4.4 ENERGY[1]

INTRODUCTION

The Northeastern United States is highly reliant upon fuel being imported to the region to meet the region's energy demands. The northeast is not the source of any significant fossil fuels, and the development of alternative energy resources have been extremely hindered by a national energy strategy that has favored exploration and exploitation of existing fuel sources over the identification of new energy sources.

The only real, significant, northeastern energy source is from water power. However this energy source, given how the region's hydropower system was developed, has had significant detrimental environmental consequences all its own. The northeast region needs to examine its regional energy needs and explore sources of energy specific to the northeast to reduce our reliance on both foreign supplies and energy sources outside of the northeast U.S. In addition, the northeast region needs to develop a strategy to ensure that the energy sources that are available are utilized in the most efficient manner possible.

The Town of Dennis, has taken a lead in the Cape Cod Light Compact, an organization that has been formed to find inexpensive energy sources for Cape Cod residents. The Cape Cod Light Compact is a creature of energy deregulation in the state. The Compact has been formed to act on behalf of municipal government, businesses and residents to enter into energy contracts that will result in long term savings to those selecting to purchase energy through the Compact.

INVENTORY

The town presently does not have an inventory of energy related infrastructure. The town also has no inventory of energy demands for the town, whether electric, natural gas or any other forms of energy. Without such an inventory it is difficult to determine what steps should be taken to reduce energy demands within the town. However, certain obvious steps that could be pursued are included in the Implementation section. The Implementation section contains action items designed to prepare a baseline inventory of energy need and use by the private and public sectors of the Town of Dennis.

[1] Much of this material is taken from the Falmouth Local Comprehensive Plan - Energy, Element 4.4 which was prepared by Matthew Patrick, a member of the Board of Selectmen, President of Self Reliance Energy Corporation and member of the Cape Cod Energy Task Force.

ANALYSIS

Barnstable County Energy Management Plan

The Barnstable County Task Force's committee, in a two and a half year process, researched, wrote and approved 146 recommendations. These recommendations and the rationale for their creation can be found the Draft Barnstable County Energy Management Plan, which is available at village libraries, the Cape Cod Commission Offices and the Cape and Islands Self-Reliance office at 446 Waquoit Highway, Box 3202, Waquoit (phone: 457-7679, fax: 457-9171).

Electric Industry Restructuring and the Community Choice Option

The Energy Policy Act of 1992 and subsequent rulings by the Federal Energy Regulatory Commission have encouraged states to deregulate the electric utility industry and create competitive markets for consumers. Massachusetts has deregulated the electricity industry, however to date competition among energy providers has been lacking.

Under deregulation energy supply is to be competitive. There are three options outlined for consumers for competitive energy supply:

1) "standard offer" energy supply from the existing utility (an option which would be phased out in five years);
2) "choice" of a new energy supplier;
3) "default service" on the "spot Market" for electric prices (all of those who do not choose a new supplier and are phased out of "standard service" after five years would receive default service, as would those who choose and later leave a new supplier).

The thrust of the plan is to bring consumers into the marketplace.

Consumer Options: Because the "standard offer" is to be phased out, the options for consumers will be "default service" with fluctuating spot market prices, or "choice" with contracts for set prices under competitive suppliers.

Under the **Community Choice** option, towns that can fully participate in competitive contracting will have the advantage of negotiating their own terms and conditions for service. It is generally acknowledged that individual residential consumers and individual small businesses will not have leverage in the market, and will need to join together, or aggregate, in order to achieve beneficial contract terms and savings. The question residential and small business consumers need to ask themselves is what will be the best way for them to aggregate.

Aggregators for consumers will include both private and public entities. Private aggregators have often been compared to telephone service solicitors (some of the emerging private companies are offering telephone deals in combination with electric service contracts). However, as the experience with telecommunications competition has indicated, the terms and conditions of these offers are often confusing and pricing is not transparent. There are also opportunities for consumer abuse and discrimination favoring higher volume and more wealthy consumers. The Community Franchise

form of aggregation by municipal government allows consumers to use the umbrella of their communities to receive savings and other benefits of aggregation, and to have choice and control over the process and terms of service. It also offers the advantage of the municipality as a core customer (whose load will likely be one of the largest and most balanced) and it offers long term opportunities to enhance local planning, environmental protection, development, and achieve savings in municipal budgets.

Under the **Community Franchise Option**, municipalities in Massachusetts aggregate consumers for a wide range of services. Under this option, municipalities may voluntarily elect to act individually or enter into joint efforts to contract for electric service franchises, the municipality, or its joint body, will not take title to, or liability for, delivery of service. It does not buy and resell electricity. The municipality sets the terms and conditions of service and the final agreement for delivery is between the service provider and individual customer under the terms established.

Individual consumers are not mandated or obligated to receive service under the Community Franchise contract and have the choice to select "standard" service or another competitive supplier.

The use of a Community Franchise for electric service and competition in the electric industry are not new ideas. Prior to the era of monopoly and state regulation of electric service to competitive bidding. In 29 states, local government still holds franchise contracts with monopoly suppliers. Massachusetts municipalities still have significant home rule and statutory powers over electric utilities and most electric utilities operate under franchise rights granted by municipalities to their predecessor companies.

Under this model, Dennis should work with the Barnstable County Commissioners and other towns to seek lower electric rates for consumers, businesses, and local government, allowing the residents of Dennis to aggregate their power demand to achieve the lowest possible rates.

Under the **Self-Franchise Option**, municipalities also have the power to "self-franchise" and create a municipal utility system - similar to a municipal water department. Under this option, municipalities enter into the electric business, own the poles and wires and other service equipment, take title to electricity and resell it to consumers. There are 40 municipal electric systems in Massachusetts. The Community Franchise differs significantly from the Self-Franchise option by not engaging the municipality in the utility operation or business. The Community Franchise is a voluntary contracting mechanism.

A steering committee made up of a representative from interested towns, of which Dennis is one, has been organized by the Barnstable County Commissioners. The Cape Light Compact has been meeting to solicit proposals for energy, and has been working on the behalf of the Cape Cod communities to ensure that deregulation can work for residents. Dennis has participated in following:

> Work with the County to insure that energy efficiency, low income assistance and renewable energy programs are maintained in the contract with the distribution company.

Work with the Barnstable County Commissioners and other towns to seek lower electric rates for consumers, businesses, and local government through the utility deregulation process. This has included developing a competitive municipal franchise model, which allows municipalities or groups of municipalities to aggregate their power demand to achieve the lowest possible rates.

Community Energy Loan Program (CELP)

Research by the Barnstable County Energy Management Plan Economic Assessment Committee and the Energy/Affordable Housing Committee established that at least 81,000 housing units (65% of the total Cape housing stock) are below the current state and national energy code requirements, having been built before the recent energy code went into effect. About 26,000 of the total housing units are owned or rented by low and moderate income residents. Many low income renters with state subsidized housing and many units operated by housing authorities are heated with electricity.

The County Energy Assessment Committee found that $188 million were spent on energy in the residential sector in 1990. Social and environmental damages, assessed at $38.6 million dollars, were attributed to pollution from fossil fuels burned by the residential sector. The total cost to Cape Cod was $226.6 million.

The families least able to afford high energy costs are forced to cope with them because there is very limited funding to help them finance necessary energy improvements. State subsidies for low and moderate income energy programs have been severely cut in recent years. For example, state subsides to help AFDC families pay utility bills have been discontinued. This results in a situation where many people could have their electricity, gas or oil shut off in the spring of any given year for non-payment of their winter utility bills. Fuel Assistance programs have been severely cut. The only program available to moderate income and low income families was the HEAT zero interest loan program. This program originally funded with oil overcharge penalty funds (no tax dollars) has been depleted.

Many moderate income residents would invest in energy saving upgrades if they had the necessary capital and technical assistance. The State's HEAT zero interest loan program filled that void for some time before funding ran out. HEAT inspired 3,600 families in southeastern Massachusetts to invest 418 million in energy improvements. To quality, HEAT applicants had to meet stringent technical requirements and inspections, therefore guaranteeing top quality, high efficiency installations by qualified technicians. A replacement source of funding for a program like HEAT is needed in Dennis. A portion of an Energy Fund would be dedicated to low income grants. An Energy Fund would provide the incentive to moderate income families and grants for low income families to reduce their energy bills.

The Cape and Island Self-Reliance has established the Community Energy Loan Program or CELP, a low interest loan program in the Fall of 1996 by using its own money to guarantee loans for recipients. Self-Reliance provides financing and technical assistance, and acts as a general contractor. Funding for the program is limited. Deregulation will enable municipalities to access funding for energy efficiency through the distribution contracts (see section entitled Electric Industry

Restructuring and the Community Choice Option on page 1).

Municipal Energy Efficiency

The National Science Foundation has found that cities can often reduce energy costs by 15% without affecting services. Here on Cape Cod, energy costs are much higher than the national average; therefore, we should be able to save a substantial amount of money. Phoenix, Arizona, was able to save several million dollars in annual energy expenses. To maintain levels of savings each year, Phoenix gave department head financial incentives by returning a percentage of savings to the department's budget. Another portion was put into a permanent energy fund to finance more energy improvements in other buildings. The largest percentage of savings was returned to the general budget.

Over 80,000 housing units on Cape Cod need energy related improvements to bring them up to code. Of those, more than 26,000 homes owned and rented by low and moderate income people on Cape Cod were built before state energy codes were in place. Some have added insulation since then, but many remain under the state energy code recommended levels, which are minimum recommended levels.

Although there are no requirements for existing homes to comply with the state energy code, eventually, many homes on will meet these state energy code requirements, saving the local economy and residents thousand of dollars in energy and pollution cots. Homes may be brought up to code at time of sale in order to qualify for the energy efficiency mortgages therefore lowering the operating costs of the home. Lower operating costs means that the homeowner has more free cash available to spend locally. There is less net loss to the local economy.

While we are cutting necessary operating expenses for education and services, taxpayer money is wasted to heat, cool, light and operate municipal buildings. This occurs because there is not enough awareness or monitoring of how much money is being spent for energy and that new more efficient technologies exist.

Dennis town departments at this time do not have a line item in their budgets for energy separated by end use. A line item would provide a baseline to detect future energy savings or added expense. With this information a town can determine if there are opportunities for savings and monitor the progress. Based on the initial analysis, the town can decide to proceed with a complete energy study which will provide a listing of energy efficiency measures, cost for installation and savings, and the payback on the investment made or the return on investment. Once this is determined the town can apply for grants from the state or the local utilities to implement the measures suggested in the energy study. Towns may also find that the return on investment is better than conventional investment strategies and decide to finance energy project themselves. In some cases the utilities will help pay for the energy study and improvement.

Capital must be found so that Dennis can invest in making their buildings more energy efficient. To start doing this, it is important to compile an annual Energy Assessment for the Town. This information will form the basis for investing in energy programs in the future.

Questions that should be answered in order to understand how energy is utilized and where the Town could make potential savings include the following:

- How much energy does the town of Dennis use?

- How much energy do our municipal buildings and schools consume? This is most important to know if we are to devise meaningful programs. We need to know how much energy municipal buildings consume separated by fuel type and end use. We also want to know the cost of the fuels by field type and end use.

- How much do we pay to operate and maintain Town vehicles? The commercial and residential sectors can be extrapolated according to the data in the Barnstable County Energy Plan's Energy Assessment section.

The Town should also be familiar with he following information:

1. Current Energy Usage, Costs and Billing Procedures
   - Identify the facilities, including street lighting, that the municipality manages.
   - Identify the number of existing electric meters.
   - Identify monthly kilowatt demand and total energy usage for each facility.
   - Identify the number and the percentage of electric accounts, the number of natural gas accounts, and the number of other energy accounts (such as steam or oil).
   - Identify the percentage of energy costs that are electric, natural gas, oil and other.
   - Identify which accounts are estimated, which are metered, and which are unmetered.
   - Compare energy costs to the regional average.
   - Identify billing errors (such as incorrectly estimated bills).
   - Identify how utility bills are monitored.

2. Rate Structure and Discount Options
   - Identify the rates at which municipal energy services are billed.
   - Identify discount rate structures or riders that the utility may offer (e.g., curtailment, 'interruptable' non-firm, or time of use rates).
   - Identify the municipality's top 10 cost centers.
   - Determine if the municipality is eligible for any discounts on electricity or natural gas.
   - Identify significant ratchet or power factor penalties.
     A rachet or power factor penalty may be imposed - as part of the rate contract - for exceeding a given demand level in any one month. The reason for such penalties? It costs electric companies more to provide extra power at times when there is excess demand for electricity on the system, since they must either turn on expensive peak power generators or purchase electricity from neighboring utilities at a premium. These costs are passed on to customers who don't stay within their typical demand levels, which are ranges of KW amounts that are called ratchets or demand.

A Kilowatt (KW) demand is the rate at which electricity is used during a defined period (usually metered over 15 minute intervals). Utility customers generally are billed on a monthly basis; therefore, the KW demand for a given month would be the 15 minutes period in which the most power is consumed. Customers may be charged a fee (demand charge) based on the peak amount of electricity used during the billing cycle. Residential customers are generally not levied a demand charge.

3. Become familiar with the cost basis and book value of the utility's assets, and the utility's position with regard to stranded cost recovery. Stranded costs are utility assets (e.g., investments in power plants or transmission lines) that may not ever be fully paid for under competition. The magnitude of these costs, as well as who should pay for them, is subject to considerable debate.

4. Identify the utilities's transmission, distribution, generation, and ancillary costs. (Much of this information can be found in the utilities's annual report).

Energy Fund for Energy Efficiency and Energy Conservation

Establishment of a local or regional energy fund that can be accessed by the commercial and residential sectors to invest in energy efficiency measures will keep dollars that are morally spent to import fossil fuels in the local economy where they will multiply in value. Various studies from around the country have documented the fact that dollars spent on energy efficiency are beneficial to the local economy because they create more local jobs and keep dollars circulating locally. Residents working in local energy efficiency business will directly benefit from the increased business each year don't disappear. They stay in the local economy longer than money spent for fossil fuels.

The economic multiplier effect can best be described by this paragraph excerpted from the National Renewable Energy Laboratory's fact sheet entitled Energy Efficiency Strengthens Local Economies:

"Economists refer to the "economic multiplier" as a measure of how much economic activity can be generated in a community by different types of investment. For example, a $1.00 purchase of ordinary consumer goods in a local store generates $2.06 of economic activity in your local economy. (The store hires local workers, who, in turn shop at local stores, etc.). The economic multiplier provides a way to compare the relative value of different types of investments (or payments). Purchase of petroleum products has an economic multiplier of $1.48; for electricity, the multiplier is $1.75. For energy efficiency expenditures the economic multiplier is $2.32. Economists for the State of Nebraska estimate that 80% of every dollar spent on energy leaves the state's economy. Saving energy is one of the best economic programs we can institute and it comes with the added benefit of cleaner air and healthier lives".

Improving Energy Efficiency in the Private Sector

Presently, the Dennis Planning Board does not specifically encourage energy efficient construction of commercial buildings and the Dennis Planning staff does not have the expertise to quantify the amount of energy commercial buildings will consume when they are built. There are advanced technologies in lighting, motors, air-conditioning and refrigeration that will create more energy efficient buildings, but awareness of them is low and they are generally not considered because, initially, they might cost more money even though the life time operating costs are lower.

Encouraging energy efficient construction methods and materials will result in stronger, more competitive local business with less of their capital tied up in operating expenses because their buildings will be much more energy efficient.

Siting decision have long term consequences on the fuel requirements of the house and little if any up-front cost. Dennis should encourage maximizing solar gain by creating bylaws that encourage consideration of solar orientation of buildings within proposed developments.

Developers can be encouraged to incorporate energy efficiency and efficient solar gain in the buildings if they understand its benefits. One way of educating developers is by providing them with a model contract, such as the one described below, that will reward the designer for creating buildings that use less energy per square foot of commercial space than the average commercial building.

A model contract can give the designer an incentive to create a more energy efficient building. The model contract can be used by the developer to help him select the designer of his building. The developer can specify a maximum energy cost per square foot of building when soliciting designers. The designer will create a building that is lower than the maximum square foot energy cost, and improve the competitive position of his proposal. In addition, the developer may choose to provide a monetary incentive to the designer if the building performs as promised.

Encourage Renewable Energy Sources

Cape Cod is completely dependent upon fossil or nuclear generated electricity and fossil fuels for heating. These sources have environmental and economic consequences that depress the local economy and contribute to global climate change. Federal and State tax write-offs to provide incentives for the installation of solar and wind systems were terminated in 1985. Several local solar businesses closed soon after.

Wind turbine technology has advanced steadily since the early 80's although that is not widely recognized on the East Coast. Cape Cod is recognized as having excellent wind resources with the Outer Cape having the highest average wind speeds in the country. Potential wind sites in Dennis should be evaluated using the Massachusetts Division of Energy Resources' criteria.

Encouraging local use of wind and solar energy will expand employment opportunities. The

potential exists for alternative energy to be a growth industry on Cape Cod. A wind powered electric generation facility will require five times as many workers as will a conventionally powered electric generation facility. Simply put, where conventional electric generation has fuel costs, wind turbine generation has labor costs. As mentioned before, 80% of the money spent on fossil fuels leaves the local economy. Prices for electricity generated with renewable technologies are competitive with conventional fuels especially when the external (societal and environmental) costs of various conventional technologies are part of the feasibility equation.

Air Pollution

Six of the ten highest readings of air pollution levels in the state were taken at Truro Air Force Base in 1996. While not all of the pollution is produced locally, we produce a substantial portion of it. It is the portion we produce that we can reduce to improve our local environment. The Energy Assessment Committee found that transportation is responsible for the largest percentage of environmental pollution. Heavy summer traffic generates pollution emissions and is a major source of irritation to both tourists and residents. Since tourism is the major industry on Cape Cod, we should do all we can to lessen the traffic in the summer months.

The benefits of fleet conversion to **Compressed Natural Gas** (CNG) range from cleaner air and a lower cost per mile driven to greater engine life because of reduced wear. Natural gas creates much less pollution than gasoline when it is burned. Currently, it is untaxed and should remain so, therefore the cost expended per mile drive is less than gasoline. Finally, because CNG is so clean the engine lasts much longer and motor oil changes are less frequent. From a water quality standpoint, CNG is environmentally safer than gasoline, since CNG is gaseous at room temperature and therefore a spill will not pollute our ground water.

The benefit derived from getting residents to use alternative modes of transportation in the summer months include better health because of cleaner air to breathe, a more active life style and happier tourists getting where they want to go without waiting in traffic. In addition, out-of-pocket expenses will be reduced for those residents who commute to work on foot, in carpools, bus or by bicycle.

State and Federal Incentives for Energy Efficiency

The Town of Dennis and the County Energy Committee should follow state and federal developments and work with state banking authorities to find ways to make energy efficient mortgages better utilized in the state and to affirm that no regulatory barriers affect the growth of this type of lending. Dennis should also examine ways for first time home-buyers to meet any increased down payment requirements if caused by energy efficiency improvements. Programs with deferred repayment provisions secured by a lien paid at sale of property should be considered as well.

The Town of Dennis should work to provide local and state incentives for financially feasible renewable energy devices but eliminate loopholes that existed in past federal and stat legislation. Utility deregulation may facilitate this effort.
Several U.S. cities have passed residential and commercial energy conservation ordinances. They

require a minimum investment (typically $400 on a hundred thousand dollar sale price) in certain energy conservation measures such as attic insulation, storm windows, water saving shower heads, etc. prior to the sale of a home.

The Town of Dennis and the County Energy Committee should provide the State Board of Building Codes and Standards information from the County Energy Management Plan analysis that justifies higher state energy codes.

Dennis Energy Committee

Currently there is no department in Dennis to implement the recommendations of the Town of Dennis Energy Plan and to ensure that maximum energy efficiency is realized. A volunteer committee charged with providing information to the Dennis Selectmen and ensuring that the goals of the Dennis Energy Plan are implemented is needed to ensure that the savings potential possible through energy efficiency is achieved.

The benefit of creating a committee with oversight over energy issues is that coordination and implementation of Barnstable County Energy Management Plan recommendations will open the doors to the possibility of saving 10% to 40% of our current annual energy usage (10% of $434 million Cape wide equals $43.4 million) and the attendant pollution costs caused by burning fossil fuels. More dollars will remain in our local economy in the form of increased disposable income in the hands of local residents. Normally, 80% of the money spent on fossil fuels goes to the state or country from which we import our fossil fuels.

The local job market will benefit because business will have less capital tied to operating costs and local energy contractors will have more work.

GOALS AND POLICIES

4.4.1 Goal: To encourage energy conservation and improved energy efficiency, to encourage and stimulate investment in energy conservation and renewable energy resources and to manage land uses to maximize energy efficiency.

Development Review Policies:

4.4.1.1 Development and redevelopment shall be designed to promote the efficient use of energy including orienting structures to take advantage of solar gain and to maintain solar access for adjacent sites. Energy efficient construction methods, materials and site design should protect and optimize the potential for the use of solar and wind energy.

4.4.1.2 New development shall be required to lay new utility lines underground for aesthetic and security purposes and to facilitate the development of walkways and bikeways.

4.4.1.3 Energy saving transportation activities including carpooling, mass transit programs, bicycling and walking shall be encouraged. Bikeways and walkways should be linked together to create a network that ties together the Dennis villages as well as adjoining communities.

Town Policies

4.4.1.4 Improve energy efficiency and energy conservation in the public sector.

4.4.1.5 Encourage and require development and redevelopment to utilize energy efficient construction techniques and materials.

4.4.1.6 Create Village Growth Centers which promote mixed use development opportunities which will promote walking, bicycling and the use of public transportation for trip making.

4.4.1.7 Create Village Growth Centers which promote the use of alternative construction strategies, such as multi-family (i.e. townhouse) development over single family detached housing to take advantage of the energy efficiencies available common-wall construction.

4.4.2 Goal: To optimize benefits made possible by the deregulation of electric and gas utilities.

IMPLEMENTATION

1. Create a standing Dennis Energy Committee (DEC) to oversee, implement and maintain the Energy element of the Local Comprehensive Plan.

   Responsible Parties: BOS
   Priority: High
   Time Frame for Completion: 2005

2. Prepare an annual energy assessment to analyze municipal energy efficiency.

   Responsible Parties: BOS, DPW, DEC
   Priority: High
   Time Frame for Completion: On-going

3. Create a model contract that will require the building designer for creating a building that uses less energy per square foot of commercial space than the average commercial building.

   Responsible Parties: DEC
   Priority: Medium
   Time Frame for Completion: 2005

4. Investigate the feasibility of placing utility lines underground for aesthetic and security purposes and to facilitate the development of walkways and bikeways.

   Responsible Parties: DEC, DPW
   Priority: Medium
   Time Frame for Completion: 2005

5. Investigate, encourage and present to Town Meeting the opportunity to place utility wires undergound and work into the distribution contract if Town Meeting so desires.

   Responsible Parties: DEC, BOS
   Priority: High
   Time Frame for Completion: 2005

6. Work with the Barnstable County Commissioners and other towns to seek lower electric rates for consumers, businesses, and local government through the utility deregulation process.

   Responsible Parties: DEC, BOS
   Priority: High
   Time Frame for Completion: Ongoing

7. Work with the County to insure that energy efficiency, low income assistance and renewable energy programs are maintained in the contract with the distribution company.

   Responsible Parties: DEC, BOS
   Priority: High
   Time Frame for Completion: On-going

8. Work with the appropriate agency(ies) to establish a Dennis Energy Fund.

   Responsible Parties: DEC, BOS

Priority: Medium
Time Frame for Completion: Ongoing

9. Continue its work on the Fuel Assistance Program.

Responsible Parties: DEC, BOS
Priority: Medium
Time Frame for Completion: On Going

10. Make municipal buildings, facilities, and street lighting more energy efficient. A percentage of the net monetary savings from conservation at municipal buildings should be invested in further energy improvements.

Responsible Parties: DEC, BLDG
Priority: Medium
Time Frame for Completion: Ongoing

11. Enforce energy conservation standards for development and redevelopment.

Responsible Parties: DEC, BLDG
Priority: Medium
Time Frame for Completion: 2005

12. Provide incentives for the use of energy conserving building improvements and renewable energy devices in all existing and new buildings, if cost effectiveness over the improvements' expected lifetime can be demonstrated.

Responsible Parties: DEC, BLDG
Priority: Medium
Time Frame for Completion:

13. Utilize clean alternative fuels, like propane gas Consolidated Natural Gas (CNG) and electricity, for all new fleet vehicles and shuttle buses.

Responsible Parties: DEC, BOS,
Priority: Medium
Time Frame for Completion: