




visioncny

Central New York
Regional Sustainability Plan

Appendix

CLEANER GREENER COMMUNITIES — NY WORKS for Business

June 2013

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Section A: Summary of Goals, Targets, Strategies, and Project Examples

To assist in the review of the CNY Regional Sustainability Plan, the following tables are presented which summarize the goals, targets, strategies and project examples that stakeholders in Central New York have identified during the planning process that would help communities achieve the sustainability principals outlined in the Plan. In reviewing this information it is important to note that the list of project examples outlined in the tables is not meant as a prioritization and this listing will be updated over time to include new projects that are identified throughout the implementation phase of the Plan and to remove projects that have been completed or become obsolete for any reason.

The information presented in this section includes project examples that were submitted by the planning team, the Technical Advisory Committee, focus group representatives, as well as members of the general public. These projects are in various stages of planning and design and were chosen, in part, for consideration in the Plan based on a qualitative assessment that was used by the planning team that took into consideration several factors including the projects likely impact on population increase, per capital income and job growth, improvements in the management of energy resources in CNY, green-house gas reductions, community resiliency, environmental stewardship, and improved quality of life. In applying this qualitative assessment, a project impact rating is presented from low to high or along the lines of a direct or indirect impact for each project activity. For purposes of the regional plan, this rating system is purposely vague and subjective, designed more to generate community discussion than to provide a precise measure of community impact at this stage of planning process.

OUTLINE

Energy—Summary of Goal, Targets, Strategies, and Project Examples

Goal

IMPROVE THE REGION'S ENERGY MANAGEMENT BY INCREASING THE EFFICIENCY OF RESIDENTIAL AND COMMERCIAL BUILDINGS, CURTAILING ENERGY DEMAND, INCREASING THE USE OF LOCAL CLEAN ENERGY SOURCES IN PLACE OF FOSSIL FUELS, AND ACCELERATING THE DEVELOPMENT OF ADVANCED ENERGY TECHNOLOGIES.

Targets

- REDUCE REGIONAL ENERGY CONSUMPTION PER CAPITA, INCLUDING ELECTRICITY AND FUELS, BY 40% (BELOW 2010 LEVELS) BY 2030.
- INCREASE THE AMOUNT OF ELECTRICITY GENERATED BY RENEWABLE SOURCES WITHIN THE REGION TO MEET 25% OF THE REGION'S CONSUMPTION BY 2030.
- INCREASE THE ANNUAL ENERGY SAVINGS ACHIEVED THROUGH NYSERDA-FUNDED COMMERCIAL ENERGY EFFICIENCY PROJECTS BY 35% BY 2020 AND BY 50% BY 2030.
- CERTIFY 20% OF EXISTING PUBLIC BUILDINGS TO ENERGY STAR® OR SIMILAR ENERGY-EFFICIENCY STANDARDS BY 2030.
- INCREASE THE PORTION OF NEW RESIDENTIAL BUILDINGS BUILT TO ENERGY STAR® OR SIMILAR ENERGY-EFFICIENCY STANDARDS TO 50% BY 2030.

Strategies

Short-Term Opportunities

a. Reduce energy consumption and improve energy efficiency in residential and commercial buildings.

b. Promote the development of renewable energy resources.

c. Increase access to private and public financing options for investments in energy efficiency and distributed generation.

d. Prepare a Regional Energy Roadmap.

Long-Term Initiatives

e. Facilitate the use of combined heat and power.

f. Develop district energy systems.

g. Develop neighborhood-scale "net zero" projects.

h. Upgrade or replace power generation, transmission, distribution and storage systems to encourage the development of renewable energy resources and smart grid technologies including vehicle-to-grid.

i. Foster local innovation including the development of clean energy businesses.

j. Encourage the deployment of advanced energy technologies such as hydrogen fuel cells.

Energy

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Syracuse Hancock International Airport Solar PV	Airport has sufficient open space to accommodate a large ground-mounted solar farm. This project will demonstrate solar PV technology at a highly visible location.	N	High	Concept	Funding, Siting	Low	Low	Low	High	Direct	High	Low	Low
Clay MWB Reservoir Solar PV	Two new reservoir tanks could accommodate 1.4 MW solar PV system that would generate approximately 1,824MWh per year. Under virtual net metering policy, the system could offset MWB energy costs at multiple sites.	Y	Med	Concept	Funding, Siting	Low	Low	Low	High	Direct	Med	Low	Low
Port of Oswego Solar PV	Roof of Port's main facility could accommodate 1+ MW solar PV system that would generate power for all Port buildings and a portside electrification system for docked vessels.	Y	Med	Concept	Funding, Siting	Low	Low	Low	High	Direct	Med	Low	Low
Camillus Honeywell Waste Beds Solar PV	Substantial vacant land is available to accommodate a large ground-mounted solar farm. This project would demonstrate solar PV technology at a highly visible location within the community.	N	High	Concept	Funding, Siting	Low	Low	Low	High	Direct	High	Low	Med
SUNY Cortland Solar PV and Geothermal	Retrofit existing ice rink and pool facility with heat pump system that extracts heat from ice making operation and uses the recovered heat to maintain pool water temperature. Roof-mounted solar PV system would provide on-site power.	Y	Med	Concept	Funding, Siting	Low	Low	Low	High	Direct	Med	Low	Low
OCC Coulter Library Geothermal	Replace existing dual duct system for 90,000 sq. ft. library with GHP HVAC installation.	Y	Low	Concept	Funding, Siting	Low	Low	Low	High	Direct	Med	Low	Low

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Cazenovia Empire Farmstead Brewery Geothermal	A GHP system would be a natural complement to the proposed 20,000 sq. ft. brewing operation, where waste heat such as that present in the mash be extracted to heat the building in winter.	Y	Low	Concept	Funding, Siting	Low	Low	Low	Med	Direct	Med	Low	Low
Syracuse Community Health Center Geothermal	The SCHC will construct a new 60,000 sq. ft. medical office building on South Salina Street in Syracuse.	Y	Low	Concept	Funding, Siting	Low	Low	Low	High	Direct	Med	Low	Low
SUNY Oswego Wind Energy System	Campus location on shoreline of Lake Ontario is suitable for a large wind turbine such as 65-meter G58-850 which would produce approximately 1,900MWh per year.	Y	Med	Concept	Funding, Siting	Low	Low	Low	High	Direct	Med	Low	Low
Oswego Novelis Aluminum Wind Energy System	Campus location on shoreline of Lake Ontario is suitable for a large wind turbine such as 100-meter GE 1.6 MW which would produce approximately 6,073MWh per year.	N	Med	Concept	Funding, Siting	Low	Low	Low	High	Direct	Med	Low	Low
Fabius Community Wind Farm	Feasibility study is underway to discover economic or technical fatal flaws for a community-based wind farm project that could supply on-site power to large users in the area or sell wholesale power.	N	High	Concept	Funding, Siting, Market	Low	Low	Low	High	Direct	Med	Med	Low
Auburn State Dam Hydropower Facility	Study completed in 2006 by City of Auburn and NYPA indicated there was potential for hydro development at the City owned and operated State Dam. The City anticipates developing a new hydroelectric facility at the State Dam site with a potential plant capacity of 315kW to 800kW.	Y	Med	Concept	Funding, Siting, Regulatory	Low	Low	Low	High	Direct	Med	Low	Low
Cazenovia WWTP Hydropower Facility	The Town of Cazenovia has examined the use of turbines at Chittenango Creek to generate power for its wastewater treatment plant.	Y	Med	Concept	Funding, Siting, Regulatory	Low	Low	Low	High	Direct	Med	Low	Low

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Onondaga County District Heating and Cooling	Existing plant provides steam and chilled water to ten county-owned buildings in downtown Syracuse and the Everson Museum of Art. Potential to expand system to serve commercial buildings including a new hotel near the Oncenter convention center or to provide heating hot water to nearby public housing complexes.	Y	High	Concept	Funding, Siting, Regulatory	Low	Low	Low	High	Direct	High	Low	Low
Syracuse University Steam Station Improvements	6.5 MW gas turbine generator with heat recovery steam generator. 1.4 MW backpressure steam turbine.	Y	High	Concept	Funding, Siting	Low	Low	Low	High	Direct	High	Low	Low
SUNY Oswego Lake Source District Energy System	Campus location on shoreline of Lake Ontario makes it a candidate for a lake source water cooling system, like facility at Cornell University . Non-contact cooling water from the lake could directly cool a campus chilled water loop, serve as a cooling source for a heat pump chiller system or a combination of both.	Y	High	Concept	Funding, Siting, Regulatory	Low	Low	Low	High	Direct	High	Low	Low
Syracuse Inner Harbor District Energy System	Destiny and COR Development's proposed $350 million mixed-use facility could provide an anchor load for a district energy system in Syracuse Lakefront	N	High	Concept	Funding, Siting, Regulatory	Low	Low	Low	High	Direct	Med	Low	Med
Syracuse Near West Side Demonstration Project	Upgrade all residential and commercial buildings and consider technologies that will reduce fossil fuel consumption for heating and cooling including geothermal or CHP/CCHP on a single target block or street.	N	Med	Concept	Funding	Med	Low	Low	Med	Direct	Med	Low	Med
Syracuse Xavier Woods Demonstration Project	33-unit residential subdivision includes energy-efficient homes that will be built to allow easy installation of clean energy systems including solar PV and solar thermal.	Y	High	Design	Funding	Low	Low	Low	Med	Direct	Med	Med	Med
Syracuse Public Lighting Efficiency Upgrade	There are approximately 18,000 street lights in the city, which account for more than 50% of total municipal electricity costs. Upgrade to LEDs or High-efficiency induction fixtures would reduce costs by as much as 70% with a payback of about 2 to 3 years.	Y	High	Concept	Funding, Regulatory	Low	Low	Low	High	Direct	Low	Low	Low

Infrastructure—Summary of Goal, Targets, Strategies, and Project Examples

Goal

PROVIDE INFRASTRUCTURE THAT REDUCES GREENHOUSE GAS EMISSIONS, REVITALIZES EXISTING COMMUNITIES, IMPROVES THE QUALITY OF LIFE, STRENGTHENS TARGETED INDUSTRY CONCENTRATIONS, AND IMPROVES THE REGION'S COMPETITIVENESS.

Targets

- REDUCE THE TOTAL VEHICLE MILES TRAVELED ANNUALLY IN THE REGION BY 25% BY 2030.
- DECREASE THE NUMBER OF BRIDGES AND ROADS THAT ARE RATED AS "DEFICIENT" OR "POOR" BY 25% BY 2030.
- UPGRADE 25% OF THE REGION'S WASTEWATER TREATMENT PLANTS BY 2030.
- MAINTAIN THE AMOUNT (NO NET DECREASE) OF ELECTRIC POWER PRODUCTION WITHIN THE REGION THAT IS DERIVED FROM CARBON-FREE SOURCES.
- INCREASE THE PERCENTAGE OF CNY RESIDENTS WITH HIGH-SPEED BROADBAND SERVICE FROM 87% TO 92% BY 2030.

Strategies

Short-Term Opportunities

a. Support a "fix-it-first" regional infrastructure policy

b. Encourage transit-oriented development and bus rapid transit service for priority corridors

c. Expand network of public transit park-and-ride facilities

Long-Term Initiatives

d. Develop a regional transportation demand management program

e. Develop "complete streets" to encourage walking and bicycling

f. Develop a network of CNG fueling stations and EV charging stations

g. Expand use of rail and barge systems in the region

h. Maintain a comprehensive water and wastewater infrastructure investment program

i. Develop safe and reliable energy production facilities and transmission resources that minimize greenhouse gas emissions

j. Expand the region's telecommunication broadband network

Infrastructure

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Syracuse Interstate Route 81 Viaduct Redevelopment I-81 Challenge	Community is evaluating the elevated portion of Interstate 81 through downtown Syracuse. Options currently being considered include rehabilitation/ reconstruction, utilizing a tunnel or depressed Highway, or bypassing the City and replacing the viaduct with an at-grade boulevard.	Y	High	Concept	Funding, Siting	Med	Med	Med	Low	Indirect	Low	Med	High
Syracuse Intermodal Transit Park-Ride Facility	Develop a strategically located park and ride facility to serve downtown and the University Hill area that incorporates a mixed-use design to enliven the streetscape and provide needed amenities for commuters and adjacent land uses.	N	High	Concept	Funding, Siting	Low	Low	Low	Low	Indirect	Med	Low	Med
Port of Oswego On-Site Rail, Road Infrastructure and Eastside Arterial Route 481 Connector	The East Terminal project will construct a combined connector roadway and rehabilitate an existing railroad track. Also provide an alternate tuck route that by-passes downtown Oswego and connects to Route 481 east and south of the City	Y	High	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Low	Low
CNY District Energy System and MWB Dual Water Transmission Line	SUNY ESF study explored feasibility of building a new MWB water transmission line from Oswego to Syracuse which could be used for district energy	N	High	Concept	Funding, Siting	Low	Low	Low	Low	Low	High	Low	Low
Clay Rebuild the I-81/ Route 31 Interchange	Provide better access and circulation at the interchange of Route 31 and Interstate 1-81 to support development of the White Pine Commerce Park in the Town of Clay.	N	High	Concept	Funding, Policy, Siting	Med	Med	Med	Low	Low	Low	Low	Med
Cortland WWTP Business Service Capacity Improvements	Incorporation of changes to treatment process in 2014. Additionally the city is pursuing a Combined Heat and Power biogas-to-electricity project expected to supply up to 60% of the facility's energy needs.	Y	Med	Design	Funding	Low	Med	Med	Med	Direct	Low	Med	Low

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Auburn WWTP Business Service Capacity Improvements	Proposed installation of a new HVAC system that utilizes waste heat that would save on future natural gas and energy costs. Additional improvements are necessary to upgrade the sewage collection and treatment process.	Y	Med	Concept	Funding	Low	Low	Low	Low	Direct	Low	Med	Low
Manlius Intermodal Rail and Inland Port	Development of a facility to facilitate connections to Port Authority of NY/NJ and regional rail freight and local truck traffic. Project will enhance regional import/export capabilities.	Y	Med	Concept	Funding, Siting	Low	Low	Low	Med	Indirect	Low	Low	Low
Cortland Downtown Intermodal Rail Center	Enhancement of NYS&W's ability to move cargo in Cortland area, benefitting several local companies and boosting economic activity in the area. The Cortland Transload Terminal Improvement will construct a rail terminal which will allow short-haul trucks to load and unload directly onto rail cars.	Y	Med	Design, Siting	Funding	Low	Med	Med	Med	Indirect	Low	Low	Low
Oswego CNG Fueling Station	Oswego County and the City of Oswego have expressed interest in the development of a compressed natural gas facility to support municipal fleets. A CNG facility would also allow Centro to switch to CNG buses in Oswego.	Y	Med	Concept	Funding, Siting	Low	Low	Low	Med	Direct	Low	Low	Low
Regional Bicycle Infrastructure	Development of regional bicycle infrastructure to include bicycle sharing, parking, on-road cycling lanes/routes, as well as dedicated off-road trails with a focus on improving alternative mobility options and connections with colleges, universities and schools in urban centers such as Syracuse, Oswego, Cortland, Auburn, Hamilton, Morrisville, Cazenovia, and Skaneateles.	N	Med	Concept	Funding	Low	Low	Low	Med	Indirect	Med	Low	High
OCWA Oneida Lake North Shore Water System	Complete OCWA water supply loop along the North Shore of Oneida Lake with connection in Oneida and Madison county. The project would improve capacity and provide system redundancy for OCWA's eastern service territory.	Y	Med	Concept	Funding, Siting	Low	Low	Low	Low	-	High	Low	Med
OCWA Otisco Lake Dual-Transmission Water Facility	Provide a second water transmission line to enhance water service to Syracuse and provide a redundant service for existing City, OCWA, and MWB service in Onondaga County	N	Med	Concept	Funding, Siting, Regulatory	Low	Low	Low	Low	-	High	Low	Low

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Madison County Agriculture and Renewable Energy ARE Park Infrastructure Facilities	Infrastructure upgrades include a new water line which would expand economic development opportunities and a new sewer line, which would significantly reduce diesel fuel consumption and GHG emissions by eliminating the need to transport landfill leachate to the Oneida wastewater treatment plant by truck.	Y	Med	Concept	Funding	Low	Low	Med	Low	Direct	-	Low	Low
Fulton Riverview Business Park Regional WWTP Improvements	Capitalize on the significant underutilized capacity of the former brewery WWTP to provide a area-wide service for communities and business parks in the area including the Oswego County Industrial Park	N	Med	Concept	Funding, Siting, Regulatory	Med	Med	Med	Low	Indirect	Med	High	Med
Cortlandville Business Service Sewer Transmission Facility	Reconstruction of sewer interceptor line along Route 13. Upgrades needed to support development at Finger Lakes East Business Park	Y	Med	Design	Funding	Low	Low	Low	-	-	Med	Low	Low
Fulton Bristol Hill Landfill Sewer Transmission Facility	Connect Bristol Hill leachate to Fulton WWTP along route 3 corridor in Volney to eliminate trucks from the road, and increase efficiency at Fulton WWTP. This project will significantly reduce vehicular GHG emissions.	Y	Med	Concept	Funding	Low	Low	Low	-	Indirect	-	Low	Low
Trush Business Park Public Water Supply	Provision of a public water supply system would support additional growth in the business park.	N	Med	Concept	Funding	Low	Low	Low	-	-	Med	Low	Low
Syracuse Downtown Bus Rapid Transit or Light Rail System	Development of dedicated commuter transit system connecting Syracuse Lakefront, St. Joseph's Hospital, downtown Syracuse, and University Hill. The corridor was identified in a 2007 study by SMTC as having greatest potential to increase transit trips.	N	High	Concept	Funding, Siting	Med	Med	Med	High	Direct	High	Med	Med
National Grid Smart Grid Demonstration Project	Deploy smart meters and other smart grid technologies for customers on east side of Syracuse and Town of DeWitt as proposed to US DOE by National Grid	Y	High	Design	Funding	Low	Low	Low	Low	Low	High	High	Indirect

Land Use—Summary of Goal, Targets, Strategies, and Project Examples

Goal

MANAGE THE REGION'S ECONOMIC AND PHYSICAL DEVELOPMENT THROUGH THE EFFICIENT AND EQUITABLE USE OF LAND TO CONSERVE ITS NATURAL AND CULTURAL RESOURCES AND REVITALIZE ITS URBAN CORES, MAIN STREETS AND EXISTING NEIGHBORHOODS.

Targets

- REDUCE THE AMOUNT OF LAND OCCUPIED IN CENTRAL NEW YORK ON A PER CAPITA BASIS TO 0.225 ACRES PER PERSON.
- INCREASE THE NUMBER OF ACRES OF CRITICAL CONSERVATION AREAS IN CENTRAL NEW YORK BY 25%.
- CREATE 50 NEW MILES OF DEDICATED CYCLE TRACKS ALONG MAJOR COMMUTING CORRIDORS BY 2030.
- REDUCE THE PERCENTAGE OF HOUSEHOLD INCOME SPENT ON HOUSING AND TRANSPORTATION COSTS IN CENTRAL NEW YORK BY 10%.
- SUPPORT ACTIVITIES THAT MAINTAIN OR INCREASE THE LEVEL OF FARMLAND IN THE REGION, CURRENTLY AT 815,000 ACRES.

Strategies

Short-Term Opportunities

a. Implement a community-based urban infill program.

b. Implement a regional pedestrian and bicycle trail access program.

c. Implement a regional main street revitalization program.

Long-Term Initiatives

d. Assist communities with the implementation of a smart growth regulatory and incentive program.

e. Support a regional natural area conservation protection program.

f. Develop a regional recreation and cultural heritage protection program.

g. Support a regional agriculture land protection program.

h. Implement a comprehensive brownfield redevelopment program.

i. Support an ECNHC waterfront revitalization program.

j. Promote municipal adoption of a complete streets program.

Land Use

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Onondaga Lake Loop-the-Lake Trail	Complete construction of the 'Loop the Lake Trail' around Onondaga Lake. A completed 12-mile lake loop connecting with the Creekwalk to Armory Square downtown, and also has the potential to link to the Erie Canalway Trail, NYS Fairgrounds, and nearby community development projects.	Y	Med	Concept	Funding	Med	Low	Low	Low	Indirect	Low	Med	High
Erie Canal National Heritage Corridor Trail	Construct the connecting 15-mile link of the Erie Canalway Multi-use Trail between Camillus and DeWitt through the City of Syracuse with connections to the Onondaga County Loop the Lake Trail, the NYS Fairgrounds, and Onondaga Creekwalk.	N	Med	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Med	High
Auburn Owasco River Greenway Trail	Six-mile multi-use trail along the Owasco River will extend from Emerson Park at Owasco Lake to Wadsworth "Park" on the City of Auburn's west side. The Plan will augment the existing transportation system with bicycle and pedestrian infrastructure along the Owasco River, connecting neighborhoods,	Y	Med	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Med	Med
Oneida Community Pedestrian Trail	Construct 10.5 miles of multi-use trail around and through the heart of downtown Oneida mostly along city-owned rail bed corridors. The trail will connect to the Village of Wampsville to the west and the Village of Sherrill to the east as well as to Oneida High school, parks and the City's downtown.	N	Med	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Med	Med
Salmon River Greenway Trail	Plans include a 3-mile multi-use trail along the banks of the Salmon River through the Village of Pulaski. Eventually this trail will connect to 12 additional miles of trail to be built along the river linking the towns of Redfield, Orwell, and Altmar to Richland and Pulaski in Oswego County.	Y	Med	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Med	Med
Oswego Breitbeck Park Waterfront Trail	Construct the extension of the Waterfront Trail from Breitbeck Park to Sheldon Beach in the City of Oswego. Extension of this trail will improve community access to the waterfront along Lake Ontario in the City of Oswego.	N	Med	Concept	Funding	Low	Low	Low	-	Indirect	Low	Med	Med

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Auburn Schines Theater Rehabilitation	Complete historic restoration and rehabilitation of the 1938 Auburn Schines Theater to support the Finger Lakes Theater Summer Musical Festival.	Y	Med	Concept	Funding	Low	Low	Low	-			Med	Med
Brewerton Waterfront Redevelopment	Complete waterfront improvements in the Village of Brewerton. A redevelopment plan has been completed identifying several projects that will remove barriers and enhance public access to the waterfront.	Y	Med	Concept	Funding	Low	Low	Low	Low	Indirect	-	Med	Med
Richland Selkirk Lighthouse Waterfront Redevelopment	Rehabilitation of the historic lakefront Selkirk Point landscape and hotel, along with redevelopment of the site to minimize impermeable surfaces, re-establish native plantings and add public space along with compatibly-scaled and -designed waterfront uses,	N	Med	Concept	Funding	Low	Low	Low	-	Indirect	Med	Med	High
Clay Three Rivers Waterfront Redevelopment	Waterfront Revitalization plan has been completed suggesting several projects including enhancements to waterfront access and redevelopment of several parcels for commercial and residential use.	N	High	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Low	Med
Oswego Route 104 "Complete Street" Design	NYS Route 104 through the City of Oswego has significant commercial uses along the corridor. A "complete street" strategy could enhance pedestrian and bicycle utilization and mobility for city residents and students at SUNY Oswego	Y	Med	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Med	Med
Syracuse Loguen Crossing Development	Loguen Crossing, will transform the former Kennedy Square housing complex adjacent to the CNY Biotechnology Accelerator into a mixed-use development with office space, housing, retail and commercial space in downtown Syracuse.	Y	High	Underway	Market	Low	Low	Low	Low	Indirect	Low	Med	Med
DeWitt Shoppingtown Mall Redevelopment Plan	Complete a redevelopment strategy for Shoppingtown Mall that incorporates a mixed-use transit oriented development concept that capitalizes on the central location of the center in the Syracuse community.	N	Low	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Med	Med

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Oswego Midtown Plaza Redevelopment	Sutton Cos. bought Midtown Plaza and its 68,000 square feet of retail center in 2012. Plans call for demolition of the existing structure and construction of a mixed-use commercial and residential complex at a critical location in the City adjacent to the riverfront.	Y	High	Design	Funding, Market	Low	Low	Low	Low	Indirect	Low	Low	Med
Cortland Route 13 Gateway Development	The City of Cortland is completing the design phase of the Route 13 Gateway project aimed at creating a "gateway" corridor to downtown Cortland with attractive signage, bike and pedestrian infrastructure, and an improved streetscape.	Y	Med	Concept	Funding	Low	Low	Low	-	Indirect	-	Low	Med
Onondaga Lake Honeywell Lakeshore Development	Continued enhancements to the lakeshore along Onondaga Lake will allow more public access, and return historically contaminated property to community use.	Y	Med	Design	Funding	Low	Low	Low	-	Indirect	-	High	High
Sherwood Equal Rights Historic District Preservation Master Plan	Preservation planning for the protection and rehabilitation the National Register-listed Sherwood Equal Rights Historic District in Cayuga County .	Y	Low	Concept	Funding	Low	Low	Low	-	Indirect	-	Med	Med
Pulaski Kallet Theater Rehabilitation	Rehabilitation of the historic Kallet Theater in the Pulaski. The facility will feature 430 theater-style folding chairs on a tiered angle to face a stage with a screen and projector. Facility will be used as a corporate training center and as community event space.	Y	Med	Underway	Market	Low	Low	Low	Low	Indirect	Low	Low	Med
St. Joseph's Hospital Prospect Hill Medical District	Based upon a master plan completed for the hospital, the project involves the development of a mixed-use complex including medical facilities, hotel, fitness and day-care center and parking garage.	N	High	Concept	Funding, Siting, Market	Low	Low	Low	Low	Indirect	Low	Low	Med
DeWitt Route 298 Carrier Gateway Corridor Master Plan	Utilize existing Carrier reuse plan as basis for a NYS Route 298 industrial corridor redevelopment plan to capitalize on the areas existing robust infrastructure resources.	N	Low	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Med	Med

Environment—Summary of Goal, Targets, Strategies, and Project Examples

Goal

CONSERVE AND PROTECT THE QUALITY OF THE REGION'S WATER, AIR, LAND AND WILDLIFE RESOURCES WITHOUT COMPROMISING THE ABILITY TO MEET CURRENT AND FUTURE RESOURCE DEPENDENT NEEDS.

Targets

- ENSURE NO NET INCREASE IN CONSUMPTIVE WATER WITHDRAWALS THROUGH 2030.
- REDUCE THE NUMBER OF IMPAIRED WATER BODIES IN CNY BY 50% BY 2030.
- REDUCE THE NUMBER OF COMBINED SEWER OVERFLOWS (CSOS) IN CNY BY 65% BY 2030.
- REDUCE THE PERCENTAGE OF IMPERVIOUS SURFACE SURFACES IN THE SYRACUSE URBANIZED AREA FROM 21% TO 18% BY 2030.
- REDUCE AIR POLLUTANT EMISSIONS BY 25% FOR OZONE, SULFUR, PARTICULATES, AND CARBON MONOXIDE BY 2030.

Strategies

Short-Term Opportunities

a. Provide tools, resources and training for local officials to encourage resource conservation.

b. Promote a comprehensive regional green infrastructure program to improve air and water quality.

c. Develop a regional urban-rural forestry restoration program.

Long-Term Initiatives

d. Implement a coordinated regional invasive aquatic weed-harvesting management program.

e. Utilize and replicate natural systems in support of critical infrastructure services to protect and improve water quality.

f. Develop a regional program to reduce the amount of impervious parking areas.

g. Implement targeted infrastructure improvement for pollution sources known to impact impaired water bodies.

h. Develop a regional public education and water conservation program.

i. Support a regional agriculture cover-crop and no-till program in priority watersheds.

j. Develop a coordinated stream restoration program for high priority water-bodies.

Environment

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Onondaga Lake and Watershed Restoration Program	Efforts to improve Onondaga Lake quality will expand from the lakeshore and near lakeshore to the entire watershed. Priority projects affecting tributaries to Onondaga Lake will be implemented to improve stream and lake quality, wetland functions, and enhance, recreational opportunities.	Y	High	Ongoing	Funding	Med	Med	Med	Low	Indirect	Low	High	High
Oswego "Green Gateway" project	The flow of nutrients and pathogens to the Oswego River from West Side CSOs will be reduced by implementing green infrastructure projects at strategic and Highly visible locations. Approximately 3.4M gal. of stormwater to the WWTP will be eliminated annually.	Y	Med	Concept	Funding	Low	Low	Low	-	Direct	Med	High	Low
Oneida Creek Streambank Restoration Program	Areas of High erosion, pollutant loading, frequent flooding, and water quality issues will be documented in a Watershed Management Plan for Oneida Creek. Priority projects utilizing "soft" engineering and biotechnical techniques will be implemented at key locations.	N	Low	Concept	Funding	Low	Low	Low	-	Indirect	Low	High	Low
Tully Kettle-Lakes Constructed Wetlands	Tully Lake is impacted by nutrient runoff and septic leachate from nearby residential development. Innovative wetland technologies such as gravel wetlands will be assessed and implemented to reduce nutrient loading to the lake.	N	Low	Concept	Funding, Siting	Low	Low	Low	-	-	-	Med	Med
Conquest Duck Lake Constructed Wetlands	Duck Lake water quality is impaired by phosphorus inputs from septic leachate, wildlife and other potential sources. This project will evaluate the best opportunities and utilize innovative wetland techniques such as gravel wetlands to treat wastewater.	N	Low	Concept	Funding, Siting	Low	Low	Low	-	-	-	Med	Med
Schroeppel Pleasant Lake Constructed Wetlands	Pleasant Lake is a 303(d)listed water for nutrients. Innovative wetland technologies such as gravel wetlands will be assessed and implemented to reduce nutrient loading to the lake.	N	Low	Concept	Funding, Siting	Low	Low	Low	-	-	-	Med	Med

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Camillus Belle Isle Landfill Constructed Wetlands	The effectiveness of municipal landfill leachate treatment using constructed wetlands and ammonia trickling filters will be demonstrated. Technology developed in Village of Minoa and further tested at the Bristol Hill landfill in Oswego County will be used.	N	Med	Concept	Funding, Siting	Low	Low	Low	-	Direct	Low	Med	Low
Fulton Lake Neathawanta Reclamation and Dredging	A hydraulic dredge will be used to clear accumulated lake bottom sediment and re-establish flow of natural springs in Lake Neathawanta. Phosphorus and sediment available for re-suspension will be reduced, dissolved oxygen levels, water circulation and overall water quality will be improved.	Y	Low	Design	Funding	Low	Low	Low	-	-	Low	Med	Med
Clay Bayberry Green Infrastructure Improvements	Bioretention, water quality swales and pervious pavement will be installed to reduce stormwater runoff that is contributing to sanitary overflows. The discharges of pathogens and nutrients to the Seneca River will be reduced.	Y	Med	Concept	Funding	Low	Low	Low	-	Direct	Low	Med	Low
Sullivan Chapman Park Bioinfiltration Demonstration	A biofilter swale designed to convey the 50-year peak stormwater discharge will be constructed on the south shore of Oneida Lake. The swale and associated native plantings will reduce shoreline erosion and other pollutants from entering Oneida Lake.	Y	Low	Design	Funding	Low	Low	Low	-	-	Low	Med	Low
Marcellus WWTP Nine Mile Creek Constructed Wetlands	An extensive natural wetlands area adjacent to Ninemile Creek will be restored and/or enhanced to provide additional treatment of municipal wastewater effluent from the Marcellus WWTP. The discharge of phosphorus to Nine mile Creek and Onondaga Lake will be reduced.	N	Med	Concept	Funding, Siting	Low	Low	Low	-	Direct	Low	High	Low
Onondaga Lake Marina Bioinfiltration Filters	Bioretention areas along the Recreation Trail at Onondaga Lake Park in Liverpool will be installed to address stormwater discharge from adjacent yard drains. Phosphorus entering Onondaga Lake from residential l awns will be reduced and public education will be improved.	Y	Low	Concept	Funding	Low	Low	Low	-	-	Low	Low	Low
Onondaga Lake Park Willow Bay Bioinfiltration	Stormwater runoff from two parking lots in the Willow Bay area at the north end of Onondaga Lake Park will be treated using bioretention and water quality swales. Localized flooding and phosphorus loading to Onondaga Lake will be reduced and public education will be improved.	Y	Low	Concept	Funding, Siting	Low	Low	Low	-	-	Low	Low	Low

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Sandy Creek Lake Ontario Barrier Beach Master Plan	Protect unique, critical shoreline features and wetland functions by identifying and implementing priority projects. Long term impacts include invasive species eradication, streambank restoration, enhanced intermunicipal land use planning, and improved public education and recreation opportunities.	N	Low	Concept	Funding	Low	Low	Low	-	Indirect	Med	High	Med
Skaneateles Lake Conservation Easement	Purchase permanent conservation easements from willing landowners. Protect water quality by limiting the development of environmentally significant properties and protecting farmland, forests, and other open spaces that act as natural buffers to Skaneateles Lake and its tributaries.	Y	Med	Ongoing	Funding	Low	Low	Low	-	Indirect	Med	High	Med
Syracuse Water Leak Detection Slip Line Technology	The City of Syracuse will undertake a dedicated leak detection program throughout its aging distribution system. The city will utilize slip line technology to address unaccounted for water loss.	Y	Med	Concept	Funding	Low	Low	Low	-	-	Med	High	Low
Owasco Lake Inlet Habitat Restoration Initiative	The Owasco Inlet will be reconnected with its floodplain. Existing and created wetlands will filter out nutrients and sediment. Riparian buffers will be planted along agricultural drainage ways to reduce nutrient and sediment inputs to the lake and improve wildlife habitat.	Y	Med	Ongoing	Funding, Siting	Low	Low	Low	Med	Indirect	Med	High	Med
Colgate University Green Infrastructure Improvements	Reduce stormwater runoff and energy usage through green infrastructure practices. Green roof(s), onsite production and use of biofuel, green purchasing programs and adherence to LEED building standards will increase water conservation, decrease energy demand and reduced reliance on fossil fuels.	Y	High	Ongoing	Funding	Low	Low	Low	Low	Direct, Indirect	Low	Med	Low
Salina Ley Creek GM/Racer Trust Remediation Initiative	The ongoing remediation of industrial wastes that discharge to Ley Creek and its tributaries in a Highly urbanized and commercial area in the Town of Salina will be completed. Enhancements will be made to the existing groundwater collection system.	Y	Med	Ongoing	Funding	Low	Low	Low	-	-	Low	High	Low
Tully Mud-Boils Containment and Management Program	A long-term solution for addressing the discharge of sediment form the Tully Valley Mudboils to Onondaga Creed will be developed and implemented. It is estimated that sediment loading will be reduced by approximately 30 tons per day.	Y	High	Concept	Funding	Low	Low	Low	-	-	Med	High	Med

Economic Development—Summary of Goal, Targets, Strategies, and Project Examples

Goal

SUPPORT THE GROWTH OF A DIVERSE ECONOMIC BASE THAT WILL PROVIDE EMPLOYMENT OPPORTUNITIES FOR A BROAD CROSS SECTION OF CITIZENS ACROSS THE FIVE-COUNTY REGION.

Targets

- INCREASE THE REGION'S CURRENT POPULATION OF 791,500 TO 1 MILLION RESIDENTS BY 2050.
- INCREASE THE REGIONS' CURRENT NUMBER OF JOBS FROM 320,000 TO 405,000 BY 2030.
- INCREASE THE REGION'S PER CAPITA INCOME TO EQUAL OR EXCEED THE NATIONAL AVERAGE BY 2030.
- IMPROVE THE REGION'S NATIONAL ECONOMIC STRENGTH INDEX RATING TO A "TOP 50" SCORE.
- INCREASE THE NUMBER OF CLEAN-ENERGY JOBS IN CENTRAL NEW YORK AS MEASURED BY THE BROOKINGS INSTITUTE BY 25% OVER THE NEXT 20 YEARS.

Strategies

Short-Term Opportunities

a. Maintain a strong foundation for the management and efficient delivery of government services at the federal, state, and local level.

b. Support the development and maintenance of a modern infrastructure network in Central New York that is focused on roads, sewer and water facilities, transit services, telecommunication resources, air and rail services, shovel ready development sites, and port facilities.

Long-Term Initiatives

c. Develop a coordinated regional program that will improve the quality of life in Central New York through targeted investments in the region's recreation, cultural, arts, and historic resources.

d. Maintain a strong network of county and regionally-based organizations with the capacity to coordinate the delivery of a range of economic development services, tax abatement, and financial assistance in Central New York.

e. Support the operation of a coordinated and robust business retention and expansion program in Central New York

f. Maximize the region's human capital by improving the alignment of workforce supply and employment demand in the region.

g. Encourage the growth of a strong entrepreneurial culture in Central New York that will strengthen the region's economy through new venture formation and product development activities.

h. Support the region's industry concentrations through investment of resources in targeted research initiatives, capital funding, and workforce training programs.

i. Coordinate implementation of a comprehensive regional marketing and business recruitment program.

j. Implement a comprehensive regional export marketing campaign and technical assistance program.

Economic Development

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Auburn Finger Lakes Musical Theatre Festival	Development of venues and facilities to serve the tourist potential of this summer musical festival	Y	Med	Ongoing	Funding, Market	Med	Med	Med	-	-	Med	Low	High
Syracuse CNY Nanotechnology Innovation Center	Rehabilitation of former manufacturing building in Salina to serve as research center for State nanotechnology industrial cluster	Y	Med	Underway	Market	Med	Med	Med	-	-	Med	Low	Low
Syracuse Convention Center Hotel	Construction of a new hotel adjacent to convention center to capitalize on opportunities to serve as a regional convention destination	N	High	Concept	Funding, Market	Med	Med	Med	-	-	Med	Low	High
SU Center of Excellence NYE-RIC Research Facilities	Capitalize on federal EDA grant and State resources being provided to construction needed laboratories and equipment at COE	Y	Med	Underway	Market	Med	Med	Med	Med	Indirect	Med	Low	Med
SUNY-ESF Willow Biomass Energy Production Program	Expand the SUNY ESF Willow demonstration planting program to more landowners and farmers in CNY to provide supply for a robust CHP network	Y	Med	Underway	Funding, Market	Low	Med	Med	High	Direct	Med	Med	Med
SUNY-ESF Biomass Cooperative Innovation Center	New equipment and facilities at center to allow for research of commercial development opportunities of biomass resources	Y	Med	Concept	Funding	Low	Med	Med	Med	Indirect	Med	Med	Low

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Cortland CNY Center for Membrane Technologies	Development of a micro-filter membrane research center at Pall Corporation in Cortland	Y	Med	Design	Market	Low	Med	Med	Low	-	Low	Low	Low
SUNY Morrisville Aquaculture Program Expansion	Development of expanded facilities and equipment that will allow for improved research and student training in the field of commercial on-site aquaculture and fish farming	Y	Med	Concept	Funding, Market	Low	Med	Med	Low	-	Low	Low	Low
Clay White Pines Commerce Park Infrastructure	Complete the construction of a major sewer line to serve the 350-acre business park along with related public road improvements	Y	Med	Design	Funding	Med	Med	Med	Low	Indirect	Med	Med	Med
Aurelius Business Park Infrastructure Improvements	Provide an appropriate access road , improvement in public sewer and water service, and a CHP facility to support a dairy business location in the park and other related companies	Y	Med	Concept	Funding, Market	Med	Med	Med	Med	Indirect	Low	Low	Med
Auburn Tech Park Infrastructure Improvements	Upgrade infrastructure in the business park to allow the City to retain existing tenants and development new sites for industrial growth	Y	Med	concept	Funding	Low	Med	Med	Low	Indirect	Low	Low	Low
Oneida Elm Street/Curtin Business Park	Extend a sewer and water line from the City of Oneida to allow for development of this 200-acre business area west of the City center	Y	Med	Concept	Funding, Siting, Market	Med	Med	Med	Low	Indirect	Med	Low	Med
Syracuse Hancock Airpark Phase V Expansion	Complete the demolition of vacant buildings on the eastern edge of the park and construction of new utilities to allow for the marketing of additional sites in the park	Y	Med	Design	Market	Low	Med	Med	Low	Indirect	Med	Low	Med

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Madison Culinary Institute and Hotel Conference Center	Capitalize on interest in the marketplace by developing a specialized hops and culinary institute and hotel conference center	N	High	Concept	Funding, Siting, Market	Med	Med	Med	Low	Indirect	Med	Med	Med
Fulton Nestle Site Redevelopment	Capitalize on the robust infrastructure network in the area by supporting the environmental remediation and reuse of the former manufacturing facility and site	Y	Med	Concept	Funding,	Low	Low	Low	Low	Indirect	Med	High	High
Central Square CNY Raceway Park Infrastructure	Develop public infrastructure including road access improvements to support the development of this commercial racing and tourist attraction	Y	Med	Design	Funding, Market	Low	Low	Low	-	-	-	Low	Low
Cortland Buckbee Meers Brownfield Site Redevelopment	Capitalize on the robust infrastructure network in the area by supporting the environmental remediation and reuse of the former manufacturing facility and site	Y	Med	Concept	Funding, regulatory, Market	Low	Low	Low	Low	Indirect	Med	High	High
Auburn Bombardier Brownfield Site Redevelopment	Capitalize on the robust infrastructure network in the area by supporting the environmental remediation and reuse of the former manufacturing facility and site	Y	Med	Concept	Funding, regulatory, Market	Low	Low	Low	-	-	-	High	Med
Madison County ARE Park Infrastructure Development	Construct a public sewer and water line along with public access road to allow for the development of this agriculture and renewable energy park adjacent to the County's landfill.	Y	Med	Design	Funding, regulatory, Market	Med	Med	Med	Med	Indirect	Med	Med	Low
Syracuse Lakefront Inner Harbor Development	Construct public road, sewer, and water improvements to support a $350 million commercial mixed- use development proposed for the Inner Harbor	Y	Med	Underway	Market	Med	Med	Med	Med	Indirect	Med	High	High

Materials Management—Summary of Goal, Targets, Strategies, and Project Examples

Goal

IMPROVE THE ENVIRONMENTAL PERFORMANCE AND THE ECONOMIC DEVELOPMENT AND JOB CREATION POTENTIAL OF THE REGION'S MATERIAL MANAGEMENT SYSTEMS BY REDUCING THE PRODUCTION OF WASTE AND INCREASING MATERIALS REUSE, RECYCLING AND ENERGY RECOVERY.

Targets

- REDUCE REGIONAL TOTAL SOLID WASTE GENERATED PER CAPITA, INCLUDING MSW, C&D, HAZARDOUS AND INDUSTRIAL MATERIALS, BY 75% (BELOW 2010 LEVELS) BY 2030.
- REDUCE THE AMOUNT OF MSW GENERATED AND THEN DISPOSED OF IN LANDFILLS OR VIA ENERGY RECOVERY BY 82% (BELOW 2010 LEVELS) BY 2030.
- REUSE 50% OF C&D WASTE BY 2030.
- INCREASE THE AMOUNT OF FOOD AND YARD WASTE COMPOSTED BY 75% BY 2030.
- INCREASE THE NUMBER OF DAIRY FARM-BASED ANAEROBIC DIGESTERS OPERATING IN THE REGION FROM SEVEN TO 20 BY 2030.

Strategies

Short-Term Opportunities

a. Increase recycling of post-consumer waste through a regional education campaign and convenient public receptacles.

b. Increase reuse and recycling of construction and demolition materials.

c. Increase diversion of residential and commercial organic material from landfills according to the EPA's food recovery hierarchy.

Long-Term Initiatives

d. Establish municipal single-stream curbside recycling programs.

e. Institute "green fees" or "pay-as-you-throw" programs to incentivize waste reduction and recycling.

f. Convert municipal and private waste transport vehicles to alternative fuels.

g. Install methane collection and control systems, including landfill gas-to-energy (LFGTE) facilities and anaerobic digesters at dairy farms, waste water treatment facilities, and industrial businesses.

h. Support industrial symbiosis through a regional outreach and technical assistance program.

i. Improve the infrastructure for managing specialized materials, including agricultural plastics, electronics and household hazardous waste.

j. Establish local government sustainable procurement policies.

Materials Management

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Syracuse Solar-Powered Recycling Receptacles	Receptacles can hold up to 5 times more material than conventional bins, resulting cost savings from fewer pick-ups. Would be installed in same locations as public waste bins.	Y	Low	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Med	Med
Oswego County Bristol Hill Landfill C&D Recycling Facility	Convert the former Oswego County Materials Recycling Facility into a C&D processor to capture the value of materials reuse and sale.	Y	Med	Concept	Funding, Regulatory, Siting	Low	Low	Low	-	Direct	Low	Med	Low
OCRRA's Food Compost Facility Expansion	County reports that food waste comprises 15% of waste stream and has a pilot program to collect materials from institutional users such as Syracuse University. Expanding the program's facilities could allow for service to other commercial customers.	Y	Low	Funded	Funding, Regulatory, Market	Low	Low	Low	-	Direct	Med	Med	Low
Cortland County Composting Facility	A new facility for organic composting in the County could provide service to residents, businesses and large institutions such as SUNY Cortland and Cortland Hospital. Compost could be sold to general public to generate revenue.	N	Med	Concept	Funding, Regulatory, Siting, Market	Low	Low	Low	-	Direct	Med	Med	Low
Auburn Toter Recycling Containers	Implement uniform recycling collection system through use of automated collection compatible recycling containers. Identified as top city priority.	Y	Low	Concept	Funding	Low	Low	Low	-	Indirect	Low	Low	Med
Cortland County Landfill Active Landfill Gas Collection and Energy System	Development of a landfill gas collection and energy system to generate community revenue and reduce methane emissions by 75%; similar to system built at Madison ARE park.	Y	Med	Concept	Funding, Regulatory	Low	Low	Low	Med	Direct	Low	High	Low

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Madison County ARE Park Agricultural Plastics/Renewable Diesel Fuel Facility	A facility to support the County's pilot collection program for agricultural plastics and convert these materials to Low-sulfur diesel fuel through a proprietary process owned by JBI, Inc.	Y	Med	Concept	Funding, Regulatory	Low	Low	Med	Med	Direct	Low	High	Low
Syracuse CNG Automated Waste Collection Vehicles	Utilize robotic arm haulers and carts to enhance service delivery, increase collection rates, improve safety. Implement CNG fuel systems in place of diesel systems.	Y	Med	Concept	Funding	Low	Low	Low	Low	Direct, Indirect	Low	Low	Low
Syracuse CNG Fueling Station	Provide central CNG station for heavy duty equipment access; utilize key system to track usage.	N	Med	Concept	Funding, Siting	Low	Low	Low	Med	Direct	Low	Low	Low
Auburn CNG Automated Waste Collection Vehicles	Utilize robotic arm haulers and carts to enhance service delivery, increase collection rates, improve safety. Implement CNG fuel systems in place of diesel systems.	Y	Med	Concept	Funding	Low	Low	Low	Low	Direct, Indirect	Low	Low	Low
Auburn CNG Fueling Station	Provide central CNG station for heavy duty equipment access; utilize key system to track usage.	N	Med	Concept	Funding, Siting	Low	Low	Low	Med	Direct	Low	Low	Low
SUNY Morrisville Community Biodigester	College proposes to construct 1 MW biodigester to service food processing facilities, with possible use of agricultural/dairy waste as substrate.	Y	Med	Concept	Funding, Regulatory, Siting	Low	Low	Low	Med	Direct	Low	Med	Low
Cayuga County Regional Biodigester Pipeline	Construction of a pipeline to collect agricultural waste from area dairy farms for a centralized biodigester facility in the Aurelius Business Park	N	High	Concept	Funding, Policy, Siting, Market	Low	Low	Low	Med	Direct	Low	Med	Low

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Syracuse Toter Recycling Containers	Implement uniform recycling collection system through use of automated collection compatible recycling containers. Identified as top city priority.	Y	Low	Concept	Funding	Low	Low	Low	-	Indirect	Low	Low	Med
Oswego County Energy Recovery Facility Heat Recapture	Recapture waste heat currently generated at County resource recovery facility and expelled into Oswego River for beneficial use of adjoining businesses	Y	Low	Concept	Funding	Low	Low	Low	Med	Direct	Low	Med	Low
Oswego County Material Recovery Facility Solar PV	Roof-mounted solar PV system could supply on-site power needs and reduce costs.	Y	Low	Concept	Funding	Low	Low	Low	Med	Direct	Med	Low	Low
Waste To Biogas Mapping Tool	A regional tool based on the one developed by the US EPA to connect large organic waste producers of High energy materials like fats, oils, and grease with potential users such as dairy biodigesters or wastewater treatment plants.	N	Low	Concept	Funding	Low	Low	Low	Low	Indirect	Low	Low	Low
CNY Waste Materials Exchange Facility	A facility to facilitate the exchange of materials or wastes that can be reused as a means of disposing of scrap or surplus items without landfilling or incinerating them.	N	Low	Concept	Funding	Low	Low	Low	Low	Direct	Low	Low	Low
Onondaga County C&D Recycling Facility	Construct facility to divert waste flow to other regions and capture value of material reuse; partner with COE C&D institute	N	Med	Concept	Funding, Siting, Regulatory	Low	Low	Low	-	Direct	Low	Med	Low
CNY Aquatic Invasive Species Biodigester Demonstration Project	Biological Methane Potential (BMP) testing of select invasive aquatic plants has shown promising results for the methane producing potential. Research also shows that biogas yields can be increased 3 to 5 times when manure is co-digested with certain biomass sources.	N	Med	Concept	Funding, Regulatory, Market	Low	Low	Low	Low	Indirect	Low	Med	Med

Climate Adaptation—Summary of Goal, Targets, Strategies, and Project Examples

Goal

ADAPT SUCCESSFULLY TO A CHANGING CLIMATE AND IMPROVE THE RESILIENCE OF THE REGION'S COMMUNITIES, INFRASTRUCTURE AND NATURAL SYSTEMS.

Targets

- REDUCE PER CAPITA REGIONAL GREENHOUSE GAS EMISSIONS TO 40% BELOW 2010 LEVELS BY 2030.
- INCREASE THE NUMBER OF COMMUNITIES PARTICIPATING IN THE NFIP COMMUNITY RATING SYSTEM FROM 2 TO 10.
- COMPLETE 25 COMMUNITY VULNERABILITY ASSESSMENTS BY 2030.
- INCREASE THE NUMBER OF CLIMATE SMART COMMUNITIES IN CNY FROM 13 TO 26 BY 2020 AND TO 40 BY 2030.
- REDUCE THE PERCENTAGE OF THE REGION'S TOTAL LAND VALUE FOUND IN FLOODPLAINS FROM 14% TO 10% BY 2030.

Strategies

Short-Term Opportunities

a. Conduct vulnerability and risk-assessments and cost-benefit analyses to identify key areas for climate adaptation.

b. Develop local greenhouse gas inventories and climate action plans and increase the number of Climate Smart Communities.

c. Implement measures to mitigate impacts to critical infrastructure.

Long-Term Initiatives

d. Provide assistance to address climate impacts on agriculture, make the regional food supply system more resilient to climate change, and enhance rural economic security.

e. Develop systems to prepare for and respond to more frequent and extreme storms and flooding events.

f. Develop a regional inventory of flood-hazard occurrence areas.

g. Complete a regional dam inventory and assessment program.

h. Create a central repository of regional climate data and provide channels for the distribution of information.

i. Develop and implement emergency and hazard mitigation plans.

j. Develop a comprehensive forest management program.

Climate Adaptation

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Conduct a Regional Infrastructure Facility Risk Assessment	Identify facilities at risk from climate change. This includes carbon foot-printing assessments to establish baseline greenhouse gas data, or conducting assessments of sewage treatment plants located in a FEMA flood zone to identify retrofitting opportunities based on cost effectiveness vs relocation.	N	Low	Concept	Funding	Low	Low	Low	-	Indirect	High	Low	Low
"Reverse 911" Emergency Notification System	In the event of significant weather or natural hazard, a "reverse 911" call-back system to notify residents of emergency information and evacuation routes. The call-back system would utilize the NY Alert/NOAA weather alert systems.	N	Low	Concept	Funding	Low	Low	Low	-	-	High	Low	Low
Regional Emergency Shelter Network	Cooling and emergency shelters will assist residents during power outages and extreme temperatures. Heat and humidity can be uncomfortable and dangerous, especially for the elderly. Emergency centers will provide air-conditioning space for residents to avoid the extreme temperatures during the hottest parts of the day.	N	Low	Concept	Funding	Low	Low	Low	-	-	High	Med	Med
Syracuse University Hill CHP	Syracuse University is developing an energy utility master plan to address options to upgrade the boilers and chillers that provide chilled water and steam to the SU campus and steam to district heating customers. System could include a CHP facility similar to plant being installed for St. Joseph's Hospital	Y	High	Concept	Funding, Siting, Market	Low	Low	Low	High	Direct	High	Low	Low
CNY Climate Change Clearinghouse	Central New York Climate Change Clearinghouse to store current data and historical trends for temperature, precipitation, lake water temperature, storm events, public health, and surveillance and monitoring data.	N	Low	Concept	Funding	Low	Low	Low	-	Indirect	Med	Low	Low

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
Port of Oswego Harbor Dredging	Extreme storm events along the Oswego River and on Lake Ontario increase the need for more frequent harbor dredging at the Port of Oswego to meet depth requirements for vessel transport.	Y	Med	Concept	Funding	Low	Low	Low	-	Indirect	High	Med	Low
Homer Little York Dam Rehabilitation	Little York Lake Dam. is located on the West Branch of the Tioghnioga River in the Cortland County Town of Homer. Construction of the dam was completed in 1956 but a refurbishment is needed to address flood hazard issues in the community.	Y	Med	Design	Funding	Low	Low	Low	-	-	High	Low	Low
Pulaski Salmon River Retaining Wall Renovation	Portions of the retaining wall along the Salmon River need to be secured to prevent washouts during periods of flooding and major storm events. The original wall was built by the village in the 1980s to protect the pump station.	Y	Med	Concept	Funding	Low	Low	Low	-	-	High	Med	Med
CNY Aquatic Invasive Species Weed Harvesting Program	A shared equipment and operator program is required to harvest aquatic weeds at key locations and waterbodies in CNY.	N	Med	Concept	Funding, Policy	Low	Low	Low	-	Indirect	Low	Med	High
Syracuse Urban Forest Management Program	Forest assessment for Syracuse provides information on resources and recommendations for forest management. Tree management strategies for maximum growth and health are recommended in order to reduce heat island effects in city environments and to reduce energy usage.	Y	Low	Design	Funding	Low	Low	Low	Low	Indirect	Med	Med	Med
CNY Integrated Emergency 911 Communications Center	Integrated Emergency Communications Center, with up-to-date, fully integrated radio, telephone and computer systems, is needed to coordinate emergency services in Central New York	Y	High	Ongoing	Schedule	Low	Low	Low	-	-	High	Low	Med

Project Examples						Project Impacts							
Title	Description	Sponsor Identified	Cost	Status	Barriers	Population Growth	Per Capita Income Growth	Job Growth	Energy Management	GHG Reduction	Community Resiliency	Environmental Stewardship	Improved Quality of Life
CNY Urban Electric Power Line Management Program	With the anticipated increase in the frequency of storm events, underground power lines would reduce problems with snow, damaged tree limbs, and wind that cause downed power lines and electrical outages for local residents.	N	High	Concept	Funding, Siting, Policy	Low	Low	Low	-	-	High	Low	Med
CNY "StormReady" Communities	Expand the National Weather Service's StormReady® program to provide communication and safety skills during storm events. Oswego County was recognized as a "Storm Ready Community".	N	Low	Concept	Funding, Policy	Low	Low	Low	-	-	Med	Low	Low
CNY Regional Water Supply Redundancy Network	Develop redundant water transmission supply facilities at key location across the region to ensure adequate supply of public water during periods of system outages.	N	High	Concept	Funding, Siting	Low	Low	Low	-	-	High	Low	Med
Onondaga County Community College CHP	Combined heat and power (CHP) systems can reduce energy costs, lower greenhouse gas emissions, and provide power during extreme weather. The technology uses one fuel source to supply both thermal and electrical energy to campus buildings, which improves system efficiency while reducing the College's carbon footprint.	N	High	Concept	Funding, Siting, Market	Low	Low	Low	High	Direct	High	Low	Low
SUNY Oswego CHP													
SUNY Morrisville CHP													
SUNY Cortland CHP													
Cayuga BOCES Center CHP													
Regional Dairy Barn Heat-Stress Demonstration Project	Agricultural practices are needed that support environmental, economic, and social sustainability. To address warmer temperatures, a demonstration project is needed that improves cooling capacities in dairy barns and animal facilities through the installation of fans, sprinklers, and cooling systems.	N	Med	Concept	Funding	Low	Low	Low	Low	Direct	Low	Low	Low

Section B: Summary of Public Participation Program

OUTLINE

A. INTRODUCTION

Work on the Central New York Regional Sustainability Plan was launched in June 2012 and is scheduled for completion at the end of January 2013. Throughout the past six months, meetings of the Steering Committee, Technical Advisory Committee, county-based focus groups, and Central New York Regional Planning and Development Board's (CNY RPDB) thirty-five member Board of Directors have provided excellent opportunities for public input regarding the regional plan. To ensure that the plan incorporated the sustainability planning efforts that are currently underway throughout Central New York, the CNY RPDB also distributed surveys to 145 municipalities. Responses were submitted from 52 local governments which provided valuable information on energy use, policies, and behavior throughout the region. In addition, the CNY RPDB designed and launched websites that inform and educate Central New York communities while providing opportunities for the public to submit local-level suggestions and feedback on the regional plan.

This report provides a summary of the CNY RPDB outreach projects, as well as the proceedings and comments received on the draft sustainability targets and implementation strategy. The appendices provide detailed information that the CNY RPDB received on sustainable development throughout the five-county region, including attendance lists, survey responses, and website outreach benefits. The CNY RPDB has carefully evaluated all public comments and has amended the sustainability targets and implementation strategy to address the concerns and ideas presented during these public outreach initiatives.

B. STEERING COMMITTEE MEETINGS

The Steering Committee consists of CNY RPDB Board members and elected representatives from partnering municipalities throughout Central New York. Committee meetings in 2012 provided an excellent opportunity to keep regional partners well-informed of the planning process and to generate feedback on goals, recommendations, and implementation strategies. Brief Steering Committee summaries are presented below.

+ The CNY RPDB held a meeting for the VisionCNY Regional Sustainability Plan on June 20, 2012 at its offices in Downtown Syracuse. Chris Carrick, Energy Program Manager for the CNY RPDB, provided an overview of the VisionCNY Regional Sustainability Plan effort. Neil Webb, Energy Specialist with O'Brien and Gere Engineers, presented on the region's energy profile including information regarding current energy sources and demand, existing renewable resources, available clean energy technologies, and a description of the opportunities and challenges related to promoting the sustainable use of energy in Central New York.

+ The CNY RPDB held another meeting for the VisionCNY Regional Sustainability Plan on August 15, 2012 at Morrisville State College. The meeting featured a review of major developments in Madison County by Scott Ingmire, Director of the Madison County Planning Department, a report on the status of the CNY RPDB's work on the Regional Sustainability Plan, and a guest presentation by Dr. Phil Hoffmeyer, Assistant Professor of Renewable Energy at Morrisville State College, on the college's Renewable Energy Training Center (RETC). Following the meeting, participants had a guided tour of SUNY Morrisville's Controlled Environmental Aquaculture Center.

+ The CNY RPDB held a Board meeting on October 17, 2012 at the Genesee Grande Hotel in Syracuse which featured presentations on the status of work accomplished by CNY RPDB staff. Board members and guests participated in break-out group discussions during which the draft goals, strategies, and project recommendations for the sustainability plan were reviewed. As a way to encourage participation, the discussion groups responded to several quiz questions pertaining to each Sustainability Plan chapter.

  Approximately 60 Board members, invited guests, and staff attended. CNY RPDB staff incorporated relevant recommendations from the discussion groups in the chapter narratives. The meeting agenda and a report called, "CNY Regional Energy and Sustainability Plan – Draft Goals, Strategies, and Project" were distributed to the Board members and invited guests prior to the meeting.

+ The CNY RPDB held a meeting on December 12, 2012 at the DoubleTree Hotel in East Syracuse. The meeting was designed to generate feedback on the recommendations included in the draft CNY Regional Sustainability Plan.

The event consisted of a series of presentations by technical consultants that are assisting the CNY RPDB with the preparation of the Regional Plan and the luncheon speaker was Dr. Bruce Bailey, President and Chief Executive Officer of AWS Truepower.

Approximately 70 people attended, including Board members, invited guests, and staff. The following documents were sent to Board members and invited guests prior to the meeting:

- Meeting agenda
- 2nd Draft of CNY Regional Sustainability Plan – Goals, Strategies and Project Recommendations
- Keynote presentation - AWS Truepower Company Information and Speaker Bio

Following the event, CNY RPDB staff met to discuss efficient ways to incorporate relevant comments from the discussion groups into the chapter narrative.

C. EVENTS SCHEDULED IN 2013

The CNY RPDB will continue to provide outreach and education opportunities to Central New York communities in 2013. Two of these events are described below.

+ **Cortland Counts Community Form**
On January 10, 2013, Chris Carrick will give a presentation at the "Cortland Counts Community Form" sponsored by the Seven Valley Health Coalition and Sustainable Cortland. Time will be provided for questions, comments, and suggestions from the audience. All comments will be compiled and documented as part of CNY RPDB's community feedback on the regional plan.

+ **F.O.C.U.S. Greater Syracuse**
Chris Carrick is scheduled to give a presentation at F.O.C.U.S. Greater Syracuse on January 18, 2013 at the City Hall Commons. His presentation, "Building Sustainable Communities – The Importance of Regional Planning", is designed to present information to the public about the regional plan while promoting the use of energy efficiency and conservation measures. F.O.C.U.S. stands for "Forging Our Community's United Strength." F.O.C.U.S. Greater Syracuse is a nonprofit community-wide visioning program that was created with the goal of making Syracuse a better place to live and work. The program, loosely modeled after several visioning projects around the country, was developed in order to determine a course of action and growth for Syracuse.

This event will provide a valuable outreach opportunity for the CNY RPDB in the continued promotion of the regional plan. Citizens throughout the Syracuse area have been asked to comment on their goals for the future of the Central New York community and to identify what they want the region to look like in the future. Approximately 50 people (including community leaders, business owners, and interested citizens) are expected to attend Mr. Carrick's presentation and time will be provided for questions, comments, and suggestions from the audience. All comments will be compiled and documented as part of CNY RPDB's community feedback for the regional plan.

+ **Energy in the 21st Century Symposium**
Chris Carrick is scheduled to give a presentation at the ninth Annual Energy in the 21st Century Symposium on April 12, 2013 in East Syracuse. The theme of this year's event, which draws attendance from across New York State and the Northeast, is "Net Zero Communities." Mr. Carrick's presentation will focus on the VisionCNY Plan and provide an opportunity to identify plan goals, targets and strategies related to energy management and transportation energy use. Mr. Carrick will participate in a panel discussion with national and state leaders including Sergej Mahnovski, Director of Energy Policy for New York City, and staff from National Renewable Energy Laboratory and the Natural Resources Defense Council.

+ **GreeningUSA Annual Meeting**
Chris Carrick is scheduled to give a presentation at the ninth Annual Meeting of GreeningUSA on April 18, 2013 in Syracuse. GreeningUSA is a local membership organization which advocates for sustainable communities to the benefit of local economies and environments. GreeningUSA has a history of engaging community leaders in public dialog about sustainable communities is order to educate and raise awareness of this growing movement. Both the City of Syracuse and Onondaga County have used GreeningUSA's 12 Traits of Sustainable Communities Rating System in developing their respective sustainability plans. The focus of the ninth Annual Meeting is a forum on the direction of community sustainability planning in Central New York. Panelists for the "Community Sustainability Plans – Collaboration and Coordination" will include Joanne M. Mahoney, County Executive, Onondaga County, Stephanie A. Miner, Mayor, City of Syracuse, and Mr. Carrick.

D. VISIONCNY TECHNICAL ADVISORY COMMITTEE

The VisionCNY Technical Advisory Committee (TAC) is comprised of CNY RPDB Board members and professionals with expertise in energy, land use, transportation, and natural resources, as shown in the table at right.

The CNY RPDB hosted five committee meetings in 2012. The first one, held on July 10, 2012 at the CNY RPDB office in downtown Syracuse, provided on overview of committee member responsibilities in the planning process, the anticipated meeting schedule, and the proposed timeline and scope for the development of the Regional Sustainability Plan.

The remaining four meetings provided opportunities for committee members to review the consultant team findings and the draft goals and strategies for the plan, and to collect committee member recommendations and priorities. Relevant comments and technical observations have been incorporated into the regional plan. Committee meeting dates and attendance information are presented in the table on the following page.

VisionCNY TAC Membership		
Name	Title/Position	Affiliation
Sherburne Abbott	VP for Sustainability	Syracuse University
Charlie Bertuch	Project Manager	Bergmann Associates
Tom Blanchard	Senior VP	CenterState CEO
Laura Bradford	Sustainability Director	Bristol-Myers Squibb
Barry Carr	Coordinator	Clean Communities of CNY
Bob Doucette	Principal	Armory Development
Peggy Gans	Multifamily Energy Program Director	PEACE Community Action
Sean Graham	Public Works Director	Village of Hamilton (Muni Electric)
Ellis Guiles	Vice President	TAG Mechanical
Art Hamlin	Director, Economic Development Upstate NY	National Grid
Phil Hofmeyer	Assistant Professor, Renewable Energy	Morrisville State College
Mike Kelleher	Sustainability Director	SUNY-ESF
Pete King	Partner	King + King Architects
Lee Klosowski	Sustainability Director	Onondaga County
Mark Lichtenstein	Managing Director	Syracuse COE
Steve Lloyd	Associate Director for Sustainability	Syracuse University
Bob Lotkowictz	Director of Municipal Operations	Village of Skaneateles (Muni Electric)
John Montone	Superintendent	Village of Solvay Electric Department
John Pumilio	Sustainability Director	Colgate University
Ravi Raman	Principal	RamTECH Engineers
Suresh Santanam	Director	Syracuse University Industrial Assessment Center
Frank Visser	Director	Oswego County Solid Waste

VisionCNY TAC Meetings		
Date (Attendance)	Agencies/Organizations	
July 10, 2012 (17)	Syracuse University Bergmann Associates Bristol-Myers Squibb PEACE Community Action TAG Mechanical National Grid Morrisville State College SUNY-ESF King + King Architects Onondaga County	Syracuse COE Syracuse University Village of Skaneateles (Muni Electric) Village of Solvay Electric Department Colgate University RamTECH Engineers Oswego County Solid Waste CNY RPDB
August 2, 2012 (11)	Bergmann Associates Bristol-Myers Squibb TAG Mechanical Morrisville State College SUNY-ESF King + King Architects	Onondaga County Syracuse COE Syracuse University Colgate University Oswego County Solid Waste CNY RPDB
September 6, 2012 (12)	Syracuse University Bergmann Associates Bristol-Myers Squibb TAG Mechanical SUNY-ESF King + King Architects Onondaga County	Syracuse COE Syracuse University Colgate University RamTECH Engineers Oswego County Solid Waste CNY RPDB
October 9, 2012 (14)	Colgate University O'Brian and Gere Bristol Myers	Solvay Electric CNY RPDB
November 15, 2012 (11)	O'Brian and Gere King and King SUNY ESF Syracuse University	Bristol Myers Onondaga County CNY RPDB

E. MUNICIPAL SURVEYS

To ensure that the VisionCNY Plan incorporated comprehensive information on sustainability planning efforts, the CNY RPDB distributed surveys to 145 local government offices throughout Central New York in 2012. The goal of the survey, called "Sustainable Practices of Local Governments in Central New York", was to compile an inventory of municipal energy projects, goals, and methods that cut energy costs, promote energy conservation, reduce greenhouse gas emissions, and create sustainable practices throughout Central New York's five-county region.

The surveys were distributed in electronic and hard copy format with personalized cover letters addressed to the municipal mayors and supervisors. Copies were also sent to key contacts within select communities that had a working relationship with the CNY RPDB. Follow-up reminders (up to four) were sent at later dates and telephone calls were made to municipal representatives in order to maximize our response rate.

CNY RPDB's primary target audience was comprised of 23 municipalities that were selected because they either had populations greater than 10,000 people and/or had adopted the Climate Smart Community Pledge. A second survey was distributed to the remaining municipalities throughout Central New York. This survey was shorter and required less time for completion than the first survey.

The CNY RPDB received responses from 52 municipalities, representing a 36% response rate. Information generated from the surveys has greatly improved CNY RPDB's understanding of municipality energy use, policies, and behavior. Comprehensive summaries of the results from both surveys are found in Section D, Sustainable Practices of Local Governments in CNY.

F. FOCUS GROUPS

During November and December, the CNY RPDB facilitated six focus groups with county representatives and regional stakeholders. The meetings were held in cooperation with partners in each participating county. The groups were called together in order to review draft

goals, strategies, and project recommendations for the VisionCNY Regional Sustainability Plan. Public officials, agency staff and private sector stakeholders in Madison, Onondaga, Cayuga, Cortland, and Oswego counties were invited to participate. An additional meeting was held for agencies and organizations that operate on a regional basis. Invitations were sent to priority stakeholders including elected officials, agency staff, and leaders from the non-profit and higher education sectors.

Each focus group was structured in a similar format. After general introductions, presentations included an overview of the CNY Regional Energy and Sustainability Plan, a review of draft targets, goals, and strategies, a discussion of the project recommendations for each chapter (Climate Adaptation, Energy, Environment, Economic Development, Land Use, Transportation and Infrastructure, and Solid Waste Management), and a discussion of the remaining timeline for the regional sustainability plan.

Eighty-six stakeholders participated in these county-based focus group discussions. The meetings provided an excellent opportunity for the CNY RPDB to inform participants of progress made with the regional plan and, more importantly, to discuss local-level responses, opinions, and suggestions. All comments were recorded and many were included in the final plan.

Focus Group Meeting Summary		
Date	Target Audience	Attendance Total
November 27, 2012	Madison County	12
November 28, 2012	Cortland County	13
November 28, 2012	Cayuga County	14
November 29, 2012	Onondaga County	13
November 30, 2012	Oswego County	19
December 6, 2012	Regional Stakeholders	15
Total		**86**

G. MEDIA COVERAGE

The CNY RPDB media strategy incorporated a diverse combination of print, electronic, and radio opportunities and effectively generated feedback from the Central New York public regarding the Sustainability Plan. It also provided creative opportunities for education and outreach. Media outreach targeted contacts throughout all of Central New York. A summary is provided in the table on the following page.

In addition, the CNY RPDB placed an online advertisement on the Syracuse Post-Standard website at www.syracuse.com for one week to direct visitors to the project website (described below). The CNY RPDB prepared several different versions of the advertisement which was placed on various locations on the Syracuse Post-Standard website including:

1. A "leaderboard" banner advertisement that appeared at the top of the Business News section (Figure 1)
2. A "logo" advertisement that appeared on the weather page (Figure 2)
3. A "rectangle ad" that appeared at the bottom of various search result pages (Figure 3)
4. A "vertical banner ad" (Figure 4)

According to information provided to the CNY RPDB by the Syracuse Post-Standard, there were a total of 224,364 "impressions" (number of appearances or views) on their website and 50 direct referrals from their website over the 1-week period. In addition, the number of direct visits to the project website increased by 12% during week that the advertisements ran over the previous week, which may or may not be a result of users viewing the online advertisement.

Electronic and Print Media Outreach		
Date	Article Title	Media
March 21, 2012	Energy Efficiency and Renewable Energy: What's in it for you?	Print media – newspaper press release
May 20, 2012	Onondaga County Awards Contract to the CNY RPDB for Cleaner Greener Communities Program	Vision News – VisionCNY website
June 20, 2012	CNY RPDB Hosts the First Meeting for the Vision CNY Regional Sustainability Plan	Vision News – VisionCNY website
June 25, 2012	Central New York coalition receives $1 million for regional sustainability plan	Syracuse.com
July 2, 2012	CNY RPDB Hires Consultant Team led by O'Brien & Gere for Vision CNY	Vision News – VisionCNY website
July 10 2012	CNY RPDB Hosts First Meeting of the Vision CNY Technical Advisory Committee	Vision News – VisionCNY website
August 2, 2012	CNY RPDB Hosts Second Meeting of the Vision CNY Technical Advisory Committee	Vision News – VisionCNY website
August 15, 2012	CNY RPDB Hosts Second Meeting for the Vision CNY Regional Sustainability Plan at Morrisville State College	Vision News – VisionCNY website
September 15, 2012	CNY RPDB Hires Consultant Team led by Arup for Vision CNY	Vision News – VisionCNY website
October 17, 2012	CNY RPDB Hosts the Third Meeting for the Vision CNY Regional Sustainability Plan	Vision News – VisionCNY website
November 26, 2012	Vision CNY Regional Sustainability Planning Effort seeks Public Input – Potential to Millions in Investment to CNY	Vision News – VisionCNY website
November 27, 2012	VisionCNY seeks input on Regional Sustainability Plan	Eagle News on Line
November 27, 2012	Public ideas wanted on CNY sustainability	Your News Now – YNN
November 27, 2012	CNY working on its part of state-wide sustainability plan,	WRVO radio
November 27, 2012	VisionCNY Regional Sustainability Planning Effort seeks Public Input – Potential to Direct Millions in Investment to CNY	Print media – newspaper press release
December 7, 2012	VisionCNY Regional Sustainability Plan to be Discussed at Central New York Regional Planning and Development Board Annual Meeting	Print media – newspaper press release
December 10, 2012	Renewable energy expert to speak at development board annual meeting Wednesday	Syracuse.com - distribution throughout Central New York
December 11, 2012	Focus Group Meetings held throughout Central New York	Vision News
December 12, 2012	VisionCNY Regional Sustainability Plan to be Discussed at Central New York Regional Planning and Development Board Annual Meeting	Print media – newspaper press release
December 19, 2012	Man with a plan: Samuel Gordon seeks bright ideas from residents to make Central New York a more sustainable place.	Print media – newspaper press release

FIGURE 1–Leaderboard banner advertisement

FIGURE 2–Logo advertisement

FIGURE 3–Rectangle ad on search result pages

FIGURE 4–Vertical banner ad

H. VISIONCNY WEBSITE

+ The visioncny.org website was officially presented to the Central New York community on November 16, 2012 and provides a creative and colorful method to encourage feedback on the Sustainability Plan. Once at the site, the public is encouraged to participate in a sustainability survey, take an energy quiz, post photographs, locate existing or proposed sustainability projects on a map, and contribute ideas on a message board that will help to shape a sustainable future for Central New York. The site also provides an opportunity for the public to learn about the steps involved in the planning process and about the diverse partnerships that have been established. In addition, a website page called Vision News provides a concise summary of public outreach events and opportunities throughout Central New York.

+ To date, the VisionCNY website has received over 555 visits with 2.35 pages/visit and average visit duration of 2 minutes 35 seconds. 78% of visits have been new visits during this time period. The graphic below shows the website header.

+ Postings on Facebook and Twitter were also used to diversify our target audiences, while promoting widespread awareness of the website.

+ The CNY RPDB encouraged regional partners to provide computer links to the VisionCNY site on their websites. This helped to increase site visibility and encouraged opinions and ideas from the public. The following table displays a list of local organizations that provide links to the VisionCNY site.

Organization	Website
O'Brien & Gere	http://www.obg.com/news.aspx?recid=184
City of Syracuse	http://www.syracuse.ny.us
OCRRA	https://ocrra.org/about-ocrra/links
F.O.C.U.S. Greater Syracuse	http://www.focussyracuse.org/2012/11/vision-cny-regional-sustainability-plan
Town of DeWitt	http://www.townofdewitt.com

I. PUBLIC FEEDBACK: PRIORITY ISSUES

Comments and meeting minutes from the CNY RPDB public outreach initiatives were evaluated and priority issues from regional partners were identified. The issues and concerns that were discussed at the Steering and Technical Advisory Committee meetings and during the focus group meetings were then incorporated into the Implementation Strategy and Sustainability Targets. The following table provides a summary of the priority topics that were addressed within each of the program areas.

Program Area	Priority Issues, Comments, and Recommendations	
Energy	+ Energy efficiency and conservation, behavior changes, and public education should be our highest priorities + Focus on local energy production and continue to promote alternative energy such as solar and wind	+ Strengthen infrastructure readiness and green buildings + Promote bioenergy production (i.e., establish biomass feed stocks on underutilized agricultural lands; expand the SUNY-ESF shrub willow biomass energy production program)
Water and Environment	+ Reduce stormwater runoff through green infrastructure and wetland protection + Provide more water conservation programs for government buildings, businesses and residential properties + Concern was expressed for the condition of water distribution in Syracuse and the ~40% loss in water	supply vs. water delivery to customers, the slow rate of repair that the City can afford, and the overall cost for necessary repairs ~$500 million + Groundwater protection should be a high priority + Prioritize water quality protection and drainage systems and reduce combined and separate sanitary overflows
Land Use	a. Prioritize mixed-use and transit oriented development b. Focus on re-use of existing buildings and in-fill development c. Develop net-zero energy demonstration projects at neighborhood or district scale	d. Create mixed-use and transit-oriented development, waterfront development and traditional neighborhood development (TND) districts that provide mixed-income housing options and access to community services that meet local needs
Transportation and Infrastructure	+ CNY needs to overcome real and perceived barriers to public transportation + Prepare a regional Sustainable Transportation Districts Plan to identify regional and metropolitan mobility corridors and high accessibility corridors + A regional pedestrian and bicycle master plan is needed to facilitate growth in alternative transportation use, accessibility, interconnectivity	+ Expand CENTRO bus services to the suburbs and outlying regions and improve system efficiency + Provide more alternative fuel vehicle infrastructure (EV charging and CNG and biodiesel fueling stations) + Promote rail and barge freight transportation as alternatives to trucks
Waste	+ Expand OCRRA's food waste composting facility + Encouraged and subsidize composting and recycling by residents and businesses	+ Expand active landfill gas collection and control systems
Economic Development	+ Incentivize private development, with a focus on region's strengths in energy and environmental systems technologies and services	+ Develop regional hubs for locally produced food + Improve telecommunications projects that provide universal broadband access
Climate Adaptation	+ Prioritize flood preparedness and infrastructure + Repair deficient combined sewer infrastructure to improve capacity during high-water events + Implement storage and reuse systems for wastewater at treatment plants to reduce impacts on infra-	structure, water quality and ecosystems during heavy precipitation and flooding events + Conduct structural and facility inventories that incorporate flood and wind parameters + Establish an online CNY Climate Change Clearinghouse to share info. and BMPs

Section C: List of Plans Reviewed

A. Important Regional Documents

1. **CNY Regional Economic Development Council Strategic Economic Development Plan 2012-2016**
   a. Author(s)
      i. CNY Regional Economic Development Council
   b. Contact
      i. http://regionalcouncils.ny.gov/content/central-new-york
      ii. nys-centralny@esd.ny.gov
      iii. Co-chairs: Nancy Cantor, Rob M. Simpson
   c. Date: 2012
   d. Full Report: http://regionalcouncils.ny.gov/themes/nyopenrc/rc-files/centralny/finalCNYREDCplansinglepages.pdf
   e. Summary: This plan for economic development in Central New York was developed by the CNY REDC and its contributing representatives from around the region and highlights goals and strategies to create a diverse, sustainable, and globally competitive economy while preserving and enhancing the region's treasured quality of life. The three priority goals are: Strengthen Targeted Industry Concentrations that Leverage Unique Economic Assets, Improve Competitiveness in, and Connections to, the Regional, National, and Global Economies, and Revitalize our Region's Urban Cores, Main Streets, and Neighborhoods.
2. **The 2009 NYS Open Space Conservation Plan**
   a. Author(s)
      i. New York State Department of Environmental Conservation
      ii. New York State Office of Parks, Recreation, and Historic Preservation
   b. Contact
      i. Osp2009@gw.dec.state.ny.us
      ii. http://www.dec.ny.gov/lands/47990.html
   c. Date: 2009
   d. Full Report: http://www.dec.ny.gov/docs/lands_forests_pdf/osp09complete.pdf
   e. Summary: NYS DEC and NYS OPRHP collaborated on this plan, which contains a list of outstanding, priority conservation areas statewide as well as policy and project recommendations to expand conservation. Recommendations made include several that specifically address climate change and adaptation in New York State through the lens of conservation. The priorities identified for the next five years are: Responding to Climate Change, Fostering Green, Healthy Communities, Connecting New Yorkers with Nature and Recreation, and Safeguarding our Natural and Cultural Heritage.
3. **The SMTC Long Range Transportation Plan**
   a. Author(s)
      i. Syracuse Metropolitan Transportation Council
   b. Contact
      i. http://www.smtcmpo.org/lrtp.asp
      ii. webmaster@smtcmpo.org
   c. Date: 2011
   d. Full Report by Chapter: http://www.smtcmpo.org/lrtp.asp
   e. Summary: The LRTP serves as a blueprint that guides the Syracuse Metropolitan Area's transportation development over a 25-year period. Updated every three years to reflect changing conditions and new planning principles, the LRTP is based on projections of growth and travel demand coupled with financial assumptions. The LRTP specifically looks at major urban transportation planning concerns as environmental/air quality; complete access to transportation; alternative transportation modes (especially bicycle and pedestrian), the impact of land development on the transportation system; highway traffic congestion; and maintenance of the existing infrastructure.
4. **Onondaga County Sustainable Development Plan**
   a. Author(s)
      i. Syracuse-Onondaga County Planning Agency

b. Contact
   i. http://future.ongov.net/?page_id=88
   ii. donjordan@ongov.net
c. Date: 2012 (living plan online)
d. Full Report: available from the CNY RPDB upon request.
e. Summary: This plan was developed by the Syracuse-Onondaga County Planning Agency with the intention of being a "living" plan online that can be used as a tool to guide future development in Onondaga County. This plan directs County policy and informs local governments, stakeholders, and residents by challenging the current approach to development and providing a framework from which sustainable development decisions can be made. The plan focuses on public outreach, scenario modeling, elements of sustainable development, characters areas, and concludes with an action plan.

5. Onondaga County Climate Action Plan

a. Author(s)
   i. Onondaga County Office of the Environment
   ii. C&S
b. Contact
   i. (315) 435-2647
   ii. http://www.ongov.net/environment/contact.html
   iii. http://www.ongov.net/environment/CAP.html
c. Date: 2012
d. Full Report: http://www.ongov.net/environment/documents/CAP2012.pdf
e. Summary: This report includes a baseline inventory of the County's carbon emissions, a listing of those emissions by source, and recommendations for improving the County's carbon emissions. Specific targets are identified and implementation recommendations are made to meet these targets.

6. City of Auburn and Cayuga County Comprehensive Sustainable Energy and Development Plan

a. Author(s)
   i. City of Auburn
   ii. Cayuga County
   iii. Larsen Engineers
b. Contact
   i. planning@co.cayuga.ny.us
   ii. http://www.cayugacounty.us
c. Date: 2009
d. Summary of Plan: This document was the result of several meetings of the City of Auburn and Cayuga County Sustainability Task Force, made up of public and private stakeholders created to develop a short and long-term comprehensive plan for Energy and Sustainable Development. The plan builds on past projects, emerging new technological initiatives, and principles of sustainability to optimize the benefits of renewable energy to make recommendations relative to eight energy and economic development topic areas.

7. NYSERDA Responding to Climate Change in New York State (ClimAID)

a. Author(s)
   i. Prepared for NYSERDA by
      2. Columbia University
      3. CUNY
      4. Cornell
b. Contact
   i. http://www.nyserda.ny.gov/About/Contacts.aspx
   ii. http://www.nyserda.ny.gov/Publications/Research-and-Development-Technical-Reports/Environmental-Reports/EMEP-Publications/Response-to-Climate-Change-in-New-York.aspx
c. Date: 2011
d. Full Report: available from the CNY RPDB upon request.
e. Summary: The ClimAID assessment provides information on climate change impacts and adaptation for eight sectors in New York State: water resources, coastal zones, ecosystems, agriculture, energy, transportation, telecommunications, and public health. Observed climate trends and future climate projections were developed for seven regions across the state, including Central NY. Within each of the sectors, climate risks, vulnerabilities, and adaptation strategies are identified. Integrating themes across

all of the sectors are equity and environmental justice and economics. Case studies of the recommendations are presented throughout.

8. **New York State Climate Action Council Climate Action Plan Interim Report**
   a. Author(s)
      i. New York State Climate Action Council
      ii. NYS DEC
      iii. NYSERDA
   b. Contact
      i. http://www.dec.ny.gov/energy/80930.html
      ii. climatechange@gw.dec.state.ny.us
   c. Date: 2010
   d. Full Report: available from the CNY RPDB upon request.
   e. Summary: This report and the NYS Climate Action Council were created to meet the target set in Executive Order No. 24 to reduce greenhouse gas emissions in NYS by 80% below the levels of 1990 by the year 2050. The plan assesses how all economic sectors can reduce greenhouse gas emissions and adapt to climate change. It also identifies the extent to which such actions support New York's goals for a clean-energy economy.
9. **Madison County Economic Development Strategy**
   a. Author(s)
      i. CNY RPDB
   b. Contact
      i. CNY RPDB
      ii. Madison County Economic Development: http://www.madisoncounty.ny.gov/planning/economic-development
      iii. Madison County IDA: http://madisoncountyida.com/
   c. Date: 2012
   d. Full Report: http://www.madisoncounty.ny.gov/sites/default/files/Final%20Madison%20County%20Strategy%202013.pdf
   e. Summary: This economic development strategy provides information about the current economic situation in Madison County, identifies potential opportunities and challenges for economic growth, and sets goals and makes recommendations for economic growth. Recommendations are broken into categories, including energy.
10. **Wastewater Infrastructure Needs of New York State**
    a. Author(s)
       i. NYS DEC
    b. Contact
       i. Dowinfo@gw.dec.state.ny.us
       ii. http://www.dec.ny.gov/chemical/42383.html
    c. Date: 2008
    d. Full Report: http://www.dec.ny.gov/docs/water_pdf/infrastructurerpt.pdf
    e. Source: http://www.dec.ny.gov/chemical/42383.html
    f. Summary: This was written by DEC to assess statewide wastewater infrastructure improvement needs. It consists of an overview of wastewater infrastructure, and overview of infrastructure funding history, how state financial needs estimates were derived, data evaluation and recommendations for implementation and funding. Greenhouse gas emissions and climate change and adaptation are considered in the document.
11. **City of Oswego 2020 Vision Plan**
    a. Author(s)
       i. City of Oswego
       ii. Bergmann Associates
       iii. Steinmetz Planning Group
    b. Contact
       i. City of Oswego: mvanouse@oswegony.org
       ii. http://www.oswegony.org/2020VisionPlan/2020VisionPlan/default.htm
    c. Date: 2011
    d. Full Report: http://www.oswegony.org/2020VisionPlan/2020VisionPlan/documents.htm
    e. Summary: This is an update of a plan originally published in 2003 intended to provide a short list of actions that will focus the next 10 years of progress and help ensure the community's vision is achieved. The report is two part, the first presenting the updated vision, policy, and objectives for the plan, while the second is an

Action Plan, culminating in ten recommendations that should be the primary focus of the city and how these recommendations can/should be implemented.

12. **NYS Forest Resource Assessment and Strategy 2010-2015 (now referred to as the Forest Action Plan)**
    a. Author(s)
        i. NYS DEC
    b. Contact
        i. lflands@gw.dec.state.ny.us
        ii. NYS DEC Division of Lands and Forests
        iii. http://www.dec.ny.gov/lands/60829.html
    c. Date: 2010
    d. Full Report: http://www.dec.ny.gov/docs/lands_forests_pdf/fras070110.pdf
    e. Summary: This report assesses the status of New York's nearly 19 million acres of forest land, and provides practical recommendations on how landowners, forest stakeholders, and federal, state, and local governments can work together to sustain the many benefits and ecosystem services our forests provide to our society. Key initiatives include ensuring that New York's forests play a critical role in federal state, and local climate action plans and programs in recognitions of the substantial carbon sequestration potential and adaptation role our forests provide and practicing sustainable forestry practices.
13. **Great Lakes Restoration Initiative Action Plan FY 2010-2014**
    a. Author(s)
        i. Great Lakes Restoration Initiative (EPA, 11 federal agencies represented)
    b. Contact
        i. Pranas Pranckeviciuss, pranckevicius.pranas@epa.gov, (312) 353-3437
    c. Date: 2010
    d. Full Report: http://greatlakesrestoration.us/pdfs/glri_actionplan.pdf
    e. Summary: This plan was developed by a task force of 11 federal agencies to implement the Great Lakes Restoration Initiative. The five urgent issues identified are: cleaning up toxics and areas of concern, combating invasive species, promoting near shore health by protecting watersheds from polluted run-off, restoring wetlands and other habitats, and tracking progress and working with strategic partners. The Action Plan identifies goals, objectives, measurable ecological targets, and specific actions for each of these focus areas. Sustainable Development is a priority issue area.
14. **25-Year Plan for the Great Lakes**
    a. Author(s)
        i. New York Great Lakes Basin Advisory Council, NYS DEC
    b. Contact
        i. NYS DEC
    c. Date: 1992
    d. Full Report: http://www.dec.ny.gov/docs/regions_pdf/25year.pdf
    e. Summary: Under the direction of Governor Mario M. Cuomo, NYS DEC prepared strategies and recommendations for the Great Lakes to meet the following six goals: formulate a shared vision, restore the integrity of the waters, manage water resources, preserve and improve natural resources, sustainable economic development, and improve intergovernmental relationships. The Plan focuses on Lakes Erie and Ontario, and the Niagara and St. Lawrence Rivers and provides the strategic framework for a broad range of public actions to be undertaken in the next 25 years.
15. **2010 Statewide Forest Resource Assessments and Strategies in the Northeast and Midwest**
    a. Author(s)
        i. Northeastern Area State and Private Forestry, Forest Service, USDA.
    b. Contact:
        i. Northeastern Area Association of State Foresters
        ii. Ian MacFarlane, NAASF Executive Director, Iam.Macfarlane@mail.wvu.edu, 202-526-4804
        iii. http://www.northeasternforests.org/FRPC
        iv. http://www.mass.gov/dcr/stewardship/forestry/docs/NE-MW_Reg_Summary- StateAssessStrategy.pdf

c. Summary: The purpose of this report is to provide a regional-level summary of content and methodology that the 20 Northeast and Midwest States and the District of Columbia used to develop their State Forest Resource Assessments and Strategies. The objectives of the report are to provide regional context, highlight approaches from individual states, and provide information to complement national efforts. One common issue amongst all the states was sustainable forest management across all ownerships.

16. NYS Invasive Species Management Strategy

a. Author(s)
   i. Ecology and Environment
   ii. Prepared for: NYS Invasive Species Council: NYS Department of Agriculture and Markets and NYS DEC

b. Contact
   i. http://www.dec.ny.gov/animals/6989.html
   ii. isingo@gw.dec.state.ny.us

c. Date: 2011

d. Full Report: http://www.dec.ny.gov/docs/lands_forests_pdf/ismgmtstrategy.pdf

e. Summary: This plan outlines approaches that should be used for species management in NYS and addresses the following issues: Adequate Staffing and Funding, Effective Administration, Coordinated IS Program Integration, Adaptive Management, and Pathway Analysis. It also serves to support the 12 recommendations developed by the Invasive Species Task Force in the report to Governor and Legislature in 2005. It emphasizes the need to a fully operational Partnership for Regional Invasive Species Management (PRISM) infrastructure.

17. National Water Program 2012 Strategy: Response to Climate Change

a. Author(s)
   i. EPA

b. Contact
   i. http://water.epa.gov/scitech/climatechange/2012-National-Water- Program-Strategy.cfm
   ii. http://water.epa.gov/contactus.cfm
   iii. Elana Goldstein, water_climate_change@epa.gov, 202-564-1800

c. Date: 2012

d. Full Report: http://water.epa.gov/scitech/climatechange/upload/epa_2012_climate_water_stra tegy_full_report_final.pdf

e. Summary: This report addresses climate change in the context of the EPA's National Water Program, recognizing that climate change poses significant challenges to water resources. It emphasizes assessing and managing risk and incorporating adaptation into core programs. The vision of the National Water Program, as well as several goals and strategic outlines are discussed.

18. Beyond Waste 2010

a. Author(s)
   i. NYS DEC

b. Contact
   i. http://www.dec.ny.gov/chemical/41831.html
   ii. nysswmp@gw.dec.state.ny.us

c. Date: 2010

d. Full Report: http://www.dec.ny.gov/docs/materials_minerals_pdf/frptbeyondwaste.pdf

e. Summary: This plan is an update to the 1988 plan that maintains the essence of the 1988 priorities while acknowledging the need for greater progress in reducing the amount of waste New Yorkers dispose of every year. Beyond Waste describes how materials are currently managed in New York and proposes many new ways for state and local government, businesses, and individual citizens to move toward a more sustainable approach, thereby reducing greenhouse gases, reducing pollution, saving energy, and creating new green jobs. The Plan sets out a twenty year goal of reducing the average amount of waste that New Yorkers dispose of from 4.1 to 0.6 pounds per person, per day.

19. Syracuse Comprehensive Plan 2040

a. Author(s)
   i. City of Syracuse

b. Contact
   i. http://www.syracuse.ny.us/planning_and_sustainability.aspx

ii. Andrew Maxwell, amaxwell@ci.syracuse.ny.us, 315-448-8005

c. Date: 2012 update

d. Full Report: ..\EnergyPlans\White Binder - Local Plans\DraftSustainabilityPlan_SYR.pdf

e. Summary: This plan contains a vision for the future—pertaining to physical assets, government services, local business and institutions, and cultural resources—and identifies policies, actions, regulations and investments that the City will pursue to achieve this vision. It builds on the 2025 comprehensive plan, but includes new components such as bicycle infrastructure, historic preservation, land use & development, public art, and sustainability. The Syracuse Bicycle Plan 2040 and the Syracuse Sustainability Plan are components of this plan.

20. CNY Comprehensive Economic Development Strategy (CNY CEDS)

a. Author(s)

i. CNY RPDB

b. Contact

i. CNY RPDB

c. Date: 2010

d. Full Report: http://www.cnyrpdb.org/docs/economic/ceds2010.pdf

e. Summary: This plan serves as a guide for the agency's economic development work in Cayuga, Cortland, Madison, Onondaga, and Oswego Counties and provides a vehicle for local, state, and federal officials to identify key projects that should be undertaken in Central New York to support economic growth in the region.

21. Essential New York Initiative

a. Author(s)

i. Metropolitan Development Association

b. Contact

i. CenterState CEO

ii. http://www.centerstateceo.com/economic-development/essential-new- york-initiative.aspx

c. Date: 2004

d. Full Report: http://www.centerstateceo.com/economic-development/essential- new-york-initiative.aspx

e. Summary: The purpose of this plan is to accelerate the transition of the CenterState New York Region into a knowledge-based economy by adopting growth strategies that build upon its strengths. There are six master strategies: aggressively targeting middle-market companies with high potential for expansion and supporting existing industries, optimizing key industry clusters, creating, retaining, and attracting talent in Central Upstate New York, leveraging colleges and universities as economic and community growth engines, encouraging the creation and growth of a stronger entrepreneurial culture, and developing a broader regional consciousness.

22. Oswego County Energy Efficiency Plan

a. Author(s)

i. O'Brien & Gere

ii. Oswego County

b. Contact

i. Renew Oswego County, C/O Blue Springs Energy, info@RenewOswego.org

c. Date: 2013

d. Full Report: not available online

e. Summary: The Oswego County of Community Development, Tourism, and Planning (County) is developing a Sustainability Master Plan that provides a roadmap for the County and its constituents to reduce energy usage, decrease operating costs, and ultimately reduce greenhouse gas (GHG) emissions. The Energy Efficiency Plan will be a key component of the County's Sustainability Master Plan.

2. Other Plans

1. Town of Niles Comprehensive Plan

a. Slow download: http://www.cnyrpdb.org/nilescompplan/docs/2010_Final_Niles_Comp_Plan.pdf;
Faster download: http://www.cnyrpdb.org/nilescompplan/docs/2010_Final_Niles_Comp_Plan_LR.pdf

2. **Village of Phoenix Strategic Plan**
    a. http://villageofphoenix-ny.gov/images/Phoenix Comprehensive Plan Update Final Draft 3-18-131.pdf
3. **Town of Richland – Village of Pulaski Comprehensive Plan**
    a. http://www.cnyrpdb.org/prcp; scroll to bottom of page and select desired link (the complete document is a very slow download).
4. **Town of Scipio Comprehensive Plan**
    a. http://www.cnyrpdb.org/scipiocompplan/docs/Scipio_Comp_Plan_2011-01-06.pdf
5. **Town of Cazenovia Comprehensive Plan**
    a. http://townofcazenovia.org/content/Generic/View/15
6. **Town of Lafayette Comprehensive Plan**
    a. http://www.thomadevelopment.com/customers/projects/planning_projects/TofLaFayette-comprehensive-plan.html
7. **Brewerton Strategic Revitalization Plan**
    a. http://www.anewdayinbrewerton.com/downloads/September_2008_Plan.pdf
8. **Owasco Lake Watershed Management Plan**
9. **Salmon River Greenway Trail Concept Plan**
    a. Available from the CNY RPDB upon request.
10. **Vision for Skaneateles Highlands**
    a. http://www.fllt.org/linkfiles/skanreport.pdf
11. **Onondaga Lake Watershed Progress Assessment and Action Strategies (2010)**
    a. http://www.onlakepartners.org/ppdf/olwpaas/PAAS for website.pdf
12. **The Fisheries and Limnology of Oneida Lake, 2000-2011**
    a. http://www.dec.ny.gov/docs/fish_marine_pdf/r7onelr10.PDF

Section D: Sustainable Practices of Local Governments in CNY

SURVEY SUMMARY

The Central New York Regional Planning and Development Board (CNY RPDB) distributed 145 surveys to local government offices throughout Madison, Oswego, Onondaga, Cayuga, and Cortland counties during the fall and winter months of 2012. Our goal was to compile an inventory of energy projects, goals, and methods that lower energy costs, promote energy conservation, reduce greenhouse gas emissions, and create sustainable practices in Central New York. The surveys were distributed in electronic and hard copy format with personalized cover letters addressed to municipal mayors and supervisors. Copies were also sent to the municipal clerks and to key contacts within communities that had a working relationship with the CNY RPDB. Telephone calls and follow-up email reminders (between one and four) were distributed during November and December in order to maximize our response rate.

Two separate surveys were distributed. The first one was sent to 25 municipalities that either had a population rate of over 10,000 people and/or had signed the Climate Smart Community (http://www.dec.ny.gov/energy/50845.html) pledge. The second survey was distributed to the 120 remaining municipalities in Central New York. This was a shorter survey that required less time to complete.

The CNY RPDB received responses from 52 municipalities, representing a 36% response rate. The information has greatly improved CNY RPDB's understanding of municipality energy use, policies, and behavior. The lack of response from the remaining municipalities was partially attributed to municipalities that may not have energy programs in place and/or municipalities that possibly didn't have sufficient staff time to complete the survey.

A summary of information from both surveys is found on the following pages. Please note that this is not a comprehensive inventory of all projects in Central New York, but instead, a summary of the information that was submitted on the survey replies. For questions or comments about this information, please contact Anne Saltman, CNY RPDB Principal Planner at (315) 422-8276 ext. 206 or asaltman@cnyrpdb.org.

(V) = Village (T) = Town (C) = City

1. Does your municipality have a staff member who is responsible for energy or sustainability projects?

Response	Municipality
No	City of Oneida, Cazenovia (T), Sullivan, Lysander, Fayetteville, Salina
No, but the idea is under consideration	Preble, City of Fulton, Clay
Yes, one or more full time staff	Syracuse, Madison County, City of Oswego, Onondaga County
Yes, a part-time staff position	Oswego County, DeWitt

2. Has your municipality established an energy or sustainability committee or advisory group?

Response	Municipality
No	City of Oneida, Cazenovia (T), City of Oswego, Sullivan, Lysander, Fayetteville, Salina
Yes	Syracuse, Madison County, Preble, City of Fulton, Oswego County, Clay, DeWitt, Onondaga County

3. Has your municipality participated in a New York State Energy Research and Development Authority (NYSERDA) program or in any utility efficiency programs (i.e. National Grid Lighting Retrofit)?

Response	Municipalities
No	City of Oneida, Sullivan, Salina
Yes but no programs were listed	Madison County and DeWitt
FlexTech/Technical Assistance Program	Syracuse, City of Oswego, Onondaga County
Energy Audit Program	Syracuse, Preble, Cazenovia (T), City of Oswego, Onondaga County
Existing Facilities Program	Preble, City of Fulton, Lysander, Onondaga County
New Construction Program	City of Fulton, Fayetteville
Alternative Fueled Vehicles Program	Syracuse
PV/Small Wind Program	Syracuse, Preble, City of Oswego, Onondaga County
Energy Smart Communities Program	Syracuse, City of Oswego, Oswego County
Focus on Local Government Program	City of Oswego, Oswego County
Focus on Municipal Water and Wastewater Facilities Program	City of Fulton, Onondaga County
Utility Sponsored Lighting Retrofit	Syracuse, Preble, Cazenovia (T), City of Oswego, Oswego County, Clay, Fayetteville, Onondaga County
Other	City of Oswego (C_2IP); Oswego County (PONs and RFPs); Clay (energy retrofits for town highway garage)

4. What is your municipality's annual aggregate energy consumption? Please provide data for 2010 or for the most recent year available.

The following municipalities provided information in response to this question: City of Oneida, Cazenovia (T), City of Fulton, Clay, Fayetteville, Lysander, City of Oswego, Oswego County, Preble, Sullivan, Onondaga County, and Salina. Municipal replies were very detailed and are not included in this summary.

	Energy Use	Year	Annual Cost ($)
Electricity			
Natural gas			
Heating oil			
Propane			
Gasoline			
Diesel			
Other			

5. What was your municipality's operating budget for 2010?

Municipality	Total
Syracuse	$130,860,813
Madison County (2012)	$102,124,000
Preble	$700,000
Cazenovia (T)	$1,934,291
Oswego County	$185,334,375
Clay	$12-$15,000,000
Sullivan	$3,000,000
Lysander	$4,700,000
Fayetteville	$5,000,000
Salina	$9,000,000

6. Is natural gas available in your community? If yes, what percentage of the community has access to it?

Response	Municipalities
Yes	Refer to percentages noted in the table below
Yes but no % provided	Cazenovia (T), Clay, Sullivan, Salina, Homer (V)

Natural gas - percent availability:

Percentage	Municipalities
0%	Preble, Smithfield, Fabius, Constantia, Fair Haven, Cleveland, Victory, Granby, Hamilton (will become available in 2014), Orwell
1-25%	Stockbridge, Sandy Creek, DeRuyter, Scriba, New Haven, Pompey
26-50%	Madison County (approximate), Eaton
51-75%	Oswego County, Lysander, Homer (T), Owasco (T), Hastings
76-100%	Syracuse, City of Oneida, City of Oswego, City of Fulton, DeWitt, Fayetteville, Onondaga County, Chittenango, Cicero, Morrisville, Geddes, Elbridge, Marcellus, Port Byron, Moravia, North Syracuse, Weedsport, Lenox, Camillus

7. Is your municipality using onsite renewable energy sources?

Municipality	Renewable Energy	Project Description
Syracuse	Solar	+ Photovoltaic panels on city hall commons and Westcott reservoir. + Year implemented: CH- 2009; reservoir - 2011 + System capacity or estimated energy output: 61 kWh Actual or estimated energy savings: 69,000 kWh annually Actual or anticipated financial savings: $3,800 annual savings + Funding source: CH = NYSERDA; Westcott = Res. Economic Recovery Act
Madison County	Solar	Project description: Madison County Solar Landfill Cap + Year implemented: 2011 + System capacity or estimated energy output: 40KW + Actual or estimated energy savings: 40,000 KWh. + Funding source: NYSERDA/County
City of Oswego	Solar	Project description: 50 kW on Crisafulli Ice Rink; 23 kW East Side Fire Station + Year implemented: 2012 + Funding source: ARRA-NYSERDA
Preble	Solar	Implemented in 2012
Oswego County	Solar	Project description: Roof mounted system on our health complex at Bunner Street + Year implemented: 2012 + System capacity or estimated energy output: 28.2 kw + Actual or estimated energy savings: 30,147 kWh + Actual or anticipated financial savings: $3,618 + Funding source: NYSERDA RFP 10
Oswego County		Project description: 6 systems at various county facilities, 3 ground mounted and 3 roof mounted, 5 @ 49.35kw and 1 @ 29.61kw + Year to be implemented: 2013 + System capacity or estimated energy output: 276.36 kw + Actual or estimated energy savings: 307,686 kWh + Actual or anticipated financial savings: $20,000+ + Funding source: operating budget (leases)
DeWitt	Solar	Project description: Solar panels on town hall roof + System capacity or estimated energy output: 51 k + Actual or anticipated financial savings: $10-$13,000

Municipality	Renewable Energy	Project Description
Onondaga County	Solar	Project description: Solar PV panels at Beaver Lake Nature Center. + Year implemented: 2011 + System capacity or estimated energy output: 17 kW Actual or estimated energy savings: 18,000 kWh Actual or anticipated financial savings: $2,600/yr. Funding source: Self, NYSERDA, DOE
Port Byron	Solar	Project description: Roof-mounted solar panels installed in 2010 with NYSERDA
Hamilton	Solar	Project description: Installed small photo-voltaic system at the Hamilton Central School for educational purposes in 2008. Contact the Hamilton Central School for energy details. + Funding source: Independent Energy Efficiency Program (IEEP)
Madison County	Biogas	Project description: In 2009, Madison County installed a landfill gas to energy generator system at our Solid Waste Facility. This captures 72% of the methane generated at the site and converts it to electric power, which is sold back to the grid. + Year implemented: 2009 + System capacity or estimated energy output: 1.4MW + Funding source: EPA, County, Waste Management
Syracuse	Microturbine	+ Year implemented: 2011 + System capacity or estimated energy output: 56 kWh + Actual or estimated energy savings: 450,000 kWh annually + Actual or anticipated financial savings: $25,000 annual savings + Funding source: Economic Recovery Act
Fenner	Wind	
Hamilton	Wind	Project description: Hamilton installed small wind turbine at the Hamilton Central School for educational purposes in 2006 - contact the Hamilton Central School for energy details. + Funding source: IEEP
Fenner	Geothermal	Oxbow Park
Additional comments		Constantia has wood boilers at the highway garage; installed in 1992; system capacity = 20,000BTUs An energy savings program was implemented in the Nelson Town Office and Highway Buildings in 2011; a financial savings of between $1,500 – $2,000/year has been observed. Funding source: National Grid Program 2011 Camillus in 2007: new boiler in the town hall, new thermostats, and new lights – not sure of energy output or energy savings; actual or anticipated financial savings - $65,000 per year

8. Please indicate if the following projects have been, or will be, completed at your municipal facilities

Project	Current	Anticipated
Energy audit	+ Syracuse, Madison County, Preble, Cazenovia (T), Oswego County, DeWitt, Onondaga County, Salina, Chittenango, Cicero - 8/17/2006, 1/28/2008, Homer (T), 2011, Sandy Creek, Town of Geddes, Jan 2010 + Elbridge, Marcellus - NYSERDA – Aug, 2010, Cleveland – December 2011, Nelson - May, 2011 + Granby, Aurora – 2008, Owasco (T) – 2011, Camillus– + 2007, Hastings, Pompey	Syracuse, City of Oneida, Hamilton

Project	Current	Anticipated
Lighting upgrades	+ Syracuse, Preble, Cazenovia (T); City of Oswego (City hall, Conway, DPW, WS WWTP; ES Fire), City of Fulton, Oswego County, Clay, DeWitt, Sullivan (completed 12/11), Lysander, Onondaga County, Chittenango Cicero - 10/23/2006, Cleveland, Smithfield, Homer (T), 2011Sandy Creek, Town of Geddes, 2011, Elbridge, Constantia in 2011, DeRuyter in 2011, Fair Haven, Hamilton, Victory, 2000, Scriba, 2008, N. Syracuse, Homer (V) 2011, Nelson - Nov 2011 completed in Town and Highway Bldgs, New Haven – December 2011, Weedsport, November 2011, Granby, Orwell – 2012, Mentz, Lenox – 2010, Camillus – 2007 (continuing), Hastings, Pompey	Syracuse, City of Oneida; City of Oswego (WS Fire, Crisafulli Rink, Cullinan Rink), Mentz
HVAC upgrades	+ Syracuse, Preble; City of Oswego (McCrobie), Oswego County, Clay, DeWitt, Sullivan (completed 12/11), Lysander, Onondaga County, Cicero in 11/13/2006, Sandy Creek, Town of Geddes – December 2012,Elbridge, DeRuyter in 2011 + New Haven – in progress, Granby, Orwell - 2008 and 2012, Camillus – 2007, Hastings	Syracuse, City of Oneida; City of Oswego (animal control), Mentz
Building shell upgrades	+ Syracuse, Madison County, City of Oneida (insulation), Preble (total building envelope); City of Oswego (McCrobie), City of Fulton, Clay (insulation of doors, windows in highway garage), Cicero town hall windows in 2007, Morrisville – during past 4 years, Homer (T) 2011, Elbridge (insulation, windows, siding), Marcellus - new, insulated exterior doors, secured by Police Chief via grant, Cleveland – replaced six windows, Constantia – insulation installed in 2010, DeRuyter, Hamilton (windows installed), Scriba in 2009, N. Syracuse (windows), New Haven - new insulation, windows, and doors in progress, Camillus – 2007, Hastings (installed additional insulation around windows)	Syracuse, Oswego County, Onondaga County, Granby – planned for 2013

Project	Current	Anticipated
Street lights	+ Cazenovia (T) done by National Grid + Clay (streetlights in parks), Onondaga County (parking lot lights), Salina, Cicero – National Grid, Smithfield, Town of Geddes, 2011, Elbridge, Marcellus – historic lights (14) to add to the 90 already in place, Victory, 2000, Homer (V), 2009, Aurora – 2008, Camillus – 2006, Hastings	Syracuse, City of Oneida, Lysander, Hamilton
Traffic signals	+ Syracuse, City of Oneida; City of Oswego (LEDs installed in 2010), City of Fulton, Cicero – county and state, Victory, N. Syracuse	
High-efficiency vehicles	+ Syracuse, Madison County is getting a charging station; City of Oswego (DPW has 2 electric vehicles for parks maintenance); Oswego County (more efficient where applicable)	Syracuse, Oswego County (more efficient where applicable), Hamilton, Mentz, Camillus (in progress)
Contracting with an energy services company or New York Power Authority	+ Syracuse, Madison County (O&G), Onondaga County (Johnson Controls, Inc.), Marcellus - OCM BOCES consortium for all utility costs (gas and electric), Hamilton, Scriba, Solar Liberty anticipated in 2013, Nelson - Energy Smart Program via National Grid, DeRuyter contracted with Agway Energy, Hamilton, Camillus (2005, NYSERDA)	Syracuse, Mentz
Energy conservation plan	+ Madison County; City of Oswego (Completed in 2012), Oswego County (in development), DeWitt, Onondaga County, Hamilton (ICLEI), Granby	Syracuse
Other	+ City of Oswego (VSDs at Water Dept) + Oswego County ("green" maintenance products where applicable, testing bio- diesel) + Marcellus - recycling of scrap metal by highway department + Scriba – 15 year lease w/ Solar Liberty for solar panels for municipal & highway buildings	

9. What organizations, agencies, and/or academic institutions have provided technical support and/or funding for your sustainability projects?

Organizations, Agencies, Academic Institutions	Municipality
Center of Excellence	Syracuse, City of Oswego
Central New York Regional Planning and Development Board	Syracuse, Madison County, Preble, City of Oswego, Oswego County, DeWitt, Lysander, Onondaga County, Cicero, Elbridge, Marcellus
Cornell Cooperative Extension	Syracuse, Preble, Cicero, Smithfield, Elbridge, Marcellus
County Planning Departments	Syracuse, Madison County, Preble, City of Oswego, Oswego County, Lysander, Cicero, Elbridge, Marcellus
Environmental Finance Center	Syracuse, City of Oswego, Elbridge
New York State Department of Environmental Conservation	Madison County, City of Oswego, Oswego County, Lysander
New York State Energy Research and Development Authority (NYSERDA)	Syracuse, Madison County, Preble, Cazenovia (T), City of Oswego, City of Fulton, Oswego County, Clay, DeWitt, Fayetteville, Onondaga County, Salina
SUNY College of Environmental Science and Forestry	Syracuse, Preble
United States Department of Agriculture	Syracuse
Other	Syracuse (DOE); Preble (SWCD), Oswego County (EPA); Clay (USDOE), DeWitt (National Grid and NY Power Authority), Onondaga County (US Department of Energy thru EECBG, National Grid)

10. Has your municipality completed a greenhouse gas inventory?

Response	Municipalities
NO	City of Oneida, Cazenovia (T) (in progress) City of Fulton, Clay, Sullivan, Lysander, Fayetteville, Salina, Chittenango, Cicero, Morrisville, Smithfield, Stockbridge, Homer (T), Home (V), Sandy Creek, Fabius, Geddes, Elbridge, Marcellus, Eaton, Constantia, Port Byron, DeRuyter, Fair Haven, Moravia, Cleveland, Victory, Scriba, North Syracuse, Nelson, New Haven, Weedsport, Granby, Mentz, Owasco (T), Lenox, Camillus, Hastings, Pompey
YES	Syracuse, Clay (highway garage), Onondaga County (for government operations only), Madison County, Preble, City of Oswego, Oswego County, DeWitt, Hamilton in 2012

11. Has your municipality adopted an official target or outlined an action plan for reducing energy consumption and reducing greenhouse gas emissions?

Response	Municipalities
NO	City of Oneida, Cazenovia (T), City of Fulton, Oswego County, Oswego County, Sullivan, Lysander, Fayetteville, Salina
YES	Syracuse = proposed 50% by 2020 over 2002 levels
Unknown	Preble
in progress	Madison County, City of Oswego, and DeWitt
1% per year for next 25 years (total of 25% reduction)	Onondaga County

12. Has your municipality participated in a New York State Energy Research and Development Authority (NYSERDA) program or in any utility efficiency programs (i.e. National Grid Lighting Retrofit)?

Program	Municipalities
FlexTech/Technical Assistance Program	Weedsport
Energy Audit Program	Chittenango, Cicero, Homer (T), Sandy Creek, Geddes, Elbridge, Marcellus, Hamilton, Granby, Owasco (T), Camillus, Hastings, Pompey
Existing Facilities Program	Homer (T), Sandy Creek, Hamilton, Lenox, Camillus
New Construction Program	Hamilton
Alternative Fueled Vehicles Program	
PV/Small Wind Program	
Energy Smart Communities Program	Camillus
Focus on Local Government Program	Hamilton
Focus on Municipal Water and Wastewater Facilities Program	Cicero, Marcellus, Hamilton
Utility Sponsored Lighting Retrofit (i.e. National Grid, NYSEG, etc.)	Chittenango, Sandy Creek, Marcellus, Hamilton, Victory, North Syracuse, New Haven, Granby, Mentz
Other	+ Port Byron; new lights and used oil burner + Hamilton: Appliance Rebate, Window Rebate, Lighting Upgrades, Insulation Upgrades all through the IEEP
Replied yes but no programs were listed	Fair Haven, Homer, and Orwell -

13. What is the municipal priority level for reducing energy use or lowering greenhouse gas emissions?

Priority Level	Municipality
High	Syracuse, Preble, City of Fulton, Clay, DeWitt, Onondaga County
Medium	Madison County, City of Oswego, Oswego County, Sullivan, Cazenovia (T), Lysander
Low	Salina

14. What motivates your municipality to reduce energy use or lower greenhouse gas emissions?

Motivation	Municipality
Reduced operating costs	Syracuse, Madison County, City of Oneida, Preble, Cazenovia (T), City of Oswego, City of Fulton, Oswego County, Clay, DeWitt, Lysander, Fayetteville, Onondaga County, Salina, Cicero, Morrisville, Homer (T), Sandy Creek, Fabius, Geddes, Elbridge, Marcellus, Constantia, Port Byron, DeRuyter, Hamilton, Cleveland, Scriba, North Syracuse, Nelson, New Haven, Weedsport, Granby, Aurora, Orwell, Mentz, Owasco (T), Lenox, Camillus, Hastings, Pompey
Collaboration with neighboring communities	Syracuse, DeWitt, Cicero, Geddes, Constantia, Hamilton
Concern for the environment/ natural resource conservation	Syracuse, Madison County, Preble, City of Oswego, City of Fulton, Oswego County, Clay, DeWitt, Fayetteville, Onondaga County, Cicero, Smithfield, Sandy Creek, Fabius, Geddes, Marcellus, DeRuyter, Hamilton, Cleveland, North Syracuse, Nelson, New Haven, Aurora, Mentz, Owasco (T), Hastings, Pompey
Pressure from residents	Fabius, Hamilton, New Haven
Pressure from state/federal government	Marcellus, Constantia, Hamilton, Victory
Funding availability	Syracuse, Madison County, Preble, Cazenovia (T), City of Oswego, City of Fulton, Oswego County, Clay, DeWitt, Fayetteville, Cicero, Fabius, Elbridge, Marcellus, Constantia, Port Byron, DeRuyter, Hamilton, Cleveland, North Syracuse, New Haven, Weedsport, Granby, Aurora, Owasco (T), Hastings, Pompey
Desire to be seen as an environmental leader	Syracuse, Madison County, Preble, City of Oswego, City of Fulton, DeWitt, Onondaga County, Hamilton, Scriba, North Syracuse, Nelson, Pompey
Interest in creating and supporting local jobs	Syracuse, Madison County, Preble, City of Oswego, City of Fulton, DeWitt, Onondaga County, Cicero, Fabius, Elbridge, Constantia, Hamilton, Nelson, Hastings

15. Does your municipality have a land use or comprehensive plan?

Response	Municipalities	Year completed	Year updated
No	Madison County, Clay, Salina, Sandy Creek, Geddes, New Haven		
Yes	Syracuse	2005	2012
	City of Oneida	2005	
	Preble	2006	
	Cazenovia (T)	2009	
	City of Oswego	2011	
	City of Fulton	Year not provided	
	Oswego County		some sections updated in 2009
	DeWitt	Year not provided	
	Sullivan	Year not provided	
	Lysander	Year not provided	2007
	Fayetteville	2008	
	Onondaga County	Year not provided	Anticipated end of 2012
	Chittenango	2008	
	Cicero	2006	
	Morrisville	1990s	
	Smithfield	2010	
	Stockbridge	2003	
	Homer T)	2002	
	Homer (V)		
	Fabius	2003	
	Elbridge	2000	
	Marcellus	2008	
	Eaton	2009	
	Constantia	2000	currently updating it

Response	Municipalities	Year completed	Year updated
Yes	Port Byron		currently being updated
	DeRuyter	1989	
	Fair Haven		
	Hamilton		
	Moravia	1965	
	Cleveland,		
	Victory	2011	
	North Syracuse	Village Plan (2004) and Village Center Plan (2012)	
	Nelson	2011	
	Weedsport		currently working with Cayuga County Planning Department to upgrade Plan from the early 80's
	Granby	2002	
	Aurora	2008	
	Orwell	1997	
	Mentz		will be updated in 2013
	Owasco (T)	2002	
	Lenox	1999	
	Camillus	2008	
	Hastings	1997	
	Pompey		currently being updated

16. If yes, does it contain goals or recommendations that will lead to conservation and future reductions in carbon emissions?

Response	Municipalities
No	City of Oneida, DeWitt, Sullivan, Fayetteville, Chittenango, Morrisville, Smithfield, Stockbridge, Homer (T), Homer (V), Elbridge, Constantia, DeRuyter, Fair Haven, North Syracuse, Aurora, Owasco (T), Lenox, Pompey, Oswego County (it will once we complete our energy efficiency plan)
Yes	Syracuse, Preble, Cazenovia (T), City of Oswego, Lysander, Onondaga County, Marcellus, Scriba, Camillus, Hastings
Not sure	City of Fulton, Fabius, Eaton, Port Byron, Hamilton, Victory, Nelson, Weedsport, Granby, Orwell

17. Does your municipality have any of the following policies or programs in place?

Response	Municipalities
Site Plan Review	Syracuse, City of Oneida (www.oneidacity.com – general code chapter 143), Preble, Cazenovia (T), City of Oswego, City of Fulton, Clay (www.townofclay.org/planning/home), DeWitt, Sullivan, Lysander, Fayetteville, Onondaga County, Salina, Chittenango, Cicero, Morrisville, Homer (T), Homer (V), Sandy Creek, Fabius, Geddes, Elbridge, Marcellus (local Law has been in effect since 2005), Constantia, Port Byron, DeRuyter, Hamilton, Scriba, Nelson, New Haven, Granby, Aurora, Lenox, Camillus, Hastings, Pompey
Tree management program	Syracuse, City of Oneida, City of Oswego, City of Fulton, DeWitt, Fayetteville, Morrisville, Sandy Creek, Fabius, Elbridge, Port Byron (small replacement program), Hamilton, North Syracuse, Camillus
Mixed use zoning districts	Syracuse, Cazenovia (T), City of Oswego, City of Fulton, Clay (www.townofclay.org/planning/home), DeWitt, Lysander, Fayetteville, Onondaga County, Salina, Cicero, Marcellus (zoning code has been in effect since 1969, with update anticipated in 2013), DeRuyter, Hamilton, North Syracuse, Homer (V), Nelson, Granby, Aurora, Mentz, Lenox, Camillus, Hastings
Smart Growth	Syracuse, Madison County (in progress), City of Oneida (in progress), Cazenovia (T) with conservation subdivisions, DeWitt, Onondaga County, Cicero, Nelson, Camillus

18. What actions have been taken to provide for alternative transportation and to make your community more walkable and bikable?

Response	Municipalities
Improved sidewalk maintenance	Cazenovia (T), City of Oswego, City of Fulton, DeWitt, Fayetteville, Chittenango, Cicero, Stockbridge, Sandy Creek, Fabius, Geddes, Elbridge, Marcellus, Hamilton, North Syracuse, Weedsport, Aurora, Camillus
Benches and rest areas in downtown areas	Syracuse, Cazenovia (T), City of Oswego, City of Fulton, Chittenango, Cicero, Elbridge, Marcellus, Hamilton, Moravia, North Syracuse, Aurora, Mentz (anticipated in 2013 with grant funding)
Bike lanes and bike racks	Syracuse, Madison County, City of Oswego, City of Fulton, Onondaga County, Sandy Creek, Marcellus, Hamilton, Moravia
Hiking trails	Syracuse, Madison County, City of Oneida (walkable survey completed in 2011), Cazenovia (T), City of Oswego, City of Fulton, Oswego County, Clay, DeWitt, Lysander, Onondaga County, Chittenango, Cicero, Port Byron, Hamilton, Scriba, North Syracuse, Nelson, Mentz (anticipated in 2013 with grant funding), Camillus
Alternative transportation options	Syracuse, Madison County, Cazenovia (T), Oswego County, Cicero, Sandy Creek, Marcellus (creek walk/trail is being planned), Hamilton, Lenox
Closed some streets to cars	None
Better street lighting	Cazenovia (T), Lysander, Cicero, Elbridge, Marcellus, Hamilton, Moravia, Hastings
No actions	Preble, Salina, Smithfield, Homer (T), Homer (V), Eaton, Constantia, DeRuyter, Fair Haven, Victory, New Haven, Granby, Orwell, Owasco (T), Pompey

19. Is green infrastructure a component of your municipal planning efforts?

Response	Municipalities	Examples
No	Madison County, City of Oneida, Preble, Cazenovia (T), Fayetteville, Chittenango, Morrisville, Smithfield, Stockbridge, Homer (T), Homer (V), Sandy Creek, Fabius, Elbridge, Eaton, Constantia, DeRuyter, Fair Haven, Moravia, Cleveland, Victory, Scriba, Nelson, New Haven, Weedsport (the Village only has 2 small parking lots), Granby, Aurora, Orwell, Mentz, Owasco (T), Lenox, Hastings	
Yes	Syracuse	+ Tree plantings, bioswales, detention basins, rain gardens, rain barrels, pervious pavement, structural soils, retention ponds, stormwater retaining tree pits + Clay (Bayberry community drainage improvements), Lysander, Onondaga County (http://savetherain.us/)
	City of Oswego	City Hall Rain Garden Demonstration project; feasibility study for Green Street program in First ward
	City of Fulton	Installation of rain garden in new community-funded housing project; bio filter for parking area at lake
	DeWitt	Porous pavement, rain gardens, rain barrels, French storm drains
	Sullivan	No examples provided
	Salina	Received a Save the Rain grant for the Town Hall parking areas to reduce storm water runoff
	Geddes (T)	Bioretention, infiltration trenches, porous pavement
	Marcellus	Coon's Pond Retention Area reconstructed (over $35,000) to prevent silt from entering Nine Mile Creek; tree nursery started at WPCP, for use of street trees when mature; sump pump redirection program, investigating all residences and businesses in the Village, to prevent storm water from entering Village sanitary sewer system; Village is not eligible for "Save the Rain Program" because we have our own Water Pollution Control Plant.
	Hamilton	All new storm water systems shall meet NYSDEC discharge requirements
	North Syracuse	Stormwater runoff management

20. Has your municipality reviewed your local codes (e.g. subdivision and zoning regulations) to determine whether they present any obstacles to green infrastructure and low-impact development?

Response	Municipality	Obstacles /comments
No	Syracuse	This will be done in conjunction with the new land use plan
	City of Oneida	In progress for update to comprehensive plan
	Preble, Sullivan, City of Fulton, City of Oswego, Lysander, Fayetteville, Salina	
Yes	Clay	In progress; zoning and highway standards will need to be upgraded
	Onondaga County	Working with the City of Syracuse on efforts to remove code obstacles
	Cazenovia (T)	None listed
	DeWitt	None listed

21. Following storm events, does your community frequently experience roadway flooding that result in property damage?

Response	Municipalities
No	Syracuse, Madison County, City of Oneida, Preble, Cazenovia (T); City of Oswego, City of Fulton, Oswego County, Clay, Sullivan, Fayetteville, Onondaga County (for county roads), Salina
Yes	DeWitt, Lysander

22. If your community has a separate sanitary sewer system, are sanitary sewer backups frequently reported following storm events?

Response	Municipalities (comments)
NO	City of Oneida, Cazenovia (T), City of Fulton, Clay, Sullivan, Lysander, Fayetteville, Salina
YES	City of Oswego (many areas are combined sewer / storm systems), DeWitt, Onondaga County
Other	Syracuse (combined sewers)

23. What percentage of your municipality has access to public water?

Municipality	Access to public water (%)
Syracuse	100%
Fayetteville	100%
City of Oneida	90-95%
City of Oswego	100%
City of Fulton	100%
Clay	85%
DeWitt	100%
Sullivan	75%
Lysander	75%
Onondaga County	unknown
Salina	100%

24. What programs are in place in your community to improve waste management?

Waste Management Program	Municipalities
Curbside recycling program	Syracuse, Madison County, City of Oneida, Preble, City of Fulton, Oswego County, Clay, DeWitt, Sullivan, Lysander, Fayetteville, Onondaga County, Salina, Chittenango, Cicero, Morrisville, Sandy Creek, Fabius, Geddes, Elbridge, Marcellus, Eaton, Hamilton, Moravia, Scriba, North Syracuse, Homer (V), Lenox, Camillus, Pompey
Construction and demolition debris removal	Syracuse, Madison County, City of Fulton, Oswego County, Clay, Fayetteville, Onondaga County, Chittenango, Geddes, Hamilton, Camillus
Food waste recycling / reuse program	Syracuse, Oswego County, Sullivan, Onondaga County
Yard waste program	Syracuse, Madison County, City of Oneida, Cazenovia (T); City of Oswego, City of Fulton, Oswego County, Clay, DeWitt, Onondaga County, Salina, Chittenango, Cicero, Morrisville, Stockbridge, Sandy Creek, Geddes, Marcellus, Constantia, Hamilton, Cleveland, Homer (V), Weedsport, Aurora, Owasco (T)
Household hazardous waste program	Syracuse, Madison County, Cazenovia (T), City of Oswego, City of Fulton, Oswego County, Sullivan, Onondaga County, Chittenango, Stockbridge, Sandy Creek, Elbridge, Marcellus, Port Byron, DeRuyter, North Syracuse, Weedsport, Granby
Electronic (i.e. computers) recycling	Syracuse, Madison County, Preble, Cazenovia (T) City of Oswego, City of Fulton, Oswego County, Clay, Lysander, Onondaga County, Chittenango, Morrisville, Stockbridge, Sandy Creek, Fabius,, Port Byron Elbridge, Marcellus, Eaton, Constantia, DeRuyter, Hamilton, Moravia, North Syracuse, Nelson, Weedsport, Granby, Owasco (T)
Consumer products (i.e. batteries) recycling	Syracuse, Madison County, City of Oneida, Cazenovia (T) City of Oswego, City of Fulton, Oswego County, Clay, Onondaga County, Chittenango, Stockbridge, Sandy Creek, Elbridge, Marcellus, Eaton, DeRuyter, Hamilton, Nelson, Granby

Other	+ Preble provides annual amnesty days. + The City of Oswego does not collect household waste but Oswego County provides all recycling and hazardous waste disposal programs. + Oswego County has waste to energy conversion. + Cicero - Onondaga County Resource Recovery Agency. + Marcellus - quarterly newsletter usually has articles related to waste management + Nelson - Farm and bulk plastic recycling to petroleum, recently implemented via central site in Lincoln for all of Madison County. Proper disposal via this recycling program, offers farmers alternative to burning or burying such products. "The use of methane, solar, and heat byproducts is serving the County landfills extremely well, saving energy and environments." + Weedsport = the Village operates its own recycling center for various household waste: cardboard; glass; magazines; newspapers; steel and aluminum. Also a private business in our area will take white goods; batteries; electronics; propane tanks, etc. all for free. + Orwell is covered by the Oswego County Plan. + Mentz – recycling is provided at town site, just outside of Village + The Village of Marcellus Compost Project provides an environmentally sound method of recycling bio-solids from the Village WPCP for the public. The compost is provided for free to the community by Village of Marcellus WPCP. This reduces operating costs at the WPCP by not having to haul sludge to a landfill or to an incinerator. It has been a very expensive project to undertake, but is expected to pay for itself in approximately a dozen years.

25. What local policies does your municipality have that encourage energy efficiency and sustainability among residents, businesses and city agencies?

Policies	Municipalities
Rebate programs / financial incentives	None reported
Tax abatements (i.e. pilot agreement)	Syracuse for LEED certified buildings
Mandates (i.e. green building policies)	Syracuse for new municipal buildings and major renovations: LEED silver standards
Zoning and permitting (i.e. density bonus)	Preble, Cazenovia (T); City of Oswego (historic review), DeWitt
Public information campaigns	Madison County (Solarize Madison, Green Living Workshop); Preble, Cazenovia (T), City of Fulton, Oswego County, DeWitt, Lysander, Onondaga County
Other	+ City of Oswego - other Solar/PV and wind code as part of the City zoning code + Onondaga County has a Green Infrastructure Fund to fund GI to reduce infiltration and inflow in the collection system

26. Does your municipality measure progress or track energy consumption trends for specific buildings or departments?

Response	Municipalities
No	City of Oneida; City of Oswego, Sullivan, Fayetteville, Salina
Yes	+ Syracuse – tracked monthly and information is provided to department heads and building managers + Madison County started this as part of our C2IP program and can make the data available + Preble – Town Hall project + Cazenovia (T) + Onondaga County is in the process of setting up a Portfolio Manager Tool for County buildings

Additional comments:	
Municipality	Comments
City of Fulton	Waste water and water treatment costs; DPW fuel usage
Oswego County	Some buildings have computerized energy management systems
Clay	Separate utility billing by buildings
Lysander	Highway department fuel usage

27. Does your municipality have zoning?

Response	Municipalities
Yes	Preble, Cazenovia (T) solar panels aren't regulated but are subject to setbacks and other codes; City of Oswego, City of Fulton, Clay, DeWitt, Sullivan, Lysander, Fayetteville, Salina, Chittenango, Cicero, Morrisville, Smithfield, Homer (T), Geddes, Elbridge, Marcellus, Eaton, Port Byron, DeRuyter, Fair Haven, Hamilton, Moravia, Victory, North Syracuse, Homer (V), Nelson, Weedsport, Granby, Aurora, Mentz, Owasco (T), Lenox, Camillus, Hastings, Pompey
If yes, does the zoning have provisions for solar PV development?	City of Oneida; City of Oswego, DeWitt
Yes, at least for some facilities	DeWitt
Yes, with a special permit	Syracuse, City of Oneida; City of Oswego, Smithfield, Owasco (T), Camillus
No, but solar zoning has been drafted and is under consideration	Homer (T)
No, but solar zoning is being considered	Salina, Cicero, Geddes, Nelson, Lenox
No, zoning for solar has not been seriously considered or proposed	Clay, Lysander, Fayetteville, Chittenango, Morrisville, Fabius, Elbridge, Marcellus, Eaton, Port Byron, Fair Haven, Hamilton, Moravia, Victory, North Syracuse, Homer (V), Weedsport, Aurora, Mentz, Pompey

28. Does your municipality's zoning have provisions for wind energy development?

Response	Municipalities
Yes, at least for some facilities	City of Oswego, Clay, Cicero
Yes, with a special permit	Cazenovia (T); City of Oswego, Lysander, Smithfield, Stockbridge, Fabius, Eaton, DeRuyter, Nelson, Owasco (T), Camillus, Hastings, Pompey
No, but zoning for wind has been drafted and is under consideration	Lenox
No, but zoning for wind is under development	DeWitt, Homer (T), Homer (V), Geddes
No, zoning for wind has not been seriously considered or proposed	Syracuse, City of Oneida, Preble, Fayetteville, Salina, Chittenango, Morrisville, Elbridge, Marcellus, Port Byron, Fair Haven, Hamilton, Moravia, Victory, North Syracuse, Weedsport, Granby, Aurora, Orwell, Mentz

29. What education programs are in place to publicize your municipality's energy efficiency and/or sustainability goals and to encourage participation by residents, businesses and agencies?

Municipality	Response
Syracuse	Sustainability plan – 14 public meetings; Website – citizen actions recommended in posted sustainability plan
Madison County	+ http://www.solarizemadison.com + http://www.madisoncounty.org/solid_waste.php + http://cnyhomepage.com/fulltext-news?nxd_id=154052 + http://www.healthymadisoncounty.org/linkeddocs/newsarchive/2012/20-12_TMaps.pdf + http://www.madisoncounty.org/planning/energy.php + http://www.madisoncounty.org/planning/CED.php
Preble	Education outreach through fireman's campaign door to door; town newsletter; www.preble-ny.org
Oswego (C)	News articles on the PV installations 6/8/2012. Workshops have been provided by Cooperative Extension/CNY Regional Planning Board on PV installation; SUNY Oswego offered Sustainability Training workshops for 2009 and 2010. Community Garden was initiated with land donation from City of Oswego and Oswego Center for Sustainability in March 2012. See http://www.oswego-cfsl.com/communitygarden.html
Fulton (C)	Waste management guides
Clay	Newspaper articles and website
DeWitt	Website, events, articles
Lysander	Electronic recycling on website
Onondaga	County's Sustainability Web Site (http://www.ongov.net/sustainability/), Renew Onondaga County Web Site (http://renewonondaga-county.org/), Climate Action Plan
County	Web Site (http://www.ongov.net/environment/CAP.html), Sustainable Development Plan Site (http://future.ongov.net/) and Save the Rain Site (http://savetherain.us/)
Salina	News releases, the Town's website and social media
Cicero	Website, OCRRA brochures, and information on town bulletin board at town hall
Fabius	Information included on their website
Marcellus	Quarterly newsletter
Eaton	Website
Moravia	Information on their website, Facebook, newspaper articles, and billing inserts
Nelson	Participates in the Annual Energy Symposium with posters, county wide seminars, and incentives
Victory	Website, newspaper articles, and workshops
Weedsport	Village website: www.villageofweedsport.org

30. Additional ideas or comments that aren't mentioned above

Preble wrote that sustainability is an ongoing evolution and experience. They have had a successful ripple effect throughout the community where residents are using the town hall project to consider work for their own homes.

Section E: Showcase Projects in CNY

OUTLINE

WASTE

Oswego County Energy Recovery Facility

The Energy Recovery Facility (ERF) is a 200 Ton per Day (TPD) Waste to Energy (WTE) conversion facility. Originally commissioned in 1985, the ERF has converted over 1.5 million tons of municipal solid waste to usable energy. The most important contribution the ERF makes to the solid waste system is the preservation of landfill space. This is a result of the volume reduction from the combustion of the solid waste. The ash remaining after the burn process takes up less than ten percent of the space of solid waste. The ERF was upgraded in 2009 to recover and recycle ferrous metals. Ferrous metals are metals derived from, or containing, iron. Steel is the most common of these metals, including alloys such as stainless steel. Recovery of ferrous metals helps to reduce landfill waste and allows the recovered metals to be reused. Since the system came online, 6,000 tons of ferrous have been recovered from the ash for recycling and sale to the scrap market.

Cayuga County Anaerobic Digester

The Cayuga County Soil and Water Regional Digester is a centralized anaerobic digester system located in Auburn. The facility was built to process manure from nearby dairy farms, food waste, and waste fats from local sources. It is the first government facility in the United States to replace 82% of its energy (electricity and fossil) needs with renewable energy produced from animal manure. Based on the current projections, the facility is expected to produce nearly $800,000 in revenues, enough to offset its cost of operation, and lower Cayuga County's cost of energy by 20%. The profit could offset capital costs for future expansion.

ENERGY

Solar panels on City Hall Commons and the Westcott Reservoir

With the help of grant funding from NYSERDA in 2009, photovoltaic panels and three high-efficiency heating and air conditioning units were installed on the City Hall Commons in downtown Syracuse. The solar panels will generate electricity for the building's atrium, known at the Sustainability Showcase. The building now serves as a year-round, energy-efficient meeting facility for city and community functions. A new monitoring system was recently added to calculate the exact output of the panels, which are estimated to produce approximately 12,300 kWh each year.

In 2011, the City of Syracuse installed a 50-kilowatt solar panel array system and 56-kilowatt hydro turbine at the Westcott Reservoir. The solar panel array and hydro- turbine at the site generate $40,000 to $50,000 a year in power-based revenue for the City, effectively offsetting the cost of powering the reservoir's operations. The primary funding source was the American Recovery and Reinvestment Act.

The two photovoltaic projects (City Hall Commons and Westcott Reservoir) produce approximately 69,000 kWh annually and result in an energy savings of approximately $3,800 per year.

Energy and Cost Saving Initiatives at the DeWitt Town Hall

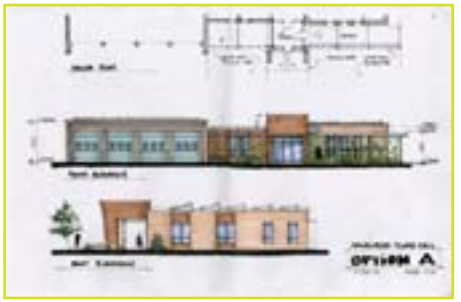
In November 2011, solar panels were installed on the roof of the DeWitt Town Hall. The 51KW polycrystalline solar unit is expected to produce almost 55,000 kWh per year, reducing the Town's greenhouse gas emissions by the same amount of electricity use of 4.6 average homes during a single year. The upgrade was estimated to provide a cost savings of $8,000 in the first year of operation.

Several additional improvements have been implemented at the facility, including sealing and re-caulking of the skylights, installation of light sensors, and a compost bin. 85 trees were planted along Town's right-of-way in order to reduce problems associated with the rate and quality of stormwater runoff. A rain garden was planted and a rain barrel was installed. In addition, green cleaning supplies and recycled paper are now used at the Town facilities. The anticipated financial savings is between $10,000 and $13,000 each year.

Green Data Center at Syracuse University

Syracuse University, in partnership with IBM and New York State, built a Green Data Center (GDC) in 2009 which is designed to use approximately 50% less energy than a typical data center. The notable addition to the SU campus was built as one of the world's "greenest" computer centers. The 12,000- square-foot facility incorporates advanced energy-efficient information technology and building systems. The energy-efficient GDC uses an innovative on-site power generation system for electricity, heating and cooling, and incorporates IBM's latest energy-efficient servers, computer-cooling technology and system management software. The advanced, cutting edge technology provides considerable energy cost savings for the University along with environmental and research benefits.

Skaneateles Village Hall Goal as a Net-Zero Energy Use Facility



Significant changes are taking place in Skaneateles to make the Village more energy sustainable. Village officials are planning to install 50-kilowatt solar panels in the new Village Hall roof. As an educational tool for the community, a 32-inch flat screen monitor will be placed inside the lobby to display the amount of electricity that is being produced. Municipal officials are also planning to install a solar car charging station in the Village, permeable pavement and walkways to reduce stormwater runoff, and insulation that exceeds code and minimizes heat loss. The Village office will be relocated to a more accessible, central location and the office will be combined with the police department. Consolidation of local government resources is expected to boost efficiency and generate cost savings for taxpayers.

The Village plans to further reduce their energy bills through the installation of a new geothermal heating and cooling system under the building's current public parking lot. Ground temperatures will be used to provide heat in the winter and cooling in the summer, providing long-term cost savings for taxpayers.

Trustees approved the purchase of new LED streetlights that are designed to conserve energy, last longer, and have a more downward-focused lighting. The Village provides financial incentives and appliance rebates to homeowners to implement energy efficient projects and equipment such as CFL installations and PV systems. Free compact fluorescent light bulbs have also been distributed to Independent Energy Efficiency Program customers.

Electric Vehicle Charging Stations in Central New York

In anticipation of electric vehicles (EV) becoming more popular in Central New York, a network of 68 charging stations has been installed throughout downtown Syracuse, Destiny USA, the University Hill neighborhoods, and the City of Rome. The EV infrastructure was implemented by Syracuse Synapse Sustainability Trust (SST) to facilitate convenient commuting throughout the region. A 22- kilowatt roof-top solar panel system helps power nine stations outside SST's headquarters in downtown Syracuse. The project was partially funded by a grant from the Department of Energy through the Clean Communities of Central New York Coalition. The primary advantage of electric vehicles is the cost savings and EVs provide motor fuel at approximately one fifth of the cost of gasoline.

Another alternative fuel initiative in Central New York is the private and public access to compressed natural gas filling stations. The National Grid Utilities Company fills their fleet of nearly 30 mixed-use CNG vehicles, displacing nearly 100,000 gallons of gasoline in the past year.

Central New York participates in the Clean Cities Coalition. The group works with vehicle fleets, fuel providers, community leaders, and other stakeholders in the public and private sectors to advance the nation's economic, environmental, and energy security by supporting local actions to reduce petroleum consumption in transportation. Clean Cities promotes alternative and renewable fuels, idle-reduction measures, fuel economy improvements, and emerging transportation technologies.

The Charge NY Plan was proposed in Governor Cuomo's 2013 State of the State Address. It builds on the BEST battery consortium and sets a goal of 3,000 EV charging stations (up from current 800) in 5 years. According to Electric Power Research Institute, 3,000 charging stations would support up to 40,000 electric vehicles. The number of plug-in EVs is estimated to increase from less than 3,000 today to 40,000 in 2018 and one million in 2025.

CuseCar of Syracuse Lowers Regional Carbon Footprint

CuseCar of Syracuse, a not-for-profit community car-share, launched its program in December 2008 and opened to the general public in 2009. The opportunity was developed in order to reduce vehicle miles traveled in Onondaga County, while lowering the regional carbon footprint, improving air quality, and assisting in developing innovative green energy fuel distribution throughout Syracuse and Onondaga County.

CuseCar currently has over 100 members that have access to a fleet of well maintained, fuel efficient vehicles, placed in convenient locations throughout Syracuse such as shopping centers, airports, and hotels. Membership is primarily made up of downtown residents and college students. CuseCar currently has six (6) vehicles in its fleet, including two (2) Electric Vehicles (EV) Plug In Hybrids. The EV Plug-ins were provided to CuseCar as part of a research and development program through 2011. CuseCar has effectively integrated green vehicles and technologies into Central New York communities, while educating the public about the benefits of car-sharing and electric vehicle use.

Energy-efficient Technology at Twin Birch Dairy Farm

During the summer of 2012, a Syracuse-based biogas company known as American Biogas Conditioning installed energy-efficient technology at the Twin Birch dairy farm in Skaneateles. The system is cutting the cost of generating electricity by using an anaerobic digestion system. Organic waste is

placed in a sealed container and broken down by bacteria into a biogas (predominately methane). The biogas is then burned in an engine to produce electricity. American Biogas makes equipment that removes hydrogen sulfide from the biogas. The company's new technology costs about one-tenth of current removal methods, has shown a significant reduction in the farm's carbon footprint, and has helped to lower maintenance and operational costs. American Biogas also has demonstration projects at the Cayuga Regional Digester Facility in Auburn. Funding for the energy-efficient technology was provided by the New York State Energy Research and Development Authority (NYSERDA).

Town of Preble Pledges to be a New York State Climate Smart Community

The Town of Preble completed a significant energy retrofit for their Town Hall in October, 2012. The improvements included lighting upgrades, insulation and air sealing to reduce the drafts in the 1906 building, window replacement, replacement of an aging oil fired forced air furnace with high efficiency electric heat pumps, and the installation of a 9kW solar photovoltaic array. As a result of these changes, the town is expecting to save approximately $7,400 in utility costs in the first year of operation and will realize a payback of approximately 9 years. The energy retrofit will completely eliminate the need for fossil fuel combustion, and the total carbon emissions reduction is projected to be 19.53 tons of carbon dioxide equivalent (CO_2e) annually.

The Town Hall retrofit projects demonstrate Preble's Climate Smart Community pledge to reduce energy consumption and greenhouse gas emissions. The Town is also a participant in the Central New York Climate Change Innovation Program (C2IP), made possible through a grant to the CNY RPDB from the US EPA Climate Showcase Communities program. Through C2IP, the CNY RPDB worked with community leaders to assess their greenhouse gas emissions impacts, develop strategies to mitigate those impacts, and implement demonstration projects to showcase their efforts. The innovative improvements at the Town Hall were launched as a result of strong local leadership, a clear vision and well-defined goals, combined with citizen and corporate commitment and active community participation. Technical assistance, financial support, rebates, and additional incentives were provided by the CNY RPDB, the NYS Legislature through the efforts of Senator James Seward, the New York State Energy Research and Development Authority (NYSERDA), and National Grid. The energy improvements are expected to provide financial savings for Preble taxpayers and long-term environmental benefits for years to come. Preble serves as an excellent example for other municipalities that are working to reduce energy consumption and costs.

Energy Efficiency Measures in Downtown Parking Garages

In 2009 the City of Syracuse was awarded funding as part of the U.S. Department of Energy's Energy Efficiency and Conservation Block Grant Program. The grant was used to implement energy efficiency measures in City-owned facilities and for the development of a new department called the Bureau of Planning and Sustainability, responsible for creating and implementing sustainability strategies. A portion of this funding was used on lighting upgrades to LED with the installation of occupancy and photo-eye sensors (where applicable) in four downtown parking garages. Energy efficient LED lights were installed at Center Armory, Harrison and Madison-Irving, and MONY parking garages. The LED lighting fixtures draw between 20 and 71 Watts (compared to the approximately 195 Watts from previous fixtures) and provide significant energy reduction and financial savings for the City. Energy efficiency is further enhanced by lower lighting levels when the garages are vacant and in areas where sunlight is available. The project payback period is less than five years. The estimated annual energy savings is 1,623,089 kWh and the cost savings is approximately $162,309 per year as a result of the four upgrades. The estimated lifetime CO_2e emission reduction is 3,684 metric tons.

City of Auburn Green Street Lighting Retrofit and Replacement Project

In 2010, the City of Auburn received funding through the American Recovery and Reinvestment Act. Through this lighting upgrade, Auburn was able to reduce their annual electricity costs and energy consumption of City-owned streetlights. The grant was used to retrofit downtown and parking garage fixtures and to replace Cobra Head fixtures with energy efficient technology. Auburn maintains approximately 4,224 streetlights within the City limits. The grant provided funding to replace 845 streetlights and 305 fixtures situated in the Auburn Municipal Parking Garage. The retrofit and replacement project was completed in May, 2012. The projected source energy savings is 7,862.3 MBTUs each year and the energy cost savings is $51,987. The total project cost was $572,872 with a payback period of 1.7 years with grant funding.

WATER / ENVIRONMENT

Green Roof on the OnCenter

A green roof system was installed on the 60,000+ square foot rooftop of the Convention Center during the summer of 2011. The roof includes a waterproof membrane liner that is covered with a layer of lightweight growing medium, and planted with a mix of sedums (low-growing succulent vegetation). The new rooftop landscape is a self-sustaining system, requiring little maintenance once established, and relies on natural processes to retain and evapotranspirate storm water runoff.

This is one of the largest green roofs in the Northeast region. The green roof is also the site of innovative research conducted by Syracuse University that plans to monitor stormwater capture and temperature variation within layers of the green roof.

Syracuse's Save the Rain Program

The Save the Rain Program involves construction of traditional gray infrastructure projects and innovative green infrastructure. These measures help to reduce stormwater pollution to Onondaga Lake and its tributaries by capturing 95% of existing stormwater runoff. Additional benefits of the program include a projected energy cost savings of $20M by avoiding pumping and treating stormwater runoff and an increase in the amount of landscaped green space in the City of Syracuse.

The Connective Corridor

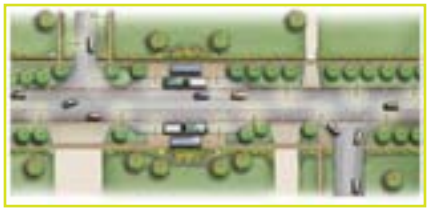
Syracuse is home to three major universities, more than 30 art and cultural venues, and shopping centers that are within close distance to one another. City officials hope to connect these sections into a regional Connective Corridor with bike paths, improved lighting, public and interactive art, and signage. The City and University are now working on a corridor between University Hill and Downtown Syracuse and the Save the Rain program has partnered with both to include green infrastructure throughout the corridor. Connective Corridor projects are expected to prevent a total of 5.9 million gallons of stormwater from entering the combined sewer system annually. The Forman Park project involved enhancing the landscaping in and around the park, while capturing stormwater from within the park. In total, 4,045 shrubs and perennials will be planted as part of this project, servicing 6,800 square feet of drainage area and capturing 121,000 gallons of stormwater annually.

Nine Mile Creek Wetland Enhancement Project

More than 50,000 trees, wetland plants, and shrubs are being planted as part of a Nine Mile Creek enhancement project. The restoration project, launched in June 2012, is designed to improve wetland diversity and creek water quality, restore fish and wildlife habitat, reduce pollution loading to Onondaga Lake, and provide access for water-based recreation along a 30-acre section of Nine Mile Creek. With guidelines established by national and local experts, workers are removing contaminated soil and invasive plants from the area, are realigning the creek, and are grading the nearby wetlands and floodplains. The Onondaga Lake Conservation Corps is coordinating community volunteers to help with the planting and follow-up monitoring and stewardship activities. Through this creative partnership, Nine Mile Creek is being transformed into a green corridor that will connect wildlife habitat from Onondaga Lake to wetlands at Geddes Brook, wetlands at the former Linden Chemicals and Plastics site, and the Shrub Willow Farm off of Airport Road in Camillus.

TRANSPORTATION

James Street Road Diet



A "Road Diet" is a plan that reduces and/or reconfigures roads in order to improve mobility, incorporate bike lanes or other modes of transportation, and instill traffic calming measures. This approach has been implemented in the City of Syracuse on East Genesee Street (between East Avenue and the eastern City line), West Fayette Street, and North Salina Street. The city is currently reviewing opportunities to adopt road diets along additional corridors such as James Street.

The James Street Road Diet focuses on a major commuter route that connects the eastern suburbs of Syracuse with downtown. James Street is a four lane roadway with traffic volumes ranging from 9,900 to 12,200 vehicles per day along 12 signalized intersections. The goal of the project is to reduce the number of travel lanes while improving access and mobility for users. The plan was designed with opportunities for all modes of transportation, including bicycling, walking, and public transit while maintaining the residential character. The Road Diet attempts to improve safety and enhance the quality of life for residents, businesses, and commuters.

The James Street Road Diet reflects a growing trend in transportation planning with a focus on roadways that fit the context or character of the surrounding neighborhood and have a positive impact on the way people relate to the corridor. The Road Diet also embraces the concept of ongoing public and stakeholder participation to ensure that the plan adequately addresses all users of the corridor, including residents and businesses.

NATURAL RESOURCES

Syracuse Creekwalk

The Creekwalk is one of the local outdoor features that make Syracuse special and is the focus of a great deal of community pride. The 2.6 mile trail connects the museums, shops, and restaurants located in Armory Square to the apartments and businesses in Franklin Square. The trail continues onto the Inner Harbor (featuring community events and concerts) and ends at the shores of Onondaga Lake. Along the way, runners, hikers, and bicyclists can enjoy downtown landmarks such as the Syracuse University Warehouse, National Grid's art deco office, and the restored park and quite streets in Franklin Square. The Creekwalk features local water resources

while providing special access to Onondaga Creek and Onondaga Lake. The trail, which was opened to the public in 2011, was constructed with porous pavement and rain gardens to reduce stormwater runoff. These green infrastructure components are expected to capture 254,000 gallons of rain water a year.

Franklin Square

Franklin Square is a recent redevelopment project in the Lakefront area in Syracuse. The area, once a poor neighborhood that was considered an industrial graveyard, has been reclaimed into an attractive residential and commercial neighborhood with restored landmarks, brick sidewalks, ornamental lighting and tree-lined streets. Most of the former factory space in Franklin Square has been converted into apartments and office space. As a result of this successful reclamation initiative, the area is now considered a priority location for Central New York employers and residents.

INFRASTRUCTURE

Village of Minoa Wastewater Treatment Facility

The Village of Minoa wastewater treatment facility services a population of approximately 3,345 residents and receives flows from the ESM High School, Pine Grove Middle School, Woodland Elementary School, and the ESM Bus Garage. Nearby wetlands were built to handle wet weather runoff and are efficiently removing pollutants while reducing treatment plant processing needs.

The Village of Minoa's Clean Water Environmental Research Facility (CERF) has been working since 2010 to perfect wastewater treatment and other sustainable technologies and to make them more accessible and affordable to municipalities with minimal operating budgets. The Village's existing wastewater treatment facility utilizes a series of three subsurface gravel wetlands, a trickling filter system enhanced by ammonia-consuming bacteria, and a sequential batch reactor. These components can be used in different combinations to accomplish removal of ammonia, total nitrogen, phosphorus, and oxygen demand-producing substances. When leachate from Oswego County's Bristol Hill landfill could no longer be accepted at the Fulton Wastewater Treatment Plant due to a consent order from NYSDEC for ammonia levels exceeding permitted limits, they approached the Village of Minoa. Oswego County worked with the CERF to manufacture a version of the trickling filter that treats 10 times the capacity of the Village's filter, while reducing ammonia levels from 3000 mg/L to as low as 1.3 mg/L. This system is now being deployed to accept leachate from the landfill. The technology is simple and inexpensive to construct and operate, saving Oswego County the costs of hauling the leachate in the short-term and ultimately, millions of dollars in construction of wastewater treatment plant improvements. The County is currently exploring the possibility of using gravel treatment wetlands for additional cost savings in pollutant removal.

LAND USE

Urban Forestry Program

The Urban Forestry program is a successful partnership between Onondaga County and the City of Syracuse with program oversight provided by City of Syracuse Arborist. Eighty-five hundred trees are being planted throughout the City in order to facilitate the absorption of rainwater and to reduce stormwater run-off to the sewer system. The Urban Forestry program is part of the Save the Rain initiative. In 2011, 407 trees were planted that are expected to capture approximately 814,000 gallons of stormwater each year. In addition, municipal-based tree management programs have been implemented in the City of Oneida, City of Oswego, City of Fulton, Town of DeWitt, and Village of Fayetteville.

City of Oswego - City Hall Rain Garden

Stormwater is precipitation that flows from roofs and other impervious surfaces such as sidewalks or driveways. It flows into sewers, absorbing and transporting contaminants such as oil residue, salt, pet waste, sand, silt, grass clippings and hydrocarbons. Oswego city officials had been exploring green alternatives for stormwater management in Oswego's sewer systems. They were also looking for educational opportunities that would show residents how to reduce the impact of stormwater on local water resources. To address these issues, a rain garden was planted on the west lawn at Oswego's City Hall and roof drainage is now being used to provide water to the plants. The runoff water is collected in a rain barrel and then drains through a culvert under the sidewalk to the garden site. Collection of roof runoff reduces the amount of water that would otherwise flow into the city's storm and sanitary sewers. City officials report that the garden uses one-quarter of the rain water from City Hall's roof. For a 1,000-square-foot roof and an inch of rain, nearly 625 gallons of water are trapped by the garden that would otherwise flow into the sewers and potentially into the Oswego River.

Smart Growth in Madison County

The U.S. Environmental Protection Agency (EPA) is providing technical assistance to Madison County to implement smart growth strategies that preserve the county's rural character. This initiative, which is part of the EPA's Smart Growth Implementation Assistance program, is designed to help Madison County communities address development challenges in ways that improve the economy, the environment, and public health. The EPA is providing opportunities for cutting-edge development issues, while identifying common barriers to sustainability and creating new tools that other communities can use. Since 2005 EPA has supported 31 Smart Growth Implementation Assistance projects, serving dozens of communities. The projects are coordinated through the Partnership for Sustainable Communities, a joint effort of EPA, the U.S. Department of Housing and Urban Development (HUD) and the U.S. Department of Transportation (DOT). The interagency collaboration coordinates federal investments in infrastructure, facilities and services to get better results for communities and use taxpayer money more efficiently. The Partnership is helping communities across the country create more housing choices, make transportation more efficient and reliable, reinforce existing investments and support vibrant neighborhoods that attract new business.

AGRICULTURE

Skaneateles Lake Watershed Agricultural Program

The City of Syracuse established the Skaneateles Lake Watershed Agricultural Program (SLWAP) in 1994 as an alternative to a costly filtration system required by the 1986 Amendments to the Safe Drinking Water Act. SLWAP is a successful partnership between the Soil and Water Conservation Districts and Cornell Cooperative Extension Associations of the three counties in the watershed, several government agencies, the City of Syracuse, and farmers in the watershed. It's a voluntary program that encourages whole farm planning and best management practices such as nutrient management and erosion and sediment control to reduce sediment and nutrient inputs to the lake. In addition to SLWAP, the Skaneateles Watershed Land Protection Program was established to arrange for preservation of lands in the watershed that are critical to maintaining the lake's water purity, particularly forested and natural land areas. The result of these efforts is continued use of the lake for drinking water by over 200,000 people, and a savings of $70 million in avoided cost for a filtration plant, along with another $7 million annually that would have been needed to maintain the plant.

Environmental Stewardship on Patterson Farms

Throughout the last 20 years, Patterson Farms grew from a small dairy into a concentrated animal feeding operation milking 1,050 cows. Today's 1,900-head dairy operation is enhanced by a 2,700-acre diversified crop program and is hooked up to a 405-kilowatt capacity biogas (methane) power system.

Patterson Farms grows corn, alfalfa, grass, hay, wheat, and willow biomass on 2,700 acres of land. The state-of-the-art manure irrigation system allows for more efficient application of nutrients in the soil. Minimal till plowing practices and cover crops are just two of the efficient farming practices through the Agricultural Environmental Management (AEM) program that are helping to minimize soil erosion and stormwater runoff.

In August 2012, New York's 19th annual Agricultural Environmental Management Award was presented to Patterson Farms for environmentally sound methods that help to protect water quality in Cayuga Lake. The Cayuga County Soil and Water Conservation District was also honored during American Agriculturist's N.Y. Ag Leadership Luncheon ceremonies at Empire Farm Days. N.Y. Commissioner of Agriculture Darrel Aubertine said the family "is a superb role model of personal environmental stewardship and resourceful innovation. We're pleased to honor this farm and their conservation district for their assistance."

CLIMATE

Flood Preparedness

Central New York municipalities often work with County Soil and Water Conservation District on projects that minimize hazard losses, protect areas from stream blockage and flooding, and preserve or restore the functions of natural stream systems. A large detention area was constructed in the Town of Cazenovia and drainage systems were installed in the Village of Morrisville and Town of DeWitt in order to control stormwater runoff and reduce the threat of flooding. Development restrictions in the Village of Chittenango are in place for properties located in the flood zone and the routine clearing of gravel and other debris from the Chittenango Creek reduces flooding in local homes and businesses. Many communities have identified flood hazard zones such as the Lake Moraine Flood Hazard Zone located in the Village of Hamilton. The Village also monitors the lake level and has an evacuation plan for residents living and working in the flood hazard zone.

Section F: CNY Greenhouse Gas Inventory and Energy Report

OUTLINE

LIST OF FIGURES

LIST OF TABLES

PREFACE

This report was issued by ICF International in December 2012 under contract with the CNY RPDB. The purpose of this report is to transmit the Final Tier II Greenhouse Gas (GHG) Inventory for Central New York and to provide an overview of the methodology used for each of the completed sources. The report begins with a general background to the inventory, a discussion of key steps in establishing and defining a GHG inventory, and description of how the inventory is organized. For each source that follows, the inventory presents a description of each source, a discussion of the data and methods used, and a brief review of the results.

In order to align the methods used here with those used by other regions in New York State, the State convened the NYGHG Working Group to develop a standard New York GHG Protocol (NYGHG Protocol). This inventory was developed based on the latest methods determined by the NYGHG Working Group, as well as the latest data provided to that group. Protocols were not finalized for all sources. The data and calculations presented here are contained in a separate Regional GHG Inventory Excel workbook and supplementary files.

ABBREVIATIONS AND ACRONYMS

ACS	American Community Survey
ANDOC	Anaerobically degradable carbon
BOD_5	5-day biological oxygen demand
COLE	Carbon OnLine Estimator
eGRID	Emissions & Generation Resource Integrated Database
EIA	Energy Information Administration
EPA	Environmental Protection Agency
FOD	First-order decay
GHG	Greenhouse gas
GHGRP	Greenhouse gas Reporting Program
C&D	Construction and demolition
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
FIDO	Forest Inventory Data Online
GRP	Gross Regional Product
HDD	Heating degree days
HFCs	Hydrofluorocarbons
HPMS	Highway Performance Monitoring System
HU	Housing units
IPCC	Intergovernmental Panel on Climate Change
LFG	Landfill gas
LFGTE	Landfill gas to energy
LUAF	Lost and unaccounted for
LULUCF	Land-use, land-use change, and forestry
Mcf	Thousand cubic feet
MF	Multi-family
MMBTU	Million British thermal units
MSW	Municipal solid waste
$MTCO_2e$	Metric tons carbon dioxide equivalent
MWh	Megawatt-hour
N_2O	Nitrous oxide
NAICS	North American Industry Classification System
NASS	National Agricultural Statistics Service
NYS DEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSERDA	New York State Energy Research and Development Authority
NYUP	NPCC Upstate New York (eGRID subregion)
ODS	Ozone-depleting substances
PFCs	Perfluorocarbons
SF_6	Sulfur hexafluoride SFA Single-family attached
SFD	Single-family detached
SIC	Standard Industrial Classification
SIT	State Inventory Tool
T&D	Transmission and distribution
TAM	Typical animal mass
Tg	Teragrams
USDA	United States Department of Agriculture
VMT	Vehicle miles traveled
VS	Volatile solids
WWTPs	Wastewater treatment plants

1. BACKGROUND

The New York Cleaner, Greener Communities Program empowers regions to create more sustainable communities by funding smart development practices. One of the key outcomes of the Plan is a regional baseline of GHG emissions and energy use. NYSERDA has provided a high-level Tier I analysis of GHG emissions and energy use by region that focuses on fuel combustion emission sources. The Tier I inventory was developed using statewide greenhouse gas emissions data and readily available regional data. This report represents a more detailed Tier II analysis that addresses sources not covered in the Tier I inventory and replaces statewide data with more detailed local data wherever possible.

The purpose of this inventory is to help the region better characterize its baseline GHG emissions and energy consumption. Identifying and quantifying key emission sources can help identify and inform strategies for reducing emissions and provide a baseline against which progress can be measured in the future. Finally, the municipal level allocation provides useful energy, GHG, demographic, and economic data for each of the region's counties, cities, towns, and villages. The municipal allocation, however, is not intended to replace detailed studies conducted by several of the region's municipalities, as it was not feasible to take an equally detailed look at each of the region's 148 municipalities.

To standardize organization and methodologies in the regional inventories being completed by each of New York's ten regions, NYSERDA has sponsored the NYGHG Protocol Working Group. ICF staff participated in this group throughout the duration of the protocol development process to discuss data sources, methodologies, and organizational structure for the regional GHG inventory. This process resulted in a common inventory protocol used by each region in the state. This Working Group also served as the organizing entity for several common data requests to New York State agencies and major electricity and natural gas utilities. Due to differences in data availability between the regions, the protocol did not provide guidance for every methodological decision. Consequently, this inventory was developed based on the available data and methods from the regional perspective.

1.1. Key Steps and Issues in Establishing an Inventory

A GHG inventory identifies activities that are responsible for GHG emissions, quantifies the level of each activity, and then calculates the associated emissions. Each of these steps—defining the activities, measuring the level of the activity, and determining the consequent emissions—must be carefully defined in order to result in a credible, transparent, and easily reproducible inventory. As discussed above, this inventory is based on the NYGHG Working Group protocol wherever possible.

The process of designing an inventory entails a number of decisions and procedural steps:

+ **Inventory geography and boundaries:** The geography for this inventory is that of the five counties of the Central New York region: Cayuga, Cortland, Madison, Onondaga, and Oswego Counties. This inventory includes emissions from electricity imported into the region and from emissions from waste that is exported from the region. Product life-cycle emissions (e.g., emissions associated with the production and distribution from imported goods and services) are not included.

+ **Sources:** The activities selected for the regional inventory are based on those defined by the U.S. Environmental Protection Agency (EPA) and the Intergovernmental Panel on Climate Change (IPCC). These categories are:

  - **Stationary Energy Consumption—**fuel and electricity use in homes, businesses, and other non- mobile settings for purposes such as space and water heating, lighting, appliances and electronics, and industrial activities;

  - **Mobile Energy Consumption—**use of energy in transportation, including on-road transportation, passenger and freight rail, aviation, marine transportation, and off-road vehicles;

  - **Agriculture—**non-energy emissions from agriculture, including both crops and livestock (e.g., methane emissions associated with livestock and nitrous oxide emissions associated with fertilizer application);

  - **Waste Management—**non-energy emissions related to managing solid waste, including trash and wastewater (e.g., methane emissions associated with the anaerobic decay of waste disposed of in landfills);

  - **Industrial Processes—**non-energy emissions associated with industrial activity (e.g., carbon dioxide emissions associated with cement production or emissions associated with coolants for air conditioners) and fugitive emissions from fuel systems (leakages in the production, distribution, and transmission of fossil fuels), and;

- **Land Use, Land Use Change, and Forestry—**emissions from changes in the amount of carbon stored in soil and plants due to land use and forestry practices (e.g., from clearing forest land for residential, commercial, or agricultural use).

+ **Greenhouse gases included:** This inventory evaluates the impact of the three gases which together comprise 98 percent of national emissions: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N2O), as well as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) emissions from the substitution of ozone depleting substances.[1] Together, these greenhouse gases accounted for 99.6 percent of national greenhouse gas emissions in 2010.[2]

+ **Quantification approach:** This inventory uses a blend of top-down data (e.g., state fuel consumption estimates) and bottom-up data (customer utility data). This mix was dictated by data availability, existing protocols, and resource limitations.

+ **Base year:** The base year for this analysis is 2010. The year 2010 was selected by the Working Group because it is the most current year for many of the data sets used in this report.

All emissions are reported in metric tons of carbon dioxide equivalent ($MTCO_2e$) or million metric tons of carbon dioxide equivalent ($MMTCO_2e$). A metric ton is 1,000 kilograms, or 2,206 pounds – about 10 percent larger than the 2,000 pound ton commonly used in the United States.

1.2. Organization of the Inventory Report

The inventory is organized by source and by Scope. Scope refers to the degree of control that the regional community has over the emission source. Although the Scope framework was first developed for corporate- level GHG inventories, a similar principal can be applied to communities. The basic definitions of the Scopes from a community perspective are as follows:

+ **Scope 1:** All direct emissions from sources within the geopolitical boundary of the community.

+ **Scope 2:** Energy-related indirect emissions that occur outside the community boundary as a consequence of consumption/use of grid-supplied electricity, heating and/or cooling within the community boundary.

+ **Scope 3:** All other indirect emissions that occur outside the boundary as a result of activities within the community's geopolitical boundary, as well as trans-boundary emissions due to exchange/use/consumption of goods and services.

In the case of the NYSERDA regional GHG inventories, the Working Group's definition of Scopes 2 and 3 has been modified slightly. For the purposes of this inventory, Scope 2 includes energy-related indirect emissions regardless of whether they occur inside or outside of the region. For example, emissions from electricity generation that occurs within the region are included in Scope 1, but emissions related to the consumption of electricity by the community are included in Scope 2. This reflects the reality that electricity generated in the region may be consumed inside or outside of the region, while electricity consumed in the region may be generated inside or outside of the region. Only the Scope 2 emissions are included in the total, while Scope 1 emissions are provided as an informational item. Similarly, in this inventory, Scope 3 includes all other indirect emissions regardless of whether they occur inside or outside of the region. The sole Scope 3 source currently in the inventory is methane emissions associated with the deposition of municipal solid waste (MSW) in landfills. Many communities in the region transfer MSW to landfills outside of the region. These emissions are estimated here even though they occur outside of the region, because they result from activities within the region. This source is discussed in greater detail in Section 5 below.

The report below is organized by source and Scope, and the emission totals for each source are listed by county below. Section 9 includes emission totals for each sector at the municipal level. The municipal-level estimates are either generated bottom-up or represent an allocation of county-level emissions. The methodology used to estimate emissions for methodologies varies by sector and is discussed in Section 9.3.

1.3. Organization of the Inventory Spreadsheet

The data and calculations discussed in this report have been developed in the Excel workbook delivered to NYSERDA, "Central New York GHG Inventory 12-7-12.xlsx." The file is organized as follows:

+ An Overview sheet with links to each worksheet

+ Sheets containing summary tables and figures for the region, including all of the tables and figures presented in this report. These are based on the NYSERDA-provided reporting template.

+ A worksheet containing summary tables for the region, including all of the tables and figures presented in this report (this will be updated once final based on key charts and graphs requested by CNY).

+ A series of color-coded sheets covering the inventory calculations. Each lists the source, Scope, and data sources used. The sheets are categorized by inventory sector:

  - Red-tabbed sheets cover stationary energy;
  - Green-tabbed sheets cover mobile energy;
  - Brown-tabbed sheets cover solid waste and wastewater;
  - The yellow tab covers industrial processes;
  - The blue tab covers agriculture; and
  - The purple tab covers land-use, land-use change, and forestry (LULUCF).

+ Lastly, the "Factors" tab at the end provides the emission, conversion, and other factors used throughout the file.

Municipal-level emissions are calculated in the file "Central New York GHG Inventory_Municipal Allocation 12-7-12.xlsx." In some cases, supplementary workbooks are used to conduct supporting calculations. These include modules of the U.S. EPA's State Inventory Tool and the California Air Resources Board's Landfill Emissions Tool.

2. SUMMARY OF RESULTS

Central New York's 2010 baseline gross greenhouse gas emissions were approximately 9.9 MMTCO$_2$e. Onondaga County had the largest share of emissions, with 55 percent, while Cortland County had the lowest share of emissions, with 8 percent. Onondaga is also the most populated county in the region (59 percent of 2010 population), while Cortland is the least populated (6 percent). The primary driver of emissions in the region is population and the report discusses these drivers in the source-specific results in cases where there are drivers other than population.

Cayuga County had the highest per capita emissions in the region (approximately 18 MTCO$_2$e/person), driven by its low population and relatively high agricultural emissions. Oswego County had the lowest per capita emissions, at 11 MTCO$_2$e per person. Per capita emissions are shown by county in Figure 2. The Central New York region as a whole has lower per capita emissions than the United States, primarily a result of the region's electricity grid mix. The Central New York electricity emissions reflect a grid mix with high proportions of nuclear, hydropower, and natural gas (with lower carbon intensities) compared to the nationwide average grid mix featuring higher proportions of coal and natural gas (with higher carbon intensities).

Energy consumption for transportation was the largest source of emissions in the region, comprising 43 percent of total emissions. Building energy consumption, consisting of electricity consumption plus stationary fuel consumption, was the largest source of emissions, accounting for 41 percent of total regional emissions (14 percent and 27 percent, respectively). When including energy supply emissions (representing 4 percent of total emissions), approximately 87 percent of the regions emissions resulted from energy consumption. In 2010, fuel consumption for energy uses cost the region an estimated $2.45 billion, which amounts to approximately 8 percent of the region's Gross Regional Product (GRP). The region's emissions are summarized in Table 1 and Table 2, with a comparison of County emissions in Figure 1.

This inventory also includes changes in forest carbon stocks. This is not a required source in the New York state protocol, but is included as an additional source in the Central New York inventory because of the large presence of forested land in the region. As discussed in Section 8, there is a high degree of uncertainty associated with these estimates. Therefore, the overall inventory results focus on gross emissions, rather than net emissions. Gross emissions do not include changes in forest carbon stocks.

TABLE 1–Total 2010 Emissions, by County and Gas (MT CO_2e)

County	CO_2	CH_4	N_2O	Other	Gross Emissions	Net Change in Forest C	Net Emissions
Cayuga	1,023,632	232,686	130,564	32,453	1,419,335	(1,950,565)	(531,230)
Cortland	580,306	112,824	34,130	19,273	746,534	(1,888,264)	(1,141,730)
Madison	729,884	142,504	58,358	28,767	959,514	1,306,939	2,266,453
Onondaga	4,840,079	326,206	120,330	185,467	5,472,081	371,225	5,843,307
Oswego	1,168,171	67,381	27,227	47,469	1,310,248	(781,498)	528,750
Central New York Total	**8,342,073**	**881,602**	**370,610**	**313,428**	**9,907,712**	**(2,942,162)**	**6,965,550**

FIGURE 1–Total 2010 Emissions by County and by Source

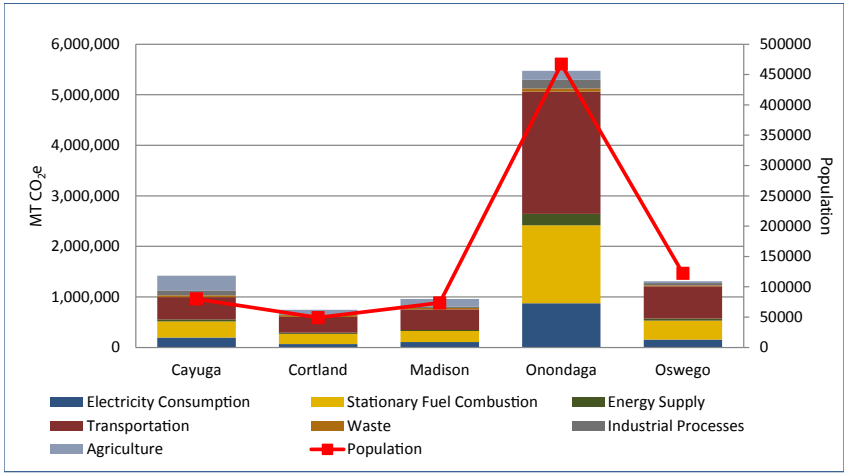


FIGURE 2–2010 Per Capita Emissions by County in Central New York ($MTCO_2e$/person)

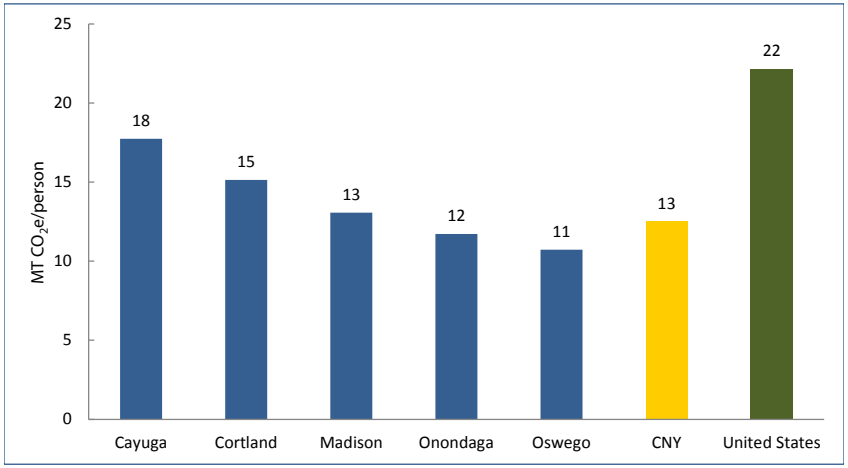


TABLE 2–Total 2010 Central New York Emissions, by Source ($MMTCO_2e$)

	Scope	2010 Regional Emissions ($MMTCO_2e$)	Percent of Gross Emissions
Electricity Generation*	**1**	**2.2**	
Electricity	**2**	**1.4**	**14%**
Residential Consumption	2	0.5	5%
Commercial Consumption	2	0.4	4%
Industrial Consumption	2	0.5	5%
Stationary Energy Consumption		**2.7**	**27%**
Residential	1	1.2	12%
Commercial	1	0.8	8%
Industrial	1	0.6	6%
Energy Supply	1 & 2	0.4	4%
Mobile Energy Consumption		**4.2**	**43%**
On-road	1	3.7	37%
Off-road	1	0.4	4%
Marine	1	0.1	1%
Rail	1	0.1	1%
Air*	1	0.2	
Waste			
Solid Waste—Landfills*	1	0.1	
Solid Waste--Waste Generation	3	0.1	1%
Wastewater Treatment	1	0.1	1%
Industrial Processes	**1**	**0.4**	**4%**
Agriculture	**1**	**0.7**	**7%**
LULUCF*		**(2.9)**	
Gross Emissions		**9.9**	**100%**

*Not included in gross emissions total

3. STATIONARY ENERGY CONSUMPTION

Stationary energy consumption includes direct emissions from the combustion of natural gas, coal, kerosene, distillate, motor gasoline and other fuels, as well as indirect emissions from electricity consumption. Direct emissions from residential, commercial, industrial, and electricity generating activities in the region are included in Scope 1. Indirect emissions from the consumption of electricity are included in Scope 2. To avoid double-counting, Scope 1 emissions from electricity generation are not included in the regional total, but are reported for informational purposes.

TABLE 3–2010 Electricity Generation GHG Emissions ($MTCO_2e$)

County	CO_2	CH_4	N_2O	**Total**	Percent of Total
Cayuga	283	0	0	**283**	0%
Cortland	0	0	0	**0**	0%
Madison	0	0	0	**0**	0%
Onondaga	672,708	6,851	3,425	**682,984**	32%
Oswego	1,473,303	1,904	1,090	**1,476,297**	68%
Central New York Total	**2,146,293**	**8,756**	**4,515**	**2,159,564**	**100%**

Note: Totals may not sum due to independent rounding.

TABLE 4–2010 Electricity Generation by Fuel (MWh)

County	Coal	Natural Gas	Fuel Oil	Biomass (LFG, MSW)	Nuclear	Hydro	Wind	**Total**
Cayuga	0	340	0	0	0	3,782	0	**4,122**
Cortland	0	0	0	0	0	0	0	**0**
Madison	0	0	0	8,207	0	10,557	128,446	**147,210**
Onondaga	101,262	165,722	854	190,067	0	0	0	**457,905**
Oswego	0	3,437,935	59,077	9,264	20,600,536	285,643	0	**24,392,456**
Central New York Total	**101,262**	**3,603,997**	**59,931**	**207,538**	**20,600,536**	**299,982**	**128,446**	**25,001,693**
Percent of Total	0%	14%	0%	1%	82%	1%	1%	100%

Note: Totals may not sum due to independent rounding.

3.1. Electricity Generation– Scope 1

Data & Methods

The primary data source for electricity generation is the U.S. Energy Information Administration's Form 923[3] facility production data for 2010. This dataset reports total fuel consumption (in physical units and BTUs) and total net generation in MWh. This data can be gathered through EIA's web data query portal. The Central New York region has 12 non-renewable electric generating facilities, the largest of which (in terms of electricity output) are Nine Mile Point Nuclear Station, the James A. Fitzpatrick nuclear plant, and Sithe Independence Station, a natural gas-fired plant, all in Oswego County.

Emissions from electricity generation are estimated by multiplying total fuel consumption for each plant by the CO_2, CH_4, and N_2O emission factors for each fuel type to calculate the total emission by gas. These emission factors are from EPA's Greenhouse Gas Reporting program, and are the emission factors recommended by the NYGHG Working Group. These emissions are summed up by gas and county to provide summary table of total electricity generation emission for the region.

Results

Over 25 million MWh of electricity were generated in Central New York in 2010. Eighty-two percent of energy use came from the region's two nuclear power plants, both located in Oswego County. Over two-thirds (69 percent) of electricity generation emission came from natural gas-fired plants. Emissions by county are presented in Table 3. The region's fossil fuel-based electricity generation is located in Cayuga, Onondaga, and Oswego Counties. Generation by resource is also presented below. Nuclear power is responsible for the majority of the region's generation, followed by natural gas, and to a lesser extent, hydropower, municipal solid waste (MSW), wind, coal, and petroleum. Natural gas and coal, however, are responsible for the majority of the region's emissions.

TABLE 5–2010 Electricity Generation and Emissions by Fuel

Fuel Type	Electricity Generated (MWh)	Percent of Electricity Generated	Emissions ($MTCO_2e$)	Percent of Emissions
Nuclear	20,600,536	82%	0	0%
Natural Gas	3,603,997	14%	1,482,491	69%
Hydro	299,982	1%	0	0%
MSW	199,331	1%	173,364	8%
Wind	128,446	1%	0	0%
Coal	101,262	0%	447,959	21%
Residual Fuel Oil	59,077	0%	54,368	3%
LFG	8,207	0%	0	0%
Distillate Fuel Oil	854	0%	1,382	0%
Total	**25,001,693**	**100%**	**2,159,564**	**100%**

Note: Totals may not sum due to independent rounding.

3.2. Electricity Consumption – Scope 2

Data & Methods

Scope 2 emissions from electricity consumption were calculated using a combination of reported consumption from utilities and, where utility data are unavailable, consumption estimates. As of December 7, 2012, electricity sales data were available from six utilities serving the Central New York region: National Grid, NYSEG, Rochester Gas and Electric, Oneida-Madison Electric Cooperative, Village of Hamilton, and Village of Solvay. All utilities except one provided electricity consumption by municipality and sector. Oneida-Madison Electric Cooperative provided total electricity usage and this consumption was divided into Residential, Commercial, and Industrial sectors using the statewide breakdown of total retail electricity sales from EIA.

The data cover 143 municipalities fully and five municipalities have no or only partial utility-reported electricity consumption. The Central New York Regional Planning and Development Board provided a list of utilities serving each municipality, which was used to determine whether cities were "fully served" by the utilities reporting.

For locations fully served by the utilities reporting, the reported usage for that area (in MWh) serves as the full electricity consumption for that town or village. If no utility data were available for the town or city, electricity usage was estimated using the following methods for each sector:

Residential – Use the same methodology used to estimate consumption for all other residential stationary fuels (see below). These estimates are based on total housing units and housing unit size. Unlike other fuels, electricity usage was not weighted by HDD or home heating fuel use, since electricity is used extensively outside of home heating.

Commercial – Use the same methodology used to estimate consumption for all other commercial stationary fuels (see below). These estimates are based on commercial square footage (which in turn is a factor of commercial sector employment and square footage-per-employee), home heating fuel use, and HDD.

Industrial – Industrial electricity consumption is not estimated if it was not provided by the utilities. County-level electricity consumption was then estimated by summing the consumption at the city and town level. Finally, electricity usage in MWh was converted to MMBTU and emissions using the 2009 eGRID emission factors for NYUP subregion, which houses all Central New York counties. The emission factors are 497.92 lb CO_2/MWh, 15.94 lb CH_4/GWh, and 6.77 lb N2O/GWh.

Results

Total emissions from electricity in the region are 1,406,418 $MTCO_2e$. The primary drivers of electricity consumption are households and commercial and industrial activities. Total electricity emissions by county and total electricity consumption by sector and county are shown in Table 6 and Table 7, respectively. Total electricity consumption in the CNY region in 2010 was estimated to be just close to 6.2 million MWh. Onondaga County had the largest share of that electricity use, with 62 percent. Cayuga County has the highest electricity use per capita, due to a relatively low population across the county but significant commercial and industrial activity in Auburn. Per capita electricity use by county and sector is shown in Figure 3.

TABLE 6–2010 Electricity Consumption Emissions ($MTCO_2e$)

County	CO_2	CH_4	N_2O	Other Gases	Total	Percent of Total
Cayuga	197,511	133	832	0	198,477	14%
Cortland	69,050	46	291	0	69,388	5%
Madison	108,256	73	456	0	108,785	8%
Onondaga	870,679	585	3,670	0	874,934	62%
Oswego	154,082	104	649	0	154,835	11%
Central New York Total	**1,399,578**	**941**	**5,899**	**0**	**1,406,418**	**100%**

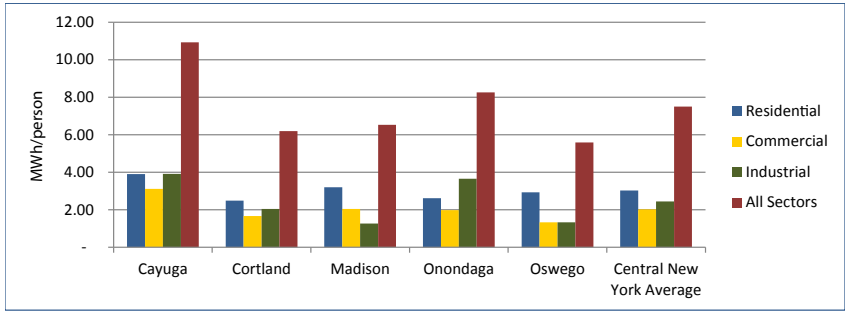
Note: Totals may not sum due to independent rounding.

TABLE 7–2010 Electricity Consumption by Sector and County (MWh)

County	Residential	Commercial	Industrial	Total	Percent of Total
Cayuga	312,651	248,839	313,024	874,514	14%
Cortland	122,885	82,130	100,716	305,731	5%
Madison	235,351	150,572	93,398	479,321	8%
Onondaga	1,224,740	923,041	1,707,293	3,855,073	62%
Oswego	357,398	162,258	162,569	682,224	11%
Central New York Total	**2,253,025**	**1,566,839**	**2,376,999**	**6,196,863**	**100%**

Note: Totals may not sum due to independent rounding.

FIGURE 3–2010 Per Capita Electricity Consumption by Sector (MWh/person)



3.3. Fuels – Scope 1

Data & Methods

Scope 1 stationary fuel combustion includes use of fuels such as natural gas, coal, fuel oil, wood, others for home heating, commercial heating, and industrial energy use. Different methods are used to estimate energy use and emissions for the residential, commercial, and industrial sectors. In addition, natural gas is estimated differently than other fuels due to the availability of utility sales data. The methods for residential, commercial, and industrial natural gas and other fuels are described below.

Residential

The primary data sources for residential stationary combustion include the US Census Bureau Redistricting data for 2010, the American Community Survey (ACS) 5-year housing characteristic estimate for 2010[4], and the Energy Information Administration's (EIA) state energy consumption data by sector for New York in 2010.[5] Statewide fuel consumption was allocated to counties using a weighted value based on the occupancy of single-family detached (SFD), single-family attached (SFA), or multi-family (MF) dwellings; energy use per housing unit by different types of dwellings; the average Heating Degree Days (HDD) for each region in the state; and the use of household heating fuels by household count. This calculation methodology was used for all fuels reported as home heating fuels in the ACS: Electricity, Natural Gas, Coal, Propane, Fuel Oil, Wood, and Solar.

Residential stationary combustion emissions are estimated by first estimating fuel consumption, and then multiplying estimated fuel consumption by fuel-specific emission factors. To estimate consumption by fuel for each county, housing data from the American Community Survey were collected for each county in the state. Total SFD and SFA housing units were indicated in the data. Total MF

housing units were assumed to equal categories for 2 or more units, plus mobile home, boat, RV, van, and other. These counts, which included both occupied and vacant housing units, were multiplied by the percentage of occupied housing units in each municipality to convert the total housing units by type to occupied units by type. The heating fuel counts were based only on occupied units.

Next, the occupied housing units were adjusted to account for the difference in energy use per housing unit by dwelling type. Per the NYGHG Working Group, a SFD uses 108 MMBTU per year, while a SFA uses 89 MMBTU per year, and a MF uses 54 MMBTU per year. The adjusted housing units for each county were calculated as:

$$Adjusted\ HU = \frac{108}{108} \times \text{SFDHU} + \frac{89}{108} \times \text{SFAHU} + \frac{54}{108} \times \text{MFHU}$$

Where:

HU = "housing units", the total number of housing units by county

SFDHU = "single-family detached housing units", the number of single family detached units by county

SFAHU = "single-family attached housing units", the number of single family attached units by county

MFHU = "multi-family housing units", the number of multi-family units by county (defined as 2+ family houses, plus mobile home, boat, RV, van, and other)

The following process was used to estimate total fuel use by county for each fuel type:

$$Adjusted\ HU_{fuel} = HU_{fuel} \times \frac{Adjusted\ HU}{HU}$$

Where:

HU = "housing units", the total number of housing units by county

HU_{fuel} = total number of housing units that heat with each fuel type by county

Finally, the residential consumption for each county, weighted by structure type and county- specific heating degree day (HDD), was calculated as follows for each fuel type, except coal:

$$Fuel\ Use_{County} = Total\ Fuel\ Use_{State} \times \frac{(Adjusted\ HU_{Fuel} \times HDD)_{County}}{(Adjusted\ HU_{Fuel} \times HDD)_{State}}$$

For coal, statewide residential consumption was not available through EIA despite a small number of households reporting using coal or coke as a heating fuel in the region. To calculate residential coal or coke consumption, the energy per housing unit value for fuel oil was used as a proxy to correct for the unreported data.

$$Coal\ Use_{County} = Adjusted\ HU_{coal} \times \frac{Oil\ Use_{County}}{Adjusted\ HU_{oil}}$$

Where:

HU_{oil} = total number of housing units that heat with oil statewide

HU_{coal} = total number of housing units that heat with coal statewide

The energy use estimated for each fuel was then multiplied by fuel-specific emission factors to estimate total emissions. All fuel emission factors in this inventory come from EPA's Mandatory Reporting of Greenhouse Gases, Final Rule.[6] Total emissions are calculated by gas and are rolled up into a total for each county.

Commercial

Commercial stationary combustion is also estimated using an apportionment of the state energy consumption in the commercial sector reported by the EIA. Statewide commercial fuel use is apportioned to counties by a weighted value based on commercial square footage, home heating fuels, and HDD.

First, the amount of commercial square footage by county was determined by multiplying the total number of commercial-sector jobs in each county (collected from the New York State Data Center and provided by the NYGHG Working Group) by the average square footage per worker per building type (collected from the Commercial Building Energy Consumption Survey and provided by the NYGHG Working Group). These were multiplied by the percentage of housing

units by each fuel type as reported in the ACS served to estimate the amount of space heated by each fuel. Next, the calculated consumption was weighted by HDD: the consumption of each fuel in each county equaled the commercial building area using that fuel multiplied by the regional HDD. The proportion of HDD-weighted fuel consumption in each county was multiplied by the statewide fuel consumption to get county-level fuel consumption for each fuel type.

The energy use estimated for each fuel was then multiplied by fuel-specific emission factors to estimate total emissions. Emission factors for CO_2, CH_4, and N_2O for each of the fuel types were gathered from guidance based EPA's Greenhouse Gas Reporting program. Total emissions are calculated by gas and are rolled up into a total for each county.

Industrial

The primary data source for industrial stationary combustion is EPA's Greenhouse Gas Reporting Program (GHGRP) data for calendar year 2010[7]. This dataset includes emission information from large facilities (defined as those that emit > 25,000 MT CO_2e per year) in nine industry groups, including: power plants, landfills, metals manufacturing, mineral production, petroleum refineries, pulp and paper manufacturing, chemicals manufacturing, government and commercial facilities, and other industrial facilities. These groups cover 29 source categories of emissions. In 2012, this EPA dataset will be expanded to include 12 additional industry groups for calendar year 2011.

Total statewide industrial fuel consumption for 2010 from EIA's State Energy Data System, Table CT6 and manufacturing employment in New York State and the Central New York counties were also used to supplement the GHGRP dataset. Manufacturing employment data came from the U.S. Census Bureau's 2007 Economic Census, Employment by NAICS Code, codes 31–33.

Industrial stationary combustion emissions are estimated using a combination of reported direct emissions from the Central New York region and a method to allocate statewide industrial fuel consumption to the Central New York counties.

First, data were pulled for known industrial emission in the Central New York region from EPA's GHGRP dataset. To identify industrial facilities located in the Central New York region, facilities were filtered by state and county. Non-industrial facilities were removed using NAICS codes. Facilities with NAICS codes for Utilities (with NAICS codes beginning with 22-), Lessors of Real Estate (531120), Solid Waste Landfills (562212), Solid Waste Combustors and Incinerators (562213), and Universities (611310) were removed. The result was a list of seven facilities located in the Central New York region from the GHGRP dataset.

The same process was completed for New York State, where non-industrial facilities were removed by NAICS code. The result was a final list of 53 industrial facilities in New York State, with NAICS codes related to manufacturing (beginning with 31-, 32-, or 33-) and pipeline transportation of natural gas (486210).

Second, the industrial facilities from EPA's GHGRP dataset were cross-checked with those in the Title V air permit dataset from the New York State Department of Environmental Conservation, distributed via the NYGHG Working Group. To identify industrial facilities from the Title V dataset located in the CNY region, facilities were filtered by state and county. Non-industrial facilities were then removed from the list based on the listed Standard Industrial Classification (SIC) code, a set of classification codes related to NAICS. Only facilities with SIC codes for Manufacturing (beginning with 20- to 39-), and Gas Production and Distribution (beginning with 492-) were kept. Facilities that were already included in the EPA's GHGRP were removed. This cross-check identified five additional industrial facilities in the CNY region. Added to the seven GHGRP facilities, this resulted in a final list of 12 industrial facilities located in the Central New York region, including their emissions by fuel type.

With the list of industrial facilities and their stationary combustion emissions finalized, "remaining" industrial emissions (i.e., emissions not captured in the GHGRP, such as from smaller industrial sources) were estimated at the state level and then allocated to the Central New York counties based on industrial employment. Using 2010 industrial fuel consumption data[8] (in trillion BTU) from EIA's State Energy Data System, total New York State emissions, by fuel, were calculated using the default emission factors per MMBTU established by the NYGHG Working Group. The remaining emissions, statewide, were then allocated to the county level by the portion of statewide industrial manufacturing employment in that county (based on employment data by NAICS code from the 2007 Economic Census).

The following process was followed **for each fuel type:**

$$EIA\ New\ York\ Sate\ Industrial\ Stationary\ Combustion\ Emissions = \sum_{by\ fuel} (trillion\ BTU\ consumed \times 10^{-6} \times {}^{MTCO_2e}/_{MMBTU})$$

$$Remaining\ emissions_{State} = EIA\ New\ York\ State\ Industrial\ Stationary\ Combustion\ Emissions - GHGRP\ Reported\ New\ York\ State\ Stationary\ Combustion\ Emissions$$

$$Remaining\ emissions_{County} = Remaining\ emissions_{State} \times \frac{Industrial\ Employment_{County}}{Industrial\ Employment_{State}}$$

$$Total\ Industrial\ Stationary\ Combustion\ Emissions_{County} = Reported\ Emissions_{County} + Remaining\ Emissions_{County}$$

Natural Gas

Natural gas consumption was estimated using a combination of reported usage from utilities and, where utility data were unavailable, consumption estimates. As of December 7, 2012, natural gas sales data were available from National Grid and NYSEG. The data cover 88 municipalities fully. Sixty towns and villages have no or only partial utility-reported natural gas consumption. The National Grid and NYSEG service territory web pages were used to determine whether a municipality was "fully served" by the utilities reporting.[9]

For locations fully served by the utilities reporting, the reported usage for that area (in therms, converted to MMBTU) served as the full natural gas consumption for that town or village. If no utility data were available for the town or city, the usage estimates generated using the methods for Residential and Commercial fuels described above were used. For industrial natural gas, natural gas consumption for GHGRP facilities in each municipality was used if there was no reported consumption from the utility. If a municipality had no reported utility natural gas consumption and no natural gas consumption from GHGRP facilities, then no industrial natural gas consumption was assumed.

Efforts were also taken to ensure natural gas consumption from the utility data did not include natural gas consumption already accounted for at electricity generation facilities. Utility natural gas consumption amounts in cities and towns with natural gas-fired power plants were cross-checked with natural gas consumption at the power plants, and values that seemed to match the power plant consumption were removed from the utility data.

County-level natural gas consumption was then estimated by summing the consumption at the city and town level. Finally, natural gas usage in MMBTU was converted to emissions using the natural gas emission factors of 53.02 kg CO_2/MMBTU, 0.001 kg CH_4/MMBTU, and 0.0001 kg N_2O/MMBTU.

Results

Emissions by end use sector and by fuel for stationary fuel consumption are presented in Table 8, Table 9, and Table 10. Total emissions in 2010 from non-electricity stationary energy use were 2,652,101 $MTCO_2e$. Natural gas is the dominant fuel in the region, representing 70 percent of energy use. Natural gas is also the dominant fuels in terms of emissions, representing 74 percent of emissions from stationary combustion. Similar to electricity, emissions from other fuels by county generally track population levels. In addition, per capita emissions from stationary fuel combustion are highest in Cayuga County due to high industrial activity at the two major facilities in Auburn (Nucor Steel and Owens-Brockway Glass).

TABLE 8–2010 Stationary Fuel Consumption GHG Emissions (MT CO_2e)

County	Residential	Commercial	Industrial	**Total**	Percent of Total	Emissions per Capita
Cayuga	158,838	95,758	61,641	**316,236**	12%	4.0
Cortland	82,446	78,374	40,989	**201,809**	8%	4.1
Madison	115,414	76,648	23,392	**215,454**	8%	2.9
Onondaga	685,975	489,165	367,483	**1,542,624**	58%	3.3
Oswego	185,238	93,275	97,465	**375,978**	14%	3.1
Central New York Total	**1,227,911**	**833,220**	**590,970**	**2,652,101**	**100%**	**3.3**
Percent of Total	*46%*	*31%*	*22%*	**100%**		

Note: Totals may not sum due to independent rounding.

TABLE 9–2010 Stationary Fuel Consumption by Sector and Fuel Type (MMBTU)

Fuel Type	Residential	Commercial	Industrial	**Total**	Percent of Total
Natural Gas	16,211,707	12,356,854	8,184,319	**36,752,879**	70%
Coal	171,239	12,447	642,770	**826,455**	2%
Distillate Fuel Oil	2,735,148	1,864,434	416,679	**5,016,261**	10%
Residual Fuel Oil	0	0	99,654	**99,654**	0%
Propane/LPG	2,229,938	564,233	43,090	**2,837,262**	5%
Other Petroleum	0	0	761,291	**761,291**	1%
Wood	4,604,197	612,703	410,714	**5,627,614**	11%
Biogas	0	0	142,476	**142,476**	0%
Solar	120,905	0	0	**120,905**	0%
Total	**33,760,454**	**20,756,726**	**18,811,314**	**73,328,494**	**100%**

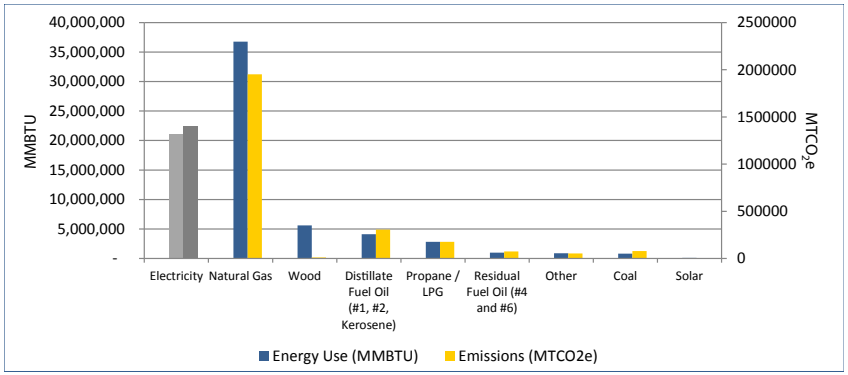
Note: Totals may not sum due to independent rounding.

TABLE 10–2010 Stationary Fuel Emissions by Sector and Fuel Type ($MTCO_2e$)

Fuel Type	Residential	Commercial	Industrial	**Total**	Percent of Total
Natural Gas	860,388	655,803	434,358	**1,950,549**	74%
Coal	17,855	1,172	60,502	**79,528**	3%
Distillate Fuel Oil	202,973	139,361	30,921	**373,254**	14%
Residual Fuel Oil			7,509	**7,509**	0%
Propane/LPG	137,607	35,676	2,724	**176,008**	7%
Other Petroleum			54,171	**54,171**	2%
Wood	9,089	1,209	746	**11,045**	0%
Biogas			37	**37**	0%
Solar	0			**0**	0%
Total	1,739,249	1,188,825	1,130,445	**4,058,519**	100%

Note: Totals may not sum due to independent rounding.

FIGURE 4–2010 Stationary Fuel Energy Use (MMBTU) and Emissions ($MTCO_2e$) by Fuel Type



3.4. Energy Supply

Emissions that result from energy supply processes are included here. These include electricity transmission and distribution (T&D) losses, natural gas T&D losses, and the use of sulfur hexafluoride (SF_6) in the utility industry. The following methods are used to calculate emissions from each.

Data & Methods

To estimate losses due to electricity T&D, total electricity consumption (MWh) was multiplied by a T&D loss factor to determine the quantity of electricity lost during T&D. This analysis used the Eastern regional loss factor from eGRID, 5.28 percent. The total electricity lost is then multiplied by the electricity emission factors to estimate emissions from electricity T&D.

Natural gas transmission and distribution losses from pipelines are sources of CH_4 emissions. Utilities often report their average annual lost and unaccounted for (LAUF) natural gas to the New York Public Service Commission. For utilities that do not report LAUF, the statewide average of 1.8 percent as documented by National Grid in Public Service Commission reporting was used. The estimated natural gas consumption per county was multiplied by the LAUF and then converted from thousand cubic feet (mcf) to $MTCO_2e$.

Sulfur hexafluoride (SF_6) is a greenhouse gas that is used as an electrical insulator in electricity T&D equipment.[10] The SF_6 may escape from this equipment and emit into the atmosphere. To estimate these emissions, a national average implied emission factor was used. The emission factor was estimated by dividing 2010 total SF_6 emissions from electricity T&D from the U.S. Greenhouse Gas Inventory[11] by total nationwide retail electricity sales from the EIA.[12] The resultant factor of 0.0031 $MTCO_2e$/MWh was applied to total electricity consumption in the Central New York Region.

Results

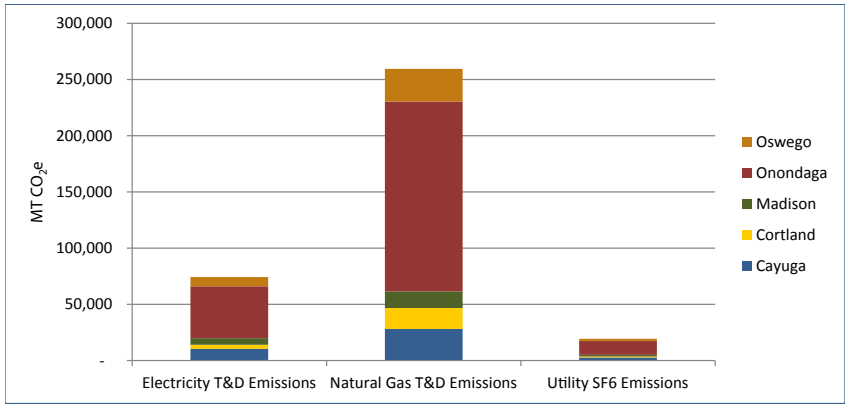
Emissions from energy supply activities in the Central New York Region were estimated to be 353,098 $MTCO_2e$. The emissions from this sector are summarized in Table 11 and Figure 5. Natural gas T&D losses are the largest source of energy supply emissions, and add about 13 percent to overall natural gas consumption. Electricity T&D losses and SF_6 emissions contribute about 7 percent to overall electricity consumption emissions. Energy supply emissions are driven by electricity and natural gas consumption in each county.

TABLE 11–Table 11 –2010 Emissions from Energy Supply Activities ($MTCO_2e$)

County	Electricity T&D Emissions ($MTCO_2e$)	Natural Gas T&D Emissions ($MTCO_2e$)	Utility SF6 Emissions ($MTCO_2e$)	**Total**	Percent of Total
Cayuga	10,480	28,112	2,749	**41,340**	12%
Cortland	3,664	18,661	961	**23,286**	7%
Madison	5,744	14,689	1,506	**21,939**	6%
Onondaga	46,197	168,791	12,116	**227,104**	64%
Oswego	8,175	29,110	2,144	**39,430**	11%
Central New York Total	**74,259**	**259,363**	**19,476**	**353,098**	**100%**

Note: Totals may not sum due to independent rounding.

FIGURE 5–2010 Energy Supply Emissions ($MTCO_2e$)



4. MOBILE ENERGY CONSUMPTION

4.1. On-road

On-road mobile transportation includes travel by motor vehicles on roads in Central New York. The combustion of fuel in vehicles results in emissions of CO_2, CH_4 and N_2O. The amount of CO_2 emitted by vehicles depends on the amount of fuel consumed, whereas CH_4 and N_2O emissions vary based on control technologies used by vehicles. On-road vehicles include passenger cars, other 2-axle/4-tire vehicles, single-unit trucks, buses, combination trucks, and motorcycles.

Data & Methods

There are 3 data components needed to estimate mobile energy emissions:

+ Types of vehicles on the road ("Vehicle Mix")
+ Distance traveled by on-road vehicles ("VMT," vehicle miles traveled)
+ Fuel consumption per vehicle type ("Fuel Economy")

Vehicle Mix. Data on the on-road vehicle mix for each functional class of road (e.g., rural interstate, urban freeways and expressways) were obtained for each NYSDOT region from NYSDOT's Environmental Science Bureau dataset[13]. The breakdown of vehicle types for each functional class of road was translated to HPMS vehicle categories by the NYGHG Working Group.

Distance. Data on vehicle miles traveled (VMT) were obtained from NYSDOT modeled data for all counties. County-level VMT data were available by functional class.

Fuel Economy. State- or regional-level data on the fuel economy of the Central New York's vehicle fleet were not available. As a proxy, national average fuel economy values by vehicle class were used, based on the Federal Highway Administration's *Highway Statistics 2010* series.

Table 12 presents characteristics of the data used to estimate emissions from on-road mobile energy consumption. As shown, 2009 is the latest year currently available for all sources.

TABLE 12–On-road Energy Consumption Data Summary

	Granularity	Data by functional class	Vintage of data	Other issues
VMT	Counties	Yes	2009	
Vehicle Mix	NYSDOT Regions	Yes	2009	
Fuel Economy	National	No	2009	Separate fuel economy values for gasoline and diesel vehicles are unavailable

The general methodology for estimating CO_2 emissions from mobile combustion is:

$$CO_2 \text{ emissions} = \text{Fuel Consumption} \times \text{Emission Factor}$$

Fuel consumption in Central New York was estimated by determining the distance traveled by different vehicle types and the amount of fuel consumed by each type of vehicle (fuel economy). First, data on total annual distance (VMT) traveled by vehicles within each county was allocated to vehicle types using the NSYDOT dataset on the breakdown of vehicles on NY roads (vehicle mix) by functional class of road. For each vehicle type and functional class, VMT data were multiplied by the average fuel economy of each vehicle type to determine total annual fuel consumption for each vehicle type. Total gasoline and diesel fuel consumption were then multiplied by the CO_2 emission factor for each fuel, which resulted in an estimate of CO_2 emissions for the region. In equation form:

$$CO_2 \text{ emissions } (MT) = \sum VMT_{ab} \times FC_{ab} \times EF_{ab}$$

Where:

VMT = annual vehicle miles traveled (miles/year)

FC = fuel consumption per mile traveled (gallons per mile; 1/ fuel economy)

EF = Emission factor (MT CO_2/gallon of fuel)

a = fuel type (diesel or gasoline)

b = vehicle type (passenger car, bus, combination truck, motorcycle, single-unit truck, and other 2/4 axle trucks)

Based on guidance from the NYGHG Working Group, the calculations assumed that 10 percent of gasoline sold in New York is comprised of ethanol, and as a result 10 percent of gasoline consumption within the region was assumed to be ethanol. CO_2 emissions from ethanol were assumed to be zero, as biogenic CO_2 is not included in this inventory.

Methane and nitrous oxide make up for less than 2 percent of on-road transportation emissions, and require data on the types of vehicle control technologies in use in the region's on-road vehicle fleet. Since this information was not available for the Central New York region, non-CO_2 emissions from vehicles were estimated by multiplying CO_2 emissions by the ratio of total (CO_2 + non-CO_2) emissions from transportation per MT of CO_2 emissions (MT CO_2e/MT CO_2). This ratio, obtained from the U.S. EPA National GHG Inventory is 0.000994 $MTCO_2e$ of CH_4 per $MTCO_2$ and 0.01367 $MTCO_2e$ of N_2O per $MTCO_2$ of on-road transportation emissions.

Results

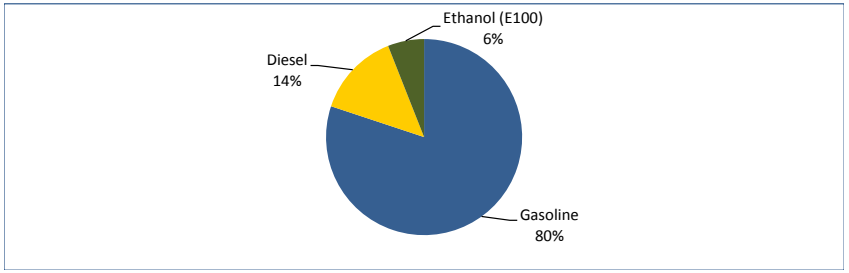
The 2010 (using 2009 as a proxy) on-road emissions in the Central New York region were 3,663,556 metric tons of carbon dioxide equivalent. Table 13 provides on-road emissions by county. Emissions are driven primarily by vehicle miles traveled, and influenced by the types of vehicles and the number of passengers per vehicle. On- road transportation emissions represent 37 percent of gross emissions in the region and 40 percent of the region's energy use. The majority of this energy consumption is gasoline, followed by diesel and ethanol, as shown in Figure 6.

TABLE 13–2010 On-Road GHG Emissions ($MTCO_2e$)

County	CO_2	CH_4	N_2O	Other Gases	**Total**	Percent of Total	Emissions per Capita
Cayuga	324,119	322	4,429	0	**328,870**	9%	4.11
Cortland	278,193	276	3,802	0	**282,271**	8%	5.72
Madison	353,475	351	4,830	0	**358,657**	10%	4.88
Onondaga	2,142,256	2,129	29,275	0	**2,173,660**	59%	4.65
Oswego	512,583	509	7,005	0	**520,097**	14%	4.26
Central New York Total	**3,610,626**	**3,588**	**49,342**	**0**	**3,663,556**	**100%**	**4.63**

Note: Totals may not sum due to independent rounding.

FIGURE 6–2010 On-Road Energy Use by Fuel Type (percent)



4.2. Off-road

Off-road vehicles include engines used for agricultural, construction, lawn and garden, and off-road recreation purposes.

Data & Methods

Off-road vehicle use and emissions data for each of the five counties in the Central New York region in 2007 were generated using EPA's NONROAD Emissions Model outputs as provided by NYS DEC via the NYGHG Working Group. The model input values were adjusted by NYS DEC. Among other emissions types, the NONROAD model estimates carbon dioxide emissions. To derive county-level emissions estimates, the emissions from all off road vehicles in each county were summed and converted to $MTCO_2e$ from short tons of CO_2. To avoid double counting, the emissions from vehicles in the pleasure craft classification are included in the marine emission source and are not included in the off-road emission source.

Results

Off-road vehicle activities generated an estimated 351,180 $MTCO_2e$ of emissions in 2010 (using 2007 data as a proxy). The results of the off-road emissions estimates are shown in Table 14, Table 15, and Figure 7. The main sources of off-road emissions are construction and mining equipment, industrial equipment, and commercial equipment, the majority of which are located in Onondaga County.

TABLE 14–2010 Off-road Emissions by County ($MTCO_2e$)

County	Total Emissions ($MTCO_2e$)	Percent of Total	Emissions per Capita
Cayuga	48,721	14%	0.61
Cortland	28,356	8%	0.57
Madison	36,643	10%	0.50
Onondaga	197,233	56%	0.42
Oswego	40,227	11%	0.33
Central New York Total	**351,180**	**100%**	**0.44**

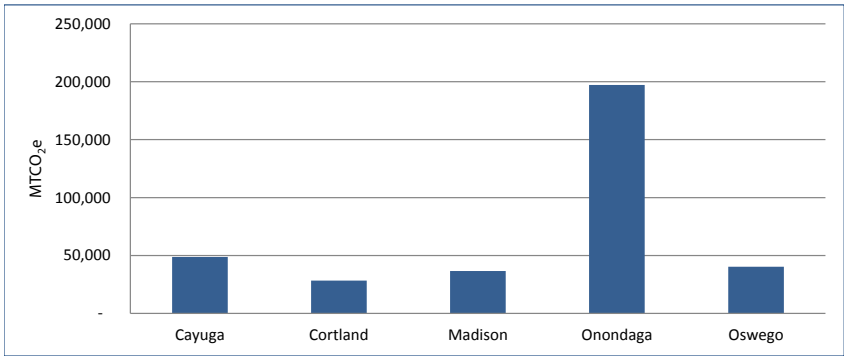
Note: Totals may not sum due to independent rounding.

TABLE 15–2010 (using 2007 proxy) Off-road Emissions by Equipment type ($MTCO_2e$)

Equipment Type	Total Emissions ($MTCO_2e$)	Percent of Total
Recreational Equipment	35,397	10%
Construction and Mining Equipment	87,422	25%
Industrial Equipment	77,831	22%
Lawn and Garden Equipment (Res)	27,050	8%
Lawn and Garden Equipment (Com)	18,940	5%
Agricultural Equipment	56,705	16%
Commercial Equipment	42,555	12%
Logging Equipment	2,762	1%
Airport Equipment	1,879	1%
Railroad Equipment	639	0%
Total	**351,180**	**100%**

Note: Totals may not sum due to independent rounding.

FIGURE 7–2010 Off-Road Emissions ($MTCO_2e$)



4.3. Marine

The marine transportation sector includes engines used for pleasure craft (recreational) purposes and commercial marine vessels.

Data & Methods

Non-commercial marine off-road vehicle use and emissions data for each of the five counties in the CNY region in 2007 was obtained from the NONROAD emissions model outputs used to calculate off-road emissions (see section 4.2). The emissions from all off-road vehicles within the pleasure craft classification in each county were summed, and converted to metric tons from short tons.

Commercial marine emissions for each county were calculated based on carbon monoxide (CO) emissions for the sector reported in the 2008 National Emissions Inventory[14]. The National Emissions Inventory contains CO emissions, by county, for the "Mobile – Commercial Marine Vessels" sector. A ratio of CO_2 to CO emissions was used to estimate CO_2 emissions from commercial marine vessels. The ratio was based on CO_2 and CO emission factors for low-sulfur fuel oil no. 6. The CO_2/CO emission factor ratio (25,000 lb CO_2/10^3 gal over 5 lb CO/10^3 gal)[15] was then multiplied by total CO emissions for each county to get CO_2 emissions for commercial marine vessels.

Results

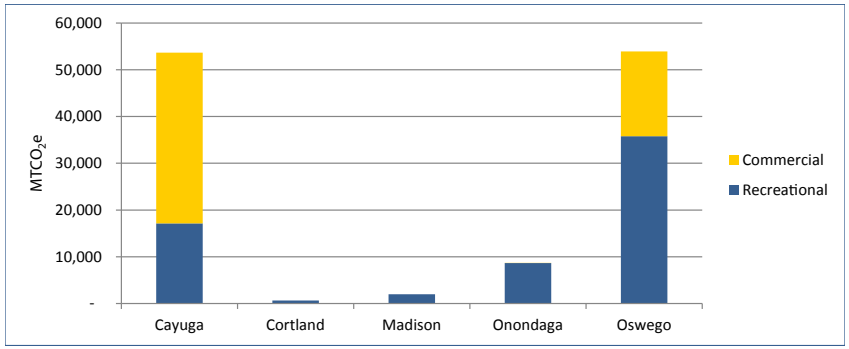
Marine emissions were estimated to be approximately 118,827 $MTCO_2e$ in 2010 (using 2007 data as a proxy). Cayuga and Oswego Counties, which border Lake Ontario, house the majority of the region's marine activity, both recreational and commercial. See Table 16 and Figure 8.

TABLE 16–2010 Marine Emissions by County ($MTCO_2e$)

County	Total Emissions ($MTCO_2e$)	Percent of Total
Cayuga	53,639	45%
Cortland	656	1%
Madison	1,969	2%
Onondaga	8,668	7%
Oswego	53,895	45%
Central New York Total	**118,827**	**100%**

Note: Totals may not sum due to independent rounding.

FIGURE 8–2010 Marine Emissions by County and Type ($MTCO_2e$)



4.4. Rail

Emissions from railroad locomotives result from the use of diesel fuel.

Data & Methods

Due to the limited amount of data available in this sector, the NYGHG Working Group elected to use data from the 2002 New York State Locomotive Survey[16] as a proxy for 2010 emissions. The survey collected information on 2002 locomotive fuel use for four categories of locomotives: Class I, Class II/III, commuter/passenger, and switchyard. Class I railroads are large, long-distance line haul railroads and Class II and III railroads consist primarily of regional and local line haul and switching railroads. Yard locomotives move railcars within a particular railway yard.

The survey reported county-level fuel consumption for Class I and system-wide fuel consumption estimates for Class II/III locomotives. The survey also reported county-level fuel consumption estimates from passenger/commuter lines that operate diesel locomotive cars. Fuel consumption estimates for a switchyard in Cortland County were reported; some Class I rail companies in New York State operate switchyards and the fuel consumption from other potential switchyards in the Central New York Region could not be separated out from line haul fuel consumption.

The county-level Class I, commuter/passenger, and switchyard fuel consumption estimates were multiplied by the diesel fuel CO_2 emission factor to calculate CO_2 emissions and converted to metric tons. The fuel consumption estimates were converted by the diesel density factor and multiplied by the emission factors,

global warming potentials, and unit conversion factors to calculate CH_4 and N_2O emissions[17]. The inventory does not report emissions from the Class II/III rail type because the fuel consumption estimates are not reported by county.

Results

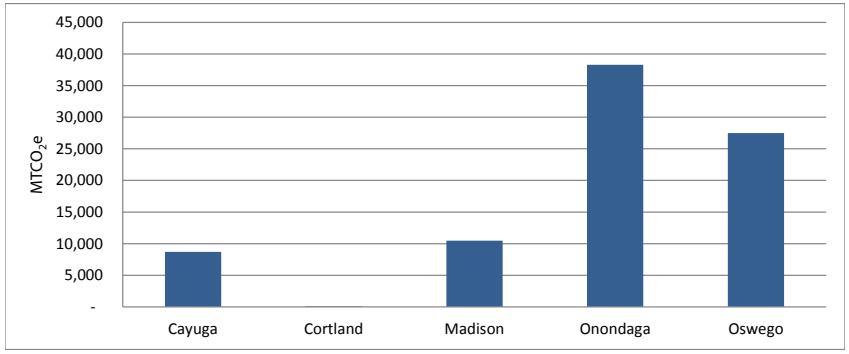
Emissions were estimated to be approximately 85,049 $MTCO_2e$ in 2010 (using 2002 data as a proxy). Onondaga County has the largest share of these emissions, followed by Oswego County. These emissions are summarized in Table 17 and Figure 9.

TABLE 17–2010 Rail Emissions ($MTCO_2e$)

	CO_2	CH_4	N_2O	Total $MTCO_2e$	Percent of Total
Cayuga	8,692	14	5	8,710	10%
Cortland	85	0	0	86	0%
Madison	10,457	17	5	10,480	12%
Onondaga	38,215	63	20	38,297	45%
Oswego	27,416	45	14	27,476	32%
Central New York Total	**84,865**	**139**	**45**	**85,049**	**100%**

Note: Totals may not sum due to independent rounding.

FIGURE 9–2010 Rail Emissions by County ($MTCO_2e$)



4.5. Air

Airplanes that fly in and out of airports in the Central New York region are sources of emissions. The airports in the region are Syracuse Hancock International Airport (airport code SYR) in Onondaga County, Hamilton Municipal Airport (VGC) in Madison County, and Fulton/Oswego Airport (NY2) in Oswego County.

Data & Methods

Emissions from air travel are estimated using a flight statistics dataset from the U.S. Department of Transportation's Bureau of Transportation Statistics[18]. Data fields used are the number of performed flights and the distance traveled in 2010 by airport.

The data were filtered to include only domestic flights from and to the three airports in Central New York (flights to Canada and The Bahamas were excluded). Total miles traveled in 2010 were calculated for each route by multiplying the number of performed flights with the distance per trip. The total miles of flights from and to each of the three airports were calculated. Then, flight miles were halved in the emissions calculations because emissions from half the trip are attributed to the origin airport and half are attributed to the destination airport. This ensures that two regions following the same methodology would not double-count emissions.

Regional flight emissions were calculated using the following equation:

$$\text{Regional flight emissions} = \frac{\text{Regional departing flight miles} + \text{Regional arriving flight miles}}{\text{National flight miles}} \times \text{National flight emissions} \times 0.5$$

National flight emissions data (114.0 Tg CO_2e) were from the U.S. EPA National GHG Inventory for 2010[19].

Results

Emissions from air travel were estimated to be approximately 167,537 $MTCO_2e$ in 2010. The emissions are summarized in Table 18. Nearly all of these emissions are from Syracuse Hancock International Airport. These emissions are considered an optional, Scope 3 source under the NYGHG Working Group guidance, and are not included in the gross emissions totals for the region. The emissions are presented for informational purposes.

TABLE 18–2010 Air Emissions by County ($MTCO_2e$)

County	Total Air Emissions ($MTCO_2e$)	Percent of Total
Cayuga	0	0%
Cortland	0	0%
Madison	3	0%
Onondaga	167,531	100%
Oswego	2	0%
Central New York Total	**167,537**	**100%**

Note: Totals may not sum due to independent rounding.

5. WASTE

The waste management sector encompasses solid waste and wastewater. The organic material in solid waste and wastewater degrade during the decomposition and treatment processes, and as a result, emit greenhouse gases.

5.1. Solid Waste

The decomposition of organic matter in solid waste produces methane. For this inventory, both Scope 1 and Scope 3 emissions for solid waste were calculated. Scope 1 represents emissions from landfills located within the region, regardless of where the waste originated. Scope 3 represents emissions from waste generated by the region, regardless of where the waste is ultimately transported. To avoid double-counting, only Scope 3 emissions are included in the total. Scope 1 emissions from solid waste are reported here for informational purposes.

5.1.1. Scope 1

Solid waste Scope 1 accounts for emissions from landfills located within Central New York counties. Municipal solid waste landfill facilities in the region include City of Auburn Landfill, Cortland County Landfill, Madison County Sanitary Landfill, and Oswego County Bristol Hill Landfill.

Scope 1 does not include emissions from waste combustion facilities to avoid double-counting. Combustion facilities within the region, Onondaga County Resource Recovery Facility and Oswego County Energy Recovery Facility, are also used to generate electricity and are included under the electricity generation sector.

Data & Methods

Data on emissions from landfills came from EPA's Greenhouse Gas Reporting Program data for calendar year 2010. This dataset includes emission information from large facilities (defined as those that emit >25,000 $MTCO_2e$ per year) in nine industry groups, including landfills.

Methane emissions from landfill processes in the Central New York region were reported as solid waste Scope 1 emissions.

Results

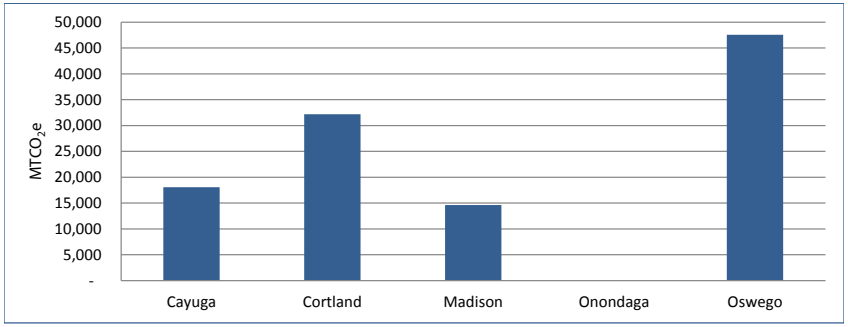
Results indicate that landfills in the region emitted 112,450 $MTCO_2e$ in 2010. The majority of these emissions came from Oswego County Bristol Hill landfill (42%), followed by the Cortland County landfill (29%). Results are shown in Table 19 and Figure 10.

TABLE 19–2010 Emissions from Landfills in Central New York ($MTCO_2e$) – Scope 1 Solid Waste Emissions

County	Landfill	Emissions ($MTCO_2e$)	Percent of Total
Cayuga	City of Auburn Landfill	18,077	16%
Cortland	Cortland County Landfill	32,197	29%
Madison	Madison County Sanitary Landfill	14,617	13%
Onondaga	-	-	0%
Oswego	Oswego County Bristol Hill Landfill	47,559	42%
Central New York Total		**112,450**	**100%**

Note: Totals may not sum due to independent rounding.

FIGURE 10–2010 Emissions from Landfills in Central New York ($MTCO_2e$) – Scope 1 Solid Waste Emissions



5.1.2. Scope 3

Scope 3 solid waste emissions account for emissions from waste generated within the Central New York counties, regardless of where the waste is sent.

Data & Methods

The general approached used to estimate emissions from waste generated within Central New York counties was to use the California Air Resources Board's Landfill Emissions Tool Version 1.3 to estimate the amount of emissions that waste generated in 2010 will produce over its decay lifetime. The tool implements the mathematically exact first-order decay (FOD) model of the 2006 IPCC guidelines. The methodology of the FOD model is available in the Local Government Operations Protocol[20]. The tool was loaded with inputs based on the characteristics of landfills that receive waste from the Central New York Counties.

Data input from the FOD model was collected from several sources. The primary source was NYS DEC 2010 Annual Landfill Facility Reports[21] provided via the NYGHG Working Group. These reports contained data for each landfill on the amount and type of waste received from each county, LFG collection acreage, total landfill acreage, and percent alternative daily cover (ADC). Data were also collected from the Onondaga County Resource Recovery Agency's 2010 Annual Report on Recyclables Recovered[22]. This report was used to estimate waste generated in 2010 from Onondaga County because data on waste generated from Onondaga County in the NYS DEC landfill reports seemed too low to be accurate. The NYS DEC 2008 solid waste plan, *Beyond Waste: A Sustainable Material Management Strategy* was used to gather information on the composition of waste discarded in New York, categorized by rural, suburban, and urban settings.

To enter data into the tool, first the number of years for which waste generated in 2010 will be releasing methane was calculated. The half-life of landfilled waste was calculated through the following equation: k = ln(2)/half-life in years. K is determined based on the amount of annual rainfall in the county, and an average rainfall of 20-40 inches per year was assumed for all counties in the Central New York region. Given the rainfall assumption, k= 0.038. The half-life was multiplied by four half-lives to determine T, the number of years for which waste deposited during the inventory year will be releasing methane. For the Central New York region, T = 73. The amount of solid waste generated in the inventory year was entered into the tool "Landfill Model Inputs tab" T years prior to the inventory year.

Various data points were calculated and input into the FOD tool to estimate emissions by county. These inputs were:

+ Waste landfilled in 2010 by county – this was calculated based on the amount of MSW and C&D generated by county and waste disposal practices

  - MSW and C&D generated in 2010 by county amounts were pulled from the NYS DEC landfill reports for Cayuga, Cortland, and Madison Counties. For Onondaga County, the waste generated was pulled from the Onondaga County Annual Report on Recyclables Recovered. For Oswego County, the amount of waste generated was estimated using the average disposal per capita in the other counties in Central New York because data on waste generated from Onondaga County in the NYS DEC landfill reports seemed too low to be accurate.

  - The proportion of waste generated in each county that is sent to landfills is calculated using the amount of waste received by landfills from each county and the amount of waste combusted at waste-to-energy facilities in the region. The proportion of total waste that is sent to landfills is applied to the total waste generated in 2010 to determine the amount sent to landfills.

+ Percentage of waste that contain anaerobically degradable carbon (ANDOC) – For MSW, this value was calculated using the composition of waste discarded in 2008 from the NYS DEC's Beyond Waste plan. New York State-specific solid waste discard composition data were used to find the fraction of waste types which contain ANDOC. The inventory assumes the waste composition from suburban settings for Onondaga County and from rural communities for other counties in the region. The suburban or rural

assignments were based on NYS DEC's definition of rural communities as those with a population density of less than 325 people per square mile and suburban communities as those with a population density between 325 and 5,000 people per square mile. Population density data for each county came from the NYS Data Center[23]. The inventory assumes the waste composition for the construction and demolition (C&D) waste emission analysis is 100 percent C&D.

+ Amount of alternative daily cover (ADC) – For each county, this value was calculated by first calculating the weighted ADC percentage for each county and then multiplying it by MSW landfilled. The weighted percentage of ADC for county was calculated by weighting the percentage of ADC for each landfill receiving MSW from the county by the amount of MSW received from that county. The inventory assumes no ADC for C&D waste.

+ k-value – The k-value was set to 0.038 for all counties. This is based on the assumption that the average annual rainfall for the Central New York Counties is 20-40 inches per year.

+ Geographic location – "US-Other" was selected from the drop=down menu for the State/Country.

+ Waste-in-place – The NY State-specific waste in place fractions were entered into the "Landfill Specific ANDOC Values" tab of the tool.

The sum of the tool's emission results over T years represents the total amount of methane expected to be released by inventory year waste generated and deposited in a landfill without a landfill gas (LFG) collection system. The methane emissions for MSW waste then were adjusted for a LFG collection system. The EPA default LFG collection efficiency of 75 percent was assumed[24]. This default value was multiplied by the weighted percent of land with a LFG collection system per county to find the LFG collection rate for that county. The weighted LFG capture coverage ranges from 18 to 100 percent (i.e. some counties sent a weighted average of waste to landfills where LFG was captured on 18 percent of the landfill, some to landfills with 100 percent LFG collection coverage). The sum of methane emissions was multiplied by 100 percent minus the LFG collection rate to determine methane emissions from MSW generated and deposited in landfills with LFG collection systems. The inventory assumes no LFG collection for C&D waste. Carbon dioxide emission outputs from the solid waste tool are considered biogenic and are not included in the inventory emissions.

Results

Results indicate that total emissions from waste generation in the region in 2010 were 102,812 $MTCO_2e$. Municipal solid waste generation contributed 85 percent of those emissions (87,310 $MTCO_2e$) and C&D contributed 15 percent (15,502 $MTCO_2e$). Overall, 580,252 tons of solid waste were generated in the region in 2010. Table 20, Table 21 and Figure 11 summarize the results.

TABLE 20–2010 Scope 3 Solid Waste Emissions ($MTCO_2e$)

County	MSW CH_4 Emissions ($MTCO_2e$)	C&D CH_4 Emissions ($MTCO_2e$)	Total CH_4 Emissions ($MTCO_2e$)	Percent of Total	Emissions per Capita
Cayuga	27,709	2,286	29,994	29%	0.37
Cortland	28,334	753	29,087	28%	0.59
Madison	20,413	1,621	22,034	21%	0.30
Onondaga	5,542	8,653	14,195	14%	0.03
Oswego	5,312	2,189	7,500	7%	0.06
Central New York Total	**87,310**	**15,502**	**102,812**	**100%**	**0.13**

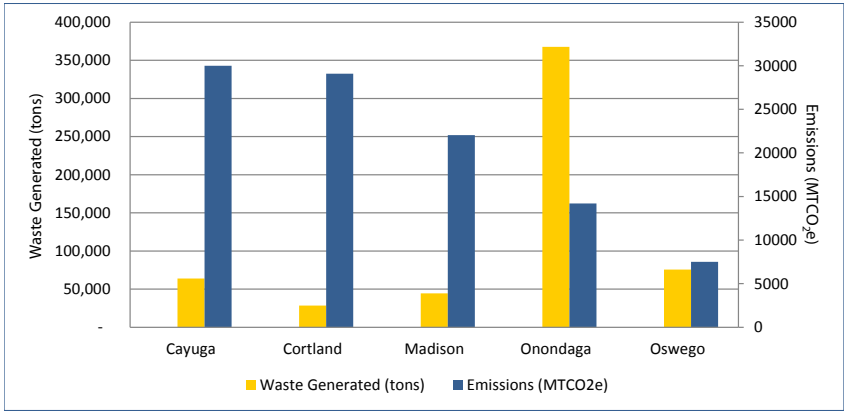
Note: Totals may not sum due to independent rounding.

TABLE 21–2010 Waste Generated by County (tons)

County	MSW Sent to Landfill Facilities (tons)	C&D Sent to Landfill Facilities (tons)	MSW Sent to Landfill Waste Combustion Facilities (tons)	C&D Sent to Landfill Waste Combustion Facilities (tons)	Total Waste Generated (tons)
Cayuga	53,245	10,661	-	-	63,906
Cortland	25,035	3,510	-	-	28,545
Madison	36,963	7,560	-	-	44,523
Onondaga	14,503	40,350	312,846	-	367,699
Oswego	5,972	10,205	56,852	2,545	75,574
Central New York Total	**135,719**	**72,288**	**369,698**	**2,545**	**580,252**

Note: Totals may not sum due to independent rounding.

FIGURE 11–2010 Waste Generation (tons) and Emissions ($MTCO_2e$) – Scope 3 Solid Waste



Onondaga County generated the largest portion of that waste, which is driven primarily by population, but generated a much smaller portion of emissions. This is because 95 percent of waste from Onondaga County is sent to combustion facilities rather than landfills. A similar pattern occurs in Oswego County, where 91 percent of waste is combusted. All waste generated in Cayuga, Cortland, and Madison Counties was landfilled in 2010. As a result, those counties have higher per capita waste emissions than Onondaga and Oswego. Cortland County has the highest per capita waste emissions, as their waste is sent primarily to Cortland County Landfill, which does not have an LFG capture system.

5.2. Wastewater

When organic waste material in wastewater degrades during the wastewater treatment process, it emits both methane and nitrous oxide. Methane is emitted during anaerobic digestion of wastewater, and nitrous oxide is emitted when nitrogen components in wastewater degrade. The amount of methane and nitrous oxide emitted from wastewater depends on the type of wastewater treatment processes used, such as septic systems, centralized wastewater treatment plants (WWTPs), and anaerobic digesters.

Data & Methods

Wastewater emissions are calculated based on the population served by wastewater treatment processes. Population data in Central New York were obtained from the Census[25].

Wastewater emissions are calculated using EPA's State Inventory Tool (SIT) Wastewater module. Methane emissions from municipal wastewater treatment are calculated by multiplying the regional population from by the annual per-capita 5-day biological oxygen demand (BOD_5) rate, then by the emission factor of CH_4 emitted per quantity of BOD_5. Default values for New York State in the SIT were used. In some equations, the percentage of the population not on septic systems is used. For these, the default value for New York State is 79 percent. The actual value for the region may be lower, due to the largely rural character of the Central New York region, but given the relatively low emissions from this source, the State value was assumed to be suitable for this use. Both centralized wastewater treatment plants and septic systems are emission sources, though the emission factors and methods are slightly different. The SIT combines these two approaches in a manner appropriate for the relatively low emissions from this source.

$$CH_4\ Emissions\ (MT) = Population\ x\ Per\ capita\ BOD_5 \left(\frac{kg}{day}\right) \times \frac{Days}{year} \times \frac{MT}{kg} \times EF \left(\frac{GgCH_4}{GgBOD_5}\right) \times \%\ of\ WW\ anaerobically\ digested$$

Where:

Population	=	Regional population.
Per capita BOD_5	=	5-day biochemical oxygen demand per capita. Default value is 0.09 kg BOD_5/day.
EF	=	Emission factor of CH_4 emitted per quantity of BOD_5. Default value is 0.6 Gg CH_4/Gg BOD_5.
% of WW anaerobically digested	=	Fraction of wastewater BOD_5 that is anaerobically digested. Default value is 16.25%.

Nitrous oxide emissions form municipal wastewater treatment are calculated by multiplying the population served by the percent of the population using centralized wastewater treatment (not septic systems), then by the amount of direct N_2O emissions from wastewater treatment per person per year.

$$N_2O\ Emissions\ (MT) = Population \times Fraction\ of\ population\ not\ on\ septic \times Direct\ N_2O\ emissions\ from\ WWT \left(\frac{\frac{gN_2O}{person}}{year}\right) \times \frac{MT}{g}$$

Where:

Population	=	Regional population.
Fraction of population not on septic	=	Percent of population that is served by centralized WWTPs as opposed to septic systems. The default value for New York State is 79%. The actual value for the region is likely lower, due to the largely rural character of the region, but given the relatively low emissions from this source, the State value was assumed to be suitable for this use.
Direct N_2O emissions from WWT	=	The amount of N_2O emitted from WWTPs. Default value is 4.0 grams N_2O per person per year.

Nitrous oxide emissions from wastewater biosolids are calculated using the following equation:

$$N\ in\ Domestic\ Wastewater = Population \times Protein \left(\frac{\frac{kg}{person}}{year}\right) \times Frac(npr) \left(\frac{kg\ N}{kg\ protein}\right) \times Fraction\ nonconsumption\ N \times \left(\frac{MT}{kg}\right)$$

$$N_2O\ Emissions\ (MT) = N\ in\ Domestic\ WW\ (MT) - Direct\ N\ Emissions\ from\ Domestic\ WW\ (MT) \times (1 - \%\ of\ Biosolids\ used\ as\ fertilizer) \times EF \left(\frac{kgN_2O - N}{kgsewageN_{produced}}\right) \times \left(\frac{N_2O}{N_2}\right)$$

Where:

Population	=	Regional population.
Protein	=	Available protein per person per year (kg/person/year). Default value is 42.6 kg/person/year[26].
Fraction of nitrogen in protein	=	Kg N per Kg protein. Default value is 16 percent[27].
Fraction of non-consumption nitrogen	=	The ratio of total N to N consumed. Default value is 1.75[28].
EF	=	Emissions of N in the form N_2O per unit of sewage-N produced. Default value is 0.01 kg N_2O-N per kg of sewage-N.

Results

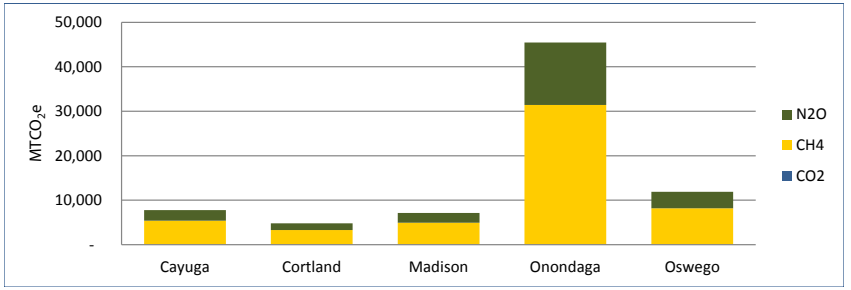
Wastewater treatment emissions are approximately 77,046 $MTCO_2e$. Table 22 lists wastewater treatment emissions by county. These emissions are driven entirely by population.

TABLE 22–2010 Wastewater Treatment Emissions

County	CH_4 Emissions ($MT\ CO_2e$)	N_2O Emissions ($MT\ CO_2e$)	Total Emissions ($MT\ CO_2e$)	Percent of Total	Emissions per Capita
Cayuga	5,383	2,403	7,786	10%	0.10
Cortland	3,318	1,481	4,800	6%	0.10
Madison	4,940	2,205	7,145	9%	0.10
Onondaga	31,412	14,024	45,436	59%	0.10
Oswego	8,213	3,667	11,880	15%	0.10
Central New York Total	**53,266**	**23,780**	**77,046**	**100%**	**0.10**

Note: Totals may not sum due to independent rounding.

FIGURE 12–2010 Wastewater Treatment Emissions by County and Gas ($MTCO_2e$)



6. INDUSTRIAL PROCESSES

Industrial process emissions are those produced as by-products of non-energy-related industrial activities. In the Central New York region, such industrial activities relate primarily to manufacturing of products, including glass and glassware, concrete manufacturing, cement manufacturing, aluminum product manufacturing, and iron and steel[29]. The primary industrial actors in the region are Nucor Steel, an iron and steel producer and Owens-Brockway Glass, a glass manufacturer, both in the city of Auburn, in Cayuga County.

Data & Methods

Industrial process emissions for Central New York were estimated for two emission sources to cover the industrial process emissions in the region. These sources are (1) CO_2, CH_4, and N_2O from general industrial activity as reported by large facilities and (2) hydrofluorocarbon (HFC) emissions from ozone depleting substances (ODS) substitutes.

Data on industrial activity from large facilities came from EPA's GHGRP dataset for calendar year 2010[30]. This dataset includes emission information from large facilities (defined as those that emit > 25,000 $MTCO_2e$ per year) in nine industry groups, including: power plants, landfills, metals manufacturing, mineral production, petroleum refineries, pulp and paper manufacturing, chemicals manufacturing, government and commercial facilities, and other industrial facilities. The dataset contains total emissions by industrial process. Only two facilities in the Central New York region reported industrial process emissions: Nucor Steel Auburn Inc. and Owens-Brockway Glass Container Inc. Plant #35, both in the city of Auburn in Cayuga County. The emissions for these two facilities were pulled directly from the GHGRP dataset.

To supplement the GHGRP facility emissions, emissions were also calculated for ODS substitutes, a key industrial process emissions source category not covered in the EPA dataset. Equipment that use ODS Substitutes are widely distributed throughout all households and businesses. An implied per capita emissions factor was used, based on the national greenhouse gas inventory for 2010[31]. Total 2010 ODS substitution emissions (114.6 Tg CO_2e) were divided by total 2010 U.S. population (308,745,538[32]) to derive an implied per capita emission factor. This implied emission factor was multiplied by the population of each of the counties in the Central New York region to estimate emissions from this industrial process source category.

Results

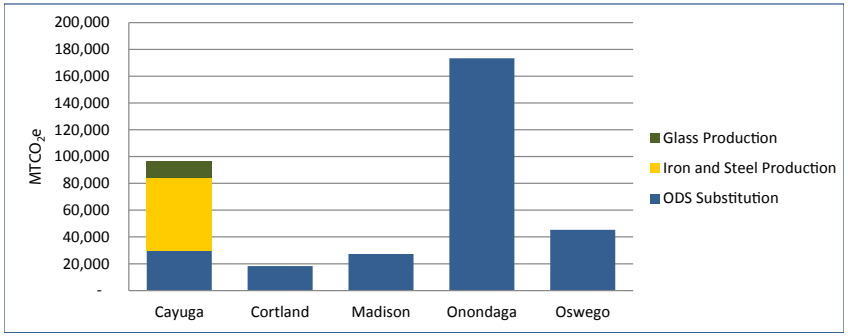
Industrial process emissions are approximately 360,710 MT CO_2e. The majority of these emissions (79%) come from ODS substitution, which is driven directly by population. All other industrial process emissions are based on large facilities that report emissions through EPA's GHGRP, both of which are in Cayuga County. The results are shown below in Table 23 and Figure 13.

TABLE 23–2010 Industrial Process GHG Emissions by Industrial Activity (MT CO_2e)

County	Iron and Steel Production	Glass Production	ODS Substitution	**Total**	Percent of total
Cayuga	54,218	12,541	29,704	**96,463**	27%
Cortland	0	0	18,313	**18,313**	5%
Madison	0	0	27,260	**27,260**	8%
Onondaga	0	0	173,350	**173,350**	48%
Oswego	0	0	45,324	**45,324**	13%
Central New York Total	**54,218**	**12,541**	**293,951**	**360,710**	**100%**
Percent of Total	15%	3%	81%	**100%**	

Note: Totals may not sum due to independent rounding.

FIGURE 13–2010 Industrial Process Emissions by Process and County ($MTCO_2e$)



7. AGRICULTURE

The Agriculture sector of the Central New York regional inventory includes non-carbon dioxide emissions from enteric fermentation in domestic livestock, livestock manure management, and agricultural soil management (including fertilizer application). Carbon dioxide emissions are not included as they are assumed to be biogenic and don't represent an anthropogenic emission source. The primary agricultural industry in the region is dairy industry, along with other livestock production. The primary crops in the region are corn (for grain and silage), and soybeans.

Data & Methods

Data on 2010 livestock populations and crop productions were available for New York State on the county- level from USDA's National Agricultural Statistics Service (NASS)[33]. Livestock populations for 2010 included beef cows, milk cows, and all cattle (including calves). Calf populations were estimated by assuming that calves account for 17.4 percent of the total non-dairy cattle/cow population[34]. Data for crop production in Central New York counties covered hay alfalfa, corn for grain, wheat, oats, and soybeans.

Data from EPA's Regional GHG Inventory Guidance on livestock population percentage breakdowns in New York State were also used to allocate dairy cattle and beef cattle populations into sub-categories. The subcategories for dairy cattle are dairy cows and dairy replacement heifers[35]. The subcategories for beef cattle are beef cows, beef replacement heifers, heifer stockers, steer stockers, feedlot heifers, feedlot steer, and bulls[36].

Fertilizer sales data came from the New York State Department of Agriculture and Markets dataset of total fertilizer and nutrients by county for calendar year 2010. For each county, the dataset included total fertilizer sales, broken into single, multi-nutrient, and other; Total N, P205, and K20 in multiple-nutrient fertilizer, and total N, P205, and K20 in all fertilizer.

County-level emissions for agriculture were calculated using EPA's State Inventory Tool (SIT), using default emission factors for New York State.

To calculate emissions from enteric fermentation and manure management, the tool requires population information for each livestock subcategory. Total county milk cow population and beef cow population from NASS were multiplied by the percentage breakdowns from EPA's Regional GHG Inventory Guidance to derive subcategory populations. The tool then multiplies the number of animals by a per-head enteric CH_4 emission factor to estimate total enteric fermentation emissions for each county. The tool multiplies the subcategory populations by New York defaults for Typical Animal Mass (TAM), volatile solids (VS), and methane conversion factors for different manure management systems to estimate CH_4 emissions from manure management and by TAM, K-Nitrogen factors, and nitrogen emission factors for different manure management systems to estimate N_2O emissions from manure management.

To calculate emissions from management of agricultural soils, the SIT follows three steps. The tool first calculates emissions from plant residues, and allows input of crop production data for 21 crop types. Six of these crop types are grown in the Central New York region: Alfalfa (pulled from NASS as "Hay Alfalfa (Dry)"), corn for grain, wheat, oats, and soybeans. The tool multiplies these production amounts by a series of factors, including residue dry matter fraction, fraction residue applied, and nitrogen content of residue to calculate the amount of nitrogen returned to soils and the amount of nitrogen fixed by crops.

The second step of calculating emissions from agricultural soil management estimates emissions from plant fertilizer application. The tool uses the total amounts of fertilizer nitrogen by type (synthetic fertilizers, dried blood, compost, dried manure, activated sewage sludge, other sewage sludge, tankage, or other organic amendments) to estimate direct and indirect N_2O emissions from fertilizer applications. For each county, the total N in all fertilizer types from the New York State dataset was entered into the tool under "Synthetic Fertilizer" to estimate fertilizer emissions.

Finally, the SIT calculates agricultural soil emissions from animals and runoff. This step uses the livestock population data entered under enteric fermentation and manure management and New York state default distributions of livestock management systems (e.g. managed systems, pasture, and daily spread) along with built-in emission factors to estimate N_2O emissions.

Results

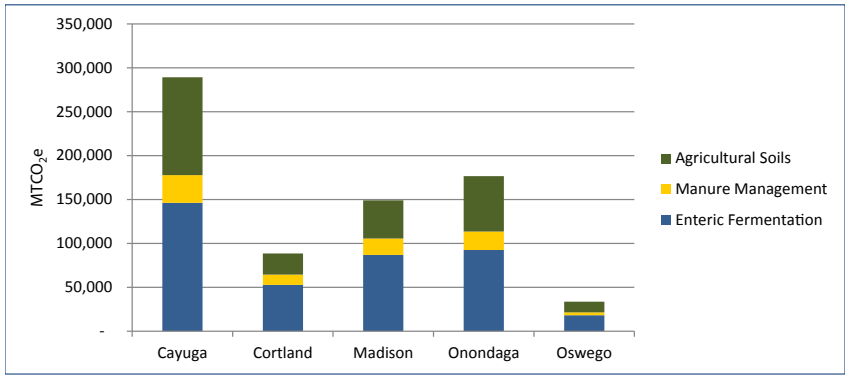
Agriculture emissions in CNY are approximately 736,914 $MTCO_2e$. Emissions are shown in Table 24 and Figure 14. Cayuga County, with the highest population of dairy and beef cows and the most crop production, has the largest emissions in the region, accounting for 39 percent of agriculture emissions. Onondaga and Madison counties follow in terms of livestock populations, crop production, and emissions.

TABLE 24–2010 Agriculture Emissions by Source ($MTCO_2e$)

County	Enteric Fermentation	Manure Management	Agricultural Soils	Total	Percent of Total
Cayuga	146,160	31,609	111,330	**289,098**	39%
Cortland	52,894	11,666	23,922	**88,483**	12%
Madison	86,862	18,694	43,592	**149,148**	20%
Onondaga	92,451	21,185	62,944	**176,580**	24%
Oswego	18,224	3,391	11,991	**33,606**	5%
Central New York Total	**396,591**	**86,544**	**253,780**	**736,914**	**100%**

Note: Totals may not sum due to independent rounding.

FIGURE 14–2010 Agricultural Emissions by County and Source ($MTCO_2e$)



8. LAND USE, LAND-USE CHANGE AND FORESTRY

Land Use, Land-Use Change and Forestry (LULUCF) measures changes to forest carbon stocks. This measurement reflects the impact of changes in land use on the capacity of forests in the Central New York Region to sequester carbon.

This source is considered "optional" under the guidance of the NYGHG Working Group and is not included in the region's gross emission totals. It is included here for informational purposes due to the importance of forest resources to the region.

Data & Methods

Two datasets were collected to calculate net emissions from LULUCF: (1) the acres of forested land by county in 2005 and 2010 and (2) the carbon sequestration rates for forests in the region.

The acres of forested land were retrieved from the U.S. Forest Service's Forest Inventory and Analysis database via the Forest Inventory Data Online (FIDO) website[37]. Data were originally pulled by county by forest-type group for 1993, 2005 and 2010. The three data samples revealed some inconsistencies in the identification of specific forest-type groups. However, the differences between the total forested area per county demonstrated reasonable changes in acreage. Therefore, to minimize the influence of data sample errors, the calculations were based on the total forested area for each county, and not forest-type groups.

To minimize another source of potential data collection error, the 2005 and 2010 sample years were selected. This decision was based on the fact that the average annual change was more likely to be similar over a shorter time frame and that data collection methodology is more likely to have changed between the 1993 and 2010 data collection than the 2005 and 2010 samples.

The second set of data, the carbon sequestration rates for forested land in the eight counties was retrieved from the Carbon OnLine Estimator (COLE)[38]. The composite rate for "All" forest-type groups in the Central New York region counties was selected, and the resulting output was 185 metric tons Carbon per hectare. This is a weighted rate that reflects the distribution of forest-type groups in the region. Only some of the forest-type groups had specific sequestration rates. This composite rate was used for all forest-types in the counties.

Calculations estimated the average annual rate of change for carbon sequestration in the counties. The methodology included a four step calculation:

(1) Subtracted the 2005 acres of forest per county from the 2010 acres of forest per county.

(2) Divided the change by five (years) to get the annual rate of change in acres.

(3) Converted acres of forest to hectares.

(4) Multiplied the annual rate of change in hectares by the composite carbon sequestration rate.

(5) Converted carbon sequestered/released to carbon dioxide by multiplying by 44/12 (g CO_2/g C).

Results

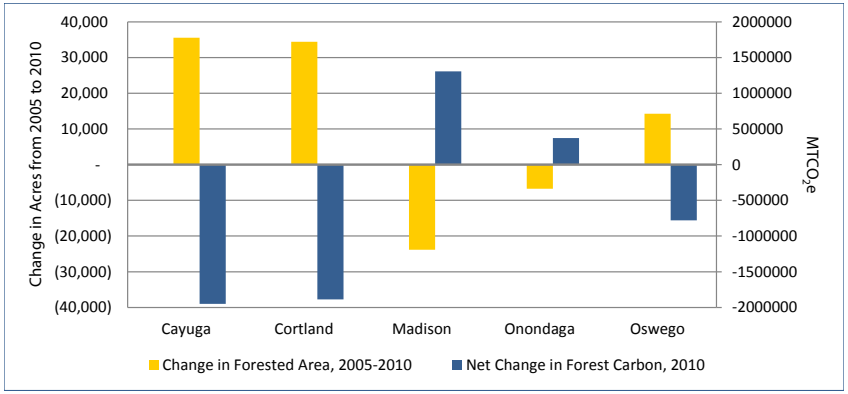
Land use changes in the Central New York region in 2010 resulted in a net sequestration of 2,942,162 $MTCO_2e$. Results by county are shown in Table 25. Madison and Onondaga Counties showed net emissions from LULUCF while Cayuga, Cortland, and Oswego Counties had net carbon sequestration from LULUCF. These net carbon emissions are driven by the change in forested acres in each county between 2005 and 2010. As shown in Figure 15, counties that gained acres of forest in that period were carbon sinks in 2010 and counties that lost acres of forest were carbon sources.

TABLE 25–2010 Net Change in Forest Carbon Stocks ($MTCO_2e$)

County	Total Net Change in Forest Carbon Stocks ($MTCO_2e$)
Cayuga	(1,950,565)
Cortland	(1,888,264)
Madison	1,306,939
Onondaga	371,225
Oswego	(781,498)
Central New York Total	**(2,942,162)**

Note: Totals may not sum due to independent rounding.

FIGURE 15–2005-2010 Net Change in Forested Acres and 2010 Net Change in Forest Carbon from LULUCF ($MTCO_2e$)



9. MUNICIPAL-LEVEL ALLOCATION

9.1. Municipal-Level Allocation

In addition to the regional GHG inventory presented above, this analysis included a municipal-level allocation of regional emissions. The inventory team allocated the region's emissions to individual towns, cities, and villages based on available data. This effort is intended to provide municipalities with baseline information about their community-level GHG emissions. Because it was not feasible to develop bottom-up GHG inventories for each of the region's 148 cities, towns, and villages, the allocation process was driven by readily available demographic and geographic data. A detailed, bottom-up inventory would likely provide more reliable results for any one community, but these estimates serve as a useful resource for those communities unable to complete their own GHG inventories. The challenges and limitations of this process are described below, followed by a description of the methods for each sector. The results are presented in county tables at the end of this report, and may also be viewed in the inventory municipal allocation spreadsheet that accompanies this report.

Municipal Boundaries

The Central New York region is comprised of 6 cities and 94 towns, in addition to 47 villages that lie within them. The region is also home to the Onondaga Nation Reservation, for a total of 148 municipalities. This municipal allocation reports total estimates for each city and town, *including* activity in the underlying villages. Activity and emissions for each village are also tracked and reported separately, but not counted in the totals.

Some sectors, however, report activity data for towns *excluding* village activities. In these cases, the primary means of assigning villages to towns is based on information from the New York State Data Center, which provides information on which villages lie within each town[39]. When activity data are reported for towns (excluding villages) and villages, the town activity data are added with those of the village(s) within it. However, five villages in the Central New York region are split between towns. To assign reported village activity data to the correct towns, the percentage of the village's population in each town is used. This population breakdown is available from the New York State Data Center[40]. The split activity data are then included in the totals for each town as appropriate.

9.2. Challenges

Data Limitations and Unallocated Portion

As expected at the outset of this process, it was not practical to fully allocate all emissions from each sector in the region. The team allocated those sources where available local-level activity data could be used to reasonably approximate the spatial distribution of emissions. In cases where no such data were available or such allocation would not be appropriate, regional emissions were not allocated to the local level. Specifically, emissions from Scope 1 electricity generation, rail transportation, marine transportation, air transportation, and LULUCF have not been allocated to the municipal level for this inventory. It would be possible to allocate sources such as aviation based on a survey of passenger air travel habits by municipality, but conducting such a survey was beyond the scope of this analysis. In addition, portions of industrial fuel combustion emissions and off-road emissions have not been allocated to the municipal level.

The percentage not allocated by sector is shown below in Table 26. Furthermore, Scope 1 emissions from electricity generation—which were calculated for informational purposes but not included in the regional total—were not included in the municipal allocation.

Village Allocation

Although village populations are also included within town population estimates, the inventory has allocated to the village level, where possible. Because there is overlap between towns and villages, these allocations should not be viewed additively. For example, three villages could be part of one town; the emissions allocated to each village should not be viewed as mutually exclusive from the town, but are also included in the town's emissions estimates. However, there is value in understanding emissions from each village for facilitating planning activities to target reducing emissions from specific sectors and locales.

9.3. Methods by Sector

9.3.1. Stationary Energy Consumption

Electricity-Scope 1

Electricity generation emissions were not allocated to the municipal level, as they are not counted in county emission totals.

TABLE 26–Percentage of Emissions Not Allocated, by Sector

Category	Allocated to Municipalities?	Percentage Not Allocated
Stationary Energy Consumption		4%
Residential	Yes	N/
Commercial	Yes	N/A
Industrial	Partially	14%
Energy Supply	Partially	0%
Mobile Energy Consumption		12%
On-Road	Yes	N/A
Air	No	100%
Marine	No	100%
Rail	No	100%
Off-Road	Partially	39%
Waste Management		N/A
Solid Waste	Yes	N/A
Wastewater Treatment	Yes	N/A
Industrial Processes	Yes	N/A
Agriculture	Yes	N/A
LULUCF	No	100%
Across All Sectors		**7%**

Electricity-Scope 2

Electricity consumption emissions were calculated "bottom-up" at the municipal level based on utility data. Utilities provided total electricity consumption by municipality. The data fully cover 143 municipalities. For the locations fully served by the utility, the reported usage for that area (in MWh) serves as the full electricity data for that town or village. For areas only partially covered by the utility data or not covered at all, different methodologies were used for each sector to estimate the missing consumption data.

For residential electricity, estimates of residential electricity consumption for each municipality were used, based on the approach described for Scope 1 fu-

els below. Similarly, for commercial electricity, estimates of commercial electricity consumption for each municipality were used, based on the commercial fuels method described below. For the industrial sector, only reported utility data were used because no proxy data (such as industrial employment) were available to apportion industrial activity to the municipal level.

Electricity usage information from the utilities separated usage between non-village components of towns and villages. To aggregate all activity data to the city and town level (to include village activity), the method of assigning villages and village components to towns, described in Section 9.1, was used. Electricity usage in MWh was then converted to MMBTU and emissions using the 2009 eGRID emission factors for the NYUP eGRID subregion.

Fuels – Scope 1

Residential fuel consumption at the municipal level was calculated using the same methodology described in the main inventory text, based on Census data for housing units, heating fuel use, and statewide residential fuel consumption. See Section 3.3 for details. Electricity or natural gas utility data for each municipality, if available, overrode these estimates.

County-level commercial fuel emissions were allocated to the municipal level based on occupied housing units. The proportion of each county's occupied housing units in each municipality was multiplied by the county-level fuel consumption for each fuel type to get fuel consumption in each municipality. Then emission factors were applied to fuel consumption.

Industrial fuel consumption at the municipal level is based on reported data from three sources: EPA's Greenhouse Gas Reporting Program industrial facilities, the New York State Department of Environmental Conservation (NYS DEC) Title V facilities database, and electric and natural gas utility data. Industrial stationary combustion emissions from any GHGRP or Title V facilities within a municipality were assigned to that municipality. For natural gas combustion, utility data override GHGRP/Title V facilities data if both are available. The estimated emissions for consumption not covered by these three sources were not allocated due to the lack of sufficient local level data.

Energy Supply

Electricity and natural gas transmission and distribution emissions at the municipal level were calculated using the same methodology as at the county level. Electricity and natural gas consumption for each municipality was multiplied by a transmission and distribution loss factor and converted to emissions. SF_6 emissions were also calculated in the same manner for municipalities as for counties, using municipal-level electricity consumption multiplied by the SF_6 loss rate in $MTCO_2e$ per MWh. See Section 3.4 for details.

9.3.2. Transportation

For the transportation sector, on-road motor vehicle activity and off-road terrestrial vehicle activity have been allocated to the town level. However, due to lack of data and solid methodological options, rail, marine, and air subsectors have not been similarly allocated.

On-Road Transportation

On-road emissions in Central New York were allocated to municipalities based on the number of occupied housing units (households) in cities, towns, and villages adjusted based on the journey-to-work mode preference. Household data were obtained from the American Communities Survey 5-year estimates on selected housing characteristics, as were journey-to-work percentages. First, the weighted proportion of commuters driving alone was calculated for each municipality and each county:

$$\begin{aligned} &Weighted\ drive\ alone\ \% \\ &= Drive\ alone\ \% + \frac{two\ person\ Carpool\ \%}{2} + \frac{three\ person\ Carpool\ \%}{3} \\ &+ \frac{four\ or\ more\ person\ Carpool\ \%}{4} \end{aligned}$$

Next, the weighted proportion of commuters driving alone was normalized by dividing by the county-wide average for each county to provide a "journey-to-work factor" (JTWF, in the equation below). Municipal on- road emissions were estimated by multiplying the county-level emission estimates by a weighting based on the number of households within each municipality and the prevalence of vehicle use for commuting relative to the rest of the county:

$$Emissions_{Municipality} = Emissions_{County} \times \frac{(\#Households \times JTWF)_{Municipality}}{\sum(\#Households \times JTWF)_{All\ Munipalities\ in\ a\ County}}$$

Off-Road Transportation

The methodologies for allocating off-road emissions to the municipal level vary by equipment type.

Emissions from recreational and logging equipment were allocated based on the inverse of population density, given the assumption that these types of equipment are more common in areas with more space available per person. The population density was normalized to the county average by dividing the inverse of the log of the each municipality's population density by the inverse of the log of the county's population density. The normalized population density was multiplied by the municipality's 2010 population. This was divided by the sum of the products of the population and normalized density of towns and cities to find the proportion of population density with respect to the county. The proportion was multiplied with the county's emissions from recreational and logging equipment. The net result of this weighting is that usage was weighted by population, but given a higher weighting in places with low population density, and a lower weighting in places with high population density.

Emissions from construction and mining equipment were allocated based on population. The municipalities' population proportions within their respective county were multiplied by the county's emissions from construction and mining equipment.

Residential and commercial lawn and garden equipment emissions were apportioned based on the number of single family housing units. The number of total single family detached and attached housing units within the municipality was divided by the total within their respective county. The housing unit proportion was multiplied with the county's emission from residential and commercial lawn and garden equipment.

Emissions from commercial equipment were allocated based on commercial fuel emissions. The commercial fuel emission from each municipality was divided by the total emissions from their respective county. The commercial fuel proportion was multiplied with the county's emission from commercial equipment.

Emissions from industrial, agricultural, airport, and railroad equipment, which account for 39 percent of off- road emission in the region, were not allocated at the municipal level due to lack of available data or method to do so.

9.3.3. Waste Management

Solid Waste

Scope 1 solid waste emissions were allocated to municipalities based on location of the landfill facilities. Scope 1 emissions are not included in the allocation totals for solid waste, however, to avoid double-counting. Scope 3 emissions were allocated to municipalities based on Census-derived populations. The towns, cities, and villages' population proportions within each of their respective counties were multiplied by the county's overall Scope 3 emissions.

Wastewater

Wastewater emissions were allocated to municipalities based on Census-derived populations. The proportion of the county population residing in each town, city, and village was multiplied by their respective county's CH_4 and N_2O emissions to obtain municipal-level wastewater emissions.

9.3.4. Industrial Processes

Industrial process emissions at the municipal level were calculated using the same methodology as calculating emissions at the county level (see Section 6). The two facilities in the region with industrial process emissions, Nucor Steel Auburn Inc. and Owens-Brockway Glass Container Inc. Plant #35, are both located in Auburn, New York, and their emissions were assigned to that city. Emissions from ODS substitution were calculated for each municipality based on population and the implied per capita ODS emission factor.

9.3.5. Agriculture

Emissions from the agricultural sector were apportioned to the municipal level using GIS-based land use data from the USDA's National Agricultural Statistics Service[41]. The dataset provides land area by crop type throughout the United States. Using this dataset, the area of each land use type within the Central New York municipalities was determined.

To apportion emissions, first, the relevant land use types were determined. For Ag Soils, the land uses for the crop types grown in CNY and calculated in the State Inventory Tool were used. These crop types are Alfalfa, Corn, Winter Wheat, Oats, and Soybeans. The sum of the land area for each of these crops for each municipality was considered its "Ag Soils Land Area."

For livestock emissions (Manure Management and Enteric Fermentation in the SIT), land area categorized as "Pasture/Grass" was used to determine the "Livestock Land Area."

Finally, total agricultural emissions (Ag Soils Emissions plus Livestock emissions) for each municipality were determined using the equations below:

$$Ag\ Soils\ Emissions_{Municipal} = Emissions_{County} \times \frac{Ag\ Soils\ Land\ Area_{Municipal}}{Ag\ Soils\ Land\ Area_{County}}$$

$$Livestock\ Emissions_{Municipal} = Emissions_{County} \times \frac{Livestock\ Land\ Area_{Municipal}}{Livestock\ Land\ Area_{County}}$$

9.4. Results

Emissions for each municipality by sector are presented in Table 27 through Table 31, organized by county. Emissions in the Stationary Energy sector include both electricity consumption and Scope 1 stationary fuel combustion. Note that totals may not sum due to independent rounding.

TABLE 27—Cayuga County Municipalities; Total Allocated Emissions by Municipality and Sector ($MTCO_2e$)

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Auburn	City	77,902	72,445	102,628	128,360	10,378	2,694	77,035	836	25,356	497,633	18
Aurelius	Town	8,257	9,798	2,008	14,462	1,046	272	1,036	23,085	1,549	61,514	22
Brutus	Town	13,004	6,120	126	20,778	1,673	434	1,657	9,636	1,390	54,819	12
Cato	Town	7,873	3,287	0	11,725	951	247	942	12,169	522	37,716	15
Conquest	Town	5,320	1,895	0	7,236	682	177	675	11,065	320	27,371	15
Fleming	Town	9,282	1,918	17	12,596	988	256	978	12,632	747	39,415	15
Genoa	Town	5,752	4,545	4	8,690	725	188	718	18,270	504	39,397	20
Ira	Town	7,591	3,925	0	12,803	827	215	819	11,838	505	38,523	17
Ledyard	Town	4,631	2,772	417	3,966	707	183	700	16,784	368	30,528	16
Locke	Town	5,141	937	4	7,443	731	190	724	9,337	303	24,810	13
Mentz	Town	6,131	3,143	65	9,388	891	231	883	7,442	681	28,854	12
Montezuma	Town	3,310	650	132	4,685	479	124	474	8,569	228	18,650	15
Moravia	Town	7,307	8,513	434	10,593	1,359	353	1,346	13,656	1,328	44,889	12
Niles	Town	3,357	1,177	0	4,549	448	116	443	18,087	203	28,380	24
Owasco	Town	13,733	5,385	0	18,615	1,422	369	1,408	9,249	1,770	51,952	14
Scipio	Town	5,406	2,307	0	7,046	642	167	636	18,183	345	34,732	20
Sempronius	Town	2,189	859	6	3,311	335	87	332	6,134	138	13,391	15
Sennett	Town	10,264	9,409	12,434	13,720	1,347	350	1,334	14,544	2,507	65,910	18
Springport	Town	6,874	2,959	248	9,904	887	230	879	12,270	736	34,986	15
Sterling	Town	8,538	3,815	0	13,450	1,139	296	1,128	8,095	579	37,040	12
Summerhill	Town	2,869	1,092	0	4,138	456	118	452	8,753	175	18,053	15
Throop	Town	5,733	691	2	7,559	746	194	739	12,542	433	28,639	14
Venice	Town	3,958	2,296	0	4,786	513	133	508	16,182	309	28,683	21
Victory	Town	5,374	2,293	0	9,643	622	161	616	9,741	345	28,796	17
Allocated Total		229,796	152,234	118,524	349,444	29,995	7,786	96,462	289,098	41,340	1,314,679	16

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Village emissions, included in town totals												
Aurora	Village	1,028	1,454	22	410	271	70	269	301	133	3,959	
Cato	Village	1,461	863	0	2,537	199	52	197	0	113	5,423	10
Cayuga	Village	1,311	554	25	2,184	206	53	204	587	198	5,321	10
Fair Haven	Village	2,688	1,265	0	3,897	279	72	277	386	191	9,055	12
Meridian	Village	788	317	0	1,101	116	30	115	269	45	2,781	9
Moravia	Village	3,771	3,502	433	5,314	481	125	476	0	656	14,756	12
Port Byron	Village	3,319	2,058	0	4,645	484	126	479	306	504	11,920	9
Union Springs	Village	3,543	2,363	246	4,472	449	116	444	1,697	581	13,912	12
Weedsport	Village	4,862	3,506	79	7,435	680	177	674	287	834	18,533	10

TABLE 28–Cortland County Municipalities; Total Allocated Emissions by Municipality and Sector ($MTCO_2e$)

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Cortland	City	36,732	49,049	13,036	102,193	11,322	1,868	7,128	166	10,915	232,409	12
Cincinnatus	Town	2,673	1,844	0	5,430	623	103	392	5,339	232	16,635	16
Cortlandville	Town	21,037	20,510	36,423	58,989	5,017	828	3,158	11,775	7,545	165,282	19
Cuyler	Town	1,666	1,004	0	5,713	578	95	364	5,717	135	15,273	16
Freetown	Town	1,804	742	0	3,795	446	74	281	6,423	126	13,690	18
Harford	Town	2,413	1,769	0	5,910	556	92	350	2,596	209	13,896	15
Homer	Town	17,275	6,936	793	41,292	3,776	623	2,377	10,732	2,081	85,885	13
Lapeer	Town	1,553	834	0	3,448	452	75	285	5,296	127	12,069	16
Marathon	Town	3,547	2,616	17	14,597	1,160	191	730	7,831	324	31,013	16
Preble	Town	3,580	2,715	0	10,227	821	136	517	3,965	292	22,253	16
Scott	Town	2,955	1,568	0	8,873	693	114	437	2,903	208	17,751	15
Solon	Town	2,680	1,322	0	7,633	636	105	401	3,708	181	16,666	15
Taylor	Town	1,300	578	0	3,028	308	51	194	4,590	98	10,147	19

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Truxton	Town	2,775	1,725	0	7,391	668	110	421	4,759	215	18,064	16
Virgil	Town	6,081	2,859	0	13,808	1,416	234	891	8,472	445	34,205	14
Willet	Town	2,265	944	0	5,003	615	101	387	4,210	152	13,678	13
Allocated Total		110,336	97,014	50,269	297,330	29,087	4,800	18,313	88,483	23,286	718,917	15
Village emissions, included in town totals												
Homer	Village	11,044	4,987	625	22,275	1,940	320	1,222	0	1,774	44,188	
Marathon	Village	1,169	5,543	0	7,270	542	89	341	0	450	15,404	17
McGraw	Village	2,634	1,539	410	7,215	621	102	391	139	472	13,524	13

TABLE 29—Madison County Municipalities; Total Allocated Emissions by Municipality and Sector ($MTCO_2e$)

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Oneida	City	22,670	24,740	14,176	64,849	3,418	1,108	4,229	3,683	5,944	144,817	13
Brookfield	Town	6,208	2,901	4	13,823	764	248	945	10,056	376	35,323	14
Cazenovia	Town	19,733	8,827	1,546	38,082	2,126	689	2,630	13,191	2,216	89,041	13
DeRuyter	Town	4,081	1,554	130	7,053	477	155	590	5,907	387	20,334	13
Eaton	Town	9,075	13,816	68	14,675	1,577	511	1,951	12,746	1,800	56,218	11
Fenner	Town	4,056	2,003	72	9,079	518	168	641	9,296	230	26,062	15
Georgetown	Town	2,050	1,223	5	3,432	292	95	362	7,860	159	15,478	16
Hamilton	Town	14,158	6,630	8,788	19,830	2,007	651	2,483	11,719	1,642	67,908	10
Lebanon	Town	4,114	1,776	24	8,658	400	130	494	13,255	241	29,092	22
Lenox	Town	20,249	19,239	5,484	53,299	2,737	887	3,386	5,369	3,692	114,342	13
Lincoln	Town	5,634	1,683	552	11,087	604	196	747	7,044	203	27,750	14
Madison	Town	9,454	3,426	95	17,383	902	293	1,117	11,847	340	44,856	15
Nelson	Town	4,564	3,170	180	9,600	594	193	735	7,065	293	26,394	13
Smithfield	Town	3,191	1,533	14	5,748	386	125	478	8,667	201	20,343	16
Stockbridge	Town	5,553	2,814	777	12,287	631	205	781	11,016	413	34,476	16

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Sullivan	Town	34,040	15,486	1,240	89,662	4,602	1,492	5,694	10,426	3,801	166,442	11
Allocated Total		168,828	110,821	33,154	378,547	22,034	7,145	27,260	149,148	21,939	918,876	13
Village emissions, included in town totals												
Canastota	Village	8,961	12,476	3,444	28,665	1,441	467	1,783	293	2,399	59,930	
Cazenovia	Village	5,846	5,415	1,248	15,527	851	276	1,052	0	1,204	31,418	11
Chittenango	Village	6,491	6,454	758	29,759	1,524	494	1,886	204	1,274	48,845	10
DeRuyter	Village	1,687	939	130	1,965	167	54	207	0	293	5,443	10
Earlville	Village	2,730	1,097	24	5,286	262	85	324	161	140	10,108	12
Hamilton	Village	6,632	3,131	8,754	5,354	1,272	412	1,573	0	1,159	28,288	7
Madison	Village	1,323	695	0	2,356	92	30	113	0	75	4,683	15
Morrisville	Village	2,226	11,312	0	2,465	660	214	816	130	1,466	19,289	9
Munnsville	Village	926	1,710	614	2,003	142	46	176	236	266	6,119	13
Wampsville	Village	1,118	2,711	1,345	2,251	163	53	202	134	481	8,458	16

TABLE 30–Onondaga County Municipalities; Total Allocated Emissions by Municipality and Sector ($MTCO_2e$)

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Syracuse	City	224,459	209,827	162,587	599,387	4,412	14,123	53,884	483	63,225	1,332,387	9
Onondaga Nation	Reservation	55	52	0	86	14	46	174	0	12	438	1
Camillus	Town	56,034	24,524	5,830	130,619	735	2,351	8,970	6,569	8,506	244,137	10
Cicero	Town	66,389	32,706	11,651	169,831	961	3,077	11,741	3,654	10,529	310,541	10
Clay	Town	113,891	71,874	21,514	306,666	1,769	5,663	21,605	5,948	19,791	568,720	10
De Witt	Town	59,018	111,326	147,459	132,939	785	2,514	9,591	1,891	32,585	498,107	19
Elbridge	Town	16,327	6,429	10,377	30,155	180	576	2,198	10,553	2,584	79,380	13
Fabius	Town	6,709	4,701	337	11,263	60	191	729	11,892	731	36,612	19
Geddes	Town	37,626	36,629	155,752	94,298	520	1,665	6,354	314	19,857	353,015	21
LaFayette	Town	14,334	3,158	530	25,933	151	482	1,838	11,459	878	58,763	12

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Lysander	Town	51,170	23,422	82,123	113,037	661	2,117	8,076	11,273	16,222	308,102	14
Manlius	Town	82,373	32,619	10,339	171,452	984	3,149	12,015	7,522	12,291	332,744	10
Marcellus	Town	18,069	6,808	7	31,005	189	604	2,305	13,251	2,219	74,458	12
Onondaga	Town	52,644	18,260	1,875	114,677	702	2,247	8,575	18,979	6,756	224,716	10
Otisco	Town	6,546	747	399	12,768	77	247	943	11,076	328	33,132	13
Pompey	Town	17,227	1,831	0	29,652	215	689	2,628	19,047	919	72,207	10
Salina	Town	68,352	57,206	39,366	195,050	1,025	3,280	12,512	251	16,590	393,633	12
Skaneateles	Town	22,733	17,618	2,475	34,183	219	701	2,676	17,747	4,166	102,519	14
Spafford	Town	6,092	413	0	10,451	51	164	626	10,207	180	28,182	17
Tully	Town	6,329	4,183	1,408	13,351	83	266	1,016	6,607	882	34,127	12
Van Buren	Town	37,559	34,324	2,029	78,964	401	1,283	4,894	7,857	7,855	175,164	13
Allocated Total		963,938	698,655	656,060	2,305,767	14,195	45,436	173,350	176,580	227,104	5,261,086	11
Village emissions, included in town totals												
Baldwinsville	Village	21,117	17,881	31,450	42,015	224	718	2,739	165	8,665	124,973	
Camillus	Village	2,431	1,050	0	6,687	37	118	450	0	352	11,125	9
East Syracuse	Village	5,829	8,205	41,403	18,560	94	300	1,145	8	5,648	81,191	26
Elbridge	Village	3,268	1,889	61	5,158	32	103	393	0	558	11,463	11
Fabius	Village	1,296	987	94	2,311	11	34	131	0	153	5,017	14
Fayetteville	Village	12,016	5,538	1,223	24,307	133	425	1,623	16	1,944	47,224	11
Jordan	Village	3,531	1,566	2,448	5,634	42	133	508	259	702	14,822	11
Liverpool	Village	9,090	4,315	548	14,443	71	228	871	1	1,498	31,065	13
Manlius	Village	7,498	5,333	3,065	25,452	143	458	1,746	0	1,485	45,179	10
Marcellus	Village	5,033	2,981	0	8,896	55	176	673	0	805	18,619	10
Minoa	Village	6,605	2,601	401	18,092	105	336	1,280	22	938	30,379	9
North Syracuse	Village	25,836	23,411	821	42,766	207	662	2,524	5	5,466	101,697	15
Skaneateles	Village	8,666	7,989	0	13,037	74	238	909	0	1,798	32,711	13
Solvay	Village	27,346	22,729	108,909	39,265	200	641	2,444	10	12,175	213,719	32
Tully	Village	1,805	2,316	464	4,287	27	85	324	0	463	9,771	11

TABLE 31–Oswego County Municipalities; Total Allocated Emissions by Municipality and Sector ($MTCO_2e$)

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Fulton	City	20,260	24,764	9,180	55,446	731	1,157	4,416	42	5,066	121,063	10
Oswego	City	34,845	29,964	41,722	84,888	1,114	1,765	6,734	0	11,122	212,155	12
Albion	Town	4,570	2,034	0	8,025	127	202	769	777	274	16,778	8
Amboy	Town	3,418	1,272	0	6,648	78	123	469	700	184	12,892	10
Boylston	Town	1,088	409	0	2,077	34	53	204	411	64	4,340	8
Constantia	Town	13,934	4,741	323	22,710	305	484	1,846	739	757	45,839	9
Granby	Town	15,876	4,395	1,319	33,666	419	664	2,532	3,378	1,192	63,440	9
Hannibal	Town	11,139	2,890	815	21,287	298	472	1,802	2,657	558	41,918	9
Hastings	Town	23,030	8,217	1,328	44,551	580	919	3,508	1,967	1,962	86,063	9
Mexico	Town	12,818	6,159	1,227	26,285	319	506	1,929	3,622	1,217	54,081	10
Minetto	Town	4,765	1,072	132	8,383	102	161	616	165	575	15,971	10
New Haven	Town	6,622	1,119	0	12,058	175	278	1,060	789	219	22,321	8
Orwell	Town	2,866	1,048	0	5,647	72	114	433	771	148	11,099	10
Oswego	Town	10,577	2,615	0	13,270	490	777	2,963	1,210	950	32,852	4
Palermo	Town	8,759	3,201	0	16,904	225	356	1,360	1,875	497	33,178	9
Parish	Town	6,252	2,745	351	12,085	157	249	949	686	373	23,846	9
Redfield	Town	1,426	569	0	3,234	34	54	204	345	82	5,946	11
Richland	Town	12,682	10,839	980	28,100	351	556	2,122	3,431	1,704	60,766	11
Sandy Creek	Town	9,669	2,618	589	17,718	242	383	1,462	2,131	659	35,472	9
Schroeppel	Town	18,741	7,151	922	38,449	522	827	3,155	3,414	1,741	74,922	9
Scriba	Town	14,628	3,907	7,179	33,309	420	665	2,539	1,037	1,550	65,234	10
Volney	Town	14,114	5,444	50,494	26,855	364	577	2,200	1,502	7,777	109,324	18
West Monroe	Town	10,997	1,721	0	19,058	261	414	1,578	1,323	400	35,753	8
Williamstown	Town	3,277	1,208	2,805	5,940	78	124	474	635	359	14,900	12
Allocated Total		266,351	130,101	119,367	546,595	7,500	11,880	45,324	33,606	39,430	1,200,154	10

Municipality	Type	Stationary Energy			Mobile Energy	Solid Waste	Wastewater Treatment	Industrial Processes	Agriculture	Energy Supply	Total, All Sectors	Emissions per Capita
		Residential	Commercial	Industrial								
Village emissions, included in town totals												
Altmar	Village	813	650	0	1,717	25	40	151	47	64	3,506	
Central Square	Village	2,896	2,630	170	9,722	114	180	686	66	520	16,983	9
Cleveland	Village	2,477	913	0	4,174	46	73	278	21	128	8,111	11
Hannibal	Village	1,418	1,534	815	2,790	34	54	206	0	323	7,175	13
Lacona	Village	1,127	512	0	2,647	36	57	216	63	147	4,804	8
Mexico	Village	3,645	4,244	821	8,928	100	158	603	0	862	19,361	12
Parish	Village	1,128	798	0	2,003	28	44	167	0	84	4,252	9
Phoenix	Village	4,280	3,036	655	12,260	146	232	884	32	770	22,295	9
Pulaski	Village	4,609	5,985	980	11,817	145	230	878	150	1,131	25,925	11
Sandy Creek	Village	1,638	1,156	589	3,750	47	75	286	0	332	7,874	10

10. EMISSIONS FORECAST TO 2030

10.1. County-Level Forecast

In addition to the regional GHG inventory and municipal-level allocation presented above, this analysis included a forecast of estimates to 2030 under a Business as Usual (BAU) scenario. The inventory team considered forecasting estimates at the municipal-level, however the projection drivers for each sector were not available at that level of granularity. The challenges and limitations of developing a forecast to 2030 are described below, followed by a description of the methods for each sector. The results are presented in county tables at the end of this report, and may also be viewed in the forecast spreadsheet that accompanies this report.

10.2. Challenges

Data Limitations

As expected at the outset of the forecasting process, most projection drivers do not extend beyond the 2020 timeframe. As a result, numerous annual growth rates were held constant through 2030. In addition, Scope 1 waste emissions were not projected as emissions from this source are pending future plans for the Cortland county landfill extension. The overall projection results for 2030 are shown below in Table 32.

10.3. Methods by Sector

10.3.1. Stationary Energy Consumption

Electricity-Scope 1

Electricity generation projections are based on projections on electricity generation from the New York Independent System Operator (NYISO) Gold Book from 2010. Since the majority of Central New York falls into the Zone C area (as classified by NYISO), the rate of increase for the region is consistent with the electricity generation forecast for this zone. The forecast only extends to 2020, and as a result, the growth rate from 2020 to 2030 is held consistent to the 2010 to 2020 growth rate. Emissions were increased for electricity generators at this same rate of growth.

TABLE 32–2010 Baseline and 2030 Projected Emissions ($MTCO_2e$), and Percent Change

Category	2010 Baseline Emissions ($MTCO_2e$)	2030 Projected Emissions ($MTCO_2e$)	2030 Percent Change
Electricity Generation*	2,159,564	2,360,565	9.3%
Energy Supply	353,098	368,205	4.3%
Stationary Energy Consumption	2,652,101	2,664,849	0.5%
Residential	1,227,911	1,043,881	-15.0%
Commercial	833,220	904,488	8.6%
Industrial	590,970	716,480	21.2%
Electricity Consumption	1,406,418	1,403,638	-0.2%
Residential	511,339	495,035	-3.2%
Commercial	355,604	404,128	13.6%
Industrial	539,475	504,475	-6.5%
Mobile Energy Consumption	4,218,612	6,636,916	57.3%
On-Road	3,663,556	5,975,612	63.1%
Off-Road	351,180	458,517	30.6%
Rail	85,049	103,008	21.1%
Marine	118,827	99,779	-16.0%
Air*	167,537	161,915	-3.4%
Waste Management	179,859	209,797	16.6%
Solid Waste(Scope 3)	102,812	133,353	29.7%
Wastewater Treatment	77,046	76,444	-0.8%
Industrial Processes	360,710	360,106	-0.2%
Glass Manufacture	12,541	12,859	2.5%
Iron & Steel Production	54,218	55,595	2.5%
ODS Substitutes	293,951	291,652	-0.8%
Agriculture	736,914	538,257	-27.0%
Across All Sectors	**9,907,712**	**11,821,662**	**19.3%**

*Not included in emissions total

Electricity-Scope 2

Electricity consumption emissions were calculated based on projections, by fuel type, from the Department of Energy's Annual Energy Outlook. Within this publication, electricity consumption is projected for the Mid- Atlantic Region through 2035. To determine projections for the Central New York Region, it was assumed that CNY electricity consumption relative to the Mid-Atlantic Region in 2010 will be equal to the same proportion in 2030. Consumption estimates were then converted into emission estimates based on the emission factors from the NYUP eGRID subregion.

For residential electricity, consumption estimates for each county were forecasted based on population growth for each county. For commercial and industrial electricity, these estimates were directly forecasted based on the projected consumption from the Annual Energy Outlook.

Fuels – Scope 1

Fuel consumption emissions were calculated based on projections, by fuel type, in the Department of Energy's Annual Energy Outlook. Within this publication, energy consumption is projected for the Mid-Atlantic Region through 2035. To determine projections for the Central New York Region, it was assumed that CNY consumption relative to the Mid-Atlantic Region in 2010 will be equal to the same proportion in 2030. This assumption was carried through to the residential, commercial, and industrial sectors. In addition, the projected fuel consumption by fuel type was distributed to the commercial and industrial sectors based on the projected employment in the county in 2030.

Energy Supply

Forecasted electricity and natural gas transmission and distribution emissions were projected by sector according to the projected natural gas and electricity consumption estimated under Electricity Scope 2, and Fuels Scope 1 above.

10.3.2. Transportation

For the transportation sector, on-road motor vehicle activity, off-road terrestrial vehicle activity, rail, marine, and aviation have been forecasted to 2030.

On-Road Transportation

On-road emissions in Central New York were projected based on the New York State Department of Transportation projections of vehicle miles traveled (VMT) to 2035. An emissions rate of 506.2 g CO_2/mile was assumed.

Off-Road Transportation

The methodologies for projecting off-road transportation vary by equipment type. Growth factors were assumed by equipment type, which are based on various emission drivers as shown in Table 33.

TABLE 33–Off-Road Equipment Category and Estimated Growth Factor

Equipment Category	Driver	Calculated/Estimated Growth Factor
Agriculture	Agricultural Land	85%
Airport Support Equipment	Aviation Emissions	97%
Commercial Equipment	Population	99%
Construction and Mining	Population	99%
Industrial Equipment	Population	99%
Lawn & Garden	Population	99%
Logging	Population	99%
Railroad Equipment	Population	110%
Recreational Equipment	Population	99%
Recreational Marine	Population	99%

Rail

Emissions from freight rail in the region were forecasted by calculating projected ton-miles from 2010 to 2030 using the FHWA's Freight Analysis Network[42]. Using this online database tool, it was assumed that the origin and destination were equal to the "Remainder of New York" region. The resulting growth in rail was used to project emissions to 2030. For passenger rail, it was assumed that there was an annual growth of 2 percent, which translated into 40 percent over the 30 year projection timeframe.

Marine

Emissions from marine in the region were forecasted by calculating projected ton-miles from 2010 to 2030 using the FHWA's Freight Analysis Network. Using this online database tool, it was assumed that the origin and destination were

equal to the "Remainder of New York" region. The resulting change in marine transport was used to project emissions to 2030.

Aviation

Emissions from aviation in the region were forecasted by assuming the same projection rate as the Mid-Atlantic jet fuel consumption from 2010 to 2030. This projection found a 3 percent decrease in fuel consumption across the projection timeframe.

10.3.3. Waste Management

Solid Waste – Scope 1

Scope 1 waste emissions were not projected as emissions from this source are pending future plans for the Cortland county landfill extension.

Solid Waste – Scope 3

Scope 3 solid waste emissions were projected based on historic per capita waste generation rates for the state, developed from state population and total waste generated. The estimate subtracted any amount of waste combusted- which applied to Onondaga and Oswego counties. The estimate relies on a first order decay (FOD) model that estimates the potential CH_4 emissions that occur during the inventory year, but are associated with the waste landfilled over the past thirty years.

Wastewater

Wastewater emissions were projected according to forecasted population estimates to 2030.

10.3.4. Industrial Processes

Industrial process emissions at the county level were calculated for iron and steel production, glass production, and ODS substitution. For iron and steel production, the forecasted emissions were dependent on the projected emissions from iron and steel in the state, calculated from the New York State Climate Action Plan[43]. Due to lack of projection data for the glass industry, it was assumed that glass manufacturing increased at the same rate of the iron and steel industry. Projected ODS substitute emissions were calculated based on projected population in the region.

10.3.5. Agriculture

Emissions from the agricultural sector were projected based on historical changes in crop land and cattle populations. For Agricultural Soils, it was assumed that the 2002 to 2007 observed trend in crop land from the USDA National Agriculture Statistics Service (NASS) would hold true through 2030. Similarly, for manure management and enteric fermentation, it was assumed that the 2002 to 2007 observed trend for livestock population would hold true through 2030 as well.

ENDNOTES

1. Different greenhouse gases have different capacities to trap heat in the atmosphere. In order to compare and sum the impacts of different gases, the United Nations' Intergovernmental Panel on Climate Change (IPCC) developed the Global Warming Potential (GWP) concept, where the GWP of each greenhouse gas is compared to that of CO_2, whose GWP is defined as 1. The GWP of methane (CH4) is 21, and nitrous oxide (N2O) is 310. GWPs for some gases are much higher— the GWP for SF6, for example is 23,900. For more information, see U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2010, April 2012.

2. U.S. EPA. 2012. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2010.

3. U.S. Energy Information Administration (EIA), 2012, Form EIA-923 detailed data merged with 860 form data, http://www.eia.gov/electricity/data/eia923/

4. U.S. Census Bureau. 2012. American Fact Finder.

5. EIA. 2012. SEDS - State Energy Data System for New York. http://205.254.135.7/state/seds/seds-states.cfm?q_state_a=NY&q_state=New%20York

6. U.S. EPA. Mandatory Reporting of Greenhouse Gases, Final Rule. 40 CFR Parts 86, 87, 89, 90, 94, 98, 1033, 1039, 1042, 1045, 1048, 1051, 1054, 1065. Table C-1 and C-2

7. Dataset is available at: http://epa.gov/climatechange/emissions/ghgdata/index.html

8. 2010 New York industrial fuel consumption data from EIA's SEDS Table CT6 were used directly with one exception; the fuel type "Other Petroleum Products" was adjusted to remove Asphalt and Road Oil, which are non-energy products. Asphalt and Road Oil makes up about 62% of the Other Petroleum Products category, so 38% of the 52.9 trillion BTU (20.1 trillion BTU) was used to distribute among the Central New York counties.

9. National Grid, Service Territory Map, http://www.nationalgridus.com/niagaramohawk/about_us/serviceterr_map.asp. NYSEG, Service Area, http://www.nyseg.com/MediaLibrary/2/5/Content%20Management/NYSEG/YourHome/PDFs%20and%20Docs/NYSEG%20Service%20Area%20Map.pdf

10. U.S. EPA. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010. Section 4.23, Electrical Transmission and Distribution.

11. U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010. Table 4-1.

12. EIA. Summary Electricity Statistics. Table ES-1, "Total Retail Sales." http://www.eia.gov/electricity/annual/xls/tablees1.xls

13. NYSDOT Environmental Science Bureau, 2009, Mobile 6.2 CO Emission Factors for project-Level Microscale Analysis, Appendix A. https://www.dot.ny.gov/divisions/engineering/environmental-analysis/manuals-and-guidance/epm/repository/coeftab0.pdf

14. U.S. EPA, 2009, 2008 National Emissions Inventory. http://www.epa.gov/ttnchie1/net/2008inventory.html

15. CO_2 and CO emission factors came from EPA's AP 42 emissions factor report, fifth edition, Volume I, Chapter 1, Section 1.3. http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s03.pdf

16. NYSERDA Clean Diesel Technology: Non-Road Field Demonstration Program. Development of the 2002 Locomotive Survey for New York State, http://www.nyserda.ny.gov/Publications/Research-and- Development/~/media/Files/Publications/Research/Environmental/locomotive%20survey%20report%20wit%20appendices.ashx

17. Default factors from EPA's 2012 State Inventory Tool (SIT), Mobile Combustion Module. The SIT's default diesel density factors are from EIA Annual Energy Review 2007. The SIT's default diesel emission factors are from IPCC 1996 Guidelines for National Greenhouse Gas Inventories.

18. U.S. Department of Transportation. 2012. U.S. Air Carriers Traffic and Capacity Data: T-100 Segment (All Carriers). Bureau of Transportation Statistics. Available at http://www.transtats.bts.gov/DL_SelectFields.asp?Table_ID=293&DB_Short_Name=Air%20Carriers.

19. U.S. EPA. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010, Table 3-12, http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2012-Chapter-3-Energy.pdf

20. Local Government Operations Protocol. Version 1.1, 2010, http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf

21. Received via email from Jim Yienger on July 26, 2012 7:30 AM. Data spreadsheets compiled by Shelby Egan.

22. Onondaga County Resource Recovery Agency's 2010 Annual Report on Recyclables Recovered. https://ocrra.org/app/webroot/img/gallery/File/downloads/Reports/Recycling/Recycling_2010.pdf

23. NYS Data Center. Table 1: Total Population, Housing Units, Land Area, and Population Density, 2010, http://esd.ny.gov/NYSDataCenter/Data/Census2010/PL2010Tab1NY.pdf

24. EPA, 2008. AP 42, Fifth Edition, Volume I, Chapter 2: Solid Waste Disposal. http://www.epa.gov/ttn/chief/ap42/ch02/final/c02s04.pdf

25. New York State Data Center, Census 2010, Revised2000to2009SubcountyTotals_Population.xls, http://www.empire.state.ny.us/NYSDataCenter/Census2010.html

26. U.S. EPA. 2012. Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990-2010. Table 8-14.

27. Ibid.

28. Ibid.

29. U.S. Census Bureau, 2007 Economic Census

30. Dataset is available at: http://epa.gov/climatechange/emissions/ghgdata/index.html

31. U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010, Table 4-1, http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2012-Chapter-4-Industrial-Processes.pdf

32. U.S. Census Bureau, 2012, State and County QuickFacts – USA. http://quickfacts.census.gov/qfd/states/00000.html.

33. USDA, 2012, National Agricultural Statistics Service, QuickStats. Data downloaded for All livestock items and All crops; Location: New York / All Counties. http://www.nass.usda.gov/QuickStats/.

34. Because calf data are not split out at the county level, assumed statewide 17.4 percent applies.

35. From Table A-24 of EPA's Regional GHG Inventory Guidance. Dairy cow population percentages by state, 2006.

36. From Table A-25 of EPA's Regional GHG Inventory Guidance. Beef cow population percentages by state, 2006.

37. US Forest Service, FIA Program: Forest Inventory Data Online, http://apps.fs.fed.us/fido/

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39. New York State Data Center, Estimates of the Resident Population: New York State Governmental Units, 2000 to 2009 – Revised September 2010, http://www.empire.state.ny.us/NYSDataCenter/Data/Population_Housing/REVISED2000to2009SubcountyTotals.pdf

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42. http://ops.fhwa.dot.gov/freight/freight_analysis/faf/faf3/netwkdbflow/index.htm

43. New York State Climate Action Plan: http://www.dec.ny.gov/energy/80930.html

Project website: visioncny.org

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