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Municipal Approaches to Energy Conservation and Renewable Energy Production: A Resource for Community Energy Initiatives

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Introduction

Energy use, production, and the need to develop renewable energy sources are becoming prominent issues at the federal, state, and local levels. To this end, several municipalities in upstate New York are addressing energy issues at the community level by pursuing initiatives to implement community energy plans, develop local renewable sources of energy, and encourage energy conservation and increased efficiency among residents, businesses, and municipal government entities. This document was prepared to serve as a reference guide to communities who are considering pursuing energy initiatives of their own. It utilizes the experience of energy initiatives in the Towns of Fabius and Caroline and in Lewis and Cayuga Counties in upstate New York as a discussion starter for others. We begin by discussing generally the energy initiatives in each of these communities, followed by summarized take home messages, lessons learned, and municipal challenges. Finally, we include detailed case studies of these initiatives as a further reference tool.

In discussing energy initiatives with these community groups, several driving forces are behind their development. First, communities view these initiatives as an opportunity for economic growth. Local production keeps energy money inside the community rather than exporting it to outside entities. This money can fuel new business opportunities leading to lower taxes and increased jobs. Farmers and other landowners can benefit from revenue generated from renewable energy production on their land. Local energy production can provide a source of low cost energy with stable long term prices that decreases costs for businesses, residents, and government. Energy conservation and increased energy efficiency throughout the community are also essential strategies for decreasing energy costs.

Second, there is an accepted premise that efforts that lead to energy conservation and the production and use of renewable energy will support longer term environmental benefits. The burning of fossil fuels emits large amounts of greenhouse gases and other air pollutants. As the issue of global climate change becomes more prominent, citizens are demanding action of their local governments. Because local governments interact directly with community members, they can be influential in changing energy usage patterns and encouraging local energy development.

Community Energy Initiatives in Upstate New York: Fabius, Caroline, and Cayuga County

Fabius is a small town southeast of Syracuse in Onondaga County whose economy revolves mainly around farming. A group of residents with help from outside experts decided to pursue the development of a community energy plan to assess the feasibility of renewable energy production in the Town. The Fabius Energy Steering Committee began to meet in May of 2007 to develop a proposal for the development of a municipal energy plan. The Fabius Energy mission includes energy education in the schools and the community, increased energy efficiency and conservation, and the adoption of renewable power generation initiatives that are environmentally and economically viable.

Caroline is a small town southeast of Ithaca in Tompkins County. The energy initiative in Caroline began in 2004 when the Town Board decided to purchase a portion of the Town's electricity needs from wind power. The advocates of purchasing wind power later had the idea that the Town instead could actively produce its own wind energy and keep the money inside the community. The group Energy Independent Caroline (EIC) was formed with two main objectives. First, the group aims to reduce the town's electricity usage by educating and informing community members about energy conservation and efficiency. Second, the group is pursuing the development of a community owned industrial scale wind farm. EIC has sponsored several community events about energy efficiency and has begun the pre-development work for the construction of locally owned wind turbines.

The renewable energy effort in Cayuga County is focused on the development of a community anaerobic digester. Unlike the Caroline project, the digester is being developed at the county level by the Cayuga County Soil and Water District. The facility will collect manure from nearby farms and anaerobically digest it with the goal of reducing odors, increasing

water quality, and producing natural gas to be used to generate heat or electricity. The liquid by-product will be transported back to farms to be used as fertilizer for fields, while the county will use the natural gas produced to provide electricity and heat for its buildings.

A Corporate Approach to Wind Power: Lewis County

It is worth noting that most wind power projects are not planned, operated, and owned by communities. A common model in the U.S. is the corporate-owned wind farm, where large energy corporations approach landowners and municipal governments to enter into contracts to build wind turbines on private land. In Lewis County, 195 wind turbines have been built as part of the Maple Ridge Wind Farm. PPM Energy and Horizon Wind Energy make payments of $6,000-$10,000 per turbine per year to landowners in exchange for the right to construct the turbines. Municipalities also receive significant payments from the project, in some cases more than twice the total annual town budget. The advantage of the corporate-owned model is that outside corporations do all of the predevelopment work. The disadvantage is that the municipality loses some control over the siting of the turbines and much of the profits go outside the community to the corporations.

Take Home Messages and Lessons Learned

Interviews with people involved with energy initiatives in Caroline and Fabius suggested several important points that could be helpful to other communities addressing similar objectives. These include:

1. *Community involvement is essential to the success of any renewable energy project.*
   a. Renewable energy technologies, wind turbines in particular, often are built on private land and are associated with concerns about aesthetics, noise, or other potential problems. It is important to involve the community and address concerns throughout the process so people do not feel that an outside group is forcing the energy project upon them.
   b. Energy committee members should represent different segments of the community. For example, the Fabius Energy Steering Committee includes residents, farmers, school officials, Town Board members, and outside professionals. The views of many different segments are represented, so it is more likely that the whole community will be supportive of the energy plan developed.
   c. Considering the implications of a community owned versus a corporate owned project is important. Communities with good wind energy potential should be prepared to be approached by a corporate wind developer.
2. *Establishing a good working relationship with local municipal government is crucial for project development.*
   a. Most Town committees (like EIC or the Fabius Energy Steering Committee) do not have any legal authority, but instead serve as advisory committees to the local municipal boards. Ultimately, it is the Town Board that will approve project activities and enter into contractual relationships.
   b. Open and continuing communications will support this relationship. Both Fabius and Caroline benefit from Town Board members serving on their energy committees as liaisons between the two groups.
   c. Energy initiatives benefit by taking advantage of partnerships with local resources. For example, staff from Cornell Cooperative Extension and the Central New York Regional Planning and Development Board has helped facilitate the activities of the Fabius Energy Steering Committee. EIC has partnered with Cornell University students to complete a survey of residential energy use and develop the business plan for a community-owned wind facility. The students benefit from completing a real life project for course credit and EIC benefits from the students' expertise and volunteer labor.
   d. Other free or low-cost opportunities may exist for local municipality groups to work directly with County planning personnel. Such support was utilized for a fee in developing the Town of

Caroline's Comprehensive plan, but could be equally as productive in developing municipal energy plans.

3. *Other communities can serve as models. Although community energy projects are relatively new concepts, resources are available from other towns that have pursued similar initiatives.* However, keep in mind that every community is different and the process that worked for one community may not work for another.
4. G*roup dynamics are very important in community energy development.* Different people involved will have different ideas. While it is important to keep the group on task, it is equally important to allow the group to be open-minded. The best ideas come when people are allowed to share their viewpoints. Form sub-committees if you have a large group because more can be accomplished in smaller groups.
5. *Renewable energy, energy conservation, and increased energy efficiency are closely linked*. While a municipality strives to power itself through local renewable energy production, it should minimize its energy usage through energy conservation and increased efficiency. Decreasing the energy demand will reduce the size and cost involved in developing renewable energy sources.

Challenges

Technical feasibility studies and community energy conservation efforts require time and/or money. Both EIC and the Fabius Energy Steering Committee have no sources of funding and operate solely on volunteer labor. Both groups will need to solicit funding from grant agencies, such as the New York State Energy Research and Development Authority (NYSERDA), economic development agencies, and federal agencies such as the U.S. Department of Agriculture, and state and federal legislators. Additionally, EIC is looking to find investors to fund the building of the wind turbines.

Getting diverse representation from all segments of the community is difficult because of the time commitment to participate in meetings and other activities. Because community energy committee members are mostly volunteers, progress can be slow given participants' time constraints because of work and family commitments. Facilitating clear communication among participants is an ongoing challenge. Balancing keeping the group on task and allowing people to express their various ideas can be challenging for the facilitator.

Renewable energy and energy conservation are new concepts for many people. It can be difficult to get people who have done the same things for years to adopt new approaches to energy use and production.

Conclusions

This case study analysis was developed based on a Public Issues Education (PIE) framework. PIE is defined as the educational process of informing and assisting people to improve group decisions about pressing and emerging issues that affect them and their communities. PIE processes are based on five core values: (1) Education, (2) Inclusion, (3) Civil Dialogue, (4) Innovative solutions, and (5) Improving communications and decision making skills. For more information on the Public Issues Education framework go to: http://www.publicissueseducation.net

We encourage you to review the detailed case study information and evaluations included in the appendix of this report. The experiences in these communities can serve as a resource to communities who are considering pursuing energy initiatives of their own. Understanding the commitments needed up front and the potential pitfalls to avoid will improve the efficiency of municipal planning efforts in addressing energy initiatives. With the proper preparation and commitment, communities can successfully address many energy issues locally. Much of the information included in these case studies comes from personal interviews with members of Energy Independent Caroline and the Fabius Energy Steering Committee.

We would like to thank the following people for their contributions:

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Municipal Approaches to Energy Conservation and Local Renewable Energy Production: Case Studies of Various Approaches in New York State

The Town of Caroline: Specific Approaches towards Energy Conservation and the Production of Wind Power

Town Profile

The Town of Caroline is a small town southeast of Ithaca in Tompkins County with a population of 2,910 people as of the 2000 census. The town is rural with large areas of farmland, woodland, and other undeveloped space, minimal regulations, and widely dispersed housing and public services. Most residents commute to Ithaca for work and for goods and services. The town has several hamlets including Slaterville Springs, Brooktondale, and Speedsville.

Historical Background

The Town of Caroline Town Board has been interested in utilizing renewable clean energy sources and educating Town residents in ways to reduce energy use and adopt renewable energy technologies for home use for several years. The effort initially began in earnest in 2004 when a Town Board member proposed purchasing the Town's electricity needs from wind power. The Town Board decided to buy enough wind power to cover approximately 25% of the Town's electricity needs. Town Board members donated the extra cost of $500 to buy wind power from their own pockets rather than add to the burden of the taxpayers. Caroline became the 8th municipality in NYS to buy wind power as part of its electricity supply. The Town worked with Community Energy through the NewWindEnergy® program to purchase the wind power.

The response from the community to the Town Board's action was very positive, so in 2005 the Town Board decided to purchase all of the town's electricity needs from wind power. The proposal was communicated to Town residents via a Board-initiated voluntary fundraising campaign to raise the funds necessary to purchase the Town's electricity needs from wind and thereby not using municipal tax dollars to pay for the wind energy premium. The initial campaign had a goal of raising approximately $3,600 to purchase 100% of the Town's need from wind power for the next three years. The campaign was administered largely by word-of-mouth, sending letters to residents, posting flyers at local establishments, and announcements posted in the community newsletter. Most of the donations were in small amounts from local community members, but there were several larger donations, including one from an absentee landowner.

The fundraising campaign was very successful, and in 2005 the town received enough financial contributions from residents to become only the second municipality in New York State to purchase 100% of its electricity from wind. In recognition of this achievement the town received an award and plaque from Governor Pataki, which are displayed in the Caroline Town Hall.

The advocates of wind energy now wondered whether the Town could go further. They had the idea that instead of passively buying wind energy from outside the community, the Town instead could actively produce its own wind energy and keep the money inside the community to help the local economy and environment. A dedicated group of volunteers

considered the possibility of the Town producing its own electricity from wind power. The group looked at wind potential maps, contacted banks and lenders, and consulted with other groups pursuing community wind farms and concluded that there was potential for the installation of wind turbines in Caroline. This group later became the Energy Independent Caroline (EIC) committee, formed via resolution of the Town Board in February, 2007, and moved forward with lots of excitement and enthusiasm towards making the vision of wind power in Caroline a reality. The original members of EIC were the advocates for purchasing the wind power and community members who donated to the effort. The remainder of this case study illustrates the Town's approach, via EIC, towards the development of municipal wind power production.

Goals and Objectives of Energy Efforts

Energy Independent Caroline is a collaborative effort between residents, the Town Board, and other interested people to effectively use available natural resources to achieve energy independence from fossil fuels on a municipal and residential level. Their mission is to produce power for electricity, heat, and transportation from renewable resources.[1] To accomplish this mission EIC has initiated several efforts to achieve the following objectives:

1. *Educate and inform community members about energy conservation and efficiency in order to build commitment to reduce energy consumption.*
2. *Pursue the development of a community owned industrial scale wind farm to produce all the Town's electricity needs.*

One of the main driving forces behind the initial move to buy the Town's electricity from wind was increasing resident concern about the dangers of global climate change, peak oil, and energy independence. Several of the EIC committee members are long-time energy activists that live off the grid and have been advocating renewable energy for years. EIC is committed to the goal of keeping renewable energy's economic contributions within the community to create jobs and promote local economic development rather than being at the whim of outside energy companies.

Methods and Process

Clearly defining the goals and objectives of municipalities' efforts towards renewable energy is important; however, understanding and administering an effective process to facilitate goal achievement is equally essential. Below we briefly highlight the overall process and methods used by EIC as a means for other communities to consider. We discuss some specific activities the EIC committee has used to address its goals and objectives. Understanding the time involved and key turning points will be useful as other communities develop similar programs.

Regular Meetings

Since Energy Independent Caroline was formed in December 2005, regular meetings have been held once a month at the town hall. All meetings are open to the public and EIC continues to encourage residents to get involved. Larger topics or committee efforts have required holding retreats on specific subjects that last several hours.

Defined Goals and Accountability

Importantly, each year EIC defines its goals and objectives for the coming year. A spreadsheet is used to track the goals, the strategy to accomplish them, the specific tasks to be completed, who is responsible for accomplishing each task, and when the tasks will be completed. This spreadsheet tool is effective for administering meetings and facilitating conversations with committee members assigned to various tasks.

Organizational Strategies

Organizational strategies have been extremely helpful in accomplishing committee goals. For example, a record of all the events the group holds is kept with information about the event and the number of people in the audience. Sign in sheets are put out

[1]Energy Independent Caroline Website: http://www.townofcaroline.org/energyindependent/

at events and interested people are added to the listserve in order to keep people involved. This allows the committee to measure the effective breadth of its outreach, while also maintaining a database of residents who participated in the committee's programs.

In addition, a spreadsheet is used to keep track of articles, publications, and letters to the editor that are relevant to the group. To help with determining committee progress, every three to four months a group member collects everyone's activity summaries and compiles them to report to the whole committee. A record of past activities is important because it can be cited in presentations, grant proposals, and reports to the public. EIC also prepares a document describing the volunteer opportunities available, which is another useful tool for attracting community members and college students.

Timeline of Accomplishments and Key Turning Points

As discussed above, the first step for the group was to establish a name, a mission statement, and goals. For its name the group picked Energy Independent Caroline (EIC) because it would appeal to older multiple generation residents with a strong passion for independence. The mission statement and the goals of the group were relatively easy to decide since the group's focus from the beginning has been on the development of an industrial scale wind farm. This goal was broadened when the group was asked to contribute to the Town's long range comprehensive plan to include the implementation of other renewable energy sources, but the group is currently focusing only on energy conservation and the development of wind turbine applications within the Town.

Early on in the process EIC decided to become an official subcommittee of the town board in order to establish a good working relationship between the two groups. Some EIC members are also on the Town board and one serves as a liaison between the two groups. To encourage more community members to get involved, the group also developed a brochure and a website describing their goals and information about meetings and events (http://www.townofcaroline.org/energyindependent/).

Energy Conservation Efforts

From the beginning the group has promoted energy conservation and efficiency efforts. The group reasoned that energy conservation and efficiency should be one of the main goals because the Town would want to use as little electricity as possible when it generates its electricity needs from wind. Key turning points and actions towards these objectives that have occurred thus far include:

1. In the fall of 2006, EIC partnered with Cornell Cooperative Extension (CCE) in implementing the *Heating Solutions Survey Program* in the Town. Volunteers, who came mainly from Cornell University's *Into the Streets* volunteer day, distributed a door-to-door survey asking residents about the efforts they currently take to conserve energy. The survey suggests ways to further reduce energy use and estimates the amount of money households could save through increased energy conservation. EIC added additional questions to the back of the energy survey asking residents whether the Town of Caroline should pursue producing wind energy and other renewable energy sources in the town. The response was very positive to these questions. The survey asked residents if they would like more information on any particular topics, so EIC members will do a follow-up visit to give residents this information and keep them informed of the activities of EIC. This effort highlights the need to develop, inform, and maintain resident support for energy initiatives moving forward.
2. Several outreach events were held to educate the community about energy conservation and the overall effort of EIC including:
   a. In the fall of 2006, EIC set up a display at the local Brooktondale Apple Festival that included a demonstration showing the energy savings of compact fluorescent light bulbs (CFL). An incandescent light bulb and a CFL were both set up with a meter spinning to show their electricity use. People could switch between the incandescent and the CFL and see how much

slower the meter turned, which provided a persuasive demonstration of the energy and cost savings associated with using CFLs. Equipment and technical support were provided by CCE.

b. In April 2007, EIC hosted a public event where a representative from the New York State Energy and Research Development Authority (NYSERDA) spoke about community wind energy and the process a community must go through to develop a wind farm. Around 25 people participated in the event.

c. Later that spring, the group hosted a showing of *An Inconvenient Truth* to raise awareness about global climate change and get people talking about renewable energy. They had a fairly large turnout from both Ithaca and Caroline.

d. In partnership with Sustainable Tompkins and EcoVillage, EIC sponsored a 3-meeting series to discuss energy issues. Unfortunately, despite lots of advertising and an article in the Ithaca Journal, only 5 people attended the event, and most of these were EIC members.

3. To further support home energy conservation efforts, EIC is soliciting donations of compact fluorescent light bulbs from national retailers like Home Depot and WalMart to give to each household in the town.

Wind Energy Production Efforts

The other segment of EIC activity surrounds the development of municipal wind power. While pursuing energy conservation efforts, the committee has been working on a business plan for the development of the municipal wind turbines. Interested Cornell University students from the Engineering Entrepreneurship, Management and Ethics class in the Biological and Environmental Engineering Department took on the objective of writing the business plan, which was subsequently submitted to a business plan competition in the spring of 2007. The plan made it to the second round of competition and got lots of helpful feedback from the judges. Now, two Cornell graduate students (an MBA and an electrical engineer) are working towards addressing the weaknesses of the plan. EIC is assisting in this effort to produce a complete business plan that can be used to elicit grant funding and to submit to potential investors in the project, including local financial institutions and Cornell University.

A considerable amount of information and data needs to be collected and analyzed when considering the placement and installation of wind turbines. Much of this work is being initially conducted by EIC. To date, the group has relied solely on wind maps available for free, but more detailed data needs to be collected. Technically assessing wind volumes in the Town is crucial to feasibility and placement of wind turbines, and the Town has initiated several efforts to this end. First, a meteorological tower must be constructed to measure wind speeds on potential sites. MEGA, an energy aggregator in the Southern Tier region of New York, was contacted by EIC to assist in this effort and may provide funds to support its construction. Second, the group is researching how the wind turbines will interconnect to the existing power grid. Transmission maps are not available for security reasons and the group had trouble connecting with someone at NYSEG (New York State Electric and Gas), the owner of transmission lines in the Town, to discuss interconnection sites. Recently, the group has found the appropriate person at NYSEG and he is providing some guidance for the project.

The committee is trying to do as much of the predevelopment work as it can through volunteer efforts because it has no funding to hire out professional contractors. The group has found AWS Truewind, a renewable energy company, to be an excellent resource for site mapping. That said, accessing funding to procure technical services is needed to move things forward on a timely basis.

Take Home Messages & Lessons Learned

People involved in EIC efforts were asked to provide comments about their efforts that they thought other communities would find helpful when addressing similar objectives. These include:

1. *Community involvement is absolutely essential for the success of any renewable energy project.*

   a. The wind turbines will ultimately end up on private land, so without the support of landowners and neighbors the project would not succeed.

   b. Caroline has pursued a community wind approach so the profits from the wind energy will

stay in the community instead of going to an outside developer.

c. The entire community's interests should be represented in an organization like EIC by getting individuals involved from different segments of the community. For example, a long time farmer will bring different issues and ideas than a new young person working in Ithaca.

2. *Establishing a good working relationship with local municipal governments is crucial for project development.*
   a. Most Town committees do not have any legal authority, but primarily serve as advisory committees to the local municipal boards (as is the case with EIC). Ultimately, it is the Town Board that will approve project activities or enter into contractual relationships. Open and continuing communications between committees and boards support this relationship. Caroline benefits from Town Board members serving as liaisons between the two groups.
   b. Other local wind energy initiatives have had difficulty in moving forward given a lack of established relationships with the community and local municipality up front. From the beginning, outreach to community interests and concerns is needed to show broad local support and address individual concerns. Outside experts at committee or group meetings can provide an unbiased view of the project and resident concerns.
   c. Early involvement with local municipalities will make legal processes less difficult to work through (e.g., permitting, zoning), and additional funding opportunities may be available when tied to local governments. Numerous communities are considering or are currently involved in developing energy plans. Working with local municipal officials will provide a more productive long-run strategy.
3. *Take advantage of partnerships with local colleges and technical services available in your community.*
   a. EIC has learned that it can accomplish some of its projects by partnering with local colleges. Students benefit by getting the experience of completing a real life project for course credit and EIC benefits from the students' expertise and volunteer labor. Students involved in planning, business, or environmental studies are potential key resources. Caroline used *Cornell Into the Streets* volunteers to help with the *Heating Solutions Survey Project* last year and Cornell students developed the business plan as part of a class.
   b. CCE provided equipment and support for several of EIC's community outreach events.. EIC also partnered with CCE to complete the *Heating Solutions Survey Project*.
   c. Other free or low-cost opportunities may exist for local municipality groups to work directly with County planning personnel. Such support was utilized for a fee in developing the Town of Caroline's Comprehensive plan, but could be equally as productive in developing municipal energy plans.
4. *Use resources available from other municipalities that have pursued renewable energy initiatives.*
   a. Although community wind power and community energy projects are relatively new concepts and Caroline is certainly ahead of most other communities, there are resources available from other towns that have pursued similar initiatives.
   b. State and federal support may also be available through targeted agencies. For example, a recent Albany County project received grant funding from NYSERDA to cover predevelopment costs; however, these specific grants are no longer available.

Challenges

The renewed and exciting agenda towards renewable energy and opportunities for municipalities is not without its challenges. Below we summarize the largest challenges or stumbling blocks faced by Caroline's EIC as a means to better prepare other municipalities and help guide their efforts. These challenges include:

1. *Technical feasibility studies and residential surveys and analyses require time and money. A major challenge for Caroline has been the financing of project activities.*

a. Currently EIC has a fund of only $126 and relies solely on volunteer work to accomplish its objectives.
b. Predevelopment of a wind farm is usually funded by the developers and can cost hundreds of thousands of dollars. So far, EIC has done a great job of using volunteer work consisting of committee members and Cornell students, but it will eventually need money and investors to complete the predevelopment process and construct the turbines.

2. *Maintaining the volunteer team's motivation, keeping the group organized, and coordinating projects with different leaders is a major challenge for EIC.*
   a. Much of the work requires specific technical and professional expertise – finding and funding such personnel is a challenge that should be addressed early on in the planning stages.
   b. Relying solely on volunteer labor has the disadvantage of not efficiently progressing toward accomplishing goals.
   c. While having active and involved volunteers is important, the time devoted is necessarily limited given work and family commitments, and oftentimes the technical nature of some of the work is beyond their educational scope or experience. EIC's goals are very lofty and it will take an extended period of time to accomplish them given the current funding and member framework.
3. *Keeping the whole community involved is time consuming and difficult.*
   a. It is sometimes difficult to get the community involved at all. For example, despite advertising and newsletter articles, EIC had to cancel a presentation by Cornell Cooperative Extension on energy efficiency due to lack of participation. They had minimal attendance from the community at the Caroline Energy Circles.
   b. In an ideal world, there would be representatives involved with EIC from all of the different sectors of the community, but this alone can be a recruiting challenge.
   c. Often times it is difficult to bridge the communication and aspirational gap between long time residents and new comers to the community.

Resources / Funding

As mentioned above, funding to support community energy activities is necessary and oftentimes difficult to find given the exploratory nature of much of the preliminary work. EIC is currently operating on a $126 fund that was raised through raffle ticket sales and auctioning a home energy audit. They have partnered with Cornell students to develop the business plan and carry out community energy conservation events. Cornell Cooperative Extension also provided support for some events.

Distinct and continuing efforts are needed to find and apply for grant funding sources. Local, state, and federal sources of funds should be researched. Also, some private foundations may be amenable to supporting local energy initiatives. NYS municipalities should consult their state municipal associations such as the Association of Towns and Association of Counties for directed searches. State development agencies may also be offering funding opportunities as directed efforts are enacted in Albany.

For more information:

Visit the Energy Independent Caroline Web site for updates on the group's progress, more information on the *Heating Solutions* survey, and ways to get involved. http://www.townofcaroline.org/energyindependent/

The New York State Energy and Research Development Authority (NYSERDA) has numerous resources on energy efficiency and conservation and renewable energy for homeowners. http://www.nyserda.org/

Caroline has looked to other communities that have already started the effort of developing a community owned wind farm. The Hillstowns Community Wind project in Albany County is an example of one of these communities. http://www.helderbergwind.org

AWS Truewind is a renewable energy company that has wind potential maps available on its website. http://www.awstruewind.com/

The Town of Fabius: An Aggregate Approach to the Development of a Municipal Energy Plan

Town Profile

The Town of Fabius is a small town southeast of Syracuse in Onondaga County. It strives to maintain a rural way of living with lots of farmland, woodland, and other undeveloped space. The population in the year 2000 was 1,974 persons according to the 2000 census. With 3,500 head of cow, the primary use of land is for agriculture and there are very few other businesses in the town. Children attend the Fabius-Pompey Elementary and Middle/High schools located in the Village of Fabius.

Historical Background

The Town of Fabius is currently involved in the process of developing a municipal energy plan. The initial activities that supported this endeavor began when a local resident and business owner involved in dairy support services and a local dairy farmer

expressed interest in the feasibility and building of a methane biodigester. In January 2007 they met with the Energy Program Developer for the Central New York Regional Planning and Development Board, and Cornell Cooperative Extension educators to discuss their ideas. The outcome of this meeting was the decision to educate the community about the opportunities for biodigesters to help the local dairy industry. A community meeting held in February on biodigesters featured objective presentations to the public by experts. Additional meetings held in March and April focused on biomass, wind power, and biodiesel fuel. Attendance increased with each new topic and the meeting on wind power had a standing room only crowd of around 75 people, indicating the effort's success. After the last community meeting the original group met again and talked about what could be done to implement some of these renewable technologies. They decided to seek approval from the Town Board to create a proposal for the development of a municipal energy plan for the Town of Fabius.

Goals and Objectives

The driving forces behind the interest in developing a community energy plan have been the increasing prices for energy and increased awareness of global climate change and other environmental issues associated with energy production and use. Local residents and business owners are interested in developing opportunities for economic development that increase the number of businesses and strengthen the tax base. Another driving force for local dairy business operations is the opportunity to develop an additional source of revenue for struggling small farms (i.e., farm and/or community digesters). Current dairy support businesses in the area view renewable energy development as an additional service that could be provided through their firms as a way of encouraging farmers to implement feasible and economical renewable energy technologies on their farms.

In the summer of 2007, by request of volunteers and action of the Town Board, the Fabius Energy Steering Committee was formed. Initial efforts of the committee focused on developing goals and objectives in order to have all committee members on the same page and moving forward with a common mission. As developed by the committee, they have adopted the following:

The Fabius Energy Steering Committee mission seeks to increase:

1) *Energy understanding and environmental learning within the community and in the schools,*

2) *The efficient use of energy by everyone in the community and incorporate the use of energy saving technologies/products where appropriate, and*
3) *The adoption of sustainable/renewable power generation initiatives that are environmentally and economically viable, and are beneficial to the community.*

The Goal of the Fabius Energy Plan is to prepare the community for the future by creating ways for individuals and organizations to implement initiatives that save energy, reduce energy costs, and strategically enable energy business opportunities that benefit the community and the environment.

Methods and Process

The volunteer group who initiated the idea of developing a proposal for an energy plan met in April 2007 to prepare a presentation to the Town Board to gauge their interest and support for the effort. The group brainstormed ideas, shared information, and discussed the method for which to present to the Town Board. The result was a presentation that outlined the proposed roadmap in the development of an energy plan. These aspects included:

1. *Defining community energy planning to provide a common framework from which to begin this process, and*
2. *Describing the process in developing a municipal energy plan, including segments on implementing energy conservation measures within the community and analyzing the feasibility of alternative technologies for renewable energy production.*

After hearing the presentation by the group, the Town Board approved the creation of the Fabius Energy Steering Committee to write a proposal for the development of a community energy plan for the Town of Fabius. As mentioned previously, developing good working relationships up front with local municipal governments is essential in effectively progressing through plan development.

One of the initial stumbling blocks in this process was developing a clear and unified understanding of the objectives of the committee and work plan items to carry out. For example, initial confusion occurred around the difference between the proposal to write the plan and the plan itself. Some members expected to write the plan themselves, while others understood their role as defining what elements should be in an energy plan for which, once approved by the Town Board, professional firms would be contracted to conduct.

The Energy Steering Committee is preparing a "Request for Proposals" or RFP that tells professionals who would develop the plan which information to collect and what elements the community wants included. In Fabius, this RFP/proposal will state the mission and goals of the project, characterize the assets, resources, and values of the community, identify the key energy user segments, and list energy goals and priorities for each user segment. It was decided that the Energy Steering Committee would only develop the RFP/proposal because members of the committee do not have the time or resources to develop the full plan in a timely fashion, even if they do have expertise in some areas.

The energy plan will examine the feasibility of the various ideas presented in the RFP/proposal and make recommendations to the Town as to how to reach its energy goals. The recommendations will be based on data about the residents and businesses of the town, their energy usage, and the town's natural resources, like wind potential, manure produced, etc. Since the plan will be carried out by a professional, it will be necessary for the committee and/or the Town Board to solicit funds to pay for its development.

The first meeting of the Energy Steering Committee was held in May 2007. The committee established an aggressive work plan with the expectation that they meet two times per month, with all meetings open to the public. The members of the committee include the original group who organized the community information meetings, and various interested farmers, residents, and town board members. A professional planner and energy program developer serves as the facilitator of the meetings, with assistance provided by staff of Cornell Cooperative Extension and faculty at Cornell University.

Identifying Committee Roles and Expectations

To develop a sound and common base from which it will work from, the committee initially discussed their mission statement and the goals of the project. There were many ideas, many complementary to one another; however, it was difficult for the group to collectively come up with a unique concise mission. Economic development staff from CCE assisted in summarizing the available alternatives from the discussion. At a subsequent meeting, the alternatives were presented, revised based on new member comment, and ultimately voted upon. Two clear favorites emerged which were ultimately synthesized into the mission presented above. While the process was lengthy, it remained a worthwhile exercise to ensure all committee members were working towards the same goals.

Identifying Components of a Municipal Energy Plan

Committee meetings clearly indicated a need to define and develop according strategies around the main energy user segments for the Fabius community. These include residential users, schools and municipal operations, and local agricultural and nonagricultural businesses. To support this effort the committee formed sub-groups to evaluate each energy user segment. All groups were instructed to discuss the following items for their segment and report back to the full committee:

1. *Characterize your energy user segment and how it fits into the community as a whole,*
2. *Identify and prioritize important energy items and topics or issues that should be included in the plan relative to your energy user segment,*
3. *Characterize the energy users within your segment and list the types of information needed to complete an energy profile of the user segment (for example fuel consumption, number of homes, etc.),*
4. *Identify effective strategies to reach out and inform community members,*
5. *Identify potential barriers to the implementation of an energy plan and strategies to overcome these barriers, and*
6. *Identify factors that decision makers within your energy user segment must understand to implement effectively new technologies or behavior changes into their operations with respect to committee goals and objectives.*

Individual groups summarized and presented their work to the committee as a whole. This allowed everyone to know what the other groups were doing and encouraged new ideas that other groups might not have thought about. The work of the small groups will eventually transform into unique aspects of the full proposal to be submitted to the Town Board and to potential funding sources.

Constructing the Municipal Energy Proposal

After the small groups had met several times and completed the tasks listed above, the committee began to think about the structure of the proposal. The business segment group drafted an outline for the RFP/proposal that included four categories: executive summary of the project, scope of work for the consultant, the desired outputs from the consultant, and a timeline for the completion of the plan.

At the next meeting the group as a whole worked to clarify the language of the outline and add details to make it clear what the committee wants the contractor to do. One of the members of the group is very knowledgeable about biodigesters while another member is familiar with the structure of RFPs, so these two worked on drafting an RFP on biodigestion for the committee to discuss and review at the next meeting. The strategy of letting one or two people take the ideas of the committee and write a draft to discuss at the next meeting has been very effective. After each meeting the committee is becoming closer and closer to having a workable document.

In addition to the language of the RFP, much discussion ensued about whether one or multiple firms would complete the plan. One firm would probably not have the expertise to complete the feasibility analysis of all the different kinds of renewable energy, so it will be necessary to hire subcontractors to do some of the work. It is important to bring the work of the different experts together into one usable report, so one firm will be selected to oversee the project and compile a usable report for the Town.

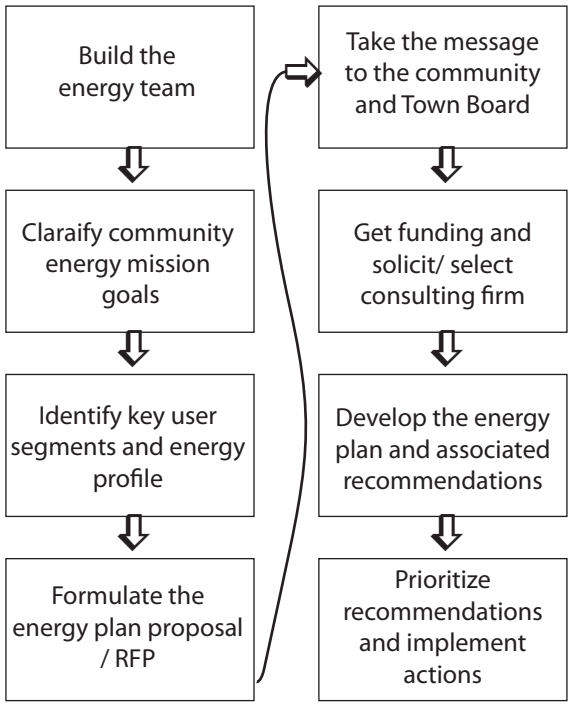
Another area of concern is the cost of the energy plan. Since each piece of information the committee requests will increase the cost of the project, there has been a lot of discussion about which information is essential to the plan. The group has no basis for estimating how much a project like this will cost. The committee hopes to invite a professional energy consultant to give more information on the cost and process for completing an energy plan.

Identifying Next Steps

After the RFP/proposal is completed the committee will pursue the development of the energy plan by completing the following steps:

1. The committee will present the completed RFP to the Town Board for approval. Since the Town Board will be handling all the money and the contracts with consultants they need to approve the proposal before the process can continue.
2. After approval from the Town Board, the committee will have to obtain funding by submitting grant proposals to various funding agencies.
3. Once funding is secured the Town Board will solicit proposals from contractors and select a firm for the development of the energy plan.
4. The committee and Town Board will correspond regularly with the consultant to monitor the progress of the energy plan development.
5. The consultant will present its findings to the Town Board and the community. The Town will decide whether to pursue the actions recommended by the energy plan.

Figure 1: Fabius Community Energy Plan Process Overview[2]



[2]Adapted from "A Tool Kit for Community Energy Planning in British Colombia" http://www.communityenergy.bc.ca/

Take Home Messages and Lessons Learned

Fabius's municipal energy planning process is a current work in progress striving towards the development of a municipal energy plan. Even so, several lessons learned may be of use to other municipalities proposing to go through similar processes. These lessons include:

1. *Understand that each town has a unique set of circumstances and characteristics, so no one project will be the same*. Towns must adjust previous models to fit their own Town if they are to be successful,
2. *Consider forming sub-committees as you develop your energy plan*. Energy issues can be complex and time consuming given differing user segments and renewable energy resources. More can be accomplished in small groups that subsequently present to the group as whole than moving all agenda items through the whole group up front,
3. *Group processes and discussions require particular attention.* It's important to allow the group the freedom to be open minded. The best ideas come when people are allowed to share their ideas,
4. *Getting the community involved is important because community members are the ones who will ultimately have to approve and implement the plan.* Residents should make the decisions, not those from outside the town. Receiving input from a variety of residents in the community is also important.

5. *In a community energy plan, renewable energy generation and energy conservation are necessarily integrated.* The greatest effect may well come from energy conservation activities and increases in efficiency.

Challenges to Consider

The renewed and exciting agenda towards developing a municipal energy plan is not without its challenges. Below we summarize the largest challenges or stumbling blocks faced by Fabius's Energy Steering Committee to date as a means to better prepare other municipalities and help guide their efforts. These challenges include:

1. *Many people in the community have been doing things the same way for years and it can be difficult to get people to change their ways and adopt new ideas about their energy use,*
2. *Steering committee members are all town resident volunteers who have full time jobs and families, so people have trouble giving a lot of their time to the effort,*
3. *Communicating clearly with all participants is an ongoing challenge,*
4. *Keeping the group on track and dealing with the huge diversity of people and ideas while keeping the group open minded can be difficult.*

Resources / Funding

The Energy Steering Committee itself was formed without funding. As this was in the middle of the Town's fiscal year and, defining the roles and responsibilities of the committee was in development, this is to be expected. The committee may, however, request funding from the Town Board for particular items if needed, but not likely until its first objectives have been met. However, the Town Board is not likely to provide significant funding because of its limited budget and the desire to keep taxes low in the town. All committee members are Town residents and serve on a volunteer basis. Currently the committee has no operating budget.

The committee is blessed with several outside members providing professional advice and guidance. The committee facilitator is a professional planner with expertise in energy development. He is funded by a regional planning and development board, as well as a state-level energy research and development association. Additional outside members include staff and faculty from Cornell University and CCE.

It is the objective of this committee to seek funding for the development of the municipal energy plan. The RFP/proposal will be developed first and reviewed and approved by the Town Board. However, the RFP/proposal will not be advertised until the committee has secured grant funding to support the cost of developing the full plan. The committee will begin searching for funding from sources such as NYSERDA, the USDA, and various other government agencies, and work with the Town Board to submit and process these grant applications.

For More Information:

Several detailed guides are available for developing community energy plans. Below are resources that could be useful for other communities:

Arctic Energy Alliance: Community energy brochure and extensive planning toolkit for communities. http://www.aea.nt.ca/

Natural Resources Canada: "Community Energy Planning: A Guide for Communities" http://www.sbc.nrcan.gc.ca/

U.S. Department of Energy: "A Workbook for Community-Based Renewable Energy Initiatives" http://www.osti.gov

Community Energy Association: "A Tool Kit for Community Energy Planning in British Columbia"" http://www.communityenergy.bc.ca/

Lewis County: Wind Farm Development by an Outside Corporation

In contrast to the Town of Caroline's plan to construct a community owned wind farm, the Maple Ridge Wind Farm in Lewis County was proposed, constructed, and is owned by two large corporations from outside the area. Corporate wind farm development brings up a different set of issues and considerations for municipalities than the community energy initiatives in Fabius and Caroline. Most wind farm development in the United States follows the corporate model so Towns should be familiar with both approaches. Towns with good wind potential may be approached by outside developers to build wind turbines, as was the case in Lewis County.

Historical Background

The effort to build the Maple Ridge Wind Farm started in 1999 when a representative from Atlantic Renewable Energy Corporation approached residents, Towns, and the County about his idea to build a wind farm in Lewis County. Lewis County is a prime location for a wind farm because of its constant lake effect winds and its abundant open farmland. Some residents expressed concerns about aesthetics, bird mortality, and the noise of wind turbines, but most people were won over by the payments the developer offered to landowners, neighbors, schools, towns, and the county. Construction of the wind farm is now complete with 195 wind turbines built since the project began.

Project Characteristics

With 195 wind turbines and the capacity to produce electricity for 125,000 homes (all of Lewis, Jefferson, and St. Lawrence counties), the Maple Ridge Wind Farm is the largest renewable energy project in the United States east of the Mississippi. At maximum capacity it can provide 2% of New York State's residential electricity demand. The project is spread over a total area of 21,000 acres in the Towns of Martinsburg, Lowville, and Harrisburg, but the wind turbines use less than 1% of this acreage. Maple Ridge is owned by a partnership of PPM Energy (owned by Iberdrola) and Horizon Wind Energy (owned by Energias de Portugal). Iberdrola and Energias de Portugal are the first and fourth largest renewable energy companies in the world respectively.

Benefits to Communities

The first benefit for communities and residents are the direct payments Maple Ridge pays to landowners. All the wind turbines are located on private land and landowners receive a yearly payment for each turbine sited on their land. The price per wind turbine averages between $6,000 and $10,000 depending on the actual amount of energy produced. These payments can be a significant source of revenue for large landowners, especially farmers, who own a lot of land and install multiple turbines. Neighbors of property owners who install wind turbines are paid $1,000 in exchange for signing a Good Neighbor Agreement, which waives some of the neighbor's rights to sue Maple Ridge.

The second benefits come in the form of PILOT payments to the schools, towns, and the County. The Maple Ridge project will make payments to these entities for 15 years before going on the tax rolls. These payments are significant infusions of money into tight budgets for local government entities. For example, the town of Martinsburg's annual budget is around $400,000 per year, but under the PILOT agreement with Maple Ridge the town will receive $1.2 million per year for 15 years, according to the Town Supervisor. Residents are excited by the prospects of new infrastructure such as broadband internet access, and new playgrounds, schools, and roads. The town has

hired a consultant to invest the money wisely and figure out the best way to spend it.

Other benefits include the creation of new jobs within the region. Most of these jobs were created temporarily during the construction phase of the project, but a smaller permanent workforce is required to maintain and monitor the turbines. The payments to farmers and landowners create a new source of income for struggling small farms and ease the pressure to subdivide and sell large portions of land. The money from Maple Ridge allows the county to maintain outdoor recreation opportunities like snowmobiling, hunting, and fishing, while keeping the agricultural base strong.

An advantage of corporate developed wind farms is that communities do not have to do the work involved with the development of a wind farm. Volunteers in groups like Energy Independent Caroline devote a huge amount of time and effort to this work, while corporations will pay for all of it in a corporate owned project.

Disadvantages for Communities

Wind turbines are controversial due to concerns of residents about noise, bird mortality, and most importantly, aesthetics. Corporate-owned wind farms take some of the control away from communities to address these issues. In a community developed wind farm, the community members are able to set stricter guidelines for siting the turbines to minimize concerns. With corporate owned farms, the turbines are placed on private land so municipalities have less control over their location.

Corporate owned wind farms also create inequalities in communities. The owners of the land where the wind turbines are installed receive payments for the turbines, but the surrounding neighbors who also have to look at the turbines receive little or no compensation. Community-owned projects distribute the money from the wind farm more equally so everyone in the community benefits.

Considerations for Communities

Municipalities and landowners where wind potential allows for the construction of a wind turbine should be prepared to be approached by a wind developer. Communities should have a comprehensive plan and zoning laws in place that set parameters for wind farm development. Individuals and municipalities should be familiar with the process of corporate owned wind farm development and the various considerations that go along with it. Individuals should consider all the implications of signing a contract with a corporation before they allow a turbine to be constructed.

For More Information

Dorociak, C.J., D. Chapman, B. Henehan, and J. Barry 2005. "Wind Energy Development in New York State: Issues for Landowners." EB 2005-04. Department of Applied Economics and Management, Cornell University. May. Available at http://aem.cornell.edu/outreach/extensionpdf/eb0504.pdf.

Tompkins County Environmental Management Council developed a 'model' utility scale wind ordinance that could be a useful reference for other communities: see http://www.co.tompkins.ny.us/emc/resolutions.htm. The Tompkins County Environmental Management Council developed a 'model' utility scale wind ordinance that could be a useful reference for other communities: see http://www.co.tompkins.ny.us/emc/resolutions.htm.

Cayuga County Anaerobic Digester: A Renewable Energy Project at the County Level

The project to build a community anaerobic digester in Cayuga County is an example of a project that is focused on a single method of renewable energy generation. The project is different from the Caroline initiative in that it is being developed at the County level instead of the Town level.

Historical Background

The idea to build a community anaerobic digester in Cayuga County was a vision of Jim Hotaling, the director of the Cayuga County Soil and Water Conservation District (SWCD). The SWCD is an agency that seeks to improve water and air quality in Cayuga County. One of the ways to accomplish this goal is to help farmers implement innovative environmental improvement projects, like the construction of an anaerobic digester. Digesters reduce odors from manure and add more plant friendly nitrogen, making the manure a better liquid fertilizer to apply to fields. The digestion process decreases the phosphorus content, which improves water quality. Digesters have the added bonus of producing methane which can be used as natural gas or to produce electricity.

Hotaling decided to research the idea of the SWCD building an anaerobic digester in Cayuga County. He visited Europe and was convinced that European technology could be used by the SWCD to build a digester. In 2004 he found a company that could install the digester and pursued grant money to build the facility from various agencies, including NYSERDA, USDA, EPA, and the New York State Department of Agriculture and Markets. The project is currently behind schedule, but it is scheduled to open in late 2007 or early 2008.

Project Characteristics:

The digester will be a 625 kW facility that can process 39,000 gallons of manure a day from four local farms. The design of the project allows the facility to be later expanded to 2MW if the project is successful. Trucks will pick up manure daily from the farms and transport it to the digester outside of the City of Auburn. The product of the digester, liquid and solid fertilizer, is then transported back to the farms for application on fields.

The electricity and heat generated from the project will be used to power nearby county buildings, including a nursing home, a jail, and an office complex. The county pays for all the trucking costs associated with the project, but benefits by saving money in the long-run by decreased energy costs for its buildings. Farmers get the free service of odor and pollution reduction for their land-applied fertilizer.

The digester is a European hydraulic-mix model that continuously stirs the manure using pressures inside the digester. It has no moving parts and is self-cleaning, so there is very little maintenance required. Food waste added to the mixture helps to supercharge the production of methane because it is undigested material where manure has been already partially digested, decreasing the energy potential. Food waste is readily available from restaurants and other food service businesses.

For More Information

Contact Jim Hotaling, executive director of Cayuga County Soil and Water Conservation, at 315-252-4171, Ext. 119. Email: Jim-Hotaling@ny.nacdnet.org