CONSERVATION AND DEMAND SIDE MANAGEMENT SERVICES AGREEMENT

THIS AGREEMENT is made as of the 1st day of January, 2005

B E T W E E N :

POWERSTREAM INC., a corporation formed under the laws of the Province of Ontario

(hereinafter called "**PowerStream**")

- and -

THE TOWN OF MARKHAM, a municipal corporation formed under the laws of the Province of Ontario

(hereinafter called the "**Service Provider**")

WHEREAS Power Stream wishes to encourage the development and adoption of energy conservation and demand side management programs and initiatives in its service areas consistent with the PowerStream Inc. Conservation and Demand Management ("**CDM**") Plan, Ontario Energy Board ("**OEB**") File No. RP-2004-0203, as approved by the Ontario Energy Board attached hereto as Schedule "A" (the "**CDM Plan**")

AND WHEREAS PowerStream wishes retain the Service Provider to provide such Services (as hereinafter defined) as are necessary to implement the CDM Plan and the Service Provider wishes to provide the Services in exchange for the payment of the fees by PowerStream to the Service Provider as set out on Schedule "B" attached hereto (the "**Service Fees**");

NOW THEREFORE THIS AGREEMENT WITNESSES that in consideration of the mutual covenants herein contained and for other good and valuable consideration, the receipt and sufficiency whereof are hereby acknowledged by the parties, the parties hereto hereby agree as follows:

1. INTERPRETATION

1.1 Definitions

However used in this Agreement, unless there is something in the subject matter or context inconsistent therewith, in addition to any other words or terms defined in the text of this Agreement, the following words and terms shall have the respective meanings ascribed to them as follows:

"**Allowable Expenditures**" means expenditures, made either by payment of money or in-kind, including:

(a) human resources such as wages, salaries, employee benefits, workers' compensation coverage as well as consultations, expert review, workshop

organization, communications, monitoring and reporting, technical, promotional, administrative, accounting and auditing services;

(b) materials, supplies and equipment: for any capital cost of assets, eligible costs will be as specifically approved by PowerStream prior to acquisition; where available, the Service Provider should purchase environmentally friendly products i.e., Environmental Choice Products;

(c) Any Goods and Services Tax (pursuant to Part IX of the *Excise Tax Act* (Canada)) that is not recoverable by way of an input tax credit, rebate or other refund mechanism; and

(d) other expenditures which will be limited to: costs incurred by the Service Provider for the organization, management and delivery of the programs detailed in Schedule "C" including, but not limited to: overhead expenses, the cost of utilities, travel expenses (including meals, lodging and incidentals in accordance with government travel directives), third-party liability insurance, the cost of licenses, and any other expenditure pre-approved by PowerStream;

"**Business Day**" means any day other than a Saturday, Sunday or a day on which the principal chartered banks located at Toronto, Ontario are not open for business during normal banking hours;

"**Party**" means either of PowerStream or the Service Provider; and "**Parties**" means both of them;

"**Services**" means the efforts of the Service Provider to support the implementation of the CDM Plan throughout the municipality of Markham, as set out in the PowerStream 2005/2007 CDM Plan which is attached as Schedule "C" hereto; and

"**Transition Phase**" means the twelve (12) month period from June 1, 2005 to May 31, 2006 during which PowerStream and Service Provider will work to establish initiatives to implement the CDM Plan including specified pilot programs, establishing a coordinating structure and finalizing a services agreement for the remaining period through to the end of 2007.

1.2 **Rules of Interpretation**

In this Agreement:

(a) words denoting the singular include the plural and vice versa and words denoting any gender include all genders;

(b) the word "including" or "includes" shall mean "including or includes without limitation";

(c) any reference to a statute shall mean the statute in force as at the date hereof, together with all regulations promulgated thereunder, as the same may be amended, re-enacted, consolidated and/or replaced, from time to time, and any successor statute thereto, unless otherwise expressly provided;

(d) all dollar amounts are expressed in Canadian Dollars;

(e) the division of this Agreement into separate Articles, Sections, subsections and Schedules and the insertion of headings are for convenience of reference only and shall not affect the construction or interpretation of this Agreement; and

(f) any rule of construction to the effect that any ambiguity is to be resolved against the drafting party shall not be applicable in the interpretation of this Agreement.

1.3 **Severability**

If any provision of this Agreement is determined by a court of competent jurisdiction to be unenforceable because it is invalid or in conflict with any law of any relevant jurisdiction, the validity of the remaining provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular provisions held to be unenforceable.

1.4 **Schedules**

The following Schedules are annexed to this Agreement and are incorporated into this Agreement by reference and are to be a part of this Agreement:

Schedule A	-	CDM Plan
Schedule B	-	Service Fees
Schedule C	-	PowerStream 2005/2007 CDM Plan
Schedule D	-	CDM Initiative Principles

2. ENGAGEMENT OF SERVICE PROVIDER

2.1 **Engagement**

Subject to the terms and conditions of this Agreement, PowerStream hereby engages Service Provider to provide the Services and Service Provider hereby agrees to be engaged by PowerStream to provide the Services.

2.2 **Support to Service Provider**

PowerStream will supply the following support to the Service Provider:

(a) linkage to potential partners in CDM initiatives;

(b) listing of potential municipal, provincial and corporate stakeholders; and,

(c) guidance and support as necessary.

3. SERVICE PROVIDER'S OBLIGATIONS

3.1 **Services**

(a) Service Provider agrees that, throughout the term of this Agreement, it will provide the Services, as and when requested by PowerStream, in accordance with

the terms and conditions of this Agreement, including the condition that they be provided in an efficient and timely manner.

(b) The Services shall be performed by employees of, or consultants or other third parties engaged by the Service Provider. The selection of the persons who will perform the Services from time to time shall be in the discretion of the Service Provider.

3.2 **Performance Criteria**

The Service Provider shall provide the Services in such a manner as is required to ensure that, at all times during the term of this Agreement, it shall perform in accordance with the following criteria. The Service Provider shall:

(a) maintain the specifications agreed to by the Parties;

(b) act in accordance with the CDM Initiative Principles set out on Schedule "D" hereto; and

(c) function in a manner which provides commercially acceptable service and responds to PowerStream's needs.

3.3 **Compliance With All Laws**

The Service Provider agrees that in fulfilling the terms and conditions of this Agreement, it will at all times comply with all laws, by-laws, ordinances and regulations promulgated or enforced by federal, provincial and municipal authorities.

3.4 **Licences and Permits**

The Service Provider will secure and maintain throughout the term of this Agreement, at its sole cost and expense, all licences and permits required by all governmental or non-governmental authorities in connection with the provision of the Services.

3.5 **Staff**

The Service Provider agrees that, at all times during the term of this Agreement, it will, at its sole cost and expense:

(a) provide and maintain a Staff adequate in numbers so as to provide for the Services; and for purposes of this Agreement, "**Staff**" means all persons employed or used by or under contract with the Service Provider for any of the purposes of this Agreement, including independent contractors, servants, agents, full-time and part-time employees hired by or under contract;

(b) ensure that the Staff is fully qualified, trained and skilled in their duties and can professionally provide the Services;

(c) appoint a senior manager or senior managers who shall be responsible at all times for supervising and directing the Staff; and

(d) be responsible for all payroll and payroll related functions, including payment of salary, commission, bonus, profit sharing, employment benefits and any other forms of compensation paid or payable, as well as any and all amounts required to be deducted therefrom in respect of contributions to the Canada Pension Plan, income taxes, Employment Insurance contributions, contributions to Workers' Compensation and to public health insurance plans and other similar deductions, and the Service Provider shall remit all amounts so deducted to the applicable governmental authority as and when required to do so.

3.6 **Reporting**

Prior to any payments being made pursuant to Section 3.8, the following conditions must be met:

(a) the Service Provider shall, by the effective date of this Agreement, have provided an operating plan and cash flow statement for the period starting as of the effective date of this Agreement and continuing for the term of this Agreement;

(b) the Service Provider shall report all expenditures, income and results according to the reporting framework and schedule established by PowerStream to facilitate ongoing CDM management and regulatory reporting; and

(c) a total resource calculation shall be completed by the Service Provider for each specific program to ensure prudence for PowerStream's annual report to the OEB. The Service Provider shall provide such materials in the form required by the OEB from time to time.

3.7 **Fees**

(a) PowerStream shall pay the service fees (the "**Service Fees**") incurred during the term as incurred by the Service Provider to a maximum of $1,000,000, inclusive of Goods and Services Tax pursuant to part IX of the *Excise Tax Act* (Canada) ("**GST**"), for all of the Services to be provided pursuant to this Agreement..

(b) The Service Provider shall invoice Service Fees to PowerStream as set out on Schedule "B", up to maximum set out at Section 3.7(a) above, which Service Fees include all compensation for Allowable Expenditures and GST.

(c) Service Fees, other than those herein allowed, are ineligible unless specifically approved in writing by PowerStream prior to the time the costs are incurred.

3.8 **Invoicing and Payment**

(a) PowerStream agrees to pay the sums to the Service Provider as and when set out on Schedule "B". Any interest earned on such payments shall be used only for such cost as are appropriate Service Fees under this Agreement.

(b) The Service Provider shall invoice PowerStream as set out on Schedule "B" detailing the Service Fees incurred (the "**Invoice**").

(c) Within thirty (30) days of receipt an Invoice, PowerStream shall pay to the Service Provider the amount of the related Invoice.

(d) Notwithstanding any other remedies set out herein or permitted at law, if a particular program to be carried out by a Service Provider pursuant to plans developed in accordance with Section 3.5(a) is not initiated, cancelled or scaled-back during the term of this Agreement, the cost reasonably attributed to such program shall be refunded to PowerStream forthwith upon demand to the Service Provider from PowerStream, unless PowerStream and the Service Provider agree to reallocate such amounts to other programs being carried out by the Service Provider.

3.9 **Books and Records**

The Service Provider shall maintain throughout the term of this Agreement and shall preserve for a period of three (3) years afterwards, separate books and financial records in respect of the provision of the Services which accurately reflect the Service Fees and the sources of all such expenses and fees and such other financial information as PowerStream may from time to time request, acting reasonably. The Service Provider shall maintain all such financial information in a manner consistent with generally accepted accounting principles and practices.

4. INSURANCE

4.1 **Insurance**

The Service Provider will procure, prior to commencement of the provision of any Services hereunder, and maintain, at its sole cost and expense, in full force and effect during the term of this Agreement, adequate insurance coverage ("**Insurance**") with a duly licensed insurance carrier of sound financial condition as appropriate to fulfill the Service Provider's indemnification obligation to PowerStream set out in Section 5.1 below.

4.2 **Evidence of Insurance**

The Service Provider agrees that certificates of Insurance will be provided to PowerStream: (a) within five (5) Business Days of PowerStream's written request; and (b) within fifteen (15) Business Days of each renewal date of the Insurance.

5. INDEMNITY

5.1 **Service Provider's Indemnity**

The Service Provider covenants and agrees to indemnify and hold harmless PowerStream, its directors, officers, employees, and agents from and against any and all losses, damages, liabilities, costs and expenses (including legal fees on a solicitor and client basis) which are incurred or suffered by PowerStream as a result of: (a) any violation of this Agreement by, or any act of omission or commission on the part of, the Service Provider or any of its directors, officers, Staff, subcontractors or anyone for whom the Service Provider is legally responsible; and (b) any and all claims, damages, suits or rights of any person arising directly or indirectly from the provision of the Services or the performance of

any obligations under this Agreement by or on behalf of the Service Provider or any of its directors, officers, Staff, subcontractors or anyone for whom the Service Provider is legally responsible.

5.2 **PowerStream Indemnity**

PowerStream covenants and agrees to indemnify and hold harmless the Service Provider , its directors, officers, employees, and agents from and against any and all losses, damages, liabilities, costs and expenses (including legal fees on a solicitor and client basis) which are incurred or suffered by the Service Provider as a result of: (a) any violation of this Agreement by, or any act of omission or commission on the part of, PowerStream or any of its directors, officers, subcontractors or anyone for whom PowerStream is legally responsible; and (b) any and all claims, damages, suits or rights of any person arising directly or indirectly from the performance of any obligations under this Agreement by or on behalf of PowerStream or any of its directors, officers, Staff, subcontractors or anyone for whom PowerStream is legally responsible

5.3 **Notice of Claim**

In the event that either Party receives notice of a claim, proceeding, fine or suit in respect of which it intends to seek indemnification from the other party pursuant to Section 5.1 or 5.2 above, as the case may be, it shall promptly notify the other party of such fact and permit the other party, at the other party's option, to conduct the defence (including any settlement discussions) with counsel acceptable to the first mentioned party, provided that no settlement shall be effective without the approval of the first mentioned party. The first mentioned party shall co-operate in any such defence.

5.4 **Survival**

The parties hereby agree that the provisions of this Article 5 shall survive the termination or expiry of this Agreement.

6. INTELLECTUAL PROPERTY RIGHTS

6.1 **Trademarks**

Each of the Parties hereto shall not copy, use, display, disseminate or authorize to be copied, used, displayed or disseminated any products or written or printed material of any kind which contain any trademarks, logos, images, designs or other intellectual property belonging to the other Party without the other Party's prior written approval, which approval may be arbitrarily withheld.

6.2 **Goodwill**

Each of the Parties hereto acknowledges and recognizes the value of the reputation, image and goodwill associated with the other Party and its trademarks, logos, images, designs and other intellectual property and hereby agrees that it shall not do, cause to be done, omit to do anything or conduct itself in any manner which may in any way jeopardize or adversely affect or degrade or detract from the reputation or image of the other Party, and such intellectual property, or the general goodwill attached thereto.

6.3 **Clients' Proprietary Information**

The Service Provider acknowledges and agrees that information: (i) which is marked "confidential", is stated to be confidential or if by its nature intended to be confidential including all financial information and information relating to customers of PowerStream; (ii) all information concerning customers and employees of PowerStream; and (iii) all information concerning the business transactions, financial projections or other financial arrangements of PowerStream(collectively the "**Information**") received by it from, or on behalf of, PowerStream concerning PowerStream or its business and shall not: (i) use the Information in carrying on its business or hiring any employees of the Corporation for a period of twelve (12) months from termination of this Agreement; (ii) disclose any Information to any competitor to PowerStream or any other person without prior written consent of PowerStream; .Notwithstanding the foregoing, the Service Provider will not be liable for disclosure of any Information if:

(a) the Information becomes generally known in the industry to which the business of PowerStream is related other than through a breach of this Agreement;

(b) the Information is lawfully obtained from a third party without breach of this Agreement by the Service Provider;

(c) the Information was known to the Service Provider prior to its disclosure by PowerStream;

(d) the Information is required to be disclosed pursuant to the requirements of applicable law; or

(e) PowerStream or any individual to whom personal information pertains provides its or their prior written approval of such disclosure by the Service Provider.

6.4 **Intellectual Property**

PowerStream acknowledges that any intellectual property (the "**Intellectual Property**") arising as a result of the Services will be vested in the Service Provider. The Service Provider hereby grants to PowerStream for its own use for an indefinite term the licence rights to produce, publish, translate, reproduce, adapt, broadcast or use at no cost any Intellectual Property.

7. TERM AND TERMINATION

7.1 **Term**

Subject to the rights of earlier termination as provided in this Agreement, this Agreement shall be binding on the Parties upon execution and shall terminate on September 30, 2007 unless terminated at an earlier date by either Party giving the other Party not less than three (3) months written notice of such termination.

7.2 **Early Termination**

Notwithstanding Section 7.1, in the event that, in the sole opinion of PowerStream the Services being provided by the Service Provider are insufficient to permit PowerStream to discharge its

obligations pursuant to the CDM Plan at the option of PowerStream this Agreement shall terminate on the twentieth (20th) Business Day (the "**Early Termination Date**") after PowerStream gives notice of termination to the Service Provider. The Service Provider shall return to PowerStream forthwith any Service Fees not spent or irrevocably committed for expenditure prior to the Early Termination Date.

In the event that a particular program within the Services is, in the sole opinion of PowerStream, contrary to the CDM Initiative Principles, that program may at the option of PowerStream be terminated on the twentieth (20th) Business Day (the "**Program Termination Date**") after PowerStream gives notice of the termination to the Service Provider. The Service Provider shall return to PowerStream forthwith any Service Fees attributable to such program and not spent or irrevocably committed for expenditure prior to the Program Termination Date, unless PowerStream aggress to the reallocation of such funds to other programs.

7.3 **Default and Cure**

Notwithstanding Section 7.1, in the event that either Party (the "**Defaulting Party**"): (i) is in default in the performance of any of the terms, covenants or obligations of this Agreement; and (ii) fails to remedy any such default within ten (5) Business Days of receipt of written notice of such default from the other party (the "**Non-Defaulting Party**"), this Agreement shall, at the option of the non-defaulting Party, be terminated at the expiry of such five (5) Business Days upon receipt by defaulting Party of a further notice from the non-defaulting Party to that effect.

7.4 **Events of Default**

In addition to any other event of default hereunder, a Defaulting Party shall be deemed to be in default under this Agreement and the Non-Defaulting Party may, at its option, immediately terminate this Agreement and all rights granted hereunder forthwith upon the occurrence of any of the following events:

(a) the dissolution, or the liquidation of the assets, of the Defaulting Party, or the filing of a petition in bankruptcy or insolvency or for an arrangement or reorganization by, for or against the Defaulting Party, or the appointment of a receiver or a trustee for all or a portion of the Defaulting Party's property, or if the Defaulting Party makes an assignment for the benefit of its creditors or commits any act for or in bankruptcy; or

(b) the property or assets of the Defaulting Party being seized by a creditor of the Defaulting Party and the same not being released from seizure or bonded out within twenty (20) Business Days from the date of notice of such seizure.

7.5 **Events Upon Termination**

Upon termination or expiration of this Agreement for any reason whatsoever, all rights granted and obligations created under this Agreement shall immediately terminate, except those which are listed in this Agreement as surviving the termination of this Agreement.

8. GENERAL

8.1 Assignment

The Service Provider shall have no right to transfer or assign this Agreement or any of its obligations to a third party without the prior written consent of PowerStream, which consent may not be withheld unreasonably.

8.2 Entire Agreement

This Agreement, including the schedules hereto, constitutes the entire agreement between the Parties with respect to the subject matter hereof. This Agreement shall be binding on the parties hereto and their successors and permitted assigns. No amendment, modification or change to this Agreement shall be valid unless made in writing and signed by both Parties.

8.3 Independent Contractor

It is agreed by the Parties hereto that this Agreement does not create a fiduciary relationship between them, that the Service Provider is an independent contractor, and that nothing in this Agreement is intended to constitute either Party as an agent, legal representative, subsidiary, joint venturer, partner, employee or servant of the other for any purpose whatsoever. The Service Provider further agrees that it shall be a condition of employment of the Staff that the Staff are not agents or representatives of PowerStream and that the Staff do not have the authority to enter into agreements on behalf of PowerStream.

8.4 No Authority to Contract

It is understood and agreed that nothing in this Agreement authorizes the Service Provider to make any contract, agreement, warranty or representation on PowerStream's behalf, or to incur any debt or other obligation in PowerStream's name, and that PowerStream shall in no event assume liability for, or be deemed liable hereunder as a result of any action, or by reason of any act or omission of the Service Provider in the provision of the Service Provider's obligations hereunder, any claim, or judgment arising therefrom against PowerStream.

8.5 Further Assurances

The parties hereto agree to execute and deliver such further and other documents and perform and cause to be performed such further and other acts and things as may be necessary or desirable in order to give full effect to this Agreement and every Article hereof.

8.6 No Waiver of Default

No action or failure to act by PowerStream shall constitute a waiver of any right or duty afforded it under this Agreement, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach of this Agreement, except as may be specifically agreed in writing.

8.7 **Headings**

The headings in this Agreement are inserted for convenience of reference only and shall not affect the interpretation hereof.

8.8 **Notices**

Any notice, direction or other instrument (a "**Notice**") required or permitted to be given to any Party hereto shall be in writing and shall be sufficiently given if delivered personally by email, by courier or by facsimile as follows:

in the case of PowerStream, at:

PowerStream Inc.
8100 Warden Avenue
PO Box 4100
Markham, Ontario L3R 8H7
Attention: Patrick Guran, Chief Energy Conversation Officer
Email: patrick.guran@powerstream.ca

in the case of the Service Provider, at:

Town of Markham.
Anthony Roman Centre
101 Town Centre Blvd
Markham, Ontario L3R 9W3
Attention: Jim Sales, Commissioner, Community & Fire Services
Email: <>

Any Notice, delivered personally or by email, shall be deemed to have been given and received on the date on which it was delivered, provided that if such day is not a business day then the Notice shall be deemed to have been given and received on the first business day next following such day. Any Notice, delivered by courier, shall be deemed to have been given and received on the day after the date on which it was delivered, provided that if such day is not a business day then the Notice shall be deemed to have been given and received on the first business day next following such day. Any party hereto may change its address for service from time to time by notice given to the other party hereto in accordance with the foregoing provisions.

8.9 **Applicable Law**

This Agreement shall be construed and enforced in accordance with, and the rights of the parties hereto shall be governed by, the laws of the Province of Ontario and the laws of Canada applicable therein.

[signature page follows]

IN WITNESS WHEREOF the parties hereto have executed this Agreement on the day and year first above written.

POWERSTREAM INC.

By: _____

name: Dennis Nolan
title: Executive Vice President Corporate Services and Secretary

TOWN OF MARKHAM

By: _____

name: Jim Sales
title: Commissioner, Community & Fire Services

SCHEDULE A

CDM PLAN

[to be attached]

PowerStream Inc.

Conservation and Demand Management Plan

Ontario Energy Board File No. RP-2004-0203

November 4th, 2004

PowerStream

YOUR CURRENT CONNECTION

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Introduction

Ontario's Minister of Energy has authorized electricity distributors to apply to the Ontario Energy Board (Board) for 2005 rate implementation of their third installment of market adjusted revenue requirement (MARR), on the condition that an equivalent amount of incremental revenue be invested by those distributors in conservation and demand management activities. In a letter dated May 31, 2004 to electricity distributors, the Minister identified some of the activities that might be included in a distributor's Conservation and Demand Management Plan, including:

- Energy efficiency;
- Behavioural and operational changes, including the application of benchmarking or "SMART" control systems;
- Load management measures which facilitate interruptible and dispatchable loads, dual fuel applications, thermal storage, and demand response;
- Measures to encourage fuel switching which reduces the total system energy for a given end-use;
- Programs and initiatives targeted to low income and other hard to reach consumers; and
- Distributed energy options behind a customer's meter such as tri-generation, co-generation, ground source heat pumps, solar, wind, and biomass systems.

On October 5, 2004 the Board issued a procedural order (RP-2004-0203) setting out the process for how distributors may apply for approval of a Conservation and Demand Management Plan. It also set out the filing requirements for a distributor's plan. Distributors were given the option of applying for interim or final approval of their plan.

PowerStream's Conservation and Demand Management (CDM) Plan has been developed within the context of the Minister of Energy's May 31, 2004 letter and the procedural order issued by the Board.

PowerStream hereby requests the Board's approval and final order authorizing its CDM plan as being appropriate and effective in discharging its CDM investment obligation, subject to issuance in due course of an order for distribution rates including the final tranche of the market adjusted revenue requirement (MARR).

PowerStream
YOUR CURRENT CONNECTION

Plan Budget and Assumptions

PowerStream's third MARR installment is approximately $6.4 million, exclusive of any payments in lieu of taxes.

Through a letter accompanying its Preliminary Guidelines for Electricity Distributor Conservation and Demand Management Activities, the Board has authorized that distributor conservation and demand management spending may occur until September 30, 2007.

PowerStream's Conservation and Demand Management Plan is therefore based on investing approximately $6.4 million in a combination of capital and operating expenses during the period from January 1, 2004 to September 30, 2007.

The implementation of this plan will require re-deployment of some existing personnel. Costs associated with the use of existing resources to implement this plan have been allocated to the individual programs and are provided for in the annual budget figures. Administrative and overhead costs have been provided for by incorporating them in the program budgets.

While the current plan is well balanced, it is recognized that the industry and regulatory framework is dynamic. PowerStream will continue to assess and update its plan as new opportunities are presented. If necessary, PowerStream will re-allocate funds between programs to respond to customer demand levels. However, PowerStream will make best efforts to achieve the target levels of capital and operating expenditures by year.

Objectives

The Province of Ontario is facing serious challenges in meeting its future electricity needs. Energy conservation and demand management has been identified as one of the most viable and cost-effective means of meeting the province's energy needs in the short term.

The Minister of Energy has called for the creation of a 'Conservation Culture' in the province, and has established two important objectives for the electricity sector and electricity consumers. First, he has targeted a reduction in Ontario's demand for electricity by 5% by 2007. Second, he has committed to the installation of 800,000 SMART electricity meters by 2007, and the full deployment of SMART meters for all electricity consumers by 2010.

The objective of this plan is to contribute to the emergence of a conservation culture in Ontario and, more specifically, to support the Minister's commitments to peak demand reduction and SMART meter installations.

Strategy

In developing this plan, the following criteria were used to guide the selection of component programs:

i. Allocation of Benefits – The overall plan should distribute benefits broadly to PowerStream's customers.

ii. Certainty of Achieving Targeted Benefits – Preference was given to investments that offer more predictable results.

iii. Leveraging Partnerships – Partnerships will be sought to deliver 'behind the meter' programs that will benefit from greater scale for cost-effective implementation, such as Markham Energy Conservation Office, City of Vaughan, Town of Markham, Town of Richmond Hill, Toronto & Region Conservation Authority, and other LDC's.

Programs

Conservation and Demand Management (CDM)

Residential and Small Commercial (< 50kW)

Co-branded Mass Market Program

Description

This flagship co-branded mass-market program (e.g. *powerWISE™*) is a multifaceted approach to fostering the conservation culture in Ontario. Through development of a significant cooperative effort amongst six of the largest municipal LDC's, this program will become synonymous with specific initiatives such as Compact Fluorescent Lighting (CFL) change out programs, LED Christmas Lights, Energy Star, Multi-Choice, energy audits, water heater blanket wraps, school based education and a host of other programs aimed at providing customers with the tools and education needed to reduce their energy usage. Access to online services such as energy consumption calculators, an energy expert, and personalized energy audit services are contemplated as components of this program.

Target users

Mass-market including residential and small commercial

Benefits

Increased awareness, improved product supply, culture shift, and significant demand and energy reductions.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$160	$224	$256	$640
Capital Expenditures	0	0	0	$0
Totals	$160	$224	$256	$640

SMART Meter Pilot

Description

A pilot program for residential SMART meters will be deployed to enable the assessment of metering, communications, settlement, load control and other technologies that may be used to accommodate the universal application of SMART meters in the future. Further, sub-metering opportunities for the purposes of customer information in a bulk-metered situation (i.e. condominiums) may be considered.

This initiative will commence upon the release of a formal definition of a SMART meter by the Board.

Target users

Residential and small commercial customers.

Benefits

This program supports the Minister of Energy's commitment to the installation of 800,000 SMART meters across Ontario by 2007. It will provide PowerStream with the experience and knowledge needed to efficiently expand the use of SMART meters over the next several years.

In conjunction with appropriate rate structures, the program will also provide customers participating in the pilot programs with an incentive to conserve or shift energy use.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$72	$70	$41	$142
Capital Expenditures	$398	278	0	$676
Totals	$470	$348	$41	$818

PowerStream
YOUR CURRENT CONNECTION

Design Advisory/Audits Program

Description

This initiative helps to create an integrated approach to the design process for new buildings, and involves architects, engineers, building owners and PowerStream design advisors. Through visits or by working through existing service advisors PowerStream will provide conservation information and make specific recommendations for energy savings.

Target users

Residential and small commercial customers

Benefits

This program results in cost effective improvements to the energy efficiency of a building without adversely affecting other performance requirements stipulated by the owner. More specifically, the Advisor can develop an energy performance model to demonstrate achievable energy savings and provide a breakdown of energy end uses. Through the installation of energy efficient equipment during construction, the customer benefits by avoiding stranded costs incurred with equipment upgrades.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$69	$110	$96	$275
Capital Expenditures	$37	$59	$52	$148
Totals	$106	$169	$148	$423

PowerStream
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Residential Load Control Initiative

Description

Load control uses a real time communications link to enable or disable customer loads at the discretion of the utility. These controls are usually engaged during system peak periods or when required to relieve pressure on the system grid and may include such "dispatchable" loads as electric hot water tanks, pool pumps, lighting, air conditioners, etc.

Target users

Direct load control applies to all market segments. Though the control systems and technologies may vary by market segment, the methodology remains the same.

Benefits

Load control allows customers to respond quickly to external price signals. This also provides a mechanism for utilities to relieve pressure on constrained areas within the distribution grid and also reduces the need to bring on large peaking generators.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$39	$62	$54	$155
Capital Expenditures	0	$187	$101	$288
Totals	$39	$249	$155	$443

Social Housing Program

Description

A province wide centralized energy management service for the social housing sector may be developed in collaboration with the Provincial Government, utilities (e.g. Enbridge, Union Gas) and others.

A pilot program will be conducted to determine feasibility with an expectation that a full-scale provincial program would follow.

Target users

Local social housing corporations, non-profit homes and co-op housing.

Benefits

Synergies will be created though the combined initiatives of the various agencies.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$97.9	$97.2	$72.9	$268
Capital Expenditures	0	0	0	0
Totals	$97.9	$97.2	$72.9	$268

Commercial, Industrial and Institutional (> 50 kW)

SMART Meter Program

Description

LDC will make an investment to further the use of PowerStream SMART or interval meters by commercial industrial and institutional customers.

This program will commence upon the release of a formal definition of a SMART meter by the Board.

Target users

Commercial, Industrial and Institutional customers

Benefits

This program supports the Minister of Energy's commitment to the installation of 800,000 SMART meters across Ontario by 2007. These meters are seen as an important means of establishing a 'conservation culture' in Ontario. In conjunction with appropriate rate structures, they will encourage customers to conserve or shift energy use.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$17.6	$28	$33.4	$79
Capital Expenditures	$70.4	$112	$97.6	$280
Totals	$88	$140	$122	$359

Energy Audits, Retrofits and Partnerships

Description

A standard energy audit will be used to assist customers in reducing their loads. As well, a training program may be implemented to allow companies with a certified employee or outside consultants to perform the audit. Any cross-linkages with the residential audit project will be accessed where feasible. Strategic partnerships will be analyzed for incentives or other synergies. These audits could led to retrofits. Existing audit/retrofit programs will be evaluated.

Target users

Large consumers over 50 kW including schools, large commercial facilities, institutional facilities, industrial, and municipal facilities like recreation centres, arenas, and libraries.

Benefits

Include increased awareness, skills development, benchmarking energy data, establishing best practices, fostering the conservation culture within this sector and significant reductions in demand and energy consumption.

Budget

$K	2005	2006	2007	Totals
Operating Expense	$132	$210	$184	$526
Capital Expenditures	$70	$112	$98	$280
Totals	$202	$322	$282	$806

Leveraging Energy Conservation and/or Load Management Programs

Description

Energy conservation and/or load management programs such as NRCan's Energy Innovators initiative, Enbridge initiatives etc. will be promoted and incentives may be provided to advance market uptake of these programs and implementation of the recommendations. The LDC's are well positioned to introduce such programs to their customer base. Work will be conducted with the existing program providers to maximize leverage opportunities. Promotion will potentially include face-to-face meetings, educational initiatives, conferences and seminars.

Target users

Large consumers over 50 kW, MUSH including schools, large commercial facilities, institutional facilities, industrial, and municipal facilities

Benefits

Customer awareness and additional incentives will help advance market uptake of audit services, feasibility studies and retrofit opportunities already established within the government program framework.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$135	$217	$190	$542
Capital Expenditures	$73	$143	$102	$318
Totals	$208	$164	$292	$860

Demand Response Initiative

Description

Load control uses a real time communications link to enable or disable customer loads at the discretion of the utility. These controls are usually engaged during system peak periods or when required to relieve pressure on the system grid.

Target Users

Larger commercial, industrial and institutional customers.

Benefit

Demand control provides lower costs and increased stability for customers and utilities.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$26	$41	$36	$103
Capital Expenditures	$48	$77	$67	$192
Totals	$74	$118	$103	$295

PowerStream
YOUR CURRENT CONNECTION

Design Advisory Program

Description

This initiative helps to create an integrated approach to the design process for new buildings, and involves architects, engineers, building owners and PowerStream design advisors.

Target users

Commercial, Industrial and Institutional customers.

Benefits

This program results in cost effective improvements to the energy efficiency of a building without adversely affecting other performance requirements stipulated by the owner. An energy performance model can be created to demonstrate achievable energy savings and can provide a breakdown of energy use. Through the installation of energy efficient equipment during construction, the customer benefits by avoiding the stranded costs incurred with equipment upgrades after the fact.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$61	$98	$86	$245
Capital Expenditures	$33	$53	$46	$132
Totals	$94	$151	$132	$377

Distribution Loss Reduction

Distribution Loss Reduction

Description

The Distribution Loss Program is a broad network based initiative to drive greater efficiencies within the distribution grid. This program will identify opportunities for system enhancements. Next steps will be to complete the engineering analysis and feasibility studies. Projects will be prioritized, selected and implemented based on the most attractive investment to results ratio. Items to be addressed may include, but are not limited to:

Power Factor Correction - Under the Power Factor Correction initiative, a power factor assessment will be completed which will identify locations for the installation of power factor correction capacitor banks.

Voltage Conversion - Voltage upgrades can save up to 90% of the losses associated with a feeder as higher voltages and lower current results in lower losses. This study will ascertain the locations and value of voltage conversions. This program could also involve changing out all the meters on a particular feeder to SMART Meters so that the exact losses can be determined.

Power System Load Balancing - This program is designed to ascertain where load shifting can occur within the grid to improve system efficiency including the location of optimized "open points".

Voltage Profile Management - Changing voltage profiles at the distribution station level can result in a peak reduction at the controllable distribution stations. This is in addition to the IMO's voltage reduction program and will not interfere with the effectiveness of that program.

Line Loss Reductions - Replacement of conductors such as #6 AWG copper with #2 AWG aluminum can reduce line losses. An evaluation of where such opportunities exist may be undertaken. The results and available funding will determine which projects proceed.

Transformer and Other Losses – Using infrared scans of transformers this program will help to identify additional electricity losses including overloaded equipment. "Hot" transformers will be investigated further to determine operational improvement opportunities.

Target users

The results of this program will positively impact all of PowerStream's customers.

Benefits

Reduced electricity distribution system delivery losses will reduce system demand, relieve network capacity to accommodate growth, and reduce the requirement for new generating capacity in the Province. Costs associated with distribution system delivery losses are recovered through electricity distribution charges. Reductions in these costs will therefore benefit all customers.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$12	$19.2	$16.8	$48
Capital Expenditures	$108	$172.8	$151.2	$432
Totals	$120	$192	$168	$480

Distributed Energy

Load Displacement

Description

Distributed generation behind the customer's meter provide an excellent opportunity to displace load from the local distribution system's grid in a very effective manner. Load displacement technology, such as combined heat and power systems, provides increased power efficiency. This may include technology such as thermal storage systems. Combined with an existing or new district heating/cooling distribution system this technology contributes to the development of sustainable energy networks within Ontario's communities.

Other technologies such as micro-turbines, wind, biomass fuels and solar provide additional options to meet the customer's needs. This initiative will facilitate the development and implementation of these opportunities. Financial incentives will be considered based on the project's viability.

Development of educational and technology programs in conjunction with local colleges and universities may be considered. Small pilots or demonstration projects to promote alternative and renewable energy sources may also be considered.

Target users

Commercial, industrial, and residential, schools, colleges and universities

Benefits

Benefits include additional capacity within the grid. Cleaner technologies result in reductions in green house gas (GHG) emissions. Other benefits include improved system reliability, reduced harmonics, backup power possibilities, education and skills development.

Budget

$k	2005	2006	2007	Totals
Operating Expense	$128	$204.8	$170.2	$503
Capital Expenditures	$32	$51.2	$44.8	$128
Totals	$160	$256	$215	$631

Conclusion

PowerStream believes that the plan set out in this document is a prudent and effective approach in helping to achieve the Province's energy conservation and demand management goals. This plan addresses many of the potential initiatives outlined in the Minister's letter and represents a responsible first step in PowerStream's implementation of CDM programs.

PowerStream looks forward to the Board's approval of this plan and the implementation of these initiatives. PowerStream requests that in the Board's Decision granting approval of PowerStream's Conservation and Demand Management Plan, the Board confirm that the approved plan will discharge PowerStream's obligation to invest an amount equivalent to it's third tranche MBRR, subject to ex post review by the Board only with respect to planned versus actual CDM spending.

Contact Information

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Program Budget and Timeline Summary

The following spreadsheet provides an overall summary of funding and timelines for the suite of PowerStream's Conservation and Demand Management Programs.

SUMMARY INFORMATION POWERSTREAM

		Annual Budget ($ '000)			Total Budget
		2004-05	2006	2007	$6,400
CONSERVATION AND DEMAND MANAGEMENT					
Residential and Small Commercial (< 50 kW)					
- Co-branded Mass Market Program	OPEX	$160	$224	$256	$640
	CAPEX	0	0	0	$0
- Smart Meter Pilot	OPEX	$72	$70	$0	$142
	CAPEX	$398	$278	$0	$676
		$0	$0	$0	$0
-Design Advisory/Audits	OPEX	$37	$59	$52	$148
	CAPEX	$69	$110	$96	$275
		$0	$0	$0	$0
-Load Control	OPEX	$39	$62	$54	$155
	CAPEX	$0	$187	$101	$288
		$0	$0	$0	$0
-Social Housing	OPEX	$98	$97	$73	$268
	CAPEX	$0	$0	$0	$0
Commercial, Industrial & Institutional Market (> 50 kW)					
-Smart Meters	OPEX	$18	$28	$24	$70
	CAPEX	$70	$112	$98	$280
		$0	$0	$0	$0
-Audits, retrofits, partnerships	OPEX	$70	$112	$98	$280
	CAPEX	$132	$210	$184	$526
		$0	$0	$0	$0
- Leveraging Conservation Programs and Initiatives	OPEX	$73	$143	$102	$318
	CAPEX	$135	$217	$190	$542
		$0	$0	$0	$0
-Demand response (load control)	OPEX	$26	$41	$36	$103
	CAPEX	$48	$77	$67	$192
		$0	$0	$0	$0
- Design Advisory	OPEX	$33	$53	$46	$132
	CAPEX	$61	$98	$86	$245
		$0	$0	$0	$0
Sub-Total, Conservation & Demand Management:		$1,539	$2,178	$1,563	$5,280

DISTRIBUTION LOSS REDUCTION					
- Distribution Loss Reduction (capacitors, balancing, voltage reduction)	OPEX	$12	$19	$17	$48
	CAPEX	$108	$173	$151	$432
Sub-Total, Distribution Loss Reduction:		$120	$192	$168	$480
DISTRIBUTED ENERGY					
- Distributed Energy (e.g. Markham District Energy)	OPEX	$128	$205	$179	$512
	CAPEX	$32	$51	$45	$128
Sub-Total, Distributed Energy:		$160	$256	$224	$640
Total Budget, All Programs		$1,819	$2,626	$1,955	$6,400

SCHEDULE B

SERVICES FEES

Due Date	September 2005	June 1 2006	June 1 2007
Service Fee Amount	$500,000	$250,000	$250,000

SCHEDULE C

SERVICES

The Service Provider will carry out the following activities related to the programs listed on this Schedule "C" while integrating the priorities of PowerStream's CDM Plan, including:

(a) Analysis and evaluation of existing CDM delivery structure;

(b) Partnership development with municipal, provincial and corporate stakeholders;

(c) Marketing and promotion of CDM to raise its, and PowerStream's, profile within the municipality of Markham;

(d) Identification and analysis of potential external sources of funding to support CDM;

(e) Development of a detailed annual work plan incorporating the elements of program administration and delivery; and,

(f) Utilizing results from activities (i) through (v), design a mutually acceptable delivery structure and program framework into 2007.

The Service Provider will carry out the following projects:

1. Cool Shops

This program targets small commercial customers to upgrade their air conditioning and lighting equipment to produce both consumption and peak energy savings. This program will work with the Clean Air Foundation, a non-profit central co-ordinating agency that works to further sustainable environmental goals.

2. High Performance Building Development

This program is targeted at architects and consultants to influence them to develop building construction standards to achieve high levels of energy efficiency. This includes incorporating the LEED building standard in their project plans.

3. Better Buildings Partnership

The Better Buildings Partnership involves comprehensive energy efficiency retrofits and building renewal initiatives for all buildings in the Town of Markham in both the public and private sectors. Comprehensive building improvements normally consist of a mix of short and long-term payback measures where significant energy and water technologies are bundled together with other building renewal measures to allow for project flexibility

4. Combined Utility Metering Pilot

This proposed program combines two concepts – district energy to a townhome complex and multi-utility metering. Markham District Energy (MDE) is uniquely situated to provide district energy to the townhouse complex and this will provide opportunities for a complimentary program with PowerStream's Smart Metering pilot programs. While PowerStream CDM Smart Meter pilot programs are planned to be multi-utility, this unique project will provide the opportunity for Markham ECO to facilitate the participation and interfacing of the District Energy project onto a common platform to encourage gas, electricity, water and district energy conservation efforts in the home.

5. Employee Awareness Program

E3@Work- Employees will be taught how to save money by reducing energy use throughout the workplace. By turning off electrical equipment (e.g. lighting, computers) when not in use, and consequently reducing the temperature in the workplace environment, significant energy savings can result.

E3@Home - Similar to E3@Work, but with concentration on teaching employees how to reduce energy use and costs at home.

6. Intelligent System Monitoring

This program involves a centralized computer monitoring system for the Town of Markham's various facilities, utilizing technology developed by York Region. The Town of Markham has already approved the purchase of the system, but there is a need for support in interpreting and using the information provided by the system.

SCHEDULE D

CDM INITIATIVE PRINCIPLES

(a) The programs and measures to be pursued by the Service Provider should be cost-effective (based on a total resource cost test).

(b) The initiative should leverage and complement PowerStream's CDM resources and activities, not duplicate them.

(c) While PowerStream and the Service Provider may have different objectives, the initiative should focus on those objectives that are mutually shared between the Parties. The specifics of the CDM project's structure and funding arrangement should reflect these shared objectives.

(d) Funding arrangements with the Service Providers will have a review period every six months to evaluate progress.

(e) CDM Initiatives that provide access to "hard to serve" markets or exclusive access to innovative technologies and programs will be reviewed prior to implementation.

(f) CDM Initiatives that provide coverage of PowerStream's entire service territory are preferable.

(g) PowerStream's logo and branding should be clearly visible in all activities of the partnership. Where appropriate the PowerWise logo will also be used.

(h) PowerStream is fully accountable to the OEB for achieving the committed results for our approved CDM program. Reporting by the Service Provider must recognise this accountability and fully integrate with PowerStream's ongoing CDM reporting obligations.

REPORT TO Committee of the Whole

TO:	Mayor and Members of Council
FROM:	John Livey, CAO Jim Sales, Commissioner of Community and Fire Services
PREPARED BY:	Stuart Taylor, Director, Strategic Services Anne Pozywiak, Director, Strategic Initiatives
DATE OF MEETING:	June 14, 2005
SUBJECT:	The Markham Energy Conservation Office

RECOMMENDATION:
THAT the staff report entitled "The Markham Energy Conservation Office", dated June 14, 2005, be received;

AND THAT the Markham Energy Conservation Office allocate $1,000,000 over three years, $500,000 in 2005, $250,000 in 2006 and $250,000 in 2007, in conservation demand management funding from PowerStream toward the objectives, programs and staffing outlined in Appendix B;

AND THAT the Canadian Urban Institute be funded to an upset limit of $65,000 from the conservation demand management funding from June 2005 through March 2006 to implement and lead the start up of the Markham Energy Conservation Office;

AND THAT approval be given to hire a Manager of the Markham Energy Conservation Office and one administrative support staff person on a annual contract for up to three years to oversee the conservation demand management program;

AND FURTHER THAT the Town provide up front funding for the contract positions at a cost of $127,100 annually to oversee the conservation demand management program to be repaid from future energy cost savings.

PURPOSE:
The purpose of this report is to establish the Markham Energy Conservation Office (MECO) objectives, business plan and staffing to initiate the energy demand conservation program.

BACKGROUND:
In February 2003, the Engage 21st Century Markham process was completed and outlined a 20-year vision for the Town. The Engage process, led by the Mayor, Council and senior staff, was built on the vision, desires and values of many stakeholders. The process created a vision and

mission for the Town that allowed a number of corporate strategic objectives to emerge including environmental protection and management. This report outlines the concept, program and benefits that the Markham Energy Conservation Office will provide to the Town and the community. Implementing the Markham Energy Conservation programs will allow for energy and resource conservation, encourage a sustainable community and assist the Town of Markham in achieving Kyoto Protocol objectives. It is within the context of the Engage 21st Century Markham strategic vision that the Town has pursued and created the Markham Energy Conservation Office.

Markham's Strategic Objective: Protect and Enhance a Healthy Ecosystem

One of the Town of Markham's strategic objectives is to "protect, enhance and restore...a healthy ecosystem". Markham residents, Council and staff share a common objective of protecting and enhancing our ecosystem. Using resources wisely is good for the environment, makes economic sense and secures a healthy future for our children and future generations. The Town has undertaken many environmental efforts to achieve our corporate environmental objective.

The Markham Energy Conservation Office is an important environmental initiative that will improve air quality, conserve resources and raise public awareness that conservation starts with individuals changing their day-to-day attitudes and behaviours. From September 2004 through May 2005 there have been ongoing negotiations with PowerStream, Markham Energy Conservation Office and the Ontario Energy Board to establish a conservation demand management program. As a result of these discussions, the Markham Energy Conservation Office will receive $1,000,000 in funding over the next three years from PowerStream to initiate energy conservation programs.

The Markham Energy Conservation Office will have a small complement of contract staff focused on developing and implementing funded programs. The office will report to Council through General Committee meetings on the Community Services and Environment agenda.

The energy conservation funding will be targeted at six programs, outlined in Appendix B, which allow Markham to assume a leadership role as a local champion for energy conservation and efficiency. The Markham ECO efforts will reduce current energy demand by encouraging better building efficiency, better building design and introducing new delivery methodologies and/or technology. The end result will be to improve energy efficiency within existing infrastructure, encourage energy efficient design in new infrastructure and create new delivery processes to reduce demand on the existing grid. In addition, Markham ECO will initiate an employee awareness program that will encourage behaviour change to reduce consumption in the workplace and at home. Markham staff will become front line ambassadors for energy conservation.

Markham Energy Conservation Office is Aligned to Provincial Conservation Culture

In January 2004, the provincial government announced its commitment to make conservation, demand management and demand response strategies a cornerstone of Ontario's long-term energy future. Specifically, the Province committed to:

- **Creating a "conservation culture" in Ontario** : Making conservation, demand management and demand response strategies a cornerstone of Ontario's long-term energy future;
- **Reliability, diversity and affordability**: A reliable, sustainable and diverse supply of competitively priced power;
- **Effective consumer protection** : Consumers, especially residential and small business consumers, will be protected from excessive price volatility;
- **A stronger investment climate** : The government will encourage new investment in conservation, generation and transmission;
- **Cleaner Air** : The government will contribute to the clean up of our air by eliminating coal fired generation and replacing it with other, cleaner sources of energy.

Markham ECO Objectives

The Markham ECO approach to energy and resource conservation has been aligned to the Province's conservation culture in determining energy conservation objectives. The Markham ECO will:

- Become a local champion for energy conservation and set a national example;
- Make Markham more energy efficient thereby reducing greenhouse gas emissions;
- Enhance Markham's local energy supply and reduce its dependency on the grid;
- Leverage multiple funding sources to deliver programs; and
- Help reduce electricity consumption by 5% in 2007, 10% in 2014, with corresponding 10% and 20% peak reductions.

Markham ECO Business Plan

In June 2004, Markham retained the Canadian Urban Institute to prepare the Energy Conservation Office business plan. The business plan has been adapted based on the ongoing negotiations with PowerStream, Markham ECO and the Ontario Energy Board to establish the conservation demand management program. The ECO objectives are best achieved through an approach that builds industry connections and delivers direct programs focused on curbing energy demand. The Markham Energy Conservation Office will;

- Solidify the partnership amongst PowerStream, Markham District Energy and Markham Business Enterprises
- Develop partnerships with Enbridge and industry associations
- Display local leadership and reach out to residents and businesses across Markham
- Leverage funding opportunities from NRCan, Federation of Canadian Municipalities, Conservation Bureau and the Association of Municipalities of Ontario
- Establish the Markham Energy Conservation Office programs in June 2005.

Programs are funded for each of the three years with the greatest expenditure incurred in the first year. The following section provides an overall description of the Markham ECO programs, environmental benefits and staffing.

Markham District Energy Thermal Storage Project Will Compliment Markham ECO
In addition, Markham District Energy will receive $150,000 in funding towards a thermal storage project. Markham District Energy is building a thermal storage chamber that cools water during off-peak periods and re-distributes to end users during peak demand periods. The storage chamber would allow existing customers to switch from their existing chillers and tap into an alternative cooling source, thereby reducing demand and conserving energy.

DISCUSSION:
The Markham ECO business plan proposes six programs which are highlighted in Table 1 (below). TABLE 1 is a summary of the demand shedding and cost avoidance targets for each program by the end of the third year. It is generally accepted that the cost to generate and distribute electricity is $0.11 per kwH. The savings from the conservation demand management program in TABLE 1 are based on a cost reduction of $0.11 per kwH.

TABLE 1: Summary of Conservation Impact

Program	kwH Reduction	Annual Cost Reduction ($.11 kwH)	Implementation Cost
1. Better Building Partnerships	3,000,000	$330,000	$295,000
2. Advancing High Performance Buildings	1,250,000	$137,500	$285,000
3. Bringing "Cool Shops" to Markham	1,200,000	$132,000	$175,000
4. Combined Utility Metering Pilot	160,000	$17,600	$105,000
5. Energy and Environmental Management System software	200,000	$22,000	$70,000
6. At-Work Energy Conservation Program	800,000	$88,000	$70,000
Total	**6,610,000**	**$727,100**	**$1,000,000**

Appendix B provides a high level overview and budget projection for each of the six programs in TABLE 1.

The Markham ECO office will need to be adept at measuring current consumption patterns and load shedding impact of energy conservation programs as behavior change takes place. Measuring the demand reduction and demand avoidance impact of Markham ECO efforts will be required throughout the program lifecycle.

For example, the *Advancing High Performance Buildings* program is focused on new designs, construction and operating approaches that will reduce the energy consumption of new infrastructure. Therefore there is a need to document existing benchmarks and measure the outputs from new buildings that participate in the *Advancing High Performance Buildings*

program. On average, high performance buildings (such as a certified Leadership in Energy and Environmental Design structure), achieve a 30% reduction in energy consumption. There are two key items to emphasize;

- The Markham Energy Conservation Office demand management program is about future cost avoidance as much as it is about reducing existing consumption patterns.

- Performance measurement will be a cornerstone of the program. This means that pre and post program measurements must be put into place for each energy conservation program.

Successful energy conservation programs will allow existing consumers and future consumers to reduce their energy costs. However, it must be anticipated that development and growth within Markham will, at some point in time, consume demand that has been shed.

Markham ECO Will Deliver a broad Environmental Benefit

The greatest benefits and returns of the Markham ECO programs will accrue to individuals, the business community and the broader community. The Markham ECO programs are anticipated to create annual CO2 reductions of 5,800 tonnes (a credit toward Kyoto objectives) having a positive impact on air quality. In addition, early adopters in the business and residential hydro market will be provided with energy cost reductions/cost avoidance of $726,000 per annum at the end of the third year. The energy conservation program will demonstrate Markham's leadership and commitment to energy conservation and environmental sustainability. Markham ECO will set new municipal government benchmarks for conservation efforts within Canada and across North America.

Energy Conservation Office will provide a Direct Benefit to the Town

This report recommends that the Town of Markham invest $127,100 on an annual basis to provide two contract staff positions toward planning, organizing, leading and controlling the energy conservation program. The Town of Markham is anticipated to realize the following annual cost savings from the program;

- Application of the Better Building Program to Town of Markham facilities is anticipated to create annual savings of $75,000
- Implementation of the high performance building program will provide cost avoidance of $35,000 in reduced energy bills for new facilities
- Initiating the Employee Awareness conservation program is projected to reduce energy consumption by $88,000
- Purchasing the Energy and Environmental Management System (EEMS) software will provide a measurement tool related to energy, water and fuel consumption that will lead to cost reductions/avoidance of $22,000

To summarize, as the energy conservation program is fully implemented, the Town will invest $127,100 on an annual basis for staffing to realize a direct cost savings/avoidance of $220,000 annually.

Program Cost Summary
The total cost estimate of these projects over three years is $1,000,000. Program budgets include the cost of the Canadian Urban Institute involvement in implementation, program specific staffing, operating costs and communication.

The Town of Markham will fund the Manager of the Markham Energy Conservation Office and one administrative support staff on a contract basis for $127,100 per annum. In addition the Town will provide office space for the Energy Conservation Office, information technology support, telecommunications and direct support from existing staff when appropriate.

Simple Payback Projection
If at the end of the third year, 100% of the energy efficiency cost avoidance and demand reduction targets identified in Table 1 are achieved, the pay back projection, including Town of Markham direct staff support, for the program is:

$1,381,300/ $727,100 = 1.90 years or 23 months

The specific programs and budget allocation for each program is attached in Appendix B.

Markham ECO Staffing
The Markham ECO will retain a combination of full time and part time contract staff. Markham ECO will retain two full time contract positions including;

- Manager of Markham Energy Conservation Office
- One Administrative Support staff

The full time ECO contract staff will be funded by the Town at a cost of $127,100 on an annual basis.

In addition, the conservation demand management budget through PowerStream will fund a number of part time and short-term full time contracts focused entirely on developing and implementing funded programs. This will include funding to retain expert knowledge for specific programs. The ECO Manager will be responsible for hiring staff, administration of the ECO conservation demand management program, applying for additional financial support, tracking performance and preparing reports on conservation demand outcomes to the CAO, Markham Council, PowerStream and the Province.

With respect to the Energy and Environmental Management System (EEMS) software and the At-Work Energy Conservation Program, existing Town staff in the environmental leadership portfolio may take on a leadership role. Existing staff have a better understanding of the internal touch points and processes required to implement the EEMS program. This knowledge will streamline implementation. In addition, existing staff have gained some valuable experience with public education through the Idle Free Challenge, which can be applied to the At-Work Energy Conservation Program. Throughout the lifecycle of the program, performance results will be tracked and reported through the Manager of the Energy Conservation Office.

Link ECO with Environmental Leadership to form a Project Management Team
In the short term there is value in integrating the Markham ECO staff and the ECO program with the existing Environmental Leadership portfolio within the Strategic Services work group in the Community Services and Fire Commission. By the fall of 2005, this will create a project team of three managers, two within the Environmental Leadership portfolio and the ECO manager. Each manager will be responsible for specific environmental projects.

The Energy Conservation Office and the Environmental Leadership project team will meet on a monthly basis. Linking this project team together will facilitate information sharing, pool resources and create a broader awareness of the environmental efforts within the organization. In addition, the Transportation Demand Management (TDM) program promotes a number of clean air programs. The TDM manager should attend these meetings to share information and coordinate efforts when appropriate.

Reporting Outcome Achievements
The Environmental Management Project Team, including the Markham ECO, will continue to report through the existing Town of Markham Committee structure. However, as the Markham ECO is established there will be a number of milestone meetings to review results of the energy conservation efforts and prepare reports for PowerStream and the Province. These meetings will be scheduled as required focusing on ECO project results. The Director of Strategic Initiatives will attend these meetings to facilitate communication to the Chief Administrative Officer and Commissioner group on conservation demand progress. This will help ensure that the energy conservation program secures support from across the whole organization as required.

Once fully operational, the Markham Energy Conservation Office is expected to produce the following results;

- Annual cost avoidance of $726,600
- Annual cost avoidance of $220,000 directly to the Town
- Annual CO2 reductions of 5,800 tonnes toward Kyoto objectives
- Additional leverage of partnerships with NRCan, FCM and OPA Conservation Bureau

Progress reports will be provided on a quarterly basis.

Retain Canadian Urban Institute to Establish the ECO Program
It is recommended that the Canadian Urban Institute be retained to work on implementing, oversight and reporting on the Energy Conservation Office efforts. The Canadian Urban Institute created the ECO business plan, has expert knowledge of the energy market and a full understanding of the performance expectations for the Markham Energy Conservation Office. It is critical to the process to continue to engage the Canadian Urban Institute over the next year to hire the ECO Manager, establish the energy conservation program and download their expertise to Markham ECO staff.

Environmental Management Plan
The Town has retained CH2MHILL to assist in the preparation of an Environmental Management Plan (EMP). The EMP will prioritize internal organizational efforts to maximize our Kyoto Accord impact and to ensure that the Town is positioned to encourage environmental responsibility across the community. As part of the EMP process, staff will work with CH2MHILL to develop organizational design options that will support environmental initiatives over the long run.

FINANCIAL CONSIDERATIONS:

Financial considerations include:

- Retain the Canadian Urban Institute to work on implementing, oversight and reporting on the Energy Conservation Office efforts from June 2005 through the end of March 2006. The cost estimate for this contract is to an upset limit of $65,000. Funding will be provided from the conservation demand management fund.

- Hire a full time Markham Energy Conservation Office Manager and administrative support staff on a contract basis to be funded by the Town of Markham at a cost of $127,100 per annum. It is anticipated that the prorated (June through December) Town cost of staffing for the remainder of 2005 will be $63,500.

The budget mandate of Markham ECO will be to operate within the approved conservation demand management budget funding of $1,000,000 over three years. The funding allocation is $500,000 in 2005, $250,000 in 2006 and $250,000 in 2007.

CONCLUSION:

Markham's strategic vision and planning process has positioned the Town to anticipate and implement effective and efficient environmental programs. The Markham ECO is one example of the benefits of strategic planning. The Markham ECO will provide significant environmental benefits to the Town. The Energy Conservation Office will improve air quality, implement programs leading to energy conservation, provide opportunities for creating a conservation culture in the provision of future infrastructure and set a leadership example for municipalities across the country. In addition, the Markham ECO program represents an investment that provides a medium and long-term return on investment.

BUSINESS UNITS CONSULTED AND AFFECTED:

CAO's Office
Corporate Services
Community and Fire Services
Markham District Energy, Inc.

ATTACHMENTS:

Appendix A Letter of Engagement from PowerStream May 13, 2005
Appendix B Proposed Markham ECO programs and budget for approved CDM programs

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Appendix B: Markham Energy Conservation Office Programs and Budget

The priority programs, the budget and the energy efficiency goals of each program are summarized below.

1. Better Building Partnership

   The Better Building Partnership (BBP) program will work with private sector energy service companies to promote and implement programs that enhance energy efficiency and building retrofits. The Better Building Partnerships model is operating in the City of Toronto and the Town of Markham will adopt and modify it to fit our needs.

   The first target for the BBP will be to determine the needs within the Town buildings and see if there is an opportunity to achieve conservation goals and emission targets in our facilities. The BBP will work across the commercial, industrial and institutional sectors providing turnkey solutions to retrofit buildings using state-of-the-art energy saving equipment.

Conservation Account Budget:	$295,000 over 3 years
Efficiency target:	3,000,000 kWh of savings ($330,000 @ year)

2. Advancing High Performance Buildings

   High performance building development is defined as using an integrated approach to the design, construction and operation of a structure to minimize negative impacts on the environment and human health. The first approval for development starts with the municipality. Markham has a unique opportunity to promote and accommodate Leadership in Energy and Environmental Design (LEED) in the planning and development process as well as in our own building projects.

   The High Performance Building Development program will promote green building projects, provide links to technical assistance, establish partnerships for funding and encourage the growth of high performance buildings.

Conservation Account Budget:	$285,000 over 3 years
Efficiency target:	1,250,000 kWh of savings ($137,000 @ year)

3. Bringing "Cool Shops" to Markham

In larger urban centres, the Clean Air Foundation has launched a program to encourage small business and retailers to implement energy conservation efforts. The Cool Shops program offers site-specific energy audits, including recommendations on how to save money, immediate installations of quick initiatives that save money, access to implementation partners who provide additional energy efficiency financing and access to incentives.

The Markham Energy Conservation Office will work with the Clean Air Foundation to develop a self-financing Cool Shop pilot program in Markham focusing on the small business community.

Conservation Account Budget:	$175,000 over 3 years
Efficiency target:	1,200,000 kWh of savings ($132,000 @ year)

4. Combined Utility Metering Pilot

This project will integrate the collection of information for each residential utility – district energy, gas, power and water into one utility meter. The metering information from each utility would be available to each resident through a dedicated Internet site and in real-time.

As the cost to purchase utilities increases, providing real-time information on energy consumption is believed to be one of the best ways to change consumer behavior and encourage conservation. The Province of Ontario is moving forward with a plan to install 800,000 Smart Meters by 2007 and 4 million by 2010. However, the Smart Meter project will not provide "real-time" information. The Combined Utility Metering Pilot project would be the first of its kind in Ontario. There are a number of regulatory and commercial issues to be addressed as part of the pilot. These include the implications of the Smart Meter program and the ability to communicate consumption information from all four utilities back to the consumer in real-time and in a format that encourages conservation. If successful, the Combined Utility Metering Pilot could become the model for all new development in Markham and across the Province.

It is estimated that providing "real-time" access to consumers could influence a load reduction of 5% during peak periods. Part of the pilot project will involve comparing the conservation and demand management attributes of the Combined Utility Metering Pilot with the standard Smart Meter installation.

Conservation Account Budget:	$105,000 over 2 years
Efficiency target:	160,000 kWh of savings ($17,600 @ year)

5. Intelligent Monitoring System

The intelligent monitoring system will involve the acquisition of York Region's Energy and Environmental Management System (EEMS) software. EEMS software is a versatile, web based application that monitors all utilities including electricity, water, gas and fuel. It provides consumption patterns for buildings, transportation systems, streetlights, and water and wastewater facilities. It will rank performance of specific buildings, produces data that is easy to read and factors in weather anomalies. The most important feature of the software is that it tracks emissions using emissions factors for each energy source and can calculate savings and emission reductions.

The Town would purchase the energy management system to establish a proper energy baseline, benchmark facilities and target energy consumption reduction of 10-15%.

Conservation Account Budget:	$70,000 over 3 years
Efficiency target:	200,000 kWh of savings ($22,000 @ year)

6. At-Work Energy Conservation Program

Establishing a system to measure current and past energy consumption is the first step to identifying conservation opportunities and reducing energy consumption. The Energy and Environmental Management System (EEMS) software will used to realize this opportunity. The At-Work Energy Conservation Program will encourage and educate employees and their families to conserve at home and on the job.

The Markham ECO will develop an effective energy awareness program for municipal employees and expand the campaign to other interested members of the Markham community. The program will be developed based on the E3@Work and E3@Home models. E3@Work is an educational program designed to conserve energy by managing office equipment power loads. E3@Home is an educational program that follows the strategies of E3@Work but focuses on how employees can reduce their residential energy costs.

Conservation Account Budget:	$70,000 over 3 years
Efficiency target:	800,000 kWh of savings ($88,000 @ year)