CONSERVATION & DEMAND MANAGEMENT PLAN

July 2019 – June 2024

Perth County
ONTARIO · CANADA

Contents

Background on O.Reg. 507/18

O.Reg. 507/18 was created under the Electricity Act, 1998 on December 12, 2018. It was Filed on December 14, 2018 and Published on e-laws the same day. This Ontario Regulation was developed to replace the revoked O. Reg. 397/11, which was filed under the repealed Green Energy Act, 2009.

This Ontario Regulation requires that every municipality, municipality service board, post-secondary education institution, public hospital and school board (public agencies), update their previous Conservation and Demand Management Plans by July 1, 2019, and update it every five years afterwards.

The Conservation and Demand Management plans should include two sections. The first section should discuss the public agency's annual energy consumption and the emissions associated with their operations. The second section must provide a description of previous, current and proposed ways to conserve or reduce energy that is consumed by the operations of the public agency. This in

turn assists in the management of the public agency's demand for energy and will forecast the results of current and proposed measures.

Each report must include:

1. The address at which the operation is conducted
2. The type of operation
3. The total floor area of the indoor space in which the operation is conducted and, in cases where subsection (4) applies, the total indoor floor area of the building or facility in which the operation is conducted
4. A description of the days and hours in the year during which the operation is conducted and, if the operation is conducted on a seasonal basis, the period or periods during the year when it is conducted
5. The types of energy purchased for the year and consumed in connection with the operation
6. The total amount of each type of energy purchased for the year and consumed in connection with the operation
7. The total amount of greenhouse gas emissions for the year with respect to each type of energy purchased and consumed in connection with the operation
8. The greenhouse gas emissions and energy consumption for the year from conducting the operation, calculating,
    a. The annual mega-watt hours per mega litre of water treated and distributed, if the operation is a water works
    b. The annual mega-watt hours per mega litre of sewage treated and distributed, if the operation is a sewage works, or
    c. Per unit of floor space of the building or facility in which the operation is conducted, in any other case

Validity Period

This report is valid between the dates of July 1, 2019 – June 30, 2024. According to O.Reg. 507/18, and will need to be updated before or on July 1, 2024.

Commitment

Perth County is driven to improve the energy efficiency of buildings and other operations because of the potential to save on costs of operations, ensure energy security as well as environmental concerns.

Perth County is pushing forward efforts to spark the growth of clean and renewable energy sources, while also focusing on our own efforts to save energy for electrical, water, heating and cooling at the various facilities we own. We hope to implement and operate geothermal and solar technology in the future to aid in the reduction of emissions and improving energy security.

The County serves over 75,000 people, and provides various services, such as planning, highways, emergency medical services, and a variety of other business operations. The county owns and operates twelve facilities.

Perth County's energy consumption has increased by approximately 658,132.33 equivalent kilowatt hours, with an increase in greenhouse gas emissions of approximately 89,712.88 kilograms of carbon dioxide equivalent or CO2e. However, the total area that Perth County reports

on has increased by 80% since the baseline, and their energy consumption has only increased by approximately 38%. Without the increase in square footage of facilities to report on, the County would have decreased their energy consumption. Although Perth County has seen an increase in its energy consumption, they have managed to reduce their overall energy intensity. In 2011, the energy intensity per square foot, averaged out to be approximately 24.15 equivalent kilowatt hours per square foot, while in 2018, the overall average was seen to be 18.56 equivalent kilowatt hours per square foot.

All County employees must contribute to the energy management objectives. The entire County will benefit through the reduction of energy waste, decreasing operating costs and increasing competitiveness.
Where feasible, Perth County will deliver skills training for operators, maintainers and employees whose jobs are "hands-on" with energy consuming systems, so that they may increase their abilities to improve energy efficiencies.

County Owned Operations

Building Name	Address	Operation Type
County Courthouse	1 Huron St, Stratford	Administrative offices and related facilities, including municipal council chambers
Listowel EMS	255 Sarah Ave, Listowel	Ambulance stations and associated offices and facilities
Milverton EMS	22 Mill St, Milverton	Ambulance stations and associated offices and facilities
Milverton Public Works	6372 Perth Line 131, Milverton	Storage facilities where equipment or vehicles are maintained, repaired or stored
Mitchell EMS	14 Napier St, Mitchell	Ambulance stations and associated offices and facilities
Mitchell Public Works	4 Napier St, Mitchell	Storage facilities where equipment or vehicles are maintained, repaired or stored

Building Name	Address	Operation Type
Perth County Registry Building	5 Huron, Stratford	Administrative offices and related facilities.
St. Mary's EMS	241 Queen St W., St. Mary's	Ambulance stations and associated offices and facilities
Stratford Public Works	4312 Perth Road 119, Stratford	Storage facilities where equipment or vehicles are maintained, repaired or stored
Stratford Perth Archives (March 2016)	4273 Perth Line 34, Stratford	Public libraries
Stratford Perth Archives	24 St. Andrew's St, Stratford	Currently unoccupied, since early 2015
Stratford EMS Headquarters	480 Douro St, Stratford	Ambulance stations and associated offices and facilities. Storage facilities where equipment or vehicles are maintained or stored

Total Fuel Consumption 2018

Type of Energy Source	Consumed by Municipality?	Energy Source Supplier	Unit of Measurement	Total Amount of Energy Source Consumed
Water	No	N/A	Mega Lite (ML)	0
Electricity (Hydro)	Yes	Festival Hydro and Hydro One	Kilowatt Hour (kWh)	776,452.057
Natural Gas	Yes	Union Gas	Cubic Meter (M^3)	153,441.202
Propane	No	N/A	Litre (L)	0
Fuel Oil (#1 & #2)	No	N/A	Litre (L)	0
Fuel Oil (#4 & #6)	No	N/A	Litre (L)	0
Coal	No	N/A	Mega Tonne (MT)	0
Wood	No	N/A	Mega Tonne (MT)	0
District Heating	No	N/A	Giga Joule (GJ)	0
District Cooling	No	N/A	Giga Joule (GJ)	0

Consumption Costs 2018

Energy Type	Total Cost
Hydro	$110,645.99
Natural Gas	$44,697.74
TOTAL	$155,343.73

Facility Consumption 2018

Common Facility Name	Water		Electricity (Hydro)		Natural Gas		Propane	
	ML	%	kWh	%	M^3	%	L	%
County Courthouse	0	0	174,387.55	22	27,856.411	18.15	0	0
Listowel EMS	0	0	33,266.102	4	2,852.086	1.86	0	0
Milverton EMS	0	0	32,175.44	4	10,945.437	7.13	0	0
Milverton Public Works	0	0	14,497.9	2	9,964.3	6.49	0	0
Mitchell EMS	0	0	26,599.66	3	4,567.567	2.98	0	0
Mitchell Public Works	0	0	72,927	9	22,487	14.66	0	0
Perth County Registry Building	0	0	69,441.39	9	9,308.853	6.07	0	0
St. Mary's EMS	0	0	25,042.89	3	5,168.37	3.37	0	0
Stratford Public Works	0	0	34,211	16	13,626	8.88	0	0
Stratford Perth Archives (March 2016)	0	0	123,373.8	4	9,053.424	5.90	0	0
Stratford Perth	0	0	3,457.125	0	4,339.154	2.83	0	0

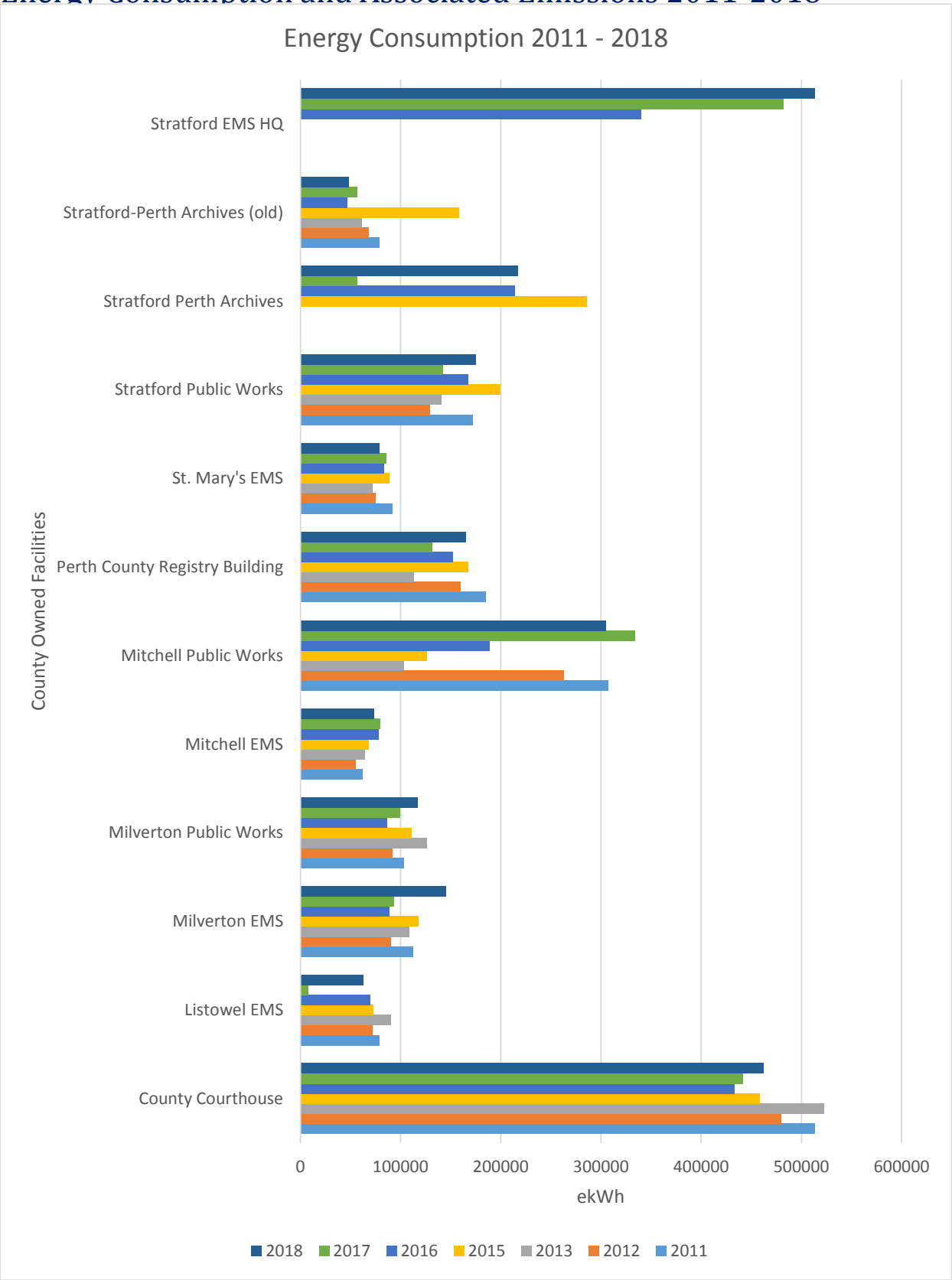
Common Facility Name	Water		Electricity (Hydro)		Natural Gas		Propane	
	ML	%	**kWh**	%	**M^3**	%	**L**	%
Archives								
Stratford EMS Headquarters	0	0	169,623	22	33,272.6	21.68	0	0
TOTAL	0	0	779,002.857	100	153,441.202	100	0	100

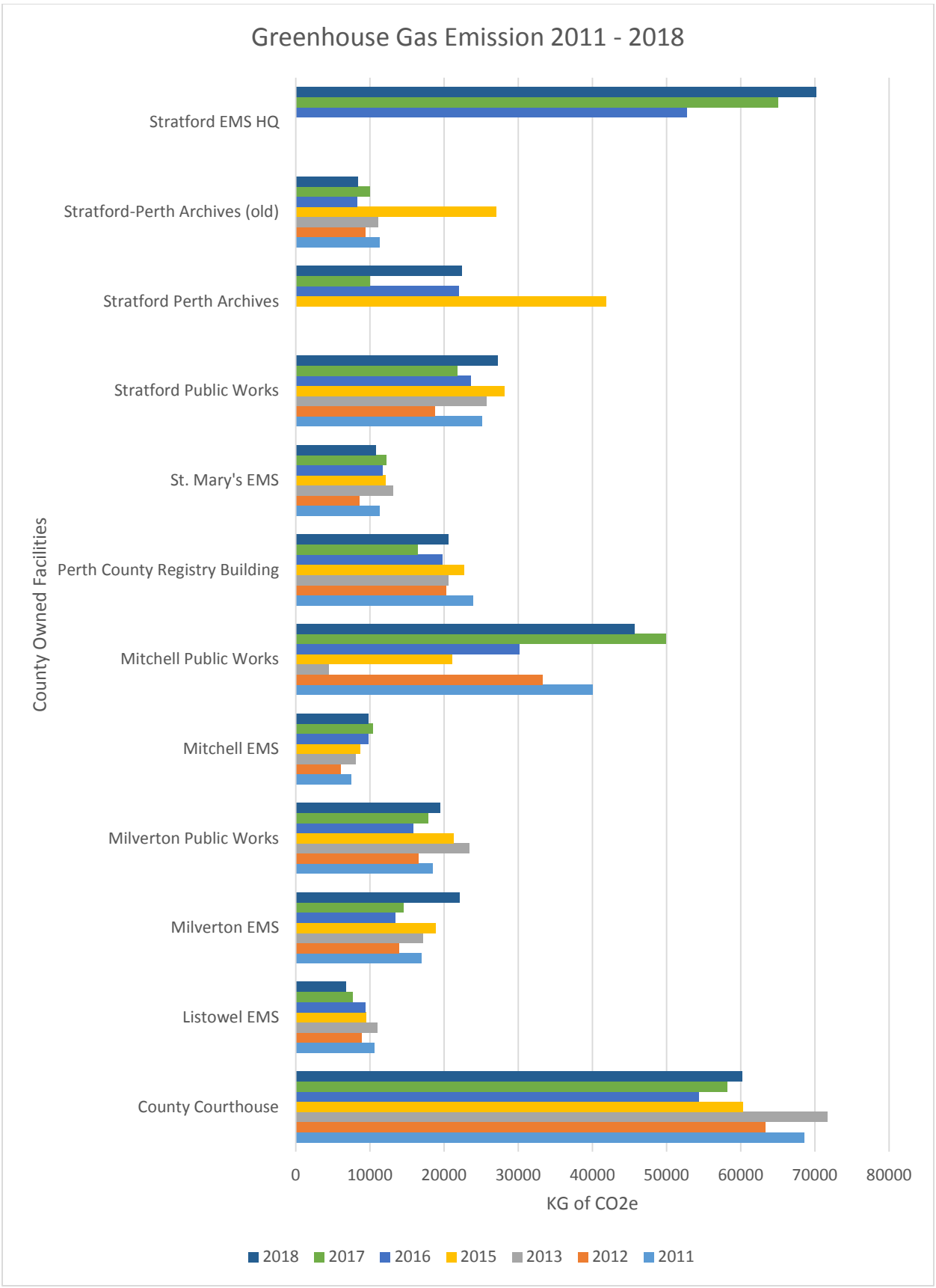
Associated Emissions 2018

Common Facility Name	Total Floor Area (sq./ft.)	GHG Emissions		Energy Intensity	
		KG CO_2e	*%*	*ekWh/sq.ft*	*%*
County Courthouse	19,080	60,175.14	19	24.22	9.2
Listowel EMS	3,500	6,823.74	2	17.92	6.8
Milverton EMS	3,413	22,081.37	6	42.56	16.2
Milverton Public Works	2,900	19,465.9	5	40.49	15.4
Mitchell EMS	3,595	9,781.05	3	20.52	7.8
Mitchell Public Works	22,120	45,658.78	14	13.80	5.3
Perth County Registry Building	8,700	20,589.02	7	19.03	7.3
St. Mary's EMS	25,042.89	10,850.23	3	22.49	8.6
Stratford Public Works	22,120	27,237.84	8	7.91	3
Stratford Perth Archives (March 2016)	10,000	22,425.10	9	21.69	8.3

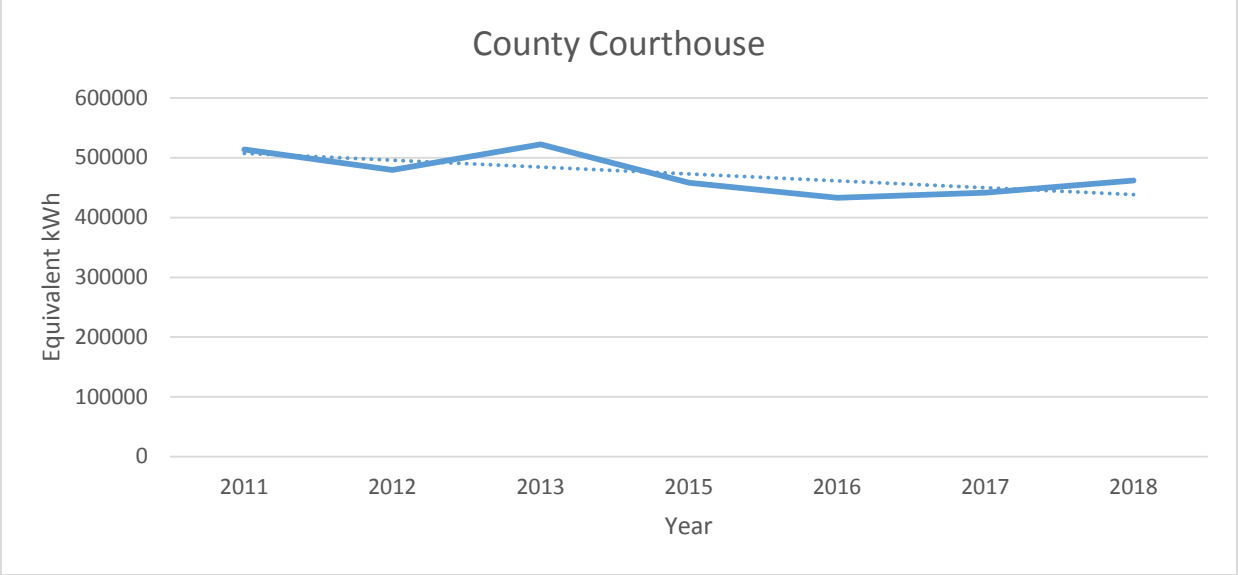
Common Facility Name	Total Floor Area (sq./ft.)	GHG Emissions		Energy Intensity	
		KG CO_2e	*%*	*ekWh/sq.ft*	*%*
Stratford Perth Archives	5,000	8,354	3	9.66	3.7
Stratford EMS Headquarters	23,437	70,212.28	22	21.90	8.4
TOTAL	127,353	323,654.44	100	262.19	100

Energy Consumption and Associated Emissions 2011-2018




Greenhouse Gas Emission 2011 - 2018
Stratford EMS HQ
Stratford-Perth Archives (old)
Stratford Perth Archives
Stratford Public Works
St. Mary's EMS
Perth County Registry Building
Mitchell Public Works
Mitchell EMS
Milverton Public Works
Milverton EMS
Listowel EMS
County Courthouse
County Owned Facilities
0
10000
20000
30000
40000
50000
60000
70000
80000
KG of CO2e
2018
2017
2016
2015
2013
2012
2011

County Courthouse

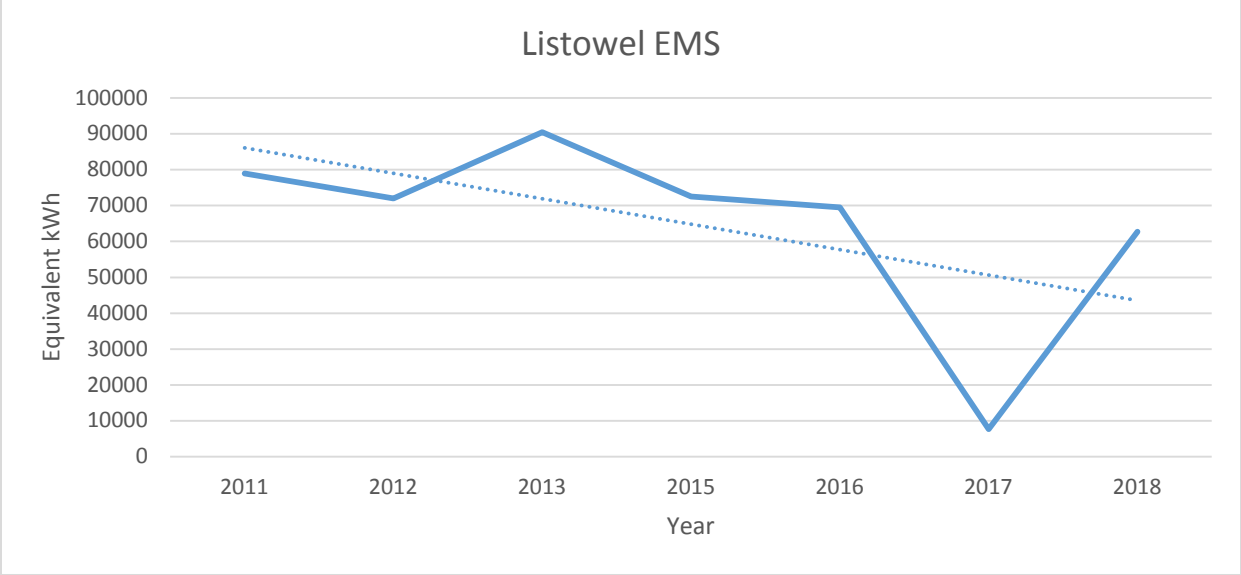


This facility was built in 1887 and houses County administrative staff and Superior and Provincial Offenses Court personnel. The building has three stories and is approximately 19,080 square feet. The average times of operation are between 8:00 AM and 5:00 PM, Monday to Friday with an average of 45 hours a week. There is a steam boiler system to heat the building, as well as a combination of ductless splits and rooftop units for cooling. High efficiency windows have been installed, as well as solar window shades, low flow washroom facilities, energy efficient lighting, occupancy sensors, an HVAC system on the lower floor, as well as a Building Automation System to control the steam boiler.

The Courthouse has reduced its energy consumption by approximately 51,598ekWh from the 2011 baseline year, for a total consumption of 462,144.28ekWh. The facility has reduced its emissions by about 8,439.85 kg of CO_2e, to emit a total of 60,175.14 kg.

Currently, the lights in the Council Chambers on the 3rd floor have been converted to LED lights. There are plans to change the entire lighting in the courthouse to LED lights.

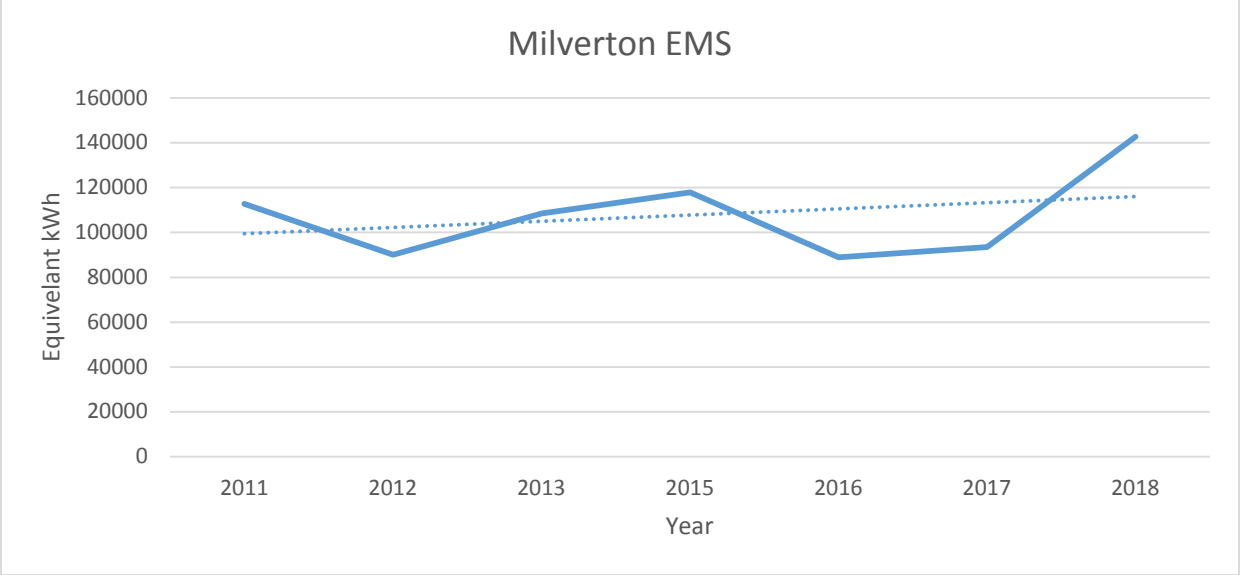
Listowel EMS



This facility was constructed in 1990, it is a 2-storey facility and is approximately 3,500 square feet. The building hosts crew quarters, general office spaces and a garage that holds 2 ambulances. This building operates for 24 hours a day. The main floor garage is heated by a forced air gas tube heater. The upper floor is heated with 3 heat pumps. The air conditioning is also provided through these heat pump units. The facility uses low-flow toilets, and has both T8 fluorescent and LED lighting.

The Listowel EMS facility has reduced its energy consumption by approximately 16,187ekWh, to consume a total of 62,728ekWh. The EMS building emitted a total of 6,823 kg of CO_2e in 2018, which is approximately 3,813.2 kg less than 2011 emissions.

Milverton EMS

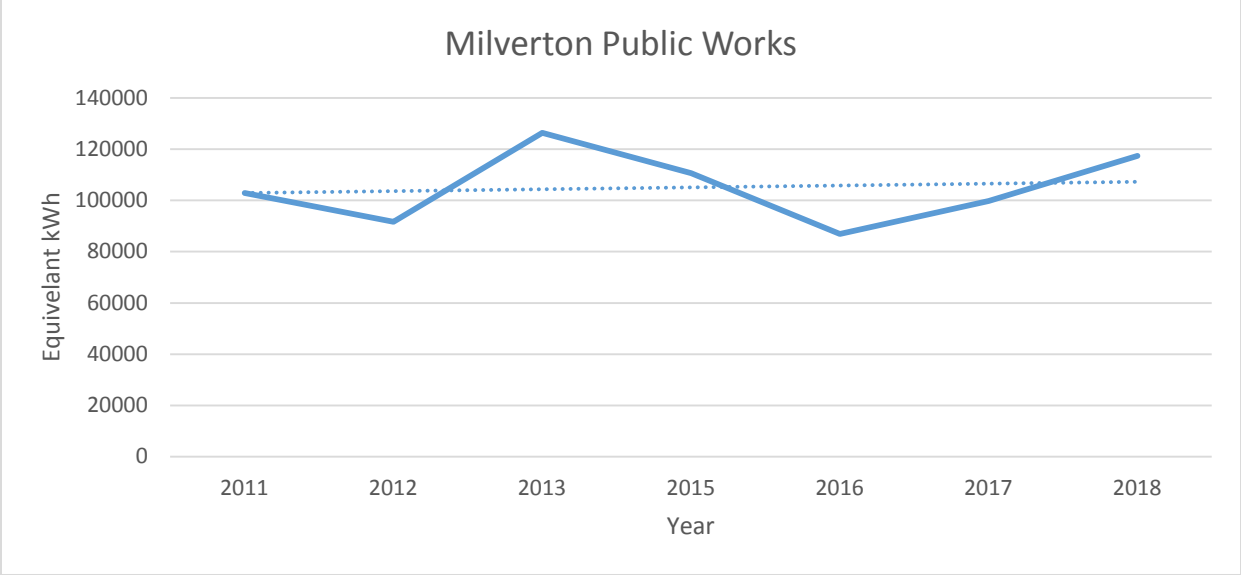


This facility was built in 2004, it is a single-storey building that is about 3,413 square feet. The building is comprised of crew quarters, general office space and a garage that holds two ambulances. The facility operates 24 hours a day. It is heated by a forced air gas furnace, while heat in the garage is provided by a forced air gas tube heater. Cooling is provided by a pad-mounted air conditioning unit.

The Milverton EMS facility has increased its energy consumption by approximately 32,452.77ekWh from 2011, for a total consumption of 145,241.8ekWh. Emissions from Milverton's EMS increased by about 5,122.98 kg of CO_2e, to emit a total of 22,081.37 kg of CO_2e in 2018.

In 2017, the Milverton EMS facility converted to Natural Gas from Propane heat.

Milverton Public Works

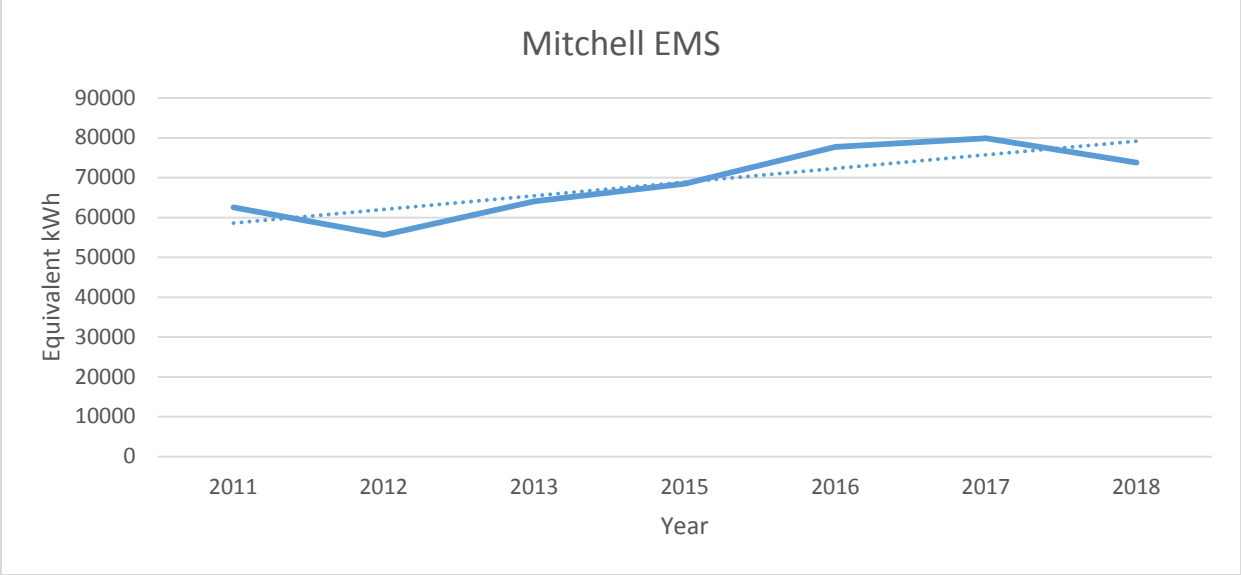


This facility was built in 1987 and is mainly used for winter operations. It is a single-storey building with a small office area and a garage that holds 3 snowplows. The building is approximately 2,900 square feet. The crew area is heated with natural gas furnace and it does not have a cooling unit. As previously mentioned in the past energy management plan, the facility is inherently inefficient, and loses a lot of heat during the winter with the constant opening and closing of the large bay doors, and the insulation is below optimal. Focus on insulation and adding translucent panels to the bay doors to assist in increasing radiant heat, can also lessen the need for lighting and electricity consumption.

The Milverton Public Works facility has reduced its energy consumption by 14,546ekWh since 2011, to a total consumption of 117,429ekWh. The emissions associated with this public works facility in 2018 were 19,465.9 kg of CO_2e.

The Milverton Public Works facility converted from Propane heat to Natural Gas in late 2017.

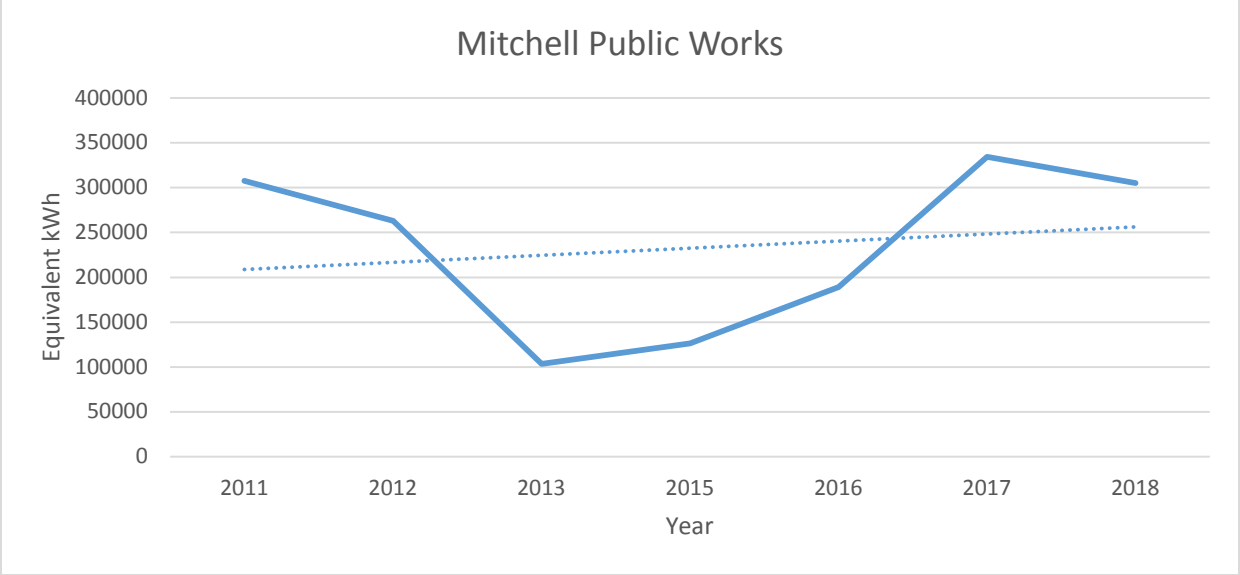
Mitchell EMS



This facility was built in 2010, and is approximately 3,595 square feet. The building is one-storey and is comprised of a crew quarters, general office space and a garage that holds two ambulances. The building operates 24 hours a day. The heating for the crew area is provided by a hot water in-floor heating unit and a forced air furnace. The garage area is heated by a hot water in-floor heating unit. The cooling of the facility is provided by a pad mounted air conditioning unit. The building was built in an efficient manner, with LED and T5 lighting, low-flow water fixtures and an R50 insulated ceiling.

The Mitchell EMS facility has increased its energy consumption by 11,274ekWh, and consumed a total of 73,782ekWh. The EMS emitted a total of 9,781.05 kg of CO_2e, which is an increase of 2,274 kg of CO_2e.

Mitchell Public Works

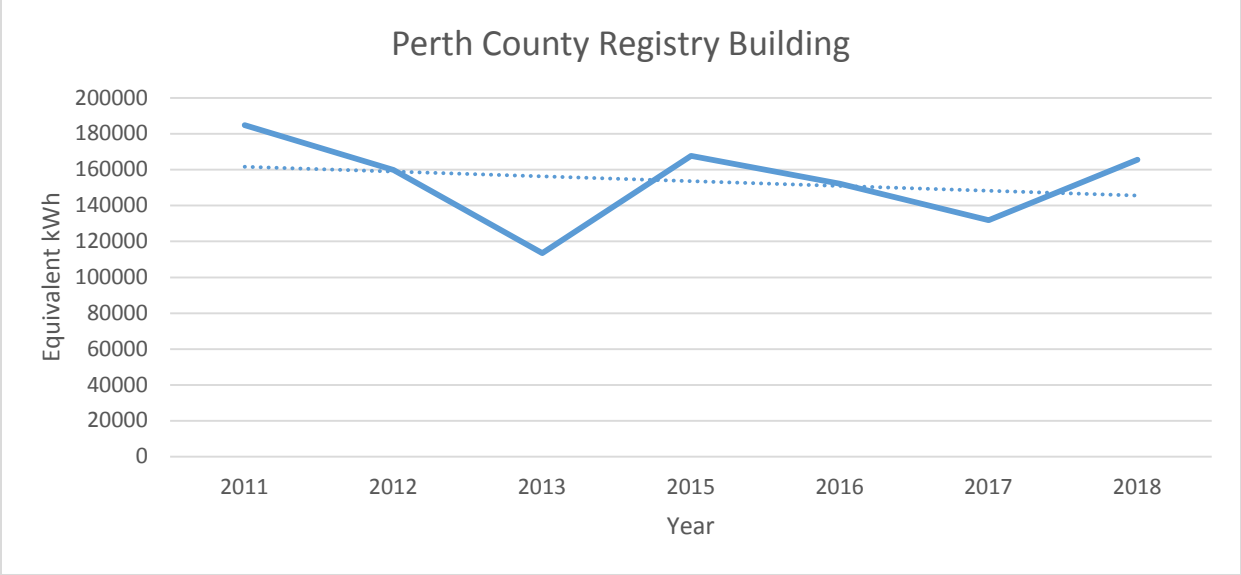


The old facility was built in 1972, and was a single-storey building with small offices, a lunch room, storage areas, and five truck bays for vehicle storage and repair facilities. There was also a large storage shed on site, and held two truck bays that are primarily used for winter storage of snow plows. As the previous energy and demand management plan has stated, this facility was not built with efficiency in mind, with concrete block walls and a steel truss flat roof.

This single storey building had a major fire in December 2013, which resulted in a total rebuild. A new facility was constructed and occupied in October 2016. The new facility consists of two storeys, 4 truck drive through bays, 2 mezzanines, 3 offices, a lunch room, 3 bay mechanics work areas with a hoist and a mechanics pit, material storage room, janitorial room, parts room, 3 washrooms, a laundry room and locker room. This facility has doubled in square footage. A solar panel was erected on the Mitchell site in 2011. The Mitchell Public Works facility has been the main base of operations for the department. During the rebuild period (2014 to 2016), the Stratford Public Works facility served as the main base.

The Mitchell Public Works facility has reduced its energy consumption by 2,221ekWh since 2011, and consumed a total of 305,217.7ekWh. The facility increased its emissions by about 5,624kg of CO_2e, to a total emission count of 45,658.8 kg in 2018.

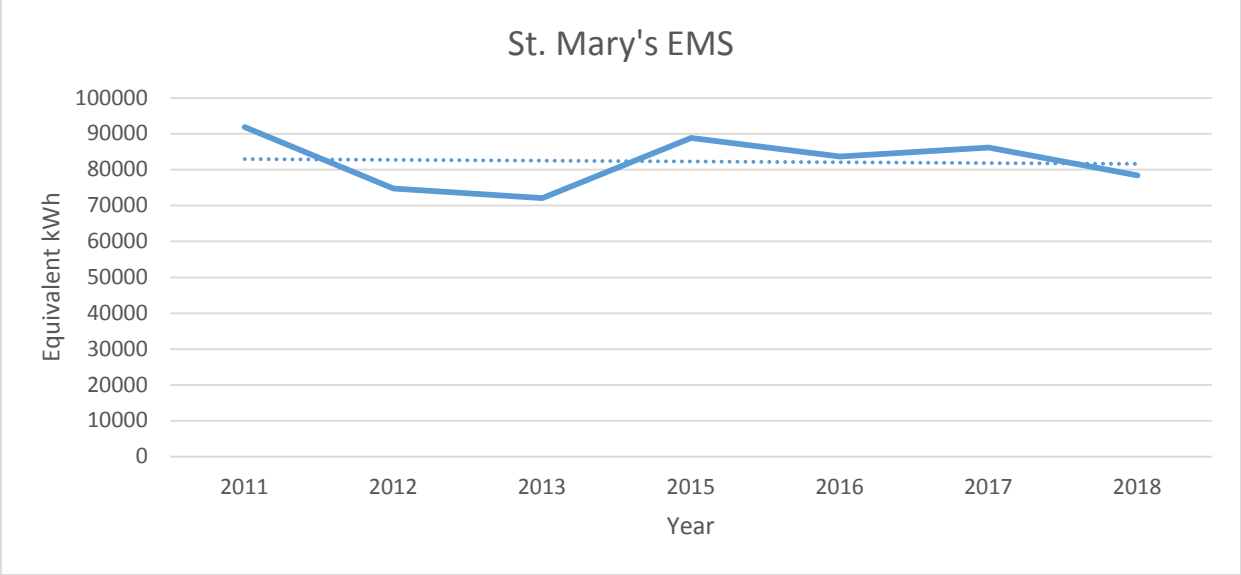
Perth County Registry Building



This facility was constructed in 1953 and is a single storey building with an unfinished basement. The total area is approximately 8,700 square feet. The basement is utilized for storage and the main floor is open to the public for regular business hours. The main floor is used by the Province of Ontario and houses Service Ontario, the Land Registry Office, and the Victim/Witness Assistance Program. The building is in operation approximately 42.5 hours a week. There are rooftop gas fired forced air units that are used to heat the building, as well as rooftop aid conditioners for cooling. The lighting on the main floor has been converted to T8 fluorescent lights and lighting in the basement is LED. The main floor windows were replaced.

The registry building has reduced its energy consumption by approximately 19,158ekWh, with a total consumption of 165,601.8ekWh. The registry building emitted a total of 20,589 kg of CO_2e, which is a reduction of about 3,343.6 kg since 2011.

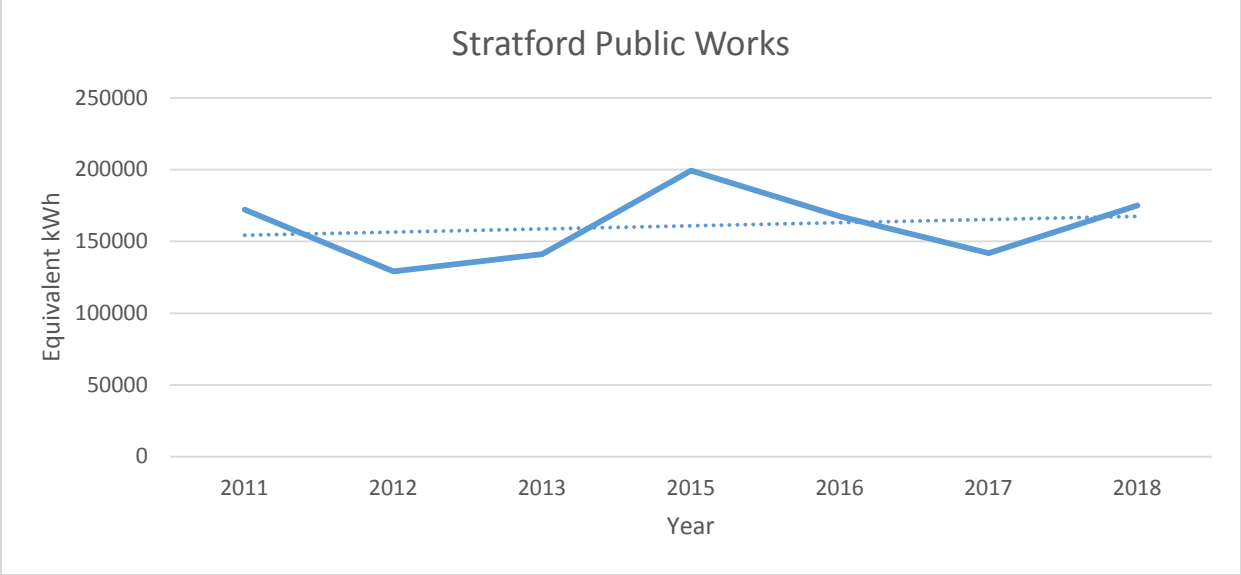
St. Mary's EMS



This EMS base was built in 2007, the ambulance base is a single storey building with has a gross floor area of approximately 3,488 square feet. There is crew quarters and general office space, as well as garage space for two ambulances. This building is in operation 24 hours a day. It is heated by a forced air gas furnace, while heat in the garage is provided by a forced air gas tube heater. Cooling is provided by a pad mounted air conditioner. The building was constructed with energy efficiency in mind. T8 fluorescent lighting, occupancy sensors, and R40 ceiling insulation were installed. The outdoor lighting was updated from mercury vapour lights to LED lights.

The St. Mary's EMS building has reduced its energy consumption by 13,477ekWh since the 2011 baseline year to a total consumption of 78,432.15ekWh. The EMS building emitted a total of 10,850.23 kg of CO_2e, which is a reduction of about 489 kg since 2011.

Stratford Public Works

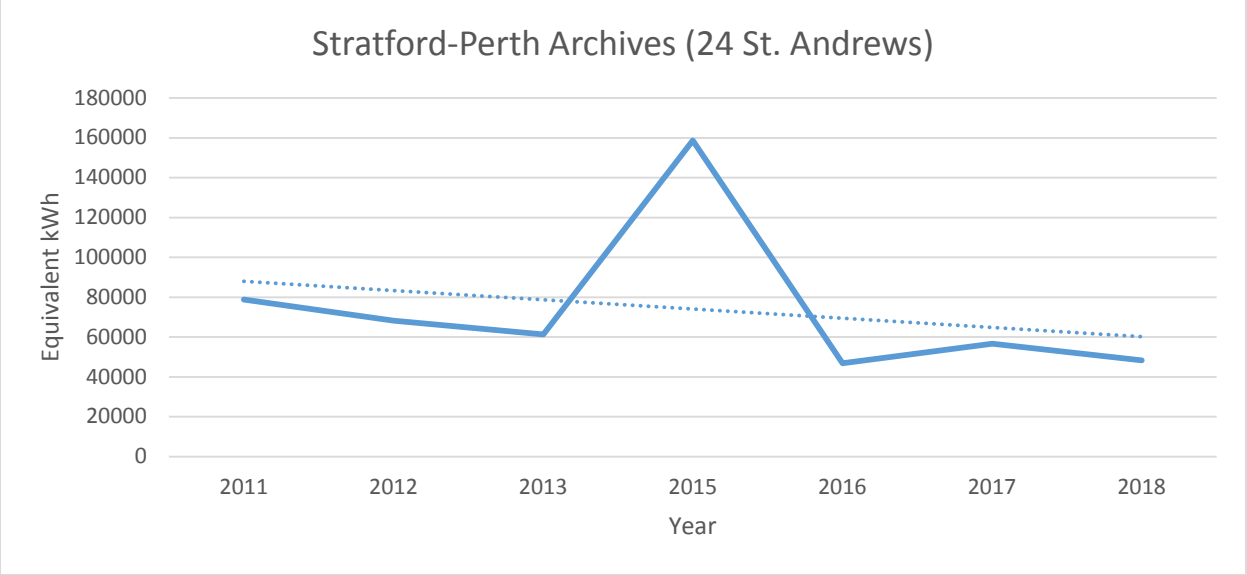


This facility was built in 2009, and is a single storey building that is used as an equipment garage and sand storage facility. The building is primarily used in the winter.

The Stratford Public Works facility has increased its energy consumption by 2,843ekWh since 2011, to a total of 174,967.6ekWh. The Stratford Public Works building emitted a total of 27,237.8 kg of CO_2e, which is about 2,064.88 kg more than 2011.

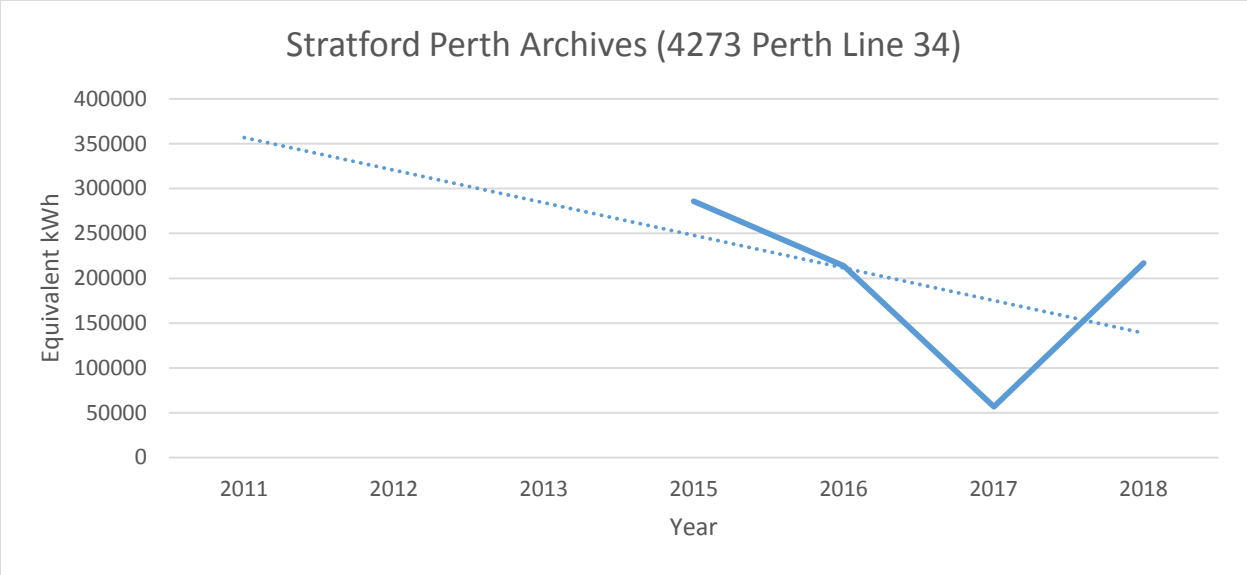
Due to the fire at the Mitchell Public Works facility in December 2013, the Stratford Public Works facility became the main base of operations for the department until October 2016. This is why there was a substantial increase in consumption during that time period.

Stratford Perth Archives



The building that formerly housed Stratford-Perth Archives is located at 24 St. Andrews and was originally constructed in 1910. It is a single storey building with a basement, and has a floor area of approximately 4,641 square feet. The facility was open to the public and would operate approximately 35 hours a week. The building is heated by a hot water system, and uses window mounted air conditioners for cooling. The building was vacated in 2015, with the construction of the new Archives building.

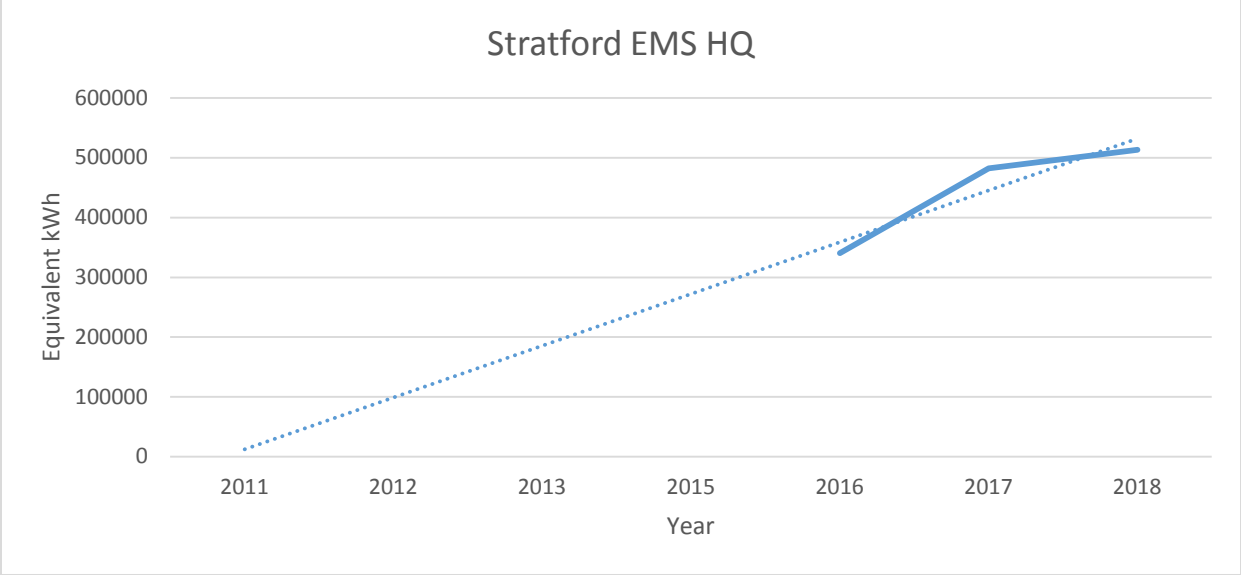
This facility has reduced its energy consumption since becoming vacant with a decrease of 30,567ekWh, and a total consumption of 48,280.6ekWh. The old building emitted a total of 8,354 kg of CO_2e, which was a reduction of 2,971 kg.



Stratford-Perth Archives at 4273 Perth Line 34, Stratford was occupied in early 2015. It is a single storey building and has double the floor area of approximately 10,000 square feet. The facility is open to the public and operates approximately 35 hours a week. The building is heated by three forced air gas furnaces and cooling is provided by 6 pad mounted air conditioners. The new facility has increased its energy consumption in recent years, but is still below its opening year consumption of 285,743ekWh. The new building has reduced its consumption by 68,848ekWh since 2015, to consume a total of 216,895.67ekWh. It emitted a total of 22,425.1 kg of CO_2e in 2018, which was a reduction of 19,419.2 kg since its first year of operation in 2015.

Perth County is anticipating a reduction in energy. In December 2018, a programming control was installed to the building systems. This will achieve an approximate $6500 savings in hydro.

Stratford EMS Headquarters



The new EMS Headquarters at 480 Douro Street, Stratford was completed and occupied in June 2016. Until 2016 we leased admin office space and garage space at the Stratford General Hospital. This ambulance base is a single storey building with a gross floor area of approximately 25,521sq ft. There is a crew quarters, office admin space, back to work area, boardroom, two training areas, kitchen, simulation room, shower and locker room, as well as garage space for 8 ambulances, 2 supervisor vehicles and emergency response trailer. This building is in operation 24 hours a day. The administration crew and training areas are heated by 3 roof top gas fired forced air units as well as roof top air conditioners for cooling. The garage/bay areas are heated by a hot water system along with a forced air system. This building was constructed with efficiency in mind, LED lighting, occupancy sensors and R40 ceiling insulation.

It has increased its energy consumption from its 2016 reported data, by 173,148ekWh, and a total consumption of 513,328.96ekWh. The building emitted a total of 70,212.28 kg of CO_2e, which was an increase of about 17,437 kg from its opening year in 2016.

Future Plans

Perth County has goals for the future to aid in the reduction of energy, one goal that will be looked upon in the near future is the potential for installation of more electric vehicle charging stations at various facilities. Currently the EMS Headquarters on Douro Street is the only facility with an electric charging station. As well, the 2020 Facilities Capital budget has scheduled the replacement of 3 heat pumps at the Listowel Paramedic Services Base and some LED lighting upgrades at the Courthouse.

The County of Perth consumes a significant amount of energy. It should also be recognized that the County has constructed 3 new facilities during 2014-2016 (Archives, Paramedic Services HQ and Mitchell Public Works) and has more than doubled the square footage since the last iteration of the Energy Demand Management Plan. This plan will be used to aid in the reduction of energy and to aid in the implementation of impactful strategies, retrofit management, as well as monitoring and tracking consumption patterns. Future energy plans and goals will be considered on a regular basis. The goals need to be annually established along with the Council's approval of the municipal budget.