Réponse à
l'Engagement numéro 2
d'Option consommateurs

Filed: 2006-01-23
EB-2005-0489
Exhibit B
Tab 2
Schedule 3.1
Attachment 1

Low–income program concepts for the Conservation Bureau

INDEC

OC-2, doc-2
Dossier R-3584-2005

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Low-income program concepts for the Conservation Bureau

INDEC

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IndEco report A5307

6 October 2005

Contents

Executive summary

The following document contains three low-income energy conservation program concepts for the Conservation Bureau as part of a province-wide low-income energy conservation retrofit initiative. These three low-income energy conservation program concepts are for:

- Social housing
- Private multi-residential rental
- Homeowners

These program concepts provide sufficient detail and rationale for the Conservation Bureau to proceed with detailed program designs, once the program concepts are approved.

For the three programs, the Conservation Bureau will spend $15 million per year over five years on program costs (for a total of $75 million). The Conservation Bureau will also contribute another $32 million per year over five years ($160 million over the life of the programs) to a revolving loan fund. For all of the programs another $78 million per year over five years will be leveraged from other sources of financing.

These expenditures will result in an energy demand reduction, over the life of all three programs, of approximately 100 MW.

1 Social housing energy conservation program

1.1 Background

Social housing sector

Social housing is a diverse sector. There are 126 Municipal Non-Profits (MNPs) operated by over 100 municipalities across the province. Private Non-Profits (PNPs) are owned and operated by independent community-based groups, such as faith groups, service clubs, ethnic organizations and community agencies. These make up the largest portion of social housing in the province with 1319 providers. There are also 47 Local Housing Corporations (LHCs) and these are owned and operated by each Service Manager in the province. Prior to 2001, these LHCs were owned and operated by the provincial government as part of the "public housing" program. First nation (Aboriginal and Métis) social housing and previously federally funded social housing will also be eligible for participation in the Conservation Bureau Social Housing Energy Conservation Program.

What all non-profit housing providers have in common is:

- All are non-profit corporations, overseen by a volunteer Board of Directors, and managed by professional staff.
- All create affordable rental housing. About 80% of non-profit housing tenants pay rents geared to their incomes (known as RGI housing). The remaining 20% pay market rents.
- All receive a subsidy to bridge the gap between the actual operating costs and the rents tenants can afford. These subsidies come from municipal, federal and provincial programs, along with community and charitable contributions. Some non-profits receive additional funds to provide support services for frail elderly, disabled or chronically homeless people.

With more than a quarter of a million homes province-wide, social housing is a huge energy consumer. Total utility costs for social housing landlords (250,000+ units) are over $400 million/yr, or 40% of overall

budget (debt repayment). The average utility costs in social housing buildings in 2003 were for[1]:

- electrically heated buildings - $1,800/housing unit (average 700 sq.ft.)
- gas heated buildings - $1,500/housing unit (average 700 sq. ft.)

About 23% of the social housing units province-wide are electrically heated. The average electricity consumption per housing unit is 13,889 kWh/yr.

Rising electricity prices in social housing

Electricity prices are expected to continue to rise over time. Under the Ontario Energy Board's Regulated Price Plan, electricity prices will rise on April 1, 2006 for the social housing sector and will be adjusted every six months to reflect market conditions. Social housing service providers pay on average 40% of their budgets to utilities, of which electricity comprises a major component. Their budgets are set based on the previous year, making it difficult to respond to changing conditions. Energy efficiency programs which result in lower energy bills are critical to social housing providers being able to meet the needs of their tenants. The opportunity to address the impending capital renewal and deferred maintenance costs in the housing infrastructure, while simultaneously reducing the ongoing operating costs through energy efficiency measures is a compelling initiative for the housing sector.

SHSC - the delivery agent

Social Housing Services Corporation (SHSC) is a provincially legislated independent corporation representing the interests of municipal services managers, local housing corporations and the non-profit and co-operative housing providers previously administered by the provincial government. SHSC is a central resource for 47 Service Managers and 1600 Housing Providers in 455 municipalities and districts who collectively manage more than 250,000 social housing units in Ontario. The Corporation also represents its members in the construction and administration of new housing units, including those created under the new Affordable Housing Program.

[1] Based on SHSC survey results to December, 2004

SHSC has a mandate described in the Social Housing Reform Act, 2000. However, SHSC is not restricted by this mandate and may provide any other services, on the basis of voluntary participation from its members.

SHSC has created a pilot program for energy efficiency upgrades to existing social housing, which it has been administering since 2004. Phase 1 of the pilot - 50 building audits -has been completed. Phase 2 – implementation of energy efficiency retrofits – will commence shortly.

SHSC's mandate, experience, services and province-wide reach make it the delivery agent of choice for the Conservation Bureau social housing energy conservation program.

SHSC is a provincially legislated entity, mandated to deliver services to the social housing sector in Ontario. SHSC's Board of Directors is elected by the social housing providers. SHSC is directly accountable to the Minister of Municipal Affairs and Housing. SHSC offers:

- an expert understanding of the social housing sector in Ontario – including legislation, management structures, issues of concern to housing provider/service managers, opportunities for collaboration/partnerships, current energy use statistics and patterns etc.
- experience in managing and implementing an energy conservation retrofit program, based on their 2004 pilot program
- proven ability to act as a central contact point and resource for all service managers and social housing providers in the province
- extensive experience in joint purchasing of goods and services
- pooling and management experience of large capital reserve funds

1.2 General program principles

The following are the general program principles:

- **No capital outlay for participants** - The program will not require a capital outlay from the social housing provider or renter.

- **Verifiable savings** - The program will track and report on measures installed, energy and power savings achieved, and education provided.

- **Savings attributed to the Conservation Bureau** - The energy and power savings achieved from the program will be attributed to the Conservation Bureau. Where SHSC brings in other funding partners (e.g. LDCs, gas utilities, NRCan, CHMC, etc.), a formula for allocating savings among funding partners will be developed. Ownership of emission credits, if any, will be negotiated.

- **Eligible measures** - Measures which will be eligible under program funding will include electricity and water efficiency improvements and fuel switching from electricity to gas (or a renewable fuel). Identification of gas saving measures is permitted as part of the audit, however the implementation of such measures would have to be funded through a separate mechanism (e.g. gas utilities, private financing). It is recommended that the Conservation Bureau, during detailed design consider partnering with the natural gas utilities that offer DSM (Enbridge Gas Distribution and Union Gas) so that the utilities can offer measures through funding/programs to incorporate natural gas savings opportunities identified as part of the comprehensive audits in the retrofits. SHSC would coordinate with the natural gas utilities during program implementation.

- **Leveraging partnerships** – The program will use public resources to leverage private sector investment. This includes continuing to leverage electric LDC funding, cooperation and assistance through LDC social housing CDM programs (this is occurring now as part of the SHSC pilot).

- **Program reach** - The program will be delivered province-wide over a 5 year period and will strive to reach approximately 50% of all existing social housing units in Ontario and the affordable housing under construction (Affordable Housing Program/Strong Start Program) during the 5 year period.

- **Education** – The provision of energy conservation education to housing providers, housing provider board members and renters is fundamental to the success of the program and the long term sustainability of the energy savings achieved through retrofits and technologies.

- **Market transformation** – The program will contribute to the market transformation of electrical appliances, lighting and new construction building standards. Similarly, a program objective is

to ratchet up the capabilities of all parties involved in the program, including housing providers, contractors, service managers, and auditors to increase their capabilities to identify and act on opportunities to cost-effectively reduce energy use.

- **Innovation** – The program will encourage innovative technologies through on-going demonstrations of progressive energy technologies.

- **Contribute to meeting provincial energy savings targets** – The electricity demand reductions achieved by the program will contribute to meeting provincial targets. A reduction in the order of 60 MW over the five years is anticipated.

1.3 Program overview

The program will consist of two main streams - a Retrofit Program for existing social housing and a New Construction Program for new social housing units.

The Retrofit Program will include:

- Building audits to identify energy retrofit opportunities

- Resource acquisition and implementation of cost effective energy efficiency measures

- Energy conservation education for social housing providers and residents

- Progressive energy technology demonstration projects

The New Construction program will include:

- Funding to enable new social housing units to be constructed to a level that significantly exceeds current energy efficiency standards

- Distributed generation demonstration projects

Funding for the education and the progressive energy technology demonstration components of the Retrofit Program will be provided by the Conservation Bureau. Housing providers will be eligible for financing to cover the costs of the building audits and retrofits, through

two loan mechanisms (described in Preliminary Budget & Financing Options section below). Funding for the New Construction program will be provided by the Conservation Bureau.

The Retrofit Program will aim to reach approximately 50% of all existing social housing units in Ontario over a five year period. The New Construction program will initially target the 500 units being constructed through the Ministry of Municipal Affairs and Housing's Strong Start Program.

1.4 Program elements

Retrofit program: measures/technologies

Energy saving measures/technologies will be identified through building audits. For retrofits to be financed through the loan mechanism, measures should have a payback period equal to or less than the life of the measure and preference should be given to measures that have the lowest cost per unit of energy/power saved. Priority should also be given to fuel switching measures which meet the required payback period.

From the audits to date completed by SHSC, it appears that measures that would pass this payback screen include: lighting, refrigerators, programmable thermostats and boilers. However this program concept is not limited to these measures alone. The audit process will include a comprehensive list of energy saving measures (e.g. improved temperature controls on electric baseboard heaters, sensors, more energy efficient lighting and appliances, co-generation facilities, renewable energy technologies to replace electricity use) to be screened by the auditor for each building. Both in-suite and common area energy saving opportunities are eligible under this program.

To minimize capital costs and to leverage its economies of scale, SHSC may purchase certain measures in bulk (e.g. refrigerators, front-loading washing machines, solar hot water heaters, replacing electric baseboards with more efficient new ones). The type and quantity of bulk purchases will be determined based on audit results and the existing knowledge base regarding the type of equipment and its vintage found in social housing across Ontario.

Energy savings opportunities that are identified during the audit but which do not meet the cost-effectiveness screen may be eligible for implementation through the on-going distributed generation component of the program. The fund will provide additional financial support for well tried, proven, but progressive distributed energy technologies to enable them to be installed in social housing. The distributed generation

fund will be administered by the delivery agent. Projects will be selected based on building operator interest, suitability at the specific site, the portfolio of projects and proximity to market readiness.

It is likely that feasibility and appropriateness of distributed generation sites will be determined by specialists in the applicable technology, not the general auditors. The feasibility of incorporating simple questions into the audit that would assist in identification of potentially suitable conditions for these technologies should be investigated during detailed program design.

An additional element of the program will be on-going documentation of barriers to reducing energy use in social housing, whether as a result of institutional obstacles, regulatory or policy obligations, provider perceptions or other factors. SHSC will report annually to the Chief Conservation Officer on barriers identified, and possible ways of removing these barriers.

Retrofit program: education

Energy conservation education specialists will provide energy conservation education to three groups:

- The social housing and co-op residents
- The housing providers
- The housing providers' Boards of Directors

The social housing and co-op residents will receive energy conservation education in a group setting. This group will include all the tenants of a building or buildings run by the housing provider. Residents will also be offered one-on-one energy conservation in their unit. Residents can receive this education by signing up at the group meeting. At the group and one-on-one education sessions the residents will receive information on the energy conservation measures that were installed in their unit and building and about no-cost energy conservation actions that they can undertake. Examples of no-cost behavioural energy conservation measures include: closing/opening blinds on summer/winter days, vacuuming refrigerator coils, washing clothes in cold water and matching pots and element size on the stove.

The housing provider and its Board will also receive education on the energy conservation measures that were installed in the building and about no-cost energy conservation actions that they can undertake throughout their building or buildings.

SHSC will develop a strategy for encouraging housing providers to participate in the program. One component of this strategy may involve designing and implementing an awards program. Housing providers would receive an award for substantial savings made, innovation etc. A competition among housing providers may generate interest in the program and encourage higher levels of savings and participation. Charettes on individual social housing units may also be used to encourage higher levels of savings and innovation. Another component of the program for housing providers will be facilitation of internal approval mechanisms for the retrofit program. For example, this might include providing tools that would assist their boards of directors to understand the opportunities and the risks associated with participating in the program, and addressing concerns they might be expected to raise. In addition, the housing providers may be assisted in understanding how to measure and monitor their energy use, and how to interpret these data.

SHSC will also develop a strategy for encouraging residents to attend the group education sessions, arrange one-on-one meetings on energy conservations and adopt the no cost energy conservation measures. One potential component of such a strategy is a shared savings mechanism which re-invests a portion of the energy cost savings back into the particular building community (community garden, play structures etc).

New Construction Program for AHP

Canada and Ontario have recently partnered on a new affordable housing program for Ontario, the Federal-Ontario Affordable Housing Program (AHP). A total of 15,000 new affordable units are included.

In order to help ensure that these new buildings achieve a high level of energy efficiency, a new construction fund will be established to encourage the construction of affordable housing that meets a level of energy efficiency which is significantly greater than the minimum standards. This level could be associated with an existing program (e.g. CBIP which strives for buildings that are 25% higher than the Model National Energy Code for Buildings) and/or with an existing building energy performance labelling/award system (e.g. LEED program, where LEED Silver is roughly 40% improvement in the energy efficiency requirements of the Building Code). The specific standard that will be applied will be determined during detailed design.

Funding would cover the marginal cost difference between what energy measures would have gone in the housing and what is being installed to meet the higher energy efficiency standard.

The Ministry of Municipal Affairs and Housing program, the Strong Start Program, includes 500 units and these may be included in the program as a starting point.

1.5 Preliminary budget and financing options

The audits and retrofits of existing housing will be financed using two loan mechanisms – (a) a government funded interest-free revolving loan fund; and (b) financing obtained by SHSC. The Conservation Bureau will provide $25 million per year for 5 years (one third of total program costs) into an interest-free revolving loan fund which will be managed by the SHSC. SHSC will secure the remaining two-thirds ($50 million per year) through other financial sources. The repayment of the provincial loan by the housing providers and SHSC will start 5 years after the loan is granted and repayment will take place over a 10 year period.

An annual contribution of $25 million into a provincial revolving loan fund, leveraged by $50 million in private financing, will be sufficient to retrofit approximately 50% of the total social housing units (125,000), at an average of $3,000 per unit (includes common areas), over the 5 year life of the program.

In addition to its annual contribution to the revolving loan fund, the Conservation Bureau will allocate $1 million to SHSC per year for operating expenses ($500k admin, $500k monitoring& evaluation), $1.5M per year for the education program to be delivered in conjunction with the retrofits, $0.5M per year for the distributed generation fund to be administered by SHSC, and $2M per year for the New Construction Program for AHP.

The total program funding for the social housing program is summarized as follows:

- $25M/yr for SHSC retrofits - revolving fund
- $1M/yr for program operating costs of SHSC (M&E, administration)
- $1.5M/yr for education to be delivered coincident with SHSC retrofits
- $0.5M/yr for distributed generation fund for progressive technologies

- $2M/yr for new construction program for affordable housing that significantly exceeds current energy efficiency standards

1.6 Estimated energy savings

Providing detailed estimates of potential energy savings is beyond the scope of this conceptual design. Based on a 20% reduction in energy use per unit, it is anticipated that with the number of units targeted, savings in the order of 60 MW over the life of the program can reasonably be expected. With typical savings per measure, some standard measures, and assumptions about the applicability of the measure per unit, savings in excess of 20% would be expected for the anticipated expenditure per unit.

1.7 Monitoring and evaluation strategy

The measures/technologies installed in the individual units and common areas will have to be tracked and engineering calculations used to estimate energy and power savings based on the standard format developed by SHSC for the retrofits and a standard format developed for the new construction program. Spot checks will be done on facilities after implementation over the 5 year period to verify the installation of equipment and the savings achieved.

For at least a sample of the buildings in the program, it will be desirable to have detailed energy use information for analysis, such as is provided by interval meters. Opportunities for acquiring these data will be explored, possibly through alliances with LDCs, through private monitoring companies, or in other ways.

As part of the requirements for participating in the program, housing providers will be required to report their energy consumption to SHSC on an ongoing basis.

1.8 Communications strategy

SHSC will need to develop a standard communications strategy to the service managers and/or housing providers to solicit their participation. This strategy will provide them with sufficient understanding of the program and energy conservation so that they are able to communicate effectively about the program to the residents including the purpose and benefits of the program to the residents and the timing of the audit, the retrofit and the group education.

SHSC will develop a communications strategy for the housing providers involved in the AHP to stimulate interest in the new construction fund and to provide education and awareness on program requirements.

1.9 Potential key partners and stakeholders

The key partner is the Social Housing Services Corporation (SHSC). SHSC will be responsible for program delivery, monitoring, evaluation and reporting to the Conservation Bureau. SHSC will administer the revolving loan fund. The housing providers will provide information and access to the buildings and tenants and enter into loan agreements with SHSC. Housing providers will contract with Energy Management Firms to conduct audits, implement retrofits, and provide additional financing, if required, to be paid for through the energy cost savings that are achieved. SHSC will contract with energy conservation education specialists to deliver the education component of the retrofit program, in cooperation with the housing providers.

SHSC may consider partnering with organizations such as Sustainable Buildings in Canada and/or CMHC to assist with providing information and training on energy efficient building design.

Roles & responsibilities

Key responsibilities for the Conservation Bureau:

- Set up and administer a bilateral agreement with SHSC as delivery agent for social housing program
- Provide $25M annually for five years to revolving loan fund
- Provide $5M annually for five years for SHSC operating expenses, education program, distributed generation fund, and New Construction Program.

Key responsibilities for SHSC in administering the social housing program include:

- Tender through a competitive process for auditors to conduct energy audits and for EMFs to implement retrofits
- Tender through a competitive process for energy conservation specialists to deliver the education component of the program

- Develop a standard audit procedure and evaluation software for the program measures to be used by all auditors

- Develop a standard reporting procedure and software for all EMFs to report on the installation of the measures and the savings achieved

- Provide training to the auditors/EMFs and the education specialists

- Provide information and general education on energy efficiency and requirements to meet the energy efficiency standard to AHP housing providers that may become involved in the new construction program

- Administer and be accountable for the revolving loan fund as well as the education program , the distributed generation fund and the new construction program

- Solicit participants from social housing and co-op units across Ontario that are representative of different regions across the province and of different housing types, to the extent practical and reasonable

- Provide monthly/quarterly progress reports to the Chief Conservation Officer on planning, results, projects and expenditures, including the achievement of milestones

- Report to the Chief Conservation Officer on an annual basis the detailed results of the retrofit and new construction programs, including audit reports (retrofit program), number of participants, measures installed, energy/power savings achieved and costs

- Report to the Chief Conservation Officer on an annual basis on the goals and objectives of the education program and the distributed generation fund, and progress toward their achievement. In particular, the report will indicate how the education program and the distributed generation fund initiatives were incorporated into the retrofit program

- Report to the Chief Conservation Officer on an annual basis on barriers to energy efficiency in social housing, and possible ways of removing these barriers

SHSC will set up appropriate organizational structures to ensure proper governance and accountability.

Key responsibilities of the housing providers are:

- Contact SHSC to express an interest in participating in the program
- Submit an application or contract to SHSC in which they:
  - Make a commitment to follow through on the audits
  - Provide the necessary support of the staff and
  - Take on the financial obligations of implementing the measures recommended by the audit process and supported by the program
  - Commit to provide energy use information at the intervals and in a manner specified by SHSC
- Coordinate with SHSC regarding the implementation of the education program
- Meet the terms of the revolving fund loan agreement with the SHSC

Key responsibilities of the auditors include:

- Conduct building (and a selection of unit) audits based on the standard audit protocol
- Submit the audit report to SHSC and the housing provider, including the output from the evaluation software
- This audit report will include:
  - A ranked list of the measures based on the standard audit and audit protocol of the SHSC
  - The energy or power saved by each measure
  - The cost of the measure
  - The total or running cost

- Lessons learned and any suggestions for improvement

Key responsibilities of the EMFs are:

- Prepare detailed specifications for the retrofit based on the audit and discussion with SHSC
- Implement the retrofit
- Submit a report on the measures installed during the retrofit based on the standard format developed by SHSC
- This retrofit report will include:
  - A description of each of the measures installed based on the detailed specifications,
  - The energy or power saved by each measure,
  - The cost of the measure
  - The total or running cost
  - Lessons learned in the process and any suggestions for improvement

2 Low-income multi-residential energy conservation program

2.1 Background

There are about 1.4 million renters in Ontario. About thirty percent of these renters spend more than 30% of their income for housing, and most of this housing is in the private sector. According to the 2001 census by Statistics Canada, 14.4% of Ontario residents (or 1,611,505 persons) were living at or below the pre-tax, post transfer low-income cut offs – a widely accepted measure of poverty. The majority of low-income people in Ontario, approximately two thirds, live in tenant households[2] .

This low-income energy conservation program is targeted at building owners and managers that own or manage buildings that primarily contain or have a large proportion of low-income residents.

For the purpose of this program, multi-residential buildings are defined as private rental buildings with more than 3 units. These include low-rise (5 storeys or less) and high-rise (more than 5 storeys) apartment buildings.

The majority of tenants do not pay directly for electricity (it is included in their rent). As such, this program will not directly lead to reduced energy costs for low-income renters in this situation – the savings will accrue to the building owner or property manager that pays the electricity bills. During detailed program design, consideration should be given to how some of the benefits from energy efficiency upgrades in bulk-metered buildings could be passed on to low-income tenants, in order to reduce their energy burden.

While this program excludes funding of sub-metering, it is seen as potentially complementary to other government programs to promote the sub-metering of multi-residential units.

It is important to note that under the Tenant Protection Act building owners and managers may apply to the Ontario Rental Housing Tribunal for an above guideline rent increase, if major capital work has been done (including energy efficiency upgrades) to their units. Steps should be taken by the Conservation Bureau and the Province to ensure that the capital costs of energy efficiency measures funded through this program

[2] Advocacy Centre for Tenants Ontario, Novmeber 5, 2003. Rental Housing in Ontario – quick facts.

are not passed on to the renters through approved above guideline rent increases.

2.2 *General program principles*

The following are the general program principles:

- **No capital outlay for tenants** - The program will not require a capital outlay from the tenant
- **Verifiable savings** - The program will track and report on measures installed, energy and power savings, and education provided
- **Savings attributed to the Conservation Bureau** - The energy and power savings achieved from the program will be attributed to the Conservation Bureau. Ownership of emission credits, if any, will be negotiated
- **Eligible measures** – Measures eligible under program funding will include electricity and water efficiency improvements, or fuel-switching from electricity to gas (or a renewable fuel). Identification of gas saving measures is permitted as part of the funded audit, however the implementation of such measures would have to be funded through a separate mechanism (e.g. gas utilities, private financing)
- **Leveraging partnerships** – The program will use public resources to leverage private sector investment
- **Program reach** – The program will be delivered province-wide over a 5 year period and will strive to reach approximately 10% of the low-income multi-residential rental units, approximately 60,000 units
- **Contribute to meeting provincial energy savings** – The electricity demand reductions achieved by the program will contribute to meeting provincial targets. A reduction in the order of 30 MW over the five years is anticipated.

2.3 Program overview

The program is targeted at building owners and managers that own or manage buildings that primarily contain or have a large proportion of low-income residents.

The retrofit program will include:

- Building audits to identify energy retrofit opportunities, where the audits lead to retrofit implementation. Other programs such as the federal Energy Innovators Program provide funding for building audits.
- Implementation of cost effective energy efficiency measures
- Energy conservation education for building residents and superintendents

The multi-residential low-income energy conservation program will be administered by a delivery agent selected by the Conservation Bureau through a tendering process.

This program will be financed by a revolving fund administered by the delivery agent (described in Preliminary Budget & Financing Options section below). Funding for the administration of the program including the energy conservation education component will be provided by the Conservation Bureau.

Eligibility and screening

The multi-residential buildings will be eligible for the program if they contain an appropriate proportion of low-income households. The screen for determining eligibility will need to be straightforward and simple to use in order to encourage participation of building owners and managers. As well it must reasonably capture low-income residents without requiring self-identification. If the building passes the eligibility screen, then all of the units in the building and the common areas will be eligible for energy efficiency measures under the program.

Two indicators can be used for screening eligibility of the buildings:

- **Average income level in the building** (based on rental application forms provided to the landlord/building owner). This may be problematic as the information related to income provided to the landlord may not be able to be used for this purpose without the

express permission of the tenant. As well, the information related to income may be considerably out of date for tenants that have resided in the building for a long period of time.

- **Average rent in building adjusted by bedroom type.** Using the average rent in a building adjusted by bedroom type is likely to be easier to administer. CMHC already provides average rents in cities and geographic areas across the province based on bedroom type. A screen, for example, that requires the average building rent to be 20 - 30% below the average for the city or geographic area (based on CMHC) numbers may be appropriate. Or alternatively, the screen could require that 50% - 75% of the units in the building be below the average rent for geographic area.

The specific screen for low-income residents will need to be worked out in the detailed program design.

2.4 Program elements

Retrofit program: measures/technologies

Energy saving measures/technologies will be identified through building audits. The measures selected for implementation should have a payback period equal to or less than the life of the measure and preference should be given to measures that have the lowest cost per unit of energy/power saved (e.g. lighting in common areas, especially lighting on for 24 hours/day). Priority should be given to common areas and to fuel-switching measures which meet the required payback period.

Energy saving measures/technologies may be installed in individual units, common areas or both.

Retrofit program: education

To be eligible for the program, building owners/managers must agree to participate in the education component of the retrofit program. The education program will be provided at no cost to the building owner/manager. In addition to providing general education on how residents and the superintendent can reduce consumption, it will be important to explain to tenants what effect the conservation measures have on energy bills, especially in an environment of rising electricity prices where the conservation measures may only keep bills from going up as rapidly.

The building custodian (and other staff) and residents of the building will have an opportunity to receive energy conservation education. The residents will receive, in a group setting, information on the energy conservation measures installed in their unit and building and about no-cost energy conservation actions that they can take.

The education component of the program will be delivered by an energy conservation education specialist approved and contracted by the delivery agent.

Ensuring tenants benefit from the program

For low-income tenants whose units are individually metered, they will benefit directly from the fuel bill savings from the energy conserving measures installed in their units. Tenants that are bulk-metered will not. Both tenant groups are at risk of having the building owner/manager retrofit costs passed on to them through an above guideline rent increase.

Steps will need to be taken at the detailed program design stage to address this problem. One suggestion for exploration is through the contract between the building owner/manager and the delivery agent (also stipulated in the contract between the delivery agent and the Conservation Bureau). The contracts could require the building owner/manager to agree not to seek an above guideline rent increase for the total costs of the retrofit, of which 20% is funded by the revolving fund. The building owner/manager would only benefit from the operating cost savings from the energy conservation measures that are implemented.

2.5 Preliminary budget and financing options

This program will be financed by a revolving fund administered by the delivery agent. The revolving fund will involve $7 million per year for 5 year provided by the Conservation Bureau. The fund will provide up to 20% of retrofit project financing to building owners/managers through a no-interest loan. The building owners/managers will be responsible for securing the remaining financing required for the projects. The repayment of the provincial loan will start 5 years after the loan is granted and repayment will take place over a 10 year period. This will allow repayment of the loan when the program starts to generate significant energy savings through the energy cost savings that are achieved.

Certain building owners and managers, in particular the smaller companies, may require assistance in securing loans for the financing not covered by the revolving fund. To provide this assistance, the

Conservation Bureau, for example, could establish a relationship with a financial institution or CMHC to provide mortgage insurance for the retrofit, or to provide easier loan access for program participants. This should be explored by the Conservation Bureau during detailed program design.

In addition to its annual contribution to the revolving loan fund, the Conservation Bureau will allocate $2 million annually to the delivery agent for operating expenses which include: administration, monitoring, evaluation and reporting, and education.

2.6 *Estimated energy savings*

Providing detailed estimates of potential energy savings is beyond the scope of this conceptual design. Based on a target of retrofitting 60,000 units[3] and a 20% reduction in energy use per unit, it is anticipated that savings in the order of 30 MW can reasonably be expected. With typical savings per measure, some standard measures, and assumptions about applicability of the measure per unit, savings in excess of 20% would be expected for the anticipated expenditure per unit.

2.7 *Monitoring and evaluation strategy*

The measures/technologies installed in the individual units and common areas will have to be tracked and engineering calculations used to estimate energy or power savings. Spot checks will be done on facilities after implementation over the 5 year period to verify installation of equipment and the savings achieved.

Building owners and managers are willing to provide access to the buildings and to their billing accounts for monitoring and evaluation of energy savings. They are reluctant to take on the administrative burden of carrying out the monitoring and evaluation. The delivery agent will need to be responsible for the design and implementation of the monitoring and evaluation program.

For at least a sample of buildings in the program, it will be important to have detailed energy use information for analysis, such as is provided by interval meters. Opportunities for acquiring these data will need to be explored by the delivery agent, possibly through alliances with LDCs, through private monitoring companies, or in other ways.

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[3] Approximately 10% of eligible units in Ontario.

2.8 Communications strategy

The delivery agent will need to develop a communications strategy to the building owners and managers to solicit their participation. This strategy will provide them with sufficient understanding of the program and energy conservation so that they are able to communicate effectively about the program to the residents including the purpose and benefits of the program to the residents and the timing of the audit, the retrofit and the group education.

2.9 Potential key partners and stakeholders

The partners and stakeholders in the program will be:

- Delivery agent
- Conservation Bureau
- Building owners and managers
- Energy conservation education specialists

The key partner is the delivery agent. The delivery agent will be responsible for program delivery, monitoring, evaluation and reporting to the Conservation Bureau. The delivery agent will also administer the revolving loan fund. The building owners and managers will provide information and access to the renters and enter into loan agreements with the delivery agent. The building owners and managers will work with the delivery agent to coordinate arrangements and ensure building custodian cooperation and assistance for the energy conservation education specialist to provide training in their building.

Roles and responsibilities

Key responsibilities for the Conservation Bureau:

- Tender for a delivery agent for this program
- Set up and administer a bilateral agreement with the delivery agent
- Provide $7 M annually for five years to the revolving loan fund

- Provide $2 M annually for five years for delivery agent operating expenses, the education program, and monitoring, evaluation and reporting

Key responsibilities for the delivery agent include:

- Tender through a competitive process for the energy conservation education specialists to deliver the education component of the program
- Administer and be accountable for the revolving loan fund
- Solicit participation from multi-residential building owners across Ontario representative of different regions across the province to the extent practical and reasonable
- Provide monthly/quarterly progress reports to the Chief Conservation Officer on planning, results, projects and expenditures, including the achievement of milestones
- Report to the Chief Conservation Officer on the detailed results of the retrofits, including audit reports, number of participants, measures installed, energy/power savings achieved and costs, and the results of the education program
- Report to the Chief Conservation Officer on an annual basis on barriers to energy efficiency in the multi-residential sector, and possible ways of removing these barriers

Key responsibilities of the building owners/managers are:

- Contact the delivery agent to express an interest in participating in the program
- Submit an application to the delivery agent in which the building owner/manager:
  - Make a commitment to follow through on the audits
  - Provide the necessary support of the staff
  - Take on the financial obligations of implementing energy efficiency measures recommended by the audit process and supported by the program

- Coordinate with the delivery agent regarding the implementation of the education program
- Report to the delivery agent on audit results and implementation results
- Meet the terms of the revolving fund loan agreement with the delivery agent

3 Low-income homeowner energy conservation program

3.1 Background

According to the 2001 census by Statistics Canada, 14.4% of Ontario residents (or 1,611,505 persons) were living at or below the pre-tax, post transfer low-income cut offs – a widely accepted measure of poverty. Low-income households face a much higher energy burden (percent of household income devoted to energy costs) than median and higher income households. Statistics Canada data show that in 2003, the lowest income quintile of Ontario households spent nearly six times more on water, fuel and electricity than did the highest income quintile. On electricity alone, Ontario households in the lowest income quintile spent 6.13% of their pre-tax income in 2003, nearly five times more than households in the top quintile that spent 1.03%[4] .

The lowest household income quintile in Ontario has a far greater proportion of households that:

- Have electric heating as their principal heating equipment (26.8% compared to a number too unreliable to be published for the highest quintile)
- Use electricity as the principal heating fuel (30.9% compared to 9.2% for the highest quintile)
- Use electricity as the principal heating fuel for hot water (42.3% compared to 19.7% for the highest quintile)
- Have principal heating equipment more than 10 years old (73.7% compared to 49.3% for the highest quintile)

This low-income energy conservation concept is targeted at low-income homeowners across Ontario. It contains an energy efficiency retrofit as well as an education component for homeowners. The program concept

[4] The electricity bills for an average residential customer consuming 1000 kWh per month currently range across the province from $87 to $124 per month. For a single mother with two children on social assistance, this represents 16% to 22% of her maximum shelter allowance of $554. For as single person working 35 hours a week at minimum wage ($7.15) this represents 8% to 11% of this worker's total monthly pre-tax income of $1084.42.

was developed using the Low- Income Energy Network's (LIEN) program template (developed in Fall 2004[5]) as a starting point. The LIEN program design recommendations were taken into consideration, as were the program design and results to date of the Brantford Power low-income retrofit pilot – Conserving Homes.

3.2 *General program principles*

The following are the general program principles:

- **No capital outlay for participant** - no capital outlay will be required from the low-income participant (homeowner) in the program

- **Comprehensive approach** - the program will take a comprehensive approach to energy efficiency – including identification and implementation of electricity- water- and natural gas-saving measures. While the Conservation Bureau budget will only cover electricity-saving, water-saving or fuel switching measures off electricity, a potential partnership with Ontario's natural gas distribution companies for upgrading the energy efficiency of existing natural gas applications should be explored by the Conservation Bureau as part of detailed program design

- **Comprehensive solutions** - the program will look at comprehensive solutions, where possible, addressing appliances, building envelopes, weatherization/draft-proofing and heating systems

- **Screening process** - there needs to be a clear, simple and easily accessible screening process for identifying eligible program participants

- **Bill savings** - the energy savings attained as a result of the energy efficiency program must be realized on the participants' utility bills

- **No claw-backs** - the financial value of energy efficiency measures should not be considered as income by the Province and should not be deducted from government monies received from other sources (no claw-backs)

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[5] See http://www.lowincomeenergy.ca/A55AB4/lien.nsf/All//designee

- **No reduction in quality of life** - the potential impact of the program on the overall quality of life for program participants, such as changes to the safety and/or comfort of the dwelling, should be recognized to ensure that changes are mutually beneficial and do not cancel each other out

3.3 Program overview

The purpose of the program is to lower the disproportionate energy burden of low-income households through the implementation of energy saving measures and the provision of one-on-one education and facilitation services. The program will consist of three main elements:

- Home energy assessment
- Installation of energy saving measures
- Education

With a budget of $8M per year for five years, the program will aim to reach more than 20,000 low-income households in Ontario. To qualify for the program, participants must have an income, which is at or below Statistics Canada's pre-tax, post-transfer Low-income Cut-off (LICO) and must be a homeowner.

Eligibility & screening

The target participants for program are low-income homeowners. To qualify for the program, participants must have an income, which is at or below Statistics Canada's pre-tax, post-transfer Low-income Cut-off (LICO) and must be a homeowner.

The pre-tax, post-transfer LICO vary according to household size and the size of community, as shown in Table 1.

Two approaches for screening program applicants related to the LICO should be explored in more detail. One approach is to use a formal application system where participants are required to provide supporting documentation as proof of income, household size, and home ownership. This approach provides assurance that only eligible individuals are participating in the program.

Table 1 Statistic Canada's Before-Tax Low-income Cut-offs (1992 Base) for 2004

Family Size	Community Size				
	Rural Areas	Less than 30,000	30,000-99,999	100,000 - 499,999	Cities of 500,000+
1	13,938	15,985	17,179	17,298	20,168
2	17,422	19,981	21,474	21,623	25,210
3	21,668	24,849	26,706	26,892	31,353
4	26,228	30,081	32,327	32,553	37,953
5	29,320	33,625	36,136	36,389	42,425
6	32,411	37,168	39,946	40,226	46,897
7+	35,502	40,712	43,755	44,062	51,369

1. Source: Statistics Canada Research Paper, Low-income cutoffs from 1994-2003 and low-income measures from 1992-2001. Catalogue no. 75F0002MIE – No. 002.

The other approach would be a 'self-identification' system where program participants sign a legal form confirming that they meet the program eligibility requirements, but are not required to provide supporting documents as evidence. This 'self-identification' approach has been successfully used in the Legal Aid Ontario system for some time.

The advantage of the self-identification system is that it will have a much lower administrative cost than the formal application system, thereby allowing more money to be allotted to the actual implementation of measures.

The specifics related to the eligibility and screening should be determined during detailed design.

3.4 Program elements

Home energy assessments

The program will begin with a home energy assessment by an experienced energy professional. The purpose of the assessment is to identify the current level of household energy consumption and the breakdown of that consumption by end use (e.g. appliances, heating, cooling, and lighting). The home energy assessment will also be used to make recommendations identifying which, if any, of the 'extended' energy saving measures should be implemented. The assessment will include a blower-door test for electrically heated homes to identify any air leakages in the building envelope. The results of the home energy assessment will be documented in an assessment form signed by both the assessment team and the program participant.

Installation of energy saving measures

Two levels of energy efficiency measures will be installed into participating homes:

- Basic measures
- Extended measures

The basic measures will be implemented in all participating homes, where applicable and feasible[6] , at the same time as the home energy assessment. These basic measures are:

- Replace ALL incandescent light bulbs with compact fluorescent light bulbs
- Install programmable thermostat[7]
- Install blanket & pipe wrap for water heater[8]
- Install low flow showerheads & faucet aerators
- Provide indoor clothes line/rack and clothes pins.

The extended measures are:

- Replace old refrigerator with an ENERGY STAR® model;
- Replace washing machine with front-loading ENERGY STAR® model
- Replace room air conditioner with an ENERGY STAR® model
- Install building envelope and ventilation measures

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[6] For example, the replacement of all incandescent light bulbs with compact fluorescent light bulbs may not be feasible depending on the light fixtures in the dwelling.

[7] May be limited to electrically heated homes, if funding partnership with natural gas LDCs is not established.

[8] May be limited to electric water heaters only, if funding partnership with natural gas LDCs is not established.

- Replace electric water heater with natural gas- or renewable-water heater (e.g. water heaters/solar hot water/instantaneous)[9]

- Replace toilet(s) with low flow model

Not all households participating in the program will receive extended measures and those that do will not receive every extended measure. Extended measures for each household will be selected based on the home assessments, up to a maximum dollar value per household. Selection will be prioritized based on cost-effectiveness. Preference should be given to measures that have the lowest cost per unit of energy/power saved. Any items replaced by more energy efficient products (e.g. light bulbs, thermostats, air conditioners and refrigerators) will be removed from the household by the delivery agents to prevent re-use. The products removed will be disposed by delivery agents in an environmentally sound fashion.

The final list of basic and extended measures to be covered in the program should be confirmed during the detailed design of the program.

Education

Customer education is a critical component of the program, and will run throughout all stages of program delivery. During the home energy assessment, the energy professional(s) will perform a 'walk-through' of the dwelling to identify ways that participants can reduce their energy consumption through behavioural changes, based on their unique situation (for example, turn off baseboard heaters in empty rooms, wash clothes using cold water and cook using a microwave). During or after the installation of the basic and extended energy saving measures, the delivery agents will explain and demonstrate how to operate and/or upkeep the new equipment (e.g. setting a programmable thermostat). The delivery agents will also leave behind literature/reference materials with energy efficiency tips for the household.

Home visits

The three elements of the program – energy assessment, installation of measures and education - will be delivered to participants through up to two home visits by the program delivery agents.

[9] Gas hook up would be included where access to gas is reasonably available

The initial home visit will include the home energy assessment, installation of basic energy saving measures and one-on-one education regarding energy efficiency. If during the initial visit the energy assessor determines that additional measures (e.g. appliance replacement) are applicable and cost-effective for the particular dwelling then a second home visit will be scheduled.

The second home visit will include the installation of the extended measures along with additional education, Delivery of the energy saving measures also includes disposal of any products removed from the household (e.g. light bulbs, thermostats, air conditioners and refrigerators) in an environmentally sound way.

3.5 *Preliminary budget and estimated energy savings*

The preliminary budget for this program is $8M per year for 5 years. Assuming an average cost of $1,850 per participant household[10] the preliminary budget would allow for more than 21,000 participating households [11] over the life of the program.

Providing detailed estimates of potential energy savings is beyond the scope of this conceptual design. Based on a 20% reduction in energy use per unit, it is anticipated that with a target of 21,000 private low-income homes over the five year life of the program, savings in the order of 15 MW could be achieved. With typical savings per measure, some standard measures, and assumptions about the applicability of the measure per unit, savings in excess of 20% would be expected for the anticipated expenditure per unit.

3.6 *Potential key partners and stakeholders*

It is envisioned that the Conservation Bureau would tender through a competitive process for the overall delivery and management of the program. There are many potential delivery agents, including non-profit groups, private energy services companies, other government agencies (e.g. Ministry of Community & Social Services). The organization should have experience in providing services/programs to low-income individuals as well as experience delivering energy efficiency and conservation services/programs.

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[10] Assumes $200 operational expenditures for delivery agent; $750 for audit & basic measures for all homes; and up to $2250 for implementation of extended measures in selected electrically heated homes.

[11] Approximately 10% of estimated low-income privately owned homes in Ontario.

Roles and responsibilities

The delivery agent would be responsible for all aspect of program implementation:

- Managing the participant in-take process (marketing/outreach, application screening etc.)
- Developing and implementing a standard audit procedure and evaluation software for the home energy assessments
- Developing standard criteria and an evaluation procedure for determining which extended measures will be installed
- Setting up and conducting the home visits
- Purchasing and installing energy savings measures
- Disposing of removed equipment in an environmentally sound fashion
- Delivering energy efficiency and conservation education to program participants
- Providing monthly/quarterly progress reports to the Chief Conservation Officer on planning, results, projects and expenditures, including the achievement of milestones
- Developing and implementing a monitoring and evaluation strategy in order to report to the Chief Conservation Officer on an annual basis the detailed results of program, including audit reports, number of participants, measures installed, energy/power savings achieved and costs, and results of the education component of the program
- Reporting to the Chief Conservation Officer on an annual basis on barriers to energy efficiency in low-income homes, and possible ways of removing these barriers

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