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CITY OF THUNDER BAY

ENERGY MANAGEMENT STRATEGY

FEBRUARY 5, 2014

THE STRATEGIC APPROACH TO CORPORATE ENERGY MANAGEMENT

CITY OF Thunder Bay

Superior by Nature

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EXECUTIVE SUMMARY

The Strategic Approach to Corporate Energy Management ("Energy Plan"), supports the 2011-2014 City of Thunder Bay Strategic Plan, Environment Pillar – "A cleaner, greener, more beautiful and proud Thunder Bay'" with the strategic action to develop and implement a comprehensive corporate energy management plan.

Energy efficiency and the wise use of energy are two of the lowest cost options for meeting energy demands, while providing many other environmental, economic and social benefits, including reducing greenhouse gas (GHG) emissions, cost avoidance and savings.[1] Along with the aforementioned benefits, energy efficiencies and the wise use of energy also promote local economic development opportunities, energy system reliability, improved energy supply security, and reduced price volatility.

There are a variety of no output cost initiatives to the Corporation of the City of Thunder Bay ("Corporation"), which can improve our energy consumption and dollar savings. Actions as simple as turning lights and appliances off, shutting off heaters in the summer, establishing efficient usage times, efficient production requirements, and much more. Such actions, along with energy efficient capital and operating process improvements, program implementation and projects, are key components which will be outlined within the Energy Plan.

A study by the "Carbon Trust" stressed the importance of engaging the people working within the facility along with technological changes to achieve meaningful, lasting energy consumption savings. As illustrated in Figure 1, four facilities within a complex each implemented a different approach to energy management. In the first and second facilities, only technological energy efficient improvements were completed. In the third building, an educational campaign was undertaken to raise awareness of energy management within the operations and facility. In the fourth building, technological energy efficiencies were implemented along with an educational awareness campaign. It was found that engaging both people and implementing energy efficient technology changes into a facility or an energy management plan resulted in energy savings of 23%. This compared with energy savings of only 16% when energy management plans did not include technological changes. Negligible savings or even cost increases resulted when energy efficient technology changes alone did not appropriately engage the people in the facility.[2]

[1] The Pembina Institute, Energy Efficiency and Conservation. http://www.pembina.org/re/efficiency

[2] UK Carbon Trust, Good Practice Guide 84 Managing and Motivating Staff to Save Energy. http://www.thecarbontrust.co.uk.

Figure 1

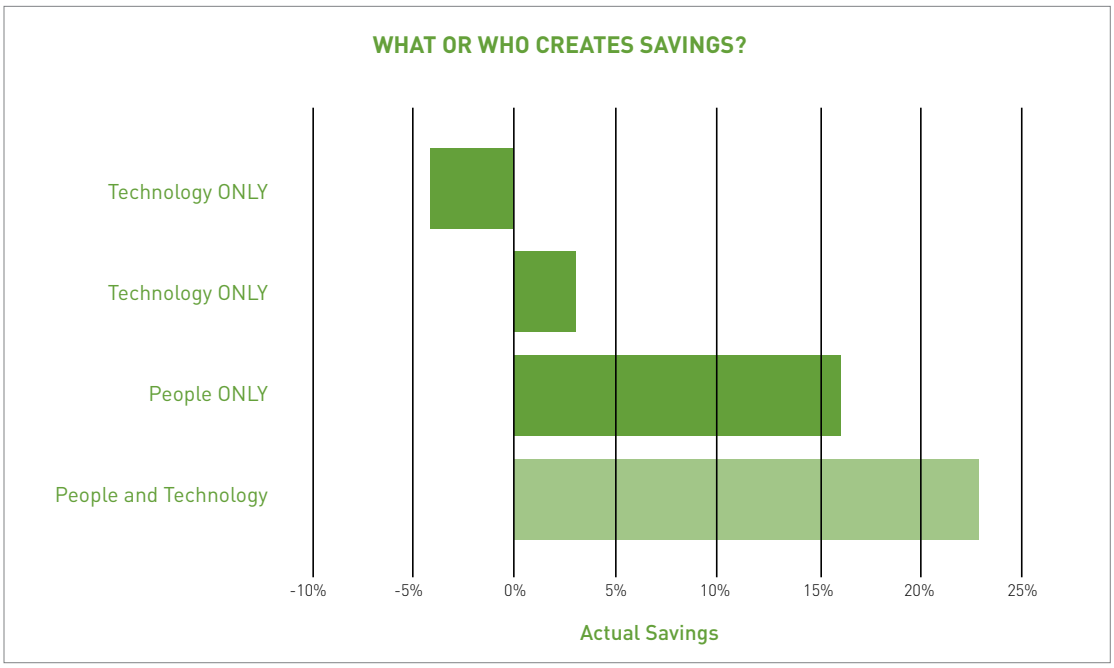

Figure 1: The Carbon Trust study stressing the importance of people in developing an energy management plan.

As part of the development of the Energy Plan, the Corporate Executive Management Team (EMT) approved a recommendation that a Corporate Strategic Energy Management Committee ("Energy Committee") be formed with a detailed mandate to integrate facility efficiencies and operations to reduce overall corporate energy consumption below 2009 energy baselines (see Energy Management Team Section pg 10).

To begin the process, the Energy Committee engaged an external consultant, 360 Energy Inc., to facilitate the initial planning process and provide the Committee with the necessary skills and awareness to begin the journey to sustainable energy management. 360 Energy Inc. spent two comprehensive days with the Energy Committee. The first day consisted of in-depth interviews with each Committee member to gather information on the Corporation's current energy management processes and practices. This pre-workshop assessment outlined an inventory of the Corporation's current energy management strengths and weaknesses. The second day, the Sustainable Energy Planning (SEP) Workshop presented 60 best practices in energy management to start the development of the Energy Plan covering areas such as an energy mandate, data management, supply management, energy use in facilities, equipment efficiencies, and organizational integration. Local representatives from Thunder Bay Hydro and Union Gas also participated in the workshop.

A 360 Radar assessment report (see Appendix A) was presented to the Energy Committee. The report provided a reference point in developing a customized strategic approach to energy management for the Corporation. The findings outlined in the report were based on the responses to the assessment questions in each of the six integral areas of successful energy management compared to 360 Energy Inc. best practices for a successful energy management program. The analysis provided feedback into areas of successful energy management practices along with highlighting areas of opportunities to incorporate into the foundation of the building of the Energy Plan.

As part of the first step in developing the Energy Plan, Corporate energy baselines were developed to inform and gather ideas on future energy efficiencies within the key initiative categories of process improvements, program implementation and projects within each Department and Division. Past energy efficient initiatives were also documented to celebrate the successes that have already been achieved within the Departments and Divisions. Through each meeting, the concept of integrating facility efficiencies with operational efficiencies was stressed to demonstrate that everyone has a role to play in energy management within their own facility and operations.

The Strategic Approach to Corporate Energy Management is a living document that will provide a roadmap and build internal energy management knowledge and awareness that will provide the foundation for successful energy management decisions and actions within all Corporate operations for the next five years and beyond. The Energy Plan will also provide the foundation for the requirements of the conservation and demand management plans required under the Green Energy Act as of July 2014.

The focus for the Energy Committee for the next five years will be to continue to build this capacity and develop the foundations intended to guide the work for internal Departments and Divisions to successfully manage energy consumption within their daily operations and consider energy in their daily decision making.

INTRODUCTION

Canadians are concerned about climate change. Public opinion polls illustrate that taxpayers across the country consistently rank the environment as one of the most pressing issues facing our citizens and our government.[3]

In 2007, the United Nations' Intergovernmental Panel on Climate Change (IPCC) concluded that there is an undeniable link between anthropogenic (human) drives and the impact and response to climate change. The report concluded that "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea levels."[4]

According to the IPCC, "global atmospheric concentrations of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), which are three long lived GHGs, have increased markedly as a result of human activities" with the global increase of CO_2 due primarily to fossil fuel use, with land-use changes providing a smaller, less significant change.[5]

Climate change is a concern that affects nearly every sector of the Canadian economy, including municipal governments. Municipal governments have either direct or indirect control of over half of Canada's greenhouse gas emissions, through decisions related to public transit, waste management, facility energy performance, and land-use planning. As a major consumer of energy, Ontario municipalities consume more than 6.6 billion kilowatt hours (kWh), at an annual cost of $680 million with expected annual price increases of 3.5% over the next 20 years.[7] It is essential that as a municipal government, the City of Thunder Bay be fully engaged in climate change initiatives.

[3] Federation of Canadian Municipalities. Clean Air and Climate Change – 1. http://www.fcm.ca/english/View.asp?mp=467&x=708

[4] Climate Change 2007: Synthesis Report: An assessment of the Intergovernmental Panel on Climate Change. This underlying report, adopted section by section at the IPCC Plenary XXVII (Valencia, Spain 12-17 November 2007), represents the formally agreed statement of the IPCC concerning key findings and uncertainties contained in the Working Group contributions to the Fourth Assessment Report.2007. Page 30. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf

[5] Climate Change 2007: Synthesis Report: An assessment of the Intergovernmental Panel on Climate Change. 2007. Pg 37. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf

[6] Federation of Canadian Municipalities. Clean Air and Climate Change – 1. http://www.fcm.ca/english/View.asp?mp=467&x=708

[7] Tight Budgets and Soaring Electricity Prices: How municipalities can cope using an integrated energy management approach. August 2011. Pg 9. Municipal World.

Along with the increasing concern of greenhouse gas emissions, there are a variety of other issues driving the need for the wise use of energy within municipal operations including:

- Energy Supply – Currently, Ontario's electricity system has a capacity of approximately 35,000 megawatt (MW) of power and the Ontario Power Authority (OPA) forecasts that more than 15,000 MW will need to be renewed, replaced or added by 2030. To help meet the increasing demand for energy, as outlined with Ontario's Long Term Energy Plan, conservation has become an integral part of the future to help meet the ever increasing demand for energy.[8]
- Energy Costs – With the cost of energy projected to continually rise over the next 20 years, the move to increase operational efficiencies and eliminate the waste of energy will help to mitigate costs.
- Energy Security – To ensure the ever increasing energy demands meet the needs of today as well as into the future, a guarantee of a stable and reliable supply of energy at reasonable prices needs to be maintained through a variety of initiatives including conservation and demand management programs.

[8] Ministry of Energy. Ontario's Long Term Energy Plan.2011. pg 9. http://www.mei.gov.on.ca/en/pdf/MEI_LTEP_en.pdf

VISION

The Corporation will continue to reduce energy consumption and mitigate costs through the wise use of energy. This will involve a collaborative effort to increase the education, awareness, and understanding of energy management within the Corporation.

> **The vision for the Corporation, as aligned with the Sustainability Plan, is to reduce total energy consumption and transition to a carbon neutral future through the wise and efficient use of energy and resources, while still maintaining an efficient and effective level of services to our customers and the general public.**

Total energy consumption includes electricity, natural gas, diesel, gasoline and propane.

This vision can be achieved through the integration of energy efficiency facility infrastructure, operational efficiencies and building the foundation for a culture of energy awareness and knowledge within the Corporation.

At the organizational level, commitment from Council and Senior Administration will demonstrate the leadership and commitment required to ensure the fulfillment of the Energy Plan by all energy consumers. Everyone has role in the wise use of energy and to showcase the appropriate leadership within Corporate facilities and operations.

STRATEGIC OBJECTIVES

In order to achieve the success of the strategic direction of the Energy Plan, there are a number of goals and objectives that align with its development and implementation.

The following are the strategic objectives:

- The creation of a culture of conservation within the Corporation will serve to reduce greenhouse gas emissions and ensure the wise use of resources
- Fiscal accountability through savings and cost avoidance will lead to both direct and indirect savings.
- Demonstrate leadership within the Corporation and community as to the commitment to energy management and investigation of new and emerging technology
- Demonstrate sound operating and maintenance practices to complement the energy efficiencies implemented through the capital asset renewal program
- Provide a forum for discussion within the Corporation on energy management to be able to explore new ideas and trends

With the development of the Energy Plan, all Corporate Departments will have a roadmap and a forum to continue to ensure energy management is a consideration in all operations and facility based decisions. The integration of operational processes, facility based infrastructure improvements and staff awareness is critical to move the Corporation towards the goal of reducing GHG emissions and transition to a carbon neutral future.

ENERGY SOURCES

Outlined within the vision, is the Corporate reduction of total energy consumption including electricity, natural gas, diesel, gasoline and propane. Within this Energy Plan, the majority of key initiatives are directed towards the reduction of GHG emissions for electricity and natural gas as these two energy sources are the greater contributors to GHG emissions for the Corporation (see Table 1).

The remaining energy uses are from fuel sources including diesel, gasoline and propane. In 2009, Council adopted the Green Fleet Implementation Plan (see Appendix B which outlines the five strategies to reduce the consumption of fuels within the Corporate Fleet Portfolio). The alignment of the strategies within the Green Fleet Implementation Plan and the recommended actions within the Energy Plan will work together to provide a roadmap to reduce greenhouse gas emissions within the overall Corporate Facilities and Fleet portfolio.

Table 1

ENERGY TYPE	CONSUMPTION	GHG EMISSIONS (TONNES)	COST ($)
Electricity	59,683,857 kWh	7,759	$ 7,926,750
Natural Gas	5,488,138 m^3	10,318	$ 1,560,304
Diesel	2,963,556 L	7,380	$ 3,172,031
Gasoline	1,090,923 L	2,662	$ 1,211,706

Table 1. City of Thunder Bay 2012 summary of energy type, consumption, GHG emissions and associated costs.

ENERGY COMMITTEE

The Corporate Executive Management Team (EMT) approved the development of a cross-functional team of Corporate stakeholders having direct responsibility in the consumption of energy within their respective Departments. This Committee's mandate is to ensure that the Energy Plan remains a priority within each operation.

The Energy Committee meets quarterly with the following objectives:

- To develop strategies within operations to work towards reducing energy consumption by 20% (GJ) below 2009 baselines by 2020
- To integrate best practices into daily operations, where feasible, to reduce energy consumption
- To provide a forum for discussion on energy management strategies that may benefit all Divisions
- Increase corporate awareness of the consumption of energy within each Department
- To provide information for the Sustainability Plan

The General Manager of Community Services Department as the Chair of the Energy Committee. Refer to Appendix C for Committee membership, roles and responsibilities of each member and the Terms of Reference of the Committee.

STRATEGIC DIRECTION

The Corporation has undertaken many initiatives to improve the environmental health of our City. Through this commitment to a cleaner, greener and more beautiful Thunder Bay, the Corporation has adopted a number of strategic initiatives as summarized in Table 3. These documents align with the development of the Energy Plan. For further information on each program and policy and their link to the Strategic Approach to Corporate Energy Management, refer to Appendix D.

Table 3

PROGRAM/POLICY	PROGRAM/POLICY OBJECTIVE	YEAR
Partners for Climate Change	Commitment to reduce GHG in municipal operations by 20% below 1990 levels	2003
City of Thunder Bay Environmental Policy	To provide leadership and continual improvement in environmental management and performance	2005
Clean, Green and Beautiful Policy	To foster and promote our quality of life, which is directly linked to establishing and nurturing a healthy community that is environmentally sustainable	2007
Community Environmental Action Plan (CEAP)	To reduce greenhouse gas emissions through the wise use of energy and to promote the transition to a carbon neutral future	2008
City of Thunder Bay Strategic Plan 2011-2014	Thunder Bay - Connected, Healthy, Vibrant, Strong. Environment Pillar - "a cleaner, greener, more beautiful and proud Thunder Bay."	2011
CITYLean	To focus on excellence in City Services, including organizational efficiency and effectiveness to make certain that the Corporation maximizes use of its available tax rate supported financial resources	2011
Sustainability Plan	Help promote a more sustainable Thunder Bay now, and in the long term	2014

Table 3. Summary of Corporate Strategic Directions and Policies supporting the development of the Strategic Approach to Corporate Energy Management

The development and implementation of the Energy Plan will support the goal and strategic direction outlined in the City of Thunder Bay's 2011 – 2014 Strategic Plan.

The Environment Pillar of the City of Thunder Bay's 2011 – 2014 Strategic Plan: Connected. Healthy. Vibrant. Strong., is a "cleaner, greener, more beautiful and proud Thunder Bay." Goal #9, under the Environmental Pillar is to 'reduce greenhouse gas emissions through the wise use of energy".

PROVINCIAL REGULATIONS

The Green Energy Act, 2009 ("GEA") received Royal Assent on May 14, 2009. This Act is part of Ontario's plan to become a leading green economy in North America. An intended outcome of the GEA is to create the potential for savings of energy expenditures through a series of conservation measures.

Conservation is not only a key component of the GEA, but also a key focus of the Ontario Long Term Energy Plan with a target of reducing consumption within Ontario by 7,100MW by 2030. Half of the target would come from the commercial sector, which includes municipal buildings in the broader public sector (BPS). The GEA repeals the Energy Conservation Leadership Act, 2006 and the Energy Efficiency Act. However, many of the provisions of those two repealed statutes are re-enacted in the GEA including the development of energy conservation plans for the municipal sector.

Green Energy Act (GEA)

The Ministry of Energy has passed a regulation under the Green Energy Act, 2009 that requires Ontario's public agencies (municipalities, universities, colleges, schools and hospitals) to demonstrate the leadership role government plays in energy conservation by developing and implementing energy conservation plans. The regulation provides the Ontario government and public agencies with valuable information on how energy is used within each sector, allowing organizations to benchmark their facilities to similar facilities.

The Green Energy Act (s.6) mandates plans to include a:

1. Summary of annual energy consumption for each of the public agency's operations
2. Description and forecast of results of all conservation and demand management (CDM) activities
3. Summary of progress made
4. Additional information as may be prescribed

The regulation was phased in with Phase 1 requiring the completion of a summary template detailing each building's energy consumption, size, age, and use of the facility. The first report was due July 1, 2013 using 2011 data. The second phase of the regulation details the development of energy conservation and demand management (CDM) plans which includes a high level description of how the organization would conserve energy and reduce demand over the life of the plan, as well as a forecast of the expected results. The plans are to cover a five year period and be approved by the public agency's senior management with public posting on the Corporation's website. Conservation and demand management (CDM) plans are due July 1, 2014. The implementation of the Strategic Approach to Corporate Energy Management will fulfill the Corporation's reporting requirements under this regulation.

CURRENT ENERGY ASSESSEMENT

As part of the one-day workshop presented by 360 Energy Inc., the Energy Committee reviewed the best practices presented to perform an assessment using the Sustainable Energy Planning (SEP) – Performance Scorecard (see Appendix E). The objective of the assessment was for the Energy Committee to assess where they felt the Corporation stood currently on energy management efforts. Team members identified areas where the Corporation has been successful and also areas for improvement.

The results of the SEP – Performance Scorecard provided a GAP analysis on the current culture of energy management while highlighting target areas for improvements. The SEP – Performance Scorecard (refer to Appendix E) and the 360 Energy Radar Assessment (refer to Appendix A) provided a foundation for the Energy Committee to highlight process improvements, program implementation and projects within the five main focus areas of energy management: energy data management, energy supply management, energy use in facilities , equipment efficiency, and organizational integration. Such an approach will position the initiatives in such a way to attain optimal results through efforts put forth.

Through the performance scorecard and radar assessment, many strengths of current energy management are highlighted. They include, but are not limited to:

- **Energy Data Management -** To reinforce the concept that energy is a variable cost and to make individuals accountable and empower them to control energy use, corporations require effective monitoring systems that provide accurate feedback. An evaluation of the process of the management of energy data within the Corporation including, accessibility, key performance indicators, reporting requirements, load profiles, and interval data.

  The Corporation currently has a comprehensive program for collecting and tracking monthly energy billing information, to ensure all energy information is analyzed based on historical trending models for each facility. This effort has produced a database of each facility's electrical and natural gas usage and cost information that is available for use in monitoring excessive variations, targeting facility follow-up evaluations, and generating areas that could be candidates for energy efficient improvement opportunities. As part of the Ontario government's Green Energy Act, annual consumption history and conservation plans are required for Corporate facilities. To help meet the requirements under the new Regulation, and to enhance staff's access to the energy consumption database, the Corporation is working to implement an Energy Management software system that will enable staff to better understand the consumption and cost impacts of energy efficiency activities.

- **Energy Supply Management -** In addition to the conservation of energy, the procurement of energy is equally as important. Proper energy procurement includes: rate optimization, utility account management, supplier choice and evaluation, supply reliability and quality, demand/supply optimization and risk management.

  In 2008, the Corporation developed a commodity hedging policy, (Corporate Report 2008.064) approved by City Council, to allow for the price hedging of the purchase commitment for a range of commodities including electricity and natural gas. The Policy identifies an acceptable range of commodities and establishes objectives, standards of care, authorized price hedging instruments, reporting requirements and responsibilities for the prudent use of hedging contracts. The primary objective of a commodity hedging agreement is to provide price stability by fixing future prices. Currently the Corporation participates in a natural gas hedge under the local Lakehead Purchasing Consortium (LPC) and for the electricity hedge under Association of Municipalities of Ontario – Local Authority Services (AMO-LAS) Electricity Procurement Program. Procurement of energy, under the direction of the Corporate Supply Management Division, continues to manage the price of the commodity effectively with the assistance of the Corporate Energy Management Committee: Financial. Quarterly meetings are held to review any cost and consumption variances, project the upcoming year's cost per commodity for budgeting and consumption load profiles. Monthly billing analysis also provides an opportunity to identify and recover any billing errors, or usage that requires further investigation.

- **Energy use in Facilities -** An evaluation of the equipment and operations within facilities to investigate potential areas of energy efficiency opportunities including tools such as facility walk-throughs, benchmarking, comprehensive audits, review of current operating processes, and monitoring and trending of equipment and systems.

  Each facility within the Corporate portfolio has various controls in place for key systems. Preventative maintenance programs and the integration of asset renewal into the day-to-day operations plays a role in ensuring the wise use of energy through the implementation of energy efficient equipment and processes. Corporation staff have a vast knowledge related to energy within the Corporate facility portfolio and incorporate energy management into daily decisions and operations. To complement the existing knowledge of the energy consumption within a Corporate facility, each year comprehensive energy audits are completed by a third party at facilities identified through analysis of the energy data management system. To continue to provide staff with effective energy data, in order to make informed energy efficient operating and capital decisions, an energy management software system will be implemented.

- **Equipment Efficiency -** An evaluation of the equipment currently being utilized within the various processes of the Departments and the energy efficiency opportunities that could be implemented through preventative maintenance programs, system controls, retrofits, system upgrades and investigation into new and emerging technology.

  The Corporation has implemented a variety of energy efficient initiatives within Corporate facilities, many of which have been embedded within the Corporate capital asset renewal program. Initiatives include interior/exterior lighting retrofits, HVAC improvements, implementation of building automation systems, installation of solar heating panels, and variable speed drives on motors. Through the continued building of awareness regarding corporate energy consumption, staff will be able to make informed energy efficient decisions on new or replacement equipment. There are currently no formalized energy efficiency design guidelines established, rather energy efficiency is a consideration. However, through the development of this Energy Plan, an energy efficient component for all new and retrofit equipment projects will be included in future purchases.

- **Organizational Integration -** All levels and all areas within the Corporation need to participate in the development of the Energy Plan and in future energy management. All Departments, functions, processes and programs that impact energy usage and cost need to be identified. The roles and expectations of the program need to be clearly defined. The program also requires promotion on a regular basis. All employees need to be updated by communicating the programs actions and results.

  The day-to-day responsibility of energy management of the facilities systems and subsystems within the Corporate facility portfolio has been the primary responsibility of Facility Services Division with a few exceptions including Homes for the Aged Division, Parks Division: Seasonal Facilities, Fort William Gardens Arena and Environment Division. The Energy Analyst provides assistance with energy data management and budgeting. With the commitment of the Energy Committee and Energy Analyst, each Division can take a more active role in their daily energy consumption. The structure of the Energy Committee allows for a more direct integration of energy efficiency and creates a culture of conservation with the Corporation. This living interactive approach to energy management will provide unique opportunities for training and awareness-building within the Corporation.

BASELINE ENERGY DATA

To be able to efficiently manage energy within the Corporation, the establishment of accurate consumption data from the base year is essential. To be able to set meaningful targets for energy reductions and ultimately, reductions in greenhouse gas emissions (GHG), an understanding of where and how the energy is consumed is critical. By establishing a trend analysis, starting with the baseline year of 2009 to year to date provides the Corporation with a unique opportunity to monitor and trend not only consumption, but assist in bill verification, procurement and budgeting.

In 2007, a local GHG emissions inventory was completed by ICLEI Energy Services using 2005 baseline data. The inventory provided the original baseline against which the Corporation could measure progress towards the reduction targets for GHG emissions set out in the 2008 Community Environmental Action Plan (updated in 2014 to the Sustainability Plan).

However, as the Energy Management Plan has evolved and to provide a more accurate representation of current infrastructure and operations, the 2009 baseline year will be used. This new baseline year will align with the revised Corporate targets set out within the Sustainability Plan, and the 2011 Thunder Bay Greenhouse Gas Emissions Inventory Report.

It should also be noted that in the original 2005 baseline, Transit Services were included under Community for GHG emissions. However, Transit Services, including Specialized Transit (2014) are now included with the Corporate inventory and within the Energy Plan as the Corporation owns, maintains and operates the service. As such, the Corporation is responsible for implementing initiatives to reduce greenhouse gas emissions within Transit Services while increasing ridership.

Along with the addition of Transit Services to the Corporate baseline inventory, Outside Boards and Agencies—Thunder Bay Public Libraries and the Thunder Bay Community Auditorium have also been included. This addition aligns the operations and facilities reporting requirement of the Green Energy Act with the Energy Management Plan baseline data.

Table 4

ENERGY TYPE	CONSUMPTION	GIGAJOULES (GJ)	GHG EMISSIONS (TONNES)	COST ($)	GHG EMISSION PERCENTAGE
Electricity	66,379,105 kWh	238,964	6,638	$ 6,839,224	23.25%
Natural Gas	6,112,249 m^3	226,153	11,492	$ 2,573,274	40.24%
Diesel	2,951,713 L	114,172	7,817	$ 2,255,608	27.38%
Gasoline	1,105,432 L	38,314	2,609	$ 979,805	9.14%

Table 4. 2009 Corporate energy consumption, GHG emissions and costs. Fuel consumption includes transit fleet and outside boards & agencies. Note: in 2009 the Ontario electricity coefficient was at it's lowest at 0.10 tonnes CO_2e/kWh.

To understand the composition of usage within each Department, the electrical and natural gas consumption for each Department was analyzed, with a further analysis into the larger Departmental consumers to determine opportunities where the most significant impact of conservation could be focused.

The 2009 baseline data provided a starting point and template for the continued tracking and monitoring of all Corporate energy data. By continually monitoring and updating the energy management database, trend analysis for all facilities to date has been established. With this historical data, models on consumption have been built to highlight areas for potential energy efficiency and conservation efforts. To complement the consumption data, in the centralization of energy management within the Community Services, Central Support Division, each facility within the Corporate portfolio has been sectioned into separate cost centres to assist in monitoring, bill verification and budgeting.

Due to the continual increasing cost of energy commodities, it is important that the Corporation reduces its energy consumption. The savings achieved through energy consumption reduction can be utilized as an offsetting model to account for the continued growth of the Corporate portfolio of facilities. Such a model is referred to as "avoided costs".

To illustrate the avoided cost through the reduction in consumption, each year the Energy Committee will report annual consumption totals to Council through the Sustainability Plan Annual Report. The report also highlights energy efficient initiatives undertaken throughout the Corporation, meeting the actions set out the Energy Plan. (see Table 5).

Table 5

INDICATORS	2009	2012	2013	2012 vs 2013
CITY OF THUNDER BAY - KWH OF ELECTRICITY				
Facilities	25,452,818	24,150,023	24,658,463	508,439
Water and Wastewater	26,327,112	21,553,831	22,310,337	756,506
Traffic/Street Lighting, Parking Authority and Other Outdoor Lighting	13,139,732	12,466,076	12,014,304	(451,772)
Outside Boards and Agencies	1,459.443	1,513,927	1,605,888	91,961
Total Electrical Consumption	**66,379,105**	**59,683,858**	**60,588,992**	**905,134**
CITY OF THUNDER BAY - m^3 OF NATURAL GAS				
Facilities	4,834,735	4,242,380	4,866,171	623,791
Water and Wastewater	1,073,784	1,066,409	1,466,743	400,334
Traffic/Street Lighting, Parking Authority and Other Outdoor Lighting	2,440	2,231	2,427	196
Outside Boards and Agencies	201,291	152,826	180,461	27,635
Total Natural Gas Consumption	**6,112,249**	**5,463,846**	**6,515,802**	**1,051,957**
City of Thunder Bay - Diesel (L)	2,951,714	2,963,553	3,082,379	118,826
City of Thunder Bay - Gasoline (L)	1,105,433	1,090,923	1,123,270	32,347

Table 5. Summary of Corporate energy consumption 2009, 2012 and 2013.

CRITERIA AND EVALUATIONS

In order to determine the key initiatives to be incorporated into the Energy Plan and develop the foundation to evaluate future initiatives, all ideas suggested through the Departmental and Divisional energy meetings were documented and distributed for comment to the respective Departments. Each Division was responsible for ensuring the initiatives aligned with the main objectives of the energy management strategy and the directions of the respective Departments. Each initiative was reviewed based on:

1. Gap analysis utilizing the Performance Scorecard.
2. Alignment with Corporate strategic directions, plans, goals and objectives.
3. Opportunities identified through analysis of baseline consumption data
4. SMART (Specific, Measureable, Accountable, Realistic and Time bound) goals.

Initiatives aligning with the outlined criteria and evaluation tools were brought forth to be included in the high level strategies proposed within the Energy Plan.

KEY INITIATIVES

The development of the Energy Plan is intended to be a living document that provides a roadmap for building the foundation for successful energy management through various capacity building initiatives, including the development of policies, procedures, processes and energy management knowledge.

With the development of the Energy Committee, the concept of an integrated approach to energy management was essential. To accomplish such an endeavour, it became readily apparent that all Departments, Divisions and Sections needed to be involved in the process. In reviewing the complexity of energy consumption within the Corporation, a strategy was developed to involve all Sections of the Corporation. Everyone has a responsibility in energy management and the earlier the involvement, the better the understanding.

To begin the process, a breakdown of energy consumption and cost for each facility within the Corporate portfolio was developed using current year data. The information was presented in a top down approach, illustrating the consumption and cost for the Corporation, then the respective Departments, the Divisions and finally each individual facility (See Appendix F).

The key initiatives that are being proposed within the Energy Plan fall within three main key initiative categories:[9]

Table 6

KEY INITIATIVE CATEGORY	KEY INITIATIVE DESCRIPTION	EXAMPLES	EXPECTED ANNUAL CONSUMPTION SAVINGS
Process Improvements	Improvements or alternatives to current process based operations that are quicker and more straightforward with lower costs	Energy tracking, Bill verification Procurement standards	1% to 2%
Program Implementation	Improvements that take longer to implement with moderate costs	Energy awareness program, Lighting upgrades, Building Automation systems (BAS) training	5% to 10%
Projects	In general these are capital projects to upgrade equipment and facilities and are usually more costly to implement with detailed planning required	Retro/Commissioning of facilities, Energy efficient equipment replacements, Building envelop improvements	10% to 20% by project

Table 6. Summary of key initiatives with examples and estimated consumption savings. (Source: Sustainable Energy Planning Workshop. GEM Management Consultants Inc., and 360 Energy Inc, 2010)

[9] GEM Management Consultants, Inc., 360 Energy Inc., Sustainable Energy Planning Workshop.2010

The process improvements, program implementation and projects contained within the Energy Plan (refer to Table 7) are high level actions that encompass the more specific goals of each Department. Each initiative and strategy is categorized as to the nature of the energy management activity to align with one of the five focus areas corresponding to one of the three key initiative categories. The initiatives and strategies, once developed, are intended to provide a roadmap for energy management within the Corporation that are not to be static, but provide the foundation to increase energy efficient and eliminate energy waste within corporate operations and facility based infrastructure decisions.

The following are the proposed process improvements, program implementation and projects that will be implemented within the next five years.

PROCESS IMPROVEMENTS

FOCUS AREA	ACTION	OBJECTIVE	PERFORMANCE MEASURES
Energy Data Management	Accessibility and Reporting	Provide access to Corporate Energy Management data to all identified staff	Corporate Energy Management Software implemented Number of staff using tool and reports generated
	Key Performance Indicators (KPI's)	Provide meaningful benchmarking indicators for all facilities	Established meaningful comparators for facility types beyond gross consumption data
Energy Supply Management	Account Management	To establish a Corporate Energy Innovation Reserve fund with incentive funding to fund future energy initiatives	Establishment of a reserve fund to take advantage of opportunities to continue to fund energy efficient projects
	Rate Optimization	To provide notification to procurement team by depts. of changes in operations that will affect consumption load requirements in future years	Establishment of procedure for notifying procurement team of expected changes to Corporate load profile
Energy Use in Facilities	Facility Standards	To develop operational standards for building controls within facilities using Industry standards	Standard developed for building operations ie: standardization of office temperatures
Equipment Efficiencies	System Controls	To develop a process to control equipment and systems when operating levels or loads are reduced as to reduce energy use	Process developed with energy management as a critical component
	Energy Efficient Procurement	To develop policy for standards for the purchase of energy efficient equipment. ie: Energy Star	Policy developed that requires and/or encourages the purchase of energy efficient equipment for new or replacement equipment where feasible
Organizational Integration	Awareness and Participation	To develop a Corporate Energy Awareness Program to build internal capacity allowing Departments to make informed energy management decisions	Development of awareness campaign and associated educational tools Number of employees trained
	Incentive Awareness	To develop a process to ensure all Departments are aware of the available energy incentives that can be leveraged in planning energy management initiatives	Incentives applied for and success in application approvals

PROGRAM IMPLEMENTATION

FOCUS AREA	ACTION	OBJECTIVE	PERFORMANCE MEASURES
Energy Data Management	Interval Data	Establish guideline for requiring interval meter installation for new or retrofit projects for facilities consuming more than 250,000 kWh or demand greater than 50 KV	Development of guideline implementation of interval meters and use of data
Energy Supply Management	Supply Management	To establish communication protocols with purchasing Department and Corporate Departments using energy in order facilitate an understanding of the energy being purchased and used	Development of awareness campaign Regular meetings with utility representatives
Energy Use in Facilities	Operating Procedures	To establish written operating procedures to control equipment systems operations so as to optimize energy efficency and eliminate waste energy	Documented operating procedures outlining energy efficiencies Number of staff aware and utilizing energy efficiency in operational practices
	Customer Awareness	To develop program to increase energy conservation awareness for customers. ie: users of City facilities	Development of awareness campaign for external customers (residents) using City facilities
Equipment Efficiencies	Lighting Upgrades	To develop standards to lighting system upgrades (interior and exterior), with consideration for appropriate lighting levels and usage	Development of lighting standards (interior and exterior) for Corporate facilities Implementation of energy efficient technology for streetlighting
Organizational Integration	Performance and Training	To develop strategy to incorporate energy management into the accountability of employee manuals, job descriptions and performance reviews as required	Strategy development to incorporate energy management accountability into daily responsibilities of staff Staff awareness of responsibilities through energy management awareness training
	Resource Management	To develop policy to build in energy management into the requirements of all external service providers	Implementation of policies and processes to ensure energy management considerations are communicated and implemented as required by external service providers

PROJECTS

FOCUS AREA	ACTION	OBJECTIVE	PERFORMANCE MEASURES
Energy Supply Management	Demand Side Optimization	To investigate opportunities to match demand size load shifting to optimize cost	Implementation of suitable demand management programs Documented demand savings
	Risk Management	Establish metric to evaluate the success of the purchasing policy	Successful and cost effective procurement of all hedged commodities
Energy Use in Facilities	Investment Grade - Comprehensive Audits	To develop criteria to determine future years facilities scheduled for audits	Development of criteria for prioritization and requirements of audits All major facilities within Corporate portfolio undergone auditing process
	Commissioning and Re-Commissioning	To develop comprehensive testing to verify that systems and equipment perform to specifications and requirements of facilities	Implementation of commissioning and re-commissioning guidelines to ensure facility operates to specifications during initial installation and after retrofits
Equipment Efficiencies	System Upgrades	To develop implementation plans for system/process improvements	Optimize systems and processes to ensure energy efficiency
	Standards	Develop policy for energy efficient guidelines and equipment specifications for major renovations and new construction projects	Energy efficient guidelines and sustainable design principles and specifications are ingrained within all major renovation and new construction projects
	Equipment and Building Operational Improvements	To undertake equipment and building operations retrofits and improvements so energy efficiency is actioned - ie: variable speed drives, occupancy sensors, programmable thermostats, etc.	Develop awareness campaign to continue to reinforce and ingrain energy efficiencies and the elimination of waste energy within daily operational decisions Develop building system standards as required within all Corporate facilities
	New and Emerging Technology	To undertake pilot projects to determine benefits/weakness of any new and emerging energy technology as applicable for Corporate use	Implement applicable new and emerging technology so as to increase energy efficiency and eliminate waste energy

Equipment Efficiencies	Capital Asset Renewal Program	To develop strategy and sustainable funding model to ensure energy efficiency is incorporated within the asset renewal program to update the Green Fleet Plan	Continued sustainable funding to implement asset management renewal program to ensure energy management is a priority
	Green Fleet Implementation Plan	To implement strategies outlined within Green Fleet Implementation Plan	Successful implementation of Green Fleet Implementation Strategies
Organizational Integration	Energy Management Training	To incorporate energy management training into employee orientation and future training opportunities offered through Human Resources	Energy management training opportunities are integrated into Corporate training courses

Table 7: Key initiatives for the development of the Strategic Approach to Corporate Energy Management.

The proposed process improvements, program implementation and projects detailed within the Strategic Approach to Corporate Energy Management have economic impacts that will be associated with the time frame and feasibility of implementation. Along with the importance of providing sustainable funding for the initiatives proposed within the energy management strategy, the prioritization of these proposed processes improvements, program implementation and projects need to be considered. Over the next five years the Energy Committee will work to develop and implement the actions and objectives outlined within the five focus areas for successful energy management.

Understanding the need to build internal energy management awareness and capacity, the first priority of the Energy Plan will focus on building awareness, as well as building the foundation for successful energy management through the development of policies, processes and procedures. Building the internal capacity for energy management and demonstrating the success of such initiatives will serve to heighten the importance of implementing the remaining focus areas into the daily operational processes and future projects.

MEASURES OF SUCCESS

The measures of success will be based on a number of key performance indicators (KPIs) including:

- Reduction of energy consumption and GHG emissions from 2009 baseline data
- Integrating energy management into daily operation processes and facility-based infrastructure decisions
- Energy efficiency projects included into capital asset management decisions
- Increased capacity building and awareness regarding energy management within the Corporation and
- Unique project-specific performance indicators dependent on the project

REDUCTION TARGETS

To align with the proposed initiatives outlined within the Energy Plan, it is proposed that the targets also align with the initiatives that will be undertaken. The implementation of mainly process improvements and program implementation initiatives, to build the foundation for successful energy management practices along with developing the capacity and awareness within the Corporation, will lead to a 2-5% saving in consumption or consumption avoidance per year. These consumption target savings through process improvements and program implementation initiatives will also complement the continued savings scheduled through the continued investment in the Corporate capital asset renewal program. Consumption savings attributed to the projects undertaken through the capital asset renewal program will be project dependent. To be able to build upon the process improvement and program implementation initiatives projected consumption savings, continued sustainable funding for capital asset renewal energy efficient projects is essential.

2014 AND BEYOND

The Energy Plan is intended to be a living, flexible roadmap that will provide guidance and encourage Departments to incorporate energy management into their daily and future decisions. As capacity building and the development of the foundation for successful energy management practices will be the primary focus for the initial implementation of the Energy Plan, future years will allow employees to apply their knowledge to investigate energy efficiency initiatives that will emerge as the energy management field continues to thrive and evolve.

FINANCIAL ASSESSMENT

The City of Thunder Bay's 2012 budget for energy expenditures including electricity, natural gas, diesel, gasoline, and propane was $13,145,100. (see Figure 8)

Figure 8

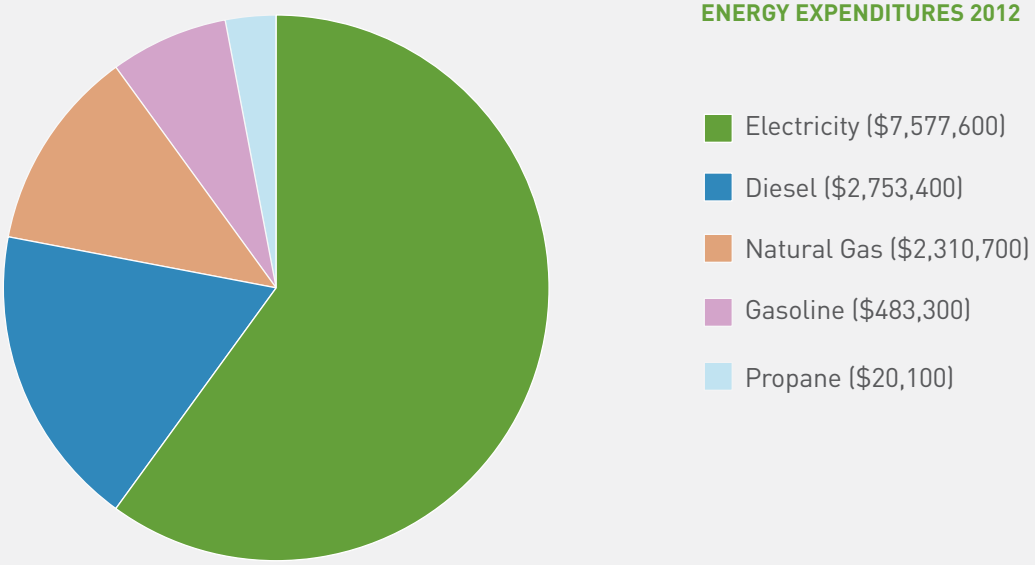

Figure 8. City of Thunder Bay Energy Budget, 2012.

Energy costs are controllable and can lead to additional savings once the culture of energy efficiency and the wise use of energy has been integrated into the Corporation. The proposed process improvements, program implementation and project initiatives can all lead to individual savings, but, as a whole, a more efficient process, facility and/or operation can lead to accumulated sustainable savings not only in consumption, GHG emissions, but also cost savings or avoidance. It is anticipated over the next twenty years that the cost of electricity will increase by 3.5% annually as projected in Ontario's Long Term Energy Plan. This increase can be mitigated through the consumption savings that can be achieved through the initiatives outlined within the Energy Plan.

To date, the success that has been achieved in energy efficiencies and the wise use of energy within the Corporation has helped to mitigate and avoid costs associated with the addition of facilities to the Corporate portfolio. For example, from 2012 to 2013, the Corporation has added 74,025 square feet of additional facilities to it's portfolio including Prince Arthur's Landing, Mountainview Cemetery, Superior North EMS District Headquarters, and additional units in the VictoriaVille Civic Centre.

In building upon the success of consumption and dollar savings and/or avoidance that has already been achieved, the initial phase of the strategy will strive to implement consumption savings within the 2%-5% target. This would result in an estimated annual savings or cost avoidance from $175,000 to $400,000.

The initial expenditures for the initial phase of the Energy Plan would require funding for approximately $25,000 to begin the development of the Corporate Awareness program. This funding for the development of the Corporate Awareness program will come from the proposed in-year savings as a result of the successful implementation of initiatives from the Energy Plan.

In addition, energy efficiency upgrades and new projects as part of the Capital Asset renewal program and operating budgets will continue to be brought forth to Council for approval within the designated budget year. As the cost of energy is expected to increase over the next years' budget, allocations toward energy efficiency are also required to help reduce the impact of these increases through energy reduction activities.

Providing a sustainable budgetary component to energy management initiatives demonstrates the leadership and commitment to energy and greenhouse gas reduction within the Corporation.

INCENTIVE FUNDING

To ensure the Corporation is able to take advantage of all funding and grant opportunities related to energy efficient programs and projects, representatives from Thunder Bay Hydro and Union Gas work closely with Corporate staff. By participating in a variety of workshops and training sessions, staff and utility representatives are in a unique position to review current and future process improvements, program implementations and projects that can meet funding requirements. This working relationship also allows utility representatives to assist in determining the potential for customized programs that may not fall into the existing prescribed funding models.

Through the development of the Energy Committee, funding for energy efficient initiatives is coordinated and documented by the Energy Analyst. The Energy Analyst will continue to work to coordinate funding opportunities with Thunder Bay Hydro and Union Gas and any other provincial or federal agencies as applicable.

Currently, any funding that is received through energy efficient initiatives is reallocated back to either operating or capital accounts. As part of the key initiatives outlined within the Energy Plan, it is proposed that a Corporate Energy Innovation Reserve fund be established with incentive funding, where applicable, to be able to fund future energy initiatives. The reserve fund details, priority and responsibility is to be managed by the Community Services Department with consultation from the Energy Committee.

ENERGY SUCCESSES AND CURRENT INITIATIVES

It is essential to build upon the successes that the Corporation has already achieved to move forward with the Energy Plan. A variety of the successful initiatives have been documented in Appendix G Corporate Energy Management Plan through the 2012 report. Each year a detailed report will continue to be provided to City Council outlining the past year's initiatives through the Sustainability Plan Annual Report. The examples of initiatives provided in the 2012 CEAP report contributed to the total energy and greenhouse gas emission reduction illustrated in Table 5.

MONITORING, VERIFICATION AND REPORTING

As part of any energy management strategy, continuous monitoring, verification, and reporting is an essential tool to track consumption and dollar savings and/or avoidance as the result of implemented initiatives.

Currently, the Energy Committee is responsible for providing an annual progress report with energy consumption data and initiatives undertaken within the calendar year through the Sustainability Plan to Council.

As part the Energy Plan, the implemented processes improvements, program implementation and projects will continued to be documented and reviewed annually to update consumption savings. By regularly monitoring and reporting consumption and dollar savings and/or avoidance to Departments, the outcomes of their participation in energy management initiatives can be demonstrated, and feedback can be obtained for any new ideas. Reporting of the Corporate energy management initiatives and consumption data will continue to be presented to Council through the Sustainability Plan.

This monitoring and reporting will also align with the requirements of the Green Energy Act's Conservation and Demand Management Plans to develop energy conservation plans which would include a high level description of how the Corporation will conserve energy and reduce demand over the life of the plan, as well as a forecast of the expected results.

ENERGY MANDATE

As part of the City of Thunder Bay's commitment to reduce greenhouse gas emissions and fiscal accountability, it is essential that all staff play a part in the Energy Mandate. It will be the responsibility of the Community Services Department, through the Energy Analyst and the assistance of the Energy Management Committee, to ensure the energy management strategy and future awareness/training programs are actively communicated and implemented to all employees.

An Energy Mandate for the Corporation of the City of Thunder Bay has been developed and is a fundamental element to the success of the Energy Plan.

CORPORATION OF THE CITY OF THUNDER BAY ENERGY MANDATE

WHEREAS energy is a resource that must be properly managed within municipal operations;

AND WHEREAS City Council has adopted the goal to reduce Corporate energy consumption through the wise use of energy and move towards a carbon neutral future;

AND WHEREAS the Energy Committee has a detailed mandate to integrate facility efficiencies and operations to reduce overall Corporate energy consumption;

AND WHEREAS in an effort to ensure the efficient and effective energy management, Council and staff are committed to integrating a culture of conservation and sustainability into daily municipal operations and decision making;

AND WHEREAS the consumption of energy is a controllable activity influenced by all staff, the responsibility of energy management must be practiced by everyone;

AND WHEREAS the City of Thunder Bay understanding that energy is a controllable cost, highlighting the importance of fiscal accountability to our citizens;

AND WHEREAS Council will ensure that the appropriate resources from all Departments will be allocated to ensure that the initiatives detailed within the Strategic Approach to Corporate Energy Management are implemented and integrated into daily operations,

AND WHEREAS the Strategic Approach to Corporate Energy Management is a living roadmap that will continue to evolve as required to ensure the effective and efficient foundations for the development of a successful energy management culture within all municipal operations.

THEREFORE BE IT RESOLVED that the Community Services Department, through the Energy Analyst and with the assistance of the Corporate Strategic Energy Management Committee, be directed to implement the initiatives outlined within the Strategic Approach to Corporate Energy Management, including but not limited to:

- Development of energy management processes and policies that will assist in the foundation of a successful energy management program within the Corporation
- Develop and implement a Corporate Energy Management education and awareness program

APPENDIX A

360 Energy Radar Assessment Summary for the Corporation of the City of Thunder Bay.

A 360 Radar assessment report was presented to the Committee providing a reference point in developing a customized energy management strategy for the Corporation. The findings outlined in the report were based on the responses to the assessment questions in each of the six integral areas of a successful energy management plan.

- **Mandate:** The Mandate for energy management illustrates senior management and Council's commitment to managing energy. The Mandate must include: accountability for implementation and results, scheduled management reviews, clearly articulated goals, meaningful metrics and explicit approval by senior management and Council.
- **Energy Plan/Strategy:** The energy plan/strategy outlines how the Corporation will put the energy mandate (goals) into action. It is to be a roadmap that will integrate energy management into daily operations and decisions. The plan/strategy will also monitor changes and results, compare them to the set out goals, adjust as required and report status to City Council on an annual basis.
- **Procurement:** The procurement of energy is a crucial element to any energy management strategy. Proper energy procurement includes: rate optimization, utility account management, supplier choice and evaluation, supply reliability and quality, demand-supply optimization and risk management.
- **Energy Information:** To ensure the daily integration of energy management practices, the concept that energy is a variable, controllable cost should be continually reinforced through effective monitoring systems that can provide accurate feedback to make individuals accountable and allow them to control energy usage.
- **Employee Engagement:** The entire organization, all levels and areas need to participate in the development of the Energy Management Strategy. All Departments, functions, processes and programs that impact energy usage need to be identified. The roles and expectations of the program need to be clearly defined and communicated to all employees on a regular basis.
- **Available Resources:** Effective energy management requires that an adequate budget be developed for the strategy. Allocating a percentage of the Corporation's annual energy expenditure on program management can set realistic goals, with a portion of the estimated savings being reinvested to further energy management initiatives. Allocating sufficient staff and time to be able to achieve the desired results is also an essential component.

As illustrated in the radar assessment chart (See Figure 1), the results show that the Corporation has a strong mandate to develop the Corporate Energy Management Strategy through formal support of City Council by way of the Community Environmental Action Plan (CEAP), the 2011-2014 Strategic Plan and senior management. The assessment also illustrates the strong commitment to Corporate Energy Management by way of the dedicated resources applied through the development of the Energy Committee and the dedicated Energy Analyst position. The assessment also outlined areas of improvement such as the development of a focused employee awareness program to engage all employees at all levels and operations, opportunities in the procurement processes, the development of an energy strategy to guide the implementation of the energy mandate, and distribution of energy consumption data to all employees enabling them to make informed daily decisions with respect to energy consumption. Each area of opportunity will be addressed within the key initiatives of the Corporate Energy Management Strategy.

360 ENERGY RADAR CHART

Figure 1

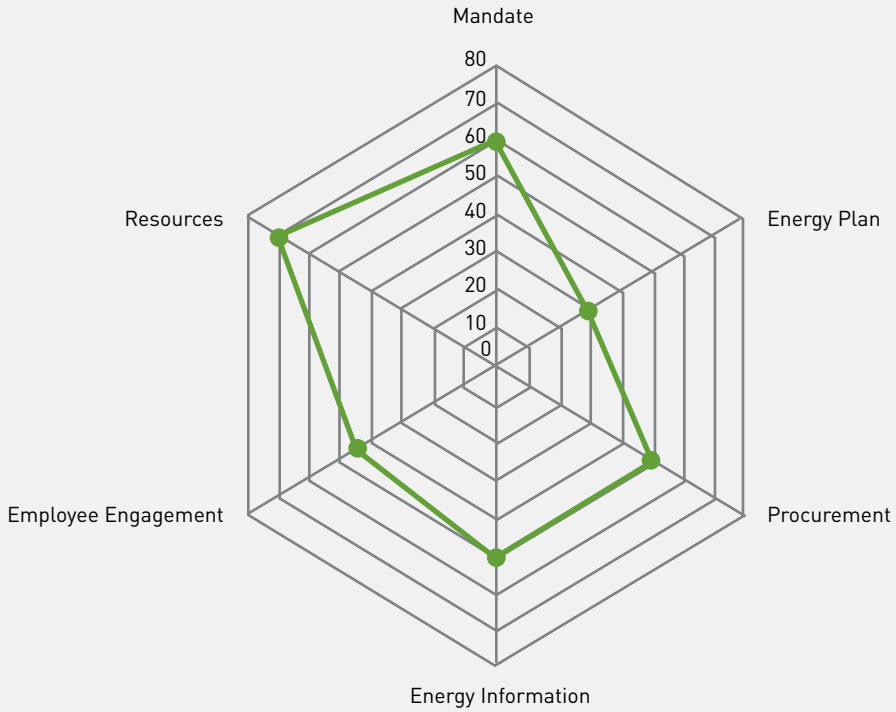

Figure 1. 360 Energy Inc's Corporation of the City of Thunder Bay Energy Radar Assessment.

APPENDIX B

Green Fleet Implementation Plan Summary

PURPOSE

The purpose of this plan is to present a sustainable strategy for the City's fleet of vehicles and equipment that will continually reduce harmful pollutants and emissions.

OBJECTIVES

The objective of this plan is to guide the reductions of greenhouse gas emissions (eC02) from the 2005 baseline emissions by the year 2017 as noted in the Community Environmental Action Plan.

STRATEGIES

Strategy 1 - Fuels Used in Combustion Engines

A phased implementation of Biodiesel fuel is recommended in all fleet areas. Starting with B5 Blend biodiesel in 2009 and 2010 and increasing the blend by 5 % every two years thereafter to 2017 reaching a blend rate of B20.

Strategy 2 - Procurement of Fleet Assets

Reduction of fuel consumption can be managed though the purchasing of fuel efficient and right sized vehicles as a standard practice across all Divisions, where they are commercially available and meet operational needs. Approximately 50 vehicles/equipment units are replaced annually with the latest emissions technology commercially available in Thunder Bay.

All equipment replacement tenders request options for the latest emission reduction available within each specific vehicle/equipment class.

Strategy 3 - Operator Education and Training

Natural Resources Canada (NRCan) Office of Energy Efficiency offers a new no fee program called "SmartDriver in the City". The program is delivered in a number of topical segment, assisting fleets to lower their fuel consumption, reduce wear and tear on vehicles, improve driver skills aimed at lowering vehicle accidents or damages and help to improve the corporate image by ensuring a cleaner, healthier environment.

Fleet Services proposes to supplement existing fleet training programs with programs like the NRCAN "SmartDriver in the City" program starting in 2009 for all existing and new operators.

Fleet Services continues to provide new vehicle orientation upon delivery. New vehicle vendors are required to provide specialized operator orientation to operators ensuring in-depth knowledge of the vehicles used day-to-day. Fleet Services will continue to improve driver performance through increased training and education of all municipal vehicle operators.

Strategy 4 New and Emerging Technologies

Continue to investigate pilot projects utilizing electric vehicle and other heavy truck hybrid technologies as they become available in Thunder Bay and recommend unique opportunities which result in cost effective and reduced fuel consumption and emissions. Currently low speed electric vehicles are not yet approved for use in Ontario. Fleet Services continues to request options for hybrid and new technologies in all Tenders and Proposals for equipment acquisition.

Participate in a hybrid technology study offered by Canadian Urban Transit Association (CUTA) to seek efficient and effective fleet products with the goal of reducing fleet fuel consumption, engine emissions and operating costs. The report will be available in the summer of 2009 and will outline current and future hybrid transit technologies along with their respective operating details. This report will also include comprehensive decision tools for administration to use in future transit bus purchases.

Strategy 5 - Fleet Efficiencies

IDLING: Continuation of the new anti-idling procedure with the goal of reducing eC02 emissions by 95 tonnes annually. No additional costs are necessary to maintain or enhance the existing idling procedures.

VEHICLE USE AND OPTIMIZATION: Continue right sizing of fleet units through discussions with Divisions utilizing city vehicles and equipment with the goal of rationalizing fleet assets, reducing fuel consumption and increasing fleet efficiencies.

APPENDIX C

Corporate Strategic Energy Planning Committee Membership and Roles and Responsibilities

The membership of the committee and roles and responsibilities include:

ROLE	RESPONSIBILITY
Chair of Energy Committee General Manager – Community Services Department	Overall Corporate Energy and Liaison with SMT/EMT
Manager – Facilities Services	Management of Corporate Facilities
Manager – Construction Services	Construction and Renovations of Corporate Facilities
Manager – Environment Division	Management Water and Wastewater Facilities
Manager – Supply Management	Procurement of Energy
Manager – Roads Division	Management of Traffic Control and Streetlighting
Manager – Parking Authority	Management of Parking Facilities/Lots with associated lighting
Manager – Parks Division	Management of Operations for Parks, Arenas/Stadium, Fort William Gardens, Cemeteries
Manager – Recreation & Culture	Management of Operations for Canada Games Complex, Community Aquatics, Community Centres, Older Adults Centres, & Child Care Centres
Operations & Budget Analyst – SNEMS	Budget Coordination, Planning, Data Analysis and Management
Division Chief – Fire Administration	Management Operations for Fire/Rescue Halls.
Manager – Fleet Services	Management of Corporate Fleet and Fuels
Supervisor – Network & Technology Systems	Management of Corporate IT systems
Manager – Energy, Financial and Administrative Services	Management and Budgeting of Corporate Energy
Sustainability Coordinator	Coordination of the Community Environmental Action Plan
Energy Analyst – Municipal Energy Conservation Officer (MECO)	Monitoring and Verification of Energy Consumption Energy Budgets Liaison for plan development and energy initiatives within Corporation Grant funding opportunities
Accounting Supervisor – TB Public Libraries	Management of budgets, Liaison to TB Public Library Board
Building Services Manager – TB Community Auditorium	Liaison to TBCA Board and operation of facilities
Manager – Finance and Support Services – Police Services	Liaison to Police Services Board and Management of Police Services budgets

CORPORATE STRATEGIC ENERGY PLANNING COMMITTEE TERMS OF REFERENCE

GOAL

To develop a strategic plan to meet the Sustainability Plan's Energy Goal to "promote the wise use of energy and the transition to a carbon-neutral future".

The breakdown of Corporate energy by category in the report is as follows:

1. Facilities
2. Water and Wastewater
3. Traffic/Street Lighting, Parking Authority and Other Outdoor Lighting
4. Fleet

OBJECTIVES

- To develop strategies with the operations to work towards reducing energy consumption (GJ) by 20% below 2009 baseline by 2020
- To integrate best practices into daily operations, where feasible, to reduce energy consumption
- To provide a forum for discussion on energy management strategies that may benefit all Divisions
- Increase Corporate awareness of the consumption of energy within each Department
- To provide information for the Sustainability Plan

MEMBERSHIP

The committee will be made of a cross functional team from Corporate Stakeholders who have responsibility for planning and authorizing Corporate Capital and Operating expenditures related to the categories outlined above and are key to the success of achieving the Corporate goal reduction.

MEETING SCHEDULE

Quarterly.

APPENDIX D

Summary of Corporate Strategic Direction and Alignment with Other Plans

Partners for Climate Protection: (2003)

In March 2003, the City of Thunder Bay passed a resolution to participate in the Partners for Climate Protection (PCP) program. This resolution makes a commitment to work towards reducing greenhouse gas emissions in municipal operations by 20% below 1990 levels, and at least 6% reduction throughout our municipal area.

In accordance with the Federation of Canadian Municipalities (FCM) Climate Protection program the City of Thunder Bay is working to complete five performance milestones (see Table 1). The milestone framework was established to help guide our municipal efforts to reduce greenhouse gas emissions. It provides a method to better understand how municipal decisions and planning effect energy use, and how we can work to mitigate global climate change while improving our community's quality of life. The five milestone process is a sequential process that includes the following:

Table 1

MILESTONE	OBJECTIVE	TIMELINE
1	An emissions inventory for community	Completed 2008
2	Setting emission reduction targets	Completed 2008
3	Developing a Community Environmental Action Plan (CEAP)	Completed 2008
4	Implementation of the Plan	Ongoing
5	Ongoing progress monitoring and reporting	Ongoing

Table 1: Summary of PCP milestones and City of Thunder Bay progress.

City of Thunder Bay Environmental Policy: (2005)

In 2005, City Council adopted an Environmental Policy statement to fulfill a goal under the 2004 City of Thunder Bay's New Foundation Living Strategic Plan to "foster and promote qualities of a healthy community and to grow greener by promoting sustainability and by being a leader in environmental stewardship." Strategic Action No. 14 of the plan specifically calls for the development and recommendation of an Environmental Policy for the City of Thunder Bay.

Policy Statement

It is the policy of the Corporation of the City of Thunder Bay to provide leadership and continual improvement in environmental management and performance. In all activities, the City will seek to identify and monitor issues and minimize our impact on the environment to further our goal of community sustainability.

Statement of Environmental Principles

The Corporation of the City of Thunder Bay will demonstrate leadership and continual improvement in the practice of environmental management and performance. To this end, we will:

1. Ensure that environmental considerations and energy conservation are fully integrated into all decisions respecting community planning, service delivery, and operations
2. Strive to achieve a level of performance that meets or exceeds all applicable environmental legislation and regulations
3. Use the best available technology economically achievable, consistent with the current knowledge of environmental protection and innovation
4. Promote the sustainable use and re-use of resources and work to reduce the consumption of non-renewables
5. Communicate openly and in a timely manner with community, business, stakeholders, and our employees, on our environmental policies and programs, and make these commitments readily available to all interested parties
6. Increase public awareness of environmental issues and actions people can take by promoting environmental education and training, and participating in projects that promote water and energy conservation, waste reduction, pollution prevention and urban green-spaces
7. Participate in community initiatives to protect and improve the quality of the environment for future generations
8. Contribute to the preparation and implementation of the Community Environmental Action Plan (CEAP) with the knowledge and assistance of community partners
9. Use the precautionary principle where there exists the possibility of significant harmful effects on health or the environment
10. Strengthen green procurement commitments by employing environmental criteria when evaluating all potential purchases

Clean, Green and Beautiful Policy: (2007)

In 2007, City Council approved the Clean, Green and Beautiful Policy, with a vision to foster and promote our quality of life, which is directly linked to establishing and nurturing a healthy community that is environmentally sustainable. The vision for improving our quality of life is centered on the creation and maintenance of a city that celebrates its culture and history through the arts and architecture, protects and enhances its natural systems, and provides a clean and healthy environment for its citizens – it is quite simply, clean, green and beautiful.

The City shall ensure that its own projects and partnership projects are evaluated based on the following Performance Criteria and review which criteria are appropriate to each project. For each City project, Council will require project managers to report the extent to which their projects meet the diamond performance standard for clean, green and beautiful.

The performance criteria include references to energy management through:

Clean: Conserving Energy
Use of Alternative Energy
Reducing Greenhouse Gas Emissions

Green: Protecting Biological Diversity
Protecting Ecological Integrity

Community Environmental Action Plan (CEAP): (2008)

In July of 2004, City Council supported a proposal for the development of a Community Environmental Action Plan. It was recognized that the development of a comprehensive, integrated Community Environmental Action Plan (CEAP) would address a number of existing initiatives within the City. It would also meet the intent of previous Council resolutions to develop a community energy plan and a sustainable energy policy to reduce greenhouse gas (GHG) emissions.

The plan takes an integrated approach to promoting a more sustainable community recognizing that environment, economy, society and culture are linked to issues such as active transportation, air, community greening, food, energy, green building, land use, pesticides, waste and water.

Energy Goal
To reduce greenhouse gas emissions through the wise use of energy, and to promote the transition to a carbon neutral future.

Objectives and Recommended Actions
4.1 Reduce total energy usage by 35% within the Corporation of the City of Thunder Bay, and 10% within the community at large, below 2005 levels by 2017

4.2 Reduce fossil fuel generation by adopting practices that reduce electricity demand during peak periods.

4.3 Encourage the development and use of renewable energy technologies.

City of Thunder Bay Strategic Plan 2011 – 2014

In June 2011, City Council adopted the "2011-2014 City of Thunder Bay Strategic Plan" and approved the Plan's Vision, Mission, Principles, Goals, Strategic Directions and Actions. The Strategic Plan was developed with input from Members of Council and the Executive Management Team (EMT) through a series of Non-Business Meetings, as well as input from employees, various stakeholders and citizens. The 2011-2014 Strategic Plan builds on the success of two previous Strategic Plans (The 2004-2006 New Foundation Strategic Plan and the 2007-2010 Building on the New Foundation Strategic Plan) and the four main pillars of economy, lifestyle, environment and governance.

Building on the aspiration and essence of the four main pillars, the Vision of Thunder Bay is
Thunder Bay - Connected, Healthy, Vibrant, Strong

The Strategic Plan presents goals under each pillar including

ENVIRONMENT PILLAR
GOAL 9: Reduce greenhouse gas emissions through the wise use of energy.

STRATEGIC DIRECTION:
9.1. Reduce the total carbon-based energy consumption within the Corporation of The City of Thunder Bay below 2005 energy baseline levels.

9.2 Support and encourage the development and use of renewable energy technologies within the community

GOAL 10: Promote a more sustainable community recognizing that environment, economy, society and culture are linked through the implementation of the Community Environmental Action Plan.

STRATEGIC DIRECTION:
10.1 Promote greening and protect the City's environment

GOAL 11: Be financially sustainable, with the resources required to support the City's plan and provide the infrastructure and services citizens need.

STRATEGIC DIRECTION:
11.1 Thunder Bay's capital financing capacity will be increased and the annual infrastructure deficit will be reduced

11.2 Achieve and sustain a healthy financial position for the City of Thunder Bay

11.3 Thunder Bay will be recognized as a centre of excellence in service and operational management and delivering services in a fiscally responsible manner

CITYLean: (2011)

In June 2011, City Council endorsed the City Manager's Corporate Review Process to focus on excellence in City Services, including organizational efficiency and effectiveness to make certain that the Corporation maximizes use of its available tax and rate supported financial resources.

Known as CITYLean, this proven methodology seeks to improve organizational processes by eliminating waste, redundancy and other inefficiencies on a smaller scale first, and then build organizational capabilities that will allow for greater improvements over time. The goal is to improve quality, contain and/or reduce costs and develop a culture of continuous improvement by:

- Improving overall performance of the City, delivering financial benefits and customer service enhancements
- Reducing wasteful and non-value-added activities
- Fostering inter-departmental cooperation, innovation and a culture focused on transforming and improving business processes
- Engaging and empowering employees to streamline and improve their business process, to increase personal performance and job satisfaction
- Creating sustainable business process change and improvement
- Increasing our commitment to environmental and social stewardship
- Identified within the potential programs for CityLEAN include
- City Fleet rationalization and measures to reduce fuel consumption and ongoing operating/capital costs through more efficient Citywide vehicle usage

With a complimentary program to

- Ongoing implementation of corporate energy management initiatives directed at saving a minimum of 1% in energy costs per year

EarthCare Sustainability Plan 2014-2020

In June 2014, City Council adopted the EarthCare Sustainability Plan 2014-2020. The development of the Sustainability Plan was the result of actively sought and valued public engagement, as well of a number of supported resolutions passed by Council. Both which have an end goal of reducing greenhouse gas (GHG) emissions within the City of Thunder Bay. The purpose of the plan is to help promote a sustainable, healthy Thunder Bay now and in the long term.

The main section of this plan reflects the extensive contribution of the EarthCare Working Groups in examining local and global issues, and in creating goals, objectives, and proposed actions leading to greater community sustainability, resilience, and reduced greenhouse gas emissions.

Energy Goal (for the Corporation)

To promote the wise use of energy and the transition to a carbon-neutral future. By 2020, the community of Thunder Bay will reduce greenhouse gas emissions by 20% below 2009 levels.

Objectives and Recommended Actions (for the Corporation)

A. By 2020, total municipal operations energy consumption (GJ) is 20% below 2009 levels

a) Adopt higher energy efficiency standards for new buildings and renovations that minimize the environmental impact of the capital projects and energy demands of city facilities

b) Continue to implement the Strategic Approach to Corporate Energy Management Plan

c) Develop a Local Improvement Charge (LIC) incentive program to facilitate energy efficiency upgrades to private property

d) Update and revise the Green Fleet Plan to meet new goals and best practices

e) Create processes to track staff travel claims and work to reduce mileage and flights

B. Renewable energy is increasingly used to meet local demand

a. Continue to implement renewable energy projects such as rooftop/land-mount solar projects

b. Pursue opportunities to increase generation capacity for renewable energy sources

APPENDIX E

SEP - Performance Scorecard

LEVEL	ENERGY DATA MANAGEMENT	ENERGY SUPPLY MANAGEMENT	ENERGY USE IN FACILITIES	EQUIPMENT EFFICIENCY	ORGANIZATIONAL INTEGRATION
PROCESSES	- Accessibility - Monthly Bills - KPI & Benchmarking - Reporting	- Error Resolution - Rate Optimization - Account Management	- Facility walkthrough - Benchmarking & Ranking Facilities	- Corrective Maintenance Program - Systems Control	- Awareness & Participation - Energy Manager's Role
PROGRAMS	- Load Profiling - Interval Data	- Supplier Choice - Purchase Set Up - Supply Management - Supplier Reliability & Quality - Deregulation	- Diagnostic Audit - Operating procedures	- Preventive Maintenance Program - Lighting Upgrades - Alternate Fuels	- Energy Planning - Performance & Training - Resource Management - Budget Preperation - Results Auditing
PROJECTS	- Sub-metered Data	- Demand-Supply Optimization - Risk Management	- Investment Grade - Comprehensive Audits - Commissioning - Ongoing Monitoring	- System Upgrades - Standards - New Technology - System Measurement/ Verification	- Project Approval - Accountability & Review

APPENDIX F

CORPORATE BASELINE ENERGY CONSUMPTION 2012

INFRASTRUCTURE & OPERATIONS

Natural Gas	
Total M3	2,013,760.54
Total $	575,574.01
Total GHG	3,786.09
% of Corp	36.69%

Electricity	
Total KWH	38,787,048.66
Total $	5,382,284.65
Total GHG	5,042.32
% of Corp	64.99%

Diesel	
Total Litres	1,031,051.00
Total $	1,067,871.05
Total GHG	2,568.12
% of Corp	34.81%

Gasoline	
Total Litres	333,323.00
Total $	375,511.51
Total GHG	813.31
% of Corp	30.56%

COMMUNITY & EMERGENCY SERVICES

Natural Gas	
Total M3	2,420,325.48
Total $	680,300.98
Total GHG	4,550.47
% of Corp	44.10%

Electricity	
Total KWH	10,839,444.73
Total $	1,298,662.56
Total GHG	1,409.13
% of Corp	18.16%

Diesel	
Total Litres	93,493.00
Total $	102,751.53
Total GHG	233.09
% of Corp	3.17%

Gasoline	
Total Litres	281,790.00
Total $	311,511.18
Total GHG	687.54
% of Corp	25.83%

FACILITIES, FLEET AND TRANSIT SERVICES

Natural Gas	
Total M3	142,721.95
Total $	42,919.65
Total GHG	268.33
% of Corp	2.60%

Electricity	
Total KWH	788,922.08
Total $	98,187.86
Total GHG	102.56
% of Corp	1.32%

Diesel	
Total Litres	1,834,119.80
Total $	1,996,237.01
Total GHG	4,566.96
% of Corp	61.88%

Gasoline	
Total Litres	16,065.00
Total $	17,676.23
Total GHG	39.20
% of Corp	1.50%

DEVELOPMENT SERVICES

Natural Gas	
Total M3	177,191.20
Total $	40,385.92
Total GHG	333.14
% of Corp	3.23%

Electricity	
Total KWH	3,399,727.64
Total $	420,865.36
Total GHG	441.96
% of Corp	5.70%

Diesel	
Total Litres	-
Total $	$ -
Total GHG	-
% of Corp	-

Gasoline	
Total Litres	22,261.00
Total $	24,527.20
Total GHG	54.32
% of Corp	2.09%

POLICE SERVICES

Natural Gas	
Total M3	115,894.15
Total $	48,677.16
Total GHG	271.48
% of Corp	2.75%

Electricity	
Total KWH	1,521,600.00
Total $	170,478.27
Total GHG	197.81
% of Corp	2.55%

Diesel	
Total Litres	3,392.00
Total $	3,707.04
Total GHG	8.45
% of Corp	0.11%

Gasoline	
Total Litres	352,634.00
Total $	388,413.56
Total GHG	860.43
% of Corp	32.32%

	GHG Coefficient (t GHG/unit of fuel) (total CO2e
Electricity	0.00013
Natural Gas	0.001880108
B10 Diesel	0.002415
B5 Diesel	0.002549
Gasoline	0.00244

Natural Gas	
Total M3	5,488,137.86
Total $	1,560,303.64
Total GHG	10,318.29

Electricity	
Total KWH	59,683,857.58
Total $	7,926,749.93
Total GHG	7,758.90

Diesel	
Total Litres	2,963,555.92
Total $	3,172,030.75
Total GHG	7,380.36

Gasoline	
Total Litres	1,090,922.96
Total $	1,211,706.27
Total GHG	2,661.83

PUBLIC WORKS YARDS

Natural Gas	
Total M3	315,770.48
Total $	99,614.55
Total GHG	593.68
% of Corp	5.75%

Electricity	
Total KWH	864,969.30
Total $	106,996.92
Total GHG	112.45
% of Corp	1.45%

CORPORATE ADMINISTRATIVE FACILITIES

Natural Gas	
Total M3	149,647.61
Total $	41,121.29
Total GHG	281.35
% of Corp	2.73%

Electricity	
Total KWH	1,968,218.08
Total $	236,240.51
Total GHG	255.87
% of Corp	3.30%

Diesel	
Total Litres	1,087.00
Total $	1,017.12
Total GHG	2.71
% of Corp	n/a

Gasoline	
Total Litres	78,615.46
Total $	87,157.34
Total GHG	191.82
% of Corp	7.21%

OUTSIDE BOARD AND AGENCIES

Natural Gas	
Total M3	152,826.44
Total $	47,502.02
Total GHG	287.33
% of Corp	2.78%

Electricity	
Total KWH	1,513,927.10
Total $	213,033.80
Total GHG	196.81
% of Corp	2.54%

Diesel	
Total Litres	413.12
Total $	447.00
Total GHG	1.03
% of Corp	0.01%

Gasoline	
Total Litres	6,234.50
Total $	6,909.25
Total GHG	15.21
% of Corp	0.58%

APPENDIX G

PROCESS IMPROVEMENT

In 2011, City Council approved the adoption of the Strategic Approach to Corporate Energy Management Plan. The Energy Management Plan is a living document that provides a roadmap and builds internal energy management knowledge and awareness. It also provides the foundation for successful energy management decisions and actions within all Corporation operations.

In 2012, the Corporate Energy Management Committee worked collaboratively within all Departments to successfully reduce greenhouse gas emission from 2011 by 4%. This aligns with the consumption reduction and/or avoidance target of 2% - 5% per year as set out in the Plan. Successes in achieving the vision of the Strategic Approach to Corporate Energy Management Plan are highlighted in the tables below.

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Energy Data Management	Accessibility & Reporting	Provide access to Corporate Energy Management Tool (EMT) for energy data to all identified staff	Continue to work with AMO-LAS to explore the use of the Energy Management Tool to meet the needs of Corporate data accessibility and reporting
	Key Performance Indicators (KPI's)	Provide meanigful benchmarking indicators for all facilities	Determined KPI's should align with the Green Energy Act reporting requirements

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Energy Supply Management	Account Management	To establish a corporate Energy Innovation Reserve Fund with incentive funding to fund future energy initiatives	Energy Innovations Reserves Fund established. Incentives funding from energy efficient upgrades are placed in fund
	Rate Optimization	To provide notification to procurement team by Departments of changes in operations that will affect consumption load requirements in future years	Continue to work with all Departments to advise of changes within operations and facilities portfolios. (i.e. addition of new Mountainview Cemetery facilities, transfer of CN Station facility to private sector)

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Energy Use In Facilities	Facility Standards	To develop operational standards for building controls within facilities using Industry standards	Various facilities reprogrammed thermostats with reduced day and night time settings 55+ Centre programmed and locked thermostats to control temperature settings

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Equipment Efficiencies	System Controls	To develop a process to control equpiment and systems when operating levels or loads are reduced as to reduce energy use	Ongoing preventative maintenance programs in Fire Stations Arena operators utilizing energy efficiency practises while operating refrigeration plant
	Energy Efficient Procurement	To develop policy for standards for the purchase of energy efficient equipment (i.e. Energy Star)	Community Services budget approved purchase of new Energy Star appliances for various community centres New energy efficient appliances purchased for 55+ Centre & Algoma Day Care

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Organizational Integration	Awareness and Participation	To develop a Corporate Energy Awareness Program to build internal capacity allowing Departments to make informed energy management decisions	Signs posted to remind users to turn off lights in rooms of 55+ Centre Fire Services promoting energy conversation with Personnel EMS reviewing energy use and phantom loads within Stations and with staff
	Incentive Awareness	To develop a process to ensure all Departments have available energy incentives that can be leveraged in planning energy management initiatives	Met with Thunder Bay Hydro and Union Gas representatives to discuss funding opportunities for energy efficient projects Participated in Ontario Power Authority's Small Business Lighting Program and other Energy Retrofit Incentive Programs Participated in various Union Gas Energy Retrofit Incentive Programs

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Energy Data Management	Interval Data	Establish policy for requiring interval meter installation for new of retrofit projects for facilities consuming more than 25,000 kWh or demand greater than 50 KV	Interval meters installed in two facilties with ability to monitor electrical consumption through Energy Management Tool

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Energy Supply Management	Supply Management	To establish communication protocols with purchasing Department and Corporate Departments using energy in order to facilitate an understanding of the energy being purchased and used	Progress to be reported in 2013

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Energy Use In Facilities	Operating Procedures	To establish written operating procedures to control equipment systems operations so as to optimize energy efficiency and eliminate waste energy	Progress to be reported in 2013
	Customer Awareness	To develop program to increase energy conservation awareness for customers (i.e. users of City facilities)	Signs posted in rooms of 55+ Centre to remind users to turn off lights when room not in use

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Equipment Efficiencies	Lighting Upgrades	To develop standards to lighting system upgrades internal and external, with consideration for appropriate lighting levels and usage	Energy efficient lighting installed in various facilities Algoma Day Care using natural sunlight when possible Lighting retrofit at Fort William Gardens Business case model initiated for installation of LED streetlights Lighting Retrofit at Front and Egan Public Works Yard including motion sensors

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Organizational Integration	Performance & Training	To develop strategy to incorporate energy management into the accountability of employee manuals, job descriptions and performance reviews as required	Fire Services, 55+ Centre and EMS staff promoting energy conservation amongst employees Parking Authority working with Parkade users to ensure lighting levels meet needs without waste
	Resource Management	To develop to build in energy management into the requirements of all external service providers	Parking Authority working with Parkade user to ensure lighting levels meet needs without waste

PROJECTS

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Energy Supply Management	Demand Side Optimization	To investigate opportunities to match demand size load shifting to optimize cost	Water Pollution Control Plant participated in demand response program Investigation into feasability of other facilities to participate in demand response programs
	Risk Management	Establish metric to evaluate the success of the purchasing policy	Progress to be reported in 2013

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Energy Use In Facilties	Investment Grade – Comprehensive Audits	To develop criteria to determine future years facilities scheduled for audits	Energy audits performed at North Central Fire Station and Balmoral Police Station
	Commissioning and Re-commissioning	To develop commissioning comprehensive testing to verify that systems and equipment perform improvements	

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Equipment Efficiencies	System Upgrades	To develop implementation plans for system/process improvement	Updated and installed Building Automation Replacement of windows, doors, weather stripping and installation in various facilities
	Standards	Develop policy for energy efficient guidelines and equipment specifications for major renovations and new construction projects	Superior North EMS District Headquarters LEED Gold Standard Building Mountview Cemetery built utilizing energy efficient guidelines and principles
	Equipment and Building Operational Improvements	To undertake equipment and building operations retrofits and improvements to energy efficiency is actioned (i.e. variable speed drives, occupancy sensors, programmable thermostats, etc.)	HVAC upgrades in Volunteer Pool Occupancy sensors installed in various facilities Ongoing preventative maintenance on heating systems in Fire Station Installation of LED exit lighting at various facilities Installation of low flow toilets and shower heads in various facilities Chiller core replacement at CGC Data Centre installed a new energy efficient A/C unit and new uninterruptible power supply Installation of infrared heaters at Mountdale Public Works Yard
	New and Emerging Technology	To undertake pilot projects to determine benefits/weakness of new and emerging energy technology as applicable for Corporate use	LED office lighting and solar tubes installed in Front and Egan Administration Building as pilot projects Solar PV Roof top projects with TB Hydro Renewable projects – City of Thunder Bay and Thunder Bay Hydro

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
	Capital Asset Renewal Program	To develop strategy and sustainable funding model to ensure energy efficiency is incorporated within asset renewal program	Roof repairs at Volunteer Pool Building envelope inprovements as various facilities New boiler & soft starts on heat pumps at Balmoral Police Station Heat pumps at Victoriaville Civic Centre and 55+ Centre Mechanical upgrades at Volunteer Pool and Grandview Arena
	Green Fleet Implementation Plan	To implement strategies outlined within Green Fleet Implementation Plan	Completed Fleet Rationalization and Utilization Study Increased use of low power LED vehicle lighting to reduce vehicle idling Replaced 35 older vehicles with new Tier 3 EPA emissions standards vehicles Introduced electric engine engine cooling systems for new and existing transit buses which improve fuel efficiency by 9% Use of retread tires for transit buses and heavy equipment Continue to use B5 and B10 biodiesel blends all year

FOCUS AREA	ACTION	OBJECTIVE	2012 PROGRESS
Organizational Integration	Energy Management Training	To incorporate energy management training into employee orientation and future training opportunities offered through Human Resources	Fleet education and orientation for all new hires

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Information on the City of Thunder Bay is available at
www.thunderbay.ca

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