Erie County

Climate Action & Sustainability Plan

Internal Operations

Erie County Climate Action and Sustainability Plan
For Internal Operations
Draft

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The cover of this document showcases artwork by local school districts for the 2018 rain barrel painting contest run by the WNY Stormwater Coalition. From left to right: Charter Middle School for Applied Technologies, Frontier Middle School, Buffalo Academy of Science Charter Middle School, and the Park School of Buffalo.

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A MESSAGE FROM THE COUNTY EXECUTIVE

COUNTY OF ERIE

MARK C. POLONCARZ
COUNTY EXECUTIVE

Dear Colleagues and Constituents:

Climate change is real and it is happening right now in Erie County, across our country and around the world. Extreme heat and extended drought, violent and unpredictable deluges and flash flooding, hurricanes of increasing frequency and intensity, altered growing seasons and surges in disease-bearing insect populations are just some of the evidence of this planetary change that we've already witnessed, but more are on the horizon. Rising temperatures today are opening the door to an expanding host of environmental and societal challenges that demand immediate action if their effects are to be mitigated for future generations.

Here in Erie County we are embracing the opportunity to confront climate change today and construct a better, more resilient community for the future. Today we are seizing our opportunity to use resources more efficiently, shed our dependence on legacy fossil fuels, and become more economically competitive in the process. Today is the day for innovation and conservation in smart energy usage, education on ways that individuals and families can reduce their own carbon footprint, and visionary leadership in the public and private sectors to collaboratively create a better county for tomorrow.

In 2018 my administration issued the *Erie County Commits to Paris* report, a comprehensive call to action outlining county governmental and accompanying community actions designed to reduce our climate impacts. As a follow up to this top level report all Erie County departments have developed an aggressive and achievable plan to lead by example in reducing the carbon footprint of their departmental operations. The Erie County Climate Action and Sustainability Plan ("CASP") contains a detailed plan to move County government operations toward a sustainable future and is intended as a template for use by other municipalities seeking to embark on their own journeys to sustainability. The CASP also reconfirms county government's commitment to climate action by increasing our 26-28% greenhouse gas reduction target (which we have achieved) to 32% by 2020, 50% by 2025, and 80% by 2040.

Our community does not deny the reality of climate change and we don't shy away from confronting challenges. I invite you to join us in envisioning and creating opportunities for the future and getting involved in governmental and community efforts to address the challenge of climate change, which is the most important issue of our lifetimes. Together we can ensure our county, country and planet will continue to be a blessing and a home for future generations.

Sincerely yours,

Mark C. Poloncarz
Erie County Executive

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LIST OF ACRONYMS

ARC	Erie County Lands Advisory Review Committee
AVL	automatic vehicle locators
C&D	construction and demolition
CASP	Climate Action and Sustainability Plan
CGC	Cleaner, Greener Communities
CHP	combined heat and power
CNG	compressed natural gas
CO2e	carbon dioxide equivalent
CSO	combined sewer overflow
DEP	Erie County Department of Environment and Planning
DISS	Erie County Department of Information and Support Services
DPW	Erie County Department of Public Works
DSM	Erie County Division of Sewerage Management
ECSD	Erie County Sewer Districts
EPC	energy performance contract
EV	electric vehicle
GHG	greenhouse gas
GIS	Geographic Information System
HFC	hydrofluorocarbon
HVAC	heating, ventilation and air conditioning
I/I	infiltration/inflow
kWh	kilowatt hour
LED	light-emitting diode
LEED	Leadership in Energy and Environmental Design
LEWPA	Lake Erie Watershed Protection Alliance
Mcf	thousand cubic feet
MSW	municipal solid waste
MTCO2e	metric ton carbon dioxide equivalent
MW	megawatt
NFTA	Niagara Frontier Transportation Authority
NRI	natural resource inventory
NYSDEC	New York State Department of Environmental Conservation
NYS	New York State
NYSEG	New York State Electric and Gas Corporation
NYSERDA	New York State Energy Research and Development Authority
O&M	operations and maintenance
REC	renewable energy certificate
SOP	standard operating procedures
SPDES	State pollutant discharge elimination system
SSO	sanitary sewer overflow
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WRRF	water resource recovery facility

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CHAPTER 1: INTRODUCTION

PHOTO

Background

In October 2018, the Intergovernmental Panel on Climate Change issued a report on the significant impacts of climate change even if the global temperature is held to a 1.5 degree Celsius increase from pre-industrial conditions. The report, authored by 18 scientists with more than 69 contributing authors, makes clear that unprecedented action is needed to avoid catastrophic changes to the climate. Scientific reports and first-hand experience provided overwhelming evidence that climate change is one of the most significant threats to Erie County, one that will have far-reaching impacts on the entire community and affect the County's ability to deliver services. For example, storms are increasing in frequency and severity, impacting Emergency Services and Public Works Departments. Erie County can do its part to support worldwide efforts to reduce the severity of these impacts by taking action to reduce greenhouse gas (GHG) emissions from its own operations.

Municipal Infrastructure

Located on the western shore of Lake Erie, Erie County has a population of 925,500, making it the eighth most populous county in the State of New York. The County government maintains an extensive municipal infrastructure system:

- **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 the 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).

Providing these services to the community requires energy and generates waste, which leads to the release of the GHG responsible for global climate change. But with challenge comes opportunity. Due to its size, reach, and breadth of functions, the County has immense potential to be an innovator in the area of climate protection.

The Erie County Climate Action and Sustainability Plan for Internal Operations (CASP) builds on existing initiatives to lay out a course for how the County will mitigate its contribution to climate change and, by extension, the impact climate change will have on County services.

The CASP supports other County goals, such as using taxpayer resources efficiently, harnessing renewable energy to power facilities sustainably, providing residents with convenient access to services, and reducing the amount of waste sent to landfills. By taking the actions recommended in the Plan, the County will create financial savings, keeping dollars in the local economy, support new jobs, improve air quality, and attract and retain dedicated public servants.

This document was written internally without the use of outside consultants, primarily by technical and leadership staff from the County. Chapters were written by their respective committees, and the writing styles reflect their contributions.

This chapter contains an introduction to the CASP. This includes discussion of the anticipated impacts from climate change; a review of the County's GHG inventory, and the policy foundation on which the Plan was developed.

Anticipated Impacts from Climate Change

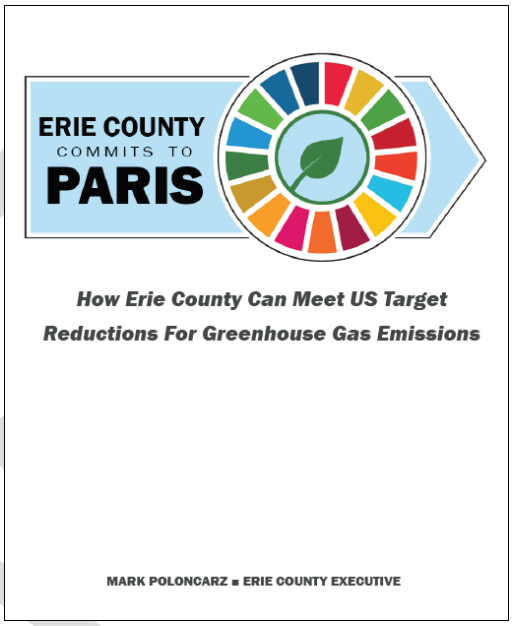
The science supporting the connection between greenhouse gas emissions from human activity and climate change is well documented and will not be discussed in this plan. It is known that human activities have already caused global warming above pre-industrial levels. Continued emission of greenhouse gases at current rates will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems. According to the most recent report by the Intergovernmental Panel on Climate Change (IPCC), titled *Global Warming of 1.5°C*, without major reductions, the world is on track for 5.4°F degrees of warming by the end of the century, which will result in more heat waves, extreme storms, significant sea level rise, destruction of ecosystems on large areas of the earth's surface, extinction of many species of plants and animals, and many other impacts.

Erie County has already experienced the impacts of climate change. Examples of these impacts include increases in pest borne diseases like Lyme disease and an increase in severe storms. Due to its supply of fresh water and moderate climate, the County appears to be less vulnerable than some regions to some impacts from climate change. However, because unmitigated climate

change poses the risk of broad ecological, economic and political destabilization, there is a near certainty that the County would be deeply impacted regardless of local weather changes, and it is imperative that the County acts in concert with communities around the world to address this problem.

The Climate Action and Sustainability Plan: a Brief Introduction

Erie County has shown strong leadership on environmental sustainability and climate protection. In June 2017, the County Executive issued Executive Order 17, which requires the County to meet the goals of the Paris Climate Agreement: a 26-28% reduction of 2005 GHG emissions by 2025. In response to that Executive Order, the County released a report in January 2018 that included GHG inventories for both County operations and the community as a whole, as well as 37 initiatives to decrease GHG emissions. Prior to that effort, Erie County's commitment to reducing GHG emissions was evident through the re-establishment of its energy director position, the unanimous support for the County to become a Climate Smart Community, the creation of the Erie County Green Team, a resolution requiring that new construction meet LEED silver standard, and approval of a 2 MW solar power purchase agreement.



The CASP was created with input from the Erie County Green Team which is made up of representatives of every County department, including those led by other elected officials such as the Sheriff and the Comptroller. The work of the Green Team was informed by both the WNY Regional Sustainability Plan (2013) and the NYS Department of Environmental Conservations' Climate Smart Community Certification Program. Vetting of identified action items was deliberated at monthly meetings of the Core Green Team, which has representatives from key departments and acts as the steering committee to make initial decisions prior to presentations to the full Green Team.

The CASP outlines and prioritizes ways the County can further reduce GHG emissions through action items specific to each chapter. Additionally, the CASP referenced the sustainability goals from the WNY Regional Sustainability Plan and created Erie County specific Guiding Principles to reflect the values and beliefs of the County.

Erie County internal operations show a 27% GHG emission reduction against the 2005 baseline. Based on already achieved reductions and currently planned projects, Erie County is setting GHG emission reduction goals over three time periods for its internal operations:

- Short-term (2020) – achieve 32% overall GHG reduction versus the 2005 baseline;
- Mid-term (2025) – achieve 50% overall GHG reduction; and
- Long-term (2040) – achieve 80% overall GHG reduction.

This document is not a detailed implementation plan, but provides the framework for additional planning to develop and implement successful projects. The CASP will remain as a living document that will guide County internal operations to become as efficient as possible and to keep their focus on creating a sustainable operation.

Recommendations outlined in the CASP are organized into 7 sections:

- Transportation:
  - Fleet
  - Employee Commute
- Buildings and Energy
- Waste Management and Recycling
- Land Management
- Water:
  - Water Conservation and Stormwater
  - Sewerage Management
- Purchasing
- Implementation, Monitoring Progress, and Reporting

Each recommendation is prioritized based on cost, feasibility, other benefits and GHG reduction potential.

PICTURE OF GREEN TEAM/ CORE TEAM

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Core Green Team

- Jen Hibit, Chief of Staff, Office of the County Executive
- Tom Hersey, Commissioner, DEP
- Mary Ellen Brockmyre, Second Deputy Commissioner, Social Services
- Gary Carrel, Solid Waste Recycling Specialist, DEP
- Mark Cornell, Budget Analyst
- Vallie Ferraraccio, Director, Bureau of Purchase
- Bonnie Lawrence, Deputy Commissioner of Environmental Compliance, DEP
- Rebecca Offermann, Fleet Manager, DPW
- Jonathan Rivera, Special Assistant to the Commissioner, DPW
- Dan Rizzo, Commissioner of Parks, Recreation & Forestry
- Tracy Skalski, Sustainability Coordinator, DEP
- Lori Stilwell, Director of Information Technology
- Josh Wilson, Coordinator-Pollution Prevention, DEP

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Erie County Green Team

Department	Staff Representative
Board of Elections	Jackie Todorov
Budget	Mark Cornell
Central Police Services	Brian Speers
County Clerk	Currently vacant
Comptroller	Scott Kroll
County Executive	Jen Hibit
Environment and Planning	Tom Hersey, Gary Carrel, Bonnie Lawrence, Tracy Skalski, Josh Wilson
Environmental Management Council	Jane Vohwinkel
DEP, Div. of Sewerage Management	Joe Fiegl
Mental Health	Marcia Kuma
Information Support Services	Lori Stilwell
District Attorney	Joseph Spino
Public Works	Bill Geary, Rebecca Offermann, Jonathan Rivera
Emergency Services	Gregory Butcher
Health	Jennifer Delaney
Law	Linda Juliano-Jack
Legislature	Louis Eve
Library	Mark Cross
Medicaid Inspector General:	Mike Szukala
Parks	Dan Rizzo, Chuck Bartlett
Personnel	Elizabeth Klump
Probation	Kelli Blakeley
Public Advocacy and Office for Disabled	Frank Cammarata
Purchasing	Vallie Ferraraccio
Real Property Tax Services	Lauren O'Meara
Senior Services	Jennifer Wood
Sheriff	Joe Savarese
Social Services	Mary Ellen Brockmyre, Steven Dlugosz, Carrie Godfrey
Veterans Services	Felice Krycia

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GHG emission reduction potential and priority

The CASP prioritizes the action items into four main categories: GHG Reduction, Co-benefits, Cost efficiency and Feasibility. Each action item was assessed and scored based on these categories and the goal timeframes of the CASP. Many action items have already been started; examples include facilities that have begun replacing traditional inefficient light fixtures with LED bulbs, and the initial purchase of two Chevy Volts for our general fleet. Many items will continually be implemented throughout the goal years of the CASP. On the other hand, there are items that will not be feasible to start until our mid or long term goal years, and for some action items, future technology will dictate the action framework.

Each measure was evaluated by committee members and given a score of one to three icons for each of the categories, in increments of half-icons. The more icons a measure receives, the higher that measure scored in the category. Thus each measure was prioritized and aligned with the goal years. These evaluations can be found within the action item prioritization tables of each chapter.

The categories and icons used are:

GHG Reduction: This rates the potential for GHG emission reduction. A high score in this category indicates a greater reduction of $MTCO_2e$ at the completion of the action item.

Co-Benefits: This rates the sustainability benefits within a measure, not including GHG emission reduction. Measures with multiple co-benefits will rate high on the scale.

Cost Efficiency: This rates implementation costs, resource necessities, required staff services and return on investment. Low cost, high savings, high ROI and minimal staff involvement resulted in higher ranking.

Feasibility: This rates how feasible a measure item is across the target goal years. Measures that have already undergone implementation were given a higher ranking than those that could not be started until mid or long term goal years.

The recommendations and prioritizations in each chapter are based on the Greenhouse Gas Inventory for internal operations discussed below.

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GREENHOUSE GAS INVENTORY

The County has developed a GHG emissions inventory for 2005, 2014 and 2017 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 and 2017 GHG inventories allows the County to assess progress towards the 2025 goals of the Paris Climate Agreement.

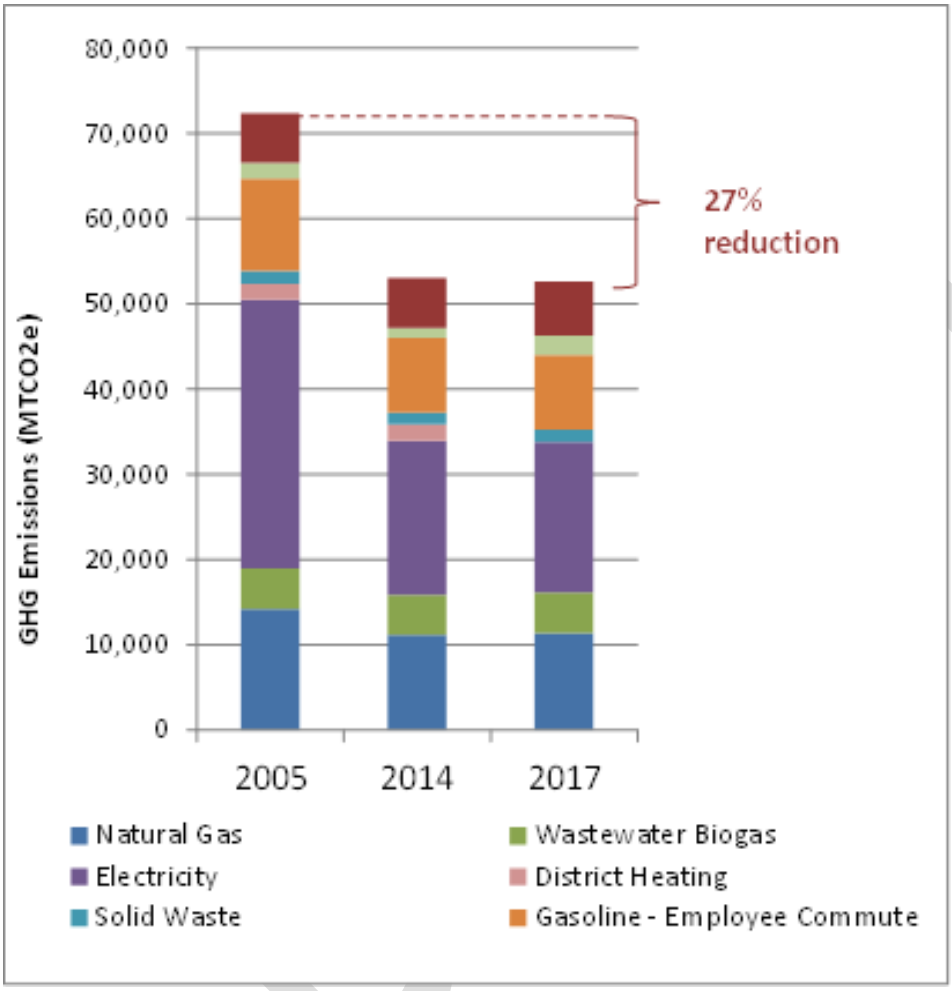

Figure 1: Internal Operations GHG inventory by source

The emissions inventory follows the international Local Government Operations Protocol. 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, this is a standard widely used across the world.

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

Erie County Scope 1 emissions include emissions from the combustion of natural gas, gasoline, and diesel fuel in County owned buildings, a wastewater treatment plant (WWTP) sludge incinerator, 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 *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 GHGs, including carbon dioxide, methane, nitrous oxide, and hydro fluorocarbon refrigerants. "Carbon dioxide equivalent" or "CO_2e" is a term for describing different GHGs in a common unit. For any quantity and type of GHG, CO_2e signifies the amount of CO_2 which would have the equivalent global warming impact. For this report, emissions are shown as metric tons carbon dioxide equivalent emissions ($MTCO_2e$).

Most emissions source types decreased from 2005 to 2017, 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 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 were substituted with 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 made were because of changes in the regional electric market, and were not because of actions taken by the County for sustainability purposes.

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Overall, Erie County GHG emissions decreased 27% from 2005 to 2017. 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 for those emissions reductions to persist and increase, the County will need to actively monitor and conscientiously choose the sources of its electricity, especially as there are trends in the overall utility grid that may increase the carbon intensity of electricity in New York State, as discussed in Chapter 4.

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CHAPTER 2: TRANSPORTATION - PIC FOR CHAPTER COVER

Introduction

A significant portion of Erie County's internal operation climate impact comes from transportation, and there are significant opportunities to reduce these impacts. The County's transportation impacts have been separated into two categories: Employee Commute and Fleet, which account for about 17% and 12% of the County carbon footprint respectively. Because the County does not own commuter vehicles, Employee Commute is an indirect emissions source; however, because the County can have a significant influence on these emissions, we have included commuter emissions in our inventory and in this plan.

Measures to reduce GHG emissions from County owned and employee owned vehicles primarily rely on two overarching strategies: 1) reduction of vehicle miles travelled, particularly for single occupancy vehicles, and 2) increasing the efficiency of travel. The former involves managing vehicle use, by implementing advanced GPS technology in the fleet, and by promoting alternatives to single occupancy vehicle use, such as rideshare, bicycling and walking and utilizing public transportation. The latter includes purchasing of low or zero emissions vehicles, building charging stations for these vehicles, and maintaining the existing fleet so that it is operating as efficiently as possible.

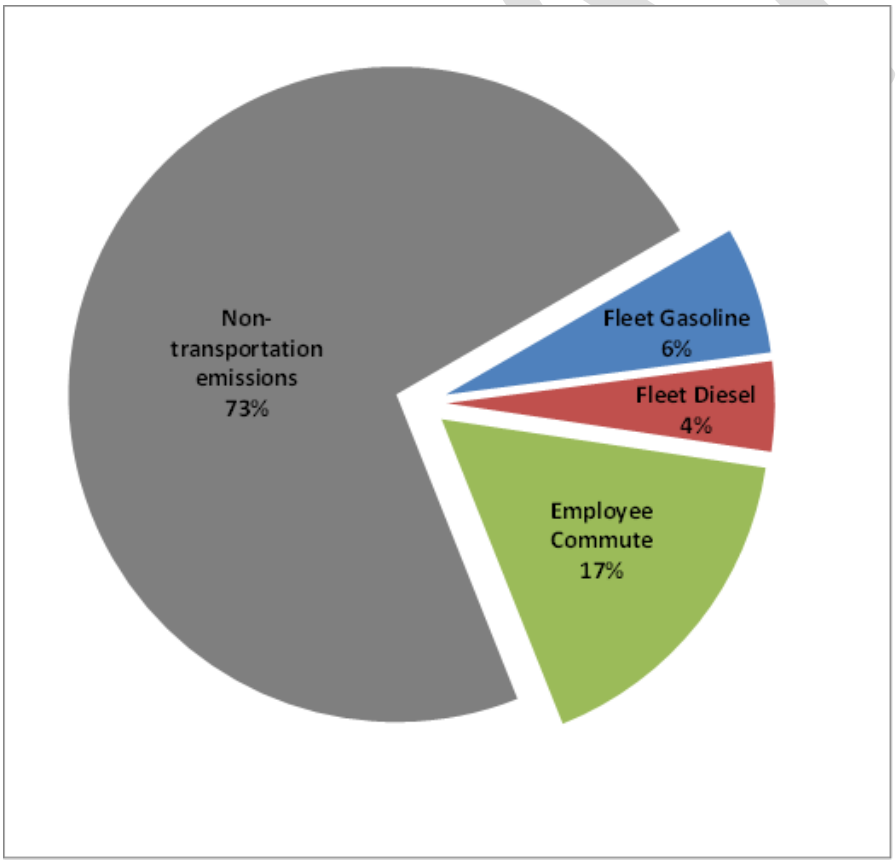

Figure 2: Transportation GHG emissions as part of the total County carbon footprint.

WNY Regional Sustainability Plan (2013) goals:

- Increase and improve alternatives to driving alone (public transit, car/vanpool, park and ride, bicycle, walking) through inter-agency partnerships and cooperative efforts, especially in serving transportation of disadvantaged populations.
- Improve regional fuel efficiency, especially in public and commercial fleets and through public and private investment in infrastructure and planning to increase the use of alternative fuels.
- Prioritize transportation infrastructure projects in line with regional smart growth efforts in existing communities and corridors, especially through projects that exemplify "Complete Streets" principles.

Erie County's Guiding Principles:

- Implementing fuel conservation plans and purchasing fuel efficient fleet vehicles will help reduce fossil fuel consumption.
- Conversions to alternative fuels in the general vehicle fleet (sedans, SUVs, trucks, heavy-duty) are effective measures to reduce GHG emissions.
- Technology advances that are in research and development should be monitored for their applicability to Erie County in the future.
- Orientation and education should be provided to employees about green fleets and the impact of vehicles on the environment. Incentives should be researched and expanded to promote use of transportation alternatives by employees.
- Creating public awareness about the County's fuel conservation programs will help drive broader community action.
- Leading by example and sharing knowledge with municipalities within the County will help drive greater efficiency within other regional governments.
- Seeking opportunities for partnership to improve transportation options throughout the region will help reduce vehicle miles traveled and emissions.

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EMPLOYEE COMMUTE –

INSERT PICTURE HERE Erie *County Staff Taking Public Transit*

Background:

Erie County employs approximately 5,500 people, most of who commute to work. In 2016, a commuter survey was distributed to employees to better understand employee commuting patterns and to calculate impact from those emissions. With over 700 responses, 76% of County commuters traveled in a single occupied vehicle. These commuting employees represent 15% of the overall emissions, emitting over 8,700 MTCO2e, and constituting 17% of the County's internal operations' GHG footprint. While the County does not control how employees commute to work, it has considerable influence over this emission source by educating and incentivizing more efficient, energy saving options, such as carpooling or mass transit, and by siting employees in locations conducive to efficient commuting.

The commuter survey also asked, "If you drive to work alone, why don't you walk, bike, take public transit or carpool?" Answers included concerns over the time alternative methods take, cost implications, lack of public transit available and the ability to leave if there were an emergency. Many of these concerns can be addressed through education and training sessions, expansion of programs offered to County employees, and through permissible changes to work schedules.

Additionally, infrastructure needs to be assessed and designed to support the use of alternative modes of transportation.

Recent Successes

- Employee training sessions were held with The Niagara Frontier Transportation Authority (NFTA), focusing on transportation and alternative commuting options available, including transit usage and carpooling options.
- An employee matching, ride-sharing system is being developed and will be an optional tool for employees to identify coworkers who are interested in carpooling to work.
- Erie County is in the process of joining GObike Buffalo to become a designated bike friendly organization.

INSERT PIC HERE. *Bike Rack at County Office Building*

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Employee Commute Action Items

#	Measure Name	Priority Tier	GHG Reduction	Co-Benefits	Cost Effectiveness	Feasibility
C-1	Implement an employee matching, rideshare commuter program to reduce single occupancy vehicle commuting	1				
C-2	Educate employees on commute alternatives through comprehensive outreach programs	1				
C-3	Construct buildings and parking areas to better support alternative transportation	1				
C-4	Expand current employee commuter programs	2				
C-5	Employee Schedule - Implement and promote a comprehensive flexible work schedule	2				

C-1 Implement an employee ride-matching commuter program to reduce single occupancy vehicle commuting:

a) Implement an employee matching service for rideshare;
b) Develop a program to promote ridesharing; and
c) Investigate options for employee vanpooling.

Priority Tier: 1

Timeline: Short-term

Lead: Personnel Department

Partners: DEP, GoBuffaloNiagara, GObike Buffalo, GBNRTC, NFTA, NYSERDA

Resources: To be determined

Many Erie County employees work similar schedules and at central locations, making rideshare an especially viable option to reduce single occupancy vehicle travel. Web-based toolkits are available that connect transportation options, track commuting behaviors, and reward participating employees. To facilitate carpools, for example, these tools can use information about employee home location, work schedule, and personal preferences to identify EC rideshare matches. Erie County will develop a program where employees will decide whether they want to 'opt-in' to the program and identify potential carpool matches. The County will promote the program to maximize employee enrollment.

If there is a concentration of employees who live within an area suitable for ridesharing, vanpool may be a reasonable option. Vanpool involves the County or a partner organization like NYSERDA purchasing a van that allows a group of employees to rideshare together. In most programs employees pay for part or all of the cost, this can be less than the cost of single occupancy vehicle commuting. There may be tax benefits and grant funding that will facilitate this action.

Co-Benefits: Less roadway congestion, employee cost savings

Next Steps: DEP and Personnel will work with GoBuffaloNiagara to implement and roll the ride matching service. The County will work with partners to research feasibility and pursue grant funding for a rideshare program and vanpool.

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C-2 Educate employees on commute alternatives through comprehensive outreach programs:

a) Offer continual educational opportunities for employees to learn about available alternative transportation options;
b) Work with local transit providers to have informational resources available; and
c) Review current commuter benefits to improve and streamline for employees.

Priority Tier: 1

Timeline: On-Going

Lead: DEP

Partners: Personnel, NFTA

Resources: Existing staff time, funding through grants

Comprehensive outreach programs will be developed with a focus on educating employees on the commute options available with the desired outcome being to reduce single-occupancy travel and therefore reduce vehicle miles travelled. These programs will be designed to showcase the benefits that come with many of these options, including likely health benefits associated with bicycling or walking and the potential cost savings from using public transit and/or carpooling.

A partnership will be developed with our local transit authority to have an ongoing presence in the County to keep employees abreast of all available services and information on how to utilize them.

Co-Benefits: Increased use of alternatively fueled vehicles, improved employee health and reduced health insurance costs to the County

Next Steps: DEP will work with the NFTA to initiate informational promotions. Personnel Department staff involvement will be requested to identify employee outreach opportunities.

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C-3 Construct buildings and parking areas to better support alternative transportation:

a) Alternative transportation construction policy and design guidelines; and
b) Enhanced implementation of the Erie County Complete Streets Policy.

Priority Tier: 1

Timeline: On-going

Lead: DPW

Partners: NYSERDA

Resources: Additional costs to current County road design/reconstruction will likely occur given the added features. Actual increase is unknown at this time.

Because of the long life of constructed facilities and roadways and the high cost to retrofit after construction, it is critical to achieving the County GHG reduction goals that the County support alternative transportation strategies.

An alternative transportation construction policy and design guideline will be developed and implemented that will 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, charging station 'ready' parking, protected employee bicycle parking, and infrastructure for alternative fuels.

Complete Streets are streets designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. In 2008, the Erie County Legislature passed a resolution requiring the inclusion of pedestrian and bicycle facilities in all new street construction, street reconstruction and park projects, where fiscally feasible. Since the passage of that resolution, DPW has used it as its policy and evaluated projects per its requirements. Going forward the County will, working with its partners, examine how to build on and improve the current policy.

Co-Benefits: Lowering costs, opening new funding sources, reducing travel times, providing employees with a range of transportation options, improved employee health.

Next Steps: Discuss strategies with DPW to fully implement our Complete Street Policy, including the bicycle and pedestrian friendly action plan and a County Bicycle Master Plan.

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C-4 Expand current employee commuter programs, including:

a) Monitor progress with Niagara Frontier Transportation Authority (to provide discounts on mass transit passes);
b) Develop an implementation plan to reinstate pre-tax incentive for bus passes; and
c) Investigate other services the County could offer for non-single occupancy commutes.

Priority Tier: 2

Timeline: Short-term

Lead: DEP

Partners: Personnel, NFTA

Resources: Existing staff time

Other communities have found that alternative commute programs are an important tool for changing employee behavior, and the County's 2016 commuter survey highlighted that this approach may be necessary to encourage behavior change. Programs will include establishing transportation reimbursement accounts whereby employees determine their contribution of pre-tax salary for mass transit fares and passes, carpools and vanpools.

The NFTA's current ticketing system creates a challenge for Erie County to offer Metro Perks, a tax-free program to its employees. The NFTA has indicated that they will make changes to ticketing that will address this issue in 2019. Erie County will monitor the progress of this program and develop an implementation plan once the new ticketing system is in place.

Other programs may include offering a guaranteed ride home for emergencies program, parking discounts, and preferential parking for carpoolers and vanpoolers.

Co-Benefits: Less roadway congestion, employee cost savings
Next Steps: DEP will monitor progress of NFTA and work with Personnel to expedite the pre-tax program for employees once the new ticketing system is in place.

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C-5 Employee Schedule - Implement and promote a comprehensive flexible work schedule, including:

a) Flexible start times;
b) Compressed work weeks; and
c) Telecommuting.

Flexible scheduling and telecommuting are commonly offered to employees to improve job satisfaction and retention as well as increase organizational efficiencies. These actions can also substantially reduce GHG emissions by facilitating alternative transportation and by eliminating employee commutes. For example, Erie County employees report being deterred from using public transportation due to inflexible start times.

Priority Tier: 2

Timeline: Mid-term

Lead: Personnel Department

Partners: Unions

Resources: Existing staff time

The County will evaluate employee start time requirements and consider new start time increments to allow employees to better align schedules with buses and trains. Additionally, the County will also explore offering a four-day compressed work week and telecommuting for staff positions, where this is feasible. The County will work with the employee unions to implement these changes.

Co-Benefits: Increase productivity, increased use of mass transit, reducing travel time, increase employee satisfaction, and attract young professionals to County

Next Steps: Commuter committee will be reconvened to discuss opportunities to rework the current employee schedule framework.

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COUNTY FLEET –

INSERT Chevy volt outside Rath picture

Background

The transportation-related GHG emissions throughout Erie County's internal operations are from gasoline and diesel fuel use in the County owned fleet and gasoline use calculated from employee commutes. Overall mobile combustion emissions from gasoline and diesel through the County fleet combined with emissions from employee commute are the highest source of GHG in the inventory at approximately 14,000 Metric tons of carbon dioxide equivalent (MTCO2e) or 29%. Erie County's fleet system consists of 1,195 County-owned vehicles, which in 2014 used about 258,000 gallons of diesel fuel and 420,000 gallons of unleaded gasoline.

Measures outlined in this chapter will detail ways to improve the efficiency of our passenger fleet and heavy duty equipment and describe GHG emission mitigation strategies.

Recent Successes

- Since 2005, the baseline year of this document, Erie County has pursued several methods to reduce GHG from its fleet; specifically implementing strategies to reduce vehicle miles travelled and increasing fuel efficiency. The County implemented an anti-idling policy to comply with NYS law, which saved fuel, and reduced vehicle emissions. Starting in 2015, Automatic Vehicle Location technology has been deployed throughout the fleet. This allows the County to carefully manage vehicle use. For example, it can alert staff if vehicles travel outside of expected areas, are idled excessively, or exceed expected speeds.
- In the autumn of 2017, Erie County purchased two 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 MTCO2e annually based on both the estimated fuel conserved and electricity used.

Overview of DPW's leasing procedures for departmental fleets

In July of 2018 the Department of Public Works (DPW) was granted the necessary approvals to enter into a contract with Enterprise Fleet Management with the goals of reducing expenses and modernizing the fleet with more fuel efficient vehicles, thus lowering GHG emissions. By utilizing an open-ended lease* as a funding mechanism, the County is able to acquire new vehicles while avoiding a large capital budget outlay. Furthermore, the County is able to replace aging vehicles with newer models to not only increase fuel efficiency but to also reduce maintenance expense. Maintenance and repairs will be outsourced to local businesses to further stimulate economic growth and the integration of more fuel efficient vehicles will reduce carbon footprint. In the end,

this program will lead to the establishment of a proactive replacement plan that maximizes potential equity at time of resale, reduces operational expenses, and increases safety.

*An open-ended lease means there is no early termination, mileage, or abnormal wear and tear penalties. Leases are written to a residual balance to preserve cash flow. The County receives flexibility of ownership, as well as net equity from sale at time of disposal.

Rightsizing and downsizing

As the County begins the fleet overhaul process, steps are being made to ensure that new vehicles are being acquired that more correctly fit the County's needs. County divisions and departments entering into the program have been advised to reduce their vehicle fleet, where possible. An example of this scenario is that in some of our highways facilities one larger crew cab pickup truck may replace two single cab vehicles given that the primary function of the vehicles is to move several workers from the facility to job sites.

Modernizing – with new, more efficient models

DPW anticipates substantial savings in maintenance and parts for vehicles. Given that 34% of our current light duty fleet is over 10 years old, the act of switching to brand new vehicles should bring quantifiable savings within the first rotation of vehicles. New vehicles also have increased fuel efficiency with new technology implemented. The analysis the department has been provided assumes 10 MPG today vs. 16 MPG on average with a new fleet on a five year cycle.

Electric conversion

Another directive to all departments is that where possible non-electric vehicles should be traded for electric or hybrid vehicles. The Division of Fleet services will replace its entire sedan sized pool of vehicles with electric cars by 2019.

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Fleet Action Items

#	Measure Name	Priority Tier	GHG Reduction	Co-Benefits	Cost Effectiveness	Feasibility
F-1	Establish and implement an enhanced preventative fleet maintenance program for County owned vehicles	1				
F-2	Implement technology to reduce idling by patrol cars and other frequently idled vehicles	1				
F-3	Increase the use of high-efficiency and alternative fuel vehicles and equipment in the County fleet	1				
F-4	Improve fleet deployment and monitoring	1				
F-5	Implement strategies to promote walking, bicycling and use of powered zero emission personal transportation devices	2				

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F-1 Establish and implement an enhanced preventative fleet maintenance program for County owned vehicles:

a) Implement electronic maintenance management system;
b) Implement best practices for refrigerant handling;
c) Purchase low rolling resistance replacement tires.

Optimzation of preventative vehicle maintenance is an important and low cost strategy to lengthen vehicle life, lower fuel costs, and avoid GHG emissions. Simple maintenance procedures such as proper tire inflation, wheel alignment and rotation, and timely air filter replacements are low cost methods for improving the County fleet efficiency.

Priority Tier: 1
Timeline: Short-term
Lead: DPW
Partners: Purchasing, DISS
Resources: Existing staff time

To optimize vehicle maintenance, an electronic fleet management system will be deployed that will allow for improved vehicle maintenance scheduling and work order tracking for those vehicles owned by the County.

Hydrofluorocarbon (HFC) refrigerants used in vehicle air conditioning are potent GHGs and the most common refrigerant, R-134A, has a global warming potential of 1,340 (i.e., 1,340 times as potent as carbon dioxide). The County will implement best practices for HVAC system leak repairs, and for handling and recycling of HFC refrigerants.

Low rolling resistance replacement tires can improve the fuel efficiency of the vehicle fleet, and are feasible for some County vehicles. The County will include fuel savings criteria in evaluating replacement tire purchases.

Co-Benefits: Fiscal savings, inventory of fleet vehicles, increased gas mileage, decrease in out of service vehicles

Next Steps: General Fleet Manager will meet with DISS staff to create database of County owned vehicles. Once established, a rotating maintenance schedule can be developed for County owned vehicles.

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F-2 Implement technology to reduce idling by patrol cars and other frequently idled vehicles.

Priority Tier: 1
Timeline: Short-term
Lead: Sheriff'
Partners: DPW, ECDSM, Budget
Resources: To be determined

More than 50% of Erie County patrol vehicle running time is spent idling. Idling is a significant source of vehicle wear, fuel consumption, and GHG emissions with patrol vehicles representing about 20% of County vehicle GHG emissions. Because patrol vehicles have unique and demanding operational requirements, reducing idling is complicated.

Recently major manufacturers have announced production of hybrid electric patrol vehicles, which will be available in 2019 that include sophisticated anti-idling technologies that appear to address the County's requirements. Currently the Sheriff's Office is planning to purchase one hybrid-electric patrol car in 2019 as a pilot to test this technology. Pending the results, additional vehicles may be purchased. Because of the large fuel and maintenance savings from reduced idling, it is likely that this initiative will have a significant return on investment.

Finally, the DPW, EC, and Sheriff's Office will explore deploying similar technology on other high idling vehicle types.

Co-Benefits: Reduced costs from maintenance and increased vehicle life from reduced idling.
Next Steps: In 2019, the Sheriff Office will acquire and evaluate a hybrid patrol vehicle, and consider broader adoption.

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F-3 Increase the use of high-efficiency and alternative fuel vehicles and equipment in the County fleet:

a) Implement vehicle and equipment purchase policy promoting fuel efficiency; and
b) Retrofit heavy duty vehicles to alternative fuels.

Because a significant amount of vehicle travel is unavoidable, and because there are limits to fuel efficiency improvements from other actions, the most important strategy for deep fleet GHG emissions reductions 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.

Priority Tier: 1

Timeline: On-going

Lead: DPW

Partners: National Fuel, NYSERDA, Purchasing, ECDSM, Sheriff

Resources: Leasing program cost

Through its new leasing program, Erie County will develop a vehicle procurement policy that will include specifying the leasing of a percentage of fuel-efficient vehicles by a short-term deadline and later requiring 100% fuel efficiency. The County will also set short and long term fleet fuel efficiency goals for its light and heavy duty fleets, and will report progress based on actual VMT and fuel consumption. The policy will require the implementation of alternative fuel vehicles and vehicles retrofits, such as for compressed natural gas (CNG) and biofuels, for light duty trucks and the heavy duty fleet until zero emission vehicle technologies are feasible. For mission critical vehicles like snow plows, dual fuel vehicles such as CNG/diesel will deployed until the alternative fuels are proven to be reliable.

Co-Benefits: Leasing program will modernize the fleet which inherently will be more efficient, rightsizing opportunities as departments order their new vehicles

Next Steps: Leasing program is currently being deployed by DPW to select departments. DEP will continue to be present as new departments are introduced to the program, to ensure sustainability is a consideration as new vehicles are ordered.

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F-4 Improve fleet deployment and monitoring:

a) Expand and improve management and monitoring using advanced Automatic Vehicle Locator technology;
b) Implement fleet reservation system to improve vehicle assignments and promote vehicle share; and
c) Manage out of county travel.

Priority Tier: 1
Timeline: Short-term
Lead: DPW
Partners: Sheriff, DISS
Resources: AVL cost, staff time

Improvements to how the fleet is deployed and monitored will allow for reduced VMT, improved fuel economy, and optimized assignment of vehicles. Additional benefits include reduced fuel consumption, vehicle wear, and GHG emissions.

Automatic Vehicle Locator (AVL) technology uses real-time location and other data from vehicles to promote efficient routing and reduction of extraneous vehicle travel. These systems also monitor vehicles for unwanted operational actions, such as hard driving, speeding, or excessive idling.

The County has already deployed AVL technology to some of its fleet in a basic form. The County will fully implement AVL to the entire fleet, and will improve its implementation, such as by requiring all departments to provide appropriate feedback to vehicle operators on driving behavior. Metric reporting such as VMT and average fuel economy will allow departments to set goals and monitor performance. Finally, as improved AVL systems become available, the County will look for additional opportunities, such as by providing engine maintenance information directly to the vehicle maintenance management system.

The County will also implement an online fleet reservation that will better manage assignment of vehicles in the County fleet to assure that the most efficient vehicle possible is deployed. The fleet manager could use reservation information to encourage ride sharing opportunities, when applicable. The reservation system will also be utilized to manage out of county travel, assuring car rentals are efficient.

Co-Benefits: Updated fleet inventory and real-time information for location of vehicles
Next Steps: Fleet manager to work with DISS to create reservation system for general fleet and use template for other County departments that have fleet pools.

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F-5 Implement strategies to promote walking, bicycling and use of powered zero emission personal transportation devices:

a) Promote alternative transportation by staff; and
b) Increase alternative transportation for police patrols.

Priority Tier: 2
Timeline: On-going
Lead: DPW
Partners: Parks, Personnel, Sheriff
Resources: Existing staff time

Substituting staff car and truck travel with walking, bicycling, and electric personal transportation devices, will reduce vehicle and fuel costs, improve staff health, and reduce GHG emissions. The County has a policy of not allowing bicycling by staff for work travel. The County will investigate obstacles to allowing bicycle and other alternative travel, and if possible change the policy, by implementing a training requirement for applicable staff or other measures.

Police walking and bicycle programs are proven to increases citizen contact, increase visibility, improve staff health and morale, and reduce GHG emissions. Erie County can benefit from police pedestrian, bike, and electric personal transportation device patrols within the parks systems, as crowd control for public events such as concerts, sporting events, large gatherings, and for other tactical purposes. The County will implement policies and procedures promoting these patrols types, and negotiate appropriate labor contract provisions as necessary with the relevant unions.

Co-Benefits: Reduction of vehicle miles travelled for close proximity meetings, potentially improved employee health, visibility to community

Next Steps: Reconvene transportation committee and discuss opportunities to promote non-powered vehicle use to County employees. Policies will be reviewed to identify potential changes to overcome obstacles regarding work travel allowances.

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CHAPTER 3: WASTE MANAGEMENT AND RECYCLING - recycle bin pic

WNY Regional Sustainability Plan (2013) goals:

1. Reduce the amount of Municipal Solid Waste (MSW) that is disposed of (via landfills or incineration). Accomplish this by reducing waste generation and/or increasing recycling.
2. Maximize the diversion of organic waste from disposal facilities (landfills and incinerators) and the beneficial reuse of the organic material.
3. Reduce the amount of construction and demolition (C&D) waste that is disposed of by reducing waste generation and/or increasing recycling.
4. Increase the number of waste transport vehicles that use alternative fuels.

Erie County's Guiding Principles:

- Recycling conserves: energy, water, and natural resources; reduces air and water pollution, as well as the cost of sending these materials to waste management facilities.
- Waste prevention, reuse, recycling, and composting are material management options that conserve resources while reducing environmental impacts.
- Sustainable materials management will impact County department operations and open opportunities to reduce GHG emissions, conserve resources, and reduce costs.
- Continually identifying opportunities and eliminating barriers to waste reduction and recycling is essential.
- Goals that are clear, achievable and measurable will help to produce metrics that support the principals related to reduction, reuse and recycling.
- Ongoing education will be used as a tool to maximize employee engagement, encourage participation and lessen resistance to change.
- Leading by example and sharing best practices with surrounding municipalities will maximize impact of the program and encourage community engagement.

Introduction

Erie County's waste reduction and recycling programs help to manage waste for over 200 properties and 5,000 employees.

The GHG emissions from solid waste have been calculated referencing a 2012 evaluation report of Erie County's Solid Waste Disposal, by Wendel, a local engineering firm, as well as through a detailed measurement of the County's current waste disposal practices from managed County facilities. Erie County's combined waste to landfill, including considerations of materials recycled equates to approximately 2,400 tons and 1,419 MTCO2e annually. The County's recycling efforts diverted over 300 tons of waste annually from landfill.

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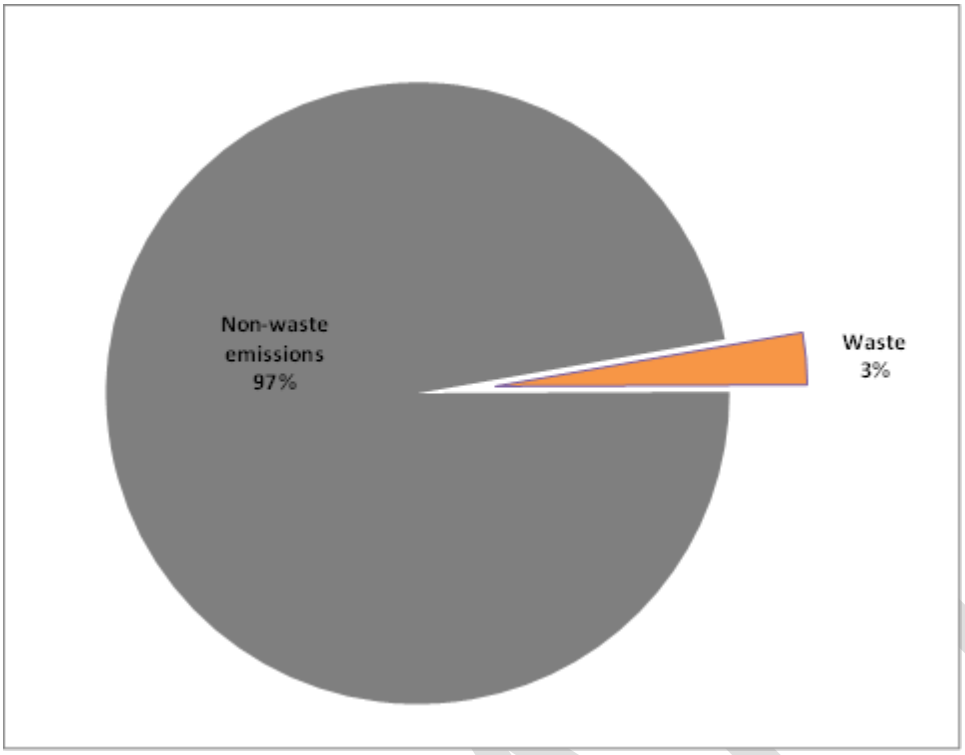

Figure 3: Waste GHG emissions as part of the total County carbon footprint.

Erie County's waste reduction and recycling goals utilize the basic hierarchy of reduce, reuse, and recycle by focusing on two strategies, waste prevention and diversion from landfill:

- Eliminating waste at the source through reduction and reuse by changing practices;
- Increasing diversion of waste to landfill by increasing recycling and composting; and
- Achieving these goals through educating employees and establishing policies.

When determining GHG savings from waste reduction and recycling, the lifecycle of the material must be taken into account. The resources used in product production, transportation, and disposal contribute to GHG emissions generated. Recycling a product has significantly less impact on our natural resources versus the use of virgin materials to create a final product. These calculations are part of the accepted models used when determining both GHG emission reductions and the use of resources.

To achieve Erie County's waste reduction goals, new initiatives are proposed as well as expanding and facilitating current sustainability programs. The strategies begin with project planning and departmental review of procedures to institute changes so that the waste is not created. Action items include creating a photo inventory of the County Surplus Warehouse, which will enable employees to more easily reuse items such as office furniture, as well as identifying recycling opportunities at County Parks, and increasing recycling at all County facilities.

Recent Successes

- In 2017, the Green Team successfully coordinated a paper use reduction contest which brought awareness amongst all county employees about the importance of reducing waste and implementing new strategies that help evaluate daily printing habits toward paper use reduction and fiscal savings.
- In 2017 and 2018, opportunities to recycle plastic, glass and metal was expanded to most County office buildings and related buildings located in the City of Buffalo.
- Erie County was awarded an ECDEC grant to construct a composting facility at the Alden Correctional Facility to change the disposal method for food waste. The expected outcome of the project includes the diversion of up to 200 tons of food waste from the facility on an annual to reduce of the creation of methane, a potent GHG.

Waste Management and Recycling Action Items

W-#	Measure Name	Priority Tier	GHG Reduction	Co-Benefits	Cost Effectiveness	Feasibility
W-1	Develop departmental waste plans to identify processes which can minimize waste and maximize recycling	1				
W-2	Develop and implement a paper use reduction policy and procedures	1				
W-3	Develop a construction and demolition waste policy for all construction projects	1				
W-4	Develop meeting & event guidelines to reduce waste	1				
W-5	Implement an organic waste reduction compost program	1				
W-6	Plan and implement ongoing waste assessments by facility	2				
W-7	Expand existing programs to divert waste from landfills and increase recycling and reuse	2				

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W-1 Develop departmental waste plans to identify processes which can minimize waste and maximize recycling:

a) Create and implement departmental schedule for internal evaluations;
b) Identify disposal method, revenue and quantity; and
c) Investigate opportunities to eliminate waste.

Priority Tier: 1
Timeline: Short-term
Lead: DEP
Partners: Full Green Team
Resources: Existing staff time

A departmental waste plan will help to maximize the effectiveness of programs to decrease the amount of materials being sent to landfill and increase the amount of materials being repurposed or recycled. Development of the waste plan requires individual departmental review of current practices and internal evaluations to identify procedural changes which would result in the reduction of waste, such as eliminating an unnecessary printing process or creating a digital file versus a hard copy. Review of current practices will include a review to repurpose materials and/or increase recycling.

Co-benefits: Fiscal savings, employee engagement.
Next Steps: DEP will work with the Green Team to develop strategies to evaluate and identify departmental procedures and the potential waste reduction associated.

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W-2 Develop and implement a Paper Use Reduction Policy and Procedures:

a) Determine department-level baseline and begin tracking and reporting of paper use;
b) Schedule comprehensive digital work process reviews and implementation timelines;
c) Include centralized printer stations in design when renovating floors; and
d) Increase email storage capacity and improve archive access for employees.

Priority Tier: 1
Timeline: Short-term
Lead: DISS
Partners: DEP
Resources: Existing staff time

Procurement, printing, and disposal of office paper constitute a significant environmental and financial cost. The County has ongoing initiatives to reduce paper throughout internal operations, including paper reduction contests, pilot projects to digitize paper-heavy processes, and efforts to centralize and reduce the number of printers. The County will implement a Paper Use Reduction Policy utilizing newly available technology to collect paper use data down to the employee level. Additionally, this policy will set reduction goals that will be monitored through a reporting mechanism, requiring systematic assessments to identify opportunities for digitizing work processes, and assessing configuration of printers to reduce paper usage, where possible.

Expanding e-mail storage and improving the archiving system will help to reduce excess printing. Increasing the ability to store emails digitally and simplifying the process of archive retrieval will reduce printing of emails, which has been identified as a key source of the County's printing.

Co-benefits: Fiscal savings, natural resource conservation, diversion from landfill
Next Steps: DISS and DEP will work together to promote and educate employees on the sustainability opportunities available with the new paper management program. This will begin roll-out to copiers in early 2019. The Sustainability Coordinator will work through the Green Team to identify potential paper reduction opportunities within each department.

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W-3 Develop Construction and Demolition Waste Policy for all construction projects, including:

a) County Facility renovations and new building construction; and
b) Develop annual reporting mechanism.

Priority Tier: 1
Timeline: Mid-term
Lead: DPW
Partners: Purchasing, DISS
Resources: Existing staff time

The County is committed to reduce construction and demolition waste with the intention of fostering recycling and conservation of materials and diversion from landfill disposal. The policy would include administrative and procedural requirements for salvaging, recycling, and disposing of non-hazardous construction waste including cardboard, pallets, wiring, etc. This includes all renovations within County facilities and new building construction. Language will be added in contracts and specifications to meet policy requirements for County projects that should demonstrate a minimum percentage of construction wastes are recycled or salvaged and diverted from landfill disposal.

The recycling percentage goal will be identified on a per project basis by DPW and reevaluated on an annual basis. Documentation will be required on all projects to include estimated rates for salvage, recycling, and disposal as a percentage of total waste generated by the work.

There are international construction codes that Erie County can adopt to implement this measure. For example, the International Green Construction Code creates a regulatory framework for new and existing buildings to include sustainability measures for the entire construction project. By establishing minimum green requirements through construction/renovation, buildings become more efficient, waste is reduced, and a positive impact on health, safety and community welfare is achieved.

Co-benefits: Fiscal savings, natural resource conservation, diversion from landfill disposal
Next Steps: DPW staff will develop language to add to contracts and specifications to include sustainability considerations.

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W-4 Develop meeting & event guidelines to reduce waste from the following:

a) Internal meetings; and
b) External meetings and events.

Priority Tier: 1

Timeline: Mid-term

Lead: DEP

Partners: Personnel, Purchasing, DISS

Resources: Existing staff time

There are a variety of strategies for reducing waste in office meetings and at events. Best practices on how to reduce waste and encourage reuse during meetings and events will be developed and the identified guidelines will be reinforced through on-going outreach and education. Examples include replacing copies of agendas and handouts with use of smart boards or tablets or having reusable tableware versus single-use items. Departmental budgets will include funding for technologies such as smart boards, tablets, and mobiles devices.

County facilities permitted by the Parks Department will include language about waste reduction in shelter rental agreements and other events at park facilities.

Co-benefits: Fiscal savings, natural resource conservation, diversion from landfill, education to employees and community

Next Steps: DEP staff will develop 'green' meeting guidelines and present to Green Team and employees.

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W-5 Implement an organic waste reduction compost program, including:

a) Food waste composting at the Erie County Correctional facility;
b) Food waste recovery at Youth Detention Center;
c) Coffee grounds and other employee-generated food waste in County offices; and
d) Wood chips, leaves, and other organic materials.

Priority Tier: 1

Timeline: Mid-term

Lead: DEP

Partners: Parks/Forestry, Social Services

Resources: Existing staff time

Separating food and organics from the waste stream will have immediate and significant impact on the reduction of GHG emissions. The Department of Environment and Planning has been awarded a grant to build a composting operation at the Alden Correctional Facility where food waste generated by the residents 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, as well as at other Erie County properties such as parks. Residents will be trained on composting techniques, thus acquiring skills, knowledge, and work experience that can be utilized after incarceration. Similar organic waste reduction composting opportunities exist at the Youth Detention Center and DEP will continue to seek funding to expand the composting program.

Additionally, County staff will be engaged to participate in a coffee ground composting pilot program generated by employees. This trial will help to determine if there are additional options for increasing composting in the office environment.

Finally, a strategy will be developed to determine best practices for disposal of organic materials, including wood chips and leaves from parks and other related County divisions.

Co-benefits: Fiscal savings, natural resource conservation, diversion from landfill.
Next Steps: Alden Correctional Facility's composting program will begin in early 2019. DEP will work with the different departments to identify expansion opportunities and logistics to add County resources to the facility.

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W-6 Plan and implement ongoing waste assessments by facility:

a) Create a facility schedule and waste assessment template;
b) Implement assessment by examining records, facility walk-throughs, or conducting waste audits; and
c) Establish reporting tool for regular comparisons.

Priority Tier: 2

Timeline: On-going

Lead: DEP

Partners: Full Green Team, DISS, Purchasing

Resources: Existing staff time

A waste assessment is a method used to examine waste generation from individual facilities to determine if existing recycling efforts are effective and to identify additional opportunities to introduce waste management practices. Erie County will create a schedule for County owned buildings and will design templates to gather desired metrics. The Department of Environment and Planning will manage the implementation of the waste assessments and quantify and characterize each waste stream to establish a baseline for all facilities for comparison with future waste generation data.

Co-benefits: Fiscal savings, visual representation for employees

Next Steps: DEP's Recycling Specialist and Recycling Coordinator will create waste reduction guidelines and an assessment procedure for a department to pilot. DEP staff will request assistance from DISS to develop a program to use throughout all county departments.

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W-7 Expand existing programs to divert waste from landfills and increase recycling and reuse, including:

a) Increase co-mingle recycling opportunities at County facilities;
b) Implement recycling program at public spaces, including parks;
c) Implement waste policy for County-leased spaces and County-hired contractors; and
d) Create on-line catalog and exchange program.

Priority Tier: 2

Timeline: Short-term

Lead: DEP

Partners: DISS, Parks, Purchasing, DPW

Resources: Departmental budgets, grant funding, existing staff time

Collection and proper disposal of a variety of materials generated by County operations and employees makes good environmental and business sense. The full recycling program is not yet available at all buildings. The County will continue to expand its recycling program. Additionally, technology to reduce waste will also be investigated, such as filtered water stations to encourage reusable water bottle usage and tablets for employee use.

A recycling program in our parks and public spaces will become a priority for Erie County. The Parks Department will explore implementing a program that includes recycling at shelters and special events.

Many of the buildings occupied by County employees are leased, but are still maintained by County staff. The Department of Public Works will amend contracts for leased facilities and outside contractors to add verbiage indicating Erie County's recycling priority and waste management requirements.

The Purchasing Department maintains the Erie County Warehouse, which holds and catalogs materials that are the property of the County but are not currently in use. This includes desks, chairs and other office-related furniture as well as items such as file folders, hangers, file organizers, etc. An on-line catalog and exchange program will be developed from materials at the warehouse to promote reuse of these items and will be available to all employees, decreasing the necessity to travel to the warehouse and encouraging reuse of materials before purchasing new items.

Co-benefits: Recovery of costs from sales/recycling, providing leadership in community, saving resources, decreased travel to the warehouse by employees.

Next Steps: Create detailed record of current recycling program and begin strategies to expand, work with Purchasing Director to begin developing on-line catalogue.

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CHAPTER 4: BUILDINGS AND ENERGY

WNY Regional Sustainability Plan (2013) goals:

- Increasing and promoting energy efficiency of existing buildings.
- Evaluation of energy efficient building standards for new construction.
- Analysis of existing financing tools that support energy efficiency and renewable energy investment.
- Consideration of innovative ownership, financing, or leasing mechanisms for renewable energy systems.
- Energy generation, use, and on-site combustion by building type.

Erie County's Guiding Principles:

- Committing to optimizing building performance with data-driven decision making to increase energy efficiency, reduce consumption, and lower the overall costs associated with operations and maintenance.
- Shifting to renewable sources of energy increases our energy independence, reduces harmful GHG emissions and helps us to become a more resilient community.
- Educating employees about the benefits of energy efficiency and recognizing them for their efforts in the workplace aids the County in achieving its comprehensive energy goals.
- Engaging municipalities and the broader community in the opportunities to take action to increase sustainability will be critical to localizing the benefits of a clean energy economy.

Introduction

The more than 200 buildings managed by the Erie County, through its Division of Buildings and Grounds in the Department of Public Works, are a major source of emissions and represent a tremendous opportunity to advance sustainability. The median age of commercial buildings in the United States is 32 years, and half of all commercial buildings were constructed before 1980. Making up the majority of our built environment, these older buildings have great potential to save money, energy, and water through efficiency upgrades.

County buildings are also the largest source of GHG emissions. These emissions are from electricity and natural gas, as shown in *Figure 4* below. In 2017, 18% of GHG emissions were from heating County buildings with natural gas, and 23% were from building electrical use. This does not include building energy use for Sewerage Management facilities, which is included in the emissions estimates shown in Chapter 6.

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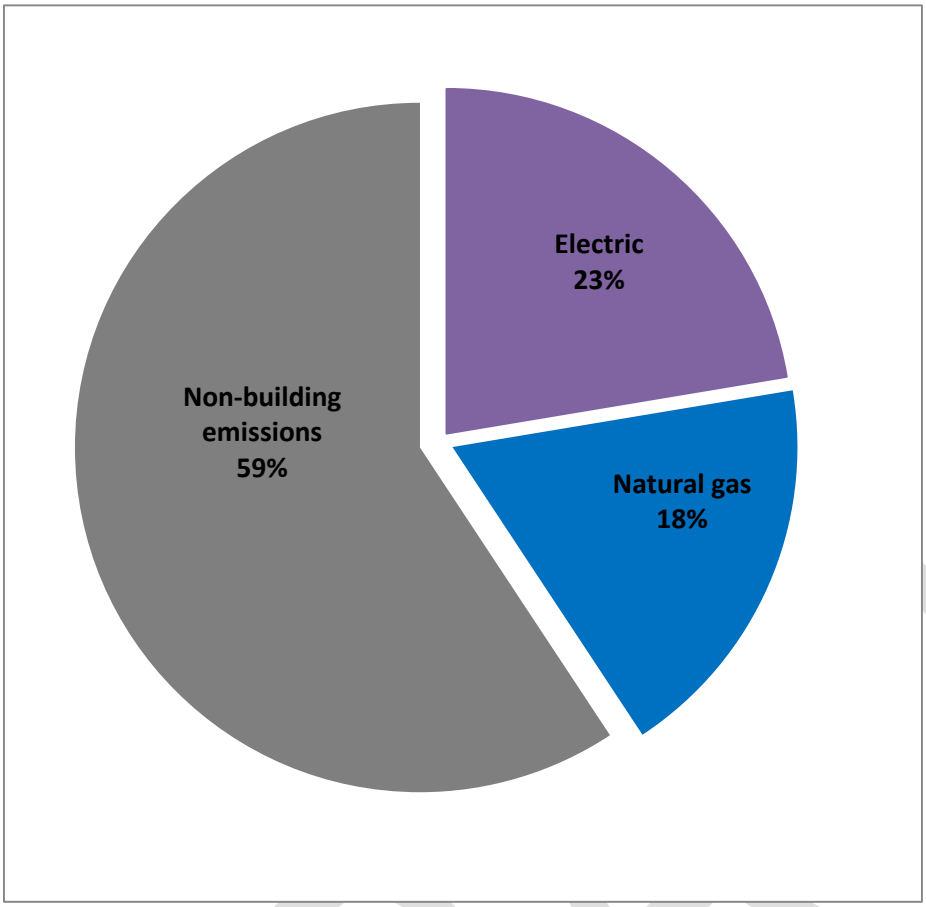

Figure 4: Buildings GHG emissions as part of the total County footprint

Erie County has been working steadily to improve building efficiency and reduce consumption through the installation of energy conservation measures. As equipment nears the end of its useful life, efficiency and cost effectiveness are primary considerations for any replacement equipment.

However, even with this focus, it has become increasingly clear that operations and maintenance of Erie County facilities will require a rigorous framework to guide deeper impact efficiency and sustainability projects. There are several standards available that could be used to facilitate institutionalizing such a framework, but no selection should be made without consideration for ease of implementation and impact on internal capacity for enforcement.

For Erie County to strengthen its sustainability leadership, it will be critically important to ensure that the construction of facilities and retrofit projects are implemented meet the highest reasonably enforceable sustainability standard.

These efforts require an investment of staff resources across senior leadership to day-to-day operations staff and employees. Through committees and outreach, Erie County will identify strategies for "hardwiring" the collection and reporting of energy and emissions data into standard operating procedures for all building operations, as well as training staff and educating employees to assure best energy practices are followed as part of its broader charter and guiding principles.

Recent Successes

- Rath Building: Re-lamping the building's interior with LED lights, and upgrading data center HVAC (heating, ventilation and air conditioning) for equipment control optimization. These projects have conserved over 1,400,000 kWh annually and will result in significant cost saving of approximately $180,000. GHG emission reduction will reach over 1,000 MTCO2e annually.
- 134 West Eagle: Boiler controls and lighting were upgraded and 202 fluorescent fixtures on the 3rd floor were replaced with LEDs. These efforts provide an estimated energy savings of more than 30,000 kWh and natural gas savings of approximately 3,000 Mcf annually, as well as an annual fiscal savings of over $8,000. Total estimated GHG emissions reduction for the facility is 195.5 MTCO2e.
- Solar Installation at the Correctional Facility - The 2 megawatt 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. It is estimated that the renewable energy generated at the site will offset County emissions by 2,233 MTCO2e, equivalent to the electric use of 335 homes.
- The Family Court Building was re-lamped with LED lights this year. The estimated annual impacts of the project are energy conservation of 668,117 kWh, cost savings of $63,471, and GHG emission reduction of 734,929 pounds of CO2.

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Buildings and Energy Action Items

#	Measure Name	Priority Tier	GHG Reduction	Co-Benefits	Cost Effectiveness	Feasibility
E-1	Implement initiatives to improve building energy performance and operate buildings more efficiently (operations & maintenance)	1				
E-2	Perform comprehensive facility energy efficiency improvements to County buildings	1				
E-3	Develop and purchase 100% renewable electric energy	1				
E-4	Design building construction projects using increased standards for sustainability and energy consumption	2				
E-5	Encourage behavioral changes that decrease the demand for energy in County facilities	2				

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E-1 Implement initiatives to improve building energy performance and operate buildings more efficiently (operations & maintenance):

a) Expand use of monitoring, control and reporting systems to continuously improve energy management;
b) Maintain a comprehensive database of building energy characteristics (including audit data and identified energy performance measures), and conduct additional energy auditing as necessary; and
c) Update standard operating procedures (SOP) to increase emphasis on energy savings, and train staff accordingly.

Priority Tier: 1
Timeline: On-going
Lead: DPW
Partners: DISS
Resources: To be determined

Improving building operations and maintenance, and the related control systems, can result in low cost energy savings.

Many of the County's largest facilities are already connected to building and energy management systems, but many opportunities remain to better control and manage building systems. The County will expand and improve existing control systems to optimize energy performance.

Another key to achieving continued energy conservation is to better house, organize and analyze information about the County's portfolio of buildings. Unfortunately, information such as energy improvement measures, energy audit data, building characteristics, and maintenance schedules are tracked in separate systems. A comprehensive database does not exist. The County will develop and implement an overall buildings information management strategy, which will facilitate robust analysis and decision-making, and improve energy performance.

Building operating procedures and staff training typically focus first on maintenance and safety. There is an opportunity to improve energy efficiency by increasing the emphasis placed on energy conservation. When updating SOPs, the County will increase the emphasis on energy efficiency in its building operating procedures, and will assure that staff is adequately trained to maintain highest efficiency.

Co-benefits: Reduced maintenance costs, improved staff comfort and health.
Next Steps: DPW staff will complete its efforts in the collection and management of energy consumption data. Staff has already begun inputting data from multiple sources into a single portfolio management system.

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E-2 Perform comprehensive energy efficiency improvements to County buildings, including:

a) Energy Performance Contract pre-audits and investment grade audits; and
b) Perform retro-commissioning on high priority buildings.

Priority Tier: 1
Timeline: On-going
Lead: DPW
Partners:
Resources: Mostly fund via energy performance contracting

In 2018, the County began planning a phased approach to comprehensive energy performance assessments and retrofits to County buildings. The first phase will include an assessment of approximately 12 buildings, some of which are the biggest energy consumers in the County's portfolio. Phase II will use a 'guaranteed savings' Energy Performance Contract (EPC) approach, whereby an Energy Service Company will perform investment grade audits of a set of buildings, and will provide comprehensive, turnkey projects while guaranteeing energy savings. Additional phases will be undertaken to fully address other low performing County buildings.

Co-benefits: Reduced maintenance costs, improved staff comfort and health.
Next Steps: DPW will finalize procurement of the energy performance contractor.

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E-3 Develop and purchase 100% renewable electric energy:

a) Develop distributed renewable energy on County property;
b) Implement a renewable energy purchasing strategy; and
c) Purchase Renewable Energy Certificates (RECs).

Priority Tier: 1
Timeline: Short-term
Lead: DPW
Partners: NYSERDA, Budget, DEP
Resources: To be determined

Electric consumption is a significant part of County GHG emissions and will increase as the County moves to sustainable technologies, like electric vehicles and heat pumps for space heating. At the same time renewable energy technologies are driving down the price of renewable electric energy. In January 2018, the County committed to purchase 100% renewable energy for its buildings by 2025. While the County's first priority will be energy conservation where practical, for the remaining electric energy use the County will employ three strategies.

First, the County will continue to review the additional potential to site rooftop and ground mount photovoltaic solar energy installations on County facilities and land. This is an ongoing discussion because decreasing costs for solar installations and future improvements to building roofs will make additional projects feasible. In addition, other technologies will be explored as they become available / practical.

As its second strategy, the County will seek to directly purchase renewable energy. Erie County serves as a large energy supplier to more than two dozen municipalities within Western New York, directly purchasing energy from the wholesale market at the lowest possible pricing. The County will use its purchasing power to secure low cost renewable energy for its own operations, and also for the operations of local government participants in its utility aggregation pool. This could include direct contracts with solar installations, or purchases on the energy market.

Finally, the County will purchase Renewable Energy Certificates (RECs). RECs are a method for allowing for a market transaction of the renewable attribute of energy generated by a renewable project. This will require careful research and consideration, as the quality of RECs and the degree to which they incentivize the creation of additional renewable energy vary greatly. The County will prioritize RECs that incentivize additional renewable energy in New York State.

Co-benefits: Fiscal savings, natural resource conservation
Next Steps: The energy committee will set up a task group at the beginning of 2019 to investigate options.

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E-4 Design building construction projects using increased standards for sustainability and energy consumption:

a) Update local law to require new and rehabbed building projects to achieve Leadership in Energy and Environmental Design (LEED) Gold certification;
b) Implement internal policy requiring minor facility projects be designed and built to LEED Silver standard; and
c) For projects on County-owned buildings apply an energy code more stringent than New York State requirements.

Priority Tier: 2
Timeline: Short-term
Lead: DPW
Partners: Purchasing, DEP
Resources: To be determined

Designing sustainable buildings from the start is more practical and cost effective than retrofitting existing buildings. In 2007 the Erie County "Green Buildings Act" became local law, and required all major facility projects to be "designed, constructed and certified to at least LEED Silver standard." The County will update the local law to require the more stringent LEED Gold standard for new construction and major rehabilitation projects.

Minor construction projects currently include an evaluation of energy efficiency, but do not adhere to a particular standard. The County will develop and implement internal policy requiring these projects to be designed and built to the LEED Silver standard, without requiring formal certification.

Like design standards, building energy code enforcement can drive significant savings. New York State has adopted a statewide energy code, which is currently enforced by the County, as required. NYSERDA provides a "Stretch Energy Code", which is more stringent than the base NYS Energy Code, and is designed to be easily adopted at the local level. The County will adopt the Stretch Code and will accept future versions as they are released.

Co-benefits: Reduced maintenance costs, improved staff comfort and health.
Next Steps: DPW engineering staff will draft a new policy standardizing adherence to new code.

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E-5 Encourage employee behavioral changes that decrease the demand for energy in County facilities:

a) Develop positive behavior change campaigns; and
b) Train employees on sustainable best practices.

Priority Tier: 2
Timeline: Short-term
Lead: Personnel Department
Partners: DEP, DPW
Resources: Existing staff time

While there are significant opportunities to reduce energy consumption through energy efficient technologies and processes on the buildings, the County will additionally focus on ways employees can decrease wasteful energy consumption during every day activities.

Erie County will create targeted and consistent behavior change campaigns integrating sustainability best practices in into all facets of County government. These campaigns will utilize different behavior change techniques to demonstrate easy, achievable changes employees can make to decrease energy consumption and bring awareness of the importance of integrating energy conservation into daily routines. For example, turning off equipment when not in use and at the end of the day and turning off lights where possible, avoiding unnecessary printing, and reduced elevator use by using stairs.

Co-benefits: Resource conservation
Next Steps: DPW can assist in the tracking and benchmarking of energy usage once campaigns have been rolled out to determine the effectiveness.

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CHAPTER 5: LAND MANAGEMENT

WNY Regional Sustainability Plan (2013) goals:

- Increase the number of local municipalities that are developing, adopting, and implementing smart growth policies.
- Develop mechanisms for regional land use planning assistance and collaboration.
- Encourage and focus development in areas served by existing infrastructure.
- Encourage the expansion of location-efficient housing and improved infrastructure/services for existing housing that increases access to employment centers and transportation options.
- Preserve, protect, and enhance the viability of agriculture, including agricultural lands, and urban agriculture.
- Encourage, enhance, and coordinate regional park, greenway, and waterfront planning to connect the public and natural resources to each other while promoting economic development and recreational opportunities.

Erie County's Guiding Principles:

- Protecting natural systems provides irreplaceable benefits such as carbon sequestration, flood and erosion control, water quality and supply, nutrient processing and soil fertility, habitat, and air quality.
- A healthy green infrastructure network minimizes County risk; in particular this can help prevent degradation to water bodies and costly restoration measures.
- County land use decisions should consider: health and ecosystem implications, equity, as well as aesthetics.
- The design of geographic spaces and structures in Erie County should reflect a strong sense of place and celebrate what is unique about our community's people, culture, heritage, and natural history.

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Introduction

Erie County owns and maintains over 10,000 acres of land and 2,100 lane miles of roadways, including parkland, two golf courses, forestland, and brownfields and/or vacant property. Other County-owned land includes right-of-ways, trails, and the green space and grounds around the more than 200 buildings. These County-owned lands serve a range of diverse purposes, and in turn, they produce different types of GHG impacts.

The Department of Environment and Planning in cooperation with the Department of Parks, Recreation, and Forestry has undertaken a major update to the 2003 Park Master Plan. This Parks Master Plan Update, which was initiated in 2016, is primarily focused on the preservation, enhancement, and improvement of the existing system assets and landscape setting. The Parks Department already has been implementing several recommendations of the Master Plan.

Recent Successes

- Elma Meadow Park has added 10-12 acres of no-mow natural areas over the last three years. Eliminating the need to mow and maintain landscapes provides savings in gas usage and labor costs. Additionally, there are designated no mow zones at Chestnut Ridge, Sprague Brook, and Wendt Beach.
- In addition, The County replaces Ash trees that die from the Emerald Ash Borer with native, non-Ash trees.
- Woodchips are made from fallen branches and brush within County Parks, which are used on trails. The remaining chips are not disposed of as waste, rather are held behind buildings to decompose naturally. Additionally, wood chips are used by DPW in a DEC approved procedure to compost deceased deer.
- Asphalt is recycled after completion of paving and road maintenance projects.

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Land Management Action Items

#	Measure Name	Priority Tier	GHG Reduction	Co-Benefits	Cost Effectiveness	Feasibility
L-1	Implement landscape management guidelines to incorporate sustainable strategies	1				
L-2	Develop a Natural Resource Inventory (NRI) for land management planning	1				
L-3	Develop and implement a native plant policy for County owned facilities	1				
L-4	Update the Forest Management Plan and identify strategies to utilize and improve protection and management of trees	2				
L-5	Reuse/repurpose underutilized properties for sustainability projects	2				
L-6	Reduce impervious surfaces throughout county roadways and parking lots	2				

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L-1 Implement landscape management guidelines to incorporate sustainable strategies, including:

a) Evaluate current maintenance practices and develop management strategies; and
   i. Mowing vs. low mow vs. natural regeneration
   ii. Fertilizer/Pesticide use
   iii. Irrigation Schedule

b) Upgrade landscaping equipment and tools.

Priority Tier: 1
Timeline: On-going
Lead: Parks
Partners: DEP
Resources: Existing staff time, other funding to be determined

Landscape management guidelines emphasizing sustainable strategies will be developed for all facilities where Erie County owns and maintains the grounds and landscape, including the parks and forestry system.

An updated Parks Master Plan, published this year, inventories areas where lawn mowing can either be reduced or eliminated altogether within passive recreation areas of the parks. By maximizing mowing efficiency, not only will GHG emissions be reduced from limiting maintenance equipment use, but also the County could see significant fiscal savings from the decreased labor and operational costs. The County will decrease mowing where possible and identify additional opportunities for low/no mow and areas appropriate for natural regeneration.

Nutrient pollution in lakes and rivers are a result of land management applications, such as fertilizers and pesticides. Erie County uses fertilizer and pesticide applications to maintain their two golf courses, Elma Meadows and Grover Cleveland. Erie County will research methods to naturally stimulate microbial activity within the soil, enhance water holding capacity, and promote natural tolerance to stress, pests and disease. Additionally, integrated pest management practices play a key role in these landscapes. The County will continue to identify best practices to sustain and protect the grasses at these golf courses.

The County will evaluate their current lawn and landscape irrigation schedules and practices to identify and implement water conservation strategies. Reuse opportunities using cisterns or rain barrels is an easily executed action to reduce water consumption throughout facilities and parks.

Aging tools and machinery for landscape management creates inefficiencies in operations and increases unnecessary waste of material, which in turn wastes money. Erie County will research available technologies and pursue funding to upgrade equipment.

Co-benefits: Reduced fiscal, maintenance and labor costs, natural habitat regeneration
Next Steps: Land Management committee will meet to discuss actionable items. Areas where cisterns and rain barrels can be installed and utilized will be researched and implemented.

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L-2 Develop a Natural Resource Inventory for land management planning

Priority Tier: 1
Timeline: Short-term
Lead: DEP
Partners: Parks, DPW
Resources: New York State Department of Environmental Conservation (NYSDEC) grant, existing staff time

To develop climate change adaptation strategies and inform local land-use, municipalities need good information on the location and status of natural resources in their community. A natural resources inventory (NRI) provides an essential foundation for comprehensive planning that proactively considers a community's land and water resources.

A NRI is a document that inventories the natural resources of an area, both physical (e.g., geology) and biological (e.g., forests), and provides a foundation for County land-use and conservation planning. The County will use its NRI to identify priorities and determine appropriate strategies for protecting important natural features and the vital services they provide. A complete and up-to-date inventory will be helpful for the County's review of development projects.

The County will inventory natural resources that will be most useful in the planning and implementation of projects. For example, resources in high risk areas as identified in Flood Risk Management Plans, hazards and risks of flooding from rivers, surface water, groundwater and reservoirs, or resources within forests and agricultural land.

Erie County has a Geographic Information System (GIS) Office that has the capability to map and inventory natural resources. The DEP's Division of Environmental Compliance and Office of GIS will work together to collect information and develop the NRI. Information gathered will be packaged and shared with interested local municipalities to promote sustainability and create interest and capacity to replicate the process and reduce GHGs at the local level.

Co-benefits: Resource for land use projects
Next Steps: Identify the resources to be inventoried, and gather data about those resources in geographic format.

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L-3 Develop and implement a native plant policy and invasive species management plan for County owned facilities:

a) Alden Correctional Facility Horticultural Program; and
b) Invasive species - elimination and prevention.

Priority Tier: 1
Timeline: Short/Mid-term
Lead: DEP
Partners: Parks, PUSH Blue Buffalo, EC Soil and Water Conservation District
Resources: Seek grant funding

Native plants are the foundation of our natural ecosystems and protect biodiversity. They have adapted to local climate and environmental conditions, as a results they are drought tolerant and typically require less maintenance. These benefits can lessen labor costs and GHG from landscaping and maintenance practices. Currently there is not a formal native plant policy to ensure that indigenous plants are used on County owned property, nor is there an invasive species management plan in place to protect County land from unwanted invasive plants and insects.

The updated Parks Master Plan (2018) has set goals to provide for the conservation of ecosystem diversity and to maintain healthy ecosystem functions through re-vegetation, restoration and rehabilitation of native plant communities. Erie County will reintroduce indigenous plants to County-owned facilities by developing and implementing a native plant policy. The policy will compile a list of indigenous plants, detail a 'no planting' list, and provide guidelines to planting techniques that increase survival rates of plants, with consideration of availability of plants.

The horticultural program at the Alden Correctional facility currently grows the ornamental plants that landscape the grounds of County owned facilities. Grant funding will be pursued to implement a training development program for the greenhouse staff, including inmates, to begin growing native plants for County use. The County will seek partnerships with outside organizations, such as PUSH Blue Buffalo to provide these training programs.

Similarly and interwoven with the aforementioned tree management plan and natural resource inventory, an invasive species management plan will be developed per site to identify and prioritize invasive plants and insects. This information will guide strategies to combat unwanted invasive species currently threatening our area as well as identify incoming threats; to proactively address invasive species before they arrive. Additionally, this information could be used to inform where to collect seed material locally for the Alden Correctional Facility's horticultural program.

Co-benefits: Address and prevent invasive species, which will result in fiscal and labor savings, job skills taught to inmates at Alden Correctional, pollinator health

Next Steps: The Sustainability Coordinator held the first Native Plant Policy Committee meeting in September 2018. Subsequent meetings will be scheduled and an outline for the policy will be presented to the Core Green Team.

L-4 Update the Forest Management Plan and identify strategies to utilize and improve protection and management of trees, through:

a) Implementation of a Tree Management Program;
   i. Planting/replacement policy
   ii. Invasive species assessment
b) Optimization of tree harvesting; and
c) Enforcement of preservation plans.

Priority Tier: 2
Timeline: Long-term/On-going
Lead: Parks
Partners: DPW, DEP
Resources: Existing staff time, grant opportunities

The Erie County Department of Parks, Recreation and Forestry drafted a Forest Management Plan in 2003 to establish a framework for the process of proper forest management practices. The County has committed to keeping climate change as a focus and will update the draft Plan to guide proper forest management practices based on sound biological, economic, recreational, educational, and public safety considerations.

Currently the County is replacing trees with native species; however, this is not done through a formalized tree management program. Within the updated Forest Management Plan, a customized Tree Management Program will be detailed for all County facilities to pin-point actions specific to each parcel to ensure proper management and maintenance of the trees, including:

- Tree replacement policy and invasive species assessment - This will determine best practices for tree replacement during construction and renovation projects and for those threatened by invasive species.
- Forestry utilization plan - Developed for each forest lots to establish best management strategies such as invasive species controls and selective tree harvesting to manage our resources for their intended uses.
- Tree preservation plan - Specific to the tree species. Strategies will be based on the importance of the tree and the percentage of the tree canopy it holds. The Hemlock tree, for example, is a climax tree at the end stage of a forest, and is vital to our forest lots. It is currently being threatened by an invasive insect, the Hemlock woolly adelgid.

Co-benefits: Tree preservation, utilizing existing resources for services
Next Steps: Parks Forester will work with DPW and DEP to formalize a committee to discuss tree policies, tree management and protection.

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L-5 Reuse/repurpose underutilized properties for sustainability projects, including:

a) Inventory county owned facilities, parking lots and properties;
b) Develop a policy to support sustainability projects; and
c) Incorporate sustainability projects in brownfield rehabilitation projects.

Priority Tier: 2
Timeline: Short term/On-going
Lead: DEP
Partners: Parks, DPW Erie County Lands Advisory Review Committee (ARC)
Resources: Existing staff time, utility funding and rebates

Redevelopment and reuse of under-utilized buildings and properties that are owned, or may be acquired, by Erie County have the potential to support sustainability projects, including green infrastructure, electric charging stations and solar installations.

Before a policy to include sustainability in rehabilitation projects can be adopted, the County must first build a complete inventory of all facilities including parking lots and vacant properties. From there, a determination can be made to identify County sites which are both unused or underutilized and able to support an energy or sustainability project. Private utility funding and rebates which make such projects economically feasible are often available to governments making sustainable improvements and should be pursued.

The County will develop an internal policy to require construction bid specifications to include an assessment of the technical and economic feasibility of integrating sustainable options. For example, incorporating electric vehicle charging stations and photovoltaic installations during the design phase of new builds and rehabilitation projects. Additionally, increasing the use of green infrastructure to reduce impervious surfaces will help reduce flooding, stormwater runoff and decrease combined sewer overflows.

Erie County's Initiatives for a Smart Economy 2.0, published in June 2017, details that many brownfield and vacant properties are in need of redevelopment and could be ideal sites to incorporate sustainability projects as part of their restoration. The County will include sustainability projects into the design phase of brownfield remediation and future site development, where feasible.

Additionally, sustainability projects should be a required consideration for the Erie County Lands Advisory Review Committee (ARC) as they discuss potential purchases and change of use for County-owned lands.

Co-benefits: To be determined.
Next Steps: Parks staff will work with DPW and DEP to complete an inventory of all facilities, including parking lots and vacant properties. The Core Green Team will discuss potential policy changes regarding construction bid specifications.

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L-6 Reduce impervious surfaces throughout county roadways and parking lots.

Priority Tier: 2
Timeline: On-going
Lead: DPW
Partners: Parks, DEP
Resources: Capital budget

Impervious roadway and parking surfaces, often comprised of concrete or asphalt, do not allow for water to run through them into the ground, instead the water must run off of the surface. Particulate matter from the atmosphere, vehicle exhaust systems, debris from vehicle and pedestrians and dozens of other pollutions collect on these surfaces and are transported by the runoff to stormwater sewers and local waterways. This has significant and direct environmental and ecological impacts, from an inundating increase of water entering the stormwater system to the pollution-filled runoff going directly into waterways during storm events.

The County will research alternative material for roadways and parking surfaces as well as utilizing material such as wood chips and recycled tires, where possible. Additionally, the County will research emerging technology to prevent runoff from paved areas, such as water-smart roadway material that is manufactured to be more porous.

Co-benefits: Stormwater pollution prevention, protect wildlife habitat
Next Steps: Through the Green Team, DPW Highways Division will be requested to identify where potential alternative, permeable materials for roadways would be feasible.

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CHAPTER 6: WATER

WNY Regional Sustainability Plan (2013) Goals:

- Improve regional water quality through a focus on the identification and management of pollution sources and protection of healthy watersheds.
- Improve regional water management systems and increase regional water use efficiency.
- Address regional water quantity concerns through a focus on flooding, stormwater/runoff, infiltration, and regional water use.
- Ensure better coordination of water management with land use and conservation planning and decisions regarding where future development occurs, including continued and increased public access.

Erie County's Guiding Principles

- Erie County is blessed with a strategic location on Lake Erie and the Niagara River. In fact, the Great Lakes account for 84% of the North America's fresh surface water.
- Maintaining the sustainable, natural function of our fresh water resources is essential to their continued use for all living beings in this and future generations.
- Increasing water efficiency and conserving water will help to save energy, reduce climate change impacts and produce fiscal savings.
- Protecting and improving water quality is an economic driver that creates jobs, improves quality of life, as well as encourages development and tourism.

Introduction

The Niagara River/Lake Erie Watershed covers over 2,000 square miles of land within New York State including all of Erie County and much of the surrounding counties. The watershed includes over 5,000 miles of freshwater rivers and streams which eventually flow into Lake Erie and the Niagara River, both of which drain to Lake Ontario.

Erie County government is committed to protecting our water and creating an environment where clean, safe water is accessible to everyone. Driving revitalization through the protection and restoration of the health and integrity of Western New York's fresh water systems is not only sound environmental policy, but also represents a smart investment in the region's economic future.

Erie County uses water throughout its buildings, facilities and grounds. Erie County also treats water within the Division of Sewerage Management. Utilizing and treating water requires a lot of energy, incurs costs, and results in GHG emissions and other environmental impacts. While Erie County reaps the benefits of its proximity to Lake Erie, fresh water is a finite and increasingly limited resource and it is incumbent on the County to develop a water conservation strategy as part of its larger sustainability planning efforts.

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Several of Erie County's parks have significant shorelines, including but not limited to: Wendt Beach, Bennett Beach, Isle View, Akron Falls, Eighteen Mile Creek, Ellicott Creek, Hunter's Creek, as well as several natural habitat parks: Red Jacket, Thomas F. Higgins (formerly Bailey Peninsula), Seneca Bluffs Natural Habitat Park, Times Beach and Lakeview Pocket Preserve. Protecting and properly managing these parks and their shorelines can help protect water quality.

Beyond the County's ability to protect water through its internal operations, Erie County is also a leader in local stakeholder groups working on water quality, including the Western New York Stormwater Coalition and the Lake Erie Watershed Protection Alliance (LEWPA). The Western New York Stormwater Coalition is a bi-county forum that shares resources and works in partnership toward compliance with the United States Environmental Protection Agency (USEPA) Phase II Stormwater requirements. The overall goal of the Coalition is to utilize regional collaboration to assist member municipalities with regulatory compliance. The Coalition partners have developed many programs aimed at reducing the negative impacts of stormwater pollution. LEWPA was formed with Cattaraugus, Chautauqua, and Erie counties as a membership of stakeholders to proactively address water quality issues affecting the New York portion of the Lake Erie watershed and its shorelines. Erie County LEWPA representatives from local and regional government, as well as the Soil and Water Conservation District, are nominated by the Erie County Water Quality Committee. LEWPA provides grant funding for projects to address water quality through the NYS Environmental Protection Fund.

WATER CONSERVATION AND STORMWATER

Background

Aging buildings and infrastructure create challenges for Erie County to manage water efficiency effectively. Water conservation efforts can be achieved within Erie County's buildings and facilities through changes in preventative maintenance, addressing more efficient landscaping procedures, within kitchen and vehicle washing operations, as well as through employee engagement, education and outreach. Sustainability programs directed at water conservation are typically easily implemented, minimally invasive, and relatively inexpensive. Additionally, online tools, such as USEPA's Water Sense program, are available as a resource for implementing Erie County's water conservation efforts.

Erie County must also manage stormwater at its facilities. Both the Erie County Department of Public Works and the Erie County Sewer District No. 6 must comply with stormwater regulations. Nonpoint source pollution caused by runoff from storms carries natural and human-made pollutants directly into our lakes and streams, and ultimately into Lake Erie and the Niagara River. Through the Western New York Stormwater Coalition, Erie County staff receives training on best management practices that will reduce potential pollutant loadings from their day-to-day operations.

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The changing climate and projected increase in severe storms raises concerns about flooding. For this reason, the County should manage any wetlands and floodplains under its control to reduce flooding.

Recent successes:

- Erie County installed a cistern at the Aurora highway garage to capture roof runoff for non-potable water uses. The 27,000 gallon cistern conserves 750,000 gallons of water per year.
- Erie County Highway Department garages have also upgraded their fueling areas, salt storage practices, and floor drain configurations to better protect water quality.
- Recent shoreline restorations at Ellicott Creek Park, Bennett Beach Park, and the Natural Habitat Parks have emphasized the importance of riparian buffers and the role they play in filtering stormwater runoff before it enters our waterways. These softened the living shorelines, including in-water and near-shore plantings, encourage bank stabilization to minimize erosion sedimentation, as well as protect and enhance both aquatic and terrestrial wildlife habitat.
- Erie County, with grant funding, is currently developing a conceptual site plan and conducting a feasibility analysis for a constructed wetland on County property upstream of Bennett Beach on the shores of Big Sister Creek. A constructed wetland would improve water quality, habitat and recreation opportunities both for the creek and for Erie County's Bennett Beach.

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Water conservation and Stormwater Action Items

#	Measure Name	Priority Tier	GHG Reduction	Co-Benefits	Cost Efficiency	Feasibility
Wa-1	Stormwater Management - Identify and implement green infrastructure practices that reduce stormwater runoff and minimize pollutant loadings to waterways.	1				
Wa-2	Educate employees on the importance of water conservation and protection efforts through outreach activities	1				
Wa-3	Develop internal operational programs and policies to conserve water in County owned buildings	2				
Wa-4	Control erosion and flooding by recreating or enhancing natural shorelines using vegetation and other natural or organic materials	2				

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Wa-1 Stormwater Management - Identify and implement green infrastructure practices that reduce stormwater runoff and minimize pollutant loadings to waterways.

Priority Tier: 1
Timeline: On-going
Lead: DPW
Potential Partners: DPW, WNY Stormwater Coalition, LEWPA
Resources: Existing staff time

Stormwater conveyance systems are in place throughout Erie County to transport excess rain water back to the ground and waterways during and after precipitation events. Impervious surfaces, such as concrete and asphalt, prevent stormwater from absorbing into the ground. Pollutants on these surfaces get caught in the flow and are transported through the storm sewer system which, in most areas of Erie County, flows directly into waterways untreated.

Likewise, runoff from vegetated areas can enter storm sewers, carrying with it organic and inorganic pollutants like animal waste and pesticides. It is important for the County to incorporate green infrastructure and other strategies to reduce pollution entering our waterways.

The County will identify opportunities for green infrastructure and will utilize existing resources to implement green infrastructure practices such as permeable pavement, tree pits, and bioretention areas, which are proven methods to treat and reduce runoff. Protecting native trout stream buffers, headwaters areas, wetlands, floodplains, or other unique areas also improves water quality and prevents flooding. Coordinating with municipalities and stakeholder groups, such as the Western New York Stormwater Coalition and LEWPA, will ensure better organization of water management practices with land-use and conservation planning.

Additionally, the County will assess the feasibility of installing water collection and retention systems. Successfully collected rainwater from cisterns can be utilized in irrigation systems throughout building operations.

Co-benefits: Increase awareness of stormwater pollution prevention, resource conservation, decreased flooding, improved water quality
Next Steps: Through a natural resources inventory, identify areas for conservation in Erie County.

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Wa-2 Educate employees on the importance of water conservation and protection efforts through outreach activities.

Priority Tier: 1
Timeline: On-going
Lead: DEP
Potential Partners: Parks, WNY Stormwater Coalition, LEWPA, Buffalo Niagara Waterkeeper
Resources: Existing staff time

Lake Erie is the southernmost of the five Great Lakes and is also the shallowest, with an average depth of only 62 feet, making it the warmest and most biologically active of the Great Lakes. Lake Erie's watershed is densely populated, extensively farmed, and highly industrialized. With drainage from Ontario, Canada and the states of Michigan, Indiana, Ohio, Pennsylvania, and New York, Lake Erie is impacted by the activities of over 12 million residents. Activities by residents within Erie County municipalities, such as leaving pet/animal waste on the lawn or using fertilizers and pesticides affects the quality of these resources.

The County will use available resources to engage employees, as well as community members, in order to teach the importance of water conservation, stormwater and watershed protection and pollution prevention. Through outreach events and activities, the County will offer guidance and resources on ways to prevent or minimize pollution and offer educational outreach on pollution prevention and conservation methods.

Co-benefits: Improved water quality
Next Steps: DEP will to promote the water conservation to county employees. The County will explore partnering with LEWPA on installing educational signage along County roads to educate the public.

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Wa-3 Develop internal operational programs and policies to conserve water in County owned buildings.

Priority Tier: 2
Timeline: On-going
Lead: DPW
Potential Partners: Parks, DEP
Resources: Existing staff time

There are many opportunities to reduce internal water consumption in daily operations. The County owns and operates over 200 buildings where water is used throughout, including janitorial closets, kitchen operations, irrigation systems and vehicle washing stations. Strategies and policies will be identified to implement changes which conserve water, to create more efficient structures throughout building and land operations, as well as through employee engagement activities that encourage behavioral changes which conserve water.

The County will conduct surveys to identify plumbing fixtures that can be retrofitted with efficiency upgrades or replaced. These upgrades include installing water reduction devices, such as faucet aerators, waterless urinals, low-flow or dual flush toilets, updating plumbing fixtures and units when possible, as well as identifying water reclamation opportunities. Once identified, a schedule will be developed to change over the inefficient fixtures throughout all County buildings.

Additionally, a preventative maintenance program will be developed to identify potential problem areas and water leaks in all facilities within county-owned buildings. This will include a schedule for visual assessments and repairs and a quarterly checklist to systematically facilitate this preventative maintenance schedule.

Water conservation requirements and water efficiency design criteria will be developed and language will be added to specs for new construction and renovations. New construction projects will also assess the feasibility for water reclamation systems such as grey water diverter applications and rain water collection. Additional requirements may be considered, including requiring WaterSense labeled fixtures, or other third-party criteria.

Co-benefits: Reduced maintenance and labor costs
Next Steps: DPW - Buildings and Grounds will develop a recurring schedule to visually assess fixtures throughout County buildings to identify leaks and problem areas. Through the Core Green Team, policy changes to add water conservation considerations to bid specs and contracts.

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Wa-4 Control erosion and flooding by creating or enhancing natural shorelines using vegetation and other natural or organic materials:

a) Conduct shoreline/bank assessments;
b) Develop Sub-watershed Implementation Plans; and
c) Identify management strategies to protect eroded areas.

Priority Tier: 2
Timeline: On-going
Lead: DEP
Potential Partners: LEWPA, Parks, EC Soil and Water Conservation District
Resources: Existing staff time

As the climate changes, there will be an increased need to protect and stabilize our streams and lake shorelines from erosion and flooding. As part of the Niagara River/Lake Erie Watershed Management Plan, five (5) in-depth Sub-watershed Implementation Plans have been developed to identify shorelines in need of protection and/or remediation. There are 18 total sub-watersheds in the region, with nine (9) in Erie County that are currently unevaluated.

The County will begin stream assessments in the sub-watersheds to determine where pollution sources such as sediment, nutrients, or bacteria originate from, and determine where to focus future improvement projects. Sub-watershed Implementation Plans will be developed and will include high erosion areas and other potential pollution sources, as well as document potential best management practices to reduce these pollution sources to improve water quality and protect against flooding.

The County will seek partnerships with LEWPA and the Soil & Water Conservation Districts to perform these stream assessments and to develop plans documenting existing conditions, improvement targets, and potential management actions.

Two County-owned beaches, Bennett and Wendt, contain sand dunes that are showing significant erosion and damage. Additionally, there is substantial erosion on the Eternal Flame Trail in Chestnut Ridge Park. The County will seek funding to develop management strategies specifically for the improvement and protection of these areas and for sites identified in the future.

Finally, the Department of Public Works - Highway Department will review the procedures for cleaning, reshaping and vegetating roadway medians and ditches, and incorporate strategies to reduce soil erosion, improve visibility and safety, and reduce future maintenance.

Co-benefits: Habitat improvements, ecotourism
Next Steps: DEP will meet with LEWPA to strategize a shoreline assessment project of Erie County property. DPW will work with Erie County Soil and Water Conservation District on ditch maintenance, hydro-seeding, and other best practices.

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SEWERAGE MANAGEMENT

Background

The mission of the Erie County Division of Sewerage Management (DMS) is to provide cost effective, customer oriented wastewater service that protects public health and enhances the natural environment. The DSM fulfills this mission through the seven (7) Erie County Sewer Districts (ECSDs). The ECSDs are responsible for the construction, operation, maintenance, and administration of the County's sewerage infrastructure, including:

- Six (6) water resource recovery facilities (WRRFs);
- Five (5) overflow retention facilities;
- One (1) biosolids incineration facility;
- Approximately 1,200 miles of sanitary sewer and force mains;
- Over 25,000 manholes;
- Close to 100 pumping stations; and
- Over 500 low pressure grinder pump installations.

Many urban areas, such as the City of Buffalo, have combined sewer systems where stormwater and sanitary wastes were designed to be conveyed in the same network of pipes and other infrastructure to a wastewater treatment plant (or what is now called a 'water resource recovery facility' or WRRF). During large storm events, flows may increase such that bypasses from the combined system or combined sewer overflows (CSO) may be necessary.

The County's sewer districts operate as 'separate' sewers, where stormwater and sanitary sewage are collected and subsequently conveyed in two (2) different systems of pipes and other appurtenances. In an area where there are separate storm and sanitary systems, stormwater is conveyed directly to local waterways while sanitary wastes are transported to WRRFs.

Sanitary sewer infrastructure is critical to properly handle wastewater generated in the County. Responsibly managing this societal pollution is in the best interest of our community; however, to convey wastewater to WRRFs and properly treat it to protect public health and water quality requires a lot of energy. DSM operations account for 29% of Erie County's carbon footprint. The DSM's GHG emissions primarily result from electric use, waste biogas emissions, fuel use for incineration of biosolids, and natural gas use (*Figure 5*). It was not possible to separate DSM building energy use from process energy use, and emissions estimates include emissions from both buildings and processes.

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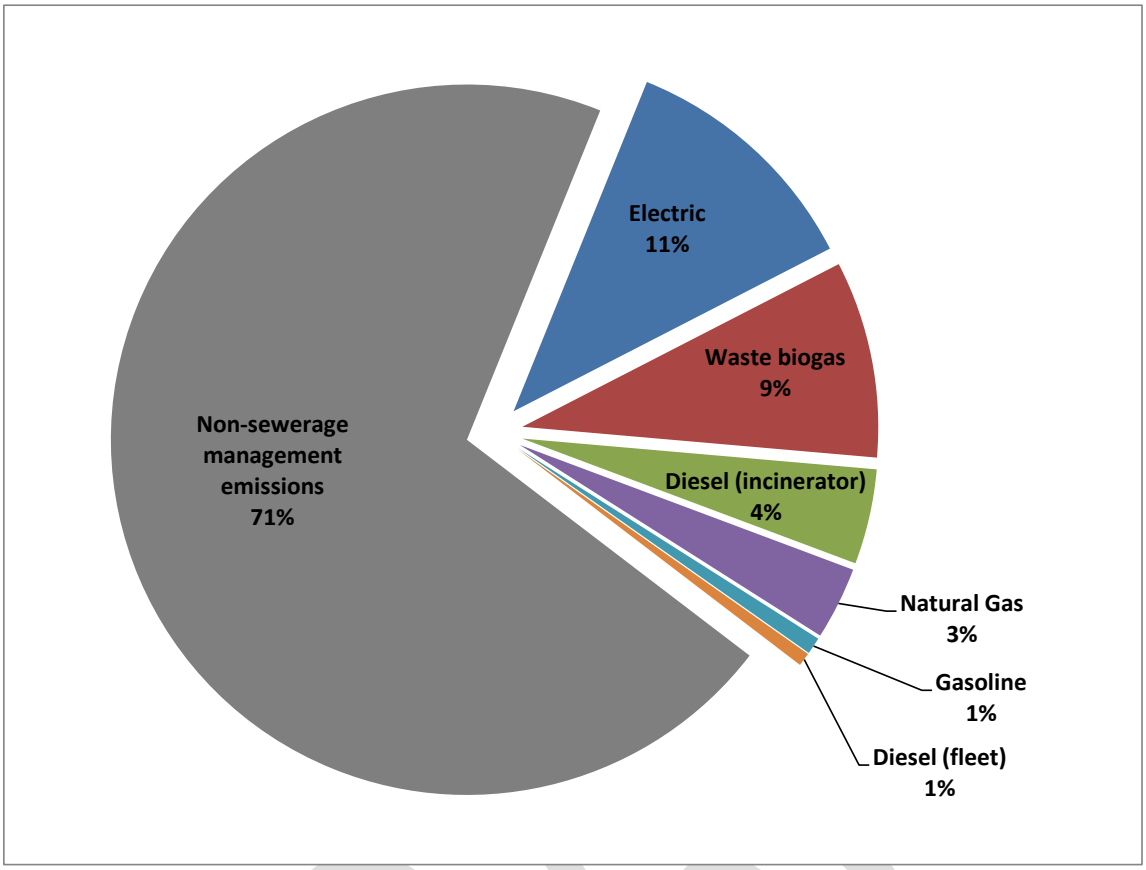

Figure 5: GHG emissions by source from Erie County sewerage management.

Recent Successes

The ECSDs have implemented a number of improvements in the last few decades to address its carbon footprint and GHG emissions in order to decrease electrical costs. These improvements include:

- Energy performance contracts at the Big Sister Creek, Lackawanna, and Southtowns WRRFs (the Big Sister Creek WRRF project alone annually saves 850,000kWh and 633 MTCO2e).
- Elimination of the Blasdell WRRF through the Rush Creek Intercept project.
- Replacement of numerous pumping stations with gravity sewer connections.
- Addressing infiltration/inflow (I/I) into the sewer systems to reduce the volume of wastewater treated and thereby reducing energy inputs.
- Upgrade of lighting, equipment, and facilities with "right sized" or more energy efficient units.
- Implementation of control changes (such as variable frequency drives) to replace constant speed operation of equipment.
- Enhancing/optimizing treatment processes to minimize electrical use.

The DSM continues to evaluate its operations to identify ways it can meet its mission while also considering its carbon footprint. The following measures detail planned initiatives to further address the GHG impacts associated with the services the ECSDs provide.

Sewerage Management Action Items

#	Measure Name	Priority Tier	GHG Reduction	Co-Benefits	Cost Efficiency	Feasibility
S-1	Investigate alternative means to manage biosolids at County owned water resource recovery facilities	1				
S-2	Address GHG Impacts at Water Resource Recovery Facilities	1				
S-3	Triple Bottom Line Decision Making Process for Large Capital Projects	1				
S-4	Assess Sewer Collection System Carbon Footprint	2				

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S-1 Investigate alternative means to manage biosolids at County owned water resource recovery facilities:

a) Evaluate existing biosolids disposal methods; and
b) Identify potential improvements for biosolids dewatering and stabilization.

Priority Tier: 1
Timeline: Mid-term
Lead: ECDSM
Partners: None
Resources: Existing staff time

The ECSDs are responsible for managing the solid byproducts of treated wastewater at six (6) County owned water resource recovery facilities (WRRFs, also referred to as wastewater water treatment plants). These byproducts are referred to as "biosolids." Ultimately, the final disposal method for biosolids produced at the County's WRRFs, after stabilization processes, is hauling to local landfills. The stabilization and transportation of biosolids is a significant source of DSM GHG emissions.

The DSM will investigate different disposal methods to potentially allow for additional resource recovery. New technologies have been developed whereby advanced stabilization of biosolids is achieved and the result is a highly desired fertilizer used for land application on farm fields. A change to land application would limit the volume of wastes sent to landfills, reducing emissions and costs, would provide a beneficial use of this resource, and would decrease the use of synthetic fertilizers.

In addition to investigating alternative disposal methods, the DSM will also investigate enhanced biosolids dewatering and stabilization methods. At the Southtowns WRRF, staff is continuing to implement upgrades to improve the performance of dewatering equipment to increase the percentage of solids in the dewatered biosolids, which in turn decreases costs and emissions associated with hauling and/or incineration. The Southtowns WRRF is also investigating the use of alternative fuels in the incineration process. As another example, the County's Lackawanna WRRF has anaerobic digesters and improvements may provide opportunities to recover additional energy from the process through better capture and/or use of methane generated by the aerobic digesters.

Co-benefits: Potential cost savings, natural resource conservation, and diversion from landfill.
Next Steps: DSM to create evaluation process for disposal methods and assess dewatering and stabilization processes for potential improvements.

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S-2 Address GHG Impacts at Water Resource Recovery Facilities:

a) Strategic energy management pilot; and
b) Potential combined heat/power.

Priority Tier: 1
Timeline: On-going
Lead: ECDSM
Partners: NYSERDA
Resources: Existing staff time

The six (6) WRRFs owned, operated, and maintained by the ECSDs utilize various processes and technologies to protect water quality and public health. While all of these facilities may use different means to accomplish the same goal, a common trait is that these facilities all require a lot of energy to perform at the required levels.

The DSM has implemented a number of energy reduction measures at its WRRFs to address electrical loads. These measures include (but are not limited to):

- Energy performance contracts,
- Right sizing equipment,
- Replacing pumps, motors, boilers, lighting and other components with more efficient models,
- Implementing better control of treatment processes, and
- Converting constant speed applications to variable speed operation.

The DSM will continue to implement similar measures as budgets allow and technologies advance. The DSM will also investigate other programs to address its electrical loads and the associated carbon footprint. NYSERDA recently released a program opportunity notice for a "Strategic Energy Management Pilot." From NYSERDA's notice, Strategic Energy Management is "a holistic approach to managing energy use, focusing both on behavioral and operational changes that result in continuously improving energy performance and long-term energy, cost, and carbon savings." The DSM applied and was awarded this program, which will provide the County access to training, coaching, and peer-to-peer knowledge sharing. Preliminary results from a similar initiative in another state found 7.8% savings annually on non-capital (operations/maintenance) projects.

Besides examining opportunities to decrease electrical loads, the DSM will also investigate the potential of generating power. Specifically, the Lackawanna WRRF has anaerobic digesters that generate methane as a byproduct of the process and this methane is currently captured and used as fuel for the boiler system at the facility. As upgrades are advanced at the Lackawanna WRRF, the DSM will determine if combined heat/power is feasible to allow for the generation of electricity.

Co-benefits: Decrease in operation/maintenance expenses, potential energy generation.
Next Steps: Work with NYSERDA on strategic energy management project.

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S-3 Triple Bottom Line Decision Making Process for Large Capital Projects.

Priority Tier: 1
Timeline: Short-term
Lead: ECDSM
Partners: None.
Resources: Existing staff time

The ECSDs recently received new State Pollutant Discharge Elimination System (SPDES) permits for some of its WRRFs. These SPDES permits contain additional requirements that necessitate large capital projects, new equipment, new processes, and other upgrades to meet more stringent discharge limitations to further protect water quality.

New processes installed at WRRFs typically add to the existing electrical loads at the facilities. For example, the Lackawanna WRRF may need additional filtration capability which could require the installation of significant energy-intensive components, including pumps, blowers, and backwash equipment

These upgrades are necessary to support environmental goals related to water quality protection. That said, because these upgrades may increase energy use the DSM believes it is critical to identify conservation measures to reduce its carbon footprint and support other environmental programs such as the County's GHG reduction goals. In an attempt to balance what are sometimes competing environmental drivers, the DSM plans to utilize "Triple Bottom Line" principles when assessing upgrade options. A Triple Bottom Line method looks not only at the financial impacts of an alternative, but also the social and environmental impacts as well. The DSM will utilize weighted matrices to account for these various factors in final decisions. By using this method, the "cost" associated with the comparative impact of GHG inputs will be incorporated into the evaluation of options along with more traditional cost metrics.

Co-benefits: Broader evaluation of potential impacts related to capital project decisions.
Next Steps: "Triple Bottom Line" matrices will be used for major WRRF capital improvement projects to assess options and formalize GHG impacts and other environmental factors into the decision making process.

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S-4 Assess Sewer Collection System Carbon Footprint:

a) Eliminate pumping stations, where practical and economical; and
b) Remove infiltration/inflow (I/I) from the systems to decrease pumping and treatment needs.

Priority Tier: 2
Timeline: Mid-term
Lead: ECDSM
Partners: None
Resources: Existing staff time

Seven ECSDs are responsible for managing over 1,100 miles of sanitary sewer and over 25,000 manholes spread out over a wide geographic area. Due to natural topography and/or the manner in which the sewer systems were developed, close to 100 pumping stations are used in ECSD collection systems for conveyance of wastewater to WWRFs.

The carbon footprint associated with sewer collection systems is affected by three main factors:

- Methane that may be released from the system,
- The number of pumps required to convey the wastewater, and
- The amount of extraneous flow (infiltration/inflow) in the system.

Methane is a sewer gas produced when anaerobic conditions occur in a sewer system. There is limited research on this topic (most sewer gas research has been around hydrogen sulfide) and considering the 25,000+ manholes in the ECSDs with numerous variables involved, it is not yet practical for the DSM to mitigate GHG emissions from this source.

The DSM has an ongoing program to evaluate options to eliminate pumping stations, when technically and economically feasible, and replace these facilities with gravity sewers that do not require mechanical means (and hence, electricity) for conveyance. Recent successes include the Rush Creek Interceptor and Aurora North Pumping Station Elimination projects. The DSM presently has designs to eliminate the Woodlands and the Commerce Green Pumping Stations located in the Town of Cheektowaga and Village of East Aurora, respectively. These projects will advance when the physical or process condition of these stations warrant capital investment. Further, while most "easy to eliminate" pumping stations have already been addressed, when future rehabilitation projects are considered, the DSM will evaluate feasibility of replacing the facility with a gravity sewer.

Separate sanitary sewer systems are not meant to collect groundwater or stormwater; however, extraneous flow from I/I is found in all systems due to leaking joints, defects, illegal connections, low-lying manholes or vents, and other sources. The DSM has a robust program to identify and eliminate I/I from both its collection system and the private properties that connect to it. Reduction of I/I decreases the amount of flow that must be pumped and treated, resulting in substantial energy use and GHG emissions reductions.

Co-benefits: Avoiding future capital costs, decrease in operation/maintenance expenses, address capacity concerns.

Next Steps: DSM will continually collect data to strategically address I/I with annual budget allocations. Projects to eliminate pumping stations will advance when capital

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monies are contemplated for these facilities based either on service concerns or failure of facility components.

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CHAPTER 7: PURCHASING

WNY Regional Sustainability Plan (2013) goals: Not Applicable

Erie County's Guiding Principles

- Purchasing Environmentally Preferable Products and services protect human health and the environment when compared with competing products or services that serve the same purpose.
- Creating public awareness about the County's purchasing programs will help drive broader community action.
- Be a leader to local governments in Erie County regarding sustainable purchasing practices.

Introduction

The Division of Purchase provides a centralized system for procurement of goods and services, management of surplus property and emergency event support for the County of Erie, and authorized political subdivisions, in an economical, transparent and efficient manner.

The purpose of policies and procedures within the Division of Purchase are to protect Erie County taxpayers by assuring that competition is sought in a reasonable, cost-effective manner for all procurements where practicable and required by law. It is the responsibility of the Division of Purchase to insure that internal efficiencies are achieved in order to minimize labor costs to procure goods and services. Within these policies and procedures, the County can make changes that will increase sustainability and reduce GHG emissions.

Currently, departmental staff uses a material group listing to choose the items they wish to procure. A material group listing exists for all items purchased, from the chemicals used in labs to the paper products used in offices. By creating internal systems that review procured items from bid specs and purchasable material group listings, the County can switch to environmentally friendly alternatives. Additionally, because most purchases are done at a departmental level, it is crucial to create a system that will itemize and evaluate those purchases and in turn, recommend sustainable alternatives.

Finally, since funding for sustainability measures is sometimes a concern, the County needs an ongoing finance mechanism to fund these projects.

Recent Successes

- Erie County currently requires at least 20% recycled content in its procurement of paper.
- Through a Green Team initiative, Styrofoam was removed from the material list for vendors to bid. This switched over 300,000 Styrofoam items to more environmentally friendly alternatives in County facilities that use tableware.

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- The Division of Purchase has modernized many procedures, including electronic purchase orders and its vendor database, all of which has reduced labor costs and paper waste.
- Through ongoing efforts to purchase more environmentally friendly cleaning products, the County has omitted bleach from all janitorial supplies. Essential oil-based applications are now used in the facilities to control pests and odors.

Companies that meet Green Seal Standards are sought to supply cleaning and other janitorial products.

Purchasing Action Items

#	Measure Name	Priority Tier	GHG Reduction	Co-Benefits	Cost Efficiency	Feasibility
P-1	Amend policies and procedures to consider the environmental impacts of procured products and services	1				
P-2	Develop financial mechanism to fund climate mitigation actions	1				
P-3	Organize a working group to evaluate departmental processes and identify green alternatives	2				

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P-1 Amend policies and procedures to consider the environmental impacts of procured products and services

Priority Tier: 1
Timeline: On-going
Lead: DEP, Purchasing
Partners: Full Green Team
Resources: Existing staff time

Erie County recognizes its responsibility to minimize negative impacts to the environment and recognizes that products and services the County procures have associated inherent impacts. The County will make purchasing decisions that embody, promote and encourage its commitment to sustainability and efforts to reduce GHG emissions.

The County currently follows procurement policies and procedures set by State and Federal regulations, and are not subject to change. The County will need to develop strategies to identify changes that can be made to the internal procedures to reduce the impact of products procurred.

Strategies will be developed to evaluate the products that are procured, through individual material group listings for each service and product bid. A pilot project to concentrate a single, known material group listing that likely contains chemicals, i.e. Janitorial Bids, may be a short-term strategy to test the action and then use as a template for other groups. Ultimately, these changes can be standardized through Executive Order directives and/or resolutions through Legislation.

The County will identify language to add to specifications that require potential applicants to adhere to our developed environmentally preferred procedures within their bids.

Co-benefits: Potential cost savings
Next Steps: DEP will continue to work with the Director of Purchasing to develop strategies to research material listing groups. The Core Green Team will discuss potential policy changes to add language to specifications and leases.

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P-2 Develop financial mechanism to fund climate mitigation actions

Priority Tier: 1
Timeline: On-going
Lead: Budget
Partners: DPW, DEP
Resources: Conservation savings

As noted in *Erie County Commits to Paris*, the County's internal operations have met the goals of the Paris Climate Agreement. As the report also notes, that was largely unintentional. It will be necessary to secure funding to initiate additional programs to further reduce GHG emissions and meet the County's goals identified in this plan.

As recommended in *Erie County Commits to Paris*, a 'Paris Fund' could be created out of fiscal savings from energy and other sustainability projects to be reinvested and fund additional projects.

The Energy Committee will review various methods for establishing such funds and recommend ways to track the fund's performance. In addition to investigating fund mechanics, the Energy Committee will develop criteria to determine eligible activities and purchases from the fund.

Co-benefits: Broad co-benefits from many actions.
Next steps: The Energy Committee, in coordination with the Division of Budget and Management, will propose a tracking methodology.

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P-3 Organize a working group to evaluate departmental processes and identify green alternatives:

a) Itemize departmental purchases; and
b) Research available alternatives.

Priority Tier: 2
Timeline: On-going
Lead: Purchasing
Partners: Full Green Team
Resources: To be determined

Since procurement of products is done within individual departments, it is essential that the process is evaluated at this level.

A working group, with representatives from Purchasing and DEP, will be established to work with the Sustainability Coordinator and departmental procurement staffs to itemize purchases, as well as research available alternatives, identify professional services utilized, and review construction specifications. Recommendations will be made to the Purchasing Director identifying the department's optimal procurement strategy.

A system will need to be developed to determine review periods after purchasing alternative products. This review or evaluation process will be put in place and will be evaluated to see the range of effectiveness the new product has compared to the original. If the new item falls within an 85% acceptable range over a certain amount of time, it can then replace the original product.

Co-benefits: Potential cost savings, waste reduction
Next Steps: The Sustainability Coordinator will meet with the Director of Purchasing to discuss additional representatives to participate in the procurement working group. Once established, committee will meet to discuss procurement opportunities.

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CHAPTER 8: IMPLEMENTATION, MONITORING PROGRESS, AND REPORTING

Introduction

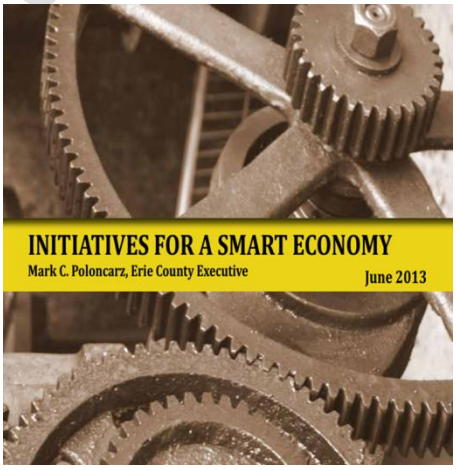
The Erie County Climate Action Sustainability Plan for Government Services and Operations will guide Erie County's GHG emissions reduction from its internal operations. The CASP outlines a course of action to reduce GHG emissions in the short term (2020), by the target year for the Paris Agreement (2025) and lays a foundation for achieving long term GHG emission reduction goals by 2040.

Although the County as a whole embraces a culture to serve, protect and represent the people of Erie County, within government buildings and agencies there is a wide-ranging assortment of departments each with unique sub-cultures and operations. The CASP will be most successful if it is fully integrated into the culture of the County through employee engagement and County leadership. It is important that each department takes steps to integrate applicable action items and goals into their operations to meet the reduction targets for the outlined years.

In order to remain relevant, the CASP should be viewed as a living document and will be revisited and updated regularly to address the changing environment. The County will regularly monitor the impact of the GHG emissions reduction measures being implemented and document changes every three (3) years in an updated GHG inventory.

Organizational structure and responsibilities:

Initially called for in Erie County's 2013 *Initiatives for a Smart Economy,* the Green Team was formed in 2015 after receiving funding from a NYSERDA, Cleaner Greener Communities Grant to develop a CASP for internal operations. The full Green Team is overseen by an executive committee called the "Core Green Team" which is chaired by the County Executive's Chief of Staff. The full team has representatives from all County departments, as well as those County organizations overseen by other elected officials, such as the Sheriff, Legislature, District Attorney, Comptroller and Clerk.



Core Green Team/ Full Green Team

The Core Green Team, which includes representatives from the County Executive's Office, Budget, Purchasing, Environment & Planning, Public Works, Parks, Information Support Services, and Social Services meets monthly to discuss current initiatives and to make executive decisions regarding the development of the CASP, as well as current Green Team projects.

For more than one year the full Green Team met monthly in the County Executive's conference room to identify pollution/waste sources within County operations and discuss possible solutions.

During the course of those monthly meetings, action items were implemented and feedback was provided back to the team. For example, a successful paper reduction initiative, which stemmed from the Green Team, resulted in reduced paper and printing equipment usage throughout the County, as well as reduced costs and energy use. Green Team representatives now meet quarterly to review action items identified in this report and encourage conservation efforts within their respective departments. They provide their departments with necessary tools and opportunities to tailor and implement the action strategies to fit in their own operational procedures. Additionally, they research alternatives to wasteful processes and encourage employees to provide suggestions to procedures they feel can become more efficient.

The Core Green Team and committees of the Green Team meet more frequently in order to pursue initiatives. Committees include: Paper Reduction Committee, Alternative Fueled Vehicles, Recycling, Land Management and Energy. The Energy Committee is discussed in more detail below.

Energy Committee

The Erie County Energy Committee is an interdepartmental Committee that pre-dates the Green Team, but now is a Green Team committee focused on building performance and renewable energy policies and projects. The Deputy County Executive and leadership from the Departments of Public Works, Environment & Planning and Budget meet monthly and oversee large projects such as the installation of a 2 MW solar array at the Alden Correctional Facility and significant energy conservation projects.

Paris Committee

Erie County's commitment to the goals of the Paris Climate Agreement was detailed in the *Erie County Commits to Paris* report that was released in January 2018. After publication of the report, it was determined that initiatives which are community-facing would be managed by the Paris Committee, whereas the Green Team and the Energy Committee would focus on projects and policies related to internal operations. This working group includes the County Executive's office, Law Department, Budget Office, Department of Public Works, Department of Environment and Planning, and the Erie County Environmental Management Council, and is chaired by the Deputy County Executive.

Environment Management Council (EMC) Committee

The EMC is an advisory board to the County, largely made up of municipal representatives, as well as 12 at-large members. In 2018, the EMC began assembling a Climate Change Task Force that, as a committee of the EMC, will provide expert guidance and community input to the County as it makes decisions about its climate and sustainability actions.

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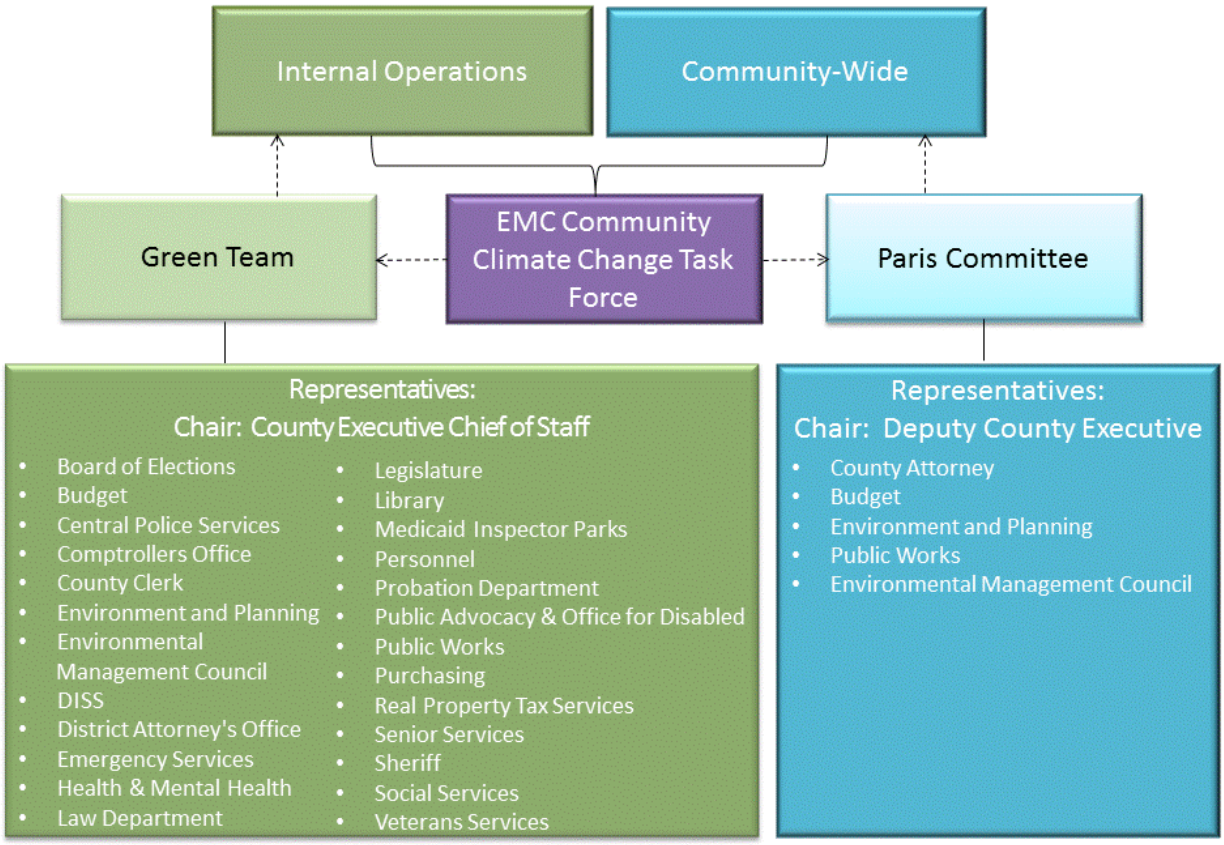

Figure 6: Breakdown of Erie County committees

Implementation Approach

Developing the CASP is a significant step in reaching the County's GHG emission reduction goals; however, additional planning and coordination is required to implement the identified actions. For example, the County may need to identify additional funding sources, conduct further research and analysis, coordinate interdepartmental projects, and, if wages, hours, or working conditions are affected, seek advisement from affected employee organizations. Completion of the actions recommended in the CASP will be overseen by the Erie County Green Team and the Sustainability Coordinator. To help ensure that the CASP effort persists, the Erie County Legislature will be requested to adopt this plan.

Departmental Green Team representatives will be responsible for reviewing the CASP and cooperating and assisting in the effort to reduce GHG emissions and increase efficiency within their departments. The individual departments are best positioned to identify strategies to address their specific operations. Identified measures should be integrated into policies, standard operating procedures, daily operations and culture of each department where possible including coordination with other departments, where similar action is being undertaken.

Although for successful execution, most County GHG emissions reductions will require executive level leadership and commitment, individual employees are integral to the success of many of the detailed action items listed. Employees can identify opportunities to reduce GHG emissions from their daily routines and procedures. It is critical that they are engaged and willing to present new ideas and identify waste reduction possibilities to their Green Team representative or through a designed suggestion box on the Erie County SharePoint site. Many of the employee-based action items will rely on the Green Team representative being an advocate for change within their departments as well as the County providing educational programs and outreach to help them understand their responsibilities.

Many action items have cut across multiple sectors. Those departments will play a key role in designing and carrying out those strategies. For example, the Division of Purchase will include requirements in policies and contracts which will impact other departments. Additionally, the Department of Information and Support Services will be the lead department when an action requires digitization or electronic work flows.

Climate Smart Communities certification and the CASP

Erie County pursued and was awarded a grant through the NYSDEC to fund the Sustainability Coordinator position to implement actions outlined in the CASP to become a Certified Climate Smart Community (CSC). A certified CSC sets goals and develops plans to decrease GHG emissions and energy use, increase renewable energy and efficiencies, and ultimately saves taxpayer dollars. By becoming a certified CSC, Erie County will demonstrate leadership and will create efficiencies that can be replicated in other governments throughout the State.

Membership in the Urban Sustainability Directors Network (USDN)

USDN is a membership organization of cities and counties whose mission is to accelerate sustainability in United States and Canadian communities. It has become the primary forum for peer learning and collaboration for communities like Erie County. Additionally, it has become a conduit for grant funding from sustainability oriented foundations. Erie County became a member of USDN in 2018, and is using USDN to link with other northeast counties and cities like Pittsburgh, Cincinnati and Detroit that have similar issues when addressing community and internal operations sustainability.

Key First-Year Deliverables

Action items identified were prioritized based on a ranking system that was averaged across four key elements: GHG reduction potential, co-benefits, cost efficiency, and feasibility. Action items that ranked highest were those that were easily executed or that were already in the implementation stage. These items will be the key deliverables for our first target year, 2020, including those actions that will contribute to the County becoming a Certified Climate Smart Community.

The CSC certification project will commence immediately following this report and will require submission and completion of action items needed for the basic level of CSC certification as well as additional priority actions to become Bronze certified. Many items identified in the CASP,

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including development of a Natural Resource Inventory as well as adopting more stringent standards for building and construction of County buildings, are potential action items needed to become a certified CSC.

Action Implementation Plans (AIP) will be developed for CSC actions and will build on the generalized planning within the CASP. They will lay out a detailed feasibility assessment, and concrete path to completion, including defined timelines, specific milestones and assignments. AIPs will allow completion and documentation of Actions within the timeframe of this grant whenever possible.

The Green Team effort will include planning and completing CSC Action Items, and will be a continuation of the existing, successful Green Team.

Monitoring and Reporting

It is integral to the efficacy of this plan to update progress on initiatives annually. Each action item has been assigned a lead department and the Green Team representative for that department will report back on the progress of the measure to the chapter committees and Green Team at the quarterly Green Team meetings.

The Sustainability Coordinator will be responsible for helping others replicate successful programs. Departments learn from each other department's successes and also from the obstacles they faced. The Green Team will help facilitate efforts to effectively manage projects and will make departmental partnership recommendations to the Sustainability Coordinator.

Review of CASP progress will occur annually. The annual CASP review will include an updated energy usage report every year, and a full update to the GHG inventory (including baseline adjustments) every three years. The report will also include progress, changes, additions, and omissions to the action items based on changing technology and /or environment. A summary of the annual review will be presented to the Green Team and will be available to all employees on the Erie County SharePoint website. A suggestion box is in place on this website for employees to voice their recommendations for actionable items within their departments and throughout County operations. Other ideas and suggestions can be made in confidence to the Sustainability Coordinator. The annual update reports will also be shared with the public on the County website.

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CONCLUSION

The 2018 Intergovernmental Panel on Climate Change report has made it even clearer that mitigating climate change is one of the most important challenges of our time. Through this internal operations CASP, Erie County has set aggressive but achievable GHG emission reduction goals, and laid out an actionable roadmap to achieve those goals. Erie County will also pursue Climate Smart Community certification through NYSDEC.

Erie County is also committed to leading community-wide GHG reductions to meet our Paris Climate goals. To this end, the County is engaging the community by working with the EMC's newly established Climate Change Committee.

Meeting the goals set forth in this Climate Action and Sustainability Plan as well as those in the *Erie County Commits to Paris* Report will require rethinking conventional approaches to operations, commitment at the highest level to implement the recommended actions outlined in this document, and the active involvement of all County employees.

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GLOSSARY OF TERMS

Action Item: The primary component of the Climate Action and Sustainability Plan. The action items are specific short, mid, and long-term policies, programs, and actions that the County will carry out to reduce its GHG emissions.

Adaptation: The ability of a system to adjust to, or minimize, the potential impacts of climate change or other environmental disturbances.

Alternative Fuels: Substitutes for traditional fossil-fuel-derived liquid motor vehicle fuels like gasoline and diesel. Includes biodiesel, hydrogen, electricity, compressed natural gas, methanol, ethanol, and mixtures of alcohol-based fuels with gasoline.

Alternative Fuel Vehicle: A vehicle powered by an alternative fuel as opposed to traditional gasoline or diesel.

Carbon Dioxide (CO_2): The GHG whose concentration is most affected by human activities. CO_2 also serves as the reference to compare all other GHGs (see Carbon Dioxide Equivalencies). The major source of CO_2 emissions is fossil fuel combustion. CO_2 emissions are also a product of forest clearing, biomass burning, and non-energy production processes such as cement production. Atmospheric concentrations of CO_2 have been increasing at a rate of about 0.5% per year and are now about 30% above preindustrial levels.

Carbon Dioxide Equivalencies (CO_2e): Emissions from different types of GHGs (carbon dioxide [CO_2], methane [CH_4], and nitrogen dioxide [N_2O]) are reported in terms of equivalent carbon dioxide units based on their ability to trap heat in the atmosphere. For example one ton of methane traps 21 times the heat of a ton of carbon dioxide, therefore, 1 ton CH_4 = 21 tons CO_2e. Similarly, 1 tons N_2O = 310 tons CO_2e.

Carbon Footprint: The total set of GHG emissions caused directly and indirectly by an individual, organization, event, or product.

Carbon Sequestration: See Sequestration

Climate: The average weather (usually taken over a 30-year time period) for a particular region and time period. Climate is not the same as weather. It is the average pattern of weather for a particular region. Climatic elements include average annual temperature, humidity, sunshine, wind speed, precipitation, and other measures of atmospheric conditions.

Climate Change: A significant change in climatic conditions (such as temperature, precipitation, or wind) that lasts for an extended period (decades or longer). Climate change should not be confused with weather, which is the short-term fluctuation in these conditions. A change in the climate effectively means that there is a new set of expected atmospheric conditions.

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Co-Benefits: Additional benefits that occur as a result of GHG reduction measures. These include financial savings, improved air quality, increased health or safety, better communications, improved employee morale, and natural resource concentration.

Composting: The controlled breakdown of organic material (e.g., plant trimmings, kitchen scraps, paper) through natural decomposition processes into a nutrient rich soil.

Compressed Work Week: An alternative work schedule that combines longer workdays with a day off. For example, a standard 40-hour work week is completed in 4 days rather than 5 days, or 80 hours of work are completed in 9 days rather than 10 days.

Decomposition: The process by which organic material (plants, animals, and items derived from them such as paper and wood products) breaks down into simpler forms of matter. Also commonly known as rotting.

Ecosystem: An ecological community of interdependent plant and animal species and their physical environment.

Electric vehicle: A vehicle that operates on an electric motor, powered by batteries, that is recharged by connecting it (plugging in) to an external electricity source.

Energy Conservation: Reducing energy consumption. Energy conservation can be achieved through energy efficiency (getting the most productivity from each unit of energy) or by reduced use of energy such as turning off appliances when not in use.

Energy Efficiency: Using less energy to provide the same level of service or complete the same task. For example, a more efficient light will use less electricity to provide the same amount of illumination.

Environmentally Preferable Purchasing: See Sustainable Purchasing

Flexible Schedule: Work arrangements that allow employees to deviate from a set schedule or location. This could include options for telecommuting, working a compressed work week, and starting or ending the workday at times other than conventional shift times (e.g., 8 am and 5 pm).

Fossil Fuel: A general term for combustible geologic deposits of carbon, including coal, oil, natural gas, oil shale, and tar sands. These fuels emit carbon dioxide into the atmosphere when burned, thus significantly contributing to the enhanced greenhouse effect.

Fuel Efficiency: The distance a vehicle can travel on an amount of fuel. This is most often measured in miles traveled per gallon of fuel. A higher-efficiency vehicle travels farther on a gallon of fuel than similar vehicles.

Global Warming: An increase in the near surface temperature of the Earth. Global warming has occurred in the distant past as the result of natural influences, but the term is most often used to

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refer to the warming predicted to occur as a result of increased emissions of GHGs due to human activity.

Green(ing): An environmentally preferable version of something (transforming something into a more environmentally friendly version of itself).

Green Building: A structure constructed using materials and building practices that reduce its impact on the environment throughout its entire life (siting, design, construction, operations, and deconstruction). Green buildings are resource efficient, using less energy, water, and other materials.

Green Infrastructure: The network of trees, plants, and natural ecosystems in a community. These provide services to a community, such as decreasing rainwater runoff, providing healthy soils, removing air pollutants and GHGs from atmosphere, and providing shade and beautification.

Greenhouse Effect: Carbon dioxide and other atmospheric gases warm the surface of the planet by trapping heat close to the surface of the Earth. In a natural state, the greenhouse effect warms the planet, making it habitable by humans. However, human activities have dramatically increased the amount of carbon dioxide and other GHGs in the atmosphere. Higher levels of GHGs trap more heat, causing temperatures to rise.

Greenhouse Gas: A gas, including water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), which traps heat close to the surface of the Earth, contributing to global warming and climate change.

Greenhouse Gas Reduction Measures: see Action Items

Hybrid Vehicle: A vehicle that uses both a conventional gasoline-powered internal combustion engine and an electric motor to achieve better fuel efficiency than a traditional vehicle. The vehicles have a battery pack that is recharged when the gasoline engine is producing more power than the vehicle needs to operate, therefore the vehicle does not need to be charged by an external electricity source (unlike a plug-in hybrid-electric vehicle or electric vehicle).

I/I: Infiltration/Inflow (I/I) is extraneous flow in separate sanitary sewer systems originating from stormwater or groundwater.

Infrastructure: The basic shared physical structures needed for an urban area to function in an efficient, safe manner. The term typically refers to items such as roads, drinking water systems, sewers, energy systems, and telecommunication systems in a community.

Jurisdiction: In general, a legal authority. The County is the governing body that oversees the unincorporated areas within its boundaries, therefore it has jurisdiction over those areas. The areas within the County's geographic boundaries can also be referred to as its jurisdiction. Similarly, other cities and counties are often referred to as other jurisdictions.

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Kilowatt (KW): One thousand watts.

Kilowatt-hour (kWh): an amount of electricity equivalent to the use of one kilowatt for one hour. A hundred watt light bulb that is on for 10 hours uses one kilowatt-hour of electricity (100 watts x 10 hours = 1,000 watt-hours = 1 kilowatt-hour). Electricity production or consumption is often expressed as kilowatt- or megawatt-hours produced or consumed during a period of time. Residential energy bills usually change users by cents per kilowatt-hour. A U.S. household might consume 10,000 kilowatt-hours per year.

Leadership in Energy and Environmental Design (LEED®): A set of green building standards developed for the U.S. Green Building Council. They provide a set of criteria against which the environmental sustainability of a building's design and construction or operations can be measured. Buildings can be LEED Certified, Silver, Gold, or Platinum depending on the number of criteria they fulfill.

Lifecycle assessment/lifecycle analysis: The evaluation of a product or service's impacts (environmental, financial, etc.) from production through use to disposal. A GHG lifecycle analysis of a product would include the emissions associated with the extraction and processing of raw material, manufacture, transportation to the County, use, and disposal (e.g., in a landfill, transfer to a reuse facility) at the end of its life. A lifecycle financial analysis would consider the costs to purchase, operate, and dispose of a product. This is often compared to an end user GHG analysis, which only considers the emissions associated with using a product, or a traditional financial analysis which focuses on the cost to purchase a product. Also known as a cradle-to-grave analysis.

Megawatt (MW): One million watts.

Methane (CH_4): A GHG that traps 21 times the amount of heat as carbon dioxide. (Recent research indicates this might be as high as 25 times; however, the USEPA uses a factor of 21 when calculating methane's impact on global warming). Methane is produced through the decomposition of waste in landfills, animal digestion, decomposition of animal wastes, incomplete fossil fuel combustion, and the production and distribution of natural gas, oil, and coal.

Metric Ton: Common international measurement for the quantity of GHG emissions. A metric ton is equal to 2,205 lbs. or 1.1 short tons (the common form of ton used in the United States).

Mitigation: A human intervention to either reduce the amount of GHGs being emitted into the atmosphere or remove previously emitted gases from the atmosphere.

National Fuel: The utility company that is the primary provider of natural gas in Western New York

National Grid / NYSEG: The utility company that is the primary provider of electricity in Western New York.

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Nitrous Oxide (N_2O): A powerful GHG with the ability to trap 320 times the amount of heat as a molecule of CO_2. Major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.

Nonpoint source pollution: Pollution generally resulting from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification.

Photosynthesis: The process by which green plants use light to synthesize organic compounds from carbon dioxide and water. In this process, carbon dioxide is absorbed from the air and oxygen and water are released. Through this process, plants become a very important reservoir for storing carbon dioxide in the form of carbon.

Plug-in Hybrid-Electric Vehicle: A hybrid vehicle with batteries that can be recharged from an external electric power source. Unlike a hybrid vehicle, it has a larger battery pack and a plug that connects to the electric grid in order to recharge. This external power source provides the vehicle with a much longer range per gallon of gasoline.

Pollutant: An air pollutant is a substance in the atmosphere that causes adverse effects to human health, property, or the environment.

Recycled-Content Products: Products made totally or partially from materials contained in items that would otherwise have been discarded, such as aluminum cans or paper. Recycled content products also include rebuilt or re-manufactured items, such as toner cartridges.

Recycling: A process that minimizes waste generation by recovering and reprocessing products that might otherwise be sent to a landfill. For example, recycling aluminum cans, paper, and bottles entails reprocessing them into new products that are made with fewer raw materials.

Renewable Energy/Power: Energy generated from sources that are naturally replenished or not used up in the course of providing power (e.g., wind, solar, biomass, and geothermal). This is in contrast to the burning of fossil fuels, which destroys the fuel source and thereby depletes the overall amount of fuel available.

Retro-Commissioning: A process in which specialists inspect major building systems (e.g., HVAC, lighting) and interview maintenance staff and building occupants to assess a building's performance and identify opportunities to improve the efficiency of its operations and to restore them to optimal performance.

Retrofit: The addition of new technology or features to older systems. For example, adding new energy-efficient lamps to existing lighting fixtures.

Sequestration: The uptake and storage of carbon from the atmosphere. Most commonly refers to trees and plants absorbing carbon dioxide through photosynthesis (see Photosynthesis).

Strategies: Groups of similar emissions reduction measures included in the Climate Action

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And Sustainability Plan.

Sustainable Purchasing: The procurement of goods and services that have a less harmful effect on human health and environment than competing goods or services that serves the same purpose. Sustainable purchasing decisions take into consideration criteria such as raw materials acquisition, production, manufacturing, packaging, distribution, operation, maintenance, reuse, disposal, energy efficiency, performance, durability, and safety, as well as needs of the purchaser and cost.

Sustainability: In a broad sense, the capacity to endure. In ecology, the word describes how biological systems remain diverse and productive over time. For human society, it is the potential for long-term maintenance of well-being, which in turn depends on the well-being of the natural world and the responsible use of natural resources. Sustainability has multiple facets: environmental, economic, and social.

Telecommute: A system that allows employees to work from home or locations other than their assigned office. Telecommuting usually involves having remote access to the business computer network and the office phone system.

United States Environmental Protection Agency (USEPA): The federal environmental science, research, education, assessment, and regulatory agency. The mission of the Environmental Protection Agency is to protect human health and the environment.

Water Resource Recovery Facility: A facility that converts wastewater into an effluent that can be returned to the water cycle with minimum impact on the environment or directly reused. Also known as a wastewater treatment plant.

Waste Assessment: An analysis of a facility's waste not being recycled or composted that involves sorting the garbage produced by type (e.g., paper, food waste, plastic) to determine what is being thrown away.

Waste Diversion: A waste reduction strategy focused on the recycling or composting of materials, diverting what would otherwise have been sent to a landfill for use in new products.

Waste Reduction: Techniques such as source reduction, recycling, or composting that reduce waste generation or prevent waste from being created at all.

Waste Stream: The total flow of solid waste from homes, businesses, institutions and manufacturing plants that is recycled, composted, burned, or disposed of in landfills.

WaterSense: A voluntary partnership program sponsored by the U.S. Environmental Protection Agency (EPA) - a label for water-efficient products and a resource for helping save water.

Watt: The standard measure of an amount of energy, usually electricity. For example, a 60 watt light bulb requires 60 watts of electricity to turn on. Energy use is measured in terms of the number of watts used over a period of time (see Kilowatt-hour).

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Weather: The specific condition of the atmosphere at a particular place and time. It is measured in terms of such factors as wind, temperature, humidity, atmospheric pressure, cloudiness, and precipitation. In most places, weather changes from hour to hour, day to day, and season to season. Climate is the average of weather over time and space. A simple way of remembering the difference is that climate is what you expect (e.g., cold winters) and weather is what happens (e.g., a blizzard).

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ACKNOWLEDGEMENTS

Erie County has demonstrated that addressing the issue of climate change and being environmentally responsible is a high priority. The CASP is the culmination of the hard work and persistence of many individuals at the County. Erie County's administration and staff have committed to lead by example and showcase how breaking down the silos of our government and working together, we can achieve the sustainability goals set within the CASP and beyond through the *Erie County Commits to Paris* report.

Thank you to the hundreds of employees who attended the outreach events and suggested ways to reduce GHG emissions throughout the wide range of County services and operations.

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Finally, during the CASP process our team lost two of its most beloved members, who were both instrumental in moving the CASP forward: Dan Fitzgibbons, Deputy Commissioner for Buildings and Grounds, and Kevin Higgins, Fleet Manager. They will be missed, and they will be in our thoughts as this work continues.

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