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For BOL Review**

**St. Lawrence County Climate Action Plan**

St. Lawrence County, New York  
March, 2011



Photo: *“The Blue Marble”* -- NASA Goddard Space Flight Center Image

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# 1. Executive Summary

Climate change, accelerated by human activities, represents a profound threat to functioning ecosystems on our planet. Despite clear evidence that we are heading toward climate catastrophes, human beings have difficulty dealing with crises that come on slowly. Yet taking action to both combat climate change and to prepare for it should be part of everyone's consciousness. Despite public debate on climate change and peak oil, there is a high degree of scientific consensus that both are real and both present significant challenges to our economy and well-being in St. Lawrence County. That is why the business community represented by the St. Lawrence County Chamber of Commerce passed a resolution requesting the Board of Legislature to address these issues in December 2008 and the Legislature responded with Resolution 111- 2009 in April 2009 calling for an GHG emissions inventory and authorizing the preparation of a plan to address climate change and peak oil. The good news is that both can be addressed following a 'no regrets' strategy that reduces County spending, stimulates the economy, creates jobs and attracts funding and investment. The sooner steps are taken to reduce our reliance on fossil fuels, the lower the costs and greater the benefits will be. St. Lawrence County, along with other local governments around the world, decided to take action to reduce greenhouse gas (GHG) emissions that arise from its operations. This plan may inspire communities in our County to begin their own efforts.

New York State's leadership role in helping communities meet the challenge of climate change is articulated in Climate Smart Communities – Guide for Local Officials- February 2009. This publication sets forth a clear framework for communities to follow that builds on the work of the International Council for Local Environmental Initiatives, USA (ICLEI-USA)<sup>1</sup> and The Climate Registry (TCR) and notes that approximately 40 New York State local governments have joined ICLEI-USA and are developing plans that use the ICLEI-USA "milestone" format to plan for GHG reductions:

*Milestone 1: Conduct a baseline emissions inventory and forecast*

*Milestone 2: Adopt an emissions reduction target*

*Milestone 3: Develop a local Climate Action Plan for reducing emissions*

*Milestone 4: Implement policies and measures*

*Milestone 5: Monitor and verify results*

St. Lawrence County's plan follows this format. In addition, the plan considers impacts of rising petroleum prices as a result of higher extraction costs (the "peak-oil" phenomenon) and responses to climate changes (resiliency).

Recently, New York State's Climate Action Council developed an Interim Climate Action Plan (CAP), which is expected to be finalized in 2011. Executive Order 24 in August 2009 formally established a State goal of reducing GHG emissions 80 percent below 1990 levels by 2050 (or "80 by 50"). St. Lawrence County's intention is to contribute toward this target through actions that we determine and control.

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<sup>1</sup> In 2003 ICLEI officially changed its name to ICLEI - Local Governments for Sustainability

*The primary goal of this plan is to institutionalize GHG emissions reductions into County decision-making and give such reductions equal weight with other considerations.*

We approach this goal with a “no regrets” strategy, that is, by taking measures that:

1. Save us money while reducing GHGs, such as energy efficiency programs; and
2. Develop the infrastructure that puts the County in a good position to attract funding from the State or federal government, such as maintaining an up-to-date GHG inventory and having a climate action plan in place.

The plan also seeks to limit (and reduce where possible) GHG annual GHG emissions to around **or below** 2,500 tons of carbon dioxide equivalent (CO<sub>2</sub>e) per year for buildings and facilities or around **or below** 3,500 tons of CO<sub>2</sub>e if vehicle fleet and refrigerants information is included. Specific possible measures to achieve these levels are identified; however they are contingent on many other decisions and additional investigations before they can be implemented.

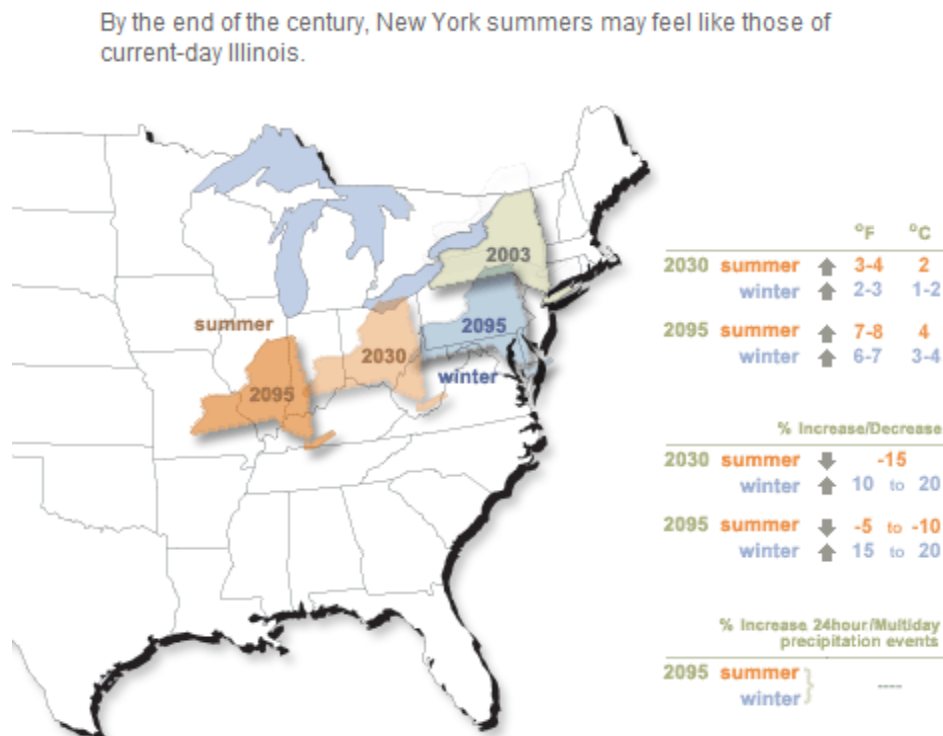
## 2. Introduction

### 2.1 Effects and Impacts of Climate Change

Humankind faces an unprecedented change in climate, both in scale and magnitude. Our use of fossil fuels has enabled economic growth worldwide but at the cost of steadily rising climate-altering GHGs in the atmosphere. As their name implies, GHGs trap solar radiation in the lower atmosphere. Fossil fuel combustion releases CO<sub>2</sub> gas, the most important GHG. GHGs trap solar radiation in the lower atmosphere. While CO<sub>2</sub> and other GHGs concentrations in the atmosphere have varied and gone through cycles for millions of years, GHG emissions from human activities has raised GHG levels in the atmosphere well beyond the historic range of variability, altering the energy balance of the planet.

The impacts of climate change are innumerable and difficult to *accurately* predict at the regional scale, such as St. Lawrence County. Nevertheless, the *Northeast Climate Impacts Assessment (NECIA)* prepared by the Union of Concerned Scientists identifies impacts of climate change that have occurred already in the northeastern U.S. [4] The assessment found that average temperatures in New York today are 2°F higher than they were in 1970. The assessment also projected the following:

🌐 Greenhouse gasses (GHGs) already in the atmosphere will continue to raise temperatures across the Northeast. GHGs can persist in the atmosphere for hundreds of years. Several decades from now, New York's winter temperatures are expected to be 2.5°F to 4°F higher than today, and summer temperatures, 1.5°F to 3.5°F higher.



[http://www.ucsusa.org/greatlakes/winmigrating/glwinmig\\_ny.html](http://www.ucsusa.org/greatlakes/winmigrating/glwinmig_ny.html)

The New York State Climate Department of Environmental Conservation's Office of Climate Change's web site (<http://www.dec.ny.gov/energy/63848.html>) notes that:

- **Average temperatures** in the state are 2 degrees Fahrenheit higher than they were as recently as 1970.
- **Winter temperatures** are almost 5 degrees higher than in 1970.
- **Plants** in New York now bloom as much as 8 days earlier in the spring than they did in 1970.
- **Birds** that traditionally breed in New York have moved their ranges northward by as much as 40 miles in the past two decades.
- **Diseases** from the tropics, such as West Nile disease and Lyme disease, are appearing further north.

The website continues: Scientists predict that New York could see additional impacts as the planet's climate warms. These include:

- **Additional warming**, estimated at 2 to 3 degrees Fahrenheit, because of greenhouse gases already in the atmosphere.
- **Dry spells** of several weeks' duration, punctuated by extreme rains and storms.
- **Winter snow cover** reduced enough to affect the recreation industry.
- **Loss of cool-weather plants and animals** that have traditionally lived in New York, such as sugar maples and some marine species.
- **Sea levels rising** by between 4 inches and 33 inches (or even more if the earth's large ice sheets are destabilized). The amount of sea level rise will depend on how successfully, and how soon, nations are able to reduce greenhouse gas emissions.

*Climate Change in the Adirondacks - The Path to Sustainability* by Jerry Jenkins is a project of the Wildlife Conservation Society, published in 2010 by Comstock Publishing Associates. This book describes both the observed and potential effects of climate change in our neighborhood. Although it uses the area inside the Adirondack Park as its focus, it is also highly relevant to the 60% of St. Lawrence County that lies outside the Park. The book is the most comprehensive publication for our area on climate change and how we can cope with it.

The main points of the book are:

- We have a climate problem.
- Weather is changing.
- The climate problem is an energy problem.
- How could climate change affect our environment and economy?
- What are our current emissions from different sources?
- Offsetting emissions with carbon sinks.
- How can we reduce emissions from these sources?
- How do we finance the needed changes?

St. Lawrence County can address the impacts of climate change and reduce our vulnerability on our own terms and in ways that uphold our own interests. This is referred to as a “no regrets” strategy. To do this, the County needs to take stock of our collective GHG impacts, wisely use our resources, and boldly use creativity and innovation to meet a future unlike any that the County has faced since its creation in 1802.

## 2.2 Introduction to Climate Change Science

The United Nations defines climate change as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.” [4]

Climate change is caused by human activities that emit greenhouse gases, such as carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), and methane (CH<sub>4</sub>). Greenhouse gases in the atmosphere absorb infrared radiation and then reradiate the radiation causing air temperature to increase. Nitrous oxide and methane have 310 and 21 times the greenhouse warming potential of carbon dioxide, respectively. However, human activities, chiefly transportation and energy production, release carbon dioxide in much larger quantities (82.3 % in 2006 [6] ) than the other two gases (14% in 2006. [6] ) making it the most important gas changing global climate.

The following table adapted from the United Nations Framework Convention on Climate Change illustrates the relative Global Warming Potential (GWP) of a variety of greenhouse gasses (GHG) as compared to CO<sub>2</sub>.

| GHG                           | GWP    |
|-------------------------------|--------|
| CO <sub>2</sub>               | 1      |
| CH <sub>4</sub>               | 21     |
| N <sub>2</sub> O              | 310    |
| HFC-23                        | 11,700 |
| HFC-125                       | 2,800  |
| HFC-134a                      | 1,300  |
| HFC-152a                      | 140    |
| CF <sub>4</sub>               | 6,500  |
| C <sub>2</sub> F <sub>6</sub> | 9,200  |
| SF <sub>6</sub>               | 23,900 |

Since the beginning of the Industrial Revolution in the 18<sup>th</sup> Century, CO<sub>2</sub> concentrations in the atmosphere have risen from about 278 ppm to about 390 ppm today, an increase of about 40%, and are currently increasing at about 2 ppm/yr. During this period, the atmosphere warmed between 0.6 and 0.9 °C (1.1-1.6° F)[6] and the global average surface temperature rose about 1.4 °C (2.5° F) [7]. [4] The earth has not had CO<sub>2</sub> concentrations at this level since the Pliocene era of about 4 million years ago.

Our use of fossil fuels and climate change are connected; peak oil and global warming have developed in tandem. To stabilize and eventually reduce GHG concentrations, we must reduce our use of fossil fuels. If we burn the remaining estimated oil, we may see CO<sub>2</sub> concentrations in the atmosphere rise to around 1,000 ppm, which could cause the release of

very large deposits of carbon in ocean sediments and permafrost and usher in runaway climate change.. It is in everyone’s interest to avoid this situation.

Much has been written about global impacts due to climate change. In the Northeast Climate Impacts Assessment [4], climate scientists have worked out the expected impacts on the northeast for two different cases:

(1) a “higher-emissions scenario” in which “the world remains on a pathway of highly fossil fuel-intensive economic growth...” and

(2) a “lower-emissions scenario” in which “the world follows a pathway of high economic growth but shifts toward less fossil fuel-intensive industries and introduces clean and resource-efficient technologies...” P.C. Frumhoff, *et. al.* [9] continues the topic of [4] in much more detail.

The likely effects of these worst-case and best-case scenarios are summarized in the table below. The important conclusion to draw is that the decisions we make today will greatly affect the climate and the state of the environment well into the future, and that we can still make choices that will improve the world we pass on to our grandchildren.

| <b>Effect</b>   | <b>High Emissions Worst-case Scenario</b>                     | <b>Lower-Emissions Best-case scenario</b> |
|---|---|---|
| Winter warming by 2099  | 8 – 12 °F   | 5-7.5 F°                                  |
| Summer warming by 2099  | 6-14 °F   | 3-7 °F                                    |
| Days/year over 90 °F, mid-century (historically 10-15)  | 30-60   | 30  |
| Days/year over 100 °F, mid-century (historically 1-2)   | 14-28   | “only a few”                              |
| Shortening of winter snow season by 2099  | 50%   | 25%                                       |
| Likelihood of summer and fall droughts  | “significantly higher” (annual droughts of 1-3 months likely) | “slightly higher”                         |
| Spring arrival  | 3 weeks earlier   | 1-2 weeks earlier                         |
| Summer length   | 3 weeks longer  | 1.5 weeks longer                          |
| Sea level, 2099   | up to 3 feet  | up to 2 feet                              |
| Changes not showing “dramatic” differences between the scenarios:   |   |   |
| <ul style="list-style-type: none"> <li>• Increased probability and severity of heavy rainfalls.</li> <li>• Increased winter precipitation “on the order of” 20 to 30 %.</li> <li>• Extended periods of low stream flow in summer and fall.</li> </ul> |   |   |
| <b>Source: Adapted from The Northeast Climate Impacts Assessment</b>  |   |   |

## 2.3 Impacts of Rising Oil and Gas Prices

“Peak oil” or “peak natural gas” occurs when the global rate of petroleum or natural gas extraction reaches its maximum, and then enters a period of permanent decline. M.K. Hubbert first predicted with satisfactory accuracy that U.S. oil production would peak in the period 1965-1970.[10] In fact, US oil production peaked in 1973. Hubbert peak oil theory has been further developed and employed to predict the timing of global peak oil.

‘Peak *oil*’ is a term of convenience inasmuch as it also includes natural gas, propane, butane, etc. Peak oil will translate into higher fuel prices for space heating, transportation and a portion of the electrical energy generation demand. Note that peak oil implies a peak and decline in propane, a by-product of natural gas processing and crude oil refining. Climate change and peak oil are directly related in the need to reduce fossil fuel use as much and as quickly as possible.

The U.S. Department of Energy [3] states:

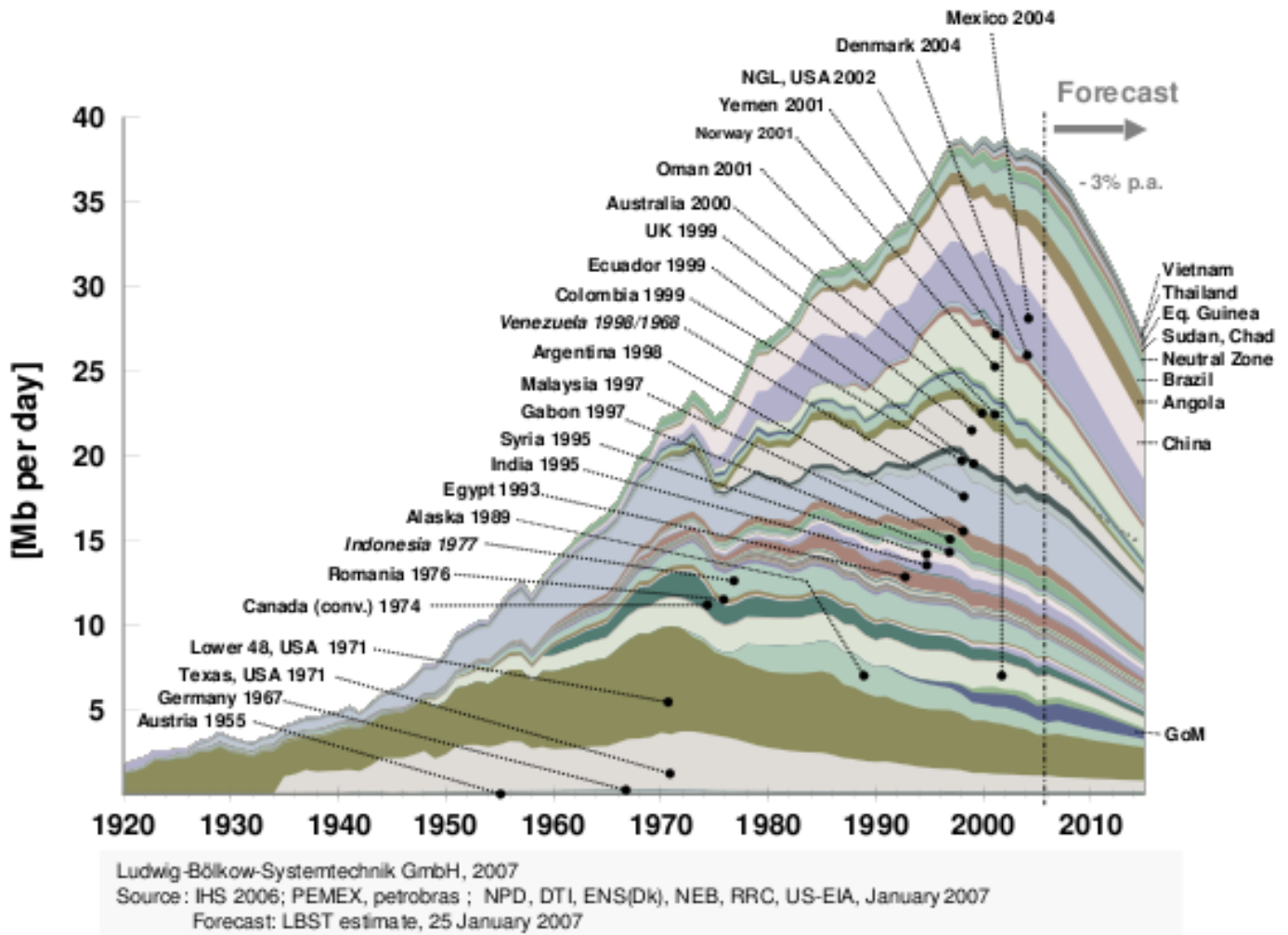
“World oil demand is expected to grow 50 percent by 2025.<sup>1</sup> To meet that demand, ever-larger volumes of oil will have to be produced. Since oil production from individual reservoirs grows to a peak and then declines, new reservoirs must be continually discovered and brought into production to compensate for the depletion of older reservoirs. If large quantities of new oil are not discovered and brought into production somewhere in the world, then world oil production will no longer satisfy demand. That point is called the peaking of world conventional oil production. When world oil production peaks, there will still be large reserves remaining. Peaking means that the rate of world oil production cannot increase; it also means that production will thereafter decrease with time.”

(<sup>1</sup>U.S. Department of Energy, Energy Information Administration, *International Energy Outlook – 2004*, April 2004.)

High and rising demand runs into the decreasing supply of increasingly expensive oil to produce serious problems.

It is impossible to predict the timing of peak oil with accuracy; only hindsight reveals when the peak arrived. However, in 2005 the Worldwatch Institute reported that oil production was already declining in 33 of the 48 largest-oil-producing countries and that production in Iraq, Kuwait, and Saudi Arabia would peak before 2020. [11] On the composite plot of 21 oil production predictions reproduced below from [1], 15 showed world peak oil occurring between 2000 and 2015, one showed it occurring by 2040, and five were inconclusive or showed no peak before 2050, the limit of the graph. Thus there is ample reason to believe that peak oil has already occurred, or will occur very soon. (Sources for the curves in the figure are in [1].)

**Figure 5: Oil producing countries past peak**



Source: [http://www.energy-watch-group.org/fileadmin/global/pdf/EWG\\_Oilreport\\_Summary\\_10-2007.pdf](http://www.energy-watch-group.org/fileadmin/global/pdf/EWG_Oilreport_Summary_10-2007.pdf)

The City of Portland, OR, as an example, has anticipated the impact of Peak Oil. As the City of Portland, OR Peak Oil Task Force Report [2] points out, it doesn't make much difference exactly when the peak will occur. We cannot change our oil and gas consumption patterns without changing transportation and building infrastructure in time to match the peak, an effort which will take years. Therefore we must start now even if the oil peak isn't expected for a decade or more. As the U.S. Department of Energy points out,

Mitigation will require an intense effort over decades. This inescapable conclusion is based on the time required to replace vast numbers of liquid fuel consuming vehicles and the time required to build a substantial number of substitute fuel production facilities. . . There will be no quick fixes. Even crash programs will require more than a decade to yield substantial relief.[3]

**St. Lawrence County Government relies on liquid fuels to conduct its business of delivering services to the public. One of the principal purposes of this plan is for the County to examine ways of reducing increasingly costly fossil fuels.**

# St. Lawrence County Plan

## 3. Emissions Inventory

In order to measure the County's GHG impact it is necessary to take inventory of emissions from all sources. The County needs to know what amount of GHG has been generated, what is being generated and what level of reduction is possible. The County needs this information in order to track progress in reducing emissions, to be able to take advantage of state or federal climate change related programs, such as energy efficiency, conservation, and/or to participate in the carbon market.

### 3.1 Methodology

The St. Lawrence County Board of Legislators passed Resolution 111- 2009 in April 2009 to initiate this plan. The County purchased annual memberships in ICLEI-USA in 2009 and 2010 for the purpose of benefitting from their technical assistance and obtaining specialized software to help inventory GHG emissions from St. Lawrence County operations. As stated in the Executive Summary, the County has followed ICLEI's performance-oriented framework and methodology:

*Milestone 1: Conduct a baseline emissions inventory and forecast:* Helps the community identify and set priorities for actions that will reduce emissions.

*Milestone 2: Adopt an emissions reduction target for the forecast year:* Establishes an emission reduction target through a resolution passed by a local government.

*Milestone 3: Develop a local Climate Action Plan:* Identifies the areas where emissions can be reduced most cost-effectively and suggests specific actions that will reduce emissions to achieve an emissions reduction target.

*Milestone 4: Implement policies and measures:* Are guided by the implementation schedule and measures identified in the local Climate Action Plan.

*Milestone 5: Monitor and verify results:* An ongoing process that provides important feedback that can be used to improve the measures over time. ICLEI's "CACP" software can also be used to monitor and report on measures.

In addition, the County provided monies for two student interns from St. Lawrence University, Lauren Vorhees and Arturs Saburovs, who performed the GHG inventory. The overall effort was under the direction of the County Planning Office.

### 3.2 Software

The interns used ICLEI's Clean Air & Climate Protection software (CACP 2009 Version 2.2.1b). This software requires data on fuel, refrigerant, and electricity use to compute CO<sub>2</sub> e and costs. The software follows a protocol named the "Local Government Operations Protocol (LGOP)" [14]. This protocol explains the development of and details the entire inventory methodology, defines terms, and the methods by which data is categorized. Relevant data was collected from each county department during the fall of 2009 and spring of 2010. Data analysis was conducted during the mid-summer of 2010.

### 3.3 Inventory Sources and Creation Process

GHG inventories require the selection of a base year from which to measure reductions. Our baseline is 2005 because it was the earliest point in time for which the County had reasonably good data. Subsequent data collection will build on the base year and allow for better trend analysis.

Part of the total GHG emissions attributable to the County are those associated with electricity consumption. The software assumes different regions of the USA have different and unique mixtures of electrical generation and therefore different rates of GHG emissions attributable to these regions. The electricity generation regions are mapped and coded. The software requires that the user specify which of these electricity regions will be used to calculate GHG emissions. St. Lawrence County is in the Environmental Protection Agency's NCPP Upstate New York region.

Data are grouped according to sectors relevant to SLC:"

- Buildings
- Solid waste facilities
- Vehicle fleet
- Employee commute
- Transit fleet
- Other process fugitive
- Refrigerants - all sectors

Within each sector data was collected for:

- Electricity consumption (kWh)
- Commercial coal (tons)
- Fuel Oil #1,2,4 (US gal)
- Kerosene (US gal)
- Landfill gas or biogas (MMBtu)
- Natural gas (therms)
- Propane (US gal)
- Stationary gasoline (US gal)
- Stationary LPG (US gal)
- Wood 12% moisture (tons)
- Carbon dioxide (tons CO<sub>2</sub>)
- Methane (lbs. CH<sub>4</sub>)
- Nitrous Oxide (lbs. N<sub>2</sub>O)
- Sulfur Hexafluoride (lbs. SF<sub>6</sub>)
- Biodiesel (B100) (US gal)
- Compressed Natural Gas (cu ft)
- Ethanol (E100) (US gal)
- Liquefied Natural Gas (LNG) (US gal)
- Gasoline (US gal)
- Off Road Aviation Gasoline (US gal)
- Off Road Diesel (US gal)
- Off Road Gasoline (US gal)
- Off Road Jet Fuel (US gal)
- Off Road Residual Fuel Oil (US gal)
- Hydrofluorocarbon refrigerants (lbs)

The Employee commute sector is also a part of County operations; however, action on this particular component of GHG emissions has been deferred pending a more thorough study of employee commuting patterns.

To more fully capture the picture of GHG emissions from County operations, the software program also accounts for direct and some indirect emissions. The ICLEI protocols follow the World Resources Institute/World Business Council for Sustainable Development GHG Protocol Corporate Standard in categorizing direct and indirect emissions into “scopes” as follows:

**Scope 1:** All direct GHG emissions (with the exception of direct CO<sub>2</sub> emissions from biogenic sources).

**Scope 2:** Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.

**Scope 3:** All other indirect emissions not covered in Scope 2, such as emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity (e.g., employee commuting and business travel), outsourced activities, waste disposal, etc.

St. Lawrence County’s GHG inventory does not include Scope 3 at present. We may reconsider this decision in the future. For example, County procurement policies are continually reviewed with an eye to minimizing environmental impacts, including, but not limited to, GHG emissions. We may want to account for such efforts in our CAP. Also, an employee commuting survey and analysis, yet to be performed, would be an example of documenting Scope 3 emissions.

Together the three scopes provide a comprehensive accounting framework for managing and reducing direct and indirect emissions. Following standardized accounting practices puts us in a position to attract state, federal, and international climate change programs and participate in the carbon market.

### 3.4 Inventory Results

The full *St. Lawrence County GHG Inventory: Baseline GHG Inventory 2005-2009* by Arturs Saburovs is attached as Appendix I to this document. Conclusions regarding GHG reduction targets have been reached based on data which has some gaps, but nevertheless provides guidance. ***All County Departments shall review this information, consider how they contribute to overall GHG emissions, and what steps they could take to reduce those emissions and save costs.***

#### 3.4.1 Emissions Summary

Of the major GHGs listed in section 2 above, St. Lawrence County mostly generates carbon dioxide and some nitrous oxides from combustion of fossil fuels, but also has small but powerful releases of refrigerants on occasion. Methane, largely emitted from operations that include areas with biogenic decomposition, plays a minor role. The County does not use sulfur hexafluoride, which has applications in electrical equipment manufacture and medicine. Therefore the actions that will have the greatest impact on reducing GHG emissions are those that reduce fossil fuel use at either stationary facilities or in vehicles. Replacing chlorine and fluorine-based refrigerants with non-GHG refrigerants is an action that should be implemented as soon as possible.

### **3.4.2 Data Quality**

The quality of energy use data for buildings and facilities is reasonably good and all departments should continue to collect data on fuel use and cost as described in the Inventory Report. Data for vehicle fleet fuel use is much less satisfactory and data on employee commuting remains to be gathered. In this regard, County departments that operate vehicle fleets shall record the amount of fuel, cost and type of fuel, not simply the total vehicle miles driven.

It appears from the data that the carbon dioxide-equivalent emissions from buildings and facilities have been ranging between 2500-2700 tons/yr and adding vehicle fleets and refrigerants brings the total to approximately 3800 tons/yr. To fill out the picture of Scope 1-3 emissions will require the addition of CO<sub>2</sub>e emissions from employee commuting. (Note: A thorough and comprehensive analysis of Scope 3 emissions attributed to supplies or services that are procured by the County is not currently contemplated due to the complexity of the task.) Nevertheless, as purchases and services are procured, the relative Scope 3 emissions of alternatives shall be considered when possible.

### **3.4.3 Electrical Energy Usage**

Ideally, in striving towards carbon neutrality, St. Lawrence County would obtain its electrical energy solely from non-fossil fuel sources, such as hydro, wind, solar, or biomass. In reality purchased electricity is generated by a mixture of sources, including fossil fuel and nuclear contributions. Each generation method for electrical energy has its own carbon-dioxide equivalent emission signature. The only meaningful way to reduce these Scope 2 emissions at this time is to use less electricity and/or purchase “green power”. Therefore, electrical energy conservation techniques need to be diligently pursued by all County Departments and agencies housed in County facilities.

### **3.4.4 Highway Construction and Maintenance:**

The County Highway Department maintains a large fleet of vehicles that contribute significantly to the County’s total GHG emissions. The Department needs to constantly strive toward reducing the total vehicle miles driven. One way of approaching this goal is to ask the theoretical question: “What is the minimum number of vehicles and vehicle-miles required in order to fulfill our legal requirements?” The answer to that question will differ from the answer based on operational considerations such as emergencies or unexpected weather or logistical situations. Shrinking budgets have forced and will continue to force an examination of vehicle use efficiency, regardless of GHG reduction goals.

Bridge construction and highway construction/maintenance have Scope 1, 2 and 3 emissions associated with them. The Department is constantly looking for ways to perform these functions using less energy and materials in order to save money and be able to accomplish more projects. One notable example is the innovative bridge abutment construction method that has been employed with great success at several sites. This method saves on concrete and cost. Another example is pavement recycling as a means to reduce virgin asphalt purchases.

### **3.4.5 Employee Vehicle Use When Commuting**

This component of the inventory is an example of documenting Scope 3 emissions. This effort would involve a survey of employee commuting behaviors and vehicle mileage, then making a projection of GHG emissions reductions based on reductions in per-capita vehicle miles driven. Emissions from employee commuting are legitimately a part of the GHG emissions for County operations, but they are not under the direct control of the County (with the exception of those employees who are allowed to use a County vehicle for this purpose). Until such time as the County obtains an accurate estimate of GHG emissions from this source and formally adds the CO<sub>2</sub>e to the total, it is premature to specify a reduction target for this source.

### **3.4.6 Waste Management**

St. Lawrence County's Solid Waste Management System is basically one of collection and transport. The County does not operate an active landfill but does perform ongoing leachate collection at the former Canton and Ogdensburg landfills. This material is taken to wastewater treatment plants for disposal. Recycling is a major emphasis and the County has contracts with a variety of firms that recycle components of the waste stream.

## **4. Forecast for Greenhouse Gas Emissions**

According to the data in Appendix 2, CO<sub>2</sub>e emissions from buildings and facilities range from 2,500-2,700 tons/yr; adding vehicle fleets and refrigerants brings the total to approximately 3,800 tons/yr. These figures do not include carbon dioxide-equivalent emissions from employee commuting. In order to accurately estimate the contribution from employee commuting, it will be necessary to conduct a survey of County employees. This is something the Planning Office could do in 2011 using templates provided by ICLEI.

GHG emissions are not expected to appreciably rise as a result of space heating loads in the near future because County operations are predicted to remain stable (no new buildings or facilities are planned). Nevertheless, in order to maintain our greenhouse gas inventory, it is extremely important that all County Departments that are responsible for fuel and electricity purchases continue to record on an annual basis, the following:

- Amount and type of fuel consumed and the cost (gallons #2 fuel oil, therms natural gas, etc., cost)
- Amount of electricity and cost (number of kWh, cost)

The Planning Office intends to compile these data yearly from each Department, enter it into the CACP software, and generate a report that will track the results of our efforts to reduce energy consumption, achieve cost savings, and limit GHG emissions.

## 5. Greenhouse Gas Emissions Reduction Target

It is virtually impossible for an entity such as St. Lawrence County Government to accomplish its mission without incurring any GHG emissions from fossil fuels. Even if cost were no object and the County were able to obtain all of its energy from renewable energy, there would still be GHG emissions associated with the manufacture, construction, and maintenance of the devices that provide these sources of power. Also, there are Scope 3 emissions associated with goods and services that are procured by the County. Therefore, a reasonable goal must be chosen that will be significant and practical at the same time.

The term “carbon-neutral” is often cited as an achievable long-term goal. Carbon neutrality means that the carbon released into the atmosphere by an entity (such as St. Lawrence County Government) is equivalent to that which is being sequestered from the atmosphere. Under such an equilibrium state it would be possible to use *some* fossil-fuel derived carbon as long as it was compensated for by reforestation or other long-term carbon sequestration methods. The key point is that the net effect on the atmospheric carbon dioxide budget on a year-to-year basis would be zero. This ideal is commonly called “getting to zero.” In practice, it remains an ideal in most instances and the actual goal chosen is some stated fraction of this ideal. In the Interim New York State Climate Action Plan, the target for the State as a whole is “80 by 50” which means a GHG emissions reduction of 80% from 1990 levels by the year 2050.

St. Lawrence County Government’s GHG emissions can only be reduced to a base level that is greater than zero. The County must use energy to provide basic services to the public. The County’s *net* GHG emissions, however, may be able to be significantly reduced by using County forests to sequester and thereby off-set emitted carbon. This is an area of research that the County shall pursue. Instead of the County choosing a goal such as “80 by 50” or “50 by 30” at this time, it makes more sense to look at GHG emissions since 2005 and try and keep them from rising from those levels as County operations expand. The data would suggest that the County attempt to remain around **or below** 2,500 tons of CO<sub>2</sub>e per year for buildings and facilities **and below** or around 3,500 tons of CO<sub>2</sub>e if vehicle fleet and refrigerants information is included. With additional data collected each year, it may make sense in the near future to pick a specific percentage reduction target number.

## 6. Existing Measures

Fiscal constraints have required most if not all County departments to examine ways to save on expenses. Some of these expenses involve GHG emissions, either directly or indirectly. The departments most central to GHG reduction efforts are those that manage the buildings and facilities and transportation fleets. The construction of the new County Correctional Facility included an energy-efficient HVAC system. The prior construction of the Human Services Center incorporated energy efficiency, although improvements are possible. The Public Safety Complex has an efficient heating system. Comprehensive energy audits of the County Courthouse Complex and Harold B. Smith Office Building are anticipated.

## 7. Proposed Measures

### 7.1 Buildings and Facilities:

The measure that would result in the single largest reduction in GHG emissions would be the installation of a biomass boiler to heat the County Complex and possibly the Harold B. Smith Office Building. A Pre-Feasibility Study: *Preliminary Biomass Heating Analysis - The St. Lawrence County Courthouse Complex* by Richmond Energy Associates in October 2008 showed that a biomass boiler that would displace some of the County's current natural gas purchases would save the county over \$400,000 over a 30-year period. Such a project would also have a positive effect on the biomass supply infrastructure and therefore local economy. The new system would use biomass to provide the base load of heat during the winter and natural gas during the spring and fall transition periods. Before such a change can be pursued further, the County needs to decide what to do with the former jail building and whether or not it is desirable to connect the Harold B. Smith Building to the hot water heating loop. Adding new load to the central heating plant will change the economics. In addition, the impact on GHG emission reduction will not be known until the system is properly sized for heating load and fuel use.

The County has not exhausted its potential for energy conservation in its various buildings. Temperature swings in the Harold B. Smith Building could be mitigated by south-facing window overhangs that let in winter sun but exclude summer sun.

The New York Power Authority (NYPA) is developing a program to install 100 MW of solar photovoltaics. From the NYPA web site (<http://www.nypa.gov/solar/100mw/default.htm>) on December 15, 2010:

We are currently exploring a public-private partnership for the installation of up to 100 megawatts (MW) of solar photovoltaic systems, including roof-mounted and ground-mounted PV arrays, at municipal facilities, public and private schools and government buildings throughout the state.”

NYPA is currently working to bring this program to fruition. There are two promising sites where ground-mounted photovoltaic arrays could be located: the Human Services Center and the County Correctional Facility. These arrays would tie into the electrical distribution grid through a net metering interface.

Operating the County's solid waste recycling and disposal system requires fuel and electricity. Compacting waste at transfer stations would reduce the number of long-distance hauls. Operating leachate pumps using photovoltaic electricity would off-set purchased electricity. Increasing recycling will generally have beneficial Scope 3 effects by reducing energy consumption associated with mining, petroleum extraction and timber harvesting.

These photovoltaic measures are examples of a “no regrets” strategy. They save money, GHGs, and by enacting the CAP, we are in a more favorable position to be the recipients of this program.

## **7.2 Vehicle Fleets:**

Vehicle fleets are maintained by Social Services, Sheriff's Office, Office for the Aging, Public Health and Highway. To maintain the GHG inventory, *departments operating vehicle fleets must accurately record annual fuel usage by quantity, type of fuel and cost. This will enable us to track costs and GHG emissions over time and discover where we can reduce fuel consumption.* The County should adopt a vehicle procurement policy specifying that all vehicles used in County operations meet or exceed E.P.A. fuel efficiency standards and that single-person trips are held to a minimum. Coupled with fuel efficiency, the County should enact an anti-idling policy for vehicles left to idle for three minutes or more. Vehicle routing optimization computer programs are available (example: ArcLogistics™) and should be used where appropriate to minimize travel distance.

## **7.3 Refrigerants:**

The County should systematically plan to replace its GHG refrigerants with non-GHG refrigerants.

## **7.4 Employee Commuting:**

As stated earlier, the Planning Staff intends to conduct a 2011 survey of employee commuting practices in an attempt to estimate GHG emissions from this sector. Depending on the results of the survey, reduction strategies could include anti-idling policies in County parking lots, incentives for car-pooling and bicycles, charging stations for electric vehicles, shuttle buses for noon shopping, etc.

Improvements in EPA fuel efficiency standards should, over time, have an important impact even in the absence of any specific local measures. It is possible that GHG emissions associated with commuting will be high when compared with other County emissions. A crude estimation based on the following assumptions yields a value of 4,713 tons as compared with 2,500-2,700 tons from buildings and facilities and 1,100-1,300 tons from vehicle fleets and refrigerants (Calculations in Appendix 4).

## 8. County Response to Changing Climate and the Effect of Peak Oil (Resiliency)

St. Lawrence County Government is facing the dual challenges of a changing climate and the inevitability that fossil fuel energy will become increasingly expensive. These phenomena will have direct cost-of-business implications and indirect effects as the public copes with the rising cost of heating their dwellings, operating vehicles and paying their taxes. Some of these effects are familiar; some are more difficult to anticipate.

For the purposes of this plan and measuring progress, the County has examined operations under its own control. In reality, however, the County Government cannot view itself as acting in isolation. Policies, practices and services of County Government will influence the public's ability to reduce GHG emissions. An example is the level of assistance provided by the IDA to emerging biomass energy businesses. Another example is the commitment to expand and improve broadband internet infrastructure that would allow increased telecommuting.

The take-home message here is that the County should, in a manner equivalent to that under NYCRR Part 617 (State Environmental Quality Review-SEQR), consider the GHG emissions ramifications of all actions it proposes to fund, approve or directly undertake. All County Departments and staff should be mandated to examine their duties, responsibilities and attendant energy use with respect to reducing GHG emissions. The County should make this a high priority and offer awareness training to employees in the same way that workplace safety and other job skills training are provided.

### 8.1 Climate Resiliency

Even if we were to dramatically reduce GHG emissions today, we are going to see some significant changes resulting from the higher concentrations of GHGs already in the atmosphere. Climate 'resiliency' or 'adaptation' refers to actions taken to prepare for climate change and reduce adverse impacts. It also includes actions to take advantage of new opportunities resulting from climate change.

The *New York State Climate Action Plan (CAP)* in Chapter 11 contains a discussion of adaptation to climate change, divided amongst the sectors of the State. The St. Lawrence County Plan incorporates those portions of Chapter 11 that are relevant to St. Lawrence County operations. Specifically, the County should follow the approach set forth on pages 11-3 and 11-4 of the NYS CAP:

- Understanding how the *climate* in New York State might change,
- Identifying potential *vulnerabilities* to a changing climate,
- Assessing *risk* levels of those vulnerabilities,
- Developing *adaptation strategies* that will help to minimize those risks,
- *Prioritizing* strategies, considering other adaptation tools, and developing an overall adaptation plan that is coordinated with greenhouse gas mitigation efforts.

The following list of potential effects on St. Lawrence County is by no means exhaustive but draws on effects identified in other publications, notably, *The New York State CAP, Climate Change in the Adirondacks-The Path to Sustainability* by Jerry Jenkins and those references in the Introductory section of this report:

1. Intense storm flooding will threaten roadways, infrastructure and developed areas.
2. Rains too intense for the land to absorb, along with reduced meltwater from dwindling snowpack, will cause erosion of topsoil, and will mean less reliable replenishment of groundwater and surface water sources used for public water supply.
3. Short-term droughts will increase in frequency, with dry spells of several weeks' duration punctuated by extreme rains and storms.
4. The range of some native plants, like the sugar maple, as well as some native animal species, may move further north, possibly becoming extirpated from New York. Mosquitoes and other pests may become more abundant.
5. Increased winter precipitation "on the order of" 20 to 30 %.
6. Extended periods of low stream flow in summer and fall.
7. Warmer summers and winters; shortened winter season.
8. Loss of winter recreation such as snowmobiling, cross-country skiing, ice fishing, etc.
9. Decrease of boreal habitats.
10. The cost of imported food will rise and its availability will decrease; increasing reliance on local food production.
11. Warmer climate insects, weeds, pathogens and parasites could increase (examples: kudzu, hemlock woolly adelgid, ticks, mosquito-borne diseases.)
12. Heat stress on livestock could increase.
13. Crop yields locally and elsewhere affected.
14. Ecosystem changes such as loss of spruce-fir forests, alpine tundra and boreal plant communities.
15. Aquatic ecosystems are particularly vulnerable (example: loss of brook trout).
16. Telecommunications infrastructure is vulnerable to severe weather events and power outages.
17. Reduced ice cover on Great Lakes; longer shipping season.
18. Changes in water levels and flows in the St. Lawrence River will affect shipping, recreation, environment and hydroelectric generation.
19. Out migration - in migration demographic shifts as the partial result of changing climate.
20. White-tail deer increases due to milder winters and increased vegetative growth.

## 8.2 Peak Oil Resiliency

When compared with the list of climate-related effects above, the rising fossil fuel prices and/or price volatility will have impacts that are more familiar to many. One merely has to think of all of the essential functions that are accomplished using oil or natural gas to see the scope of these impacts. Consequences for County Government may include:

1. Heating, maintenance, and monthly housing costs will occupy a larger share of household budgets. Heating assistance requests will increase.
2. Population will shift to urban centers, and density and mixed-use buildings will increase.
3. The economy will experience “significant” disruption and volatility.
4. Transportation will experience “profound pressure” to shift to more efficient modes.
5. Unemployment will increase along with the costs of doing business.
6. Increased competition will occur for biomass energy resources as an alternative to fossil fuels.
7. Increased building abandonment will occur with aging housing stock and inability to bring it up to energy efficiency standards.
8. Tax increases will result from a shrinking tax base yet continued demand for services.
9. Reduced travel and tourism are expected as fuel expense increases.
10. Contraction of fuel-dependant services, such as those provided by Highway, Social Services, Public Health and Office for the Aging (which have vehicle fleets) will occur as government attempts to contain costs.

## 9. Conclusions

The County Government will be called upon to an increasing degree to help its citizenry both conserve energy and use it efficiently, maintain a decent quality of life including affordable housing and employment, promote land uses that help sequester carbon and control land uses that generate GHG emissions. New York State will play a major role in this effort, yet critical decisions will be made locally. Individual towns, villages and the City of Ogdensburg must be fully engaged partners, but many municipalities will benefit from collective actions undertaken at the County level. County government must lead by example by taking definite steps to reduce its GHG emissions. ***This plan must be re-evaluated on a regular basis as climate change and energy knowledge increases.***

Decisions by the County have in the past been made for any number of reasons and often, but not always, a key factor is the impact on taxes. Taxes will always be a concern. Now the County needs to add to its normal decision-making checklist a new guiding principle: *The net impact on energy efficiency and GHG emissions.* This new principle is not an exercise in political correctness or a faddish add-on after other more important factors have been considered. It should be equal in stature with the most urgent of other concerns.

The availability of energy so profoundly enables our quality of life (even our life itself!), that we have become desensitized to it. Only when energy becomes costly or scarce are we reminded of the unbreakable grip it has on us. Therefore, to confront a change in our energy use can be quite threatening. Yet we must confront our energy habits and make choices.

St. Lawrence County -- as an entity -- is but one actor in a worldwide play that is unfolding before our eyes. This play has a large cast of supporting actors and the play will not succeed without the entire cast performing their individual parts.

## 10. Summary Guide for Further Steps

The following list represents steps that should be taken as soon as possible. Some of these steps represent work already in progress; some are new:

1. Perform energy audit of County buildings, including a re-examination of using a biomass-fired boiler to heat the Courthouse Complex.
2. Decide on the future use and configuration of the building in which the Old Jail was located.
3. Perform survey of employee commuting practices.
4. Require all County departments to examine their energy use and to maintain annual energy consumption data for use in tracking progress in GHG reduction efforts. Training and informational seminars should be made available to all County employees.
5. Build an assessment of GHG impact and energy efficiency into the standard State Environmental Quality Review (SEQR) process which the County is already required to use for actions that are funded, approved or directly undertaken.
6. Implement compaction at selected solid waste transfer stations to reduce the number of long-distance hauls.
7. Investigate innovative use of photovoltaics in both grid-tied and off-grid applications.
8. Adopt a vehicle procurement policy which affirms that all vehicles used in County operations meet or exceed E.P.A. fuel efficiency standards and that single-person trips are held to a minimum.
9. Consider enacting an anti-idling policy that applies to County parking lots.
10. Utilize vehicle routing optimization computer programs where appropriate to minimize travel distance.
11. Invest in reliable teleconferencing equipment as an alternative to travel to meetings.
12. Replace all GHG refrigerants with non-GHG refrigerants.
13. Continue to examine the County's procurement policies with respect to energy conservation and GHG impact.
14. Continue St. Lawrence County's annual membership in ICLEI-USA for the periods of September 1, 2011 to August 31, 2012 and September 1, 2012 to August 31, 2013.

## **11. 6 NYCRR Part 617 State Environmental Quality Review (SEQR) Compliance**

New York State Codes, Rules and Regulations (6 NYCRR) Part 617.1 (b-d) states:

(b) In adopting SEQR, it was the Legislature's intention that all agencies conduct their affairs with an awareness that they are stewards of the air, water, land, and living resources, and that they have an obligation to protect the environment for the use and enjoyment of this and all future generations.

(c) The basic purpose of SEQR is to incorporate the consideration of environmental factors into the existing planning, review and decision-making processes of state, regional and local government agencies at the earliest possible time. To accomplish this goal, SEQR requires that all agencies determine whether the actions they directly undertake, fund or approve may have a significant impact on the environment, and, if it is determined that the action may have a significant adverse impact, prepare or request an environmental impact statement.

(d) It was the intention of the Legislature that the protection and enhancement of the environment, human and community resources should be given appropriate weight with social and economic considerations in determining public policy, and that those factors be considered together in reaching decisions on proposed activities. Accordingly, it is the intention of this Part that a suitable balance of social, economic and environmental factors be incorporated into the planning and decision-making processes of state, regional and local agencies. It is not the intention of SEQR that environmental factors be the sole consideration in decision-making.

Among the actions listed as requiring compliance with SEQR is: “Agency planning and policy making activities that may affect the environment and commit the agency to a definite course of future decisions.” This Climate Action Plan, if approved, is an example of such an action and therefore requires SEQR compliance. The Plan itself is an Unlisted Action but contains specific recommended actions that individually could require their own individual SEQR compliance before they are funded, approved or directly undertaken. A short form Environmental Assessment (EAF) and Determination of Significance is attached to this document in Appendix 3. Prior to the time the St. Lawrence County Board of Legislators approves this plan, the board should accept the determination and it should be retained on file.

6 NYCRR Part 617.4 (a-b) states:

(a) Article 8 of the Environmental Conservation Law requires all agencies to adopt and publish, after public hearing, any additional procedures that may be necessary for them to implement SEQR. Until an agency adopts these additional procedures, its implementation of SEQR will be governed by the provisions of this Part. If an agency rescinds its additional SEQR procedures, it will continue to be governed by this Part. The agency must promptly notify the commissioner, and the commissioner shall publish a notice in the ENB, of the adoption of additional procedures or the rescission of agency SEQR procedures.

(b) To the greatest extent possible, the procedures prescribed in this Part must be incorporated into existing agency procedures. An agency may by local law, code, ordinance, executive order, resolution or regulation vary the time periods established in this Part for the preparation and review of SEQR documents, and for the conduct of public hearings, in order to coordinate the SEQR environmental review process with other procedures relating to the review and approval of actions. Such time changes must not impose unreasonable delay. Individual agency procedures to implement SEQR must be no less protective of environmental values, public participation and agency and judicial review than the procedures contained in this Part. This Part supersedes any SEQR provisions promulgated or enacted by an agency that are less protective of the environment.

St. Lawrence County should, pursuant to these sections (including public hearing and formal adoption by the Board), require the addition of the following to both the Short and the Full EAFs:

Short EAF, new question #13: Will the proposed action affect net energy use?

Short EAF, new question #14: Will the proposed action affect net greenhouse gas emissions?

Full EAF, Part 2, new statement 16b: Proposed action will not result in net energy conservation.

Full EAF, Part 2, new statement 16c: Proposed action will not result in net greenhouse gas emission reduction.

The addition of these questions and statements will insure that attention to the related issues of energy use and GHG emissions is included as a standard feature of required environmental reviews.

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## 13. Appendices

### APPENDIX 1

#### St. Lawrence County Resolution 111-2009

**PASSED BOL APRIL 6, 2009**

Operations Committee: 3-9-2009

RESOLUTION NO. 111-2009

#### **ST. LAWRENCE COUNTY BOARD OF LEGISLATORS RESOLUTION ON CLIMATE CHANGE AND PEAK OIL**

By Mr. Morrill, Chair, Operations Committee

**WHEREAS**, much of the scientific community worldwide is in agreement that fossil fuel use and land use patterns are contributing factors to global climate change, and

**WHEREAS**, changes in climate will continue to cause variations in temperature, precipitation, length and timing of seasons, and sea level, which will likely affect St. Lawrence County agriculture, forestry, fish and wildlife, recreation and tourism, and

**WHEREAS**, experts agree that fossil fuels are a finite resource, and many experts **generally** believe that among the major fossil fuel sources, oil and gas may be at or approaching maximum production worldwide (peak oil), and

**WHEREAS**, the St. Lawrence County Chamber of Commerce, representing approximately 800 businesses, passed a resolution asking the Board of Legislators to take action on climate change/peak oil, and

**WHEREAS**, there may be tangible actions that can be taken in St. Lawrence County to ameliorate climate change and mitigate the effects of peak oil through new educational programs, generation and enforcement of new policies, and reallocation of current financial resources, and

**WHEREAS**, the American Recovery and Reinvestment Act includes substantial funding opportunities for local governments and communities to undertake such actions, and

**WHEREAS**, combating climate change and mitigating the effects of peak oil can help create a more sustainable local economy, increase local jobs, create local business and investment opportunities, create a cleaner environment, and promote greater energy security, and



**APPENDIX 2**

**St. Lawrence County Greenhouse Gas Inventory**

201

# St. Lawrence County Government GHG Inventory

Baseline GHG Inventory 2005-  
2009

Inventory was created using ICLEI-Local Governments  
for Sustainability software CACP 2009

Arturs Saburovs



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## Introduction

The greenhouse gas inventory was completed by Lauren Vorhees (Fall 2009) and Arturs Saburovs (Spring 2010); both interns were supervised by Mr. Jon Montan, Planner at the Planning Office of St. Lawrence County government. ICLEI-USA – Local Governments for Sustainability created software CACP 2009 was utilized to compile natural gas, electricity, and refrigerant and fuel use information to estimate direct and indirect carbon dioxide, nitrous oxide, methane, carbon dioxide equivalent emissions, energy use and costs. Carbon dioxide equivalent is the main measuring method which includes nitrous oxide and methane emissions translated into carbon dioxide equivalents depending on their global warming potentials. For example, 1 ton of methane contributes to global warming the same as would 21 tons of carbon dioxide therefore the global warming potential of methane is 21. When it comes to GHG inventories all the emissions data is usually translated into CO2 equiv. Information from energy and other bills spanning from 2005-2009 was collected creating a 5 year inventory.

The following buildings and facilities were included in the inventory:

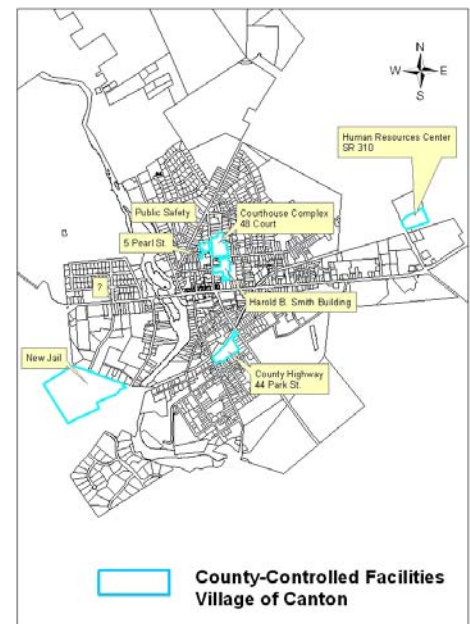
- 1) 5 Pearl Street (electricity, natural gas);
- 2) Canton Human Services (electricity, natural gas);
- 3) HBS Building (electricity, natural gas);
- 4) Highway Department (electricity);
- 5) Office of the Aging (electricity, natural gas);
- 6) County Complex (Old Jail) (electricity, natural gas);
- 7) Public Safety Complex (electricity, natural gas);
- 8) Sheriff's Garage (electricity);
- 9) Surrogate Building (natural gas);

The following solid waste facilities were included in the inventory:

- 10) Canton Landfill (electricity);
- 11) Gouverneur Transfer Station (electricity);
- 12) Ogdensburg Transfer Station (electricity);
- 13) Star Lake Transfer Station (electricity);

The following vehicle fleet information was included in the inventory:

- 14) Social Services (diesel, vehicle miles travelled annual data for 2005-2009);
- 15) Gouverneur Transfer Station (diesel, 2009);
- 16) Massena Transfer Station (diesel, 2009);
- 17) Ogdensburg Transfer Station (diesel, 2009);
- 18) Star Lake Transfer Station (diesel, 2009).



This inventory gives an overall look at the trends and amounts of emissions and costs of energy. The nature of creating such inventories is complicated and can only provide estimates, not mathematically precise data. The emissions amounts are calculated using various coefficients that are particular to our area's electricity generation methods and carbon content in the natural gas and diesel fuel, vehicle miles driven, etc. The major challenge to build this inventory was getting precise information on vehicle fleets. A suggestion for the future is to account for fuel use more precisely so that appropriate data for GHG estimations can be used. This inventory is imprecise because no accurate vehicle fleet information was obtainable.

## Analysis

### Year 2005

#### Buildings & Facilities

##### 5 Pearl Street

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 16         | 0          | 1          | 16                | 285            | 3,706     |

##### Canton Human Services

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 382        | 12         | 36         | 383               | 4,157          | 141,925   |

##### HBS Building

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 376        | 12         | 40         | 377               | 4,425          | 134,673   |

##### Highway Department

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 52         | 0          | 3          | 52                | 503            | 18,105    |

##### Office of the Aging

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 26         | 0          | 2          | 26                | 338            | 8,170     |

##### County Complex (Old Jail)

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 1133       | 23         | 143        | 1136              | 14,751         | 344,545   |

##### Public Safety Complex

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 182        | 0          | 16         | 182               | 1,943          | 53,610    |

Sheriffs Garage  
*Data missing*  
 Surrogate Building

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 39         | 0          | 6          | 39                | 660            | 7,139     |

**Subtotal: Buildings & Facilities**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 2,206      | 47         | 247        | 2,211             | 27,062         | 711,873   |

**Solid Waste Facilities**

**Canton Landfill**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 0          | 0          | 0          | 0                 | 20             | 1,008     |

**Gouverneur TS**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 18         | 0          | 0          | 18                | 152            | 8,012     |

**Ogdensburg TS**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 0          | 0          | 0          | 0                 | 6              | 473       |

**Star Lake TS**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 12         | 0          | 0          | 12                | 107            | 6,671     |

**Solid Waste Subtotal:**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 30         | 0          | 0          | 30                | 285            | 16,164    |

## Vehicle Fleet

### Social Services

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 246        | 1          | 1          | 246               | 3,046          | 0         |

### TOTAL 2005

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 2,482      | 48         | 248        | 2,487             | 30,393         | 728,037   |

## Year 2006

### Buildings & Facilities

#### 5 Pearl Street

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 13         | 0          | 0          | 13                | 202            | 3,549     |

#### Canton Human Services

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 322        | 12         | 28         | 322               | 3,289          | 114,647   |

#### HBS Building

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 377        | 12         | 38         | 378               | 4,340          | 124,222   |

#### Highway Department

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 52         | 0          | 2          | 52                | 492            | 21,244    |

#### Office of the Aging

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 22         | 0          | 1          | 22                | 295            | 8,757     |

#### County Complex (Old Jail)

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 1109       | 23         | 143        | 1114              | 14,556         | 317,658   |

#### Public Safety Complex

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 180        | 0          | 16         | 180               | 1,928          | 61,586    |

#### Sheriff's Garage

*Data missing*

#### Surrogate Building

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 41         |            | 6          | 41                | 716            | 8,506     |

**Subtotal: Buildings & Facilities**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 2,116      | 47         | 234        | 2,122             | 25,818         | 660,169   |

**Solid Waste Facilities**

**Canton Landfill**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 0          | 0          | 0          | 0                 | 15             | 906       |

**Gouverneur TS**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 15         | 0          | 0          | 15                | 131            | 8,534     |

**Ogdensburg TS**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 0          | 0          | 0          | 0                 | 3              | 493       |

**Star Lake TS**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 15         | 0          | 0          | 15                | 118            | 7,638     |

**Solid Waste Subtotal:**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 30         | 0          | 0          | 30                | 267            | 17,571    |

**Vehicle Fleet**

**Social Services**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 251        | 1          | 1          | 251               | 3,108          | 0         |

**TOTAL 2006**

| CO2 (Tons) | N2O (lbs.) | CH4 (lbs.) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|------------|------------|-------------------|----------------|-----------|
| 2,397      | 48         | 235        | 2,403             | 29,193         | 677,740   |

## Year 2007

### Buildings & Facilities

#### 5 Pearl Street

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 15         | 0         | 1         | 15                | 265            | 3,745     |

#### Canton Human Services

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 357        | 12        | 31        | 360               | 3778           | 132,482   |

#### HBS Building

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 380        | 12        | 40        | 383               | 4414           | 132,410   |

#### Highway Department

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 49         | 0         | 1         | 49                | 478            | 21,042    |

#### Office of the Aging

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 25         | 0         | 1         | 25                | 342            | 9,612     |

#### County Complex (Old Jail)

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 1147       | 24        | 145       | 1154              | 15,090         | 332,649   |

#### Public Safety Complex

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 186        | 0         | 16        | 186               | 1,965          | 63,918    |

#### Sheriff's Garage

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 20         | 0         | 0         | 20                | 192            | 9,206     |

#### Surrogate Building

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 43         | 0         | 8         | 43                | 759            | 7,730     |

#### Subtotal: Buildings & Facilities

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 43         | 0         | 8         | 43                | 759            | 7,730     |

## Solid Waste Facilities

### Canton Landfill

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 0          | 0         | 0         | 0                 | 11             | 885       |

### Gouverneur TS

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 17         | 0         | 0         | 17                | 141            | 9,358     |

### Ogdensburg TS

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 0          | 0         | 0         | 0                 | 5              | 540       |

### Star Lake TS

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 13         | 0         | 0         | 13                | 131            | 8,078     |

### Solid Waste Subtotal:

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 30         | 0         | 0         | 30                | 288            | 18,861    |

## Vehicle Fleet

### Social Services

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 241        | 1         | 1         | 242               | 2,993          | 0         |

### **TOTAL 2007**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 2,493      | 49        | 244       | 2,507             | 30,564         | 731,655   |

## Year 2008

### Buildings & Facilities

#### 5 Pearl Street

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 12         | 0         | 0         | 12                | 201            | 3,297     |

#### Canton Human Services

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 372        | 12        | 35        | 376               | 4037           | 235,910   |

#### HBS Building

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 378        | 12        | 39        | 380               | 4388           | 140,673   |

#### Highway Department (*December data missing*)

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 42         | 0         | 0         | 42                | 406            | 18,177    |

#### New Jail (*Readings start from August*)

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 90         | 3         | 6         | 90                | 854            | 32,890    |

#### Office of the Aging

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 22         | 0         | 0         | 22                | 293            | 9,027     |

#### County Complex (Old Jail)

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 1074       | 23        | 133       | 1080              | 13,897         | 339,467   |

#### Public Safety Complex

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 181        | 0         | 15        | 181               | 1,890          | 64,303    |

#### Sheriff's Garage (*December data missing*)

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 12         | 0         | 0         | 12                | 130            | 6,761     |

**Surrogate Building**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 40         | 0         | 6         | 40                | 694            | 7,102     |

**Subtotal: Buildings & Facilities**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 2,211      | 50        | 234       | 2,223             | 26,589         | 854,310   |

**Solid Waste Facilities****Canton Landfill**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 0          | 0         | 0         | 1                 | 17             | 1,048     |

**Gouverneur TS**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 17         | 0         | 0         | 17                | 130            | 8,825     |

**Ogdensburg TS**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 1          | 0         | 0         | 1                 | 13             | 878       |

**Star Lake TS**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 15         | 0         | 0         | 15                | 123            | 8,112     |

**Solid Waste Subtotal:**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 33         | 0         | 0         | 34                | 283            | 18,863    |

**Vehicle Fleet****Social Services**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 265        | 1         | 1         | 265               | 3,289          | 0         |

**TOTAL 2008**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 2,509      | 51        | 235       | 2,522             | 30,161         | 873,173   |

## Year 2009

### Buildings & Facilities

#### 5 Pearl Street

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 14         | 0         | 1         | 14                | 228            | 2,833     |

#### Canton Human Services

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 515        | 17        | 44        | 518               | 5286           | 74,563    |

#### HBS Building

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 352        | 12        | 38        | 352               | 4094           | 74,345    |

#### Highway Department

*No 2009 data*

#### New Jail (first read 7/30/08)

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 973        | 18        | 120       | 979               | 12710          | 153,497   |

#### Office of the Aging

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 23         | 0         | 0         | 23                | 293            | 5,536     |

#### County Complex (Old Jail)

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 946        | 16        | 119       | 950               | 12,307         | 182,888   |

#### Public Safety Complex

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 176        | 0         | 15        | 177               | 1,850          | 29,526    |

#### Sheriff's Garage (No 2009 data)

#### Surrogate Building

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 39         | 0         | 7         | 39                | 720            | 6,015     |

#### Subtotal: Buildings & Facilities

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 3,024      | 63        | 343       | 3,038             | 37,260         | 526,370   |

**Canton Landfill**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 0          | 0         | 0         | 1                 | 15             | 864       |

**Gouverneur TS**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 15         | 0         | 0         | 15                | 125            | 6,707     |

**Ogdensburg TS**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 0          | 0         | 0         | 0                 | 3              | 398       |

**Star Lake TS**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 11         | 0         | 0         | 11                | 117            | 6,162     |

**Solid Waste Subtotal:**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 26         | 0         | 0         | 27                | 260            | 14,131    |

**Refrigerants****Canton Human Services, Old Jail/Courthouse; 2009 (HFC-23)**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
|            |           |           | 491               |                |           |

**Vehicle Fleet****GTS, MTS, OTS, SLTS, Social Services**

| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 295        | 1         | 1         | 295               | 3659           | 0         |

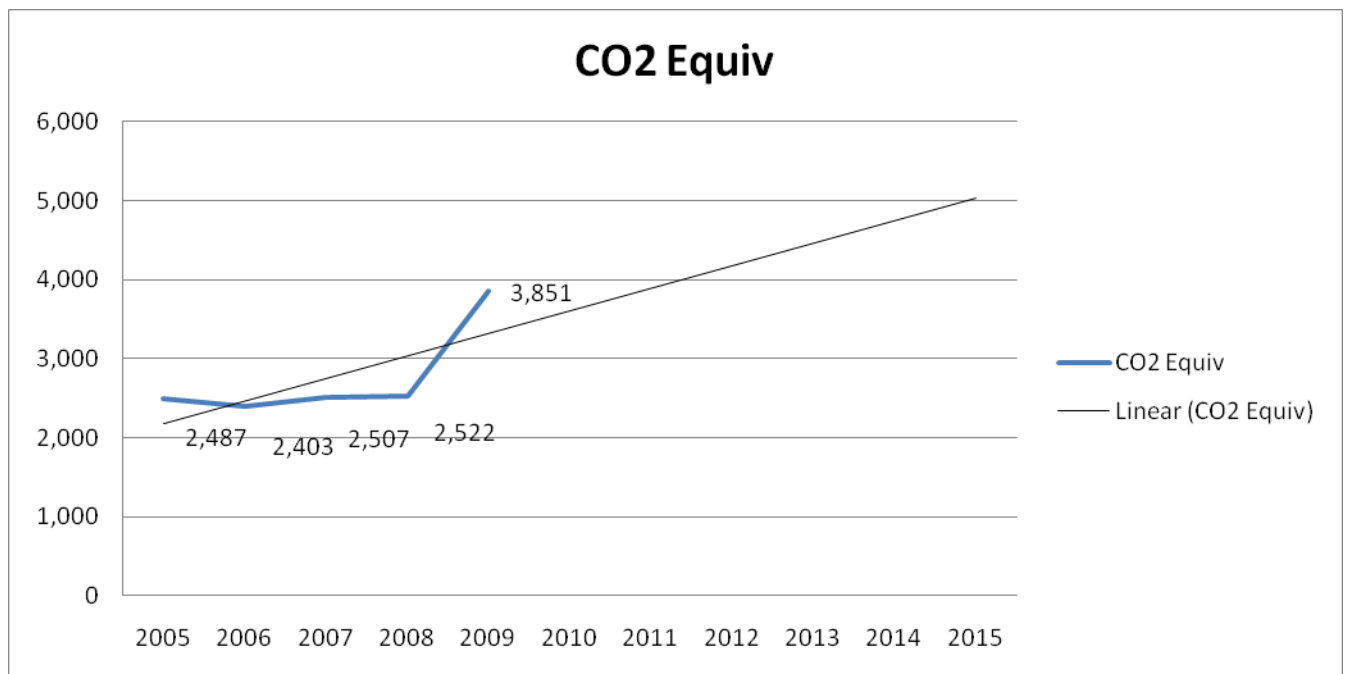
**TOTAL 2009**

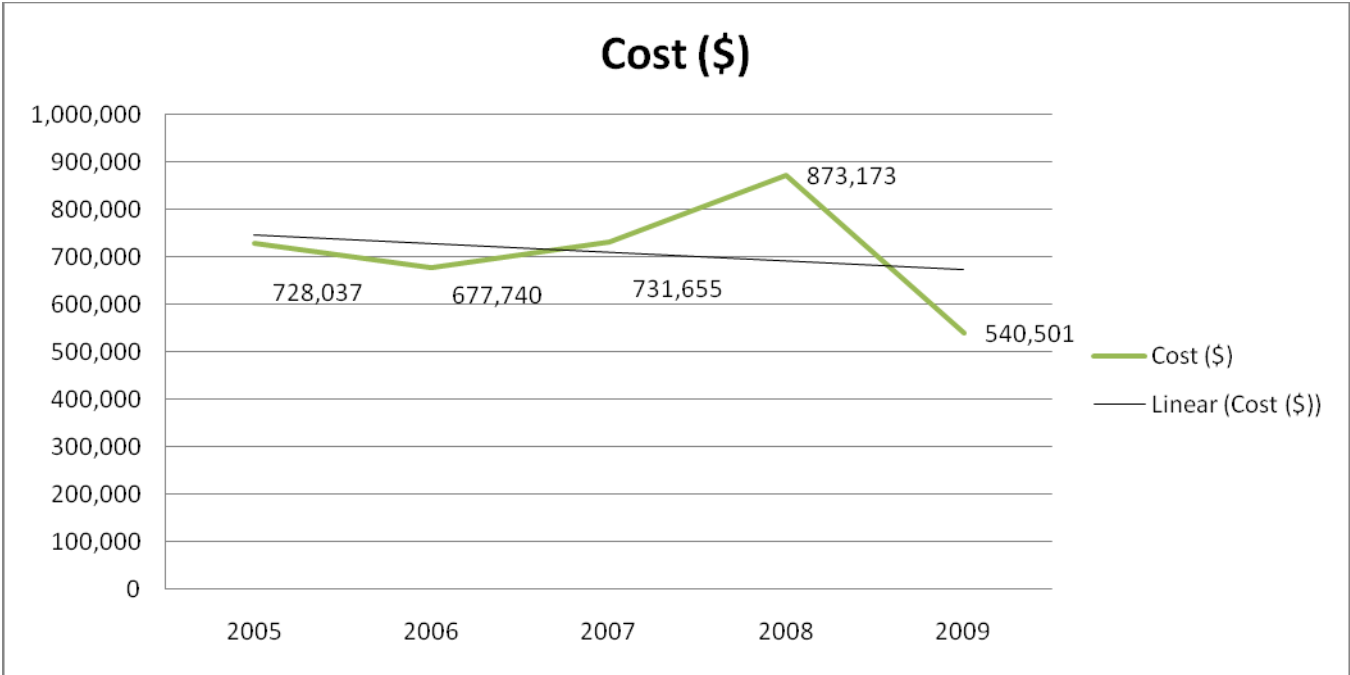
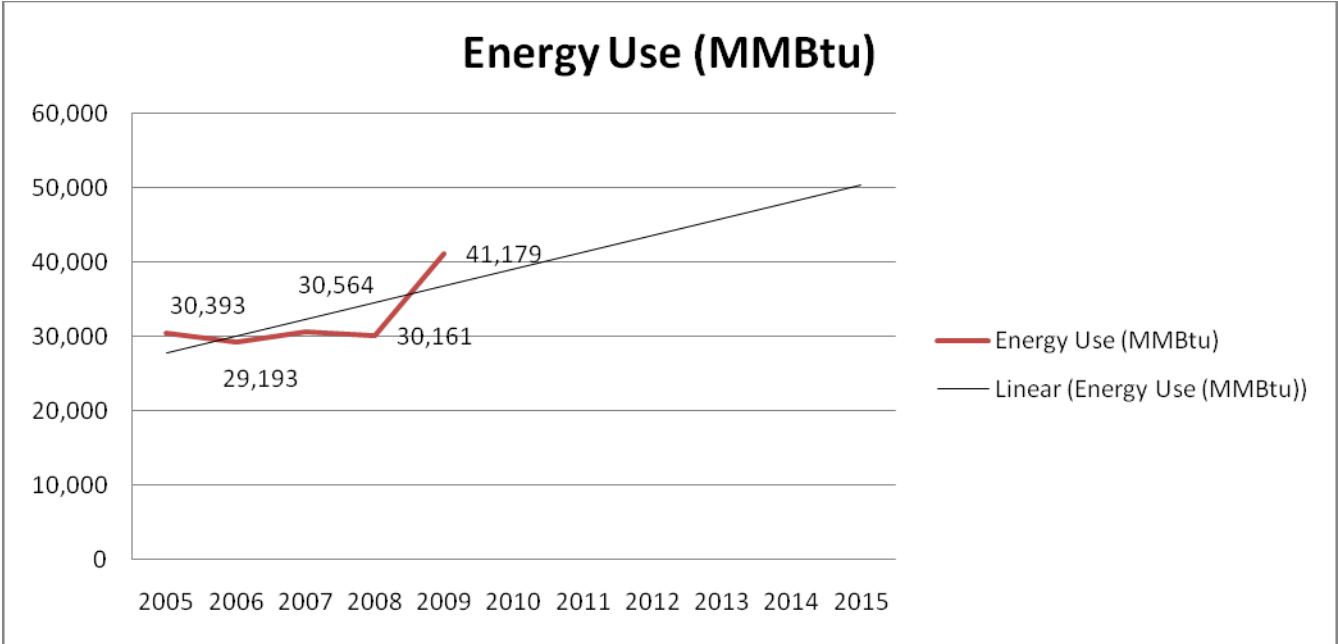
| CO2 (Tons) | N2O (lbs) | CH4 (lbs) | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$) |
|------------|-----------|-----------|-------------------|----------------|-----------|
| 3,345      | 64        | 344       | 3,851             | 41,179         | 540,501   |

## 5 Year Summary

(See discussion below when interpreting this tabular and graphical data.)

| Year           | CO2 (Tons)    | N2O (lbs)  | CH4 (lbs)    | Equiv. CO2 (tons) | Energy (MMBtu) | Cost (\$)        |
|----------------|---------------|------------|--------------|-------------------|----------------|------------------|
| 2005           | 2,482         | 48         | 248          | 2,487             | 30,393         | 728,037          |
| 2006           | 2,397         | 48         | 235          | 2,403             | 29,193         | 677,740          |
| 2007           | 2,493         | 49         | 244          | 2,507             | 30,564         | 731,655          |
| 2008           | 2,509         | 51         | 235          | 2,522             | 30,161         | 873,173          |
| 2009           | 3,345         | 64         | 344          | 3,851             | 41,179         | 540,501          |
| <b>Total</b>   | <b>13,226</b> | <b>260</b> | <b>1,306</b> | <b>13,770</b>     | <b>161,490</b> | <b>3,551,106</b> |
| <b>Average</b> | <b>2645.2</b> | <b>52</b>  | <b>261.2</b> | <b>2,754</b>      | <b>32,298</b>  | <b>710,221.2</b> |





## Results Analysis and Recommendations

The baseline GHG emissions inventory for the St. Lawrence County Government covers 5 years of mostly electricity and natural gas data used by the government's buildings. The inventory mostly focused on the "buildings & facilities" category which is generally known to contribute about 40% of total GHG emissions in the US. Nine buildings or facilities and four transfer stations were surveyed. It is important to review the list of buildings and facilities reported to make sure that all of the county government property is fairly reported and included in the inventory.

Vehicle fleet data in annual miles travelled was consistently available for Social Services. Vehicle fleet information was the most challenging task in this project. Significant improvements in how data is reported and collected need to be implemented. Information per department, per year, in gallons of gasoline, diesel, biodiesel or any other fuel burnt, or miles traveled, costs met would be most handy to include in the inventory. It is also important to know the average manufacturing years and types (passenger, minivans, etc.) for vehicles used.

In the future, I suggest that the county attempt to calculate employee commute and get inclusive and comprehensive vehicle fleet fuel use data (gallons and costs) that can be compiled on an annual basis. From the current understanding, vehicle fleets alone might be responsible for about one third of county government's GHG emissions, not even counting employee commute. Once the vehicle fleet and commute information is properly and comprehensively compiled, a new stage in planning can be started to consider restrictions, alternatives, etc.

Refrigerants information was available only from 2009. It is unknown if same or different or any refrigerants were used prior 2009. The method of accounting for involuntary refrigerant releases or leaks is simple: amounts of refrigerants that are put in to replace leaks is measured and reported which means that the same amount was most likely leaked into the atmosphere. If possible, ammonia could be a good, climate neutral replacement for refrigerants but that would depend on the refrigeration technology. Refrigerant information is worth investigating further because refrigerants are incredibly powerful greenhouse gases. They have high global warming potentials.

All the energy consumption data was entered into ICLEI's CACP 2009 software which produced relevant pollution, energy use and costs summary information. Data was entered by facility per month which turned out not to be most efficient method. In the future I suggest creating separate tabs (Go to Menu -> Years) for different years and data should be summarized per annum (combine total Jan.-Dec. data). That method will be faster and more efficient.

The St. Lawrence County Government over five years (2005-2009) was responsible for contributing at least **13,770 tons of carbon dioxide equivalent**, using at least **161,490 MMBtu** of energy and spending at least **\$3,551,106**.

On average the St. Lawrence County Government produced **2754 Tons of CO2 equiv.** per annum, used **32,298 MMBtu** of energy per annum and spent **\$710,221.2 per annum**. The trend has been mostly consistent with no major peaks or changes, although with slow increases since 2007.

It is important to note that information for Sheriff's Garage was not available for 2005, 2006, 2009. New Jail readings began only 7/30/2008. Highway Departments' Dec. 2008 data was also missing. Refrigerants information was available only for 2009. Vehicle fleets information was consistently available for the Social Services in vehicle miles traveled - no actual diesel or gasoline fuel costs were known therefore not included in the inventory. Transfer station vehicle fleet 2009 data was available. Several distortions therefore occur in the graphs above. If refrigerants and additional transfer station fleet information for 2009 were to be excluded then 2009 data would be the following:

CO2: 3050 Tons; N2O: 63 Tons; CH4: 343 Tons; CO2 equiv.: 3065 Tons; Energy: 3659 MMBtu; Cost: \$540,501 (remains the same).

In terms of carbon dioxide equiv. emissions they have been more or less consistent with a small rise in 2007 (2,507 Tons) and 2008 (2,522 Tons) and with a significant rise in 2009 (3065 or even 3,851 Tons, if refrigerants and additional vehicle fleet data is included). The overall trend has been rising.

In terms of energy use, on average the county government used 32,298 MMBtu per annum of energy.

In terms of costs, the county government's spending peaked in 2008 (\$873,173 per annum) and decreased sharply in 2009 (\$540,501). It has been on average above \$700,000 per annum.

I would recommend applying for and completing comprehensive energy (heating, lighting, etc.) audits on all nine facilities, transfer stations and any other buildings in country's possession. NYSERDA and National Grid audits could be the first ones to consider in the near future. These audits would evaluate heating and lighting use and suggest improvements. The very basic improvements include proper insulation, weather stripping on doors and windows, lighting sensors, properly installed and set thermostats that would help to not only monitor but also use minimum or optimum energy per building and avoid waste when buildings or rooms are not in use. I suggest consulting an energy audit entity for further questions regarding improvements.

The information gathered mostly from buildings and facilities shows that the county government emits roughly around 2,500-2,700 Tons of carbon dioxide equivalent per year. If vehicle fleet and refrigerants information is included that number rises to

roughly around 3,800 Tons of carbon dioxide equivalent emissions. That is a significant difference. I would suggest that the county attempt to remain around or below 2,500 Tons of carbon dioxide equivalent per annum for buildings and facilities and below or around 3,500 Tons of carbon dioxide equivalent if vehicle fleet and refrigerants information is included. Also, refrigerants could be replaced with chemicals that are not GHG that would help to keep the annual carbon dioxide emissions lower. In order to remain around those numbers I suggest energy audits and improvements/retrofits where and whenever possible and feasible. I do not predict significant rises in energy consumption for the county government unless new buildings are built or vehicle fleets are expanded. The only factor that is almost sure to rise is energy cost on which the county government should focus. By cutting down and becoming energy smart the county will be able to save itself money and GHG cuts will come as a positive benefit.

## APPENDIX 3

### 6 NYCRR Part 617 (SEQR) Materials

617.20

#### Appendix C

#### State Environmental Quality Review

### SHORT ENVIRONMENTAL ASSESSMENT FORM

For UNLISTED ACTIONS Only

**PART I - PROJECT INFORMATION (To be completed by Applicant or Project Sponsor)**

|   |  |
|---|--|
| 1. APPLICANT/SPONSOR<br>St. Lawrence County   | 2. PROJECT NAME<br>Climate Action Plan |
| 3. PROJECT LOCATION:<br>Municipality Multiple County St. Lawrence County  |  |
| 4. PRECISE LOCATION (Street address and road intersections, prominent landmarks, etc., or provide map)<br>Buildings and vehicle fleets under direct control of St. Lawrence County Government.  |  |
| 5. PROPOSED ACTION IS:<br><input checked="" type="checkbox"/> New <input type="checkbox"/> Expansion <input type="checkbox"/> Modification/alteration   |  |
| 6. DESCRIBE PROJECT BRIEFLY:<br>Adoption of a Climate Action Plan whose scope is energy use and greenhouse gas emissions reduction for operations under the direct control of St. Lawrence County Government. Plan contains specific recommendations whose actions would be subject to future SEQR review.  |  |
| 7. AMOUNT OF LAND AFFECTED:<br>Initially NA acres    Ultimately NA acres  |  |
| 8. WILL PROPOSED ACTION COMPLY WITH EXISTING ZONING OR OTHER EXISTING LAND USE RESTRICTIONS?<br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No    If No, describe briefly  |  |
| 9. WHAT IS PRESENT LAND USE IN VICINITY OF PROJECT?<br><input type="checkbox"/> Residential <input type="checkbox"/> Industrial <input type="checkbox"/> Commercial <input type="checkbox"/> Agriculture <input type="checkbox"/> Park/Forest/Open Space <input checked="" type="checkbox"/> Other<br>Describe:<br>This criteria is not relevant. |  |
| 10. DOES ACTION INVOLVE A PERMIT APPROVAL, OR FUNDING, NOW OR ULTIMATELY FROM ANY OTHER GOVERNMENTAL AGENCY (FEDERAL, STATE OR LOCAL)?<br><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    If Yes, list agency(s) name and permit/approvals:  |  |
| 11. DOES ANY ASPECT OF THE ACTION HAVE A CURRENTLY VALID PERMIT OR APPROVAL?<br><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    If Yes, list agency(s) name and permit/approvals:  |  |
| 12. AS A RESULT OF PROPOSED ACTION WILL EXISTING PERMIT/APPROVAL REQUIRE MODIFICATION?<br><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |  |
| I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE TO THE BEST OF MY KNOWLEDGE<br>Applicant/sponsor name: Jon R. Montan, Jr., Planner III    Date: 2/8/2011<br>Signature: <i>Jon R. Montan Jr.</i>   |  |

**If the action is in the Coastal Area, and you are a state agency, complete the Coastal Assessment Form before proceeding with this assessment**

OVER  
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**PART II - IMPACT ASSESSMENT (To be completed by Lead Agency)**

A. DOES ACTION EXCEED ANY TYPE I THRESHOLD IN 6 NYCRR, PART 617.4?  Yes  No If yes, coordinate the review process and use the FULL EAF.

B. WILL ACTION RECEIVE COORDINATED REVIEW AS PROVIDED FOR UNLISTED ACTIONS IN 6 NYCRR, PART 617.6? If No, a negative declaration may be superseded by another involved agency.  
 Yes  No

C. COULD ACTION RESULT IN ANY ADVERSE EFFECTS ASSOCIATED WITH THE FOLLOWING: (Answers may be handwritten, if legible)

C1. Existing air quality, surface or groundwater quality or quantity, noise levels, existing traffic pattern, solid waste production or disposal, potential for erosion, drainage or flooding problems? Explain briefly:

C2. Aesthetic, agricultural, archaeological, historic, or other natural or cultural resources; or community or neighborhood character? Explain briefly:

C3. Vegetation or fauna, fish, shellfish or wildlife species, significant habitats, or threatened or endangered species? Explain briefly:

C4. A community's existing plans or goals as officially adopted, or a change in use or intensity of use of land or other natural resources? Explain briefly:

C5. Growth, subsequent development, or related activities likely to be induced by the proposed action? Explain briefly:

C6. Long term, short term, cumulative, or other effects not identified in C1-C5? Explain briefly:  
 This action is part of an international effort to reduce greenhouse gas emissions and thereby mitigate and cope with potentially severe climate change.

C7. Other impacts (including changes in use of either quantity or type of energy)? Explain briefly:  
 This action seeks to reduce energy consumption through conservation, efficiency and decreased reliance on fossil fuel sources.

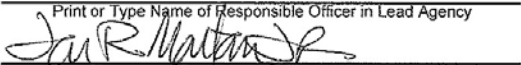
D. WILL THE PROJECT HAVE AN IMPACT ON THE ENVIRONMENTAL CHARACTERISTICS THAT CAUSED THE ESTABLISHMENT OF A CRITICAL ENVIRONMENTAL AREA (CEA)?  
 Yes  No If Yes, explain briefly:

E. IS THERE, OR IS THERE LIKELY TO BE, CONTROVERSY RELATED TO POTENTIAL ADVERSE ENVIRONMENTAL IMPACTS?  
 Yes  No If Yes, explain briefly:  
 Despite overwhelming scientific evidence of anthropogenic greenhouse gas-caused climate change, there remain skeptics.

**PART III - DETERMINATION OF SIGNIFICANCE (To be completed by Agency)**

**INSTRUCTIONS:** For each adverse effect identified above, determine whether it is substantial, large, important or otherwise significant. Each effect should be assessed in connection with its (a) setting (i.e. urban or rural); (b) probability of occurring; (c) duration; (d) irreversibility; (e) geographic scope; and (f) magnitude. If necessary, add attachments or reference supporting materials. Ensure that explanations contain sufficient detail to show that all relevant adverse impacts have been identified and adequately addressed. If question D of Part II was checked yes, the determination of significance must evaluate the potential impact of the proposed action on the environmental characteristics of the CEA.

- Check this box if you have identified one or more potentially large or significant adverse impacts which **MAY** occur. Then proceed directly to the FULL EAF and/or prepare a positive declaration.
- Check this box if you have determined, based on the information and analysis above and any supporting documentation, that the proposed action **WILL NOT** result in any significant adverse environmental impacts **AND** provide, on attachments as necessary, the reasons supporting this determination.

|   |   |
|---|---|
| St. Lawrence County   | 2/8/2011  |
| _____   | _____   |
| Name of Lead Agency   | Date  |
| Jon R. Montan, Jr.  | Planner III   |
| _____   | _____   |
| Print or Type Name of Responsible Officer in Lead Agency                            | Title of Responsible Officer                                  |
|  | _____   |
| Signature of Responsible Officer in Lead Agency                                     | Signature of Preparer (If different from responsible officer) |

**Reset**

State Environmental Quality Review  
**NEGATIVE DECLARATION**  
Notice of Determination of Non-Significance

Project Number N/A

Date: 2/8/2011

This notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (State Environmental Quality Review Act) of the Environmental Conservation Law.

The St. Lawrence County Board of Legislators as lead agency, has determined that the proposed action described below will not have a significant adverse environmental impact and a Draft Impact Statement will not be prepared.

**Name of Action:**

Adoption of the St. Lawrence County Climate Action Plan

**SEQR Status:** Type 1   
Unlisted

**Conditioned Negative Declaration:**  Yes  
 No

**Description of Action:**

Adoption of a Climate Action Plan to inventory and reduce greenhouse gas emissions, conserve energy and save money with respect to operations under the control of St. Lawrence County Government.

**Location:** (Include street address and the name of the municipality/county. A location map of appropriate scale is also recommended.)

County-owned facilities, vehicles and operations.

**Reasons Supporting This Determination:**

(See 617.7(a)-(c) for requirements of this determination ; see 617.7(d) for Conditioned Negative Declaration)

The Climate Action Plan itself is an Unlisted Action but contains specific recommended actions that individually could require their own individual SEQR compliance before they are funded, approved or directly undertaken. Adopting the Plan does not insure that any particular action will occur - only that they should occur. Notably, the Plan calls for amending the SEQR short and full EAFs used by St. Lawrence County to address the two related issues of energy conservation and net greenhouse gas emissions.

**If Conditioned Negative Declaration**, provide on attachment the specific mitigation measures imposed, and identify comment period (not less than 30 days from date of publication in the ENB)

**For Further Information:**

Contact Person: Jon R. Montan, Jr., Planner III

Address: St. Lawrence County Planning Office, 48 Court St., Canton, NY 13617

Telephone Number: 315-379-2292

**For Type 1 Actions and Conditioned Negative Declarations, a Copy of this Notice is sent to:**

Chief Executive Officer, Town / City / Village of

Other involved agencies (If any)

Applicant (If any)

Environmental Notice Bulletin, 625 Broadway, Albany NY, 12233-1750 (Type One Actions only)

## APPENDIX 4

### Employee Commuting GHG Estimates

A = # County employees = 954 (data from Payroll Office)

B = # Work days/yr. = 260

C = # Trips/day = 2

D = Ave. distance to work (from 2000 Census) = 20.4 min/60 X 55 mph = 19 miles

E = Ave. passenger/vehicle = 1

F = Ave. Pounds CO<sub>2</sub> (e) per mile ~ 1 (<http://www.epa.gov/oms/consumer/f00013.htm> , combined passenger car and light truck emissions factors)

Approximate Annual CO<sub>2</sub>(e) tons from commuting = [(A/E)\*B\*C\*D\*F]/2000 ~ 4713 tons

