PHASE I

GOVERNMENT OPERATIONS

CLIMATE ACTION PLAN

MONROE COUNTY New York

July 2022

APPENDICES

ADAM J. BELLO
COUNTY EXECUTIVE

TABLE OF CONTENTS

- Appendix A: Business as Usual Greenhouse Gas Inventory Memo and ClearPath Data Inputs 1
- Appendix B: Greenhouse Gas Reduction Scenario Memo 17
- Appendix C: Implementation Actions Priority Ranking 33

Appendix A: Business as Usual Greenhouse Gas Inventory Memo and ClearPath Data Inputs

Michael Baker
INTERNATIONAL

To: Joseph Vankerkhove, Monroe County

From: Robert Dabadie, MBI
Hannah Clark AICP, MBI
Chris Rabasco, MBI

CC: John Steinmetz, Bergmann Associates
Molly Gaudioso, Bergmann Associates

Date: March 9, 2022

Subject: Baseline 2019 Greenhouse Gas Inventory the Government Operations Greenhouse Gas Inventory for Monroe County

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PURPOSE

Monroe County, NY is currently undertaking an effort to formulate a Climate Action Plan (CAP) for the government operations, including an inventory of existing Greenhouse Gas (GHG) emissions, the development of goals and formulation of alternative plans including GHG emissions forecasting.

The Monroe County CAP will focus on identifying strategies and recommendations to:

- Improve sustainability, reduce greenhouse gas emissions, and strengthen resiliency;
- Address both mitigation and adaptation;
- Create goals, actions, and policies that are innovative and achievable;
- Build on recent sustainability successes in County operations, from Clean Fleets and green building design practices to the County's Green Building Initiative;
- Advance Monroe County to the next level with an integrated and more detailed approach to climate action planning and community resilience;
- Create a plan that builds a consensus and momentum to spur action and provides a clear path for transitioning to Phase 2: Community-wide Climate Action Plan; and
- Provide a long-term vision to Monroe County with actionable pathways.

As a first stage in the process to develop the Monroe County CAP, a baseline inventory of the county operations GHG emissions was developed. Due to the ongoing COVID-19 pandemic and other economically disruptive events in 2020 as well as the availability of county data, 2019 was chosen as the year for the baseline inventory.

The team employed ICLEI USA's (Local Governments for Sustainability) online tool ClearPath to calculate the 2019 baseline county emissions inventory. ClearPath is one of the leading online software platforms for completing greenhouse gas inventories, forecasts, climate action plans, and monitoring at the community-wide or government-operations scales. ClearPath is used throughout the state of California and nationally. The methodologies underpinning the City of Rochester's CAP are the same as those encapsulated in Clearpath, ensuring compatibility between these local efforts.

It should be noted that this Phase 1 baseline inventory represents the GHG emissions for county government operations and those sources under the direct control of Monroe County. Phase 2 will be a more encompassing effort addressing all GHG sources in the county, public and private realms. Also, emissions from the Gloria Drive Landfill will be addressed in the Phase 1 baseline inventory under the title Solid Waste & Materials Management. Other landfills and composting facilities will be addressed in the Phase 2 study.

BASELINE INPUT DATA

ClearPath is a uniform model used by many communities to document and provide accessible data for developing GHG emission inventories. In this first inventory for Monroe County government operations, MBI considered all Scope 1 emissions (direct GHG emissions with the exception biogenic sources) and Scope 2 emissions (indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling) as detailed in the ICLEI Protocols. This includes County-owned or County-purchased operations that produce GHG emissions.

To obtain the required baseline data, the project team worked with County staff to determine the relevant facilities and operations to document in the ClearPath tool. ClearPath defines emissions by sector, and through engagement with County staff, it was determined that Monroe County had County-owned, County-operated, or County-purchased emissions in the following sectors:

- Buildings and Facilities
- Expressway Lights and Traffic Signals
- Pure Waters Infrastructure
- County Fleet
- Solid Waste & Materials Management

To analyze each of these sectors, specific inputs are necessary for ClearPath or for accompanying calculation tools, and the project team worked with County staff to obtain the needed data. A master spreadsheet detailing the specific data needs was created, and Monroe County staff provided the data by sector, sourcing information from its departments' records. The data

request is summarized below, with a description of the data received shown in **bold**. The complete data set of inputs can be found in in Attachment B.

- Buildings and Facilities
    - Emissions from Grid Electricity
        - Electricity Used
            - **All County Buildings (Total)**
    - Emissions from Stationary Fuel Combustion
        - Fuel Use and Fuel Type
            - **All County Buildings (Total)**
    - Steam and District Heating Purchases
        - District Heat Fuel Type, Quantity of Steam Purchased, Enthalpy of Delivered Steam, Boiler Efficiency, and Transport Losses
            - **RDH to COB and Civic Center purchases**
    - Heat and Power Purchases from Combined Heat and Power (CHP)
        - Total Facility Fuel Consumption, Total Electricity Produced, Total Useful Heat Produced, Efficiency of Steam/Heat Production, Efficiency of Electricity Production, and Heat Purchases
            - **Lola CHP**

- Expressway Lights and Traffic Signals
    - Emissions from Grid Electricity
        - Electricity Used
            - **MCDOT Traffic Signals, Buildings/Structures, Expressway Lights**
    - Emissions from Stationary Fuel Combustion
        - Annual Gas Usage
            - **None**

- Pure Waters Infrastructure
    - Emissions from Stationary Fuel Combustion
        - Fuel Use and Fuel Type
            - **20 Facilities/Pump Stations**
    - Emissions from Grid Electricity
        - Electricity Used
            - **87 Facilities/Pump Stations**

- County Fleet
    - Fleet Vehicle Emissions
        - Fuel Type, Fuel Use, Percent Biofuel in Blend
            - **Sheriff's Fleet – Diesel, Sheriff's Fleet – Total Gas, 40 other vehicle types**
    - Emissions from Off-Road Vehicles
        - Equipment Type, Fuel Use, and Fuel Type
            - **Sheriff's Fleet – Marine Unit, 6 other vehicle types**
    - Transit Fleet Emissions
        - Fuel Type, Fuel Use, Vehicle Type, Percent Biofuel in Blend
            - **Paratransit Fleet**

- Solid Waste & Materials Management (Gloria Drive landfill only).

RESULTS

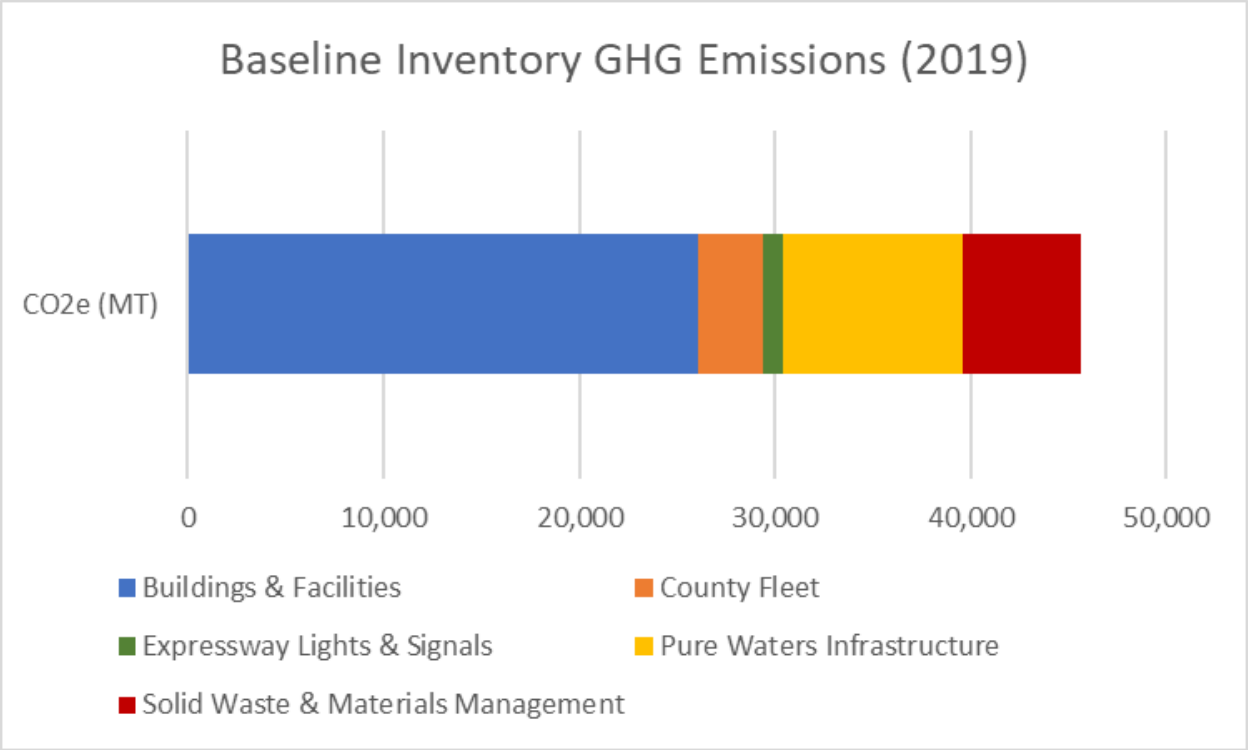
Using data received from the County, records were created as needed and populated in the ClearPath tool by sector. The total GHG emissions for each sector are shown in Table 1 and Figure 1 on the following page. Further details are provided in Attachment A which contains a series of output charts generated directly by ClearPath, including additional breakouts that further summarize the results, showing each sector as a proportion of the County total, followed by data results for each individual sector. The results were reviewed by ICLEI staff who reported that the results were in line with other studies. This baseline inventory will be used in the development of goals and alternatives in the next steps of the study.

Overall, the most dominant sector was Buildings & Facilities, which represented 57.14% of total County emissions. The next largest emission sectors were Pure Waters Infrastructure, followed by County Fleet.

Table 1: Monroe County Baseline GHG Emissions Inventory Summary

Sector	CO2e (MT)	%
Buildings & Facilities	26,073	57.2%
County Fleet	3,295	7.2%
Expressway Lights & Signals	1,004	2.2%
Pure Waters Infrastructure	9,225	20.2%
Solid Waste & Materials Management	6,035	13.2%
Total	**45,632**	**100%**

Figure 1: Monroe County Baseline GHG Emissions Inventory By Sector



BUSINESS AS USUAL FORECAST (BAU)

Following the Baseline Inventory, a Business as Usual Forecast (BAU) was developed in order to project future emissions given no mitigation actions from the County. Therefore, the BAU does not feature any reductions in consumption across any sector. However, it does factor in reduction strategies that are beyond the County's control. These include federal vehicle emission standards, and state clean power goals. Federal vehicle emissions standards are projected to increase by 1.8% every five years. New York State clean power goals project for 100% zero-emission grid electricity by the year 2040. Given this BAU scenario, the results for Monroe County are shown in Table 2 below.

With the completion of the Baseline BAU inventory, the county and the project team will move forward in developing response or actions plans representing conservative, moderate and aggressive levels of intervention, as determined by the County and the advisory group.

Table 2 – Business as Usual Greenhouse Gas Emissions Forecasts for Monroe County

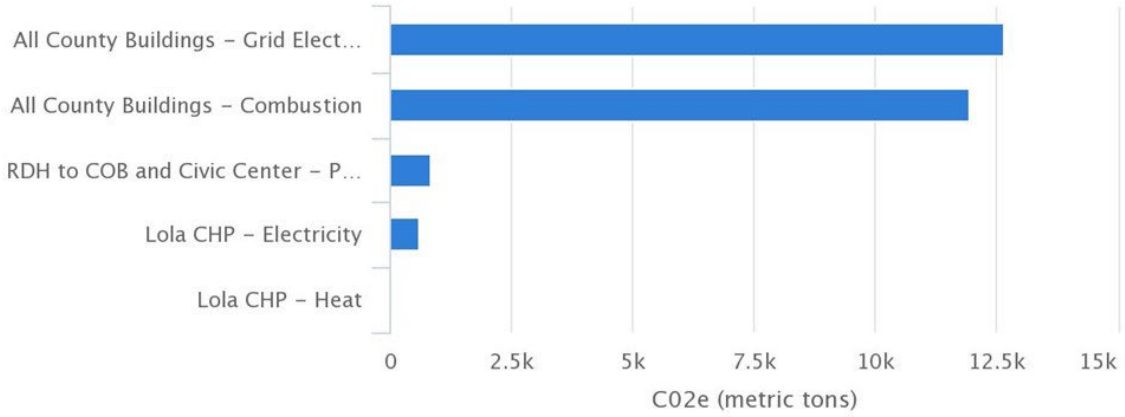
Sector	CO_2e (MT)			
	2019	2030	2040	2050
Buildings & Facilities	26,073	14,342	13,037	13,037
Expressway Lights & Signals	1,004	121	0	0
County Fleet	3,295	2,735	2,686	2,643
Solid Waste & Materials Management	6,035	4,661	3,288	1,914
Pure Waters Infrastructure	9,225	4,138	3,546	3,546
Total	**45,632**	**25,997**	**22,557**	**21,140**

CLEARPATH OUTPUT

Summary by Sector - Monroe County Baseline GHG Emissions Inventory

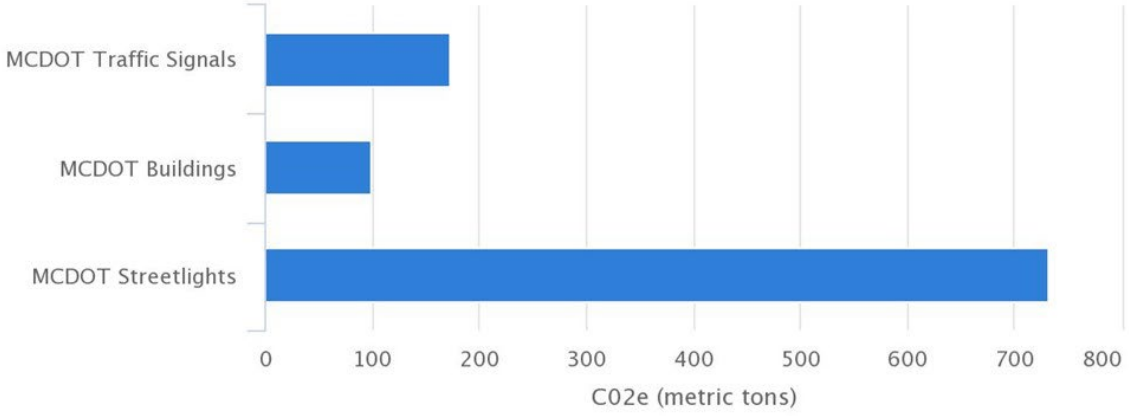
Buildings & Facilities

BERGMANN ARCHITECTS ENGINEERS PLANNERS Michael Baker INTERNATIONAL



Streetlights/Traffic Signals

BERGMANN ARCHITECTS ENGINEERS PLANNERS Michael Baker INTERNATIONAL



Pure Waters Infrastructure

- **Total Emissions (2019): 9,225 CO2e (MT)**
  - FEV WRRF: 6,448 CO2e (MT)
    - 69.9% of sector total
    - Combustion: 2,649 CO2e (MT)
    - Grid Electricity: 3,799 CO2e (MT)
  - NWQ WRRF: 1,441 CO2e (MT)
    - 15.6% of sector total
    - Combustion: 709 CO2e (MT)
    - Grid Electricity: 732 CO2e (MT)
  - FEV + NWQ WRRF = 85.5% of sector emissions
    - 94 other stations, pumps, facilities combine for remaining 14.5%

Notes:

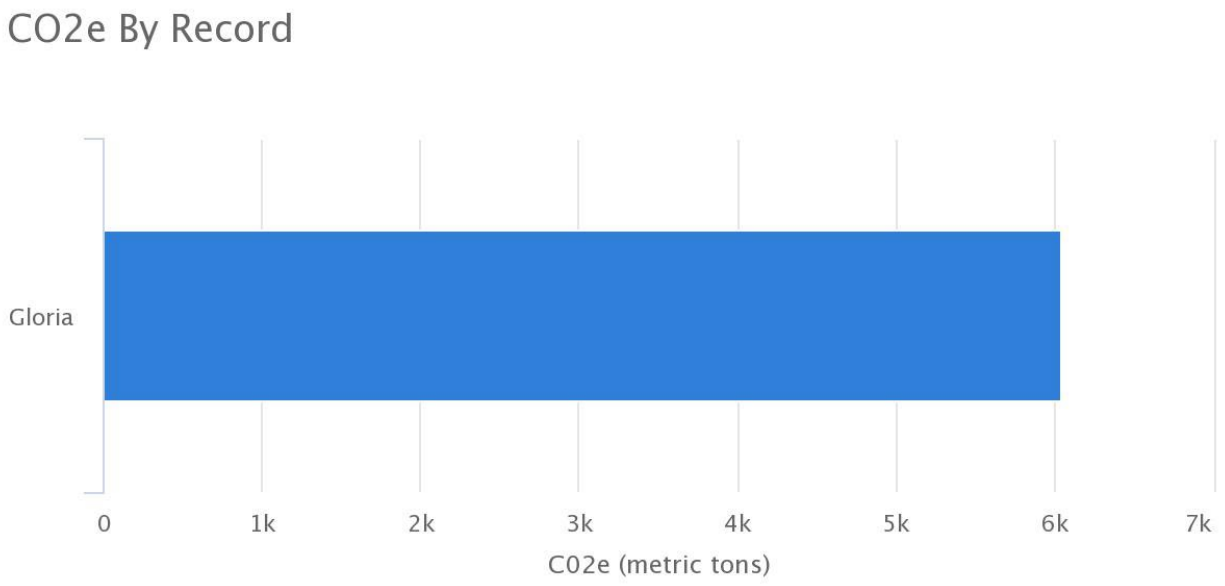
- WRRF = Water Resource Recovery Facility
- FEV = Frank E. Van Lare
- NWQ = Northwest Quadrant
- 5,785 CO2e (MT) from Grid Electricity (62.7%)
- 3,440 CO2e (MT) from Stationary Fuel Combustion (37.3%)

County Fleet

- **Total Emissions (2019): 3,295 CO2e (MT)**
  - Sheriff's Fleets: 1,424 CO2e (MT)
    - 47.2% of sector total
    - Gasoline: 1,160 CO2e (MT)
    - Diesel: 196 CO2e (MT)
    - Marine: 68 CO2e (MT)
  - 9 Oshkosh Jets: 228 CO2e (MT)
  - 47 Chevy Impalas: 227 CO2e (MT)
  - 34 F250s: 200 CO2e (MT)
  - 18 Chevy Tahoe's: 103 CO2e (MT)
  - **These 5 inputs = 72.3% of sector emissions**
- 42 other vehicle types with emissions under 100 CO2e (MT)
  - Remaining 27.7%

9

Solid Waste & Materials Management



BUILDINGS & FACILITIES INPUTS

Grid Electricity							
Name	**Electricity Used**	**Units**					
All County Buildings	94542207	kWh					
Stationary Combustion							
Name	**Fuel Type**	**Fuel Use**	**Units**				
All County Buildings	Natural Gas	224760	Therms				
Steam and District Heating Purchases							
Name	**District Heat Fuel Type**	**Quantity of Steam Purchased**	**Enthalpy of Steam Delivered**	**Boiler Efficiency**	**Transport Losses**		
RDH to COB and Civic Center	**Natural Gas**	79902000 lbs.	321.85	86%	18%		
Combined Heat and Power Purchases (CHP)							
Name	**Facility Fuel Type**	**Total Fuel Consumption**	**Electricity Produced**	**Total Useful Heat Produced**	**Efficiency of Steam/Heat Production**	**Efficiency of Electricity Production**	**Your Electricity Purchases**
Lola CHP Electricity	Natural Gas	146681 MMBtu	11022056.31 kWh	81867 MMBtu	80%	35%	1654346 kWh
Lola CHP Heat	Natural Gas	85107 MMBtu	11022056.31 kWh	81867 MMBtu	80%	35%	n/a

EXPRESSWAY LIGHTING & SIGNALS INPUTS

Grid Electricity		
Name	**Electricity Used**	**Units**
MCDOT Traffic Signals	1291546	kWh
MCDOT Streetlights	5460952	kWh
MCDOT Buildings	741580	kWh

SOLID WASTE & MATERIALS MANAGEMENT INPUTS

Government Owned/Operated Landfill		
Name	**CH4**	**Waste in Place**
Gloria Drive	215.524 MT	438470 Tons

COUNTY FLEET INPUTS

Fleet Vehicle Emissions				
Record Name	**Fuel Type**	**Annual Fuel Use**	**Units**	**Percent Biofuel in Blend**
47- CHEVY IMPALA	Gasoline	25850	Gallons	E10
13-CHEVY MALIBU	Gasoline	5200	Gallons	E10
10-MALIBU/HYBRID	Gasoline	1270	Gallons	E10
1-FORD FUSION	Gasoline	215	Gallons	E10
3-FUSION/HYBRID	Gasoline	750	Gallons	E10
3-TAURUS POLICE	Gasoline		Gallons	E10
15-FORD F150	Gasoline	9750	Gallons	E10
34-FORD F250	Gasoline	22780	Gallons	E10
5-FORD F350	Gasoline	3440	Gallons	E10
19-SILVERADO	Gasoline	9500	Gallons	E10
9-CHEVY HHR	Gasoline	3150	Gallons	E10
1-FORD EXCURSION	Gasoline	201	Gallons	E10
1-JEEP CHEROKEE	Gasoline	101	Gallons	E10
18-CHEVY TAHOE	Gasoline	11700	Gallons	E10
18-FORD ESCAPE	Gasoline	3600	Gallons	E10
2-ESCAPE HYBRID	Gasoline	374	Gallons	E10
12-CHEVY 3500 VAN	Gasoline	3600	Gallons	E10
20-FORD E350 VAN	Propane	6300	Gallons	
18-FORD E350 VAN	Gasoline	9900	Gallons	E10
1-FORD T150 VAN	Gasoline	100	Gallons	E10
1-FORD F650 BOX	Diesel	107	Gallons	B20
1-FORD F450 BOX	Diesel	362	Gallons	B20
1-FORD F550 BOX	Gasoline	700	Gallons	E10
1-FORD E350 BOX	Gasoline	220	Gallons	E10
1-FR/LINER BOX	Diesel	57	Gallons	B20
5- F550 AERIAL LIFT	Diesel	2000	Gallons	B20
1-E350 AERIAL LIFT	Gasoline	630	Gallons	E10
1-FR/LINER AERIAL	Diesel	365	Gallons	B20
2-CHEVY COLORADO	Gasoline	800	Gallons	E10
3-UPLANDER VAN	Gasoline	900	Gallons	E10
16-DODGE CARAVAN	Gasoline	5200	Gallons	E10
8-F450 DUMP BODY	Diesel	2000	Gallons	B20
7-F350 DUMP BODY	Diesel	2800	Gallons	B20
1-MACK RD690 DUMP	Diesel	646	Gallons	B20
2-STERLING DUMP	Diesel	2940	Gallons	B20
6-FR/LINER DUMP	Diesel	6000	Gallons	B20
2-WST/STAR DUMP	Diesel	200	Gallons	B20
2-KENWORTH DUMP	Diesel	3050	Gallons	B20
2-INTER CV515 DUMP	Diesel		Gallons	B20
1-FR/LINER FLATBED	Diesel	556	Gallons	B20
4-F550 FLATBED	Diesel	1600	Gallons	B20

1-WST/STAR FLAT	Diesel	677	Gallons	B20
1-KW PRENTIS	Diesel		Gallons	B20
1-PETERBLT STRIPR	Diesel	513	Gallons	B20
4-FR/LINER MT45	Diesel	1936	Gallons	B20
2-FR/LINER VACTOR	Diesel	3600	Gallons	B20
1-WST/STAR VACTOR	Diesel	472	Gallons	B20
1-WST/STAR TRK/TRL	Diesel	517	Gallons	B20
1-FR/LINER TRK/TRL	Diesel	244	Gallons	B20
3-FORD F250	Propane	4817	Gallons	n/a
Sheriff's Fleet	Gasoline	132126.054	Gallons	E10
Sheriff's Fleet	Diesel	19215.79	Gallons	B20
Sheriff Fleet - Marine	Gasoline	7636.6	Gallons	E10

Transit Vehicle Emissions				
Record Name	**Fuel Type**	**Annual Fuel Use**	**Units**	**Vehicle Type**
4-FORD E450	LPG	21692	Gallons	Paratransit Bus
3-FORD E450	Gasoline	17247	Gallons	Paratransit Bus
1- FORD E350	Gasoline	172	Gallons	Paratransit Bus

PURE WATERS INPUTS

Grid Electricity		
Record Name	**Annual Electricity Used**	**Units**
31/60	300	kWh
Airport PS	26,723	kWh
Beau Lane PS	4,429	kWh
Brighton 5	63,700	kWh
Browncroft	6,709	kWh
Buttonwood	1,954,997	kWh
Carthage	300	kWh
Central Gates	33,200	kWh
Charlotte	357,545	kWh
Churchville PS	154,368	kWh
Cliff St Screenhouse	27,080	kWh
Clinton & Keeler	53,532	kWh
CS41	10,993	kWh
CS243	135,360	kWh
CS45/Maplewood	104,700	kWh
Culver Atlantic	6,950	kWh
Culver Goodman	75,191	kWh
Dearcop	10,842	kWh
Deming	5,339	kWh
Densmore	25,972	kWh
Dewey & Seneca	2,400	kWh
Eastman & Woodside	2,400	kWh
Elmwood	68,920	kWh
Fairbanks	12,241	kWh
FEV WRRF	28,349,531	kWh
First St	1,523	kWh
Flynn Rd	1,247,944	kWh
Forestview	4,541	kWh
Freeland	2,400	kWh
Front St	5,497	kWh
GCO	2,004,640	kWh
Genesee	7,103	kWh
Glenwood Screenhouse	38,680	kWh
GRI Shaft 1	2,633	kWh
GRI Shaft 2	2,035	kWh
Hortense	2,400	kWh
Howard	3,910	kWh
Industry PS	13,034	kWh
Inglewood	2,270	kWh
Irondequoit Shaft 4	8,073	kWh
Irondequoit Shaft 5	23,174	kWh

Island Cottage	811,746	kWh
John St PS	370,600	kWh
Karenlee	490	kWh
Leedale	53	kWh
Lincoln & Copley	2,400	kWh
Lyceum	2,400	kWh
Lyell Ave	2,400	kWh
Malvern	7,378	kWh
McEwen Drive PS	170,200	kWh
Mill Seat PS	45,337	kWh
Municipal	4,044	kWh
NWQ WRRF	5,464,849	kWh
Pattonwood	122,080	kWh
Pinnacle	78,564	kWh
Railroad	2,400	kWh
Renaissance	4,062	kWh
Ridge & Carlisle	2,400	kWh
Riverdale 1	8,287	kWh
Riverdale 2	5,595	kWh
Riverdale 3 PS	9,370	kWh
Riverdale 4	18,206	kWh
Riverdale 5	2,290	kWh
Riverdale 6	21,193	kWh
Riverton PS	75,400	kWh
Rose Hill	2,206	kWh
Sandbar PS	170,200	kWh
Scottsville PS	93,680	kWh
Seabury	3,942	kWh
Site 12	300	kWh
Site 35	604	kWh
Site 7	300	kWh
Southwest	186,700	kWh
Spencerport	272,240	kWh
Stoney Point	9,523	kWh
Sunset Hills	12,338	kWh
Tarwood	4,792	kWh
Thomas Creek	89,711	kWh
Timpat	43,612	kWh
Trolley	93,750	kWh
Union Station	11,645	kWh
Vantage Point	951	kWh
West Chili	2,325	kWh
West Henrietta Rd PS	58,693	kWh
Western Gateway	1,421	kWh

Westover	6,600	kWh
Whittier	8,786	kWh

Stationary Combustion		
Record Name	**Fuel Type**	**Annual Fuel Use**
Brighton 5	Natural Gas	99.3
Dearcop	Natural Gas	31.6
FEV WRRF	Natural Gas	49809.8
GCO	Natural Gas	927.8
Irondequoit Bay PS	Natural Gas	454.9
NWQ WRRF	Natural Gas	13324.7
Riverdale 4	Natural Gas	11.8
Riverdale 6	Natural Gas	4.8
Stoney Point	Natural Gas	0
West Henrietta Rd PS	Natural Gas	30.7
Beau Lane PS	Diesel	3
Charlotte PS	Diesel	357.6
Churchville PS	Diesel	2.95
John St PS	Diesel	77
McEwen Drive PS	Diesel	28.25
Riverdale 3 PS	Diesel	144
Riverton PS	Diesel	157.5
Sandbar PS	Diesel	14.35
Scottsville PS	Diesel	35
West Henrietta Rd PS	Diesel	12.3

Appendix B: Greenhouse Gas Reduction Scenario Memo

Michael Baker
INTERNATIONAL

We Make a Difference

To: Joseph Vankerkhove, Monroe County

From: Robert Dabadie, MBI
Hannah Clark AICP, MBI
Chris Rabasco, MBI

CC: John Steinmetz, Bergmann Associates
Molly Gaudioso, Bergmann Associates

Date: March 10, 2022

Subject: Monroe County Climate Action Plan – Conservative, Moderate, Aggressive Scenarios

PURPOSE

Monroe County, NY is currently undertaking an effort to formulate a Climate Action Plan (CAP) for the government operations, including an inventory of existing Greenhouse Gas (GHG) emissions, the development of goals and formulation of alternative plans including GHG emissions forecasting.

As a first stage in the process to develop the Monroe County CAP, a baseline inventory of the county operations GHG emissions was developed. Using this data, three scenarios were modeled using the ICLEI USA online tool ClearPath.

These scenarios were organized by target reduction levels through the year 2050, per sector. Three scenarios were developed per sector: Conservative, Moderate, and Aggressive. Each scenario also represents differing levels of capital investment and mitigation strategies. The resulting total emissions for the County based on each reduction scenario per sector is shown in the chart below:

Sector	2019	Conservative 2050	Moderate 2050	Aggressive 2050
Buildings & Facilities	26,073	13,037	9,126	5,215
Expressway Lights & Signals	1,004	0	0	0
County Fleet	3,295	1,648	989	330
Pure Waters Infrastructure	9,225	3,546	2,768	1,845
Solid Waste & Materials Management	6,035	1,914	1,914	862
Total	**45,632**	**20,145**	**14,797**	**8,252**

MODEL NOTES PER SECTOR

Buildings & Facilities Reductions

Sector	2019	Conservative 50%	Moderate 60%	Aggressive 80%
Buildings & Facilities	26,073	13,037	9,126	5,215

Emissions reductions accounts for increases in clean electricity, and a reduction in energy consumption in buildings powered by stationary fuel combustion. Quantifiable goals need to be developed to achieve these targets.

- **Independent Variables Adjusted**
  - Electricity Energy Equivalent (Quantity MMBtu)
  - Natural Gas – Energy Equivalent (Quantity MMBtu)
  - Natural Gas – District Heat Energy Consumption (Quantity MMBtu)
  - Electricity – Purchased Combined Heat and Power (Quantity MMBtu)
  - Heat – Purchased Combined Heat and Power Energy (Quantity MMBtu)
  - Carbon Intensity Factor
- Conservative = 50% Reduction
  - Clean Power Goals for Electricity, Energy efficiency increases, enforcing new building codes, incentive programs for energy efficient retrofits.
- Moderate = 65% Reduction
  - Clean Power Goals for Electricity and combining conservative energy efficiency and reduction strategies with renewable energy will increase reductions if the county adopts 1-2% of renewable energy adoption annually.
- Aggressive = 80% Reduction
  - Clean Power Goals for Electricity and Fuel Switching strategies to use less carbon intensive energy sources, shifting away from natural gas.

County Fleet Reductions

Sector	2019	Conservative 50%	Moderate 70%	Aggressive 90%
County Fleet	3,295	1,648	989	330

- **Independent Variables Adjusted**
  - Gasoline (Quantity)
  - Diesel (Quantity)
  - LPG Quantity
  - Energy Equivalent (Quantity MMBtu)
  - Carbon Intensity Factor
- Conservative (50% reduction)
  - Entails changing roughly 106 gas vehicles to EV by 2050, or 3.5 per year on average. And changing 22 diesel vehicles to EV by 2050, or 0.73 per year on average.
- Moderate (70% reduction)
  - Entails changing roughly 164 gas vehicles to EV by 2050, or 5.5 per year on average. And changing 35 diesel vehicles to EV by 2050, or 1.1 per year on average.
- Aggressive (90% reduction)
  - Entails changing roughly 222 gas vehicles to EV by 2050, or 7.4 per year on average. And changing 47 diesel vehicles to EV by 2050, or 1.6 per year on average.

Expressway Lights & Signals Reductions

Sector	2019	Conservative 100%	Moderate 100%	Aggressive 100%
Expressway Lights & Signals	1,004	0	0	0

Expressway Lights & Signals is 100% electric in its consumption. Therefore, if the NY State Clean Power Goals are followed, grid electricity will be 100% renewable by 2050 in all scenarios.

- **Independent Variables Adjusted**
  - Electricity Energy Equivalent (Quantity MMBTu)
  - Carbon Intensity Factor

Solid Waste & Materials Management Reductions

Sector	2019	Conservative 68.3%	Moderate 68.3%	Aggressive 90%
Solid Waste & Materials Management	6,035	1,914	1,914	862

Gloria Drive, if given zero mitigation, will naturally deteriorate by 68.3% by 2050 in all scenarios. Dormant, uncapped landfill waste and CH4 intensity decreases over time on its own. If capped, landfill emissions will decrease significantly in an aggressive scenario.

- **Independent Variables Adjusted**
  - Methane
  - Waste in Place
  - Carbon Intensity Factor
- Conservative and Moderate (68.3% Reductions)
- Aggressive
  - Capping of the landfill will capture 90% of Methane emissions regardless of year, but note, this report denotes 2044 as the year the landfill will be capped.

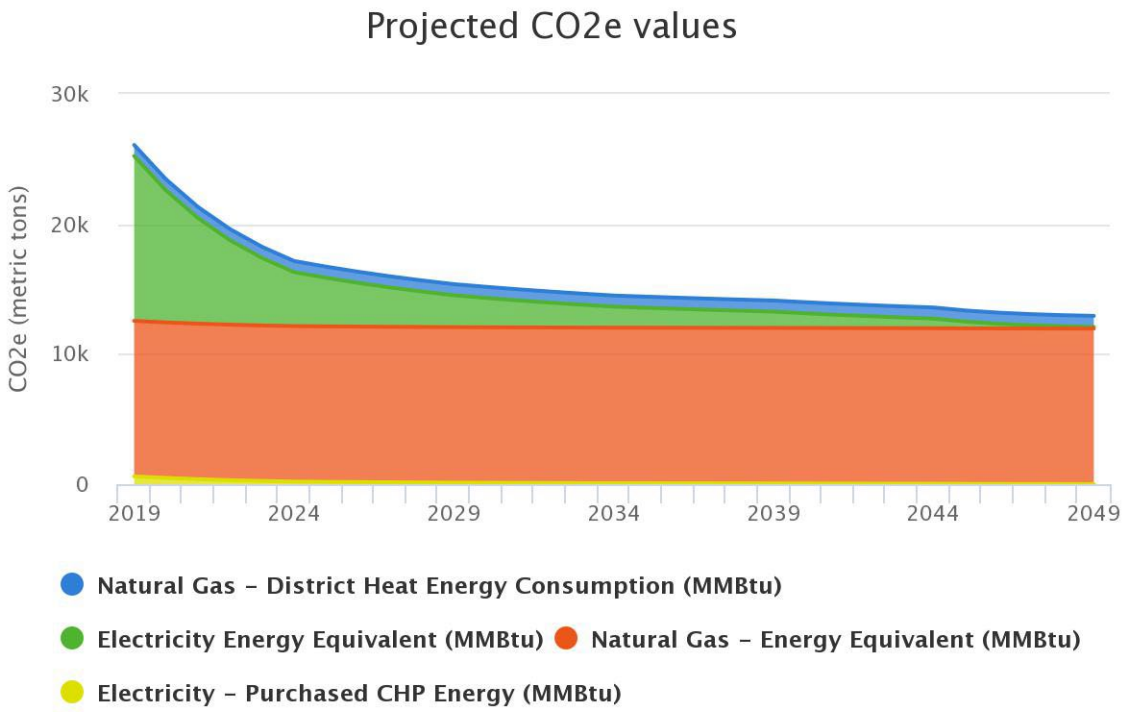
Pure Waters Infrastructure Reductions

Sector	2019	Conservative 62%	Moderate 70%	Aggressive 80%
Pure Waters Infrastructure	9,225	3,546	2,768	1,845

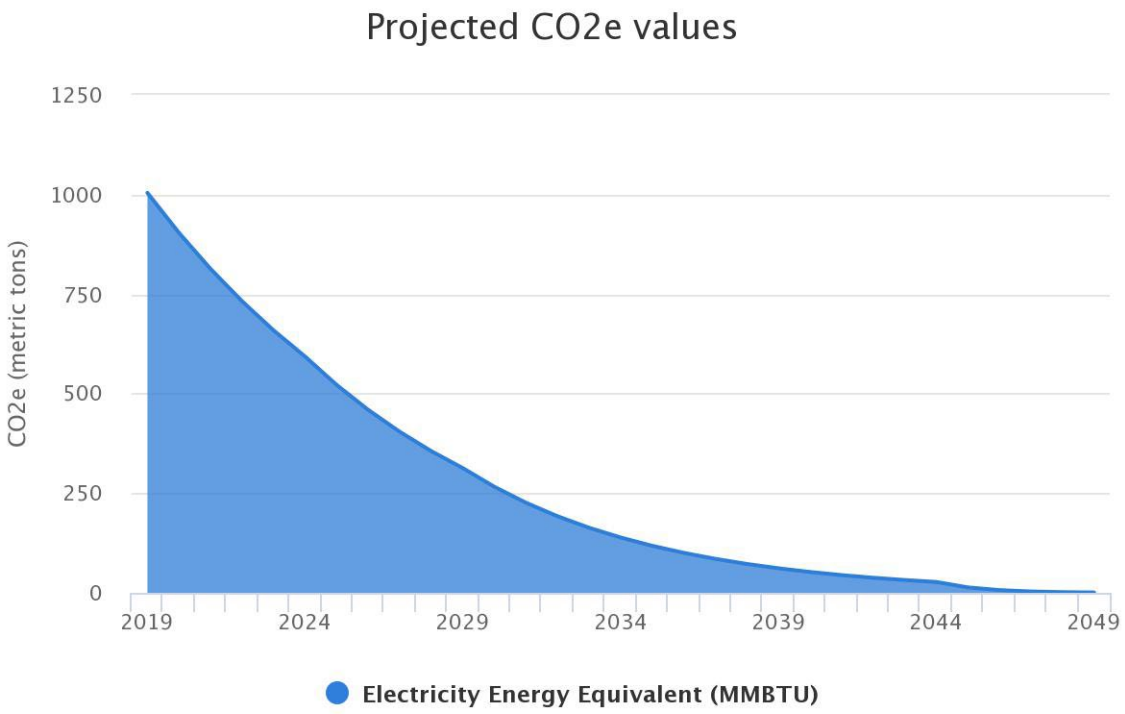
Reductions represent changes in electricity standards and a reduction in use of stationary fuel combustion. Quantifiable goals need to be developed to achieve these targets.

- **Independent Variables Adjusted**
  - Electricity Energy Equivalent (Quantity MMBtu)
  - Natural Gas Energy Equivalent (Quantity MMBtu)
  - Carbon Intensity Factor
- Conservative (62% Reduction)
  - Clean Power Goals for Electricity, Natural Gas standard operations
- Moderate (70% Reduction)
  - Clean Power Goals for Electricity and 1-2% natural gas reductions annually.
- Aggressive (80% Reduction)
  - Clean Power Goals for Electricity and Fuel Switching strategies.

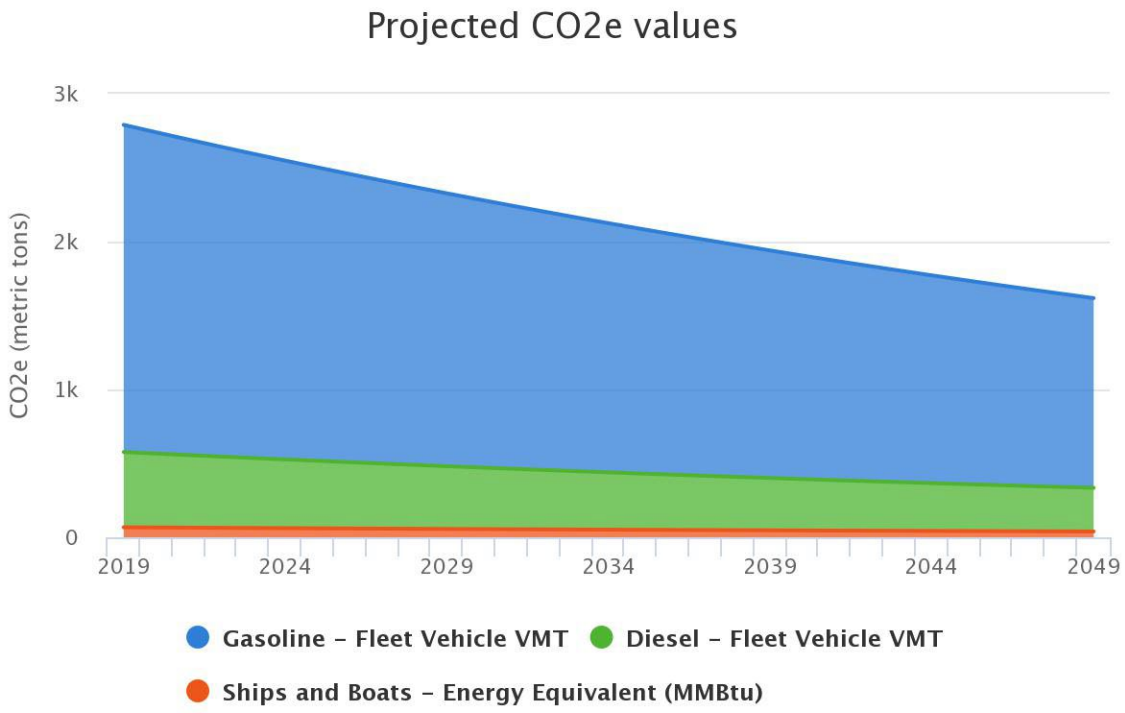
Buildings and Facilities



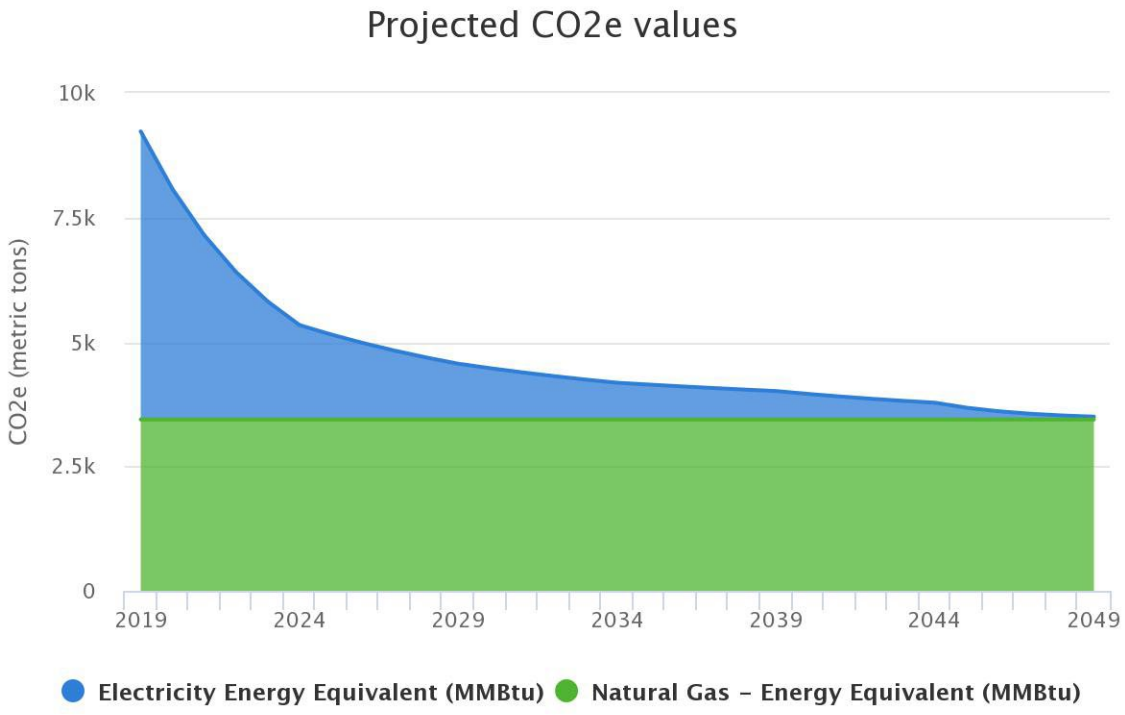
Expressway Lights & Signals



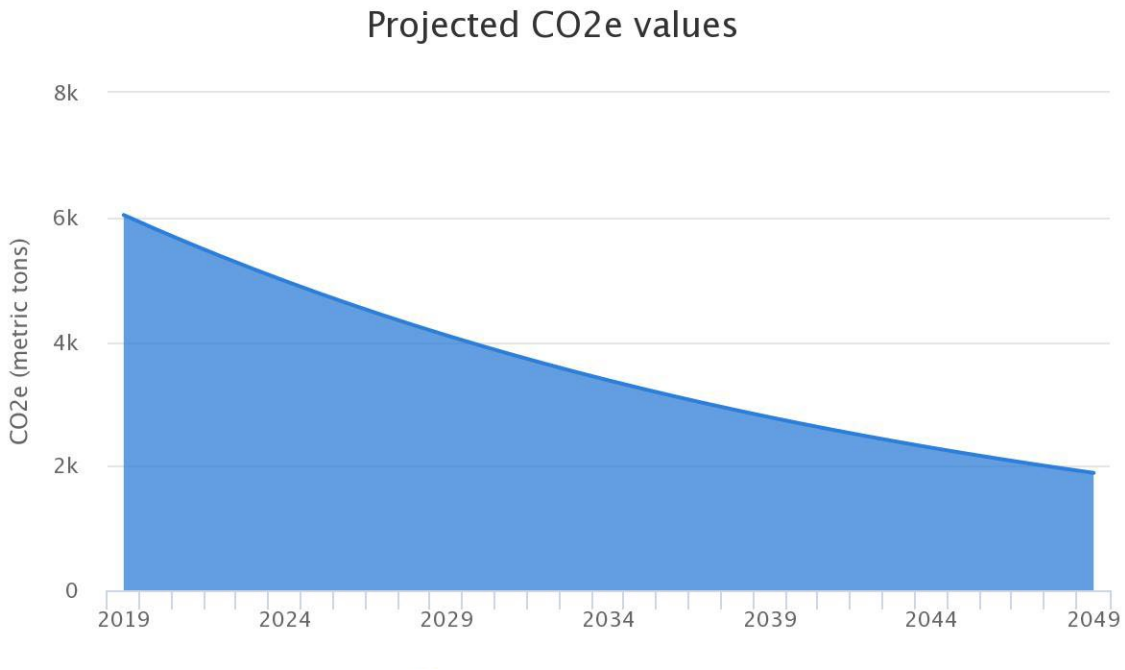
County Fleet



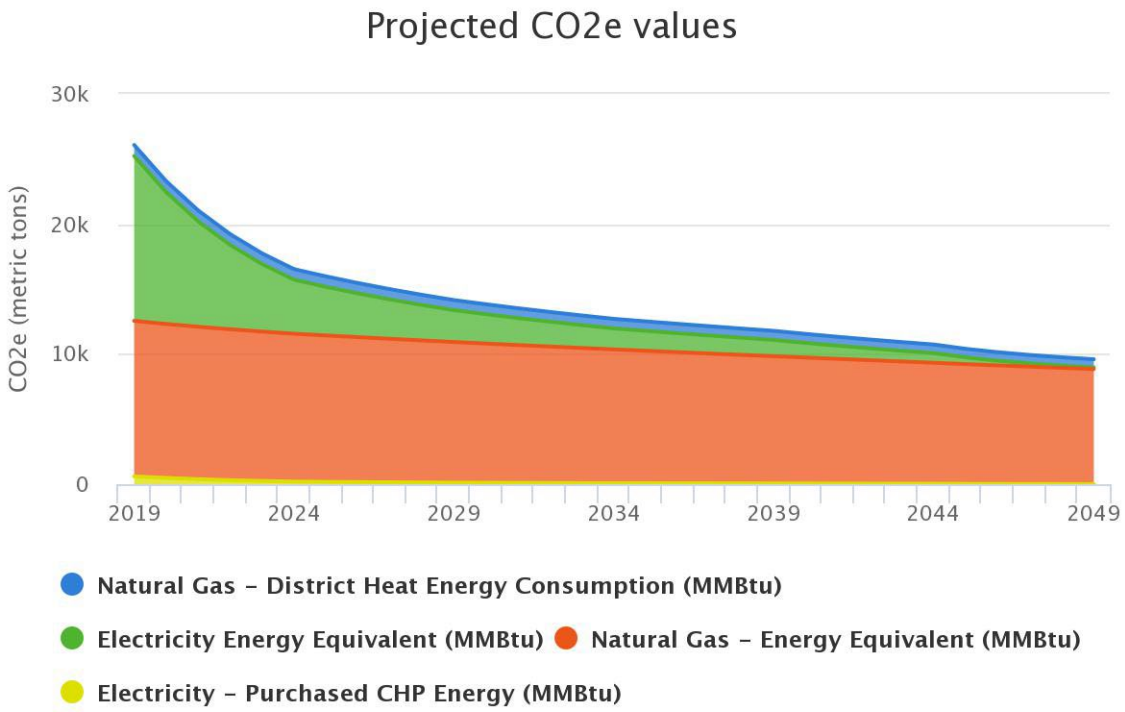
Pure Waters Infrastructure



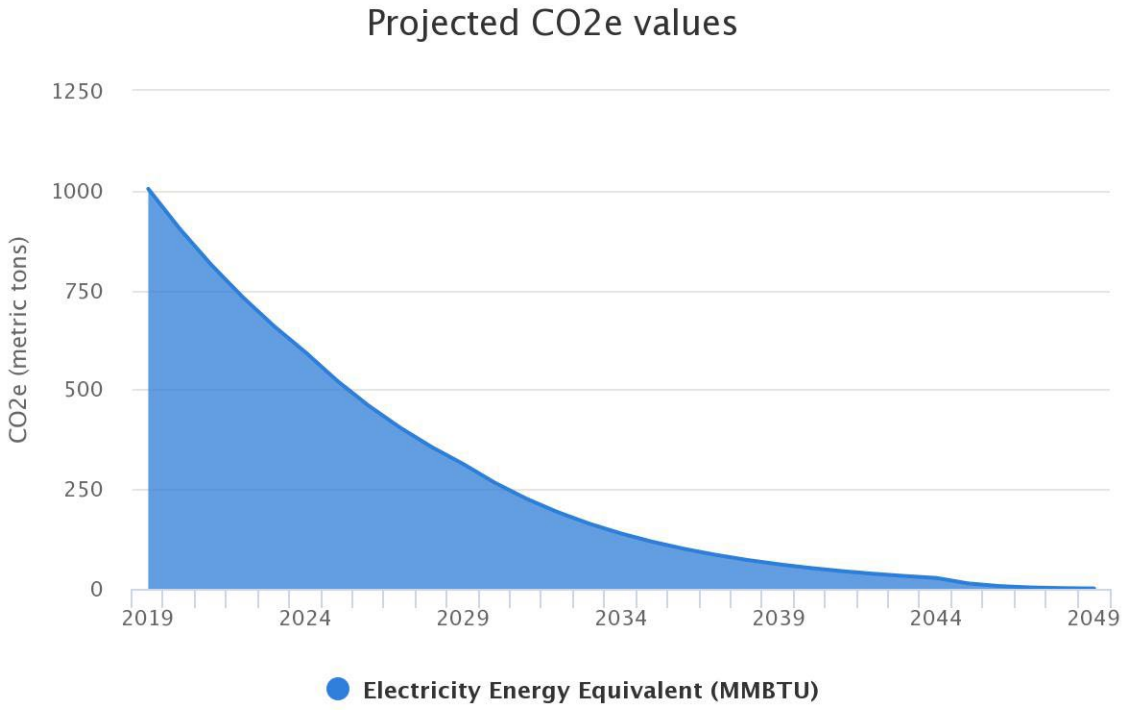
Solid Waste & Materials Management



Buildings and Facilities



Expressway Lights & Signals



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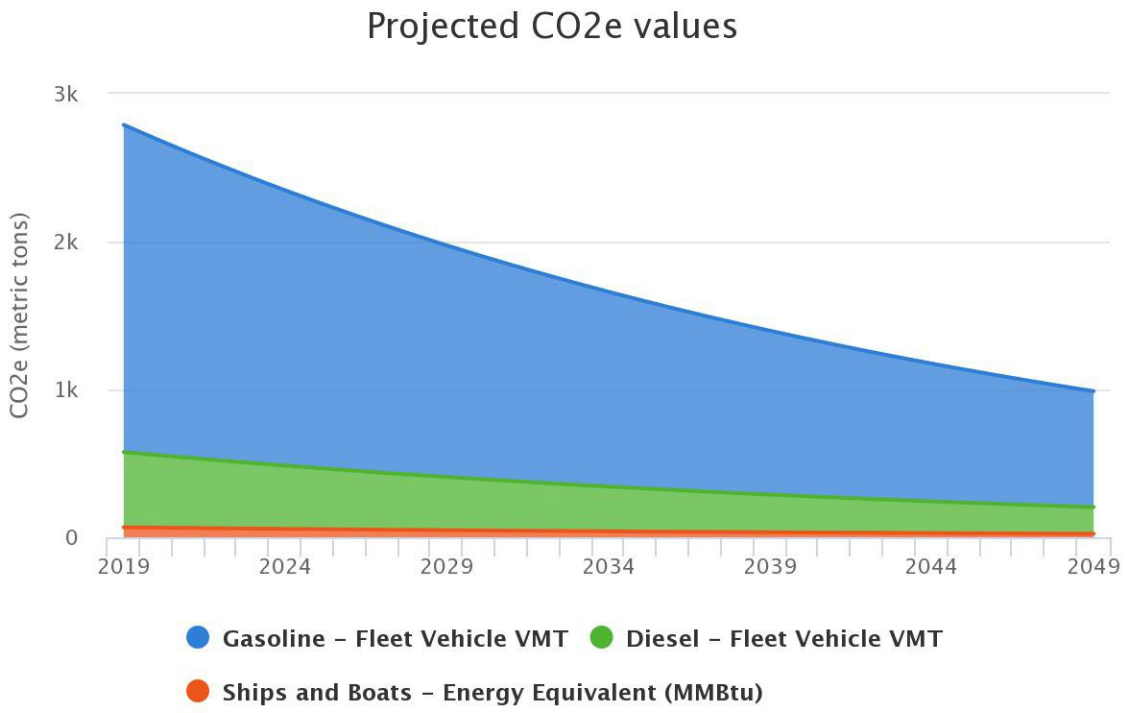
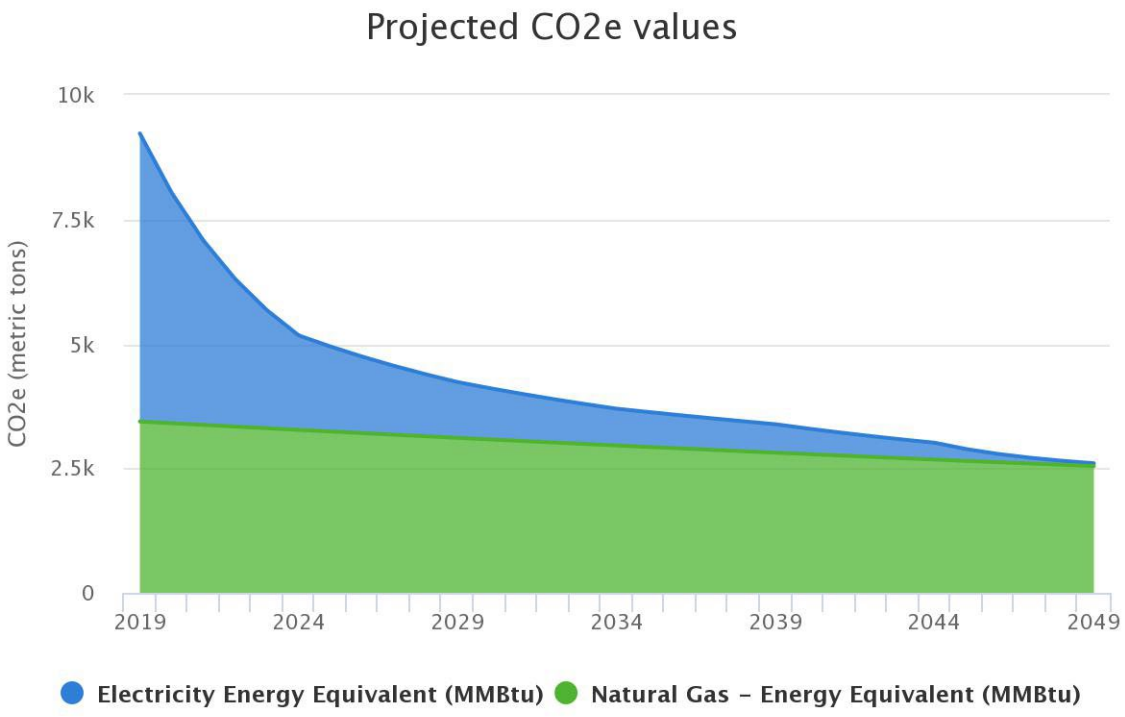
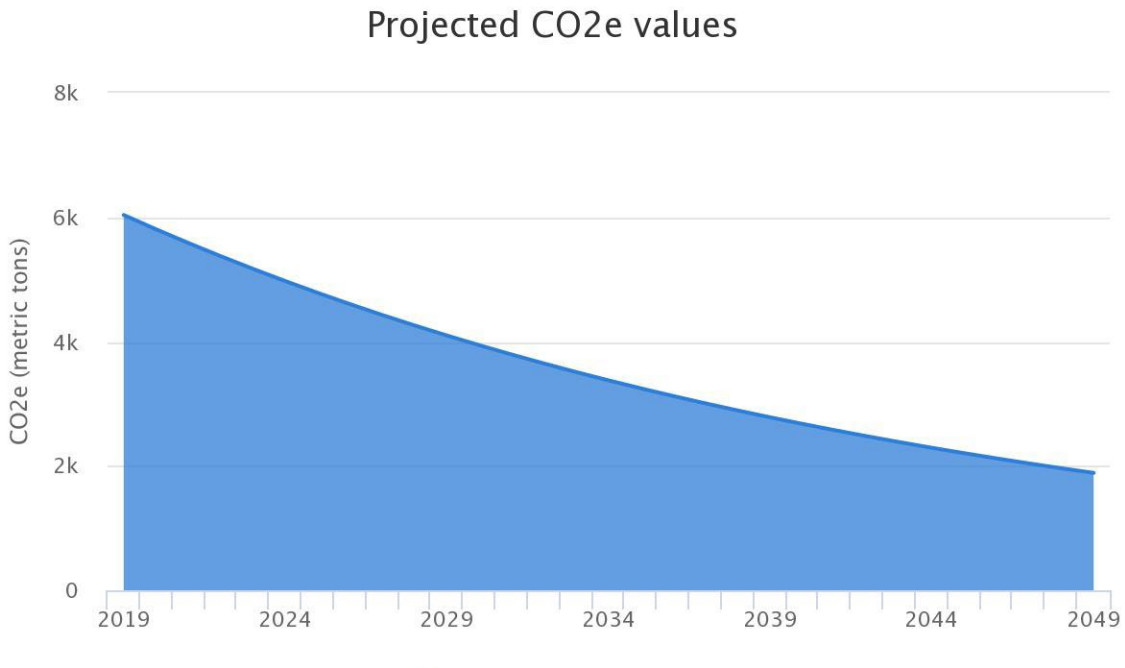


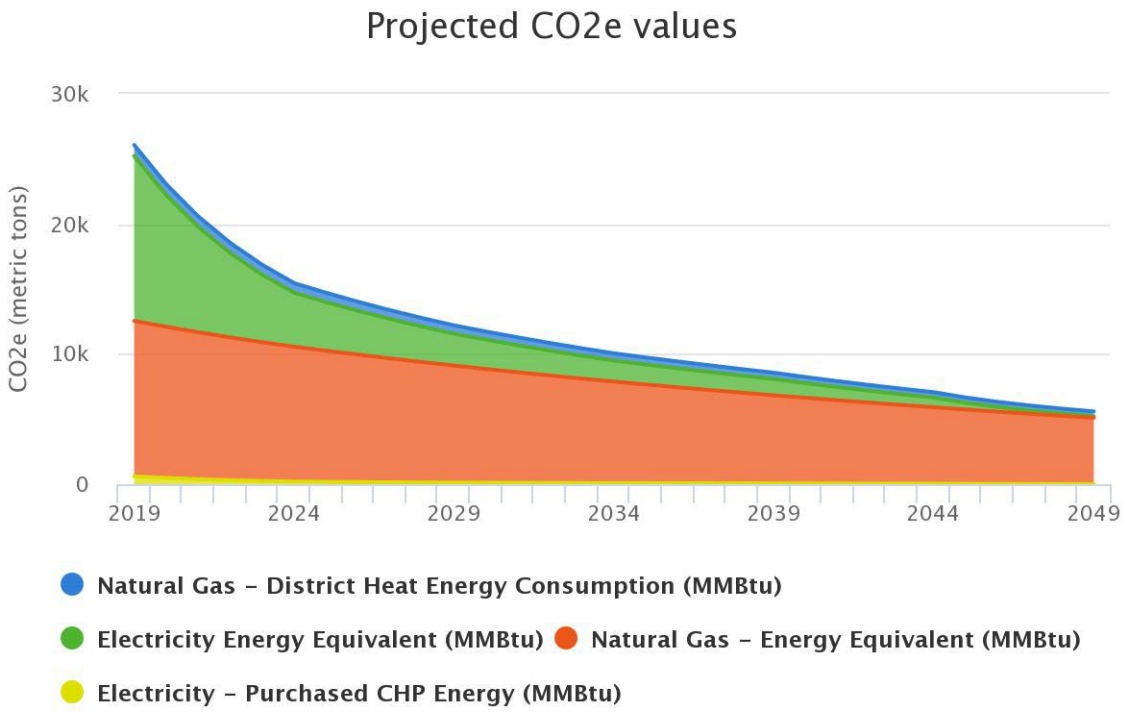
Pure Waters Infrastructure



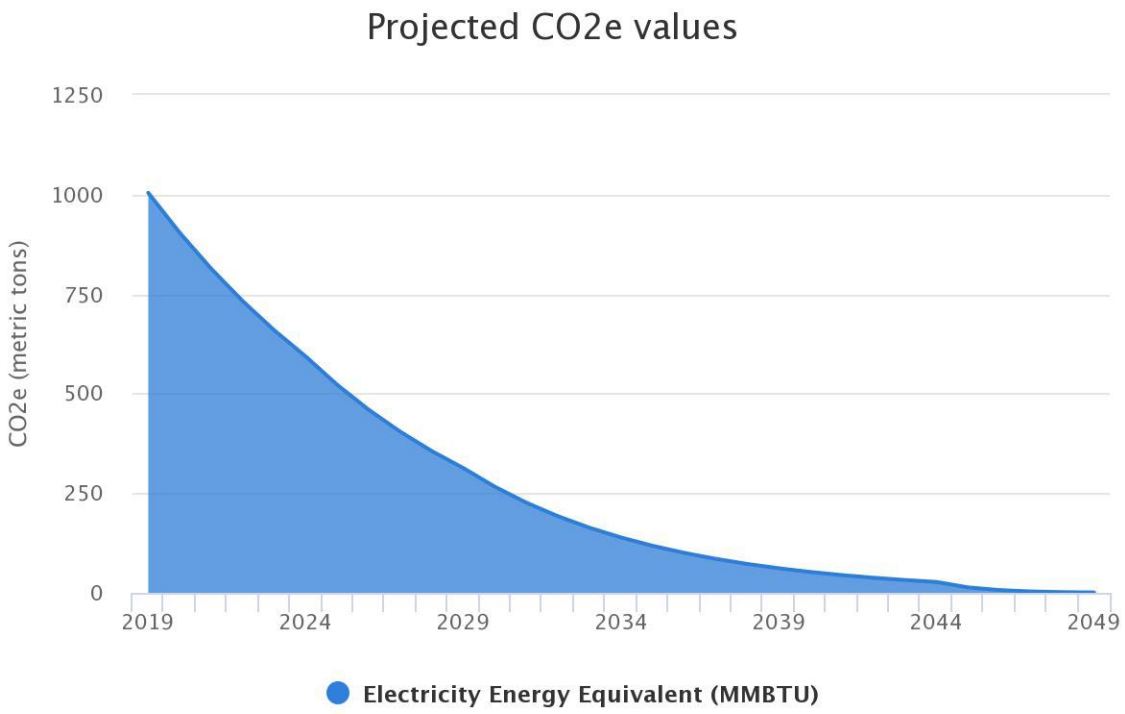
Solid Waste & Materials Management



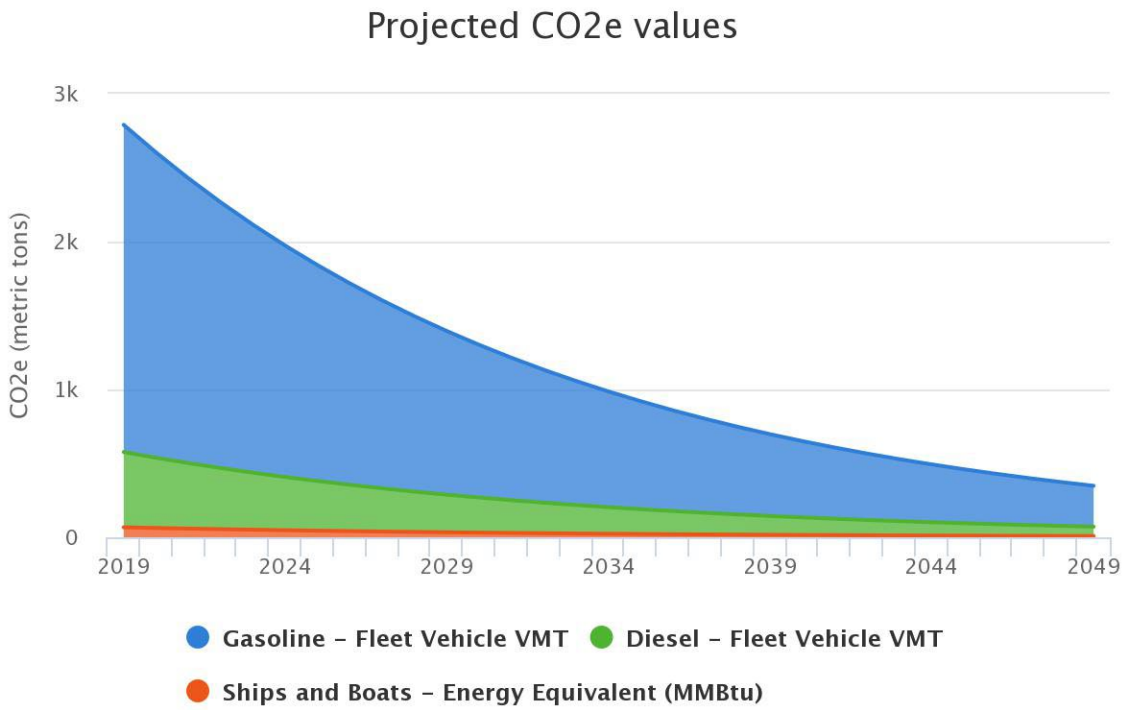
Buildings and Facilities



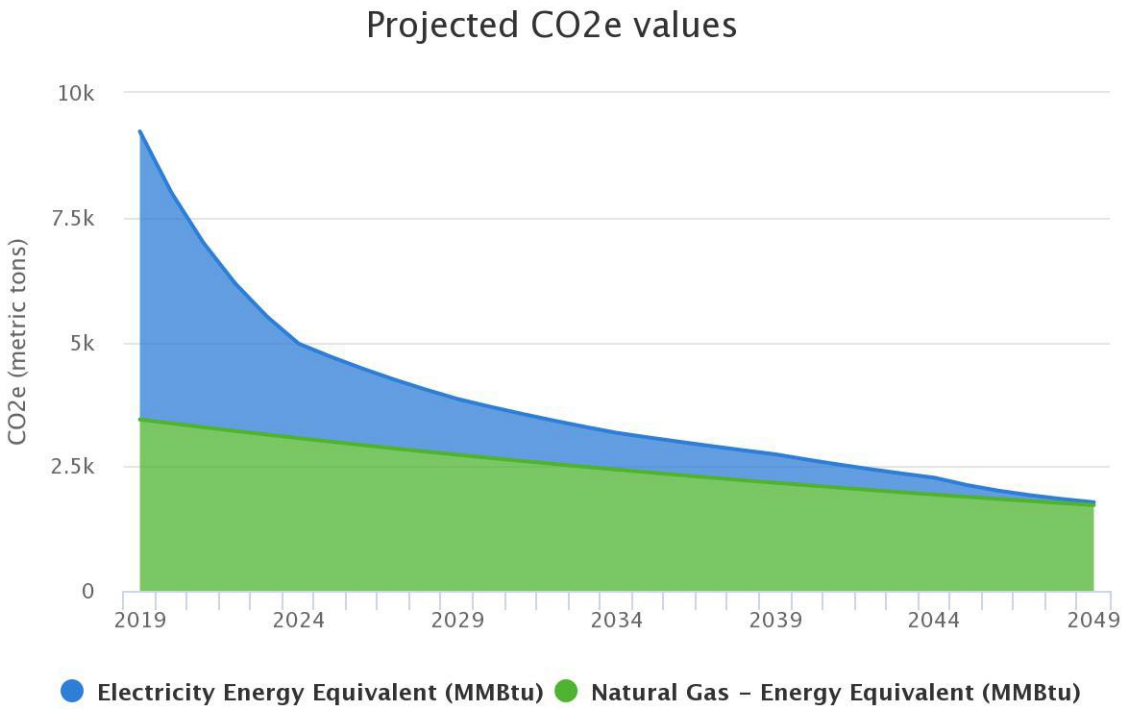
Expressway Lights & Signals



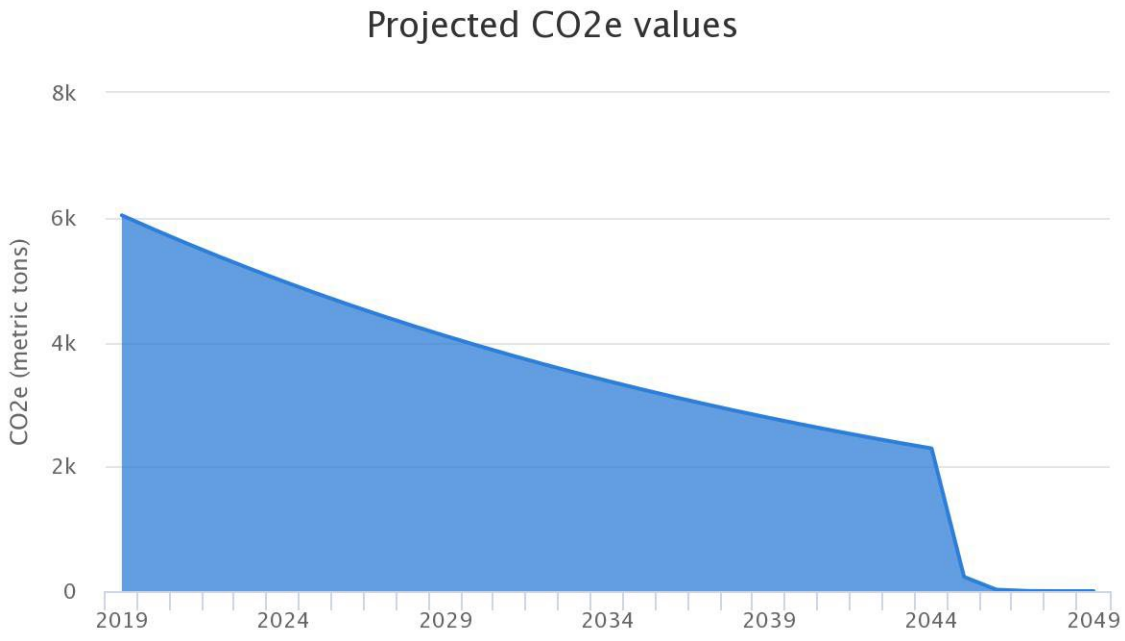
County Fleet



Pure Waters Infrastructure



Solid Waste & Materials Management



Appendix C: Implementation Actions Priority Ranking

Summary of the Triple Bottom Line Analysis

This tool was created by Dmitry Liapitch, under Larsen Engineers, for Bergmann PC, in preparation for the Monroe County Climate Action Plan © 2022

Buildings & Facilities

Combined	Priority	Strategy	Description
100%	1	Tier 1	Institute procedures and/or training to encourage facility managers and municipal employees to improve heating, cooling and lighting use efficiency (e.g. incentives to reduce building energy use through programs such as a County Energy Challenge or Strategic Energy Management).
92%	1	Tier 1	Install additional solar PV system (s).
86%	2	Tier 1	Install/update building energy management systems for lighting and HVAC equipment.
86%	2	Tier 1	Lower building temperature settings to adjust for localized floor heating systems. Heat the people spaces NOT the entire building volume.
86%	2	Tier 1	Maximize day light with window shades that allow light from the top section of windows near roofing level.
81%	2	Tier 1	Participate in district energy programs, i.e. district heating and cooling.
81%	2	Tier 1	Upgrade efficiency of outdoor lighting on County properties.
75%	3	Tier 1	Provide Radiant Electric heat in offices under the desk area. Control these localized heating systems with Wireless smart thermostats.
72%	3	Tier 2	Update 2012 inventory of current building energy use to serve as benchmark and identify priority properties.
72%	3	Tier 3	Require new County buildings to be net zero carbon emissions.
72%	3	Tier 1	Increase the proportion of renewable energy used in County government buildings.
72%	3	Tier 2	Utilize the incentives and programs from Utility to manage peak demand and help achieve their demand reduction goals. Install new Battery Storage systems with Infrastructure grants and provide Intelligent energy management controls at public buildings.
67%	4	Tier 2	Assess feasibility of small wind turbine system (s) for County-owned properties.
67%	4	Tier 2	Complete renewable energy feasibility studies.
67%	4	Tier 3	LEED principles create energy efficient buildings. These benefits can be enhanced by Measures to create Health and Wellness. It will encourage County employees to be part of the solution by conserving energy and shifting to ELECTRIFICATION programs in Transportation sector and purchasing solar power from Community Solar power generation.
64%	4	Tier 1	Complete interior lighting upgrades for 100% of County buildings.
64%	4	Tier 1	Green the lifecycle of office equipment.
64%	4	Tier 1	Plant trees in parking lots and near the building and irrigated with stormwater harvesting and reuse. Indoor plants create green environment and exposure to plants. Healthy work environment creates Wellness and higher productivity and employee participation and support of Climate Smart actions.
61%	4	Tier 1	Install geothermal heating and cooling system (s).
61%	4	Tier 1	Retro-commission low-performing buildings.
61%	4	Tier 1	Install alternative energy technology (e.g. battery storage, hydrogen fuel cell emergency generation) on County property.
58%	5	Tier 1	Install water efficient fixtures.
53%	5	Tier 1	Improve Indoor Air quality with high Oxygen levels, Lower CO2 values with increasing ventilation with Fresh air intakes using high efficiency heat exchangers.
47%	5	Tier 2	Create plan for upgrading HVAC equipment based on building inventory, maintenance schedule, and planned improvements.
33%	5	Tier 3	Consider purchasing RECs to offset emissions from buildings and facilities.

Expressway Lighting & Signals

Combined	Priority	Strategy	Description
100%	1	Tier 1	Convert any remaining traffic signals and blackout signs from incandescent to LED bulbs.
90%	2	Tier 3	Consider adopting/following International Dark-Sky Association standards for future streetlight and signal fixtures.

90%	2	Tier 2	Identify areas where light pollution may be a concern. Align with LED replacement program, where appropriate.
90%	2	Tier 2	Develop transition plan for lighting and signal facilities based on inventory of existing energy use, maintenance schedule, and planned infrastructure improvements.
83%	2	Tier 2	Assess feasibility of transitioning to Solar Photovoltaic (PV) powered street and emergency lighting as technology advances.
69%	4	Tier 1	Upgrade to more energy efficient LED bulbs on the off-expressway lighting system.
59%	5	Tier 1	Reduce energy use through reducing hours of operation and/or number of lights.

Pure Waters Infrastructure

Combined	Priority	Strategy	Description
100%	1	Tier 3	Incorporate energy efficiency as a key component of equipment specifications for improvement of wastewater systems.
91%	1	Tier 2	Evaluate existing biosolids disposal methods and identify potential alternatives/improvements for biosolids management, dewatering, stabilization, and methane recovery.
91%	1	Tier 2	Encourage a life-cycle approach to water supply through waste treatment-to-energy generation, water reuse (including potable reuse of purified municipal reclaimed water, the use of graywater in buildings and for irrigation, and municipal reuse of treated wastewater through a “purple pipe” distribution system), and post-treatment groundwater recharge.
84%	2	Tier 2	Continue to look for changes to process operations to improve energy efficiency in wastewater conveyance and treatment.
81%	2	Tier 2	Evaluate/model potential methane, nitrous oxide, and carbon dioxide emissions from specific WRRF processes if onsite biosolids stabilization or nitrification/denitrification requirements are added to future SPDES permits.
72%	3	Tier 2	Evaluate feasibility of emergency power generation alternatives that rely upon renewable energy sources, such as hydrogen for emergency generators.
69%	4	Tier 1	Continue an energy efficient retrofit of facilities, especially pumping and aeration processes.
69%	4	Tier 1	Improve energy efficiency of existing equipment.

Solid Waste & Materials Management

Combined	Priority	Strategy	Description
100%	1	Tier 3	Update the County’s Existing Green Procurement Policy.
92%	1	Tier 3	Closed Waste management facilities and other low value land parcels could be put into solar power generating role in partnership with Private sector or Utilize Green infrastructure funding for long term financed production of solar dedicated to serve County Buildings and other Facilities. Economic and Environmental justice communities of low to moderate income households could be offered power with over 10% lower cost and fixed over the life of the system.
86%	2	Tier 2	Evaluate processing capacity for composting of food waste organics.
86%	2	Tier 1	Participate in EPA WasteWise program.
86%	2	Tier 3	Incorporate reuse and deconstruction policies in Solid Waste Management Plan.
81%	2	Tier 1	Maximize the diversion of organic waste from County facilities to disposal and the beneficial reuse of the organic material.
78%	3	Tier 1	Cap Gloria Drive inactive landfill to prevent fugitive methane emissions and consider methane recovery.
72%	3	Tier 2	Perform a solid waste audit of County facilities operations.
72%	3	Tier 1	Establish a Green Office Challenge that includes a reduction in office waste.
64%	4	Tier 3	Develop and implement a paper use reduction policy and procedures – Under broader sustainability measures (sustainability committee); e.g. efforts to go paperless.

64%	4	Tier 3	Food waste management by all Monroe County communities is key to producing valuable fertilizer and soil conditioner at multiple decentralized sites around the County to reduce haul distance and generate value priced natural fertilizer for replacing commercial fertilizer materials. Low value agricultural lands can be regenerated with this approach to grow plants and trees and increase the Carbon capture at these sites. This cooperative effort with towns and villages could develop sites that can host small 2 to 5 acres of land for producing the Food waste recycling systems and generating soils and amendments that can support regenerative soils program.
61%	4	Tier 3	Consider adopting a zero waste policy for County facilities and parks, including recycling, repurposing, and composting components. Expand current recycling/trash policy and procedures. Investigate feasibility of an organic waste program for County buildings/facilities.
61%	4	Tier 1	Purchase biodegradable cleaning supplies in accordance with Green Procurement Policy.
58%	5	Tier 1	Reduce waste generation and increase recycling at County facilities.
58%	5	Tier 1	Reduce and/or eliminate single-use plastics within County facilities.
58%	5	Tier 2	The closed landfill at Gloria drive property could be considered for some environmental improvements for Gas collection and use land adjacent to the solar farm for other job creating activities
47%	5	Tier 2	Investigate feasible techniques for methane recovery at landfills.

Transportation

Combined	Priority	Strategy	Description
100%	1	Tier 2	Retrofit the public safety vehicles and School buses with rechargeable batteries should be evaluated to reduce emissions from exhaust while idling. It will also Reduce fuel consumption and save money in operating transportation budgets.
97%	1	Tier 2	Eliminate unnecessary vehicle idling through policy action, reduction technologies, and zero emission vehicle use.
81%	2	Tier 1	Increase alternative fuel use for County-owned vehicles (biodiesel, hydrogen, B8, etc.).
81%	2	Tier 3	Certify County fleet mechanics to maintain and repair EVs.
81%	2	Tier 2	Require fuel use reports from County contractors and incorporate emission reduction standards into County contracts.
78%	3	Tier 1	Reduce trips taken by County vehicles.
78%	3	Tier 2	Improve fleet deployment and monitoring.
78%	3	Tier 1	Retrofit and conversion of existing heavy duty diesel trucks and construction equipment with dual fuel may use CNG to have lower carbon exhaust and reduce fuel costs. Low duty electrical truck could soon be purchased with incentives from Federal or NY State grant subsidies.
75%	3	Tier 1	Deploy solar Electric Vehicle Supply Equipment (EVSE).
75%	3	Tier 2	Identify opportunities for cross-department use of County fleet through a Fleet Efficiency Policy including fleet right-sizing.
75%	3	Tier 1	New affordable electric trucks and vehicles using alternative clean fuels are expected to be available in 2-3 years. Increased production of EV's and installation of Fast Charging systems near the major highways would expedite the electrification of the Transportation sector.
69%	4	Tier 1	Purchase EVs for Sheriff's Department (passenger vans, patrol fleet, etc.).
69%	4	Tier 1	Purchase electric grounds maintenance equipment.
69%	4	Tier 1	Offset emissions from vehicle fleet and transit operations (Renewable Energy Credits, carbon credits, etc.).
66%	4	Tier 1	Install additional Level 2 (AC) and Level 3 (DC) EV charging stations to support fleet operations.
63%	4	Tier 3	Continue preventative fleet maintenance program for County-owned vehicles.
63%	4	Tier 2	Quantify and track vehicle miles traveled for County fleet.

Buildings & Facilities

		Triple Bottom Line			Qualitative Analysis					Qualitative Analysis					Decision Analysis			
		Planet Environmental *Impact*	People Social *Timeframe*	Profit Financial *Investment*	100% Planet Environmental	100% People Ecology	100% Profit Economy	EQUAL		300% Planet Environmental	100% People Ecology	200% Profit Economy	WEIGHTED		COMBINED values are the average between the EQUAL and WEIGHTED values.			
Strategy	Description	High/Moderate/Low	Short/Medium/Long	Low/Moderate/High	*Impact*	*Timeframe*	*Investment*	*SUM*	*NORM*	*Impact*	*Timeframe*	*Investment*	*SUM*	*NORM*	EQUAL	WEIGHTED	COMBINED	Priority
Tier 2	Update 2012 inventory of current building energy use to serve as benchmark and identify priority properties.	Low	Short	Low	1	3	3	7	78%	3	3	6	12	67%	78%	67%	72%	3
Tier 1	Institute procedures and/or training to encourage facility managers and municipal employees to improve heating, cooling and lighting use efficiency (e.g. incentives to reduce building energy use through programs such as a County Energy Challenge or Strategic Energy Management).	High	Short	Low	3	3	3	9	100%	9	3	6	18	100%	100%	100%	100%	1
Tier 1	Participate in district energy programs, i.e. district heating and cooling.	High	Medium	Moderate	3	2	2	7	78%	9	2	4	15	83%	78%	83%	81%	2
Tier 2	Assess feasibility of small wind turbine system (s) for County-owned properties.	Moderate	Medium	Moderate	2	2	2	6	67%	6	2	4	12	67%	67%	67%	67%	4
Tier 2	Complete renewable energy feasibility studies.	Moderate	Medium	Moderate	2	2	2	6	67%	6	2	4	12	67%	67%	67%	67%	4
Tier 3	Require new County buildings to be net zero carbon emissions.	High	Long	Moderate	3	1	2	6	67%	9	1	4	14	78%	67%	78%	72%	3
Tier 1	Upgrade efficiency of outdoor lighting on County properties.	High	Medium	Moderate	3	2	2	7	78%	9	2	4	15	83%	78%	83%	81%	2
Tier 1	Install/update building energy management systems for lighting and HVAC equipment.	Moderate	Short	Low	2	3	3	8	89%	6	3	6	15	83%	89%	83%	86%	2
Tier 1	Complete interior lighting upgrades for 100% of County buildings.	Moderate	Short	High	2	3	1	6	67%	6	3	2	11	61%	67%	61%	64%	4
Tier 1	Green the lifecycle of office equipment.	Low	Medium	Low	1	2	3	6	67%	3	2	6	11	61%	67%	61%	64%	4
Tier 1	Install geothermal heating and cooling system (s).	High	Long	High	3	1	1	5	56%	9	1	2	12	67%	56%	67%	61%	4
Tier 1	Retro-commission low-performing buildings.	High	Long	High	3	1	1	5	56%	9	1	2	12	67%	56%	67%	61%	4
Tier 2	Create plan for upgrading HVAC equipment based on building inventory, maintenance schedule, and planned improvements.	Moderate	Long	High	2	1	1	4	44%	6	1	2	9	50%	44%	50%	47%	5
Tier 1	Install additional solar PV system (s).	High	Medium	Low	3	2	3	8	89%	9	2	6	17	94%	89%	94%	92%	1
Tier 1	Install alternative energy technology (e.g. battery storage, hydrogen fuel cell emergency generation) on County property.	High	Long	High	3	1	1	5	56%	9	1	2	12	67%	56%	67%	61%	4
Tier 1	Increase the proportion of renewable energy used in County government buildings.	High	Long	Moderate	3	1	2	6	67%	9	1	4	14	78%	67%	78%	72%	3
Tier 1	Install water efficient fixtures.	Moderate	Long	Moderate	2	1	2	5	56%	6	1	4	11	61%	56%	61%	58%	5
Tier 3	Consider purchasing RECs to offset emissions from buildings and facilities.	Low	Long	High	1	1	1	3	33%	3	1	2	6	33%	33%	33%	33%	5
Tier 1	Provide Radiant Electric heat in offices under the desk area. Control these localized heating systems with Wireless smart thermostats.	Moderate	Short	Moderate	2	3	2	7	78%	6	3	4	13	72%	78%	72%	75%	3
Tier 1	Lower building temperature settings to adjust for localized floor heating systems. Heat the people spaces NOT the entire building volume.	Moderate	Short	Low	2	3	3	8	89%	6	3	6	15	83%	89%	83%	86%	2
Tier 1	Maximize day light with window shades that allow light from the top section of windows near roofing level.	Moderate	Short	Low	2	3	3	8	89%	6	3	6	15	83%	89%	83%	86%	2
Tier 2	Utilize the incentives and programs from Utility to manage peak demand and help achieve their demand reduction goals. Install new Battery Storage systems with Infrastructure grants and provide Intelligent energy management controls at public buildings.	High	Long	Moderate	3	1	2	6	67%	9	1	4	14	78%	67%	78%	72%	3
Tier 1	Plant trees in parking lots and near the building and irrigated with stormwater harvesting and reuse. Indoor plants create green environment and exposure to plants. Healthy work environment creates Wellness and higher productivity and employee participation and support of Climate Smart actions.	Low	Medium	Low	1	2	3	6	67%	3	2	6	11	61%	67%	61%	64%	4
Tier 3	LEED principles create energy efficient buildings. These benefits can be enhanced by Measures to create Health and Wellness. It will encourage County employees to be part of the solution by conserving energy and shifting to ELECTRIFICATION programs in Transportation sector and purchasing solar power from Community Solar power generation.	Moderate	Medium	Moderate	2	2	2	6	67%	6	2	4	12	67%	67%	67%	67%	4
Tier 1	Improve Indoor Air quality with high Oxygen levels, Lower CO2 values with increasing ventilation with Fresh air intakes using high efficiency heat exchangers.	Low	Medium	Moderate	1	2	2	5	56%	3	2	4	9	50%	56%	50%	53%	5

Expressway Lighting & Signals

		Triple Bottom Line			Qualitative Analysis					Qualitative Analysis					Decision Analysis			
		Planet Environmental *Impact*	People Social *Timeframe*	Profit Financial *Investment*	100% Planet Environmental	100% People Ecology	100% Profit Economy	EQUAL		300% Planet Environmental	100% People Ecology	200% Profit Economy	WEIGHTED		COMBINED values are the average between the EQUAL and WEIGHTED values.			
Strategy	Description	High/Moderate/Low	Short/Medium/Long	Low/Moderate/High	*Impact*	*Timeframe*	*Investment*	*SUM*	*NORM*	*Impact*	*Timeframe*	*Investment*	*SUM*	*NORM*	EQUAL	WEIGHTED	COMBINED	Priority
Tier 1	Convert any remaining traffic signals and blackout signs from incandescent to LED bulbs.	High	Medium	Moderate	3	2	2	7	78%	9	2	4	15	83%	78%	83%	81%	2
Tier 1	Upgrade to more energy efficient LED bulbs on the off-expressway lighting system.	Moderate	Medium	High	2	2	1	5	56%	6	2	2	10	56%	56%	56%	56%	5
Tier 1	Reduce energy use through reducing hours of operation and/or number of lights.	Moderate	Long	High	2	1	1	4	44%	6	1	2	9	50%	44%	50%	47%	5
Tier 2	Assess feasibility of transitioning to Solar Photovoltaic (PV) powered street and emergency lighting as technology advances.	Moderate	Medium	Moderate	2	2	2	6	67%	6	2	4	12	67%	67%	67%	67%	4
Tier 2	Develop transition plan for lighting and signal facilities based on inventory of existing energy use, maintenance schedule, and planned infrastructure improvements.	High	Long	Moderate	3	1	2	6	67%	9	1	4	14	78%	67%	78%	72%	3
Tier 3	Consider adopting/following International Dark-Sky Association standards for future streetlight and signal fixtures.	Low	Short	Low	1	3	3	7	78%	3	3	6	12	67%	78%	67%	72%	3
Tier 2	Identify areas where light pollution may be a concern. Align with LED replacement program, where appropriate.	Low	Short	Low	1	3	3	7	78%	3	3	6	12	67%	78%	67%	72%	3

Pure Waters Infrastructure

Strategy	Description	Triple Bottom Line: Planet Environmental *Impact*	Triple Bottom Line: People Social *Timeframe*	Triple Bottom Line: Profit Financial *Investment*	Qualitative Analysis (EQUAL): 100% Planet Environmental *Impact*	100% People Ecology *Timeframe*	100% Profit Economy *Investment*	EQUAL *SUM*	EQUAL *NORM*	Qualitative Analysis (WEIGHTED): 300% Planet Environmental *Impact*	100% People Ecology *Timeframe*	200% Profit Economy *Investment*	WEIGHTED *SUM*	WEIGHTED *NORM*	Decision Analysis: EQUAL	WEIGHTED	COMBINED	Priority
		High/Moderate/Low	Short/Medium/Long	Low/Moderate/High											COMBINED values are the average between the EQUAL and WEIGHTED values.			
Tier 2	Evaluate existing biosolids disposal methods and identify potential alternatives/improvements for biosolids management, dewatering, stabilization, and methane recovery.	High	Medium	Moderate	3	2	2	7	78%	9	2	4	15	83%	88%	94%	91%	1
Tier 2	Encourage a life-cycle approach to water supply through waste treatment-to-energy generation, water reuse (including potable reuse of purified municipal reclaimed water, the use of graywater in buildings and for irrigation, and municipal reuse of treated wastewater through a "purple pipe" distribution system), and post-treatment groundwater recharge.	High	Medium	Moderate	3	2	2	7	78%	9	2	4	15	83%	88%	94%	91%	1
Tier 1	Continue an energy efficient retrofit of facilities, especially pumping and aeration processes.	High	Long	High	3	1	1	5	56%	9	1	2	12	67%	63%	75%	69%	4
Tier 3	Incorporate energy efficiency as a key component of equipment specifications for improvement of wastewater systems.	High	Short	Moderate	3	3	2	8	89%	9	3	4	16	89%	100%	100%	100%	1
Tier 1	Improve energy efficiency of existing equipment.	High	Long	High	3	1	1	5	56%	9	1	2	12	67%	63%	75%	69%	4
Tier 2	Continue to look for changes to process operations to improve energy efficiency in wastewater conveyance and treatment.	Moderate	Short	Moderate	2	3	2	7	78%	6	3	4	13	72%	88%	81%	84%	2
Tier 2	Evaluate/model potential methane, nitrous oxide, and carbon dioxide emissions from specific WRRF processes if onsite biosolids stabilization or nitrification/denitrification requirements are added to future SPDES permits.	Low	Short	Low	1	3	3	7	78%	3	3	6	12	67%	88%	75%	81%	2
Tier 2	Evaluate feasibility of emergency power generation alternatives that rely upon renewable energy sources, such as hydrogen for emergency generators.	Low	Medium	Low	1	2	3	6	67%	3	2	6	11	61%	75%	69%	72%	3

Solid Waste & Materials Management

Strategy	Description	Triple Bottom Line: Planet Environmental *Impact*	Triple Bottom Line: People Social *Timeframe*	Triple Bottom Line: Profit Financial *Investment*	Qualitative Analysis (EQUAL): 100% Planet Environmental *Impact*	100% People Ecology *Timeframe*	100% Profit Economy *Investment*	EQUAL *SUM*	EQUAL *NORM*	Qualitative Analysis (WEIGHTED): 300% Planet Environmental *Impact*	100% People Ecology *Timeframe*	200% Profit Economy *Investment*	WEIGHTED *SUM*	WEIGHTED *NORM*	Decision Analysis: EQUAL	WEIGHTED	COMBINED	Priority
		High/Moderate/Low	Short/Medium/Long	Low/Moderate/High											COMBINED values are the average between the EQUAL and WEIGHTED values.			
Tier 1	Cap Gloria Drive inactive landfill to prevent fugitive methane emissions and consider methane recovery.	High	Short	High	3	3	1	7	78%	9	3	2	14	78%	78%	78%	78%	3
Tier 1	Reduce waste generation and increase recycling at County facilities.	Moderate	Long	Moderate	2	1	2	5	56%	6	1	4	11	61%	56%	61%	58%	5
Tier 3	Consider adopting a zero waste policy for County facilities and parks, including recycling, repurposing, and composting components. Expand current recycling/trash policy and procedures. Investigate feasibility of an organic waste program for County buildings/facilities.	High	Long	High	3	1	1	5	56%	9	1	2	12	67%	56%	67%	61%	4
Tier 1	Maximize the diversion of organic waste from County facilities to disposal and the beneficial reuse of the organic material.	High	Medium	Moderate	3	2	2	7	78%	9	2	4	15	83%	78%	83%	81%	2
Tier 1	Reduce and/or eliminate single-use plastics within County facilities.	Moderate	Long	Moderate	2	1	2	5	56%	6	1	4	11	61%	56%	61%	58%	5
Tier 2	Investigate feasible techniques for methane recovery at landfills.	Moderate	Long	High	2	1	1	4	44%	6	1	2	9	50%	44%	50%	47%	5
Tier 2	Evaluate processing capacity for composting of food waste organics.	Moderate	Short	Low	2	3	3	8	89%	6	3	6	15	83%	89%	83%	86%	2
Tier 1	Participate in EPA WasteWise program.	Moderate	Short	Low	2	3	3	8	89%	6	3	6	15	83%	89%	83%	86%	2
Tier 2	Perform a solid waste audit of County facilities operations.	Low	Short	Low	1	3	3	7	78%	3	3	6	12	67%	78%	67%	72%	3
Tier 1	Establish a Green Office Challenge that includes a reduction in office waste.	Low	Short	Low	1	3	3	7	78%	3	3	6	12	67%	78%	67%	72%	3
Tier 3	Develop and implement a paper use reduction policy and procedures – Under broader sustainability measures (sustainability committee); e.g. efforts to go paperless.	Low	Medium	Low	1	2	3	6	67%	3	2	6	11	61%	67%	61%	64%	4
Tier 3	Update the County's Existing Green Procurement Policy.	High	Short	Low	3	3	3	9	100%	9	3	6	18	100%	100%	100%	100%	1
Tier 1	Purchase biodegradable cleaning supplies in accordance with Green Procurement Policy.	Low	Short	Moderate	1	3	2	6	67%	3	3	4	10	56%	67%	56%	61%	4
Tier 3	Incorporate reuse and deconstruction policies in Solid Waste Management Plan.	Moderate	Short	Low	2	3	3	8	89%	6	3	6	15	83%	89%	83%	86%	2
Tier 3	Closed Waste management facilities and other low value land parcels could be put into solar power generating role in partnership with Private sector or Utilize Green infrastructure funding for long term financed production of solar dedicated to serve County Buildings and other Facilities. Economic and Environmental justice communities of low to moderate income households could be offered power with over 10% lower cost and fixed over the life of the system.	High	Medium	Low	3	2	3	8	89%	9	2	6	17	94%	89%	94%	92%	1
Tier 3	Food waste management by all Monroe County communities is key to producing valuable fertilizer and soil conditioner at multiple decentralized sites around the County to reduce haul distance and generate value priced natural fertilizer for replacing commercial fertilizer materials. Low value agricultural lands can be regenerated with this approach to grow plants and trees and increase the Carbon capture at these sites. This cooperative effort with towns and villages could develop sites that can host small 2 to 5 acres of land for producing the Food waste recycling systems and generating soils and amendments that can support regenerative soils program.	Low	Medium	Low	1	2	3	6	67%	3	2	6	11	61%	67%	61%	64%	4
Tier 2	The closed landfill at Gloria drive property could be considered for some environmental improvements for Gas collection and use land adjacent to the solar farm for other job creating activities	Moderate	Long	Moderate	2	1	2	5	56%	6	1	4	11	61%	56%	61%	58%	5

Transportation

Strategy	Description	Triple Bottom Line: Planet Environmental *Impact*	Triple Bottom Line: People Social *Timeframe*	Triple Bottom Line: Profit Financial *Investment*	Qualitative Analysis: 100% Planet Environmental *Impact*	Qualitative Analysis: 100% People Ecology *Timeframe*	Qualitative Analysis: 100% Profit Economy *Investment*	Qualitative Analysis: EQUAL *SUM*	Qualitative Analysis: EQUAL *NORM*	Qualitative Analysis: 300% Planet Environmental *Impact*	Qualitative Analysis: 100% People Ecology *Timeframe*	Qualitative Analysis: 200% Profit Economy *Investment*	Qualitative Analysis: WEIGHTED *SUM*	Qualitative Analysis: WEIGHTED *NORM*	Decision Analysis: EQUAL	Decision Analysis: WEIGHTED	Decision Analysis: COMBINED	Decision Analysis: Priority
		High/Moderate/Low	Short/Medium/Long	Low/Moderate/High	*Impact*	*Timeframe*	*Investment*	*SUM*	*NORM*	*Impact*	*Timeframe*	*Investment*	*SUM*	*NORM*	EQUAL	WEIGHTED	COMBINED	Priority
Tier 1	Purchase EVs for Sheriff's Department (passenger vans, patrol fleet, etc.).	High	Long	High	3	1	1	5	63%	9	1	2	12	75%	63%	75%	69%	4
Tier 1	Purchase electric grounds maintenance equipment.	High	Long	High	3	1	1	5	63%	9	1	2	12	75%	63%	75%	69%	4
Tier 1	Increase alternative fuel use for County-owned vehicles (biodiesel, hydrogen, B8, etc.).	High	Long	Moderate	3	1	2	6	75%	9	1	4	14	88%	75%	88%	81%	2
Tier 1	Deploy solar Electric Vehicle Supply Equipment (EVSE).	Moderate	Medium	Moderate	2	2	2	6	75%	6	2	4	12	75%	75%	75%	75%	3
Tier 2	Eliminate unnecessary vehicle idling through policy action, reduction technologies, and zero emission vehicle use.	Moderate	Short	Low	2	3	3	8	100%	6	3	6	15	94%	100%	94%	97%	1
Tier 1	Reduce trips taken by County vehicles.	Moderate	Long	Low	2	1	3	6	75%	6	1	6	13	81%	75%	81%	78%	3
Tier 1	Install additional Level 2 (AC) and Level 3 (DC) EV charging stations to support fleet operations.	Moderate	Long	Moderate	2	1	2	5	63%	6	1	4	11	69%	63%	69%	66%	4
Tier 2	Improve fleet deployment and monitoring.	Moderate	Long	Low	2	1	3	6	75%	6	1	6	13	81%	75%	81%	78%	3
Tier 3	Certify County fleet mechanics to maintain and repair EVs.	Low	Short	Low	1	3	3	7	88%	3	3	6	12	75%	88%	75%	81%	2
Tier 3	Continue preventative fleet maintenance program for County-owned vehicles.	Low	Long	Low	1	1	3	5	63%	3	1	6	10	63%	63%	63%	63%	4
Tier 2	Require fuel use reports from County contractors and incorporate emission reduction standards into County contracts.	Low	Short	Low	1	3	3	7	88%	3	3	6	12	75%	88%	75%	81%	2
Tier 2	Quantify and track vehicle miles traveled for County fleet.	Low	Long	Low	1	1	3	5	63%	3	1	6	10	63%	63%	63%	63%	4
Tier 1	Offset emissions from vehicle fleet and transit operations (Renewable Energy Credits, carbon credits, etc.).	High	Long	High	3	1	1	5	63%	9	1	2	12	75%	63%	75%	69%	4
Tier 2	Identify opportunities for cross-department use of County fleet through a Fleet Efficiency Policy including fleet right-sizing.	Moderate	Medium	Moderate	2	2	2	6	75%	6	2	4	12	75%	75%	75%	75%	3
Tier 1	Retrofit and conversion of existing heavy duty diesel trucks and construction equipment with dual fuel may use CNG to have lower carbon exhaust and reduce fuel costs. Low duty electrical truck could soon be purchased with incentives from Federal or NY State grant subsidies.	High	Medium	High	3	2	1	6	75%	9	2	2	13	81%	75%	81%	78%	3
Tier 2	Retrofit the public safety vehicles and School buses with rechargeable batteries should be evaluated to reduce emissions from exhaust while idling. It will also Reduce fuel consumption and save money in operating transportation budgets.	High	Short	Moderate	3	3	2	8	100%	9	3	4	16	100%	100%	100%	100%	1
Tier 1	New affordable electric trucks and vehicles using alternative clean fuels are expected to be available in 2-3 years. Increased production of EV's and installation of Fast Charging systems near the major highways would expedite the electrification of the Transportation sector.	Moderate	Medium	Moderate	2	2	2	6	75%	6	2	4	12	75%	75%	75%	75%	3