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Draft
MEETING MINUTES
February 18, 2009 7:00 PM
Room 226, County Courthouse
Canton, New York
Action items in bold italics

1. **Call to Order:** Chairman D. Katz called the meeting to order at 7:05 PM.

2. **Roll Call, Determination of Quorum:** A quorum was NOT initially present. A quorum was achieved at 7:18 PM.
Members present included: T. Cutter; B. Flavin; A. Heidenreich, R. Horst; D. Katz; C. Rediehs, J. Rosales; L. Rudiger; P. Skomsky; A. Soutar; B. Zimmerman.
Members absent included: D. Church; D. Howard; G. Johnson; L. Perry D. O'Shea.
Staff: J. Montan; J. Tenbusch.
Guests: S. Rau.
Press: None.

3. **Hearings, Comments from the Public:** D. Katz introduced Jon Montan, Planner III with the St. Lawrence County Planning Office, and senior staff to the EMC.

Montan delivered a presentation titled "Bad Actors: Invasive Insects in Northern New York". His presentation centered on two insects: the Asian Longhorned Beetle (ALB), and the Emerald Ash Borer (EAB). (See pictures, next page.)

Montan reported that the Asian Longhorned Beetle was first observed in New York in Brooklyn, in 1996. It was subsequently found in 1998 in Chicago, Illinois and in 2002 and 2004 in some communities in New Jersey. Most recently, an intensive effort has been mounted to eliminate infested trees in Worcester, Massachusetts. ALB larvae bore tunnels into trees, disrupting the flow of nutrients and ultimately killing the trees. Eradication involves the elimination of all maple trees (the preferred host for ALB) in an affected area. Montan noted that if ALB were to become established in St. Lawrence County, the maple syrup/sugar business would ultimately be destroyed.

Regarding the Emerald Ash Borer (EAB), Montan reported that this insect was first observed in the Detroit area in 2002. Recently, the EAB has been found as close to St. Lawrence County as Ottawa and Montreal. Ash trees affected by EAB typically die in 3-5 years.

Montan summarized by saying that the threat of these insect infestations is the prime reason that DEC has issued a ban on moving firewood more than 50 miles. It is vitally important that everyone be able to recognize these invasive insects and report them immediately if found to Cornell Cooperative Extension and/or the Animal, Plant Health Inspection Service (APHIS).

Asian Longhorned Beetle

Emerald Ash Borer

4. **Acceptance of Order of Business, Items for New Business, Items for Unfinished Business:** The Order of Business was accepted by consensus.

5. **Approval of the Minutes of the January 16, 2009 Meeting:** J. Tenbusch reported that the draft minutes of the January meeting indicated (in Item #9) that the EMC had decided to reconvene the Ad Hoc Wind Farm Model Ordinance Committee. Further review of the notes from that meeting indicate that, while that topic was discussed, no motion was made to reconvene that committee. Instead, the motion that was made (Rudiger, Horst) at that point was to approve the EMC Work Plan for 2009. Tenbusch apologized for the mistake. A motion to approve the amended January meeting minutes (R. Horst, R. Flavin) was passed.

6. **Report by the Representative of the Board of Legislators**: No report. C. Rediehs reported that Laura Perry had recommended that the Board of Legislators ask the EMC to look at the dredging project proposed by the Ogdensburg Bridge & Port Authority.

7. **Reports by EMC Members on Conversations with County Legislators**:
   - T. Cutter spoke with G. Paquin. He will e-mail Paquin after EMC meetings.
   - C. Rediehs spoke with P. Turbett about invasive insects.

8. **Report of the Committees:**

   a. **Executive** – D. Katz. No report.

   b. **Education** – R. Horst reported:
      - The Education Committee suggested that the EMC incorporate a Prescription Medicine collection effort as part of its upcoming Household Hazardous Waste Collection Days. Staff will look into the feasibility of including a prescription collection component.
      - The Committee proposed possible speakers for EMC meetings, including one on the rooftop highway, and another on climate change – possibly a speaker from DEC's Office of Climate Change.
      - The Committee began to discuss a resolution proposed by the St. Lawrence County Chamber of Commerce asking that the County Board of Legislators to prepare a plan of response to the negative impacts caused by climate change and peak oil; the Committee then adjourned its meeting in order to join discussion with the Natural Resources Committee.

   c. **Natural Resources** – A. Heidenreich reported that:
      - The Committee had discussed the proposal by the Ogdensburg Bridge & Port Authority to dredge the harbor at Ogdensburg; the Committee needs additional information about this project (invite Wade Davis to speak to the EMC?).
      - The Committee discussed a proposal to harvest wood from County land.
      - The Committee discussed the potential impacts of further development of a Rt. 11 highway corridor. Staff will contact SLU to find students who might be able to research some potential routes/bypasses that might be least invasive to the environment.

- The NR Committee had reviewed the Chamber of Commerce draft resolution. The Committee developed a draft EMC resolution for consideration by the Board of Legislators. The Committee also prepared several accompanying documents: a *Background Information and Rationale* on the resolution, a *Proposed Action Framework*, and a *Summary of Current Science & Expected Regional Impacts*.
  - L. Rudiger made a motion (Horst) that the EMC send their draft resolution to the Board of Legislators for action.
    - Heidenreich stated that the EMC should emphasize the Chamber resolution, since that resolution represented the majority agreement of over 800 businesses in the County.
    - Rudiger noted his support for the EMC resolution; he noted that the background information might be considered controversial, and suggested that it not be included when the resolution is sent to the Board of Legislators.
    - Horst (Cutter) then called the question: four ayes; seven nays. The motion failed.
  - J. Rosales proposed amending the EMC resolution be amended to include reference to similar guidelines being proposed by DEC; T. Cutter and B. Zimmerman disagreed. Rosales noted that the *Summary of Current Science* is widely accepted.
  - Rudiger made a motion (Cutter) to remove the *Summary of Current Science* from the packet to be forwarded to the Board of Legislators; Rudiger felt that its inclusion would make the document too political, while Cutter felt that it would be overkill. Upon a vote, there were three ayes; six nays. The motion failed.
  - Rediehs made a motion to revise the draft EMC resolution to state "Whereas the scientific community worldwide is in agreement…"; after some discussion the motion was approved (nine ayes; three nays).
  - Them resolution was approved by a vote of nine ayes, two nays.

    (Documents attached as approved by the EMC.)

d. NYSAEMC – No report.

9. Report of the Staff: No report. Rudiger asked about Planning staff's presentation to the Board of Legislators about biomass. Montan reported that that presentation was delayed; he will share that presentation with the EMC after it is presented to the Board of Legislators.

10. Unfinished Business: None.

11. New Business:

- Katz appointed R. Horst and B. Zimmerman to serve as a Nominating Committee to determine a slate of EMC officers (Chair, Vice Chair, Secretary) for election at the next EMC meeting.

12. Announcements:

- Rosales announced that the White Paper on Citizen Science, which was co-written by Rosales, Montan and Flavin, has been submitted to the Adirondack Journal of Environmental Science for publication.

13. **Message to Board of Legislators:** Please inform your Legislator that the EMC is forwarding a Resolution on Climate Change and Peak Oil, with supporting documents. Ask them to consider it carefully.

The meeting adjourned at 8:50 PM.

Andrew Soutar, Secretary

Minutes prepared by J. Tenbusch, J. Montan

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ST. LAWRENCE COUNTY BOARD OF LEGISLATORS
RESOLUTION ON CLIMAGE CHANGE AND PEAK OIL

WHEREAS the scientific community worldwide is in agreement that fossil fuel use and land use patterns are contributing 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 generally agree that, among the major fossil fuel sources, oil and gas are at or are approaching maximum production worldwide (peak oil), and

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

WHEREAS there are 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 federal economic recovery bill 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

WHEREAS early action by St. Lawrence County to identify such funding, business, investment, and job creation opportunities will maximize the availability of such opportunities

NOW, THEREFORE BE IT RESOLVED that St. Lawrence County Board of Legislators directs the County Planning Office to initiate a climate change/peak oil planning process by submitting a scope-of-plan, timetable, and budget recommendation to the St. Lawrence County Board of Legislators by July 10, 2009, for action, and

BE IT FURTHER RESOLVED that, in order to complete the planning process and produce a climate change/peak oil plan, the County Planning Office shall draw upon the knowledge and opinion of representatives from the Environmental Management Council, County Planning Board, municipal governments, colleges/universities, NYS Department of Environmental Conservation, agricultural and non-agricultural businesses, St. Lawrence County Chamber of Commerce, non-profit organizations and interested citizens.

ST LAWRENCE COUNTY CHAMBER OF COMMERCE RESOLUTION ON CLIMATE CHANGE AND PEAK OIL

WHEREAS international scientific experts are generally in agreement that human factors are contributing to the warme/ climate, and

WHEREAS changes in climate will continue to cause variations in temperature, precipitation, season and sea level, which could affect North County agriculture, forestry, fisheries, and tourism, and

WHEREAS experts generally agree that oil and gas are approaching maximum production worldwide (peak oil), and

WHEREAS there are 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 combating climate change and mitigating the effects of peak oil can help create a more sustainable economy, increase local jobs, create a cleaner environment and promote greater energy security, therefore, be it

RESOLVED that the Board of Directors of the St. Lawrence County Chamber of Commerce acknowledges the challenge and need for St. Lawrence County to prepare a plan of response and to mitigate negative impacts, and further

RESOLVED that the joint St. Lawrence County Chamber of Commerce Energy Task Force and the North Country Symposium Energy Research/Action Team urge the St. Lawrence County Board of Legislators to implement a plan to reduce local greenhouse gas emissions, adapt to current climate changes, and mitigate the effects of peak oil.

Passed by the St. Lawrence County Chamber Board of Directors, Dec. 18, 2008

Climate Smart Communities

A Guide for Local Officials

February 2009

State of New York - David A. Paterson, Governor

New York State Department of Environmental Conservation – Pete Grannis, Commissioner
New York State Energy Research and Development Authority – Francis Murray, President
New York State Department of State – Lorraine Cortés-Vázquez, Secretary of State
New York State Public Service Commission – Garry Brown, Chair

New York State Department of State

Model
CLIMATE SMART COMMUNITY PLEDGE

Councilmember_____ moved and Councilmember _____ seconded that:

WHEREAS, the Town/Village/City of _____ (hereinafter "local government") believes that climate change poses a real and increasing threat to our local and global environments which is primarily due to the burning of fossil fuels; and

WHEREAS, the effects of climate change will endanger our infrastructure, economy and livelihoods; harm our farms, orchards, ecological communities, including native fish and wildlife populations; spread invasive species and exotic diseases; reduce drinking water supplies and recreational opportunities; and pose health threats to our citizens; and

WHEREAS, we believe that our response to climate change provides us with an unprecedented opportunity to save money, and to build livable, energy-independent and secure communities, vibrant innovation economies, healthy and safe schools, and resilient infrastructures; and

WHEREAS, we believe the scale of greenhouse gas (GHG) emissions reductions required for climate stabilization will require sustained and substantial efforts; and

WHEREAS, we believe that even if emissions were dramatically reduced today, communities would still be required to adapt to the effects of climate change for decades to come,

IT IS HEREBY RESOLVED that Town/Village/City of _____ , in order to reduce greenhouse gas emissions and adapt to a changing climate will

1. Pledge to Combat Climate Change by Becoming a Climate Smart Community

Set goals to reduce GHG emissions and adapt to predicted climatic changes. Establish a task force of local officials and community members to review the issues and propose a plan of action. Designate a point person who will oversee climate change initiatives and publicly report on progress. Work cooperatively with similar task forces in neighboring communities to ensure that efforts complement and reinforce one another. As an official signal of commitment and for access to technical resources, sign on to a widespread climate campaign such as ICLEI Local Governments for Sustainability - Climate Protection campaign.

2. Set Goals, Inventory Emissions, Move to Action

Gather data, inventory GHG gas emissions, and establish baselines for local government operations and community sectors. Develop quantifiable interim GHG emission targets consistent with emission reduction goals and propose a schedule and financing strategy to meet them. Encourage stakeholder and public input and develop an action plan. Report emissions to The Climate Registry (TCR), which has developed a standardized method for reporting emissions inventories; use ICLEI and TCR's tools to track and evaluate progress.

3. **Decrease Energy Demand for Local Government Operations**

Adopt a goal of reducing electricity use by 15 percent from projected levels no later than 2015.

A. **Existing Public Facilities**. Inventory current building electricity usage and identify opportunities for conservation and efficiency retrofits. Obtain energy assessments from the New York State Energy Research and Development Authority (NYSERDA), the New York Power Authority, the Long Island Power Authority or other professionals. Consider actions such as purchasing energy efficient equipment and appliances, such as ENERGY STAR®; improving lighting, heating, and cooling efficiency; setting thermostats for maximum energy conservation; decreasing plug load from office equipment; and increasing pump efficiency in water and wastewater systems.

B. **New Public Buildings**. Achieve at least minimum U.S. Green Building Council Leadership in Energy and Environmental Design standards (LEED Silver) for all new local government buildings.

C. **Infrastructure**. Incorporate energy efficient technologies and operations and maintenance practices into municipal street lighting, traffic signals, and water and wastewater treatment facilities.

D. **Vehicle Fleet and Commuting**. Improve the average fuel efficiency of local government fleet vehicles. Discourage vehicle idling and encourage bicycling, car-pooling and public transit for employees. Consider reducing the number of vehicles; converting fleet vehicles to sustainable alternative fuels; and using electric vehicles where possible.

4. Encourage Renewable Energy for Local Government Operations

Supply as much of the local government's power, heat and hot water needs as possible from solar, wind, and small hydro through purchase or direct generation.

5. Realize Benefits of Recycling and Other Climate Smart Solid Waste Management Practices

Expand the "reduce, reuse and recycle" approach to waste management in local government operations and in the whole community. Reduce the amount of solid waste generated -- promote backyard composting, implement volume-based pricing and educate residents on how to prevent waste. Promote reuse by organizing community-wide yard sales, and providing a space for drop-off or trade of reusable goods. Provide recycling receptacles in local government buildings and outdoor spaces, require duplex printing in government offices, compost food scraps and green waste, and adopt a comprehensive green purchasing program.

6. Promote Climate Protection through Community Land Use Planning

Combat climate change by encouraging low-emissions development that is resilient to climatic changes. When updating land use policies, building codes or community plans, include provisions to combat climate change; reduce sprawl; preserve and protect open space, biodiversity, and water supplies; promote compact, transit-oriented, bikeable and walkable communities; promote infill development; minimize new development in floodplains; maintain or establish healthy community forests; and promote best forest management practices and encourage tree planting, especially along waterways, to increase shading and to absorb carbon dioxide.

7. Plan for Adaptation to Unavoidable Climate Change

Evaluate risks from unavoidable climate change, set adaptation goals and plan for adaptation. Identify climate change impacts (such as flooding, drought, and extreme temperatures) that could affect the community. Identify areas such as water supply and sewer infrastructure that may be at risk due to sea-level rise and future changes in climate. Factor risks into long-term investments and decision-making. Execute climate change adaptation and preparedness measures through local government planning, development and operations, giving priority to the highest risk areas.

8. **Support a Green Innovation Economy**

Identify opportunities to incorporate climate protection, sustainability and environmental goods and service industries into economic development plans. Encourage workforce development training and school curricula that support the emerging green collar job sector, including renewable energy and energy efficiency, as well as climate smart solid waste management practices. Procure climate smart goods and services for local government operations and support modernizing of local and national electricity grids.

9. Inform and Inspire the Public

Lead by example. Highlight local government commitment to reducing energy use, saving tax dollars, and adapting to changing conditions. Demonstrate the benefits of energy savings, energy efficiency, and renewable energy projects by hosting open houses; distributing fliers; holding local meetings; working with school districts, colleges, and universities to develop climate change curricula and programs; engaging faith-based communities in climate protection; and regularly communicating community climate protection goals and progress to constituents.

10. Commit to an Evolving Process

Acknowledge that research and policy on climate protection are constantly improving and evolving. Be willing to consider new ideas and commit to update plans and policies as needed. Compare successes, cooperate and collaborate with neighboring communities to redirect less-effective actions and amplify positive results.

St. Lawrence County
Resolution on Climate Change and Peak Oil
Background Information and Rationale

Rationale

Global climate change and peak oil present great opportunities to St. Lawrence County's residents, farms, businesses, and governments. The United States is re-engaged with the international community on climate change through the United Nations. New York State is acting in concert with ten other states through the Regional Greenhouse Gas Initiative (RGGI), with a carbon market for coal-fired power plants, and possibly for the transportation and other sectors in the near future. Nationwide, local governments have pledged to reduce their greenhouse gas emissions, and are positioning themselves to take advantage of the opportunities afforded by the emerging national and international climate change framework and greenhouse gas market.

Greenhouse gas reduction credits are already being bought and sold on the international and national markets. For example, over $110 million dollars in credits have already been generated around the world under the Kyoto Protocol from landfill gas recovery projects alone.[1] Over $145 million dollars marked for energy efficiency and renewable energy investment have been raised under the first two RGGI auctions.[2] And the federal government's economic recovery package is likely to make large amounts of money available for green development projects.

St. Lawrence County can tap in to these potential revenue streams, and can be the recipient of energy-related investment, but we must be prepared to take advantage of them. By preparing for these emerging opportunities now, the Board of Legislators can position our county to create new business and investment opportunities and the jobs that go with them. These efforts will provide the added benefits of better preparing us for renewed oil price increases caused by peak oil and, ideally, improving the quality of life of county residents while reducing our contribution to global climate change.

Conversely, if we fail to position ourselves to take advantage of these opportunities, we will miss out on the business development, investment dollars, and job growth that will go elsewhere, and we will not be able to lessen the local impact the next time gas and oil prices start to climb.

While other organizations could take action on these opportunities, the Board of Legislators can most effectively speak for the entire county, and should therefore take the lead. The following pages outline a method that would begin the process by

1. Developing a climate change and peak oil action plan, and
2. Developing the needed infrastructure to take advantage of these emerging opportunities.

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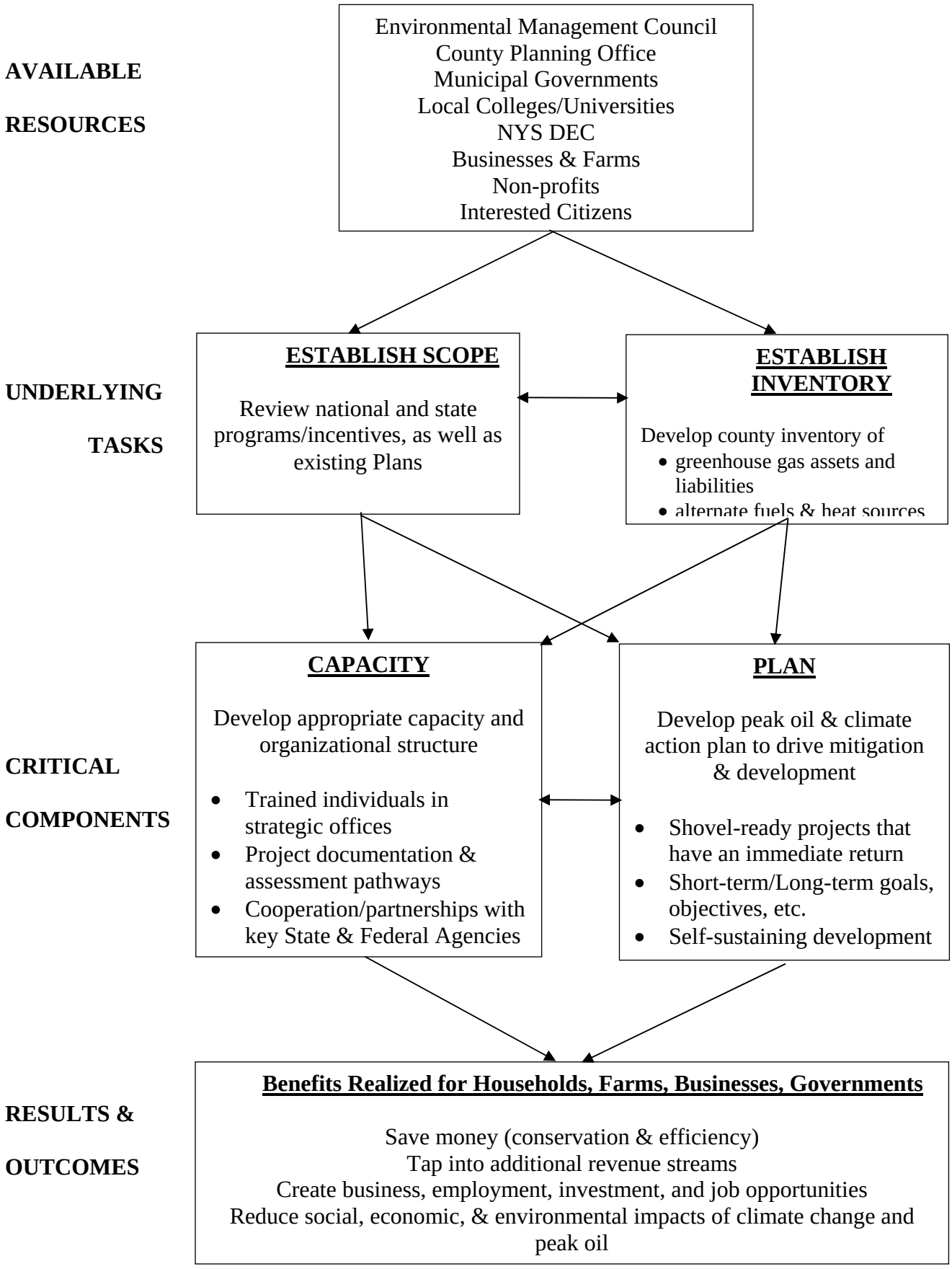
1 United Nations Environment Programme. CDM/JI Pipeline and Analysis Database.
< http://www.cdmpipeline.org/>

2 Regional Greenhouse Gas Initiative. Post Settlement Auction Report Shows Robust Market for RGGI Carbon Dioxide Emissions Allowances.
< http://rggi.org/docs/Auction%202%20Post%20Settlement%20Auction%20Report.pdf>

Proposed Action Framework



1. **LOCAL/ REGIONAL STAKEHOLDERS** should be engaged as **AVAILABLE RESOURCES** for the completion of initiatives, underlying tasks, and components critical to the development of a climate action plan:
    a. Environmental Management Council
    b. County Planning Office
    c. Municipal governments
    d. Colleges/universities
    e. NYS Department of Environmental Conservation
    f. Businesses and farms
    g. Non-profits
    h. Interested citizens

2. Two **UNDERLYING TASKS** should be initiated to help inform the development of the critical components, and the **AVAILABLE RESOURCES** can be tapped to initiate/complete them:

    a. **ESTABLISH SCOPE** - A comprehensive review of all national and state programs/incentives, and existing plans will inform the establishment of the Infrastructure.

    b. **ESTABLISH COUNTY LEVEL INVENTORY** - A comprehensive St. Lawrence County inventory, including energy use profiles, greenhouse gas assets and liabilities, and alternative energy sources will identify areas for immediate action and realization of short-term benefits while informing the development of the long-term plan

3. Development of the two proposed **CRITICAL COMPONENTS** should be informed by the outcomes of the **UNDERLYING TASKS** and should incorporate additional input from critical stakeholders as **AVAILABLE RESOURCES** for implementation:

    a. **CAPACITY** - develop appropriate infrastructure to implement plan & capture benefits, including:
        i. Engage/train key individuals in strategic offices
        ii. Establish project documentation & assessment pathways
        iii. Cooperate/partner with key State & Federal Agencies

    b. **PLAN** - Develop peak oil and climate action plan to drive mitigation and development, including:
        i. Shovel-ready projects that have an immediate return.
        ii. Short-term/long-term goals, objectives, etc.
        iii. Self-sustaining development strategies

4. RESULTS & OUTCOMES - Benefits realized for numerous stakeholders including households, farms, businesses, & governments:
    a. Save money (conservation & efficiency)
    b. Tap into additional revenue streams
    c. Create business, employment, investment, and job opportunities
    d. Reduce social, economic, & environmental impacts of climate change & peak oil

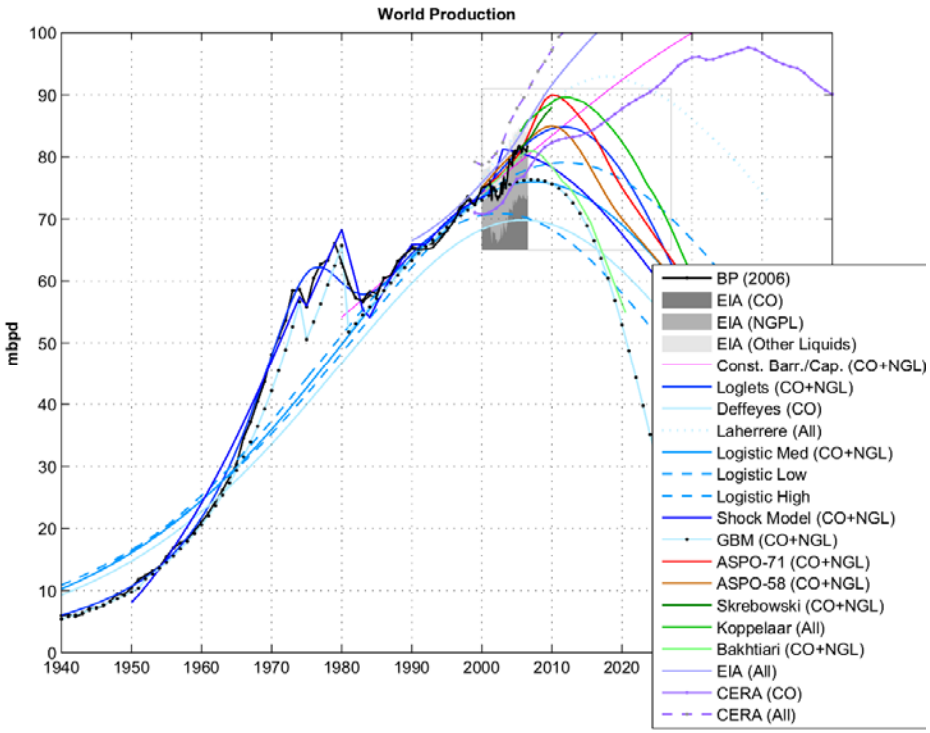
Summary of Current Science & Expected Regional Impacts

Peak Oil, Natural Gas, and Propane

The term "peak oil" or "Peak Natural Gas" is defined as the time when the global rate of petroleum or natural gas extraction reaches its maximum, and then enters a permanent decline. M.K. Hubbert first predicted with satisfactory accuracy that U.S. oil production would peak in the period 1965-1970.[10] Hubbert peak oil theory has been further developed and employed to predict the timing of global peak oil.

According to the U.S. Energy Information Administration (US EIA) [12], world natural gas reserves, though large, have been "virtually unchanged" since 2004, whereas annual world consumption has been steadily increasing, closely matched by annual world production. This will continue until at least 2030, the time limit of the prediction. Consequently, we conclude that the three effects given by [3] for oil production and listed on the next page will also characterize natural gas production. Note that peak oil implies a peak and decline in propane, a by-product of natural gas processing and crude oil refining.

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 (WWI) reported that oil production was already declining in 33 of the 48 largest-oil-producing countries. WWI also predicted 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 general agreement that peak oil will occur, or has occurred. (Sources for the curves in the figure are in [1].)



As the City of Portland [Oregon] 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, an effort which will take years, so 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]

The report goes on to note that peak oil does not mean that the world is going to run out of oil or natural gas in the near future. Peak oil generally occurs when about half the resource has been used, meaning that half still remains. The crucial point is that, as production approaches its peak, the supply of oil is increasing and the cost of production decreasing. This situation causes relatively low prices, which encourages rapidly rising worldwide demand for oil. After the peak, oil availability gradually decreases and the cost of production increases, but worldwide demand remains high and continues to rise. High and rising demand runs into the decreasing supply of increasingly expensive oil to produce serious problems.

The DOE report continues: "Currently, global oil production capacity exceeds demand by only a few percent, and that margin is steadily shrinking. As in any market where production costs are rising, demand is rising, and supply and demand are closely matched, basic economic theory holds that:

- Long-term prices will rise;
- Short-term prices will be more volatile, with spikes and drops occurring at an increasing rate; and
- Supplies will become less reliable because even small disturbances at any point in the production or delivery chains will lead to immediate shortages for consumers."

Recent experience would seem to validate these points.

The anticipated effects of peak oil on Portland, Oregon, were that:

3. Transportation will experience "profound pressure" to shift to more efficient modes.
4. Population may shift to city centers, and density and mixed-use buildings increase.
5. The cost of food will rise and its availability will decrease.
6. The economy will experience "significant" disruption and volatility.
7. Unemployment could increase.
8. Increasing costs and decreasing incomes will reduce health coverage.
9. Heating, maintenance, and monthly housing costs will occupy a larger share of household budgets and push people toward lower-quality housing choices.

Portland is a large urban center, whereas St. Lawrence County is rural. But Portland is located in a major agricultural region (the Willamette Valley), as is St. Lawrence County, and its economy has global connections, as does St. Lawrence County's. So it is reasonable to assume that St. Lawrence County will experience effects similar to those expected for Portland.

Climate Change

The UN Framework Convention on Climate Change 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 which emit "greenhouse gases," such as carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4). Greenhouse gases absorb infrared radiation from the Earth, causing air temperature to increase. Nitrous oxide and methane have 310 and 25 times the greenhouse warming potential of carbon dioxide, respectively, when calculated for a 25-year span. 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]).

Since the beginning of the industrial revolution in 1751, the CO_2 concentration in the atmosphere has risen rapidly from about 278 ppm to about 375 ppm in 2000, an increase of about 35%. (The CO_2 concentration in the atmosphere is now much higher than at any time during the previous 700,000 years.[4]) During this period, the climate (atmosphere) warmed between 0.6 and 0.9 °C [6] and the global average surface temperature about 1.4 °C [7]. Climate Change and Peak Oil are connected, as Heinberg points out [8]: "…Climate Change and Peak Oil both result from societal dependence on fossil fuels."

Reference [4] gives the expected impacts on the northeast for two 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…" Reference [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 from the differences between the worst case and best case 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.

Effect	Worst-case Scenario	Best-case scenario
Winter warming by 2099	8 – 12 °F	5-7.5 °
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: • Increased probability and severity of heavy rainfalls. • Increased winter precipitation "on the order of" 20 to 30 %. • Extended periods of low stream flow in summer and fall.		

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