

Bringing the Power Back Home

A case study of the Town of Caroline's path toward greater energy independence

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In 2004, all five council members in the Town of Caroline, a small rural community in Tompkins County, NY, donated all or a portion of their incomes to provide 27 percent of the municipality's energy needs with wind power, becoming one of the first in the state to venture into renewable energy for municipal governments. This move marked the beginning of a community-led effort to become more independent from fossil fuels by not only using renewable sources to power homes, businesses, and government facilities, but by implementing energy conservation measures as well.

Through an initial fundraising letter to interested citizens in 2005, Caroline exceeded its goal of raising \$1,500 by nearly \$3,000—enough to completely offset its entire municipal electricity needs with wind power, becoming only the second municipality in New York State to do so.¹ (In fact, this support allowed the town to meet its municipal electricity needs for the next *three* years.)

Over the next few months, citizens in the town began to explore two central questions: Could all the homes and businesses in the town be powered with renewable energy, and what would it take to produce this power? In order to begin to consider their options, a group of several public officials and town residents came together in early 2006 under the name *Energy Independent Caroline* (EIC). As Caroline Town Supervisor Don Barber sees it, “That outreach to the citizens and their response was really the foundation of Energy Independent Caroline.” Also, two founding members, Ed Cope and Steve Nicholson, were homeowners² who already had a longstanding interest in renewable energy and lived “off the grid”—or without reliance on public utilities or fossil fuels—by generating solar and wind power.

The name for Caroline's nascent work group was chosen strategically; Town Council member and Deputy Supervisor Dominic Frongillo explains that the name was meant to invoke “a sense of rural independence that is not just resonant with urban-minded people or progressive people but also is a value that the more ‘old-timer’ members of our community... would be excited about, too.” Indeed, to Barber, the word “independence” brings to mind thoughts of historical energy transitions:³ before the age of petroleum and the automobile, people had to work together to maximize their human and draft animal work potential, therefore the “independence that we had by being energy independent made us community-dependent.” Barber predicts that as we reach peak oil and energy becomes more expensive, “we have to be looking at a community that is once again more dependent on one another.”

Energy Independent Caroline reached several milestones during its first year in existence. In 2006, the Caroline Town Board granted EIC official designation as a Town Advisory Committee, legitimizing the group's numerous achievements. EIC was also successful in

Town of Caroline Demographics, 2010	
Population	3,282
Median age	40.3
Land area (sq. miles)	55.1
Density (persons per sq. mile)	59.6
Median household income	\$51,354

Source: U.S. Census Bureau

¹ Caroline was recognized with awards from both the Environmental Protection Agency (EPA) and the Municipal Electric & Gas Alliance for this effort.

² These members were Ed Cope and Stephen Nicholson, who is the current chair of EIC.

³ D. Barber, interview held at the Caroline Town Hall, Caroline, NY, September 2011.

contributing several energy-related goals to the *Town of Caroline 2006 Comprehensive Plan*, which outlines a 20-year vision for town leaders to follow.⁴ The vision calls for increased energy conservation, the use of clean and renewable sources of energy, more sustainable business practices, and a reduction in individual automobile trips within the town through a better-planned transportation system.

The group made its first large public appearance at an annual festival in one of the town's hamlets. There, it "shared its renewable energy vision with over one hundred community members"⁵ by distributing brochures, directing attendees to its website,⁶ and raffling off a free home energy audit. EIC also attracted additional members through announcements in the town's monthly newsletter.

Between 2006 and 2007 the number of core EIC volunteers doubled, allowing the group to take advantage of several community outreach opportunities and raise general awareness about renewable energy and energy conservation. Barber attributes the strong level of

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enthusiasm to certain people in every community who are “natural leaders,” but need to first be recognized. “You have to have a good marketing or sales person...someone that’s really going to be up front. There are natural leaders; there are people who other people will follow. Those are the ones who are going to carry the day and get more people.”

EIC continued to meet monthly during its formative years, addressing questions such as, “What would it take to actually produce energy to power the entire town? Are people interested in this idea? Are there members of the community that are excited about this idea, that have a vision for the town producing its own energy?”⁷ It was clear through conversations had at festivals and elsewhere that there was significant interest among community members, and it also became clear to the group that a transition to renewable energy would be most effective only if the town reduced its energy consumption at the same time.

Energy Conservation

This realization resulted in a variety of initiatives aimed at both household and municipal energy conservation during 2006 and 2007. Eager to gather community input, EIC members distributed short energy conservation surveys with education factsheets on energy efficiency and conservation through a partnership with Cornell Cooperative Extension (CCE) of Tompkins County.

The most notable energy conservation and education accomplishment was *Lighten Up Caroline!*, a result of several months of planning and preparation by EIC and members of the community. On April 29, 2008, over one hundred volunteers from Cornell University, Ithaca College, and Caroline travelled on bikes, on foot,



Bags provided by SewGreen, a local non-profit

⁴ *Town of Caroline 2006 Comprehensive Plan*, accessed July 12, 2011, at <http://carolinetown.powweb.com/wp-content/uploads/2007/11/comprehensive-plan-2006.pdf>; “2006-2007 Accomplishments – Energy Independent Caroline,” Caroline, NY: Energy Independent Caroline.

⁵ “2006-2007 Accomplishments – Energy Independent Caroline,” Caroline, NY: Energy Independent Caroline, 2007.

⁶ See <http://www.townofcaroline.org/energyindependent>.

⁷ D. Frongillo, interview held during meeting of Energy Independent Caroline (EIC), Caroline, NY, June 2011.

in hybrid cars, and even on horseback to deliver a compact fluorescent light bulb (CFL)—each within a homemade bag along with educational materials—to all 1,400 households in the Town of Caroline. Dozens of volunteers sewed a total of over 1,000 bags for the event, and the event itself cost less than \$5,000. Shawn Lindabury, then a Cornell undergraduate and author of the grant proposal from the Cornell University Community Partnership Board that helped fund Lighten Up, estimated that the bulbs would save a combined \$73,920 and prevent 374 tons of carbon dioxide from entering the atmosphere over their lifetime.¹⁰

In addition to the light bulbs, the bags contained an educational pamphlet profiling six town households using renewable energy to power their homes and a comprehensive home energy survey¹¹ developed in partnership with CCE. The survey was returned by over ten percent of the households in the town and provided insight into respondents' experience with weatherization, motivations for making energy-conscious decisions, and barriers to home energy conservation, among other things. Results from the survey indicated that¹²:

- The majority of survey respondents were willing to pay more for renewable energy, however, a lack of money was reported as the primary obstacle to becoming more energy independent;
- The most important issues expressed by survey respondents were 'the environment' and 'saving money on energy bills,' but a majority of respondents felt that environmental concerns were *more* important than saving money;
- In addition, many survey respondents indicated they had already developed energy-saving habits such as using fans rather than air conditioning and turning down the thermostat; and
- The majority of respondents had already purchased energy efficient appliances but many had not yet performed an energy audit on their homes.

The survey included language that urged residents to explore ways to 'save energy, control our future, and keep our money in the local economy'; in a raffle, EIC also gave away energy-saving prizes as an additional incentive to complete the survey. Over 85 percent of survey respondents indicated they would be interested in the town exploring the potential for wind energy development.



Solar panels on the Town of Caroline Office Building

Another significant accomplishment was the construction of a near-carbon-neutral town office building in 2010, equipped with superinsulation, photovoltaic solar panels, geothermal heating and cooling, and solar tubes for daylighting.¹³ This project also had generous community support, with nearly 80 Caroline residents collectively donating over \$5,000 toward the cost of renewable technologies for the

¹⁰ Rebecca James, "A Fluorescent Bulb in Every Home; Ithaca Environmentalists Team Up with Tompkins County Town to Shine Light on Green Choices." *The Post-Standard*, April 3, 2008.

¹¹ This was completed through a partnership between Cornell Cooperative Extension of Tompkins County, the Town of Caroline, and Cornell University.

¹² Town of Caroline Energy Survey, 2008

¹³ "Selected Accomplishments: 5-year anniversary," Caroline, NY: Energy Independent Caroline, 2010; see <http://www.townofcaroline.org/information/office-building-solar-array/>.

building. During this time EIC was also awarded over \$45,000 in grant funding to perform energy assessments and subsequent upgrades on the adjacent town hall, a historic structure, and the nearby highway building.

Other EIC conservation efforts included screenings of several well-attended educational movies such as *An Inconvenient Truth* and *The Power of Community: How Cuba Survived Peak Oil*, distributing educational resources produced by Cooperative Extension, and tabling at community events with the “energy bike”—an interactive display which enables residents to feel how much pedaling is needed to power a compact fluorescent light bulb as compared to an incandescent bulb.

Most recently, EIC co-sponsored *Tighten Up Caroline!*, an event that educated over 50 residents¹⁴ on how to apply for low/no-cost home energy assessments, how to best finance home energy upgrades, and how to choose the right home energy efficiency contractor. Organizers worked with Cooperative Extension to calculate and communicate the fact that if every Caroline home became more energy efficient, it would result in significant energy savings every year.¹⁵

Wind Power & the Public Process

In 2005, several members of the committee also formed a wind development project team. Tasked with assessing the feasibility of wind power generation in Caroline, the group began talks in 2006 with several wind developers. From the time of its conception, however, the team felt that any wind project should be community owned, rather than designed as a large-scale industrial development. It was important that “the benefit would stay with the community as much as possible,” says Frongillo.

As it turned out, findings from a preliminary wind resource analysis would actually work in the team’s favor,¹⁶ as they revealed that Caroline contained not one site that an industrial developer “would even sneeze at.”¹⁷ In fact, Caroline lies in a relatively calm section of the Southern Tier where wind speeds average between only 5.0-5.5 meters per second (approx. 11-12 miles per hour).¹⁸ After learning that the development of a large-scale wind farm in Caroline was unlikely, and that only one to two turbines were needed to power every home in the town, the project team began to explore community-owned financing models for wind energy development.

Roles for Extension Educators

- Plan educational events (e.g., seminars, informational meetings, movie showings)
- Lead tours of buildings and projects that showcase energy efficiency measures and the use of renewable energy
- Help design and distribute surveys, and then help to analyze their results
- Provide leadership training and development
- Help disseminate educational information to the public through marketing and outreach
- Facilitate meetings and the public process through negotiation and mediation support
- Assist public officials with grant applications
- Initiate a network of related organizations

¹⁴ D. Frongillo, e-mail message to author, September 27, 2011.

¹⁵ D. Frongillo, e-mail message to author, September 7, 2011.

¹⁶ See http://www.windpoweringamerica.gov/wind_maps.asp.

¹⁷ D. Frongillo, interview held during meeting of Energy Independent Caroline (EIC), Caroline, NY, June 2011.

¹⁸ See http://www.windpoweringamerica.gov/images/windmaps/ny_80m.jpg; while wind power suitability also depends on turbine height, wind speeds less than 5.9 m/s are considered to fall under Class 1 and 2 of 7 possible wind power classes identified in the National Renewable Energy Laboratory (NREL) *Wind Resource Assessment Handbook*, <http://www.nrel.gov/wind/pdfs/22223.pdf>.

Over the ensuing months, the team received generous support and advice from several wind experts. From the outset, John Rancich, then owner of Enfield Energy, worked with the group to identify the town's strengths and weaknesses and how to overcome or take advantage of them. The first, and arguably most critical task was site selection. In need of a finer analysis than the U.S. Department of Energy could provide with their state-level suitability maps, EIC oversaw the work of an undergraduate class in Cornell University's Department of Biological and Environmental Engineering charged with monitoring wind speeds around Caroline and selecting the most suitable sites for wind power generation. (Lou Albright, Professor Emeritus and founding member of EIC, taught this class.)

The resulting report¹⁹ identified three spots within the town that were most suitable for wind development, all lying in close proximity to a requisite three-phase power line. Site selection was based on maximal wind profile (i.e., where the greatest wind speeds are), proximity to neighboring structures, and access to transmission infrastructure. While the students' analysis provided a strong foundation for EIC's continuing work, the report cautioned that the development of wind power in Caroline would ultimately rest on a more detailed meteorological analysis, an appropriate financing solution, and, perhaps most importantly, approval from the community.

A participatory process was especially important in Caroline, where past projects had been met with NYMBYism (not in my backyard) from independent landowners and rural residents. Accordingly, EIC waited nearly a year after the release of Cornell's feasibility study to approach residents. "We decided to take a different approach than past efforts in the town," says Frongillo.²⁰ Eventually, when they had a plan of action, the project team scheduled a public meeting to share the results of the Cornell study and solicit residents' views of the wind project. In an intentional break from conventional means of distributing information, EIC hand delivered—rather than mailed—a carefully crafted letter and meeting invitation to each household in the neighborhoods surrounding the potential wind tower sites. This intensive but well thought out effort allowed residents to ask questions of the committee members beforehand, thus demystifying much speculation about the meeting and project in general.

“We decided to take a different approach...”

Due to the significant efforts of the committee, an ample number of residents and members of the neighborhoods in question showed up to the first meeting to hear what the committee had to say. In order to avoid initial discussions over the proposed project's impact on individual properties, the group decided not to display any siting maps during the first gathering,

“If you can appeal to people's pocketbooks, that's how this thing is going to happen.”

rather using the opportunity to provide general information and answer questions. Still, the results of the feasibility report and plans to move forward were met with skepticism from some attending. One resident, in particular, was still upset over the recent construction of a cellular tower near his property and was consequently moving elsewhere. He

expressed his reservations about a large wind project.

¹⁹ Aaron Cunningham, Erik Eibert, and Morghan Transue, *Energy Independent Caroline: Wind Power Feasibility Study for Preliminary Development* (Ithaca, NY: Cornell University Department of Biological & Environmental Engineering, 2009).

²⁰ Frongillo, 2011.

Frongillo described an important turning point at that meeting: after a wind expert was probed with a question concerning the potential of wind turbines to generate additional revenue for the town, a resident raised her hand and asked, ‘Wait a minute...How many turbines would it take to eliminate property taxes in the Town of Caroline?’ Heads turned instantly, and from then on “the meeting was on fire.”²¹ By the end of the night, sentiment had shifted, and the same gentlemen who had expressed reservations concluded ‘If you can appeal to people’s pocketbooks, that’s how this thing is going to happen.’

Moving Forward

Rural wealth creation in the form of household energy savings and a reduced tax burden may be the ultimate promise of wind power and energy conservation, but any decision involving numerous stakeholders involves important trade-offs and raises difficult questions. For instance, will everyone benefit from wind development and the redistribution of additional revenues? Or will some benefit more than others? And will building wind turbines and access roads affect the profile and rural character of Caroline for better or for worse?²² How should a community balance concerns over the environment, the economy, and equity?

Next steps in the planning process will be informed by excellent work by Tristan Morris and Professor Albert George from Cornell’s College of Engineering, with the assistance of Cooperative Extension. Their recent interim report, titled, *Community Energy Choices*, is written especially for community organizers, planning officials, and “technically inclined” members of the public. The report outlines a process for helping small communities develop new sources of renewable energy.²³

Energy Independent Caroline is currently taking important steps toward the development of wind energy, having recently received several quotes for a professional wind feasibility study. Given the significant cost of a study and the relatively small scale of the proposed project, however, EIC has explored the possibility of collaborating with Enfield Energy—a local company planning a nearby development of between 6-20 turbines—in order to take advantage of the project’s economies of scale. For example, EIC has entertained ideas ranging from borrowing Enfield Energy’s meteorological tower to assess Caroline’s wind resource to simultaneously placing an order for a turbine when Enfield places their order, leasing the crane used during their construction phase, or even sharing maintenance workers with the company. After some discussion, EIC now sees a possibility for merging the two potential projects, and has also approached Enfield Energy about considering a community-financed project. If financed this way, Caroline residents could essentially “buy” a stake in one turbine.

EIC has its sights set on a wind-powered Caroline, but the supervisor admits that the committee’s momentum ebbs and flows—“sometimes we’re there and sometimes we’re not.” As energy initiatives move forward in Caroline, “You always have to stay nurturing that group,” he says. Like many community-led efforts, “At some point in time you get to the tipping point where you have enough people working on an initiative that the thing kind of just takes off on its own.”²⁴

²¹ Ibid.

²² For an example of this dilemma from a case in Northern Vermont, see <http://www.nytimes.com/2011/09/29/opinion/the-not-so-green-mountains.html?src=recg>.

²³ Tristan Morris and Albert R. George, *Community Energy Choices: Guide and Planning Overview* (Interim Report) (Ithaca, NY: Cornell University College of Engineering, 2011).

²⁴ Barber, 2011.

Getting enough people involved may be “the biggest barrier,” however, as it becomes difficult to transfer the energy and excitement generated by a passionate few to others. While the supervisor and members of EIC acknowledge the importance of having “a few members on the board that are receptive for bringing ideas forward,” and the importance of local college and university partnerships, the critical factor, “beyond all others,” according to Barber, “was the core group of citizens that were passionate about this...energy and green energy. They were, first of all, willing to put their money where their mouth is and, second, is stand up and work on these issues.”

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