



ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN

Executive Summary

The *Green Energy Act* (Act) was passed on May 14, 2009. The purpose of the Act is to “green” Ontario’s energy sector through increased energy conservation and utilization of alternative forms of energy production. The Act requires Municipalities to prepare and implement Energy Conservation and Demand Management (ECDM) Plans.

ECDM plans are required to be approved by Council, published and made available to the public in accordance with sections 6 and 7 of the Act and in accordance with Ontario Regulation 397/11.

An ECDM plan (“Plan”) is composed of two parts:

1. An annual summary of energy consumption and greenhouse gas emissions for the operations of the municipality
2. A description of measures for:
 - a. Conserving and otherwise reducing the amount of energy consumed by operations, and
 - b. Managing the demand for energy, including a forecast of the expected results of current and proposed measures

Annual summaries of energy consumption and greenhouse gas emissions for the operations of the municipality are posted on the Town’s web site.

The contents of this document address the second component of the ECDM requirement. It includes Goals, Objectives, Actions and Targets designed to conserve and otherwise reduce the amount of energy consumed by operations and manage the demand for energy, including a forecast of the expected results of current and past measures.

The ECDM is to be updated every five years or less and is to include:

1. A description of current and proposed measures for conserving and otherwise reducing energy consumption and managing its demand for energy;
2. A revised forecast of the expected results of the current and proposed measures;
3. A report of the actual results achieved; and
4. A description of any proposed changes to be made to assist the public agency in reaching any targets it has established or forecasts it has made.

March 30, 2015



Introduction

In August of 2007, the Province of Ontario produced *Go Green: Ontario's Action Plan on Climate Change*. The Action Plan acknowledges the environmental crisis caused by the burning of fossil fuels and commits to producing solutions.

The Action Plan challenges our society to embrace this environmental crisis as an economic opportunity; “We don’t have to choose between a strong economy and a healthy environment”.

Go Green: Ontario's Action Plan on Climate Change contains targets that, although ambitious, are also deemed to be achievable. Those targets include:

- To reduce Ontario’s greenhouse gas emissions to 6% below 1990 levels by 2014 – a reduction of 61 megatonnes
- To reduce Ontario’s greenhouse gas emissions to 15% below 1990 levels by 2020 – a reduction of 99 megatonnes
- To reduce Ontario’s greenhouse gas emissions to 80% below 1990 levels by 2050

The Action Plan details how these reductions will be achieved, noting 15% will come from other new policies, which includes “**working with municipalities to reduce their greenhouse gas emissions**”. In 2009, the *Green Energy Act* was passed which included direction for municipalities, among other public agencies, to ultimately work towards energy conservation and the reduction of greenhouse gas emissions through the development of Energy Conservation and Demand Management Plans.

There are two strong arguments to support the development and implementation of ECDM plans and they are generally well known.

1. Environmental – Climate change and pollution are linked to greenhouse gas emissions. The majority of greenhouse gas emissions are produced through the combustion of fossil fuels to produce energy. Efforts to reduce energy consumption will reduce energy production and greenhouse gas emissions and therefore reduce pollution and the rate of climate change.
2. Financial – Energy is costly in financial terms. The Town of Tecumseh incurred \$896,000 in Utility charges in 2013, the bulk of which applies to electricity, natural gas and fuel consumption. These charges accounted for 4% of total Town expenditures. Electricity costs per kWh have been increasing significantly and are expected to continue to do so. Reducing energy consumption will help to minimize the tax burden on property owners and/or allow for investment or expenditure on other valued services.

The significant cost of energy is not a new development; the Town has actively monitored energy consumption and invested in energy saving initiatives for many years. Some examples of recent Town initiatives are referenced on page eleven (11).



The development and implementation of the ECDM Plan will enhance the Town's established pursuit of energy efficiency by incorporating the reduction of greenhouse gas emissions.

Furthermore, the Town should achieve greater success through the formal practices inherent in our ECDM Plan, such as:

- Setting goals, objectives and reduction targets;
- Data collection and submission requirements;
- Demand management; and
- Increased energy conservation and GHG emission awareness.

Town of Tecumseh ECDM Plan

Regulation 397/11 requires that energy consumption be documented on the following Town facilities:

1. Administrative offices and related facilities, including municipal council chambers
2. Public libraries
3. Cultural facilities, indoor recreation facilities and community centres, including art galleries, performing art facilities, auditoriums, indoor sports arenas, indoor ice rinks, indoor swimming pools, gyms and indoor courts for playing tennis, basketball or other sports
4. Ambulance stations and associated offices and facilities
5. Fire stations and associated offices or facilities
6. Police stations and associated offices and facilities
7. Storage facilities where equipment or vehicles are maintained, repaired or stored
8. Buildings or facilities related to the treatment or pumping of water or sewage
9. Parking garages

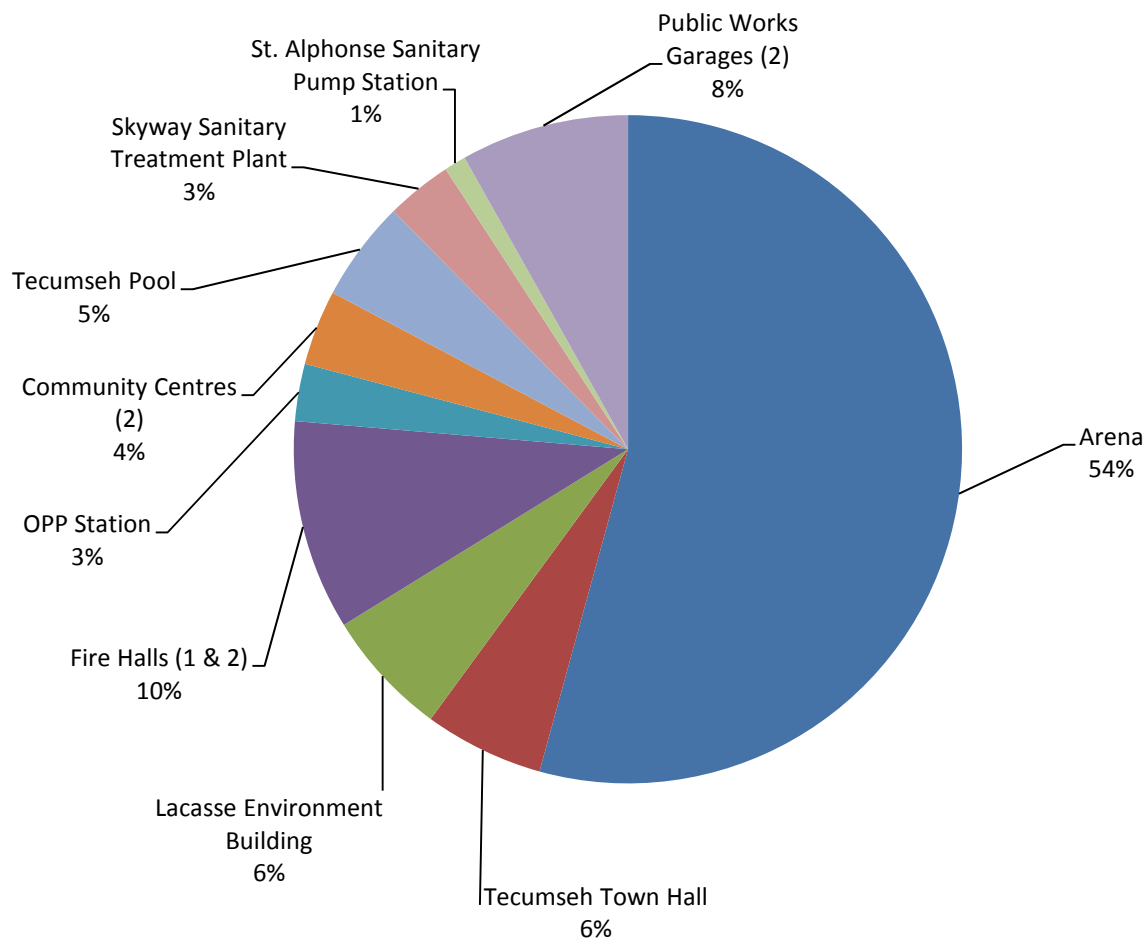
Based on the regulation, the Town facilities required to be included in the Plan are:

- Town Hall
- Fire Halls 1 & 2
- OPP Station
- Arena
- Outdoor Pool
- Community Centres
- Public Works Building
- Parks Buildings
- Public Works Garages
- Water Tower
- Sanitary and Storm Water Pump Stations
- Skyway Treatment Plant

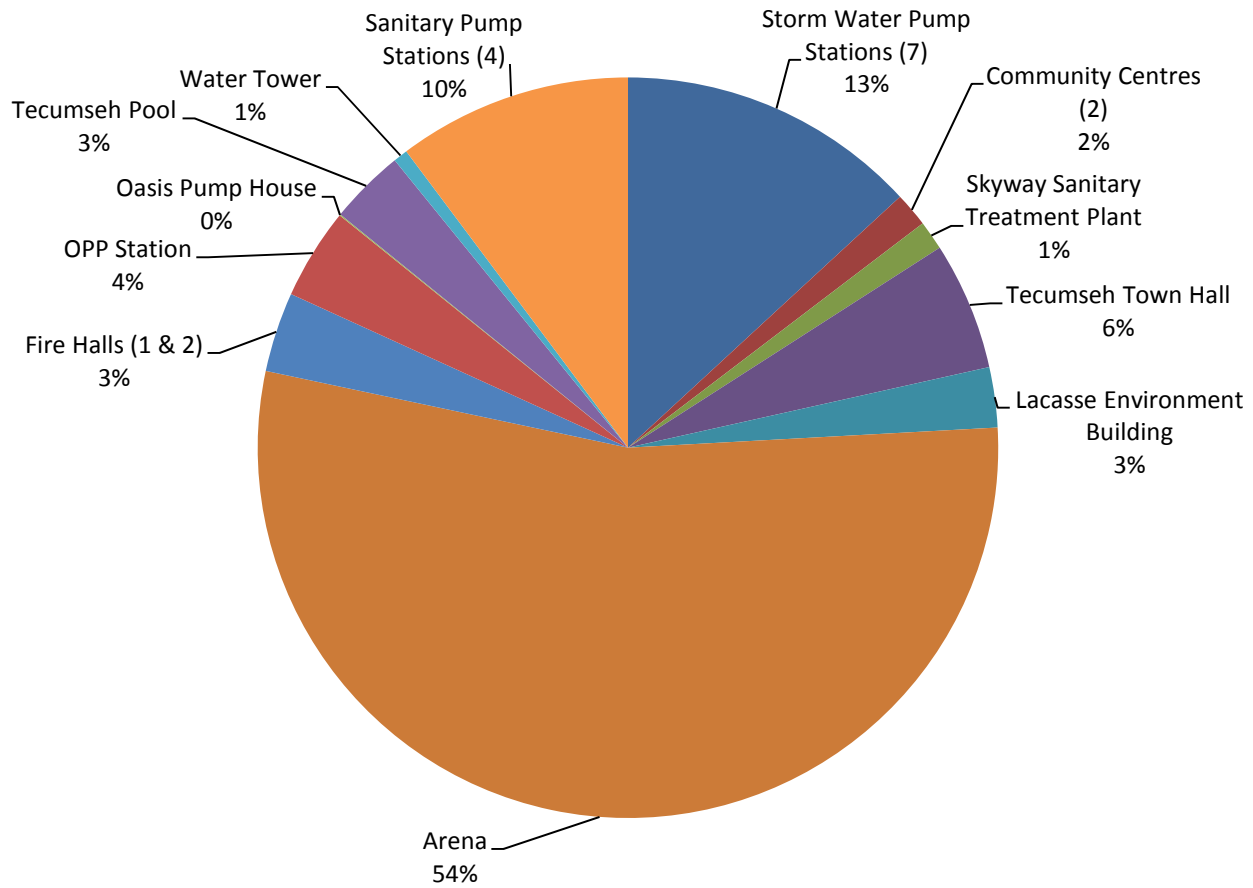


Based on the required facilities listed above, the Town submitted initial consumption data for the base year 2011. Electricity and Natural Gas consumption by facility are represented in the following pie charts. These charts emphasize the few large energy consumers that should be the main targets for near-term energy conservation initiatives.

Natural Gas Consumption – 2011



Electricity Consumption – 2011



Additionally, the Town has elected to include the following in our Plan:

- Street lights
- Fuel

Street lighting, as a category, is the single greatest consumer of electricity for the Town. Street lighting consumed over 2.1 million kWh in 2013 at a cost of \$308,000 (34% of total Utility costs), with future costs expected to increase due to increasing hydro rates.

Fuel was elected to be included as well as these costs have been climbing steadily and are expected to continue to do so. Town operations consumed upwards of 135,000 litres of fuel in 2013 at a cost of \$167,000.

Together, street lights and fuel account for 53% of the Town's Utility costs in 2013.

The Town's ECDM Plan includes electricity, natural gas and corporate fuel consumption. The Plan defines actions in the following areas:

- Energy data management
- Energy training and awareness
- Facility and Equipment operations
- Energy conservation in existing facilities
- New construction opportunities
- Renewable energy
- Fleet energy
- Street lighting

Costly initiatives are subject to financial feasibility review and cost/benefit analysis. Early emphasis will be placed on the implementation of low/no cost and/or short payback period initiatives.

The ECDM Plan is intended to be long term in nature with updates every five years. Elements of this initial plan will be implemented over the course of the five-year period from 2014-2019. The gauge of success will be in the long term trends of energy consumption and GHG emissions as year-over-year changes can fluctuate due to weather conditions, however annual consumption and GHG data will be monitored and reported.

The plan will serve as a guide to improve efficiency, reduce consumption, reduce GHG emissions, maintain service levels, reduce energy costs, increase awareness and be a community leader and advocate for a culture of conservation.

Declaration of Commitment

A declaration of the Town's commitment to Energy Conservation and Demand Management is recommended in support of this initiative. This declaration of commitment can be in the form of Council Adoption of the ECDM Plan.

Vision

The Vision for the Town of Tecumseh is to be an environmentally sustainable community. We will exercise stewardship in our use of finite energy resources to demonstrate leadership, optimize our delivery of services and enhance the overall quality of life in our community.

Goals

1. To improve the energy efficiency of our corporation by utilizing best practices to reduce our operating costs, energy consumption and greenhouse gas emissions.
2. To create a culture of conservation.

Consumption data will be reported annually to Town Council and the province and will be available on the Town's web site. The data will include GHG emissions.

Every five years, commencing July 1, 2019, the Town will report on success with targets established from this original plan and have the opportunity to update goals, targets and/or the plan itself.

Targets

1. **Reduce corporate overall energy consumption by 10% by 2019 (Base year 2011)**

Base year consumption and Target year consumption for ECDM Plan required facilities:

	Floor Space		Unit of		
Energy Source	(Sq. metres)	Total Usage	Measurement	10% Reduction	Target Usage
Hydro	11,482	2,541,642	kWh	254,164	2,287,478
Natural Gas	12,340	238,364	M3	23,836	214,528

Base year consumption and Target year consumption for ECDM Plan optional categories:

Optional			Unit of		
Category	Unit Count	Total Usage	Measurement	10% Reduction	Target Usage
Street lights	784	2,080,227	kWh	208,023	1,872,204
Fuel	77	137,579	Litres	13,758	123,821

Refer to Appendix A for a complete detailed listing of the Town's base year (2011) data, including optional categories.

Objectives

The following strategic objectives have been established to achieve the ECDM Plan goals and ultimately reach or exceed targets established:

1. Improve awareness of greenhouse gas emissions and consumption behaviours;
2. Complete energy walk-through audits on all municipal facilities;
3. Improve the efficiency of energy use through low-cost/no-cost opportunities by implementing the following:
 - a. Sound operating and maintenance practices;
 - b. Employee training and staff awareness;
 - c. Monitoring and tracking system;
 - d. Retrofitting of building envelopes;
 - e. Energy demand management program; and
4. Investigate new and emerging technology.

Actions

Actions can be defined as any initiative of the Town to accomplish the plan goals and objectives. Within this Plan, Actions will be classified in one of three categories; Program, Process or Project. Throughout the plan term, the Energy Team will identify and implement Actions where feasible. Funding considerations will be included in the annual budget process.

A select list of preliminary Actions is listed below:

- A. Program
 - a. Add energy awareness to management/department meetings
 - b. Improve staff education and awareness
- B. Process
 - a. Maintenance procedures, eg. vacuum refrigeration coils of vending machines, etc.
 - b. Turn off electronic devices at night and weekends
 - c. Ensure energy conservation is considered as part of any new construction or equipment purchase
- C. Project
 - a. Walk-through audits
 - b. Enhance building envelopes
 - c. Ensure all lighting is updated
 - d. Renewable energy initiatives



Past Initiatives

Some recently implemented conservation initiatives include:

- Many Town buildings operate with programmable thermostats and motion detector lighting
- 2009 – changeover from T12 fluorescent lighting to more efficient T8 fluorescent lighting in the Historical Society building
- 2010 – Lighting retrofits to Green Acres Community Centre, Golden Age Community Centre and Arena ice surface lighting
 - Arena – 1,000 watt metal halide to 540 watt fluorescent
- 2010 – Arena improvements including fibreglass insulation enhancement of Rink B and dehumidifiers changed from four (4) mechanical to two (2) gas powered
- 2010 – 500 kW photovoltaic solar panel installation on the arena rooftop through Essex Power Services
- 2013 – Public Works Lacasse building and all public works garages changed from high pressure sodium lighting to T5 fluorescent
 - Garages - 400 watt metal halide to 216 watt fluorescent
- 2013 – Street light LED pilot project implemented
- 2013 – Parking lot LED lighting
 - McAuliffe and Lakewood parks – LED lighting in parking lots
- 2013 – Fire Hall – 70 watt high pressure sodium to 10 watt LED
- 2013 – Arena energy audit completed

Future Initiatives

Proposed initiatives for the near term include:

- Arena – Infra-red ice temperature control system
- Arena - De-super heater – hot water pre-heating system
- Energy Audits – to be performed for Town Hall, Fire Hall #1 and OPP Station by energy consultants
- Street lighting – conversion to LED
- Walk-through Audits – to be performed by Energy Team for each facility
- Awareness – Energy conservation and GHG emission awareness program

Renewable Energy

O. Reg. 397/11 requires the ECDM plan to include a description of any renewable energy generation facility operated by the public agency and the amount of energy produced on an annual basis by the facility.

As per Council Report, Financial Services 12/14 - Pursuant to Financial Services Report No. 19/09 Council approved by-law No. 2009-71 which was an agreement with Essex Power Corporation ("Solar Co.") for the purpose of granting a lease or license to Solar Co. to use a portion of the Tecumseh Recreation Complex (Arena) lands and buildings to allow a Photovoltaic (PV) Array on the Tecumseh Arena.

The main terms of the agreement include:

- 10 year term with an option for a second 10 year term. Term to commence when the system is commissioned (November 19, 2010)
- Annual 7% dividends are guaranteed with the opportunity to go as high as 11% based on performance measures
- A lease payment for use of the arena roof and a portion of the arena lands
- EPC to install, maintain and operate the system
- Project was estimated to cost \$2,729,115 with the Town's share being a \$341,000 investment in Green Shares

The table below illustrates actual results as compared to original projections.

	Original	Actual	
Size	434	500	kW
Panels	2,170	2,212	#
Output	570	539 to 569	MWh/year
Capacity Factor	13.5%	2011 - 12.3% 2012 - 13.7% 2013 - 12.9%	
Cost	\$ 2,729,115	\$ 2,991,540	
Town Investment	\$ 341,000	\$ 373,943	
Dividend Rate	7% to 11%	7%	
Dividend Dollars	\$ 23,870	\$ 26,176	yearly
Lease		\$8,750	yearly
Base power expected	513,248	591,300	
Base power realised		2011 - 546,701 2012 - 606,625 2013 - 565,476	

Plan Implementation

Components of the plan will be implemented throughout the five-year period 2014-2019 and will be spearheaded by the Energy Team.

The Energy Team members include:

- Ray Hammond, Manager Town Facilities – Energy Team Champion
- Tom Kitsos, Deputy Treasurer
- Chad Jeffery, Manager Planning Services
- Kirby McArdle, Manager Roads & Fleet
- Dan Desrosiers, Building Maintenance

The Energy Team will be responsible to ensure that annual consumption data is reported to Council and the province, and that annual consumption and GHG emission data is made available on the Town's web site.

Additionally, the team will work to Link the ECDM Plan to other corporate activities – such as 5-yr capital plans, operating budgets, corporate strategic priorities as set by Council, etc.

Additional resources and incentives will be sought where opportunities present themselves. Essex Power Services has and will continue to assist the Town to identify grant funding and/or investigate opportunities for grant funding.

The Energy Team will monitor and evaluate plan progress on an annual basis. A formal evaluation/review, as per the Act, will be completed for July 2019.

Appendix A

Energy Consumption and Greenhouse Gas Emission Reporting - 2011

12-Month Period

Operation Name	January 2011 to December 2011		Operation Hrs per week	Annual Flow (Mega Litres)		District Heating	District Cooling	GHG Emissions (Kg)	Energy Intensity (GJ / m2)	Energy Intensity (GJ / Mega Litres)	
	Address	Indoor Floor Space		Electricity	Natural Gas						
Tecumseh Town Hall	917 Lesperance Rd.	1,104 Square meters	30		141,914 kWh	13,763 Cubic meter	No	No	37,374	0.9397	
Lacasse Environment Building	1189 Lacasse Blvd	1,036 Square meters	168		66,811 kWh	14,623 Cubic meter	No	No	32,992	0.7722	
Fire Hall 1	985 Lesperance Rd	542 Square meters	20		43,052 kWh	11,839 Cubic meter	No	No	25,827	1.1217	
Fire Hall 2	5520 Walker Rd	396 Square meters	40		45,401 kWh	12,378 Cubic meter	No	No	27,034	1.6087	
OPP Station	963 Lesperance Rd	514 Square meters	168		101,508 kWh	6,618 Cubic meter	No	No	20,633	1.2036	
Arena	12021 McNorton St	6,317 Square meters	112		1,377,547 kWh	129,364 Cubic meter	No	No	354,783	1.5686	
Green Acres Community Centre	13731 St Gregorys	193 Square meters	20		11,228 kWh	2,601 Cubic meter	No	No	5,816	0.7251	
Golden Age Community Centre	12421 Tecumseh Rd E	353 Square meters	40		27,025 kWh	6,054 Cubic meter	No	No	13,608	0.9318	
Tecumseh Pool	590 Lacasse Blvd	333 Square meters	55		76,910 kWh	10,629 Cubic meter	No	No	26,249	2.0527	
Tecumseh Pool	590 Lacasse Blvd	31 Square meters	55		7,160 kWh	990 Cubic meter	No	No	2,444	2.0527	
Skyway Sanitary Treatment Plant	2475 McCord Lane	82 Square meters	168	39,043	32,218 kWh	7,611 Cubic meter	No	No	16,967	4.9656	0.0104
Water Tower	Tecumseh Rd	13 Square meters	168	3,657	15,836 kWh		No	No	1,267	4.3854	0.0156
Brighton Rd. Storm Water Pump Station	Tecumseh & Brighton Rd	102 Square meters	168	2,964	50,995 kWh		No	No	4,080	1.7998	0.0619
Cedarwood Sanitary Pump Station	Gauthier Dr	58 Square meters	168	2,961,628	163,801 kWh		No	No	13,104	10.1670	0.0002
East St. Louis Stormwater Pump Station	13089 Riverside Dr	122 Square meters	168	751	56,486 kWh		No	No	4,519	1.6668	0.2708
John Scully Stormwater Pump Station	N/S Riverside Dr	46 Square meters	168	585	34,625 kWh		No	No	2,770	2.7098	0.2131
Lakewood (Hayes) Sanitary Pump Station	Hayes Ave	40 Square meters	168	1,142,029	75,188 kWh		No	No	6,015	6.7669	0.0002
St. Alphonse Sanitary Pump Station	2475 St Alphonse	1 Square meters	168	160,237	17,248 kWh	2,525 Cubic meter	No	No	6,154	158.6993	0.0010
Sylvester Sanitary Pump Station	Sylvester Dr	1 Square meters	168	160,237	3,657 kWh		No	No	293	13.1652	0.0001
Lesperance Stormwater Pump Station	Lesperance & Riverside D	48 Square meters	168	1,867	87,021 kWh		No	No	6,962	6.5266	0.1678
Oasis Pump House	3455 N. Talbot Rd	9 Square meters	168	1	1,095 kWh		No	No	88	0.4380	4.8577
St. Marks Stormwater Pump Station	13774 Riverside Dr	25 Square meters	168		15,054 kWh		No	No	1,204	2.1678	
West St Louis Stormwater Pump Station	12924 Riverside Dr	85 Square meters	168	588	56,361 kWh		No	No	4,509	2.3871	0.3451
Public Works Garage/Depot/Storage	Lacasse Blvd	1,000 Square meters	40			5,496 Cubic meter	No	No	10,391	0.2103	
Public Works Garage South	2495 McCord	438 Square meters	40			13,873 Cubic meter	No	No	26,229	1.2118	
Peter Cecile Stormwater Pumping Station	N/S Riverside Dr	31 Square meters	168	33,501	33,501 kWh		No	No	2,680	3.8904	0.0036
Totals		12,920			4,507,088	2,541,642			653,989		
		Quantity	Measure		Electricity	Fuel					
Street lights		784	Street lights		2,080,227 kWh				166,418 *		
Fuel		79	Units (vehicles/equipment)			137,579 Litres			330,441 *		
									496,859		
Grand Total									1,150,848		

* - GHG calculation for vehicles - based on U.S. Department of Energy - 20 lbs of GHG emissions per gallon consumed - equivalent to 2.4 Kg per litre
 GHG calculation for street lights based on 0.08 Kg GHG per kWh