Brockton Energy Conservation and Demand Management Plan

Introduction

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 reduced greenhouse gas (GHG) emissions, cost avoidance and savings.[i1] 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. The Municipality of Brockton supports energy conservation and a strategic approach to managing the demand for energy to operate all of its facilities. In addition, the management of energy used by the municipality is strategic to its sustainability in the future.

The Municipality of Brockton developed its first Sustainable Strategic Plan –Building a Better Brockton (B^3) - a long-term plan to guide the Municipality over the next twenty-five (25) years – in response to local and global changes.

The B^3 Plan is centred on the principles of sustainability, defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission, 1987). While sustainability has much to do with foresight and progressive thinking, it is also about striking a balance between culture, the economy, the environment, and society. The B^3 Plan views sustainability through these lenses, also commonly referred to as the four pillars of sustainability, and uses them to help organize ideas and aspirations for our community (see Figure 1).

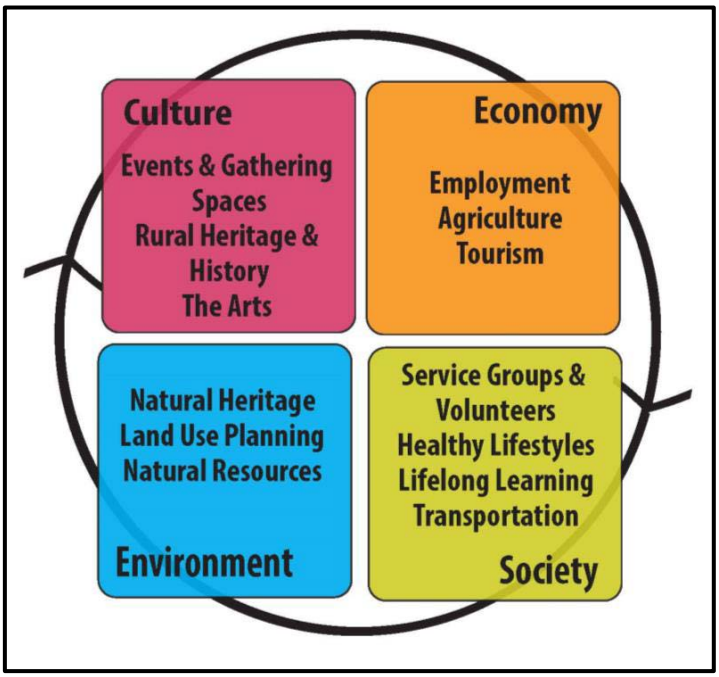

Figure 1: Four Pillars of Sustainability used to guide the creation of Brockton's Sustainable Strategic Plan (2013).

Under the Environmental Integrity pillar of the Sustainable Strategic Plan it identifies "where are we now" with regard to policies, programs and initiatives related to Natural Resources.

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

Where Are We Now?

- Brockton is part of the Saugeen Valley Source Protection Area, which has recently produced an in-depth report assessing potential threats to local drinking water.
- Brockton's residential, industrial, commercial, and institutional waste diversion rate (as calculated for 2011) is approximately 26 percent.
- Brockton has a variety of policies in place designed to reduce and divert waste, including a clear bag program; bi-weekly seasonal waste collection; and electronic waste, hazardous waste, scrap metal, and polystyrene collection depots.
- Brockton's commitment to providing excellent drinking water is reflected in the fact that it received no issues of non-compliance in all three of its drinking water systems in 2010 and 2011.
- The Brockton Parks and Recreation Department is reducing water consumption by 40 percent by switching from water to a glycol cooling system for its compressors in the arena.
- The Municipality has set a wide range of policies to achieve energy conservation throughout the community, such as encouraging the energy efficient design of buildings.
- Brockton is home to a large number of solar panels, as well as a biogas facility, that are generating renewable energy.

The Sustainable Strategic Plan (B^3) also specifies the goal of "making wise use of natural resources, keeping current and future generations in mind" as a guiding principle in formulating a response to the question of Where Do We Want to Go? The B^3 Plan then offers up the following new ideas for action in response to the question of How Are We Going to Get There?

- Prepare an Energy Management Plan for municipal facilities that could include:
  1. Designing future municipal buildings to meet LEED standards (or equivalent); and
  2. Implementing an energy conservation policy.
- Undertake a Community Energy Planning initiative to better understand where savings can be made.
- Investigate participating in the Partners for Climate Protection program and begin achieving its milestones.
- Consider developing green building guidelines or standards for energy conservation in new development.
- Promote provincial (Ontario Power Authority) incentive programs for energy conservation.

The municipality's Energy Conservation and Demand Management (ECDM) Plan should give consideration to those sections of the Brockton Sustainable Strategic Plan that speak to energy conservation and the use of energy as part of formulating goals and objectives for conserving and reducing energy consumption and managing the demand for energy for all of its facilities.

Commitment

Brockton Council and staff are committed to investigating energy use at all of its facilities to determine the best application of energy saving measures, as identified in the ECDM Plan, to yield positive results. This commitment is formalized in Brockton Resolution # and by regular monitoring of energy use by municipal staff to determine compliance with the goals and objectives as contained in the municipality's ECDM Plan.

In addition, senior staff will provide regular opportunities for all subordinate staff to offer suggestions for energy conservation and to provide ideas on energy efficiency.

Baseline Energy Use

The Municipality of Brockton has been tracking its energy use for several years in order to gain a better understanding of demand pressures and the energy efficiency of its various facilities. Historical energy data is contained in Appendix A - 2012 Energy Consumption Report. At the present time the municipality does not own the facility where its municipal offices are located and is not billed for the energy used at this facility. As of the fall of 2014 the Walkerton Day Care facility will be moving operations to the Mother Teresa School in Walkerton where it will be a tenant. The energy used at these two facilities is outside the control of the municipality. Municipal staff is conscious of energy efficiency and willing to investigate and initiate new ways to improve on the efficiency of its facilities. Some examples of this are;

- Solar heating for the Walkerton pool
- Supportive encouragement for the installation of solar panels in the municipality's business park
- Retrofit of the lighting in the Walkerton Community Centre Arena
- Investigation of biogas generation at Walkerton Wastewater Treatment Plant

The purpose of this Plan is to provide the direction and the tools to allow the municipality to build on these successes and to find new opportunities to build on. Appendix B – Energy Management Practices outlines some of the practices the municipality has been using in monitoring and managing energy use and demand, as well as some of the practices that will be used in the future.

Goals

The goals of the Brockton Energy Conservation and Demand Management Plan are;

- To encourage a culture of energy conservation within the corporation that has the result of creating a forum for discussion of new ideas and methods on how to save energy and how we can use what energy is needed, wisely.
- To improve the energy efficiency of our facilities by utilizing best practices to reduce our operating costs, energy consumption and greenhouse gas emissions.

- Maximize fiscal resources and minimize cost increases through direct and indirect energy savings.
- Demonstrate sound operating and maintenance practices to compliment energy efficiencies thereby improving the reliability of municipal equipment.

Objectives

The objectives of the Brockton Energy and Demand Management Plan are;

- Improve the management of the municipality's energy consumption.
- Complete energy audits on the top three (3) energy consuming facilities existing as of July 2014.
- Improve the efficiency of energy use through low cost opportunities by implementing the following;
    - Sound operating and maintenance practices.
    - Employee training and staff awareness.
    - Monitoring and tracking energy use.
- Reduce the energy intensity (energy required per square metre) for all municipal facilities and operations by 10 percent by 2016 compared to 2013.
- Identify and investigate renewable energy generation opportunities where economically feasible.
- Design new facilities to be equivalent to, at least, the silver standard under the Leadership in Energy and Environmental Design (LEED) program.

The individual actions of the Plan have their own unique measurements of success as detailed in Appendix C – Action Plan.

Energy Management Actions

The actions that will be initiated under this plan fall under one of three headings (Process, Programs, Projects) and address one of five focus areas (Energy Data Management, Energy Supply Management, Energy Use in Facilities, Energy Efficiency, Operational Integration).

Five Focus Areas

1. **Energy Data Management**

   Evaluate all elements within an organization with regard to energy usage data. This can include evaluating monthly bills, establishing key performance indicators, load profiles, interval data, benchmarking and sub-metering.

2. **Energy Supply Management**

   Investigate the municipality's exposure to the energy market and suppliers; monitor changes and account management with the utility. Look at choices regarding the supplier, green energy alternatives, reliability and risk management.

3. **Energy Use in Facilities**

   Evaluate facilities through diagnostic/comprehensive audits, operating procedures and monitoring efficiency of equipment and systems.

4. **Equipment Efficiency**

   Reduce the consumption of energy without sacrificing the services provided. This includes preventative maintenance, fuel switching and the investigation of new systems and technologies.

5. **Organizational Integration**

   Include staff throughout the organization in the planning and implementation of the ECDM Plan. This involves spreading awareness regarding roles in various elements of the plan.

Table 1: Municipal Energy Management Actions

	Process Improvement	Program Implementation	Projects
Energy Data Management	✓ Establish Key Performance Indicators ✓ Bill optimization and verification ✓ Energy Tracking	✓ Load management	✓ Energy Service Company opportunities
Energy Supply Management	✓ Corporate energy reserve procedures	✓ Solar photovoltaic rooftop leasing ✓ Renewable electricity procurement ✓ Supply management awareness	✓ Solar photovoltaic projects
Energy Use in Facilities	✓ Municipal building standard ✓ Equipment inventory ✓ Preventative and corrective maintenance procedures ✓ Shutdown procedures	✓ Energy conservation incentive programs ✓ Commissioning and recommissioning procedures ✓ Phantom power program	
Equipment Efficiency	✓ Energy efficiency procurement standards ✓ Incorporate life cycle costing	✓ Interior lighting designs	✓ Recreation facility lighting retrofits ✓ LED/Induction streetlight pilot ✓ Daylight sensor controls ✓ Waste heat recovery project
Organization Integration	✓ Incentive tracking ✓ Energy reporting and ✓ feedback	✓ Energy awareness campaign ✓ Building automation system (BAS) training	✓ Energy management training

Appendix A - 2012 Energy Consumption Report

UP or DOWN ARROW in column A to read	**Energy Consumption and Greenhouse Gas Emissions Reporting - for 2012**
Confirm consecutive 12-mth period (mth-yr to mth-yr)	
Sector	
Agency Sub-sector	**CityMunicipality**
Organization Name	**Municipality of Brockton**

Please fill in the mandatory fields indicated in red, in addition to submitting data on your energy usage.

									Energy Type and Amount Purchased and Consumed in Natural Units																								**Total (calculated in webform)**				
									Electricity		**Natural Gas**		**Fuel Oil 1 & 2**		**Fuel Oil 4 & 6**		**Propane**		**Coal**		**Wood**		**District Heating**				**District Cooling**									
Operation Name	**Operation Type**	**Address**	**City**	**Postal Code**	**Total Floor Area**	**Unit**	**Avg hrs/wk**	**Annual Flow (Mega Litres)**	**Quantity**	**Unit**	**Quantity**	**Unit**	**Quantity**	**Unit**	**Quantity**	**Unit**	**Quantity**	**Unit**	**Quantity**	**Unit**	**Quantity**	**Unit**	**Quantity**	**Unit**	**Renewable?**	**If Yes, enter Emission Factor**	**Quantity**	**Unit**	**Renewable?**	**If Yes, enter Emission Factor**	**GHG Emissions (Kg)**	**Energy Intensity (ekWh/sqft)**	**Energy Intensity (ekWh/Mega Litre)**	**Building / Operation Identifier**	**Comments**
Stephenson Building	*Administrative offices and related facilities, including municipal council chambers*	*2160 Yonge Street*	*Toronto*	*M7A 2G5*	*135034*	*Square meters*	*70*	*23516.00224*	*2181065*	*kWh*	*123300*	*Cubic meter*		*Litre*		*Litre*		*Litre*		*Metric Tonne*		*Metric Tonne*	*26.73*	*Giga Joule*	*No*	*0*	*20.506*	*Giga Joule*	*No*	*0*					*max. 255 characters*
Walkerton Community Centre	Indoor ice rinks	290 Durham Street	Walkerton	N0G 2V0	2379.79	Square meters	100	0	598731.2	kWh	41514.51	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			135990.5979	436.9873621	0		
Walkerton Fire Hall	Fire stations and associated offices and facilities	510 Napier Street Eas	Walkerton	N0G 2V0	1467	Square meters	65	0	45403	kWh	9230.694	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			21812.30343	97.82192051	0		
Walkerton Public Library	Public libraries	249 Durhams Street	Walkerton	N0G 2V0	595	Square meters	67	0	90960	kWh	12314.13	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			32017.22506	372.826601	0		
Walkerton Works Shop	Storage facilities where equipment or vehicles are maintained, repaired or stored	130 Wallace Street	Walkerton	N0G 2V0	250	Square meters	65	0	20775	kWh	1903.52	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			5594.077307	164.0207443	0		
Veolia Building - Administration for W	Administrative offices and related facilities, including municipal council chambers	136 Wallace Street	Walkerton	N0G 2V0	209	Square meters	65	0	18687	kWh	2070.132	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			5708.546933	194.6789534	0		
Walkerton Sewage Treatment Plant	Facilities related to the treatment of sewage	300 Durham Street	Walkerton	N0G 2V0	0		168	1080.316	813631	kWh	36010.65	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			146223.8284	0	1107.402054		
Bradley Community Centre	Community centres	RR #2	Paisley	N0G 2N0	148.64	Square meters	10	0	2915	kWh	0	Cubic Meter	2094	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			0	0	0		
Cargill Community Centre	Community centres	Cargill	Cargill	N0G 1J0	1072	Square meters	40	0	60090	kWh	0	Cubic Meter	0	Litre	0	Litre	7857	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			5771.0436	56.05410448	0		
Brant Works Shop	Storage facilities where equipment or vehicles are maintained, repaired or stored	Brant Line	Brockton	N0G 2V0	400	Square meters	65	0	32694	kWh	0	Cubic Meter	0	Litre	0	Litre	13287.4	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			23655.46476	315.2794913	0		
Greenock Works Shop	Storage facilities where equipment or vehicles are maintained, repaired or stored	Greenock Line	Brockton	N0G 2V0	500	Square meters	65	0	17540	kWh	0	Cubic Meter	0	Litre	0	Litre	19854.6	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			32339.72633	314.2577146	0		
Cargill Public Library	Public libraries	Cargill	Cargill	N0G 1J0	3600	Square meters	30	0	5742.13	kWh	0	Cubic Meter	1062	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			551.4741652	1.595036111	0		
Walkerton Water Wells 7 & 9-pumpin	Facilities related to the pumping of water	1244 Bruce Road 3	Brockton	N0G 2V0	0		168	555.605	258587	kWh	0	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			24834.69548	0	465.415178		
Chepstow Water Well-pumping and t	Facilities related to the pumping of water	51 John Cr Chepstow	Brockton	N0G 2V0	0		168	5.052	19336	kWh	0	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			1857.02944	0	0		
Lake Rosalind Water Well-pumping ar	Facilities related to the pumping of water	442 Lake Rosalind Ro	RR #3 Hano	N4N 3B9	0		168	8.669	33945	kWh	0	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			3260.0778	0	0		
Walkerton Community Centre	Auditoriums	290 Durham Street	Walkerton	N0G 2V0	382.75	Square meters	40	0	54762.8	kWh	3792.017	Cubic Meter	0	Litre	0	Litre	0	Litre	0	Metric Tonne	0	Metric Tonne	0	Giga Joule			0	Giga Joule			12428.70904	248.3697219	0		

Appendix B – Energy Management Practices

Level	Energy Data Management	Energy Supply Management	Energy Use in Facilities	Equipment Efficiency	Environmental	Organizational Integration
Processes	Monthly Bills Benchmarking Reporting	Error Resolution Rate Optimization Account Management	Facility Walk-through	Corrective Maintenance Program Systems Control	Energy Use and Carbon Footprint	Awareness and Participation
Programs	Load Profiling Internal Data	Supplier Choice Supply Management Supplier Reliability and Quality	Diagnostic Audit Operating Procedures	Preventive Maintenance Program Lighting Upgrades Alternate Fuels	Targets, Green Energy Alternatives Incentives and Studies	Energy Planning Performance and Training Budget Preparation Results Auditing
Projects	Monitoring/Targeting	Demand-Supply Optimization Risk Management	Comprehensive Audits Commissioning On-going Monitoring	System Upgrades Standards New Technology System Measurement	Carbon Footprint Green sourced energy	Project Approval Accountability and Review

Appendix C – Action Plan

Processes

Future	Activity	Gas ?	Elec ?	Groups Involved	Review Frequency	Estimated Annual Savings	Cost	Completion Date	Objective	Measurements of Success
Energy Data Management	Energy tracking	Yes	Yes	Director of Recreation, C F O , Facility Managers, Utilities Manager, Roads Superintendent	Monthly	Indirectly affects the saving of most proposed actions.	Labour Costs Only	2014-Ongoing	Data allows for improved budgeting, goal setting, conservation program and project development, monitoring and verification, and awareness campaigns.	• Energy management software is operational. • Creation of energy management database.
	Establish Key Performance Indicators (KPI)	Yes	Yes	Director of Recreation, Utilities Manager, Road Superintendent	Quarterly	Capacity Building	Labour Costs Only	2014	Allows for fair comparisons when benchmarking facilities against each other and targeting projects based on conservation potential not gross consumption.	• Exceeding Local Authority Services benchmarks.
	Bill optimization	Yes	Yes	Department Heads	Semi-annually	-	Labour Costs Only	2014-2015	Identify billing anomalies, costs that can be controlled, and where the utility can improve rate structure. Provide staff billing education.	• Identification of billing costs that can be controlled (ex. Gas – transportation Elec. Peak demand). • Identifying where the utility can help. • Identifying anomalies in consumption.
	Bill verification	Yes	Yes	Department Heads	Monthly	-	Labour Costs Only	2014-Ongoing	Ensure correct billing, inaccurate bills will be identified and addressed. Improve understanding and accuracy of energy consumption and costs.	• Inaccurate bills are identified and addressed. • Improved energy consumption and billing accuracy.
Energy Supply Management	Energy reserve account procedures	Yes	Yes	CFO	Biennially	N/A	Labour Costs Only	2014-2015	Determine revenue stream for corporate energy reserve fund (i.e. renewable energy earnings, cost avoidance, incentive money). Develop reporting procedures.	• Accumulation of funds from successful energy conservation initiatives.
Energy Use in Facilities	Develop Municipal building standard, Encourage Energy Efficiency in Building	Yes	Yes	Chief Building Official, Building Inspector	Biennially	-	Labour Costs Only	2015-2016	Provide leadership to the community by encouraging energy efficient building standards	• Increased number of new buildings constructed to energy efficient standards beyond the Ontario Building Code.

Future	Activity	Gas ?	Elec ?	Groups Involved	Review Frequency	Estimated Annual Savings	Cost	Completion Date	Objective	Measurements of Success
	Equipment inventory	Yes	Yes	Facility Managers, Department Heads	Annually	Capacity Building	Labour Costs Only	2015-2016	List major motors, devices and drives. Catalogue associated nameplate, hours of operation, existing controls, and age. Necessary to enhance understanding of building operation.	• List of motors, devices, and drives. • Catalogue of associated nameplate, hours of operation, existing controls, and equipment age. • Develop load profiles. • Determine best practices within facilities. • Replacing equipment when fiscally and environmentally sensible.
	Maintenance and tracking procedures	Yes	Yes	Facility Managers, Department Heads	Annually	-	-	2015-2016	Determine where current maintenance practices can be improved to allow for reduced energy consumption and prolonged equipment life.	• Extended equipment life.
	Shutdown procedures	No	Yes	Facility Managers, Department Heads	Annually	-	-	2015	Determine all non-critical loads that can be turned off at the end of each shift. Reduce overnight and weekend baseload consumption. Focus will be on buildings with interval meters and high weekend baseload.	• Reduction in off-peak electricity consumption.
Equipment Efficiency	Energy efficiency procurement standards	Yes	Yes	Department Heads	Biennially	N/A	Labour Costs Only	2014-Ongoing	Use of appropriate efficiency standards when procuring equipment. Use of life-cycle cost and NPV, instead of first-cost evaluation.	• Use of appropriate efficiency standards when procuring an item • Use of life-cycle cost and net present value, instead of first-cost evaluation.
	Incorporate life cycle costing	Yes	Yes	CFO, Department Heads	Annually	N/A	Labour Costs Only	2014-Ongoing	Develop methods that consider costs that are incurred over the life of a piece of equipment rather than just considering the initial capital cost.	• Consideration for operational costs. • Consideration of equipment life-expectancy.
Organization Integration	Incentive tracking	Yes	Yes	CFO, Department Heads	Semi-annually	-	Labour Costs Only	2015-Ongoing	Develop incentive database that can be referenced during development of budget and project implementation.	• Database of available energy conservation incentives. • Capital and/or operation budget savings due to the utilization of incentives.

Future	Activity	Gas ?	Elec ?	Groups Involved	Review Frequency	Estimated Annual Savings	Cost	Completion Date	Objective	Measurements of Success
	Energy reporting and feedback	Yes	Yes	CFO	Quarterly	-	Labour Costs Only	2015-Ongoing	Provide department heads with feedback on energy consumption departments and facilities to assist with the setting of conservation goals and the tracking of progress.	• Department/facility will set individual energy conservation targets that fall in line with corporate energy management team mandate. • Department heads will include energy conservation in department meetings. • Department heads will make energy conservation part of staff responsibilities and will recognize and hold staff accountable for their energy management.

Appendix C – Action Plan continued

Programs

Future	Activity	Gas ?	Elec ?	Groups Involved	Review Frequency	Estimated Annual Savings	Cost	Completion Date	Objective	Measurements of Success
Energy Data Management	Load management	Yes	Yes	CFO, Department Heads	Semi-annually	-	Labour Costs Only	2015-2016	Shift and reduce energy demand and consumption during peak periods. Assess opportunities to participate in demand response programs.	• Participation in a demand response programs. • Favourably change rate structure through demand reduction. • Shift energy consumption to off-peak periods.
Energy Supply Management	Solar photovoltaic rooftop leasing	No	Yes	CAO, CFO, Department Heads	Annually	Capacity Building	Labour Costs Only	2015	Evaluate market for leasing roofspace for solar p.v. projects. Perform a cost-benefit analysis for leasing opportunities.	• Cost benefit analysis for solar photovoltaic roof top leasing. • Municipal scan of roof top leasing practices
	Renewable electricity procurement	Yes	Yes	CFO	Biennially	Capacity Building	Labour Costs Only	2015	Reassess objectives for purchasing renewable electricity certificates.	• Develop criteria for renewable electricity certificate purchase
	Supply management awareness	Yes	Yes	Department Heads, Westario/ Hydro One	Annually	Capacity Building	Labour Costs Only	2015	Build internal energy supply management capacity through the dissemination of energy market research with the intent to increase awareness and improve purchasing practices.	• Regular energy market meetings with energy retailers. • Production of energy market newsletter for interested staff and councillors.
Energy Use in Facilities	Energy conservation incentive programs	Yes	Yes	Department Heads	Annually	-	-	2015 - Ongoing	Provide incentives and a competitive environment to encourage conservation through annual facility and individual energy conservation competitions.	• Establishment of annual facility and individual energy conservation competitions. • 70% staff participation rate at all facilities. • Energy conservation and improved awareness.
	Phantom power program	No	Yes	Department Heads, Westario/ Hydro One	Annually	-	-	2015 - Ongoing	Provide information on the concept of phantom loads and how it can be resolved.	• Improved staff awareness of phantom power. • Make addressing phantom power part of daily routine. • 70% reduction in evening and weekend phantom load.

Future	Activity	Gas ?	Elec ?	Groups Involved	Review Frequency	Estimated Annual Savings	Cost	Completion Date	Objective	Measurements of Success
	Commissioning & recommissioning procedures	Yes	Yes	Department Heads, Westario/ Hydro One	Biennially	-	-	2016	Verify systems & equipment are operating as efficiently as designed. Establish performance specifications, measurement and verification of compliance.	• Establish performance specification. • Measurements and verification of compliance.
Equipment Efficiency	Interior lighting designs	No	Yes	Department Heads	Annually	-	-	2015	Reduce excessive lighting, while maintaining safe and secure light levels.	• Lighting design is reevaluated. • All staff and residents are comfortable with the adjusted light levels.
Organization Integration	Energy awareness campaign	Yes	Yes	Department Heads	Annually	-	-	2015 - Ongoing	Increase staff awareness and understanding of the energy they consume and the implications of their consumption.	• Incorporation of energy awareness into job training. • Staff appreciation for the impact of energy cost on financial performance.
	Building automation system (BAS) training	Yes	Yes	Department Heads, Municipal Staff	Annually	-	Labour Costs Only	2015	Re-educate appropriate staff on the use of Town building automation systems allowing for increased energy awareness and optimal system usage.	• All appropriate staff feels comfortable using the municipality's BAS. • Staff incorporates the use of the BAS to improve their energy awareness. • Expand the use of the municipality's BAS.

Appendix C – Action Plan continued

Projects

Future	Activity	Gas?	Elec?	Groups Involved	Review Frequency	Estimated Annual Savings	Cost	Completion Date	Objective	Measurements of Success
Energy Data Management	Energy Service Company opportunities	Yes	Yes	CFO, Department Heads	Biennially	Cost of proposed projects	Labour Costs Only	2015	Evaluate project funding opportunities provided by energy service companies and the internal capacity to manage funded project.	• Cost benefit analysis of using energy service companies to finance projects. • Municipal scan of energy service company practices.
Energy Supply Management	Solar photovoltaic microFIT projects	No	Yes	CFO, Department Heads	Semi-annually	-	Grant funding	2016	Generation of 40 kW of solar energy with the intent to provide community leadership and revenue while reducing greenhouse gas emissions.	• Completed contract with the OPA for the sale of solar electricity. • Tracking and displaying solar energy being generated by the Municipality of Brockton.
Equipment Efficiency	Recreation facility lighting retrofits	No	Yes	Recreation Director	N/A	-	-	2015	Replace inefficient lights at municipal recreation facilities. Remove T12 systems, standard halogens and incandescent.	• Elimination of all inefficient lighting at municipal recreation facilities.
	LED/Induction streetlight pilot	No	Yes	Roads Superintendent, CFO	Quarterly	-	-	2014-2015	Address liability concerns associated with streetlight pilot. Create business case. Pilot LED/induction street lighting in new subdivision.	• Address liability concerns associated with streetlight pilot. • Creation of business case. • Pilot LED/Induction street lighting on a street new subdivision.
	Daylight sensor controls	No	Yes	Department Heads	Annually	-	-	2015	Assess opportunities to conserve energy through the use of natural light at municipal facilities.	• Reduced number of lights on in naturally lit areas.
	Waste heat recovery project	Yes	Yes	Utilities Manager, Recreation Director	Annually	-	-	2015	Assess opportunities to capture wasted heat from equipment and discharged water and applied to other appropriate applications. Pursue projects deemed to be feasible.	• Technological feasibility investigations. • Development of business case. • Harnessing wasted energy. • Reduced costs and energy consumption.
Organization Integration	Energy management training	Yes	Yes	Department Heads	Annually	-	-	2015	Energy management training will allow for the internal capacity building necessary to ensure that staff are making informed decision and reducing the need for costly external assistance.	• Staff from all departments attending energy related internal and external training sessions.