian Municipalities' green municipal fund, which provides below-market loans and grants, as well as education and training services to support municipal initiatives that improve air, water

and soil quality and protect the climate. Start-up capital for Halifax's solar hot water LIC project will likely be in the form of loans and grants from this fund (see page 56 for details). However, FCM green fund money has to date only been provided on a "one-off" basis rather than multi-year funding for ongoing programs, and amounts available are probably only sufficient to fund pilot projects. More information on the FCM green municipal fund can be found online at gmf.fcm.ca.

V. Program design considerations[47]

Good program design is crucial to developing viable, effective LIC for EE and On-Utility Bill Financing retrofit programs. While there is no single catch-all formula to fit every municipality, case studies and other research suggest a number of key considerations to take into account during program design and implementation:

- **Program delivery and administration:**
    - Program administration would involve processing applications, assessing/approving energy-efficiency retrofits and collecting repayments. Depending on the circumstances and capacities of a municipality and the scale of the program, this work could be carried out directly by city staff, by a separate municipal corporation or other city agency established specifically to run the program. There are also examples of municipalities contracting program administration to nonprofits, financial institutions or other third-party agencies (see US case studies in this report).
    - "One-stop shopping": Ideally, applications for financing, building permits, inspections and retrofit evaluation can be kept together in a one-stop shopping intake model that makes the process as simple as possible for property owners. Bouncing between different offices, agencies and levels of government adds time and complexity to the retrofit process and would likely act as a deterrent to some homeowners. Where available, it would be good for the program to help participants connect or even coordinate with grant and rebate programs administered by other levels of government and/or energy utilities.
    - Administration of this type of program may be beyond the capacity and resources of some smaller municipalities. In such cases, municipalities could consider cooperating by establishing a regional agency or public corporation to administer programs. Provincial agencies could still play administrative roles, even when repayment is managed through LICs. For example, a rural electricity connection financing program in the Yukon is administered and funded by the province, but repayment is collected as an LIC on the borrower's property taxes.
- **Administrative and transaction costs:** To keep programs affordable for consumers and revenue-neutral for the municipality, administrative costs must be planned and managed carefully. For example, to avoid "free riders" it is best to charge an upfront fee for energy audits, which can be made refundable for those who actually carry through with retrofits. Similarly, the administrative

cost of financing small, inexpensive retrofits may undermine the cost-efficiency of the program, so a baseline minimum amount of financing is a feature of many existing EE financing programs.

- **Calculating cost effectiveness:**
    - **Matching cost savings with repayments:** From the economic perspective of property owners, retrofit projects make the most sense when their full cost can be recovered through savings in energy costs during the period of repayment, i.e., if repayments on the retrofit are essentially cash-flow neutral or even lower than the amount saved on utility bills. After repayment, cost-effective retrofits should of course provide consumers with significant energy savings compared to a non-retrofitted home.
    - **Interest rates:** Balancing repayments with energy cost savings means that interest rates are crucial to the viability of any retrofit program. If interest rates lead to repayments higher than the expected rate of return in energy savings, retrofits become much less appealing to homeowners.
    - **Energy prices:** Energy prices are also crucial to calculating cost effectiveness—consumers in jurisdictions with low energy costs will generally take longer to recoup the cost of retrofit investments, and repayment times would need to be lengthened to balance energy cost savings with retrofit repayments. However, calculations should take into account expected energy price hikes; a retrofit that is not cost effective in its initial year could nonetheless lead to big savings if energy prices rise by 25% over a 5- or 10-year period of repayment.
- **Retrofit evaluation, audits and certification:** To ensure the effectiveness and value of retrofit work for programs and participants, a clear, effective audit, certification and/or inspection process is necessary.

    Provincial-level energy-efficiency and retrofit programs in Canada have to date generally piggybacked on the evaluation system and auditors certified under the federal ecoENERGY Retrofit for Homes program. The EcoENERGY model combines inspections by energy auditors licensed by Natural Resources Canada (NRCan) with a pre-approved list of eligible improvements. Vancouver will be using NRCan inspections for its municipal program, though only funding a specific range of proven, cost-effective measures recommended through the NRCan audits.

    While some concerns have been raised about the consistency of evaluations carried out under federal programs, the system nonetheless provides an established infrastructure for municipalities looking to launch programs in the immediate future and facilitates relatively simple harmonization with federal and provincial incentive programs. Over the longer term, provincial and federal agencies may need to improve and update building efficiency standards and training for auditors.
- **Retrofit financing for rental and multi-unit housing:** Retrofit financing programs are easiest to implement in owner occupied, single detached houses and rental buildings where the owner (rather than tenants) are responsible for energy costs, but strategies are being developed to address chal-

lenges around retrofitting owner-occupied multi-unit housing and rental buildings where tenants pay the energy bills.

- **Rental housing and "split incentives":** Encouraging energy retrofits in some rental buildings can be challenging because of what are commonly called "split incentives."In rental housing where tenants pay heating bills, landlords have little economic incentive to reduce heating costs. Tenants are not legally in a position to carry out structural renovations and likely would not want to pay for improvements on a property they don't own and may only be living in for a short period of time.

  While this problem make some types of LIC and on-bill financing unfeasible, financing models have been developed which address some of the problems of split incentives. One example is Kansas City's on-bill tariff program, which overcomes the split incentive problem by attaching retrofit repayments to the electric meter, so the responsibility can be passed from tenant to tenant (see the case study on page 81 - 83 for more information). Nonetheless, split incentives are an important challenge to retrofit financing, and in many cases will require policy measures beyond just energy-efficiency financing.
- **Multi Unit Residential Buildings (MURBs):** Condos and similar types of owner-occupied, multi-unit buildings occupy a large and rapidly growing segment of the housing market in urban Canada and present some challenges for designing municipal retrofit financing programs. A 2010 report from the UBC Sauder School of Business identifies some of these issues and proposes potential solutions.[48] While the Sauder report is focused specifically on the context of Vancouver, it may offer starting points and ideas for municipalities elsewhere in the country.

  Obstacles to energy efficiency financing for condos and other MURBs

  - Financial institutions are often hesitant to lend to strata corporations because corporations do not "own" common property and cannot give conventional mortgage security.
  - Condo owners tend to own their units for shorter durations than single-family homeowners, which can make it more difficult for them to recoup the cost of a retrofit through energy savings before moving.
  - Strata regulations often require relatively high thresholds of member approval (as high as 75%) to make nonessential building renovations, which means winning over a significant number of people who may not understand the benefits of energy retrofits.

  Potential solutions for MURBs

  - On-utility bill financing that is charged to the strata corporation could help overcome difficulties obtaining financing, but would require clear provincial legislation facilitating on-utility bill financing.
  - Financing could be secured through Local Improvement Charges or similar property tax repayment mechanisms attached to a strata's property tax, which would lessen default

rates and exposure for lenders.

- Capital could be acquired from utility companies and other sources (rather than private financial institutions) and pooled in a green fund administered by the city.
- Energy efficiency education and promotional strategies could be developed that specifically target MURBs and strata councils.

Minimizing financial risk and exposure: A survey of energy-efficiency financing programs by the UBC Sauder School of Business found that default rates in all types of efficiency financing programs were quite low — in the range of 1% to 3% — with property secured mechanisms like LICs having some of the best performance.[49] Nonetheless, good program design can further reduce risk for all parties involved.

- **For all parties:** Limiting the amount of financing to a low percentage of the total property value helps minimize the risks for municipalities, lenders and homeowners. Retrofits carried out under the federal EnerGuide for Homes program, for example, cost less than $7,000 to realize efficiency gains in the range of 25% to 35%. Even in the event of default, an amount this size is unlikely to have significant impact on a mortgage lender and would likely be offset by the increased resale value of the retrofitted property.
- **For municipalities:** Because LIC-based financing mechanisms are attached to a property (rather than an individual) and repaid as a charge on property taxes that is generally secured by a priority lien, municipalities face little risk of exposure in the event of default.
- **For mortgage lenders:** While some concerns have been raised about risks for mortgage lenders because of the LICs generally involve priority liens in cases of homeowner default, programs can be designed so that these risks can be minimized. For example, property liens for LIC retrofits can be structured so that in the event of default, the municipality collects only the missed payments rather than total cost of retrofit and then transfers the remainder of retrofit payments as continued special assessment to the new owner of the property. In the event of default and resale, mortgage lenders are also likely to benefit from the value added to the property by the retrofit.
- **For homeowners:** While amounts required for basic energy-efficiency retrofits are relatively small and unlikely to push a homeowner into default, even the perception that people were being pushed into default is problematic. To avoid this, municipalities could include emergency refinancing options in LIC programs for individual property owners whose ability to repay is hindered by unavoidable financial hardship. Berkeley, California included refinancing contingency mechanisms in their own pilot project for precisely this reason. Municipalities could also offer homeowners some form of "tax holiday"' on any increase in home value directly attributable to the retrofit.

Minimizing impact on municipal balance sheet/credit rating: Direct financing of these projects by

municipalities from reserves could of course have implications for the city budget, and depending on the scale and administrative structure of the projects, direct borrowing could have implications for the municipality's available credit and credit rating.

However, a number of reports have suggested ways financing can be structured, with the help of senior levels of government, to minimize impacts on municipal balance sheets and credit ratings.

- A report prepared for CMHC in 2009 proposed that if "the federal government were to guarantee the loan from [a federal loan fund for energy efficiency and renewable energy] to the municipality, that loan may be accounted for differently. A government-guaranteed loan may not actually add to the municipal debt ratios."[50]
- Research from the Pembina Institute notes that "some provinces have provincial financing authorities that provide financing to municipalities for municipal works or other projects and programs. In some cases, if there is full recovery of costs from the beneficiaries, these loans are not treated as a debt."[51] This is already the case for municipalities in the province of Ontario and under the Vancouver Charter and possibly in some other Canadian jurisdictions.
- Another way to keep overall debt levels low is to finance EE retrofits through a revolving fund that only makes new financing as repayments roll in from earlier projects. This approach keeps the level of municipal borrowing for the program at a fixed level. However, depending on the size of the revolving fund and rate of repayment, may slow or restrict the uptake of retrofit projects.

Promotion, marketing and public education: Community engagement and clear, effective communications are crucial to the success of these types of programs. EE retrofit programs clearly won't work if people don't know about them or don't understand their economic, environmental and personal benefits. Likewise, support will be difficult to build if the public misunderstands an LIC-financed program as a "new tax," or overestimates the level of financial risk involved to the municipality.

- **Promotional strategies, messages and materials also need to be adapted for particular target groups.** For example, strata-title multi-unit residential buildings in BC require 75% approval to go ahead with nonessential renovations[52], and the strategy for bringing people on board may differ from what attracts owners of detached single-family homes.
- **Some key messages to communicate include:**
  - Program participation is entirely voluntary and not a new "tax."
  - The program is self-sufficient and not "subsidized" by nonparticipating residents.
  - The program operates at full cost recovery and minimal risk to both the municipality and individual property owners.
  - Retrofits reduce energy bills and save homeowners money.
  - Energy efficiency is the quickest way to do something about climate change at the community level.

  - Retrofits create good local jobs, encourage local spending and can stimulate or even help launch new local industries.
- **Municipalities can build support for retrofit programs and also find partners to help promote established programs by engaging key stakeholders, including:**
  - Environmental organizations.
  - Community associations.
  - Building trades and other unions.
  - The not-for-profit sector, including employment training programs and other social enterprises.
  - Business associations, including:
    - Chambers of commerce — the Halifax Chamber of Commerce, for example, has endorsed the solar installation financing program established in that city).
    - Real estate boards — the Toronto Real Estate Board, for example, has endorsed an LIC-based retrofit model in Ontario.
    - Homebuilders and building contractors' associations.

POLICY IDEAS FOR BUILDING AWARENESS AND DEMAND FOR EFFICIENCY RETROFITS

Mandatory energy-efficiency audits for real estate sales and major renovations

One way local and provincial governments can boost public awareness and demand for home energy-efficiency measures is to require mandatory energy-efficiency audits when homes are put up for sale or as a condition for approval of major home renovations. Home energy labeling is already mandatory in some jurisdictions, including the UK and California. Municipal examples include the city of Austin, Texas, which has an Energy Conservation Audit and Disclosure (ECAD) ordinance for the sale of homes and buildings that receive electricity from the local energy utility.

Ontario's Green Energy Act originally proposed the introduction of mandatory energy audits on all homes going up for sale in order to help create demand for features that reduce consumption of heating fuel and electricity. Unfortunately, the province withdrew the proposal because of pressure from some elements within the real estate industry.

Energy and water conservation kits

Strategies can also be developed that package program promotional material with low-cost conservation kits— often a box containing items such as low-energy light bulbs, digital thermostats and/or low-flow shower heads, or sometimes even a voucher for a reduced-cost energy-efficiency audit. Babylon, New York for example, promoted its retrofit program with a mail out package that included free compact fluorescent light bulbs, an energy-efficiency tips booklet and information on how to apply for the town's energy-efficiency financing program.[53]

This model can be used to help build demand for a specific retrofit program, or can serve as a stand-alone program that creates savings through individually small but cumulatively significant energy savings. For example, the Australian state of Queensland has reached more than 240,000 households since 2009 with a package that includes the installation of an energy efficient shower head, CFL light bulbs, an electrical inspection and a simple digital power monitor. Homeowners pay $50 for the package to help cover some of the program costs. All together, program participants have so far saved as much as $78 million on power and water bills and reduced greenhouse gas emissions in Queensland by up to 4.3 million tonnes.[54]

At the municipal level in Canada, the District of Saanich, BC has worked with the nonprofit organization City Green Solutions to launch a similar program that allows residents to exchange their old inefficient shower heads for a free energy-and-water savings kit.[55] The Saanich Tap by Tap kit includes a high-efficiency shower head, kitchen and bathroom faucet aerators, a shower timer, thread seal tape, installation instructions and a water efficiency booklet. The district estimates that the average participating household will reduce energy consumption by 1558 kw/hours per year, water usage by 41,975 litres per year, and save between $70 and $137 in annual utility costs. In addition to their direct impact on energy and/or water consumption, these types of programs can also raise public awareness around conservation issues and pave the way for more ambitious programs in the future.

PROMOTING RETROFITS THROUGH COMMUNITY OUTREACH AND COMMUNITY PARTNERSHIPS

Successful retrofit programs often combine efforts to overcome financial barriers with efforts to overcome information barriers. Some programs have had better success reaching potential participants using community-based outreach and mobilization strategies rather than traditional marketing approaches. Community-based approaches emphasize face-to face interaction and partnerships with trusted local organizations, such as neighbourhood associations, churches and Parent Teacher Associations.

In addition to increasing public interest in retrofits, these approaches provide opportunities to build demand in specific neighbourhoods, allowing for bulk purchasing and economies of scale in retrofit work.

Mini case study: Changing the climate in Cully (Portland, Oregon)

> "Our church is proud to be part of this wonderful opportunity for the Cully neighborhood. Through this effort we can reduce energy bills, foster economic security, and increase home comfort and value for our parishioners and Cully families. Best of all, neighbors are uniting here today to improve their community."
>
> — Joan Winchester, Pastoral Associate with
> St. Charles Borromeo Catholic Church in Portland, Oregon[56]

"Changing the Climate in Cully" is an innovative, community-based organizing campaign to recruit homeowners from a lower-income neighbourhood to participate in Portland, Oregon's residential energy retrofit program.

In spring 2010, Clean Energy Works Portland awarded a $20,000 grant for outreach and marketing to a coalition of community groups led by the Metropolitan Alliance for Common Good (MACG), with an end goal of delivering 140 energy assessments and 100 full home energy-efficiency retrofits. Key partners in the coalition include the St. Charles Borromeo Catholic Church, the Laborers International Union of North America, Cully Association of Neighbors, a social enterprise called Verde Inc., the Native American Youth and Family Center, and the local chapter of the Sierra Club.

MACG and its partners developed a community-based organizing campaign that focused on delivering personalized messages to homeowners in the Cully neighborhood, using community meetings, door-to-door canvassing, phone calls, and other visibility and grassroots marketing efforts. The project partnered with six contractors to carry out retrofit work on homes in the neighbourhood. All contractors are locally based and half are woman- or minority-owned businesses. In order to maximize community benefits, new workforce members were recruited locally from disadvantaged populations. By the end of 2010, 221 applications had been submitted, with 109 energy assessments completed, and 19 loans signed.

For more details, see: www.greenforall.org

Further Reading and Key Resources

While our report provides a starting point for looking at municipal financing for energy-efficiency retrofits in Canada, a number of other organizations have produced excellent research and policy recommendations for those wanting to further explore these concepts.

David Suzuki Foundation: Two reports published by the David Suzuki Foundation in 2011 provide up-to-date and detailed research available on municipal LIC-based retrofit financing program design and implementation in Canada. While the reports focus on Ontario, much of the research is applicable to other Canadian jurisdictions. Both reports are available online:

- Sonja Persram [Sustainable Alternatives Consulting Inc.].Property Assessed Payments for Energy Retrofits: Recommendations for Regulatory Change and Optimal Program Features. David Suzuki Foundation. www.davidsuzuki.org/publications/reports/2011/property-assessed-payments-for-energy-retrofits/index.php. April 2011.
- Sonja Persram [Sustainable Alternatives Consulting Inc.].Property Assessed Payments for Energy Retrofits and Other Financing Options. David Suzuki Foundation. In press, 2011.

Pembina Institute is a sustainable energy research, advocacy and consulting organization that has produced important research on LIC-based energy efficiency/renewable energy financing opportunities for Canadian municipalities. Key reports from Pembina include:

- Peters, Roger, Johanne Whitmore and Matt Horne. Using Local Improvement Charges to Finance Energy Efficiency Improvements: Applicability Across Canada. The Pembina Institute. http://www.pembina.org/pub/197. 2005.
- Peters, Roger, Matt Horne and Nicholas Heap. Using Local Improvement Charges to Finance Building Energy Efficiency Improvements: Concept Report. The Pembina Institute http://www.pembina.org/pub/170. 2004.

UBC's Sauder School of Business has published two reports on municipal energy-efficiency financing:

- Addressing the Barriers to Energy Efficiency in Vancouver. isis.sauder.ubc.ca/files/2010/08/Addressing-the-Barriers-to-Energy-Efficiency-in-Vancouver.pdf
- Case studies of energy-efficiency financing programs. isis.sauder.ubc.ca/files/2010/08/Summary-of-Energy-Efficiency-Financing-Program-Interviews.pdf

Canada Mortgage and Housing Corporation Consultants Report

This report outlines options for a federal loan fund that would allow municipal borrowing at low rates to make retrofit financing available to homeowners at below standard market interest rates.

- Martin Tampier. A Canadian Loan Fund for Residential Energy Efficiency and Renewable Energy Preliminary Business Plan & Backgrounder. Canada Mortgage and Housing Corporation. http://www.envint.ca/files/Final%20Report%20March%2020%202009.pdf. 2009.

SECTION 2:

Provincial contexts for retrofit financing programs (Organized from West to East)

British Columbia

Emissions from residential space heating, space cooling and hot water:

4.54 Mt of CO_2e

6.8% of provincial total

Keys to Moving Forward

- Municipalities outside Vancouver need clarity from the provincial government regarding the use of Local Improvement Charges to finance energy-efficiency improvements on private property.
- Individual municipalities or the UBCM could formally request that the province approve the use of LICs for this purpose or pass any necessary legislative changes. Halifax used a similar approach to get municipal charter changes permitting its LIC-backed residential solar program.
- On-utility bill financing may require legislation that allows retrofit financing charges to be transferrable upon change of ownership.[57]
- Utility companies' charters may need to be changed, as BC energy utilities are currently only able to fund programs that reduce usage of the specific type of energy they supply.[58]
- Municipalities outside Vancouver would benefit from legislative amendments allowing them to record money borrowed to fund full cost-recovery local improvement projects separately from regular municipal debt. Vancouver already has this capacity under its Charter, as do municipalities in Ontario (see Appendix B).
- Legislative amendments may be required to allow LIC-backed retrofit financing to stay attached to a property (rather than the owner) upon resale of a home. Vancouver encountered barriers to this mechanism in the development of its retrofit pilot program.

Overview

Interest in the use of LICs to fund energy-efficiency retrofits has been strong in BC, but it has been difficult for municipalities to actually launch such programs because of ambiguity in provincial legislation and regulations. The City of Vancouver, which has greater latitude through its separate municipal charter, is planning in 2011 to become the first municipality in Canada to successfully launch a retrofit financing program using a property assessment–based repayment mechanism (see details in box below).

Local Improvement Charges

A number of analyses have indicated that the use of LICs as a financing mechanism for residential clean-energy measures is within the authority of BC municipalities, but the provincial government has not so far been supportive of efforts to launch pilot projects.

An analysis of the BC Community Charter by the Pembina Institute in 2005 found that there were no strictly legal impediments to municipalities funding energy-efficiency improvements. Likewise, a 2007 legal opinion commissioned by the District of Central Saanich found that the definition of local area services under the BC Community Charter is broad enough to likely give BC municipalities the authority to finance energy-efficiency improvements on private property. According to the opinion, it can be argued that energy-efficiency improvements provide "benefit to a part of the municipality" (the Charter criterion for financing improvements) from an environmental point of view and financially through reducing conventional energy demand, and thus reducing the need for infrastructure improvements such as new transmission lines, etc.

While these interpretations are favourable, the Ministry of Community and Rural Development has yet to make any public statement on whether the provincial government would consider this type of program a legitimate use of the LIC mechanism. For LIC-based retrofit financing to get off the ground outside of the City of Vancouver, BC municipalities need formal clarification from the Ministry of Community and Rural Development. If the province doesn't approve, then organized advocacy to amend relevant legislation and/or regulations will likely be necessary.

On-Bill Financing

The structure of BC's energy utility sector suggests limitations on the direct role of municipalities in any on-bill financing programs. Publically owned BC Hydro provides electricity to 94% of the BC population, while Terasen Gas (a private utility owned by Fortis) supplies 96% of natural gas users. While municipalities could potentially form partnerships with BC Hydro or Terasen to administer on-bill retrofit repayment programs, in most instances the structure of the utility sector seems better suited to on-bill programs administered by the province or the utilities themselves. Manitoba Hydro, for example, operates a successful on-bill financing model that could provide a starting point for a similar BC program (see page 42 for more information). However, a small but growing number of BC municipalities are operating district energy systems that could potentially provide on-bill retrofit financing to customers.

MUNICIPAL RESIDENTIAL ENERGY RETROFIT PILOT PROJECTS IN BC

Vancouver's Energy Efficiency Financing pilot project: The City of Vancouver plans to launch a pilot program for property tax based residential retrofit financing in 2011. Vancouver's Energy Efficiency Financing pilot will finance up to 500 energy-efficiency retrofits in single family homes, using a revolving capital fund backed partly by the City of Vancouver, a financial institution and a private foundation. The program is designed to be self-financing, have minimal risk exposure, and no net cost to city taxpayers.

Program participants will be able to choose from a select range of retrofit options recommended by an NRCan energy audit. The use of NRCan audits will facilitate easier coordination with federal and provincial retrofit programs. The City's goal is that program participants will be saving more on utilities than they pay in financing charges and repayments.

Vancouver is also investigating financing options for retrofits of multi-unit residential buildings.

Dawson Creek: The City of Dawson Creek has worked with the Pembina Institute to develop plans for an LIC retrofit pilot project. Unfortunately, the pilot was put on hold because of unrelated local political challenges and a lack of clarity to date from the ministry regarding the use of LICs for this purpose. For more information, contact the Pembina Institute at: www.pembina.org/bc

Sources of Capital

MUNICIPAL FINANCE AUTHORITY

With the exception of the City of Vancouver, BC local government borrowing longer than five years must be undertaken through the Municipal Finance Authority. The MFA is able to provide loans at well below regular market rates and would likely be the cheapest source of capital available.

Municipalities can borrow through the MFA to finance local improvements, as long as the full cost is recovered. It is unclear whether the LIC financing could be used to fund improvements on private commercial property, as it could be argued that this is a "business subsidy" from the municipality, which is prohibited under the BC Community Charter. In some cases, municipal borrowing requires a referendum or other electoral assent process, depending on amount borrowed and ability to pay (based on a formula involving existing debt levels, lease obligations, etc).[61]

As MFA loan approval is sometimes lengthy and complex, the province and municipalities could work with the MFA to develop an expedited borrowing process for cost recovery, LIC retrofit programs. If necessary, the province could also remove referendum/elector assent requirements for LIC retrofit programs, as long as the programs minimize risk to the municipality through full cost-recovery design, financing secured by priority liens and voluntary program participation.

OTHER SOURCES OF CAPITAL

The scale of BC's electric and natural gas utilities and their respective stakes in energy conservation raises the possibility of them acting as banks to capitalize retrofit projects, either in cooperation with municipalities or in some type of province-wide program.

Similarly, the scale and social mission of BC's credit union financial sector raises the possibility of cooperation between municipal governments, the province and credit unions to develop affordable retrofit financing options. Some credit unions are already interested in financing energy-efficiency measures; at the time of writing, Vancity Credit Union offered a Bright Ideas Home Renovation Loan that provides energy-efficiency low-interest renovation financing for improvements recommended by an ecoENERGY Retrofit evaluation of their home.

PILOT PROJECT FINANCING

While the options for large program financing are limited, funding for smaller-scale pilot projects could come from any number of sources. Vancouver's LIC pilot project, for example, will be capitalized with private capital and have administrative help from a financial institution.

Dawson Creek was investigating funding from the FCM Green Municipalities Fund for its LIC retrofit pilot, and FCM GMF funding will be used to back an LIC for renewable energy project in Nova Scotia (see p. 56).

PRECEDENTS FOR PUBLIC FINANCING OF HOME IMPROVEMENTS IN BC

"Leaky Condo" Repair Loans (Homeowners' Protection Office)

The provincial Reconstruction Loan Program established to remedy BC's leaky-condo crisis provides a precedent of publically backed financing for improvements on private property. While the context is obviously somewhat different, the GHG emissions reductions and energy savings from efficiency retrofits on private property can be argued, much like the prevention of mass foreclosures and the prevention of public health problems related to building envelope failure, "public goods" that benefits the general community. While HPO financing support was most often in the form of interest relief and other assistance for homeowners securing affordable private sector financing, in some cases (most often for seniors with no existing mortgage), the HPO provided a type of direct, property-secured financing in the form of a deferred payment loan which homeowners didn't have to repay until selling their home.[59]

BC Hydro Home Improvements Program (1990–2002)

BC Hydro operated a province-wide on-bill financing program that financed more than 26,000 energy-efficiency retrofits from 1990 to 2002.[60] The Home Improvements Program (HIP) provided a free audit, a $1,000 rebate for energy-efficiency improvements, and a below-market interest rate for on-bill financing on the balance. The program was cancelled because it was not seen as cost-effective or able to operate on a cost-recovery basis at the time, in part because

of relatively low energy prices during the program's time in operation and also because of high program costs related to rebates, full interest subsidies and the financing of non-necessary retrofit measures to attract consumers. Manitoba Hydro has avoided some of these problems in a similar on-bill financing program in that province, which has operated successfully since 2001 (see the Manitoba section of this report for more details).

Resources

Pembina Institute is a sustainable energy research, advocacy and consulting organization that has produced important research on LIC-based energy efficiency/renewable energy financing opportunities for Canadian municipalities. Pembina's BC office has worked with the City of Dawson Creek to draft plans for an LIC retrofit pilot project. http://www.pembina.org/bc/community

UBC Sauder School of Business report on "Addressing the Barriers to Energy Efficiency in Vancouver" that outlines potential LIC-based retrofit financing option for Vancouver.
isis.sauder.ubc.ca/files/2010/08/Addressing-the-Barriers-to-Energy-Efficiency-in-Vancouver.pdf

Community Energy Association supports local governments throughout BC in accelerating the application of energy efficiency and renewable energy in community design and infrastructure.
www.communityenergy.bc.ca/

BC Sustainable Energy Association promotes the use of sustainable energy to the people of British Columbia and has been supportive of the LIC retrofit financing in budget submissions to the provincial government. BCSEA has also identified strategies for dealing with the problem of split incentives through its Green Landlords Project. www.bcsea.org/

BC Hydro's Electricity Conservation & Efficiency Advisory Committee formally recommended in November 2009 that BC Hydro begin promoting and adopting LIC and on-bill financing strategies for funding energy-efficiency measures in BC.
www.bchydro.com/etc/medialib/internet/documents/stakeholder_engagement/2009_annual_report.Par.0001.File.2009_ece_advisory_committee_annual_report.pdf

Alberta

Emissions from residential space heating, space cooling and hot water:

10.498 Mt of CO_2e
4.3% of provincial total

Keys to Moving Forward

- The Municipal Government Act defines local improvements flexibly, which could open the door to the use of LICs for energy-efficiency improvements without changing the existing legislation.
- Individual municipalities or the AUMA could request that the province give formal permission to use LICs for energy-efficiency financing. Clarity from the province would reduce uncertainty and increase the appeal of the concept for Alberta municipalities.

Overview

Alberta is a promising candidate for experimentation with innovative residential retrofit and renewable energy financing models. The province has the highest overall GHG emissions in the country, and the second highest GHG emissions from residential heating, cooling and hot water. Alberta has relatively flexible legislation governing Local Improvement Charges, and the provincial government's climate action nonprofit has indicated interest in the use of LICs to finance retrofits and other clean-energy measures. In addition, Alberta has two large municipally owned energy utilities that could potentially be directed to back and/or administer on-bill financing programs.

But despite these apparent incentives and advantages, no LIC or on-bill financing programs have so far been launched in Alberta. Co-operation from the Alberta Ministry of Municipal Affairs and clarification or amendment of legislation governing the use of LICs seem to be the key requirements for moving ahead on energy retrofit financing.

Local Improvement Charges

An analysis by the Pembina Institute in 2005 concluded that the wording of the Alberta Municipal Government Act is flexible enough to allow municipalities to define energy-efficiency retrofits as eligible "local improvements." Climate Change Central, a nonprofit established by the Alberta government to help take action on climate change proposed LIC retrofit financing pilots as an option in its 2007–08 business plan and joined BC Hydro in commissioning a Pembina Institute report on LIC financing in 2004.[62]

However, the ministry responsible for municipal affairs told Pembina researchers that they felt use of LICs in this way was "against the spirit" of the Act.[63] Moving ahead with any LIC-financed retrofit project on private property in Alberta will need regulatory clarification or explicit permission from the provincial government.

On-Bill Financing

Edmonton and Calgary both own large energy utilities, which raises the potential for municipally led on-bill retrofit financing programs. Further research will be required to ascertain any legislative or regulatory measures necessary to move ahead on that type of program in Alberta.

Sources of Capital

Alberta municipalities can borrow at low rates through the Alberta Capital Finance Authority to finance local improvements, subject to approval based on the debt level of the municipality. Voter assent is required if there is a petition against a borrowing bylaw.

Resources

Pembina Institute is a sustainable energy research, advocacy and consulting organization that has produced important research on LIC-based energy efficiency/renewable energy financing opportunities for Canadian municipalities. www.pembina.org/alberta

RePower Alberta: RePower Alberta is a campaign launched by the Sierra Club and Greenpeace calling on the Alberta Government to implement a Green Energy Strategy, including energy conservation measures. www.repoweralberta.ca

Alberta Federation of Labour: The AFL worked with leading environmental groups to produce a report on green job opportunities in Alberta, which includes information on the potential environmental and economic benefits of home energy retrofits in the province.
www.afl.org/index.php/View-document/114-Green-Jobs-It-s-time-to-build-Alberta-s-future.html

Climate Change Central is a nonprofit established by the Alberta government. CCC proposed municipal LIC retrofit pilot projects as an option in its 2007–08 business plan and also co-funded a report on LIC financing from Pembina Institute in 2004. www.climatechangecentral.com/

Saskatchewan

Emissions from residential space heating, space cooling and hot water:

2.342 Mt of CO_2e
13% of provincial total

Keys to Moving Forward

- There are no specific barriers to the use of LICs for energy efficiency projects in the wording of Saskatchewan's *Northern Municipalities Act, Rural Municipality Act,* 1989, *Urban Municipality Act,* 1984 or the *Local Improvements Act*, 1993.[64]
- Clarification from the provincial government could be requested by individual municipalities, SUMA and/or SARM, or an individual municipality could take a bylaw for an LIC retrofit financing program to the Municipal Board for a decision.

Overview

Saskatchewan's legislation governing the use of LICs is relatively flexible, and a director of the province's Office of Energy Efficiency indicated in 2005 that he felt legislation could be adapted to allow the financing of energy-efficiency measures on private property.

In addition to apparent interest in LIC measures with at least one provincial agency, Saskatchewan's electric and natural gas Crown corporations are already involved in financing specific residential energy efficiency and renewable energy measures. This mandate could potentially be extended into on-bill financing programs or perhaps contributions to a capital pool for municipally administered LIC-based retrofit financing programs.

Local Improvement Charges

Independent analysis from the Pembina Institute and comments from a Saskatchewan provincial agency spokesperson both suggest that LIC-based retrofit financing could be an option in Saskatchewan.

A 2005 analysis by the Pembina Institute found no strictly legal impediment to adding EE/RE improvements to the list measures that could be funded through LICs, though any enabling bylaw for such a project would have to be approved by the Saskatchewan Municipal Board. The analysis also found that there is no explicit wording saying local improvements cannot be located on private property, but some municipal staff felt that the current legislation wasn't drafted with the financing of private buildings in mind.

That same year, the director of Saskatchewan's Office of Energy Conservation delivered a presentation suggesting that the Saskatchewan *Local Improvements Act* is flexible enough to add or consider improvements not defined in current legislation. However, he felt that legislation would need to be changed to authorize financing to be provided for privately as opposed to publicly owned works and services.[65]

On-Bill Financing

Two Crown corporations, SaskPower (electricity) and SaskEnergy (natural gas) provide the vast majority of energy used in residential and commercial buildings in Saskatchewan. While neither at present operates a specific on-bill financing program per se, they do provide reduced interest rate loans and flexible repayment on loans for specific efficiency and renewable energy measures (see descriptions below). On-bill financing for retrofits could be seen as in keeping with these existing programs, as would capitalizing or providing guarantees for a capital pool that municipalities could draw upon for LIC-based programs.

Two Saskatchewan municipalities — Saskatoon and Swift Current — do own energy utilities, opening up the potential of offering efficiency retrofit programs for local customers. Further research will be required to ascertain any legislative or regulatory measures necessary to move ahead on that type of program in Saskatchewan.

SASKATCHEWAN UTILITIES AND ENERGY EFFICIENCY/RENEWABLE ENERGY FINANCING

Energy utilities in Saskatchewan are already offering financing for a limited range of energy efficiency and renewable energy measures. While these measures are a good start and could be included in programs elsewhere, the limited range of projects presently financed means there are still a lot of ways municipalities could get involved in residential energy-efficiency improvements.

ENERGY STAR Loan Program

SaskEnergy offers loans of up to $15,000 at prime + two per cent, with no money down, on the purchase of qualifying ENERGY STAR furnaces, boilers and other high-efficiency natural gas appliances from August 1, 2010 to March 31, 2011.

Geothermal and Self-Generated Renewable Power Loan Program[66]

SaskPower offers loans of $1,000 to $50,000 for residential and farm customers who choose to install a Canadian Geoexchange Coalition (CGC) certified geothermal heating and/or a renewable electricity system in a new home or during a retrofit. SaskPower will subsidize the interest rate by 3.5 per cent.

Sources of Capital

The best borrowing option currently available to Saskatchewan municipalities is through Saskatchewan Municipal Financing Corporation, which allows local authorities to borrow for capital projects at competitive interest rates with flexible borrowing terms.[67]

Saskatchewan Municipal Board (SMB) approval is required for any MFC loan, and may be required for other long-term debt (any debt not payable within the current year), depending upon how the

money is being borrowed, the term of the debt and the municipality's current financial situation.[68]

SMB approval is also required to authorize any municipal borrowing where the borrowing will cause the municipality to exceed its debt limit, is not repayable within three years or is secured by the issue of municipal debentures.

A dedicated provincial fund or capital pool was suggested as an option by municipal staff surveyed by the Pembina Institute in 2005.[69] In addition, financing efficiency retrofits could be seen as an extension of SaskPower's and SaskEnergy's pre-existing involvement in other efficiency and renewable loans programs.

Saskatchewan's cooperative and credit union sector may also present opportunities for partnerships in this type of financing program.

Resources

Local Improvement Charges — A Potential Tool for Sustainable Community Financing. Presentation by Grant McVicar, Director, Office of Energy Conservation and Director, Climate Change Saskatchewan at Road Map 2020 conference November 17, 2005.
Available online at www.roadmap2020.ca/forum/lics.ppt

Pembina Institute is a sustainable energy research, advocacy and consulting organization that has produced important research on LIC-based energy efficiency/renewable energy financing opportunities for Canadian municipalities. www.pembina.org/

The Saskatchewan Environmental Society is a nonprofit with an interest in energy conservation and a strong track record in policy development, education and implementing demonstration projects.
www.environmentalsociety.ca/

Manitoba

GHG emissions from residential space heating, space cooling and hot water

1.116 Mt of CO_2e
5.3% of provincial total

Keys to Moving Forward

- Manitoba Hydro offers a province-wide efficiency retrofit loan program and other incentives, so municipal programs need to be planned to coordinate with and compliment existing programs.
    - Possibilities include renewable energy measures such as residential solar hot water installations or other measures not financed by Manitoba Hydro.
- There are no specific barriers to the use of LICs for energy efficiency projects in the wording of the Municipal Act or the Winnipeg Charter.
- Individual municipalities or provincial municipal associations could seek formal permission from the province, or bring a bylaw for an LIC-based energy efficiency/renewable energy project to the provincial municipal board for approval.

Overview

Manitoba Hydro already offers on-bill financing through their Power Smart Residential Loan program, which has provided at least 41,000 residential energy-efficiency loans since 2001. The participation rate of 2% of residential customers each year is one of the best in North America for this type of program and may offer useful lessons for on-bill financing programs elsewhere (see box below for details). In addition to energy-efficiency financing, Manitoba Hydro has also started offering loans to assist homeowners with the cost of installing a geothermal heat pump.

Given the success of the existing province-wide energy-efficiency loan programs, a municipal role in basic residential retrofit financing may not be necessary in Manitoba. If Manitoba municipalities want to get involved in energy efficiency or clean-energy financing, they could potentially play roles in financing more expensive "deep energy retrofits" or residential renewable energy measures beyond the scope of existing programs. See Halifax's residential solar hot water installation pilot program (page 56 of this report) for an example of how municipalities can support more advanced residential clean-energy measures.

Local Improvement Charges

Pembina Institute research from 2005 indicates that Manitoba's legislative framework could allow LIC-financed energy efficiency/renewable energy programs. According to the Pembina analysis, EE/RE could be treated as "capital projects," but would need approval from the Manitoba Municipal Board.

In addition, the Winnipeg Charter allows for the designation of Local Improvement Districts that could be applied to energy efficiency/renewable energy improvements. While clarification from the province would likely be required, this nonetheless gives municipalities a starting point for the investigation of clean-energy financing measures beyond the scope of Manitoba Hydro programs.

Sources of Capital

Manitoba Hydro's scale and conservation mandate make it a potential source for municipal programs, though a clear rationale would be required for why municipalities would administer programs rather than Hydro instead expanding the scope of its own financing programs.

Every proposed borrowing by a municipality must be approved by the Manitoba Municipal Board. The Board reviews the nature of the proposed project, the financial position of the municipality and the necessity or expediency of proceeding with the project. The Board issues an Order either approving, rejecting, or varying the bylaw. A hearing is held if objections are made to a borrowing bylaw by taxpayers that will be affected by the bylaw.

MANITOBA HYDRO'S SUCCESSFUL ON-BILL FINANCING PROGRAMS

Power Smart Residential Loan

Manitoba Hydro's Power Smart Residential Loan provides up to $7,500 per residence for measures including adding insulation, sealing air leaks, replacing windows and doors, electrical service and wiring, upgrading the efficiency of an existing furnace or water heater and solar water-heating systems.

The minimum loan is $500, and no down payment is required. The maximum term is 60 months, and the minimum monthly payment is $15. Annual interest rate is fixed at 4.9%. Loans are repaid as monthly installments on participants' energy bill, and owners, rather than tenants, are responsible for repayment. The loan becomes due and payable when the house is sold.

Since 2001, at least 41,000 loans and $167 million have been distributed through the program. 2007 loan volume was 8,100 loans with an average value of $4,800 and the participation rate of 2% of residential customers each year is one of the best in North America. Manitoba Hydro says the default rate is lower even than expected and below the default rate of typical banks loans in Canada.[70]

Residential Earth Power Loan

Manitoba Hydro also offers the Residential Earth Power Loan, which provides loans of up to $20,000 to assist homeowners with the cost of installing a geothermal heat pump. Interest is 4.9% (initial five-year fixed term) and the maximum term is 15 years.

Resources

Manitoba Hydro Residential Power Smart Savings, Rebates and Loans programs.
www.hydro.mb.ca/savings_rebates_loans.shtml

UBC Sauder School of Business report that includes an overview and program information for Manitoba Hydro's residential loan program.
http://isis.sauder.ubc.ca/files/2010/08/Summary-of-Energy-Efficiency-Financing-Program-Interviews.pdf

Warm Up Winnipeg is a program delivered by Building Urban Industries for Local Development (BUILD), which focuses on making housing more affordable and environmentally friendly by lowering energy and water bills. WUW is also a training program that hires workers who are interested in gaining family supporting jobs in the construction sector. www.warmupwinnipeg.ca/

Canadian Centre for Policy Alternatives Manitoba Office. CCPA Manitoba has produced reports supporting energy-efficiency programs in Manitoba. www.policyalternatives.ca/offices/manitoba

Pembina Institute is a sustainable energy research, advocacy and consulting organization that has produced important research on LIC-based energy efficiency/renewable energy financing opportunities for Canadian municipalities. www.pembina.org/

Ontario

GHG emissions from residential space heating, space cooling and hot water

23.519 Mt of CO_2e
12.4% of provincial total

Keys to Moving Forward

- Explicit approval from the Ministry of Municipal Affairs and Housing for municipalities to use Local Improvement Charges to finance energy-efficiency measures on private property.
- OR revisions to the Ontario Municipal Act regulations.
    - Could include explicit definition of energy-efficiency retrofits as 'local improvements' in the same sense as water and sewage works and also language that defines environmental benefits and energy efficiency as "public benefits."[71]
- Advocacy by interested municipalities and/or the AMO likely the best way of moving the LIC financing concept forward with provincial government.
- Municipalities that own energy utilities could explore options for on-bill financing programs.

Overview

In absolute terms, Ontario has far and away the most GHG emissions from residential energy use and is in third place behind Alberta and Nova Scotia for residential heat, cooling and hot water as a percentage of overall provincial emissions.

The Ontario government is beginning to take action on the problem and has declared the "transition to a cleaner energy economy" to be a key policy objective, supported by measures such as investments in renewable energy generation in the 2010 Green Energy Act. While the Ontario's ambitious wind and solar generation efforts have received the most media attention, the province is also prioritizing energy conservation, with targets of 1,330 megawatt (mw) of provincial peak demand savings over a four-year period beginning January 1, 2011.[72] With the right regulatory and financing support from the province, municipally led retrofit programs could play an important role in meeting these objectives.

A number of municipalities in Ontario are already investigating municipal financing options for efficiency retrofits, and there is at least one precedent of using LICs to fund other types of improvement on private residential property. Ontario municipalities also have available some of the most thorough research on LIC energy financing in Canada, most notably two detailed reports written in 2011 by Sonja Persram for the David Suzuki Foundation.[73]

Research suggests that the key challenges in Ontario will be securing approval from the province; regulatory changes to simplify the set-up process, enable appropriate cost allocations, and or if necessary legislative and regulatory changes that explicitly permit the use of LICs for energy improvements

on private property. Changes along these lines would be facilitated in part by amendments defining residential energy efficiency and GHG reductions as 'public benefits'.

Local Improvement Charges

Unlike some other provinces, municipalities may enter into agreements to provide specific types of improvements on private property (private roads, water and sewage works, fire hydrants) due to the Ontario Municipal Act. Most recently, Hamilton has been using LIC-based financing to fund lead water pipe replacement on private residential properties, a useful precedent in that it is a use of LICs for improvements on private property to benefit public and environmental health.[74]

However, while Ontario's regulations for the use of LICs specifically name a number of measures that can be funded through LICS, they do not specifically identify energy efficiency or renewable energy measures as eligible improvements. A 2005 opinion from the Ministry of Municipal Affairs indicated that existing provincial legislation regarding LICs does not allow for the financing of energy efficiency projects on private property.[75]

The consensus in policy research on the use of LICs for EE measures in Ontario is that clarification is needed from the province, either through an official opinion from the ministry, or through regulatory change to explicitly define EE retrofits as "local improvements" in the same sense as water and sewage works. This process might also entail environmental benefits and energy efficiency being explicitly defined as "public benefits."[76] The use of LICs for retrofits may also require require a simple set-up process, modifications to costing criteria and other details within the existing regulatory framework for LICs.

A PRECEDENT FOR USING LICS FOR IMPROVEMENTS ON PRIVATE PROPERTY: HAMILTON'S LEAD WATER SERVICE REPLACEMENT LOAN PROGRAM

Hamilton's Lead Water Service Replacement Loan Program for residential property owners is a very close precedent for using LICs to finance an environmental/health improvement on private property.

Loans of up to $2,000 are available to cover all applicable estimated costs of replacing lead pipes in the owner's private service (located on private property, from the water meter to the property line).

The yearly loan amount plus applicable interest will be repayable on the final tax installment due dates, and calculated in a like manner as Local Improvement Charges are calculated.

Repayments of the loan plus interest will be made through taxes as set out in the commitment letter signed by the owner(s). The loan may be transferable to a new owner provided that the new owner agrees in writing to the terms and conditions of the loan. In the event of default in loan repayment over 30 days, or in the event of sale of the property, the outstanding balance (including principal and interest) may be immediately payable.

CURRENT MUNICIPAL RETROFIT FINANCING PROPOSALS IN ONTARIO

Mayor's Tower Renewal Project

The proposed Tower Renewal Program in the City of Toronto would set up a municipal corporation to finance and administer loans for energy-efficiency retrofits to privately owned residential tower blocks, with repayment secured through a priority lien collectable through municipal taxes.

At the time of writing, statements by the new city manager appointed by Mayor Rob Ford suggest that the City of Toronto's involvement in the Tower Renewal project may be in jeopardy. Nonetheless, it remains likely that pilot projects will go ahead, if not in Toronto, then possibly with the support of the province and/or in another Southern Ontario municipality.[77]

Ottawa Community Energy Retrofit Pilot Project

The City of Ottawa and several partners are exploring ways to use the property tax system to finance affordable energy retrofits. The program would add low-cost financing to the property tax bill, with the intent that any tax increases would be offset by energy savings.

On-Utility Bill Financing

A number of major electric utilities in Ontario — notably Toronto Hydro and Ottawa Hydro — are municipally owned, opening up the possibility of municipally led on-bill retrofit financing programs, financed and administered through local energy utilities, with repayment collected through participants' utility bills. While the administrative, financial and legal details of launching this type of program in Ontario require further research, the goal would fit well with the Ontario government's stated intention to support the expansion and intensification of local distribution company conservation programs. These types of programs have been delivered successfully at the provincial level in Canada and in a number of US jurisdictions.

Capital Sources and Financing Issues

INFRASTRUCTURE ONTARIO LOANS PROGRAM

Ontario municipalities and municipal corporations (including municipally owned energy utilities and housing corporations) can apply for low-interest loans for capital expenditures under Infrastructure Ontario's Loan Program. This is likely the least expensive capital available to Ontario municipalities, but access would of course be contingent on the redefinition of municipally funded EE retrofits on private property as "local improvements."

It is worth noting here that public sector projects eligible for Infrastructure Ontario loans already include energy conservation retrofits in public buildings, smart meter installation and alternative energy generation facilities. While Local Improvement Charge eligibility regulations would obviously have to change to allow for financing similar projects on private property, this is nonetheless a pre-

cedent for Infrastructure Ontario loans being used to finance energy efficiency and clean-energy measures.[78]

CREDIT-ENHANCED CAPITAL POOL

A report for the Toronto Tower Renewal project proposed the use of "credit-enhanced capital pool" as a source of capital for LIC-secured financing for EE retrofits on MURBs. Under this model, a municipality would create a municipal corporation or similar entity to finance individual projects, which would be pooled together and financed through bond issues to capital markets. This option would allow for risk to be shared between the pooled projects, which would improve overall credit terms. The report suggests that the city could further protect the capital pool and further reduce financing costs by "over-collateralizing" the pool with a limited investment from city funds.[79]

There do not appear to be any direct legal barriers to the municipalities acting as financing entities through the use of LICs in Ontario. As noted, the City of Hamilton is already using loans repaid as a special assessment on municipal property taxes to finance lead water pipe replacement on private residential properties. Nonetheless, the idea of municipalities providing financing has met with some concern from some City of Toronto staff and in Council discussions regarding the potential use of LICs for lead pipe replacement in that city.[80]

In addition, The City of Toronto Act prohibits the city from providing financial assistance to a city-owned corporation — this could potentially create problems if EE programs are administered through an energy utility or other municipally owned corporation (such as a specific EE retrofit administration corporation).[81] This of course has implications for the administrative model of any retrofit financing projects and would need to be addressed in provincial legislation if the city chose to establish a new municipal corporation or task an existing municipal corporation to administer a program.[82]

Resources

A number of organizations are already advocating for the use of LIC financing for energy efficiency and renewable energy in Ontario. Relevant and useful research has been produced by these organizations and also by city staff and consultants.

David Suzuki Foundation: Two recent reports for the David Suzuki Foundation by consultant Sonja Persram provide the most detailed information and recommendations available on municipal LIC-based retrofit financing program design in Ontario. A third report is forthcoming on implementation.

- **Sonja Persram** [Sustainable Alternatives Consulting Inc.].Property Assessed Payments for Energy Retrofits: Recommendations for Regulatory Change and Optimal Program Features. David Suzuki Foundation. www.davidsuzuki.org/publications/reports/2011/property-assessed-payments-for-energy-retrofits/index.php. April 2011.

- **Sonja Persram** [Sustainable Alternatives Consulting Inc.].Property Assessed Payments for Energy Retrofits and Other Financing Options. David Suzuki Foundation. In press, 2011.

Ecology Ottawa released a report in 2010 examining "Pay as You Save Loans" for investments in green energy and energy efficiency. The report was part of Ecology Ottawa's policy platform for the 2010 municipal elections. http://www.ecologyottawa.ca/webyep-system/program/download.php?FILENAME=88-8-at-PDF_File_Upload_3.pdf&ORG_FILENAME=PAYSL_policy.pdf

City of Toronto Tower Renewal Financing Options Report. This consultant's report provides useful information regarding LIC and on-bill financing policy and financing options in Ontario.
http://www.toronto.ca/city_manager/pdf/tr_financing_options_report.pdf

Pembina Institute is a sustainable energy research, advocacy and consulting organization that has produced important research on LIC-based energy efficiency/renewable energy financing opportunities for Canadian municipalities. www.pembina.org/ontario

Quebec

Emissions from residential space heating, space cooling and hot water:

4.666 Mt of CO_2e
5.7% of provincial total

Keys to Moving Forward

- There are no formal legal barriers in Quebec to LIC financing for residential energy-efficiency retrofits, but the provincial municipal affairs ministry told earlier researchers that LIC for EE was "against the spirit" of existing municipal legislation.
- Municipalities and/or the FQM could focus on advocacy for provincial permission for LIC-based financing and/or changes to existing legislation and regulations (if required).

Overview

Quebec has the highest percentage of households using electricity for heating of any province in Canada and because of Quebec's abundant hydroelectric capacity, the lowest GHG emissions intensity from electricity of any province in the country.

Nonetheless, emissions from residential space heating, cooling and hot water accounted for 5.7% of provincial emissions in 2008, mostly from the continued use of heating oil, wood and natural gas in about 45% of Quebec residences. Energy-efficiency measures, combined with transition from wood and fossil fuel heating to low-emission electricity have the potential to reduce GHG emissions from residential heating and hot water to almost zero in Quebec.

Local Improvement Charges

The primary obstacle to the use of LICs in Quebec appears to be the clarification of potential legal issues around the interpretation of energy-efficiency improvements as "municipal works" and whether municipalities can "lend" money to finance energy-efficiency improvements in private buildings.

Pembina Institute research in 2005 found that there was no strict legal impediment in the relevant sections of the *Municipal Code of Québec* dealing with Local Improvement Charges to adding EE/RE improvements, as there are no specified limitations on what municipalities can define as "improvements."

While officials from the Ministère des Affaires municipales et des Régions agreed that there was no legal barrier (as long as EE/RE measures could be defined as "municipal works"), they also told Pembina researchers that they deemed the use of LICs for such purposes as "against the spirit" of existing legislation. MAMR's primary concern, according to Pembina, was that using LICs to finance energy efficiency projects could be interpreted as a subsidy to private owners by municipalities, which is illegal under provincial law.

On-Bill Financing

Provincially owned Hydro-Québec supplies most of the province with electricity and has perhaps the "cleanest" electricity supply on the continent. Given the prevalence of electricity in residential heating in the province, Hydro-Québec would be well placed to administer on-bill financing for energy-efficiency improvements or potentially for conversion to electric heating equipment in residences currently reliant on wood or fossil fuels.

Gaz Métro, a private corporation, is the distributor for most natural gas used in Quebec. Gaz Métro offers energy efficiency grants and rebates through an Energy Efficiency Fund (EEF) created following an agreement between the company and representatives of Quebec social and environmental groups. While loans are not currently part of Gaz Métro's programs, the company's dominance in the natural gas sector could make them a partner for municipal or province-wide on-bill financing or LIC-based programs.

Sources of Capital

The most affordable potential source of capital available to Quebec municipalities would be low-interest financing through the provincial public sector finance pool, Financement-Québec.

Hydro-Québec's scale, public ownership and environmental responsibility mandate make it a potential candidate for providing capital for energy-efficiency financing fund, though this would obviously require provincial government action. Similarly, Gaz Métro's participation in an Energy Efficiency Fund sets a precedent for that utility's involvement in funding energy-efficiency measures.

Quebec also has a significant credit union/caisses populaires, cooperative and social enterprise sector which could play a role in providing capital residential energy efficiency and clean-energy financing. Quebec-based Desjardins, the largest cooperative financial group in Canada, is in fact already offering a "green loan" for business energy-efficiency retrofits in Quebec, with repayment schedules linked to expected energy savings (see box below for more information). Such an approach closely parallels the core ideas in on-bill financing, and it may be worthwhile for interested municipalities to investigate partnerships with Quebec credit unions/caisses populaires to develop energy-efficiency financing programs for residents.

CREDIT UNIONS AND INNOVATIVE ENERGY-EFFICIENCY FINANCING: DESJARDIN'S ENERGY-EFFICIENCY LOAN FOR BUSINESSES[83]

In 2010 Quebec-based Desjardins Caisse Populaire, Canada's largest financial cooperative, launched an energy-efficiency loans program for Quebec businesses based on principles similar to on-bill financing models used to support energy-efficiency measures in other jurisdictions.

Desjardins' describes their program as "the first greenhouse gas–emission reduction loan in the country," with favourable interest rates and other benefits to "to help members move to more environment-friendly practices." $20 million was allocated in the program's first year.

There are no immediate plans to offer similar loans to homeowners, but the Desjardins program points to the viability of this type of model of energy-efficiency loans and suggests that municipalities might want to investigate cooperation and partnerships with credit unions, caisses populaires and similar financial institutions with a shared social and environmental mandate.

Features of the Desjardins Program

- **Repayment based on energy cost savings:** Repayment amortization period, terms and conditions based on projected savings following energy-efficiency work.
- **Eligibility tied to existing provincial energy audit process:** Loan eligibility based on first receiving a grant or subsidy for energy-efficiency projects from Hydro-Québec, the provincial energy efficiency agency or the Quebec Department of Agriculture, Fisheries and Food.
- **Capital reimbursement holiday** of up to six months to accommodate downtime if a business has to shut down production lines or operations to install and test new equipment during the retrofit. During that period, only interest payments will have to be made.
- **Carbon credits:** Remuneration in the form of carbon credits equivalent to 50 basis points — one-half of one per cent — on the balance of the loan at the end of each year.

Resources

Desjardin's energy-efficiency loan for businesses: This large Caisse Populaire offers an energy-efficiency loans program for Quebec businesses based on concepts similar to on-bill financing programs elsewhere. www.desjardins.com/en/entreprises/solutions/financement/pret-ecoenergetique/

Rénoclimat: Energy-saving renovation grants program for homes offered by the Agence de l'efficacité énergétique, with a home energy evaluation process that could be used for other programs. www.aee.gouv.qc.ca/en/my-home/renoclimat/

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New Brunswick

Emissions from residential space heating, space cooling and hot water:

2.342 Mt of CO_2e
13% of provincial total

Keys to Moving Forward

- A provincial residential retrofit loans program is already in place through Efficiency NB.
- Municipalities could build on the provincial program by financing renewable energy installations (such as solar hot water heating) or other measures not covered by Efficiency NB.
- Provincial legislation and regulations would likely need to be amended to permit LIC-based financing of clean-energy projects on private property.

Overview

New Brunswick's heavy dependence on expensive heating oil and high emissions, coal- and oil-fired electricity-generation for residential and commercial space and water heating give the province a particularly strong motivation to reduce energy use and switch to cleaner, renewable energy sources.

While the province's relatively restrictive legislation on the use of LICs at present limits the direct role of municipalities in energy-efficiency financing, effective energy-efficiency loans and grants programs are already being delivered by Efficiency NB, the provincial government's stand-alone agency responsible for energy efficiency. Given this already existing program infrastructure, scaling up the resources and capacity of Efficiency NB, perhaps in cooperation with municipalities, may be more effective than launching freestanding retrofit financing programs.

New Brunswick municipalities could however play a role by supporting residential renewable energy installations. Halifax's new residential solar hot water program provides a nearby example of how such a program might work (see details on page 56). Provincial legislation would likely need to be changed to enable municipalities to use local improvement charge-based repayment and security mechanism though (see below).

Local Improvement Charges

New Brunswick's legislation governing LICs is explicit about what measures are permissible and energy efficiency/renewable energy improvements are not included in the current list of allowed local improvements. Unlike similar legislation in other provinces, New Brunswick's municipal act doesn't appear to have a mechanism for additions or changes to permitted improvements, short of passing amended legislation.[84]

On-Bill Financing

The fragmented structure of NB's energy utility industry does not readily loan itself to large-scale, on-bill financing programs. However, loans offered by the province through Efficiency NB fill a similar niche and offer the benefit of zero-interest financing (see details below).

EFFICIENCY NB'S ZERO-INTEREST LOAN FOR ENERGY-EFFICIENCY UPGRADES

New Brunswick's Existing Homes Energy Efficiency Upgrades program provides homeowners with a grant or an interest-free loan to help make their houses more energy-efficient. Scaling up this program may be the best route to residential energy efficiency in NB, and the program may offer useful ideas for programs in other Canadian jurisdictions.

The Efficiency NB program subsidizes up to $400 of a Natural Resources Canada's residential energy inspection and post-improvement assessment. Once recommended upgrades have been completed and participants receive a final home energy efficiency rating, Efficiency NB offers either a grant covering 20% of eligible upgrade costs (including HST) to a maximum of $2,000, or an interest-free loan of up to $10,000 repayable over a maximum six-year term. Owner-occupied 2-3 unit MURBs are eligible for an interest-free loan of up to $15,000 repayable over a six-year maximum term.

Program data from 2007/08 estimated that energy-efficiency upgrades from this program produced a total greenhouse gas reduction of 7,543 tonnes annually and significant savings in energy expenses for participants. The $813,000 in grants and $2.9 million in interest-free loans issued to program participants, coupled with additional spending by homeowners on these home energy efficiency renovations, amounted to an estimated $10.7 million in economic stimulus.[85]

Sources of Capital

Municipal loans must go through the provincial Capital Borrowing Board (CBB), which then sets up the loan for the municipality via the New Brunswick Municipal Finance Corporation. The CBB cannot provide loans for services a municipality is not allowed to provide, which under current legislation would exclude municipalities from borrowing for energy-efficiency measures on private property. The province is currently providing funding for interest-free energy-efficiency retrofit loans through Efficiency NB (see above).

Resources

Efficiency NB: Provincial government energy-efficiency agency that operates a zero-interest loan for home energy-efficiency upgrades.www.efficiencynb.ca

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Nova Scotia

Emissions from residential space heating, space cooling and hot water:

2.42 Mt of CO_2e
11.58% of provincial total

Keys to Moving Forward

- Nova Scotia in 2010 became the first province in Canada to amend legislation to specifically allow a municipality (Halifax) to use LIC-based financing for residential energy-efficiency and renewable-energy retrofits.
- Municipalities could focus on advocating for the extension of the 2010 Halifax charter amendments to municipalities across the province.
- Because of pre-existing provincial efficiency retrofit loans programs, municipalities may want to follow the Halifax model and focus on residential renewable energy installations. Nova Scotia municipalities may be able to benefit both from economies of scale and existing capacity in solar thermal installation in the province.

Overview

The Nova Scotia government already has in place a province-wide residential energy-efficiency loans program that provides interest-free loans of up to $5,000 for Nova Scotia homeowners. While the provincial program reduces the need for base-level municipally run retrofit financing programs, municipalities could still play an important role by financing residential renewable energy installations and other more advanced measures not covered by the provincial program.

In the fall of 2010, Halifax Regional Municipality announced plans to launch a residential solar hot water installation pilot project that would use an LIC-based financing mechanism f or repayment, and the provincial government soon after passed enabling legislation to allow the municipality to use LIC financing for energy-efficiency and renewable-energy measures on private property. If Halifax chooses to go ahead with this project, it will set an important precedent for the use of LIC financing for energy efficiency and renewable energy in other Canadian jurisdictions and will also demonstrate ways municipalities can play a role in clean and renewable energy financing even when provincial loan programs are in place.

It's good news that provincial and municipal governments in Nova Scotia are making serious efforts to reduce emissions. The province is highly dependent on fossil fuels for residential heating, with more than 40% of Nova Scotia homes in 2008 reliant on heating oil furnaces, and most of the province's electricity in 2008 coming from the combustion of coal and other fossil fuels. In fact, Nova Scotia was second only to Alberta in the amount of GHGs emitted per unit of electricity produced — almost 40 times the GHG intensity of electricity production in BC and 390 times the emissions intensity of elec-

tricity generation in Quebec! In addition to support for the Halifax community solar plan, the provincial government has developed an energy plan that commits to 25% renewable electricity by 2015 and 40% renewable electricity by 2020. Nova Scotia has shown willingness to use other innovative policies to further this goal, including community-based feed-in tariffs that give municipalities, First Nations, cooperatives and nonprofit groups incentives to launch renewable energy projects.

Local Improvement Charges

In December 2010, the Nova Scotia Legislature passed amendments to the Halifax Regional Municipal Charter that allow Halifax to move ahead on a proposed LIC-financed residential solar hot water project and open the door to expanded use of LICs to finance other types of energy-efficiency and renewable-energy measures on private property. Prior to this amendment, the only use of LICs to fund work on private property had been for tree removal, and the use of LICs remains restricted elsewhere in the province.[86] Nonetheless, the amendments to the Halifax charter sets an important precedent for other jurisdictions interested in using LIC financing for energy-efficiency and renewable-energy measures.

Two main factors seem to have come together in facilitating the change in the Halifax charter. First is the initiative shown by the Halifax Regional Municipality in deciding to formally ask the province of Nova Scotia to amend the Halifax municipal charter to allow participants to be billed as part of their annual tax bill.[87] The second factor is the Nova Scotia government's commitment to moving forward on renewable energy and energy efficiency efforts, and a willingness to support innovative policy measures in these efforts.

Capital Financing

Nova Scotia's *Municipal Government Act* requires the provincial approval of capital borrowing by municipalities and municipal enterprises and agencies. Long-term municipal capital borrowing is secured through the Nova Scotia Municipal Finance Corporation (MFC) and a provincial guarantee. Municipalities are required to borrow through the MFC for capital financing of ten years or more. MFC is able to offer interest rates that in the early years are generally lower than the stated prime interest rate at the municipality's financial institution.

For Halifax's solar hot water pilot project, the municipality will likely be seeking $5 million from the FCM Green Municipalities Fund. Larger-scale RE/EE programs will obviously require a larger pool of capital.[88]

Precedents

Halifax is currently exploring a directly city-run solar hot water panel installation program that would use an LIC mechanism for repayment. If this pilot is successful, the municipality has expressed interest in expanding the financing model to other types of improvements, including energy-efficiency retrofitting or other renewable energy technologies. However, city reports note that these are more

technically complex, expensive and difficult to administer in a "holistic, turn-key fashion" than their solar hot water program, which would benefit from economies of scale in purchasing and installation and also the city's already acquired experience installing solar hot water technology.

At the time of writing, Halifax was in the process of public consultation, refining the project model and beginning preliminary program intake. Staff will finalize the details and submit a final report to Council for approval early in 2011. If all goes well, it is estimated that HRM residents could see the first solar panels installed in the fall of 2011.

LIC FINANCING FOR RENEWABLE ENERGY: HALIFAX COMMUNITY SOLAR PROGRAM[89]

Program details

- Pilot project to encourage individual homeowners to install solar panels for heating domestic hot water.
- Typically two solar hot water panels installed on homeowner's property.
- Pilot will include 500 to 700 homes (1,000 panels).
- $5 million capital for pilot from FCM Green Municipalities Fund.
- Potential to scale up to a $50-million-a-year program if pilot is successful.
- Scaled-up program could create an estimated 300 jobs and $3 million in energy savings.

Financing model

- Financed through a charge on the property tax bills of individual homeowners participating in the project.
- Repayment estimated at approximately $400 per year, and cost is expected to be less than participants' annual energy savings.
- Payback expected in 5 to 10 years, depending upon available rebates and interest rates.

Administration

- Municipality would act as financial administrator and contracting agent
- Economies of scale in materials purchasing and installation would reduce costs to homeowners.
- Plan to bring in revenue exceeding costs in order to ramp up program and make it financially self sustaining.
- Plan to generate a surplus from recapturing low interest rates on capital from FCM fund.

Certification and Auditing

Halifax's solar hot water project builds directly on the city's own experience installing proven renewable energy technology in public buildings. By keeping the program in house and implementing a standardized type of project, this program avoids some of the uncertainties associated with audits and certification of private contractors.

Legislative Changes Required

- Halifax Regional Municipality made a formal request in November 2010 for the province to amend their municipal charter to "enable security of financing of energy conservation or environmental improvement of a property via lien authority." (Council Report, Nov. 2, 2010.)
- The provincial government introduced an amendment based on the request on November 25th, and the amendment was passed into law by December 10th. (See Appendix A of this report.)

NOVA SCOTIA ZERO-INTEREST ENERGUIDE LOAN PROGRAM

- Program administered through the provincial government's agency for energy efficiency.
- Program is available to all Nova Scotians, so long as they pass a credit check and have an EnerGuide energy evaluation completed in their home.
- Participants qualify by getting an EnerGuide evaluation from an approved advisor, and then have 18 months to make recommended upgrades.
- Loan generally paid out upon completion of work, but low- and modest-income applicants can qualify for an advance of up to $1,500.
- Maximum loan is $5,000.
- Five years to repay the loan, through fixed monthly payments.
- If 90 days go by without a payment, interest will be charged to the loan, and it will be sent to the provincial government collections unit for follow-up.

Resources

Halifax Regional Municipality's Community Solar Project: www.halifax.ca/solarcity/

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Prince Edward Island

Emissions from residential space heating, space cooling and hot water:

Full data on emissions are not available for PEI.

Keys to Moving Forward

- An existing provincial energy-efficiency loans program and the relatively small scale of the province may limit the scope of action for municipalities.
- Municipalities could nonetheless play a role in financing renewable energy installations and other measures not covered in provincial programs
- Municipalities would have to specifically apply to add residential EE/RE improvements as services municipalities can offer under section 30 of the PEI *Municipalities Act.*

Overview

PEI already has a provincially run energy-efficiency loan and grant program, and the province's relatively small size and population mean that a provincially delivered program likely makes the most sense from an administrative and practical perspective.

As with provincially run programs elsewhere, PEI's program points both to the feasibility and public demand for energy-efficiency loan programs.

Local Improvement Charges

Analysis from 2005, prior to the launch of PEI's current provincial loan and grant programs in 2008, found that PEI legislation could provide a path to LIC financing for energy efficiency and renewable energy measures. Municipalities would have to specifically apply to add EE/RE improvements as services municipalities can offer under section 30 of the PEI *Municipalities Act.*[90]

However, the establishment of provincial loans programs means that a municipal role in PEI would probably make sense only in relation to specific niche programs not financed by the province —possibly certain types of residential renewable energy projects (for example, see description on page 56 of Halifax's residential solar hot water pilot project) or more extensive and costly "deep energy" retrofits. More research would be required to see if such measures are viable and cost-effective in the PEI context and, if so, which level of government would be best positioned to finance them.

Sources of Capital

Municipalities in PEI handle their own borrowing. This would give larger municipalities some degree of freedom in locating capital for energy retrofit/renewable energy loans programs, but could make it difficult to raise capital for smaller communities.

PEI ENERGY-EFFICIENCY LOAN/GRANT PROGRAM

Prince Edward Island offers another successful example of residential energy-efficiency financing. In 2008, PEI established a combined provincial loan/grant program for home energy-efficiency retrofits, operated through the Office of Energy Efficiency, under the Environment, Energy and Forestry ministry.

The program offers loans up to $10,000 available at 6% interest, with "zero interest" and other loan-relief options for qualifying low-income households.[91]

Eligible measures under the program include an approved list of upgrades and replacements to insulation, heating systems (including solar warm air and earth energy systems), hot water, energy-efficient windows/doors, air sealing, thermostats, ventilation, plumbing and installation of biomass systems (approved woodstoves, pellet stoves, etc.).

In its first two fiscal years, the program was able to process 1,200 low-income household applications, and completed more than 2,700 household energy audits —roughly 6% of the province's housing stock —and anticipates completing another 2,000 audits in the 2009–10 fiscal year. Six hundred and sixty-two clients completed work and received a loan or grant from the program in the initial period, with an average annual energy savings per household of 56 gigajoules, or $1,200 annually in heating oil costs.[92] Available program information indicates that the program loaned $1.2 million in its first fiscal year.

Marketing and Outreach

Program administrators have noted the importance of direct outreach to community groups, church groups and other groups that aren't necessarily reached through promotion in traditional media. Outreach to building suppliers and other industry players has also been important.

Resources

UBC Sauder School of Business report: This 2010 report from the UBC Sauder School of Business provides a detailed overview of the PEI program, based on program data and interviews with program administrators.
isis.sauder.ubc.ca/files/2010/08/Summary-of-Energy efficiency-Financing-Program-Interviews.pdf

The PEI Residential Energy-Efficiency Program is an incentive program for residential property owners who wish to upgrade the energy efficiency of their properties. It consists of a loan or grant program to assist with the implementation of eligible upgrades.
www.gov.pe.ca/oee/index.php?number=1032076&lang=E

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Newfoundland & Labrador

Emissions from residential space heating, space cooling and hot water:

0.493 Mt of CO_2e
4.9% of provincial total

Keys to Moving Forward

- No apparent barrier to using LICs for energy-efficiency financing under existing legislation, but municipalities will want to seek clarification/approval from the province.
    - Clarification hinges on whether energy-efficiency measures on private property can be deemed "public works."
- Retrofit financing programs should be designed to harmonize/compliment existing electrical upgrade financing available through Newfoundland Power.

Overview

Newfoundland and Labrador's municipal legislation appears to be adaptable to LIC-based municipal financing for residential energy retrofits. While an on-bill financing program is offered by the province's dominant private electric utility for efficiency upgrades and installation of residential electrical heating, hot water and other electrical work, the program does not cover insulation upgrades or other key nonelectric efficiency measures. Provincial grants programs provide some support for nonelectrical energy-efficiency measures, but not enough to overcome the high upfront costs. Targeted, well-designed municipal programs from Newfoundland municipalities could help fill this glaring gap in energy-efficiency financing.

Local Improvement Charges

Pembina Institute analysis from 2005 concluded that Newfoundland's municipal legislation makes the province a good candidate for municipally financed energy-efficiency retrofit programs.[93] "Service levies," which appear to be equivalent to LICs elsewhere in Canada, can be used for "public works," with water, sewer and storm systems, curbs, gutters, sidewalks and streets listed as examples, but legislation does not explicitly exclude other options, such as energy-efficiency improvements. Ultimately though, the viability of using service levies in this manner will depend on the provincial government's interpretation of the definition of a "public work," and municipalities would want to clarify this before embarking on this type of retrofit financing program.

On-Bill Financing

Newfoundland has an on-bill electrical services financing program operating through Newfoundland Power, the private electric utility that supplies electricity to at least 85% of consumers in the province.

While not limited exclusively to energy-efficiency measures, the Electrical Services Financing Plan

provides up to $10,000 of financing for the purchase and installation of efficiency upgrades including electric water heaters, electric home-heating systems, heat pumps, heat-recovery ventilation systems and high-performance thermostats. Payments are made through customers' monthly electric bills, and repayment schedules up to 60 months can be arranged.[94]

The program does not presently deal with nonelectrical efficiency measures, such as insulation upgrades, energy-efficient natural gas furnaces and water heaters, or residential renewable energy installations. Municipal programs could be targeted to fill this gap but would of course require partnerships between municipalities and energy utility companies.

Sources of Capital

Newfoundland is winding down its Crown Municipal Financing Corporation (NMFC), with the expectation that Newfoundland municipalities are now capable of financing their capital programs independently through financial institutions. This gives Newfoundland municipalities some degree of autonomy in borrowing, though it is unclear at this point how this impacts the cost of financing available to municipalities. Other options could include a dedicated capital pool from the province, available to municipalities at a preferred rate of interest or perhaps capital loaned by Newfoundland Power as an extension of its own conservation efforts.

Resources

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SECTION 3

Case Studies of Energy Efficiency and Renewable Energy Retrofit Programs in US Cities

Introduction

The first municipal pilot programs using Local Improvement Charge–based financing for energy-efficiency retrofits and renewable energy installations are just getting off the ground in Canada, but similar programs have been operating in US cities for a number of years. While the policy context and jurisdictional authority of local governments varies between the two countries, US examples nonetheless provide a sense of the different financing and administrative models, program-design considerations and the types of roles municipalities can play.

The most widely known model in the US context is called Property Assessed Clean Energy and closely parallels the Local Improvement Charge for Energy Efficiency models this report focuses on in the Canadian context, in which repayment for a retrofit loan is charged to a program participant's property taxes and often secured by a lien on the homeowner's property in the event of default. But as will be explored below, on-utility bill financing and other innovative models have also been implemented by US cities.

Overview of US Case Studies

The following case studies demonstrate differences and variations in municipal clean-energy finance programs. All of the programs have the same goal — to create mechanisms for residents to access the upfront capital required to make energy-efficient retrofits to their homes. However, the approach each program uses varies.

Three of the five cases (Babylon, Boulder and San Francisco) represent typical PACE-style loans in the sense that local governments use their taxing powers to add the costs of improvements as assessments to property taxes. Thus the payments are attached to the property, not the owner. Yet even within these programs there is significant variation. Babylon is unique because it uses funds from its solid waste reserve fund to finance the program. San Francisco and Boulder, on the other hand, sell bonds. One of the issues with using bonds is the ability to obtain capital as needed. San Francisco and Boulder each address this issue differently. In San Francisco, the government contracted with a third-party organization called Renewable Funding, which purchases micro-bonds from the government,

bundles them and then later sells them on the open market. In Boulder, the local government solved the problem by having specific application periods within which people could apply to the program. This allows the government to prequalify homeowners and know the total size of the funds it will need to raise through bonds.

The other two case studies (Portland and Midwest Energy) represent different approaches to clean-energy financing. In Portland, the local government has collaborated with a number of local organizations to launch the Clean Energy Works Portland (CEWP) pilot. The pilot has set up a revolving loan fund, which homeowners may borrow from to make eligible energy improvements to their homes. Unlike PACE programs, the loans are attached to the homeowner, not the property. Another standout feature of CEWP is the approach and effort it has made towards using this program to ensure good, high-quality local jobs are created. Midwest Energy is a utility located in Kansas. This program applies to both property owners and tenants. The program makes capital for improvements available to its customers, who then repay the amount on their utility bills. The program has strict rules around the amount of the repayments, requiring them to be less than the savings achieved.

Aside from these fundamental differences, each case differs in the way it addresses some of the common issues around setting up clean-energy financing programs. Questions such as eligibility requirements, application processes, certification for contractors that do the work, monitoring and evaluation and marketing and outreach need to be thought through, as local governments design their own programs. These cases outline some of the ways different programs have addressed these issues.

A note on recent challenges faced by Property Assessed Clean Energy (PACE) programs in the USA: Is this relevant to Canada?

Despite strong presidential support and enabling legislation passed in about half thus states, residential Property Assessed Clean Energy (PACE) energy- financing programs were put on hold in 2010 in a number of jurisdictions, due to a dispute involving the Federal Housing Finance Agency (FHFA), the federal agency that regulates mortgages in the USA.

In the panic following the US mortgage crisis, the FHFA became worried that property liens for repayment of municipal energy-efficiency financing could take precedence over mortgages in the event of defaults and decided to apply penalties to jurisdictions with PACE programs.

Most of the concerns underlying the FHFA's decision are specific to the US mortgage system and not applicable to the Canadian context.95And even in the USA, state governments, municipalities, environmental groups and clean-energy advocates are adamant that that the FHFA's worries are misguided. The State of California, several county governments and a major environmental organization have already launched legal challenges to reverse the decision.

WHY LIC-BACKED ENERGY-EFFICIENCY LOANS ARE LOW RISK FOR CANADIAN MORTGAGE LENDERS

- Default rates in existing US PACE programs have been very low —less than 1% overall, and zero in some programs.[96]
- Property-tax default rates in Canada are also very low.
- The value of retrofit financing relative to the value of a mortgage can be kept small. A typical retrofit under Canada's EnerGuide program cost less than $7,000 —less than 2% of the average cost of a home in Canada in 2011, and less than 1% of the value of a house in an expensive market like Vancouver.
- Efficiency improvements generally increase the value of a home, further offsetting any risks to mortgage holders in the event of default.
- LIC-backed financing can be structured so that only the specific payments in arrears are added to a tax lien, rather than the entire financing balance. This is already how similar situations with property-tax defaults are handled in some Canadian jurisdictions. After delinquent payments are collected, the remaining repayments are simply passed on to the new owner of the property.
- Homeowners' lower household expenses from energy retrofits will actually increase the funds they have available for mortgage payments.
- Canada has a much higher rate of insured mortgages than the US, further reducing the risk to lenders.
- Canada's residential mortgage default rate level is very low — less than 0.5% in early 2011. In contrast, around 7% to 9% of US mortgages, on average, have been arrears in the wake of the subprime crisis.

San Francisco — GreenFinanceSF

In April 2010, San Francisco launched a $150 million home and business retrofit program called GreenFinanceSF. This program is a typical PACE program in that the upfront project costs are financed by the program (through the sale of bonds), added as an assessment to the property and paid by property owners through their property tax bill. The city and county have the ability to establish special tax districts through existing state legislation. Property owners apply to join the district and, if accepted, authorize the city and council to levy a special tax. The tax is secured by a senior lien on the property. In San Francisco and other PACE programs, the use of senior liens also allowed the program to issue bonds to raise capital for these programs. In effect, the bonds are secured by the senior lien.

GreenFinanceSF is the largest program and is notable for the fact that it includes water conservation measures as well energy-efficiency improvements. Unfortunately, not long after the program was officially launched, it was suspended when the Federal Housing Finance Administration (FHFA) deemed that the first-priority liens typical of PACE programs were creating additional risk to mortgage lenders. The FHFA oversees Fannie Mae and Freddie Mac, which collectively guarantee more than half the residential mortgages in the US.

The GreenFinanceSF program was shaped and supported in large part by Renewable Funding, a company that provides administrative and financing services to local governments starting PACE programs.

Date started.	April 2010; suspended July 6, 2010.
Process of implementation.	Throughout 2008 and 2009, there were some initial meetings between various departments within the City. Departments that continued to support the project included San Francisco Public Utilities Commission, the Controller's Office of Public Finance and the Department of Environment. Shortly thereafter the city issued RFPs for administrative and financial partners. During the same period, the California Energy Commission was working with the California Public Utilities Commission to design a residential retrofit incentive program. San Francisco worked to align its program with that of the CEC.
Size of local population.	815,000
Enabling legislation.	Mello-Roos Special Tax District.
Results.	Before the program was suspended, it had received 33 applications. Of that 33, 20 had been pre-approved and had paid the $300 application fee.

Lessons learned.	In designing the program, staff had to contend with a number of issues. Other municipalities thinking about starting such a program are advised to consider: • legal and legislative requirements of implementing a tax lien financing program and potential conflicts with lenders; • the administration process (in-house or third-party); • the financing structure; • single local program or consolidated regional or statewide program.

Type of program.	PACE.
Source of capital.	Bonds —$150 million bonding capacity. The city received a $2 million grant from the California Energy Commission to buy down the cost of the loans.
Target.	Residential. Commercial and industrial could also apply but under a different set of guidelines.
Scope.	Each category contains a defined set of eligible measures: • air sealing and ventilation; • insulation; • space heating and cooling; • reflective roof; • water heating; • windows; • solar; • water conservation — fixtures and landscaping.
Eligibility.	Eligibility criteria included scope of projects proposed, the property's tax and mortgage payment history and the value of the property relative to its outstanding debt.
Application process.	The website advises that most homes will need an energy audit and highly recommends that participants get one. If someone does not want to get an audit, they will need to include a basic energy-efficiency package as one of the projects they finance. Applicants were required to pay a $300 application fee. Participants were also required to submit a "Notice of Special Tax Lien" to their lenders.
Security	Tax lien.

Terms of financing.	7% interest rate. Minimum loan of $5,000. Maximum loan of $50,000 or 10% of home, whichever is less. Besides the costs of the project (minus incentives), each loan also included a 7.5% debt reserve charge, the application fee and administrative costs of about 5.5%. The payback period is tied to the life of the project (up to 20 years). For example, if the loan was used to finance a furnace and solar PV, the payback period would differ for the finance and the solar PV as a result of different useful lives of each.
Administration.	During the early stages of program development, the city issued RFPs for an administration partner and a financing partner. Renewable Funding submitted a proposal to do both and was selected as the proponent. Renewable Funding not only administered the program, they also agreed to underwrite the bonds and committed to providing on-demand financing for each project in the form of micro-bonds. Renewable Funding was then going to pool these micro-bonds together and remarket them to the wider bond market. Having a third party administer the application process and collect any other data was beneficial in the sense that it helped the city avoid any privacy issues.
Marketing.	The marketing campaign included: an internet town hall with the mayor in which 8,500 people participated; direct mail to targeted homes; ads in the online city newspaper. About 40,000 homeowners were targeted through direct mail and robo calls.
Monitoring and evaluation.	Renewable Funding's portal had infrastructure to collect data that would have been used to monitor and evaluate the data.

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Babylon, New York — Long Island Green Homes

In 2008, the Town of Babylon, New York launched the Long Island Green Homes initiatives (LIGH). The program is set up like a PACE program in the sense that payments for energy-efficiency improvements are added as a benefit assessment to properties. Where Babylon differs from other PACE programs is in the billing and the source of capital. Participants in the program are billed on their municipal services bill. If they default on these payments, then the assessment is added to their property taxes. The other unique feature is that the source of financing for the program comes from the town's solid waste reserve fund and functions like a revolving loan fund.

In response to the FHFA, the Town of Babylon has filed suit against the agency. From the town's point of view, environmental remediation is a vital public purpose, and the LIGH program is key to the town meeting its goals in this regard. Where the FHFA claims that these programs do not deliver the typical community benefits associated with tax assessments, Babylon emphatically refutes this position and claims that the projects are being done on an individual basis for a public purpose and, that as a local government, it is well within their purview to institute such programs.

Savings-to-Investment Ratio

One of the requirements of LIGH is that the savings-to-investment ratios of projects show that the average annual savings will be equal or greater than the monthly payments. If people are pre-approved to participate in the program, they receive a home-energy audit from a certified contractor. Based on the findings of the audit, the contractor provides the homeowner with a complete breakdown of the home's energy efficiency and potential measures that could improve the home's efficiency and the costs of those measures.

Date started.	October 2008
Process of implementation.	Babylon has an energy-from-waste facility. The state requires the town to maintain a reserve fund to cap the inert ash produced from this process. The Town of Babylon reclassified CO_2 as solid waste and was able to tap $2million of the fund. Another component of implementation was engaging with local contractors around whether or not they would be interested in performing the required work in the residential sector. The town approached the builders' and plumbers' union, training organizations and the utility company.
Size of local population.	211,792
Enabling legislation.	The town amended its code to reclassify CO_2 as solid waste. This amendment was affirmed later by the New York State Assembly.

Results.	700 audits completed. 638 jobs completed or in progress. 8.77 —average payback in years.
Lessons learned.	It can prove difficult to get participants to submit data after the improvements have been made.

Type of program.	PACE-type program.
Source of capital.	Municipal solid waste revolving fund. Babylon classified carbon as solid waste and was therefore able to access $2 million from this fund.
Target	Residential.
Scope.	• Upgrading insulation, focusing on attics and basements; • replacing or upgrading high-efficiency heating systems (boilers, furnaces, hot water heaters, etc.); • ventilation and duct work; • weather-stripping, air sealing, and caulking of problem areas to prevent heat loss.
Eligibility.	Homeowners in Babylon.
Application process.	Potential participants fill out an application form. Participants are prescreened based on their homes' physical characteristics and two years of energy-use data. If applicants are accepted at this point, LIGH schedules an energy audit to be completed by a contractor that's been licensed by the town. A $250 fee is required at the time of the audit. If the participant decides to make the recommended changes, the $250 will be applied to those costs. The auditor has to determine if the proposed work will have a savings-to-investment ratio of 1 or higher. If it is, then the proposed work is submitted to the program for review and approval.
Security.	Benefit assessment —if the owner fails to fulfill the obligation it is assigned to the property tax and becomes a senior lien.
Terms of financing.	Administration fees of 3% charged. Monthly repayment terms are based on projected savings. Average cost of improvements —$9,000. Average annual savings $1,060. Average payback period — 9 years.
Administration.	In-house.

Marketing.	August 2008 —all residents received a free compact fluorescent light bulb, an energy tips booklet and an announcement about the Green Homes program. Cover of recycling calendar every home receives. Media coverage and public speaking at community events. Attached program stickers to park permits.
Monitoring and Evaluation.	One year after the work is completed, the town asks participants to submit utility bills. This has proven to be somewhat challenging and the town is currently working towards getting the data directly from utility companies. As well, LIGH makes field visits to ensure that the work is being carried out as expected.

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Boulder, Colorado — ClimateSmart Loan Program

The ClimateSmart Loan Program began in April 2009, but has since been suspended due to the actions of the FHFA. This program is the first county-wide program in the US. As well, it was the first program that was able to make use of tax-exempt bonds, which helped to lower interest rates of participants.

One of the interesting program design features of the ClimateSmart Loan Program is that in order to aggregate bonds for the market and secure good rates, the program has defined application periods. As well, the program limits the amount of time in which work can be completed to 180 days as a way of lowering administrative costs.

Date started.	April 2009
Process of implementation.	Since 2007, the Board of County Commissioners had been aware of and interested in the Berkeley FIRST program. Throughout 2008, the county worked with officials and departments at the state level to ensure the passage of House Bill 08-1350, which allowed municipalities to use their capacity to issue bonds to create funds to provide loans for renewable energy and energy efficiency systems and to create improvement districts for investing in renewable energy districts. HB 08-1350 also allowed municipalities to issue tax-exempt bonds to finance the program.
Size of local population.	300,136
Enabling legislation.	House Bill 08-1350. Voters also had to pass Ballot Measure 1A to authorize $40 million in bonding capacity. The $40 million included $14 million in tax-exempt bonds. A second ballot measure that would have authorized $40 million more was rejected in November 2009.
Results.	The first application period (April 2009) closed with 393 applications for $7.5 million in financing.

Type of program.	PACE- type program.
Source of capital.	Bonds
Target.	Residential and commercial.
Scope.	• Air sealing and ventilation; • insulation; • space heating and cooling; • water heating; • lighting retrofits; • daylighting; • windows, doors, skylights; • reflective roofs; • pool equipment; • landscaping; • solar hot water; • solar PV; • small wind and wood/pellet stoves.
Eligibility.	All homeowners who are not and have not been delinquent on their property-tax bill in the last three years. Eligible improvements include those that are permanent attached to the property, have an expected life shorter than or equal to the financing period, and in some cases, the improvements must meet specified ratings.
Application process.	The program accepts applications during a predetermined period of time. Participants are required to attend workshops about the program which are offered over a 3-week period. After the workshop period ends, the application period is opened, during which time property owners may submit online applications. In order to complete their applications, homeowners must also obtain and submit project bids and pay a $75 application fee. At this point the county may approve and prequalify the applications. If they are prequalified, homeowners then meet with a loan originator who approves the loan. At this point, the county is able to aggregate the applications and sell bonds. This process ultimately determines the assessment rates.
Security (underwriting?)	Senior lien on the property. County also has a surplus, deficiency and a reserve fund to cover potential losses.

Terms of financing.	Minimum loan of $3,000. Maximum of $50,000 or 20% of statutory actual value of the property, whichever is less. Loan terms of 15 years. All applicants are eligible for open loans (non–tax exempt bonds), while income-qualified participants are eligible for income-qualified loans (tax-exempt bonds). Interest rates depend on the sale of bonds; however, the maximum rates are 6.75% for income-qualified loans and 8.75% for open loans. During the first round of applications, the interest rates were 6.68% for open loans. Other loan costs capitalized into the principal amount include a 4% cost of issuance, 4% to cover prepaid interest and a debt reserve fund of 5%.
Administration.	Developed and administered by the County Sustainability Office. New administrative costs were budgeted at $90,000 for a full-time administrator/accountant and between $20,000 and$30,000 for outreach and marketing. The program also contracted out financing origination and parts of the application process to two private companies.
Marketing and outreach.	Colorado has a number of programs under the ClimateSmart banner, including the loan program and the Residential Energy Audit Program (REAP), run by a local nonprofit (Center for ReSource Conservation). Website, print and radio advertisements, public meetings, Sierra Club and other groups. Contractors are also invited to county-sponsored briefings. The program has also experimented with direct contact and paid advertising. Applicants to the loan program are required to attend a CRC workshop, where they are highly encouraged to have a professional audit done by a third-party organization. 1,700 people attended the workshops before the first funding round. REAP is run in partnership with Xcel Energy. One way for homeowners to be contacted by the program is via an opt-out on the Xcel Energy audit form —or as a result of CRC's outreach work. Xcel offers audits to customers for $35. REAP's goal is to improve the conversion rate of those getting an audit to actually implementing improvements.
Monitoring and Evaluation.	Program participants sign releases to allow access to electric and natural gas bill for the previous two years.

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Portland – Clean Energy Works Portland

In June 2009, the City of Portland, in collaboration with Energy Trust Oregon, launched the Clean Energy Works Portland (CEWP) pilot program. The pilot intends to retrofit 500 homes in Portland and Multnomah County and expects to sign the 500th loan by early 2011. A revolving loan fund was capitalized with $2.5 million in federal American Recovery and Reinvestment Act funds, $2 million from Enterprise Cascadia resources and a $3.5 million grant from the Portland Development Commission. As CEWP nears the end of the pilot phase, a new nonprofit, Clean Energy Works Oregon, Inc. (CEWO) is preparing to launch in early 2011. The City of Portland helped to create this organization and subcontracted $18 million of a $20 million Better Buildings (American Recovery and Reinvestment Act) grant to implement the program. The mandate of CEWO is to retrofit 6,000 homes and small businesses throughout Portland. CEWO will take the lessons learned from CEWP and apply them to its own programs.

CEWP has been described as a "loan origination program with on-bill repayment." Participants receive low-interest loans through a revolving loan fund administered by a local bank. Participants then pay back the loan through their local utility bills, which includes the payments as separate line items. Engagement with a wide array of community organizations has been key to developing and supporting the strategies employed by the program. More than 30 organizations were involved in the development of the program and in various aspects of its implementation. These organizations include EnergyTrust Oregon, a public purpose agency that is responsible for enrolling and serving participants in the program; ShoreBank Enterprise Cascadia, a community development financial institution that provides the loans to participants; local utilities that are collecting the payments as part of the utility bills they issue; and Green For All, a national organization concerned with finding ways to support a green economy and which helped the city develop its Community Workforce Agreement.

Supporting the Local Economy

One of the unique features of CEWP is the determined effort it has made to ensure that the program results in the creation of a highly skilled, well-paid, diverse workforce. The Community Workforce Agreement is the main tool used to achieve this.

When homeowners enter the program, they select contractors to both carry out assessments and complete the improvements from a preselected pool of qualified contractors. CEWP developed a Community Workforce Agreement (CWA) that applies to all contractors, subcontractors and workers in the program. The agreement promotes equity, training and employment opportunities for all groups, including those that have been traditionally disadvantaged such as people of colour and women. The document was signed by over 30 organizations including faith groups, labour unions and professional associations. A Stakeholder Evaluation and Implementation Committee of community stakeholders oversees and monitors the agreement.

The Community Workforce Agreement sets targets and goals around:

- Local hiring.
- Family-supporting jobs.
- Health insurance.
- Diverse workforce.
- Diverse business participation.
- Highly-skilled workforce.

For the contractors that are selected to be part of the contractor pool, the rules address:

- Wages.
- Certification.
- Training of employees.
- Workforce safety.
- Unions and the right to unionize.
- Reporting to the Evaluation and Implementation Committee.
- Inclusive work environments.

According to program administrators, the development of the CWA took a significant amount of time and discussion, but the program has met and exceeded its goals. Though contractors have been supportive of the agreement, one of the challenges has been the reporting requirements. Contractors are required to submit bimonthly reports about work and cost statistics for every job. Some of the contractors have found this burdensome, and for the scale-up to CEWO administrators are working to develop a more streamlined reporting system that will reduce the amount of time spent manually pulling and recording data.

Loan Transfers

Unlike other energy-efficiency retrofit programs, loans are made to individuals and do not automatically transfer to new owners upon sale of property. In order to qualify for a loan, ShoreBank Cascadia requires participants in the program to have a good credit score and a good payment history with their utilities. If the participant qualifies for a loan, ShoreBank also requires a lien on the property as a condition of the loan. The lien is subordinate to any mortgage financing.

Under this structure, the loan is to be paid in full at the time of sale. This means that unlike other programs, the loan does not automatically transfer to the new owner at the time of sale. If a participant sells their home they can apply to transfer the loan for an $850 fee. The new owner will also have to meet the standard loan requirements of good credit history and utility bill payment history.

Neighbourhood-based Programs

In the final phase of the pilot, CEWP set up the Changing the Climate in Cully program, which targeted a specific neighbourhood in Portland. Cully was chosen because the neighbourhood has a high ratio of homes that would be eligible for upgrades. As well, residents in the neighbourhood tend to have incomes that are too high to qualify them for weatherization assistance but too low to be able to directly finance retrofits.

Metropolitan Alliance for Common Good (MACG) is leading the effort and working with a number of community-based organizations including local unions, churches and other religious/cultural organizations. The program is targeting 1,800 eligible homes and aims to recruit 100. The program used more than ten different outreach techniques including phone-banking, meeting announcements, direct mail, email, tabling and door-hangers. The two most effective forms of outreach have been door-to-door canvass efforts and smaller community meetings. With the door-to-door canvassing, for example, staff knocked on 2,503 doors and made contact with about 825 people. Out of the 825 people contacted, 84 made applications to the program. With the community meetings, about 59 people attended, with 24 applications made. Staff suggested that the application rate could have been even greater had they prescreened for eligibility beforehand.

One of the key lessons learned from the Climate Change in Cully program is that potential participants require repeated, sustained follow-up. Staff notes that this means keeping track of contacts, ensuring timely follow-up and using multiple outreach methods are all critical to success.

Date started.	Launched in 2009.
Process of implementation.	Initiated by the City of Portland, in partnership with a number of other organizations including Multnomah County, Energy Trust of Oregon, ShoreBank Enterprise Cascadia, local utilities and Green for All.
Size of local population.	582,130
Enabling legislation.	As Portland was developing the pilot, the State of Oregon was drafting the *Energy Efficiency and Sustainable Technology Act,* HB2626, which passed in 2009. HB 2626 supports retrofits in Oregon's homes and businesses and establishes a state-wide Loan Offset Grant Fund. It also calls for a series of pilot programs. CEWP and HB2626 were developed in conjunction with each other.
Results.	At the end of September 2010, 323 loans had been singed and 250 homes had been retrofitted. The number of contractors, subcontractors and workers from historically disadvantaged groups has increased.

Lessons learned.	The program uses the Home Performance with ENERGY STAR assessment. This assessment analyzes the energy performance of the whole house and the effects of potential improvements. An evaluation of CEWP found that this approach is beneficial because it allows contractors to develop integrated plans for efficiency upgrades that maximize the funding.

Type of program.	Loan origination, on-bill.
Source of capital.	Revolving loan fund capitalized with $2.5 million in ARRA funding, $2 million from Enterprise Cascadia resources and a $3.5 million grant from the Portland Development Commission.
Target.	500 residential properties.
Scope.	Basic weatherization (attic, insulation, air sealing, duct sealing); Extended weatherization (above and wall and floor insulation); both of the above and furnace, heat pump and/or hot water system (not solar); project cost caps are determined for each set of measures.
Eligibility.	Single-family, site-built dwellings heated with electricity from Pacific Power or Portland General Electric or with natural gas from NW Natural. Participants must have lived in the house for at least 12 months. As well, participants' credit history and utility bill payment history is reviewed.
Application process.	Homeowners apply through the CEWP website and are prescreened according to the home's potential for improvements. If homes meet prequalification criteria, Enterprise Cascadia reviews the owner's financial history. If applicants are accepted at this point, they receive a phone call from an Energy Advocate to discuss the process and review the financing requirements. If at this point staff determine that there are no structural issues with the home and the homeowner still wants to proceed, Clean Energy Works schedules a home energy assessment to be performed by one of the preselected contractors. Based on the findings of the assessment, the contractor then prepares a bid and presents the proposed Scope of Work, monthly payment and estimated incentives. If the homeowner accepts the bid, ShoreBank will generate the loan documents. Once the loan is signed, the contractor will undertake the work.
Security.	ShoreBank requires a lien on the property. If the property is sold, loans do not automatically transfer to the new owner at time of sale.
Terms of financing.	The loans are 20-year loans. Interest rates are 5.99% for general borrowers and 3.99% for applicants with incomes 250% below the federal poverty level. ShoreBank also charges a $300 loan administration fee. Participants do not incur penalties for early repayment.

Administration.	In terms of administration and staffing, the pilot benefitted from the contributions of staff from a number of organizations as well as support around things like IT, marketing, media relations and other services. The core team of CEWP is about a dozen people that have spent at least half of their time on CEWP in the last year.
Marketing.	City coordinates marketing and outreach. Direct marketing strategies including email, direct mail and ads. The utilities also helped with outreach. The Changing the Climate in Cully program used more traditional outreach methods including door-to-door canvassing and neighbourhood meetings. From the experience of the pilot, it was found that for every five applicants, about one would actually complete the program.
Monitoring and evaluation.	Pilot participants are required to authorize Clean Energy Works Portland to access their utility usage and payment history.

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M. Kulley, email correspondence with author, Dec. 6, 2010.

Midwest Energy — How$mart

Midwest Energy is a cooperative utility located in Kansas. It provides both electricity and natural gas to about 90,000 customers. In 2007, Midwest Energy was the first utility to voluntarily implement a Tariffed Installation Program, modeled on the Pay As You Save concept. The program offers customers the opportunity to make energy-efficiency improvements to their homes, and pay for the improvements through a surcharge on their utility bill. To date, 478 projects at 465 locations have been completed. Eighty-nine per cent of the projects were at residential properties.

A couple of features distinguish this program from PACE-style financing. First of all, the obligation to pay back the cost of the improvement is attached to the meter, not the property. This means that renters can also participate in the program. To date about 12% of residential participants have been renters.

Another distinguishing feature is that the program will only finance improvements that cost less than the savings achieved. In other words, the improvements have to result in savings to the customer in terms of their utility bills, and the payments have to be less than the predicted savings. The average investment is $5,600. The average monthly surcharge is $41.68 per month and the average savings are $49.45 a month. If customers decide that they want to make an improvement that does not meet this criterion, Midwest Energy offers them the option to buy down the project costs. About two-thirds of the customers choose to buy down the project costs.

Utility's View on Risk

In terms of risk to the utility of this program, staff contends that the risks are minimal. Midwest Energy considers the repayment of the improvements as part of the service it bills customers for. When customers don't pay their bills, Midwest Energy has the right to disconnect service. Because the payments are tied to the meter, the balance of How$mart payments are transferred to the next customer. From the utility's point of view, because How$mart actually results in lower energy bills, the bad debt it incurs when customers don't pay their bills is less than it would have otherwise been.

Calculating Savings from Improvements

Customers interested in the How$mart program are first screened to ensure that they are eligible for the program. This includes looking at their energy bills. In most cases, customers then receive a comprehensive audit performed by one of five certified energy raters employed by the utility. The audit may include duct testing, combustion analysis, blower door test, infrared scans, insulation inspections and heating-cooling ventilation-system size calculations. Upon completion of the audit, customers then receive a Conservation Plan which outlines recommended improvements and expected savings. When asked how How$mart is able to ensure that the savings it identifies will be realized, program staff explained that the methodology used relies on actual historical data about energy use at the property. According to program staff, energy modeling software often tends to overestimate energy usage and

thus overestimate potential savings. By using the actual data from energy use, Midwest Energy is able to arrive at a much better estimate of energy savings when improvements are made.

Date started.	2007
Process of implementation.	Midwest Energy already had in-house auditing capabilities. It was also able to use their billing system to add How$mart charges to regular bills.
Size of population.	90,000 gas and electric customers.
Enabling legislation.	In 2007, the Kansas legislature passed a statute that allowed public utilities to enter into agreements with customers for the financing of energy conservation measures. The statute requires utilities to receive approval for the tariffs from the state regulatory agency.
Results.	In late 2010, the program has completed 478 projects at 468 locations. 11% of these projects were at commercial locations. Of the residential locations, 12% are in rental properties.
Lessons learned.	One of the lessons learned was that property-owning participants are not likely to inform buyers of the How$mart obligation attached to the meter. Midwest Energy is obliged to provide notification to the new owner. To address this issue, Midwest Energy now files "Uniform Commercial Codes" with local County Registers of Deeds. Thus, when a title search is done prior to the sale of a home, the prospective buyer will be made aware of the obligation.

Type of program.	Tariffed Installation Program.
Source of capital.	Kansas Housing Resources Corporation provides 50% of project funds at 0% interest; The rest comes from the utilities general revenues.
Target	Residential and commercial.
Scope.	Any improvements that are permanently attached to the foundation are eligible. 93% of the projects include furnace, air conditioning, or both. Currently 53% of the projects include thermal shell improvements and this proportion is growing. Furnaces must be at least 90% AFUE, and AC must be at least 14 SEER.
Eligibility.	The surcharge payments must not exceed 90% of the energy cost savings —on average they come out to about 82%.

Application process.	The program is open to renters and property owners alike. To be eligible, customers must be current on their utility bills. Interested customers receive a description of the program and a high-level screening of energy usage. In most cases, this leads to a comprehensive audit from Midwest Energy and a Conservation Plan. Midwest Energy employs five certified energy raters. If customers get an audit but choose not to make any of the improvements they may be charged $200. Customers will not be charged the $200 if the auditors are unable to find improvements that would cost less than the energy savings. Renters are eligible,
Security	Disconnection for nonpayment.
Terms of financing.	Maximum 180 months for the residential sector. Maximum 120 months for the commercial sector or 75% of life of expected measures. Below market interest rates. Current interest rate is 5.05% for residential customers and 6.6% for commercial customers.
Administration.	The administration of the program is all done in-house. Participants pay an administrative fee of 5% of the program costs.
Monitoring and evaluation.	A formal evaluation process has not been determined by regulators. However, internally, the utility does do a very thorough before-and-after project energy use analysis.
Other innovations.	The utility maintains what it calls an "easy on, easy off" list of contractors. Every contractor has to have a Contractor Master Agreement with the utility. Midwest Energy maintains that one of the reasons the program has been so successful is because of the relationships with contractors, who in many cases act as ambassadors of the program. To engage contractors in the program, Midwest Energy offers local training opportunities.

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R. Volker, email correspondence with author, Nov. 3, 2010.

Appendix A:

Nova Scotia government's amendment to allow LIC financing for renewable energy and energy-efficiency financing under the Halifax Regional Municipality Charter

BILL NO. 112

Government Bill

2nd Session, 61st General Assembly
Nova Scotia
59 Elizabeth II, 2010

An Act to Amend Chapter 39 of the Acts of 2008, the Halifax Regional Municipality Charter

CHAPTER 52
ACTS OF 2010

AS ASSENTED TO BY THE LIEUTENANT GOVERNOR
DECEMBER 10, 2010
The Honourable Ramona Jennex
Minister of Service Nova Scotia and Municipal Relations

An Act to Amend Chapter 39of the Acts of 2008, the Halifax Regional Municipality Charter

Be it enacted by the Governor and Assembly as follows:

1 Subsection 79(1) of Chapter 39 of the Acts of 2008, the *Halifax Regional Municipality Charter,* is amended by adding immediately after clause (ad) the following clause:

(ada) providing for, financing and installing energy-efficiency equipment on private property including, without restricting the generality of the foregoing, solar panels;

2 Chapter 79 is further amended by adding immediately after Section 104 the following Section:

104A (1) The Council may make by-laws imposing, fixing and providing methods of enforcing payment of charges for the installation of energy-efficiency equipment on private property with the consent of the property owner including, without restricting the generality of the foregoing, solar panels.

(2) A by-law passed pursuant to this Section may provide

(a) that the charges fixed by, or determined pursuant to, the bylaw

may be chargeable according to a plan or method set out in the bylaw;

(b) that the charges may be different for different classes of

development and may be different in different areas of the Municipality;

(c) when the charges are payable;

(d) that the charges are first liens on the real property and may be

collected in the same manner as other taxes;

(e) that the charges be collectable in the same manner as taxes and, at the option of the Treasurer, be collectable at the same time, and byte same proceedings, as taxes

(f) a means of determining when the lien becomes effective or when the charges become due and payable;

(g) that the amount payable may, at the option of the owner of the property, be paid in the number of annual installments set out in the bylaw and, upon default of payment of any installment, the balance becomes due and payable; and

(h) that interest is payable annually on the entire amount outstanding and unpaid, whether or not the owner has elected to pay by installments, at a rate and beginning on a date fixed by the by-law.

Appendix B:

Examples of legislation and regulations allowing municipalities to adjust funds borrowed for LIC projects from their credit limits.

EXAMPLE A:

www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/vanch_25

Vancouver Charter
[SBC 1953] CHAPTER 55

Part XXIV — Local Improvements
Effect on city's debt

521. A by-law authorizing the issue of debentures to defray the property-owners' share of the cost of a project pursuant to this Part need not be submitted for the assent of the electors, and such debentures shall be deemed to form no part of the debt of the city under Part V, nor shall it be necessary to include the amount of the debt created by such debentures in any recital, under that Part, of the total amount of the existing debenture debt of the city.

1953-55-521.

EXAMPLE B:

www.e-laws.gov.on.ca/html/regs/english/elaws_regs_020403_e.htm

Ontario Municipal Act, 2001
Loi de 2001 sur les municipalités

ONTARIO REGULATION 403/02
DEBT AND FINANCIAL OBLIGATION LIMITS

Updated limit

4. (1) Before authorizing any specific work or class of work or any increase in expenditure for a previously authorized specific work or class of work that would require a long-term debt or financial obligation described in section 2, the council of the municipality shall have its treasurer calculate an updated limit using the most recent debt and financial obligation limit determined by the Ministry. O. Reg. 403/02, s. 4 (1).

(2) The treasurer shall update the most recent limit determined by the Ministry as follows:

[...]

5. Add to the amount obtained in paragraph 1 the estimated amount annually payable for any long-term debt or financial obligation described in section 2 in respect of the owner's share of the cost of a work undertaken as a local improvement under Ontario Regulation 586/06 (Local Improvement Charges — Priority Lien Status) made under the Act. O. Reg. 403/02, s. 4 (2); O. Reg. 294/09, s. 2 (1).

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This Green House

BUILDING FAST ACTION FOR CLIMATE CHANGE AND GREEN JOBS

To avoid catastrophic climate change, the UN Intergovernmental Panel on Climate Change is calling on developed countries to lower Green House Gas (GHG) emissions 25% to 40% below 1990 levels by the year 2020. Canada, the world's 9th largest economy, is failing spectacularly at this goal. Adjusted to the same 1990 baseline, Canada's current target amounts to a 3% reduction. Even this ambition is not on track. Emissions continue to rise in Canada.

The fast and affordable way to reduce GHG emissions in Canada is to retrofit buildings to make them more energy efficient.

Municipalities can take action on climate change, stimulate their local economy, and help homeowners save money on energy bills, live in increased comfort and add value to their homes all at the same time.

This Green Home: Building Fast Action for Climate Change and Green Jobs highlights a path for municipalities to provide low-cost financing to retrofit homes, with homeowners repaying the cost over time on their property tax or utility bills. These programs can be run at full cost recovery, allowing municipalities to take action without adding to overall taxes.

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