Five Year Energy Conservation And Demand Management Plan 2014-2020

City of Elliot Lake
a natural choice
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City of Elliot Lake
Energy Conservation and Demand Management Plan

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1.0 Commitment:

1.1 Declaration of Commitment

Through declaration of Council, and pursuant to the requirements under Ontario Regulation 397/11, the City of Elliot Lake is committed to the development, implementation, and monitoring of an energy management plan. The plan will include measures to identify areas of energy consumption, investigate measures available to reduce energy consumption and subsequent environmental impact, and implement measures to achieve goals established through the planning process.

1.2 Vision

The City of Elliot Lake, through the implementation of this Energy Management Plan, will exercise appropriate levels of governance over the use of energy resources under our care. This will ultimately result in and contribute to a reduction in carbon footprint, lower operating costs and, an enhanced quality of life within our community.

1.3 Goals

To create and foster a culture of awareness by all personnel within the Corporation, to introduce efficiencies in the use of our energy resources, and to reduce overall energy consumption.

1.4 Overall Target

The Corporation of the City of Elliot Lake will strive to reduce our consumption of fuels and electricity in all municipal operations by an average of 1.5% per year for the duration of this Five Year Energy Conservation Plan.

1.5 Objectives

To initiate energy audits on all municipal facilities during the next five years. Through the audit process, options for reduction of energy consumption will be identified which will permit the Municipality to:

- Implement measures to reduce energy consumption associated with facility lighting;
- Reduce overall energy consumption at the water and wastewater treatment facilities through the use of various available technologies;
- Review options for energy consumption reduction at municipal recreational complexes.

In carrying out the above processes we intend to reduce total energy consumption in municipal facilities, (normalized to weather conditions), by 7.5% over the next five years.

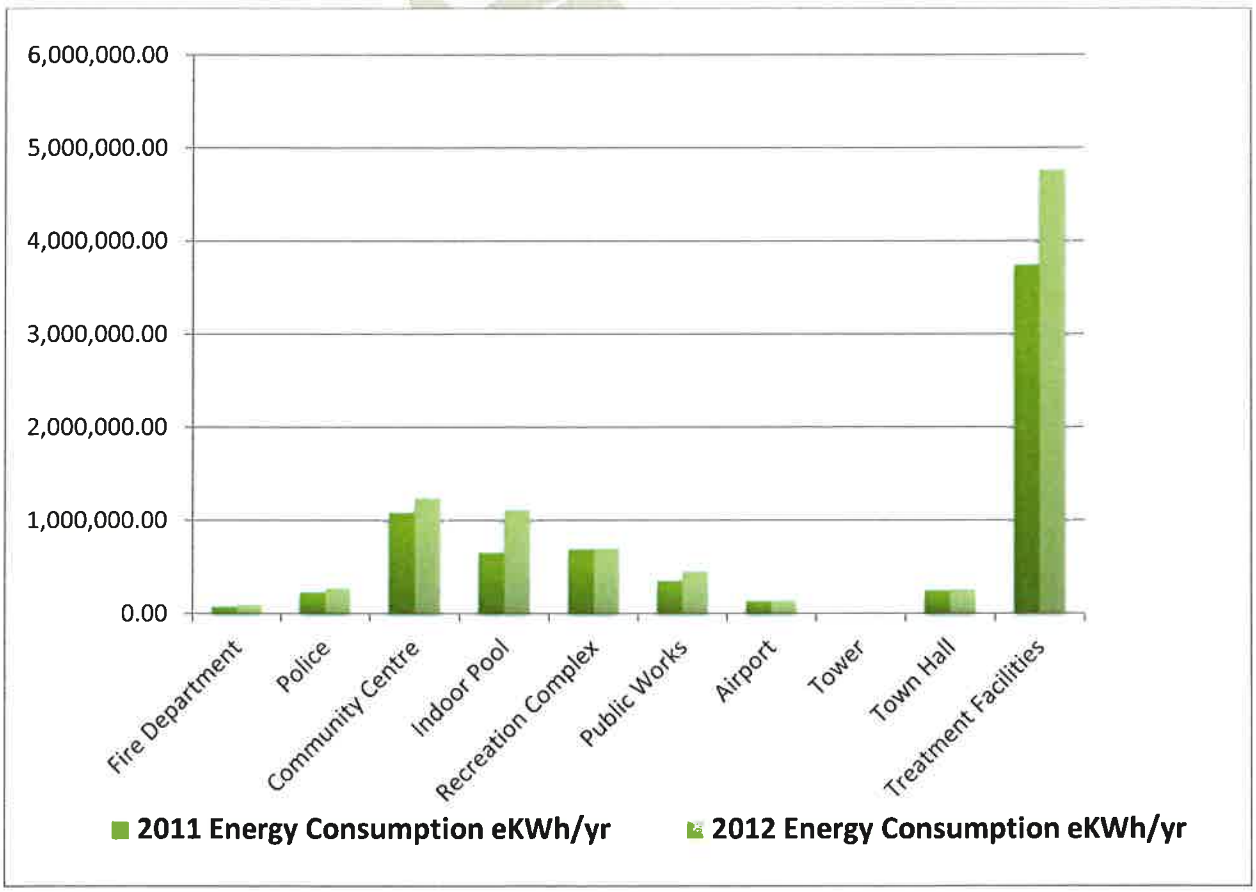
2.0 Understanding

2.1 Summary of Current Energy Consumption, Cost, and GHG's

Total reported cost for energy, including natural gas and electrical energy for the City of Elliot Lake increased from 2011 to 2012. This is attributed to a number of factors including environmental variables as well as variations in the quality of data provided from service providers. The totals as represented in the graph below are as follows:

2011 - Energy Consumption – 7,269,580.15 eKWh/yr
Green House Gas Emissions – 806,195.11 kg CO2e/yr
Total Cost for reportable areas - $809,119.76

2012 - Energy Consumption – 9,097,904.36 eKWh/yr
Green House Gas Emissions – 1,054,995.86 kg CO2e/yr
Total Cost for reportable areas - $996,394.00



2.2 Renewable Energy Utilized or Planned

The City of Elliot Lake wastewater treatment facility utilizes a two stage anaerobic digestion process to break down and reduce organic content in the biosolids removed during the treatment process. Methane gas is a by-product of the anaerobic digestion process and is utilized for heating of most of the treatment structures at the location. The original boilers were replaced in 2013 with two newer design Cleaver Brooks flex tube boilers which are expected to provide higher efficiencies in both methane and natural gas operating modes.

Methane production totals for the reporting years of 2011 and 2012 are as follows:

2011 – Total Methane produced – 126,909 m^3

2012 – Total Methane produced – 126,679 m^3

3.0 Planning

3.1 Energy Leader

The Director of Operations has been given overall responsibility for the development of the Corporate Energy Plan. The Plan, in addition to the status and success of various initiatives will be reviewed annually by a committee consisting of the Director of Operations, one representative of the Buildings Department and one representative drawn from the Treasury Department.

3.2 Consideration of energy efficiency of acquired equipment

The City of Elliot Lake Procurement Policy outlines the importance of energy efficiency in the acquisition of materials and equipment. Section II – Procurement Principals and Goals, consists of various articles that refer to the consideration of long term operating costs as well as instruction on consideration of the natural environment in the purchasing process.

4.0 Execution

4.1 Municipal Level

The administration and implementation of this plan will be responsibility of the Director of Operations working in conjunction with members of the Senior Management Team. In order to ensure the success of all initiatives, it is critical that each individual in the employ of the City of Elliot Lake be aware of their own energy use habits and strive towards a culture of conservation. Through appropriate staff training and information sharing, particularly as it relates to the annual energy consumption report, staff will be able to see the results of their efforts. This will inevitably contribute to the development of the culture of awareness so critical to the success of our initiatives.

4.2 Asset Level

The implementation and execution of a successful conservation program is contingent on employee awareness and understanding. Staff will become familiar with all energy conservation initiatives only through proper training and information sharing practiced through the Management Team.

The completion of facility energy audits is a critical step in the determination of the best approaches for optimization as well as the establishment of baseline energy consumption profiles for the various departments. The outcome of facility energy audits must be given careful consideration by management to determine return on investment and assess best approaches for implementation where applicable.

Aside from training in the culture of conservation, and energy auditing, it is crucial that standard operational practices and routines in the various facilities be scrutinized and compared against original design intent. This process can bring to light inefficiencies borne over time which, in many cases, can have a detrimental effect on the overall energy efficiency of a given process. Factoring in changes to the delivery and billing of power, such as time of use billing, and applying this to current operational processes can identify opportunities for optimization.

5.0 Evaluation

5.1 Energy Plan Review

While the annual report required by the Ministry of Energy will provide the necessary tools for assessing the success of the Energy Management Plan.

5.2 Evaluation of Energy Consumption

Facility energy consumption data is compiled and submitted on an annual basis. This data will be used in part to determine the effectiveness of energy reduction plans. As energy consumption is highly dependent on environmental conditions and trends, all data must be assessed in such a manner that weather and environmental circumstance are taken into consideration.

6.0 Projects:

6.1 Summary of Proposed Projects

Proposed processes and projects to be undertaken in order to achieve the targeted reduction in energy consumption over the duration of this plan period are as follows:

- Streetlight LED retrofit – scheduled for completion in 2014;
- Municipal facility lighting audit;
- Recreational facility energy efficiency audit;
- Water treatment plant operational audit;
- Wastewater treatment plant dual fuel boiler replacement – scheduled for completion July 2014;
- Wastewater treatment plant energy efficiency audit;
- Variable frequency drive installation at water treatment plant.

7.1 - Energy Consumption and GHG Emmissions

January 1st, 2011 to December 31st, 2011

Facility Name	Fuel Types	Consumption	Cost ($)	Energy (ekWh/yr)	GHG Emissions (kg CO2e/yr)	GHG Intensity (kg CO2e/m2)	Energy Intensity (eKWh/m^2)
Facility Primary Type: Fire							
Fire Department	NG	3656.00 m3	1,934.49	38,855.15	6,912.13	15.03	84.47
	Elect.	44853.00 kWh	4,548.02	44,853.00	43,076.82	93.65	97.51
		Facility Type Total	**6,482.51**	**83,708.15**	**49,988.95**		
Facility Primary Type: Police							
Police Department	NG	6099.00 m3	3,319.34	64,818.81	11,530.93	14.78	83.10
	Elect.	171711.00 kWh	15,469.98	171,711.00	164,911.24	211.42	220.14
		Facility Type Total	**18,789.32**	**236,529.81**	**176,442.18**		
Facility Primary Type: Community Centre							
White Mountain Academy	NG	15492.00 m3	5,231.27	164,645.52	29,289.59	11.59	65.15
	Elect.	297066.00 kWh	24,872.66	297,066.00	285,302.19	112.90	117.56
Collins Hall	NG	5723.00 m3	1,517.15	60,822.77	10,820.06	10.40	58.48
	Elect.	123644.00 kWh	12,832.90	123,644.00	118,747.70	114.18	118.89
Lester B. Pearson Civic Center	NG	9275.00 m3	3,970.45	98,572.63	17,535.57	10.15	57.04
	Elect.	342394.00 kWh	41,476.62	342,394.00	328,835.20	190.30	198.14
		Facility Type Total	**89,901.05**	**1,087,144.92**	**790,530.30**		
Facility Primary Type: Indoor Pool							
Juben Yli-Juuti Center	NG	12545.00 m3	3,720.28	133,325.46	23,717.92	11.59	65.13
	Elect.	526600.00 kWh	57,057.15	526,600.00	505,746.64	247.07	257.25
		Facility Type Total	**60,777.43**	**659,925.46**	**529,464.56**		
Facility Primary Type: Recreation Complex							
Centenial Arena	NG	9260.00 m3	1,870.56	98,413.22	17,507.21	5.71	32.10
	Elect.	524458.00 kWh	72,611.33	524,458.00	503,689.46	164.28	171.06
Rio Den Arena	NG	4857.00 m3	2,588.32	51,619.11	9,182.78	3.51	19.75
	Elect.	20699.00 kWh	2,122.32	20,699.00	19,879.32	7.61	7.92
		Facility Type Total	**79,192.53**	**695,189.33**	**550,258.76**		
Facility Primary Type: Public Works							
Public Works Department	NG	18411.00 m3	9,159.62	195,668.00	34,808.33	75.02	421.70
	Elect.	160196.00 kWh	16,128.97	160,196.00	153,852.24	331.58	345.25
		Facility Type Total	**25,288.59**	**355,864.00**	**188,660.57**		

Facility Primary Type: Transit							
Airport	Elect.	138688.00 kWh	16,392.34	138,688.00	133,195.96	328.07	341.60
		Facility Type Total	**16,392.34**	**138,688.00**	**133,195.96**		
Facility Primary Type: Tower							
Lookout Tower	Elect.	12574.00 kWh	8,317.71	12,574.00	12,076.07	108.79	113.28
		Facility Type Total	**8,317.71**	**12,574.00**	**12,076.07**		
Facility Primary Type: Town Hall							
City Hall	NG	2720.00 m3	1,478.97	28,907.55	5,142.51	8.64	48.58
	Elect.	225204.00 kWh	31,642.73	225,204.00	216,285.92	363.51	378.49
		Facility Type Total	**33,121.70**	**254,111.55**	**221,428.43**		
Facility Primary Type: Water Treatment Facility							**(eKWh/ML)**
Elliot Lake Water Treatment Plant	Elect.	1827049.00 kWh	242,299.23	1,827,049.00	1,754,697.86	1,041.36	715.42
Elliot Lake Wastewater Treatment Plant	NG	22116.00 m3	33,896.31	235,043.92	41,813.11	14.52	112.52
	Elect.	897180.00 kWh	108,096.54	897,180.00	861,651.67	299.18	429.49
Angel Lift Station	Elect.	133411.00 kWh	13,557.90	133,411.00	128,127.92	1,731.46	409.51
North Lift Station	Elect.	43034.00 kWh	4,373.33	43,034.00	41,329.85	2,952.13	385.63
Horne Lift Station	Elect.	297844.00 kWh	30,268.41	297,844.00	286,049.38	4,086.42	365.78
Washington Lift Station	Elect.	124133.00 kWh	12,615.02	124,133.00	119,217.33	2,536.54	358.15
Lakeview Lift Station	Elect.	18117.00 kWh	1,841.14	18,117.00	17,399.57	1,739.96	374.39
Dunn Lift Station	Elect.	10702.00 kWh	1,087.59	10,702.00	10,278.20	734.16	369.77
No Frills Lift Station	Elect.	7448.00 kWh	7,320.00	7,448.00	7,153.06	376.48	361.33
Lakeside Lift Station	Elect.	18752.00 kWh	1,905.67	18,752.00	18,009.42	643.19	349.54
Spruce Street Lift Station	Elect.	11922.00 kWh	1,277.57	11,922.00	11,449.89	1,272.21	374.27
Porridge Lift Station	Elect.	121209.00 kWh	12,317.87	121,209.00	116,409.12	1,662.99	383.26
		Facility Type Total	**470,856.58**	**3,745,844.92**	**3,413,586.39**		
Grand Total			**809,119.76**	**7,269,580.15**	**6,065,632.16**		

7.2 - Energy Consumption and GHG Emmissions

January 1st, 2012 - December 31st, 2012

Facility Name	Fuel Types	Consumption	Cost ($)	Energy (ekWh/yr)	GHG Emissions (kg CO2e/yr)	GHG Intensity (kg CO2e/m2)	Energy Intensity (eKWh/m^2)
Facility Primary Type: Fire							
Fire Department	NG	5029.00 m3	3548	53447.09	9507.96	20.67	116.19
	Elect.	48749.00 kWh	6302	48749	46818.54	101.78	105.98
		Facility Type Total	**9,850.00**	**102,196.09**	**56,326.50**		
Facility Primary Type: Police							
Police Department	NG	7655.00 m3	4848	81355.63	14472.75	18.55	104.3
	Elect.	198483.00 kWh	25505	198483	190623.07	244.39	254.47
		Facility Type Total	**30,353.00**	**279,838.63**	**205,095.82**		
Facility Primary Type: Community Centre							
White Mountain Academy	NG	27696.00 m3	17198	294346.91	52362.81	20.72	116.48
	Elect.	327077.00 kWh	37532	327077	314124.75	124.31	129.43
Collins Hall	NG	10885.00 m3	3667	115683.35	20579.47	19.79	111.23
	Elect.	135758.00 kWh	17837	135758	130381.98	125.37	130.54
Lester B. Pearson Civic Center	NG	9173.00 m3	9013	97488.6	17342.72	10.04	56.42
	Elect.	273993.00 kWh	37284	273993	263142.88	152.28	158.56
		Facility Type Total	**122,531.00**	**1,244,346.86**	**797,934.61**		
Facility Primary Type: Indoor Pool							
Juben Yli-Juuti Center	NG	32273.00 m3	17345	342990.25	61016.21	29.81	167.56
	Elect.	775761.00 kWh	85516	775761	745040.86	363.97	378.97
		Facility Type Total	**102,861.00**	**1,118,751.25**	**806,057.07**		
Facility Primary Type: Recreation Complex							
Centenial Arena	NG	12769.00 m3	7342	135706.08	24141.42	7.87	44.26
	Elect.	484665.00 kWh	61427	484665	465472.27	151.82	158.08
Rio Den Arena	NG	5413.00 m3	4143	57528.16	10233.96	3.92	22.02
	Elect.	27159.00 kWh	3444	27159	26083.5	9.98	10.39
		Facility Type Total	**76,356.00**	**705,058.24**	**525,931.15**		
Facility Primary Type: Public Works							
Public Works Department	NG	28671.00 m3	16390	304708.99	54206.17	116.82	656.7
	Elect.	154413.00 kWh	18670	154413	148298.25	319.61	332.79
		Facility Type Total	**35,060.00**	**459,121.99**	**202,504.41**		

Facility Primary Type: Transit							
Airport	Elect.	147125.00 kWh	23861	147125	141298.85	348.03	362.38
		Facility Type Total	**23,861.00**	**147,125.00**	**141,298.85**		
Facility Primary Type: Tower							
Lookout Tower	Elect.	10158.00 kWh	9327	10158	9755.74	87.89	91.51
		Facility Type Total	**9,327.00**	**10,158.00**	**9,755.74**		
Facility Primary Type: Town Hall							
City Hall	NG	3966.00 m3	2850	42149.76	7498.23	12.6	70.84
	Elect.	223064.00 kWh	32500	223064	214230.67	360.05	374.9
		Facility Type Total	**35,350.00**	**265,213.76**	**221,728.89**		
Facility Primary Type: Water Treatment Facility							**(eKWh/ML)**
Elliot Lake Water Treatment Plant	Elect.	2319769.00 kWh	282483	2319769	2227906.15	1322.2	821.5
Elliot Lake Wastewater Treatment Plant	NG	48577.00 m3	31496	516265.52	91840.99	31.89	246.07
	Elect.	1025775.00 kWh	117807	1025775	985154.31	342.07	488.91
Angel Lift Station	Elect.	153447.00 kWh	20203	153447	147370.5	1991.49	430
North Lift Station	Elect.	46247.00 kWh	6089	46247	44415.62	3172.54	427.23
Horne Lift Station	Elect.	323901.00 kWh	42645	323901	311074.52	4443.92	430.64
Washington Lift Station	Elect.	156622.00 kWh	20621	156622	150419.77	3200.42	430.03
Lakeview Lift Station	Elect.	14371.00 kWh	1892	14371	13801.91	1380.19	418.65
Dunn Lift Station	Elect.	9643.00 kWh	1270	9643	9261.14	661.51	412.75
No Frills Lift Station	Elect.	10735.00 kWh	1413	10735	10309.89	542.63	414.56
Lakeside Lift Station	Elect.	19768.00 kWh	2603	19768	18985.19	678.04	422.01
Spruce Street Lift Station	Elect.	45985.00 kWh	6054	45985	44163.99	4907.11	427.2
Porridge Lift Station	Elect.	123566.00 kWh	16269	123566	118672.79	1695.33	429.71
		Facility Type Total	**550,845.00**	**4,766,094.52**	**4,173,376.76**		
		Grand Total	**996,394.00**	**9,097,904.36**	**7,140,009.81**		