



The Township of Algonquin Highlands
Energy Management Plan
2019 - 2024

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Introduction

The *Green Energy Act* was passed by the Ontario Government in 2009 as part of a commitment to help public agencies better understand and manage their energy consumption. Ontario Regulation 397/11 was released and required public agencies to report their energy consumption and greenhouse gas (GHG) emissions, as well as develop and implement an energy Conservation and Demand Management (CDM) plan. In 2018, the Green Energy Act was repealed and O. Reg. 397/11 was moved to the *Electricity Act, 1998* and re-named as O. Reg. 507/18. No changes were made to the regulation's requirements. This is the first update of the Energy Management Plan developed by the Township in 2014.

1.0 Township Profile

The Chief Administrative Officer is the Township of Algonquin Highlands' Plan Administrator. It is his/her responsibility to ensure all aspects of the plan are implemented, and that best practices are being followed. The Plan Administrator will also be responsible for updating Council on all aspects of the plan. Department Heads are responsible for ensuring that their staff are utilizing best practices in the conservation of energy.

Annual reporting of energy intensity and greenhouse gas emissions to the Province will be carried out by the Plan Administrator. On a quarterly basis Department Heads will be provided with current energy usage and consumption savings.

This plan relates to the Township's 21 facilities that are heated or cooled covering a gross floor area of approximately 49,250 ft². Community centres and fire stations are available 24/7 on an as needed basis. The remainder of the buildings operate on scheduled hours ranging from 10 to 40 hours per week.

2.0 Energy Management Policy

2.1 Commitment by the Township

The Township of Algonquin Highlands will use existing resources and leverage outside agencies where appropriate, to implement a strategic energy management plan that will reduce our energy consumption and its related environmental impact.

2.2 Vision

The Township of Algonquin Highlands will strive to continually reduce energy consumption and costs through sensible use of energy and resources, while still maintaining an efficient and effective level of service for our ratepayers and the general public.

2.3 Goals and Objectives

- To improve energy efficiency of Township facilities by utilizing best practices to reduce operating costs, energy consumption and the associated greenhouse gas emissions
- To improve awareness of climate change and greenhouse gas emissions by providing education and awareness of opportunities to Township staff as well as the general public
- Demonstrate energy management leadership and commitment within the Township of Algonquin Highlands
- Demonstrate sound operating and maintenance practices to improve the reliability of the Township of Algonquin Highlands' equipment and reduce maintenance costs

- Enhance fiscal accountability through savings and cost avoidance leading to both direct and indirect savings
- Provide an ongoing forum for discussion within the Township of Algonquin Highlands on energy management to explore new ideas and trends

2.4 Reduction Target

The Township will continue to make every effort to reduce energy consumption by 1% per year between now and 2024.

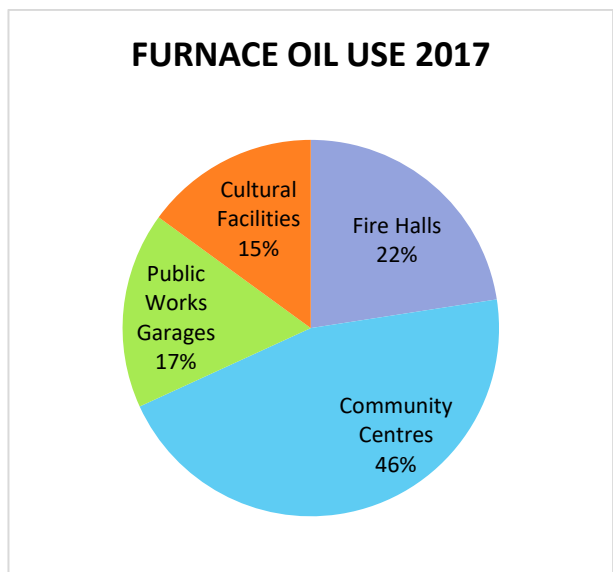
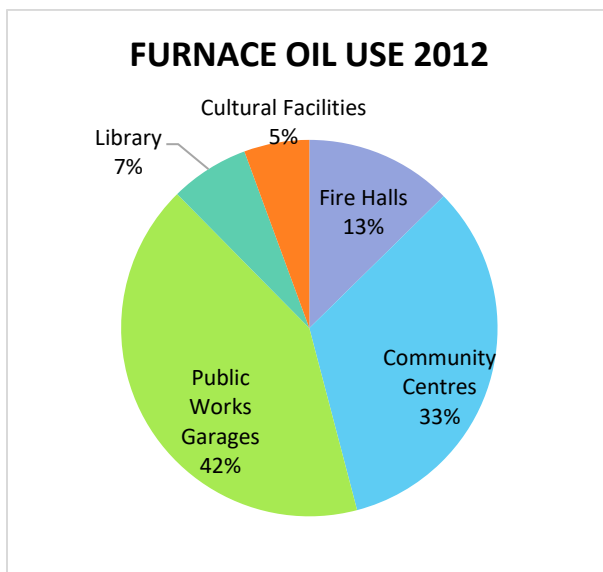
3.0 Energy Consumption and Green House Gas Emissions

3.1 Energy Consumption for 2012 through 2017

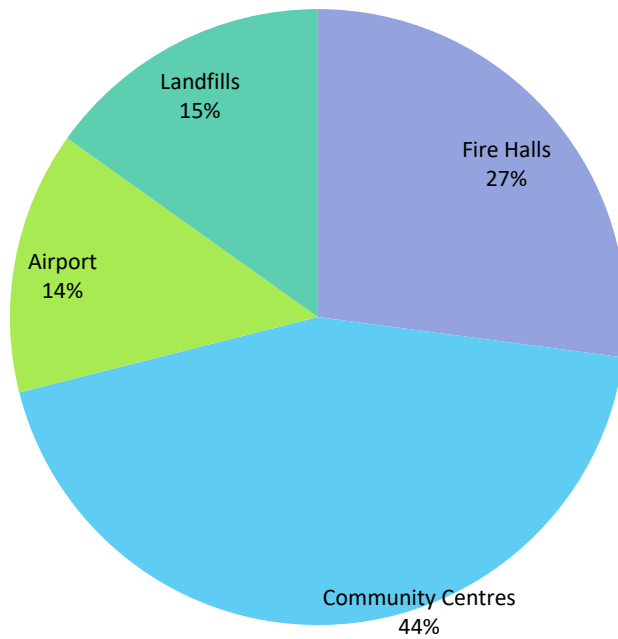
Year	kWh	Furnace Oil (L)	Propane (L)
2012	472,677.79	46,275.20	17,808.00
2013	432,720.57	32,601.05	32,990.78
2014	430,820.57	27,644.72	40,962.76
2015	408,939.70	24,152.78	50,253.92
2016	388,541.22	21,855.52	50,689.83
2017	382,731.41	24,031.62	55,934.14

For each building, a CUSUM graph was developed for the electricity, furnace oil and propane usage and these are included as Appendix 1. A CUSUM graph is the cumulative sum of the difference between actual usage and predicted usage. The predicted usage is based on a baseline period which has been noted with each graph.

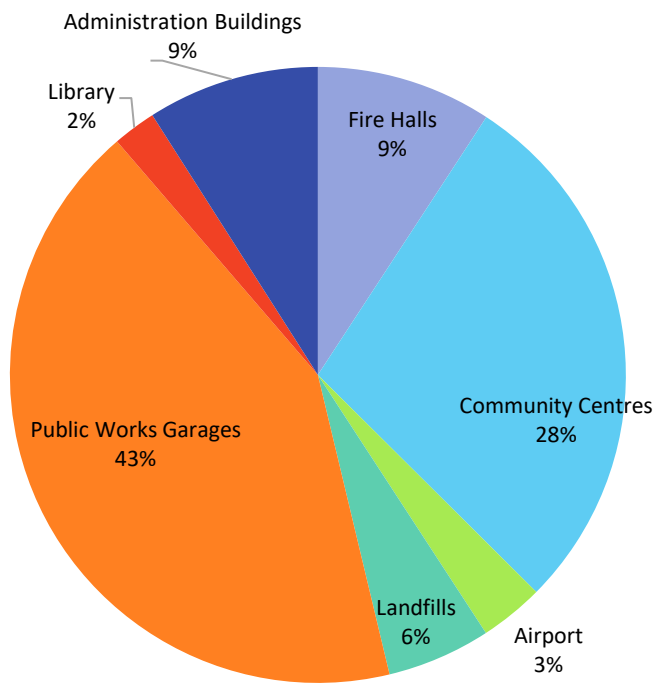
The following graphs illustrate the usage of energy throughout the Township facilities in 2012 compared to 2017.

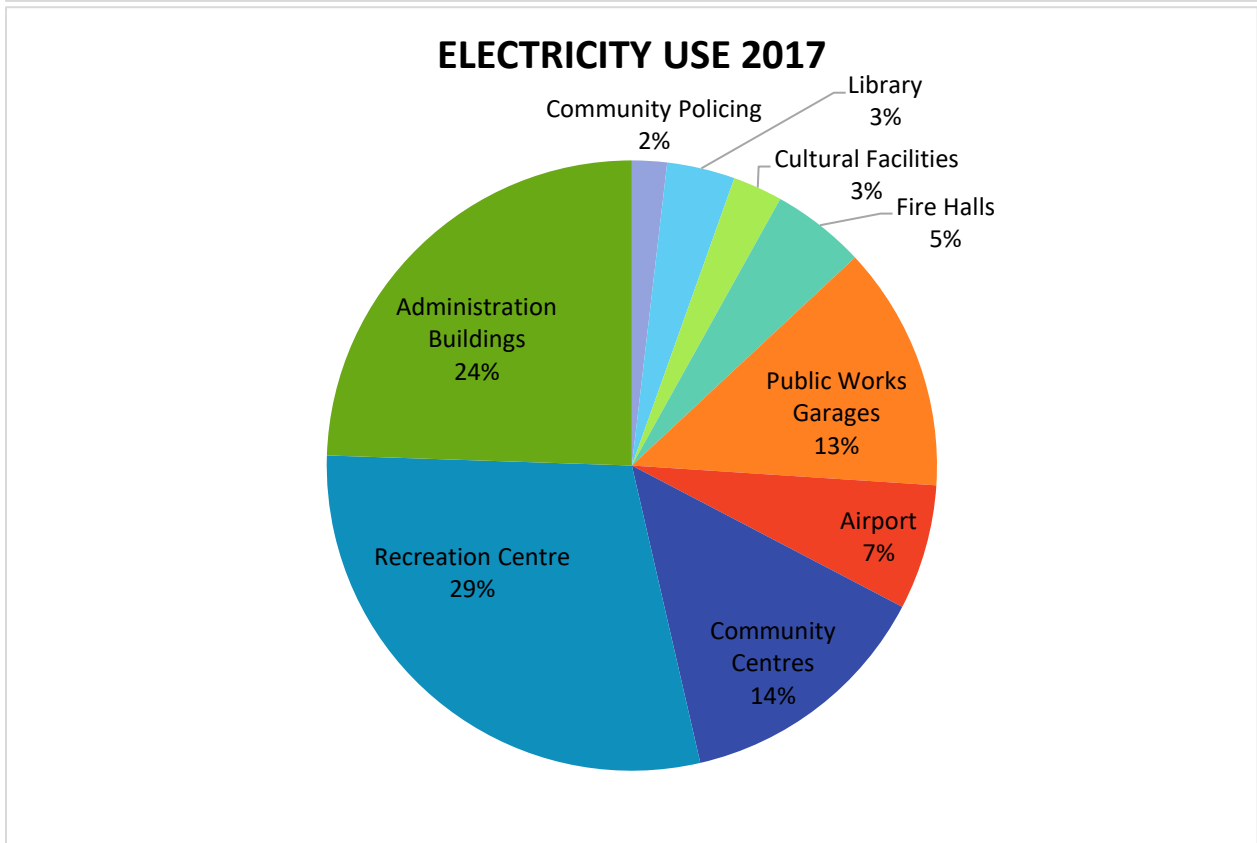
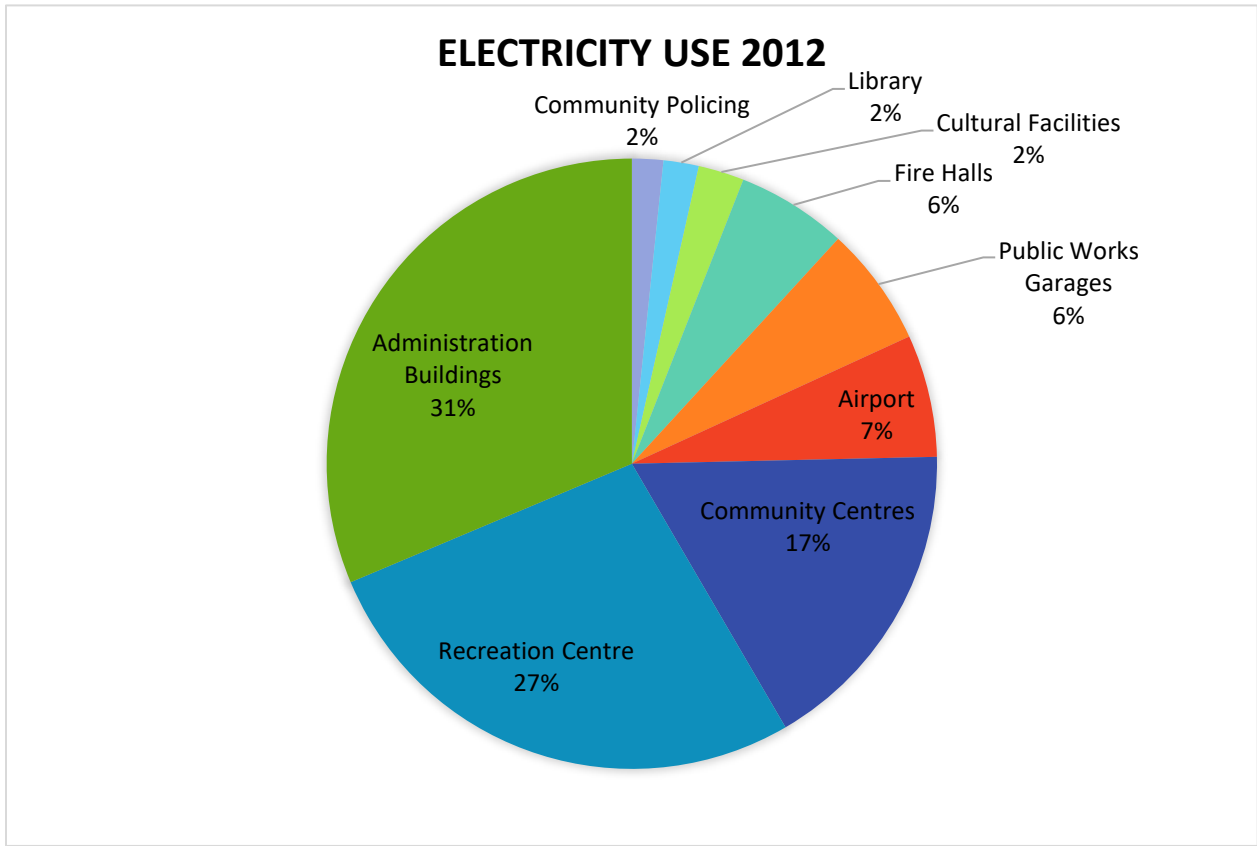


PROPANE USE 2012



PROPANE USE 2017





3.2 Greenhouse Gas Emissions (kg) for 2012 through 2017

	2012	2013	2014	2015	2016	2017
A H Fire Station 60 (Dorset)	11,162.28	10,597.06	14,195.26	12,922.39	11,781.00	14,958.44
A H Fire Station 70 (Oxtongue)	7,489.79	9,151.83	6,263.57	9,722.50	7,381.48	8,126.36
A H Fire Station 80 & CC-Stanhope *	22,528.56	17,150.89	20,719.41	20,243.06	35,898.71	47,893.56
A H Main Administrative Office	5,399.50	4,082.23	2,032.81	1,983.94	2,892.23	4,914.26
A H Satellite Administrative Office	5,069.47	4,058.15	2,145.54	2,187.44	1,319.90	662.83
Club 35	4,945.99	5,110.45	4,427.49	4,002.24	2,679.03	1,852.20
Dorset Community Police	834.20	611.51	310.27	237.90	215.68	122.49
Dorset Museum	6,163.27	8,727.47	10,846.31	8,014.62	8,107.34	10,021.08
Dorset Public Works Garage (OLD)	8,758.00	20,672.03	5,294.06	20,698.56	13,546.75	11,143.30
Dorset Recreation Centre	17,016.76	25,011.63	26,265.71	4,760.78	4,357.54	1,928.42
Dorset Roads Garage (NEW)				14,671.87	19,271.12	21,054.96
Haliburton-Stanhope Airport				3,370.47	3,399.54	3,339.17
Landfill - Dorset				651.16	1,233.26	1,168.36
Landfill - Hawk Lake				781.79	791.08	1,062.34
Landfill - Maple Lake				1,041.32	759.32	863.14
Landfill - Oxtongue Lake				753.43	493.98	594.65
Landfill - Pine Springs				570.24	484.87	1,005.38
Oxtongue Lake Community Ctr	5,189.83	6,606.76	7,429.55	5,554.97	5,285.47	5,472.08
Stanhope Firefighters Comm Ctr *	15,342.91	21,476.45	21,829.06	17,582.74		
Stanhope Public Library	7,949.04	9,366.79	5,334.53	3,649.86	1,627.80	2,200.14
Stanhope Roads Garage	22,053.35	26,058.74	20,267.14	19,484.78	12,254.17	16,316.09
Water Trails Office	2,458.48	1,539.58	828.99	992.99	2,593.13	3,827.45
TOTAL	142,361.43	170,221.57	148,189.70	153,879.05	136,373.42	158,526.73
<i>* combined, starting 2016</i>						

3.3 Energy Intensity for 2012 through 2017

	2012	2013	2014	2015	2016	2017
A H Fire Station 60 (Dorset)	15.54	15.03	18.71	15.86	14.75	18.27
A H Fire Station 70 (Oxtongue)	11.12	13.16	10.37	14.05	11.48	13.09
A H Fire Station 80 & CC-Stanhope *	19.12	15.95	20.04	19.48	17.79	22.82
A H Main Administrative Office	16.63	15.89	15.03	14.48	11.66	14.12
A H Satellite Administrative Office	20.28	20.51	20.60	20.73	14.27	14.72
Club 35	18.41	19.83	20.23	17.61	9.01	5.84
Dorset Community Police	22.62	20.95	20.19	15.28	15.80	18.44
Dorset Museum	9.55	12.50	15.82	12.07	12.64	15.27
Dorset Public Works Garage (OLD)	15.94	47.55	23.13	40.07	25.73	21.50
Dorset Recreation Centre	32.45	47.21	49.88	20.53	21.43	19.49
Dorset Roads Garage (NEW)				13.67	24.43	23.84
Haliburton-Stanhope Airport				34.32	36.13	38.61
Landfill - Dorset				37.14	70.33	66.63
Landfill - Hawk Lake				44.59	45.12	60.58
Landfill - Maple Lake				47.51	34.64	39.38
Landfill - Oxtongue Lake				34.37	22.54	27.13
Landfill - Pine Springs				26.02	22.12	45.87
Oxtongue Lake Community Ctr	23.93	30.21	33.31	26.39	25.80	26.92
Stanhope Firefighters Comm Ctr *	15.58	20.55	22.11	18.46		
Stanhope Public Library	36.19	42.17	28.68	23.59	18.85	21.46
Stanhope Roads Garage	29.05	34.54	31.00	30.10	20.47	26.77
Water Trails Office	51.20	40.51	41.44	36.93	36.10	49.02
TOTAL	22.51	26.44	24.70	25.60	24.34	28.08
<i>* combined, starting 2016</i>						

3.4 Percentage Change GHG Emissions and Energy Intensity

	Percent Change (2012 - 2017) GHG Emissions	Percent Change (2012 - 2017) Energy Intensity
A H Fire Station 60 (Dorset)	34.01%	17.55%
A H Fire Station 70 (Oxtongue)	8.50%	17.72%
A H Fire Station 80 & CC-Stanhope	26.46%	-34.23%
A H Main Administrative Office	-8.99%	-15.10%
A H Satellite Administrative Office	-86.93%	-27.40%
Club 35	-62.55%	-68.28%
Dorset Community Police	-85.32%	-18.48%
Dorset Museum	62.59%	59.92%
Dorset Public Works Garage (OLD)	27.24%	34.89%
Dorset Recreation Centre	-88.67%	-39.94%
Dorset Roads Garage (NEW)	43.51%	74.38%
Haliburton-Stanhope Airport	-0.93%	12.50%
Landfill - Dorset	79.43%	79.41%
Landfill - Hawk Lake	35.89%	35.87%
Landfill - Maple Lake	-17.11%	-17.11%
Landfill - Oxtongue Lake	-21.07%	-21.06%
Landfill - Pine Springs	76.31%	76.29%
Oxtongue Lake Community Ctr	5.44%	12.50%
Stanhope Public Library	-72.32%	-40.71%
Stanhope Roads Garage	-26.02%	-7.83%
Water Trails Office	55.68%	-4.27%
TOTAL	11.36%	16.46%

4.0 Energy Conservation Measures

4.1 Past and Current Projects

In 2013 a high efficiency propane furnace was installed at the Stanhope Library.

In 2015 the Dorset Public Works Garage was replaced. The new building includes energy efficient lighting and has been designed for future installation of a photovoltaic system.

In 2015 and 2016 all Township street lights were upgraded to LEDs with funding through the Ontario Power Authority Rebate.

In 2015 the Dorset Landfill site was converted to a transfer station with compactor bins. The compaction units are powered by a solar photovoltaic system and back-up propane generator.

In 2016 an unleaded fueling tank and station was installed at the Stanhope Municipal Airport. This will help reduce fuel emissions and travel costs for fueling Township vehicles and equipment.

In 2016 the Stanhope Firefighters' Hall HVAC system was replaced with a more energy efficient unit.

In 2016 and 2017 new construction and retro-fits occurred at the Main Township office including upgrading lighting to LED, a new high efficiency propane furnace and heat recovery ventilators.

In 2017 the existing lighting at Fire Station 70 was upgraded to LED lighting.

In 2019 a new radiant tube heater was installed in the Airport Garage. This is expected to provide an immediate reduction in heating costs for this building.

In 2019 the existing lighting at the Airport Terminal was upgraded to LED lighting.

The Public Works Department has been purchasing equipment with Tier 4 requirements. The aim is to drastically reduce two primary exhaust pollutants. Particulate matter, or PM, is mostly unburned hydrocarbons like soot that previously shot out the exhaust stack unimpeded, and nitrates of oxygen or NO_x, which is a primary ingredient of smog.

4.2 Proposed Projects

There is a considerable amount of heat loss through the windows in the winter in the main administrative office on North Shore Road. New windows and a new door are scheduled to be replaced in 2019.

New windows, roof, soffit and fascia are scheduled to be installed at the Stanhope Library in 2019.

The Township of Algonquin Highlands is currently in the planning stages of building a new Public Works Garage for the Stanhope yard. Construction is planned for 2020. The Township is reviewing a variety of options for energy efficient products, including solar and a high efficiency heat source furnace.

Future opportunities are being considered for energy audits to identify thermal and lighting efficiencies at recreation and community centres.

4.3 Renewable Energy Considerations

The Algonquin Highlands Main Administrative Office located on North Shore Road has had a ground source heat pump in place since 1990, providing central heating and cooling for the building.

The feasibility of implementing other types of renewable energy technologies with building systems should be evaluated when opportunities arise with building renewals, major renovations, etc.

4.4 Measures to Ensure Success

Staff will continue to monitor and assess energy performance of municipal facilities and will seek energy efficiency improvements.

Energy efficiency and cost analysis will be incorporated into the design of new construction projects and incorporated into capital planning and budget development procedures where practicable.

Staff will investigate and communicate funding sources for energy projects including government and utility grants and incentives.

The Township will utilize purchasing cooperatives to procure diesel and furnace oil. Opportunities to jointly procure other energy commodities will be investigated.

Energy efficient will be considered as part of the criteria for selection and evaluation of materials and equipment.

5.0 Evaluation

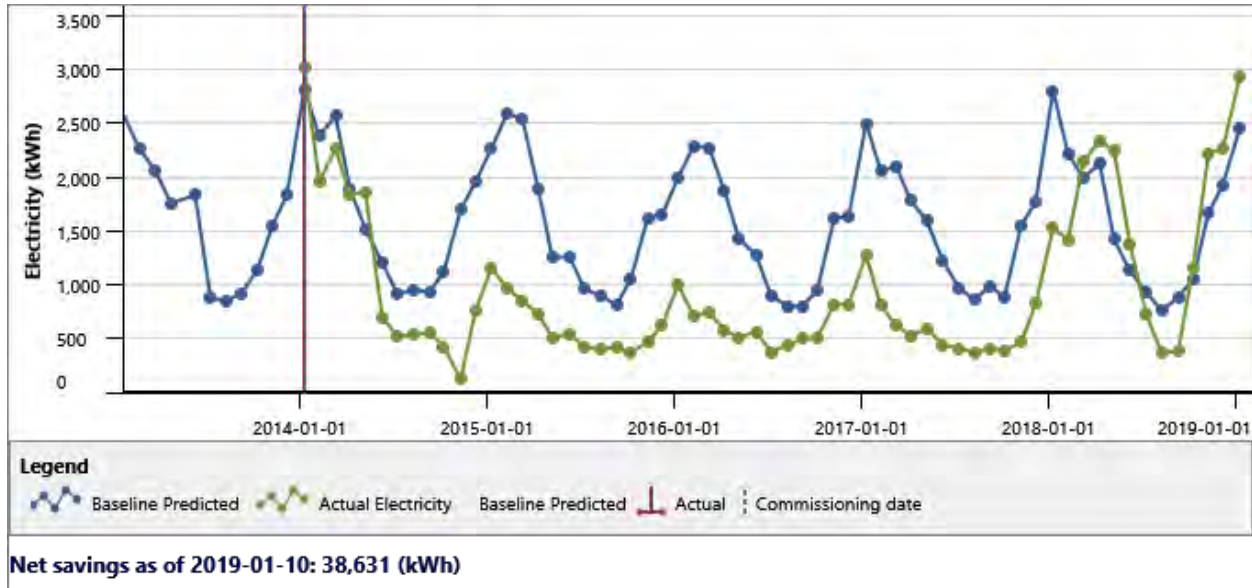
On a quarterly basis Department Heads will be updated on the energy usage across the Township, compared with the baseline and previous years. This will assist the Township in monitoring, measuring and managing consumption in facilities.

Upon completion of the annual reporting, Township staff will review changes in annual consumption. This review will assist in tracking our overall consumption progress.

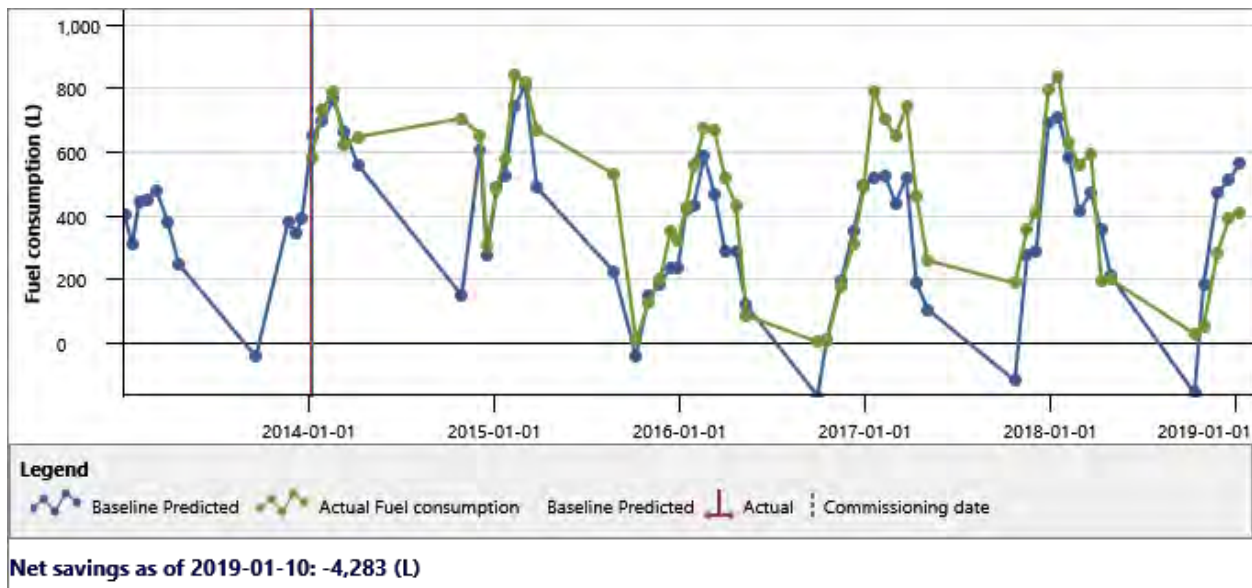
In addition, the Energy Management Plan will be reviewed and updated as necessary.

Appendix 1

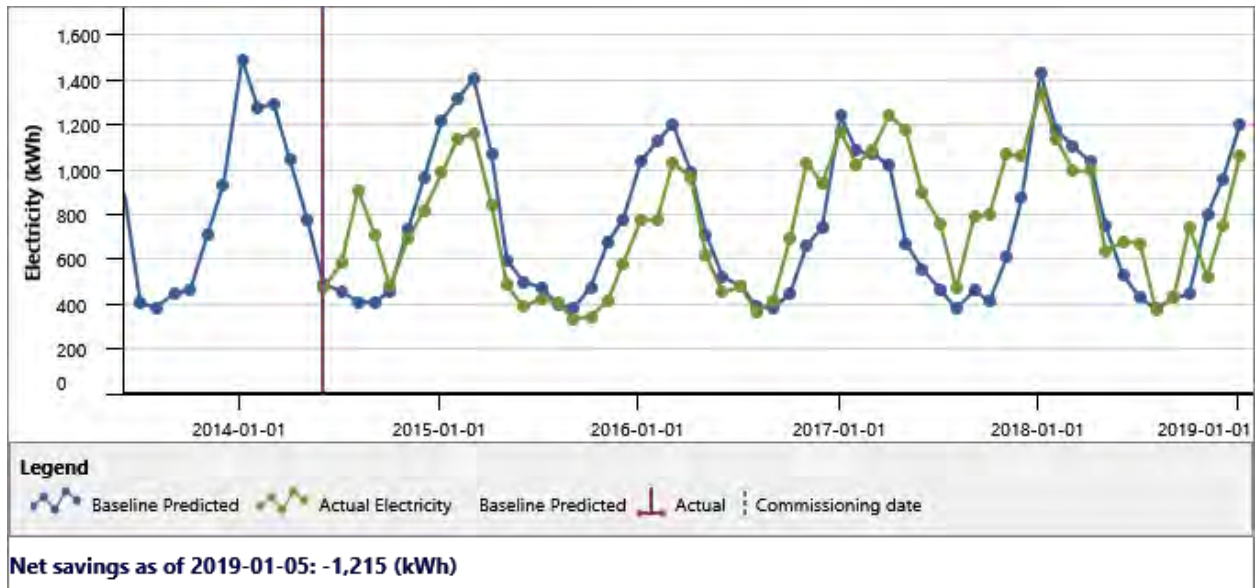
Graph 1-1: Dorset Fire Hall Electricity Consumption
Baseline January 1, 2013 to January 1, 2014



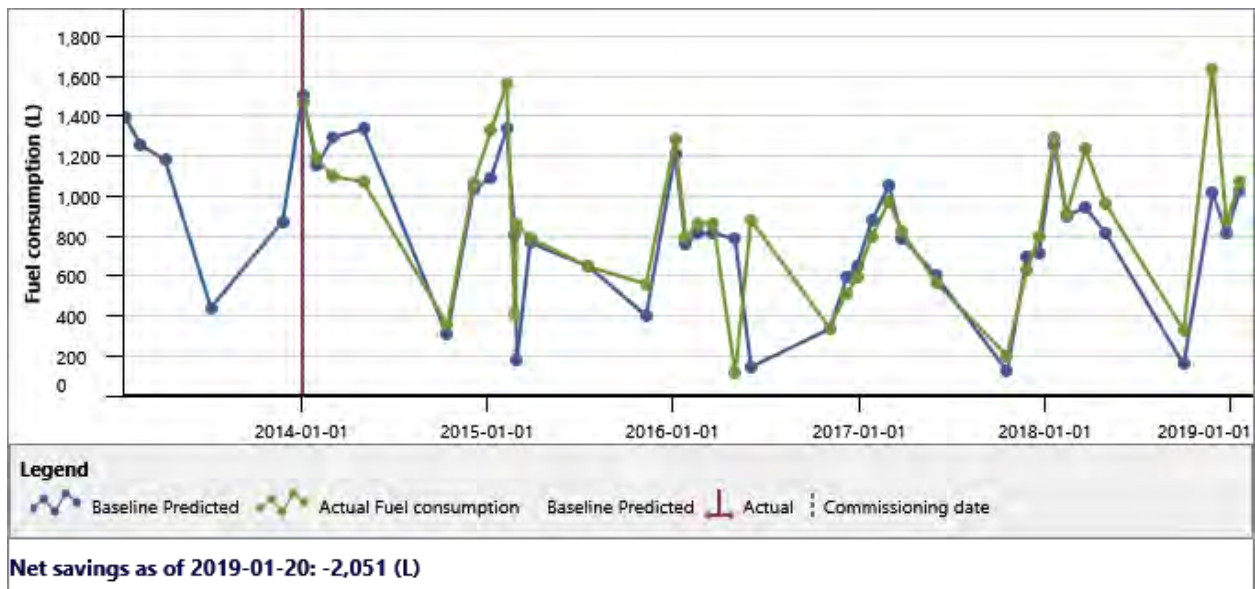
Graph 1-2: Dorset Fire Hall Furnace Oil Consumption
Baseline January 1, 2013 to January 1, 2014



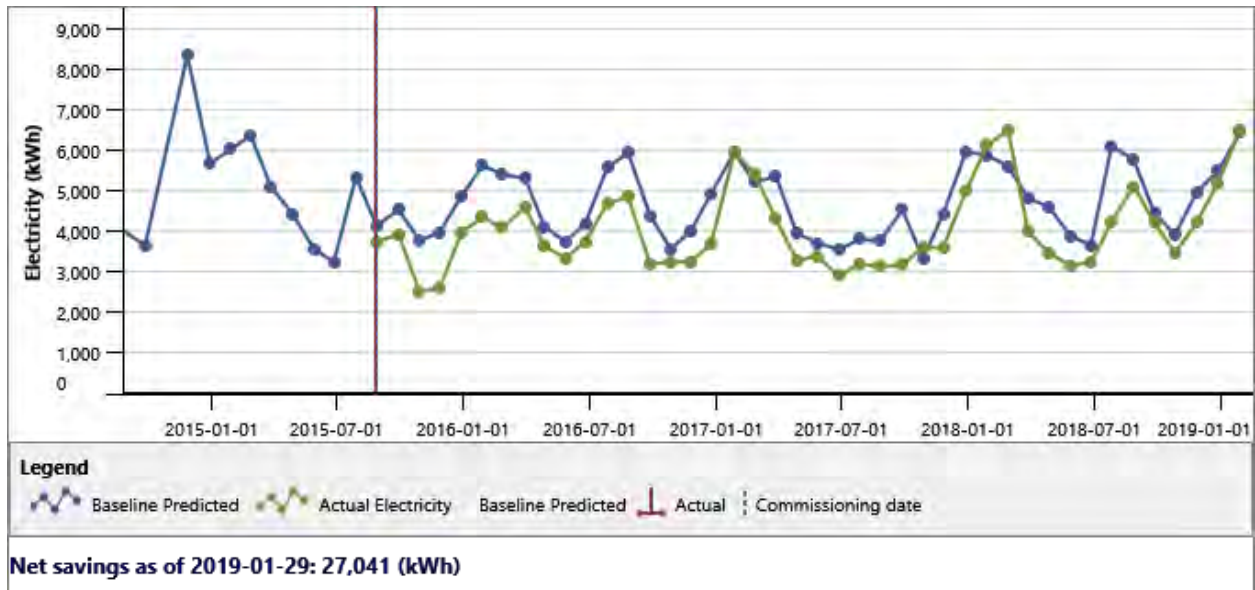
Graph 1-3: Oxtongue Fire Hall Electricity Consumption
Baseline June 1, 2013 to June 1, 2014



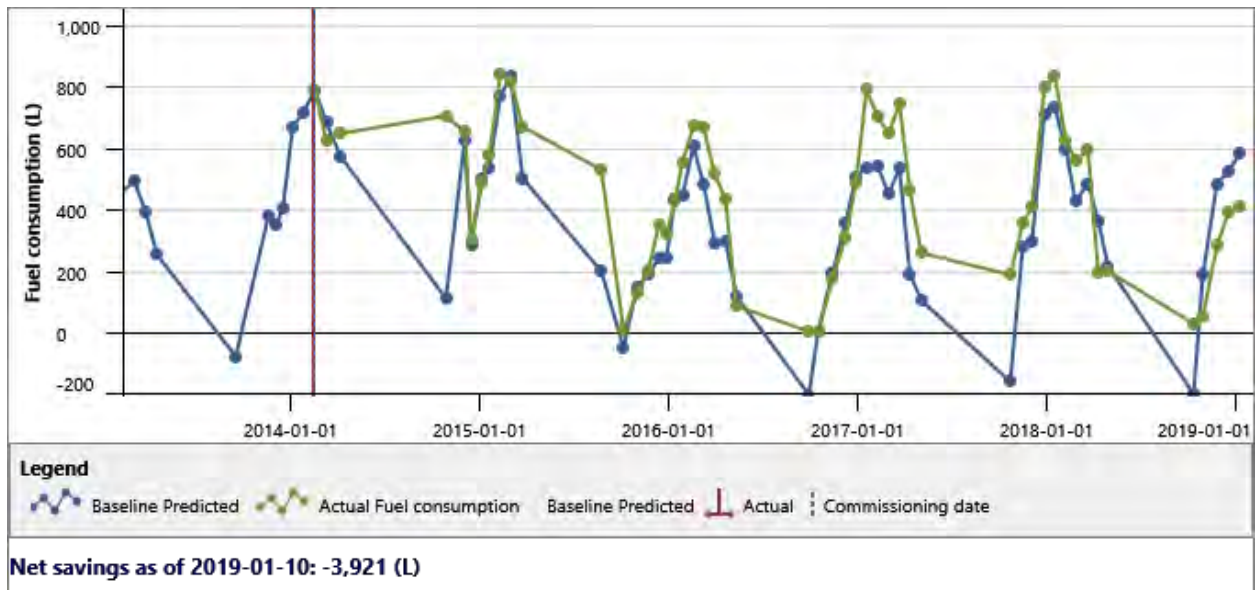
Graph 1-4: Oxtongue Fire Hall Propane Consumption
Baseline January 1, 2013 to January 1, 2014



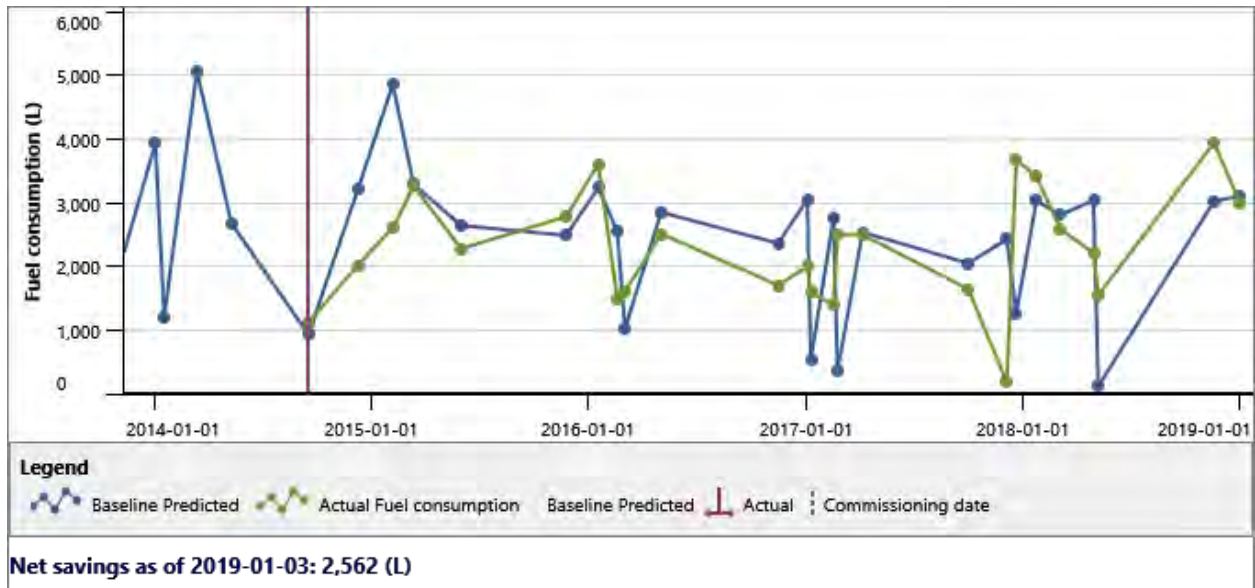
Graph 1-5: Stanhope Firefighters' Community Centre and Stanhope Fire Hall Electricity Consumption
 Baseline August 1, 2014 to August 1, 2015



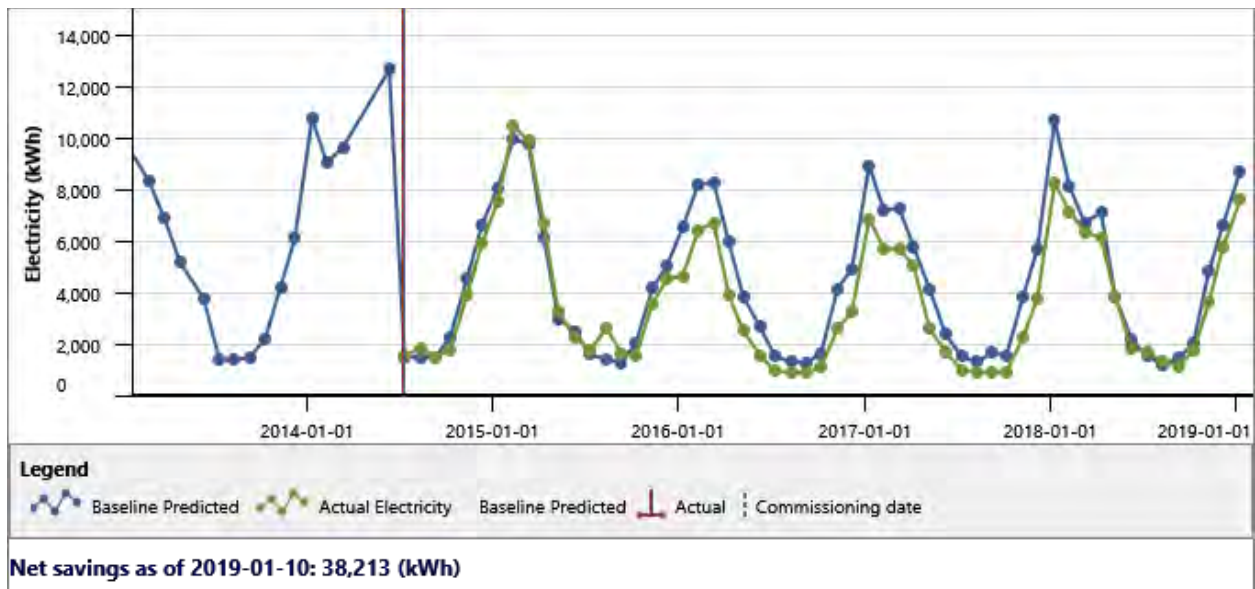
Graph 1-6: Stanhope Firefighters' Community Centre Furnace Oil Consumption
 Baseline February 1, 2013 to February 1, 2014



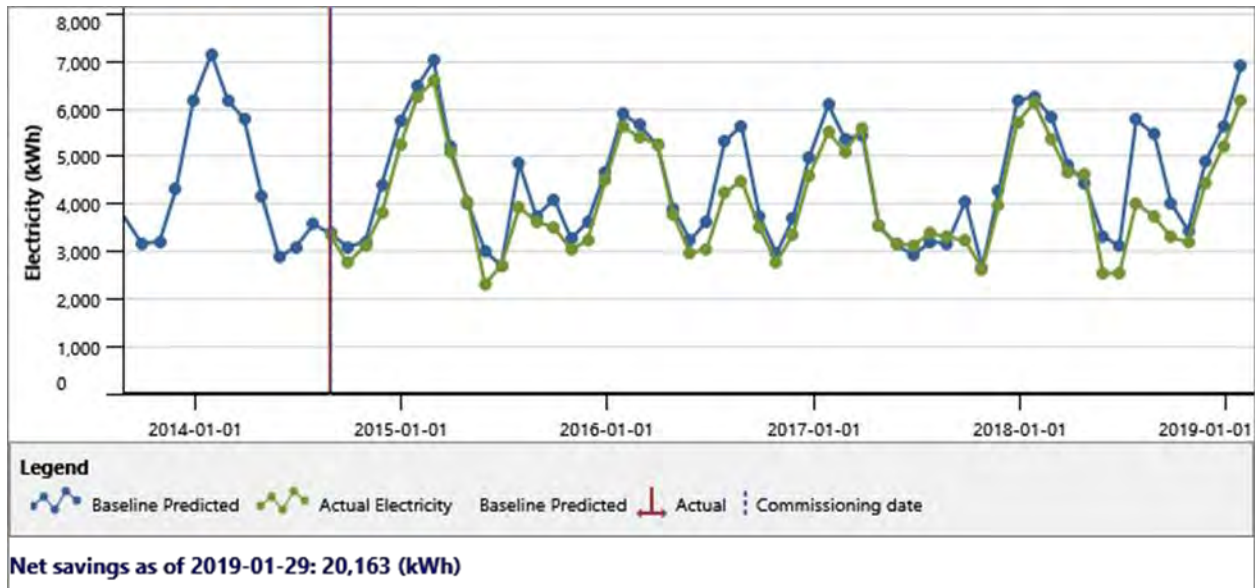
Graph 1-7: Stanhope Fire Hall Propane Consumption
Baseline June 1, 2013 to June 1, 2014



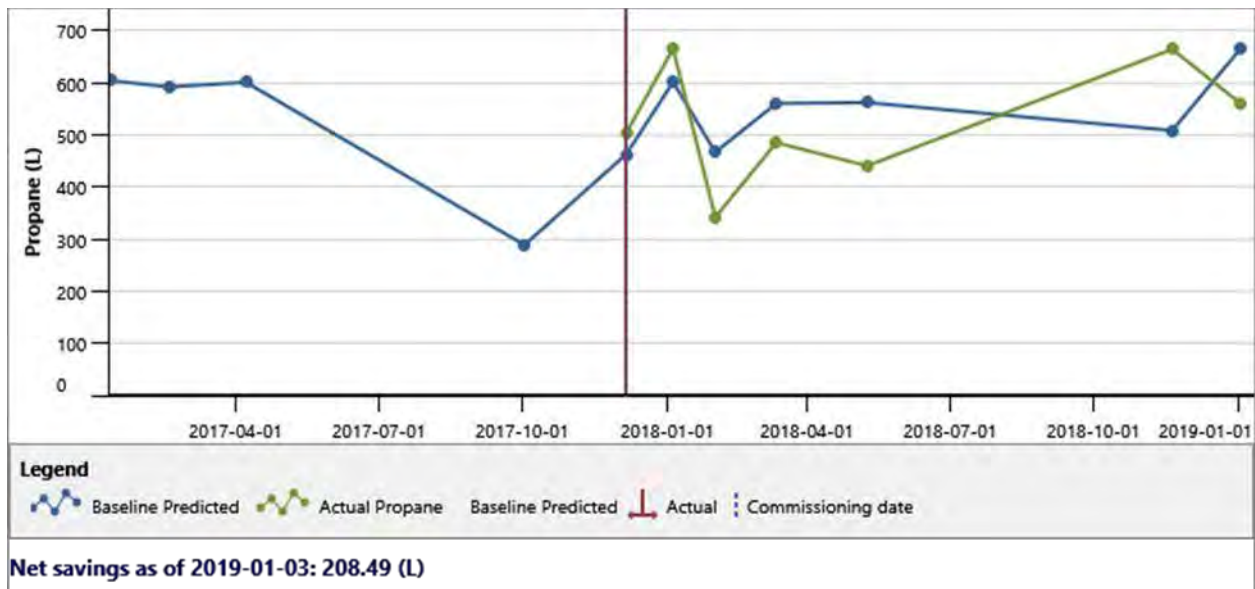
Graph 1-8: Dorset Satellite Office Electricity Consumption
Baseline December 22, 2012 to July 11, 2014



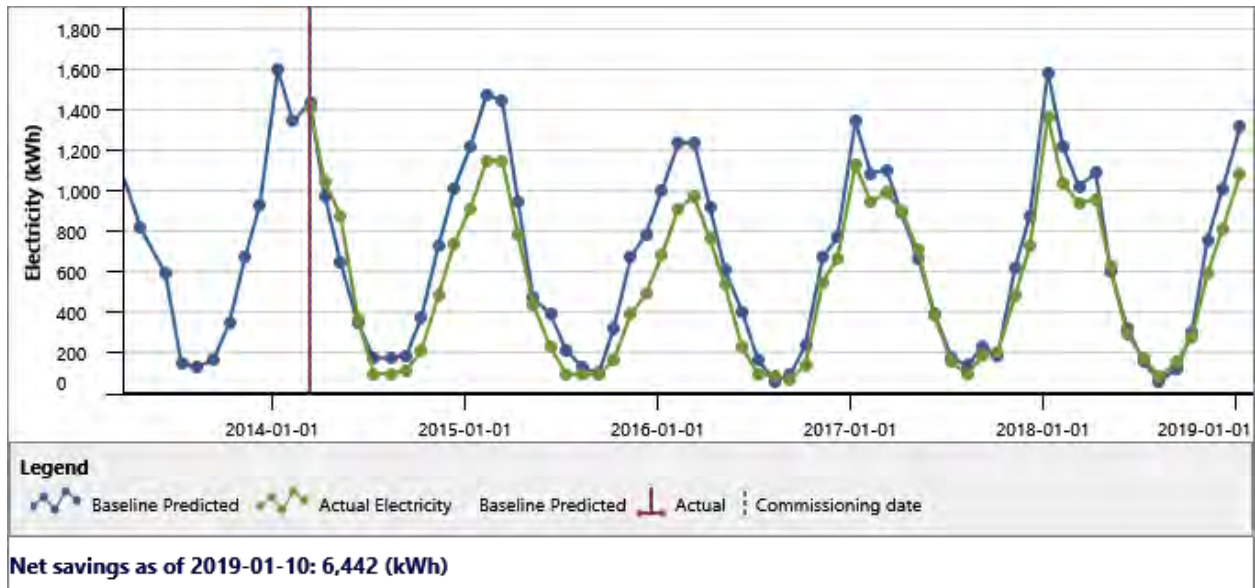
Graph 1-9: North Shore Administrative Office Electricity Consumption
Baseline August 1, 2013 to August 1, 2014



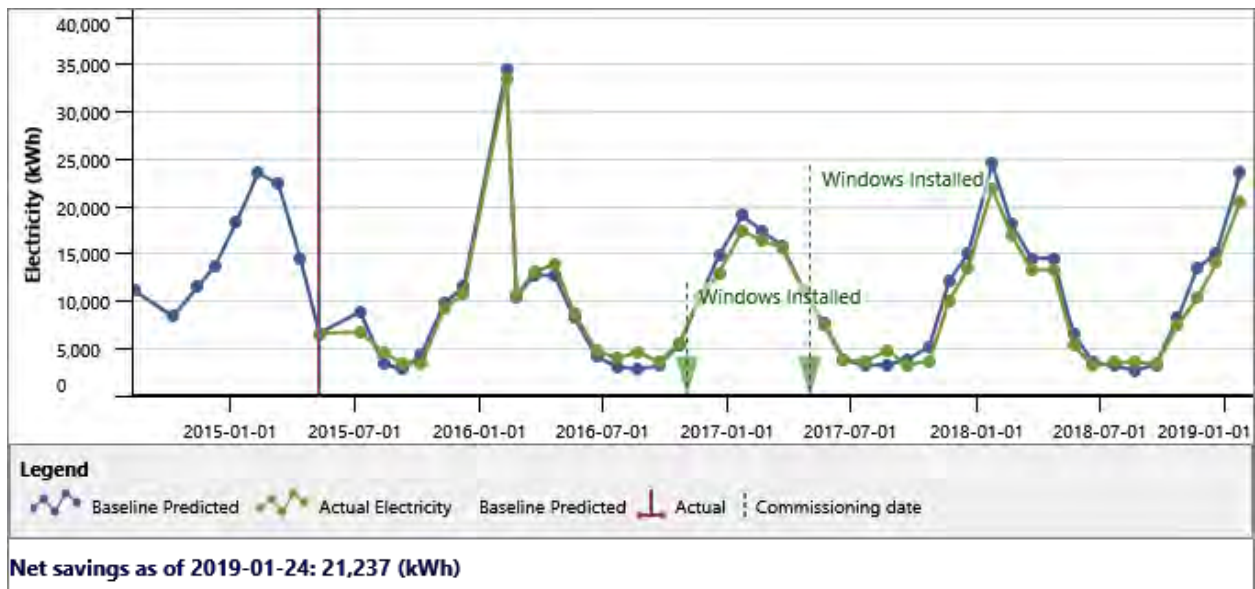
Graph 1-10: North Shore Administrative Office Propane Consumption
Baseline December 3, 2016 to December 3, 2017



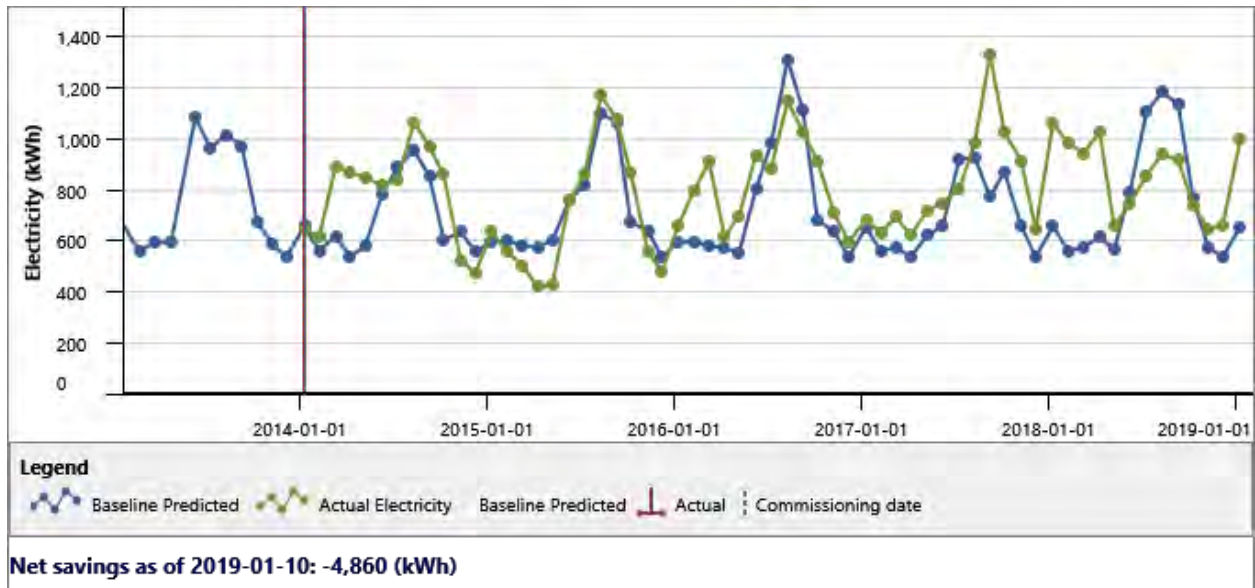
Graph 1-11: Dorset Community Policing Electricity Consumption
Baseline March 1, 2013 to March 1, 2014



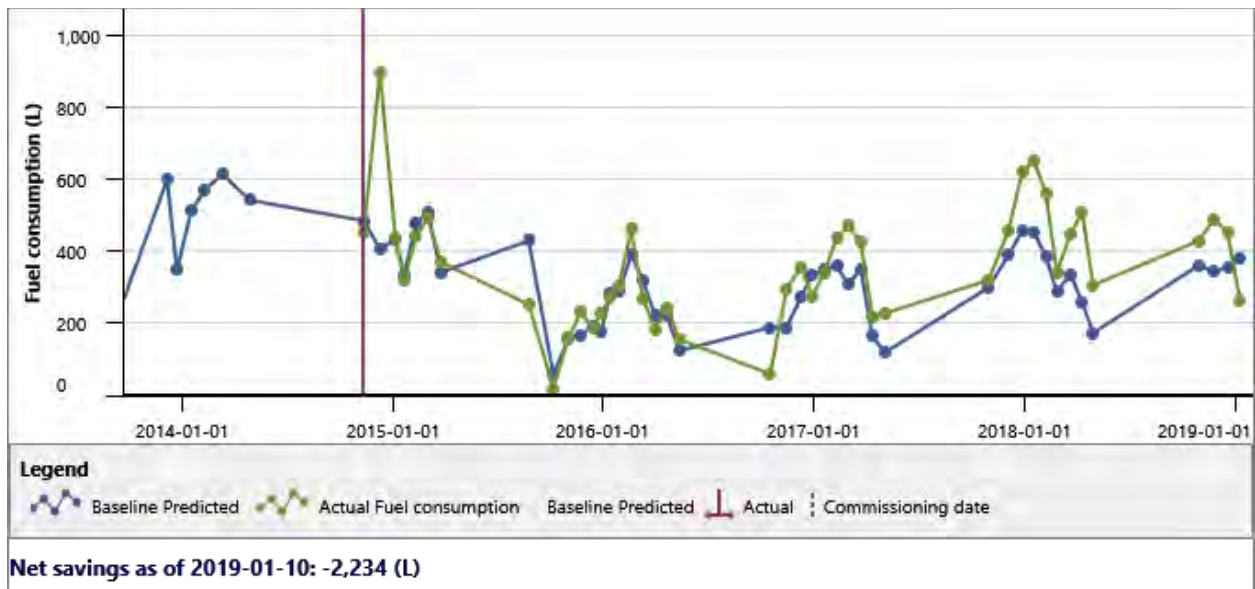
Graph 1-12: Dorset Recreation Centre Electricity Consumption
Baseline August 11, 2014 to May 11, 2015



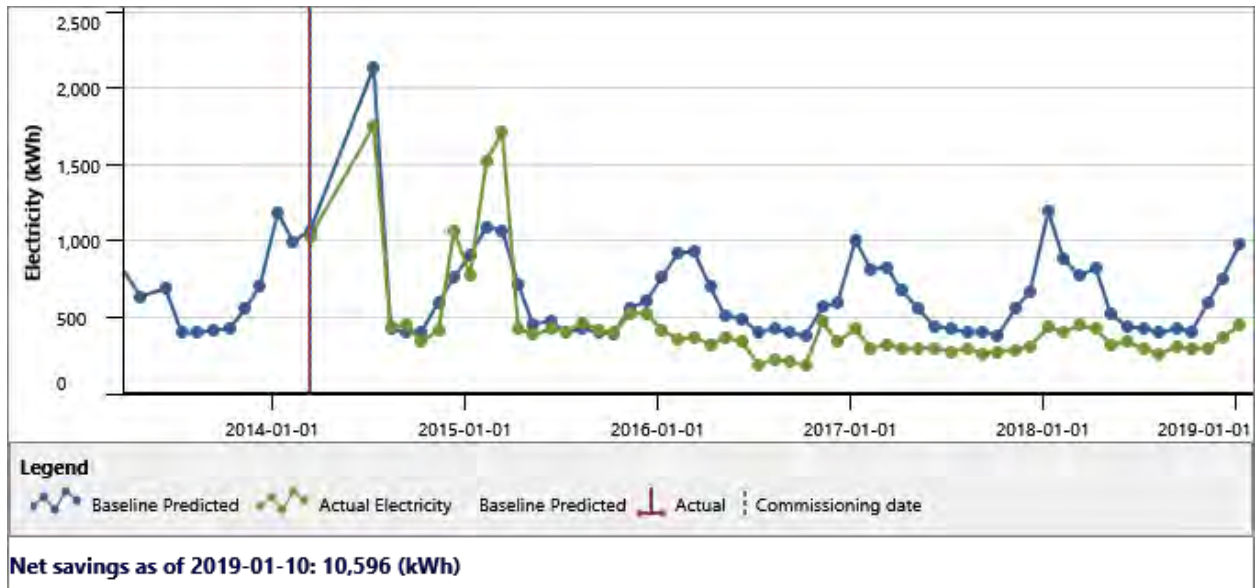
Graph 1-13: Dorset Museum Electricity Consumption
Baseline January 1, 2013 to January 1, 2014



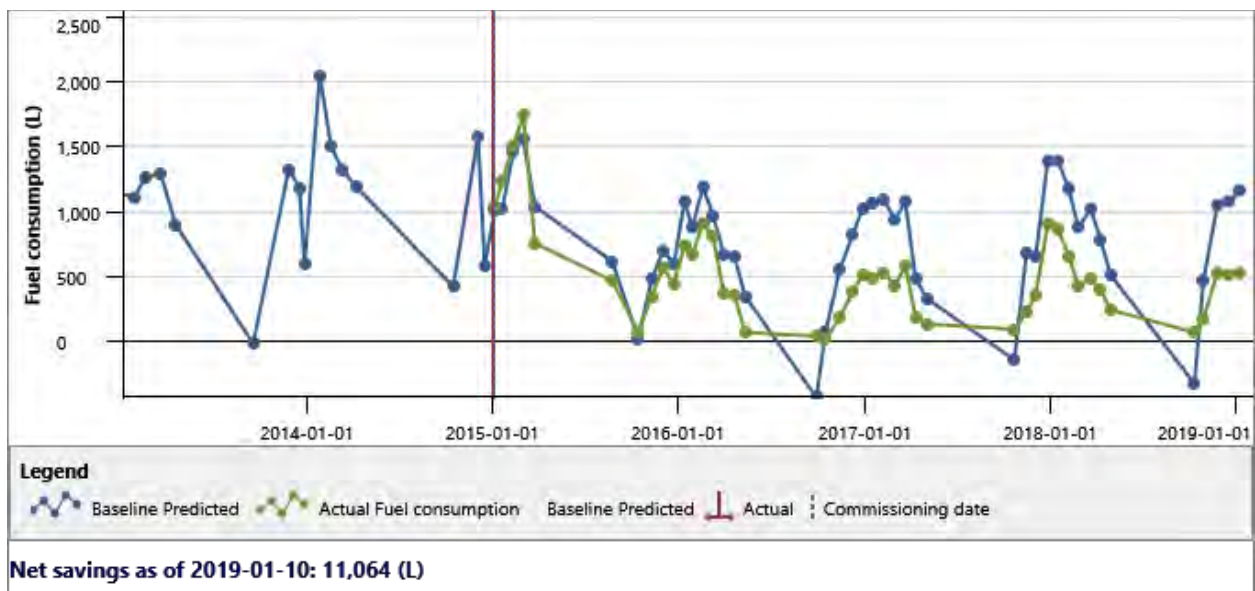
Graph 1-14: Dorset Museum Furnace Oil Consumption
Baseline May 1, 2013 to May 1, 2014



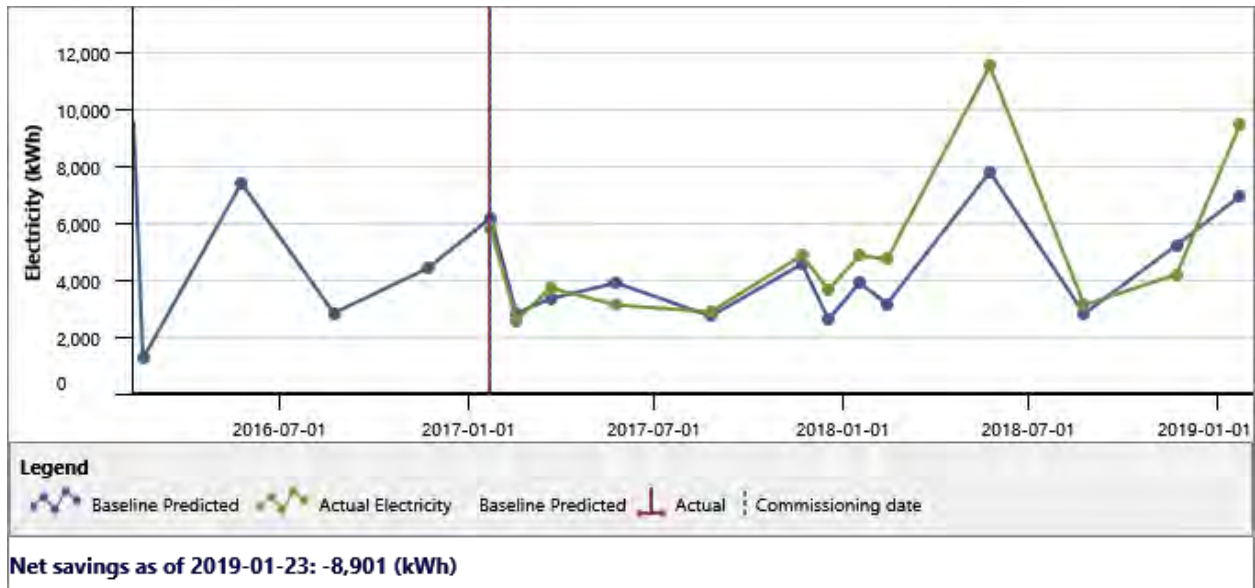
Graph 1-15: Dorset Garage (Old) Electricity Consumption
Baseline March 1, 2013 to March 1, 2014



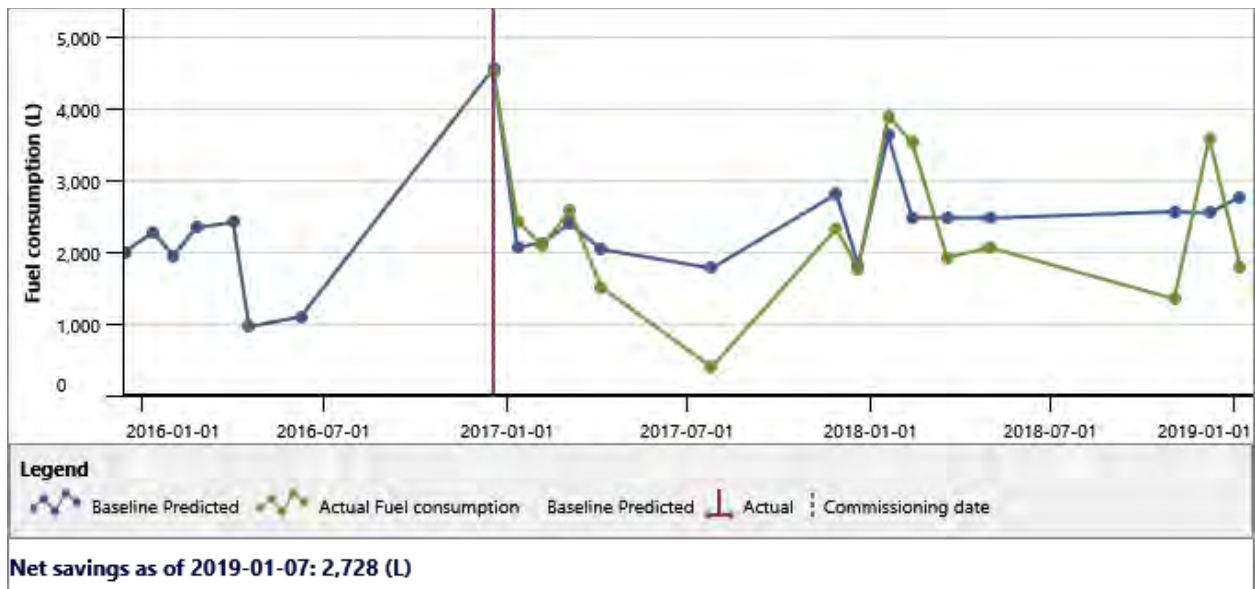
Graph 1-16: Dorset Garage (Old) Furnace Oil Consumption
Baseline January 1, 2013 to January 1, 2015



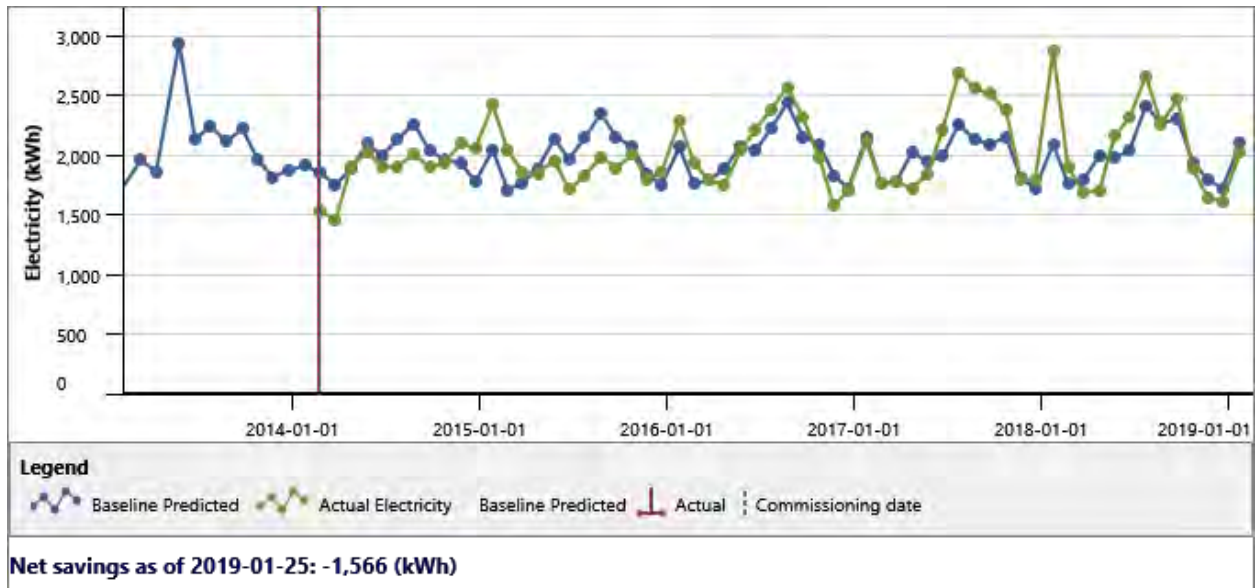
Graph 1-17: Dorset Garage (New) Electricity Consumption
Baseline December 1, 2015 to December 1, 2016



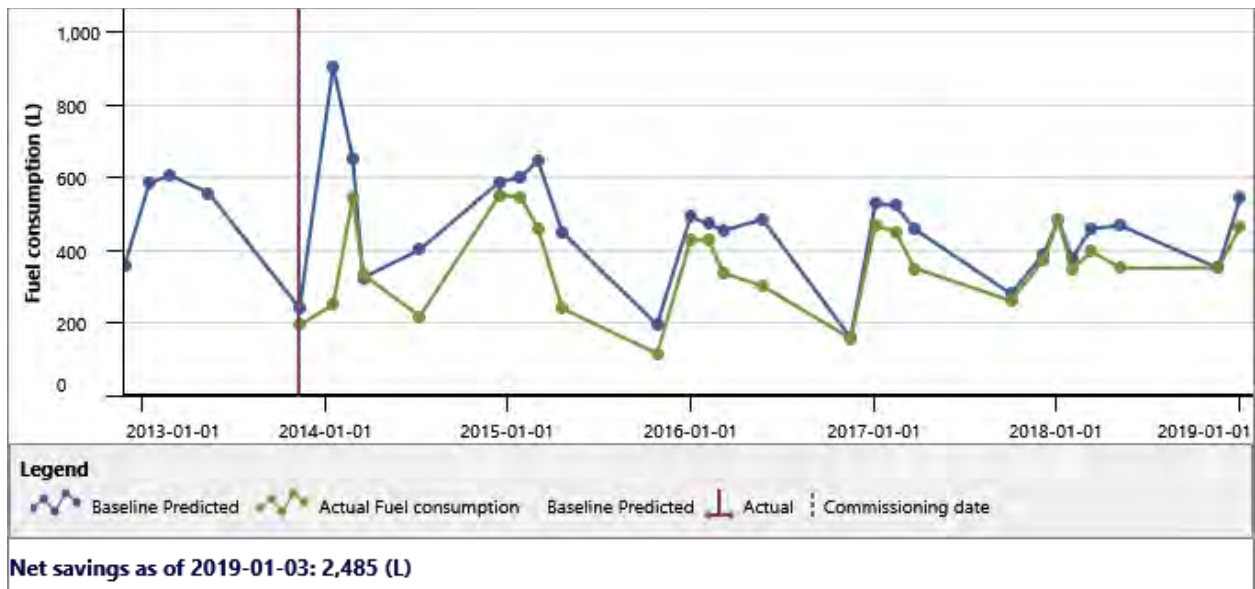
Graph 1-18: Dorset Garage (New) Propane Consumption
Baseline October 28, 2015 to October 28, 2016



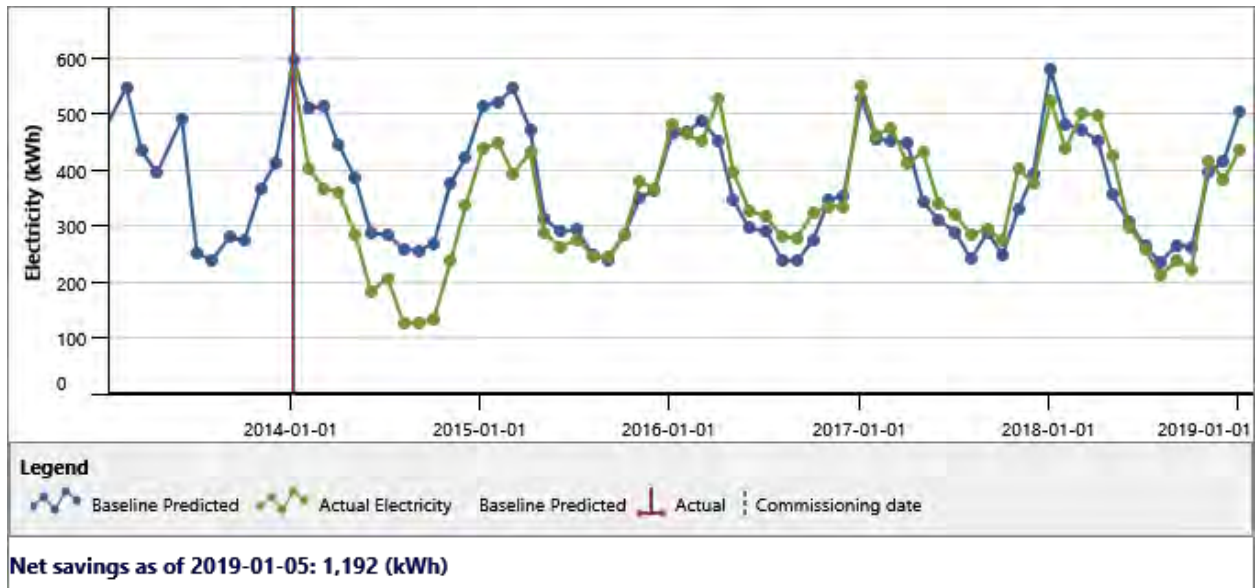
Graph 1-19: Airport Terminal Electricity Consumption
Baseline February 1, 2013 to February 1, 2014



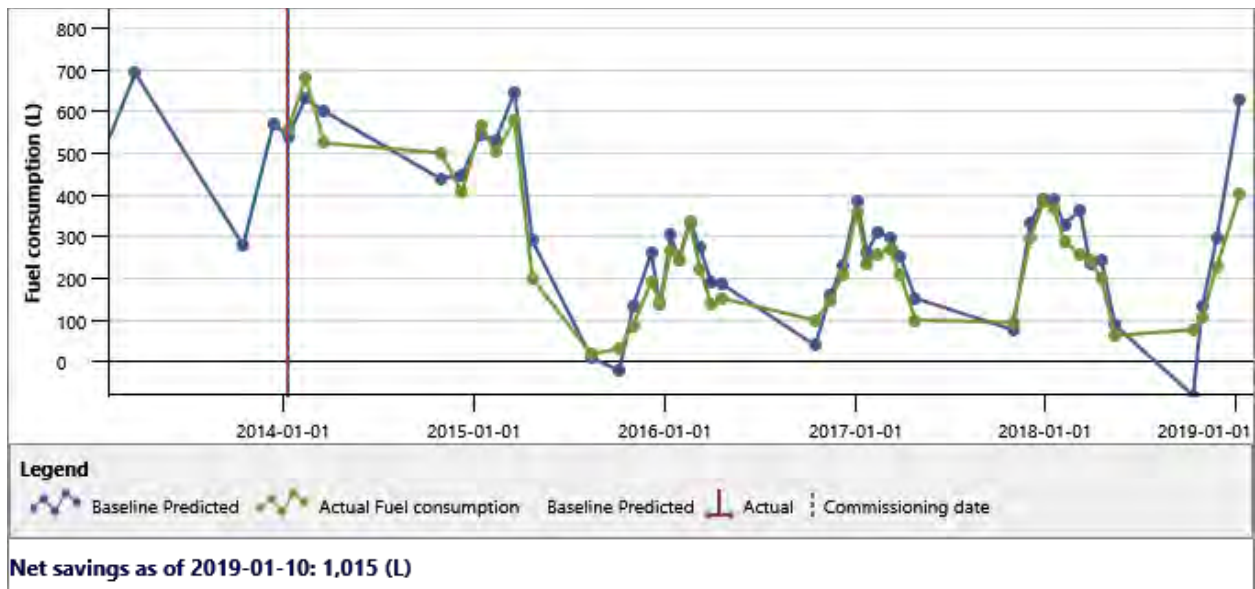
Graph 1-20: Airport Terminal Propane Consumption
Baseline September 9, 2012 to September 9, 2013



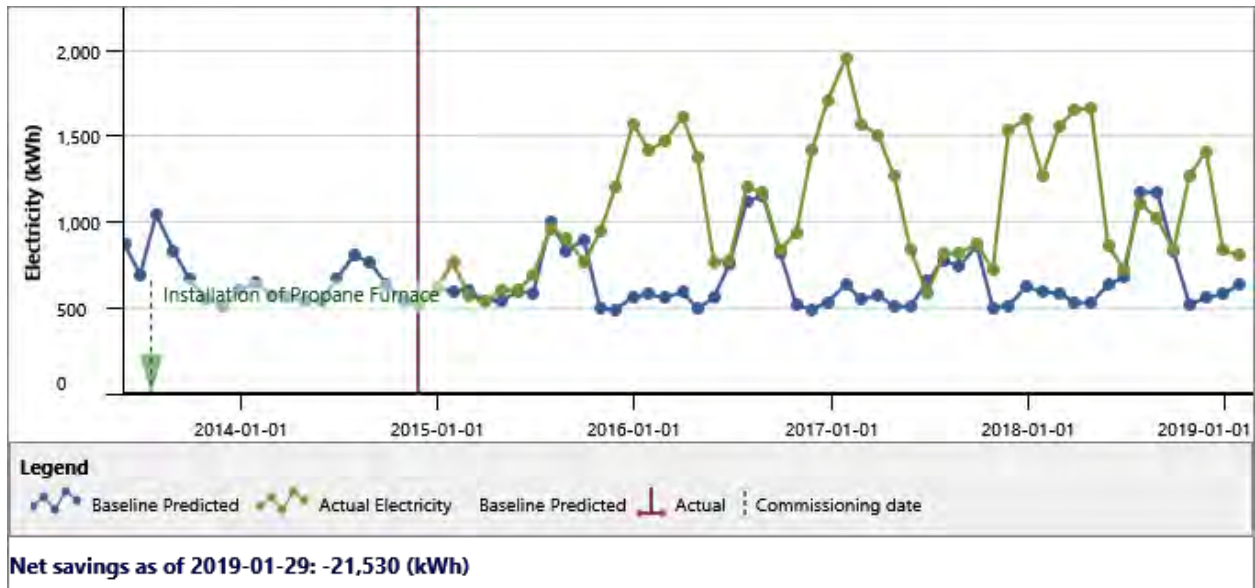
Graph 1-21: Oxtongue Lake Community Centre Electricity Consumption
Baseline January 1, 2013 to January 1, 2014



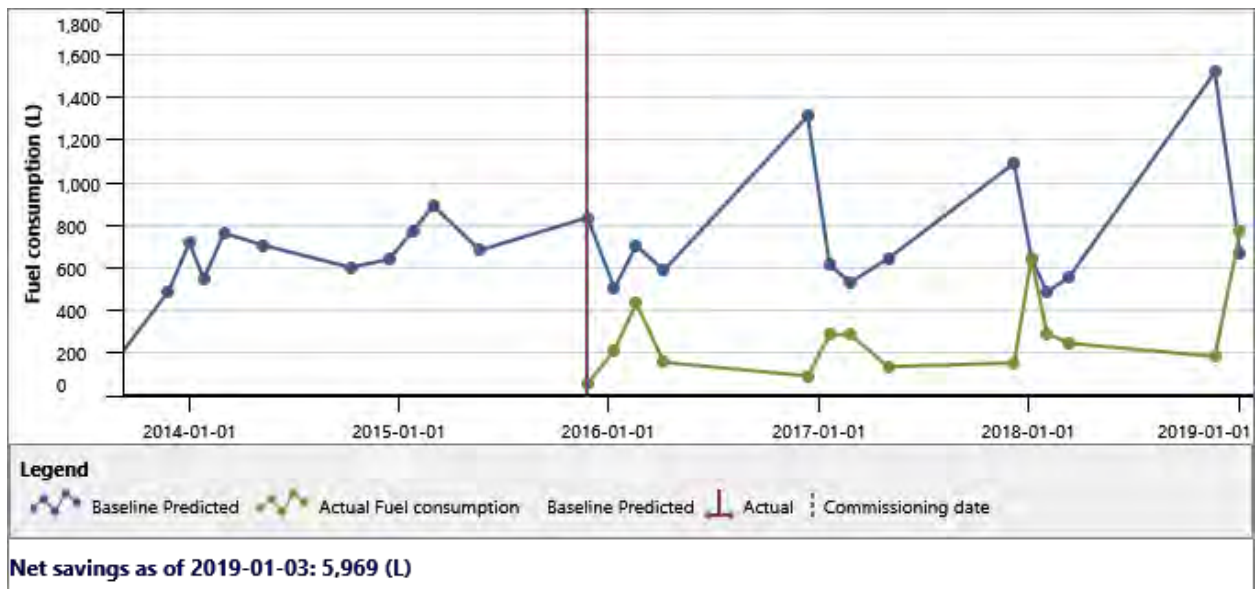
Graph 1-22: Oxtongue Lake Community Centre Furnace Oil Consumption
Baseline January 1, 2013 to January 1, 2014



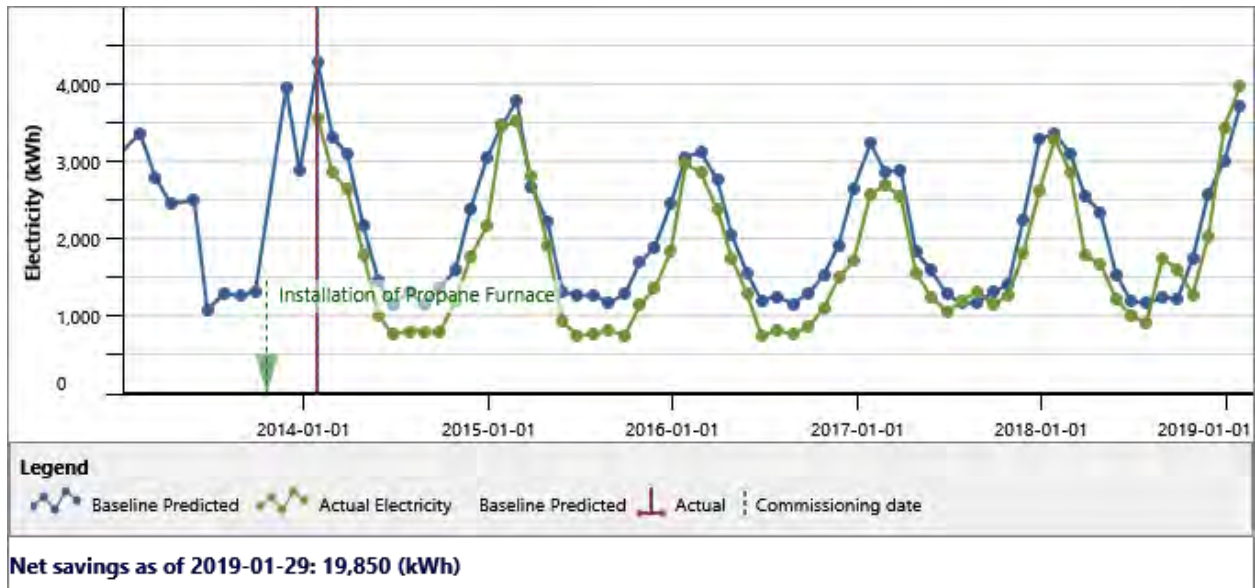
Graph 1-23: Stanhope Library Electricity Consumption
Baseline May 1, 2013 to November 27, 2014



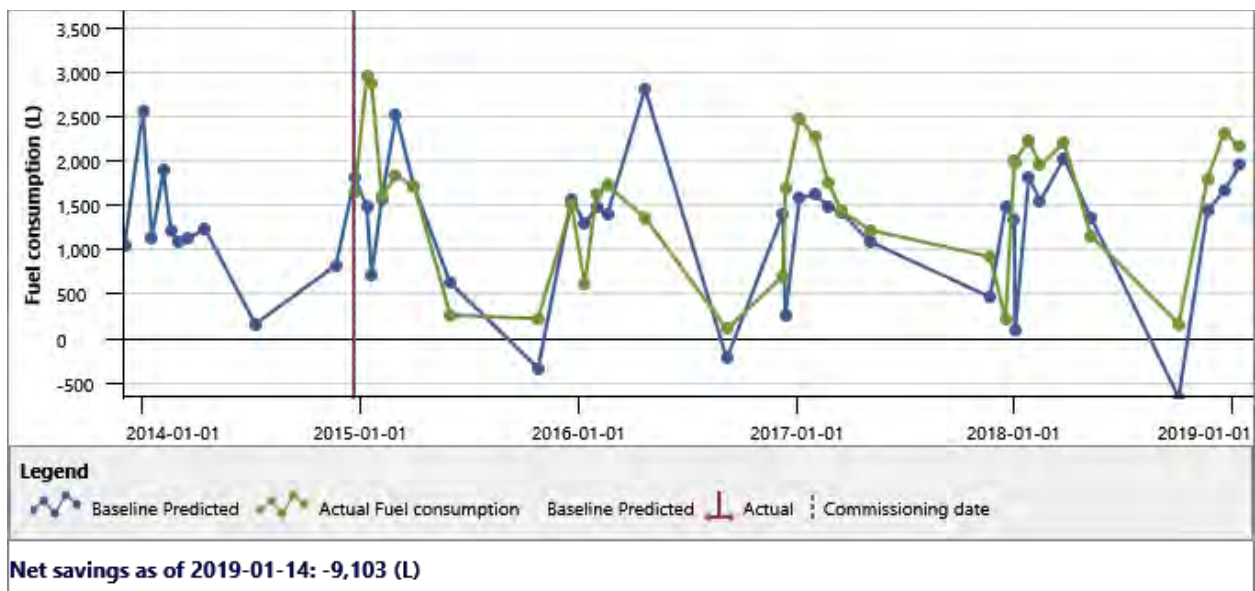
Graph 1-24: Stanhope Library Propane Consumption
Baseline July 18, 2013 to November 25, 2015



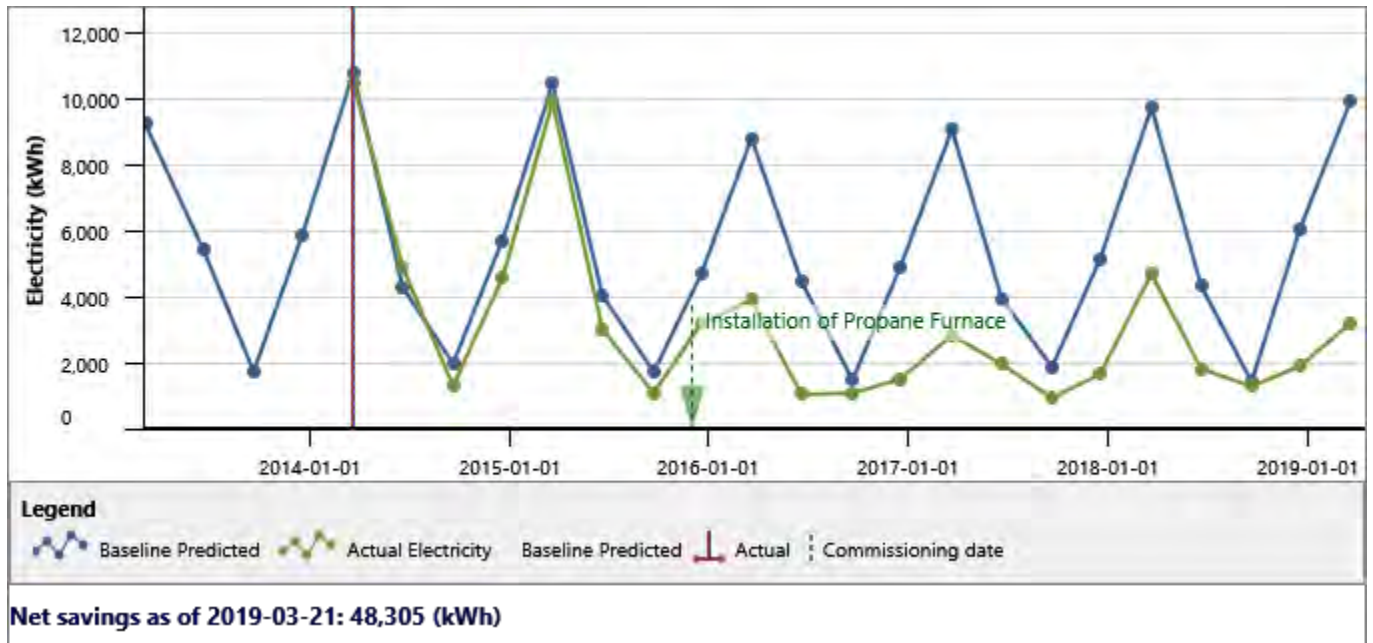
Graph 1-25: Stanhope Garage Electricity Consumption
Baseline January 1, 2013 to January 1, 2014



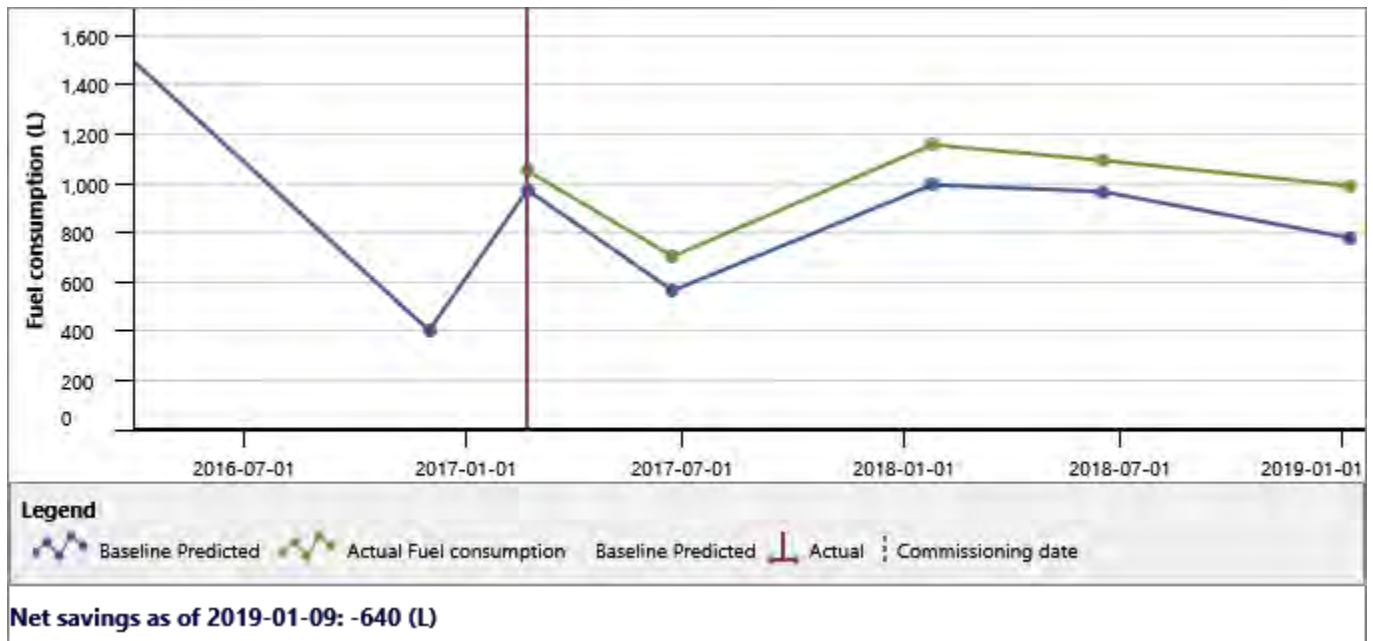
Graph 1-26: Stanhope Garage Propane Consumption
Baseline December 1, 2013 to December 1, 2014



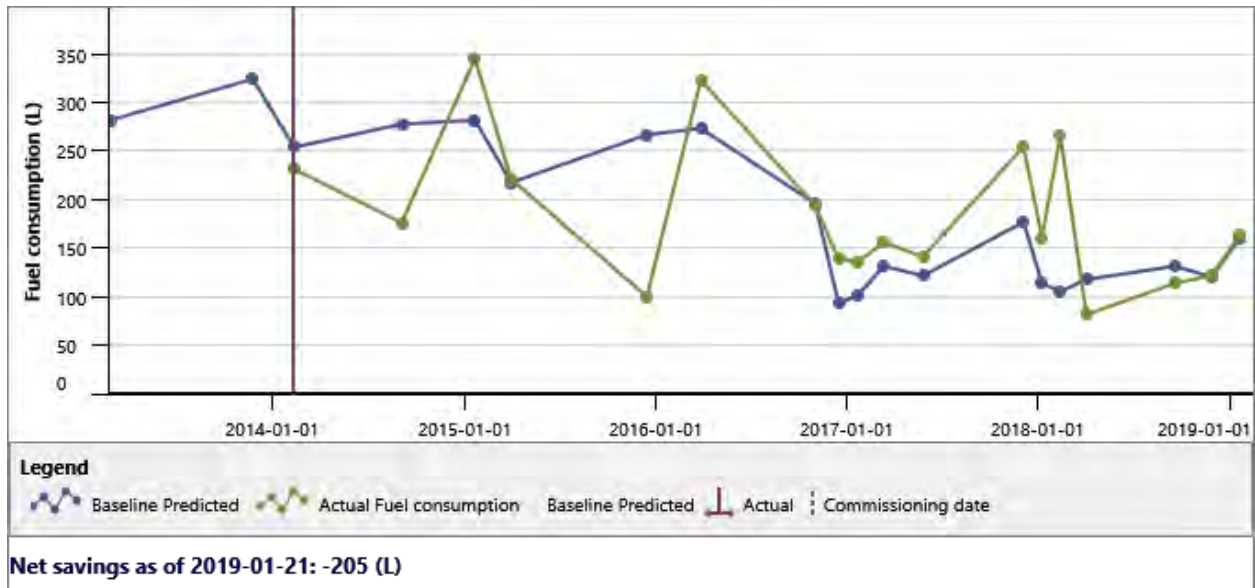
Graph 1-27: Water Trails Office Electricity Consumption
Baseline January 1, 2013 to January 1, 2014



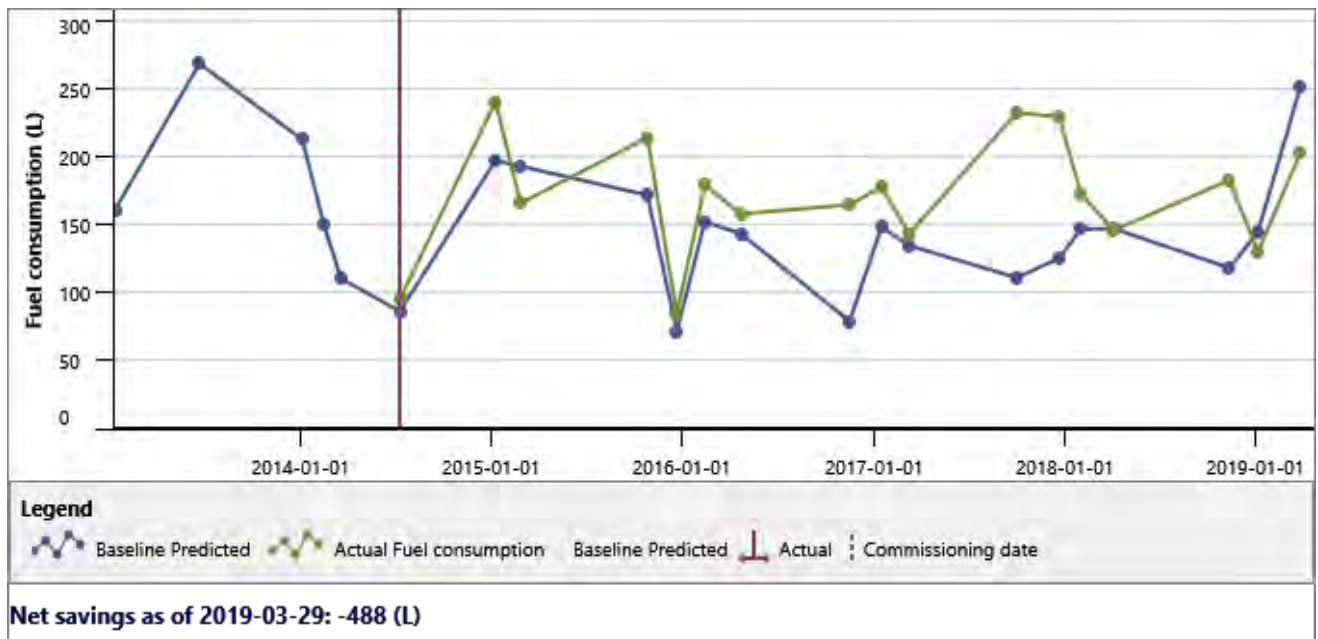
Graph 1-28: Water Trails Office Propane Consumption
Baseline January 1, 2016 to December 31, 2016



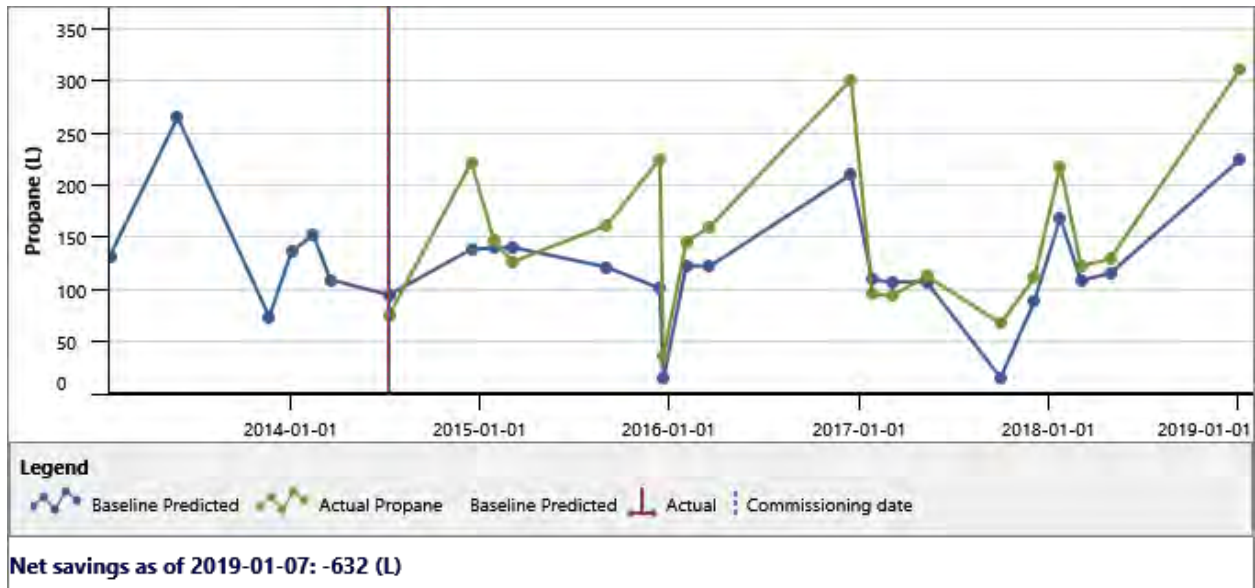
Graph 1-29: Dorset Transfer Station Propane Consumption
Baseline January 1, 2013 to January 1, 2014



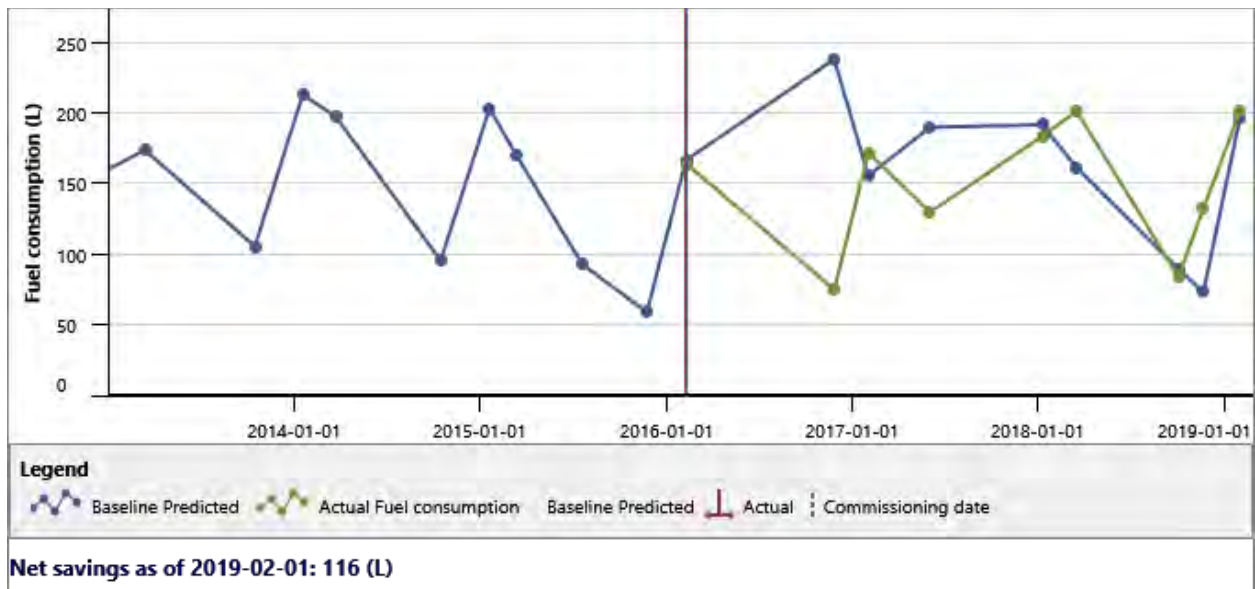
Graph 1-30: Hawk Lake Landfill Propane Consumption
Baseline January 1, 2013 to June 30, 2014



Graph 1-31: Maple Lake Landfill Propane Consumption
Baseline January 5, 2013 to July 9, 2014



Graph 1-32: Oxtongue Lake Landfill Propane Consumption
Baseline January 1, 2013 to January 1, 2016



Graph 1-33: Pine Springs Landfill Propane Consumption
 Baseline January 1, 2012 to January 3, 2014

