



# 2017

## Onondaga County Climate Action Plan Annual Update Report



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# EXECUTIVE SUMMARY

Onondaga County finalized its Climate Action Plan (CAP) in April 2012. This Plan recommended a suite of projects that would reduce greenhouse gas (GHG) emissions associated with County operations. The CAP is based upon a baseline greenhouse gas inventory, which was performed using County electricity and natural gas usage data from calendar year 2008 and County gasoline and diesel consumption data from calendar year 2010. Updates to this baseline are described in the introduction Section of this report. The 2012 CAP set an emissions reduction target of 25% over 25 years (2036). This amounts to an average reduction in emissions of 1% per year.

This annual Update Report details the progress that the County has made in achieving this goal to date, with a specific focus on calendar year 2017. In total, the County emitted 63,588 metric tons of CO<sub>2</sub> equivalent (MTCO<sub>2</sub>e) in 2017. This represents a 3% decrease in emissions since 2016 and a 2.5% decrease in emissions since the baseline year.

## 2017 County Emissions

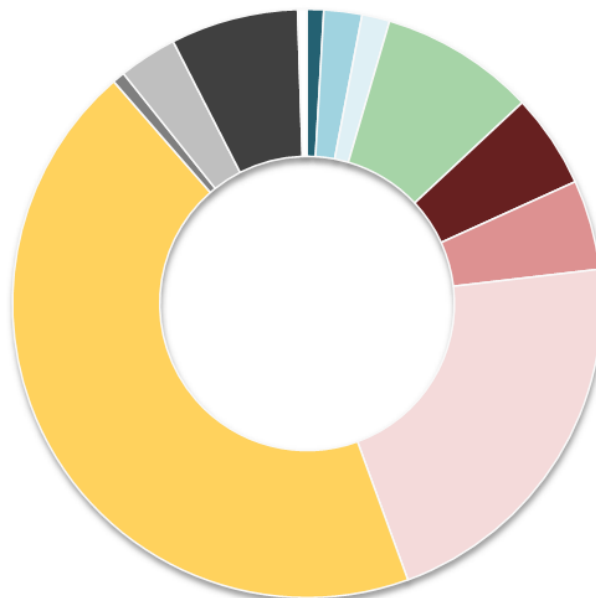
**63,588 MTCO<sub>2</sub>e**

## 2.5% reduction in emissions

**since baseline year**

In keeping with this annual reduction goal of 1% per year, the County strove to achieve a reduction in emissions of 5% by 2017. The County fell short of attaining this goal, however, it remains committed to doing so in the future. The target of a 1% reduction per year was made with the understanding that some years would not meet this mark and that others would exceed it. The County has a number of future projects planned that should result in a considerable reduction in greenhouse gas emissions. Examples of these projects are highlighted on Page 13 of this report. In addition, changes in the scope and nature of County functions have adversely impacted the progress on the CAP goals. However, prior County efforts to reduce GHG continue to benefit the community (see Analysis Section).

**2017 Total GHG Emissions by Department**



■ WEP	43.2%	■ OnCtr	3.3%
■ Fac. Mgmt	21.3%	■ DOC	2.1%
■ DOT	8.5%	■ OCPL	1.5%
■ Process Em.	7.1%	■ 911	0.9%
■ Sheriff	5.3%	■ Hillbrook	0.7%
■ Parks	5.0%	■ Other Depts.	0.5%

# INTRODUCTION

## 2012 CAP BASELINE OVERVIEW

Onondaga County finalized its Climate Action Plan (CAP) in April 2012. This Plan recommended a suite of projects that would reduce greenhouse gas (GHG) emissions associated with County operations. Appendix 1 provides a status update of the key recommendations included on Pages 3 and 4 of the 2012 CAP.

The CAP is based upon a baseline greenhouse gas inventory, which was performed using county electricity and natural gas usage data from calendar year 2008 and county gasoline and diesel consumption data from calendar year 2010. This baseline has since been updated to reflect process emissions from wastewater treatment operations (which were inadvertently not included in original baseline calculations), the sale of Van Duyn Home & Hospital and the consolidation of the Metropolitan Water Board (MWB) with the Onondaga County Water Authority. Van Duyn and the MWB were the third and fourth highest emitting County Departments, therefore their removal from the baseline and annual Update Reports moving forward will have a noticeable impact. Table 1 below shows the original 2012 CAP Annual GHG Emissions Baseline and the revised baseline.

**Table 1**  
**Original and Revised GHG Emission Baseline**

Baseline	Emissions
Original 2012 CAP Annual GHG Emissions Baseline	72,000 MTCO <sub>2</sub> e 25% reduction = 18,000 MTCO <sub>2</sub> e Average yearly reduction = 720 MTCO <sub>2</sub> e
Revised 2012 CAP Annual GHG Emissions Baseline <sup>1</sup>	65,121 MTCO <sub>2</sub> e 25% reduction = 16,280 MTCO <sub>2</sub> e Average yearly reduction = 651 MTCO <sub>2</sub> e

For the purposes of this document, the 2012, 2013, 2014, 2015 and 2016 annual Update Report calculations have been changed to reflect this revised baseline. The 2012 CAP set an emissions reduction target of 25% over 25 years (2036). This amounts to an average reduction in emissions of 1% per year. Therefore, the updated CAP baseline calls for a total reduction in GHG emissions of 16,280 MTCO<sub>2</sub>e (metric tons of CO<sub>2</sub> equivalent) over 25 years, or an average of 651 MTCO<sub>2</sub>e per year. The CAP states that this goal, and progress toward achieving it, should be evaluated every five years. The following section includes a summary of the first 5-year review.

**“The CAP sets an emissions reduction target of 25% over 25 years.”**



1) Excluding emissions associated with the Metropolitan Water Board and Van Duyn Home & Hospital. Including the initially omitted process emissions associated with wastewater treatment operations.

## FIRST 5-YEAR REVIEW DISCUSSION

Great effort was made to achieve the county's stated goal of a 1% reduction in GHG emissions per year. The County implemented large scale renewable energy and efficiency improvement projects at multiple facilities. It was anticipated that these projects would greatly reduce our GHG emissions. However, these facilities are no longer owned and operated by the County, therefore we cannot use these realized reductions in our calculations to achieve CAP goals. It is important to note that regardless of ownership, these projects will result in a reduction of greenhouse gas emissions and will generate a positive impact County-wide.

Examples of the recommended changes for improvements to the CAP recently provided to us through the first CAP evaluation are as follows<sup>2</sup>:

- Clearly track the progress of the Key Recommendations presented on Pages 3 and 4 of the 2012 CAP
- Expand the scope of the CAP beyond County operations to include a community-wide GHG inventory
- Include an assessment of Climate Change Hazards and Resiliency

Appendix 1 of this report contains the entire third party 5-Year Evaluation. The County is in the process of reviewing all of the recommendations provided by SUNY ESF and Syracuse University. This 2017 Update Report includes the 2012 Key Recommendations (Appendix 1). This will be included in future iterations of the annual Update Report. Furthermore, this 2017 Update Report has been restructured to include a more in depth description of projects completed this year and a discussion of future projects . This report will also be accompanied by a short fact sheet which will serve to provide outreach to the general public. The County's Environmental Sustainability Advisory Committee will convene in 2018 to comprehensively discuss the 5-year update recommendations.



2) Dr. Rick Smardon (SUNY ESF), Dr. Temir Teron (SUNY ESF), Janet Marsden (Syracuse University), Christa Kelleher (Syracuse University) and Cliff Davidson (Syracuse University) provided comments for the first 5-year CAP Review

## 2017 PROJECT HIGHLIGHTS

### Ley Creek Pump Station

The Ley Creek Pump Station is the largest pump station in WEP's wastewater conveyance system. It is able to send 60 million gallons of wastewater a day to the Metro Wastewater Treatment Plant. The 2017 upgrades to the Ley Creek Pump Station were the first in 27 years. Several energy efficiency measures were completed in 2017 as part of the Department's asset renewal project. The Pump Station features three wastewater pumps. Each of these pumps were outfitted with a variable frequency drive, which allows them to run at varying speeds based upon the volume of flow being managed. The Pump Station heating/cooling (HVAC) system was also replaced and 26 light fixtures were converted to LED lighting.

*Annual energy savings: 67,734 kWh*

*Annual reduction in MTCO<sub>2</sub>e: 22.27 MTCO<sub>2</sub>e*

### Oak Orchard Wastewater Treatment Plant

#### 'A' Building Infrastructure

A number of upgrades were completed at Oak Orchard's Building "A" in 2017. This project included the replacement of the existing biosolids pumps with four new pumps. The existing grit and effluent blowers were also replaced. These pump and blower replacements included the installation of variable frequency drives. Lighting upgrades resulted in the replacement of exterior lighting with LED fixtures.

*Annual energy savings: 238,247 kWh*

*Annual reduction in MTCO<sub>2</sub>e: 78.32 MTCO<sub>2</sub>e*

### Solar Array at the Oak Orchard Main Plant

A 2.65 megawatt solar array was installed at Oak Orchard's main plant. This project supplies approximately 70% of the electricity used at the facility each year.

*Annual energy savings: 80,139 kWh (array operational for portion of 2017)<sup>3</sup>*

*Annual reduction in MTCO<sub>2</sub>e: 148 MTCO<sub>2</sub>e in 2017, typical yearly reduction projected to be 207 MTCO<sub>2</sub>e*



3) 2018 energy savings should be significantly higher than 2017, as the system will be operational for an entire calendar year

# EMISSIONS BREAKDOWN

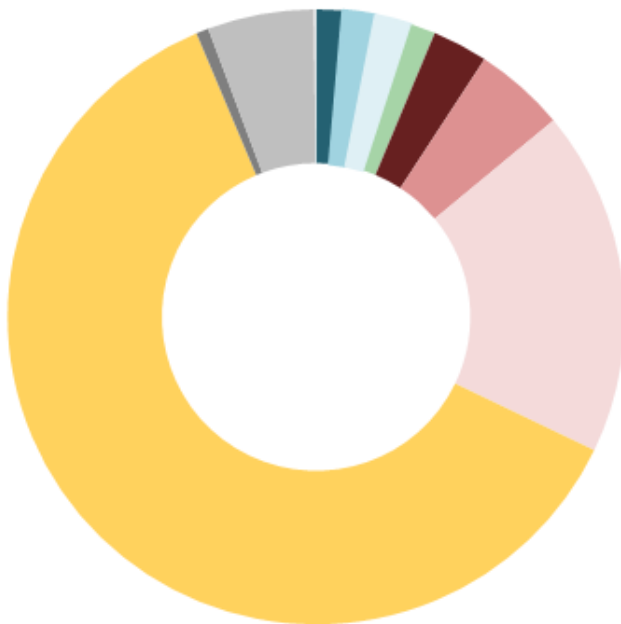
## Stationary Emissions

In 2017, Onondaga County used 109,075,913 kWh of electricity and 2,753,762 therms of natural gas in County-owned and operated facilities. GHG emissions associated with this stationary energy use were approximately 50,907 MTCO<sub>2</sub>e. Close to 70% of these emissions resulted from electricity usage and about 30% resulted from natural gas usage. The County generated and used 452,408 kWh of solar energy from its solar arrays located at the Oak Orchard Wastewater Treatment Plant. This solar generation accounted for .41% of the County's total electric usage and reduced GHG emissions by 148 MTCO<sub>2</sub>e in 2017. Please see the 2016 Annual Update Report for an explanation of the magnitude of solar power production at MWB sites (which remain in operation and were formally owned by the County).

The four largest generators of GHG emissions associated with electricity and natural gas use in County facilities are: Water Environment Protection (WEP) (50.8%), Facilities Management (26.9%), Parks and Recreation (5.6%) and Transportation (3.8%). Together, these four departments account for 87.1% of the County's stationary emissions. Figure 1 below shows the respective departmental emissions from 2017 electricity usage and Figure 2 below includes the respective departmental emissions from 2017 natural gas usage. Figure 3 on Page 8 shows the departmental breakdown of 2017 emissions resulting from total stationary energy use. Appendix 3 includes a breakdown of the magnitude of stationary emissions, in MTCO<sub>2</sub>e.

**Figure 1**

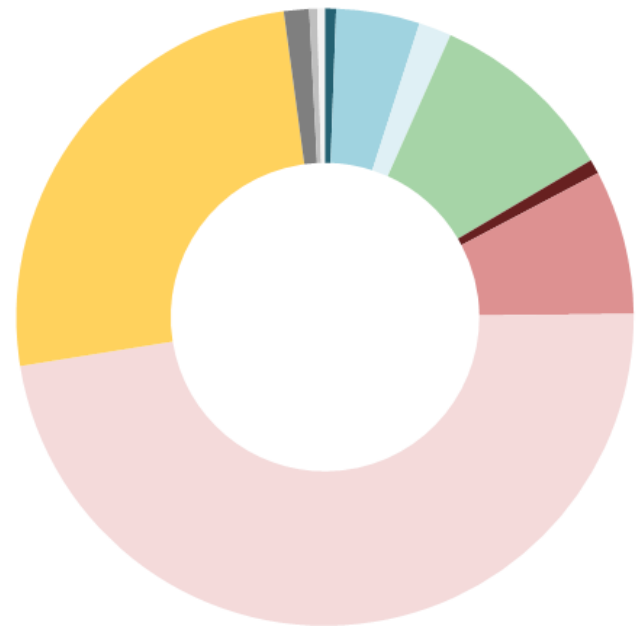
**2017 Electricity GHG Emissions by Department**



■ WEP	61.4%	■ DOC	1.7%
■ Fac. Mgmt	18.2%	■ 911	1.4%
■ OnCtr	5.6%	■ DOT	1.3%
■ Parks	4.8%	■ Hillbrook	0.7%
■ Sheriff	2.9%	■ BOE	0.1%
■ OCPL	1.9%		

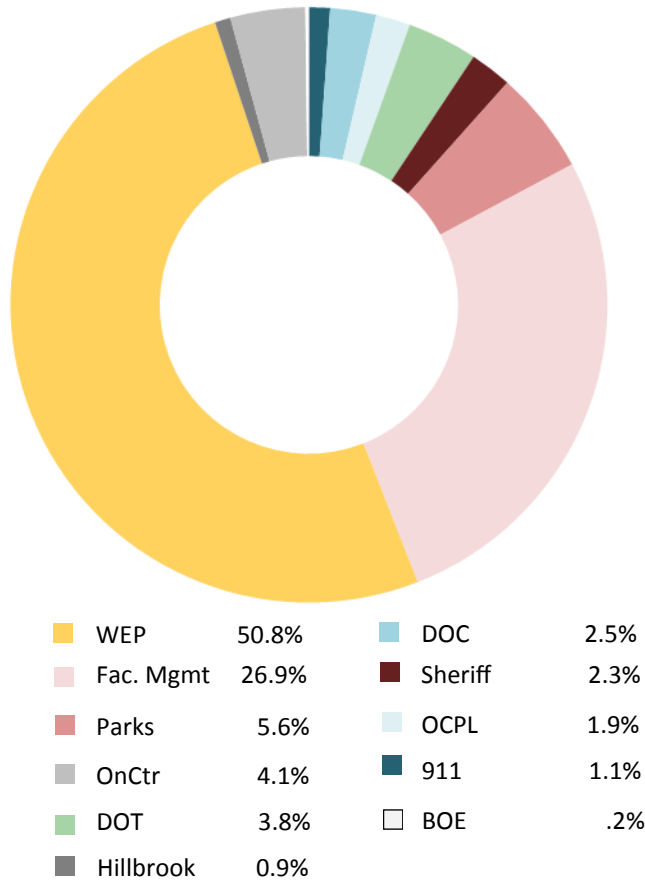
**Figure 2**

**2017 Natural Gas GHG Emissions by Department**



■ Fac. Mgmt	47.6%	■ Hillbrook	1.3%
■ WEP	25.3%	■ Sheriff	0.8%
■ DOT	9.9%	■ 911	0.6%
■ Parks	7.6%	■ OnCtr	0.4%
■ DOC	4.4%	■ BOE	0.4%
■ OCPL	1.7%		

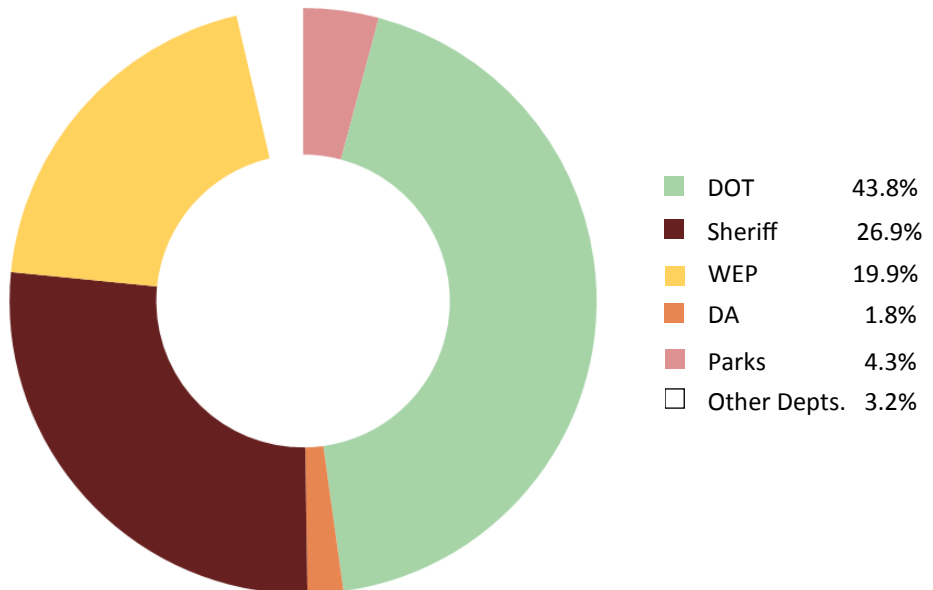
**Figure 3**  
**2017 Total Stationary GHG Emissions by Department**



### Vehicle Emissions

The County used 482,399 gallons of gasoline and 382,169 gallons of diesel fuel in 2017. GHG emissions associated with vehicle fuel use were 8,156 MTCO<sub>2</sub>e. Three Departments account for 90.3% of vehicle emissions. Figure 4 below shows the respective departmental emissions for 2017 vehicle fuel use. Appendix 3 includes a breakdown of the magnitude of vehicle emissions, in MTCO<sub>2</sub>e.

**Figure 4**  
**2017 Total Vehicle GHG Emissions by Department**

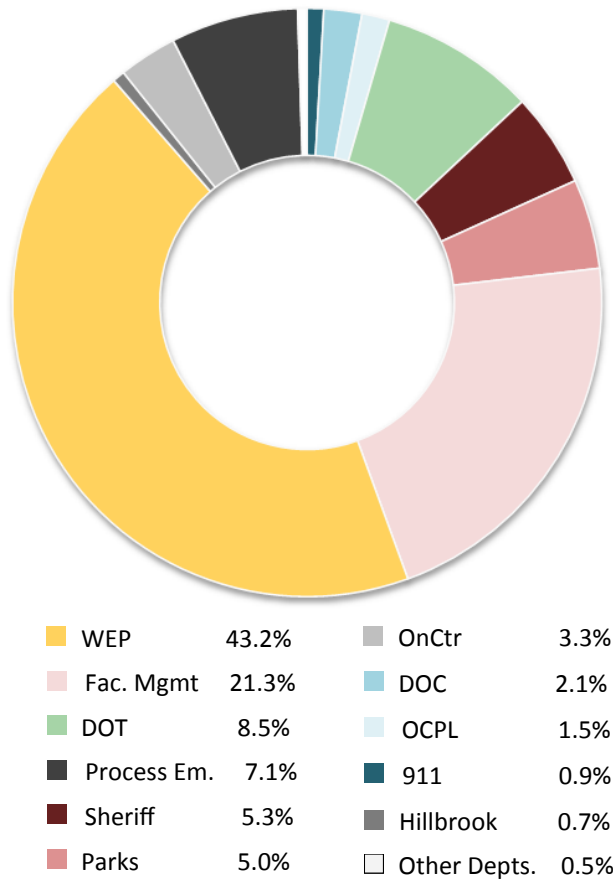




## Total Emissions

In total, Onondaga County emitted 63,588 MTCO<sub>2</sub>e in 2017. As previously stated, 50,907 MTCO<sub>2</sub>e are associated with stationary (building) energy use and 8,156 MTCO<sub>2</sub>e are due to emissions produced by the County's fleet. The balance (4,525 MTCO<sub>2</sub>e) resulted from wastewater process emissions. This process emissions figure has remained constant since the 2012 Summary Report and will remain so in future updates, until process emissions are recalculated based upon changes in population, as determined in the next census. Figure 5 below breaks down total County emissions, by department. The four largest GHG emitting departments are: WEP (43.2%), Facilities Management (21.3%), the Sheriff's Office (5.3%) and Parks and Recreation (5.0%). Appendix 5 includes a breakdown of the magnitude of total emissions, in MTCO<sub>2</sub>e.

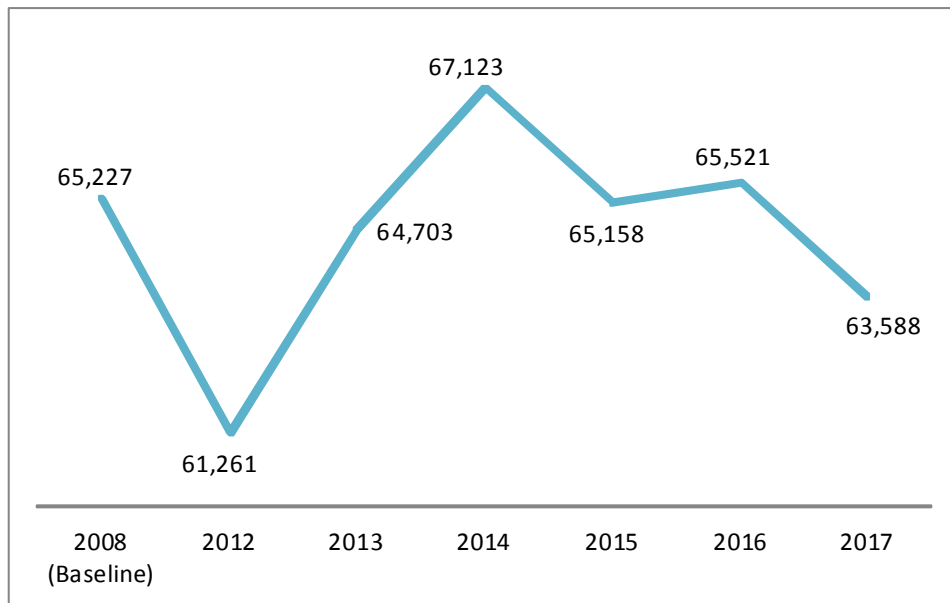
**Figure 5**  
**2017 Total GHG Emissions by Department**



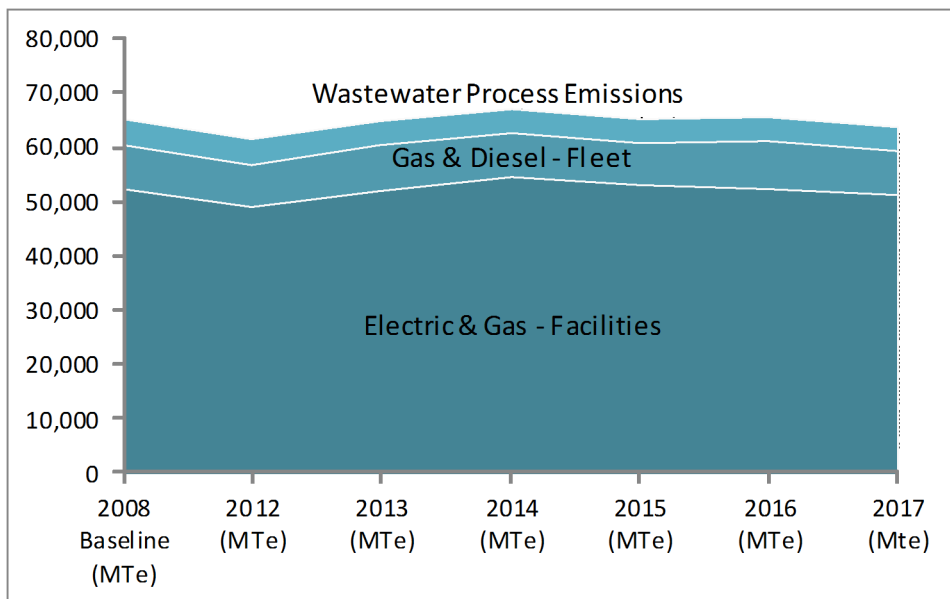
# ANALYSIS

As stated in the previous section, GHG emissions associated with County operations were 63,521 MTCO<sub>2</sub>e in 2017. The energy used in County facilities accounted for approximately 80% of emissions, while gas and diesel fuel emissions accounted for 13%. The remaining 7% of emissions resulted from wastewater process emissions. Figure 6 below details the trend in County GHG emissions over time and Figure 7 below shows a breakdown of emissions by source. Total emissions in 2017 were 3.0% lower than 2016 and 2.5% lower than the baseline year (2008). Table 2 on Page 11 details the trend in emissions over time, broken down by department, in MTCO<sub>2</sub>e.

**Figure 6**  
**Onondaga County GHG Emission Trend (MTCO<sub>2</sub>e)**



**Figure 7**  
**Onondaga County GHG Emissions by Source (MTCO<sub>2</sub>e)**



**Table 2**  
**GHG Emissions Trend by Department**

Department	2008 (Baseline MTCO <sub>2</sub> e)	2012 (MTCO <sub>2</sub> e)	2013 (MTCO <sub>2</sub> e)	2014 (MTCO <sub>2</sub> e)	2015 (MTCO <sub>2</sub> e)	2016 (MTCO <sub>2</sub> e)	2017 (MTCO <sub>2</sub> e)	% Change from Prior Year	% Change from Base Year
911	384	568	680	632	604	620	580	-6.5%	51.0%
DOC	1,422	1,240	1,355	1,495	1,398	1,276	1,268	-0.6%	-10.9%
Van Duyn	0	0	0	0	0	0	0	0.0%	0.0%
Libraries	856	786	842	843	812	827	948	14.6%	10.8%
DOT	1,905	1,554	1,762	2,173	1,881	1,852	1,944	5.0%	2.0%
Sheriff	1,291	1,145	1,130	1,170	1,144	1,159	1,155	-0.4%	-10.6%
Parks	2,772	2,367	2,498	3,007	2,860	3,024	2,852	-5.7%	2.9%
Facilities Management	15,015	13,971	13,663	14,712	14,190	14,127	13,681	-3.2%	-8.9%
WEP	26,275	24,899	27,231	27,960	27,373	26,852	25,885	-3.6%	-1.5%
MWB	0	0	0	0	0	0	0	0.0%	0.0%
Hillbrook	412	475	419	374	377	387	434	12.1%	5.3%
OnCtr	1,777	1,924	2,031	1,891	1,951	1,975	2,065	4.5%	16.2%
BOE		101	105	118	111	102	97	-5.2%	-3.8%
<b>Total</b>	<b>52,109</b>	<b>49,031</b>	<b>51,716</b>	<b>54,376</b>	<b>52,701</b>	<b>52,202</b>	<b>50,907</b>	<b>-2.5%</b>	<b>-2.3%</b>
<b>Vehicle Emissions</b>	<b>8,301</b>	<b>7,706</b>	<b>8,462</b>	<b>8,223</b>	<b>7,933</b>	<b>8,795</b>	<b>8,156</b>	<b>-7.3%</b>	<b>-1.8%</b>
<b>Waste Water Process Emissions</b>	<b>4,817</b>	<b>4,525</b>	<b>4,525</b>	<b>4,525</b>	<b>4,525</b>	<b>4,525</b>	<b>4,525</b>	<b>0.0%</b>	<b>-6.1%</b>
<b>Total GHG Emissions</b>	<b>65,227</b>	<b>61,262</b>	<b>64,703</b>	<b>67,124</b>	<b>65,159</b>	<b>65,521</b>	<b>63,588.24</b>	<b>-3.0%</b>	<b>-2.5%</b>

The 2012 CAP set a goal of reducing emissions by 25% in 25 years. This translates to an average reduction of 1% per year. 2017 emissions met the annual reduction goal of 1%/year; however the County's overall progress is behind its intended target. At this point, emissions should be 5% lower than where they stood in 2008.

The vast majority of departments decreased their fuel usage in 2017 (as compared to 2016). In fact, the Department of Transportation saw a decrease of about 530 MTCO<sub>2</sub>e (~13% reduction). This downward trend in vehicle emissions is expected to continue as older, less fuel efficient vehicles are replaced by more fuel efficient models. Water Environment Protection (WEP) is the largest emitting County department. However, as shown in the 2017 Project Highlights and in the 2018 Planned Projects, WEP is placing an emphasis on energy efficiency. Future annual Update Reports are expected to show a significant decrease in WEP emissions.



Weather has a large impact on yearly emissions. Large amounts of energy are required to heat and cool buildings, and as such, excessively hot or cold years will lead to higher emissions. Heating degree days (HDD) and cooling degree days (CDD) are used to report the energy needed to heat and cool buildings. Higher HDD and CDD values translate to a larger number of very cold and very hot days per year. It is helpful to compare historic HDD and CDD values in order to gauge if reductions in GHG emissions are due to actual gains in efficiency and conservation or if they are perhaps related to a milder year in terms of temperature or weather. Snow and rainfall also have an impact on yearly energy use. For example, heavy snowfall leads to greater use of snowplows and associated fuel. Heavy rainfall leads to an increased demand for electricity to run pumps. Table 3 below details the HDD, CDD, snow and rainfall totals for 2017 and compares them to 2016 and 2008 (baseline).

**Table 3**  
**Historic HDD, CDD, WTR and SNW Values and Comparison**

Weather	2008	2012	2013	2014	2015	2016	2017	% Change from Prior Year	% Change from Base Year
HDD	6,587	5,394	6,504	6,754	6,744	6,320	5,247	-16.98%	-20.34%
CDD	541	953	712	647	717	809	562	-30.53%	3.88%
HDD+CDD	7,128	6,347	7,216	7,401	7,461	7,129	5,809	<b>-18.52%</b>	<b>-18.50%</b>
WTR (in)	41.77	35.11	40.32	40.50	41.86	40.53	42.18	4.07%	0.98%
SNW (in)	126.50	78.60	123.50	117.20	94.10	140.00	80.80	-42.29%	-36.13%

2017 saw about 18.5% fewer combined HDD and CDD days than in both 2016 and 2008. In fact, 2017 had a lower combined number of HDD and CDD than any other year that has been evaluated as part of the CAP. It also saw 42% and 36% less snow than 2016 and 2008, respectively. 2017 rainfall was slightly greater than in 2016 and within 1% of the baseline year. Overall, 2017 was a good deal milder than the average year included in the study. Table 4 below includes a breakdown of historic emissions per HDD+CDD. This calculation normalizes emissions for changes in weather and seeks to show if the County is achieving a true reduction in emissions or if fluctuations in weather patterns are contributing to reductions.

**Table 4**  
**Historic Emissions per HDD+CDD**

	2008	2012	2013	2014	2015	2016	2017
HDD+CDD	7128	6347	7216	7401	7461	7129	5809
Total Emissions (MTCO <sub>2</sub> e)	65,227.20	61,261.52	64,703.42	67,123.58	65,158.97	65,521.31	63,588.24
MTCO <sub>2</sub> e/HDD+CDD	9.15	9.65	8.97	9.07	8.73	9.19	10.95

These normalized values show that emissions have remained steady or have slightly decreased most years. However, the value for 2017 suggests that reductions in this year are likely associated with fluctuations in the weather rather than due to true gains in efficiency and conservation. As a final note, it is important to note that the St. Joseph's Health Amphitheater at Lakeview became operational during 2016. This facility, and any others built in the future, will increase the County's emissions as compared to the baseline. Therefore, it will be more difficult to attain yearly reduction targets. However, future facilities will be constructed with newer, more efficient fixtures and thus will have a smaller impact on emissions than a comparable, older facility. Although the County has not attained its annual emissions reduction goal of 1%/year it remains committed to doing so. Implementation of the CAP is still in the early stages and 19 years remain to meet the overall goal of achieving a 25% reduction in emissions. The next section highlights some of the projects that the County has planned in 2018.

# PLANNED PROJECTS

The County has a number of future projects planned to reduce energy consumption and associated greenhouse gas emissions. This section offers a highlight of planned projects. Future annual Update Reports will discuss these projects, and others, in greater depth. In order to meet its 25% emission reduction target by 2036, the County must reduce its emissions by 651  $MTCO_2e$  each year. The three highlighted projects below have the potential to reduce County emissions by 1,894  $MTCO_2e$ , which is equivalent to achieving approximately 3 years of target reductions.

## Department of Water Environment Protection, Metro Plant

### Aeration Blower Upgrades

Metro uses oxygen to help treat wastewater. This oxygen is supplied to aeration tanks through the use of blowers. At times, the current 15 year old blowers provide more air than is necessary. This older system limits opportunities for energy efficiency, therefore this project will upgrade the blowers with more efficient blower technology and improved system controls.

*Estimated annual electricity cost savings: \$203,141*

*Estimated annual energy savings: 2,776,011 kWh*

*Estimated annual reduction in  $MTCO_2e$ : 913  $MTCO_2e$*

## Department of Water Environment Protection, Metro Plant

### RAS Pump Replacement

Return Activated Sludge (RAS) is a key component of the wastewater treatment process. RAS is pumped from a later stage of the treatment process back to an earlier stage of the process. This recycling of material helps to ensure that wastewater is effectively treated. The existing RAS pumps operate at a constant pumping rate, regardless of the flow volume requiring treatment. The new pumps will be smaller in horsepower and will be equipped with variable frequency drives, which will reduce energy use and costs.

*Estimated annual electricity cost savings: \$135,765*

*Estimated annual energy savings: 1,785,316 kWh*

*Estimated annual reduction in  $MTCO_2e$ : 587  $MTCO_2e$*

## Department of Water Environment Protection, Oak Orchard Plant

### Oxygen Basin Mixer Replacement

The wastewater treatment process requires oxygen. Oak Orchard is currently equipped with aeration (air circulation) equipment that is approximately 40 years old. They also run at a constant speed and do not have variable speed capability. This project will replace these antiquated models with new, variable speed aerators, which will reduce the energy requirement of the system.

*Estimated annual electricity cost savings: \$93,281*

*Estimated annual energy savings: 1,198,696 kWh*

*Estimated annual reduction in  $MTCO_2e$ : 394  $MTCO_2e$*



# APPENDICES

**Appendix 1: 2012 CAP Key Recommendations: Status Update**

**Appendix 2: 2017 Electricity and Natural Gas (Stationary) Emissions**

**Appendix 3: 2017 Gasoline and Diesel (Fleet) Emissions**

**Appendix 4: Total 2017 Greenhouse Gas Emissions**

**Appendix 5: 5-Year CAP Evaluation**



# Appendix 1

## 2012 CAP Key Recommendations—Status Update

Category	Recommendation	Status	Notes
Energy			
	Adopt a hierarchy of policies and practices to reduce energy consumption and reduce associated GHG emissions. The hierarchy should generally be as follows: 1) Conserve, 2) Improve efficiency, 3) Use energy not produced by fossil fuels		
	Reduce the amount of unoccupied County office and operational space and either sell, lease, or put excess space into "shut-down" mode		
	Establish County goals and standards for the energy efficiency of its facilities and publically disclose building performance		
	Identify priority facilities (worst energy performance) using Portfolio Manager Benchmarking tool		
	Verify energy and GHG reductions actually realized by implemented energy conservation measures via Portfolio Manager Tool		
	Consider increasing the use of energy that does not rely on fossil fuels for production		
Green Buildings			
	Adopt an aggressive approach leading to the establishment of Green Building Standards employing the United States Green Building Council's Leadership in Environmental and Energy Design (LEED) rating system for all buildings owned, and where possible, occupied by Onondaga County		
	All County projects should be reviewed by a Department of Facilities Management LEED Accredited Professional (AP) to determine the category of LEED certification which appropriately applies to the defined scope of work		
	All new construction, interior construction and core and shell projects that are designed by contracted design professionals should achieve LEED Silver as a baseline certification		
	All renovation work performed on existing buildings under the supervision of Facilities LEED Aps, for the defined project scope, should meet LEED Silver criteria as baseline, to be verified (not certified) using the most appropriate USGBC criteria and checklists, including and Re-Green		

Appendix 2 will eventually be switched to landscape format, to account for the Notes section

Fleet			
	Purchase and use the smallest and/or most fuel efficient vehicle makes and models available that meet the intended uses and operational needs of the department for which the vehicles are intended. Include a minimum efficiency standard in miles per gallon by type of vehicle and include such a standard in any new vehicle procurement specifications		
	As appropriate (based on fuel prices, fuel efficiency, infrastructure considerations and GHG emission reductions) begin converting the County fleet to alternative fuel vehicles		
	The County should develop and departments should maintain an inventory and perform routine analysis of their fleet vehicles and, based on this inventory, departments should identify older vehicles that are used infrequently, as well as those that are disproportionately inefficient and schedule their elimination or replacement		
	Implement a no idling policy prohibiting County employees from idling County-owned or operated vehicles		
Purchasing			
	Integrate life cycle cost analysis, including direct and indirect costs, in the procurement of products requested by County departments		
	Use the buying power of the County and participating municipalities to encourage changes in the products (and associated packaging) and services the County receives and the cradle to cradle process used to make them		
	Fully implement the elements of the existing County Administrative Directive concerning the purchase and use of environmentally preferable products		
Outreach			
	The County should create a targeted and consistent messaging campaign, with and for County employees, integrating concepts embodied in the County's "Path for a Sustainable Future" initiative - which includes GHG emission reduction initiatives - into all facets of County government		
Financing			
	Establish a funding mechanism to implement those GHG reduction projects that provide the best economic payback or largest GHG reduction per dollar invested		



## Appendix 2

### 2017 Onondaga County Electricity and Natural Gas (Stationary) Emissions

#### Onondaga County Climate Action Plan 2017 Electricity Usage and Greenhouse Gas Emissions

Department	Electrical Usage (kWhr)	Electrical Usage (MWh)	CO <sub>2</sub> Emissions (Mton/yr)	CH <sub>4</sub> Emissions (Mton/yr)	N <sub>2</sub> O Emissions (Mton/yr)	CO <sub>2</sub> e Emissions (Mton/yr)	% of total emissions
911	1,499,881	1499.9	490.39	0.02	0.01	493.06	1.38%
DOC	1,853,197	1853.2	605.91	0.02	0.01	609.20	1.70%
Van Duyn	0	0.0	0.00	0.00	0.00	0.00	0.00%
OCPL	2,100,891	2100.9	686.90	0.02	0.01	690.63	1.93%
DOT	1,402,231	1402.2	458.47	0.02	0.01	460.96	1.29%
Sheriff	3,167,630	3167.6	1,035.67	0.03	0.02	1,041.30	2.90%
Parks	5,216,332	5216.3	1,705.51	0.06	0.03	1,714.77	4.78%
Fac. Mgmt.	19,806,378	19806.4	6,475.79	0.22	0.10	6,510.96	18.16%
WEP <sub>1</sub>	67,111,857	67111.9	21,942.55	0.73	0.33	22,061.70	61.53%
MWB	0	0.0	0.00	0.00	0.00	0.00	0.00%
Hillbrook	715,040	715.0	233.79	0.01	0.00	235.06	0.66%
OnCtr	6,092,996	6093.0	1,992.13	0.07	0.03	2,002.95	5.59%
BOE	109,480	109.5	35.80	0.00	0.00	35.99	0.10%
<b>Total<sub>2</sub></b>	<b>109,075,913</b>	<b>109,076</b>	<b>35,663</b>	<b>1</b>	<b>1</b>	<b>35,857</b>	<b>100.00%</b>
<b>Total Solar<sub>3</sub></b>	<b>452,408</b>	<b>452</b>	<b>147.92</b>	<b>0.00</b>	<b>0.00</b>	<b>148.72</b>	

- 1) Reflects total electricity usage of 67,564,265 kWh less 372,269 kWh of solar generation at the Oak Orchard Lagoon site and less 80,139 kWh of solar generation at the Oak Orchard WWTP site
- 2) Total solar generation = 452,408kWh, approximately .41% of total electric usage
- 3) Solar generation reduced GHG Emissions by 148 CO<sub>2</sub>e Mt

#### Onondaga County Climate Action Plan 2017 Natural Gas Usage and Greenhouse Gas Emissions

Department	Electrical Usage (Therms)	Electrical Usage (MMBtu)	CO <sub>2</sub> Emissions (Mton/yr)	CH <sub>4</sub> Emissions (Mton/yr)	N <sub>2</sub> O Emissions (Mton/yr)	CO <sub>2</sub> e Emissions (Mton/yr)	% of total emissions
911	15,889	1,588.9	84.21	0.01	0.00	86.84	0.58%
DOC	120,535	12,053.5	638.84	0.06	0.00	658.78	4.38%
Van Duyn	0	0.0	0.00	0.00	0.00	0.00	0.00%
OCPL	47,133	4,713.3	249.80	0.02	0.00	257.61	1.71%
DOT	271,385	27,138.5	1,438.34	0.14	0.00	1,483.25	9.86%
Sheriff	20,723	2,072.3	109.83	0.01	0.00	113.26	0.75%
Parks	208,030	20,803.0	1,102.56	0.10	0.00	1,136.99	7.55%
Fac. Mgmt.	1,311,818	131,181.8	6,952.64	0.66	0.01	7,169.74	47.64%
WEP	699,476	69,947.6	3,707.22	0.35	0.01	3,822.99	25.40%
MWB	0	0.0	0.00	0.00	0.00	0.00	0.00%
Hillbrook	36,366	3,636.6	192.74	0.02	0.00	198.76	1.32%
OnCtr	11,286	1,128.6	59.82	0.01	0.00	61.68	0.41%
BOE	11,121	1,112.1	58.94	0.01	0.00	60.78	0.40%
<b>Total</b>	<b>2,753,762</b>	<b>275,376</b>	<b>14,595</b>	<b>1</b>	<b>0</b>	<b>15,051</b>	<b>100.00%</b>

**Onondaga County Climate Action Plan**  
**2017 Greenhouse Gas Emissions Associated with Stationary Energy Use**  
*(Combined Electricity and Natural Gas Emissions)*

<b>Department</b>	<b>Electrical Usage (kWhr)</b>	<b>Nat. Gas Usage (Therms)</b>	<b>CO<sub>2</sub> Emissions (Mton/yr)</b>	<b>CH<sub>4</sub> Emissions (Mton/yr)</b>	<b>N<sub>2</sub>O Emissions (Mton/yr)</b>	<b>CO<sub>2</sub>e Emissions (Mton/yr)</b>	<b>% of total emissions</b>
<b>911</b>	1,499,881	15,889.0	574.61	0.02	0.01	579.90	1.1%
<b>DOC</b>	1,853,197	120,535.0	1,244.75	0.08	0.01	1,267.99	2.5%
<b>Van Duyn</b>	0	0.0	0.00	0.00	0.00	0.00	0.0%
<b>OCPL</b>	2,100,891	47,133.0	936.70	0.05	0.01	948.23	1.9%
<b>DOT</b>	1,402,231	271,384.6	1,896.80	0.15	0.01	1,944.21	3.8%
<b>Sheriff</b>	3,167,630	20,723.0	1,145.50	0.04	0.02	1,154.56	2.3%
<b>Parks</b>	5,216,332	208,030.0	2,808.06	0.16	0.03	2,851.75	5.6%
<b>Fac. Mgmt.</b>	19,806,378	1,311,818.0	13,428.43	0.87	0.11	13,680.70	26.9%
<b>WEP</b>	67,111,857	699,476.0	25,649.77	1.08	0.34	25,884.68	50.8%
<b>MWB</b>	0	0.0	0.00	0.00	0.00	0.00	0.0%
<b>Hillbrook</b>	715,040	36,366.0	426.53	0.03	0.00	433.81	0.9%
<b>OnCtr</b>	6,092,996	11,286.0	2,051.95	0.07	0.03	2,064.64	4.1%
<b>BOE</b>	109,480	11,121.0	94.74	0.01	0.00	96.77	0.2%
<b>Total</b>	<b>109,075,913</b>	<b>2,753,762</b>	<b>50,258</b>	<b>3</b>	<b>1</b>	<b>50,907</b>	<b>100.00%</b>

## Appendix 3

### 2017 Onondaga County Gasoline and Diesel (Fleet) Emissions

#### Onondaga County Climate Action Plan

#### 2017 County Gasoline and Diesel Fuel Usage and Greenhouse Gas Emissions

(Total Fleet Emissions)

Department	Gasoline (Gallons)	Diesel (Gallons)	CO <sub>2</sub> (Mton/yr)	CH <sub>4</sub> (Mton/yr)	N <sub>2</sub> O (Mton/yr)	CO <sub>2</sub> e (Mton/yr)	% of total
District Attorney	18,111	0	160	0.0045	0.0016	160.16	2.0%
Corrections	8,143	1,073	83	0.0022	0.0008	82.93	1.0%
Transportation	51,716	304,855	3,550	0.0489	0.0310	3,560.52	43.7%
E911	806	0	7	0.0002	0.0001	7.13	0.1%
Emergency Management	2,891	40	26	0.0007	0.0003	25.97	0.3%
Facilities	8,930	603	85	0.0023	0.0009	85.11	1.0%
Fire Coord	0	0	0	0.0000	0.0000	0.00	0.0%
Health	4,917	0	43	0.0012	0.0004	43.48	0.5%
Hillbrook	362	0	3	0.0001	0.0000	3.20	0.0%
Library	4,192	0	37	0.0010	0.0004	37.07	0.5%
Mental Health	138	0	1	0.0000	0.0000	1.22	0.0%
MWB	0	0	0	0.0000	0.0000	0.00	0.0%
ON Center	780	92	8	0.0002	0.0001	7.83	0.1%
Parks	26,874	9,903	337	0.0079	0.0033	338.46	4.1%
Sheriff	246,461	681	2,178	0.0616	0.0224	2,186.48	26.8%
Social Services	0	0	0	0.0000	0.0000	0.00	0.0%
Van Duyn	0	0	0	0.0000	0.0000	0.00	0.0%
WEP	107,755	64,922	1,608	0.0345	0.0154	1,613.77	19.8%
BOE	20	0	0	0.0000	0.0000	0.18	0.0%
Purchasing	0	0	0	0.0000	0.0000	0.00	0.0%
Probation	304	0	3	0.0001	0.0000	2.69	0.0%
<b>Total</b>	<b>482,399</b>	<b>382,169</b>	<b>8,129</b>	<b>0.1654</b>	<b>0.0767</b>	<b>8,156</b>	<b>100%</b>

# Appendix 4

## Total 2017 Onondaga County Greenhouse Gas Emissions

### Onondaga County Climate Action Plan

#### 2017 Greenhouse Gas Emissions

(Combined Stationary and Fleet Emissions)

Department	2008 (Baseline MTCO <sub>2</sub> e)	2012 (MTCO <sub>2</sub> e)	2013 (MTCO <sub>2</sub> e)	2014 (MTCO <sub>2</sub> e)	2015 (MTCO <sub>2</sub> e)	2016 (MTCO <sub>2</sub> e)	2017 (MTCO <sub>2</sub> e)	% Change from Prior Year	% Change from Base Year
911	384	568	680	632	604	620	580	-6.5%	51.0%
DOC	1,422	1,240	1,355	1,495	1,398	1,276	1,268	-0.6%	-10.9%
Van Duyn	0	0	0	0	0	0	0	0.0%	0.0%
Libraries	856	786	842	843	812	827	948	14.6%	10.8%
DOT	1,905	1,554	1,762	2,173	1,881	1,852	1,944	5.0%	2.0%
Sheriff	1,291	1,145	1,130	1,170	1,144	1,159	1,155	-0.4%	-10.6%
Parks	2,772	2,367	2,498	3,007	2,860	3,024	2,852	-5.7%	2.9%
Fac. Mgmt	15,015	13,971	13,663	14,712	14,190	14,127	13,681	-3.2%	-8.9%
WEP	26,275	24,899	27,231	27,960	27,373	26,852	25,885	-3.6%	-1.5%
MWB	0	0	0	0	0	0	0	0.0%	0.0%
Hillbrook	412	475	419	374	377	387	434	12.1%	5.3%
OnCtr	1,777	1,924	2,031	1,891	1,951	1,975	2,065	4.5%	16.2%
BOE		101	105	118	111	102	97	-5.2%	-3.8%
Total	52,109	49,031	51,716	54,376	52,701	52,202	50,907	-2.5%	-2.3%
Vehicle Emissions	8,301	7,706	8,462	8,223	7,933	8,795	8,156	-7.3%	-1.8%
Waste Water Process Emissions	4,817	4,525	4,525	4,525	4,525	4,525	4,525	0.0%	-6.1%
Total GHG Emissions	65,227.20	61,261.52	64,703.42	67,123.58	65,158.97	65,521.31	63,588.24	-3.0%	-2.5%