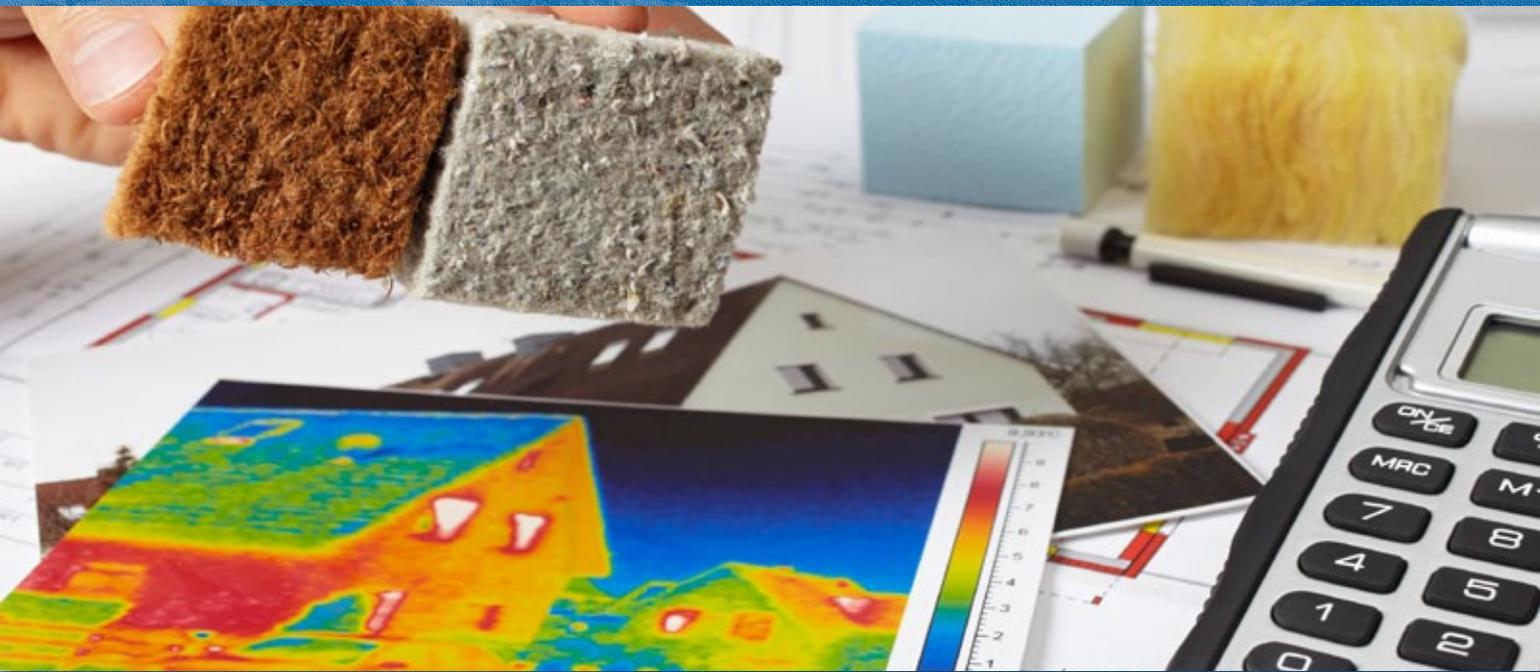


# property assessed payments for energy retrofits and other financing options

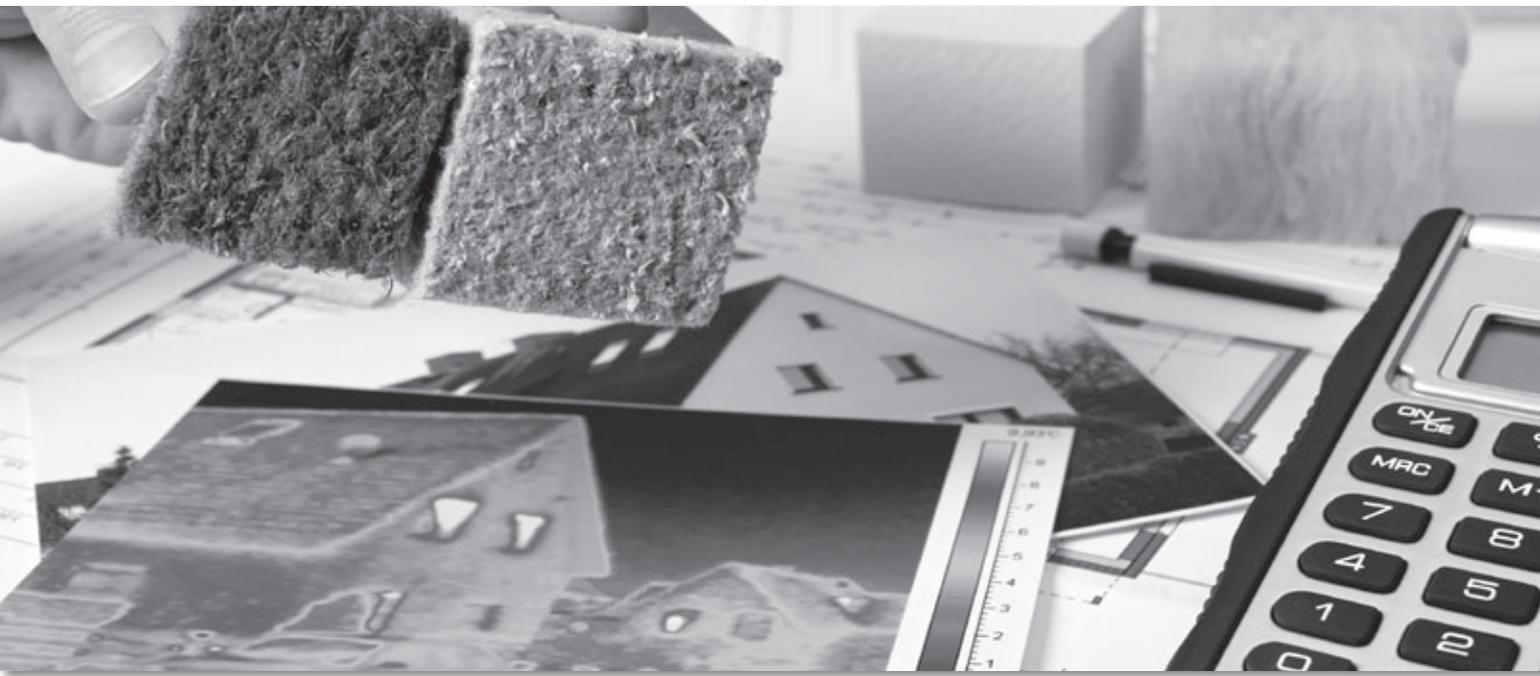


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# property assessed payments for energy retrofits and other financing options



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## Property Assessed Payments for Energy Retrofits and Other Financing Options

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# Executive Summary

**P**roperty Assessed Payments for Energy Retrofits (“PAPER”)<sup>1</sup> is a promising financing concept derived from the Local Improvement Charges mechanism under the Ontario Municipal Act, 2001 (and the City of Toronto Act, 2006). This financing concept (under other names) is available in Yukon Territory and Halifax Regional Municipality, is being explored by Alberta and British Columbia, and will be available in the U.K.; and a version of it will be implemented in the City of Vancouver. However, PAPER financing is not currently available in Ontario. A previous report, “Property Assessed Payments for Energy Retrofits: Recommendations for Regulatory Change and Optimal Program Features”, identified regulatory changes that would be needed to make the concept feasible, and optimal program features. This report analyzes a PAPER program in relation to financing options available in the private sector and through governments and utilities. The analysis indicates that PAPER financing comes out on top and should be included in a comprehensive strategy to enhance home-energy efficiency.

Here’s why:

## **Top 10 Reasons Why Ontario Needs a “PAPER” (Property Assessed Payments for Energy Retrofits) Financing Program**

- 1) **The program would result in deep reductions in energy use and GHG emissions** by enabling medium to large capital investments and focusing on cost-effective energy savings. It would help all levels of government (federal, provincial, regional and municipal) meet their targets and would reduce needs for costly power generation plants.

- 2) **A low-interest PAPER program makes it easy for homeowners at all income levels to do energy saving retrofits.** Unlike private sector financing, low interest rates would be provided to all.
- 3) **Multiple societal benefits would ensue.** Every sector,<sup>2</sup> as well as future generations, would be able to reduce the risks associated with energy security and climate change<sup>3</sup> and their associated environmental, social and economic impacts.<sup>4 5 6 7</sup> Homeowners' risks of rising and volatile energy costs would be mitigated.<sup>8</sup> Health care costs to taxpayers and individual health impacts from non-renewable energy sources would be lowered.<sup>9</sup> Green jobs would be created and the initiative would be profitable to local businesses and financing institutions.<sup>10</sup> More capital would circulate,<sup>11 12</sup> benefiting municipalities' local economies.<sup>13</sup> Provincial<sup>14</sup> and federal budgets would benefit from increased income tax revenues. Unemployment costs would be reduced.<sup>15</sup>
- 4) **An optimal PAPER program would be a collaboration between government, industry and NGOs, providing economies of scale to each partner** and enabling a higher percentage uptake with lower costs due to the collaboration. Higher level governments would participate because of multiple benefits to their budgets. Investors would participate in energy efficiency financing at a profitable scale. Other partners would provide services valuable to one another.
- 5) **A PAPER program would be a secure way for municipalities to encourage energy saving retrofits at no cost to the municipal governments.** Program costs would be payable by participants. This, together with multi-sector collaborations, would enable municipalities to deliver a revenue-neutral program. The PAPER mechanism is designed to have high priority security, and other program provisions would enhance mitigation of default risks. As well, combining PAPER with default risk mitigation products would reduce risks further for municipalities, investors, mortgage lenders (mortgagees) and homeowners.
- 6) **Homeowners would save money in the first year.** The program would be designed to be cost effective and delivered by highly trained service providers so annual savings exceed annual payments.<sup>16</sup>
- 7) **PAPER financing would be transferable to the property's new owner on sale.** Many people anticipate moving before a loan could be paid off, which may discourage them from making more expensive energy retrofits with longer paybacks. By assessing the obligation to the property as a form of stewardship financing<sup>17</sup> that is not a property tax but a fee repaid on the property tax bill, the new owner continues to repay the obligation and receive benefits from the savings.

- 8) **The financing would not be added to the owner's debt and would not be subject to property taxes.** The financing would not be a personal loan but is a fee (not a tax) assessed to the property. This has been an appealing feature to middle-income owners in a similar U.S. program.<sup>18</sup> The Ontario Assessment Act includes wording regarding exemption of energy efficiency and renewable energy equipment and machinery from property tax.<sup>19</sup> A process is under way to outline eligible renewable energy systems.<sup>20</sup> Energy efficiency measures, however, would need to be prescribed by the Minister. There also needs to be clarity in the definition so that all energy efficiency measures would be exempt, encompassing (for example) insulation and passive solar design features.<sup>21</sup>
- 9) **The financing would be adjusted from the municipality's debt totals,** similar to financing for Local Improvement Charges.
- 10) **Municipal facilitation would enable service delivery with neighbourhood-level economies of scale and social equity.** Neighbourhood scale retrofits would be enabled through municipal financing, and allow participation by owners with differing income levels and energy use.

PAPER programs would provide benefits that other financing alternatives don't. Other financing mechanisms such as on-bill financing will be beneficial, will suit some situations and will dovetail with an optimal PAPER financing program that will suit many situations and provide all 10 benefits.



# 1. Preface

**T**he building sector, and housing in particular, has the potential to address our current significant needs to reduce greenhouse gas emissions and energy use. The Environmental Commissioner of Ontario (ECO) noted that “in 2007, the building sector was responsible for 33.4 MT or 17 per cent of Ontario’s emissions”<sup>22</sup> and also stated there will be an emissions target shortfall of 15 MT in 2014 and 35 MT in 2020. (The targets are: six per cent below 1990 levels by 2014, 15 per cent below 1990 levels by 2020, and 80 per cent below 1990 levels by 2050).<sup>23</sup>

A broad range of initiatives focuses on enhancing energy efficiency of both the new and existing housing stock. These strategies include energy labelling, ratcheting up standards for buildings and equipment, requiring energy efficiency improvements on major renovation, and neighbourhood programs. Given that 66 per cent of all buildings that will exist in 2050 have already been built,<sup>24</sup> the majority of building sector emissions will continue unchecked without energy retrofits.

Yet, Ontario’s Home Energy Savings Program (HESP) will end in 2011.<sup>25</sup> And, although the federal government announced its intent to reduce GHGs by 17 per cent from 2005 levels, emissions trends continue to increase, the current ecoENERGY program is winding down with no long-term assurance that it will be continued, and there is no federal plan to reduce emissions in the future.<sup>26</sup> As well, municipalities have varying targets, but no broad-based energy efficiency programs.<sup>27 28 29</sup>

Ontario municipalities are currently engaged in ways to help their communities become more sustainable and energy efficient. Typically this has been a process of stages. Community sustainability and/or energy plans often begin by setting goals for reductions in buildings’ energy use and greenhouse gas emissions, addressing municipal operations, land-use planning, enabling district systems and private renewables (in connection with Ontario’s feed-in-tariffs). Strategies may then move toward the development of sustainable guidelines and standards for new construction for commercial and residential properties in addition to providing informational support about energy conservation for owners of

existing buildings.<sup>30 31 32</sup> Municipalities have also linked to other governments' residential energy retrofit incentive programs.

Even with the HESP and ecoENERGY incentives, market penetration has been subject to barriers to homeowners' investments in home efficiency retrofits. Some of the biggest challenges have include high upfront retrofit costs, uncertainty about recouping retrofit investments before selling one's property, knowledge gaps about the measures that contribute to cost effective energy savings, workforce capability concerns and the complexity of retrofits.<sup>33</sup> Except for financing, these challenges are not addressed by the private sector, and even financing is not accessible to fiscally responsible homeowners across all income levels.

Many municipalities have provided direct financial support to property owners in the form of grants and loans; however, this support has been focused on owners of buildings in commercial, industrial and institutional sectors. There are some residential exceptions<sup>34</sup> such as the City of Toronto, which provided pilot project financing for solar thermal installations<sup>35</sup> and some funding for insulation.<sup>36</sup> As well, both the cities of Ottawa<sup>37</sup> and Toronto<sup>38</sup> have conducted market demand research regarding energy retrofit financing.

Given the huge potential for GHG reductions in existing buildings<sup>39</sup> and the gap between the three levels of governments' goals and achievements to date,<sup>40 41</sup> there is a pressing need for an effective and affordable program capable of significantly increasing the overall energy efficiency of Ontario's existing housing stock through medium- to large-scale investments. An exciting new energy retrofit program can be developed in Ontario to reduce energy use and associated GHG emissions in existing houses and address barriers to energy retrofits discussed above. This new program, called Property Assessed Payments for Energy Retrofits, or PAPER, would assess energy improvement costs to properties using a modified version of a long-established local government mechanism called Local Improvement Charges.

The concept has been championed throughout North America during the past few years, and is available in Yukon Territory and in Halifax Regional Municipality.<sup>42</sup> It is being considered within Alberta and British Columbia,<sup>43</sup> will be legislated in the U.K.,<sup>44</sup> and a version will be developed in the City of Vancouver,<sup>45</sup> but it has yet to be implemented in the province of Ontario.

The David Suzuki Foundation, with funding from the Trillium Foundation, is working with municipalities, industry stakeholders and senior governments to implement Local Improvement Charges as a promising new approach to home energy efficiency retrofits in Ontario. The first year of this project involved researching challenges to adapting LICs for financing energy improvements. Three reports are being published over the two-year study.

The first report, "Property Assessed Payments for Energy Retrofits: Recommendations for Regulatory Change and Optimal Program Features", details the barriers to home-energy retrofits, sets out recommendations for a PAPER regulation to enable the use of Local Improvement Charges for financing home energy retrofits in Ontario, and identifies key features of an ideal program. This second report is a comparative analysis of energy retrofit financing alternatives in relation to PAPER, including those provided by the private sector. The third study, to be published in mid-2011, will outline strategic recommendations on optimal PAPER program implementation for Ontario municipalities in collaboration with senior levels of government and the finance and construction sectors.



## 2. Overview of PAPER

**P**roperty Assessed Payments for Energy Retrofits would be derived from the municipal financing mechanism called Local Improvement Charges (LICs), authorized under the Ontario Municipal Act, 2001.

Local Improvement Charges allocate infrastructure costs for public benefit and community enhancement measures to properties whose owners benefit from the improvements. LICs are currently used for financing<sup>46</sup> sewers, sidewalks and other local neighbourhood amenities, uses that abut or are near the benefiting properties. Repayment of the Local Improvement Charge is achieved through a charge on the property owner's property tax bill until the obligation is paid off.

LICs allow a homeowner who still has an outstanding retrofit obligation to sell his or her property and to transfer the remaining obligation automatically to the new owner. The new owner would assume payments for the obligation because the obligation is assessed to the property as a fee (not a tax). If a payment is in arrears, it triggers a tax lien (on the defaulted payments only) and if default continues, the municipality can proceed with a tax sale or foreclosure. Given the priority lien, the small outstanding payment would take priority over any outstanding mortgage on sale, and the new owner would resume the LIC payments.

In 2008, more than 25 per cent of municipalities added \$19.6 million in local improvement charges to property tax bills.<sup>47</sup>

Current regulatory challenges to applying the LIC mechanism for energy improvements are primarily that costs are allocated based on lot frontage; the process for setting up LICs is very complex; and municipalities are uncertain whether their broad powers extend to using LICs for this purpose. The previous paper<sup>48</sup> described the challenges and recommendations for this regulatory modification.

If these regulatory challenges were addressed, a PAPER program would be able to apply the LIC financing mechanism to assess energy improvement costs to properties. Key aspects of LICs that would transfer to PAPER financing are that payments for the up-front financing

would be assessed to the property (not a personal loan of the owner) and would be repaid on the property tax bill – but would not be an increase in property tax.

Potential financing that the homeowner could qualify for would be determined based on eligibility criteria. After an energy assessment is conducted on the home by knowledgeable, accredited energy evaluators, the homeowner would have access to a “one-stop shop,” find out the cost of recommended measures that would enhance the home’s energy efficiency, and arrange for a pre-qualified contractor to do the work. A follow-up energy assessment and access to bill details would confirm the amount of energy and costs saved and GHG emissions avoided.

Best practices from similar programs already implemented outside of Canada have been integrated into proposed PAPER program details outlined below.<sup>49</sup>

## **Annual savings exceed annual payments**

Optimal PAPER financing would support installing cost-effective energy retrofit measures that produce a net positive cash flow beginning in the first year.<sup>50</sup> This would occur when annual energy cost savings exceed the annual retrofit payments, since the allowed term is longer than that of other financing options.<sup>51</sup>

Additionally, municipalities would help facilitate a neighbourhood approach whereby homeowners in the same geographical location would be encouraged (but not required) to participate in the program at the same time. This would produce economies of scale for service providers and allow participation by both high energy-consumers and low energy-users in the neighbourhood (the latter of whom may be using less energy because they can’t afford it or because they are frugal).<sup>52</sup>

## **Payments are associated with property; they transfer to new owner on sale**

The financing and payments would be associated with the property so if the owner moves the payments are continued by the property buyer – who also receives the energy cost savings. This is a key benefit because property turnover in Ontario is fairly frequent relative to the time period required for a return on investment for more costly home energy improvements.<sup>53,54</sup> PAPER financing therefore allows people to invest in higher-cost energy improvements whose payback period may be longer than the owner’s expected stay in the home.

In an optimal PAPER program, local governments would be able to minimize homeowners’ costs by providing energy retrofit financing to homeowners at no cost to the municipalities. Collaboration among municipalities and with private and non-governmental sectors, along with financial supports from provincial and federal governments, would enable economies of scale for a cost-effective program. The higher level governments’ supports<sup>55</sup> would be offset by their budgetary savings on energy infrastructure and health care costs, as well as the income tax revenues from the increased economic activity and job creation. In addition to these budgetary benefits, the energy retrofit program would help them achieve their goals for energy and GHG emission reductions.

Key private sector members of the collaboration would be finance, real estate and construction participants. NGOs could be engaged in multiple roles, such as in marketing and helping to facilitate behavioural change through promotion and education.

An important aspect of the revenue neutrality is that municipalities would not profit from property owners by increasing property taxes as a result of any property value increment from the energy retrofits. The Ontario Assessment Act includes phrasing regarding the exemption of energy efficiency and renewable energy equipment and machinery from property taxes.<sup>56</sup> Some renewable energy measures are expected to be made exempt in the near future,<sup>57</sup> however this also needs to be prescribed by the Minister so that all energy efficiency measures could be eligible. For example, definitions also should include insulation and passive solar design features.<sup>58</sup> Property tax exemption is a popular economic incentive used to encourage energy and green building improvements throughout the U.S.<sup>59</sup>

Another feature that would help reduce municipalities' costs and risks is being explored by municipalities in Canada:<sup>60</sup> if the market were developed, municipalities could sell aggregated PAPER financing to investors to repopulate revolving funds.<sup>61</sup> Municipalities would ideally receive enforcement support from the investors (in case of default) in exchange for servicing the PAPER financing.

Three entities potentially bear the risk of homeowner default. They are the municipality that provides capital to property owners for the retrofits, the financing entity that provides that capital to the municipality, and the existing mortgagees of homes undergoing retrofits in a PAPER program.

The security to the municipality and its financing entity provided by the LIC is a unique, attractive feature. This security rests in the default mechanism: if property taxes are in default (including LIC payments), the overdue amount becomes subject to a tax lien, which has priority over other debts on the property, including mortgages.

This priority lien has been considered elsewhere<sup>62</sup> as a risk factor for mortgagees and is one of the reasons allegedly given by the Federal Housing Finance Agency for freezing U.S. PACE financing, although the potential amount that takes priority over a mortgage is deemed very small. This is one of the hotly debated issues by the large coalition of supporters from all levels of government and industry. (Please see Appendix II for further details regarding this situation and in relation to the Canadian environment.) Consequently, there would need to be PAPER program features that address this challenge. As well, there would be other default risk mitigation strategies; for example, this risk type is mitigated by factors including an acceptable loan-to-value ratio and proportion of property value, and obtaining an acknowledgement letter from the existing mortgagee.<sup>63</sup>

Another challenge for lenders and investors – but an attractive PAPER social equity feature that also applies to on-bill financing – is that income is not used as an eligibility criterion and therefore credit ratings are not taken.<sup>64</sup> Income is also not used to assess eligibility in U.S. PACE and similar initiatives; for example, in the *Long Island Green Homes* program described at the end of this section. In determining on-bill financing eligibility, bill payment history is one proxy for taking a credit rating.

Other **PAPER program provisions to mitigate default risk for all three groups** could be considered, such as:

- 1) bonus provisions built in to reward participants for adhering to the payment schedule.
- 2) a minimum equity requirement.<sup>65</sup>
- 3) property value increments from the retrofits, which would mitigate the risks of loss on foreclosure.
- 4) a PAPER program partner could increase owners' awareness about conservation so owners don't consume more because their bills are lower.
- 5) risk mitigation measures could be blended in a product with PAPER for greater security, lower interest rates, and higher homeowner cash flow. These products are discussed further in Appendix III:
  - a) a guarantee/loan loss reserve.
  - b) a new financing insurance type for home energy retrofits via PAPER that would be similar to CMHC's Mortgage Loan Insurance<sup>66</sup> (which would provide security and lower interest rates, and ideally also include a partial premium refund similar to CMHC's Green Home program<sup>67</sup>).
  - c) an energy savings guarantee scaleable to the residential sector.
  - d) a closing cost-additional amount paid by homeowners that when aggregated across participants serves as a fund from which delinquent payments can be made. When there are few delinquencies this allows the obligations to be paid down early near the end of the term.

These factors collectively would help make PAPER profitable for lenders and investors, and revenue neutral for municipalities.

Another major homeowner benefit is that **PAPER financing is not added to the owner's debt** because the obligation stays with the property and not the owner. This would appeal to middle income earners with good credit ratings but with many uses for their available cash as it would allow dedicated financing for retrofits while retaining owners' budgetary flexibility. It would also help those who are more leveraged who meet the program criteria. This feature was a major factor in program uptake elsewhere.<sup>68</sup>

**Bonds for PAPER would not affect municipal debt and financial obligation limits.** When (general obligation<sup>69</sup>) bonds are issued for financing Local Improvement Charges the amounts are adjusted from the municipality's total debt limits.<sup>70</sup> This is an important LIC provision that ideally would be carried over to PAPER financing.<sup>71</sup> As well, one municipality in Canada is considering selling LIC financing to banks. This capacity would enable an exchange whereby municipalities would continue servicing LICs, in exchange for the bank taking over enforcement in case of default, a mutually beneficial arrangement enabling banks' investment in energy efficiency investments at a profitable scale. It would also be ideal if municipalities could issue revenue bonds<sup>72</sup> whose income could be tied to repayments from LICs/PAPER financing.

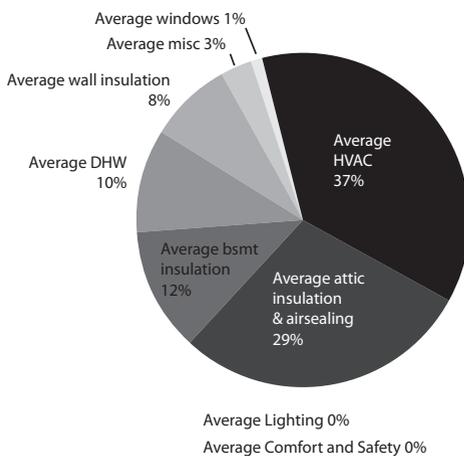
The interest rate charged to homeowners for this kind of program would depend on the investor's perceived financing risk in issuing the bond, and the municipality's setup and ongoing program costs. Program costs would be reduced due to the collaboration,<sup>73</sup> and provincial and federal leveraged supports (ideally) would be obtained via loans that would help keep interest rates low.

One key challenge to implementation has been municipalities' perception of their authority to engage in energy retrofits using LICs. As interpreted by Ontario Ministry of Municipal Affairs and Housing staff,<sup>74</sup> "although the regulation does not currently list energy retrofits as a sample type of work, the list is not limiting and ... any capital work could be undertaken as a local improvement." This work can also be done on private property. However, as long as municipal staff are uncertain about whether they can interpret the regulation in this way they will be reluctant to set up this kind of program. The solution would be for the Ontario government to identify clearly that energy improvements are allowed, and disseminate this.

An example of this type of financing that remains with the property and is not a personal debt of the owner is the *Long Island Green Homes* initiative in the Town of Babylon, New York State.<sup>75</sup> This is a BACE initiative (for Benefit-Assessed Clean Energy), differentiated from U.S. PACE programs (property-assessed). This is the only early U.S. pilot program in which savings were specifically designed to exceed the energy improvements financing payments (which stay with the property and is a recommended feature of PAPER programs). The overall administration costs for the program were about 12 per cent in 2009 and 10 per cent in 2010, with the qualifier that these are rough approximations.<sup>76</sup> The financing rate to participants was three per cent,<sup>77</sup> representing the opportunity cost to the Town if it had invested the funds on the money market instead of financing the retrofits.<sup>78</sup>

Owners are invoiced monthly; this bill is not associated with the biannual property tax payment. Only an ongoing delinquency would trigger a levy assessment of the delinquent amount onto the property tax bill. As of August 2010, after 302 completed jobs, actual data are shown.

**Breakdown of Measures in the "Average" LIGH House**



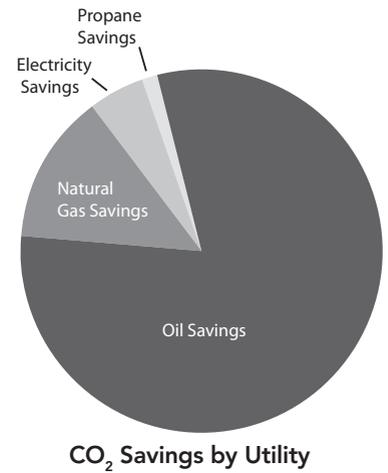
**Long Island Green Homes initiative, Town of Babylon, New York State**

<b>Total cost of projects (est.)</b>	<b>\$2,560,240.41</b>
<b>Average project cost</b>	<b>\$9,014.93</b>
<b>Average annual savings</b>	<b>\$1,068.65</b>
<b>Average payback period (years)</b>	<b>8.796376812</b>
<b>Average Savings-to-Investment Ratio</b>	<b>1.882313433</b>
Average Domestic Hot Water	\$916.94
Average HVAC	\$3,356.23
Average basement insulation	\$1,083.26
Average attic insulation and airsealing	\$2,632.70
Average wall insulation	\$766.99
Average lighting	\$5.17
Average windows	\$140.47
Average misc.	\$262.53
Average comfort and safety	\$22.40

Source: Dorian Dale, Town of Babylon, August 2010. Used with permission.

<b>Long Island Green Homes initiative, Town of Babylon, New York State</b>		
<b>Total CO<sub>2</sub> saved (annualized)</b>	<b>2,550,404.482 lbs</b>	<b>1,275 tons</b>
<b>Total solid carbon saved (annualized)</b>	<b>714,113.255 lbs</b>	
Total annual electricity savings	144,359 Kwh	124,148.31 lbs CO <sub>2</sub>
Total annual oil savings	91,717.6 gallons	2,053,006.758 lbs CO <sub>2</sub>
Total annual natural gas savings	29,110.9 CCF	342,491.2837 lbs CO <sub>2</sub>
Total annual propane savings	2,421.9 gallons	30,758.13 lbs CO <sub>2</sub>

Source: Dorian Dale, Town of Babylon, August 2010. Used with permission.





## 3. Drivers, goals and evaluation criteria

**T**his section describes the evaluation methodology for the analysis of financing options provided by the private sector, government and utilities. The evaluations are based on drivers of an energy retrofit program. The goals and objectives against which the options are assessed are directed toward achieving deep reductions per household, retrofitting a large percentage of existing homes, ensuring access to affordable capital for all, and facilitating benefits to society.

### Drivers

There are several key drivers for energy retrofits in Ontario. These are:

- 1) **Reducing energy consumed in our existing buildings has enormous potential to lower GHG emissions, achieve government targets, and provide savings on energy infrastructure** (as described above).
- 2) **Homeowners are motivated to save money on their energy bills**<sup>79</sup> – especially with increasing risks of rising and volatile energy prices. They also seek to enhance their homes' value.<sup>80 81</sup>
- 3) **Societal benefits are a significant driver** for multiple sectors to support energy improvements.

**Scaled-up energy retrofits would create large numbers of local “green” jobs.**

Funds saved on property owners' energy bills circulate more frequently and provide a significant local economic multiplier<sup>82</sup> in an energy efficiency retrofit program. This is an import substitution approach that replaces energy outsourcing with local “freed-up” energy savings from energy efficiency improvements.<sup>83 84 85</sup>

Substituting energy conservation retrofits for imported energy (such as for natural gas) results in less money leaving the local economy. Conservation of electricity use by means of energy efficiency would create 3.5 times more direct

jobs than creating the same amount of electricity from fossil fuels such as coal and natural gas.<sup>86</sup>

There are also economic benefits associated with supporting Canadian industry development for products addressing energy efficiency as well as some renewables for homeowners able to engage in larger investments that include (for example) solar thermal installations. Including multiple green job creation benefits, \$1 million invested is estimated to provide jobs for 14.2 person-years to 70 person-years.<sup>87 88 89</sup>

**An energy retrofit program generates an economic stimulus for all levels of government.** Many costs that are associated with using large amounts of energy and using non-renewable energy sources are externalized to society and therefore paid for by taxpayers.

A scaled-up energy retrofit program would reduce energy infrastructure costs and result in other major economic and social benefits<sup>90</sup> for local and higher level governments. These include health care savings from avoided nuclear impacts<sup>91</sup> and reduced pollution<sup>92 93 94</sup> from non-renewable energy generation (national economic costs of air pollution due to ozone and small particulates amounted to \$8 billion in 2008<sup>95</sup>); lowered expenses for environmental impacts;<sup>96 97</sup> reduced costs due to unemployment; increased income tax revenues; and additional economic benefits from mitigation of climate change.<sup>98</sup>

Individuals and the private sector would also gain. Scaled up energy efficiency would be an economic stimulus due to avoided health impacts and via job creation potential. The Canadian Medical Association report on these costs noted levels would be rising in subsequent years: unchecked, they would total about \$258 billion between 2008 and 2031.<sup>99</sup>

- 4) Additionally, **many sectors' climate change risk levels would also benefit from participation in energy retrofits and these translate to economic benefits.** For instance, where the retrofits increase the properties' energy efficiency, mortgagees would benefit from a reduction in climate change risks<sup>100</sup> to their mortgage portfolios without any cash outlay by the mortgagees themselves.<sup>101</sup> Groups such as the Canadian Council of Chief Executives are urging carbon pricing.<sup>102</sup> "Mortgage values for residential properties that are not energy efficient themselves ... may decrease due to rising carbon prices, and therefore may underperform over the medium- to long-term."<sup>103</sup> As well, investors in bond issues would be able to include energy retrofits in their portfolios at a larger scale than individual small loans, thus addressing shareholder environmental, social and governance concerns.

These drivers comprise triple-bottom-line rationales in supporting our environment, economy and society.

## Goals and objectives for a housing energy retrofit program

In order to respond effectively to the prime driver noted above – that of reducing greenhouse gas emissions – a housing energy improvement program needs to be accessible and

achieve greenhouse gas reductions that are significant at the provincial scale. Specifically, a successful retrofit program will:

- 1) achieve deep reductions per household,
- 2) retrofit a large percentage of existing homes,
- 3) ensure access to sufficient affordable capital to enable this scale of retrofits, and
- 4) benefit society.

Objectives for attaining these goals are described below.

## Achieve deep reductions per household

Ideally, home energy improvements would be cost effective in optimizing home energy efficiency. Generally, measures producing deeper reductions are medium- to higher-cost and repaid over terms of five years or more.<sup>104</sup>

### LOW INTEREST RATES

A major component in achieving the net energy cost savings goal is minimizing the interest rate paid, which reduces the total amount financed (for a fixed amount of capital) or allows more measures to be installed for the same amount of money (higher capital, lower interest for the same financing total). Since interest rates vary with the level of risk, enabling low financing rates requires investment risk to be kept as low as possible.

**Ensure net energy cost savings:** It is important to obtain the greatest energy cost savings per dollar spent, and ensure that energy cost savings achieved from doing retrofits exceed the cost of purchasing and installing them.

A major component of this objective is ensuring affordability for the homeowner. There are several key aspects to this. One is the overall capital required, and another is the payment:

1. Capital obtained for the improvements needs to be in keeping with the home's achievable energy savings and the debt that the owner can take on (e.g., if the home is very energy efficient the additional capital required to achieve enhanced energy efficiency may be large).
2. Energy retrofit financing will also be affordable if energy cost savings can exceed financing payments reliably on an annualized basis, so there is a net savings from the first year. The financing term also needs to be congruent with terms the financing entity can provide and match the useful life of the asset.

**Optimize energy savings:** It is important that an energy retrofit program achieve the greatest extent of cost-effective improvements possible, including higher-cost, longer-payback opportunities<sup>105</sup> while recognizing that capital replacement needs near equipment end-of-life may compete with other energy efficient measures for a limited amount of financing.

The above objectives imply that, ideally, achieving optimal energy savings would matter to a financing entity for three reasons:

- 1) it would ease the owner's cash flow and therefore increase the owner's ability to pay,
- 2) this would result in lower risk to the financing entity,

- 3) it also would have greater potential for increasing the home's value due to the enhanced energy efficiency.

Please see Appendix I on Value for further details.

### **Minimize homeowners' debt totals and municipalities' debt loads**

Municipalities have a finite capacity to borrow, and many programs they must finance from limited budgets. Ideally the capacity to borrow would not be affected by financing energy improvements.

As well, homeowners with good credit scores and others who are more leveraged may not want to add to their debt. Ideally the capacity to obtain financing for energy improvements to properties also would not affect an owner's total debt. This sounds like almost an impossible objective based on our knowledge of typical financing mechanisms, but it is achievable.

### **Minimize per house costs to retrofit financing entity (private sector/government/taxpayers)**

A retrofit financing entity needs to minimize costs per home. Typically these expenses are passed onto the homeowner. The costs include interest (which the entity may pay to its investor), administration, servicing the financing and dealing with defaults.

If the financing entity's program costs are high, the interest rates charged on financing to the homeowner will also be high. Costs increase with higher risk and administrative complexity, as well as a profit requirement, among other factors.

## **RETROFIT A LARGE PERCENTAGE OF EXISTING HOMES**

Market penetration of enhanced energy efficiency requires optimizing achievement of key objectives:

### **Overcoming up-front capital cost barrier**

Homeowners cannot necessarily invest in home energy retrofits without upfront capital.<sup>106</sup> Homeowners have noted that high costs were a barrier to implementing all post-evaluation recommended energy improvements. An Ipsos Reid Public Affairs Alberta study for Climate Change Central found that large upfront costs were recognized as a barrier to green home improvements.<sup>107</sup> A City of Toronto study also found homeowners would be more likely to apply for a loan that paid the up-front capital costs for energy improvements that lowered monthly energy bills.<sup>108</sup>

### **Preventing separation of debt and asset**

Retaining the financing costs with the property (so they are not the owner's personal debt) would allow an owner to invest in retrofits for the benefit of the home and current owner. Enhancing the home's energy efficiency would benefit the current owner as well as future owners, via savings on energy bills. However, if instead the debt would be attached to the owners via a personal loan and they moved before it was repaid, they would be continuing to pay for measures from which they could not benefit. The uncertainty of whether the homeowners could offset any obligation balance with an increase in home value adds to the challenge.<sup>109</sup>

## **ENSURE ACCESS TO AFFORDABLE CAPITAL**

A critical success factor for scaled-up energy retrofits goes beyond access to capital; the capital must also be affordable. And, affordability is related to risk.

### **Minimize risk to lenders and investors**

The financing entity that provides the funds upfront to the homeowner needs to have assurance that the funds would be repaid, and it also needs protection from default. If the financing entity obtains funds from an investor, the investor in turn needs to have confidence that the investment will be repaid by the financing entity. The degree to which each of these entities' risk is addressed determines the interest rate for each type of financing.

## **BENEFITS SOCIETY**

Programs need to benefit society; reduce the negative impacts on governments, individuals and the private sector; and improve individual, environmental and economic factors.

### **Access to credit available to all income and energy use levels.**

Benefits from energy improvements need to be accessible so all homeowners can reduce their energy bills. Those with the best credit ratings and high income earners tend to obtain the lowest interest rates. Yet lower- and fixed-income owners need low interest rates the most. They are the most vulnerable and need the greatest protection from fossil fuel risks.

This challenge can add to lower- and fixed-income owners' fuel poverty particularly with rising energy prices,<sup>110</sup> which leads to greater health risks<sup>111</sup> and therefore health care costs. Energy improvements to their homes would free up operating funds for other uses. As well, when identifying who might benefit most from energy improvements, although it is known that high energy users produce the highest energy savings, low energy users may be consuming less energy because they can't afford it or because they are frugal.<sup>112</sup> Ideally an energy retrofit financing program would provide for homeowners at all income and energy use levels.

As well, interest rates charged and accessibility to financing mechanisms often vary with factors that include the total assets and credit scores of the homeowner, so that lower-income homeowners are less likely to receive better interest rates. This reduces the affordability of energy improvements for this population segment. Other mechanisms' eligibility criteria make the mechanisms less accessible to lower-income owners. Ideally a program would provide low rates and serve homeowners at all income levels.

### **Health and environmental benefits**

Health and environmental impacts of non-renewable energy sources (as discussed in the Drivers section) will be avoided with scaled-up energy improvements.

### **Economic benefits**

Avoided economic costs and enhanced government, private sector and individual budgets would be associated with a broad-based energy retrofit program as mentioned previously.



## 4. Evaluation of options

Several sectors provide financing mechanisms applicable to energy retrofits: the private sector (banks and credit unions), the public sector (government levels) and utilities. All but two mechanism options are currently available in Ontario; however, the two mechanisms are now available elsewhere in Canada.

Assessments are summarized in individual tables below, making it easier to compare across options. Evaluation criteria in the tables are worded so a “Yes” represents a beneficial situation and means the financing option provides for that factor. A “Mixed” evaluation means there are some ways in which the objective is achieved and some ways in which it is not. A “No” evaluation means the option examined does not achieve this objective. Financing options assessed are both mechanisms and programs, and in some cases these are blended with existing risk-mitigating products with a view to optimizing these options for the purposes of this assessment. In some cases, options’ goals are also evaluated to assist the analysis.

### 1. Private financing

Compared to the desired criteria there are three major challenges with the typical mechanisms provided by financial institutions. These typical mechanisms are mortgage refinancing, a home equity loan or an unsecured loan. The challenges are:

- 1) Owners may be dissuaded from engaging in retrofits with longer payback periods. This occurs if they:
  - a) believe they might sell the house before their investments in increased energy efficiency could be paid back fully from energy cost savings,
  - b) are unsure that the improvements made will result in a higher property value on sale that offsets the remaining net expenditure.
- 2) The owner may prefer not to add to personal debt. An obligation may be attached to the person taking out the loan, it may be attached to an object, or it may be

attached to both. Personal loan and mortgage amounts are automatically included in borrowers' debt totals.

- 3) There is a relative lack of security for banks in making home retrofit loans. If banks were to lend unsecured funds for energy improvements directly to the homeowners, the banks would be paid off second after mortgages if the property goes into a power of sale process or foreclosure. This lack of security adds risk to the lender and this risk would be translated into relatively higher interest rates.

### **MORTGAGE REFINANCED TO ADD ENERGY IMPROVEMENT COSTS**

This is the simplest type of financing that attaches the debt to immovable equipment (fixtures), including buildings and land. Mortgages in Canada are attached to both the property and to the owner, who signs a promissory note.<sup>113</sup>

Mortgage refinancing would involve increasing the amount of the mortgage by the energy improvement costs. Since the mortgage is secured to the property, mortgages would be expected to be at low risk of default, and in fact Canadian experience indicates this.<sup>114</sup> As a result, mortgage refinancing interest rates would be among the lowest of private financing rates.

**Mortgage refinancing**, with the inclusion of **CMHC Mortgage Loan Insurance**<sup>115</sup> for highly leveraged homeowners<sup>116</sup> and the **Green Home** program (providing a partial premium refund when energy retrofits are conducted) has the potential to help facilitate energy retrofits because of the low interest rates they can achieve (relative to unsecured loans). The CMHC Green Home program is also notable for its requirement for the retrofit to achieve a minimum increase in the home's energy efficiency) and a minimum home energy rating (as measured on the EnerGuide for Houses rating scale).

Some facts about mortgages in Canada will help the reader understand this option. The data are from a recent paper<sup>117</sup> entitled *Canadian Mortgage Market Primer*, by Eric LaScelles, TD Securities' Chief Canada Macro Strategist. First, over 50 per cent of Canadian homes are mortgage-free. This means the mechanism would not apply to the over 50 per cent of homeowners without mortgages unless they want to finance their energy improvements with a new mortgage.

LaScelles also notes that, of homeowners who have mortgages, equity represents just over 50 per cent of the home's value. This represents support for using mortgage refinancing for energy improvements, as many homeowners would have room to use some of their equity to finance the improvements.

However, there are drawbacks to using this financing option. Chiefly, the private sector's profit motivation underlies mortgage lenders' tendency to not limit what is financed, so long as the borrower can repay. As a result homeowners can choose energy retrofits that are high cost with long paybacks and low energy savings – such as replacing many windows – over measures that would achieve greater energy savings over medium- to long-term paybacks.

As well, only homes participating in the CMHC Green Home program require a minimum energy improvement and minimum energy rating. The program enables a partial premium refund of CMHC Mortgage Loan insurance, and this insurance tends to be offered only to those who require it; i.e., with equity less than 20 per cent. This means that once

the program's minimum energy requirements are satisfied, lenders can approve additional financing under this program for cosmetic improvements that do not produce significant energy savings per dollar spent, thereby lowering overall cost-savings achieved.<sup>118</sup>

**Table 1. 1<sup>st</sup> Mortgage refinanced to include energy retrofit costs (+ CMHC Mortgage Loan Insurance and Green Home program participation for those with <20% home equity):**

GOAL / OBJECTIVE	EVALUATION
GOAL: Deep reductions	<b>Mixed: lenders do not require owners to optimize energy savings. Only owners with &lt; 20% home equity have energy performance requirements.</b>
Low interest rate	<b>Yes:</b> lower rates. CMHC Mortgage Loan Insurance enables interest rates for people with <20% equity that are similar to rates if owners had 20% equity.
Net energy cost savings	<b>No:</b> energy cost savings are not designed to be greater than payments
Optimize energy savings	<b>Mixed:</b> only for owners with <20% home equity. Others have no requirements.
Minimize debt of owner	<b>No:</b> debt appears on owner's totals.
Minimize debt of municipality	<b>Yes:</b> municipalities are not involved in this type of financing.
Minimize per house cost to program facilitator	<b>Mixed:</b> lower costs to financing entity but no retrofit program.
GOAL: retrofit large % homes	<b>Mixed: has the capacity but not a program.</b>
Provides upfront capital	<b>Yes</b>
Attaches financing to asset	<b>Mixed:</b> financing is also attached to owner; i.e., if owner moves, owner repays but does not continue to benefit.
GOAL: access to affordable capital	
Keeps lender/investor risks low	<b>Mixed:</b> secured to immovable property via title + owner's promissory note. However, since savings are not designed to exceed payments, there are no cash flow benefits from retrofits. Also, no mitigation of climate change risks.
GOAL: Benefits society	<b>Mixed</b>
Available to all income levels	<b>Mixed:</b> access to lower rates varies with credit scores, so lowest rates available to higher-income homeowners. However, Green Home Mtg Loan Insurance (GHMLI) is available to those with <20% home equity. <sup>119</sup>
Health + environmental benefits	<b>No:</b> health + environmental benefits are not assured since energy savings are not required except for those with <20% home equity with GHMLI
Economic benefits	<b>Mixed:</b> some green jobs. Economic benefits limited; no net energy cost savings requirement + only those with <20% home equity with GHMLI need energy savings

## SECOND OR THIRD MORTGAGES

This method of private financing is paid out after a first mortgage. Eligibility for this mortgage would be based on the owner's credit rating, as well as the loan-to-value ratio<sup>120</sup> (among other factors). Like a refinanced mortgage, the second or third mortgage is secured to the property as well as to the owner.

As Jens Lohmueller, co-founder and partner of CU Consulting Group and treasurer of the Community Power Fund, notes, most lenders prefer to issue first mortgages and although second and third mortgages can be obtained, they are less available due to their higher default risks.<sup>121</sup> These default risks are as follows. Assuming the homeowner already has a first or second mortgage, the existing mortgages would be senior to this new one, and any property tax payments in arrears would in turn be senior to any previous mortgage(s). Chris Corps, CEO of Asset Strategics,<sup>122</sup> also observes that typically having a second or third mortgage means that the owner is near the maximum mortgage amount. And, in case of a foreclosure, the holder of a mortgage that goes into default (who typically is the last mortgage holder; i.e., the second or third mortgage lender) is the one that triggers the foreclosure, but is also the one most susceptible to loan losses.

The key challenge to market penetration of energy retrofits using a second or third mortgage is low availability and likely low uptake for those to whom it would be available. Given their high levels of debt, participating owners would likely have many other competing uses for new financing. As well, the higher proportion of debt to equity is associated with higher interest rates.

**Table 2. 2nd or 3rd mortgages including energy retrofit costs:**

GOAL / OBJECTIVE	EVALUATION
<b>GOAL: Deep reductions</b>	<b>No: low uptake and no goals facilitating deep reductions.</b>
Low interest rate	<b>No:</b> higher interest rates than 1 <sup>st</sup> mortgages.
Net energy cost savings	<b>No:</b> not a requirement.
Optimize energy savings	<b>No:</b> not a requirement.
Minimize debt of owner	<b>No:</b> debt appears on owner's totals.
Minimize debt of municipality	<b>Yes:</b> municipalities are not involved in this type of financing.
Minimize per house cost to program facilitator	<b>Mixed:</b> lower costs to financing entity but no retrofit program for owners to connect to.
<b>GOAL: retrofit large % homes</b>	<b>Mixed: has the capacity but not a program.</b>
Provides upfront capital	<b>Mixed:</b> not available to lower-income.
Attaches financing to asset	<b>Mixed:</b> financing is also attached to owner; i.e., if owner moves, owner still repays.
<b>GOAL: access to affordable capital</b>	
Keeps lender/investor risks low	<b>No:</b> higher risk to lender since ranks behind 1 <sup>st</sup> mortgage on liquidation.
<b>GOAL: Benefits society</b>	<b>Mixed</b>
Available to all income levels	<b>Mixed:</b> not available to lower-income owners given leverage and rates. Also, energy cost savings not designed to be greater than payments.
Health + environmental benefits	<b>No:</b> benefits are not assured since energy savings are not required.
Economic benefits	<b>Mixed:</b> would create some green jobs. Energy savings not required so limited health and infrastructure benefits, as well as limited mitigation of climate change risks.

## HOME EQUITY LOAN

A home equity loan that is taken out for energy improvements would be secured to an existing (first) mortgage, and therefore at first priority (paid out on a par with the mortgage on foreclosure), and beneficial to an existing mortgage lender. A home equity loan might be very simple to implement, observes Jens Lohmueller,<sup>123</sup> in that “it implies that the owner has built up sufficient equity in the home that would warrant a line of credit against the unleveraged part of the house.”

The great potential of this mechanism is in its low interest rate, and its ranking on par with the mortgage on liquidation (therefore, it has a lower risk than some of the other options in case of default). However, repayment schedules are short since the term must match that of the mortgage (less than five years), therefore limiting the use of this mechanism for longer-payback improvements. As a result of the short terms, the energy cost savings are unlikely to be greater than the payments (since paybacks for deeper energy retrofit measures tend to be mid- to longer-term), and so this mechanism may be less accessible to lower- and middle-income homeowners unless they have sufficient cash flow for the high payments. Further, the funds are not required to be used for optimal energy savings and cost savings.

**Table 3. Home Equity Loans for energy retrofits**

GOAL / OBJECTIVE	EVALUATION
<b>GOAL: Deep reductions</b>	<b>No:</b> optimizing energy savings not required.
Low interest rate	<b>Mixed:</b> lower interest rates than 1st mortgages, but not accessible to all.
Net energy cost savings	<b>No:</b> not a requirement.
Optimize energy savings	<b>No:</b> not a requirement.
Minimize debt of owner	<b>No:</b> debt appears on owner's totals.
Minimize debt of municipality	<b>Yes:</b> municipalities are not involved in this type of financing.
Minimize per house cost to program facilitator	<b>Yes:</b> tied to mortgage and uses available equity so lender has less processing.
<b>GOAL: retrofit large % homes</b>	<b>Mixed</b>
Provides upfront capital	<b>Mixed:</b> not available to lower income owners + low uptake at middle incomes unless cash flow available for payments.
Attaches financing to asset	<b>Mixed:</b> financing is also attached to owner; owner still repays on moving
<b>GOAL: access to affordable capital</b>	
Keeps lender/investor risks low	<b>Yes:</b> ranks with 1st mortgage on liquidation.
<b>GOAL: Benefits society</b>	<b>Mixed</b>
Available to all income levels	<b>Mixed:</b> less available to lower-income sector due to short terms (since loan matches mortgage terms which are < 5 years, therefore payments are higher). Energy cost savings unlikely to be > payments. However, Green Home Mtg Loan Insurance available to those with <20% home equity.
Health + environmental benefits	<b>No:</b> benefits are not assured since energy savings are not required.
Economic benefits	<b>Mixed:</b> would create some green jobs though deeper retrofits facilitate more jobs; deep retrofits are not directed by a program but are owner-directed.

### CHATTEL MORTGAGE<sup>124</sup> ATTACHMENT TO MOVEABLE EQUIPMENT

This mechanism<sup>125</sup> is based on the existing lender's capacity to attach loans to moveable property, via the (Ontario) Personal Property Security Act. For instance, an owner would borrow to have energy retrofits done with a chattel mortgage on moveable equipment for that obligation. The chattel mortgage allows property owners the opportunity to finance moveable energy improvements, *and take them with them when they move*. This kind of security grants the lender first priority to be paid in case of default.

This option would seem to be beneficial for a (moveable) renewable home energy retrofit but not necessarily an energy efficiency retrofit that would include insulation and other fixed retrofit measures. Analyzing the kinds of measures that would be included in retrofits and the most appropriate form of security in each instance is complex due to the fixed or moveable feature of the asset. Also, it may be difficult to finance a combination of fixed and moveable assets.<sup>126</sup> The problem here is that many kinds of energy efficiency improvements – including many of the most important and cost-effective ones – are not movable. As such, this measure cannot be used to finance many of the more important upgrades.

**Table 4. Chattel mortgages for energy improvements:**

GOAL / OBJECTIVE	EVALUATION
<b>GOAL: Deep reductions</b>	<b>No: not suited for immovable energy efficiency improvements.</b>
Low interest rate	<b>No:</b> higher interest rates than 2nd mortgages.
Net energy cost savings	<b>No:</b> not a requirement.
Optimize energy savings	<b>Mixed:</b> not a requirement; however, moveable RE technologies would reduce energy use.
Minimize debt of owner	<b>No:</b> debt appears on owner's totals.
Minimize debt of municipality	<b>Yes:</b> municipalities are not involved in this type of financing.
Minimize per house cost to program facilitator	<b>No:</b> much legwork for lenders, increasing their costs.
Affordability	<b>No:</b> energy cost savings may not be greater than payments given interest rates.
<b>GOAL: retrofit large % homes</b>	<b>No: low uptake.</b>
Provides upfront capital	<b>Mixed:</b> not available to lower-income.
Attaches financing to asset	<b>Yes:</b> financing is attached to asset via PPSA; i.e., if owner moves, owner takes asset and continues to repay.
<b>GOAL: access to affordable capital</b>	
Keeps lender/investor risks low	<b>No:</b> PPSAs are not typically searched in home-buying.
<b>GOAL: Benefits society</b>	<b>Mixed</b>
Available to all income levels	<b>Mixed:</b> less available to lower-income sector since interest rates and payments are high.
Health + environmental benefits	<b>Mixed:</b> energy savings from applicable uses would produce health benefits. However, no benefits from immovable energy efficiency measures.
Economic benefits	<b>Mixed:</b> would create some jobs and, therefore, some economic benefits, but none from immovable measures.

Terms are for up to five years, making payments higher than over a longer period, and therefore savings are unlikely to be higher than payments on an annualized basis. In addition, although in case of default the lender can seize the asset, due diligence seems to be costly to a lender at the single family dwelling scale,<sup>127</sup> resulting in a higher interest rate. Also, a PPSA database is not typically searched by homebuyers,<sup>128</sup> so a buyer might mistakenly think equipment comes with the property when the owner will be taking it on moving.

### UNSECURED ENERGY EFFICIENCY LOAN WITH RISK REDUCTION VIA PORTFOLIO DIVERSIFICATION

In order to avoid risks associated with defaults on property-assessed energy retrofit financing, expert recommendation<sup>129</sup> is instead for financial institutions to reduce default risk by achieving portfolio diversification through large loan volumes (with a range of risk levels) instead of by a priority lien. Although there still would be a risk of default, the risk would be small and the costs incurred in such cases would be lower than costs in case of foreclosure on financing secured to property. This diversification is deemed sufficient risk reduction to allow the credit union to not require security in the form of an attachment to property.

The challenge in Ontario is that lenders do require security to mitigate their risks, and prefer priority liens over title liens.<sup>130</sup> Moreover, even if Ontario credit unions agree to the diversification strategy (in contrast to banks), they do not have sufficient investment assets to

**Table 5. Unsecured loans for energy retrofits:**

GOAL / OBJECTIVE	EVALUATION
<b>GOAL: Deep reductions</b>	<b>Mixed: less available to lower-income homeowners.</b>
Low interest rate	<b>Mixed:</b> varies with owner credit scores.
Net energy cost savings	<b>Yes</b>
Optimize energy savings	<b>Yes:</b> energy evaluator signoff required.
Minimize debt of owner	<b>No:</b> debt is included on the owner's totals.
Minimize debt of municipality	<b>Yes:</b> municipalities are not involved in this type of financing.
Minimize per house cost to program facilitator	<b>Yes:</b> linked to service provider for turnkey approach with evaluator signoff on loan.
<b>GOAL: retrofit large % homes</b>	<b>Mixed</b>
Provides upfront capital	<b>Mixed:</b> less available to lower-income owners.
Attaches financing to asset	<b>No:</b> financing is attached to owner; i.e., if owner moves, owner still repays.
<b>GOAL: access to affordable capital</b>	
Keeps lender/investor risks low	<b>Uncertain:</b> "yes" given portfolio diversification; "no" according to Ontario sources since there is no security and no senior lien.
<b>GOAL: Benefits society</b>	<b>Yes</b>
Available to all income levels	<b>Mixed:</b> less available to lower-income sector; also, energy cost savings not designed to be greater than payments. Limited availability from financial institutions.
Health + environmental benefits	<b>Yes</b>
Economic benefits	<b>Yes:</b> program would create jobs plus benefits linked with reduced energy use.

be able to take on the volume of loans that a scaling up of energy retrofits would require.<sup>131</sup> Moreover, this does not address the barrier to investment on a part of homeowners, who may be dissuaded from taking on long-term debt for homes they may sell before the improvement is paid off, given uncertainty about recouping a value increment equal to an obligation balance.

This analysis considers an unsecured energy retrofit loan of up to \$100,000 provided by Alterna credit union in Ontario with connection to a turnkey service provider.<sup>132</sup> An energy evaluator sign-off is required by the lender as due diligence. However ensuring that the energy cost savings exceed the payments is not required, and the owner would continue to repay any outstanding obligation on sale without benefit as the debt would be separate from the asset.

## 2. Renewed ecoENERGY program

There are two key challenges accompanying renewal of the ecoENERGY program:

- 1) lack of upfront financing reduces both uptake of deep improvements and access for lower-income homeowners.
- 2) the size of the funding that would be required to achieve both a significant fraction of the cost-effective energy efficiency opportunities in Ontario over the long term, as well as significant greenhouse gas reductions, may be prohibitive in the current national budget scenario.

**Table 6. Renewed ecoENERGY program:**

GOAL / OBJECTIVE	EVALUATION
<b>GOAL: Deep reductions</b>	<b>Mixed:</b> lack of up-front financing reduces uptake of deep improvements by middle and particularly lower-income homeowners.
Low interest rate	N/A no financing.
Net energy cost savings	<b>No:</b> not a requirement.
Optimize energy savings	<b>Yes:</b> energy savings targeted.
Minimize debt of owner	<b>Mixed:</b> many owners need upfront financing to benefit fully from these grants.
Minimize debt of municipality	<b>Yes:</b> municipalities are not involved in this type of financing.
Minimize per house cost to program facilitator	<b>Yes</b>
<b>GOAL: retrofit large % homes</b>	<b>Mixed: government unlikely to have budget for all homes' retrofits.</b>
Provides upfront capital	<b>No</b>
Attaches financing to asset	N/A: no financing.
<b>GOAL: access to affordable capital</b>	
Keeps lender/investor risks low	<b>Yes</b>
<b>GOAL: Benefits society</b>	<b>Mixed</b>
Available to all income levels	<b>Mixed:</b> deeper retrofits and greater impacts are less available to lower-income + middle-income sectors.
Health + environmental benefits	<b>Mixed:</b> energy savings produce multiple benefits.
Economic benefits	<b>Mixed:</b> program would continue to create jobs and other economic benefits would ensue.

### 3. Renewed Ontario Affordable Housing program

An Affordable Housing program was developed from 2006 to 2010 for northern remote regions. It enabled municipalities<sup>133</sup> to provide secured loans (attached to title<sup>134</sup>) for private home improvements for repair and rehabilitation, including energy retrofits. It was a separate municipal program from Local Improvement Charges and Community Improvement Plans, and was enabled through flow-through funds received from CMHC combined with Ontario and municipal financing. Expansion of this program could have had enormous positive impact on home energy efficiency. However, there would have been several concerns related to scaling up the program. These include the expected insufficient capacity of higher governments to provide loans in the volumes required for retrofitting Ontario municipalities' existing homes, and the insufficient security<sup>135</sup> provided by an attachment via title, especially for such large loan volumes.

A title lien is not as beneficial to a lender as a tax lien attached to overdue payments, which has priority over other obligations in case of foreclosure.

**Table 7. Renewed Ontario Affordable Housing Program - for energy retrofits**

GOAL / OBJECTIVE	EVALUATION
GOAL: Deep reductions	Mixed: was only accessible to lower-income homeowners in northern communities.
Low interest rate	Yes
Net energy cost savings	No: not a requirement.
Optimize energy savings	No: not a requirement; was part of overall retrofit support.
Minimize debt of owner	No: debt appears on owner's totals.
Minimize debt of municipality	No: municipality was financing entity; contributed financing in addition to that obtained from provincial and federal governments. Funds were not adjusted (not the kind of mechanism that allows adjustment).
Minimize per house cost to program facilitator	Unknown
GOAL: retrofit large % homes	No: government unlikely to have funds for all Ontario homes' retrofits.
Provides upfront capital	Yes
Attaches financing to asset	Mixed: via title; but financing balance not transferable to new owner.
GOAL: access to affordable capital	
Keeps lender/investor risks low	Mixed: title is insufficient security according to lenders.
GOAL: Benefits society	Mixed
Available to all income levels	Mixed: program was only available to lower-income owners in northern Ontario.
Health + environmental benefits	Mixed: allowed deeper retrofits and greater impacts; energy savings produced health benefits.
Economic benefits	Mixed: would create some green jobs and other economic benefits.

## 4. Municipal Community Improvement Plan (CIP) loans

Under municipal legislation there are two kinds of improvements financing that municipalities can engage in: Community Improvement Plan loans are one type (Local Improvement Charges are the other).<sup>136</sup> Current Ontario legislation allows municipalities to designate an area in which community improvement plan loans can be provided to private property owners for a specified set of improvements, including energy improvements.

The CIP loan<sup>137</sup> option would provide up-front capital<sup>138</sup> and the municipality as financing entity could ensure net annual energy cost savings and optimized energy savings. However, although municipalities tend to be able to obtain lower financing rates than are available in the private sector, this option would be less accessible to lower-income homeowners due to the mechanism's higher interest rates and eligibility criteria.<sup>139</sup>

These higher rates arise from the cost of setting up the mechanism and the less preferable security in the form of a title lien plus an agreement<sup>140</sup> (versus a senior lien<sup>141</sup> on delinquent payments, which is preferred by the banking sector<sup>142</sup>).

As well, municipal Community Improvement Plan (CIP) loans require setting up a Municipal Business Corporation (MBC), a new CIP, or modifying an existing CIP, each of which would take time and expense.

**Table 8. Municipal Community Improvement Plan loans for energy retrofits**

GOAL / OBJECTIVE	EVALUATION
<b>GOAL: Deep reductions</b>	<b>Mixed: not available to lower-income homeowners.</b>
Low interest rate	<b>No:</b> security type related to higher risk and therefore higher interest rate.
Net energy cost savings	<b>Yes:</b> municipality can stipulate.
Optimize energy savings	<b>Yes:</b> municipality can stipulate.
Minimize debt of owner	<b>No:</b> debt gets added to owner's totals.
Minimize debt of municipality	<b>Mixed</b> (see details above table).
Minimize per house cost to program facilitator	<b>No:</b> would require municipality to set up CIP; takes time. Also, without sufficient security, high interest rates would be charged by investors.
<b>GOAL: retrofit large % homes</b>	<b>Mixed: not available to lower income owners.</b>
Provides upfront capital	<b>Yes</b>
Attaches financing to asset	<b>Yes:</b> title and agreement with municipality; transfers to new owner on sale.
<b>GOAL: access to affordable capital</b>	<b>Mixed</b>
Keeps lender/investor risks low	<b>No:</b> not as high a level of security as desired by investment banks since on default, there is no senior lien. Participating sectors would obtain protection from climate change risks.
<b>GOAL: Benefits society</b>	<b>Mixed</b>
Available to all income levels	<b>Mixed:</b> deeper retrofits and greater impacts less available to lower-income + middle-income sectors.
Health + environmental benefits	<b>Mixed:</b> energy savings produce health benefits.
Economic benefits	<b>Mixed:</b> would create jobs and some other economic benefits.

There are two financing options available for CIP loans, which have different impacts on the total debt capacity of the municipality. If the municipality needs financing for the energy retrofit loans, a general obligation bond would be issued, which would reduce credit available to the municipality. However, if a Municipal Business Corporation can use revenue bonds for this purpose, the bonds would not impact municipal debt.<sup>143</sup>

Using risk mitigation products such as a loan loss reserve fund (or a loan guarantee) would address the challenges with the security and reduce interest rates; however, it would not change other evaluation factors.

## 5. Utility on-bill financing

Utility on-bill financing is a useful mechanism for financing low- to medium-cost retrofits with short- to medium-term paybacks.<sup>144</sup> In on-bill financing the utility pays upfront for energy efficiency measures, recouping the cost over an extended period of time by means of a surcharge on the utility bill. The term of the financing can enable a positive cash flow where payments are less than savings.<sup>145</sup>

On-bill financing is currently being used to encourage uptake of energy efficiency improvements in Manitoba, Newfoundland, the U.S., and the U.K.,<sup>146</sup> and is pending in B.C., but is not available in Ontario. Manitoba Hydro provides both electricity and gas, and so whole-home retrofits can be financed through an on-bill approach. However, in Ontario there is no indication that this will happen for the residential sector in the near future,<sup>147</sup> although Enbridge provides an interesting billing service discussed further in this section.

In on-bill financing the rate can be fairly low due to a utility's borrowing power.<sup>148</sup> The individual paying the bills could be the owner or the tenant.<sup>149</sup> <sup>150</sup> Eligibility for on-bill financing may or may not include taking credit scores; other criteria are also considered such as bill payment history. If the obligation is attached to the meter, it can be transferable to a new occupant when the existing occupant moves, or on sale, but if it is not attached to the meter, on-bill financing has the same issues as any financing mechanism where the owner or occupant may be considering moving: the balance owing would be due. This would be a deterrent to the homeowner taking on a larger retrofit if a move is anticipated prior to retirement of the debt.

Additional issues relate to the lack of recourse in the event of default, as there tends to be no security taken on the financing. Utilities have no recourse except for disconnection, and the rationale for this may be more difficult if the owner pays the utility bill but not the financing portion.<sup>151</sup> <sup>152</sup> This could limit utility interest in financing higher cost retrofits at large volumes.

On-bill financing has great potential for market penetration of retrofits up to a cost of around \$7,500<sup>153</sup> to \$10,000<sup>154</sup> but may not be as well-suited to the more expensive, deep whole-home retrofits needed in Ontario due to the lack of utility provision for this purpose (which typically requires collaboration between gas and electricity utilities), the size of optimal financing, the five-year repayment term,<sup>155</sup> the lack of recourse options,<sup>156</sup> and where the obligation must be paid out on moving,<sup>157</sup> among other factors.<sup>158</sup>

Enbridge does not provide financing; however, it is allowing an innovative use of its billing systems for third parties to finance and conduct whole-home energy retrofits on a

revenue-neutral basis.<sup>159</sup> Previously, Direct Energy was the sole entity to benefit from this arrangement, but as of 2008, Enbridge opened this to contractor companies and financing entities and now has 31 billing service clients.<sup>160</sup> This is provided that the “energy-related, non-commodity products” whose financing is repaid on the Enbridge bills do not compete with gas (such as products using oil, electricity and solar thermal panels).

There is no maximum amount currently identified for this financing, nor is there a maximum term. Eligibility criteria include a credit check. Interestingly, participants can be builders, owners and tenants, and do not need to be existing customers, but must simply reside in the franchise area.<sup>161</sup>

Enbridge’s fee for this service comprises 0.53 per cent, which includes provision for defaults based on the actual rate for all receivables in the previous year plus 0.03 per cent combined into a payment guarantee of 97.47 per cent. Additionally, there is a monthly charge of between about \$1 and \$2 for the bill, which includes information on actual monthly gas consumption with comparisons to the previous year.

It should be noted that the billing service does not allow transferring a remaining obligation to a new owner or occupier on moving as the debt is attached to the individual. As well, actual financing terms would be subject to the maximum terms of financing entities – which mostly are up to five years; for high-cost retrofits short terms result in payments exceeding savings.

**Table 9. Utility on-bill financing for energy retrofits**

GOAL / OBJECTIVE	EVALUATION
GOAL: Deep reductions	Mixed: maximum amounts financed are low-medium cost range and over near-to-medium terms (5 years). Limits deeper retrofits and impacts.
Low interest rate	Yes
Net energy cost savings	Yes: capacity to do so; Newfoundland Power’s program is designed this way. <sup>162</sup>
Optimize energy savings	Mixed: capacity to do so; however, only one of two current programs has this goal. <sup>163</sup>
Minimize debt of owner	Yes: typically financing does not get added to owner’s debt.
Minimize debt of municipality	Yes: municipalities are not involved in this type of financing.
Minimize per house cost to program facilitator	Yes: administration costs can equal costs to participants.
GOAL: retrofit large % homes	Yes
Provides upfront capital	Yes
Attaches financing to asset	No: however, can attach financing to meter allowing financing transfer so new owner continues to repay.
GOAL: access to affordable capital	
Keeps lender/investor risks low	No: no security, only recourse is service cut-off, but this may be limited when homeowner is current on utility bill but in arrears on retrofit repayments.
GOAL: Benefits society	Mixed
Available to all income levels	Mixed: is suitable for both owners and tenants who pay utility bills; credit scores may be considered.
Health + environmental benefits	Mixed: no capacity to do deep improvement; limits benefits.
Economic benefits	Mixed: job creation and other economic impacts are limited since cannot do deep improvements.

Because this is not a financing option and financing details are unknown, it is not analyzed in a matrix; however, this billing service enables provision of low-interest financing given the low default rate and guaranteed percentage repayment.

## 6. Property Assessed Payments for Energy Retrofits (PAPER)

A Property Assessed Payments for Energy Retrofits (PAPER) program would have a number of key features providing multiple benefits.

A PAPER program would be **delivered by municipalities on a revenue-neutral basis**, minimizing the costs to municipalities and taxpayers. PAPER would provide upfront financing for energy improvements and ensure that annual energy cost savings exceed annual payments beginning in the first year, similar to an LIC.<sup>164</sup>

The **financing and payments would be assessed to the property**, like an LIC (but would not be a property tax, only repaid on the property tax bill) and repaid as a surcharge to the homeowner's tax bill, so if the owner moves, the payments are continued by the new owner, who also receives the energy cost savings. If any payments go into default, the small delinquent payments would be attached to the property and take priority over mortgages and other encumbrances (also like an LIC) if the property eventually went into foreclosure.<sup>165</sup> Default risk mitigation measures would be part of the program design, as below.

There would be a focus on **optimizing energy savings**,<sup>166</sup> and **energy cost savings would be designed to exceed payments**.<sup>167</sup> This financing would allow people to invest in deeper, more costly improvements with longer payback periods than the owner's expected stay in the home.

PAPER financing would be **accessible to homeowners at all income levels**. It could provide the same level of interest for all, or, as in the case of Boulder, Colorado, provide a lower interest rate for income-qualified owners. Municipalities tend to be able to obtain lower financing rates than accessible in the private sector.

At present, there are **three key challenges** to this financing option:

1. The **mechanism needs to be authorized for use in Ontario via regulatory change** to expand the current uses of local improvement charges.
2. The **senior lien provision for delinquent payments** would be of some **potential concern to existing mortgagees**. At issue is that a relatively small overdue payment on PAPER financing would be paid out before the property's mortgage if the property went into foreclosure (on sale the buyer would resume PAPER financing payments).
3. **Municipalities need to be assured of the revenue-neutral aspect of the program, so that the financing of municipal roles is covered** by a combination<sup>168</sup> of participant user fees, economies of scale through collaboration, and startup support.

However, the concerns are addressed by key program features including the following:

- a) Eligibility criteria such as a minimum home equity requirement, an acceptable loan-to-value ratio and that PAPER financing would be limited to a maximum stipulated proportion of property value.

- b) Incremental property value from the energy improvements exceeding an overdue payment.
- c) Having energy cost savings from the improvements exceed the payments would increase owners' available cash flow and decrease likelihood of default.

**Table 10. Property Assessed Payments for Energy Retrofits**

GOAL / OBJECTIVE	EVALUATION
<b>GOAL: Deep reductions</b>	<b>Yes</b>
Low interest rate	<b>Yes:</b> due to lower risk of both the municipality and its investor as well as from collaboration to reduce costs.
Net energy cost savings	<b>Yes:</b> municipality can stipulate.
Optimize energy savings	<b>Yes:</b> municipality can stipulate.
Minimize debt of owner	<b>Yes:</b> obligation is not attached to the owner and does not get added to owner's totals.
Minimize debt of municipality	<b>Yes:</b> debt that the municipality takes on to finance LIC improvements is adjusted.
Minimize per house cost to program facilitator	<b>Yes:</b> due to collaboration among governments, private sector and NGOs.
<b>GOAL: retrofit large % homes</b>	<b>Yes</b>
Provides upfront capital	<b>Yes</b>
Attaches financing to asset	<b>Yes:</b> in that the financing is not a personal loan and defaulted payments are attached to the property via a priority lien. On sale, the obligation balance continues to be paid by the new owner.
<b>GOAL: access to affordable capital</b>	
Keeps lender/investor risks low	<b>Yes:</b> risks are mitigated by program features as well as by blending PAPER with a financing insurance product, a loan loss reserve, an energy savings guarantee or closing costs (see Appendix III). Climate change risks are mitigated for all sectors.
<b>GOAL: Benefits society</b>	<b>Yes</b>
Available to all income levels	<b>Yes</b>
Health + environmental benefits	<b>Yes:</b> deeper retrofits and greater impacts possible. Energy savings produce maximum health and environmental benefits out of all options due to deepest energy retrofits.
Economic benefits	<b>Yes:</b> maximum economic benefits out of all options due to deepest energy retrofits.

From the analysis of all alternatives, a PAPER program is the only financing option that could provide **low-interest up-front capital to enable higher-cost energy retrofits over longer terms for people at all income levels**. It would enable **deep reductions in energy use and GHG emissions** in a large percentage of homes and significant benefits to society. Risk to financial institutions advancing the retrofit capital would be very low since defaulted payments would be subject to a senior tax lien.

PAPER financing appears to be one of the financing tools that would be complementary to a comprehensive package of mechanisms aimed at increasing home energy efficiency, including whole-home on-bill financing.

Table 11. Summary of Options:

GOAL / OBJECTIVE	PRIVATE SECTOR					FEDERAL	ONTARIO	MUNI	UTILITY	MUNI
	1ST MTG	2ND/3RD MTG	HOME EQ LNS	CHATTEL MTG	UNSEC LOAN	RENEWED ecoENERGY	RENEWED AFFORD HSG PROG	CIP	ON-BILL	PAPER
<b>GOAL: Deep reductions</b>	Mixed	No	No	No	Mixed	Mixed	Mixed	Mixed	Mixed	Yes
Low interest rate	Yes	No	Mixed	No	Mixed	N/A	Yes	No	Yes	Yes
Net energy cost savings	No	No	No	No	Yes	No	No	Yes	Yes	Yes
Optimize energy savings	Mixed	No	No	Mixed	Yes	Yes	No	Yes	Mixed	Yes
Minimize debt of owner	No	No	No	No	No	Mixed	No	No	Yes	Yes
Minimize debt of municipality	Yes	Yes	Yes	Yes	Yes	Yes	No	Mixed	Yes	Yes
Minimize per house cost to program facilitator	Mixed	Mixed	Yes	No	Yes	Yes	Unknown	No	Yes	Yes
<b>GOAL: retrofit large % homes</b>	Mixed	Mixed	Mixed	No	Mixed	Mixed	No	Mixed	Yes	Yes
Provides up-front capital	Yes	Mixed	Mixed	Mixed	Mixed	No	Yes	Yes	Yes	Yes
Attaches financing to asset	Mixed	Mixed	Mixed	Yes	No	N/A	Mixed	Yes	No	Yes
<b>GOAL: access to affordable capital</b>	Mixed	No	Yes	No	Uncertain	Yes	Mixed	No	No	Yes
Keeps lender/investor risks low	Mixed	No	Yes	No	Uncertain	Yes	Mixed	No	No	Yes
<b>GOAL: Benefits society</b>	Mixed	Mixed	Mixed	Mixed	Yes	Mixed	Mixed	Mixed	Mixed	Yes
Available to all income levels	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Yes
Health + environmental benefits	No	No	No	Mixed	Yes	Mixed	Mixed	Mixed	Mixed	Yes
Economic benefits	Mixed	Mixed	Mixed	Mixed	Yes	Mixed	Mixed	Mixed	Mixed	Yes

## 7. Options not evaluated

As noted above, three products and their potential to mitigate default risk in an energy retrofit program would be important to consider for a PAPER program. These products were not evaluated as separate options because of their complexity. They are:

- 1) a **loan guarantee/loan loss reserve**.
- 2) an **energy savings guarantee**.
- 3) a similar CMHC product to the **Mortgage Loan Insurance** with a **Green Home program** provision for a partial premium rebate (which stayed with the property and did not move with the homeowner) would be made available for PAPER financing.
- 4) **Closing costs** comprising an extra financing payment plus a loan loss reserve fund. These monies would be aggregated from all participants and be used for bond repayments in case of delinquencies. Few delinquencies would allow the fund balance to be used for early repayment of the obligations near the end of the term.
- 5) Although tax credits were not mentioned earlier, **federal and provincial tax credits** for energy efficiency would also contribute to affordability, and are used extensively in the U.S.<sup>169</sup> And, **property tax credits** would be important to establish for value increments arising from the improvements.

Options 1-4 as risk mitigation measures are discussed in Appendix III.

## Conclusion

The above analysis indicates the optimal financing mechanism would be a PAPER program. On-bill financing as described for whole-house retrofits addressing both gas and electricity would be a useful complementary mechanism for financing less-expensive, shorter-payback investments. Yet neither financing option is available at present in Ontario.

A PAPER financing program would enable deep reductions in energy use and GHG emissions. It would facilitate market penetration of retrofits and provide affordable financing. And it would result in important economic benefits for all sectors. Each sector would have key supports and services that the PAPER program would need.

An optimal PAPER program would reduce governments' budgetary expenses for energy infrastructure as well as environmental and health care costs, be a stimulus for the economy, and create green jobs. It would also help all government levels to achieve targets for reductions in energy use and greenhouse gas emissions, and it would assist in mitigating participants' and partners' energy security and climate change risks with considerations for other economic, social and environmental benefits to society. The mechanism would provide unique means of mitigating investors' default risks, and the program would also be designed to minimize risks to existing mortgages.

PAPER financing is not the only mechanism that is needed, and financing is one aspect of a comprehensive approach to enabling buildings' energy efficiency. But PAPER could address key barriers and provide important benefits to homeowners, governments, businesses and future generations. Implementing a successful PAPER program will require the involvement of government at all levels, finance, real estate and construction sector professionals, and collaboration with NGOs to ensure widespread subscription to the program.

## Recommendations

- 1) **Enable PAPER financing as a mechanism for energy retrofits in Ontario (Province)**  
Amend the regulation as needed.
- 2) **Support the development of the PAPER program (All levels of government, industry and NGOs)**  
Facilitate collaboration among government levels with industry and NGOs to develop an optimal PAPER program. The mechanism is described in the previous paper, and a report on strategic program implementation needs will follow in 2011.
- 3) **Blend the PAPER financing mechanism with default-risk mitigating products (All levels of government, industry and NGOs)**  
PAPER financing ideally would be blended with other products that mitigate risk to make energy improvements even more affordable for both the homeowner and the municipality, and would create profits for green businesses and financing institutions.
- 4) **Enable and support financial sector purchase of PAPER financing (Province)**  
Having this capacity to sell PAPER could allow municipalities to set up revolving

funds that would be replenished periodically. It would also enable additional financial sector engagement at an affordable scale, while providing enforcement support for municipalities to help them deliver affordable programs.

**5) Address tax rate issues related to increased property value (Province, municipalities, lenders, appraisers)**

Owners' home value increments that would arise from the energy improvements need to be protected as otherwise this would erode the business case and affordability. Machinery and equipment for energy conservation or efficiency need to be exempt from property taxes, i.e., prescribed by the Minister.<sup>170</sup> It would also be important to have clarity in the definitions so that all energy efficiency measures, such as insulation and the costs for passive solar design<sup>171</sup> were also clearly exempted from property tax increments. There are ample precedents in the U.S. for applying no property tax to value increments, whether for a specified or unspecified period.<sup>172</sup>

Appraisers, lenders and the real estate sector will need to incorporate methods of building awareness in markets about the benefits to property value and cost savings of energy efficient homes over conventional ones. This would include recognizing the value increments to homes based on (for example) operational savings on energy bills; the increased income available to owners of energy efficient homes, and the methods of including energy efficient homes' features in listings. Neighbourhood-scale retrofit programs would also allow more comparables.

Investing in and facilitating residential energy efficiency would also leverage enhanced value into portfolios and address market and investor environmental, social and governance concerns at the portfolio scale.<sup>173</sup>

## GLOSSARY

**CASH FLOW** Available cash after expenses and debt payments.

**CIP** A Community Improvement Plan. Authority for municipalities to create CIPs in Ontario is under the Planning Act, Section 28. CIPs are a means by which municipalities can assist property owners with conducting improvements. The municipality undergoes a public process to set up a CIP and designate an improvements area, which can take one or two years. CIPs support grant and loan incentives for repair, rehabilitation, and redevelopment initiatives such as brownfield remediation; heritage property, building code and accessibility upgrades; and energy improvements. A loan under a CIP is attached to the property on title, and overdue payments are subject to a title lien. A CIP *loan* is compared to an LIC in this report. (Note: by contrast, LIC financing is not a loan.) See the Ministry of Municipal Affairs and Housing's Community Improvement Planning Handbook: <http://www.ontla.on.ca/library/repository/mon/14000/262948.pdf>

**DEFAULT** Failure to meet a financial obligation; overdue payment.

**DEFAULT RISK MITIGATION** Reduction of risks to the financing entity of defaults on payments.

**ECONOMIES OF SCALE** Increased efficiencies due to larger production volume.

**ESCO** An Energy Service Company conducts an energy evaluation of a client's building to determine the energy savings potential and establish a baseline for energy consumption. There are different kinds of ESCO contracts. In one frequently used type, if the business case including energy savings and a performance contract fee makes sense, the ESCO engages in a performance contract with a client. The ESCO would agree to install specific energy improvements, *guaranteeing the client that installing these measures will result in a specific amount of energy savings*. With this security an ESCO can get preferred financing at a lower rate. The ESCO assesses the operations and maintenance of the systems, trains the client's staff to continue optimal systems functioning and monitoring, calculates the energy savings, and the project is handed off to the client. A guaranteeing agency receives a guarantee fee for overseeing the initiative to ensure that the energy savings are as agreed.

**HOME EQUITY** A home's market value less the amount of the mortgage owing.

**LEVERAGE** Proportion of borrowed funds. A commonly used leverage ratio is the amount of debt divided by the amount of equity.

**LIC** Local Improvement Charge. Authority for Ontario municipalities to use LICs is under the Municipal Act, 2001, and the City of Toronto Act, 2006. LICs are applied to allocate infrastructure costs for public benefit and community enhancement to properties whose owners benefit from the improvements. An energy improvement application for LICs has been discussed previously in two ground-breaking reports published by the Pembina Institute.<sup>174 175</sup> Typical uses include funding sidewalks, street lights, sewers, curbs and gutters, and building a local park – uses that abut or are in proximity to the benefiting (and paying) properties. LICs allow a homeowner who still has an outstanding retrofit obligation to sell his or her property and to transfer the remaining obligation automatically to the new owner. The new owner would assume payments for the obligation because the obligation is assessed to the property. If a payment is in arrears, it triggers a tax lien (on the defaulted

payments only) and if default continues, the municipality can proceed with a tax sale or foreclosure. Given the priority lien, an outstanding payment would take priority over any outstanding mortgage on sale, and the new owner would resume the LIC payments.

**LOAN-TO-VALUE RATIO** The property's mortgage amount divided by the appraised value.

**MORTGAGEE** Existing mortgage lender.

**PACE** Property Assessed Clean Energy is the name given to U.S. energy retrofit programs that are supported by the Obama administration. Twenty-four states have legislated enabling authority for PACE financing to be used by municipalities, counties and other regions with two states already having had that provision. This financing mechanism assesses retrofit costs to the property (it is not a property tax but is repaid on the property tax bill). If the property is foreclosed on, through non-payment of mortgage obligations, for example, only the defaulted PACE financing repayment would be due and subject to a priority lien. PACE financing has been effectively frozen given opinions by Federal Housing Finance Agency, although this has been hotly disputed by the program's supporters. Issues are discussed in Appendix II in terms of the Canadian environment.

**PACENOW** A large, multi-sector coalition of PACE stakeholders with representation from all levels of government and industry, who support the retrofitting of homes in the U.S. using PACE financing. The coalition has a persuasive economic, environmental and social business case. [www.pacenow.org](http://www.pacenow.org) See also Appendix II.

**PAPER** Property Assessed Payments for Energy Retrofits is the current name for the Ontario initiative proposed in this report.

**PAYS** Pay As You Save refers to two programs, one in the U.S. and one in the U.K. The U.S. program,<sup>176</sup> developed by the Energy Efficiency Institute,<sup>177</sup> is a utility on-bill financing mechanism. In this case, the utility pays upfront for energy retrofits and the property owner – or renter – responsible for the utility bills repays the financing as a surcharge. There is no credit check on the bill payer, nor is there any impact on their credit. The payments are designed to be less than the energy cost savings. Non-payment recourse to the utility is customer disconnection.

In the U.K.,<sup>178</sup> 5 Pay As You Save pilots are testing the consumer reaction to the approach, whereby customers' energy cost savings exceed the payments, with the program facilitated by different kinds of partners in addition to utilities. These pilots and their facilitating partners are Gentoo Group Ltd., a social housing landlord; British Gas, which will finance retrofits even if the homeowner is not a subscriber; Birmingham City Council; B&Q UK, a DIY supply store; and Stroud District Council. Originally, one of these programs had been planned to be delivered by a credit union. The assessment to property feature that allows the new owner to assume the obligation on property sale is policy but not legislated as yet; but the U.K. government has announced that it will bring in such legislation.

**PRIORITY LIEN** This is a lien that is paid out first over other debts on foreclosure, regardless of when the other debts were registered. Tax liens are priority liens.

**TITLE LIEN** This is a lien that is secured against title, and is paid on foreclosure based on the (date) order on which it appears on the title. A title lien is subordinate to a priority lien.

## Appendix I: Value

An optimal PAPER program would include knowledge exchange with real estate and appraisal professionals. Information on a home's energy efficiency would be recommended for inclusion in MLS listings, and appraisal methods would include energy cost savings.<sup>179</sup> Valuations would begin to recognize environmental impacts and benefits.<sup>180</sup> A neighbourhood-scale approach to energy retrofits would provide more comparables for assessing the effect that improving the energy efficiency of homes has on their market value. This information, along with a province-wide, government- and industry-supported marketing program, would increase market awareness of the benefits of energy efficiency. Rising energy prices will also contribute to this awareness. Awareness builds demand, and value reflects demand.<sup>181</sup>

Currently there are differing opinions as to the likelihood of a value increment resulting from increasing a home's energy efficiency. Canadian appraiser Chris Corps, founder of Asset Strategies and project leader of the *Green Value* study notes<sup>182</sup> in relation to the current research, "Any green attribute that is lacking in a home will have an effect on value as dictated by market perception. The value increment after a home retrofit will vary: an energy improvement with a saving of say \$1,000/yr and a ten year life cycle might at best show  $10 \times \$1,000 = \$10,000$  better value. This would be the largest discount for a non-green versus green building."

"...in the market, full value for energy savings is rarely obtained. This is caused by factors including: (a) A buyer might want to keep some of the benefit in value to themselves and thus be unwilling to pay all of it up front to the vendor; and/or, (b) a buyer may be skeptical that all the value will be achieved from energy savings and thus pay less ... and/or (c) be using a 'time value of money' approach to looking at the benefit." He notes that consequently, "the savings from energy retrofit are rarely recouped when a property is sold."

In *An Introduction to Green Homes*,<sup>183</sup> published by the U.S. Appraisal Institute, author Alan Simmons, SRPA, LEED® AP, anticipates a value increment based on a home's relatively higher energy efficiency compared to a conventional, code-built home. This perceived value increment will be enhanced by providing the home's energy evaluation.<sup>184</sup> U.S. research<sup>185</sup> has noted that appraisals of residential house values are enhanced by a multiple of the amount spent on increasing the home's energy efficiency. The U.K.'s Royal Institution of Chartered Surveyors will be publishing a Guidance document on residential property valuations and the impact of energy improvement measures in 2011.<sup>186</sup> At present, there is no known Ontario data that finds homes increase in value as a result of energy improvements.

Value also should be considered at the portfolio scale. Mortgagees of conventional properties would benefit from PAPER programs as they would result in a reduction in climate change risks to their mortgage portfolios *without any cash outlay by the mortgage lenders*. In 2007, the Institute for Responsible Investment noted: "... mortgage values for residential properties that are not energy efficient themselves or that do not have easy access to sustainable transportation may decrease due to rising carbon prices, and therefore may underperform over the medium- to long-term."<sup>187</sup> As well, debt syndicates in the same banks could participate in energy retrofits at a cost-effective scale (rather than issuing many smaller loans).

These financial sector initiatives together would pre-empt carbon market challenges as well as address shareholder concerns about environmental, social and governance issues.

## Appendix II: Canada vis-à-vis the U.S. PACE situation

The White House Council for Environmental Quality has recommended using a financing mechanism for energy retrofits that assesses the costs to properties but is not a property tax and is not a personal loan. This mechanism is called Property-Assessed Clean Energy (PACE). Federal policy support and millions in Recovery Act funding have been provided, designed to leverage billions more from other sources. Twenty-four states passed enabling PACE legislation, two more authorized these previously, and pilots commenced in several regions and were considered in many more.<sup>188</sup> Endorsers as of this writing include mayors, senators, 68 members of Congress, the Royal Bank of Canada (bond underwriters for the CaliforniaFIRST PACE program), the American Institute of Architects and ICLEI. This program has been part of a major economic and green jobs stimulus.

In July 2010, a controversial statement by the U.S. Federal Housing Finance Agency (FHFA) resulted in a freeze in PACE residential projects (but not commercial or institutional initiatives). This decision is the subject of several legal challenges including one by the State of California.

The FHFA position is that the entire amount financed would trigger a tax lien instead of just the delinquent payments. This is the case in the State of Colorado;<sup>189</sup> however, it is in contrast to (for instance) PACE legislation in California. As well, PACE supporters challenge the attribution by the FHFA that energy improvements are not in the public benefit, again in contrast to PACE legislation. And, as noted by Dorian Dale,<sup>190</sup> FHFA is alleged to challenge the sovereign rights of states and the 10th Amendment.

Other issues raised by the FHFA have been rebutted by PACE supporters (see the [www.pacenow.org](http://www.pacenow.org) website for details), and lawsuits have been filed by the State of California, ICLEI, the Sierra Club, the Natural Resources Defense Council and others against the regulator of Fannie Mae and Freddie Mac: the FHFA.

The FHFA also noted concerns about the reliability of energy savings that arise from the improvements. Dorian Dale, Energy Director & Sustainability Officer in the Town of Babylon, New York, observed<sup>191</sup> that in early pilots, savings were not designed to exceed payments. For instance, in another program there were many purchases of windows and PV, both of which have 30-year paybacks. By contrast, in the Town of Babylon's *Long Island Green Homes* Benefit-Assessed Clean Energy program, actual annual energy cost savings exceeded payments; the average savings-to-investment ratio was 1.88.<sup>192</sup>

An impact of energy improvements that also makes the FHFA position baffling is that value increments may accrue not only to the home, *they may also increase the value of the mortgage on that home*, since it then would be on a higher-performance dwelling. Multiply reliable value increments by the size of a mortgage lender's portfolio and this could be a significant impact, *at no additional cost to the mortgage holder*.

The FHFA applied a series of serious penalties not only to PACE-financed properties, but also to other properties within PACE-legislated regions that do not have financing. For instance, this would affect seniors, many of whom own their homes outright, from obtaining energy retrofit financing to reduce their energy bills.<sup>193</sup>

When looking at U.S. PACE financing vis-à-vis Ontario PAPER financing, it is important to be clear about the issues. For instance, FHFA responses do not appear to address

the observations by PACE stakeholders that the relative amount of a defaulted payment on PACE financing that could be senior to a mortgage is extremely small.<sup>194</sup> Nor do responses discuss the greater cash flow and value increment arising from the improvements.

By contrast, optimal PAPER authority would allow only payments that are in arrears to be added to a tax lien, not the entire financing balance. Similar to PACE, this payment would be a small amount compared to the mortgage.

Other fees in default have been senior to mortgages in some regions. For instance, in the City of Toronto, as per O. Reg. 594/06 these include water wastewater, solid waste disposal and steam heat. In the event of a property tax sale, only delinquent payments would be brought up to date, and the new owner would resume payments on the retrofit financing balance as a property tax bill surcharge.

As well, an increment over the value assessed at time of mortgage issuance could arise from the operations savings and building/equipment upgrades. If required for reasons of foreclosure or property tax sale, the property sale would satisfy the mortgage obligation in addition to any outstanding property tax payments.

The decrease in operations expenses arising from the retrofits would enhance the owner's cash flow and resulting capacity to make both payments to both municipality and mortgagee.

Existing mortgage holders would be fully informed prior to the retrofit financing arrangement so as to avoid violating covenants in case of tax liens (arising from defaulted payments).

Other risk mitigating features of a PAPER program are typical to the Canadian lending environment.

### **Differences between the U.S. and Canadian lending environments**

In the U.S., no promissory note is signed on negotiation of a mortgage, in contrast to Canadian requirements. This means that a U.S. property owner (but not a Canadian one) could walk away from a property whose payments were in arrears, and not be personally liable for those payments. This would have been a major factor in the U.S. losses.

As well, while about one-half of Canadian mortgages are insured, only 15 to 30 per cent of U.S. mortgages are. Moreover, Canadian mortgage insurance is for the entire principal plus interest, while in the U.S. this insurance is only for the amount that would reduce the loan-to-value ratio to the required level.<sup>195</sup>

**PITI vis-à-vis PITH:** In the U.S., the Principal, Interest, (property-related) Taxes and (homeowners') Insurance are used in assessing the mortgage amount (among other criteria). This means that in the U.S., neither heating nor electricity carrying costs for the property are included, and in the scenario of rising energy costs, this could lead to homeowners being financed with mortgages that are harder to sustain.

In Canada, Principal, Interest, (property-related) Taxes and Heat are used. As a result, when heating costs are reduced through energy improvements financed via LICs, a homeowner technically could obtain a higher mortgage amount, which would be offset by the inclusion of LIC energy improvement financing into (property-related) taxes component of the carrying cost analysis. (At present, it appears that only CMHC Mortgage Loan Insurance includes retrofit financing and the resulting impact on heating costs within eligibility ratios).

Another major difference is the secondary market for mortgages: securitized mortgages represent about 29 per cent of all Canadian mortgages (about 91 per cent of which are CMHC-backed) and 60 per cent of all U.S. mortgages.<sup>196</sup> The latter were traded so frequently prior to the U.S. crisis that it was not certain who actually owned a specific mortgage, although a homeowner might have been paying one specific lender. This may have made it difficult for any one lender to renegotiate.

**Mortgage Default Rates** Quoted from TD Securities' chief Canada macro strategist Eric LaScelles's recent *Canadian Mortgage Market Primer*: "*The current [Canadian residential mortgage default rate] level is just slightly above the 0.42% average from 1990-2009 [at 0.44%]. By contrast, the fraction of prime U.S. mortgages delinquent three or more months was 7.01% as at Q4 2009.*"<sup>197</sup>

#### **REFERENCES: PACE FINANCING ISSUES**

[White House Council on Environmental Quality – Recovery Through Retrofit Report](#)

[White House Policy Framework for PACE Financing Programs](#)

[PACE Mortgage Seniority Memo](#)

[FHFA Letter](#)

[PACE NOW Response to Regulatory Agency Questions](#)

[FHFA statement July 6, 2010](#)

[Congress Letter to President Obama in support of PACE](#)

[PACE Status Update](#)

## Appendix III: Products that Mitigate Default Risk

### CMHC MORTGAGE LOAN INSURANCE AND CMHC GREEN HOME PROGRAM

CMHC offers loan insurance premium discounts of 10 per cent and surcharge-free extended amortization periods to purchasers of existing buildings who engage in prescribed levels of energy use improvements. This product is also available to existing owners who want to conduct energy retrofits to their homes.<sup>198</sup> As noted previously, almost 50 per cent of Canadian mortgages are insured, according to Eric LaScelles, TD Securities' chief Canada macro strategist.<sup>199</sup>

#### Benefits

“Mortgage loan insurance protects lenders against mortgage default and enables consumers to purchase homes with a minimum down payment of 5% — with interest rates comparable to those with a 20% down payment.”<sup>200</sup> Further, this insurance provides a means of extending the amortization (over and above the typical 25 years, up to 35 years) with no surcharge. This, when added to the 10 per cent refund, helps home-energy retrofits to be more cost effective.

Savings on heating costs are reflected in borrowers' Debt Service Ratios in the program.<sup>201</sup>

Loan insurance is a profit-making enterprise that reduces default risk and would lower interest rates at scale.<sup>202</sup>

#### Limitation

This is an attractive mechanism if it could be applied to PAPER financing; however, the Mortgage Loan Insurance coverage does not stay with the property. It moves with the owner to a new property/mortgage.

### LOAN GUARANTEE / LOAN LOSS RESERVES

This tool would involve committing funds as a guarantee that is placed on the expectation of the amount that would go into default.

#### Benefits

The default risk is reduced; any costs arising from delinquent payments are covered by the guarantee funds. This is a means of using a small amount of funds to leverage (for example) economic activity in energy retrofits, achieving energy and cost savings and GHG emission reductions. Jens Lohmueller notes<sup>203</sup> that a two per cent guarantee on housing defaults (which were at 0.44 per cent in March 2010<sup>204</sup>) would earn the guaranteeing organization about a 1.5 per cent profit on the guaranteeing amount. A \$2 million guarantee could cover about 10,000 homes with \$10,000 each in energy improvements.

#### Limitations

Challenges with a guarantee include the long-term commitment that would be required by the financing body. Governments may be concerned about commitments of 15 to 20 years, however, this may be one of the lowest-cost options to enabling energy use and GHG emission reductions.

## GUARANTEE OF ENERGY SAVINGS

Another excellent way to address many challenges, if provided on an affordable scale, is a mechanism used in the commercial sector. Jonathan Westeinde, co-founder and CEO of Windmill Development Group, suggested that a guarantee of energy savings might reduce concerns about security as well as the achievability of energy savings. Municipalities might be able to use a third-party guarantee of energy savings obtained from installing energy improvements, similar to that provided in some Energy Service Company (ESCO) contracts.<sup>205</sup> Several companies in the U.S. provide home energy savings guarantees on their energy retrofits.<sup>206</sup>

On a large scale such as for an Energy Service Company, the process is as follows: the client obtains financing for the improvements (e.g., \$10,000 cost with \$1,000 annual savings), knowing that the energy savings – and energy cost savings – are guaranteed, and further, that the savings will exceed the payments. For example, the owner borrows at five per cent from the bank, but the bank can obtain funds at a three per cent Bank of Canada rate. The difference of two per cent paid by the bank to the guarantor is a guarantor's fee, for which the guaranteeing entity both guarantees the loan and authenticates the data. Terms are about 10 years. Building envelope improvements' payback is about 10 years, and lighting improvements are about three years for a hybrid of about seven to eight years.

One critical success factor is the ability to provide the processes at an affordable level for homes. Another is the availability of a guarantor that can also provide the quality assurance. Jonathan Westeinde is negotiating an initiative with the Toronto Atmospheric Fund such that Windmill Development Group will produce TAF-guaranteed energy savings from the energy improvements Windmill installs for a building owned by construction giant Ledcor in the City of Toronto. Other government agencies that he thinks may be able to deliver this guarantee for the residential sector include the Federation of Canadian Municipalities and Canada Mortgage and Housing Corporation. As well, the province may be able to play a role in this regard.

### Benefits

This mechanism would provide additional security and lowers risk even further for a municipal or private lender, which therefore would reduce the financing interest rate.

## CLOSING COSTS

This is an interesting mechanism that has been used by Boulder County in Colorado to reduce default risk and therefore lower the interest rate on bonds from investors for the energy retrofits. The financing rates paid by homeowners in residential financing Round 1 were 5.2 per cent for income qualified homeowners and 6.68 per cent for owners obtaining open loans.

Closing costs are not the interest rate but instead include an extra amount added to the total financing paid by participants. Closing costs are aggregated among all participants, and during the term of the loan, delinquencies draw down from this fund so the municipal budget is not impacted.

Using the example below, if a moderate income homeowner (i.e., income-qualified) obtains financing for \$15,000 in energy retrofits during the first round, and includes the closing costs into the amount financed, the total amount is:

$$\$15,000 + \text{interest} + (12.65\% \text{ of } \$15,000 \text{ i.e. } \$1,897.50) = \$16,897.50 + \text{interest}.$$

<b>Boulder County, Colorado Closing Costs</b>				
	<b>ROUND 1</b>		<b>ROUND 2</b>	
	<b>MODERATE INCOME 2009A</b>	<b>OPEN CLASS 2009B</b>	<b>MODERATE INCOME 2009C</b>	<b>OPEN CLASS 2009D</b>
Bond Premium	1.15%	1.65%	1.01%	1.10%
Capitalized interest	3.21%	4.31%	1.14%	1.35%
Debt service Reserve fund	3.94%	4.46%	5.74%	6.23%
Issuance costs	3.93%	5.44%	5.72%	6.20%
Bond Rounding	0.06%	0.08%	0.00%	0.00%
<b>Closing Costs</b>	<b>12.65%</b>	<b>15.94%</b>	<b>13.61%</b>	<b>14.87%</b>

Source: Emily Beam, Boulder County Financial Services, September 21, 2010

When participants pay the debt service reserve fund component of closing costs, as the end of the financing term approaches, the remainder of the fund is used to pay down the obligation balance early. However, current commercial closing costs are at around seven per cent because the U.S. Department of Energy has supported a revolving Debt Service Reserve Fund.

## NOTES

- 1 The PAPER term and acronym will change in future
- 2 Canadian Council of Chief Executives, *Bold Steps Required To Spur Canada To Global Leadership In Energy And Environmental Innovation, Business Leaders Say*, November 8, 2010 [http://www.ceocouncil.ca/en/view/?document\\_id=1427&area\\_id=1](http://www.ceocouncil.ca/en/view/?document_id=1427&area_id=1)
- 3 Mills, Evan, *Insurance in a Climate of Change*, <http://insurance.lbl.gov/>
- 4 David Suzuki Foundation, *Economic Impacts*, <http://www.davidsuzuki.org/issues/climate-change/science/impacts/economic-impacts/>
- 5 Nelder, Chris, *The True Cost of Oil: \$65 Trillion a Year?*, June 29, 2007, *Energy and Capital: Practical Investment Analysis in the New Energy Economy*: <http://www.energyandcapital.com/articles/oil-gas-crude/461>
- 6 Laustsen, Jens, *Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings: In Support of the G8 Plan of Action*, Organisation for Economic Co-operation and Development/International Energy Agency, IEA Information Paper, March 2008
- 7 Institute for Responsible Investment, *Handbook on Climate-Related Investing Across Asset Classes*, Boston College, Carroll School of Management, Center for Corporate Citizenship, 2007: This affects Environmental, Social and Governance factors in assessing corporations. [http://www.fbheron.org/documents/bc\\_responsible\\_investing\\_handbook.pdf](http://www.fbheron.org/documents/bc_responsible_investing_handbook.pdf) downloaded October 11, 2010
- 8 77% of respondents in the City of Toronto study by Ipsos Reid stated they conducted energy improvements on their homes to save money on their energy bills. Source: Ipsos Reid, *City of Toronto Home Energy Financing Survey*, 2010. This consultant contributed to the study's development and analysis.
- 9 Economic damages related to air pollution (i.e., small particulate matter and ozone) were estimated. Smog includes these pollutants (and others), which are impacts of coal-fired plants. [Source: [http://action.psr.org/site/DocServer/Coal\\_Power\\_Fact\\_Sheet.pdf?docID=2821](http://action.psr.org/site/DocServer/Coal_Power_Fact_Sheet.pdf?docID=2821)] Small particulate matter is also linked to gas-fired plants. The impacts of ozone and small particulates included 21,000 premature deaths in Canada in 2008, of which 70% were in Ontario and Quebec. "The economic impact of air pollution because of worker absenteeism, higher health care costs and other factors will top \$8 billion [in 2008], and the cumulative total between [2008] and 2031 will be more than \$250 billion." Source: Canadian Medical Association, *No Breathing Room: National Illness Costs of Air Pollution*, 2008: [http://www.cma.ca/index.php?ci\\_id=10042903&la\\_id=1](http://www.cma.ca/index.php?ci_id=10042903&la_id=1) downloaded February 2011.
- 10 ICLEI Local Governments for Sustainability, *Profiting from Energy Efficiency: 2.0 Why Invest in Energy Efficiency?* <http://www.iclei.org/index.php?id=1672>
- 11 American Council for an Energy Efficient Economy, *Savings Estimates for Jobs Bill: ACEEE's preliminary estimate of the potential energy, carbon and economic savings*, 9 March 2010, [http://www.aceee.org/sites/default/files/publications/otherpdfs/Jobs\\_Analysis\\_0309.pdf](http://www.aceee.org/sites/default/files/publications/otherpdfs/Jobs_Analysis_0309.pdf)
- 12 "Economists for the State of Nebraska estimate that 80% of every dollar spent on energy bills leaves the state economy without generating further economic activity." Young, Abby, *State-Local Government Perspective*, Cities for Climate Protection – U.S. International Council for Local Environmental Initiatives. "Investments in energy efficiency boost the local economy by creating economic opportunities for local vendors, manufacturers and installers of energy efficiency technology. In many cases, by contrast, money spent on energy bills goes to outside corporations and utilities, and is not reinvested in the community. The city of Wooster, Ohio ... found that 90 percent of the money it was spending on energy was leaving the city [equivalent to] losing a local payroll of 3,000 jobs. .... In addition to economic benefits, actions taken to protect the climate change and reduce CO2 emissions also improve local air quality." Published on website by U.S. Global Change Research Information Office: <http://www.gcrio.org/USGCRP/sustain/young.html>
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- 14 Thompson, David, *Green Jobs: It's time to build Alberta's future*, Sierra Club Prairie, Greenpeace and the Alberta Federation of Labour, 2009: <http://www.greenpeace.org/raw/content/canada/en/documents-and-links/publications/green-jobs-report.pdf>
- 15 Ibid.

- 16 Achieving this would depend on the home's energy efficiency, installed measures and energy use (Source: Merrian Fuller, Lawrence Berkeley National Laboratory, December 2010).
- 17 Baser, Bob, Le Pan, Nick and Peters, Roger, *Pay As You Save Loans (PAYSL): A call for leadership and good policy*, 27 September 2010, Ecology Ottawa. The report describes LIC financing in terms of the stewardship responsibility that each homeowner has for the property.
- 18 Dorian Dale, Energy Director and Sustainability Officer with the Town of Babylon, New York State. Personal communication with Sonja Persram, September 21, 2010
- 19 See: the Ontario Assessment Act, excerpted below:  
 "Property assessable and taxable, exemptions 3. (1) All real property in Ontario is liable to assessment and taxation, subject to the following exemptions from taxation: ...  
 "Machinery for producing electric power 18. All machinery and equipment including the foundations on which they rest to the extent and in the proportion used for producing electric power but not including any buildings, structures, structural facilities or fixtures used in connection therewith.  
 "Machinery for energy conservation 18.1 Machinery and equipment used for the purposes of energy conservation or efficiency and prescribed by the Minister for the purposes of this paragraph."  
[http://www.e-laws.gov.on.ca/html/statutes/english/elaws\\_statutes\\_90a31\\_e.htm#BK2](http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90a31_e.htm#BK2) downloaded Dec. 2010.
- 20 Ontario Ministry of Finance staff, personal communication with Sonja Persram, March 2011.
- 21 See: [http://www.energysavers.gov/your\\_home/designing\\_remodeling/index.cfm/my-topic=10250](http://www.energysavers.gov/your_home/designing_remodeling/index.cfm/my-topic=10250)
- 22 As well: "Between 1990 and 2007, the building sector in Ontario was responsible for 7 Mt of the 22 Mt increase in GHG emissions over this period." Source: Environmental Commissioner of Ontario, *Rethinking Energy Conservation in Ontario: Annual Energy Conservation Progress Report – 2009 (Volume One)*, May 3, 2010
- 23 Targets from 2007. Sources: GoGreenOntario.ca, *Ontario Greenhouse Gas Emissions Targets: A Technical Brief*, 2007 [http://www.toronto.ca/livegreen/downloads/2009-10\\_report.pdf](http://www.toronto.ca/livegreen/downloads/2009-10_report.pdf) and Environmental Commissioner of Ontario: <http://www.eco.on.ca/eng/index.php/pubs/eco-publications/finding-a-vision-for-change.php> downloaded November 2010
- 24 Government of Canada, *Canada @ 150: Research Report*, Public Works and Government Services Canada, 2010: [http://www.policyresearch.gc.ca/doclib/can150\\_rp-eng.pdf](http://www.policyresearch.gc.ca/doclib/can150_rp-eng.pdf)
- 25 See: <http://www.mei.gov.on.ca/en/energy/conservation/ohesp/?page=ohesp-faqs>
- 26 Environment Canada, *News Release: Canada Lists Emission Target Under the Copenhagen Accord*, February 1, 2010: <http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=EAF552A3-D287-4AC0-ACB8-A6FEA697ACD6> downloaded November 2010
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- 29 The City of Toronto's goals include 80% reductions in GHG emissions from 1990 levels by 2050. Source: Toronto Environment Office, *The Power to Live Green: Toronto's Sustainable Energy Strategy*, October 2009.
- 30 See: City of Toronto Better Buildings Partnership: <http://bbptoronto.ca/> downloaded December 18, 2010
- 31 Lassaline Planning Consultants Inc., *Draft Chatham-Kent Commercial Community Improvement Plan (CCIP)*, Municipality of Chatham-Kent, November 25, 2010 [https://www.chatham-kent.ca/NR/rdonlyres/267C4643-CE73-43BE-B905-60BE2E5D674C/13735/CCIP\\_The\\_Plan\\_and\\_ProgramsNovember25.pdf](https://www.chatham-kent.ca/NR/rdonlyres/267C4643-CE73-43BE-B905-60BE2E5D674C/13735/CCIP_The_Plan_and_ProgramsNovember25.pdf) downloaded January 3, 2011
- 32 See: Association of Municipalities of Ontario, *Integrated Sustainability Plan: What will be required in order to fulfill the integrated community sustainability plan condition of the municipal funding agreement?* <http://www.amo.on.ca/Content/NavigationMenu/SustainableMunicipalities/FederalGasTax/IntegratedCommunitySustainabilityPlan/default.htm> and Live Green Toronto: <http://www.toronto.ca/livegreen/greenlife.htm>. Support provided has included:

- a) Developing and implementing Integrated Community Sustainability Plans
- b) Greening municipal operations: addressing sustainability, energy efficiency and renewables in municipal buildings, infrastructure and transportation
- c) Facilitating local economic development
- d) Enabling sustainable land use planning initiatives for community revitalization
- e) Facilitating district and private renewables uptake in communities,
- f) Financing commercial, industrial and institutional sector energy efficiency investments
- g) Developing guidelines and standards for new construction for residential properties
- h) Encouraging private residential energy conservation through education and linking with programs
- g) Financing private residential energy conservation through grants and incentives, as well as coordination with applications for other programs' funding (which will be winding down).
- 33 These barriers are described in: Persram, Sonja, *Property Assessed Payments for Energy Retrofits: Recommendations for Regulatory Change and Optimal Program Features*, David Suzuki Foundation, 2011.
- 34 The City of London provided loans for improvements (though not for energy efficiency) to private homeowners through Community Improvement Plans, years ago. Sources: Barrett, Gregg, and Turcotte, Brian, City of London, personal communications with Sonja Persram, April 2010. See also Community Improvement Plan loans.
- 35 The Toronto Solar Neighbourhood Initiative provided support for 100 solar thermal installations in Wards 29, 30, 31 and 32: <http://solarneighbourhoods.ca/>. Residents received either a \$1,000 cash discount or half that discount with 0% interest on the financing.
- 36 Home Energy Assistance Toronto grants owners up to \$1,000 for insulation, until March 2011: [http://www.toronto.ca/livegreen/greenlife\\_saveenergy\\_rebates\\_heat.htm](http://www.toronto.ca/livegreen/greenlife_saveenergy_rebates_heat.htm) downloaded December 20, 2011. The program is in partnership with the federal ecoENERGY and Ontario HESP programs.
- 37 SES Research (Ottawa), *Municipal Enviro-Loans for Energy Efficiency and Alternative Energy Study*, for the City of Ottawa, June 2007.
- 38 *City of Toronto Home Energy Financing Survey*, Ipsos Reid, 2010. This consultant contributed to the development of the survey questionnaire and discussion of the findings.
- 39 Existing buildings represent about 98% of all homes. In 2006 housing starts represented about 1.7% of the 13.3 million units of existing housing stock. Source: Natural Resources Canada Office of Energy Efficiency, Residential Sector Canada, Table 21: Housing Stock by Building Type and Vintage: [http://oe.nrcan.gc.ca/corporate/statistics/neud/dpa/tablestrends2/res\\_ca\\_21\\_e\\_3.cfm?attr=0](http://oe.nrcan.gc.ca/corporate/statistics/neud/dpa/tablestrends2/res_ca_21_e_3.cfm?attr=0) downloaded August 2010. This is also relevant to commercial properties: In 2006, Natural Resources Canada's Analysis and Modelling Division noted the annual growth rate of commercial properties' floor space in millions of m<sup>2</sup> between 1990 and 2004 was 1.6%, and was expected to increase by 2.2% annually between 2005 and 2020: *Canada's Energy Outlook: The Reference Case 2006*: Table C1, <http://www.nrcan-rncan.gc.ca/com/resoress/publications/peo/peo2006-eng.pdf>.
- 40 The Environmental Commissioner of Ontario states: "in 2007, the building sector was responsible for 33.4 Mt or 17 per cent of Ontario's emissions. Between 1990 and 2007, the building sector in Ontario was responsible for 7 Mt of the 22 Mt increase in GHG emissions over this period." Source: Environmental Commissioner of Ontario, *Rethinking Energy Conservation in Ontario: Annual Energy Conservation Progress Report – 2009 (Volume One)*, May 3, 2010.
- 41 National Round Table on the Environment and the Economy, Chapter 2.2 Framing Issues: Competitiveness and Policy Delay, in *Parallel Paths: Canada-U.S. Climate Policy Choices*, 2011. "The NRTEE's modelling suggests that with no new policies, Canadian GHG emissions will continue to climb, and by 2020, the total gap between emissions and the 2020 target would be 171 Mt." <http://www.climateprosperity.ca/eng/studies/canada-us/report/chapter-2-2-canada-us-eng.php> downloaded March 2011.
- 42 Nova Scotia, November 25, 2010: <http://gov.ns.ca/news/smr/2010-11-25-suburban/>

- 43 The Yukon allows this financing. Other provinces and communities across Canada are examining the possibility of using LICs for this purpose. The City of Ottawa and the City of Toronto conducted market research on the possibility; results are discussed in the previous paper. Endorsers of the U.S. program, called Property Assessed Clean Energy (PACE) include: the U.S. White House Council for Environmental Quality; 24 states that have passed enabling legislation and two more that already had provision; mayors, senators, 68 members of Congress, the Royal Bank of Canada (bond underwriters for the CaliforniaFIRST PACE program), the American Institute of Architects and ICLEI. In the U.S., the PACE programs have been frozen to date given challenges by the Federal Housing Finance Authority. The FHFA is subject to several lawsuits in this regard. Please see details on the programs and issues in relation to the Canadian environment in Appendix II.
- 44 Chapman, Tom, Assistant Project Manager, U.K. Energy Saving Trust, personal communication with Sonja Persram, May 28, 2010 and September 14, 2010; and Helen Martin, U.K. Government, Department of Energy and Climate Change.
- 45 The City of Vancouver is using a financing mechanism that will attach energy retrofit costs to properties on title (somewhat different from the Local Improvement Charges concept because the latter involves attaching a priority lien for any payments that are in arrears, while the former does not).
- 46 In this report the term “financing” is discussed in relation to two major uses. One is the provision of capital to private property owners for energy improvements, through a funding mechanism. The second is the provision of large amounts of capital to those financing entities. Both roles ideally provide low-interest financing.
- 47 Ontario Ministry of Municipal Affairs and Housing staff, personal communication with Sonja Persram, August 9, 2010
- 48 Persram, Sonja, “*Property Assessed Payments for Energy Retrofits: Recommendations for Regulatory Change and Optimal Program Features*,” David Suzuki Foundation, 2011.
- 49 Derivations of these best practices are outlined in more detail in the previous paper. See also: U.S. Department of Energy, *Guidelines for PACE Financing Programs*, May 7, 2010: [http://www1.eere.energy.gov/wip/pdfs/arra\\_guidelines\\_for\\_pilot\\_pace\\_programs.pdf](http://www1.eere.energy.gov/wip/pdfs/arra_guidelines_for_pilot_pace_programs.pdf)
- 50 Achieving this will depend on home energy efficiency measures installed in the home, and home energy use and efficiency.
- 51 Methodologies for obtaining assurances about energy cost savings will be discussed in the subsequent strategic implementation report. See also the results to date of the *Long Island Green Homes* initiative at the end of this section, in which actual savings have exceeded payments.
- 52 Typically, addressing home energy efficiency of high users of energy would generate the greatest energy savings. Source: Michael Blasnik, M. Blasnik & Associates (a nationally respected U.S. energy-efficiency researcher), personal communication with Sonja Persram, September 2010. However this would not help homeowners living on lower or fixed incomes, whose homes may need the most improvements. A neighbourhood approach would address both homeowners’ needs and provide economies of scale for practitioners. Source: Linda Wigington, Affordable Comfort Inc. See: <http://www.affordablecomfort.org/>. (Wigington and Affordable Comfort have been engaged in information sharing on optimizing energy improvements and high performance homes with a social equity approach, via consultations and conferences in the USA and Canada.)
- 53 Johnston, Bill, President, Toronto Real Estate Board, July 2010 noted people move about every 8-10 years. Natividad Urquizo, Environmental Planner, City of Ottawa observes that in Ottawa people move approximately every 3-5 years.
- 54 The City of Toronto study conducted by Ipsos Reid found that 31 per cent of homeowners surveyed would be more likely to purchase an energy efficient home with an outstanding energy efficiency loan and lower monthly energy bills; this would rise to 42 per cent if there was also a higher resale value. Source: Ipsos Reid, *City of Toronto Home Energy Financing Survey*, 2010. Note that there are educational goals associated with property-assessed financing: the real estate community and the public would need to be informed of the continuing benefits to the buyer of the energy improvements for which the buyer would be assuming the obligation balance.
- 55 Chris Corps of Asset Strategics has referred to these contributions from savings towards local programs that save energy as “transfer pricing.” Source: Corps, Chris, personal communications with Sonja Persram, June 2010.

- 56 See the Ontario Assessment Act, excerpted below:  
 “Property assessable and taxable, exemptions  
 3. (1) All real property in Ontario is liable to assessment and taxation, subject to the following exemptions from taxation: ...  
 “Machinery for producing electric power  
 18. All machinery and equipment including the foundations on which they rest to the extent and in the proportion used for producing electric power but not including any buildings, structures, structural facilities or fixtures used in connection therewith.  
 “Machinery for energy conservation  
 18.1 Machinery and equipment used for the purposes of energy conservation or efficiency and prescribed by the Minister for the purposes of this paragraph.”  
[http://www.e-laws.gov.on.ca/html/statutes/english/elaws\\_statutes\\_90a31\\_e.htm#BK2](http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90a31_e.htm#BK2) downloaded Dec. 2010.
- 57 Ministry of Finance staff, personal communications with Sonja Persram, Friday March 4, 2011.
- 58 See: [http://www.energysavers.gov/your\\_home/designing\\_remodeling/index.cfm/mytopic=10250](http://www.energysavers.gov/your_home/designing_remodeling/index.cfm/mytopic=10250)
- 59 See the Database of State Incentives for Renewable Energy website [www.dsireusa.org](http://www.dsireusa.org), which includes incentives at all levels of government, for both energy efficiency and renewable energy.
- 60 Various municipalities’ staff, confidential personal communications with Sonja Persram, 2010
- 61 Securitized mortgages represent about 29% of all Canadian mortgages (about 91% of which are CMHC-backed). Source: LaScelles, Eric, TD Securities’ Chief Canada Macro Strategist, *Canadian Mortgage Market Primer*, June 17, 2010 [http://www.td.com/economics/special/el0610\\_cdn\\_mort\\_market.pdf](http://www.td.com/economics/special/el0610_cdn_mort_market.pdf) downloaded September 20, 2010.
- 62 See the discussion of PACE financing issues in Appendix II, especially in relation to the Canadian environment.
- 63 This measure is recommended in the U.S. also to avoid potential violations of a mortgage covenant (if one exists) by the existence of a tax lien. Covenants require the mortgage payments to not be superseded by a higher priority lien (such as an LIC), or the mortgage would then go into default.
- 64 This is typical of LICs, which are used currently for measures like sidewalks and sewers.
- 65 Williams, Robert L. Jr., Managing Director, RBC Capital Markets, San Francisco, personal communication with Sonja Persram, September 24, 2010. His underwriting guidelines included CaliforniaFIRST owners having 20% home equity. Another recommendation was for 10% minimum equity, in: “*Property Assessed Clean Energy (“PACE”) Programs White Paper: Helping Achieve Environmental Sustainability and Energy Independence, Improving Homeowner Cash Flow and Credit Profile, Protecting Mortgage Lenders, and Creating Jobs*. By The National Resources Defense Council, PACE Now, Renewable Funding, LLC, and The Vote Solar Initiative, May 3, 2010 <http://www.renewfund.com/resources/resources>
- 66 See <http://www.cmhc-schl.gc.ca/en/co/moloin/index.cfm>
- 67 See <http://www.cmhc-schl.gc.ca/en/hoficlincl/moloin/hopr/upload/CMHC-Green-Home.pdf>
- 68 This is one of the major criteria interesting homeowners according to Dorian Dale, Energy Director and Sustainability Officer with the Town of Babylon, New York State. Personal communication with Sonja Persram, September 21, 2010
- 69 Revenue bonds cannot be issued to finance LICs.
- 70 Ontario Ministry of Municipal Affairs and Housing staff, op. cit. As at September 16, 2010 Reg 403/02 states, in respect of the annual debt and financial obligation limit for municipalities that the municipality’s treasurer may adjust the debt and financial obligation limit by “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).”
- 71 As noted by Bronskill, David, Partner, Goodmans LLP, personal communication with Sonja Persram, August 2010.
- 72 Source: Bronskill, David, Partner, Goodmans LLP, personal communication with Sonja Persram, April 2010.
- 73 This collaboration has been initially discussed in the previous paper, and will be described further in an upcoming report on strategic implementation to be published in 2011.
- 74 Ontario Ministry of Municipal Affairs and Housing staff, personal communication with Sonja Persram, September 9, 2010
- 75 Dale, Dorian, Energy Director and Sustainability Officer, Town of Babylon, personal communications with Sonja Persram in March, September and October 6, 2010. See also: <http://ligreenhomes.com/page.php?Page=home>

- 76 Dale, Dorian, Energy Director and Sustainability Officer, Town of Babylon, personal communications with Sonja Persram, October 2010. The Town of Babylon has a tight budget and staff do not have the capacity at present to closely monitor all program costs, although there are plans to be able to do this in the future. The current figures are therefore estimates.
- 77 ICLEI-Local Governments for Sustainability, Long Island Green Homes Program in Babylon, New York, Municipal Clean Energy Toolkit, [http://www.townofbabylon.com/uploads/pdf-files/CaseStudy\\_BabylonNYGreenHomes.pdf](http://www.townofbabylon.com/uploads/pdf-files/CaseStudy_BabylonNYGreenHomes.pdf)
- 78 Dale, Dorian, op. cit. The degree to which the administrative costs are covered by the rate charged is being determined. The financing is from a Town waste reserve fund; the Town of Babylon has defined carbon as “waste.” Note: other, PACE programs were specifically designed so that administrative costs would be covered by program costs. These include: Boulder County, Colorado, and Palm Desert, California. The Boulder County initiative incurred unexpected additional costs which were extension of program staffing due to the FHFA challenge; these costs are anticipated to be recovered due to the program’s 1% interest rate “fee,” which is the difference between the rate from the bond issue and that charged to participants. The Palm Desert initiative has not evaluated program costs as yet. Sources: Will Toor, Boulder County Commissioner, personal communications with Sonja Persram, November 2010 and Allen, G., Persram, S., Kani, M. and Lester, S., *Assessment of North American Property-Attached and Other Financing Programs For Low-Rise Residential Energy Retrofits*, Final Report, prepared for the Toronto Environment Office, City of Toronto, December 17, 2010
- 79 77% of respondents in the City of Toronto study by Ipsos Reid stated they conducted energy improvements on their homes to save money on their energy bills. Source: Ipsos Reid, *City of Toronto Home Energy Financing Survey*, 2010. This consultant contributed to the study’s development and analysis.
- 80 Ibid. 59% of respondents gave “Increasing the resale value of your home” as a reason for conducting energy improvements.
- 81 The value dynamics are complex and difficult to analyze at present; they are discussed in Appendix I
- 82 People with local jobs tend to spend locally. National Renewable Energy Laboratory, *Energy Efficiency Strengthens Local Economies*, U.S. Department of Energy: Tomorrow’s Energy Today: For Cities and Counties, 1995
- 83 American Council for an Energy Efficient Economy, *Savings Estimates for Jobs Bill: ACEEE’s preliminary estimate of the potential energy, carbon and economic savings*, 9 March 2010, [http://www.aceee.org/sites/default/files/publications/otherpdfs/Jobs\\_Analysis\\_0309.pdf](http://www.aceee.org/sites/default/files/publications/otherpdfs/Jobs_Analysis_0309.pdf)
- 84 “Economists for the State of Nebraska estimate that 80% of every dollar spent on energy bills leaves the state economy without generating further economic activity.” Young, Abby, State-Local Government Perspective, Cities for Climate Protection – U.S. International Council for Local Environmental Initiatives. “Investments in energy efficiency boost the local economy by creating economic opportunities for local vendors, manufacturers and installers of energy efficiency technology. In many cases, by contrast, money spent on energy bills goes to outside corporations and utilities, and is not reinvested in the community. The city of Wooster, Ohio ... found that 90 percent of the money it was spending on energy was leaving the city [equivalent to] losing a local payroll of 3,000 jobs. ... In addition to economic benefits, actions taken to protect the climate change and reduce CO2 emissions also improve local air quality.” Published on website by U.S. Global Change Research Information Office: <http://www.gcrio.org/USGCRP/sustain/young.html>
- 85 U.S. Department of Energy, *The Jobs Connection: Energy Use and Local Economic Development*. Produced for the National Renewable Energy Laboratory, DOE/GO-10096-342, November 1996:
- 86 Source: “*Property Assessed Clean Energy (“PACE”) Programs White Paper: Helping Achieve Environmental Sustainability and Energy Independence, Improving Homeowner Cash Flow and Credit Profile, Protecting Mortgage Lenders, and Creating Jobs*. By The National Resources Defense Council, PACE Now, Renewable Funding, LLC, and The Vote Solar Initiative, May 3, 2010 <http://www.renewfund.com/resources/resources>
- 87 ICLEI noted that every \$1 million invested in energy efficiency can create employment for up to 70 person-years. This includes direct, indirect and induced jobs. Source: ICLEI Local Governments for Sustainability, *Profiting from Energy Efficiency: 2.0 Why Invest in Energy Efficiency?* <http://www.iclei.org/index.php?id=1672>

- 88 The FCM notes that the Canadian government estimates jobs created by \$1 million invested in energy retrofits total 20 person-years. Federation of Canadian Municipalities, *Municipal Building Retrofits: The Business Case* [http://fmv.fcm.ca/files/Capacity\\_Building\\_-\\_MBRG/MBRG\\_thebusiness\\_case\\_En.pdf](http://fmv.fcm.ca/files/Capacity_Building_-_MBRG/MBRG_thebusiness_case_En.pdf) downloaded Jan. 4, 2011.
- 89 A recent Pembina Institute report noted direct and indirect employment impacts of the Ontario Green Energy Act included employment in conservation and demand management for 14.2 job-years per \$1 million spent. Demerse, Clare, *reducing pollution, creating jobs: The Employment Effects of Climate Change and Environmental Policies*, The Pembina Institute, March 2011.
- 90 Laustsen, Jens, *Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings: In Support of the G8 Plan of Action*, Organisation for Economic Co-operation and Development/International Energy Agency, IEA Information Paper, March 2008
- 91 Caldicott, Dr. Helen, *The medical and economic costs of nuclear power*, Global Research, October 14, 2009, citing 1 German and 2 large multi-national studies: <http://www.globalresearch.ca/index.php?context=va&aid=15673> downloaded June 2010
- 92 Physicians for Social Responsibility, *Coal-Fired Power Plants: Understanding the Health Costs of a Dirty Energy Source*, downloaded June 2010: [http://action.psr.org/site/DocServer/Coal\\_Power\\_Fact\\_Sheet.pdf?docID=2821](http://action.psr.org/site/DocServer/Coal_Power_Fact_Sheet.pdf?docID=2821)
- 93 Greenpeace Briefing: *Interesting facts about coal-fired power plants, mercury, and other pollutants*: <http://www.greenpeace.org/raw/content/seasia/en/press/reports/coal-plants-a-greenpeace-brie.pdf>
- 94 Citizens for Clean Air: *Health Facts #1 re: Oakville Power Plant*: <http://www.c4ca.org/files/C4CA%20Health%20Facts%20%231%20FINAL%20Jan%202010.pdf>
- 95 Note that these costs were noted as being underestimated. They arise from: lost productivity, healthcare costs, quality of life and loss of life. Ontario costs were estimated at \$3.6 billion for 2008 and \$117.7 billion for 2008-2031. Source: Canadian Medical Association, *No Breathing Room: National Illness Costs of Air Pollution*, 2008: [http://www.cma.ca/index.php?ci\\_id=10042903&la\\_id=1](http://www.cma.ca/index.php?ci_id=10042903&la_id=1) downloaded February 2011.
- 96 Pembina Institute, OilSandsWatch.org, multiple reports
- 97 Nelder, Chris, *The True Cost of Oil: \$65 Trillion a Year?*, June 29, 2007, Energy and Capital: Practical Investment Analysis in the New Energy Economy: <http://www.energyandcapital.com/articles/oil-gas-crude/461>
- 98 David Suzuki Foundation, *Economic Impacts*, <http://www.davidsuzuki.org/issues/climate-change/science/impacts/economic-impacts/>
- 99 Canadian Medical Association, op.cit.
- 100 Mills, Evan, *Insurance in a Climate of Change*, <http://insurance.lbl.gov/>
- 101 Persram, Sonja, email to PACE discussion group, June 3, 2010
- 102 Canadian Council of Chief Executives, *Bold Steps Required To Spur Canada To Global Leadership In Energy And Environmental Innovation, Business Leaders Say*, November 8, 2010 [http://www.ceocouncil.ca/en/view/?document\\_id=1427&area\\_id=1](http://www.ceocouncil.ca/en/view/?document_id=1427&area_id=1)
- 103 Source: Institute for Responsible Investment, *Handbook on Climate-Related Investing Across Asset Classes*, Boston College, Carroll School of Management, Center for Corporate Citizenship, 2007: "... mortgage values for residential properties that are not energy efficient themselves or that do not have easy access to sustainable transportation may decrease due to rising carbon prices, and therefore may underperform over the medium- to long-term." This affects Environmental, Social and Governance factors in assessing corporations. [http://www.fbheron.org/documents/bc\\_responsible\\_investing\\_handbook.pdf](http://www.fbheron.org/documents/bc_responsible_investing_handbook.pdf) downloaded October 11, 2010
- 104 Peters, Roger; Horne, Matt; and Heap, Nicholas, *Using Local Improvement Charges to Finance Building Energy Efficiency Improvements: A Concept Report*, Pembina Institute, May 1, 2004, <http://www.pembina.org/pub/170>
- 105 Source: *Enabling Investments in Energy Efficiency: A study of energy efficiency programs that reduce first-cost barriers in the residential sector*, Energy & Resources Group, UC Berkeley, prepared for California Institute for Energy and Environment, May 21, 2009 <http://uc-ciee.org/downloads/Resfinancing.pdf>. Also, the useful life of the energy improvement investments should be the same as or greater than the financing term. Source: U.S. Department of Energy, *Guidelines for Pilot PACE Financing Programs*, May 7, 2010: [http://www1.eere.energy.gov/wip/pdfs/arra\\_guidelines\\_for\\_pilot\\_pace\\_programs.pdf](http://www1.eere.energy.gov/wip/pdfs/arra_guidelines_for_pilot_pace_programs.pdf)

- 106 In a 2010 City of Toronto study, 82% of homeowners who had conducted energy improvements in the previous 5 years had paid for them with cash. Of the 20% of respondents who did not do all post-audit energy efficiency improvements, 66% unprompted had found the costs too high, and 62% had found this when prompted. Of the 15% who did not do any energy improvements at all in the previous 5 years, when prompted 54% strongly or somewhat agreed that the costs were too high. A surprising 85% of homeowners in the study made energy efficiency improvements within the past 5 years. However, about one-half of these owners spent up to \$5,000, and the mean expense was \$10,384. Source: Ipsos Reid, *City of Toronto Home Energy Financing Survey*, 2010. 500 Toronto owner-occupiers of homes were surveyed.
- 107 Ipsos Reid Public Affairs, *Green Home Improvement Program Qualitative Research Final Report*, February 2009 for Climate Change Central.
- 108 31% of homeowners surveyed would be much more likely, and 35% would be somewhat more likely to apply for a loan with those characteristics. Source: Ipsos Reid, *City of Toronto Home Energy Financing Survey*, 2010.
- 109 Jens Lohmueller notes there are two possibilities which depend on a value increment arising from the improvement: “[Existing homeowners] either pass on the cost to the next owner which assumes the house’s value has increased due to the improvements, which actually might be the case (a leaky house should be valued less than a well insulated one) or it comes out of [the] sales price and the old owner has to pay it from the proceeds of the sale (assuming no value added was cashed in).” Source: Lohmueller, Jens, personal communication with Sonja Persram, September 20, 2010.
- 110 Williams, John, (Responsible Cabinet Member) and Alty, Richard, (Responsible Director), Darlington Borough Council (U.K.), *Financial Inclusion Strategy Summary Report*, and *Money Matters: A Financial Inclusion Strategy for Darlington*, May 4, 2010: <http://www.darlington.gov.uk/PublicMinutes/Cabinet/May%204%202010/Item%207c.pdf> and <http://www.darlington.gov.uk/PublicMinutes/Cabinet/May%204%202010/Item%207c%20-%20Appendix%201.pdf>
- 111 Health Impact Evaluation of Warm Front, U.K. Department for Environment Food and Rural Affairs (Defra) with support from the Department of Health (DH) and the Department of Trade and Industry (DTI): [http://www.energysavingtrust.org.uk/uploads/documents/aboutest/HIE\\_of\\_WF\\_Summary\\_Dec\\_04.pdf](http://www.energysavingtrust.org.uk/uploads/documents/aboutest/HIE_of_WF_Summary_Dec_04.pdf)
- 112 Typically, addressing home energy efficiency of high users of energy would generate the greatest energy savings. Source: Michael Blasnik, M. Blasnik & Associates (a nationally respected U.S. energy-efficiency researcher), personal communication with Sonja Persram, September 2010. However this would not help homeowners living on lower or fixed incomes, whose homes may need the most improvements. A neighbourhood approach would address both homeowners’ needs and provide economies for practitioners. Source: Linda Wigington, Affordable Comfort Inc. See: <http://www.affordable-comfort.org/>. (Wigington and Affordable Comfort have been engaged in information sharing on optimizing energy improvements and high performance homes with a social equity approach, via consultations and conferences in the USA and Canada.)
- 113 By contrast, homeowners in the U.S. do not sign a promissory note so they are not personally liable if payments on the property are in arrears. Source: Lohmueller, Jens, personal communication with Sonja Persram, April, 2010
- 114 0.44% of Canadian mortgages were in arrears by 3 months or more in March 2010. Source: LaScelles, Eric, TD Securities’ Chief Canada Macro Strategist, *Canadian Mortgage Market Primer*, June 17, 2010 [http://www.td.com/economics/special/el0610\\_cdn\\_mort\\_market.pdf](http://www.td.com/economics/special/el0610_cdn_mort_market.pdf) downloaded September 20, 2010.
- 115 Please see Appendix III for more details. [http://www.cmhc-schl.gc.ca/en/co/moloin/moloin\\_008.cfm](http://www.cmhc-schl.gc.ca/en/co/moloin/moloin_008.cfm)
- 116 Lohmueller, Jens, Co-founder and Partner, CU Consulting Group and Treasurer, Community Power Fund, (personal communication with Sonja Persram, September 2010) notes that challenges with mortgages include that the loan-to-value ratios may be high with an added energy retrofit obligation if the homeowner is already highly leveraged. “the real challenge with this is that ... the extra amounts could push the loan to value

- over 80% ... *If the appraiser would assess the house as having a higher value, that might be avoidable... For people who have carried their mortgage and amortized some debt, i.e. have a lower loan to value, this might not be an issue.*" For these homeowners, using the CMHC 'Green Home' Mortgage Loan Insurance product may be appropriate.
- 117 LaScelles, Eric, TD Securities' Chief Canada Macro Strategist, *Canadian Mortgage Market Primer*, June 17, 2010 [http://www.td.com/economics/special/el0610\\_cdn\\_mort\\_market.pdf](http://www.td.com/economics/special/el0610_cdn_mort_market.pdf) downloaded September 20, 2010.
- 118 Cost savings in relation to payments would be difficult to calculate and have investment certainty on, due to the 5-year duration of mortgages and consequently changing rates. For example if interest rates rise, this would affect the business case and negatively impact payback.
- 119 About 35% of mortgages are insured by CMHC. This figure is derived from LaScelles' note that almost 50% of mortgages are insured in Canada and about 70% of the insuring is conducted by CMHC (with private companies insuring the remainder). Source: LaScelles, Eric, op.cit. As well, CMHC Insurance is only provided where equity on the home is <20%.
- 120 (for example), according to credit union charters. Source: Lohmueller, Jens, personal communication with Sonja Persram, June 2010
- 121 Lohmueller, Jens, Co-founder and Partner, CU Consulting Group and Treasurer, Community Power Fund, (personal communication with Sonja Persram, September 20, 2010) notes: "*2<sup>nd</sup> and 3<sup>rd</sup> mortgages are technically possible, but most lenders want to secure their position with first position security, i.e., 1<sup>st</sup> mortgage. ... [Lenders] are less keen on mortgages past the 1<sup>st</sup>. There are greater default risks with a 2<sup>nd</sup> or 3<sup>rd</sup> mortgage.*"
- 122 Corps, Chris, CEO of Asset Strategics, personal communication with Sonja Persram, June 2010.
- 123 Lohmueller, Jens, Sept. 20, 2010, op.cit.
- 124 <http://www.canadian-money-advisor.ca/what-is-a-chattel-mortgage.html>
- 125 This option was suggested for the sector by Jonathan Westeinde, co-founder and CEO of Windmill Development Group in an interview with Sonja Persram at the CaGBC conference, June 9, 2010
- 126 According to Chris Corps, CEO of Asset Strategics, it is important to consider whether the moveable property under consideration is defined as fixtures or fittings: fixtures are fixed and transfer on sale of the land, and fittings are/do not. Definitions are complex: lighting, for example, can be fittings or fixtures. As well, many retrofit measures in aggregate will be a mixture of fittings (moveable) and fixtures (not moveable) – and both cannot be secured together under the PPSA, only fittings (i.e., chattels can). Also, he observes "*the problem is, by the time the asset is paid off the situation becomes esoteric as to whether the asset is fixed or moveable.*" Corps, Chris, interviews with Sonja Persram June 9 and 15, 2010
- 127 An example of the issue about fixtures and fittings and due diligence required is noted by Jens Lohmueller: "*[Lenders] are very analytically intensive and [transfer of this mechanism from the commercial sector] wouldn't work with the way residential loans are managed; [there would be] too much legwork ... The cost of processing wouldn't be justified for a \$10,000-30,000 green loan.*" Source: Lohmueller, Jens, Co-founder and Partner, CU Consulting Group and Treasurer, Community Power Fund, personal communication with Sonja Persram, June 14, 2010 and September 20, 2010
- 128 Ibid: Lohmueller notes: "*doing a title search is typical in real estate transactions, but searches of the provincial registry for PPSAs are far less frequently conducted as they add an additional cost.*"
- 129 This financing option is recommended by Chris Corps, CEO of Asset Strategics, personal communication with Sonja Persram, June 2010. It arises due to his concerns about costs to government of financing programs where financing is secured to the property (including costs of foreclosure), and given his belief in a risk-mitigating alternative to securing a private sector loan or municipal financing to property. He recommends that other lenders follow the example of VanCity Credit Union, noting that VanCity has diversified their risk due to the large numbers of loans, and provides engineer signoff on energy improvement loans.
- 130 Source: confidential communications between major banks and municipal staff, some of which were attended by Sonja Persram, 2010.

- 131 Confirmed by Jens Lohmueller, fall 2010.
- 132 <http://www.alterna.ca/Templates/SavingsPersonalSub.aspx?mid=272&id=3602&langtype=1033>
- 133 These loans were for affordable Northern Housing upgrades, which included a requirement for some level of energy efficiency retrofits. The funds came from Canada Mortgage and Housing Corporation, the Ministry of Municipal Affairs and Housing, and the municipality. Loans of \$20,000 or less were secured by promissory notes and attached to Title or by means of a lien; larger loans needed to be attached via a mortgage. Since the loans were made by government with various levels of oversight, these factors together may have reduced their perception of risk (compared to the risks of being junior to the mortgage, as noted by financial institution staff). Source: confidential feedback by staff in one municipality, who noted that the city received provincial funding under the Affordable Housing Program for private residential properties. See also: <http://www.mah.gov.on.ca/AssetFactory.aspx?did=4082> downloaded September 2010
- 134 A title lien is paid out on foreclosure based on the (date) order on which the attachment appears on the title.
- 135 Source: confidential communications between municipal staff and representatives of major banks.
- 136 Loans under Community Improvement Plans (CIPs) are legislated under the Planning Act, Section 28. CIP loans are attached to the property and not the owner. CIP loans are used for property repair, rehabilitation and redevelopment, including brownfields, heritage, accessibility, and code upgrades. Energy improvement uses have also been specified.
- 137 Thanks for input to this section from Ontario Ministry of Municipal Affairs and Housing staff; Scott Pasternack, City of Toronto; Jane Welsh, City of Toronto; Peter Moore, City of Toronto; Gregg Barrett, City of London; Brian Turcotte, City of London; Carolyn Dawe, City of Greater Sudbury; Stan Makuch, LLM, of Makuch & Associates and David Bronskill, LLB, partner at Goodmans.
- 138 Private-home owners in the City of London have benefited from these kinds of loans, years ago. Sources: Barrett, Gregg, and Turcotte, Brian, City of London, personal communications with Sonja Persram, April 2010.
- 139 There is *no* stipulation in the legislation that establishing eligibility for a CIP loan *cannot* include looking at income; this means that to obtain a CIP loan a credit rating *could* be used. This is similar to private financing.
- 140 The attachment type and security provision for CIP loans is different from a Local Improvement Charge. The CIP loan attachment is instead via a Title lien as well as an Agreement with the municipality that is signed by the owner. Commonly, the Agreement is written such that on sale the municipality may either require payment *or* give permission for the obligation to be postponed and the Agreement (and loan) to transfer to the new owner with the new owner's obligation registered against Title. The City of London has been using CIP loans for years, and this permission process duration is a few days. For municipalities already subject to approvals lags, Agreement transfer process delays may be much longer, and this may produce challenges in property sale transactions. Source: Turcotte, Brian, City of London, personal communications with Sonja Persram, April 2010. According to lawyer [Stan Makuch](#), although the Agreement may appear to require municipal permission if the property is sold, it also could be written so that property transfer does not require this. As well, he notes that the owner who first engages in the Agreement with the municipality is the only person who needs to sign this Agreement. The new owner does not need to sign a new Agreement; the old Agreement would still be applicable to the new owner because the Agreement is not subject to civil law. Source: Makuch, Stan, LLM, personal communications with Sonja Persram, March – April 2010.
- 141 A priority lien has been noted by Dorian Dale (Energy Director and Sustainability Officer in the Town of Babylon, New York State) as contributing to lower interest rates. September, 2010
- 142 Sources: Source: confidential communications from representatives of major banks to municipal staff and Sonja Persram, 2010.
- 143 CIP loans can be issued by either a municipality or a municipality's municipal business corporation (a third party entity that is owned by the municipality). If CIP loans are issued by the municipality, financing must be either via general funds, or a general obligation bond. General obligation bonds used for a CIP loan would affect the municipality's debt capacity. If a Municipal Business Corporation is set up for energy retrofit financing, it could obtain capital through revenue bonds (defined as a bond that finances public works such that the

- revenue from the activities financed, i.e., the energy improvements' resulting savings, repays the bond) which theoretically would not affect the municipality's debt capacity as CIP loan repayments would constitute the revenue bond's income stream. However it is to be determined whether this can be done as it has not yet been implemented. Source: Ontario Municipal Affairs and Housing staff, personal communications with Sonja Persram, Fall 2009
- 144 Peters, Roger, personal communications with Sonja Persram, June & September, 2010. See also the example of British Gas, (Source: interview with Tom Chapman, Energy Saving Trust, United Kingdom) and information on utilities in the State of California, according to Fuller, Merrian, *Enabling Investments in Energy Efficiency: A study of energy efficiency programs that reduce first-cost barriers in the residential sector*, Energy & Resources Group, UC Berkeley, prepared for California Institute for Energy and Environment, May 21, 2009 (an earlier version was produced in 2008).
- 145 This requires the utility to have a goal of homeowner energy cost savings: in one current utility program in Canada, participants installed many measures that had a long payback, because the utility did not have this goal. Installed measures were: windows and doors (50%), high-efficiency furnaces (47%) and only 3% installed insulation (which is a very cost-effective measure). Source: Allen, G., Persram, S., Kani, M. and Lester, S., *Assessment of North American Property-Attached and Other Financing Programs For Low-Rise Residential Energy Retrofits*, attachments to the Final Report, prepared for the Toronto Environment Office, City of Toronto, Dec. 17, 2010
- 146 An interesting example of cooperation in on-bill financing is British Gas in the U.K., which is facilitator of one of the U.K.'s five Pay As You Save (PAYS) pilot projects. The utility supplies both electricity and gas, and also allows pilot project homeowners *who are not their customers* to participate in the upfront energy improvements financing program, with repayments to British Gas. Source: Chapman, Tom, Assistant Project Manager, U.K. Energy Saving Trust, personal communication with Sonja Persram, May 28, 2010 and September 14, 2010; and Helen Martin, U.K. Government, Department of Energy and Climate Change.
- 147 Peters, Roger, personal communication with Sonja Persram, March 14, 2011.
- 148 Manitoba Hydro's rate is 4.9% and Newfoundland Power's is prime plus 5%. Source: Allen, G., Persram, S., Kani, M. and Lester, S., *Assessment of North American Property-Attached and Other Financing Programs For Low-Rise Residential Energy Retrofits*, Final Report, prepared for the Toronto Environment Office, City of Toronto, December 17, 2010
- 149 This is applicable to many small businesses as well as rental single family dwellings, provided the properties are metered. Southern California Gas Company has such a program for non-residential customers and multifamily unit owners who are not also occupiers of the properties. See: <http://www.socalgas.com/business/rebates/onBillFinancing.html> downloaded June 2010
- 150 Thus far, analysis has not been done to determine how a PAPER program would serve rental properties, for reasons of project budget and scope.
- 151 This was the experience of BC Hydro's former on-bill financing program years ago. Source: *ibid.*
- 152 Fuller, Merrian, *Enabling Investments in Energy Efficiency: A study of energy efficiency programs that reduce first-cost barriers in the residential sector*, Energy & Resources Group, UC Berkeley, prepared for California Institute for Energy and Environment, May 21, 2009 (an earlier version was produced in 2008).
- 153 Manitoba Hydro has multiple on-bill financing programs: the Power Smart program for energy efficiency retrofits is for a maximum term of 5 years and \$7,500 (the average loan was \$4,700). There is an additional \$5,000 available for electrical or gas system upgrades and up to \$20K for geothermal plus up to \$7,500 for solar thermal installations for a total maximum financing of \$40,000. Source: Allen, G., et al, *op.cit.*
- 154 Newfoundland Power's maximum on-bill financing amount available (although special approval might be obtained for larger amounts. Source: Source: Allen, G., Persram, S., Kani, M. and Lester, S., *Assessment of North American Property-Attached and Other Financing Programs For Low-Rise Residential Energy Retrofits*, Final Report, prepared for the Toronto Environment Office, City of Toronto, December 17, 2010
- 155 Most deep retrofit measures have longer paybacks, and as noted by energy consultant Roger Peters, it is much easier to sell deeper retrofits when the terms result in a positive cash flow.

- 5 years is the maximum payment term in Manitoba Hydro's and Newfoundland Power's programs. Source: Allen, G., Persram, S., Kani, M. and Lester, S., *Assessment of North American Property-Attached and Other Financing Programs For Low-Rise Residential Energy Retrofits*, Final Report, prepared for the Toronto Environment Office, City of Toronto, December 17, 2010
- 156 Recently lenders in Ontario have noted in private conversations with municipal staff that they require security for energy improvement loans, although there is at least one unsecured loan product which requires energy evaluator signoff.
- 157 This is typical of both Newfoundland Hydro and Manitoba Hydro's programs. Source: Allen et al, 2010, op.cit.
- 158 In the Ontario scenario with multiple local distribution companies there is no monopoly, so occupants could move without paying utility bills, and relocate in another utility's service area. However in Manitoba, Manitoba Hydro is the sole utility for both gas and electricity which is a deterrent to non-payment of bills. Source: Ibid.
- 159 Sources: Chihata, Bill, Portfolio Manager, Mass Markets DSM and Fenn, Mike, Manager, Billing Relationships, both at Enbridge Inc., personal communications with Sonja Persram, March 22-23, 2011.
- 160 According to Mike Fenn (ibid), these are mostly HVAC companies with some financing companies.
- 161 According to Mike Fenn (ibid), "If a loan is being given or if the amount charged is > \$1,800 in 12 months then a credit check must be performed by the Biller via either Transunion or Equifax. The customer must have a credit score of at least 550. Also Billers can't send charges to customers that have been redlocked for non-payment more than once."
- 162 Source: Allen, G., Persram, S., Kani, M. and Lester, S., *Assessment of North American Property-Attached and Other Financing Programs For Low-Rise Residential Energy Retrofits*, Final Report, prepared for the Toronto Environment Office, City of Toronto, December 17, 2010.
- 163 Ibid.
- 164 Implementation parameters like factors producing confidence in energy savings and the need for addressing behavioural issues will be discussed in a subsequent paper.
- 165 LaScelles notes the Canadian mortgage delinquency rate is 0.44% Source: LaScelles, Eric, TD Securities' Chief Canada Macro Strategist, *Canadian Mortgage Market Primer*, June 17, 2010 [http://www.td.com/economics/special/el0610\\_cdn\\_mort\\_market.pdf](http://www.td.com/economics/special/el0610_cdn_mort_market.pdf) downloaded September 20, 2010
- 166 Source: Home Performance Resource Center, *Best Practices for Residential Energy Retrofit Program Design: Financing Incentives and Recommendations*, March 2010.
- 167 This is to ensure energy cost savings; in one U.S. PACE program, 40% of applications were for solar pv systems and most of the balance were for windows and attic insulation. Source: Home Performance Resource Center, *Best Practices for Residential Energy Retrofit Program Design: Case Study: Boulder, Colorado*, March 2010.
- 168 These are described in the previous report, and summarized as follows. Costs include startup and operations expenses such as for obtaining funding, developing the program, marketing, qualifying participants and processing the financing, administration, risk management, repayment enforcement, program quality assurance and performance measurement and evaluation. Participants could pay application fees, building and other permit fees, as well as (for example) a one per cent increment between the interest charged by a lender to the municipality and the rate the municipality charges the homeowner.
- 169 See a long list of U.S. federal and state tax credits in: Database of State Incentives for Renewable Energy (DSIRE): [www.dsireusa.org](http://www.dsireusa.org) (including incentives by all government levels, and for energy efficiency).
- 170 See: the Ontario Assessment Act, excerpted below:  
 "Property assessable and taxable, exemptions  
 3. (1) All real property in Ontario is liable to assessment and taxation, subject to the following exemptions from taxation: ...  
 "Machinery for producing electric power  
 18. All machinery and equipment including the foundations on which they rest to the extent and in the proportion used for producing electric power but not including any buildings, structures, structural facilities or fixtures used in connection therewith.  
 "Machinery for energy conservation  
 18.1 Machinery and equipment used for the purposes of energy conservation or efficiency and prescribed by the Minister for the purposes of this paragraph."  
[http://www.e-laws.gov.on.ca/html/statutes/english/elaws\\_statutes\\_90a31\\_e.htm#BK2](http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90a31_e.htm#BK2) downloaded December 16, 2010

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- 172 See 15 states listed in [www.dsireusa.org](http://www.dsireusa.org). Abatement terms tend to be for 100% of the value increment. Search: renewables, residential sector, property tax incentives, solar – passive. Property tax abatement terms vary: e.g., case-by-case (Ohio), 5 years (Iowa), 15 years (Connecticut, New York State) to unspecified durations (Arizona, Illinois, Oregon). Some are available if the installations achieve minimum specified performance standards (e.g., Arizona).
- 173 Source: Institute for Responsible Investment, *Handbook on Climate-Related Investing Across Asset Classes*, Boston College, Carroll School of Management, Center for Corporate Citizenship, 2007: "... mortgage values for residential properties that are not energy efficient themselves or that do not have easy access to sustainable transportation may decrease due to rising carbon prices, and therefore may underperform over the medium- to long-term." This affects Environmental, Social and Governance factors in assessing corporations. [http://www.fbheron.org/documents/bc\\_responsible\\_investing\\_handbook.pdf](http://www.fbheron.org/documents/bc_responsible_investing_handbook.pdf) downloaded October 11, 2010
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- owned free and clear. Naturally, more of those are owned by seniors than by any other age group, because seniors have spent much of their life paying off the mortgage.” And, as a result of the ‘guidance letters’ issues by the FHFA, “the Agency effectively denied senior citizens access to the only tool available to protect themselves against the rising energy prices that prudent thought tells them are very likely in their future. FHFA went further, and told banks to tighten lending requirements on all properties in any city or county that offers a PACE program to its citizens.” Source: Strachan, Alan and Walker, Chris, *PACE, FHFA and Seniors*, YGreene Energy Fund & U.K. Carbon Trust, 2010
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- 205 Westeinde, Jonathan, co-founder & CEO, Windmill Development Group, personal communication with Sonja Persram, June 2010. An ESCO is an Energy Service Company. In an example of this type of guaranteed savings contract, an ESCO conducts an energy evaluation of a client’s building to determine the energy savings potential and establish a baseline for energy consumption. If the business case including energy savings and a performance contract fee makes sense, the ESCO engages in a performance contract with a client, such that the ESCO agrees to install specific energy improvement measures, with a guarantee to the client that installing these measures will result in a specific amount of energy savings. This security enables the client to get preferred financing. The ESCO assesses the operations and maintenance of the systems, trains the client’s staff to continue optimal systems functioning and monitoring, calculates the energy savings, and the project is eventually handed off to the client. A guaranteeing agency oversees the initiative to ensure that the energy savings are as agreed, and for that the agency gets a guarantee fee. This guarantee would be delivered by an agency that has both the capacity to assess energy savings and the financing capability to backstop the loan. Jonathan Westeinde observes that CMHC currently is guarantor for construction loans for multi-unit residential buildings. A one-time payment for one year, this guarantees the construction loan for the banks in case of default, and in return CMHC gets a guarantee fee in the amount of about \$700/residential unit. He suggests that in a similar fashion, guaranteeing a block of housing units can leverage guaranteeing funds based on default. For further information see many publications by Lawrence Berkeley National Labs, <http://eetd.lbl.gov/>
- 206 For example: Every Watt Matters: <http://www.everywattmatters.com>; and WellHome by Masco: <http://www.wellhome.com>.



**L**ocal Improvement Charges are fees for municipal financing of infrastructure improvements that benefit homeowners and are repaid on tax bills. This report discusses how a similar mechanism could be used in Ontario to finance retrofits to make homes more energy efficient, reduce overall energy use and greenhouse gas emissions, and save homeowners money on their energy bills.

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