Energy Conservation and Demand Management (CDM) Plan

2019-2023

Township of Brock

This document is available in alternate formats upon request.
Please contact the Clerk's Department at 705-432-2355.

Table of Contents

Section 1 – Introduction

Successful energy management depends on the integration of energy efficient practices into the overall conduct of the organization, is based on a regular assessment and review of energy performance, and requires the implementation of procedures and measures to reduce energy waste and increase efficiency. Regardless of the size of the municipality, the common element of successful energy management is the allocation of staff and resources to continually improve energy performance.

An Energy Conservation and Demand Management Plan is a past, present, and future document related to your energy use and management: what we have done in the past, what we are doing now, and what we plan to do in the future.

The Township of Brock's Energy Conservation and Demand Management (CDM) Plan a brief background and summary of the requirements relating to Ontario Regulation 397/11 *Energy Conservation and Demand Management Plans.* Results from the completion of the Ministry of Energy's 2017 Energy Consumption and Greenhouse Gas Emissions Template is included as an energy consumption benchmark can be found in Appendix A. In addition, completed energy reduction projects from the Townships previous energy plan (2014-2018) can be found in Appendix B, as well as a list of current and proposed energy reduction projects to implement over the next five years (2019-2023) can be found in Appendix C.

Section 2 – Purpose

The Energy CDM Plan aims to provide a basis for the Township of Brock to implement improvements to its infrastructure and operations that reduce energy and water use, their associated costs, as well as environmental effects on the Township's activities.

Section 3 – Background

In 2009, the Ministry of Energy and Infrastructure enacted the *Green Energy Act* to help public agencies including municipalities, hospitals and schools manage and reduce their energy consumption. As part of this Act, *Ontario Regulation 397/11* requires certain public agencies – municipalities, municipal service boards, school boards, universities, colleges and hospitals – to report on their annual energy consumption and greenhouse gas emissions beginning in 2013, starting with reporting amounts from 2011. These reports are posted to the Township website, at http://townshipofbrock.ca/energy-use/

The same regulation also requires the development and implementation of an Energy Conservation and Demand Management Plan, to be reviewed and updated at a minimum of every 5 years. The existing Township of Brock's Energy CDM Plan was for a 5 year period, 2014-2019. The CDM Plan must be approved by Council resolution, posted to the Township of Brock website, and submitted to the Ministry of Energy by July 1st, 2019.

Section 4 – Township's Commitment

Effective energy management begins with the specific visible expression of commitment by the senior authorities, including staff and members of Council, in the municipality, to make the reduction of energy consumption an organizational priority. At a minimum, this commitment includes a resolution by Council articulating the staff mandate to plan and implement measures for energy efficiency improvement.

Declaration of Commitment

The Township of Brock is committed to the promotion of responsible energy management through the implementation of economically viable energy efficiencies and environmental care throughout all facilities, plants, and equipment.

Vision

A description of the municipality at a future date in terms of energy management:

- We are community leaders in the efficient use of energy resources.
- We are continually reducing our total energy consumption and associated carbon footprint through wise and efficient use of energy and resources, while still maintaining an efficient and effective level of service for our clients and the general public.

Section 5 – Current Municipal Energy Situation

Energy Consumption and Demand:

The 2014 CDM Plan covered the period of 2014 through 2018. The total annual energy consumption, cost, and greenhouse gas emissions are outlined in the chart below for this period.

	2014	2015	2016	2017	2018
Total Annual Energy Consumption (ekWh)	4,805,865	4,536,613	3,783,137	4,124,452	4,294,857
Total Annual Energy Cost	$439,425	$461,058	$443,934	$428,388	$418,158
Total Associated GHG Emissions (tonnes CO2e/year)	495	443	348	403	406

Besides the effect of energy conservation initiatives, the total energy consumption can vary year to year due to a number of factors, but the most significant effect is caused by changes in outdoor temperature measured by total number of heating and cooling degree days each year. This measure is approximately the same for the years 2014 and 2018, so weather effects are not a significant factor when comparing these two years.

Energy consumption was reduced by 11% from 2014 to 2018 and GHG emissions decreased by 18% during this period. The larger percentage emissions reduction is mainly as a result of reduced electricity emissions intensity in the provincial grid from 2014 to 2017 (the most recent published year).

Energy consumption reductions from facility and streetlighting technical upgrade projects resulted in a 4% savings during this period as provided in Appendix B. The remaining 7% savings were likely a result from non-quantified technical changes, and ongoing behavioural and cultural changes including:

- Installation of motion detectors;
- Insulation, weather-stripping, caulking in top priority buildings;
- Reduction of phantom energy consumption;
- Cleaning back of all vending machines and refrigerators for more efficient operation;
- Installation of efficient Dyson hand dryers in washrooms;

- Providing recycling containers in all facilities and encourage efficient waste management practices;
- Energy awareness at management meetings;
- Paperless meeting agendas and minutes; and
- Energy reports distributed to building managers.

Section 6 – Goals and Objectives

The strategic energy objectives identified within the Energy CDM Plan 2019-2023 include:

- To improve the energy efficiency within Township facilities by utilizing best practices to reduce our operating costs, energy consumption and greenhouse gas emissions;
- To maximize fiscal resources through direct and indirect energy savings, including taking advantage of green energy grants;
- To increase conservation knowledge and mindfulness among staff through education and utilizing best practices;
- To reduce the environmental impact of Township operations;
- To demonstrate leadership and awareness within the Township of Brock community by creating a culture of energy conservation and sustainability;
- To increase the comfort and safety of Township staff, Council and residents while using Township facilities;
- To report energy performance changes and improvements annually; and
- To support Ontario's Long-Term Energy Plan target of 30 TWh by 2032.

Section 7 – Reduction Target

The Township's energy consumption benchmark, based on 2017 electricity, natural gas and greenhouse gas emission data, can be found in Appendix A. A requirement of

Ontario Regulation 397/11 involves municipalities reporting electricity and natural gas consumption to the Ministry of Energy on an annual basis. Municipalities report energy and natural gas usage two years prior to the current year (i.e., the report for 2017 energy consumption was submitted this year in 2019).

The completion of the energy consumption projects from the Township's 2014 Energy CDM Plan has built the foundation for successful energy management practices. The completed projects from the previous Energy Plan can be found in Appendix B.

In 2019, a number of energy efficient LED lighting projects are underway, which will result in an estimated overall energy savings of 1.6%. In the period from 2020 to 2023, a number of LED lighting projects are planned, which will result in an estimated overall energy savings of 2.3%, as can be found in Appendix C.

The streetlight conversion program to LED's was initiated in 2012 and approximately 20 streetlight fixtures will be converted in 2019 and each subsequent year resulting in a 70% reduction in energy as well as a significant reduction in maintenance costs. Streetlights will continue to be converted to LED's at approximately 20 fixtures per year until all streetlights have been changed-out.

The total estimated energy savings for current and planned measures is 3.9% of total facility and streetlighting energy consumption. This provides a solid basis for an overall energy reduction target of 1-5% between 2019 and the end of 2023. The proposed energy conservation projects to support the Township in achieving this target can be found in Appendix C.

Council will review the proposed energy conservation measures during annual budget discussions. These proposed measures may change as technology is improved, or the priorities of Council are reformed.

Section 8 – Incentive Funding

The Township of Brock will take advantage of all funding and grant opportunities both in the public and private sector related to energy efficient projects. The Township will continue to maximized from the Independent Electricity System Operator (IESO) and Enbridge for relevant projects. In addition, Township staff will liaise with representatives from all local utility providers. Township staff and utility representatives are in a unique position to review current and future process improvements, program implementations and projects that can meet future funding requirements. As new funding opportunities arise that are suitable for specific Township energy conservation projects, Township staff will report to Council and clearly outline the cost savings associated with a

successful application.

Section 9 – Asset Management

Asset Management planning takes into consideration the potential impacts of climate change and provide the Township of Brock with the information it needs to make decisions on how best to manage capital assets in a sustainable way, as well as take actions that may be required to address vulnerabilities that may be caused by climate change to the Township's overall capital assets.

The Township of Brock's contribution to climate change through greenhouse gas emissions will be mitigated in accordance with local reduction targets, financial capacity, and stakeholder support. In addition, climate change will be considered as part of the Township's risk analysis within its Asset Management Plan. The awareness of infrastructure risks will help to enable the Township to balance the potential cost of climate change vulnerabilities with the cost of proactively reducing or eliminating these vulnerabilities before they occur.

Section 10 – Review & Reporting

Reporting requirements for the Green Energy Act and other pertinent provincial legislation will be factors into our reporting procedures. An annual energy performance summary report will be generated to apprise Council of the progress the Township has made towards its energy goals and objectives. The report will be posted to the Township of Brock website to ensure the community is apprised.

The Township will review and evaluate its Energy CDM Plan, as necessary, and review and update it at a minimum of every five years.

Section 11 – Summary

The Township of Brock's Energy CDM Plan will assist the Township in meeting its energy related goals. These energy related goals will need to be established annually through Council's approval of the budget. This plan can help reduce overall energy usage and costs within the Township of Brock through the implementation of effective energy reduction strategies, initiatives and programs.

Appendix A – 2017 Township of Brock Detailed Energy Report

Energy Consumption and GHG Emissions

From: 2017-01-01 To: 2017-12-31

Facility Name	Fuel Types	Consumption	Cost ($)	Energy (ekWh/yr)	GHG Emissions (kg CO2e/yr)
Facility Primary Type: Office					
Beaverton Health Centre	NG	6208.00 m3	2476.84	65977.24	11737.01
	Elect.	107650.00 kWh	16075.81	107650	1862.13
Cannington Mun. Office	NG	18906.00 m3	5832.96	200928.75	35744.19
	Elect.	102600.00 kWh	16780.35	102600	1774.77
Facility Type Total			41165.96	477155.99	51118.11
Facility Primary Type: Library					
Beaverton Library	NG	5788.00 m3	2329.11	61513.57	10942.95
	Elect.	42840.00 kWh	6684.76	42840	741.05
CTH & Library	NG	6049.00 m3	2249.16	64287.42	11436.4
	Elect.	76389.00 kWh	11900.78	76389	1321.38
Cannington Old Library & Seniors Centre					
Facility Type Total			23163.81	245030	24441.78
Facility Primary Type: Museum					
Sund Historical Bldg (Bill to Hist Soc)	NG	1039.00 m3	994.17	11042.26	1964.36

	Elect.	3493.00 kWh	778.96	3493	60.42
Facility Type Total			1773.13	14535.26	2024.78
Facility Primary Type: Fire					
Sunderland Fire Hall - New	NG	11776.00 m3	3964.9	125152.7	22264.02
	Elect.	21751.00 kWh	4362.3	21751	376.25
Beaverton Fire Hall	NG	7465.00 m3	2836.47	79336.36	14113.53
	Elect.	12767.00 kWh	2019.78	12767	220.84
Cannington Fire Hall	Elect.	49918.00 kWh	7681.41	49918	863.48
Sunderland Fire Hall - Old					
Facility Type Total			20864.86	288925.06	37838.13
Facility Primary Type: Community Centre					
Beaverton Harbour (Pole)	Elect.	1853.00 kWh	525.31	1853	32.05
Cannington Old Library & Seniors Centre					
Manilla Hall	NG	3541.00 m3	1825.71	37632.96	6694.71
	Elect.	5922.00 kWh	1407.24	5922	102.44
Wilfrid Hall	NG	3238.00 m3	1694.53	34412.74	6121.85
	Elect.	9295.00 kWh	2273.75	9295	160.78
Facility Type Total			7726.54	89115.7	13111.84
Facility Primary Type: Curling					
Cann Curling Club (Enb 91 00 29 57419)					
Facility Type Total			0	0	0
Facility Primary Type: Recreation Complex					

Beaverton Baseball Lighting	Elect.	2364.00 kWh	496.74	2364	40.89
Beaverton Harbour (Washrooms)	Elect.	2620.00 kWh	557.38	2620	45.32
Beaverton Harbour (Parking Lot)	Elect.	694.00 kWh	314.76	694	12
Facility Type Total			1368.88	5678	98.22
Facility Primary Type: Public Works					
Beaverton Garage	NG	5897.00 m3	2429.11	62672	11149.03
	Elect.	4819.00 kWh	915.56	4819	83.36
Cannington Garage (Bill to HOSC)	NG	3412.00 m3	1789.31	36261.98	6450.82
	Elect.	9579.00 kWh	1618.47	9579	165.7
Colyer Storm System	Elect.	509.00 kWh	292.85	509	8.8
Beaverton Patrol Yard	oil 1&2	8578.00 L	8061.92	92451.77	23462.17
	Elect.	62955.00 kWh	12449.15	62955	1089
Beaverton Harbour	Elect.	420.00 kWh	274.19	420	7.27
SPY - Bill to Region	NG	11076.00 m3	3795.62	117713.26	20940.58
	Elect.	15394.00 kWh	3320.38	15394	266.29
Facility Type Total			34946.56	402775.01	63623.01
Facility Primary Type: Other					
Beaverton Animal Shelter					
Cannington Animal Shelter	NG	3810.00 m3	1802.78	40491.83	7203.29
	Elect.	32735.00 kWh	4869.29	32735	566.25
Main St Ticket Booth	Elect.	138.00 kWh	232.8	138	2.39
Sunderland Arena Farmers	Elect.	30.00 kWh	221.15	30	0.52

Market					
Sunderland Park - Baseball Lights	Elect.	6105.00 kWh	1098.58	6105	105.6
Sunderland Park - Grandstands	Elect.	60.00 kWh	225.09	60	1.04
Beaverton Small Animal Bldg	Elect.	2411.00 kWh	531.78	2411	41.71
Cann. Park - Water Fountain	Elect.	3779.00 kWh	696.1	3779	65.37
Beaverton Ball Lighting (2nd Diamond)	Elect.	1332.00 kWh	381.28	1332	23.04
Facility Type Total			10058.85	87081.83	8009.2
Facility Primary Type: Town Hall					
Beaverton Town Hall	NG	24496.00 m3	7358.29	260338.03	46312.8
	Elect.	33574.00 kWh	5870.67	33574	580.76
Sunderland Town Hall	NG	10011.00 m3	3510.62	106394.68	18927.07
	Elect.	18658.00 kWh	2919.97	18658	322.75
Facility Type Total			19659.55	418964.7	66143.38
Facility Primary Type: Single-Pad Arena					
Beaverton Arena	NG	28498.00 m3	8135.01	302870.39	53879.09
	Elect.	308533.00 kWh	49651.47	308533	5337
Cannington Arena	NG	13595.00 m3	4447.43	144484.63	25703.07
	Elect.	215053.00 kWh	35253.49	215053	3719.99
Sunderland Arena	NG	16615.00 m3	5300.03	176580.51	31412.77
	Elect.	274713.00 kWh	46044.38	274713	4751.99

Facility Type Total			148831.8	1422234.53	124803.91
Facility Primary Type: Storage Facility					
Sunderland Park - Booth	Elect.	499.00 kWh	150.68	499	8.63
Sunderland Park - Shed @ Ball Field	Elect.	1837.00 kWh	465.9	1837	31.78
Facility Type Total			616.58	2336	40.41
Facility Primary Type: Streetlights (optional)					
Cannington Park - Baseball Lights	Elect.	2621.00 kWh	515.57	2621	45.34
Kiosk Franklin Street	Elect.	5647.00 kWh	1042.43	5647	97.68
Ethel Park Kiosk	Elect.	5828.00 kWh	1465.45	5828	100.81
Cann. Park Campground	Elect.	0.00 kWh	216.97	0	0
Manilla Park (lights)	Elect.	0.00 kWh	356.3	0	0
Beaverton Patrol Yard (lights)	Elect.	3188.00 kWh	905.47	3188	55.15
Mara Rd @ Simcoe	Elect.	16.00 kWh	218.76	16	0.28
Streetlights - Brock	Elect.	460108.00 kWh	69478.34	460108	7958.95
Streetlights - Thorah Dock Lights	Elect.	864.00 kWh	574.28	864	14.95
Streetlights - Howard Subdivision	Elect.	8904.00 kWh	1963.55	8904	154.02
Streetlights - Regional Road 13	Elect.	2912.00 kWh	679.59	2912	50.37
Streetlights - Gamebridge	Elect.	10032.00 kWh	2216.41	10032	173.53
Streetlights - Ball Subdivision	Elect.	988.00 kWh	270.51	988	17.09
Streetlights - Manilla	Elect.	19488.00 kWh	4301.43	19488	337.1

Streetlights - Maple Beach (Conc 2 Lot 19)	Elect.	1316.00 kWh	346.76	1316	22.76
Streetlights - Saginaw	Elect.	5551.00 kWh	1250.58	5551	96.02
Streetlights - Port Bolster	Elect.	3172.00 kWh	740.55	3172	54.87
Streetlights - Wilfrid	Elect.	9324.00 kWh	2057.27	9324	161.29
Streetlights - 0 Sunderland St	Elect.	3630.00 kWh	826.86	3630	62.79
Streetlights - Reg Rd 12 West of Cannington	Elect.	793.00 kWh	232.24	793	13.72
Streetlights - Vallentyne	Elect.	10374.00 kWh	2241.77	10374	179.45
Streetlights - 12 Conc Lot 24 Regional Road 2 & 12	Elect.	2158.00 kWh	519.06	2158	37.33
Streetlights - Meadowgreen Subdivision	Elect.	9373.00 kWh	2065.76	9373	162.13
Streetlights - Blackwater	Elect.	6695.00 kWh	1476.35	6695	115.81
Streetlights - Maple Beach (Conc 2 Lot 21)	Elect.	39153.00 kWh	8449.72	39153	677.27
Streetlights - 4 Conc Sideroad 17 & Regional Road 23	Elect.	2158.00 kWh	513.07	2158	37.33
Streetlights - Riverside Beach	Elect.	1976.00 kWh	484.07	1976	34.18
Streetlights - Ethel Park	Elect.	47724.00 kWh	10831.72	47724	825.53
Streetlights - Beaverton Estates (Conc 5, Lot 16)	Elect.	1128.00 kWh	305.37	1128	19.51
Streetlights - 3 Con. Lot 30, wb-rr 13@23	Elect.	0.00 kWh	61.87	0	0
Streetlights - 4 Concession Lot 7200	Elect.	4368.00 kWh	985.21	4368	75.56

Streetlights - 59 Ball subdivision	Elect.	0.00 kWh	61.9	0	0
Streetlights - 59 Ball subdivision	Elect.	0.00 kWh	0	0	0
Streetlights - Highway 7 & 12	Elect.	1131.00 kWh	556.15	1131	19.56
Streetlights - 23 Brethour ST					
Facility Type Total			118211.3	670620	11600.38
Grand Total			**428387.9**	**4124452.07**	**402853.14**

Appendix B – Completed Energy Conservation Projects 2014 to 2018

Year	Facility	Project Description	Total Capital Cost ($)	Energy Savings (ekWh/y)	% Energy Reduction	Annual Cost Savings ($)	Simple Payback (years)
2015	Beaverton Arena	Relamping - ice surface lights	36,000	28,750	4.6%	5,175	7.0
2016	Cannington Arena	Relamping - ice surface lights	35,000	16,822	4.0%	3,028	11.6
2016	Cannington Admin Office	HVAC Roof Top Units upgrade	155,000	28,418	9.8%	3,841	40.4
2017	Beaverton Arena CC	HVAC Roof Top Unit upgrade	74,000	37,063	5.9%	2,577	28.7
2017	Sunderland Arena	Relamping - spectator lights	1,200	1,500	0.3%	270	4.4
2018	Sunderland Town Hall	Relamping - indoor lights	1,000	2,450	1.8%	441	2.3
2018	Sunderland Arena	Relamping – ice surface lights	21,000	18,390	3.5%	3,310	6.3
2014 to 2018	Streetlighting	Relamping - LED lights	100,000	58,800	8.0%	10,584	9.4
Total			**423,200**	**192,193**	**4.0%**	**29,226**	**14.5**

External incentive funding from IESO at $28,000 reduced the capital cost for Brock by 6%.

Appendix C – Current & Proposed Energy Conservation Projects 2019-2023

Current Projects – 2019

Year	Facility	Project Description	Total Capital Cost ($)	Energy Savings (ekWh/y)	% Energy Reduction	Annual Cost Saving ($)	Simple Payback (years)
2019	Cannington Animal Shelter	Relamping - outdoor wall packs	2,230	5,046	5.0%	908	2.5
2019	Cannington Admin Office	Relamping - outdoor wall packs	1,200	1,480	0.5%	266	4.5
2019	Cannington Admin Office	Relamping - outdoor wall packs	1,200	1,480	0.5%	266	4.5
2019	Sunderland Arena	Relamping - ice surface lights	21,000	18,390	3.5%	3,310	6.3
2019	Cannington Admin Office	Relamping - indoor lights	24,000	40,394	13.9%	7,271	3.3
2019	Streetlightin g	Relamping - LED lights	20,000	11,760	1.6%	2,117	9.4
Total			**69,630**	**78,550**	**1.6%**	**14,139**	**4.9**

External incentive funding from IESO at $17,000 reduces the capital cost for Brock by 25%.

Planned Projects – 2020 to 2023

Facility	Project Description	Total Capital Cost ($)	Energy Savings (ekWh/y)	% Energy Reduction	Annual Cost Savings($)	Simple Payback (years)
Cannington Library	Relamping - indoor and outdoor lights	4,500	18,167	10.2%	3,270	1.4
Cannington Firehall	Relamping - indoor and outdoor lights	17,200	6,472	10.3%	1,165	14.8
Cannington Firehall	Electricity to natural gas heating	20,000	(13,014)	-20.7%	7,400	2.7
Cannington Arena CC	Relamping - indoor and outdoor lights	15,600	11,389	2.7%	2,050	7.6
Sunderland Firehall	Relamping - indoor and outdoor lights	24,000	7,278	3.6%	1,310	18.3
Beaverton Arena CC	Relamping - indoor and outdoor lights	22,928	12,161	1.9%	2,189	10.5
Beaverton Library	Relamping - indoor lights	6,400	3,239	2.6%	583	11.0
Beaverton Town Hall	Relamping - indoor lights	11,000	2,328	0.8%	419	26.3
Beaverton Garage	Relamping - indoor and outdoor lights	5,400	3,672	5.1%	661	8.2
Beaverton Health Centre	Relamping - indoor lights	7,500	10,456	4.9%	1,882	4.0
Beaverton Firehall	Relamping - indoor lights	12,000	3,656	2.6%	658	18.2
Streetlighting	Relamping - LED lights	80,000	47,040	6.4%	8,467	9.4
Total		**226,528**	**112,843**	**2.3%**	**30,054**	**7.5**

Estimated external incentive funding from IESO at $22,000 is estimated to reduce the capital cost for Brock by 10%.