



LIC Primer:

Using Local Improvement Charges to Finance Residential Energy Upgrades

by

**Sonja Persram, BSc., MBA, LEED® AP
President, Sustainable Alternatives
Consulting Inc.**

for



25 July 2013

Acknowledgements

The author gratefully acknowledges the following for their generous continuing support: Bill Johnston who also provided advice and editorial comments throughout the development of the author's prior reports on this topic; Stan Makuch, who assisted over several years by providing interpretations of the original regulatory and legislative authorization, drafting requests for the regulatory amendments, and providing verbal legal opinions on difficult matters of law for the author's prior reports; the David Suzuki Foundation; Peter Love; and other long-time and new collaborative advocates.

For their helpful comments on earlier versions of this work and contributions in specific areas, the author thanks the Toronto Atmospheric Fund, Clean Air Partnership, their fellow CHEERIO reviewers and others:

Rebecca Aird, Rupinder Assi, Laura Atkins-Paul, Mark Bekkering, Kevin Behan, Julian Boyle, Heather Donison, Amy Hogan, Marco Iacampo, Gaby Kalapos, Brian Kelly, Robert Kerr, Claude Lefrançois, Julia Langer, Mike Layton; Renée Lazarowich, Jim Logan, Eleanor McAteer, Ontario Ministry of Municipal Affairs and Housing staff, Mary Pickering, Bryan Purcell, Dave Ramslie, Anne Robinson, Nick Ruder, Mark Salerno, Debbie Schaefer, Graham Seaman, Dan Stone, Natty Urquizo and Scott Vokey.

Use of the LIC Primer

This LIC Primer was produced by Sustainable Alternatives Consulting Inc. for the Collaboration on Home Energy Efficiency Retrofits in Ontario (CHEERIO). The LIC Primer is intended to assist municipal decision-makers in understanding the use of local improvement charges to support the cost of energy efficiency and other improvements on private property.

Municipal representatives may use and edit this document to assist in educating local constituents on this matter. We request that the authorship by Sonja Persram, President of Sustainable Alternatives Consulting Inc. for CHEERIO be acknowledged by municipal representatives when using all or part of this information. All others (including those under contract to municipalities) are required to appropriately reference and acknowledge this material's authorship, and its co-ownership by Sustainable Alternatives Consulting Inc. with the Toronto Atmospheric Fund. For more information contact Mary Pickering at mpickering@tafund.org (416) 392-1217 or Sonja Persram at sonja@sustainable-alternatives.ca (416) 324-9388. Please also note that legal opinion in this document is supported by a recent opinion authored by Aird and Berlis.¹

This LIC Primer by Sustainable Alternatives Consulting is one of several documents in this series developed by consultants for CHEERIO. Additionally you may be interested in: the [LIC FAQ](#) by Sustainable Alternatives Consulting, [the LIC Legal Briefing Note](#), [LIC Program Evaluation Qualitative Research Study](#), and the [LIC Program Design Guidelines](#). See also the references cited.

Introduction

Local Improvement Charge (LIC) financing is enabled by the Ontario Ministry of Municipal Affairs and Housing and has been used in Ontario municipalities for decades. LICs are used by Ontario municipalities to finance local improvements such as sewers and sidewalks. For example, a municipality could finance the construction of a sewer system in a new residential development. It would recoup its investment, including capital, interest, and administration costs, by imposing a special charge on the property tax bill of the properties benefiting from the investment. Recently, the Ontario government amended the regulation governing LIC to allow the mechanism to be applied on a voluntary basis to private properties such as private single family or multi-residential homes or commercial or industrial properties.

The LIC could be used to fund a variety of upgrades, but in particular, there has been strong interest in using the charge to address energy and water efficiency opportunities to improve the quality of existing building stock, to reduce pressures on local energy infrastructure, to reduce greenhouse gas and air pollutant emissions, to support energy cost savings for local residents and to generate local employment.

Municipalities are considering creating their own energy upgrade programs in order to fill a gap left by the withdrawal of the provincial and federal governments from incentive-based programs and the limited programming currently offered by local utilities. Municipal program designs can also be focused firmly on key local goals, such as integration of both gas and electricity conservation along with other goals like water conservation, and can be focused in a way that supports multiple local objectives such as reducing pressure on energy infrastructure in specific local areas or providing support to specifically-targeted communities such as low-income neighbourhoods.

The CHEERIO Initiative

As a result of a long collaborative effort (see the section on the Evolution of LICs for energy upgrades) many Ontario municipalities are now interested in pilot testing the amended LIC mechanism to help understand its practical implications, benefits, and challenges. A new Collaboration on Home Energy Efficiency Retrofits in Ontario ([CHEERIO](#)) has evolved with support from the first collaboration (which is ongoing).² CHEERIO represents 22 Ontario municipalities with contributions from key consultants as well as industry supporters. This group was initiated by the [Toronto Atmospheric Fund](#) with funding from Natural Resources Canada, the Ontario Power Authority, the Ontario Ministry of Energy, Enbridge, the Region of Durham, and the cities of Guelph, London, Hamilton and Toronto. Support for the collaboration was provided by the [Clean Air Partnership](#). The purpose of CHEERIO is to facilitate cost-sharing and co-operation in creating an LIC pilot-program template and other tools that can be used or adapted by any Ontario municipality.

The interest is in using the pilots to explore energy and water efficiency LIC programs. The **LIC Primer** was created for use by municipal decision-makers or others interested in information about the opportunities presented by the amended LIC regulation.

The **LIC Primer** outlines the evolution of interest in this LIC financing mechanism for energy upgrades; the regulatory amendments that enabled its use; the rationales for using this mechanism; the opportunities, benefits and risk management considerations of property-assessed financing for energy efficiency and renewable energy; the source and flow of LIC financing and implications for municipal budgets and financing; how an LIC financing program for energy upgrades might work; and others' experiences with property assessed and similar energy upgrade programs.

Evolution of LICs for energy upgrades in Canada

Municipal interest in expanding the traditional use of LIC mechanisms to support renewable energy and energy efficiency purposes dates to 1984, when Yukon Territory pioneered use of Local Improvement Charges to provide upfront financing for solar electricity generation capacity to outlying regions.

The opportunities for applying the LIC mechanism for energy upgrades across Canada were first detailed in two Pembina Institute reports.^{3 4} Another study was undertaken beginning in 2009 by Sonja Persram of Sustainable Alternatives Consulting in partnership with the David Suzuki Foundation (DSF). This study comprised an analysis of the existing LIC mechanism, its utility for home energy upgrades, a comparison with other financing tools, an outline of the regulatory changes needed in Ontario, and strategic recommendations for an optimal program. This work also involved development of a collaboration with a broad group of municipal,⁵ provincial and federal government representatives and related industry leaders and NGOs in Canada and the US. Ms Persram's analysis was published by DSF in three reports.^{viii, ix, x} During this period, several other jurisdictions had also been working toward similar regulatory authorization. At the end of 2011, Halifax Regional Municipality obtained a Charter change, followed a year later by legislation for the Province of Nova Scotia. (See the section on LIC financing in other jurisdictions).

In 2012, a small group from Ms Persram's collaboration submitted a [Request for a Review of Local Improvement Charges and Related Regulations and Legislation](#)⁶ to the Environmental Commissioner of Ontario and a federal petition⁷ seeking support for the mechanism's public benefits, a loan loss reserve and other requests. The City of Windsor, the Township of King, the Town of East Gwillimbury and the City of Hamilton passed Council Resolutions in early 2012 in support of the concept and requesting the regulatory amendments to allow an expanded use of LICs. The Association of Municipalities of Ontario, the City of Guelph and the Town of Huntsville provided supporting letters, and there was federal response to the petition. Key collaboration members led by Ms Persram continued to support and grow the group of municipal and other constituents with an interest in the potential to accelerate green energy and energy efficiency options through LIC financing and develop implementation tools.

In May, 2012, The Ontario Ministry of Municipal Affairs and Housing issued a notification about pending regulatory changes. In June 2012, Toronto City Council passed a [motion](#) requesting that staff prepare a

pilot project designed to use an LIC mechanism for residential energy upgrades. Kathleen Wynne, then Minister of Municipal Affairs and Housing, authorized the proposed amendments in October 2012.

Provincial amendments to LIC regulations

Until recently, use of the LIC mechanism was confined to public, not private property. On October 24, 2012, the Ontario Ministry of Municipal Affairs and Housing authorized Ontario Regulations [322/12](#) and [323/12](#), amending O.Reg. 586/06 and 596/06 under the *Municipal Act, 2001* and the *City of Toronto Act, 2006* respectively. While the original LIC can still be applied to the existing uses, the regulatory amendments expanded the examples of uses to specifically include energy efficiency, renewable energy and water conservation in alignment with municipal goals and policies. As part of the amendments,⁸ lengthy and burdensome LIC set-up barriers were removed. The set up process for this new LIC was simplified since program participation is voluntary. As a result there can be no petition against, or in favour of, this type of LIC. Also, there would be no potential appearance before a committee of revision or appeal before the OMB, as could be the case for frontage-based LICs.

The new LIC regulation describes a user-pay cost allocation method that covers all costs, which include the upgrades plus pro-rated administrative costs of delivering the program (such as marketing) as well as interest on borrowing. As with traditional LICs, this LIC would be repaid as a special temporary charge on the participating owner's property tax bill that would be removed once the cost is recovered by the municipality.

Another unique LIC benefit is that financing stays with the property not the owner, on sale.⁹ As a result, if owners move before completing the repayments, the new owner continues LIC payments and receives the benefits.¹⁰ If property ownership changes before the full LIC debt is repaid, the municipality continues to collect the charge through the property tax charged on that property. In legal terms, the charge runs with the land. The property owner is able to make a one-time payment to the municipality to clear the outstanding balance before selling a property. Otherwise, the LIC automatically transfers to successive owners upon sale.¹¹

Using LICs for energy efficiency upgrades

A municipality, with local Council approval, could offer a LIC financing program to local property owners to support energy efficiency upgrades and other work as defined by the municipal program. Currently, many municipalities are interested in making this offer to owners of single family homes, but LICs could also be used to finance energy upgrades of condominiums and privately owned multi-unit residential buildings subject to the applicable legislation and the bonus provisions of the Municipal Act.¹² The municipality would create the program, perhaps relying in whole or in part on the model created

collectively by CHEERIO. Program design includes arranging for a financing source with an attractive interest rate and term by leveraging the municipality's borrowing power.

How can municipalities finance an LIC program?

Municipalities have a variety of options for financing LIC programs. For smaller programs they can draw on internal funds, such as operating surpluses or capital reserves. This type of program might also qualify for financing through external parties such as Infrastructure Ontario, which provides a low-cost and flexible source of capital. Alternatively, municipalities can raise financing by direct borrowing from the bond market.

Participation in the program is completely voluntary. Upon entering into an agreement with the municipality, participants could access financing for extended terms up to 20 years at a competitive fixed rate that would include a provision for administrative costs. The opportunity to have long term financing at an attractive rate can help homeowners finance larger, higher-impact upgrades that could achieve deeper savings. The participants repay the financing as a user fee on their property tax bill for the duration of the term. The LIC does not increase the owner's property taxes.

The participants in the program, not the general taxpayer, share the cost of program administration. Or, program administration and set-up costs can be offset by external funding such as grants or reduced by collaboration among multiple municipalities in program design, evaluation or other key set-up services.

What would an LIC program look like?

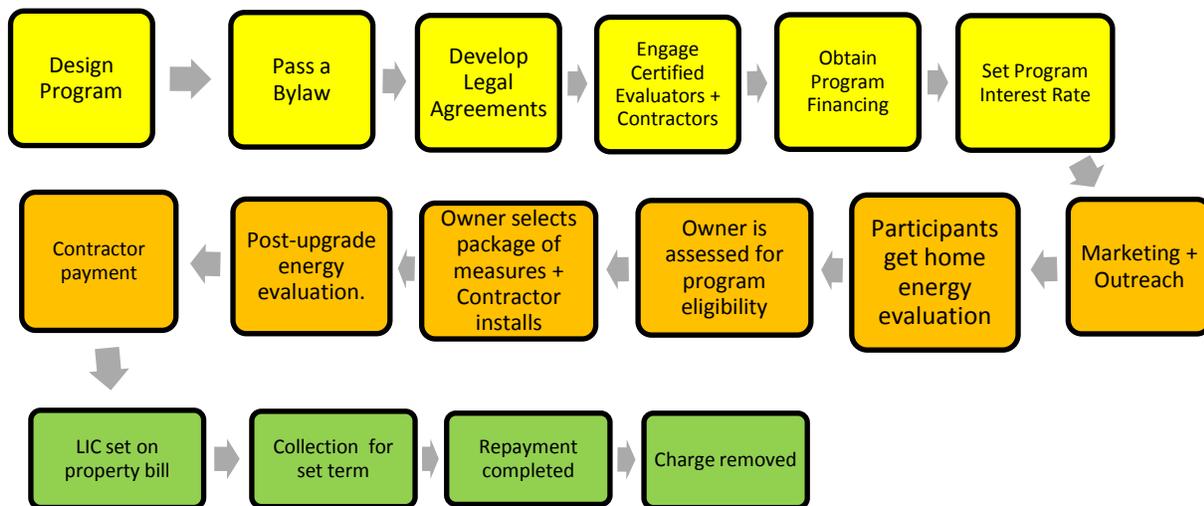


Figure 1: An LIC energy upgrade program example

(yellow = set-up phase; orange = delivery phase; green – collection phase)

Benefits to municipalities

Supporting energy efficiency in all sectors is the cheapest, fastest way to ease energy demand, especially as municipalities grow, and helps **offset the need for costly energy infrastructure development**. For example, by shaping LIC program design, municipalities could target offers to areas where there are electricity system constraints in order to have the program specifically address local concerns and contribute to reducing infrastructure costs.¹³

Burning unnecessary fuels for home use also contributes to **avoidable illness costs of air pollution**.¹⁴

Energy use in homes and buildings accounts for a significant portion of greenhouse gas emissions, so addressing the energy efficiency opportunities in the built environment helps municipalities to **achieve established greenhouse gas reduction targets** for their communities, especially in the absence of comprehensive programs offered at the federal, provincial or utility level. The Ontario Clean Air Alliance study cited above found that energy efficiency upgrades lowering natural gas use by 15 per cent by 2026 would also reduce Ontario GHG emissions by 5.5 %.

LIC program costs are supported by the participants, not the general taxpayer, so these types of **programs pay for themselves** and do not add any operational costs to the municipality. The regulatory amendment permits the municipality to recover pro-rated administrative, marketing and other costs associated with running the program directly from participants.

LIC financing can **fill a gap in public support for energy efficiency retrofits**. While some utility sponsored programs exist, the successful Ontario Home Energy Savings Program and the federal ecoENERGY incentive program have ended and will not be renewed. While owners can only take advantage of incentive programs if they have sufficient funds for the upgrades,¹⁵ former federal and provincial programs (Natural Resources Canada's ecoENERGY program and the Ontario Home Energy Savings Program) provided incentives with successful uptake. For example, over 10% of Ontario's low-rise housing stock built before 2000 was retrofitted in the federal government's ecoENERGY program. However these incentive programs have ended with no new initiatives in their place, and utilities are not offering similar programs to all their ratepayers.¹⁶

Reducing energy wasted in homes could **improve health and reduce individual and public health care costs** that arise from pollution.^{iii x 17} A UK study of energy efficiency retrofit program impacts noted health benefits of reductions in fuel poverty, and of warmer and drier homes that would arise from home energy efficiency upgrades.¹⁸ The World Health Organization recognizes that energy efficiency and weather-proofing measures that make homes warmer and more comfortable can be justified on the basis of the health impacts. For example risks of extreme weather and thermal stress are lowered; and increased insulation and better ventilation reduce risks of respiratory diseases. As well, air quality rises from the reduction in emissions from heating and electrical generation.^{iii 19}

Energy efficiency upgrades are labour intensive and programs **provide an economic stimulus when carried out at scale.**^{x 20} The American Council for an Energy Efficient Economy notes that there are about 20 construction jobs created per \$1 million spent on energy upgrades. This is compared to half as many jobs created per \$1 million spent in power generation and distribution.²¹ A 2011 Ontario study^{xii} found that energy efficiency upgrades lowering natural gas consumption by 15 per cent by 2026 would also reduce money flowing out of the Ontario economy by \$486 million. As well, it would increase personal income by \$2.6 billion and corporate profits by \$451 million. A US study of home energy retrofit pilot projects using a similar financing mechanism to the LIC found that an average per-home investment of \$21,000 resulted in \$61,000 in economic benefits.²²

There is emerging potential for energy efficiency upgrades to result in increased home value. Energy efficiency upgrades could result in energy efficient and green homes and buildings being preferred over conventional ones.²³ These changes have the potential over time to **increase the municipal property tax base.**²⁴ For example, homes in California with an Energy Star label were sold at prices 9 per cent higher than comparable non-labeled homes.^{25 26}

Municipalities could ensure that any **future potential emissions credits** or income are assigned to them as additional benefits for managing the program. This could become a major source of future income year over year, continuing long after the program is sunset.

Funds raised and used for private LIC financing are **subject to all the usual specific statutory provisions** governing municipal debt and investment established in the *Municipal Act, 2001 (and the City of Toronto Act, 2006)* including debt limits.²⁷

Benefits to property owners

People who invest in home energy upgrades **reduce their energy bills and protect against energy price increases.** Participating home owners in the federal ecoENERGY home retrofit program saw an average energy savings of 20 percent after completing their upgrades.²⁸ Reducing energy waste improves overall housing affordability and energy security given energy prices that are rising and unpredictable.^{29 30}

Homes are healthier when they are less drafty and indoor temperatures are more comfortable.^{31 32}

An LIC program **removes upfront capital barriers** that often impede energy upgrade investments.^{33 34 35}
^{viii ix x} Lower interest rates are facilitated by high security from the priority lien in addition to municipal borrowing power and the same LIC rate could be offered to all participating owners.³⁶ As well, the financing is offered at a competitive fixed rate over longer terms such as 10-20 years compared to the 5-year terms with fixed or variable rates that banks or utilities generally offer. This allows greater affordability and the potential for annual energy cost savings to more closely match annual payments. While mortgage re-financing or home equity lines of credit (HELOCs) tend to be offered at lower interest

than unsecured loans and could be used for energy upgrade funding, mortgage rates are less predictable beyond a 5-year term and HELOCs are typically variable-rate.^{ix x} LIC financing can be transferred to subsequent property owners, allowing ***the costs and benefits of the energy-efficiency investment to be shared fairly between current and future owners.*** Another unique LIC feature addresses a barrier to deeper investments with longer paybacks. The barrier is that owners who anticipate moving before payback are less likely to carry out the upgrades,^{vi v} no matter how affordable the financing.^{37 38} Since the LIC passes on to subsequent owners, at the time of sale any balance stays with the property and the new owner continues repaying while receiving the benefits.³⁹

Established barriers to energy upgrades,⁴⁰ including lack of access to a highly skilled workforce as well as lack of homeowner time^{vi} or knowledge^v to supervise the improvements could be addressed by ***turnkey approaches.***^{iv x}

Improved home-energy performance can contribute to ***increased property value.*** As mentioned previously, California homes with an Energy Star label were sold at prices 9% higher than comparable non-labelled homes.^{41 42} Another key factor is that homes may in future reflect preferential values for energy- and water-efficiency, and appraisals may indicate not just energy ratings and types of installed measures, but also operating costs.⁴³

Managing LIC program risk

Addressing liability for faulty contractor work

There is no requirement that the municipality provide contractor guidelines; require the use of licensed and insured contractors; provide suggested contractors; or require the use of pre-approved contractors in an LIC program. However, there are also no restrictions set out in the Regulation that prevent a municipality from doing so in the interest of ensuring the successful completion of work at the expected level of quality and to limit liability. Similarly, there are no requirements regarding the form and structure of an agreement with an independent contractor to construct/install the LIC works on private property. The municipality can determine the optimal structure of its agreements, including an agreement with the independent contractor, a joint contract with the property owner and independent contractor, or an alternative structure.⁴⁴

Each municipality should review its procurement policies to ensure that any programs established to undertake such work are in compliance with its procedures. Each municipality should also review any agreement with an independent contractor on a case-by-case basis to ensure that it will not place them in breach of their statutory and contractual obligations, for example, the ICI Labour Trade agreement, fair wage obligations, and the *Construction Lien Act*, among others.⁴⁵

Mitigating default risks

Municipalities collect LIC payments in the same manner as property taxes. Any payment in arrears (and only the overdue amount) is subject to a special priority lien and may be recovered by the municipality from both current and future owners of the property. The regulation allows for an encumbrance on the land to be imposed for any defaults. Additionally, priority lien protection makes the municipality's lien rank ahead of other liens on the property (except for liens of the Crown) and enables the municipality to force a tax sale if the property taxes are in arrears and recover the amounts added to the tax roll from those proceeds. Only defaulted payments would be paid (not the entire debt owed) before the mortgage if the property goes to municipal tax sale.⁴⁶ Municipalities can mitigate the risk of defaults by screening participants, capping the amount of the LIC based on the estimated property value (e.g. no more than 10% of assessed property value), or through a loan loss reserve. Reducing municipal and homeowner risk is important. A range of risk mitigation best practices have been identified that may be provided as part of administrative costs, or funded directly by partners or participants.^x Municipalities may address default risk potential at the outset through strict eligibility criteria.⁴⁷ In setting criteria, restrictions or eligibility for private LIC charges or fees, municipalities must comply with the provisions set out in Section 394 of the *Municipal Act, 2001* and relevant human rights legislation, and municipalities may want to examine eligibility criteria for other types of municipal funding of works on private property, such as through community improvement plans and building rehabilitation loans.⁴⁸

In addition, municipalities may choose to have a loan loss reserve, for example to cover cash flows for a municipality with investor repayments, or to provide for any tax sale costs. Ontario property tax default rates are on average 5 per cent,⁴⁹ however the incidence of LICs going to municipal tax sale is virtually nil.⁵⁰ Research on actual defaults in Energy Star and non-Energy Star homes indicates that energy efficiency reduces mortgage default risk.⁵¹ A new financing insurance product may also mitigate municipalities' and owners' risk if circumstances change over the LIC term.^{viii}

Budgeting program set-up costs accurately

A thorough evaluation of potential administrative costs from goal-setting stages through to project and program evaluation will help administrators fulfill and assess their programs' potential. An analysis of real costs is likely to be a key research finding from pilot programs. Details on potential costs are described in a City of Toronto study.ⁱ Start-up costs include planning the program delivery process; developing the application, marketing and communications strategies as well as legal documents in collaboration among departments; modifying systems to dovetail with program needs; developing monitoring, measurement and verification protocols; establishing loan loss reserves as well as other risk mitigation solutions; and developing systems to ensure sufficient highly skilled personnel are available in the program. CHEERIO collaboration materials may reduce these expenses. Another possibility might be for municipalities to provide some support for administration costs.

Managing administrative costs

Since LIC financing programs rely on economies of scale to spread administrative costs over a sufficient number of participants, low uptake is a risk. Program design needs to **clearly define and engage primary target audiences** and must be supported with adequate **marketing and outreach** budgets. Program

designers should **ensure that any possible financial incentives are incorporated** into the program to keep the offer attractive, and that **suitable marketing partnerships are identified and mobilized** with community groups, contractors, and local utility companies. **Administrative costs need to be carefully managed and monitored** and, where opportunities exist, municipalities should seek sponsorships or other external funding sources **to offset the costs of set up and administration by external funding sources**. Finally, **estimates of pilot program enrollment should be conservative**. The administration cost balance after reductions due to collaborations and incentives may be recovered by (for example): a premium on the interest rate paid to investors that still allows the program to be affordable to homeowners; an application fee (Boulder County's fee was \$75); and support for co-marketing and for marketing expenses from utilities.ⁱ

Ensuring reliable practitioners and products are available

Providing information and access to reliable practitioners and products would help address significant barriers to energy upgrades, as noted in the Economist.⁵² Reasons why homeowners did not carry out any or all of the upgrades recommended in their energy evaluations in a City of Toronto study included lack of access to trusted service providers, and lack of confidence in the installations⁵³ and in the resulting energy savings. Further restrictions arise for homeowners who are uncertain about products,^v or do not have time to oversee the work.^{vi}

Focusing on cost-effective measures to achieve bill savings and GHG reductions

While allowing a wide variety of energy-efficiency actions does create broader appeal, there is the risk that more popular options, like window replacements and photovoltaic systems, will not achieve significant greenhouse gas reductions for dollars spent. This can be managed by creating **a tiered list of eligible measures** and ensuring that participants have a **home-energy evaluation** to emphasize the highest impact measures. A focus on cost-effective measures and the requirements for achieving these goals (such as highly-skilled practitioners) reduces program risk and homeowner barriers.^{54 x 55 56}

Furthermore, **ensuring certified energy assessors and contractors are highly skilled**, understand building science, and produce reliable results will help to protect against defective installations and products. Finally, US White House policy;⁵⁷ US Department of Energy policy;⁵⁸ and the UK Green Deal on-bill financing program all require savings from the installed measures to exceed payments.^{59 60} However it should also be noted that if energy prices are low or unpredictable, net savings may be difficult to achieve.⁶¹

Quantifying program impacts

LIC programs, especially in pilot stages, need an **appropriate monitoring and verification protocol embedded in program design**. Monitoring and reporting activities should be designed to **achieve meaningful results**. **Performance benchmarks should be reported** throughout the pilot phase, not just at the end, allowing for the **flexibility to adjust the program design** as necessary.

Program measures

Below are examples of measures that could be funded in an LIC project on recommendation from an energy evaluation. Measures would meet Energy Star qualifications or other specified standards.⁶²

Several factors regarding LICs are important to note here. First, since LIC financing is associated with the property, LIC energy upgrade programs would probably not fund appliances and most lighting measures since they can be removed from the property. Also, the term of the financing cannot exceed the lifetime of the upgrades. (There may be a choice between ensuring each measure has an appropriate lifetime or taking the average lifetime of the measures).

LIC financing is for capital costs (not maintenance). Municipalities may include water conservation, energy conservation and renewable energy measures. The amended regulation provides considerable authority and flexibility for municipalities to define the scope of energy works. Possible measures include:

Home energy evaluation: certified home energy assessment by approved agents or contractors (including blower-door tests and thermography where warranted). The cost paid by the homeowner could be included after approval to participate in the program.

Thermal envelope upgrades: Attic insulation; wall insulation; basement wall insulation; doors, air sealing, floor insulation (over garages and crawl spaces), and basement header insulation. Given the high costs and long paybacks of high-efficiency windows, programs may prefer to fund cost premiums between conventional and high-efficiency types.

Mechanical systems: Furnace replacement, boiler replacement, water heater replacement, tankless water heaters, integrated mechanical systems replacing space and domestic hot water heating equipment, thermostats and control systems (especially the interactive and remote control types), drain water heat recovery systems, air-source heat-pumps, ground-source heat-pumps, efficient humidifiers and dehumidifiers, heat recovery ventilators, special ducting. Future funded items may include: fuel cells and energy storage equipment.

Water efficiency upgrades: Low-flow aerators, shower heads, low-flow toilets, downspout disconnection.

Renewable energy systems: Solar water heaters, photovoltaic electricity generation systems, and small wind generators.

Leveraging partnerships

Lower program design costs through multi-municipality collaboration. The CHEERIO model allows development of a flexible set of program design and evaluation tools using a cost-sharing and co-creation approach to leverage municipalities' resources.

Integrate programs with relevant offerings from government and utilities. Wherever possible, LIC programs should take advantage of incentives offered by other players. For example, Natural Resources Canada's EnerGuide Rating System (ERS) is used as the technical backbone for many innovative Canadian financing programs. This standardized, Canada-wide system leverages the tools and marketplace knowledge that have been used to rate more than one million Canadian homes.⁶³

The ERS is designed to support a "whole house" approach to energy efficiency programming. It offers:

- measurement based on standard operating conditions, allowing comparison between homes;
- access to certified energy advisors, providing homeowners with independent third party advice;
- a standardized home energy performance label for homeowners; and
- extensive support to partners' programs, including software tools, evaluation protocols, paper and electronic file submission systems, quality assurance, licensed service organizations, certified energy advisors, access to the ERS database for research and results reporting, and more.

ERS is funded by NRCAN, offering significant value to homeowners and enabling program administrators to deliver high quality programs without the cost of all of the elements provided under ERS. The use of the ERS offers partners the opportunity to support long-term market recognition of energy efficiency in the residential sector and leverage the activities of other players. ERS offers a one-stop shop for homeowners, consolidating various incentives and offerings from various sources (e.g. utility grants), making use of the ERS system now and in the future. Broad uptake of ERS will also increase homeowner energy literacy, contributing to ongoing energy improvements over time.

Co-marketing. To keep communications costs manageable, and to ensure messaging is properly targeted, program designers should work with key stakeholders who can serve as marketing channels, including contractors, retail outlets, community groups, and utility companies.

Collaboration allows partners to provide complementary offerings which together help increase uptake. Although individual municipalities (or upper tiers) would administer their own energy upgrade programs, these programs offer extensive opportunities for additional collaboration among government, industry and NGOs. Costs are likely to be reduced by multi-sector collaborations such as the CHEERIO initiative, since they may improve program effectiveness and/or produce economies of scale. Higher level governments may choose to support programs in a number of ways to benefit their own budgets and environmental goals,^{ii viii x 64 65 iv 66} or stimulate local economic activity and increased tax revenue.

Program uptake challenges have been experienced in the absence of adequate financial and technical support for marketing and outreach.⁶⁷ These may be delivered via multiple channels which can include both conventional and community-based approaches.^{iv} Utilities are key co-marketing partners to help enhance uptake and for billing information to enable project and program evaluation.⁶⁸ Key marketing channels also include contractors^{iv 69} who can provide referrals to the program for owners carrying out conventional improvements and act as program partners. Trusted peers can act as educators via local organizations using community engagement⁷⁰ and companion marketing at events. Local community and elected leaders are important role models.

Integration of existing incentives from all levels of government. It is important that higher level governments and utilities also offer financial incentives to encourage uptake, given the benefits to budgets and program goals noted above. For example, rebates could be offered for participants' home energy evaluations and installed measures. Halifax Regional Municipality is offering an incentive for the first round of program participants supported by a \$550,000 grant obtained from the Federation of Canadian Municipalities.⁷¹

Program design principles

For information on program design principles created as part of the CHEERIO initiative, see the [report](#) which includes recommendations regarding program design and monitoring and evaluation.

Program evaluation

What is not measured cannot be evaluated. Making data available to municipalities as well as analysts will also help evaluation and planning. Best practices incorporate quality control and quality assurance procedures for the energy assessments, the projects and the program.^{x, iv} Developing systems in advance that allow monitoring, measurement and verification can help municipalities avoid costly outlays in future. Several US programs did not have budgets to put these systems in place prior to program launch.ⁱ It has sometimes been difficult to obtain owner data post-retrofit in the Long Island Green Homes initiative.⁷²

Timing considerations also impact program implementation, for example uptake may be impacted by the time for processing program applications and permits.^x There are issues related to lags between owner sign-up and notification of property tax payments.⁷³ Also, timely information about potential delinquency is difficult when repayment schedules are semi-annual/quarterly, or via cheque. Long Island Green Homes' program changed their system of receipts to monthly payments via direct debit.ⁱ Timing risks also relate to cash flows between payments to investors and receiving LIC repayments; this lag was initially overlooked by a US municipality.ⁱ Additionally, prompt payment of contractors is important.⁷⁴

LIC financing in other jurisdictions

Property Assessed Clean Energy (PACE) financing, a mechanism very similar to LICs, has been authorized in 29 states and the District of Columbia and undertaken in multiple American jurisdictions. For example, the [Sonoma County Energy Independence Program](#) opened in March 2009 and has now completed over 1,800 residential projects totalling \$61,395,389. The PACE [HERO](#) program in Western Riverside County launched in Spring of 2012 has so far approved 5,800 residential applications totalling \$105 million in financing with 1,368 completed projects. A PACE program launched in 2011 by [Efficiency Maine](#) has installed over 350 renewable energy and energy efficiency weatherization upgrades. [Efficiency Vermont](#) launched a program in 2013.

Experience in Canada is also growing. Halifax Regional Municipality is offering a turnkey solution including an LIC financing option in its [Solar City](#) program. The program was launched in 2013. They are targeting installation of 1,000 solar water heating systems with LIC financing provided to about one-half of the homes in the program (the other half will self-finance). While the [City of Vancouver's Home Energy Loan Program](#) launched in 2012 was not an LIC-based model, it was a similar approach. Financing was attached to the property up front on title, and repaid on property tax bills. The program has since been cancelled due to challenges related to program design and marketing.

The American programs have stimulated concerns at the Federal Housing Finance Agency (FHFA) related to the PACE mechanism's priority lien status. Many US jurisdictions attach a lien at the outset on the entire financed amount; others only apply a lien on defaulted payments. As well, in the US, if payments are in default, some jurisdictions require the entire financed amount to be repaid, and in others only the overdue payments must be repaid. The FHFA is concerned about entire financing being paid out before any mortgages and the agency is now in a rulemaking process to address concerns.⁷⁵ The City of Toronto is working with financiers to address these and related concerns.

References

- i. 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 City of Toronto, Toronto Environment Office, December 2010
- ii. Borgeson, M., Zimring, M., and Goldman, C., *The Limits of Financing for Energy Efficiency*, American Council for an Energy Efficient Economy, Summer Study on Energy Efficiency in Buildings, 2012
- iii. Canadian Medical Association, *No Breathing Room: National Illness Costs of Air Pollution (ICAP)*, 2008.
- iv. Fuller, M., C. Kunkel, M. Zimring, I. Hoffman, K.L. Soroye, and C. Goldman, *Driving Demand for Home Energy Improvements*, Lawrence Berkeley National Laboratories, LBNL-3960E, September 2010
- v. Granade, H.C., Creyts, J., Derkach, A., Farese, P., Nyquist, S., and Ostrowski, K., *Unlocking Energy Efficiency in the U.S. Economy*, McKinsey Global Energy and Materials, McKinsey & Company, Villanti & Sons, Vermont, 2009
- vi. Ipsos Reid and City of Toronto, *City of Toronto Home Energy Efficiency Financing Survey, 2010*. PowerPoint presentation, 91 slides.
- vii. Natural Resources Canada, *Response* to the PAPER collaboration's submission of a federal petition regarding enabling uses of LICs for PAPER on private properties, single family dwellings, August 2012
- viii. Persram, Sonja, *Property Assessed Payments for Energy Retrofits: Recommendations for Regulatory Change and Optimal Program Features*, copyright David Suzuki Foundation and Sustainable Alternatives Consulting Inc., March, 2011.
- ix. Persram, Sonja, *Property Assessed Payments for Energy Retrofits and Other Financing Options*, copyright David Suzuki Foundation and Sustainable Alternatives Consulting Inc., May, 2011.
- x. Persram, Sonja, *Strategic Recommendations for an Optimal "PAPER" Program*, copyright David Suzuki Foundation and Sustainable Alternatives Consulting Inc., August, 2011
- xi. Region of Durham, *From Vision to Action: Region of Durham Community Climate Change Local Action Plan*, October, 2012
- xii. Stokes, Dr. Ernie, *The Economic Impacts of Reducing Natural Gas Use in Ontario*, The Centre for Spatial Economics, study for the Ontario Clean Air Alliance and Ontario Clean Air Alliance Research Inc., April 2011

Endnotes

¹ See written opinion by [John Mascarin, Aird & Berlis, April 29, 2013](#).

² Ms Persram is currently leading a group from this collaboration in addressing LIC applications to non-residential building upgrades and other uses.

³ See: Peters, Roger; Horne, Matt; and Heap, Nicholas; [Using Local Improvement Charges to Finance Building Energy Efficiency Improvements: A Concept Report](#), The Pembina Institute, 2004.

⁴ Peters, R.; Whitmore, J.; and Horne, M.; [Using Local Improvement Charges to Finance Energy Efficiency Improvements: Applicability Across Canada](#), Pembina Institute, 2005.

⁵ Including 28 engaged municipalities in Ontario and 22 more that were interested. Funding for this work came from the Ontario Trillium Foundation, and Ms Persram also contributed via this project to associated studies funded by the Ontario Power Authority (see Reference vi above) and Natural Resources Canada (see Reference i).

⁶ Co-signers: Bill Johnston, Peter Love, Janet Gasparini, legal advisor David McRobert and Sonja Persram (lead author), [Request for a Review of Local Improvement Charges and Related Regulations and Legislation](#) January 11, 2012.

⁷ Co-signers: Bill Johnston, Peter Love, Sonja Persram (lead author), Janet Gasparini, and legal advisor David McRobert, [Federal support to facilitate a Property Assessed Payments for Energy Retrofits Program](#), March 1, 2012.

⁸ For a discussion of underlying rationales for these changes, see Bill Johnston, Peter Love, Janet Gasparini, David McRobert, and Sonja Persram (principal author), [Request for a Review of Local Improvement Charges and Related Regulations and Legislation](#), March 1, 2012.

⁹ It may be important to build homeowner awareness of this technical feature of LICs. Although LICs are not paid out on sale in the Greater Toronto Area (Source: Bill Johnston, past President, Toronto Real Estate Board: see Persram, Sonja, Reference x, 2011) or currently in Oakville (Source: Bill Johnston, personal communication with Sonja Persram, March 2013), in many other municipalities LICs are often paid out on sale depending on the measures financed. (Source: seminar participants, Ontario Municipal Taxation and Revenue Association, Spring Training Seminar, *Regulation 586/06 Local Improvement Charges: What does it all Mean?* April 15, 2013). See also Aird and Berlis, *Op. Cit (1)*.

¹⁰ 25% of Toronto homeowners who did not do any or all recommended retrofits after an energy evaluation said that moving before payback was a reason. See Reference vi. 36-41% of owners in a Vancouver program review gave that reason for not engaging in energy upgrades. Source: Ramslie, Dave, [Greenest City 2020: Home Energy Loan Program](#), presentation to FCM, 2012.

¹¹ Aird and Berlis, *Op. Cit (1)*.

¹² Verbal opinion by Stanley M. Makuch, Barrister & Solicitor, April 2013. O.Reg. 322/12. Aird and Berlis, *Op. Cit (1)*.

¹³ Ontario Clean Air Alliance and Ontario Clean Air Alliance Research Inc., [An Energy Efficiency Strategy for Ontario's Homes, Buildings and Industries](#), October, 2011.

¹⁴ A 2008 study by the Canadian Medical Association found that by 2031, burning fossil fuels will have had the following total impacts in Ontario for the years from 2008-31: approximately 39,600 people will have died prematurely, \$117.7 billion in economic damages due to lost productivity, healthcare costs, negative impacts on quality of life and loss of life. Source: Canadian Medical Association, Reference iii.

¹⁵ Laitner, S., McDonnell, M.T., Erhardt-Martinez, K., *Consumer Engagement Programs as a Smart Energy Efficiency Strategy for Our Nation's Utilities*, working paper prepared for the Garrison Institute, January 2013.

¹⁶ After a successful Markham pilot, Enbridge Gas Distribution is offering an [energy performance incentive program](#) for gas efficiencies to York Region homeowners. This program also enables access to other organizations' incentives.

¹⁷ These are difficult to quantify, as noted by Copenhagen Economics, [Multiple benefits of investing in energy efficient renovation of buildings: Impact on Public Finances](#), October 2012. This study included health budget impact estimates.

¹⁸ Cambridge Econometrics, [Jobs, growth and warmer homes Evaluating the Economic Stimulus of Investing in Energy Efficiency Measures in Fuel Poor Homes: Final Report for Consumer Focus](#), October 2012.

¹⁹ World Health Organization, [Health in the green economy: Co-benefits to health of climate change mitigation: Housing sector](#), 2011.

²⁰ Copenhagen Economics, *Op. Cit (17)*.

²¹ Bell, Casey, [How Does Energy Efficiency Create Jobs?](#), American Council for an Energy Efficient Economy, November 2011.

²² ECON Northwest Study "Economic Impact Analysis of PACE," May 2011

²³ The US Appraisal Foundation and the US Department of Energy signed a Memorandum of Understanding to develop guidance documents for the valuation of green properties. US and Canadian appraisal entities have an agreement so that we can expect these appraisal impacts in Canada. See Appraisal Institute, [Residential Green and Energy Efficient Addendum](#), 2012.

²⁴ To address the business case for owners, income tax credits and property tax exemptions were incentives suggested in Reference x by Sonja Persram and by the PAPER collaboration in [provincial](#) and federal [requests](#).

²⁵ Kok, N., & Kahn, M., [The Value of Green Labels in the California Housing Market: An Economic Analysis of Green Labeling on the Sales Price of the Home](#), July 2012.

²⁶ Kahn, M. & Kok, N., [The Capitalization of Green Labels in the California Residential Housing Market](#), February 2013.

²⁷ Aird and Berlis, *Op. Cit (1)*. Funds raised and used for **LIC financing via general obligation bonds** can be **adjusted from municipal debt totals** (verbal opinion by Stanley M. Makuch, Barrister & Solicitor, April 2013. O. Reg. 403/02,

s. 4 (2) 5; O. Reg. 294/09, s. 2 (1)). This section increases the limit on debt by an amount equal to the local improvement charge. This may be important if a municipality makes a large investment for this purpose.

²⁸ Source: Natural Resources Canada staff, personal communication with Sonja Persram, March 7, 2013.

²⁹ Ontario Ministry of Energy, [Electricity Prices: Why are electricity prices changing?](#) October 12, 2012.

³⁰ Natural Resources Canada, [North American Natural Gas Market: 2012-2013 Heating Season Outlook, Executive Summary](#), 2013.

³¹ Housing upgrades that result in greater warmth can enhance occupant health. Source: Thomson, H., Thomas, S., Sellstrom, E., and Petticrew, M., *The Health Impacts of Housing Improvement: A Systematic Review of Intervention Studies From 1887 to 2007*, *Am J Public Health*. 2009 November; 99(S3): S681–S692.

³² World Health Organization, *Op. Cit (19)*.

³³ A City of Toronto study on the LIC mechanism found that many homeowners who did not carry out any or all of the recommendations from an energy evaluation of their home had found them too expensive. 82% of homeowners financed their upgrades with cash or savings, and of homeowners who conducted energy improvements in the previous 5 years, about one-half spent \$5,000 or less. See *Ipsos Reid & City of Toronto*, Reference vi.

³⁴ The Economist, [The Elusive Negawatt](#), May 8, 2008.

³⁵ Fuller, M., Portis, S., and Kammen, D., [Toward a Low-Carbon Solution: Municipal Financing for Energy Efficiency and Solar Power](#), *Environmental Magazine*, Vol. 51, No. 1, January/February 2009.

³⁶ Boulder County offered lower rates for income-qualified owners in their energy upgrade program, which used a similar financing mechanism. See: Persram, Sonja, Reference x.

³⁷ In Toronto, people move about every 8-10 years; in the City of Ottawa, every 3-5 years. See Reference x, 2011.

³⁸ The City of Toronto study found that, among people who did not undertake all or any of the recommendations from an energy assessment, one-quarter were planning to move before payback on their investment. See Reference vi.

³⁹ See note 8

⁴⁰ These include difficulties in finding contractors, supervision, and obtaining permits. Copenhagen Economics, *Op. Cit (17)*.

⁴¹ Kok, N., & Kahn, M. *Op. Cit (25)*.

⁴² Kahn, M. & Kok, N. *Op. Cit (26)*.

⁴³ The US Appraisal Foundation and the US Department of Energy signed a Memorandum of Understanding regarding valuation of green properties. US and Canadian appraisal entities have an agreement so that we can expect these appraisal impacts in Canada over time. See: Appraisal Institute, [Residential Green and Energy Efficient Addendum, 2012](#).

⁴⁴ Aird and Berlis, *Op. Cit (1)*.

⁴⁵ Aird and Berlis, *Op. Cit (1)*.

⁴⁶ Aird and Berlis, *Op. Cit (1)*.

⁴⁷ For example: history of LIC payments as well as property tax and mortgage payments, no involuntary liens on the property, no defaults on mortgage and no tax sale filings in the previous five years, assessment value and special tax liens not totaling more than 10 per cent of assessment value or market value, the sum of the mortgage and the special assessment not totaling more than 80 per cent of either the assessed value or the market value, property valuation as part of the application eligibility process, pre- and post-upgrade utility bill criteria, and the current energy efficiency of the property. See: Persram, Sonja, Reference x, August 2011.

⁴⁸ Aird and Berlis, *Op. Cit (1)*.

⁴⁹ Bruzzese, Jim, CGA, BMA Management Consulting Inc., personal communication with Sonja Persram, April 11, 2013.

⁵⁰ Logan, Jim, Manager of Revenue and Tax Collector, City of London, personal communication with Sonja Persram, March 12, 2013. This was supported by about 68 seminar participants at the Ontario Municipal Taxation and Revenue Association, Spring Training Seminar, *Regulation 586/06 Local Improvement Charges: What does it all Mean?* April 15, 2013 session: one or two homes went to tax sale among those municipalities that had any tax sales at all in the last fiscal year. The exception was one municipality of about 300,000 single family homes with nine tax sales.

-
- ⁵¹ A recent US study of actual mortgage defaults on 71,000 Energy Star-rated and non-Energy Star homes found that default risks are 32 per cent lower in energy efficient homes. Also, homeowners in energy efficient homes are 25% less likely to prepay mortgages (prepayment is a risk to banks). Source: UNC Center for Community Capital, [Home Energy Efficiency and Mortgage Risks: Research Report](#), Institute for Market Transformation, March 2013.
- ⁵² The Economist, *Op. Cit* (34).
- ⁵³ Also a factor noted by McKinsey & Company. See Reference v.
- ⁵⁴ US Department of Energy, [Guidelines for Pilot PACE Financing Programs](#), May 2010.
- ⁵⁵ See Gillingham, K., Newell, R. and Palmer, K., [Energy Efficiency Economics and Policy](#), National Bureau of Economic Research, 2009.
- ⁵⁶ Copenhagen Economics, *Op. Cit* (17).
- ⁵⁷ The White House, [Policy Framework for PACE Financing Programs](#), October 2009.
- ⁵⁸ US Department of Energy, *Op. Cit* (54). note 40.
- ⁵⁹ Blighty, [Green Deal: Energy-saving the domestic way](#), January 28, 2013 notes the Green Deal's "Golden Rule": savings from installed measures must exceed payments over 25 years before a project is approved.
- ⁶⁰ Fuller et al., 2009, *Op. Cit.* (35). found a positive net present value for energy efficiency upgrades carried out for the average US home using a financing term of 20 years, and NPV analysis over the measures' lifetime of 25 years.
- ⁶¹ Ontario electricity prices are anticipated to increase 2.9% beginning May 2013 (see [Canada News Wire](#), April 5, 2013) and increase 7.9% per year over the coming 5 years (see Ontario Ministry of Energy, [Electricity Prices](#), downloaded April 7, 2013). For the natural gas outlook, see [Canada's Energy Future: Energy Supply and Demand Projections to 2035 - Energy Market Assessment](#).
- ⁶² See also: Eligible Improvements and Retrofits, [Ontario Home Energy Savings Program - Ontario Provincial Grant Amount Only](#): http://www.mei.gov.on.ca/en/pdf/conservation/ohesp/ohesp-rebate_chart.pdf.
- ⁶³ Natural Resources Canada staff, personal communications with Sonja Persram, March 2013.
- ⁶⁴ See also the previously cited [provincial](#) PAPER collaboration request and federal [petition](#).
- ⁶⁵ Ontario Clean Air Alliance and Ontario Clean Air Alliance Research Inc., [An Energy Efficiency Strategy for Ontario's Homes, Buildings and Industries](#), October, 2011.
- ⁶⁶ Copenhagen Economics, *Op. Cit* (17).
- ⁶⁷ Ramslie, Dave, [Greenest City 2020: Home Energy Loan Program](#), presentation to FCM 2012.
- ⁶⁸ In several US PACE programs homeowners did not provide signed privacy releases, and utilities have not provided previously-agreed billing information. See [Applied Solutions, Case Study: Charlotte County, FL PACE Program](#), January 2013.
- ⁶⁹ See Applied Solutions, *Op. Cit* (68).
- ⁷⁰ For example, see [Project Neutral](#)'s model.
- ⁷¹ Boyle, Julian, personal communication with Sonja Persram, February 2, 2013.
- ⁷² Dorian Dale, personal communication with Sonja Persram, February 8, 2013 noted that Long Island Green Homes offered a month's grace on the financing repayment as an incentive for homeowners to provide post-upgrade project data, but this did not work. Homeowners were pleased with the comfort of their homes after the upgrades, assumed they were saving money, and did not provide data although it was available on a dashboard.
- ⁷³ City of Toronto staff, February 26, 2013.
- ⁷⁴ See Applied Solutions, *Op. Cit* (68).
- ⁷⁵ See <http://pacenow.org/category/news/> for details.