



In search of Lt. Governor Dubie's Green Valley: a review of his proposal and recommendations for further development.

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Introduction

This project developed in partnership with the Vermont Public Interest Research Group and students from the fall 2004 environmental studies senior seminar. It was inspired by a proposal that Lieutenant Governor Dubie announced publicly in December of 2003, after a visit in China that opened his eyes to the need for environmental goods and services all over the world. Dubbed the Green Valley Initiative, the proposal emphasizes Vermont's reputation as a leading steward of the environment, and suggests utilization of the "green brand" represented by Vermont to further develop and establish a leading role in environmental goods and services. Broadly, Lt. Governor Dubie introduced the Green Valley Initiative (GVI) as:

... a plan to create a business climate in Vermont that supports existing environmental goods and services (EGS) businesses through networking, education and marketing, and promotes the formation of new EGS companies and the relocation of entrepreneurial EGS companies to the state.¹

It is our hope that this project will encourage the development and focus of the GVI, especially in regards to renewable energy technologies and services in Vermont. Since the GVI was proposed nearly a year ago, there has been minimal public development to further define its purpose. In order to gain a more in depth conception of what the Lieutenant Governor has planned, we set up an interview to discuss his ideas for the GVI.

Vermont is often called one of the greenest states in the U.S., but one of the reasons why it remains so green is because the state is able to import nearly everything. This "being green" is more a matter of image than of economic reality. Lt. Governor

¹ Brian Dubie, "Lt. Governor's Log Entry for 1/15/04" (http://www.lt.gov.state.vt.us/index.php3/press_room/diary?id=19, accessed November 15, 2004).

Dubie is trying to change Vermont's dependence on imported goods with his revolutionary idea of GVI. Dubie proposes creating a kind of "silicon valley" for the renewable energy industry right here in Vermont, which would not only bring jobs to the state, but also could get the state more involved in using renewables right here in our own back yard. David Blittersdorf, Renewable Energy Vermont member and President of the Vermont-based NRG Systems, said his company makes world class wind measuring equipment and sells their product all around the world, but does few sales in his home state of Vermont. "Vermont has a lot to offer other companies in our industry but it's not even in the game," Blittersdorf said.²

The interview in Montpelier was an interesting and challenging experience, but did fill in some of the holes in our information about the Green Valley Initiative and where it came from, and more importantly the role of the current Lt. Governor in seeing it come to life. One of the most significant and frustrating things that we learned during our interview is that while the GVI is a positive and popular idea, it is not yet a policy initiative. Lt. Governor Dubie cannot make promises at this point because he lacks the means nor a legislative mandate. Throughout our interview Dubie emphasized exactly how little power he had in the grand scheme of things, and went on to say that he has passed on most of the forward movement of the GVI to the Vermont Environmental Consortium. Dubie defined his role in government, especially in regards to GVI, as that of a cheerleader. He could vocalize and focus the economic development policy towards expanding environmentally oriented businesses. Furthermore, he sees himself as a networker who puts people and organizations in touch with each other. However, his

² David Blittersdorf, NRG Systems (personal communication, October 5th, 2004).

position has two major shortcomings when it comes to being a potent force in pushing policy through. The first, as mentioned before, is that he is not allocated funding for such projects, and the second, is that he only votes when there is a tie. The fact that he only votes on ties could be a potent tool if the vote was highly controversial, but how controversial the GVI will be remains to be seen. As of yet reception has been positive, but it has seen minimal publicity since its introduction.

Dubie sees the GVI as a good solution to the future questions and challenges that Vermont faces, which have been used to outline the rest of the information we gathered at the interview.

How do we compete in the global marketplace we live in?

The idea for the Green Valley Initiative was conceived during the Lt. Governors trip to China last year. While visiting officials there, Lt. Governor Dubie came to the realization that Chinese citizens had a strong desire to clean up their environment, because it was affecting their daily quality of life and level of health. Dubie expanded on this new information and realized that other states and countries view Vermont as being a green state and as particularly environmentally oriented. This idea was further encouraged by the fact that a Vermont based company was supplying China with the software for turbo chargers that are used to clean the air in China's highly polluted cities. These ideas coalesced into an economic development initiative that would encourage and foster the growth of the 'environmental goods and services' industry in Vermont.

How do we reconcile the competing desires of a clean environment with economic growth and security?

One of the reasons that the Green Valley Initiative has excellent possibilities is that it builds on Vermont's tradition of environmental ethics and attempts to harmonize them with economic benefits. Environmental issues have historically been in conflict with industry, and this history of conflict has influenced the popular belief that one has to sacrifice progress and economic wealth for a healthier environment. The newly emerging industry of environmental goods and services may prove to be the vector for changing this dichotomy, opening up new avenues for business in the state. In fact, the current growth of environmental goods and services looks like the most promising economic expansion opportunity Vermont has had in a long time.

How do we ensure that future generations have a healthy environment and employment opportunities?

Vermont is a wonderful place to live in and has a great quality of life, but not many of us will stay in the state for work after we graduate from school, due to a lack of job opportunities. Another goal of GVI is to partner the top students in state schools with the leading companies in the state, so that the economy and companies can grow, and Vermont's human resources can excel. This would be achieved through internship and job opportunities set up through a partnership with the Green Valley Initiative network and this part of the program is already in the works. Phil Susmann of Norwich University has agreed to pioneer this program and is enthusiastic of the benefits for both Norwich students and the companies in Vermont.

Project Goals

Knowledge of the current status of the renewable energy sector in the state is imperative to an effective implementation of GVI. Our project sought to answer several questions concerning companies that do work in renewable technologies, with a focus on their contribution to the current Vermont economy. The most important of these questions focused on payroll and employment numbers, as well as gross annual sales. We also looked into the level of familiarity with the GVI and asked questions about what companies and programs are perceived to be the major players in renewable industry, statewide and nationwide.

We located possible contacts through two sources. The first is a Renewable Energy Business Directory that is on the Vermont State website.³ The second is from Renewable Energy Vermont, an organization that works to encourage state policy that supports growth in renewable technologies. Renewable Energy Vermont (REV) is helpful because it is a network of businesses in the state, but that means that their listings are limited to their members only. By supplementing REV with the directory from the Vermont State website, we hoped to reach all relevant businesses in the state. Unfortunately, we found that the government website is out of date and has a great deal of incorrect contact information, an indication, perhaps, of the lack of support the industry has been getting in recent years.

The role of government in supporting renewable energy technology development is vital to GVI for a number of reasons. The best way to get to the Green Valley is to give broad support first to the *concept* of renewable energy, because energy policy will

³ Renewable Energy Business Directory, State of Vermont (http://www.state.vt.us/psd/Menu/EE_and_Renewable/ee16.htm accessed on December 13, 2004).

encourage the economic growth of the renewable industry in the state, through facilitating demand. Other states across the country (such as New York, Massachusetts, Connecticut, New Jersey, and California) have caught on to this correlation and have surpassed Vermont in energy policies that support and encourage the development of renewable energy.⁴ Not only is renewable energy important from an environmental standpoint, but also it is good economic policy to have a more diversified energy portfolio in case oil and liquid natural gas (LNG) prices continue to rise, as they have done dramatically in 2004. While Vermont is less dependent on oil and LNG for electricity, many Vermonters use fuel oil for heating, and this could be reduced through encouragement of solar water heater installations, and passive solar design. State policy plays a role in the economics of energy consumption through policies such as the Renewable Energy Standard (RPS), a policy adopted by many east coast states, though not yet Vermont. The Union of Concerned Scientists, which has done extensive research into the impact of policies indicates that, “ten states have adopted renewable electricity standards that could lead to the development of 5,450 MW of new renewables by 2012 and support 3,600 MW already in place. Combined, this capacity will generate enough clean power to meet the entire electricity needs of 5.7 million typical (nonelectric heating) US homes.”⁵ It is these signs of rapid growth in renewable energy industry that has more and more economists and policy makers buzzing about the benefits.

Governor Douglass himself has stated a similar realization. In September of 2004 he stated, “the choice we face today is not a choice between jobs and the environment. It

⁴ Jesse Broehl, “Vermont Governor Critiqued on Renewable Energy,” *Renewable Energy Access*, electronic newsletter, October 13, 2004 edition (<http://www.renewableenergyaccess.com>, accessed December 13, 2004).

⁵ Union of Concerned Scientists, “Clean Power Surge: Ranking the States,” 2000 (http://www.ucsusa.org/clean_energy/archive/page.cfm?pageID=115, accessed November 22, 2004), 5.

is a choice between both or neither."⁶ However, while Governor Douglas voiced his support lightly during his campaign for re-election in 2004, Vermonters will have to see if he backs the GVI with a policy to match. Vermont's electricity costs are the fourth most expensive in the nation according to the Energy Information Association's (EIA) 2001 state rankings, and Vermont is eleventh in energy expenditures per person.⁷ In order to ensure Vermont consumers are not forced to pay above market price for their electricity, the state needs to consider restructuring the electricity utilities and their contracts with Hydro-Quebec, and re-allocating that spending towards a long-term reduction of prices. The state should also boost the local economy through the development of renewable energies. The following sections of this report will further elaborate on why the renewable energy sector should be central to the government's development of a Green Valley Initiative.

The Importance of Acting Now

The benefits of using renewable energy sources instead of fossil fuels are numerous and fulfill a wide variety of needs. For the State of Vermont, the most significant forms of renewable energy are biomass (e.g. wood as fuel), wind, hydro, solar, hydrogen, and to a small extent geothermal. One of the most obvious benefits is the minimal impact renewable energy sources have on the environment. First off, renewable energy facilities are smaller than conventional facilities and thus their footprint on the

⁶ "Vermont Governor Backs Renewable Energy," *Renewable Energy Access* electronic newsletter, September 28th, 2004 edition (<http://www.renewableenergyaccess.com> accessed on December 13, 2004).

⁷ Energy Information Administration, "Price and Expenditures: State Ranking," 2001 (http://www.eia.doe.gov/emeu/states/sep_sum/html/pdf/rank_pr_all.pdf, accessed on December 13, 2004)

landscape is smaller. However, the most important benefit for the environment achieved from using renewable energy is the reduction in air pollution and the production of greenhouse gases.⁸ There is no air pollution associated with renewable energy sources with the exception of minimal or even negligible emissions associated with biomass and hydrogen power. Therefore, renewable energy is the path the energy market can take to mitigate the impacts of global climate change while sustaining current standards of living.

Beyond the environmental benefits, renewable energy has many practical benefits in a nation whose government is increasingly concerned about the threat of terrorist attacks. With the exception of large dams, power plants fueled by fossil fuels or nuclear power are much larger in size than energy plants fueled with renewable energy. Therefore these large plants are vulnerable and important targets for terrorist attacks in the United States. The very fuel source of fossil fuel powered plants is highly flammable and can do significant local damage beyond the disruption of power. However, the power plants that are most at risk are nuclear power plants and to a smaller extent large hydroelectric power plants.⁹ Nuclear power plants are dangerous because an explosion at a plant would result in nuclear fallout harming thousands or even millions of people over a large area. While large hydro dams are commonly thought of as a renewable energy source, the damage they cause to the local environment makes these plants a poor

⁸ Barry Hopkins, "Trends Alert Critical Information State Decision Makers: Renewable Energy and State Economies," The Council of State Governments, 2003 (<http://www.csg.org/NR/rdonlyres/eojdro6vzmmepzgmgyzo44okq3qe7jt3mn5gwsnlieabco3cfddka2rbjd76zhpozkp3ehv56thkmy6okjmwbyvuad/TrendsAlert++Renewable+Energy++State+Economies.pdf>, accessed December 16, 2004) 5.

⁹ Ibid., 6.

alternative to fossil fuels.¹⁰ Additionally, large hydro plants are potential targets of terrorist attacks since their destruction would lead to severe flooding down river that could destroy cities.¹¹ Renewable energy is virtually safe from terrorist attack because, with the exception of hydrogen, the fuel sources are not explosive and the power plants themselves tend to be small so that the destruction of one unit will have little impact on the power supply. Consequently, in an age of terrorism, renewable energy should also be considered as a means of protecting homeland security.

While critics claim that renewable energy has not performed up to expectations, the fact is that renewable energy has reached or surpassed original projections in regard to their costs, but has fallen short of expected market penetration. James McVeigh et. al reviewed 25 studies from the 1970s, 80s, and 90s that predicted the future penetration and costs of solar, wind, and biomass in the future.¹² Of these three forms of renewable energy, only biomass reached or exceeded the predicted penetration into the markets. However, wind, solar and biomass all reached or came close to reaching the predicted costs associated with each industry. Biomass was still able to reach expected market penetration only because of advances in co-firing biomass with fossil fuels. However, the reason wind and solar did not reach the expected levels of market penetration while they both reached the expected levels of costs is due to an unforeseen decline in the price of fossil fuels. Between 1983-95 fuel prices were projected to rise by 21 percent, but

¹⁰ Large hydroelectric is not defined by the Vermont Senate as renewable, bill S.261 only considers hydro renewable if it is smaller than 80 megawatts.

¹¹ Hopkins, 5.

¹² James McVeigh, Dallas Burtraw, Joel Darmstadter, and Karen Palmer, "Winner, Loser, or Innocent Victim: Has Renewable Energy Performed As Expected?," Resources for the Future, 1999 (<http://www.rff.org/rff/Documents/RFF-DP-99-28.pdf>, accessed on December 16, 2004).

instead they actually declined by 65 percent during this period.¹³ This unexpected drop in fuel prices meant that even with declining prices in the renewable energy sectors, wind and solar energy became less appealing investments because wind and solar require large upfront investments while the infrastructure for fossil fuels already exists. Once fossil fuel prices begin to rise again (as they did dramatically in 2004) renewables will be able to gain deeper penetration into the energy market.

The fossil fuel market is unstable and prices of fossil fuels are currently rising and are expected to continue to rise into the future, as a result of the depletion of oil reserves worldwide. Scholars agree that oil reserves are being depleted at an alarming rate while the discovery of new reserves has been declining rapidly.¹⁴ The decline of reserves signals that we are approaching not only the end of our oil reserves, but more dramatically the “end of oil” as a foundation for our contemporary way of life.¹⁵ While the effect of diminishing oil reserves currently does not have a large impact on the price of oil, the United States has experienced the impact of diminishing oil supplies during the energy crisis of the 1970s. The United States is not currently experiencing an energy crisis like the one in the 1970s, but it is facing a price spike in the cost of oil. Since the Iraqi war, the price of oil has risen dramatically as the supply of oil has become less dependable. These price spikes have affected energy prices directly through the price of gasoline and heating oil and indirectly through the price of electricity. New England’s electrical market, in particular, has reached extremely high prices for market purchases.

¹³ Ibid., 24-25.

¹⁴ Ross Gelbspan, *The Heat is On: The Climate Crisis, The Cover-Up, The Prescription* (Cambridge, Massachusetts: Perseus Books, 1998); James Gustave Speth, *Red Sky at Morning: America and the Crisis of the Global Environment* (New Haven: Yale University Press, 2004); Paul Ehrlich and Anne Ehrlich, *One with Nineveh: Politics, Consumption, and the Human Future* (Washington DC: Island Press, 2004).

¹⁵ Paul Roberts, *The End of Oil: On the Edge of a Perilous New World* (Boston: Houghton Mifflin, 2004), 44-65.

In fact, market purchases are the most expensive sources of electricity right now while electricity from methane recapture is one of the cheapest sources of electricity.¹⁶ Since Vermont utilities rely on market purchases as a portion of their electrical supply, consumers must pay higher electrical bills. Thus the best way to ensure stable market prices for electricity would be through the use of more renewable sources that depend on a source of energy that is infinite, rather than finite.

Unlike the fossil fuel industry, the renewable energy industry will see continued declining costs since for most sectors the source of the energy is free and capital costs are decreasing. The capital costs for all renewable energy will most likely decrease if the sale of renewable energy increases, a probability based on what is called the “economy of scale.”¹⁷ For example, if the sale of photovoltaic cells increased, then companies in that sector would be able to sell photovoltaic cells for less since they will have learned how to make the systems more efficiently and the companies will be working at their maximum level of output making them more efficient overall. In addition to reaching economies of scale, the renewable energy sectors expect to see additional price declines due to advances in technology.

Wind energy has seen significant reductions in prices lately due to advances in technology and more efficient production methods. Between 1991 and 1997 the costs of producing wind turbines has decreased by 20 percent, while installation costs have decreased by 50 percent and costs of electricity production have decreased 30 percent. The primary causes for these reductions in costs are technological development, manufacturing improvements, up-scaling of turbines, and increase in sales of turbines.

¹⁶ Bill Powell, (personal communication, November 22, 2004).

¹⁷ McVeigh, et. al, 1-2.

These steps have been accomplished through designing blades and machines that are more easily manufactured, in addition to being easier to transport and install. Also, manufacturing has become much more flexible by utilizing just-in-time production, which reduces costs by eliminating costly inventory. Finally, manufacturers have implemented quality assurance systems that bolster the marketability of the product. Due to these improvements, the wind energy sector has grown between 30 and 50 percent in the late 1990s. The overall impact of these improvements in the wind sector is expected to drop the costs of wind energy by 30 percent by the year 2010.¹⁸ Consequently the wind sector will be an even stronger competitor with fossil fuels in the near future.

Photovoltaic cells have also experienced recent technological gains that are leading to decreases in the costs of energy produced. Right now the industry is in the midst of a transition from “first-generation” technology to “second-generation” technology. Second-generation technology consists of using thin-film photovoltaic cells. The advantages of this technology are numerous. First off, there is a reduction in the materials used to construct photovoltaic cells and consequently a reduction in the costs needed to construct photovoltaic cells. Also, the units produced are much larger leading to a reduction in manufacturing costs. Finally, thin film technology allows for an essentially infinite number of semiconductors to be used, unlike the traditional silicon. These improvements are leading to a decrease in production costs as well as an increase in efficiency of the units.¹⁹ Improvements in technology and declining costs as well as

¹⁸ Per Dannemand Andersen and Peter Hjuler Jensen, “Wind Energy Today and in the 21st Century,” *International Journal of Global Energy Issues*, 13, no. 1-3, 2000 (<http://www.environmental-center.com/magazine/inderscience/ijgei/art7.pdf>, accessed on December 16, 2004).

¹⁹ M. A. Green, “Photovoltaics: technology overview,” *Energy Policy*, 28, 2000 ([http://netserv.ipc.unilinz.ac.at/~dieter/DsWeb/Lit/PV/GEnPol28\(00\)989.pdf](http://netserv.ipc.unilinz.ac.at/~dieter/DsWeb/Lit/PV/GEnPol28(00)989.pdf), accessed on December 16, 2004) 993.

expansion into new markets is expected to lead to an annual 20-30 percent increase in business in the photovoltaic industry over the next few decades.²⁰ As a result, this deeper market penetration of the photovoltaic industry will help renewable energy gain a larger portion of the world energy supply.

Increasing the supply of renewable energy sources in the U.S. will not only reduce costs for consumers, but renewables will also serve to boost local economies. Estimates from the Union of Concerned Scientists show that a conversion to 20 percent renewable energy by the year 2020 would save consumers in the United States \$49.1 billion due to lower energy costs. In addition, this conversion to renewable sources would create 30,000 new jobs in agriculture, generate \$72.6 billion in new capital investment, provide \$15 billion in sales from farmers, produce \$5 billion in property tax revenues, and make available \$1.2 billion to rural land owners for lease payments for wind energy sites.²¹ Both jobs and increased sales would be created in the agriculture sector since farmers can harvest crops or even trees for energy generation on lands that are currently left out of production. Capital investment would be put into the construction of new energy facilities. Finally, property tax revenues and lease payments would be generated in rural America since renewable energy such as wind are generally sited on rural lands. With this data in mind, it is clear that the renewable energy sector will have a large impact in rural states such as Vermont.

²⁰ G. H. Lin and D. E. Carlson, "Photovoltaics in the Year 2025," *International Journal of Hydrogen Energy*, 25, 2000 ([http://netserv.ipc.uni-linz.ac.at/~dieter/DsWeb/Lit/PV/IJHE25\(00\)807_PV_Rev2005.pdf](http://netserv.ipc.uni-linz.ac.at/~dieter/DsWeb/Lit/PV/IJHE25(00)807_PV_Rev2005.pdf), accessed on December 16, 2004) 807.

²¹ Union of Concerned Scientists, "Renewing America's Economy," Union of Concerned Scientists (http://www.ucsusa.org/clean_energy/renewable_energy/page.cfm?pageID=1505, accessed December 16, 2004).

On a national level, conversion from traditional energy power sources to renewable energy will generate more economic benefits due to renewable energy's greater reliance on manual labor, as well as the fact that it keeps money in the local economy. For instance, wind and solar electric production produce 40 percent more jobs than does coal electric production.²² However, not all renewable energy sources provide more jobs than do traditional energy sources. For instance, electricity production from coal does provide more jobs than from biomass; however, biomass provides a greater range of possible jobs while coal production (in addition to producing devastating environmental harm) is limited to mining, preparation, and transport.²³ Again, in contrast to traditional mining, biomass can help poor farmers by replenishing topsoil, harvesting rainwater, and reclaiming waterlogged and salinated soils. Furthermore, the local environment benefits from biomass through providing habitat for local species, stabilizing slopes or river banks, revegetating barren land, and protecting watersheds.²⁴ Finally, renewable energy sources have a larger impact on the local economy due to what is called the "multiplier effect." Unlike traditional oil fired power plants renewable sources do not send money overseas to purchase the fuel source. Either the fuel source is free as is the case in wind, solar, hydro, and geothermal, or the fuel source is purchased locally as is the case with biomass. Therefore, nearly all the capital that is invested in a renewable energy source stays in the local economy through paying local employees to

²² Hopkins, 9.

²³ Ibid.

²⁴ Eric D. Larson and Sivan Kartha, "Expanding Roles for Modernized Biomass Energy," *Energy for Sustainable Development*, 4, no. 3, 2000 (http://www.princeton.edu/~energy/publications/pdf/2000/Larson_00_ESD_Expanding_roles_for_biomass.pdf, accessed on December 16, 2004) 20-23.

operate the site, lease the land, and purchase the fuel locally.²⁵ Oil power plants on the other hand, send a portion of the capital investment overseas when they purchase oil. By investing more in renewable energy sources, consumers will not only benefit from reduced utility bills and a cleaner environment, they will also benefit from an increase in cash flow in their local economy.

While the benefits of investing in renewable energy are substantial, investing in renewable energy needs to occur soon if Vermont wants to capture its market share. Currently the United States leads the world in the manufacture of renewable energy power systems with many of these systems being exported to developing and newly industrialized nations.²⁶ While Vermont has several manufacturers, the number needs to increase and current manufacturers must become a greater presence on the world market to capture future growth in the industry. In 2002, the solar, wind, and hydrogen fuel cell industries combined formed a \$9.5 billion a year industry worldwide. However, by 2012 these renewable industries will combine to be an \$89 billion a year industry worldwide.²⁷ With the United States already the leader in renewable energy systems, the country as a whole has a chance to maintain a strong market presence by capturing much of this growth in the industry. Since Vermont already has the image of a green state and Vermont products are associated with a more environmentally-conscious way of life, the state is in the unique position to become a leader in the manufacture of renewable energy systems in the United States. By becoming a leader in the United States, which is already the global leader, Vermont has the opportunity to capture a large share of the growing renewable energy market and thus could bring in millions or even billions of dollars into

²⁵ Hopkins, 8-9.

²⁶ Hopkins, 11.

²⁷ Hopkins, 11.

the state economy. However, for Vermont to gain control of the renewable energy market, the state must act soon by aiding the growth of manufacturers of renewable energy in the state. Without the support of the government, the renewable energy sector in Vermont may be out competed by other states or even other nations and thus Vermont will lose out on this growing market.

Current Economic Impact of Green Industry in Vermont

Presentation of Research Findings

Summary

Using a group decision-making process, we determined that we would attempt to contact all of the businesses in the Vermont Renewable Energy Business Directory, Vermont's most complete listing of "Green Industry."²⁸ Over the course of six weeks in October and November of 2004 we called and emailed sixty of the businesses in the directory, asking questions about their company's non-proprietary economic data. Although we asked many financial questions such as payroll size and taxes paid, companies were generally only comfortable with releasing sales and employee figures. In some cases, respondents were not comfortable releasing even that data to us. We were able to contact nearly 50% of the businesses in the State of Vermont's Renewable Energy Business Directory, but were only able to get suitable information from almost 30% of those contacted. In this section, we present our findings and show that the green industry sector in Vermont contributes significantly to the state's overall economy. The companies who responded conduct an estimated \$27,750,000 in sales annually, actively employing 186 people.

²⁸ Vermont Department of Public Service, Energy Efficiency Division, "Vermont Renewable Energy Business Directory," (http://www.state.vt.us/psd/Menu/EE_and_Renewable/ee16.htm, accessed October 30, 2004).

Research Methodology: Approaches and Limitations

We determined the best way to calculate the current economic impact of Vermont's green businesses was to contact them directly, ask for their own economic statistics, and tally these figures up. First, we compiled a list of green businesses in Vermont. This process was aided greatly by the State of Vermont's Renewable Energy Business Directory, which we regarded as the most comprehensive "green industry" listing in the state. There are other directories of Vermont's renewable energy businesses, including commercial sites promoting the businesses on the lists (e.g. "VT Energy Source Guide," and "SolarBuzz.com"), and business association lists (e.g. Solar Energy Business Association of New England and the American Wind Energy Association).^{29,30,31,32} We found that these directories were not as comprehensive as the State of Vermont Business Directory, probably because their first goal was as a service to the businesses they were promoting. As a rule, they do not show all of the businesses in Vermont so that the member businesses do not suffer from competition. This was not the case with the Vermont Department of Public Service (DPS), which maintains the directory we used. DPS is a governmental organization that looks out for the interest of the public and in this case they have put together a listing more comprehensive than any other we could find.

²⁹ Momentum Technologies LLC, "Renewable Energy Businesses in Vermont," (<http://energy.sourceguides.com/businesses/byGeo/US/byS/VT/VT.shtml>, accessed October 30, 2004).

³⁰ Solarbuzz.com, "US Solar Energy Installers (Retailers/Dealers)," (<http://www.solarbuzz.com/CompanyListings/UnitedStates8.htm#Vermont>, accessed December 16, 2004).

³¹ Solar Energy Business Association of New England, "Member Directory," (http://www.sebane.org/sebane_info/members_list.asp?id=10, accessed October 30, 2004).

³² American Wind Energy Association, "American Wind Energy Business Directory," (<http://web.memberclicks.com/mc/prelogin.do?hidOrgID=awea>, accessed December 16, 2004).

It should be noted that we have not included power generation stations in our survey. We decided to focus only on designers and installers because we needed to limit the scale of this study and because we believed this data would be of most use to our community partner and the greater Green Valley Initiative. The Green Valley places the greatest emphasis on the design, manufacture and installation of green technologies; therefore we decided to tailor our research to this area.

The State of Vermont Renewable Energy Business Directory contains five business categories: solar, wind, biomass, geothermal, and sustainable design. There was some debate about the validity of these businesses once we began the interviews, since many businesses seemed to do both “green” work and “non-green” work. This case was especially true for the sustainable design architecture firms, most of which will do design jobs whether or not they involve green design elements such as solar, wind, or biomass. Many claimed to specialize in green design, with particular mention of passive solar design.

Along the same lines, we found that many companies were not “industry specific.” Although Company A might be called “Joe’s Solar” that does not necessarily mean that they installed only solar systems. In fact, 58% of the companies in the directory listed themselves as covering two or more sectors in this field (e.g. wind *and* biomass). Most of those “multi-sector” businesses covered wind and solar. This may be due to the fact that wind and solar systems mesh well with each other in small-scale power generation situations: when the sun is powerful and shining the wind is often light. On the other hand, days when the sun is blocked by clouds are often the best times to generate power using a windmill. It appears that Vermont renewable energy businesses

have geared themselves to benefit from this phenomenon, but we must note that this is only speculation. Another possible explanation for the multi-sector business trend is that there is not enough demand in either single division to sustain a renewable energy contractor, so he has to be versatile in both energy sources to survive.

Continuing with the survey, we divided these businesses into four random groups, each member of the team members taking a list of about 16 businesses. We then called or emailed each business on the list, hoping to speak to an official at the company who had the authority to release economic information. Some companies were very helpful in giving data, quickly and easily providing figures for annual sales and employees. A number of company representatives proved truculent and secretive; refusing to share data on the basis that it was “proprietary information.” No amount of clarifying conversation seemed to make them yield. We typically explained the fact that we were college students doing a survey of the economic impact of green businesses in Vermont, going further to state that we were in conversation with Lt. Gov. Dubie and that our work might influence the future of green industry in Vermont. This worked for some respondents, others were not willing to take the risk of divulging company data to people they did not know. Finally, many businesses were impossible to contact, because they would not return repeated phone calls or emails. Some companies has gone out of business or had listed out of date contact information.

Once we had established contact, we tried to ask questions that were specific enough to be useful, but general enough to make the respondents feel comfortable with our survey. In this section we present the questions we asked during the interviews, followed by a summary of the thoughts and considerations that went into each question.

- **Is your company focused only on renewable energy related products?**
- **If not, how big is your renewable sector?**

The State of Vermont's Renewable Energy Business Directory includes a category of businesses they call "passive design and construction." This section includes many architects and building firms, only a few of which are geared specifically toward green design. All of these businesses incorporate green design into projects as their clients see fit, but most fall into a "conventional design" capacity if the mandates of their customers require that. This proved to be an issue to consider when recording and representing our data. If a business does *some* green design work, but also does a sizable amount of conventional design work that incorporates non-renewable energy sources into the overall design plans, how do we treat this data? Do we count the total sales figures and people employed by the business because they work at least in part in the green sector? Do we eliminate these businesses altogether because their sales and employment figures would include the conventional work they do, thus skewing the data? Or do we ask the respondents to try to separate out figures for the "renewable" portion of the business vs. the "nonrenewable" portion?

We decided to ask respondents to separate out figures, as can be seen in the question above. Unfortunately, this tactic proved only marginally successful. Many businesses could not or would not separate out renewable from non-renewable portions of sales and employment figures, possibly because they did not want to take the time, possibly because it would be too difficult to do so. In the case of smaller firms, it is reasonable to assume that some employees work on both types of projects. Accounting at

most firms does not separate categories because it seems that is not of interest to their business strategy, although in our view it could be.

Some companies were able to give us estimates, and these proved interesting but not entirely useful beyond raising more questions. How would the Green Valley Initiative handle these hybrid businesses? At what point does an industry become “green enough” to qualify for participation in the initiative? These are questions that must be considered and addressed by citizen, business, and government groups before the GVI swings into full effect. We would argue on the side of lenience and openness in this case, because most small firms, to survive, must accept conventional work. In fact, we remain confident that this work often supports the green industry portion of their business, which also must be supported by the GVI in order to grow and prosper.

Of course the flip side to this leniency in accounting is that government officials in Vermont or other states could use the process to qualify businesses as “green” when in fact they are using skewed data and could do much more.³³ There is a delicate balance between lip service and green consciousness. For the data analysis, businesses that included a mix of “green” and conventional work, yet could not provide figures for the renewable component of their business, were not included.

³³ Dr. Rebecca Gould, Assistant Professor of Religion, Middlebury College, (personal communication, November 22, 2004).

- **How much are your total sales? What are sales instate v. out of state?**

When charged with assessing the economic impact of green industry in the state of Vermont, we decided that sales figures were a good place to start. Sales figures, though not always public, are a good indication of how much business a company is conducting. They can also be used to estimate the larger amount of economic activity generated by businesses, through the multiplier effect. Based on a multiplier calculated for tech-based economic activity in Oregon, we believe a multiplier of 2 is a conservative estimate for Vermont's green industries.³⁴ Given that, we estimate total economic activity generated by sales at Vermont's green industries to be \$222,000,000.

This question represents another quandary we confronted while collecting data. When a company completes a sale, does it matter where that sale comes from? If it comes from California or overseas, how do we figure this into our economic impact? The business is bringing money into the state and that is seen as good for the economy. The money has been transferred to a Vermont business that then decides what to do with it. It could use it to pay wages (instate) or to purchase supplies (instate or out of state). Economic activity generated by an initial out-of-state sale will multiply the greatest if every link in the chain of supply and demand is satisfied in Vermont after the initial sale.

For instance, Company A installs designs and installs PV solar systems. If it buys solar panels from Arizona, a portion of the revenue the company generates is immediately transferred back out of state. If they buy solar panels from a Vermont manufacturing facility, the dollar spent initially is recycled to the local state economy. If

³⁴ Reva Shrestha and Felicia Lorelli, "The Economic Effects of Local Purchasing Preferences: A Case Study of Computer Systems West in Lane County," University of Oregon, 2003 (<http://www.uoregon.edu/~exper/honors/2003/CSW%20paper.pdf>, accessed December 17, 2004).

the solar panel manufacturer sources its materials instate, the effect continues. It is easy to conceive of a chain of production for green products from design to raw materials to production to commercial sale and installation. Each link in the chain would generate economic activity in the state, driving up employment and increasing local incomes.

To satisfy our questions about this chain of production, and to check our economic multiplier figures we decided to ask the following question:

- **What are your instate v. out of state input materials?**

Unfortunately, most businesses could not provide figures for in-state versus out-of-state materials used in their businesses, most likely because they have not compiled the data. To get this information would require an in-depth investigation where researchers work 1-on-1 with businesses to determine where they source their materials. We imagine, as part of developing the GVI, a wing of the Vermont Agency of Commerce that focuses on helping businesses find and purchase local materials and products for use in their businesses. This would provide a quick jolt to the Vermont economy and the development of green industries in the state, and could become an integral part of the Green Valley Initiative.

- **How many employees do you have in the section of your business that handle projects dealing with renewable energy?**

Employees are a good indicator of the economic impact of a business in a state. Employment provides income to Vermont residents, generates higher rates of consumer spending, as well as important tax revenues for municipalities and the state.

We asked this particular question because we wanted to separate out those employees working on “green” projects versus those who did not. In fact, most businesses could not give us this data because in these situations employees typically worked on both types of projects at different times.

- **Are you aware of Lt. Gov. Dubie’s Green Valley Initiative?**
- **What are your opinions?**

We found during the research stage of this project that not much had been said about the GVI besides that which was published on the Lt. Governor’s own website. This led us to wonder if in fact the GVI was as widespread an initiative as we had originally thought. We decided to include this question as an attempt to gage the awareness and popularity of the GVI. Indeed, we found that 72 percent of total interviewees had no knowledge of the GVI. However we did frequently talk to individuals who would not be involved in the beginning stages of such a project, such as secretaries, rather than the founders or CEOs of the companies, who would be more in touch with such developments. Nonetheless, it is apparent that publicity of the GVI is currently underdeveloped. When we gave brief overviews, most people said that the initiative sounded great, but were dubious of it ever coalescing. Even the few interviewees who expressed some familiarity with GVI, thought it was more of a green platform for Dubie than an economic plan that would become fully developed. Indeed, many interviewees expressed cynicism regarding support from the government for green industries selling, designing, and installing systems. We believe this stems from the inconsistencies in incentive programs (initiated and then stopped) over the years. When we first told companies about the GVI, employees generally reacted to it as if it were

another incentive program on which they could not rely. The appreciation of those programs, but also the frustration with them was clear.

- **Who do you think are the most significant companies in the renewable energy field today?**

This was an important question for us because it helped us identify flagship examples of green industry in the state using the knowledge of the business community network. Our community partner also had specifically requested that we collect this information.

The above questions reflect many of the questions and concerns we grappled with in the course of planning and conducting this research. As we carried out the phone interviews we found that in many cases, companies could not or would not be so specific with us. However, from these questions we were able to glean revealing data.

Data

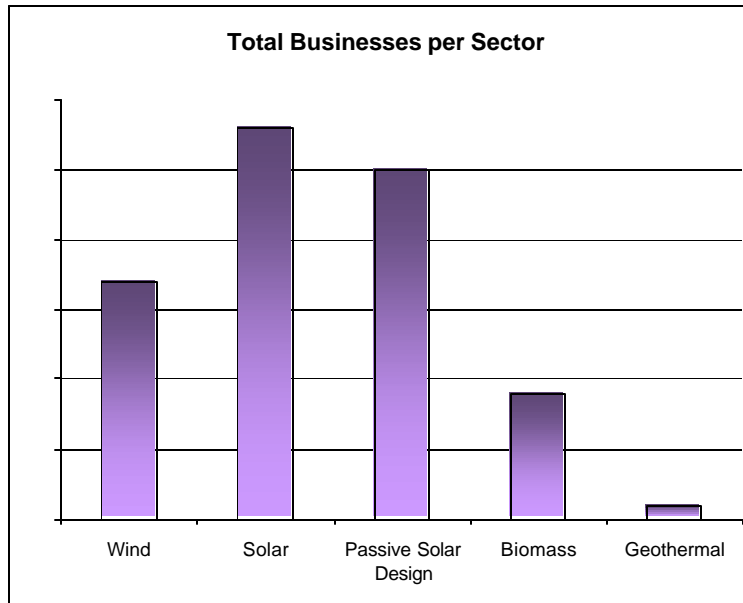


Figure 1. The amount of businesses that address each sector
(from Vermont Renewable Energy Directory, some business address multiple sectors)

Company type	Location	employees	sales*
Biomass	Northern VT	10	1
Biomass	Northern VT	15	7
Biomass	Southern VT	1	0.5
Passive Solar	Central VT	4	2
Passive Solar	Northern VT	27	2
Passive Solar	Central VT	12	0.75
Passive Solar	Northern VT	8	1
Passive Solar	Central VT	10	
Solar	Northern VT	45	0.2
Solar	Southern VT	1	0.1
Wind	Central VT	2	1.5
Wind	Northern VT	4	0.4
Wind/Solar	Central VT	3	0.3
Wind/Solar	Central VT	17	4.5
Wind/Solar	Central VT	20	6
Wind/Solar	Northern VT	5	0.5
Wind/Solar/Passive Solar	Central VT	2	
Totals:		186	27.75
Extrapolated Totals**:		657	111

* In millions of dollars

**The above 17 business who responded to the employees question represent 28.3% of the 60 businesses contacted. Using 186 employees for 28.3% of the businesses = 657 employees for 100% of the businesses. The above 15 businesses that responded to the total sales question represent 25% of the 60 businesses contacted. Using 27.75 million in sales for 25% of the businesses = 111 million for 100% of the businesses.

Judging by the data we collected, Vermont's Green Industrial sector is strong and diverse. Annual sales can be estimated to be close to \$111 Million, and the sector employs 600-700 people, not including subcontractors. Unfortunately the sector is exhibiting weakness due to recent changes in government policies and incentives.

Most businesses we contacted were confident in the strength of their business, however, many were distressed at the losses of or changes in incentive programs from state policies. They see a direct connection between private incentives to purchase renewable energy products and the quality of their business. Furthermore, some businesspeople see the incentive process as riddled with inconsistencies and believe there ought to be more equitable incentive programs across the board.

Road to the GVI

After talking to many of the companies in Vermont that either only sold renewables, or simply dabbled in them, we realized that one large obstacle stood between these companies and the consumers: incentives. After conducting numerous phone interviews and having extensive correspondence via email with these companies our group noted the apparent trend that the wellbeing of their companies and renewables relied substantially on the incentive programs, the subject of a report by two of our colleagues.³⁵

The money for Vermont's renewable energy incentive programs originally came from fines collected by the state from oil companies found guilty of overcharging customers in the 1970s. Additional funds came from insurance rebates from the sale of the state's only nuclear reactor, Vermont Yankee. Yet now that these fines have run out and Governor Douglas and his administration have made no promises to find new ways to replenish it.³⁶ Other states, such as New York and Pennsylvania, have taken the next step and began supporting these renewable industries. In 2004, New York passed a renewable portfolio standard (RPS) and Pennsylvania's Governor Edward Rendell helped broker a deal for the Spain-based Gamesa wind power company to locate their new U.S. headquarters and manufacturing facility in Pennsylvania.³⁷ "The political leadership in Pennsylvania, and New York have embraced wind energy while Vermont has turned a

³⁵ Caitlin Prentice and Andrea Hamre, "Vermont Homeowner Renewable Energy Incentives: Towards an Effective Incentive Strategy," Middlebury College ES 401 report, 2004, available from <http://www.middlebury.edu/academics/ump/majors/es/academic/service/es401.htm>

³⁶ Jesse Broehl, "Vermont Governor Critiqued on Renewable Energy," *Renewable Energy Access*, electronic newsletter, October 13, 2004 edition (<http://www.renewableenergyaccess.com>, accessed December 13, 2004).

³⁷ Ibid.

cold shoulder," said Andrew Perchlik, executive director of REV. "Now we are seeing the fruits of those decisions. While wind has been stalled here since 1998, other states are moving forward, and they will get the jobs, tax benefits, and economic growth instead of us."³⁸

Incentives (for both consumers and businesses) were a common topic when we talked to the different companies around the state, especially the small independent architectural firms. Many architects explained that they do not push renewable products upon their customers, while they do often suggest them and incorporate them into their designs. Each firm mentioned that it was easier to talk to their clients about using renewables in their houses when they could also present the client with financial incentives. When state and federal incentive program funding expired, the interest from clients dropped drastically. Nevertheless, the optimistic architects insisted that even if it is simply day lighting they always try to integrate minor renewable or efficiency aspects into each design.

Our renewable business sampling had 22 companies who do work in passive solar when clients show interest. With the cold winters Vermonters endure and the rising prices in fuel oil for home heating, passive solar has excellent possibilities for economic expansion, not to mention the added plus of aesthetically pleasing design that passive solar houses tend to embody.

Many companies around the state had a story to tell us about incentives, though unfortunately in some cases the incentive void forced companies to close their doors. For example, a local Vermont solar company had to shut down in 2003 because of the lack of

³⁸ Andrew Perchlik, Executive Director, Renewable Energy Vermont, (personal communication October, 2004).

fair incentive programs. The business started up designing and installing active solar systems. It employed one full time worker and one contractor. They designed and installed systems for a number of years. But while their consumers had incentives to buy, the business was lacking incentives on the installation and maintenance. Without incentives of their own, the company had to close down operations. Today the owner holds another job outside the renewable energy sector, but he still services the renewable energy systems he installed because he feels a professional obligation to do so. Incentives, then, must not only be promoted on the consumer side, but also for the businesses as well, perhaps in the form of tax breaks.

Although there were examples of failure we also found success stories such as the achievements of Global Resource Options. Based out of Strafford Vermont, Global Resource Options experienced a boost in sales due to the Y2K scare and peoples' desire to be energy independent. The company was lucky and never experienced any a major set backs due to a strong and supportive cliental base, although they did run into problems with lack of money in the rebate program. Global Resource Options experienced the greatest success in the photovoltaic sector mostly because it is referred to as an "idiot proof" sector and provides instant gratification with the flick of a switch. While their photovoltaic systems had mostly been purchased by wealthier clients who enjoyed being off the grid, Global Resource Options recently expanded again, now functioning as the northeast distributor for BP. They distribute 10 percent of the panels to Vermont, but most panels go to New Jersey, followed by New York, due to the great rebate programs in those states. A Global Resource Options representative told us that consistent rebate programs are critical here in Vermont so that businesses can establish themselves.

This is what Lt. Governor Dubie's GVI plan is missing, he mentions nothing of incentives. Lt. Governor Dubie's summary of his vision, as expressed on a web site log entry from January 15, 2004, reads:

“Let's attract the smartest people in environmental science and agriculture, and the green capital to fund their ideas. Let's focus our universities and colleges on growing green knowledge -- knowledge the Green Valley will need to create green jobs and advance green agriculture. Let's challenge Vermont's young people to study hard, and learn the skills they'll need to lead in a green space race to clean the world.”³⁹

Dubie is ambitious with his goals, if this is truly a vision that he wants to see materialize here in Vermont. To ward off questions over the scope and size of this vision and if it could truly take root in Vermont, he further writes in his log entry:

“Clean Earth Technologies of North Ferrisburg is a world leader in detecting and cleaning contaminated ground water. Concepts NREC of Wilder is a world leader in turbo machinery design, which is helping clean the air in China today. By taking phosphates out of the waste stream, dairy farmers like Bob Foster of Middlebury add dollars into the revenue stream, selling potting soil produced from manure. They convert methane from waste digesters into electricity for the farm, or use it to fuel a bio-refinery that produces clean-burning biodiesel. The Green Valley will help to nurture and grow more enterprises like these. I've briefed the US Departments of Energy, Commerce and Agriculture on this idea; they are enthusiastic and supportive. They've suggested a Green Valley Region, with Vermont in the center. With them, their Vermont counterparts and some private sector innovators, we're working now on a no-nonsense plan for long and short-term actions required to make the dream of the Green Valley a reality.”⁴⁰

Lt. Governor Dubie expresses optimism for education programs and names model examples, but nowhere in his entry does he mention incentives, which will be the glue that is going to hold this whole project together.

States such as California, New York, Pennsylvania, New Jersey and Connecticut have a strong incentive program. In Connecticut, the industry has funds available for

³⁹ Brian Dubie, “Lt. Governor's Log Entry for 1/15/04” (http://www.lt.gov.state.vt.us/index.php3/press_room/diary?id=19, accessed on December 13, 2004).

⁴⁰ Ibid.

private solar development and just now the funds are starting to be used. The Connecticut Clean Energy Fund (CCEF) has established a \$1.8 million clean energy incentive program for rebates on solar photovoltaic installations through approved photovoltaic installation companies. The fund will not only bring clean energy into the state but also will provide work for the local companies that deal with photovoltaic installations. This is a win win situation for the state. Individual rebates through the residential program could go as high as \$25,000,” says Heather Utter, CCEF program director.⁴¹ The source of the funding is a surcharge that is added to the monthly electricity bills of Connecticut consumers, that was established in 1998 through a legislative mandate, and goes to programs that benefit the state’s rate payers. Vermont businesses benefit from CCEF, as one of the installers approved by Connecticut was Global Resource Options and Solar Works, both located in Vermont.⁴²

One concern with initiatives such as the CCEF, is that they are too popular and funding may run out before the state budget is scheduled to replenish it, as happened in Vermont earlier. The CCEF also had a crisis in 2003 when the government looked seriously at reallocating Clean Energy funds to the state’s General Fund, because it was experiencing ‘hemorraging state budget deficits.’⁴³ While CCEF survived, the decision was controversial and questioned by its supporters, who pointed out that it was illogical to cut funding to a program designed to encourage economic growth in time of a fiscal crisis, because economic growth is the best way to alleviate the problem. We hope that Dubie will look out of state and see what is working for others both close to Vermont and

⁴¹ Renewable Energy Access, “New Solar Energy Incentives for Residential Systems,” October 6, 2004 (<http://www.renewableenergyaccess.com>, accessed on December 14, 2004).

⁴² Ibid.

⁴³ Jesse Broehl, “Uncertain Days for Connecticut Clean Energy Fund” *Renewable Energy Access*, March 10, 2003 (<http://www.renewableenergyaccess.com>, accessed on December 17, 2004).

far away. It is by looking at these examples that Vermont will be able to strive forth and truly become a green state.

Renewable portfolio standards are another tool the state should explore. Clean Edge News, a web-based industry newsletter that analyzes economic and policy trends in clean energy technologies, discussed the two main strategies for enhancing the renewable energy industry in an article from August 3, 2004. One is green power markets, a free market approach. The other is a state renewable energy requirement such as the renewable portfolio standard (RPS).⁴⁴ While both strategies help the renewable economy to grow, the state requirements have created more growth, “resulting in 2,004 megawatts of new renewable energy capacity as of the end of 2003, according to a new analysis by Department of Energy's Energy Information Administration (EIA).”⁴⁵ However optimistic Lt. Governor Dubie may be about GVI, Vermont continues to lag in forward moving policy for renewable energy. In a Union for Concerned Scientists evaluation of state energy policies, they tracked the state renewable electricity policies and electric industry restructuring activity and ranked the states in accordance to the ability of their policies to encourage renewable energy growth and development. They looked at comprehensive restructuring policies, renewable electricity standards, renewable electricity funds, net metering and disclosure.⁴⁶ In their rankings, Vermont was only mentioned as including net metering and restructuring, it was lacking in the major pushers of renewable energy, a portfolio standard, funds, or legally required disclosure of the electricity source.

⁴⁴ Clean Edge News, “State Requirements and Green Power Markets: Both Yield More Renewables” August 3, 2004 (<http://www.cleaneedge.com/>, accessed on December 16, 2004).

⁴⁵ Ibid.

⁴⁶ Union of Concerned Scientists, “Clean Power Surge: Ranking the States,” 2000 (http://www.ucsusa.org/clean_energy/archive/page.cfm?pageID=115, accessed November 22, 2004).

Since this report came out, bills have been nominated through the state house to introduce some of these initiatives, however, with little success. An act that had formerly included the renewable portfolio standard was amended to exclude it before the bill was passed into law.⁴⁷ Additionally, with Vermont having the second most expensive electricity costs in the nation according to the Energy Information Association's (EIA) state rankings, it is unlikely that any substantial renewable energy funds would be established if it is to be included as another fee on electricity bills for Vermont consumers.⁴⁸ Innovative thinking and research is needed to develop a viable source of funding for not only an incentive program, but also to develop an RPS that does not increase electric bills for Vermonters.

Although it is not a viable source of funding for the state renewable energy funds, one possible option for some of the GVI funding is the public pension funds. The state's retirement system has a provision for devoting 2 percent of its total funds to alternative investments. In this case, the 2 percent could be as much as \$48 million, a healthy sum to start up the initiative and give it the necessary support to make sure it succeeds.⁴⁹ However there are challenges in this source of funding, GVI is not the only investment being considered for the funding, and the decision to invest in GVI is made by of the boards of the three funds. The decision would not be made unilaterally, so if one board decided to invest, others may not and GVI would not see all \$48 million.⁵⁰ State

⁴⁷ Vermont General Assembly, "An Act Relating to a Renewable Energy, Energy Efficiency, Electric Reliability Policy, and Independent Negotiations for Power Supply Contracts" S.261, 2004, (<http://www.leg.state.vt.us>, accessed on December 17, 2004).

⁴⁸ Energy Information Administration, "Price and Expenditures: State Ranking," 2001 (http://www.eia.doe.gov/emeu/states/sep_sum/html/pdf/rank_pr_all.pdf, accessed on December 13, 2004).

⁴⁹ Kevin Kelley, "The Green Valley, Can Vermont Turn a Legacy into Gold?" *Vermont Business Magazine* June (2004) 47-52.

⁵⁰ There are three sectors to the pension fund: The Vermont State Retirement System, the State Teacher Retirement System, and the Vermont Municipal Employees Retirement System.

Treasurer Jeb Spaulding says that the pension fund investors would look for maximizing returns and minimizing risks, so they would not put all their eggs into one basket, but would more likely “provide some seed capital for a Green Valley venture fund” rather than directly investing in specific renewable companies.⁵¹

We also need to keep looking in state at where we can improve, such as making the Vermont Environmental Consortium (VEC) more comprehensive and accessible to companies, universities and non profit organizations that do work in environmental goods and services. The VEC defines itself as an environmental trade organization whose members include “private businesses, government agencies, and educational institutions dedicated to promoting the economic vitality of the environmental and renewable energy service, technology, and education sectors in Vermont.”⁵² The board of directors represents an array of leaders of various sectors of environmental interests, ranging from Lt. Governor Dubie to Michael Pottinger of Stone Environmental, a consulting firm. The VEC held a symposium at Norwich University in September of 2004 on the Green Valley Initiative. This symposium introduced the Green Valley Initiative into the academic community at Norwich University and was the first comprehensive display of the goals and functions of GVI. At a board meeting later that fall, the VEC developed a supporting infrastructure to make GVI come together. They established membership, events, planning, academic links, funding and membership services, committees as well as an executive director and outlined their plans and priorities for the next fiscal year.⁵³

⁵¹ Kelley, 48.

⁵² Vermont Environmental Consortium, “Our Mission,”(<http://www.envirovermont.com/mission.html>, accessed on December 14, 2004).

⁵³ VEC Board Meeting Agenda November 4, 2004 (supplied by Lt. Governor Dubie after our interview).

Among their organizational development activities the meeting agenda listed “establish links between Vermont educational institutions and environmental industries.” To date, the Vermont Environmental Consortium has only made contacts with the University of Vermont and Norwich University. We recommend that these connections be substantially expanded to take advantage of the numerous other schools in the state.

Publicity also needs to be increased—support for this project needs to come from the public as much as it needs to come from the State House, but we cannot expect that if people are not aware of GVI. During our survey we found that 72 percent of the companies we talked to had no knowledge of GVI. Those that did had limited knowledge, which lead them to believe that the project would not come to fruition. If these are the major players in renewable energy in our state and they are not informed, how can we expect the public to become informed and supportive of the GVI? The most cynical interviewees put the weight of their doubt on Lt. Governor Dubie and his commitment to follow through on such an environmentally supportive idea, when Governor Douglas’ energy policy has a record of being lack-luster in its ability to sustain and support the incentives program funding and its overall weakness in comparison to other state policies that are designed to support the growth of renewable energy industries. For optimism and faith in the Vermont government to increase among environmentalists, the Governor will have to “walk the talk” and carry out the green platform that the Lt. Governor pledged to in the election season.

In summary, promotion of the GVI needs to be understood at many levels: economic, educational, and public awareness. A comprehensive plan the incorporates developing a strong incentive program with consistent funding, working towards a

renewable portfolio standard, formalizing and strengthening the role and visibility of the Vermont Environmental Consortium, utilizing the research capabilities of the state's colleges and universities, and greatly raising awareness of the GVI and its possibilities is needed. We hope that the information provided in this report can serve as a starting point for developing this plan. We have also developed a draft logo for the GVI and a mock-fact sheet and newsletter that could be used as part of publicity efforts. These materials can be found in the appendices.

Listing of Renewable Energy Companies in Vermont

Company	Phone/email/websites	Renewable catagories
Atlantic Orient Corporation Farrell Farm Road, Rt. 5 N. Norwich, VT 05005	(802) 649-5446 mmacinnis@aocwind.com www.aocwind.net	Wind
Bast and Rood, Architects PO Box 220, Hinesburg, VT 05461	(802) 482-5200 (802) 482-3953 bastrood@together.net	Passive solar design
Better World Workshop 1915 E. Hill Rd. Marshfield, VT 05658	456-8993 Srogs@aol.com	Biomass
Black River Design 73 Main St., Montpelier, VT 05602	(802) 223-2044 (802) 223-1132	Passive solar design
Blake Spencer, Builder 188 Justin Morrill Hwy, Strafford, VT 05072	(802) 765-4490 (802) 765-4490	Passive solar design
BPVS 169 Maqee Rd., Stamford, VT 05352	413-743-0152 cdkbpvs@sover.net	Solar Wind
Central Vermont Solar and Wind 213 N. Main (RT 7), Rutland, VT 05701	(802) 747-0577 (802) 773-0924 cvsolar@aol.com www.cvsolar.com	Solar Wind Passive solar design
Central Vermont Solar and Wind 200 West Rd., N. Chittenden, VT 05763	(802) 747-0577 (802) 483-6233 cvsolar@aol.com www.middlebury.net/cvsolar	Wind Solar
CET Solar Store, LLC 65 Route 106 North Springfield, VT 05150	cetsolar@vermontel.net www.cetsolar.com	Solar
Chiptec Wood Energy Systems 48 Helen Avenue S. Burlington, VT 05403	658-0956 chiptec@together.net www.chiptec.com	Biomass
Chimney Sweep 3113 Shelburne Rd. Shelburne, VT 05482	985-4900	Biomass
Chimney Sweep Two 1284 US RT 302 Berlin St. Suite 10 Barre, VT 05641	476-4905	Biomass
CIFCO 34 Frost Place, Brattleboro, VT 05301	(802) 254-4591 (802) 254-7677	Solar
Jeremy Coleman Architecture & Planning 111 Main St. Brattleboro, VT 05301	(802) 257-1950 (802) 254-2568 jcoleman@sover.net	Passive solar design
Cumulus Engineering 1619 Frosty Lane Bridport, VT 05734	(802) 758-2287 paulkenyon@iuno.com	Wind
Cushman + Beckstrom Inc. Architecture and Planning PO Box 655 Stowe, VT 05672	(802) 253-2169 (802) 253-2160 design@cbap.net	Passive solar design

Dewey + Associates, Architects* PO Box 612, Londonderry, VT 05148-0612	(802) 828-5612 (802) 829-3936 deweayaia@sover.net	Passive solar design
John Q. Doane Architect 1 Grove Street, Essex Junction, VT 05452	(802)879-3091 (802)872-7790 doane@together.net	Passive solar design
Draker Solar Design, LLC P.O. Box 8346 Burlington, VT 05402	(802) 238-2964 (802) 657-3731 logan@drakersolar.com www.drakersolar.com	Solar
Echelon Environmental Energy 59 Spruce St. Burlington, VT 05401	(802) 660-9463 echelonenergy@excite.com	Wind
Edgecomb Design Group RR 1 Box 113, Warren, VT 05674	(802) 496-2165 (802) 496-2166	Passive solar design
Elmer Construction & Design 208 Stone Farm Rd., Marshfield, VT 05658	(802) 563-2035	Passive solar design
Elemental Energy 1750 Clark Rd., E. Montpelier, VT 05651	(802) 476-3441 (802) 476-3441 iggrundy@aol.com	Solar Wind
Energy Balance, Inc. 45 Perkins Road, Montpelier, VT 05560	(802) 229-5676	Solar Passive solar design
Four Seasons Sun Rooms PO Box 8304, Brattleboro, VT 05304	(802) 258-6565 (802) 258-9809	Solar Passive solar design
Friends of the Sun 671B Depot St., Route 11/30 Manchester Center, VT 05255	362-4070 800 639-2603 hotstuff@friendsofsun.com www.friendsofsun.com	Biomass
Glassworks PO Box 206, Waterbury, VT 05676	(802) 244-5449 (802) 244-593	Passive solar design
Global Resource Options, LLP PO Box 51, Strafford, VT 05072	(802) 765-4632 (802) 765-9983 800-374-4494 global@sover.net www.globalresourceoptions.com	Solar Wind
Gossens Bachman Architects 85 Granite Shed Lane, Montpelier, VT 05602	(802) 229-1664 (802) 229-4822	Solar
Guillot-Vivian-Viehmman Architects Inc. 284 S. Union St., Burlington, VT 05401	(802) 862-9631 (802) 660-9010 fguillot@together.net http://together.net/~fguillot/fqa.htm	Passive solar design
Hearth & Cricket Rts. 140 & 155 E. Wallingford, VT 05742	259-2841 daryleone@aol.com www.rutlandherald.com/hearthandcrick	Biomass

Independent Power & Light* 462 Solarway Drive, Hyde Park, VT 05655	(802) 888-7194 (802) 888-4230 indeppower@aol.com www.independent-power.com	Solar
Indiana Architecture & Design 477 Ten Stones Circle, Charlotte, VT 05445	(802) 425-7717 (802) 425-7717 indarch@sover.net www.sover.net/~indarch	Passive solar design
KAB Enterprises, Inc. 2832 East Hill Road Plainfield, VT 05667	(802) 454-1321	Biomass
Keefe & Wesner Architects, P.C. PO Box 367, N. Bennington, VT 05257	(802) 447-1724 (802) 447-7580 keefewes@sover.net www.keefeandwesner.com	Passive solar design
Little Village Sustainable Living Center Center 147 North Main St. Rochester, VT 05767	(802) 767-9999 www.vermontsolarliving.org mail@vermontsolarliving.org	Solar Wind
Maclay, William Architects & Planners 4509 Main St., Waitsfield, VT 05673	(802) 496-4004 (802) 496-4007 wmap@wmap-aia.com www.wmap-aia.com	Passive solar design
John Mallery, Architect & Builder 108 Norton Road, Worcester, VT, 05602	(802) 223-1500 johnmallery@hotmail.com	Passive solar design
Montpelier Stove Works 178 River Street Montpelier, VT 05602	(802) 229-0150 800-287-0150	Biomass
Montpelier Stove Works 3762 Shelburne Rd. Shelburne, VT 05482	(802) 985-8280	Biomass
New England Geothermal Systems P.O. Box 636 Putney, VT	(802) 258-6504 (802) 463-2232 info@negeothermal.com www.negeothermal.com	Geothermal
Northern Architects, Inc. 207 King Street, Burlington, VT 05401	(802) 658-1953 (802) 658-2975 northarch@aol.com	Passive solar design
Northern Power Systems PO Box 999, Waitsfield, VT 05673	(802) 496-2955 (802) 496-2953 www.northernpower.com	Solar Wind
NRG Systems, Inc. 110 Riggs Road Hinesburg, Vermont 05461	T: (802)482-2255 F: (802)482-2272 www.nrgsystems.com	Wind
Oak Ridge Alternative Energy Hamond Hill Rd., Brownsville, VT 05089	(802) 674-9236 Syrinx21@aol.com	Solar Wind Quit last year

Patullo Consulting Inc. 107 Cherry Lane, Burlington, VT 05401	(802) 660-8903 (802) 660-8903 sunergy@together.net	Solar Passive solar design
Sam Daniels PO box 868 Montpelier VT 05601	223-2801	Biomass
Solar Applications Company 22 S. Main St., Brattleboro, VT 05301	(802) 257-7493	Solar Wind Passive solar design
Solar Works, Inc. 64 Main St., Montpelier, VT 05602	(802) 223-7804 (802) 223-8980 info@Solar-Works.com www.solar-works.com	Solar Wind
South Face Design & Construction PO Box 82, Brownsville, VT 05037	(802) 484-3307 (802) 484-3307 soface@sover.net www.sover.net/~soface	Solar Passive solar design
Specialized Power Systems, Inc. 30 Depot Road Hartland, VT 05048	436-2463 or 877-806-4221 info@specializedpowersystems.com www.specializedpowersystems.com	Solar
Spectacle Technology PO Box 114, E. Calais, VT 05650	(802) 456-7097 scheckel@sover.net www.spectacletech.com	Solar
Sunlight Electric 2257 Lightening Ridge Rd. Plainfield, VT 05667	(802) 454-8020 sunlight@plainfield.bypass.com	Solar
Sunnyside Solar, Inc. 1014 Green River Road, Guilford, VT 05301	(802) 257-1482 (802) 254-4670 sunnysde@sover.net www.sunnysidesolar.com	Solar
Sunrise Solar Services PO Box 129, Randolph, VT 05060	(802) 728-6510 (802) 728-6510 sunsol@sover.net	Solar
Sustainable Solutions 170 Lafirira Pl. Marshfield, VT 05658	(802) 426-3556 sunsol@sover.net	Solar
Vermont Castings PO box 501 Bethel, VT 05032	234-2300	Biomass
Associates (VERA) 1209 Harvey Farm Road Waterbury Center, VT 05677	(802) 244-7522 (802) 244-1857 vera@northeastwind.com www.northeastwind.com	Wind
Vermont Green Energy Systems*	(802) 388-4334 (802) 388-4334 thannon@sover.net	Wind Solar

Vermont Solar Engineering* PO Box 697 Burlington, VT 05402	(802) 863-1202 & (800) 286-1252 (802) 863-7908 sales@vtsolar.com www.vtsolar.com	Solar Wind
Vermont Sun Structures 206 Walker Hill Road Williston, VT 05495	(802) 879-6645 (802) 879-4144	Solar
Michael Weinberger Associates 79 Pleasant St., Woodstock, VT 05091	(802) 457-1866 (802) 457-4649	Passive solar design
Williams & Frehsee, Inc. 7 Holstein Place, Brattleboro, VT 05301	(802) 257-1311 (802) 257-9429 jim@wfvvt.com	Passive solar design
WindstreamPower Systems, Inc.* PO Box 1604, Burlington, VT 05402	(802) 658-0075 (802) 658-1098 info@windstreampower.com www.windstreampower.com	Solar Wind
Yestermorrow Design/Build School RR Box 97-5, Warren, VT 05674	(802)496-5545 (802) 496-5541 designbuild@yestermorrow.org www.yestermorrow.org	Passive solar design



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Business Sector with
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Great Articles: The Union Makes Them Strong: A Blue-Green Alliance on Climate Change Adopts a New Agenda: Jobs

By Laura Paskus,
March/April 2005 Orion
Magazine

Some things you will
learn by reading this
article :

- From 1980-1999, employment in U.S. coal mining and oil refining fell 66% and 40% respectively.
- Oil and gas industry jobs are expected to decline by 28% through 2012 as automation increases, domestic supplies dwindle, and companies shift exploration and production overseas.
- The U.S. lags behind Europe where employment in wind energy alone tripled from 1998-2003 and is expected to triple again, to 200,000 jobs, by 2020.

Middlebury College Students

Visit the state house to talk about GVI

Students from Middlebury College met with Lieutenant Governor Brian Dubie on November 23rd to discuss his proposal for the Green Valley Initiative. Sarah Weldon and John Hanley are both seniors in the Environmental Studies Senior Seminar, a class which is doing several service learning projects that focus on renewable energy in Vermont, and initiatives that can and are being taken by individuals, companies, and religious groups to encourage further development.

A presentation of the class's findings will be presented at

the College on December 9th, members of the community are invited to come for lunch and an enlightening lecture about energy possibilities in our state.

The projects that will be presented are on Interfaith environmental awareness and action in Vermont, the state of renewable energy in Vermont, renewable energy and homeowners, barriers, options incentives, and finally a summary and analysis of the possibilities of the Green Valley

Initiative.

Students conducted interviews, designed and implemented surveys, and created GIS maps as part of their research. They also put together lobbying packets.

The projects were coordinated in partnership with community groups; Vermont Public Interest Research Group, Renewable Energy Vermont, and Vermont Interfaith Power and Light.

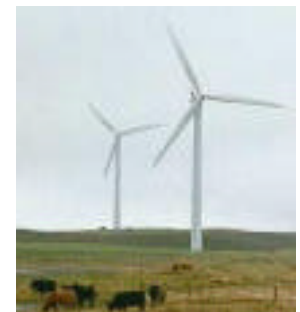


Union of Concerned Scientists' Study Says Rural Economies Benefit from Renewable Energy

A study by the Union for Concerned Scientists reported that rural economies stand to benefit the most from expansion in renewable energy across the country. Clean energy sources such as wind, solar, and biomass, frequently have excellent site locations on agricultural land. Therefore, landowners can lease or sell portions of their land to energy corporations and reap the profits.

The UCS also recommends their Renewable Energy Blueprint, a plan for state and national energy policy that calls for a 20% renewable portfolio standard (RPS) nation wide, or average across state governments by 2020. If the United States where to adopt this RPS policy, then UCS projects that it could "stimulate \$60 billion in capital investments in renewable energy technology

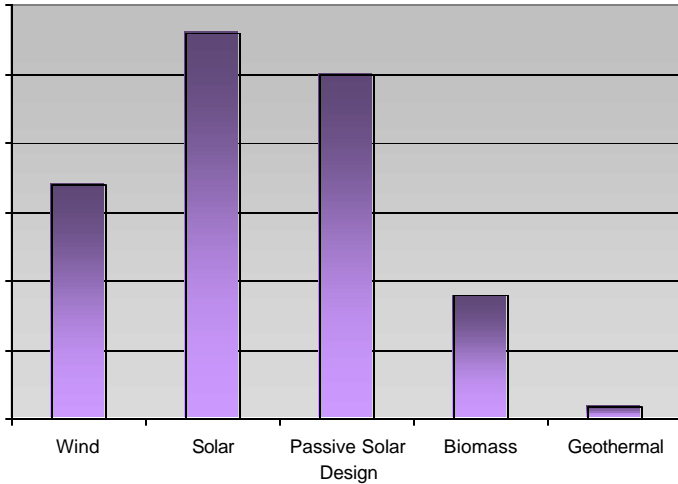
investment in rural economies" over the next 18 years.



The Impact of the Renewable Energy Industry on Vermont



Businesses in Sector



High Payrolls Benefit the Economy

Money that businesses bring into the state in sales is circulated into the local economy through payrolls to full-time employees and subcontractors.

The Renewable Energy Industry employs an estimated **600-700 Vermonters** and generates annual sales figures estimated to be over **\$11 million**

Dubie's Green Valley Initiative
"Green Valley is a plan to create a business climate in Vermont that supports existing environmental goods and services businesses through networking, education and marketing, and promotes the formation of new EGS companies and the relocation of entrepreneurial EGS companies to the state."

Talking Points:

Hot Green Industry Sectors

Green Industries are an important part of Vermont's economy. Currently there are more than 60 businesses that design, manufacture, or install green energy systems. Many of these companies focus on more than one sector; a wind power company may also design and install solar panel systems. Currently solar design (both active and passive) is the largest sector in Vermont. Wind and Biomass also generate a significant amount of economic activity in the state.

Annual payrolls at businesses manufacturing, designing or installing green energy systems range from

\$80,000 to \$7 million

Employment Green Industries directly employ an estimated 600-700 Vermonters. These good quality, high-paying jobs are good for our economy, keeping unemployment rates low and communities healthy.

The Sales/Incentives Connection

Business owners in the state have repeatedly pointed out the connection between high sales rates and consumer incentives provided by the government. Incentives programs must continue.

Our Recommendations

- Create incentives for existing green businesses
- Fund incentives for consumers
- Adopt a renewable portfolio standard.
- Mandate disclosure of power source on utility bills