



***How Erie County Can Meet US Target
Reductions For Greenhouse Gas Emissions***

MARK POLONCARZ ■ ERIE COUNTY EXECUTIVE

TABLE OF CONTENTS

REPORT

Introduction	2
<i>Background</i>	2
<i>Purpose</i>	3
<i>Report Organization</i>	4
Part One: Internal Operations	5
<i>Background</i>	5
<i>Greenhouse Gas Inventory for Internal Operations</i>	6
<i>Initiatives</i>	10
Part Two: Community Wide	16
<i>Background</i>	16
<i>Community GHG Inventory and Goals</i>	17
<i>Initiatives</i>	18
Part Three: Additional Partnership Opportunities	24
Conclusion	26

APPENDICES

Appendix A: Glossary of Acronyms	27
Appendix B: Summary Table	28
Appendix C: Community and Internal Operations GHG Inventory Methods	32
Appendix D: Acknowledgements	36

INTRODUCTION



BACKGROUND

“Erie County can take action to ensure its part in protecting the well-being and future of our planet by promulgating a plan to implement the United States target contribution plan to the Paris Agreement, as it pertains to Erie County, and to take such further action as it may by law to enforce the target contribution goals set by the United States within the bounds of the County of Erie, State of New York.”

This statement in Erie County Executive Mark Poloncarz’s Executive Order #17 - *Enforcement of the Paris Climate Agreement*, captures the essence of why Erie County is compelled to take action on this global priority despite a lack of leadership at the federal level. With other state and local officials across the United States, County Executive Poloncarz seeks to protect our County, as well as our state, nation and world, from the impacts of climate change by committing to reduce greenhouse gas (GHG) emissions. Substantial global emission reductions are needed to mitigate the most severe impacts of climate change, which have been seen recently in frequency and intensity of hurricanes and wildfires. Local impacts have been documented as well. For example, changes in climate have already resulted in a longer growing season¹ and an increase in the tick population in western New York².

As Erie County plans its strategy, there are two other factors to consider regarding climate change. First, the effects of climate change disproportionately impact the poor. For example, during severe heat events, residents who do not have air-conditioning are at more risk of health complications than those who have access to indoor air-conditioning. Consideration of vulnerable communities has been a priority of this administration and will also need to be part of the County’s efforts to address this issue.

Second, it has also been widely noted that the efforts which reduce greenhouse gas emissions and thus mitigate climate change have other immediate benefits. As former New York City Mayor Michael Bloomberg and former Executive Director of the Sierra Club Carl Pope noted in the introduction of their recent book *Climate of Hope: How Cities, Businesses and Citizens Can Save the Planet*, “fighting climate change goes hand in hand with improving public health, strengthening economic growth and raising living standards.”³ For example, transitioning to clean energy reduces emissions, improving air quality and respiratory health. The economic impacts of addressing climate change include reduced energy bills from energy conservation projects, as well as the strong

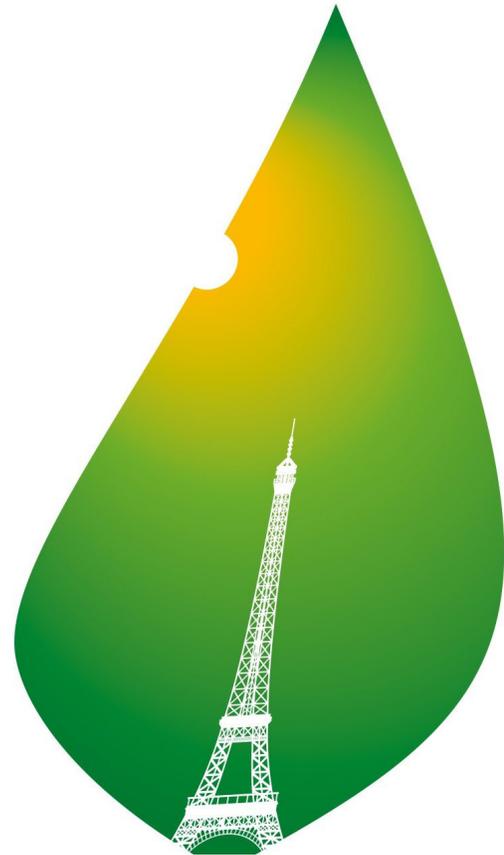
1 <https://buffalo-niagaragardening.com/2012/02/07/what-does-climate-change-mean-for-buffalo-area-gardeners/>
2 <https://19january2017snapshot.epa.gov/sites/production/>

files/2016-09/documents/climate-change-ny.pdf
3 Michael Bloomberg and Carl Pope, *Climate of Hope*, (St. Martin’s Press, 2017), page 5.

job growth in the renewable energy sector. Therefore, by investing in actions which reduce GHG emissions, the County has the opportunity to also positively impact equity, public health and the economy of the region.

In response to the aforementioned Executive Order, the “Erie County Commits to Paris” Working Group was formed to identify strategies for the County to meet the target goals set out by the international climate agreement. This group included Erie County’s Departments of Public Works, Law, Environment & Planning, and the Office of Budget. The Erie County Environmental Management Council, an advisory group to the County, was also a vital member of the group.

The working group was informed by previous work that has been done in the region, such as Erie County’s *Initiatives for a Smart Economy 1.0* (2013) and *Initiatives for a Smart Economy 2.0* (2017), *One Region Forward* (2015), the *Western New York Regional Sustainability Plan* (2013) and the Erie County Environmental Management Council’s annual recommendation reports. In order to prepare this report, the “Erie County Commits to Paris” Working Group reviewed these existing plans and documents, as well as reached out to community stakeholders and experts.



PURPOSE

There is no silver bullet. Thus, this report outlines a wide variety of projects and recommendations for the County to meet the goal of reducing GHG emissions to 26-28% below 2005 levels by 2025.

Erie County’s current climate mitigation efforts are focused on internal projects in an effort reduce its GHG emissions and to lead by example. However, as can be seen when comparing the GHG inventory for internal operations to the GHG inventory for the entire community, Erie County’s internal operations are only a small percentage of the community’s GHG emissions. Therefore, it is vital that Erie County position itself as a leader and partner for community action on this critical issue. The report recommends several policies, partnerships, and strategies to mitigate climate change at the community level. The recommendations focus on the two main strategies to reduce GHG emissions that have been emphasized by the international effort to address climate change. The first strategy is to keep fossil fuels in the ground by conserving energy. The second is to strive for 100% renewable energy.

To meet these aggressive goals, Erie County will need to work to conserve energy and, as many other communities across the U.S. have done, aim to procure 100% of the electric power used for its own operations from renewable sources by 2030. Furthermore, the County can leverage its resources to assist other municipalities within the County to strive for the same goal. At the same time, as the report outlines, there are ways the County can reduce barriers and incentivize energy conservation and the use of renewables by businesses and private citizens.

REPORT ORGANIZATION

The report has been divided into three parts, as directed by the Executive Order:

- PART ONE - Internal Operations
- PART TWO - Community-Wide
- PART THREE – Additional Partnerships

PARTS ONE and TWO both contain a brief background including a GHG inventory baseline, as well as descriptions of initiatives to reduce GHG. Whenever possible, the GHG emission reduction for each initiative was estimated. The initiatives are grouped by two strategies described above, keep fossil fuels in the ground and strive for 100% renewable energy.

PART THREE speaks to additional efforts that the County could pursue that are outside County control, which require partnerships. The appendix includes a table summarizing the initiatives, a list of acronyms, and details about the data sources for the GHG inventories. ■

PART ONE: INTERNAL OPERATIONS



BACKGROUND

Overview of Erie County Operations

Erie County government has extensive internal operations to serve the public, which oversee a variety of operations such as plowing roads, treating sewage, and housing inmates. These operations include:

- More than 220 County buildings managed by the Division of Buildings and Grounds in the Department of Public Works (DPW), which in 2016 consumed 4,860,757 kilowatt hours (kWh) of electricity and 34,234 thousand cubic feet (Mcf) of natural gas. This portfolio includes 20 large buildings that have more than 3.5 million square feet, as well as New Era Field and Erie County Botanical Gardens.
- 1,195 County-owned vehicles managed by Fleet Division of DPW, which in 2016 used approximately 200,000 gallons of diesel fuel and 350,000 gallons of unleaded gasoline.
- 1,100 miles of sewer, 6 water resource recovery facilities (WRRFs), 5 excess flow management facilities, and over 90 pumping stations. In 2016, the County's WRRFs treated almost 10 billion gallons of sewage, with another approximately 6 billion gallons collected and transmitted by the Erie County Sewer Districts for treatment at WRRFs owned by other municipalities.
- 1,187 miles of County roads (2,400 lane miles) and 290 bridges greater than 20 feet – the largest inventory of any county-owned infrastructure in New York State.
- Approximately 5,500 (4,400 full time) employees, who collectively commute approximately 2 million miles per year.
- A Utility Aggregation Program for the benefit of more than 30 municipalities, as well as more than 2,000 social services clients. The primary mission of the program is to reduce the cost of utilities for County facilities and other participating governments through group purchasing. This program is administered through a Utilities Fund in the DPW in conjunction with an energy services contractor.
- More than 300,000 residents are served by the Social Services programs administered by the County including Medicaid, Supplemental Nutrition Assistance Program (SNAP) and Home Energy Assistance Program (HEAP).

Greenhouse Gas Inventory for Internal Operations

The County has developed a greenhouse gas (GHG) emissions inventory for both 2005 and 2014 to better understand the County's carbon footprint and measure progress in reducing emissions. The baseline 2005 emissions inventory represents the starting GHG emissions level against which future changes in emissions will be measured, and the 2014 GHG inventory allows the County to assess progress towards the 2025 goals of the Paris Climate Agreement. The inventory effort is part of the County's government operations Climate Action Sustainability Plan (CASP) and is supported by New York State Energy Research and Development Authority (NYSERDA) grant funding. More information about the CASP can be found in the description of "Recent Efforts" below (page 10).

The emissions inventory follows the international Local Government Operations Protocol¹, a standard widely used across the country. GHG emissions are divided into three categories:

- Scope 1 emissions directly from sources owned by the County;
- Scope 2 emissions resulting from County electric and district heat consumption; and
- Scope 3 emissions from other sources the County

¹ This protocol was established by ICLEI - Local Governments for Sustainability, the leading global network of more than 1,500 cities, towns and regions committed to building a sustainable future. Erie County joined ICLEI in 2016.

does not own, but over which it has substantial control.

County Scope 1 emissions consist of emissions from the combustion of natural gas, gasoline, and diesel fuel in County owned buildings, vehicles and equipment. Scope 2 emissions are indirect emissions from two source types: electric use at County buildings and by sewers machinery; and energy purchased from the City of Buffalo district hot water heating system for the County Office Building and County Court House. Scope 3 emissions result from solid waste disposal and employee commuting.

The change in the County consumption of natural gas, gasoline, diesel and electric, along with biogas emissions from County-owned sewers and landfilled solid waste are shown in Table 1 and Figure 1. There are two adjustments to this data to note. First, the baseline year is adjusted to reflect changes in the County structure and to determine the real change in emissions and energy use of the current portfolio of operations. Specifically, the 2005 baseline is adjusted to account for the closing of the Erie County Home in Alden in 2005, and the completion of the Erie County Public Safety Campus in 2006. Second, natural gas and district heating energy use is weather normalized by heating degree days, in order to remove seasonal variation when comparing 2014 to the 2005 baseline year.

The County emits several types of greenhouse gases, including carbon dioxide, methane, nitrous oxide, and hydro fluorocarbon refrigerants. "Carbon dioxide equivalent" or "CO₂e" is a term for describing different

Table 1. Fuel Use, and Biogas Emissions, and Solid Waste by Source

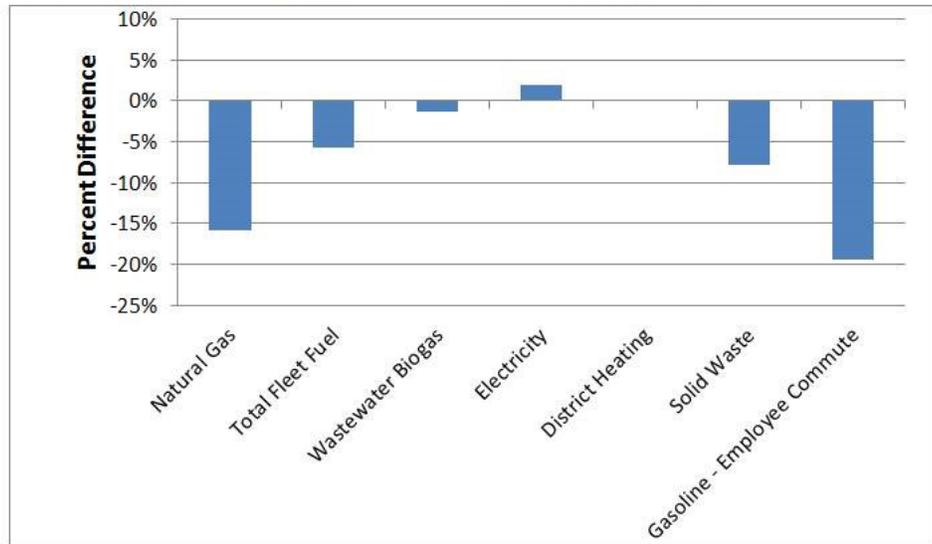
Emissions Source	Units	2005	2014	Difference	Percent Difference
Natural Gas	MCF	247,265	208,297	-38,968	-16%
Fleet - gasoline	gallons	451,208	351,759	-99,449	-22%
Fleet - diesel	gallons	138,430	203,874	65,444	47%
Total Fleet Fuel	gallons	589,638	555,633	-34,005	-6%
Wastewater Biogas	kg CH ₄	147,483	145,440	-2,043	-1%
Electricity	kWh	59,759,588	60,896,287	1,136,699	2%
District Heating	MMBTU	25,655	25,655	0	0%
Solid Waste	short tons	2,652	2,444	-208	-8%
Gasoline - Employee Commute	gallons	670,386	540,809	-129,577	-19%

greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO₂e signifies the amount of CO₂ which would have the equivalent global warming impact. For this report, emissions are shown as metric tons carbon dioxide equivalent emissions (MTCO₂e).

Most emissions source types decreased from 2005 to 2014, although diesel fuel consumption and electric consumption increased (see Figure 1). The decreases are due to a variety of factors including investments in building energy efficiency, improvements in fleet fuel economy, and less emissions from commuting due to a 37% reduction in staff between 2005 and 2014. The 2% electric consumption increase is in spite of significant electric efficiency improvements, and is likely caused by an increased use of information technologies within County operations and new treatment systems introduced at County wastewater treatment plants to meet more rigorous clean water requirements.

GHG emissions changes for most sources match the changes in fuel consumption, waste generated, or biogas

Figure 1. 2005 versus 2014 Fuel Use, Biogas Emissions and Solid Waste



emitted, shown in Table 2 and Figure 2. The exception is GHG emissions from electric consumption, which decreased by 42%, in spite of the 2% increase in electric consumption discussed above. This is because the mix of electricity generators who provided electric energy to the County has become much cleaner since 2005, with a drop in electric energy from coal (36% to 6%) and oil (15% to 1%), which was substituted by less GHG intense sources including natural gas (21% to 38%), wind (<1% to 6%) and nuclear (22% to 32%). The County's clean energy electric purchases were because of changes in

Table 2. GHG Emissions by Source

Emissions Source	2005 Emissions (MTCO ₂ e) ¹	2014 Emissions (MTCO ₂ e)	Difference (MTCO ₂ e)	Percent Difference
Natural Gas	13,646	11,495	-2,151	-16%
Fleet - gasoline	3,977	3,100	-876	-22%
Fleet - diesel	1,418	2,089	670	47%
Total Fleet Fuel	5,395	5,189	-206	-4%
Wastewater Biogas	4,775	4,709	-66	-1%
Electricity	31,468	18,125	-13,342	-42%
District Heating	1,873	1,873	0	0%
Solid Waste	1,539	1,419	-121	-8%
Gasoline - Employee Commute	10,821	8,730	-2,091	-19%
Total	69,517	51,540	-17,977	-26%

¹ MTCO₂ - Metric tons carbon dioxide equivalent emissions

the regional electric market, and were not because of actions taken by the County for sustainability purposes.

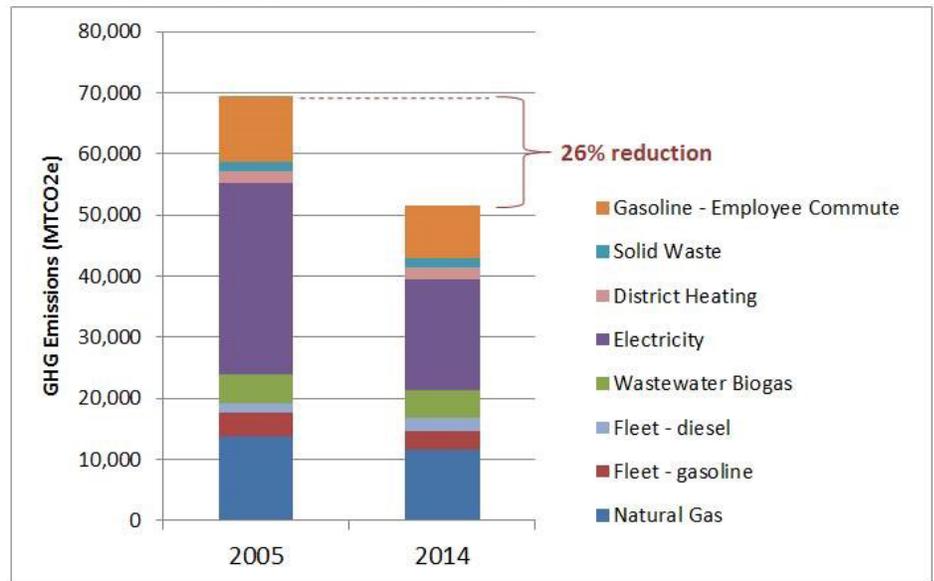
Overall, Erie County GHG emissions decreased 26% from 2005 to 2014. Therefore, the County has achieved its Paris Climate Agreement goal for government operations. However, most of that decrease was due to the County's unintentional purchase of much less carbon intense electricity. In order to retain those emission reductions, the County will have to actively monitor and conscientiously choose the sources of its electricity, especially as there are some trends in the overall utility grid that may increase the carbon intensity of electricity in New York State (discussed in PART TWO below). Additionally, there is uncertainty in this GHG inventory, which is described in Appendix C, and as the inventory is improved it may turn out we have made less progress than this initial inventory suggests. Finally, if the County were able to exceed the goal set by the Paris Climate Agreement, it would augment the broader, more challenging community-wide effort.

Methods to Reduce GHG Emissions

There are several ways that Erie County can reduce GHG emissions in its internal operations. The main methods and associated strategies that this report will focus on are:

- Reducing energy use in County buildings - keep fossil fuels in the ground;
- Reducing fuel consumption in County fleet - keep fossil fuels in the ground;
- Reducing the impact of employee commute - keep fossil fuels in the ground;
- Increasing production and use of renewable energy - strive for 100% renewable energy; and
- Pursuing sustainable funding strategies for energy efficiency, renewable energy, sustainability projects and other greenhouse gas reduction efforts - supports both keeping fossil fuels in the ground and striving for 100% renewable energy.

Figure 2. 2005 versus 2014 GHG Emissions by Source



Overview of GHG Reducing Policies and Efforts

2005 Through 2011 Efforts

Erie County has pursued many of the methods to reduce GHG emissions listed above. Since 2005, the baseline year of the Paris Climate Agreement, the County has implemented energy conservation projects in its buildings and increased the fuel efficiency of its fleet. There are also a couple of decade-old County policies which speak directly to this issue:

- *The Green Buildings Act* - In 2007 Erie County passed this local law which requires LEED Silver standards for the construction or renovation of buildings owned by Erie County. "LEED" is the United States Green Building Council's Leadership in Energy and Environmental Design green building rating standard. The law applies to major facility projects, such as the recent construction of the STEM building at Erie Community College's North Campus scheduled to open in January 2018.
- *Anti-idling policy and equipment* - This policy was put together to comply with state law, while also conserving fuel, saving money, and reducing air pollution, including GHG emissions. A portion of the County fleet currently has Automatic Vehicle Locators (AVLs) which monitor idling in addition to vehicle location.

Recent Efforts - Green Team and Energy Committee

More recently, the County has organized efforts specifically around the issue of climate change and a detailed Climate Action & Sustainability Plan (CASP) for its internal operations that is being developed by the County's interdepartmental Green Team. The Green Team is making great progress in large part because there has been leadership from County Executive Poloncarz. Not only did the County Executive ask his Chief of Staff to chair the team meetings and request that all departments have high level involvement, he also invited the other elected officials to join the Green Team, including the Sheriff, the Comptroller, the District Attorney, the Clerk and the Legislature. The Green Team met monthly over the course of a year to discuss efforts, brainstorm new opportunities, and communicate information to their departments. The team was able to implement many projects in its first year and has planned many of the upcoming projects that are detailed in this report.

The Green Team's committees are now developing the CASP, which will guide County operations toward sustainable practices. It will outline action measures by sector including: energy, transportation, solid waste, land management and water quality, with GHG emission reduction, data and procurement as overarching topics. This in-depth plan, that will include the items outlined in this report and many others, will be finalized in 2018. The CASP is a key guidance document for the "Erie County Commits to Paris" Working Group for this report and will be instrumental when it is released in 2018.

The Energy Committee, which includes DPW, DEP, Budget and the Office of the County Executive, has monthly meetings that are coordinated by the Director of Energy Management and Development. This committee, which began meeting a couple of years ago, is separate from but related to the "Erie County Commits to Paris" Working Group. In an effort to regain an understanding of the County's energy use in its facilities, the Energy Committee recently spearheaded two significant efforts.

First, scoping studies were conducted on several high energy consuming buildings. These studies, sponsored by National Grid, were conducted to identify actionable energy conservation and efficiency measures. The studies, which examined a handful of buildings, found approximately 5 million kWh of electricity conservation opportunities (a reduction of 3,721 MTCO₂e) and an estimated \$365,000 in annual savings. The energy conservation projects identified and implemented



Exterior lighting improvements on the Rath Building.

through this process are described below in *Initiatives – Current/Recent Efforts*.

Second, in May of 2017, the County Executive proposed and the Legislature adopted a resolution establishing an energy benchmarking policy requiring the collection and reporting of energy and emissions data for all but the smallest County owned facilities. This policy will allow Erie County to make more informed and cost-effective capital investment decisions, and drive widespread continuous improvement within facilities operations. The benchmarking process is in its data collection phase and is being facilitated by the University at Buffalo Regional Institute as part of its role as technical assistant in NYSERDA's Clean Energy Communities Program. The data, which will assist in the identification of priority projects, will be entered into the ENERGY STAR® Portfolio Manager tool as a platform for public disclosure and comparison of building performance data.

The work of the Erie County Green Team and its committees has facilitated the recent and upcoming initiatives described below. Moreover, the Green Team has been critical in identifying opportunities that the County has to dramatically reduce its GHG emissions.

INITIATIVES

Current/Recent Efforts

Erie County has been actively pursuing projects to reduce GHG emissions from its internal operations. Many of these projects have been made possible through grant funding. The following is a description of current and recent projects that are reducing GHG emissions in County operations. They are organized into the two main strategies: keeping fossil fuels in the ground through energy conservation and striving for the use of 100% renewable energy.

Energy Conservation Projects – Keep Fossil Fuels in the Ground

I-1. Rath Building

There have been significant energy conservation projects in the Rath Building, the County's main administrative building. These projects include re-lamping the building's interior with LED lights, and upgrading data center HVAC (heating, ventilation and air conditioning) for equipment control optimization. The LED lights not only save energy, but due to their long life, they reduce staff time used to replace light bulbs. Very recently the colonnade outside the Rath Building was also re-lamped. **These projects have conserved 1,432,194 kWh annually and will result in significant cost saving of \$180,664 and GHG reduction of 1,066 MTCO_{2e} annually.**

I-2. 134 West Eagle

Boiler controls and lighting were upgraded at 134 West Eagle. The boiler controls included high performance turndown burners, parallel positioning controls, variable frequency drives and oxygen trim systems. In addition, 202 fluorescent fixtures on the 3rd floor were replaced with LEDs. **These efforts provide an estimated energy savings of 30,273.45 kWh and natural gas savings of 3,154 Mcf annually, as well as an annual cost avoidance of \$8,322. Total estimated GHG emissions reduction for the facility is 195.5 MTCO_{2e}.**

I-3. Big Sister Creek Water Resources Recovery Facility

An energy performance contract, a comprehensive approach to energy reduction and efficiency improvements, was completed at the Big Sister Creek Water Resources Recovery Facility (WRRF). Improvements included an upgrade of key equipment,

implementation of a new energy management platform through development of a SCADA system¹, and more efficient process controls. The return on investment for this \$1.1 million project is 8.4 years even before factoring in funding from the NYS Environmental Facilities Corporation's "Green Innovation Grant Program" and National Grid incentives. **The total annual energy savings implemented through this energy performance contract were estimated to be over 850,000 kWh and \$76,500 or 633 MTCO_{2e}.**



Energy Conservation Projects at the Rath Building have saved taxpayer dollars.

I-4. Gravity Sewer Projects

The Rush Creek Interceptor and Aurora North Pumping Station Elimination, both completed in 2016, had significant energy savings as the result of replacing equipment with a gravity sewer. The Rush Creek Project eliminated three existing sanitary sewer overflows that Erie County Sewer District No. 3 took over from other municipalities in the early 2000's, eliminated the Blasdell WRRF, and eliminated three pumping stations – all of which were aging facilities that would require future upgrades. These facilities were replaced with a gravity sewer to convey flows to the Southtowns WRRF. The Aurora North Pumping Station Elimination provided energy conservation through replacement of this facility

¹ Supervisory control and data acquisition (SCADA) is a system of software and hardware elements that allows industrial organizations to: control industrial processes locally or at remote locations; monitor, gather, and process real-time data; directly interact with devices such as sensors, valves, pumps, motors, and more through human-machine interface (HMI) software; and record events into a log file.

with a gravity sewer. The total annual energy savings and GHG reductions as a result of these projects is estimated to be approximately 470,000 kWh and \$42,300 or 350 MTCO_{2e}.

I-5. Electric Vehicle Purchase

In the autumn of 2017, Erie County purchased 2 Chevy Volts to test the inclusion of electric vehicles (EVs) into the fleet. While Erie County has made a distinct effort to create a more efficient fleet since 2006 through rightsizing and fuel economy, the next step to reduce emissions from its fleet is to test alternative fuels. This effort will serve as a pilot project as the County plans for the eventual electrification of its entire vehicle fleet. **It is anticipated that these vehicles will reduce GHG by 4.0 MTCO_{2e} annually based on both the estimated fuel conserved and electricity used.**

Renewable Energy – Strive for 100% Renewable

I-6. Solar Installation at the Correctional Facility

The 2 megawatt (MW) solar array at the Erie County Correctional Facility in Alden, NY is Erie County's first major effort to pursue renewable energy in its operations. This project is being constructed through a Power Purchase Agreement (PPA) with Greenskies Renewable Energy, LLC (Greenskies). The array will host more than 7,900 solar panels on a 9.5 acre site that will produce over 3 million kWh of electricity annually. As outlined in the beginning of this report, this project employs the strategy of increasing the use of renewable energy to help Erie County reach its goal. **It is estimated that the renewable energy generated at the site will offset County emissions by 2,233 MTCO_{2e}, equivalent to the electric use of 335 homes¹.**

Upcoming Projects

Erie County has projects that will begin in 2018 that will result in significant GHG reductions. This list of projects includes energy conservation, renewable energy and other projects.

ENERGY CONSERVATION – Keep Fossil Fuels in the Ground

I-7. Energy Performance Contract

To increase the scale of energy improvements among

¹ <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

County facilities, the Energy Committee recommended, and the County Executive authorized, the development of a pilot energy performance contract (EPC) – a budget-neutral approach to make comprehensive building improvements that reduce energy use and increase operational efficiency. The EPC method uses guaranteed energy savings to pay for facility upgrades while minimizing impacts on capital budgets ². Energy performance contracting has been noted by both the New York State Department of Environmental Conservation (DEC) and NYSERDA as an important strategy for local governments to reduce emissions and save money.

A pilot project for up to five (5) buildings has been authorized as a test of such an approach. Preliminary assessments were conducted to determine the feasibility of an energy performance contract among high energy consumption buildings. After a review of those preliminary assessments, it was determined that a solicitation for more detailed auditing services was warranted to evaluate the financial feasibility of a comprehensive, multi-facility energy improvement project.

This type of comprehensive effort will result in large energy savings and GHG emission reductions. By pairing quick payback items with longer return on investments, the County can replace old, yet vital, equipment with high-efficiency models without negatively impacting the County budget. Once completed, this strategy will be evaluated for replication in other County buildings. **It is estimated that the County will have a net savings of over \$175,000 annually from this initial 5 building pilot as well as reduce GHG emissions by 600 MTCO_{2e} every year.**

² <https://energy.gov/eere/slsc/energy-savings-performance-contracting>



Energy Performance Contracts can save money.

I-8. Strategy for Future Re-Lamping Projects

High efficiency lighting is proving to be one of the County's best opportunities for reducing energy costs and greenhouse gas emissions. However, the County must move forward with this conversion to high efficiency lighting in a strategic way that does not prevent utilization of the EPC strategy listed above, as that could potentially reduce the opportunity for even deeper energy savings. That is, when lighting projects, with a relatively short return on investment, are coupled with longer payback items (such as HVAC replacement) the EPC option becomes viable. This is important when thinking about how to fund equipment that is need of replacement.

For this re-lamping strategy, the County has identified the following large buildings for conversion to LED by 2020: Youth Detention; Public Safety; Family Court; 1500 Broadway; Fire Training Academy; and 608 William Street. **It is estimated that on an annual basis the conversion of these 6 buildings would result in the conservation of 1,730,601 kWh, reduction in GHG of 1,288 MTCO_{2e}, as well as \$123,248 in savings.**

Six additional buildings have been targeted for completion by 2025: 134 West Eagle; Old County Hall; 10- Highway Facilities; EC Park Street lights; Alden Correctional Facility; and Erie County Holding Center. **It is estimated that on an annual basis the conversion of these additional 6 buildings would result in the conservation of 1,564,530 kWh, reduction in GHG of 1,164 MTCO_{2e}, as well as \$113,793 in savings.**

RENEWABLE – Strive for 100%

I-9. REV Campus Challenge

Erie County is currently participating in an aggressive renewable energy initiative being spearheaded by the University at Buffalo, made possible through funding from NYSERDA. The goal of the project is to develop up to 100 MW of renewable energy, mostly solar, by 2020. A set of large institutions are participating in this unprecedented collaborative clean energy procurement process including Erie Community College, Buffalo State College, and the City of Buffalo.

Erie County aims to procure up to 15 MW of clean energy through the project that would account for approximately 40% of the electric usage of Erie County's operations. Thus, this collaboration has the potential to catalyze significant integration of renewable energy in the County's power supply as it moves toward 100% renewable electric energy supply. **It is estimated that**

this will result in reduction in GHG of 4,463 MTCO_{2e} annually.

OTHER OPPORTUNITIES

I-10. Composting Project at Jail

The Erie County Correctional Facility Food Composting Project, a three-year project funded through a DEC grant, will change the disposal method for food waste at the County's correctional facility in Alden, New York. This project, kicking off in early 2018, will plan, design and construct a small composting area directly on the site. Food waste generated by the inmates and staff will be composted along with other organic waste generated at the facility. The compost will then be used in the facility's horticultural program and at other Erie County properties, such as parks.

The expected outcome of the project includes the diversion of up to 200 tons of food waste from the facility on an annual basis. Not only will this project turn waste into a usable product and save landfill disposal costs, but it will prevent the creation of methane, a potent GHG. This project will track and document waste diversion and the associated GHG emissions prevented. Further, inmates will be trained on composting techniques, thus giving them skills, knowledge, and work experience they can put to use after incarceration. **It is estimated that the project will result in reduction of 72 MTCO_{2e} annually.**

Recommended Actions

The "Erie County Commits to Paris" Working Group has outlined several recommended projects that will reduce GHG emissions from Erie County government operations, which are not currently underway. Many of these are the result of the collaborative work of the Green Team and its committees. These recommended actions utilize the two strategies of keeping fossil fuels in the ground and striving for 100% renewable energy, and are divided into three areas: energy conservation; renewable energy; and other.

ENERGY CONSERVATION – Keep fossil fuels in the ground

I-11. Erie County Fleet Policies and Standards

For deep GHG emissions reductions in the County fleet, the most important strategies will be the purchase of low and zero emissions vehicles and use of alternative

fuels. While initially the most advanced technologies were only available for light duty passenger vehicles, advances in technology are increasingly bringing to market cost-effective, low and zero emissions vehicles.

For the purposes of this report, the following targets are recommended:

- 20% of the County fleet will be electric and/or hybrid vehicles by 2025, and
- Reduce fleet GHG emissions by 30% below 2005 levels by 2025.

Through the upcoming CASP, Erie County will work to develop a robust vehicle procurement policy. The County will also set short and long-term fleet fuel efficiency goals for its light and heavy-duty fleets to achieve these goals, and will report progress based on actual vehicle miles traveled and fuel consumption. The policy will require adoption of best management practices, implementation



More of Erie County's vehicles will be electric.

of alternative fuel vehicles and vehicle retrofits, and testing of new technology as it becomes available.

It is vital that the use of the vehicle be considered as these options are explored. For example, as part of the work of the Green Team's transportation committee, the County is investigating anti-idling retrofit technology built for patrol vehicles. Patrol vehicles have a unique and challenging duty cycle that involves high amounts of idling, making traditional anti-idling technologies difficult to implement. Important features of anti-idling equipment for patrol vehicles include: 1) cycling the vehicle engine on and off to maintain cab temperature and battery charge; 2) continuous coolant circulation through the engine to support cab heating while the motor is off; 3) additional battery storage; and 4) fast drive-off features, so the vehicle operator experiences minimal delay when the motor is off. **Next steps:** Through the Green Team, a transportation committee will develop a draft vehicle

procurement policy and conduct a pilot test of anti-idle retrofit technologies for patrol vehicles.

I-12. Other Procurement Policies

Erie County is exploring the ways that it can use its purchasing power to reduce GHG emissions. For example, the County Attorney's office is examining guidelines for lease negotiation that include considerations of energy efficiency. The Green Team is also examining purchasing policies regarding energy efficient equipment. **Next steps:** As part of the CASP, the Green Team will coordinate with the Law Department and Bureau of Purchasing to review opportunities related to leases and other purchasing policies.

I-13. Tax Incentives for Public Transportation for Employees

The federal government currently offers significant tax incentives for employees who use public transportation for commuter travel. However, due to the rules governing the IRS incentive, the Niagara Frontier Transportation Authority (NFTA) ticketing method makes it challenging for Erie County to offer the tax incentive to its employees. The Green Team, including the Personnel Department, met with NFTA regarding this issue. NFTA has indicated that they will make changes to ticketing that will address this issue in 2018. Once the new ticketing system is in place, Erie County will offer the commuter incentive to employees in an effort to reduce single-occupancy vehicle travel and the resultant fuel consumption and GHG emissions. **Next Steps:** The



Employees will be encouraged to use public transportation.

Sustainability Coordinator will monitor progress of NFTA and work with the Personnel Department to expedite pre-tax incentives to employees once the new ticketing system is in place.

I-14. Support Alternative Transportation through Infrastructure and Policy

Another strategy to reduce single-occupancy vehicle use for commuting is to create County buildings and parking structures that support alternative transportation strategies. A construction and design policy could be developed and implemented to require new builds and renovations to incorporate infrastructure for alternative vehicles, bicycles, and pedestrians. Strategies to be considered will include electric vehicle charging stations for employee and County fleet parking structures, protected employee bicycle parking, infrastructure for alternative fuels like biodiesel, and maintenance shop accommodations for repair of alternative fuel vehicles. **Next steps: Erie County can join Gobike Buffalo's bike friendly employer program, which can provide guidance on how to incorporate these changes.**

RENEWABLE ENERGY – Strive for 100%

I-15. Erie County Utilities

Erie County could decrease its GHG emissions through procurement of renewable electricity. This could be achieved with assistance from the energy contractor, Fluent Energy, which manages the County's utility fund. Fluent Energy will work with the County to explore the different ways the County could pursue this action.

One option is for the County, utilizing its position as a participant in the wholesale market, to contract directly with a renewable energy generator. Typically, a deal of this type would be for significant volumes over a long period. Another option would be for the County to purchase Renewable Energy Credits (RECs). These RECs would need to be outside of the Public Service Commission's mandated program¹ and could be sourced either in-state or out-of-state. New York State RECs are sourced from a renewable generator delivering power in the NY market via an annual RFP process or long-term contract. Purchasing out-of-state RECs that are "Green-e

¹ Starting 2017, by order of the Public Service Commission ("PSC"), the Aggregate, along with every electricity consumer in NYS, must procure Renewable Energy Credits ("RECs") consistent with NY's goal of 50% renewable by 2030. CES RECs are tracked separately from other renewable purchases and do not allow the buyer to make any special environmental claim, other than maintaining compliance with PSC regulations.

Certified" or otherwise validated, may be a less expensive option than in-state REC procurement. Finally, the County could pursue more net metering projects. The County has gained experience with this through the Power Purchase Agreement at the Correctional Facility and the work that is being done through the REV Campus Challenge. **Next Steps: DPW, Budget and Law will engage Fluent Energy in an analysis of these options and their cost implications.**

I-16. Assess Solar on Roofs of County Buildings

Understanding all the available options for solar installations on all County facilities will prioritize which buildings should be targeted for future installations. As part of the REV Campus Challenge, described above, a preliminary review has been conducted that has identified 358,000 square feet of County-owned rooftops that meet a minimum threshold area of approximately 5,000 square feet each. To help facilitate deeper analysis of rooftop suitability, additional technical resources have been requested through the National Renewable Energy Lab's (NREL) Solar Resources for Universities and



Solar Panels will help reduce the County's carbon footprint.

Local Governments². It is important to note that such installations may require investment in roof replacement. **Next steps: The Director of Energy Management and Development will work to leverage outside resources for a coordinated effort with the Parks Department, as well as the Divisions of Highways, Buildings and Grounds, and Sewerage Management.**

² <https://www.nrel.gov/technical-assistance/universities.html>

I-17. Create renewable thermal targets within Erie County operations¹

Erie County will examine thermal energy used to heat its buildings to set a goal for the use of renewable thermal technologies, such as heat pumps, by 2025. The County should design this target through the CASP plan process and set a target to encourage compliance strategies that emphasize adoption of renewable thermal technologies over gas conversions or procurement of high-efficiency gas technologies. Such an effort would reduce the County's GHG emissions from its use of fossil fuel to heat buildings. **Next Steps: Erie County will identify a series of buildings that meet the eligibility criteria for applying to NYSERDA's Geothermal Clean Energy Challenge to explore a renewable thermal pilot project.**

OTHER RECOMMENDATIONS

I-18. Paris Fund

By creating a "Paris Fund" within its own budget, Erie County could reinvest savings from energy conservation projects to fund further initiatives geared towards sustainability and energy conservation. To do so, the County would create a methodology to track combined NYSERDA incentives, utility rebates and savings realized due to specific energy conservation efforts. The Energy Committee, in coordination with the Division of Budget and Management, would calculate the energy savings from the previous year using a baseline number which would be adjusted to account for a variety of factors including the severity of weather, price fluctuations, inflation, etc. Foremost, the savings would fund the following year's debt service costs for related energy capital projects

1 See Meister Consulting Groups work on RT for Rhode Island (p. 50 of document): <http://www.synapse-energy.com/sites/default/files/RI-Renewable-Thermal-15-119.pdf>

in existence at the time the savings are realized. Next, a portion of the net savings would be reserved and available to conduct additional projects to reduce GHG emissions. Lastly, any remaining funds would be returned to the general fund. Such funding is important for those projects that have the potential for large GHG emission reductions but are not cost saving measures. **Next steps: The Energy Committee, in coordination with the Division of Budget and Management, will propose a tracking methodology.**

I-19. Tree Management and Habitat

The County can also mitigate greenhouse gas emissions through land use, such as the proper management of its forests and through habitat restoration projects. **Wooded areas absorb CO2 from the atmosphere and serve to mitigate climate change.** The County will consider climate change as it updates its 2003 Forestry Management Plan and its Parks Master Plan. Other opportunities for mitigation include adopting a tree management plan for County Parks and Highways, as well as utilizing the horticulture program at the County Correctional Facility to propagate trees. Finally, continued habitat improvements are important not only for climate change mitigation, but also for adaptation to climate change. For example, riparian buffers² provide protection against flooding. **Next steps: DEP and the Department of Parks, Recreation and Forestry will update the Forest Management Plan and Parks Master Plan, keeping climate change as a focus. ■**

2 A riparian buffer is a vegetated area (a "buffer strip") near a stream, usually forested, which helps shade and partially protect a stream from the impact of adjacent land uses. It plays a key role in increasing water quality in associated streams, rivers, and lakes, thus providing environmental benefits.

PART TWO: COMMUNITY WIDE



BACKGROUND

The report has discussed the County’s internal operations, but Erie County government is just one government in a field of 3 cities, 25 towns, 16 villages, and more than 920,000 residents. Meaningfully impacting GHG emission reductions in Erie County will require substantially more than Erie County can attain in its own operations. For this reason, Erie County is equally focused on its role as educator and facilitator to municipal, commercial and residential efforts to reduce GHG emissions.



New York State is a home rule state. Therefore, the County does not have the legal authority to take many actions that could result in significant GHG reductions. For example, the County cannot require buildings to have stringent energy standards or directly impact zoning regulations for planning development that would reduce sprawl and reduce emissions from vehicle travel. That legal authority resides exclusively with the towns, cities and villages. However, the County can have an impactful role by promoting community initiatives, providing leadership, convening partners, adopting New York State enabling legislation, and working across the State to create additional programs and support.

As stated at the outset of this document, while the County must reduce GHG in its own operations, the vast majority of the GHG emissions in Erie County are not produced by County government operations. This is demonstrated in the next section which outlines the community-wide GHG inventory for Erie County. Despite the lack of direct responsibility for emissions, the County has the opportunity to influence these emissions through a variety of projects, policies, and actions. Erie County is currently partnering or providing leadership on several projects that have the goal of reducing GHG emissions. There are also many other opportunities described below that the County will explore.

COMMUNITY GHG INVENTORY AND GOALS

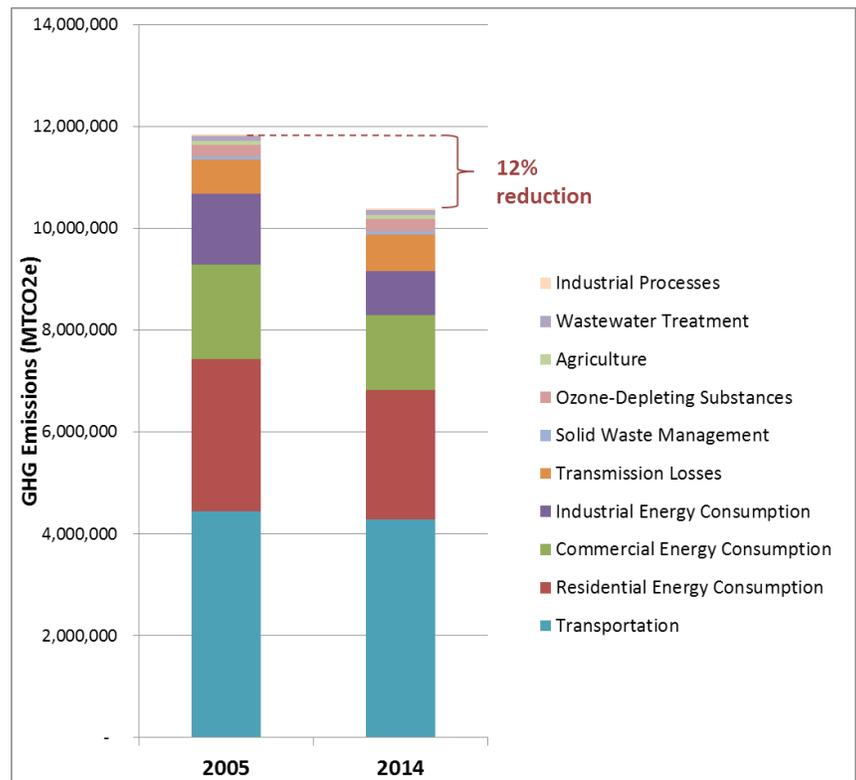
Community GHG Inventory

Similar to the Internal Operations GHG Inventory, the County developed 2005 and 2014 community-wide GHG emissions estimates as described in Figure 3 on the right. For this effort, the County adjusted the 2010 Erie County GHG inventory developed for the WNY Regional Sustainability Plan, and follows methods specified in the New York Community and Regional GHG Inventory Guidance (NYCRGIG). Residential and transportation emissions sources were adjusted by County 2005 and 2014 population, and other sources were adjusted by County gross domestic product. Emissions resulting from electricity consumption were also adjusted by statewide electric GHG emissions factors for 2010 and 2014 provided by the New York State Public Services Commission. Gasoline combustion emissions were adjusted by vehicle fleet-wide fuel economy factors. Finally, National Fuel Corporation provided weather normalized natural gas consumption data for this inventory. The County is pursuing actual community electric consumption data from the utilities and also fuel sales data from New York State Department of Finance, and will improve these estimates as better data becomes available.

Community GHG emissions declined 12% between 2005 and 2014, as shown on Figure 3. Most of the emissions reductions are from a decrease in emissions resulting from electricity consumption due to a transition to cleaner generation sources for electricity supplied to the County. Partly because Western New York has relatively low carbon intensity electricity, GHG emissions from transportation dominate the inventory, accounting for 41% of GHG emissions in 2014 – followed by residential, commercial and industrial energy consumption. By fuel type, liquid transportation fuels, natural gas and electricity are the largest emissions sources, and comprise 38%, 29%, and 22% of the 2014 inventory respectively.

While GHG emissions resulting from electricity consumed in the County are included, emissions from electricity generation in Erie County are not included in this GHG inventory (as specified by NYCRGIG) and reduction in these emissions will not be counted towards the County's achievement of its Paris Climate Agreement

Figure 3. 2005 and 2014 Community GHG Emissions by Sector



goals. Until recently, electric generation was a significant source of air pollution in Erie County, comprising 3.2 million mtCO₂e in 2005. These emissions were almost entirely from coal combustion at the Huntley Power Plant in Tonawanda, NY, which closed in 2015.

With a 12% community GHG emissions reduction between 2005 and 2014, the County will still need to achieve an additional 14-16% emissions reduction to achieve the United States Paris Agreement goals. However, there are reasons to view this estimate of progress to date with caution. First, the community GHG inventory has some uncertainty, described in Appendix C, which will be improved in future years. For example, while actual natural gas consumption is included in the inventory, most other fuel and electric consumption rely on layered assumptions. Fortunately, there is a significant initiative being undertaken by NYSERDA to create a utility registry of community energy consumption data to support community GHG inventories. It is expected that actual utility energy consumption data will be available in the next few years. Also, actual volume fuel sales data for bulk fuels such as heating oil, gasoline and diesel are

collected by the New York State Department of Taxation and Finance, and the County has started a dialogue with the state to make this data available.

A second reason for caution is that while the main reason for progress to date is the shift to greener generation sources for electricity – there is some uncertainty as to whether this trend will continue or even reverse. In particular, the closing of zero emission nuclear power plants such as Indian Point (scheduled to close in 2021), the scheduled elimination of the federal

investment tax credit for solar power, and changes in electricity markets that could favor higher emissions electricity imports may cause an increase in the carbon intensity of the County’s electricity. Counter to that trend, New York State has significant initiatives, including the REV initiative and the Governor Andrew Cuomo’s “30 by 30” initiative that will serve to lower carbon emissions from electricity. Overall, there is a lack of certainty that suggests that to Erie County may need to exceed the 14%-16% emissions reduction described above.

INITIATIVES

As organized in the internal operations section, the descriptions of these community-wide opportunities are divided into 3 categories: current/recent efforts, upcoming projects, and recommended actions. Like the Internal Operations Initiatives section, the initiatives are further organized around the two main strategies of keeping fossil fuels in the ground and striving for 100% renewable energy.

Current/Recent Efforts

Erie County has been pursuing projects to reduce GHG emissions in the community. The following is a description of current and recent projects. They are organized into the four areas: both energy conservation and renewable energy, keeping fossil fuels in the ground through energy conservation, striving for the use of 100% renewable energy, and other.

BOTH – Keep fossil fuels in the ground & Strive for 100% Renewable Energy

C-1. WNY Sustainable Business Roundtable

Erie County worked with several local businesses and the University at Buffalo to establish the **WNY Sustainable Business Roundtable (SBR)**. When the SBR was officially started on Earth Day 2014, it had 35 members. It is now an official 501c3 not-for-profit organization with more than 75 member organizations that are changing the way they do business by optimizing their use of energy and materials, reducing waste and pollution, and investing in their communities. The SBR helps its member organizations meet these goals by organizing an annual Summit, as well as regular workshops and networking opportunities. The County currently supports the organization with staffing, office

space and administrative assistance - the majority of which is paid for through a federal grant. **The SBR demonstrated a 20,000 MTCO₂e reduction in GHG emissions from reporting members in its first year.**



RENEWABLE ENERGY – Strive for 100%

C-2. Solarize Campaign

Erie County recently participated in one of SBR's efforts to address climate change - a Solarize Campaign. With technical guidance from NYSERDA, the Solarize campaign leveraged group purchasing power to negotiate rates 20% lower than the average price in the region. The campaign was recently extended through February 2018 and is open to both the member organizations and their employees. As one of SBR's founding members, Erie County promoted the opportunity to its employees and many took advantage of the campaign. **As of the writing of this report, the campaign has resulted in contracts for individual residential installations which are estimated to produce 141,954 kWh of energy annually, reducing GHG by 106 MTCO2 every year.** Due to the success of the project, the SBR and Erie County should consider promoting another such campaign that harnesses the power of group purchasing to meet GHG reduction goals.

Upcoming Projects

The County has two major community projects planned that will begin in 2018.

ENERGY CONSERVATION – Keep fossil fuels in the ground

C-3. ECLIPSE: Erie County Low Income Program for Sustainable Energy

Erie County will create a community scale energy program to spur local energy-related economic development and address the Home Energy Affordability Gap ("HEAG"). HEAG represents the difference between an affordable energy bill and an actual energy bill among energy insecure households. As of April 2017, the cumulative HEAG in Erie County stood at \$126 million. This represents an incredible drain on the local economy and is a driver of chronic economic vulnerability among households as they struggle to meet their basic needs. Reducing trade-offs associated with energy insecurity (such as the "heat-or-eat" scenario) will promote healthier, more prosperous communities across Erie County.

Erie County will use ECLIPSE in several ways. First, it will extend the benefits of Erie County's bulk purchasing efforts to residential, small commercial and non-profit customers. Second, ECLIPSE will drive collaboration among departments that provide energy and environmental services – breaking down silos within government – to reduce disparities across populations

facing high energy burdens. Third, ECLIPSE will utilize data driven program design and evaluation to gain valuable insights about individuals and populations participating in the program to determine its impact, optimize outcomes, and better align services to help reduce costs. **Next Steps: Erie County is working to finalize a contract for this work, expected to begin by mid-2018.**

OTHER

C-4. Climate Smart Communities – Certification and Community Climate Change Task Force

Erie County will pursue Climate Smart Community Certification. To become certified the County must complete and document dozens of actions which mitigate the impacts of climate change. DEC has a detailed guidance document for certification, which has served as a guidepost for the County's existing and upcoming projects.

A DEC grant will provide staff funding that will enable the implementation of several projects identified in the CASP, which will assist with the County's certification. Many of these projects will have a community-wide element. For example, the County will convene a Community Climate Change Task Force to create a dialogue about how to move forward on the issue of Climate Change. The Task Force will be assembled in 2018 and will provide feedback and guidance regarding many of the projects in this report. **Next Steps: Finalize the grant contract with DEC.**

Recommended Projects

There are several projects recommended for the County to pursue that could have a significant impact on County-wide GHG emissions. These are organized by the following categories: both energy conservation and renewable energy, striving for the use of 100% renewable energy, and other.

BOTH – Keep fossil fuels in the ground & Strive for 100% Renewable Energy

C-5. PACE – Property Assessed Clean Energy Financing

Erie County will work with the Erie County Legislature to pass enabling legislation allowing PACE financing for renewable energy projects and energy efficiency

upgrades on commercial buildings. PACE is a New York State initiative that provides financing for renewable energy projects and energy efficiency upgrades on commercial buildings. Bringing PACE financing to Erie County will catalyze investments in commercial buildings, including improvements to multi-family housing. PACE financing is lower cost and longer term than typically available to property owners, and is paid as an annual assessment on the owner’s property tax bill, allowing the loans to be transferable on sale of the property. The program allows for projects that would not otherwise be feasible, spurring investment in the region’s building stock.

PACE requires the local taxing authority to pass enabling legislation and administer some aspects of the program. If adopted in Erie County, by virtue of its taxing authority, this financing mechanism would be available to all areas of Erie County except the Cities of Buffalo, Lackawanna and Tonawanda. Due to their taxing authority, these cities would need to pass their own enabling legislation in order for PACE to be accessed in their communities. Recently PACE was adopted by Wyoming County and the City of Lockport. **Next Steps: DEP will work with EnergizeNY to present information to interested legislators and other parties, such as the SBR.**

C-6. Property Tax Exemptions

Although Erie County cannot pass a local law to require LEED standards as it has done on its own buildings, the County can offer incentives for those who choose to implement LEED standards on their private property by way of a real property tax exemption. Pursuant to New York State Real Property Tax Law §470, Erie County could adopt a local law offering a real property tax exemption for improvements to real property meeting LEED certification, or substantially similar standards, for green buildings. Such an exemption would serve to incentivize homeowners and businesses to comply with LEED standards, which are known to help produce energy efficiency and reduce greenhouse gas emissions. In August 2014, Niagara County adopted a similar local law, which became effective January 1, 2015. **Next Steps: DEP, Law and Budget should meet with Niagara County to discuss success and challenges.**

C-7. Revolving Loan Fund

A revolving loan fund (RLF) is a pool of capital from which loans can be made to support clean energy

projects. As the loans are repaid, the RLF can then re-loan the funds for another project, and so on. Erie County, through DEP, presently has a program in place that acts like an RLF, known as the Community Development Block Grant (CDBG) that funds home improvements and repairs for low income residents. Similarly, an RLF could be created to encourage energy improvement projects within the private sector.

According to the U.S. Department of Energy, RLFs used by other local governments have been proven an effective tool for residential energy efficiency improvements in the \$2,000 to \$10,000 range. Oftentimes, these improvements are too costly for cash or credit purchases, but do not warrant a home equity loan. For instance, a home owner could look to the County’s RLF for help with purchasing a new energy efficient furnace, or other efficiency upgrades, such as appliances and lighting.

In order to create an RLF, the County would need to set criteria regarding the types of projects it would be willing to fund, as well as the available dollar amounts. The County would also need to consider how to fund the RLF. Some RLFs are funded by taxpayer dollars, while others utilize state bond proceeds, treasury investments, and other special funds. **Next Steps: Investigate the success of other such County programs.**



RENEWABLE ENERGY – Strive for 100%

C-8. Community Solar

Erie County will work with partners to identify sites suitable for community solar and implement both place-based and community-wide programs for enrollment of households that are not otherwise candidates for solar energy installations. Solar and other forms of renewable energy are delivering tremendous benefits across the

country and the State, but renewable energy hasn't reached all communities equally. The traditional "panels-on-your-roof" approach to solar simply doesn't work for a majority of Americans, as much as 75% of households, because of roof suitability problems, lack of access to financing, or lack of ownership. One way of achieving broader adoption of renewable energy is through community solar, bypassing the need for a "solar-ready" roof, and allowing residents from across the region to share in the generation of energy from an off-site solar array. **Next Steps: Erie County was recently selected for National Renewable Energy Lab's (NREL) City and County Solar Training Program, which will provide no-cost technical assistance and training on this issue starting in January 2018.**

C-9. Renewable Heating and Cooling

An increase of renewable thermal technology is vital in Erie County, as a large portion of the community's carbon footprint is the result of heating. While Erie County will seek to address this issue through ECLIPSE (see above), the County should also participate in "thermalize" campaigns. Like solarize campaigns, these bulk purchasing campaigns would help residents and business access renewable thermal technology systems, such as heat pumps, to reduce GHG emissions through energy savings and fuel shifting. Within New York State, HeatSmart Tompkins¹ is an early example of how local government can drive the State energy and climate goals². **Next steps: Work with NYSERDA to develop a GIS based targeting tool to identify high priority geographies for renewable thermal technology conversion.**

C-10. Purchasing Renewables through Utilities Aggregation

Employing the utility fund to enhance coordination on renewable electricity procurement among the membership is a natural extension of its mission. As outlined in the internal operations section of this report, with assistance from Fluent Energy – the energy contractor that manages the utility fund, a strategy could be pursued to purchase renewable energy for the more than 30 participating municipalities. Of course, this

1 HeatSmart Tompkins is a community based campaign to promote the adoption of home energy efficient, fossil fuel free heating and cooling technology. See: <http://www.solartompkins.org/get-heatmart.html>
2 Tompkins County government agreed to act as fiscal sponsor and administrator of funding from the Park Foundation to facilitate the launch of the HeatSmart Tompkins Campaign via resolution on October 4, 2016. See: https://tompkinscountyny.iqm2.com/Citizens/Detail_Legifile.aspx?Frame=&MeetingID=2575&MediaPosition=&ID=6611&CssClass=

strategy will be more effective and may be much more feasible if it involves the entire utility fund and not just Erie County's accounts. Fluent Energy will work with the County to explore the different ways the County could pursue this action.

One option is for the utility fund, utilizing its position as a participant in the wholesale market, to contract directly with a renewable energy generator. Typically, a deal of this type would be for significant volumes over a long period. Another option would be for the utility fund to purchase Renewable Energy Credits (RECs). These RECs would need to be outside of the Public Service Commission's mandated program³ and could be sourced either in-state or out-of-state. New York State RECs are sourced from a renewable generator delivering power in the NY market via an annual RFP process or long-term contract. Purchasing out-of-state RECs that are "Green-e Certified" or otherwise validated, may be a less expensive option than in-state REC procurement. Finally, the utility fund could pursue net metering projects. **Next Steps: DPW, Budget and Law will engage Fluent Energy in an analysis of these options and their cost implications.**

OTHER

C-11. Parking Lot Policy: Public Electric Vehicle Charging Stations, Green Infrastructure and Solar Installations

Parking lots are often under-utilized spaces that have the potential to create multiple benefits. The County should consider an internal policy to evaluate options when repaving or installing a parking lot at facilities like County Parks and Erie Community College. First, to encourage use of electric vehicles by the public, Erie County should make a concerted effort to place electric vehicle charging stations in public places. The policy should include consideration of the feasibility of installing charging stations during any improvement project or new build. The County should also pursue NYSERDA rebates for these installations if available. The County should also consider the use of green infrastructure in parking lots. With the increased heavy rain events anticipated with a changing climate, reducing impervious surfaces will help reduce flooding and issues with combined sewer overflows. Finally, large parking lots could include solar

3 Starting 2017, by order of the Public Service Commission ("PSC"), the Aggregate, along with every electricity consumer in NYS, must procure Renewable Energy Credits ("RECs") consistent with NY's goal of 50% renewable by 2030. CES RECs are tracked separately from other renewable purchases and do not allow the buyer to make any special environmental claim, other than maintaining compliance with PSC regulations.

installations which provide protection for vehicles. **Next Steps: Work with the Green Team to further develop this for the CASP.**



C-12. Carbon Pricing

The idea behind carbon pricing is two-fold: first, by placing a price on carbon, polluters will be encouraged to reduce their use of carbon, thus leading to a reduction in GHG emissions; second, it creates a means to fund research for further carbon reduction and cleanup. According to the Carbon Pricing Leadership Coalition, the phrase “put a price on carbon” is becoming increasingly more popular amongst government and business leaders.

Erie County, along with other local governments, could support a statewide effort to bring carbon pricing to New York State. There are two different schools of thought on how best to establish a carbon price. First, a government can create a “carbon tax” on the distribution, sale or use of fossil fuels, based upon their carbon content. A carbon tax approach has the effect of increasing the cost of the goods and services created with the use of those fuels. In so doing, businesses would be encouraged to switch to greener production and consumption.



The second approach is known as an “emissions trading system” (ETS) or a “cap-and-trade system”. An ETS would set a cap on the amount of allowable GHG emissions in New York State, which would be lowered over a period of time. This model allots companies a set number of emissions permits. Companies are allowed to then buy and sell the permits, thus creating a marketplace and price for GHG emissions. The idea is that emissions will be reduced by creating a set cap at the outset.

Many economists believe that carbon pricing is a necessary step to reduce GHG emissions and must be incorporated into a larger portfolio of sustainability projects. **Next Step: Explore this concept with other Counties across the state.**

C-13. Energy Performance Ratings

Erie County could work with local governments, real estate associations, NYSERDA, utilities, and the County Clerk’s office to create an energy performance rating program for residential and commercial properties. In order to reduce GHG emissions, these programs should be cross-referenced with technical assistance and financing programs for energy efficiency and conservation.

Residential:

Consumers often lack awareness and information on the energy performance of homes and apartments. Energy efficiency is hard to “see” in homes and is therefore hard to prioritize when making home buying and retrofit or upgrade decisions. To address this challenge, several states and several cities have developed residential energy labeling programs and policies. Residential energy labeling programs produce an assessment of a home’s energy performance and how the energy performance compares to that of similar homes. The audience for the energy label is typically a homeowner, homebuyer, or tenant, and can also include other stakeholders such as real estate professionals, appraisers, or lenders. The energy label and supplementary information are used to inform real estate purchasing and renting decisions or investments in energy efficiency upgrades. Numerous considerations go into local residential energy labeling programs, such as determining the best metrics to use when describing home energy performance, how to account for differences in new and existing homes, and how to incentivize or mandate use of the labeling program¹.

¹ <http://www.naseo.org/residential-energy-labeling>

Commercial:

Benchmarking is the practice of comparing the measured performance of a device, process, facility, or organization to itself, its peers, or established norms, with the goal of informing and motivating performance improvement. When applied to building energy use, benchmarking serves as a mechanism to measure the energy performance of a single building over time, relative to similar buildings, or to modeled simulations of a reference building built to a specific standard (such as an energy code).

New York City's Greener Greater Buildings Plan included one of the first benchmarking ordinances passed in the US: Local Law 84 of 2009, and could serve as a model for a similar program in Erie County. This law requires private buildings over 50,000 square feet (about 24,000 buildings in New York City) and public sector buildings over 10,000 square feet to report their energy and water consumption each year for public disclosure. The County could work with local government partners to develop and implement similar benchmarking strategies in Erie County. The program would utilize transparency to create competition and recognition within key building sectors, including high performing buildings, and provide data and feedback to owners and tenants. **Next Steps: Investigate the success and lessons learned of other programs, such as New York City. ■**

PART THREE: ADDITIONAL PARTNERSHIP OPPORTUNITIES



This section outlines organizational partnerships that the County can explore to leverage resources, as well as increase educational and outreach opportunities.

P-1. Inter-County

Erie County could seek to work with its partners in the Erie County Association of Governments to create a **climate change committee**. Creating such a committee would help to facilitate the sharing of information about opportunities to reduce GHG emissions. As has been demonstrated in the Energy Usage Plan also prepared for Executive Order #17 - *Enforcement of the Paris Climate Agreement*, reducing GHG emissions is frequently achieved through waste reduction, efficiency and conservation, which also generate cost savings. Such a committee could also discuss the municipal adoption of policies recommended for the County in the Energy Usage Plan, such as PACE, as well as opportunities available through the County's Energy Aggregation Program or other group purchasing campaigns.

P-2. Intra-County

Erie County has been a leader on many issues Statewide, from micro-beads to opioids. **Erie County should work with the New York State Association of**

Counties to work cooperatively on climate change across the State. By working together with other counties, Erie County may help to identify needs and influence State policies, programs or enabling legislation. Indeed, as was seen in the case of micro-beads, working with other counties across the State can influence federal policy.

P-3. Regional Transportation

Transportation is a major source of GHG emissions in Erie County. **The County should identify and assess policy options within its authority that could significantly reduce community-wide GHG emissions. Additionally, the County should actively collaborate with partners,** such as the Niagara Frontier Transportation Authority (NFTA), Greater Buffalo Niagara Regional Transportation Council (GBNRTC), Niagara River Greenway Commission (NRGC), Citizens for Regional Transit, and GObike Buffalo to expand public transportation, multi-use trail networks, and alternative commuting options to reduce GHG emissions. Because the County's current involvement with GBNRTC is rather limited from a planning perspective, the Erie County Department of Environment and Planning should take a more active role in GBNRTC's transportation planning process for the region.

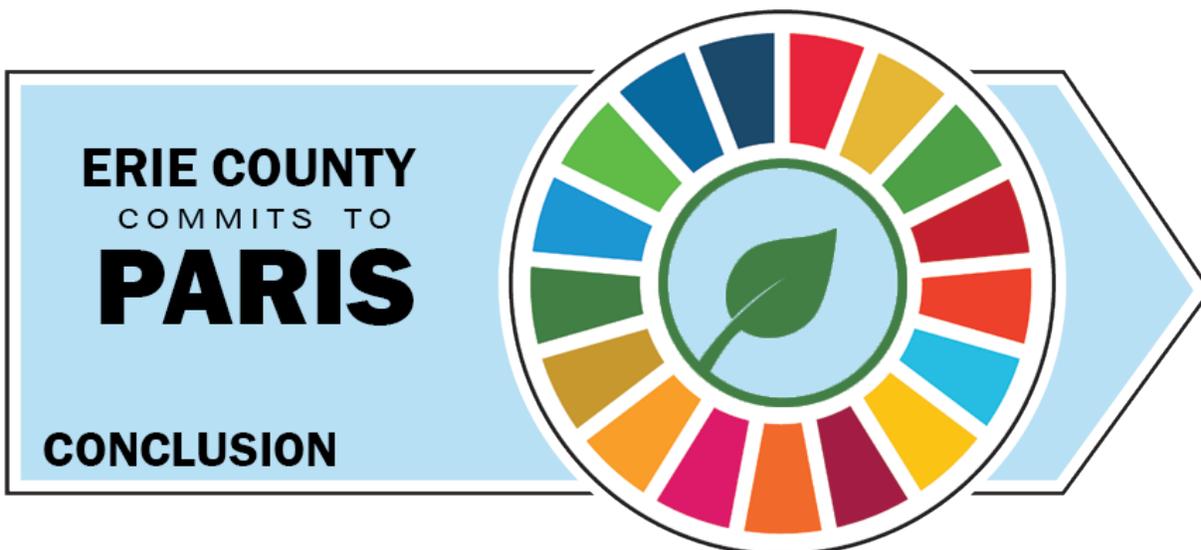
P-4. Utility Infrastructure

Erie County should work closely with utilities to promote their efficiency programs and initiate demonstration projects that reduce GHG emissions. Erie County has met with both National Grid and National Fuel to discuss potential partnership projects. Utility data related to energy consumption has been incredibly valuable to the development of this report. The County should continue to work together with the utilities to significantly reduce GHG emissions and provide benefits to taxpayers. This would include detailed data sharing related to energy consumption that could be used for community-wide energy planning and energy infrastructure development.

P-5. Outreach and Training Partnerships

There are a variety of opportunities that the County is currently pursuing or have been recommended in Parts A and B of this report that the County could share with the public, as well as business and municipal partners, to encourage replication and further reduction of GHG emissions. The County could provide technical and other support to local governments in implementing and enforcing Energy Code, developing sustainability plans and to achieve Climate Smart Communities certifications and other sustainability actions. For example, Erie County fleet managers can partner with managers of private and other government fleets, as well as nonprofit groups such as Clean Communities of Western New York, to provide a forum to share best practices and advance broader-based transportation sustainability initiatives. This initiative could include shared procurements and specifications, an Annual Fleet Show program, presentations by vendors and partnership on legislation and recognition events. The Erie County Environmental Management Council, an advisory group to the County, should be an ongoing ally in such efforts. ■

CONCLUSION



The “Erie County Commits to Paris” Working Group has identified many strategies to reduce Erie County’s GHG emissions.

There is no silver bullet. While the County has dramatically reduced its GHG emissions from the 2005 baseline year, it will need to implement several of the identified initiatives simultaneously in order to make additional progress. Fortunately, many of these recommended projects will also result in fiscal savings. Additionally, it will take political and community will to implement those initiatives which do not demonstrate as much cost savings, at least in the short-run.

Erie County will also make a concerted effort to explore partnerships around this issue. As the economic and population hub of western New York, and at the epicenter of one of the largest international regions in North America, the County can use its influence to positively impact the greater region. By reaching out to allies, both within and outside of the County’s borders, its efforts can be more effective and impactful.

As required by Executive Order #17 - - *Enforcement of the Paris Climate Agreement*, this working group will update this report annually and submit it to the County Executive by October 31 each year. ■

APPENDIX A: GLOSSARY OF ACRONYMS

Acronym	Meaning
AVLS	Automatic Vehicle Locators
CASP	Climate Action and Sustainability Plan
CDBG	Community Development Block Grant
DEC	New York State Department of Environmental Conservation
DEP	Erie County Department of Environment and Planning
DMV	Department of Motor Vehicles
DPW	Erie County Department of Public Works
EMC	Environmental Management Council
EPC	Energy Performance Contract
ETS	emissions trading system
EV	electric vehicles
GBNRTC	Greater Buffalo Niagara Regional Transportation Council
GHG	Greenhouse Gas
HEAG	Home Energy Affordability Gap
HVAC	heating, ventilation and air conditioning
ICLEI	ICLEI - Local Governments for Sustainability
KWH	Kilowatt hours
LEED	Leadership in Energy and Environmental Design
MCF	Thousand cubic feet
MTCO ₂ E	metric tons carbon dioxide equivalent emissions
MW	Megawatt

Acronym	Meaning
NFTA	Niagara Frontier Transportation Authority
NREL	National Renewable Energy Lab
NRGC	Niagara River Greenway Commission
NYCRGIG	New York Community and Regional GHG Inventory Guidance
NYSERDA	New York State Energy Research and Development Authority
PACE	Property Assessed Clean Energy
PPA	power purchase agreement
PVTN	PV Trainers Network
QECBS	Qualified Energy Conservation Bonds
REC	Renewable Energy Credits
REV	Reforming the Energy Vision
RFP	Request for Proposal
RLF	revolving loan fund
SCADA	Supervisory control and data acquisition
VMT	Vehicle Miles Traveled
WNYSBR	Western New York Sustainable Business Roundtable
WRRFS	Water Resources Recovery Facility

APPENDIX B: SUMMARY TABLE

Initiative	Number	Status*	Sector			
			Buildings - Electricity	Buildings - Heating	Renewable Energy	Transportation
Rath Building	I-1	C	X	X		
134 West Eagle	I-2	C	X	X		
Big Sister Creek Water Resources Recovery Facility	I-3	C	X			
Gravity Sewer Projects	I-4	C	X			
Electric Vehicle Purchase	I-5	C				
Solar Installation at the Correctional Facility	I-6	C	X		X	
Energy Performance Contract	I-7	U	X	X		
Strategy for Future Re-Lamping Projects	I-8	U	X			
REV Campus Challenge	I-9	U	X		X	
Composting Project at Jail	I-10	U				
Erie County Fleet Policies and Standards	I-11	R				X
Other Procurement Policies	I-12	R	X	X		X
Tax Incentives for Public Transportation for Employees	I-13	R				X
Support Alternative Transportation through Infrastructure and Policy	I-14	R				X
Erie County Utilities	I-15	R	X		X	
Assess Solar on Roofs of County Buildings	I-16	R	X		X	

Status: C = Current, U = Upcoming, and R = Recommended

Sector			Key Departments & Partners				
Methane and Biogas	Funding Mechanism	Policy	DEP	DPW	Law	Budget	Partners
				X			
				X			
			X				
			X				
				X			
			X	X	X	X	Office of Sheriff
	X		X	X	X	X	
			X	X		X	
			X	X	X	X	UB
X			X	X			Office of Sheriff
			X	X	X	X	
			X	X	X	X	Bureau of Purchasing
			X				Personnel Dept. and NFTA
			X		X		NFTA, GBNRTC, and Citizens for Regional Transit
				X	X	X	
			X	X			NREL

Initiative	Number	Status*	Sector			
			Buildings - Electricity	Buildings - Heating	Renewable Energy	Transportation
Create renewable thermal targets within Erie County operations	I-17	R		X		
Paris Fund	I-18	R				
Tree Management and Habitat	I-19	R				
WNY Sustainable Business Roundtable	C-1	C	X	X	X	X
Solarize Campaign	C-2	C			X	
ECLIPSE: Erie County Low Income Program for Sustainable Energy	C-3	U	X	X	X	
Climate Smart Communities - Certification & Community Climate Change Task Force	C-4	U	X	X	X	X
PACE - Property Assessed Clean Energy Financing	C-5	R	X	X	X	
Property Tax Exemptions	C-6	R	X	X	X	
Revolving Loan Fund	C-7	R	X	X	X	
Community Solar	C-8	R	X		X	
Renewable Heating and Cooling	C-9	R	X	X	X	
Purchasing Renewables through Utilities Aggregation	C-10	R			X	
Parking Lot Policy: Public Electric Vehicle Charging Stations, Green Infrastructure & Solar Installations	C-11	R			X	X
Carbon Pricing	C-12	R				
Energy Performance Ratings	C-13	R	X	X	X	
Inter-County	P-1	R				
Intra-County	P-2	R				
Regional Transportation	P-3	R				X
Utility Infrastructure	P-4	R	X	X	X	
Outreach & Training Partnerships	P-5	R	X	X	X	X

Status: C = Current, U = Upcoming, and R = Recommended

Sector			Key Departments & Partners				
Methane and Biogas	Funding Mechanism	Policy	DEP	DPW	Law	Budget	Partners
			X	X			
	X	X			X	X	
		X	X				Parks Dept.
			X				Business Community
			X				NYSERDA
			X	X	X	X	
X		X	X	X			
	X		X		X	X	Real Property
		X	X		X	X	
	X		X	X	X	X	
			X	X	X	X	NYSERDA
		X	X	X	X		
		X	X	X	X	X	Municipalities
		X	X	X	X	X	
		X			X		
		X	X		X		
		X	X	X			Assoc. of Gov'ts
		X	X	X			New York State Assoc. of Counties
			X	X	X		NFTA, GBNRTC, and Citizens for Regional Transit
		X	X	X	X		Utilities
X	X	X	X	X			Public, Business, Munis

APPENDIX C: COMMUNITY AND INTERNAL OPERATIONS GHG INVENTORY METHODS

Internal Operations GHG Inventory Notes

The Internal Operations GHG Inventory provides emissions estimates for 2005 and 2014. The inventory follows guidance provided by the ICLEI Local Government Operations Protocol v1.1. The inventory boundary includes all departments for which the County is responsible for fuel costs. The Erie County Medical Campus and Erie County Community College are not included in the inventory. Methods and assumptions for the emissions estimates are described in Table 1, by emissions source.

Emissions were included for natural gas and electric costs for which the County is responsible. Some spaces for

which the County does not have ownership are included in inventory. In the future, the inventory will be improved by separating leased-space emissions from owned-space emissions, as per the protocol and because the County has limited control of leased spaces. Additionally there are some leased spaces for which the County does not pay energy costs. For this situation, the County will investigate opportunities to access that information as part of the County's lease agreements. This category of emissions is estimated to be relatively modest.

Emissions of wastewater system biogas are estimated using a relatively simplistic calculator developed by NYSERDA, which primarily bases emission on population

Table 1. Internal Operations GHG Inventory Methods and Assumptions by Emissions Source

Emissions Source	Methods and Assumptions	Citation
Natural gas	Actual natural gas consumption is multiplied by USEPA emission factors for natural gas consumption, and is normalized to average heating degree days using NYSERDA heating degree day data. Baseline adjustments were made to remove the County Home, and add the Public Safety Campus.	1, 2
Fleet fuel	Erie County has had a central fuel tracking system in place since before 2005. Actual volume of dispensed fuel is multiplied by USEPA emission factors.	1
Wastewater biogas	A GHG reporting tool calculator developed by NYSERDA was used to estimate emissions. Inputs include population served by the wastewater collection and treatment system operated by Erie County, and specifications about the system.	3
Electricity	Actual electric consumption (kWh) is multiplied by emission factors developed using the NYSDPS environmental disclosure generation mix for the Erie County load serving entity (LSE), and generation type (gas, oil, coal) power plant emission factors from USDOE. Baseline adjustments were made to remove the County Home, and add the Public Safety Campus.	4, 5
District heating	Natural gas and electric energy consumption for the district heat plant were provided by the City of Buffalo and are proportioned based on delivered heat load (MMBTU) to County owned buildings served by the plant. 2005 data was not available, and was assumed to be the same as 2014 on a weather normalized basis.	1, 4, 5
Solid waste	Estimates of landfilled solid waste were developed from the results of an internal waste study the County conducted in 2014. 2005 waste was estimated based on the change in County staff count. Emissions were calculated using an ICLEI method for GHG emissions from municipal solid waste.	6
Gasoline - employee commute	Erie County conducted a commuter behavior survey in 2015, and that data was used to estimate employee commuting annual vehicle miles travelled. Emissions were estimated using fleet average fuel efficiency, and USEPA emission factors. 2005 VMT estimates were made by adjusting 2014 by the change in staff count.	1, 7

served by the wastewater system. While this source is estimated to account for a relatively small proportion of the County's inventory (3.6%), because biogas emissions are under its control, the County plans to research opportunities to better measure and mitigate biogas emissions as part of its Climate Action Sustainability Plan (CASP) process. This inventory has highlighted how a lack of monitoring capability for this emissions source makes it difficult to manage reductions and track progress towards County emissions reduction goals.

The County purchased hot water district heat energy from the City of Buffalo for 2005 and 2014 for the Rath County Office Building and for the Erie County Family Court Building. The City provided County heat load and heat plant natural gas and electric consumption to support this inventory. Information was not available for 2005. In 2017, the County installed high efficiency boilers and separated its buildings from the district heat system, which is expected to reduce GHG emissions.

Similar to wastewater biogas, emissions from solid waste are estimated using a relatively simplistic emissions calculator which estimates landfill emissions based on landfilled tons of solid waste. In this case, the County does not control the emissions source (the landfill). But, to better manage emission and costs from landfilled solid waste, the County is developing better tracking systems for solid waste. Measures to improve tracking and reduction of solid waste will be addressed by the CASP.

Employee commute emissions were based on a survey of employee commute behavior. The survey was emailed to County staff, and staff volunteered to participate in the survey. The survey found 76% of staff commute using single occupancy vehicles. There has been some discussion that this estimate may be low, and may suffer from reporting bias (whereby alternative transportation commuters might be more likely to respond to a commuter survey).

Community GHG Inventory Notes

The Community GHG Inventory provides emissions estimates for 2005 and 2014. The inventory effort substantially builds on a 2010 regional GHG inventory developed for the *Western New York Regional Sustainability Plan*, and uses a methodology described in a document titled *New York Community and Regional GHG Inventory Guidance*. The 2010 Erie County emissions were adjusted to 2005 or 2014 using the change in population or Gross Domestic Product (GDP), depending on the source type, as shown in Table 2 below.

Besides these adjustments, there were two significant improvements to the inventory. First, the New York State Department of Public Service (DPS) provided emission factors for the electric supply. The 2010 regional inventory used USEPA eGRID regional electric emission factors that account for generation emissions from power plants located within upstate New York, but do not include emissions imports into and exports out of the region. Electric imports tend to be from high emissions out-of-state coal power plants. DPS develops emissions factors for its environmental disclosure program, and these emission factors account for imported and exported electricity. Per County communication with DPS, the statewide emissions factors are appropriate for estimating emissions from electricity supplied to Erie County. Using the DPS emissions factors increased the GHG emissions for Erie County versus using eGRID factors used for the 2010 regional inventory.

A second significant change is that actual natural gas data by sector was provided to Erie County by National Fuel Corporation, and this data was used for the 2005 and 2014 inventories. When the 2010 regional inventory was conducted, natural gas supply data was not available, and that inventory used an indirect method to estimate emissions. Using the National Fuel supply data showed substantially higher emissions for natural gas than the method used for the 2010 inventory.

As discussed in the main report, it appears likely that actual Erie County electric consumption data will be available for electricity in the next few years, as NYSERDA is working with the energy utilities to develop a registry for community energy consumption data. It has also come to the County's attention that the New York State Department of Taxation and Finance collects bulk fuel volumetric data for petroleum product sales including gasoline, diesel, heating oil and propane. The County has started a dialogue with NYSERDA to make that data available to communities. Given the high proportion of the community GHG emissions that are from transportation, and the potential for error from the current methodology, actual fuel sales data would significantly improve the County inventory. ■

Table 2: Community GHG Emissions Adjustments

Emissions Source	Adjustment from the WNY Regional Sustainability Plan 2010 Inventory
Residential Energy Consumption	
Electricity / Steam	Change in County population and NYSDPS emissions factors for NYS
Natural Gas	Substituted actual fuel delivery data provided by National Fuel
Propane / LPG	Change in County population
Distillate Fuel Oil (#1, #2, Kerosene)	Change in County population
Wood	Change in County population
Commercial Energy Consumption	
Electricity / Steam	Change in County population and NYSDPS emissions factors for NYS
Natural Gas	Substituted actual fuel delivery data provided by National Fuel
Propane / LPG	Change in GDP
Distillate Fuel Oil (#1, #2, Kerosene)	Change in GDP
Residual Fuel Oil (#4 and #6)	Change in GDP
Coal	Change in GDP
Wood	Change in GDP
Industrial Energy Consumption	
Electricity / Steam	Change in County population and NYSDPS emissions factors for NYS
Natural Gas	Substituted actual fuel delivery data provided by National Fuel
Propane / LPG	Change in GDP
Distillate Fuel Oil (#1, #2, Kerosene)	Change in GDP
Residual Fuel Oil (#4 and #6)	Change in GDP
Industrial Processes	
Iron and Steel Production	Change in GDP

Emissions Source	Adjustment from the WNY Regional Sustainability Plan 2010 Inventory
Product Use (Ozone Depleting Substances)	
All Refrigerants- except SF6	Change in GDP
On-road	
Motor Gasoline (E-10)	
Diesel	Change in GDP
Rail	
Diesel	Change in County population
Electricity Consumption	Change in County population
Marine	
Distillate Fuels	Change in GDP
Air	
All Fuels (Jet and Aviation Gasoline)	Change in GDP
Off-road Mobile	
All Fuels (Diesel and Gasoline)	Change in GDP
Solid Waste Management	
Landfill Methane and Combustion	Change in GDP
MSW incineration (non- grid connected)	Change in GDP
Sewage Treatment	
Central WWTPs and Septic Systems	Change in County population
Livestock	
Enteric Fermentation	Change in GDP
Manure management	Change in GDP
Crop Production and Soil Management	
Use of Fertilizer	Change in GDP

Citations:

- 1 United States Environmental Protection Agency: “Emission Factors for Greenhouse Gas Inventories”, 2014
- 2 NYSERDA, “ Heating and Cooling Degree Data”, accessed 12/21/2017
- 3 NYSERDA Climate Smart Communities, “Local Government Greenhouse Gas Accounting Tool”, 2013
- 4 New York State Department of Public Service, Environmental Disclosure Program, <http://www3.dps.ny.gov/e/energylabel.nsf/>, accessed 12/21/2017
- 5 United States Department of Energy, “Environment Baseline, Volume 1: Greenhouse Gas Emissions from the U.S. Power Sector”, p.18, 2016
- 6 ICLEI, “Local Government Operations Protocol v1.1”, 2010
- 7 United States Department of Transportation, Bureau of Transportation Statistics, “Average Fuel Efficiency of U.S. Light Duty Vehicles”, https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_04_23.html, accessed 12/21/2017

APPENDIX D: ACKNOWLEDGEMENTS

The Poloncarz Administration gratefully acknowledges the work of many individuals who developed this report. Specifically, we wish to thank the following people:

- Maria Whyte, Deputy County Executive
- Anne Bergantz, Chair, Erie County Environmental Management Council
- Scott Bylewski, Deputy Director, Budget and Management
- Daniel Fitzgibbons, Deputy Commissioner of Buildings and Grounds, DPW
- William Geary, Commissioner, DPW
- Thomas Hersey, Jr., Commissioner, DEP
- Gregory Kammer, Assistant County Attorney
- Robert Keating, Director, Budget and Management
- Bonnie Lawrence, Deputy Commissioner of Environmental Compliance, DEP
- Michael Siragusa, County Attorney
- Tracy Skalski, Sustainability Coordinator, DEP
- Kristen Walder, Assistant County Attorney
- Eric Walker, Director of Energy Development, DPW
- Josh Wilson, Coordinator - Pollution Prevention Program, DEP
- Brian Bray, Erie County DSS
- Vicki Haas, Erie County DEP
- Mary MacSwan, Erie County DEP
- Kara Zambito, Erie County DEP

The Administration also wishes to acknowledge the support of partners, including the New York State Department of Environmental Conservation and the New York State Energy Research and Development Authority. Finally, we thank the National Fuel Corporation for providing community natural gas consumption data and other support that has been critical to understanding energy usage in the County. ■