City of Canandaigua
Greenhouse Gas Inventory
January 2022

Prepared by GreenHows Consulting & Impact Earth
Prepared for the City of Canandaigua Climate Smart Communities Committee

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GLOSSARY OF TERMS AND ACRONYMS

A. **GREENHOUSE GAS (GHG)**: Six greenhouse gasses included in an emissions inventory as noted by as required by the United Nations Intergovernmental Panel on Climate Change (IPCC) are carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur Hexafluoride (SF6) but then the emissions are converted into an equivalent amount of CO2 and reported as metric tons of carbon dioxide).
B. **SCOPE 1 EMISSIONS**: all direct GHG emissions associated with the burning of fuels of the emitter.
C. **SCOPE 2 EMISSIONS**: indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.
D. SCOPE 3 EMISSIONS: all other indirect emissions not covered in scope 2, such as emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the City (i.e. employee commutes), outsourced activities, and waste disposal.
E. **EMISSIONS FACTORS (EF)**: an amount of GHG emissions associated with a unit of activity data.
F. **MT CO_2e (METRIC TONS OF CARBON DIOXIDE EQUIVALENT)**: standard unit for measuring GHG emissions.
G. **STATIONARY:** for the purpose of this report, “stationary” refers to the combustion of natural gas.
H. **BASELINE**: a measurement, calculation, or time used as a basis for comparison.
I. **COMMUNITY INVENTORY:** a collection of data that includes all GHG emissions that can be attributed to the residents and others within the City boundaries.
J. **CITY (MUNICIPAL) OPERATIONS INVENTORY:** a collection of data that includes only the GHG emissions that are directly related to municipal operations.
K. **EPA:** United States Environmental Protection Agency.
L. **LGOP:** Local Government Operations Protocol.
M. **NYSERDA:** New York State Energy Research and Development Authority.
N. **CSC:** Climate Smart Communities Program.
O. **MMBtu:** million British Thermal Units, a measure of energy.
P. **GTC:** Genesee Transportation Council.
Q. **RG&E:** Rochester Gas and Electric, local utility provider.
R. **MSW:** Municipal Solid Waste
S. **WARM:** waste reduction model created by the EPA.

SECTION 1: INTRODUCTION

Overview of the GHG Inventory

Climate Smart Communities (CSC) is a New York State program that helps local governments take action to reduce greenhouse gas emissions and adapt to a changing climate. Benefits include leadership recognition, free technical assistance, and access to grants. The CSC program includes two designations- Registered and Certified. Registered communities have made a commitment to act by passing legislation and formally taking the CSC pledge. Certified (Bronze or Silver, Gold being developed) communities are the foremost leaders in the State; they have gone beyond the CSC pledge by completing and documenting a suite of actions that mitigate and adapt to climate change at the local level. The City of Canandaigua has pledged to be a part of Climate Smart Communities, a network of New York communities engaged in reducing GHG emissions and improving climate resilience. Two types of actions enable Climate Smart Communities to minimize the risks of climate change and reduce its long-term costs:

- Reducing GHG Emissions
- Adapting to a Changing Climate

Local governments can act directly to reduce fossil fuel consumption in municipal buildings and vehicles, to improve solid waste management practices and to adapt infrastructure and operations for resilience to anticipated changes as the climate warms. Flooding and changes in precipitation and snow pack that may affect water supplies are of special concern to localities.

Many municipalities begin by reducing emissions and increasing climate resilience in municipal operations alone, but action by the entire community is needed to make significant reductions in GHG emissions and to successfully adapt to unavoidable climate change.

The first step in becoming a Climate Smart Community is to adopt the Climate Smart Communities Pledge and send it to the New York Department of Environmental Conservation. This pledge is a public commitment to reduce GHG emissions and prepare for unavoidable climate change. Local legislative bodies must adopt a resolution that includes all ten pledge elements but can add their own legislative findings of pledge elements as desired. The elements included are:

1. Pledge to be a Climate Smart Community
2. Set Goals, Inventory Emissions, and Plan for Climate Action
3. Decrease Community Energy Use
4. Increase Community Use of Renewable Energy
5. Realize Benefits of Recycling and other Climate-Smart Waste Management Practices
6. Reduce GHG Emissions Through Use of Climate-Smart Land-Use Tools
7. Enhance Community Resilience and Prepare for Effects of Climate Change
8. Support Development of Green Innovation Economy
9. Inform and Inspire the Public
10. Commit to Evolving Process of Climate Action

On April 23, 2019, the City of Canandaigua was designated as a Bronze Certified Climate Smart Community by the New York State Department of Environmental Conservation (NYSDEC) with 122 points earned from 15 completed actions. This designation made the City of Canandaigua the 23rd municipality in the State to receive certification. Unlike other certified communities, however, the action items that ultimately earned them the recognition were not done as part of the CSC Program. While other communities followed the prescribed path outlined by the CSC program, the City of Canandaigua's certification is the culmination of all the work done by the City over the last decade. One of the explicitly stated goals in their Strategic Plan is Environmental Stewardship, which includes promoting practices that conserve our natural resources, taking a leadership role in the utilization of alternative energy sources, and reducing the City's impact on the environment. However, because the City of Canandaigua has been proactively addressing climate change and taking steps towards creating a more sustainable community for quite some time, they earned the certification without establishing the critical benchmarks other certified municipalities have used to guide future actions. These baselines and inventories must be completed so the City can pursue Silver Certification successfully.

This RFP is aimed at completing the following action items:
- PE2 Action: Government Operations Greenhouse Gas Inventory
- PE2 Action: Community Greenhouse Gas Inventory
- PE6 Action: Natural Resources Inventory
- PE7 Action: Climate Vulnerability Assessment

As a part of this project, Impact Earth and Greenhows Consulting has convened a team of experienced folks to complete this Greenhouse Gas Inventory Report. This project kicked off it's data collection in late spring 2021, and the report was completed in January, 2022.

What is a greenhouse gas inventory? A GHG Inventory quantifies all greenhouse gasses emitted into the atmosphere by an organization, facility, or geographic area and identifies the activities that cause emissions and the associated fuels. The information will then be used by the City to track emissions trends, develop future strategies and policies, and assess future progress. There are six greenhouse gasses included in an emissions inventory as noted by as required by the United Nations Intergovernmental Panel on Climate Change (IPCC) are carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur Hexafluoride (SF_6) but then the emissions are converted into an equivalent amount of CO_2 and reported as metric tons of carbon dioxide).

To date, this GHG Inventory is the first known to be completed for the City of Canandaigua.

Following NYS leadership laws and goals, the City of Canandaigua is interested in limiting their greenhouse gas emissions to 40% of 1990 levels by 2030, and 85% by 2050. Because this inventory is considered the original baseline of data, we recommend that the City of Canandaigua aim to reduce emissions by 40% of 2021 levels by 2030 and 85% by 2050 due to availability of data and progress tracking.

Geographic Boundaries of Inventory

The City of Canandaigua is located in the Finger Lakes Region of New York State in Ontario County. The City is surrounded by the Town of Canandaigua and the southern end of the city sits on Canandaigua Lake, one of the eleven Finger Lakes. According to the 2019 census, the City's current population is 10,576 with about 4,932 households, which is approximately a -1% change in population from the 2010 census.

Early on in the inventory the CSC Committee determined that the geographic boundaries of this inventory would be the physical boundaries of the City Proper. It is noted that certain operations within the City's purview are also contributed to by surrounding municipalities, such as, waste water treatment, and when possible, we incorporated just the City's contribution to these emissions in the calculations.

Methodology

This inventory began in 2021 and was completed in 2022. Based on City projects that were completed as well as data availability, it was determined that the baseline year for this inventory would be 2015. When 2015 data was not available, the next closest year of reliable data was utilized, which is noted in this report. The data used in this inventory was collected from a variety of sources including but not limited to Rochester Gas and Electric bills and documentation, a multitude of City department reports, Casella Waste Systems reports, NYSEG reports, conversations with hospital administration, Impact Earth assessments, iCanopy, NYSERDA, NYSERDA Consultant (Jim Yienger), representatives from Ontario County (Regina Sousa), the Canandaigua City School District energy dashboard, and the Genesee Transporation Council. Sources of emissions included in this inventory were based on the Climate Smart Communities GHG Accounting Tool, which outlined Stationary (natural gas), Electricity, Vehicles, Solid Waste, Street Lighting, Urban Forestry, Water, Wastewater, and Employee Commutes. Of these categories, the City Operations were split into departments, based on data availability, and the Community, based on the Local GHG Inventory Tool: Community Module, the emissions sources were split into Residential, Commercial, Industrial, Public Authority, Vehicles, Solid Waste and Other.

The City of Canandaigua 2021 GHG Inventory included the use of excel spreadsheets and the Local GHG Inventory Tools: Government Operations Module, Community Module. While these two prepared tools were primarily used for the input and calculations regarding these inventories, some data, was collected and analyzed outside of these tools due to available data and limitations of the tools. All resulting emissions however were collected back into the summary documents.

Greenhouse Gas Emissions Accounting Tools & Classifying Emissions

Municipal Inventory

The Climate Smart Communities GHG Accounting Tool was developed by ICF International in consultation with VHB Engineering, Surveying and Landscape Architecture, P.C., independent contractors to NYSERDA. The Tool is designed to help local governments in New York State evaluate the GHG emissions associated with local government operations and model reductions associated with various strategies. This Tool can help local governments begin preliminary decision-making of GHG reduction strategies before undertaking more detailed feasibility studies. It also helps users to develop a baseline municipal GHG inventory of local government operations. The Tool consists of an Excel template that can be manipulated by the user to determine estimated GHG emissions. This template is titled *lggit_10_16_2020*.

Data in this Tool are categorized into the following Scopes 1-3:

- Scope 1: all direct GHG emissions from municipal operations
- Scope 2: indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling for municipal operations
- Scope 3: all other indirect emissions not covered in Scope 2, such as emissions from vehicles not owned or controlled by the cities, waste disposal, or emissions from the production of purchased materials

Due to available data at the time of compilation, we had to use other tools outside of the CSC GHG Accounting Tool to calculate emissions related to Vehicles and Solid Waste with additional analysis. For Solid Waste, we used the Environmental Protection Agency Waste Reduction Model (WARM), to determine Scope 3 emissions derived from the waste produced by City operations that are hauled by the City but disposed of at a non-City owned landfill. This data was collected through data provided to the team by the City that they received from Casella, the waste management company that owns and operates the landfill. This calculation was then added back into the CSC GHG Accounting Tool for summary purposes only. For Vehicles, the City did not have the specific detailed data that the CSC GHG Accounting Tool required, so the team created a sub sheet within the Tool to calculate vehicle consumption data with the information that was available via the Department of Public Works. These calculations were then linked, through pre existing formulas in the Tool, for summary purposes. It is also noted that the data provided by the City's DPW was extensive with great historical information, greatly detailed and extremely helpful in performing the necessary calculations.

All resulting emissions calculations from this inventory are estimations because calculations were performed with the standardized coefficients and could not account for all factors. The Tool is pre-programmed with default emissions factors and system assumptions needed to calculate emissions according to the LGOP. Default values that are specific to local governments in NYS are used whenever possible. When state-level data is not available, national default values are used. The Tool provides users with the options to use default data or to override values with local government-specific information. It was also decided, with the CSC committee, to include a local government value in the calculation as the eGRID subregion chosen within the tool was the NYS Average for emissions factors.

Community Inventory Tool

For the Community Inventory, the team followed the New York Community and Regional GHG Inventory Guidance[1]. Within this guidance is the use of a similar accounting tool that is used in the municipal inventory. This Tool was developed by ICF International with the Local Climate and Energy Program. It was designed to help cities evaluate and estimate GHG emissions within their communities. The Tool helps cities understand their GHG emissions profile and break down the sectors that are driving emissions, provide information for emissions trends, and help to inform a climate action plan that will address and reduce emissions. From this Tool, users are able to develop a base year GHG inventory for their community, according to the Global Protocol for Community-Scale GHG Emissions (GPC). This module includes an excel template that is manipulated by the user and allows for the option of applying locality-specific data if the community would prefer that over the pre-loaded default data which was gathered by federal agencies and other sources covering the default emissions facts and system assumptions needed to calculate emissions according to the GPC.

Similarly to the Town Inventory, due to information available at the time, Solid Waste and Vehicles related emissions were calculated outside the Tool. For Solid Waste, we also used the EPA WARM Model in order to determine the Scope 3 emissions derived from the Community waste streams. This data was provided by Waste Management and then calculated back into the Tool for summary purpose.. For Vehicles, data from the Genesee Transportation Council was manipulated in a sub sheet within the Tool to calculate the required data for the summary which was then linked through preexisting formulas within the sheet.

[1] https://climatesmart.ny.gov/fileadmin/csc/documents/GHG_Inventories/ghgguide.pdf

SECTION 2: Greenhouse Gas Inventory Results

Overall GHG Inventory Emissions Profile

GHG emissions were inventoried for the baseline year of 2015. The overall profile of the City of Canandaigua's GHG emissions included emissions from Electricity, Stationary (natural gas), Vehicles, and Waste. The total 2015 emissions from both the City Operations and the Community-wide inventory is 92,845.62 $MTCO_2e$. As shown in ***FIGURE 1***, Community emissions account for 97.1% of total emissions for the City of Canandaigua while City Operations accounts for a mere 2.9%. Nevertheless all emissions are significant when looking for ways to improve on efficiency, technology, and programs that affect emissions.

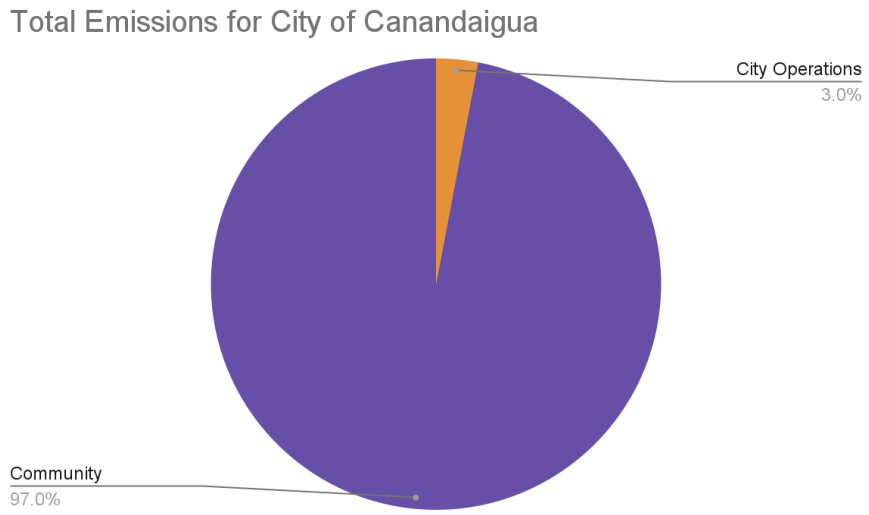


FIGURE 1

The City Operations and Community emission profiles will be discussed in further depth in the following sections of this report. Nevertheless all emissions are significant when looking for ways to improve on efficiency, technology, and programs that affect emissions. The City Operations and Community emission profiles will be discussed in further depth in the following sections of this report.

Summary TOTAL Emissions and Energy for City of Canandaigua		
	MMBTU	**Emissions**
City Operations	75,679.62	2,703.62
Community	1,680,616	87,449
TOTAL	1,756,295.62	90,152.62

TABLE 1

The inventory reported that the City's total GHG emissions in 2015 were 92,845 metric tons of carbon dioxide equivalents. Based on population data from the 2019 census, the City's 2015 emissions per capita were approximately 8.78 $MTCO_2e$. This number is significantly lower than the per capita emissions for the United States which is currently 15.2 MTCO2e[2]. The inventory also provided the ability to compare energy usage by converting different measures of energy (kilowatts, therms, etcetera) into million British Thermal Units (MMBtu). This gave a standardized measurement with which to compare total energy consumption across different sectors for the City. The resulting data looks very similar to the breakdown of GHG emissions because the two datapoints are directly correlated. Based on population data from the 2019 census, the City's 2015 per capita energy usage was 166 MMBtu.

Municipal Operations Emissions Profile

While the local government's role in leading the fight against climate change is an extremely important one, the City of Canandaigua's contribution to the City Community emissions as a whole is a very small percentage of total energy consumption and emissions. The City Operations sector in Canandaigua only accounts for 2.9% (2,703.62 $MTCO_2e$) of the total emissions in the City of Canandaigua. The fraction of the City's Government's contribution to total emissions is typical, for most municipalities have found they fall around a similar value. While the City Operations emissions may seem small in comparison to the Community emissions, it is still important to make government operations more energy efficient to not only reduce emissions but to also reduce the City's budget, and thus taxes. Furthermore, it is extremely important for the City government to lead by example in the City of Canandaigua and promote more energy conscious practices and sustainable projects within the community.

TABLE 2 hows the breakdown of energy use and emissions by source. ***FIGURE 2*** details a visual representation of municipal operations by source.

Summary Energy & Emissions by Source		
Source	**MMBTU**	**MTCO2e**
Stationary	23,847.00	1,264.00
Electricity	12,885.05	568.52
Vehicles	38,844.13	887.84
Waste	103.44	-16.74
Totals	75,679.62	2,703.62

*Vehicles include Employee Commute in emissions but not energy due to available data

TABLE 2

[2] https://data.worldbank.org/indicator/EN.ATM.CO2E.PC

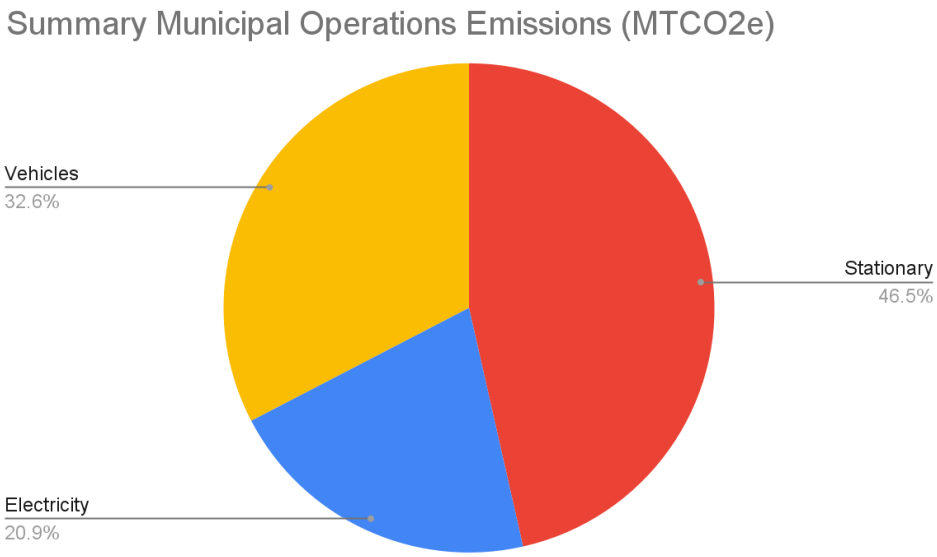


FIGURE 2[3]

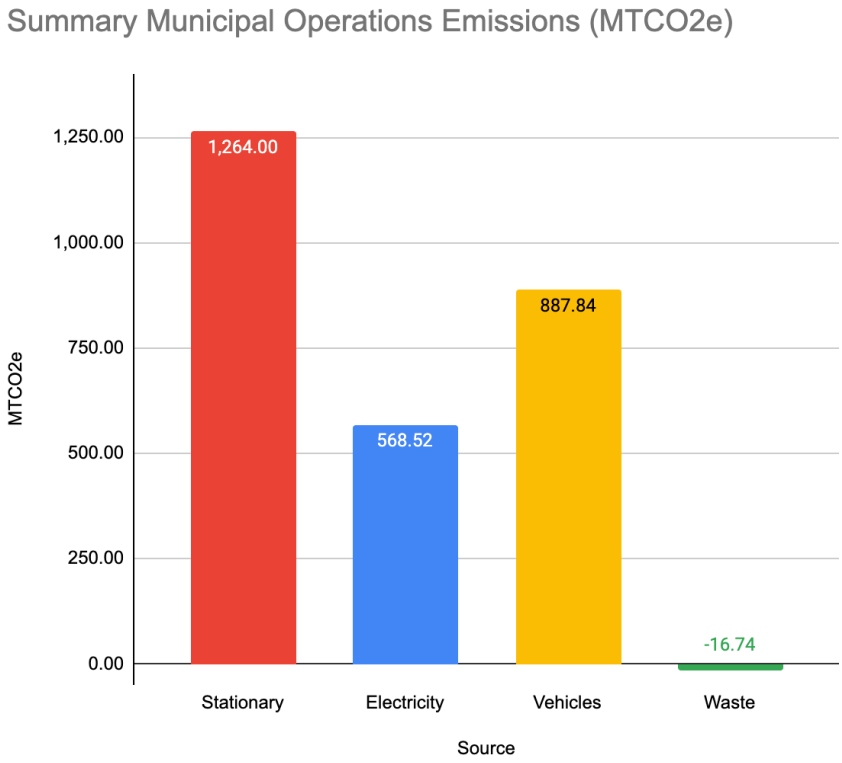


FIGURE 3

[3] Chart does not include waste because there is a negative value to waste emissions.

City Operations Department Breakdown

With the help of City Manager John Goodwin, we identified the different departments that operate within the City of Canandaigua. ***FIGURE 4*** was sent to the team by John Goodwin and based on available data and inventory guidelines, the team identified 5 main departments within City Operations. There is also an additional catchall department titled “Other” in some of the data reporting that could not be simplified into a particular department or was an identified outlier that was owned and operated by the City but that did not fall within one of the 5 main departments or was split between multiples of them. An example of this are Employee Commutes, which span over all departments and cannot be attributed to just one in our analysis.

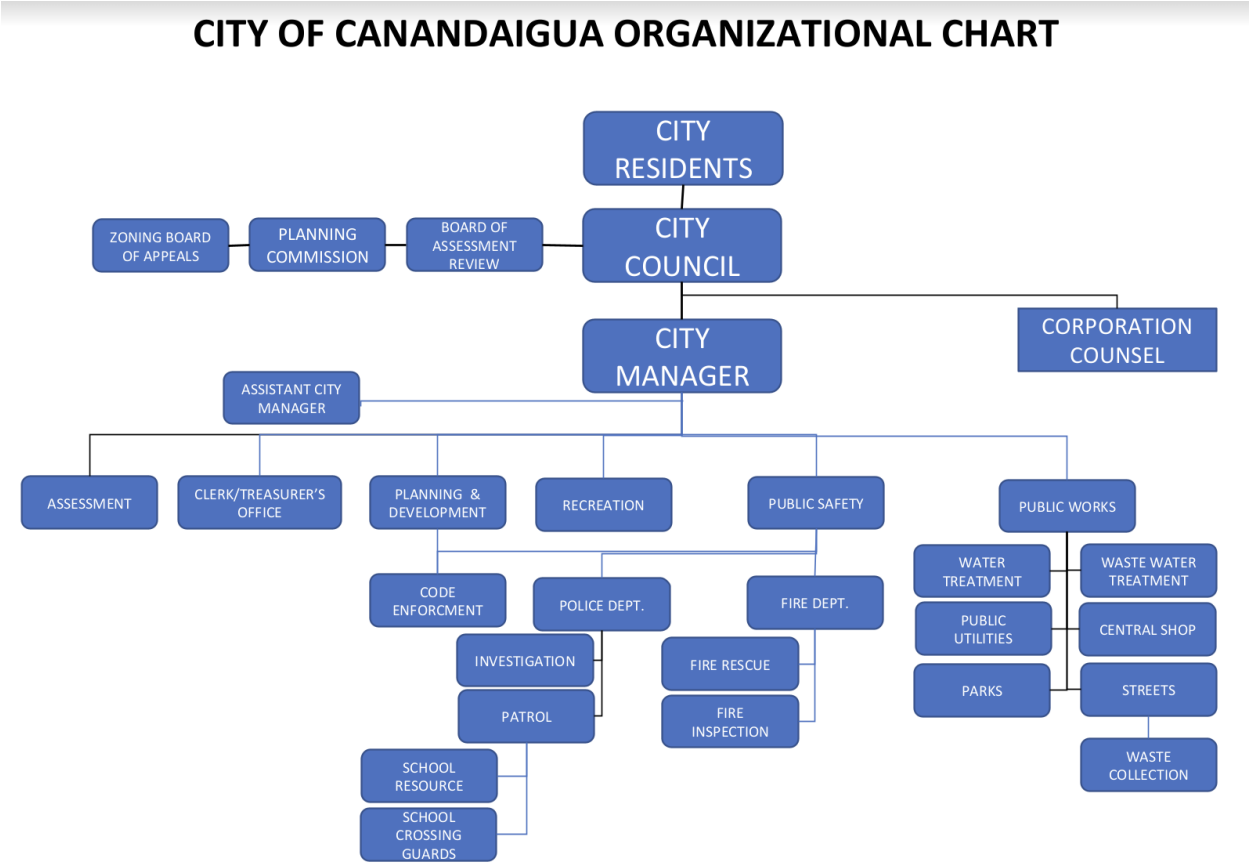


FIGURE 4

The main departments and subdepartments were identified as follows:

- City Hall/City Manager Office
    - Planning and Development
        - Code Enforcement
- Recreation
- Police Department
- Fire Department
    - Rescue
    - Inspection
- Public Works
    - Water Treatment, Public Utilities, Wastewater Treatment, Streets, Street Lights, Waste Collection, Parks

The City Operations analysis contains many different sectors than the Community analysis with each sector relating to a department within the local government operations and the emission sources as Electricity, Stationary (natural gas), Vehicles and Waste. We are using these sectors to assist in preparation of a climate action plan so that as the City is planning for future programs and projects, they will know exactly how many tons of CO_2e each department and sector is releasing into the atmosphere.

There are a variety of energy sources within City Operations including electricity, gasoline, diesel and natural gas. The following breakdowns include all of these sources and are noted within the analyses.

City Operations Data Breakdowns

Energy Use by Department and Source (MMBTU)				
Department	**Electricity**	**Stationary**	**Vehicles**	**Waste**
City Hall	12.00	351.90	226.00	-3.98
Recreation	314.50	NA	NA	NA
Police Department	276.30	305.30	18,964.00	-0.60
Fire Department	0.88	NA	1,216.50	-31.20
Public Works	1,465.60	1,896.80	18,437.70	-68.20
Other	17.10	6.90	NA	NA

TABLE 3

Emissions by Department and Source (MTCO2e)				
Department	**Electricity**	**Stationary**	**Vehicles**	**Waste**
City Hall	0.53	192.00	2.01	-0.14
Recreation	13.87	NA	NA	NA
Police Department	12.19	35.00	168.53	0.42
Fire Department	0.03	NA	45.34	-5.12
Public Works	553.36	1,034.00	428.06	-11.81
Other	0.76	NA	NA	NA

TABLE 4

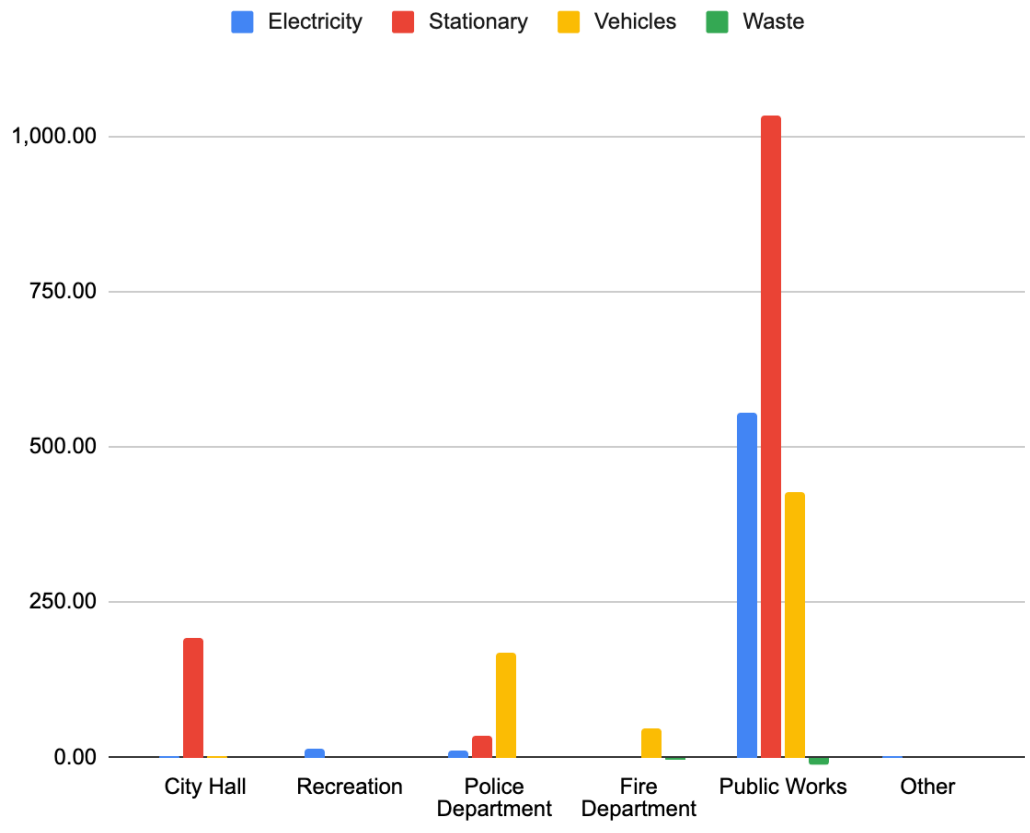


FIGURE 5 (Emissions, $MTCO_2E$)

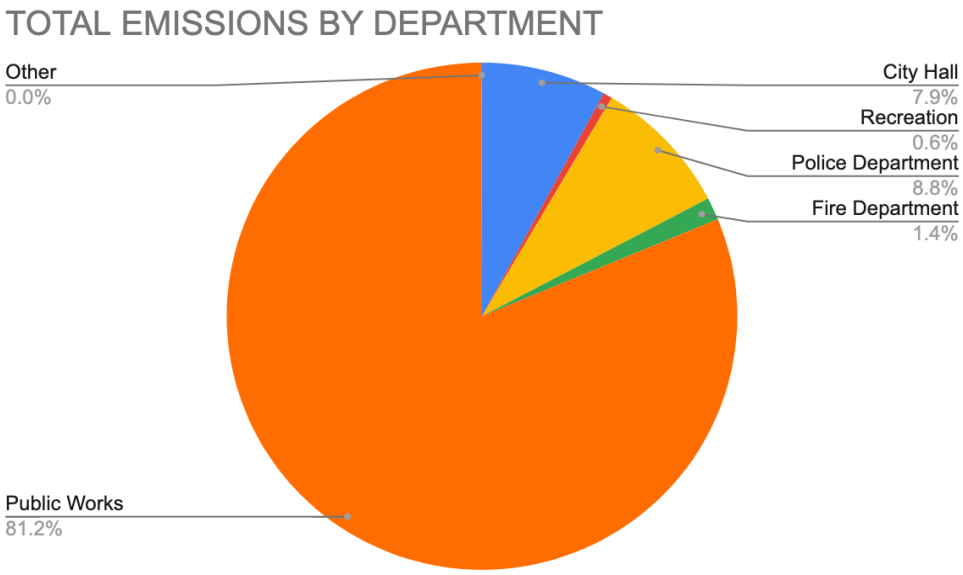


FIGURE 6

City Operations: Electricity and Stationary

The electricity and stationary (natural gas) that is consumed by City Operations is provided by RG&E. In totality, Electricity and Stationary contributes 916.26 $MTCO_2e$ to the City Operations' emissions. Approximately 30% of all emissions are generated within the Department of Public Works operations. The Fire Department contributed the least amount of emissions with a total of 0.03 $MTCO_2e$. Please note that while in 2015 the streetlights were not owned by the City, because they are currently (2021) owned and maintained by the City, we decided to put all streetlight energy usage and emissions within the City Operations inventory as it is now a controlled source of emissions.

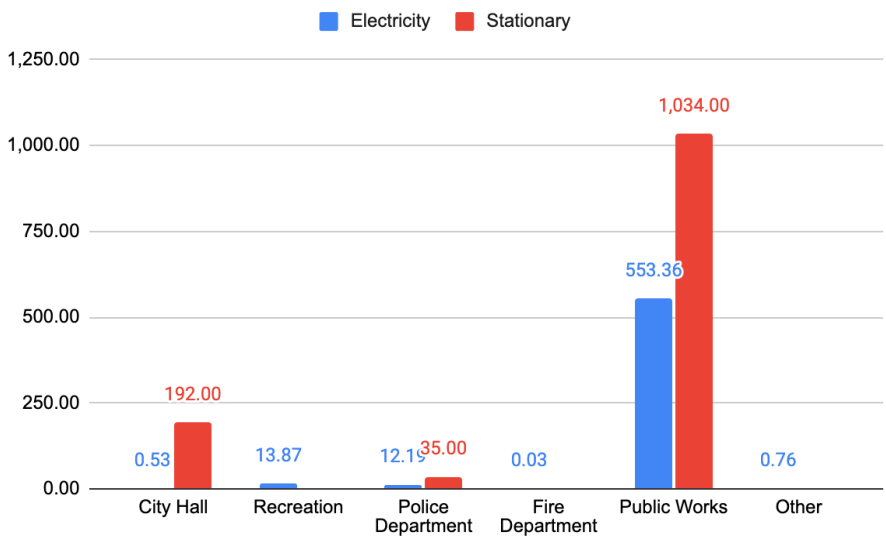


FIGURE 7

City Operations: Vehicles

The Vehicle contribution for emissions and energy use was calculated outside of the Accounting Tool as the data we had did not work with the Tool. The excel spreadsheet that was created to calculate energy usage and emissions for City fleet vehicles is within the document titled *DRAFT_Canandaigua_Municipal_ALL_Data* under the "Vehicles" tab. In totality, City Vehicles contributed 643.94 $MTCO_2e$ to the City Operations' emissions. These emissions make these energy sources the largest contributor to emissions within City Operations.

In ***TABLE 5*** you can see the more detailed breakdown of vehicles into subdepartments within the overarching departments as well as gallons of fuel per fuel type (gasoline versus diesel), cost of that fuel in $2015, emissions, and energy usage. Please note that Employee Commute is not a part of these calculations, as they were calculated separately and detailed later in the report. Data for these calculations were collected from the City's Central Garage Supervisior, were extremely detailed, and included everything needed for proper calculations.

Department	Gallons of Fuel	MT CO2e	Cost Gas	Cost Diesel	Total Cost	MMBtu
Parks	5,386	51.34	$6,553.71	$7,287.19	$13,840.90	3,066.42
DPW Admin	353	3.14	$857.79	$ -	$857.79	353
Central Garage	743	6.6	$1,805.49	$ -	$1,805.49	743
Streets	16,556	160.99	$14,183.91	$29,048.49	$43,232.40	7,309.59
Water	5,227	50.16	$5,737.23	$7,766.86	$13,504.09	2,754.73
Waste	9,788	99.64	$ -	$26,525.48	$26,525.48	1,344.69
Code Enforcement	226	2.01	$549.18	$ -	$549.18	226
Fire Protection	4,541	45.34	$1,669.41	$10,444.34	$12,113.75	1,216.47
Police Protection	18,964	168.53	$46,082.52	$ -	$46,082.52	18,964.00
Street Cleaning	2,144	21.83	$ -	$5,810.24	$5,810.24	294.54
Sewer Collection	1,836	17.98	$ -	$3,479.64	$3,479.64	728.4
Waste Water	1,007.3	8.95	$2,447.74	$ -	$2,447.74	1,007.30
Water Treatment	836	7.43	$2,031.48	$ -	$2,031.48	836
	Gallons of Fuel	**MT CO2e**	**Cost Gas**	**Cost Diesel**	**Total Cost**	**Total**
Total	**67,607.3**	**643.94**	**$81,918.46**	**$90,362.24**	**$172,280.70**	**38,844.13**

TABLE 5

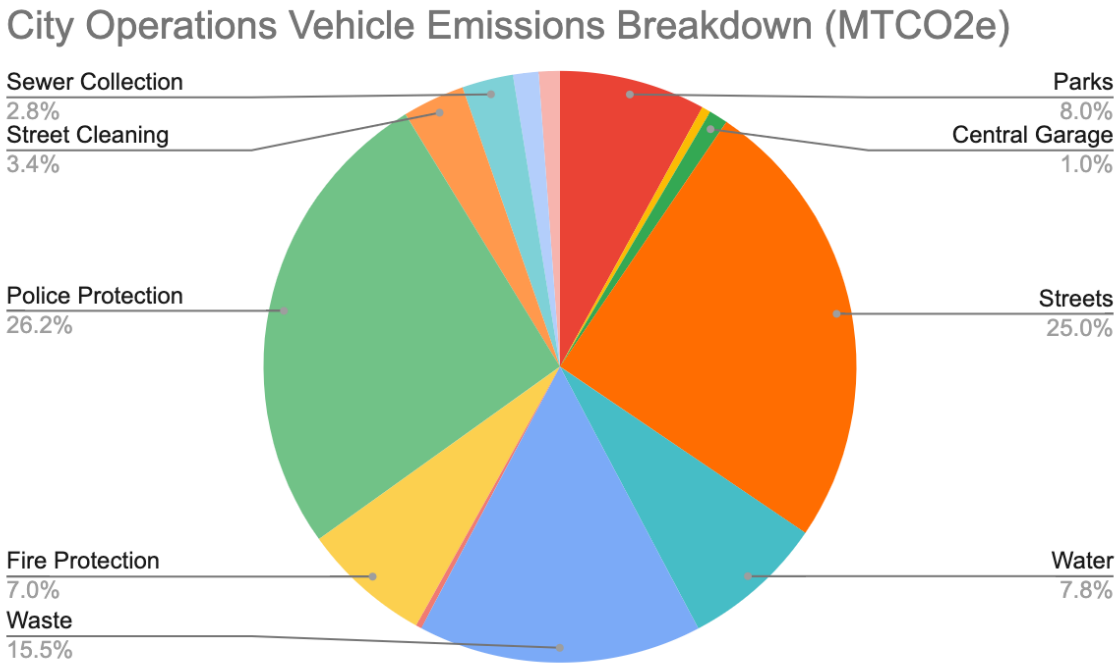


FIGURE 8

A majority of vehicle energy usage and emissions can be attributed to the Department of Public Works, which makes logical sense based on the City's geographic location, services provided, and infrastructure needs. However, it should be noted that the Police Department is a close second largest contributor to emissions, which can mostly be explained by older vehicle usage and idling during vehicle operation. ***FIGURE 9*** depicts the direct correlation between fuel usage and emissions.

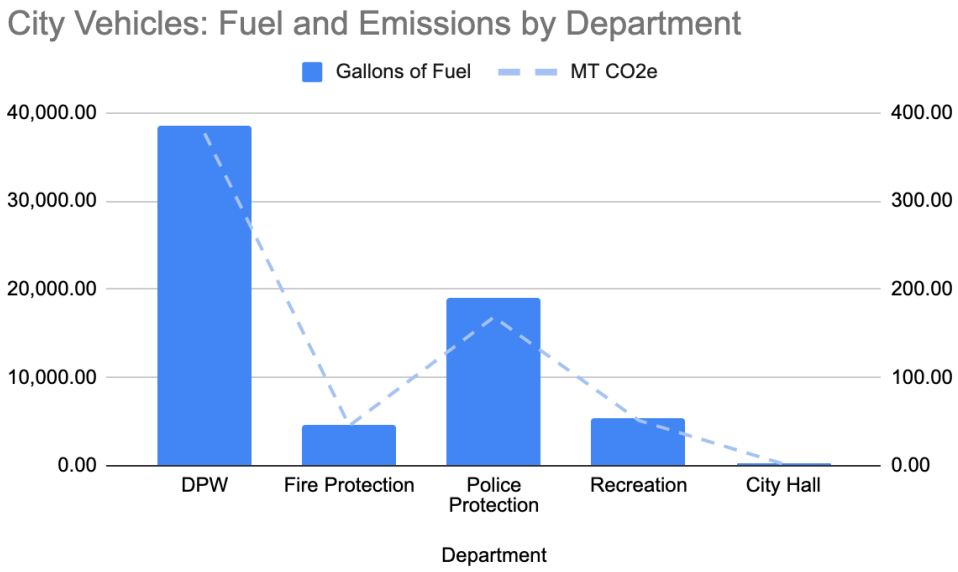


FIGURE 9

Employee Commute vehicle emissions were calculated based on a survey of existing City employees in 2021 that worked for the City in 2015. From this survey we calculated that

employee commutes contribute approximately 34.4 $MTCO_2e$ to City Operations' emissions. As a small aside and comparison, we also survey the same group of employees about their mode of transportation comparing 2015 to 2021 and discovered the following:

	2015	2021
Seasonal Walkers	1	4
Seasonal Bikers	2	2

TABLE 6

In the summary calculations, Employee Commute data was categorically considered "Other" due to it's nature of being cross-departmental and therefore was not divided into the specific departments.

City Operations: Waste

Waste calculations were completed outside of the Accounting Tool. All energy and emissions calculations were done using the EPA WARM tool[4]. Waste data was not available for 2015, so we utilized data that was collected during Impact Earth's Waste Assessment of City Operations dated 2019. Due to they City's existing recycling and composting programs in 2019, Waste generation and processing was a mitigation of emissions totaling -16.74 $MTCO_2e$.

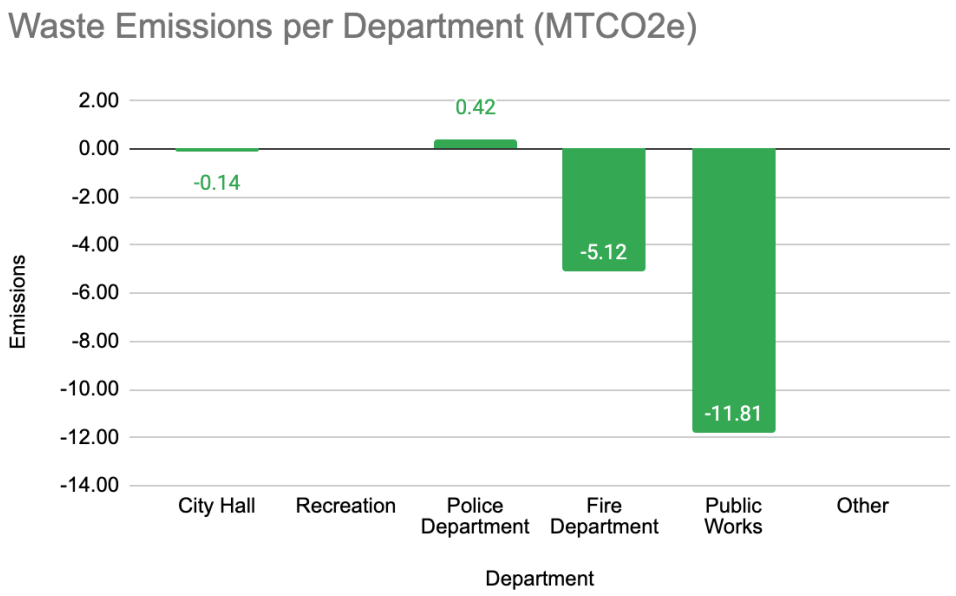


FIGURE 10

[4] All WARM calculation sheets are included in appendices.

Community Emissions Profile

The Community Inventory included the same emissions sources as the City Operations Inventory, but based on the Local Greenhouse Gas Inventory Tool: Community Module, the emissions sources were split up into the following categories: Residential, Commercial, Industrial, Public Authority, Vehicles, and Solid Waste. Furthermore, Thompson Hospital and Canandaigua School District were also noted separately, as these stakeholders provided gas, electricity, transportation, and waste data inputs (school district only). Additionally, school buses and school non-bus vehicles were included in the Community inventory. However, water was excluded in the Community Inventory as a scope 3 emissions source. Water was excluded because the City of Canandaigua withdraws 100% of its water locally (rather than importing) from Canandaigua Lake[5].

Year	Amount of Raw Water Withdrawn (Gallons)	Amount of Finished Water (Gallons)
2019	1,516,260,000	1,437,540,000
2020	1,555,030,000	1,480,210,000
2021 (as of July 13)	791,065,000	743,961,000

TABLE 7: Amount of Water Withdrawn and Distributed to the City of Canandaigua

The Community Inventory emissions account for 97.1% of the total emissions in the City of Canandaigua. These emissions total 90,142 $MTCO_2e$. ***TABLE 8*** shows the breakdown of energy use and emissions by source. ***FIGURE 11*** details a visual representation of the community by source. Additionally ***TABLE 9*** shows the breakdown of energy use and emissions by sector and ***FIGURE 12*** details a visual representation of the community by sector.

Summary Energy & Emissions by Sector		
Sector	**MMBTU**	**MTCO2e**
Residential	474,725	23,612
Commercial/Institutional	444,193	22,261
Industrial	103,386	5,097
Other Commercial/Insitutional - School	48,862	3,789
Other Commercial/Insitutional - Hospital	98,075	4,973
Public Authority	82,799	4,382
Other - No Specific Category	428,576	23,335
Totals	1,680,616	87,449

TABLE 8

[5] Email from Peter Virkler, Chief Operator Canandaigua Water Plant on July 14, 2021.

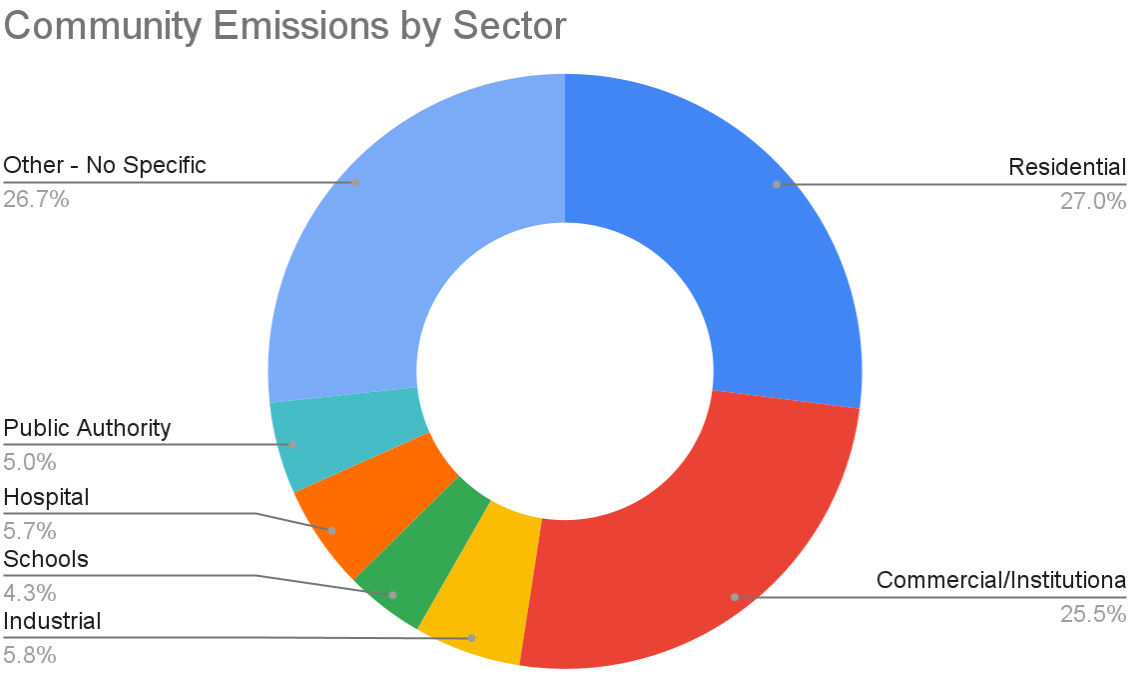


FIGURE 11

Summary Energy & Emissions by Source		
Source	**MMBTU**	**MTCO2e**
Stationary	881,699	46,894
Electricity	359,021	15,841
Vehicle	428,576	29,340
Solid Waste	11,320	-1,347
Water	NA	NA
Urban Forestry	NA	-3,279
Totals	1,680,616	87,449

TABLE 9

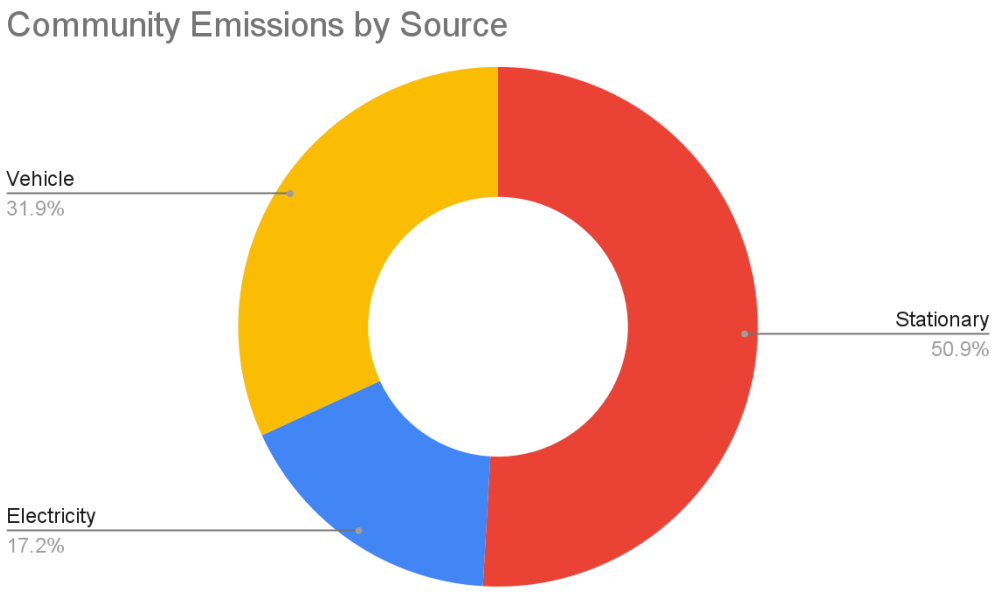


FIGURE 12[6]

Community: Electricity and Stationary

The electricity and stationary (natural gas) that is provided to the community of the City of Canandaigua is provided by RG&E. Stationary is the major emitter which can be contributed to the use of natural gas as the main source of heat for buildings across all sectors. Electricity contributes a total of 15,841 $MTCO_2e$ while Stationary contributes a total of 46,893 $MTCO_2e$.

[6] Note that Solid Waste & Urban Forestry are not represented in this pie chart as they are a negative value.

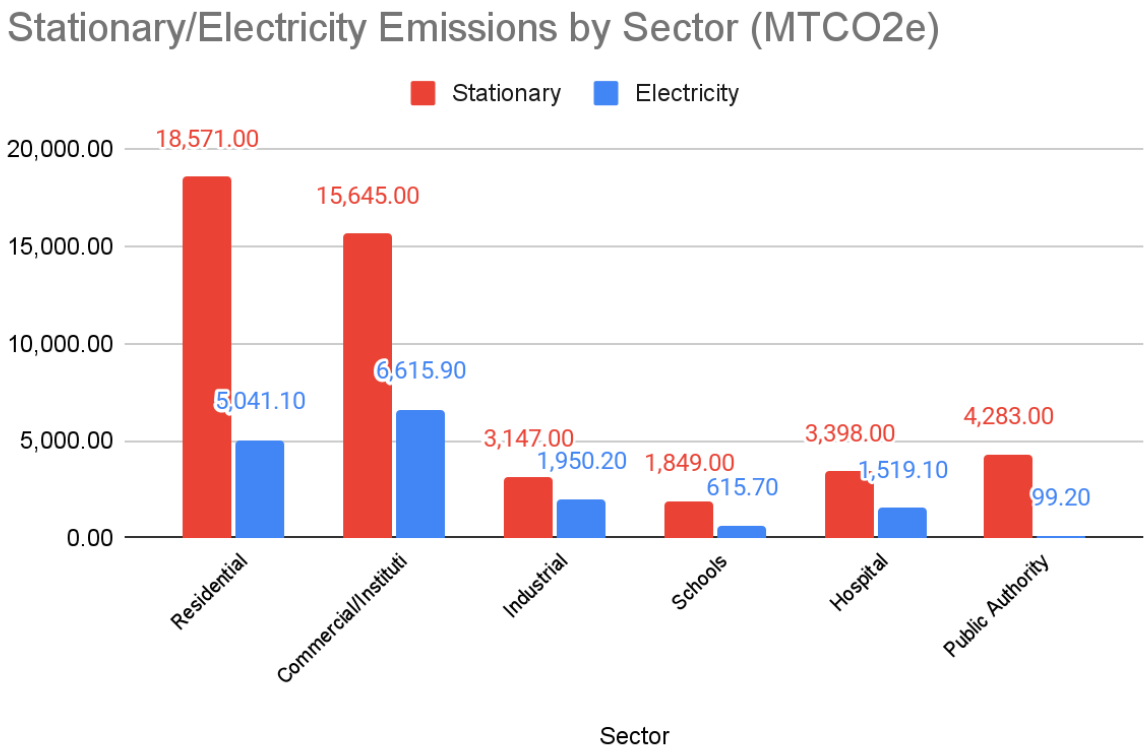


FIGURE 13

Based on the population of the community, it can be estimated that residents contribute 4.43 $MTCO_2e$ from their use of natural gas and 1.50 $MTCO_2e$ from their use of electricity within their own homes.

Community: Vehicles

Calculations for the Community's vehicles were conducted within the recommended methodology provided by the New York Community and Regional GHG Inventory Guidance. Vehicle emissions were calculated outside of the Community Module Tool due to lack of available data. Despite this slight change in calculation method, Ontario County Community level transportation data inputs were provided by Chris Tortora from the Genesee Transportation Council (GTC) via email on April 27 and May 19, 2021.

This data included:

1. Estimated VMT (vehicle miles traveled) for one day using GTC's travel demand model for the City of Canandaigua. It is an average weekday in September/October 2015. This one day estimate was used to estimate VMT/year
2. A breakdown of vehicle types using the percentage of population using each vehicle type for Ontario County (passenger cars, motorcycles, etc.) for the year 2017.

The energy, transportation, and waste data received from the hospital and school district stakeholders was subtracted from any community level data and noted separately.

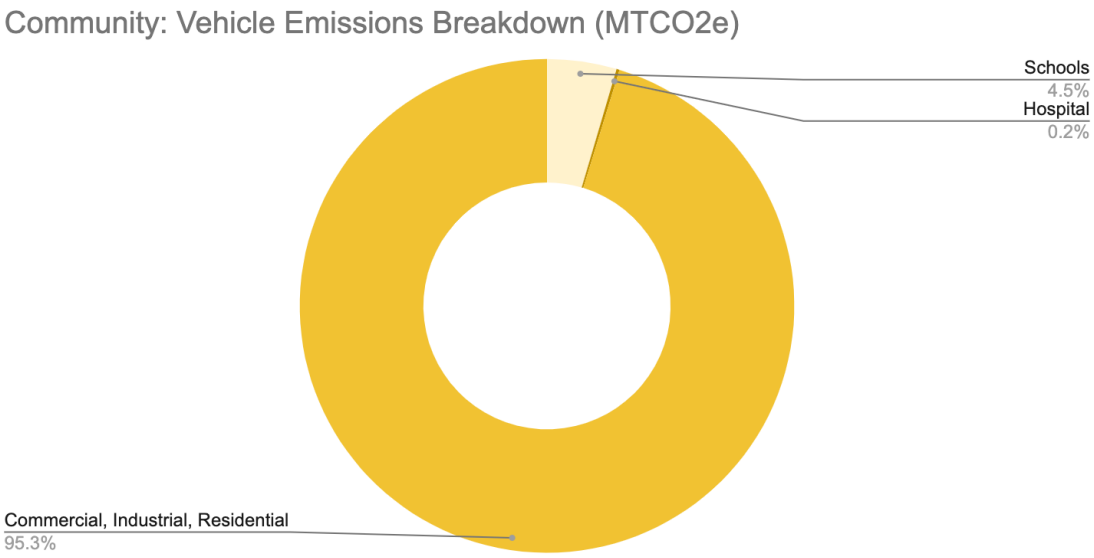


FIGURE 14

When summarized, vehicle emissions contributed to overall emissions from the community by producing 29,340 $MTCO_2e$. This is approximately 31.4% of total emissions within the community inventory.

Community: Solid Waste

In this inventory, the way that the data was communicated to the team limited the ability to provide detailed calculations for solid waste and specifics about where it originated. As such, 99.4% of the waste produced in the City of Canandaigua is attributed to residential and commercial sources combined together, and 0.6% of the waste is produced within the School

District. We were able to separate out the school data because it was provided separately from the rest of the data which was provided as summary information by Casella.

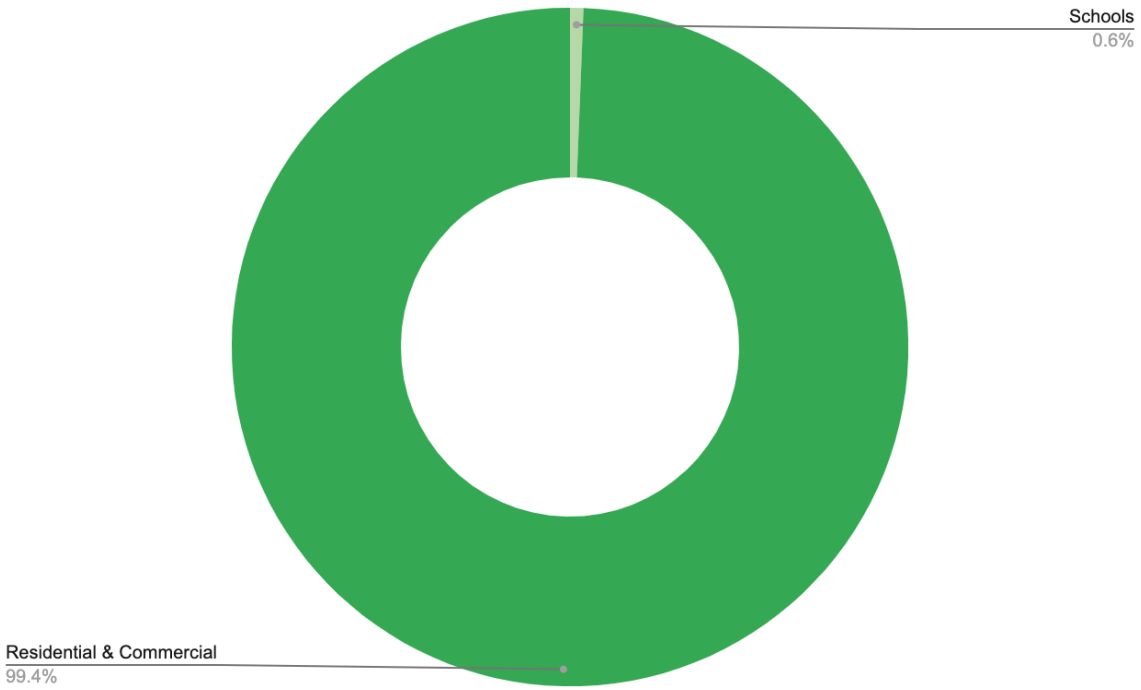


FIGURE 15

In total, solid waste contributes -1,347 $MTCO_2e$ to the entire emissions produced in the community. This mitigates approximately 1.4% of the total emissions produced within the community inventory. This emissions mitigation can be contributed to the community's rate of recycling and composting.

Community: Urban Forestry

The one section of the Community Inventory that did not contribute, but rather mitigated emissions was the Tree Canopy within the City of Canandaigua.

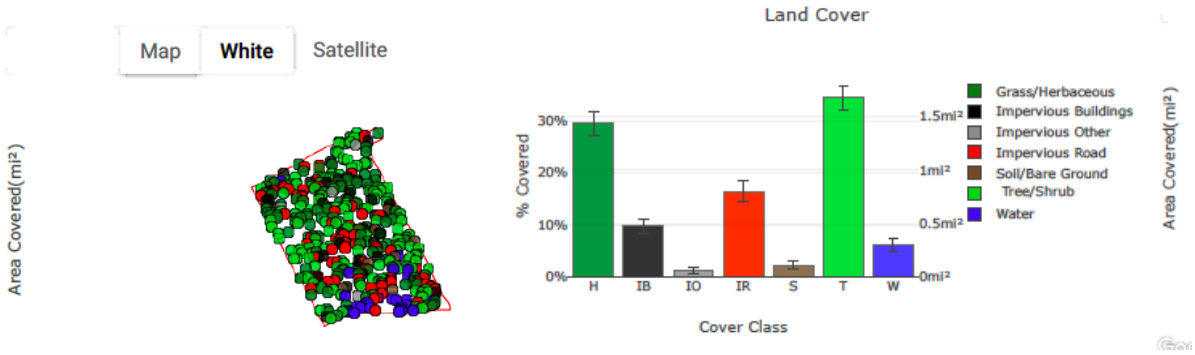


FIGURE 16: Developed with: i-Tree Canopy, April 21th, 2021

400 data points were taken using i-Tree Canopy and the following summary was determined:

1. City of Canandaigua total area: 11.8 km^2 (4.6 sq. miles)
2. Percent forest coverage (via iCanopy): 34%
3. Total carbon sequestration from urban trees: 3,279 $MTCO_2e$

So, in total, the existence of the urban forest within the City of Canandaigua geographic boundaries actually sequesters approximately 3,279 $MTCO_2e$ from the atmosphere. This sequestration offsets an estimated 3.51% of total emissions that are produced within the Community Inventory sources of GHG emissions. This further proves it's importance to be preserved, protected, and maintained into perpetuity.

SECTION 4: PROJECTIONS

We developed a forecast for the City of Canandaigua's emissions to project into 2050. These projections were developed based on the City's identified alignment with NYS emissions reductions goals as well as a BAU projections based on a 10% growth rate from 2015 to 2020.

	GHG Emissions (MTCO2e)	NYS Goal 2030 (40% reduction)	NYS Goal 2050 (85% reduction)
	2015	**2030**	**2050**
Community	90,566	54,340	13,585
Municipal	2,703	1,622	405
Total	93,269	55,961	13,990

TABLE 10

	BAU Emissions Growth	Projected Emission Reduction
2015	93,269	93,269
2025	102,596	76,947
2030	107,259	55,961
2050	125,913	13,990

TABLE 11

The reduction potential exists based on these projects to implement projects, processes, policies, and initiatives that close the gap between the BAU growth and the emissions reductions goals. The difference between the 2030 data is an approximate 47% reduction in emissions and the 2050 data is an approximate 88% reduction in emissions from the BAU emissions growth.

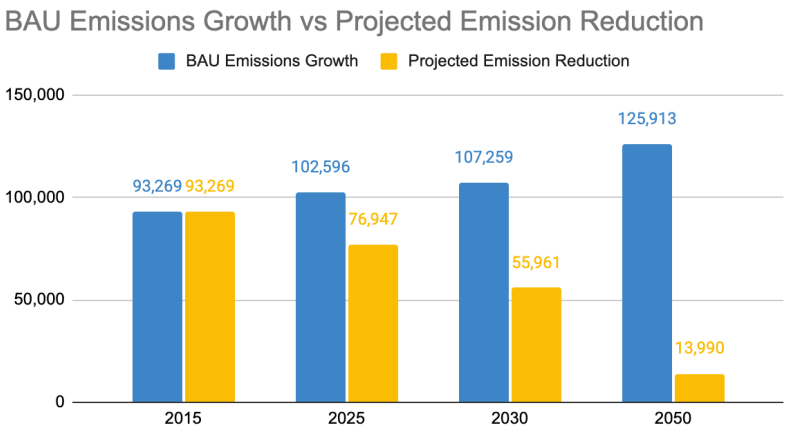


FIGURE 17

Knowing these numbers helps when trying to set specific intermediary reductions goals and determining which actions need to be prioritized to meet these goals.

SECTION 5: RECOMMENDATIONS

This project was originally created because of how many projects, actions, and initiatives the City of Canandaigua has started or completed in the last 5 years or so (2015-2021). These climate actions included large capital projects like installing a solar array as well as the purchasing and transfer of ownership of the streetlights to City Operations. There are these larger actions as well as smaller (or seemingly smaller) actions that have been completed since 2015 that need to be, and should be inventoried in the next City GHG Inventory to properly keep track of and identify the impact of these actions on the City and the Community's emissions profile.

Relating to future steps towards climate action, specifically related to GHG emissions and inventories, our recommendations are as follows:

1. Perform a GHG Inventory and update with the latest data every 5-10 years starting in 2025.
2. Utilize the data and analysis presented in this report to inform a formal climate action plan, including a GHG Inventory update in 2025, 2030, 2040, 2050 and so on.
3. Utilize this report's finding to prioritize projects and actions that will impact the sectors or sources that have the largest opportunity for emissions reductions.
    a. For example, spearhead an initiative that targets reducing emissions within the Department of Public Works and their vehicle emissions, or target resident behaviors such as energy savings in the winter time which would directly impact stationary emissions.

We appreciate the opportunity to inventory this data, work with the CSC Committee and other stakeholders, and present this information to help the City of Canandaigua continue their progress towards a more efficient and sustainable future.

SECTION 6: ASSUMPTIONS & CALCULATIONS

Municipal Vehicles

Calculations:
8,887 grams of CO2/gallon of gasoline = 8.887 × 10-3 metric tons CO2/gallon of gasoline
10,180 grams of CO2/gallon of diesel = 10.180 × 10-3 metric tons CO2/gallon of diesel
Coefficients from the EPA
https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

Total Cost per year (2015)= annual fuel consumption (gallons)*2015 average price of gasoline (or price of diesel)

I. $2.71 per gallon of diesel in 2015
II. $2.43 per gallon of gasoline in 2015
III. Average Cost From (https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_nus_a.htm) Diesel (On-Highway) - All Types

Assumptions:

- Emissions were calculated using gallons of fuel consumed (provided by City) and not miles traveled (also provided by City)
- “Vehicles” include all City owned fuel-burning machinery that they keep track of (for example, dump trucks, street cleaners, and lawn mowers)
- Based on calculated MPG of vehicles, and expected EPA MPG, approximately 11% of vehicles spend a decent amount of time idling because fuel burned is high while mileage is very low.

Community Assumptions and Calculations

Community Vehicles

A. Methods/sources

1. City of Canandaigua School district gave us **2018-2019 data:** gallons consumed per general vehicle type that consume gas or diesel. School bus data obtained via email on 4/8 from Seth Clearman

2. Hospital - Thompson Health/UMRC data from Jim dietz via email 4/14/2021- gave us total gasoline consumption; will use light duty vehicle for hospital vehicles- **2015** total gallons consumed by all vehicles:

a) 3 pickup trucks (2- 250 and 1- 450), 1 lab/security economy small vehicle, and 1- 15 passenger bus for CCC. All consume gasoline

3. All other community data- from Chris Tortula at GTc- provided estimated total VMT (Vehicle Miles Traveled) for one day for the city boundary -192179.96 miles

B. Assumptions/factors

1. Annual Gallons per fuel sources* CO2 emissions in KG/gallon of gas = total CO2 annual emissions in Kg
    a) 8.78 kg/gallon gas and 10.21kg/gallon diesel from emissions tool we used to do Town of Brighton (also on EPA community spreadsheet
2. Total CO2 Emissions (metric tons) = Total CO2 emissions in Kg/year* 0.001
3. MMBtu = annual consumption of diesel fuel*.14 or annual consumption of gasoline*.13
4. **Total Cost per year (2015)**= annual fuel consumption (gallons)*2015 average price of gasoline (or price of diesel)
    a) $2.71 per gallon of diesel in 2015
    b) $2.43 per gallon of gasoline in 2015
    c) Average Cost From (https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_nus_a.htm) Diesel (On-Highway) - All Types

5. For Community VMT conversions:
    a) 2017 Monroe County population and allocation per vehicle type (motorcycle, non school busses, school bus, light duty vehicles (passenger cars and small SUV/trucks), etc.)-he figured that would be closer to the city of canandaigua as Ontario County is more rural.
    b) MPG- based on 2015 US DOT FHA-https://www.fhwa.dot.gov/policyinformation/statistics/2015/vm1.cfm
    c) 192179.96 miles/one day*365 days/year= total VMT
    d) Yearly fuel consumed= total VMT per year per vehicle type*MPG per vehicle type in 2015)
    e) Need to take out hospital and school bus data- the GTC overestimates school bus..
6. City of Canandaigua School District

a) We service 27 schools (3 are in district); 3608 are scheduled riders and 196 are scheduled walkers; we have total mileage but not per fuel type (total mileage is 775,000). They provided 2018-2019 school year data b/c it would be too hard to go back to 2015 Data provided on 4/8 by seth clearman

b) Re: gasoline vehicles- seth on 4/9:Hi Erinn, For the unleaded fuel usage, -Our 12 passenger school buses, Chevy Tahoes (registered as school bus), Ford Expeditions- district vehicle- non school bus, maintenance vehicles and various school equipment all use unleaded. 72% would be school bus usage.

C. Issue/Other-

1. Should we use monroe county vehicle type allocation?

2. Using 2015 $ per gallon with 2018-2019 data?

Forestry coverage/Tree Canopy:

A. Methods/sources

1. Used icanopy to determine total forestry coverage- there is no way to break it down per sector.

2. Comp plan uses a value of 4.6 sq miles - Abbi found 12.55 km2 which converts to 4.7 sq miles.

3. we got 34%

B. Assumptions/factors

1. 1 km2 = .39 sq miles (from emissions tool)

2. Carbon Sequestration Factor (from Source: EPA State Inventory Tools, Land-Use Land Use Change and Forestry module)- from EPA community tool= 2.23 (metric ton C/hectare/year)

Community Electricity and Gas

A. Issues

1. RGE data is weird and we need to find out the terminology- not presented in a way we received for the town of brighton- but once we figure out- we

probably can differentiate residential, small business/commercial, industrial. This data is 2016, 2017, 2018, 2019, and 2020- not 2015.

a) *We can use 2016 as an estimate for 2015 or do a multi year (2016-2019)…*

2. Hospital gave us Electricity and gas for 2015- Need to create a spreadsheet for hospital E/g/oil- I started a spreadsheet for community based on Town of Brighton's.

3. no data from the schools but they said they would give us data- will try again in May- it might only be for 2018-2019 year but that is probably similar

RGE UER Community Electric/Gas Information:

A. Defintitions from https://utilityregistry.org/app/UER.National.Protocol.Feb2020.pdf

1. "The UER Protocol includes residential (R), commercial (C), and industrial (I) consumption, and combinations like non-residential (C+I) and total (T=R+C+I)…Utilities then have a choice. They can either publish R and C they merge I and C and report R, C+I (non-residential), and T. The latter is preferred as it provides total consumption while preserving some sector granularity. " NYS reports R, SC, O- not I or C… see pp. 12-13

2. Residential Consumption (R): An energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances. The residential sector excludes institutional living quarters.

3. Small Commercial (SC): This is all **non-residential** rates classes eligible for opt-out Community Choice Aggregation in New York7 . This field differs from the Commercial data field in the National UER Data Field Library since not all commercial businesses are opt-out eligible.

4. Other (O): This is all non-residential rates classes not opt-out eligible for opt-out Community Choice Aggregation in New York8 . These are **typically large commercial and industrial rate classes o**n demand meters.

5. Small Consumer (R+SC): A combination of residential and small commercial sectors.

6. Business (SC+O): See the National UER Data Field Library for this definition. This is also called nonresidential.

7. Under the National UER Data Field Library - Commercial Consumption (C): An energy-consuming sector that consists of service-providing facilities and equipment of: **businesses; federal, state, and local governments; and other private and public organizations, such as religious, social, or fraternal groups**. The commercial sector includes institutional living quarters. It also includes **sewage treatment facilities.**

    a) **Industrial Consumption (I):** An energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity: manufacturing (NAICS codes 31-33); agriculture, forestry, fishing, and hunting (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); and construction (NAICS code 23).

Email from Jim:

Jim Yienger <**jim.yienger@utilityregistry.org**> 9:03 AM (1 hour ago)

to Picardo, Laurie

You are viewing an attached message. Gmail can't verify the authenticity of attached messages.

Hi again Laurie-

Please find attached REG's data from 2010-2015 for your whole service territory. This was prepared by Alan Hoffman year ago for the pre UER pilot. See row 89.

Advise the City that to be comparable to 2016-2020 UER data, they should make the 2015 GHG inventory with total electricity consumption broken only into residential and non-residential sectors

2010-2015 pre-UER pilot data: Residential is there, and then all others added up (commercial, industrial, public authorities, and streetlighting) equal non-residential

2016-2020 UER data: Use Residential (R) , and Business (SC+O)

Feel free to forward to them, we'd be happy to answer any detailed questions.

Jim

Jim Yienger

Principal

Climate Action Associates LLC

Cell: 518-560-9830

"Tomorrow's innovations, today"

From: Picardo, Laurie <Laurie_Picardo@rge.com>

Sent: Tuesday, May 11, 2021 3:51 PM

To: Jim Yienger <jim.yienger@utilityregistry.org>

Subject: Energy Usage Data Request for the City of Canandaigua

Hi Jim,

The City of Canandaigua's vendor is seeking energy usage data from 2015 to conduct a greenhouse gas emission analysis. The City of Canandaigua is requesting data from 2015 because it was the year before they installed a solar array. The City of Canandaigua would like to use this information comparatively. The data provided on NYSERDA's website does not include 2015 data nor does it include the City of Canandaigua. Allan Hoffman provided me with your contact information and informed me that you have provided this data in the past. I hope you can help me with this request.

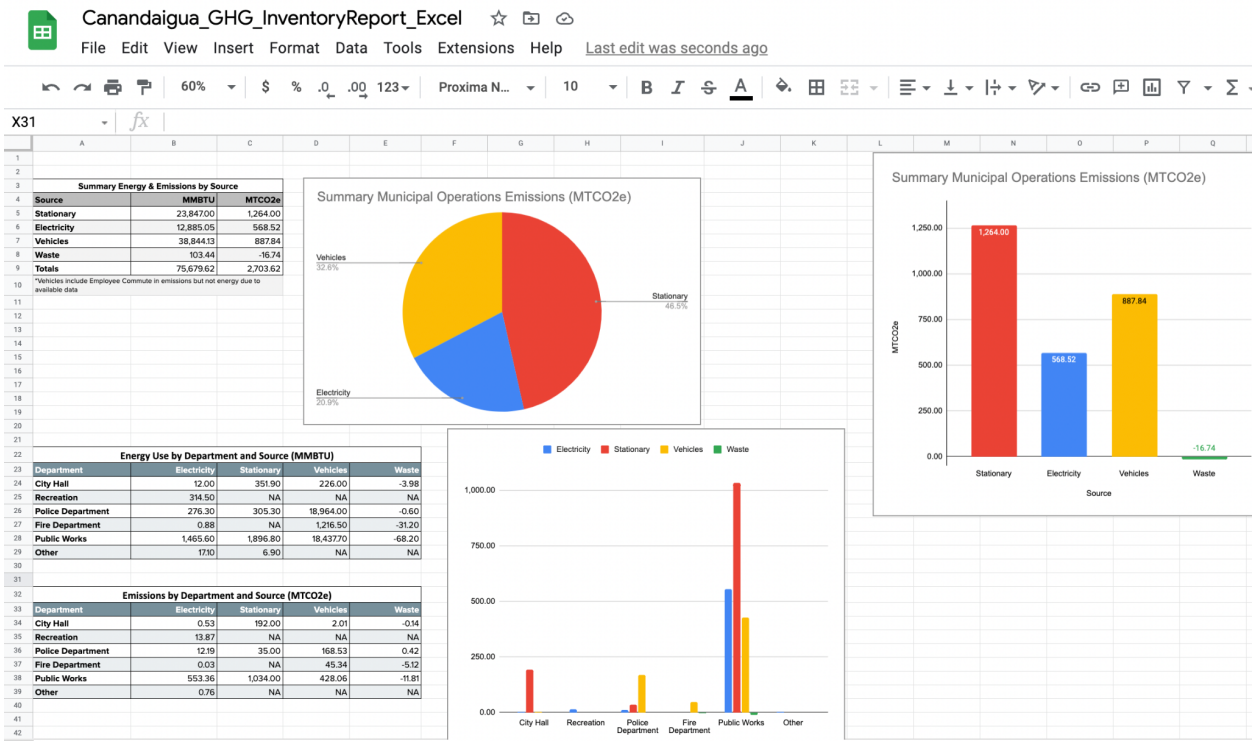
Please let me know if you can provide this information to me.

Thank you,

Laurie

SECTION 7: APPENDICES

Municipal Operations Inventory



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Summary Energy & Emissions by Source

Source	MMBTU	MTCO2e
Stationary	23,847.00	1,264.00
Electricity	12,885.05	568.52
Vehicles	38,844.13	887.84
Waste	103.44	-16.74
Totals	75,679.62	2,703.62

*Vehicles include Employee Commute in emissions but not energy due to available data

Summary Municipal Operations Emissions (MTCO2e)

Vehicles 32.8%
Stationary 46.5%
Electricity 20.9%

Summary Municipal Operations Emissions (MTCO2e)

1,264.00
568.52
887.84
-16.74
MTCO2e
Stationary
Electricity
Vehicles
Waste
Source

Energy Use by Department and Source (MMBTU)

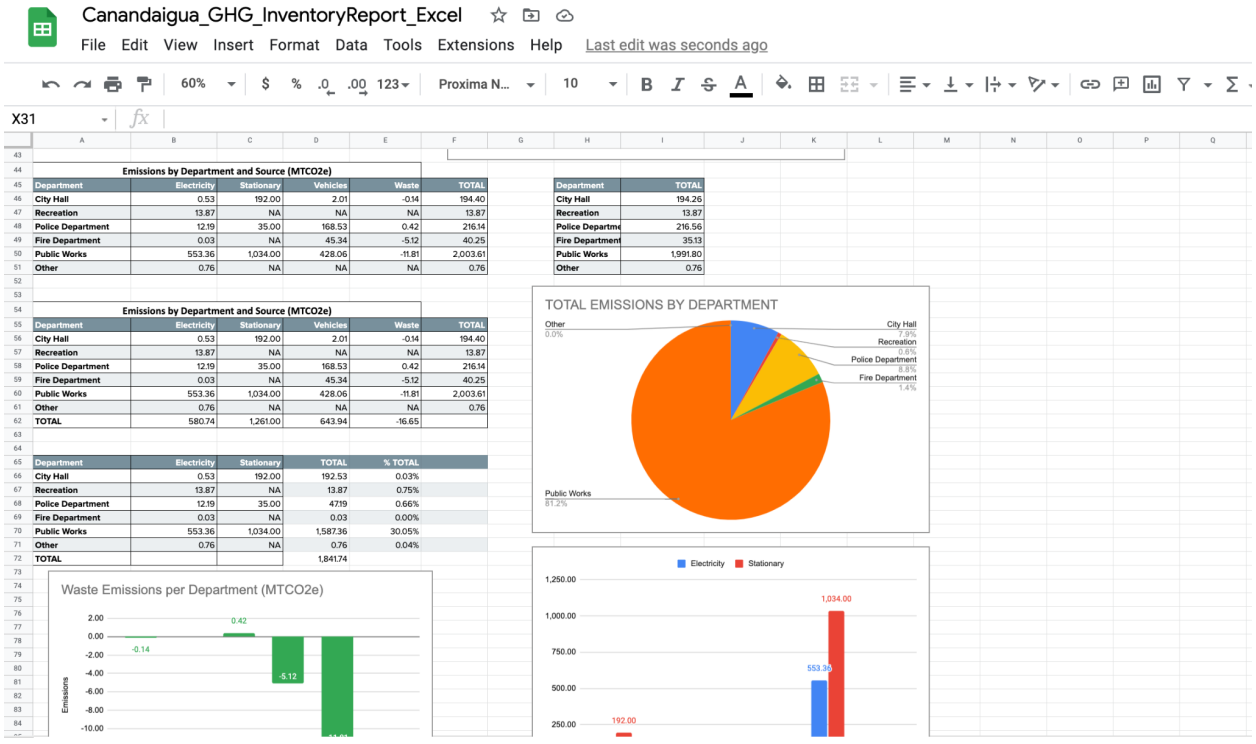
Department	Electricity	Stationary	Vehicles	Waste
City Hall	12.00	351.90	226.00	-3.98
Recreation	314.50	NA	NA	NA
Police Department	276.30	305.30	18,964.00	-0.60
Fire Department	0.88	NA	1,216.50	-31.20
Public Works	1,465.60	1,896.80	18,437.70	-68.20
Other	17.10	6.90	NA	NA

Emissions by Department and Source (MTCO2e)

Department	Electricity	Stationary	Vehicles	Waste
City Hall	0.53	192.00	2.01	-0.14
Recreation	13.87	NA	NA	NA
Police Department	12.19	35.00	168.53	0.42
Fire Department	0.03	NA	45.34	-5.12
Public Works	553.36	1,034.00	428.06	-11.81
Other	0.76	NA	NA	NA

Electricity Stationary Vehicles Waste

City Hall Recreation Police Department Fire Department Public Works Other



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Emissions by Department and Source (MTCO2e)

Department	Electricity	Stationary	Vehicles	Waste	TOTAL
City Hall	0.53	192.00	2.01	-0.14	194.40
Recreation	13.87	NA	NA	NA	13.87
Police Department	12.19	35.00	168.53	0.42	216.14
Fire Department	0.03	NA	45.34	-5.12	40.25
Public Works	553.36	1,034.00	428.06	-11.81	2,003.61
Other	0.76	NA	NA	NA	0.76

Department	TOTAL
City Hall	194.26
Recreation	13.87
Police Departme	216.56
Fire Department	35.13
Public Works	1,991.80
Other	0.76

Emissions by Department and Source (MTCO2e)

Department	Electricity	Stationary	Vehicles	Waste	TOTAL
City Hall	0.53	192.00	2.01	-0.14	194.40
Recreation	13.87	NA	NA	NA	13.87
Police Department	12.19	35.00	168.53	0.42	216.14
Fire Department	0.03	NA	45.34	-5.12	40.25
Public Works	553.36	1,034.00	428.06	-11.81	2,003.61
Other	0.76	NA	NA	NA	0.76
TOTAL	580.74	1,261.00	643.94	-16.65	

Department	Electricity	Stationary	TOTAL	% TOTAL
City Hall	0.53	192.00	192.53	0.03%
Recreation	13.87	NA	13.87	0.75%
Police Department	12.19	35.00	47.19	0.66%
Fire Department	0.03	NA	0.03	0.00%
Public Works	553.36	1,034.00	1,587.36	30.05%
Other	0.76	NA	0.76	0.04%
TOTAL			1,841.74	

TOTAL EMISSIONS BY DEPARTMENT

Other 0.0%
City Hall 7.9%
Recreation 0.8%
Police Department 8.8%
Fire Department 1.4%
Public Works 81.2%

Waste Emissions per Department (MTCO2e)

2.00
0.00
-2.00
-4.00
-6.00
-8.00
-10.00
Emissions
-0.14
0.42
-5.12

Electricity Stationary

1,250.00
1,000.00
750.00
500.00
250.00
1,034.00
553.36
192.00

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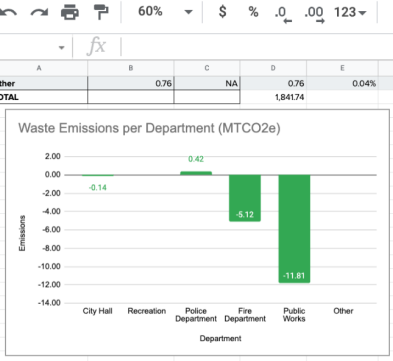
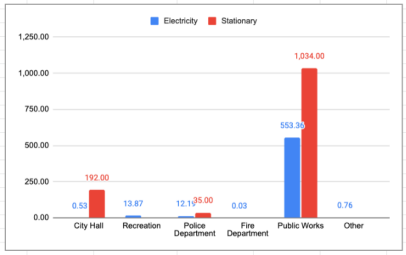
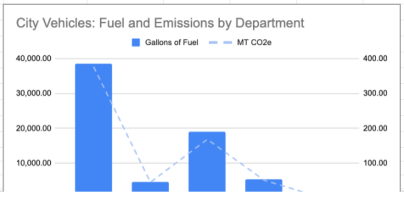




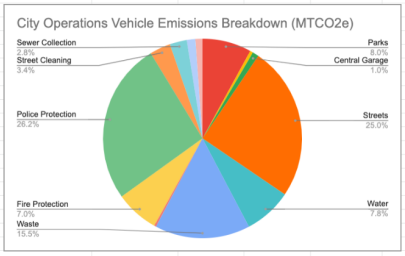
Other	0.76	NA	0.76	0.04%
TOTAL			1,841.74	

Department	Gallons of Fuel	MT CO2e	Cost Gas	Cost Diesel	Total Cost	MMBtu
Parks	5386	51.34	$6,553.71	$7,287.19	$13,840.90	3,066.42
DPW Admin	353	3.14	$857.79	$ -	$857.79	353
Central Garage	743	6.6	$1,805.49	$ -	$1,805.49	743
Streets	16556	160.99	$14,183.91	$29,048.49	$43,232.40	7,309.59
Water	5227	50.16	$5,737.23	$7,766.86	$13,504.09	2,754.73
Waste	9788	99.64	$ -	$26,525.48	$26,525.48	1,344.69
Code Enforcement	226	2.01	$549.18	$ -	$549.18	226
Fire Protection	4541	45.34	$1,669.41	$10,444.34	$12,113.75	1,216.47
Police Protection	18964	168.53	$46,082.52	$ -	$46,082.52	18,964.00
Street Cleaning	2144	21.83	$ -	$5,810.24	$5,810.24	294.54
Sewer Collection	1836	17.98	$ -	$3,479.64	$3,479.64	728.4
Waste Water	1007.3	8.95	$2,447.74	$ -	$2,447.74	1,007.30
Water Treatment	836	7.43	$2,031.48	$ -	$2,031.48	836
	Gallons of Fuel	MT CO2e	Cost Gas	Cost Diesel	Total Cost	Total MMBTU
Total	67607.3	643.94	$81,918.46	$90,362.24	$172,280.70	38,844.13

Department	Gallons of Fuel	MT CO2e
DPW	38,490.30	376.72
Fire Protection	4,541.00	45.34
Police Protection	18,964.00	168.53
Recreation	5,386.00	51.34
City Hall	226.00	2.01



City Operations Vehicle Emissions Breakdown (MTCO2e)



Canandaigua_GHG_InventoryReport_Excel

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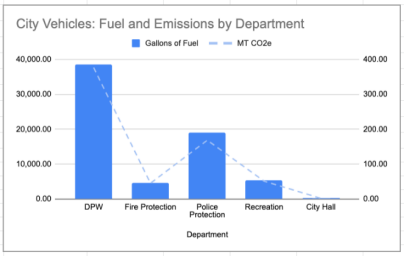
Department	Gallons of Fuel	MT CO2e	Cost Gas	Cost Diesel	Total Cost	MMBtu
Parks	5386	51.34	$6,553.71	$7,287.19	$13,840.90	3,066.42
DPW Admin	353	3.14	$857.79	$ -	$857.79	353
Central Garage	743	6.6	$1,805.49	$ -	$1,805.49	743
Streets	16556	160.99	$14,183.91	$29,048.49	$43,232.40	7,309.59
Water	5227	50.16	$5,737.23	$7,766.86	$13,504.09	2,754.73
Waste	9788	99.64	$ -	$26,525.48	$26,525.48	1,344.69
Code Enforcement	226	2.01	$549.18	$ -	$549.18	226
Fire Protection	4541	45.34	$1,669.41	$10,444.34	$12,113.75	1,216.47
Police Protection	18964	168.53	$46,082.52	$ -	$46,082.52	18,964.00
Street Cleaning	2144	21.83	$ -	$5,810.24	$5,810.24	294.54
Sewer Collection	1836	17.98	$ -	$3,479.64	$3,479.64	728.4
Waste Water	1007.3	8.95	$2,447.74	$ -	$2,447.74	1,007.30
Water Treatment	836	7.43	$2,031.48	$ -	$2,031.48	836
	Gallons of Fuel	MT CO2e	Cost Gas	Cost Diesel	Total Cost	Total MMBTU
Total	67607.3	643.94	$81,918.46	$90,362.24	$172,280.70	38,844.13

Department	Gallons of Fuel	MT CO2e
DPW	38,490.30	376.72
Fire Protection	4,541.00	45.34
Police Protection	18,964.00	168.53
Recreation	5,386.00	51.34
City Hall	226.00	2.01

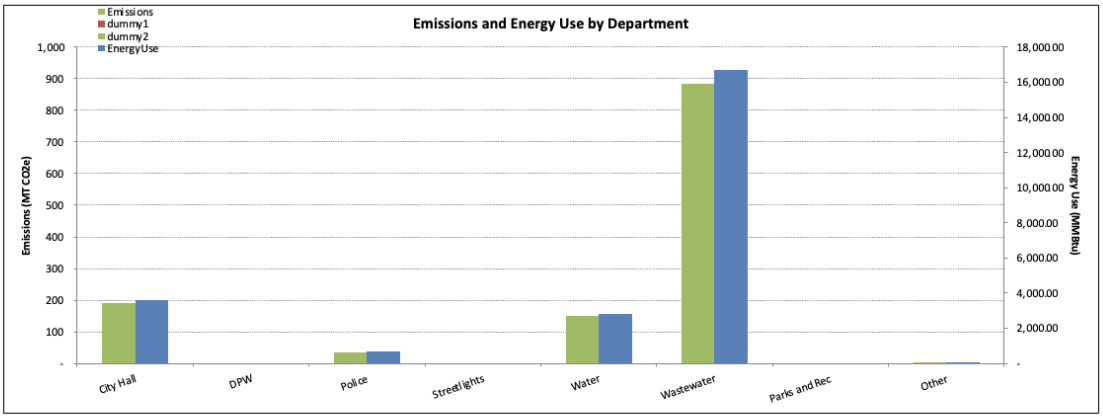


Department Summary

Emissions by Department (MT CO_2e)				
Department	CO_2	CH_4	N_2O	Total
City Hall	192	0	0	192
DPW	-	-	-	-
Police	35	0	0	35
Streetlights	-	-	-	-
Water	149	0	0	149
Wastewater	885	0	0	885
Parks and Rec	-	-	-	-
Other	4	0	0	4
Total Stationary Combustion Emissions	**1,264**	**0**	**0**	**1,264**

Fuel and Energy (MMBtu) Use by Department				
Department	mcf	gal	tons	Energy Use
City Hall	3,519	-	-	3,618
DPW	-	-	-	-
Police	641	-	-	659
Streetlights	-	-	-	-
Water	2,727	-	-	2,803
Wastewater	16,241	-	-	16,696
Parks and Rec	-	-	-	-
Other	69	-	-	71
Total Stationary Combustion Energy Use	23,197	-	-	**23,847**

Check to display: ☑ Emissions ☑ Energy Use



Fuel Summary

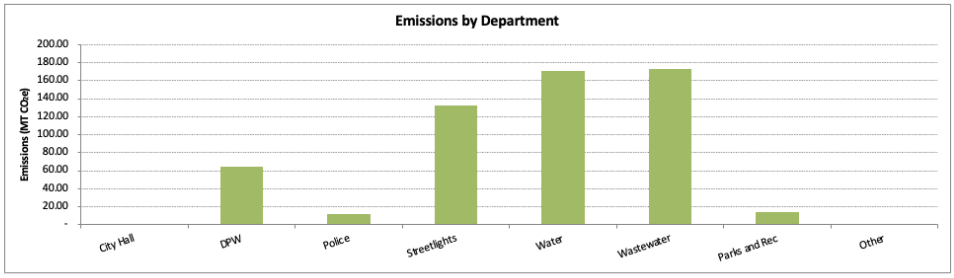
Emissions by Fuel Type (MT CO_2e)				
Fuel Type	CO_2	CH_4	N_2O	TOTAL
Natural Gas	1,264	3	1	1,268
Diesel	-	-	-	-
Gasoline	-	-	-	-
LPG	-	-	-	-
Propane	-	-	-	-
Butane	-	-	-	-
Residual Fuel Oil No. 5	-	-	-	-
Residual Fuel Oil No. 6	-	-	-	-
Jet Fuel	-	-	-	-
Bituminous Coal	-	-	-	-
Digester Gas	-	-	-	-
Total Emissions from Stationary Fuel Combustion	**1,264**	**3**	**1**	**1,268**

Fuel and Energy Use by Type			
Fuel Type	Fuel Used		Energy Use (MMBtu)
Natural Gas	23,197	mcf	23,846.62
Diesel	0	gal	-
Gasoline	0	gal	-
LPG	0	gal	-
Propane	0	gal	-
Butane	0	gal	-
Residual Fuel Oil No. 5	0	gal	-
Residual Fuel Oil No. 6	0	gal	-
Jet Fuel	0	gal	-
Bituminous Coal	0	tons	-
Digester Gas	0	mcf	-
Total Stationary Fuel Consumed			**23,846.62**

Check to display: ☑ Emissions ☑ Energy Use

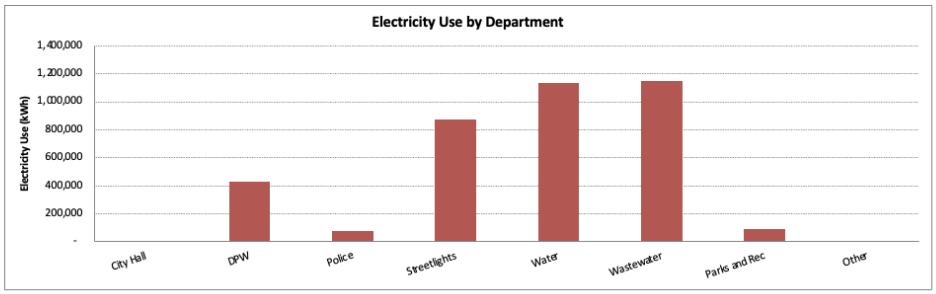
GHG Summary

Emissions by Department (in MT CO_2e)				
	CO_2	CH_4	N_2O	Total
City Hall	0.53	0.00	0.00	0.53
DPW	64.37	0.13	0.21	64.70
Police	12.13	0.02	0.04	12.19
Streetlights	131.48	0.26	0.42	132.16
Water	170.18	0.33	0.55	171.06
Wastewater	172.35	0.34	0.56	173.24
Parks and Rec	13.80	0.03	0.04	13.87
Other	0.75	0.00	0.00	0.76
Total Emissions from Electricity Use	**565.59**	**1.11**	**1.82**	**568.52**



Grid Electricity Summary

Electricity Use by Department (in kWh)	
Department	**kWh**
City Hall	3,520
DPW	429,798
Police	80,991
Streetlights	877,858
Water	1,136,269
Wastewater	1,150,773
Parks and Rec	92,162
Other	5,021
Total Electricity Use	**3,776,393**



1. Enter Employee Data

Please enter the number of employees in each department. This will be used to calculate the commute emissions per department.

Department	Number of employees
City Hall	100
DPW	
Police	
Streetlights	
Water	
Wastewater	
Parks and Rec	
Other	

2. Enter mode of transit proportions, commute length, and work days

Please enter what percentage of employees use each form of transportation to work. These values will be used to determine how many city employees travel by each mode every day.
Default values are from the American Communities Survey, and represent the average distribution of transit modes in the United States. For more accurate emissions estimates, use proportions gathered from a travel survey of city employees.

Mode	Employees who use mode (%)	Default Values
Single Occupancy Vehicle	83%	76%
Carpool		10%
Motorcycle		0%
Transit		5%
Bike		1%
Walk	17%	3%
Work at home		4%
Other		1%
Total	**100%**	

Please enter the average one-way commute length for city employees. Default commute distance is 12.6 miles (from FHWA's 2010 Status of the Nation's Highways Bridges and Transit, http://www.fhwa.dot.gov/policy/2010cpr/execsum.htm).
This commute distance may be longer or shorter than the average commute for your city's employees. For the most accurate emissions estimates, use data from a travel survey of city employees.

Average One-Way Commute Length (miles)	12.5	12.6

Please enter the number of days each city employee works per year. This number will be multiplied by the emissions from daily commutes. Default work-year days is provided (240 days), assuming a 5-day week, two weeks (10 days) of vacation, and 10 federal holidays.

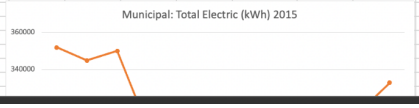
Workdays per year	240	240

Employee Commute Emissions Summary

Emissions by Department (MT CO_2e)	
	CO_2
City Hall	202.43
DPW	-
Police	-
Streetlights	-
Water	-
Wastewater	-
Parks and Rec	-
Other	-
Total	202.43

Municipal Electric and Gas Accounts

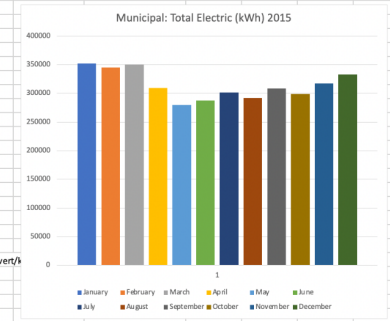
						2015											
NUMBER	Account #	Active	Service Address	Department	Total Electric (kWh)	January	February	March	April	May	June	July	August	September	October	November	December
30	20011721204	Y	City Pier CFTSTA	?	3101	144	680	110	100	114	652	408	368	375	90	30	30
63	10017590596	Y	2 N Main St	City Hall	3519.7	797	539.2	623.3	62.5	42	9.2	4.1	15.3	48.1	192.5	194.8	991.7
1	20024271882	Y	599 MAIN ST S	DPW	460	44	36	19	0	0	23	33	31	37	37	74	126
2	20018252674	Y	250 EASTERN BLVD TRMTPMP	DPW	1389		330	331	71	71	81	151	110	37	73	64	70
3	20018101491	Y	167 MILL ST PRKING LOT	DPW	18993	2004	1858	1540	1615	1253	1632	1354	1375	1585	1407	1675	1695
21	20011722020	Y	14 LAKE SHORE DR OUTGAT	DPW	4	0	0	0	0	0	0	0	1	0	1	1	1
23	20011721832	Y	NEAR 704 WEST LAKE DR WTRPMP	DPW	1597	200	186	121	178	41	106	51	72	117	103	249	173
25	20011721642	Y	302 LAKE SHORE DR FEDGAT	DPW	12	1	1	1	1	1	1	1	1	1	1	1	1
26	20011721550	Y	NEAR 92 YACHT CLUB DR PUMP	DPW	70	1	0	1	0	1	4	3	25	2	2	2	29
27	20011721477	Y	21 ONTARIO ST P3	DPW	77	0	1	1	0	0	59	0	0	0	0	0	16
28	20011721394	Y	183 SALTONSTALL ST STGBLG	DPW	77	0	1	1	0	0	59	0	0	0	0	0	16
32	20011721014	Y	395 Main St N P46C	DPW	290	91	92	5	0	0	15	19	18	20	2	0	28
33	20011720933	Y	Near 42 Island LA Pump	DPW	4400	591	739	687	207	178	168	184	31	104	434	315	762
37	20011720602	Y	158 1/2 Lake Shore Drive P56A	DPW	61571	5332	6283	6244	4308	5083	5083	5289	4503	4832	4354	4763	5497
38	20011720511	Y	335 Main St S PE2	FIRE DEPT	260.4	20.4	20	16.8	19.6	28	25.2	19.2	31.6	20.8	16.8	20.8	21.2
40	20011720354	Y	205 Saltonstall St P22	DPW	160960	16720	17880	14960	11120	11200	12880	12920	12920	12680	11320	12640	13720
43	20011722103	Y	2 Main St N P1	DPW	165600	21960	23040	15800	12800	11040	11240	11920	13400	11920	8800	9800	13880
44	20024799064	Y	157 1/2 Main St S Xmas Lght	DPW	4836	0	2	2417	2	1	3	3	3	3	1	1021	1380
45	20018814770	N	245 Main St S XWALKLTE	DPW	0	0	0	0	0	0	0	0	0	0	0	0	0
47	20011723200	Y	169 Lake Shore Dr Pump	DPW	1284	0	0	0	0	147	51	712	301	47	26	0	0
49	20011723069	Y	Lafayette Ave P3	DPW	17	0	0	0	0	0	0	17	0	0	0	0	0
50	20011722970	Y	5 Coach St Park-P1A	DPW	6401	187	195	221	156	176	925	533	956	720	33	408	1891
51	20011722871	Y	230 Chapel St PT13	DPW	600	50	50	50	50	50	50	50	50	50	50	50	50
52	20011722798	Y	390 Eastern Blvd	DPW	600	50	50	50	50	50	50	50	50	50	50	50	50
54	20011722616	Y	480 Main St N Sign	DPW- Street Ligh	300	25	25	25	25	25	25	25	25	25	25	25	25
57	20011722350	Y	155 Lake Shore Drive Bth/HS	Parks and Rec	31320	2280	2200	2200	2040	2840	3400	3880	3400	2720	2120	2360	1880
24	20011721733	Y	185 BUFFALO ST P19B	Parks and Rec	7904	504	443	11	22	231	588	647	1065	828	1928	1289	348
35	20011720776	Y	329 Jefferson Ave Park	Parks and Rec	8139	480	864	144	96	296	521	1333	856	1595	1598	173	183
36	20011720693	Y	5298 Parkside Drive PT16	Parks and Rec	44746	6968	6511	5979	4468	2383	2034	2470	2342	2601	2389	2830	3771
46	20017160845	Y	272 Chapel St NE Park	Parks and Rec	45.21	3.5	3.56	3.46	3.99	3.93	4.46	4.03	4.44	4.47	3.4	2.61	3.36
55	20011722525	Y	City Pier Park	Parks and Rec	8	0	0	0	0	0	0	0	5	2	0	1	0
39	20011720438	Y	21 Ontario St Police	Police	80991	6746	7306	6119	5965	6167	6834	9004	7721	7244	5506	5844	6535
4	20011380720	Y	STREET LIGHTING CIT @ LARG	Street Lights	692901	74254	63332	59839	50071	44923	40185	43697	49624	55384	65347	70145	76100
5	20011380928	Y	STREET LIGHTING GRND MEADW	Street Lights	2872	306	262	249	209	188	168	181	205	229	270	290	315
6	20011381017	Y	TRAFFIC SIGNALS STATE TS	Street Lights	36264	3022	3022	3022	3022	3022	3022	3022	3022	3022	3022	3022	3022
7	20011381090	Y	TRAFFIC SIGNALS CITY-CNDGA	Street Lights	6048	504	504	504	504	504	504	504	504	504	504	504	504
8	20011381181	Y	STREET LIGHTING N MAIN ST-	Street Lights	546	60	58	50	47	40	36	32	34	39	44	51	55
9	20011381363	Y	STREET LIGHTING LAKESHORE	Street Lights	61057	6512	5568	5292	4449	3999	3576	3837	4361	4870	5743	6163	6687
10	20011381462	Y	STREET LIGHTING PICKERING	Street Lights	13560	1455	1244	1182	994	893	799	857	974	1088	1203	1377	1494
11	20011381553	Y	STREET LIGHTING S MAIN ST-	Street Lights	1020	109	93	88	74	67	60	64	73	81	96	103	112
12	20011381744	Y	100 PEARL ST N FLASHING L	Street Lights	0	0	0	0	0	0	0	0	0	0	0	0	0
13	20011381827	Y	99 WEST GIBSON ST FLASHING L	Street Lights	120	10	10	10	10	10	10	10	10	10	10	10	10
14	20011381918	Y	30 CITY PIER LIGHT	Street Lights	1200	100	100	100	100	100	100	100	100	100	100	100	100
15	20011382015	Y	170 PEARL ST N P17-FLASHI	Street Lights	120	10	10	10	10	10	10	10	10	10	10	10	10
16	20011382114	Y	STREET LIGHTING COY ST EO-	Street Lights	3277	349	299	284	239	215	192	206	234	261	308	331	359
17	20011382171	Y	STREET LIGHTING CDG EST EO	Street Lights	3411	364	311	296	248	223	200	214	244	272	321	344	374
18	20011382627	Y	STREET LIGHTING CDGA CLASS	Street Lights	2436	260	222	211	177	160	143	153	174	194	229	246	267
19	20011382726	Y	STREET LIGHTING SIGNS CDGA	Street Lights	1361	145	124	118	99	89	80	86	97	109	128	137	149
20	20020074918	Y	STREET LIGHTING COVINGTON	Street Lights	3885	414	354	337	283	254	228	244	278	310	365	392	426
29	20011721303	Y	3782 County Rd 16 PT22I	Street Lights	861	243	128	201	55	51	52	0	24	62	14	15	16
31	20011721113	Y	Near 92 Yacht Club Dr	Street Lights	6695	808	1121	997	309	359	337	370	334	341	377	421	921
34	20011720875	Y	Near 116 Howell St P20B	Street Lights	686	60	54	54	60	56	54	62	54	56	60	54	62
53	20011722699	Y	Lafayette Ave P2B - LGT	Street Lights	300	25	25	25	25	25	25	25	25	25	25	25	25
56	20011722434	Y	155 Lake Shore Drive Pk/Lts	Street Lights	6560	720	420	600	400	520	480	520	480	460	600	720	640
59	20011722186	Y	195 Lake Shore Drive Pk/Lts	Street Lights	2602	235	269	233	235	198	246	235	24	24	22	577	304
60	10010857687	Y	3772 W Lake Road	Street Lights	2727.8	434.4	604.4	277.4	162.1	148.3	0	16.4	1	0	181.2	313.6	589
61	10010013190	Y	183 Saltonstall St	Street Lights	16241.9	3324.9	3697.4	2652.6	1468	174	112.3	704.7	152.8	408.5	881.5	1792.8	872.4
62	10017696856	Y	21 N Ontario St	Street Lights	3053.1	641.4	992.5	282.6	268.7	14.3	26.5	14.3	15.3	46	68.6	533.1	149.8
64	10016541699	Y	Near 94 Yacht Club Dr	Street Lights	68.6	5.1	4.1	6.2	4.1	8.2	7.1	4.1	6.1	5.1	5.1	7.2	6.2
58	20011722285	Y	195 Lake Shore Drive Dock	Street Lights- doc	7985	481	511	371	413	245	374	431	409	1268	784	1525	1173
42	20011720149	Y	183 Saltonstall St	Waste Water Fac	1150773	93268	97854	108664	96034	93462	105306	96762	88388	96196	86748	93748	94343
48	20011723135	Y	205 Saltonstall St Ar Lte	Water Shed Coun	1920	184	178	173	132	117	124	119	131	167	170	202	223
22	20011721931	Y	3772 COUNTY RD 16 T14	Water Treatment	638	125	110	110	121	110	30	6	4	7	5	5	5
41	20011720230	Y	3772 County Rd 16 Wtrplnt	Water treatment	1135631	98353	94158	106202	105592	88226	85040	98515	92795	95371	90702	90250	90427
					TOTAL	January	February	March	April	May	June	July	August	September	October	November	December
TOTALS					3776392.71	351980.7	344975.16	350121.36	309174.99	279832.73	288049.76	302085.83	292467.54	308587.97	298906.1	317296.91	332913.66

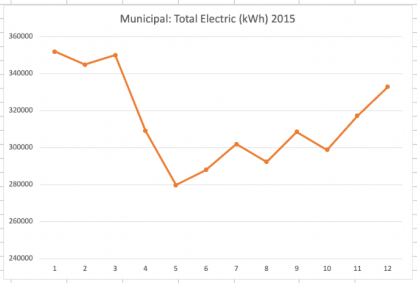


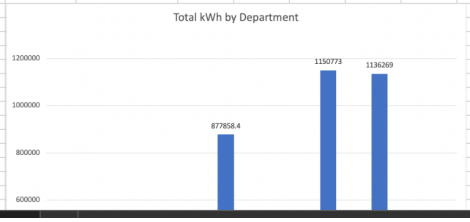
Department	Total kWh	Total MMBTU
DPW	429538	1465.583656

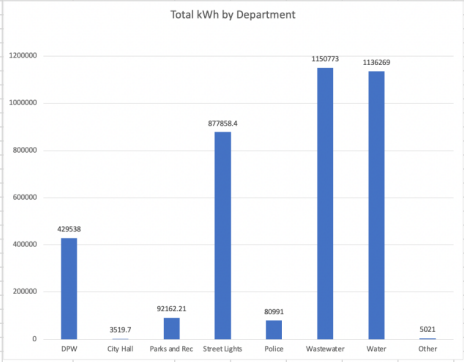
Department	Total kWh	Total MMBTU
DPW	429538	1465.583656
City Hall	3519.7	12.0092164
Parks and Rec	92162.21	314.4574605
Street Lights	877858.4	2995.252861
Police	80991	276.341292
Wastewater	1150773	3926.437476
Water	1136269	3876.949828
Other	5021	17.131652
Fire	260.4	0.8884848
Total	3776132	12885.05193

MMBTU conversic 1kwh=0.003412 https://www.inchcalculator.com/convert/k

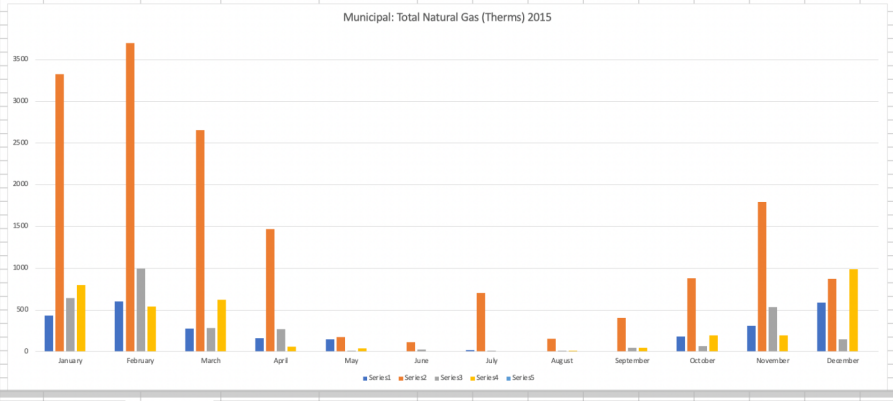






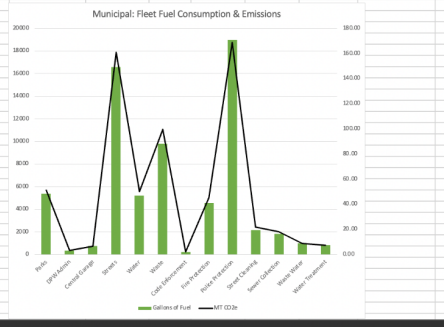


NUMBE	Account n	Activ	Service Address	Department	Total Gas (Therms	mmbtu	January	Februar	March	April	May	June	July	August	Septembe	Octobe	Novembe	Decembe
60	1.0011E+10	Y	3772 W Lake Road	Water Treatment	2727	272.7	434.4	604.4	277.4	162.1	148.3	0	16.4	1	0	181	313	589
61	1.001E+10	Y	183 Saltonstall St	DPW	16240.9	1624.09	3324.9	3697.4	2652.6	1468	174	112	704	152.8	408.5	881.5	1792.8	872.4
62	1.0018E+10	Y	21 N Ontario St	Police	3053.1	305.31	641.4	992.5	282.6	268.7	14.3	26.5	14.3	15.3	46	68.6	533.1	149.8
63	1.0018E+10	Y	2 N Main St	City Hall	3519.2	351.92	797	539	623	62.5	42	9.2	4.1	15.3	48.1	192.5	194.8	991.7
64	1.0017E+10	Y	Near 94 Yacht Club Dr	Other	68.6	6.86	5.1	4.1	6.2	4.1	8.2	7.1	4.1	6.1	5.1	5.1	7.2	6.2
					25608.8													
					2491.73624		mcf											
			total	mmbtu														
				2560.88														



Department	Vehicle Number	YEAR	Vehicle Make	Vehicle Model	Fuel Type	Gallons Used	Miles Traveled	Est. MPG	Grams CO2e	KG CO2e	MT CO2e	BTU
Parks	P-1	2011	FORD	F-450 DUMP	DIESEL	493	3978	8.07	5018740	5018.74	5.02	67,728,833.00
Parks	P-2	2013	FORD	F-250	GAS	816	6435	7.89	7251792	7251.79	7.25	816,000,000.00
Parks	P-3	2008	FORD	F-350 DUMP	GAS	831	4092	4.92	7385097	7385.10	7.39	831,000,000.00
Parks	P-4	2004	CHEVROLET	BUCKET TRUCK	DIESEL	424	639	1.51	4316320	4316.32	4.32	58,249,544.00
Parks	P-6	2015	CHEVROLET	COLORADO	GAS	194	3085	15.90	1724078	1724.08	1.72	194,000,000.00
Parks	P-7	2013	FORD	F-350 DUMP	GAS	632	5189	8.21	5616584	5616.58	5.62	632,000,000.00
Parks	P-8	1988	FORD	TRACTOR	DIESEL	78	NA	NA	794040	794.04	0.79	10,715,718.00
Parks	P-9	2013	NEW HOLLAND	TRACTOR	DIESEL	133	NA	NA	1353940	1353.94	1.35	18,271,673.00
Parks	CHIPPER	2009	BANDIT	CHIPPER	DIESEL	182	NA	NA	1852760	1852.76	1.85	25,003,342.00
Parks	FERRIS	2007	FERRIS	MOWER	DIESEL	269	NA	NA	2738420	2738.42	2.74	36,955,489.00
Parks	JAC2	2011	JOCOBSEN	MOWER	DIESEL	103	NA	NA	1048540	1048.54	1.05	14,150,243.00
Parks	TORO 4000	2006	TORO	MOWER	DIESEL	397	NA	NA	4041460	4041.46	4.04	54,540,257.00
Parks	TORO 360	2013	TORO	MOWER	DIESEL	315	NA	NA	3206700	3206.70	3.21	43,275,015.00
Parks	TORO 7210	2012	TORO	MOWER	DIESEL	295	NA	NA	3003100	3003.10	3.00	40,527,395.00
Parks	MISC GAS MOWERS	MISC	MISC	MOWER	GAS	224	NA	NA	1990688	1990.69	1.99	224,000,000.00
DPW Admin	C-63	2014	FORD	F-150	GAS	353	5412	15.33	3137111	3137.11	3.14	353,000,000.00
Central Garage	T-30	2012	DODGE	1500	GAS	743	11435	15.39	6603041	6603.04	6.60	743,000,000.00
Streets	T-7	2015	MACK	DUMP	DIESEL	1312	4853	3.70	13356160	13356.16	13.36	180,243,872.00
Streets	T-8	2012	MACK	DUMP	DIESEL	1626	5389	3.31	16552680	16552.68	16.55	223,381,506.00
Streets	T-9	2013	FORD	F-250	GAS	1416	12458	8.80	12583992	12583.99	12.58	1,416,000,000.00
Streets	T-10	2008	FORD	F-250	GAS	706	5689	8.06	6274222	6274.22	6.27	706,000,000.00
Streets	T-11	2009	MACK	DUMP	DIESEL	1487	4744	3.19	15137660	15137.66	15.14	204,285,547.00
Streets	T-13	2008	MACK	DUMP	DIESEL	1916	6015	3.14	19504880	19504.88	19.50	263,221,996.00
Streets	T-15	2002	STERLING	DUMP	DIESEL	550	1682	3.06	5599000	5599.00	5.60	75,559,550.00
Streets	T-18	2008	FORD	F-350	GAS	618	4850	7.85	5492166	5492.17	5.49	618,000,000.00
Streets	T-19	2008	FORD	F-250	GAS	512	4254	8.31	4550144	4550.14	4.55	512,000,000.00
Streets	T-23	2008	FORD	F-350	GAS	860	5916	6.88	7642820	7642.82	7.64	860,000,000.00
Streets	T-28	2008	FORD	F-550	DIESEL	417	1602	3.84	4245060	4245.06	4.25	57,287,877.00
Streets	T-32	2008	FORD	F-350	GAS	603	3917	6.50	5358861	5358.86	5.36	603,000,000.00
Streets	T-35	2011	CHEVROLET	1500	GAS	552	8173	14.81	4905624	4905.62	4.91	552,000,000.00
Streets	T-38	2014	FORD	F-150	GAS	570	6547	11.49	5065590	5065.59	5.07	570,000,000.00
Streets	R-16	2014	CATERPILLAR	ROLLER	DIESEL	167	NA	NA	1700060	1700.06	1.70	22,942,627.00
Streets	R-51	2011	STONE	ROLLER	DIESEL	38	NA	NA	386840	386.84	0.39	5,220,478.00
Streets	EX-1	2012	KUBOTA	EXCAVATOR	DIESEL	236	NA	NA	2402480	2402.48	2.40	32,421,916.00
Streets	L-25	2010	CATERPILLAR	LOADER	DIESEL	807	NA	NA	8215260	8215.26	8.22	110,866,467.00
Streets	L-26	1997	JOHN DEERE	LOADER	DIESEL	917	NA	NA	9335060	9335.06	9.34	125,978,377.00
Streets	B-22	2012	JOHN DEERE	BACKHOE	DIESEL	805	NA	NA	8194900	8194.90	8.19	110,591,705.00
Streets	B-31	2014	BOBCAT	SKID STEER	DIESEL	419	NA	NA	4265420	4265.42	4.27	57,562,639.00
Streets	SA COMP	NA	INGERSOLL	COMPRESSOR	DIESEL	22	NA	NA	223960	223.96	0.22	3,022,382.00
Water	W-2	2008	FORD	E-350	GAS	580	4096	7.06	5154460	5154.46	5.15	580,000,000.00
Water	W-3	1999	INTERNATIONAL	4700 DUMP	DIESEL	265	1289	4.86	2697700	2697.70	2.70	36,405,965.00
Water	W-4	2007	CHEVROLET	1500 4X4	GAS	733	7498	10.23	6514171	6514.17	6.51	733,000,000.00
Water	W-5	2014	FORD	F-150	GAS	1048	13589	12.97	9313576	9313.58	9.31	1,048,000,000.00
Water	W-6	2000	VOLVO	DUMP	DIESEL	49	289	5.90	498820	498.82	0.50	6,731,669.00
Water	W-12	2014	MACK	DUMP	DIESEL	2039	7433	3.65	20757020	20757.02	20.76	280,119,859.00
Water	W-34	2012	JOHN DEERE	BACKHOE	DIESEL	513	NA	NA	5222340	5222.34	5.22	70,476,453.00
Waste (MSW)	T-14	2008	MACK	PACKER	DIESEL	3663	8798	2.40	37289340	37289.34	37.29	503,226,603.00
Waste (MSW)	T-39	2009	MACK	PACKER	DIESEL	2539	6065	2.39	25847020	25847.02	25.85	348,810,359.00
Waste (MSW)	T-55	1999	INTERNATIONAL	LEAF VAC.	DIESEL	336	495	1.47	3420480	3420.48	3.42	46,160,016.00
Waste (Recycle)	T-54	2008	MACK	PACKER	DIESEL	3250	8378	2.58	33085000	33085.00	33.09	446,488,250.00
Code Enforcement	C-60	2005	JEEP	GRAND CHEROKEE	GAS	167	2003	11.99	1484129	1484.13	1.48	167,000,000.00
Code Enforcement	C-61	2005	CHEVROLET	IMPALA	GAS	59	694	11.76	524333	524.33	0.52	59,000,000.00
Fire Protection	R261	2012	FORD	F-450 RESCUE	DIESEL	208	2558	12.30	2117440	2117.44	2.12	28,575,248.00
Fire Protection	R262	2014	FORD	EXPLORER	GAS	687	8234	11.99	6105369	6105.37	6.11	687,000,000.00
Fire Protection	E211	2004	SPARTAN	PUMPER	DIESEL	1409	5039	3.58	14343620	14343.62	14.34	193,569,829.00
Fire Protection	E212	1996	FREIGHTLINER	PUMPER	DIESEL	207	610	2.95	2107260	2107.26	2.11	28,437,867.00
Fire Protection	T281	2006	SPARTAN	PLATFORM	DIESEL	400	993	2.48	4072000	4072.00	4.07	54,952,400.00
Fire Protection	T282	2013	SUTPHEN	LADDER	DIESEL	1630	5828	3.58	16593400	16593.40	16.59	223,931,030.00
Police Protection	CP-40	2015	FORD	EXPLORER	GAS	4193	32152	7.67	37263191	37263.19	37.26	4,193,000,000.00
Police Protection	CP-41	2014	FORD	TAURUS	GAS	3394	27971	8.24	30162478	30162.48	30.16	3,394,000,000.00
Police Protection	CP-42	2011	CHEVROLET	CAPRICE	GAS	2284	10951	4.79	20297908	20297.91	20.30	2,284,000,000.00
Police Protection	CP-43	2015	FORD	TAURUS	GAS	2762	17985	6.51	24545894	24545.89	24.55	2,762,000,000.00
Police Protection	CP-44	2011	CHEVROLET	CAPRICE	GAS	3021	17876	5.92	26847627	26847.63	26.85	3,021,000,000.00
Police Protection	CP-45	2011	FORD	CROWN VICTORIA	GAS	308	4355	14.14	2737196	2737.20	2.74	308,000,000.00
Police Protection	CP-46	2013	CHEVROLET	IMPALA	GAS	229	4125	18.01	2035123	2035.12	2.04	229,000,000.00
Police Protection	CP-47	2009	CHEVROLET	IMPALA	GAS	598	10672	17.85	5314426	5314.43	5.31	598,000,000.00
Police Protection	CP-48	2012	CHEVROLET	IMPALA	GAS	256	4589	17.93	2275072	2275.07	2.28	256,000,000.00
Police Protection	CP-49	2013	CHEVROLET	IMPALA	GAS	588	13497	22.95	5225556	5225.56	5.23	588,000,000.00
Police Protection	CP-50	2015	CHEVROLET	IMPALA	GAS	414	2157	5.21	3679218	3679.22	3.68	414,000,000.00
Police Protection	CP-51	2010	FORD	CROWN VICTORIA	GAS	784	10951	13.97	6967408	6967.41	6.97	784,000,000.00
Police Protection	CP-52	2010	CHEVROLET	TAHOE	GAS	133	964	7.25	1181971	1181.97	1.18	133,000,000.00
Street Cleaning	S-24	2011	FREIGHTLINER	SWEEPER	DIESEL	2144	2202	1.03	21825920	21825.92	21.83	294,544,864.00
Sewer Collection	T-36	2014	FREIGHTLINER	VACUUM TRUCK	DIESEL	1284	3812	2.97	13071120	13071.12	13.07	176,397,204.00
Sewer Collection	T-65	2011	FORD	RANGER PICKUP	GAS	552	8826	15.99	4905624	4905.62	4.91	552,000,000.00
Waste Water Plant	T-62	2014	FORD	F-150	GAS	421.9	4144	9.82	3749425	3749.43	3.75	421,900,000.00
Waste Water Plant	T-67	2012	FORD	F-150	GAS	585.4	8608	14.70	5202450	5202.45	5.20	585,400,000.00
Water Treatment Plant	T-50	2015	FORD	F-250	GAS	836	6142	7.35	7429532	7429.53	7.43	836,000,000.00
Totals						**67607.3**			**643,939,867.10**	**643,939.87**	**643.94**	**38,844,132,064.00**

Department	Gallons of Fuel	MT CO2e	Cost Gas	Cost Diesel	Total Cost	MMBtu
Parks	5386	51.34	$ 6,553.71	$ 7,287.19	$ 13,840.90	3,066.42
DPW Admin	353	3.14	$ 857.79	$ -	$ 857.79	353.00
Central Garage	743	6.60	$ 1,805.49	$ -	$ 1,805.49	743.00
Streets	16556	160.99	$ 14,183.91	$ 29,048.49	$ 43,232.40	7,309.59
Water	5227	50.16	$ 5,737.23	$ 7,766.86	$ 13,504.09	2,754.73
Waste	9788	99.64	$ -	$ 26,525.48	$ 26,525.48	1,344.69
Code Enforcement	226	2.01	$ 549.18	$ -	$ 549.18	226.00
Fire Protection	4541	45.34	$ 1,669.41	$ 10,444.34	$ 12,113.75	1,216.47
Police Protection	18964	168.53	$ 46,082.52	$ -	$ 46,082.52	18,964.00
Street Cleaning	2144	21.83	$ -	$ 5,810.24	$ 5,810.24	294.54
Sewer Collection	1836	17.98	$ -	$ 3,479.64	$ 3,479.64	728.40
Waste Water	1007.3	8.95	$ 2,447.74	$ -	$ 2,447.74	1,007.30
Water Treatment	836	7.43	$ 2,031.48	$ -	$ 2,031.48	836.00
	Gallons of Fuel	**MT CO2e**	**Cost Gas**	**Cost Diesel**	**Total Cost**	**Total MMBTU**
Total	**67607.3**	**643.94**	**$81,918.46**	**$90,362.24**	**$172,280.70**	**38,844.13**



Gasoline	8,887	grams
Diesel	10,180	grams

conversion for mmbtu%20to%201%20MMBtu%3A&text=Propane%3A%2010,917%20gal%20%40%2091%2C000%20Btu,8.0%20gal%20%40125%2C000%20Btu%2Fgal

Community Inventory

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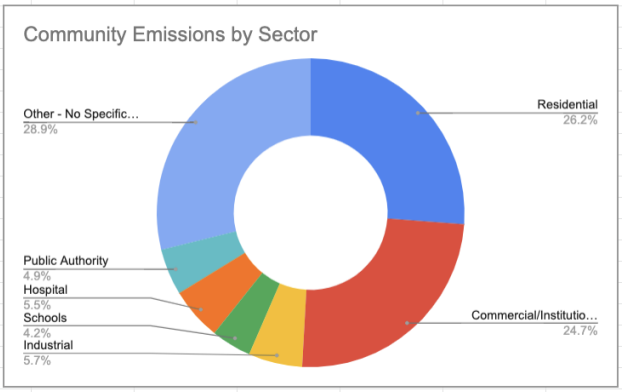
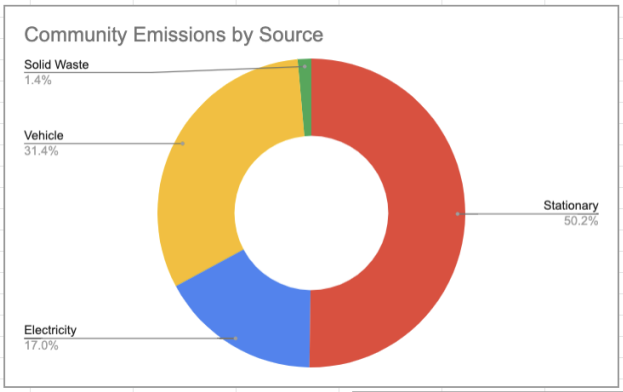
Summary Energy & Emissions by Sector		
Sector	**MMBTU**	**MTCO2e**
Residential	474,725	23,612
Commercial/Institutional	444,193	22,261
Industrial	103,386	5,097
Other Commercial/Insitutional - School	48,862	3,806
Other Commercial/Insitutional - Hospital	98,075	4,973
Public Authority	82,799	4,382
Other - No Specific Category	428,576	26,011
Totals	1,680,616	90,142

Summary Energy & Emissions by Source		
Source	**MMBTU**	**MTCO2e**
Stationary	881,699	46,894
Electricity	359,021	15,841
Vehicle	428,576	29,340
Solid Waste	11,320	1,347
Water	NA	NA
Urban Forestry	NA	-3,279
Totals	1,680,616	90,143
Emissions without Urban Forestry	93,422	
Percent decrease	3.51%	





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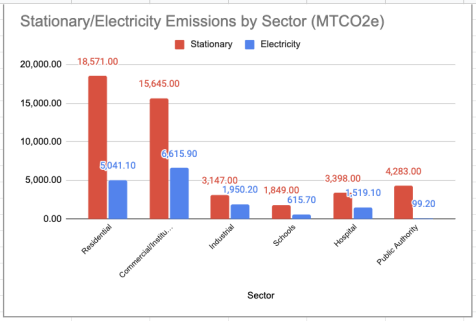
Community Emissions by Sector and Source				
Sector	**Stationary**	**Electricity**	**Solid Waste****	**Vehicles***
Residential	18,571.00	5,041.10	NA	NA
Commercial/Institutional	15,645.00	6,615.90	NA	NA
Industrial	3,147.00	1,950.20	NA	NA
Schools	1,849.00	615.70	8.64	1,332.19
Hospital	3,398.00	1,519.10	NA	56.00
Public Authority	4,283.00	99.20	NA	NA
Other - No Specific Category	NA	NA	1,338.00	27,952.00
Total	46,893	15,841	1,347	29,340
Per Capita Residents	4.43	1.50		

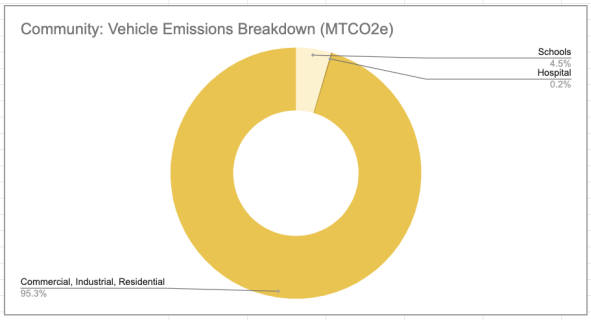
*Hospital and school data is separated out- rest is combined into one category (other)- but is really commercial, industry and residential altogether

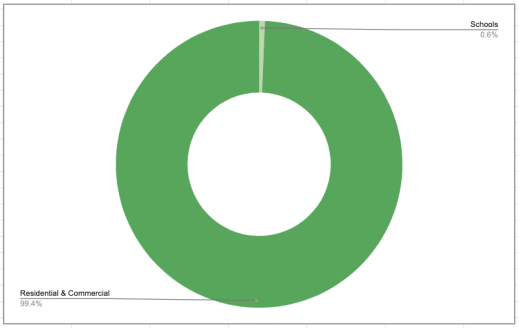
**Solid waste has residential and commercial in the other category and schools separated

Population

10,576







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Energy - OK to use

Sector- in inventory sheet	Date of data	Scope	Stationary (MCF)	Stationary (Gallons	Electricity (KWH)	Wastewater- NA- would be in Municipal	Stationary (MMBTU)	Electricity (MMBTU)	Mobile- MMBTU	Solid Waste - MMBTU	Total Energy (MMBTU)	sector contribution to energy	
Residential			339,768		33,485,000		349,282	114,251	NA	11192.75	474,725	28.25%	SW is totalled- not broken out
Commercial/i			286,238		43,945,000		294,253	149,940	NA	NA	444,193	26.43%	
Industrial			57,574		12,954,000		59,187	44,199	NA	NA	103,386	6.15%	
Other	2017		33,834		4,089,362		34,782	13,953	NA	127.39	48,862	2.91%	
Other	2015		61,230	5012.00	10,090,510		63,646	34,429	NA	NA	98,075	5.84%	
Public			78,356		659,128		80,550	2,249	NA	NA	82,799	4.93%	
other- no									428,576		428,576		
Total			857,000	5,012	105,223,000		881,699	359,021	428,576	11,320	1,680,616	1	
Source % contribution						0.00%	52.46%	21.36%	25.50%	0.67%			
Notes			Excludes municipal	Excludes municipal	Excludes municipal		My MMBTU total is 1 more than their total	Excludes municipal;	MMBTU based on erinn's fuel analysis; gasoline and diesel vehicles only; Commercial/Institutional - is GTC data (includes residential, commercial, industrial, public authority) and excludes hospital and school - now is ontario county data	SW energy is totalled residents, commercial and school			
Gasoline			Diesel							73,308			
Disel Vehicles			Gasoline							355,268			
Residential	Residential		NYUP eGRID	33485000									
Commercial	Commercial/In		NYUP eGRID	43945000									
Industrial	Industrial		NYUP eGRID	12954000									
Hospital	Commercial/In		NYUP eGRID	10090510									
Public	Commercial/In		NYUP eGRID	4748490									
				0.08077861323				Percent pubic					
				0.9192213868				percent					
											fuel		
1	School District		Commercial/In	20182019				Heavy-Duty		Diesel	115,000		
2	School District		Commercial/In	20182019				Light Truck		Gasoline	18,000		
3	Thompson		Commercial/In	2015				Light Truck		Gasoline	6,418		
4	Community		Commercial/In	2015				Light Truck		Gasoline	2640337.473		
5	Community		Commercial/In	2015				Motorcycle		Gasoline	68,074		
6	Community		Commercial/In	2015				Heavy-Duty		Diesel	7651.419513		
7	Community		Commercial/In	2015				Heavy-Duty		Diesel	309170.9518		
8	Community		Commercial/In	2015				Heavy-Duty		Diesel	91805		

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R30

Emissions (MT CO2e) - Ok to use

Sector- in inventory sheet	Wastewater	Mobile	Solid Waste	Urban Forestry	Stationary Emissions	Electricity Emissions	Total Emissions	sector contribution to emissions (WWT not by sector so this is misleading)				
Residential	NA	NA	NA	NA	18,571	5,041	23,612	26.19%	Residential			
Commercial/i	NA	NA	NA	NA	15,645	6,616	22,261	24.70%	Commercial/institutional			
Industrial	NA	NA	NA	NA	3,147	1,950	5,097	5.65%	Industrial			
Other	NA	1332.19	8.64	NA	1,849	616	3,806	4.22%	Other commrcial Insitutional-			
Other	NA	56	NA	NA	3,398	1,519	4,973	5.52%	Other commrcial Insitutional-			
Public	NA	NA	NA	NA	4,283	99	4,382	4.8612%	Public Authority			
other- no	NA	27,952.00	1,338	(3,279)	na	na	26,011	28.8554%	Other			
Total	NA	29,340	1,347	(3,279)	46,894	15,841	**90,143**					
Source % contribution	WWT in municipal			-0.03637558166	52.02%	0.1757349448						
Notes	From inventory data. No breakdowns by sector only total level data. This is not based on the electricity only the emissions from water treated. Total only based on population of 10287 split evenly between facilities with nitrification/denitrificaiton and anaerobic treatment	Hospital and school data is separated out- rest is combined into one category (other)- but is really commercial, industry and residential	Solid waste has residential and commercial in the other category and schools separated	Credit from carbon sequestration- amount sequestered from 34% coverage; done at aggregated community scale	Calculations done by Erinn using inventory tool emission factors - using "calculcated emission - electricity and stationary tabs	Calculations done by Erinn using inventory tool emission factors						
Gasoline												
Disel Vehicles												
							Residential - Community					0
Residential							Commercial - Community	Residential	Natural Gas	3,491,965	mcf	0
Commercial							Industrial - Community	Commercial/Institutional	Natural Gas	2,941,811	mcf	0
Industrial							Net Public Authority -	Industrial	Natural Gas	591,721	mcf	Net Public
Hospital							Hospital- Community- gas	Commercial/Institutional	Natural Gas	1,154,430	mcf	Commercial/I
Public							Hospital- Community oil only	Commercial/Institutional	Natural Gas	60522	mcf	Commercial/I
								Commercial/Institutional	Residual Fuel Oil No. 5	5012	gal	

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O13 Total Emissions from Electricity Use

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	*Emissions = Electricity Consumed (kWh) × Utility Emissions Factor (lb CO2/MWh) × MWh/kWh × MT/lb × CO2 GWP*								Total kwh	Total CO23									
2	*Emissions = Electricity Consumed (kWh) × Utility Emissions Factor (lb CH4/kWh) × MWh/kWh × MT/lb × CH4 GWP*								105,223,000	15,841.3									
3	*Emissions = Electricity Consumed (kWh) × Utility Emissions Factor (lb N2O/kWh) × MWh/kWh × MT/lb × N2O GWP*																		
4									Electricity										
5							Erinns calc		Summary of Erinn's calculations										
6		Electricity con	CO2 lbs/mwh	MWH/kwh	MT/lb	CO2 GWP	CO2E emissio			CO2	CH4	N20	TOTAL Emissions (CO2E)		Reported Values in inventory tool				
7	residential	33,485,000	330.187	0.001	0.000453592	1	5,015.1		residential	5,015.1	9.80	16.3	5,041.1		Emissions by Sector (in CO2e)				
8	Commercial/i	43,945,000	330.187	0.001	0.000453592	1	6,581.7		Commercial/i	6,581.7	12.9	21.4	6,615.9			CO2	CH4	N2O	Total
9	Industrial	12,954,000	330.187	0.001	0.000453592	1	1,940.1		Industrial	1,940.1	3.79	6.30	1,950.2		Residential	5,015.10	9.8	16.2	5,041.00
10	Other	4,089,362	330.187	0.001	0.000453592	1	612.5		Other	612.5	1.2	2.0	615.7		Commercial/I	8,804.10	17.2	28.4	8,849.70
11	Other	10,090,510	330.187	0.001	0.000453592	1	1,511.3		Other	1,511.3	3.0	4.9	1,519.1		Industrial	1,940.10	3.8	6.2	1,950.20
12	Public	659,128	330.187	0.001	0.000453592	1	98.7		Public	98.7	0.2	0.3	99.2		Energy Gener	-	-	-	-
13						Matches tool	15,759.3	Total	Total	15,759.3	**30.78**	**51.2**	**15,841.3**		Total Emissio	15,759.30	**30.8**	**50.8**	**15,840.90**
14																			
15	CH4		CH4 lbs/mwh in 2015					*reported in inventory tool*											
16	residential	33,485,000	0.0258	0.001	0.000453592	25	9.80	9.81											
17	Commercial/i	43,945,000	0.0258	0.001	0.000453592	25	12.9												
18	Industrial	12,954,000	0.0258	0.001	0.000453592	25	3.79	3.8											
19	Other	4,089,362	0.0258	0.001	0.000453592	25	1.2												
20	Other	10,090,510	0.0258	0.001	0.000453592	25	3.0												
21	Public	659,128	0.0258	0.001	0.000453592	25	0.2												
22						This is slightly	30.78	Total											
23																			
24																			
25																			
26																			
27	NO2		N20 lbs/mwh in 2015																
28	residential	33,485,000	0.0036	0.001	0.000453592	298	16.3												
29	Commercial/i	43,945,000	0.0036	0.001	0.000453592	298	21.4												
30	Industrial	12,954,000	0.0036	0.001	0.000453592	298	6.30												
31	Other	4,089,362	0.0036	0.001	0.000453592	298	2.0												
32	Other	10,090,510	0.0036	0.001	0.000453592	298	4.9												
33	Public	659,128	0.0036	0.001	0.000453592	298	0.3												
34						My total if off	51.2	Total											
35																			
36																			

Summary_Community .XLSX

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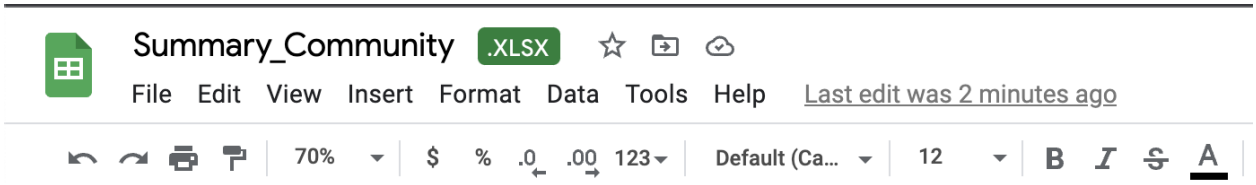
Y8

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		*CO2 Emissions = Fuel use × CO2 Emission Factor (kg CO2/unit of fuel*								Total Stationary Emissions				
2		**Fuel consumed**	**Stationary (Gallons**	**kg CO2/unit**	**MT/kg**	**MT CO2**	**× GWP =**	**MT CO2e**		**Sector**	**CO2**	**CH4**	**N20**	**Total**
3	residential	339,768		54.5	0.001	18517.356	1	18,517.36		Residential	18,517	44	10	18,571
4	Commercial/institutional	286,238		54.5	0.001	15599.971	1	15,599.97		Commercial/institutional	15,600	37	9	15,645
5	Industrial	57,574		54.5	0.001	3137.783	1	3,137.78		Industrial	3,138	7	2	3,147
6	Other commrcial Insitutional-School	33,834		54.5	0.001	1843.953	1	1,843.95		Other commrcial Insitutional-School	1,844	4	1	1,849
7	Other commrcial Insitutional-Hospital	61,230		54.5	0.001	3337.035	1	3,337.04		Other commrcial Insitutional-Hospital	3,388	8	2	3,398
8	Other commrcial Insitutional-Hospital		5012.00	10.21	0.001	51.17252	1	51.17		Public Authority	4,270	10	2	4,283
9	Public Authority	78,356		54.5	0.001	4270.402	1	4,270.40		Total	46,758	110	26	46,894
10														
11	CH4	**Fuel consumed**	**Stationary (Gallons**	**kg CH4/unit**	**MT/kg**	**MT CH4**	**× GWP =**	**MT CO2e**						
12	residential	339,768		0.00514	0.001	1.74640752	25	43.660188						
13	Commercial/institutional	286,238		0.00514	0.001	1.47126332	25	36.781583						
14	Industrial	57,574		0.00514	0.001	0.29593036	25	7.398259						
15	Other commrcial Insitutional-School	33,834		0.00514	0.001	0.17390676	25	4.347669						



	A	B	C	D	E	F	G	H	I
15	Other commrcial Insitutional-School	33,834		0.00514	0.001	0.17390676	25	4.347669	
16	Other commrcial Insitutional-Hospital	61,230		0.00514	0.001	0.3147222	25	7.868055	
17	Other commrcial Insitutional-Hospital		5012.00	0.0015	0.001	0.007518	25	0.18795	
18	Public Authority	78,356		0.00514	0.001	0.40274984	25	10.068746	
19									
20									
21									
22									
23	NO2	Fuel consumec	Stationary (Gallons	kg N2O/unit	MT/kg	MT N2O	× GWP =	MT CO2e	
24	residential	339,768		0.0001	0.001	0.0339768	298	10.1250864	
25	Commercial/institutional	286,238		0.0001	0.001	0.0286238	298	8.5298924	
26	Industrial	57,574		0.0001	0.001	0.0057574	298	1.7157052	
27	Other commrcial Insitutional-School	33,834		0.0001	0.001	0.0033834	298	1.0082532	
28	Other commrcial Insitutional-Hospital	61,230		0.0001	0.001	0.006123	298	1.824654	
29	Other commrcial Insitutional-Hospital		5012.00	0.0001	0.001	0.0005012	298	0.1493576	
30	Public Authority	78,356		0.0001	0.001	0.0078356	298	2.3350088	
31									

Summary_Community .XLSX

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P17

	A	B	C	D	E	F	G	H	I
1	Stationary Fuel Emission Factors							**Conversions**	**Multiply by**
2			kg CO2	kg CH4	kg N2O			CO2 to CO2e	1
3		Fuel	CO2	CH4	N2O	Heat Content (l	Unit	CH4 to CO2e	25
4		**Natural Gas**	54.505	0.0051	0.0001	1.028	mcf	N2O to CO2e	298
5		Digester Gas	43.791	0.0027	0.0005	0.841	mcf	lbs to metric ton	0.000453592
6		**Diesel**	10.21	0.0015	0.0001	0.138	gal		
7		LPG	5.79	0.001	0.0001	0.092	gal		
8		**Gasoline**	8.78	0.0014	0.0001	0.125	gal		
9		**Residual Fuel Oil No. 5**	10.21	0.0015	0.0001	0.14	gal		
10									
11	Electricity emission factors				NYUP eGRID su	(lb/MWh)			
12					Gas	2015			
13					CO2	330.19			
14					CH4	0.0258			
15					N2O	0.004			
16									
17									

Summary Calculations

Canandaigua_GHG_InventoryReport_Excel

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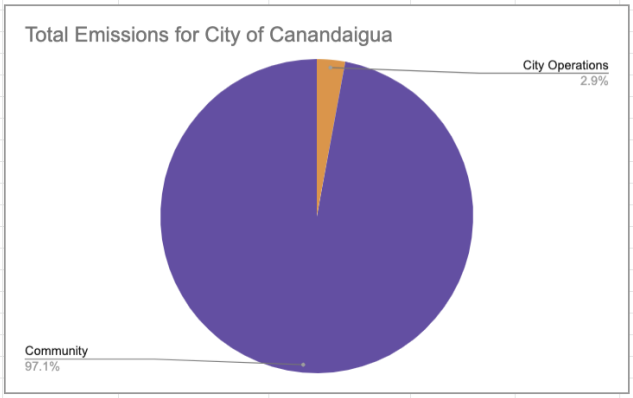
Q24

	A	B	C	D	E	F	G	H	I	J
1										
2										
3	**Summary COMMUNITY Energy & Emissions by Sector**				**Summary TOTAL Emissions and Energy for City of Canandaigua**					
4	**Sector**	**MMBTU**	**MTCO2e**			**MMBTU**	**Emissions**			
5	**Residential**	474,725	23,612		**City Operations**	75,679.62	2,703.62			
6	**Commercial/Institutional**	444,193	22,261		**Community**	1,680,616	90,142			
7	**Industrial**	103,386	5,097		**TOTAL**	1,756,295.62	92,845.62			
8	**Other Commercial/Insitu**	48,862	3,806							
9	**Other Commercial/Insitu**	98,075	4,973							
10	**Public Authority**	82,799	4,382							
11	**Other - No Specific Cate**	428,576	26,011							
12	**Totals**	1,680,616	90,142							
13										
14	**Summary CITY Energy & Emissions by Source**									
15	**Source**	**MMBTU**	**MTCO2e**							
16	**Stationary**	23,847.00	1,264.00							
17	**Electricity**	12,885.05	568.52							
18	**Vehicles**	38,844.13	887.84							
19	**Waste**	103.44	-16.74							
20	**Totals**	75,679.62	2,703.62							
21										
22										
23	**Population**	10,576								
24	**Emissions per capita**	8.78								
25	**Emergy per capita**	166.06								
26										
27										
28										



All WARM Calculations

police department

GHG Emissions Analysis -- Summary Report

Version 15

GHG Emissions Waste Management Analysis for Water Treatment Facility

Prepared by: CSC

Project Period for this Analysis: 01/01/19 to 12/01/19

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): (1.73)

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Anaerobically Digested	Total $MTCO_2E$
Mixed Recyclables	0.65	-	-	NA	NA	(1.85)
Mixed MSW	NA	0.39	-	NA	NA	0.12
						0
						0
						0
						0
						0

water treatment facility

GHG Emissions Analysis -- Summary Report

Version 15

GHG Emissions Waste Management Analysis for Fire Houses

Prepared by: CSC

Project Period for this Analysis: 01/01/19 to 12/01/19

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): (5.21)

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Anaerobically Digested	Total $MTCO_2E$
Mixed Recyclables	2.08	-	-	NA	NA	(5.93)
Mixed MSW	NA	2.34	-	NA	NA	0.72
						0
						0
						0
						0
						0

wastewater treatment facility

GHG Emissions Analysis -- Summary Report

Version 15

#REF!

Prepared by: Waste Water Treatment

Project Period for this Analysis: 01/01/19 to 12/01/19

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): 0.12

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Anaerobically Digested	Total $MTCO_2E$
Mixed MSW	NA	0.39	-	NA	NA	0.12
						0
						0
						0
						0
						0
						0
						0

department of public works

GHG Emissions Analysis -- Summary Report

Version 15

GHG Emissions Waste Management Analysis for Department of Public Works

Prepared by: CSC

Project Period for this Analysis: 01/01/19 to 12/01/19

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): (10.20)

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Anaerobically Digested	Total $MTCO_2E$
Mixed Recyclables	3.90	-	-	NA	NA	(11.13)
Mixed MSW	NA	2.99	-	NA	NA	0.92
						0
						0
						0
						0
						0
						0

fire houses

GHG Emissions Analysis -- Summary Report

Version 15

#REF!

Prepared by: Waste Water Treatment

Project Period for this Analysis: 01/01/19 to 12/01/19

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): 0.12

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Anaerobically Digested	Total $MTCO_2E$
Mixed MSW	NA	0.39	-	NA	NA	0.12
						0
						0
						0
						0
						0
						0
						0

community

GHG Emissions Analysis -- Summary Report

Version 15

GHG Emissions Waste Management Analysis for CSC

Prepared by: Residential Waste

Project Period for this Analysis: 01/01/15 to 12/01/15

Note: If you wish to save these results, rename this file (e.g., WARM-MN1) and save it. Then the "Analysis Inputs" sheet of the "WARM" file will be blank when you are ready to make another model run.

GHG Emissions from Baseline Waste Management ($MTCO_2E$): (1,338.13)

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Anaerobically Digested	Total $MTCO_2E$
Mixed Recyclables	741.00	-	-	NA	NA	(2,114.28)
Mixed MSW	NA	2,510.00	-	NA	NA	776.15
						0
						0
						0
						0
						0
						0