

## **STATEMENT OF PURPOSE**

Recent events – global warming, wars in the oil rich Middle East, awareness of "peak oil" concerns, electricity shortages and blackouts and skyrocketing energy prices – have lead to an understanding that the sources of energy that we have become so dependent on are not limitless. The reality is that most of our energy comes from nonrenewable, finite sources. The unprecedented and continuing rise in human population (increasing from approximately 1.65 billion to 6 billion over the course of the 20<sup>th</sup> century) creates additional pressures on these resources. If demand continues to increase, our supply of energy will only become scarcer, and more expensive, putting a drain on our economy, and degrading our environment.

In order to plan for the long-term energy security of our Town, we must first understand that it is not energy itself that we want or need, but the services that energy provides. We do not demand heating oil; we need heat for our homes. We do not need gasoline; we want cheap transportation. We do not require electricity; we need light for our work place. The energy security of Thetford depends on being able to provide these energy services consistently, sustainably and at the lowest expense to the townspeople.

Sustainability must be the basic principle of a long-term energy plan. We cannot rely on nonrenewable energy sources indefinitely. Nonrenewable sources are by definition unsustainable. Nor can we rely on energy sources that degrade our natural environment. In fact, the sustainable use of renewable energy resources often depends on a healthy ecosystem.

Currently, the Town is highly dependent on imported sources of energy. On average, towns in Vermont consume 74% of their energy in the form of fossil fuels (oil, natural gas, and propane), and another 17% in the form of electricity. And these figures don't even include transportation, which is almost entirely fossil fuel based. Because these nonrenewable forms of energy are produced outside our region, most of the money spent on that energy is exported from our local economy.

Local energy sources, (wood, wind, solar, and hydropower) offer distinct advantages over nonrenewable energy sources. For every dollar spent on fuel wood, only 18-20% of that dollar leaves the local community. The rest remains in our own region, creating jobs and buying goods locally. On the other hand, for every dollar spent on nonrenewable energy sources, 85% of that dollar flows out of the community. Another point to consider is the long-term availability of local energy sources. Once developed, these resources are not subject to politically induced shortages, nor to interruptions in the distribution network. In contrast, foreign fuel sources are insecure and unstable, subject to huge price swings, potential terrorist attack and supply shortages beyond our control.

Any energy plan must include the most abundant local energy "source" available to us: conservation. Every kilowatt of electricity we don't use is that much more money in our pockets, that much more money that stays in the local economy. Increased efficiency means more viable businesses and greater economic security. And this is available to us with no reduction in the quality of service or the standard of living, and with no degradation to our natural environment.

Therefore, the Town of Thetford resolves to take action that will create a sustainable energy future: one that minimizes environmental impact, supports our local economy, and emphasizes energy conservation, efficiency and the increased use of local and regional renewable energy sources.

## **ENERGY RESOURCES AVAILABLE**

### **Non-renewable Sources**

#### **Electricity**

In the previous twelve months, Central Vermont Public Service Company (CVPS) provided 34,420,393 kWh to 1463 Thetford accounts (i.e. meters). One substation supplies the entire town (1344 accounts) except for Union Village (119 accounts). The energy usage quoted above is the primary substation output increased proportionately to include Union village. Three-phase power lines run along:

- Route 113 from the Connecticut River to the Tucker Hill Road
- Route 113 south of the landfill through Post Mills along Route 244 to the Fairlee town line
- Pavillion Road a short distance south of the northerly intersection with Route 5
- Route 5 from the northerly intersection with Pavillion Road to the Fairlee town line
- Academy Road from its intersection with Route 113 to the covered bridge.

Thetford CVPS customers include approximately 1100 households as well as businesses with multiple accounts. Households average 600 kWh per month statewide. Therefore, households account for roughly 8,000,000 kWh or 23% of the total electrical power consumption in the town.

CVPS derives its power from nuclear (51%, Vermont Yankee and Milestone 3), hydro (35%), wood (3.6%), oil (1.7%), cow power (0.1%), sun and “unspecified” sources (8.6%), according to its 2005 annual report. No generators are located in Thetford. CVPS representative Bob Morey gave a slightly different breakdown for 2006: Vermont Yankee (i.e. Entergy Corp, 45%); Hydro Quebec (30%); hydro in state (6%); joint projects with other utilities (gas, wood, oil, 13%); independent producers (hydro, wind, solar, 6%). He also explained that CVPS’s contracts with Entergy and Hydro Quebec expire in 2010 and 2012 respectively. Due to volatility in the energy market, future contracts will likely be limited to three-year terms.

Many fuel distributors provide liquid fossil fuels (oil, kerosene, fuel oil, gasoline, diesel fuel, and propane). Together they are capable of supplying the Thetford fuel demand. However, none carry large amounts of inventory and all would run out of fuel within a week of a shut off of interstate and international fuel delivery. The only significant amount of storage is the fuel in resident's tanks.

## **Renewable Resources**

### **Wood**

Thetford is largely forested. Prior to the wide-scale use of fossil fuels, all of Thetford was wood heated. Thetford contains enough forested land that it could produce sufficient fuel wood for the entire Town on a sustainable basis.

### **Hydro Generation**

Early Thetford settlers relied on hydropower for grinding flour and sawing lumber. Subsequently, Thetford Center, Post Mills, Rice's Mills, and several other locations in Town became thriving communities based on waterpower. No electricity is currently produced by hydropower but the potential still exists for projects at Union Village (600-1500 KW), Thetford Center (350 KW), Post Mills and Rice's Mills (100 KW) and the head of Lake Fairlee (50 KW). Together these projects could produce enough energy annually to supply Thetford's households, given 1kW per customer, but not its businesses.

### **Solar**

Solar power has the potential to provide space heating, water heating, and photovoltaic electricity. Currently one resident has a moderate solar array providing electricity for his residence and selling a small amount of surplus to CVPS. There are households that are not serviced by CVPS and have independent solar arrays. These projects usually provide sufficient electricity to run a small number of lights and electronics, but considerably less than most modern houses utilize. One household has sufficient panels to provide most modern conveniences.

### **Wind**

Wind power has never been utilized on any large scale in Thetford.

### **Geothermal**

Geothermal energy is not widespread. Some residents utilize earth/water-based heat exchangers but the economics of such projects have been questioned in northern latitudes.

### **Transportation**

Transportation through the Town of Thetford is primarily by private vehicle at this time. Because road maintenance and school bus services make up the greatest portion of the Town's energy costs, the Town should limit expansion of its road system and provide school busing through a policy that maximizes energy efficiency while maintaining safety considerations.

## **GOALS, OBJECTIVES AND RECOMMENDED POLICIES**

### **GOALS**

1. Reduce our dependence on nonrenewable and imported energy sources.
2. Maximize cost effective development of local renewable energy resources.
3. Reduce energy consumption in all Town and school buildings and operations.
4. Encourage energy conservation and efficiency and the sustainable development of local renewable sources of energy.
5. Protect the Town's renewable energy resources.

OBJECTIVES	RECOMMENDED POLICIES
<b>ENERGY PLAN</b>	
<ol style="list-style-type: none"> <li>1. Evaluate our patterns of energy use. Modify as indicated for energy efficiency.</li> </ol>	
<b>ENERGY - RESIDENTIAL, COMMERCIAL, INDUSTRIAL, AND PUBLIC BUILDING PROGRAMS</b>	
<ol style="list-style-type: none"> <li>2. Investigate and consider cost-effective energy conservation and efficiency measures for use in all Town buildings and operations.</li> <li>3. Encourage the sustainable development and use of local renewable energy re-sources for all Town and school buildings and operations.</li> <li>4. Continue on-going energy audits of all Town buildings to: Identify areas of energy waste and areas of potential savings; Determine whether the end-uses of energy are properly matched with the types of energy sources used; Recommend cost-effective energy conservation and efficiency measures and modifications that could make use of renewable energy; Prioritize these modifications and incorporate them into the Town's Capital Budget; and Implement programs as prioritized by the previous steps.</li> <li>5. Consider energy consumption when performing life cycle cost planning and least-cost planning.</li> <li>6. Promote energy-efficient lighting.</li> <li>7. Engage in long-range planning for the sustainable use and acquisition of energy.</li> </ol>	<ol style="list-style-type: none"> <li>1. Require that developers quantify and evaluate the energy impact of all major development proposals.</li> <li>2. Efficiency standards should be at least equivalent to Energy Rated Homes of Vermont 4-star level.</li> <li>3. Encourage landlords to bring apartment buildings up to Town standards for efficiency, especially those in which tenants are responsible for their own heating bills. The Town might consider offering a one-time only property tax credit for the purchase and installation of retrofit conservation materials such as insulation, caulking and weather-stripping.</li> <li>4. Support local and regional funding for energy audit and cost-effective weatherization services on all existing homes, with special emphasis on low-income housing.</li> <li>5. Support emergency energy supply programs, with special emphasis on low-income households.</li> </ol>
<b>ENERGY - TRANSPORTATION</b>	
<ol style="list-style-type: none"> <li>8. Promote cost-effective energy efficiency in future transportation planning.</li> <li>9. Educate the public about energy-efficient transportation.</li> <li>10. Coordinate land-use and transportation planning which promote energy-efficient transportation.</li> <li>11. Promote and implement strategies to encourage ridesharing, public transit, bicycling and walking.</li> </ol>	<ol style="list-style-type: none"> <li>6. Cooperate with local communities to: Increase access to bus routes especially during peak transit hours and encourage education programs on the benefits of using public transportation.</li> <li>7. Encourage major employers in the Town and the region to promote energy-efficient commuting.</li> <li>8. Promote the development of commuter parking lots as viable transportation components, with</li> </ol>

12. Increase the efficiency of all Town vehicles.

particular attention given to connecting schools, recreation facilities, shopping centers, major places of employment, and mass transportation facilities. This could be accomplished through tax incentives or by acquiring easements.

9. Provide shelters, where needed, for pedestrians and bicyclists at bus stops and rideshare pickup locations.
10. Consider bicycle paths, pedestrian walkways, and mass transportation access in the review of all proposals for commercial development and new Town recreation facilities.
11. Adopt zoning regulations that support development of mixed-use growth centers containing daily residential services, thereby reducing transportation needs.
12. Consider transportation efficiency issues and bicycle use when making road expansion decisions.
13. Encourage the schools to:

Teach and promote cycling in the schools as a viable transportation alternative,  
Teach the true costs of various energy options, including car ownership, and  
Teach energy-efficient driving techniques in driver's education.

#### **ENERGY – LAND USE**

13. Encourage and support settlement patterns and densities that reduce travel requirements for work, services, shopping and recreation.
14. Encourage growth centers - co-mingled residential development, employment areas, commercial districts, shopping areas and ride share lots with access to mass transit - in order to discourage land use that would create or lead to energy inefficient sprawl and strip development.

14. Encourage, through site review, the use of these energy conservation measures, such as:  
Vegetation as winter wind buffers and summer shading,  
Building development on southern slopes, in order to take advantage of natural light and heat,  
Building development orientation to the south through any combination of street, lot, or building layout, in order to take advantage of natural light and heat,

Protection of solar access for existing buildings from shadows cast by new structures, and Building development in areas sheltered from the wind.

**RENEWABLE ENERGY RESOURCES AND RECOVERY TECHNOLOGIES**

15. Promote the Use Value Tax Program for stimulating sustainable fuel-wood production, and for improving the management of forests.

15. Manage Town properties, where possible, to provide fuel-wood and other wood products, recreation uses, and wildlife habitat, for the benefit of the Town and its residents in a sustainable manner.