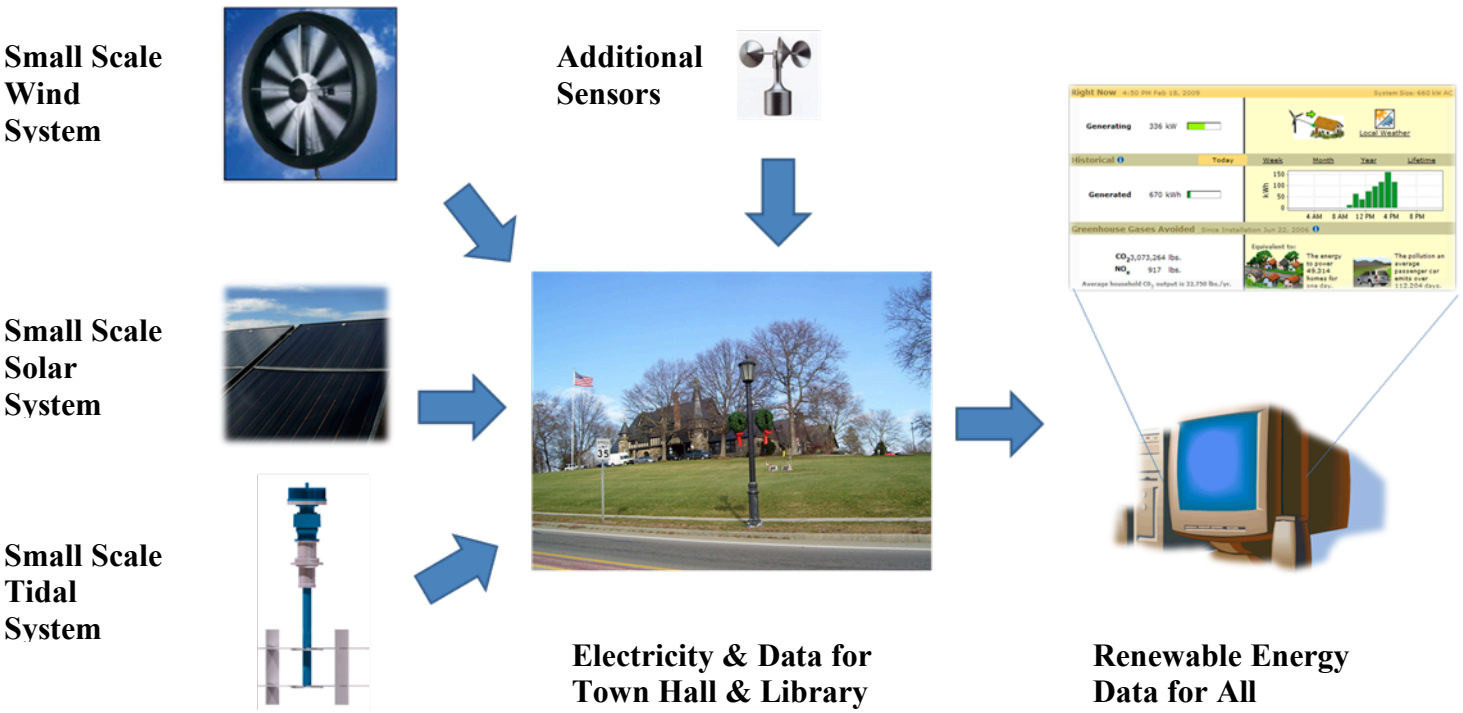
Barrington Renewable Energy Center

Executive Summary



One of the key objectives in the Town's Comprehensive Community Plan and Strategic Energy Plan is education of citizens on the importance of energy conservation and the use of renewable energy resources. A critical first step toward meeting this objective is the establishment of a Barrington Renewable Energy Center (BREC). The Center will consist of small scale renewable energy systems of the latest commercially available technology. Operational data from these systems will be collected automatically and made available to all members of the community, including the students. In addition to general education of the public, this data will help the town, residents and businesses determine the technical and economic viability of larger scale systems prior to making expenditures. Although it will not initially have a large economic impact, the Center should provide the impetus for the installation of many municipal and private systems. If successful, it should stimulate job growth in the green technology and energy sectors of the Rhode Island economy.

In 2007 and 2008 the Town of Barrington spent considerable time and effort on a municipal wind energy project. Approval was obtained from the IRS for a Clean Renewable Energy Bond and from the Barrington citizens at the Financial Town Meeting. Analyses were completed, an RFP written and bids for purchase and installation obtained. In the end, the project was put on hold due to the lack of reliable data, particularly in the amount of wind. There was also a general "fear of the unknown" by many citizens about wind turbines. Before proceeding with future cost effective renewable energy projects, the Town needs more reliable information about candidate municipal systems. Real world experience in the collection and analysis of the data will also be useful to residents and businesses in Barrington and neighboring towns in establishing private systems.

Data from the Center will be available at several locations in the Town including the Library and Barrington High School where it will provide direct support to the science and math programs. The primary location for the small scale systems will be

the Town Hall / Library complex. This location will provide the most visibility to the residents and is a favorable location for wind, solar and tidal resources. Additional renewable energy sensors will be located at appropriate sites around the town with links to the central computer at the Library.

Data acquisition, storage and display are well understood and can be implemented in a variety of ways. The Center will make the data available at the Library, the High School and over the web. An example of what the website will look like can be seen at:
http://www.sunskool.com/school/bentleigh.aspx

High technology small scale wind and solar renewable energy systems designed for residential and small business applications are commercially available. Many come with sensors that facilitate the collection of operational parameter data. Each system will provide about 1 kilowatt of electricity. The wind turbine will be about 7 feet in diameter. The solar panels will be about 10 feet square. Tidal technology is not as mature. If a suitable tidal system is not available, the Center will initially use an instrument to measure the tidal flow for possible future systems.

The roof sensors will be visible to large numbers of people who pass by the Library every day and will help increase public awareness as to the importance of renewable energy. In addition, information about the systems and real-time data will be available on a website.

The Center will collect the necessary data to evaluate the technical and economic viability of the respective energy systems. The primary data to be collected is the magnitude of the respective renewable energy source (wind, solar & tide) and its distribution over the course of a year. Additional data will be collected for solar and wind in each of the following areas:

- Energy Produced
- Energy Conversion Efficiency
- Environmental Impact
- Economic Impact
- Operational Issues (advantages, disadvantages, maintenance etc.)

The Center will provide resources to educate the citizens of Barrington and neighboring towns about renewable energy systems.

- Increase awareness in renewable energy
- Help alleviate the “fear of the unknown”.
- Support math and science curricula in the schools
- Gain support for municipal and private renewable energy projects

Although the main purpose of the Center is education, there would be some economic benefit. Each system will produce several hundred dollars worth of electricity per year. The energy will be used at the Library and will result in a comparable reduction in the National Grid charges.

The infrastructure (facilities, communication links, displays) for the Center exist but current budgetary constraints do not allow for the procurement of candidate systems. Funds from this and other grants will be used to purchase system modules. Establishment of the Center will be treated as a “design to cost” project with a “not to exceed” budget of $75,000. Existing municipal and school budgets and volunteer work (from CREB members, students etc.) will cover the $25,000 required for project management, facilities modifications, energy system installation, computers, software etc. The Town plans to use $16k of its $164k allocation from the Energy Efficiency and Conservation Block Grant program to purchase the first renewable energy system module. $34k of RIEDC grant money will be used to purchase additional modules and remote sensors. Typical modules will cost between $10k and $15k. The remainder will be used for equipment to acquire, store and display the data from the systems and for additional sensors.

The Public Works Department will assume full responsibility for the ongoing maintenance of the Center. The cost of the required maintenance will be more than offset by the reduced energy cost from National Grid.

The Barrington Town Council and the School Committee have expressed their commitment to the project and request RIEDC’s approval for this grant. This Center will enable future renewable energy project that will provide economic benefit to Barrington and the State of Rhode Island.