

From: Meghan Dewald

Sent: Monday, April 08, 2013 5:08 PM

Subject: David Blittersdorf -- Comments to the VT Energy Generation Siting Policy Commission

Dear members of the Energy Generation Siting Policy Commission:

Please find attached David Blittersdorf's comments, as a single .pdf file.

Thank you for your consideration,
Meghan Dewald

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To: Members of the Vermont Energy Generation Siting Policy Commission

From: David Blittersdorf, President / CEO, AllEarth Renewables
Managing Partner, Georgia Mountain Community Wind
Founder and Past President / CEO (1982-2004), NRG Systems

Date: Monday, 9 April 2013

Re: Comments to Energy Generation Siting Policy Commission

AllOpen Letter to the Vermont Energy Generation Siting Policy Commission

I applaud the commission's work focused on improving the siting of renewable energy in our state. The charge you carry from Governor Shumlin is a very important one for Vermont. As you deliberate and prepare to issue your findings, I urge you to please look at the big picture of energy and how we obtain it in Vermont—this includes where our renewable energy resource is located, and the practical means of harnessing it at a scale that will meet our needs now and in the future.

The Vermont Comprehensive Energy Plan's key goal is for 90% of all energy to be supplied by renewable energy sources by 2050 - including energy used for heating and transportation. This goal requires at least three times as much electrical energy as the state currently uses. The plan outlines the majority of that electricity will need to come from wind and solar. I believe this goal is necessary and urgently required. Fossil fuels will not be around in abundance forever, and our finite planet is depending on us to do the right thing, while economic conditions can support this transition.

Science and getting the facts correct matters. It is very difficult to disagree a negative statement, but in the case of determining the right path to take for the good of all, it's important to sort the signal from the noise. *My concern is that many of those opposed to large scale renewable energy are not operating from a familiarity with the big-picture issues involved, or from any basis of energy expertise. I do this work in energy because I believe in its importance for society, but my convictions are rooted in science and its practical application. This is why I know that converting to an electric economy powered by renewable energy is the right path for us to take. At this crossroads in Vermont's implementation of the Comprehensive Energy Plan, please do not let renewable energy opponents create doubt in your minds just by virtue of their opposition. Weigh the facts, first, judging their source and veracity.*

I speak from experience. I'm very familiar with Vermont's permitting process as it stands, because I have built both a large-scale solar farm and a large-scale wind farm in Vermont within the past two years - the 2.2 MW South Burlington Solar Farm, and Georgia Mountain Community Wind, a 10 MW, four turbine farm on the Georgia-Milton town border. I have also devoted 33 years of my life to the study of renewable energy and the advancement of renewable energy systems. My background in this field includes a B.S. in mechanical engineering (UNH 1981), and subsequently founding NRG Systems in 1982 and developing it to be a worldwide leader in wind energy measurement equipment as CEO for 23 years. For seventeen years, I served on the board of the American Wind Energy Association, and I'm a founding member of Renewable Energy Vermont. I have ongoing service commitments with several non-profit organizations that are concerned with the scientific evaluation of energy resources and systems: these include being a board member of the Association for the Study of Peak Oil - USA, and an advisory board member of the Union of Concerned Scientists. After 33 years running renewable energy businesses, I've also got a boots-on-the-ground familiarity with what will and won't work in terms of practical applications. I've been involved in every wild

reinvestment program in Vermont; I know the state's wind resources very well. Today, my company Alliant Renewables is advancing the technology of ground-mounted solar tracking systems. To date, we have installed over 1500 solar trackers, all manufactured at our factory in Williston, VT. We are the largest solar installer in Vermont.

Vermont has the toughest large energy project permitting of any state, and that permitting process has already been very thoroughly vetted with public input at every step of the way. If we are serious about transitioning our energy economy, it is important to remember that renewable energy projects don't *only* require permits; they require developers willing to make them happen. True federal leadership is lacking on this issue. Without the benefit of directly federally funded transition initiatives, any successful large-scale infrastructure change requires public-private partnerships – in this case, communities and policymakers must acknowledge that developers bring essential funds and expertise to the table, and share the common goal of retooling our energy economy to run on renewable resources. Spare off the developers, and we hobble our chances at developing a state that is energy- and climate-secure. Global climate change is a greater threat to human survival than any geopolitical situation past or present; but the United States fought World War II more quickly than Vermont can currently permit a single wind farm. We must explore ways to permit renewables more quickly, and with predictable timelines.

I urge the commission to recommend ways to improve permitting for all involved, not weigh projects down with additional requirements. We must simplify and standardize the process. We must switch to renewable electrical energy, away from fossil and nuclear fuels, and lead the nation in showing how this can be done. We are running out of time, and the common good of all Vermonters trumps individual self-interest. Please stand strong and do what our kids and grandkids are expecting of us: lead us forward to a true renewable energy economy.

Respectfully,

David Blittersdorf
President / CEO, Alliant Renewables
Managing Partner, Georgia Mountain Community Wind
Founder and Past President / CEO (1982-2004), NRG Systems

P.S. I have submitted this document as an open letter to the commission, to run in place of my column in the April 15 issue of *Green Energy Times*, a newspaper published 6 times per year from Bradford, VT and distributed statewide. I have been writing columns regularly for the paper since May of 2010, and would like to submit all of my past published writings for the commission's consideration, in hopes that they may offer some context for all of the data now before you. Here is a table that summarizes the columns and their contents, in reverse chronological order:

1. February 2013. Our Vermont Community
2. December 2012. Turbine Turbulence: Blower in the Wind.
3. August 2012. Waking Up from Wishful Thinking.
4. April 2012. Our core/true relationship with China.
5. February 2012. Dateline New Zealand: Feeling the Heat.
6. December 2011. (I Don't Wanna See it!)
7. October 2011. Energy Target Fixation!
8. May 2011. A Light at the End of the Tunnel.
9. February 2011. We Won the Energy Lottery – What Now?
10. November 2010. Statewide Solar Incentives.
11. July 2010. "Clean" vs. Renewable Energy.
12. May 2010. Too Much Carbon.

David Blittersdorf's **View from the Top** – February 2013

Our Vermont Community

Vermont is one of the smallest states in both size and population – by geographic area we're 45th in the country, and as of the 2010 census, only Wyoming has fewer people. Not surprisingly, we Vermonters are used to the idea of relying on our neighbors, and figuring out how to get along with each other. Our state is also one of the most socially and environmentally progressive. While we're not strangers to conflict here, many of us share common beliefs and strongly value being on the forefront of positive change, as far as the rest of the nation is concerned. We are proud of who we are and what we do, and enjoy the idea that in future we'll continue to show the same sort of cohesive, common-sense attitude toward energy, the environment, civil rights, and sustainable food systems, among other areas of our collective community life. We also value socially responsible businesses that nurture people and the planet as much as profits. Over all, we have a commitment to working things out. A key part of the Vermont way of doing things is a respect for individual rights and privacy, while also holding certain "common goods" as being greater than any individual wish or need.

It's rare to run across an entire state where this kind of community cohesion is possible. Most other states struggle to achieve it, as they are too big in most regards. We share a strong belief in being independent and of taking care of ourselves. We are strong and fortunate enough to have the wherewithal – the time, energy and money – to be responsible and caring for each other. We recognize that climate change is real and is caused by burning fossil fuels. As a state, we accept our role in causing the horrible dilemma we're in as a society, where a century of carbon consumption, and consumptive behaviors generally, have contributed to resource depletion and a major shift now underway in the very way nature behaves.

We are now acting to do something about the energy situation in which we find ourselves. We have a comprehensive energy plan that sets an ambitious but necessary goal: 90% of Vermont's total energy needs – that's all the energy used for electricity, heating and for transportation – will come from renewable energy sources by 2050. In order to meet this goal, Vermont needs to pursue large wind and solar, the two largest energy resources we have within our borders. I firmly believe this shift is required and cannot be denied if we are going to survive and prosper in coming years, as fossil fuels become less available, and nuclear and imported hydro either too fatally risky, or too distant and outside of our control. Access to reliable, non-polluting energy is an undeniable common good. We have a strong need to maximize our in-state renewable resources, reduce our energy consumption, and develop systems of living within and by our energy means, while we still can.

A very small group of anti-renewable-energy folks is dividing our statewide community on energy issues, and this group claims to speak for the majority. I applaud their passion and their love of place, and I understand their urge to protect Vermont's natural resources, i.e., to protect the "commons," because I too am working to protect the natural resources of our state. Today we use fossil fuel resources from other states and countries around the world to supply over 90%

of our energy for electricity, heating and transportation. These external resource needs are far more damaging to all of us than developing our own in-state renewable resources would ever be. We must think of ourselves as the Vermont community. We cannot let the personal self-interest of small groups or towns stop what is necessary to provide for ourselves as a state. We must look out for the greater common good, and serve as a model for other communities and states looking for leadership in our society's present energy transition. Vermont must lead in this major energy transition, and I believe we will.

David Blittersdorf is the President/CEO of AllEarth Renewables in Williston, VT – a company that specializes in the design, manufacture and installation of the grid-connected AllSun Tracker solar energy system. He is also the founder of NRG Systems in Hinesburg, VT, and the managing partner of Georgia Mountain Community Wind.

David Hittersdorf's **View from the Top** – December 2012

Turbine Turbulence: Blüvin' in the Wind

Vermont is currently experiencing tensions over how best to pursue development of renewable energy – despite having in place an already rigorous permitting process for larger projects. As conversations unfold between developers, clean-energy advocates, communities and state officials, it's important to realize that the roots of large wind energy run deep in the Green Mountains, and that energy infrastructure always requires initiative from private developers, in partnership with public interests. We should recall that Vermont has a history of innovation in wind, and use the goal of becoming innovative again as a framework for our current statewide discussion.

Think of big wind turbines, and lots of places come to mind: Midwestern U.S. farmland, Denmark, and the maritime provinces of Canada, to name a few. But Vermont was home to one of the first. It's important to remember that a landmark wind energy project was built in Vermont more than 70 years ago. Grandpa's Knob near Rutland was the site for a 1.25MW turbine, and when it was energized in 1941, it became was the first large wind turbine in the world to feed power to an electric utility (Central Vermont Public Service, just 12 years after that utility was founded).

The development and construction of the Smith-Putnam turbine was a proud feat of engineering by a private Pennsylvania manufacturer of hydro turbines. It was designed in Pennsylvania, then transported and installed atop the 2000-foot summit of Grandpa's Knob in less than 3 years. It ran for a few months in the spring of 1945 as a standard generating unit of the CVPS electrical system, until it had mechanical problems symptomatic of the new technology. Unfortunately, WWII focused attention elsewhere, and after the war concluded, the U.S. energy economy stopped actively developing replacements for fossil fuels in favor of coal power, and then initiative to develop large-scale wind turbines lapsed until the 1970s and 1980s.

This history has personal resonance for me, because it has shaped my life. As an intrepid 12-year-old in the late 1960's, I came across an old *Vermont Life* magazine article about the Smith-Putnam turbine, whose original site was a short distance from my boyhood home in Pittsford, VT. My mother encouraged me to visit the site, and think about what it meant. I became passionate about the promise of wind and solar power vs. nuclear, coal and oil, which led to a 32-year career in renewable energy. I've founded two Vermont-based renewable energy companies, and I'm currently the managing partner of Georgia Mountain Community Wind, a four-turbine project in Milton and Georgia which will supply about 10% of the Burlington Electric Department's power needs.

Why does all this matter to Vermont? Wind and solar are the major renewable resources we have on earth. Vermont was at one time a global pioneer in wind power – we now need to recapture our position as a leader. The reasons Palmer Putnam and his

teams of the best scientists in the U.S. decided on Vermont as their turbine's proving ground are still valid today: great wind resources in the mountains, complementary water power generating stations, and a Yankee can-do population proud to be self-sufficient. Today as a state, we import over 90% of our energy, and much of our food, from out of state. The overwhelming majority of Vermonters share the goal of generating most of our energy from renewables and growing more of our own food. Time is short; we've surpassed peak oil; we must move much faster in installing wind turbines and solar systems.

For those interested in further details, photos and narrative about the Grandpa's Knob turbine may be found on these two websites:

http://en.wikipedia.org/wiki/Smith-Putnam_wind_turbine

<http://www.wind-works.org/photos/Smith-PutnamPhotos.html>

(includes a link to film footage of the original turbine).

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David Blittersdorf's **View from the Top** – August 2012

Waking Up from Wishful Thinking

I recently took a train eastward from Portland, Oregon to the Midwest. Traveling through the boom town of Williston, North Dakota, I saw the prairie aflame with natural-gas burn off flares from the hundreds of oil wells being drilled and fracked in the Bakken shale deposits there. The view was disgusting and dispiriting: Drill rigs, tank farms, trailer cities, flaring gas vents, poorly made roads and piles of fracking pipe as far as the eye could see. I also saw tons of carbon literally going up in smoke in those flares. What was most disheartening was the knowledge that all of this waste and degradation is extremely shortsighted. The shale oil deposits annually produce less than 1% of the world's oil demand, and once it's gone, it's gone — just like the billions of cubic feet of natural gas that is being burned off these same deposits because it's unsafe to drill with the gas sitting on top of the oil, and the drill sites aren't equipped to capture or transport it. The environmental after-effects of fracking liquids will remain in the prairie soil and its aquifer for a long time. The people who live in this North Dakota town may see the shale oil as an economic miracle, but it's a boom that will go bust — just like the material they are mining, the drillers' jobs will go up in smoke when the resource is all gone. And the oil isn't even going to be kept as a national reserve for future generations to carry out important infrastructure projects on a limited basis — it's going right into pipelines, refineries and gas stations. All this so we can drive our cars for maybe an extra month or two.

It's time we truly realized that peak oil production has happened, and sooner than we think, oil is going to be more scarce and expensive. The era of cheap fossil fuels is over — we just don't want to accept it. When Texas was spouting gushers 80 years ago, Williston, ND wasn't on the map, for good reason — its oil is trapped in flakes of rock, and it's deep underground. Fracking is suddenly economically feasible because 1) all the easily accessible oil is gone, 2) the price we're willing to pay to get oil out of the ground has gone up accordingly, and 3) our society doesn't put a dollar value on the natural systems we need to live, like clean water. Apart from the economic folly of pretending that the earth will forever supply as many resources as we can demand (and it won't), we can't burn all the currently existing coal, or gas or oil reserves willy-nilly without further warming our atmosphere and skewing the climate.

I'd like to suggest a couple of homework assignments: Read Bill McKibben's essay "Global Warming's Terrifying New Math" recently published in *Rolling Stone*, and the book *Too Much Magic* by James Howard Kunstler. These two articulate authors point out the missing pieces of how humanity can live within its means on our finite planet. The completed puzzle may not be pretty in a storybook sense, but reality never is.

We in Vermont can actually show the world a different way. We're at a scale where it's feasible to re-localize our food system, encourage the majority of our

population to move to towns and cities, get serious about efficiency and conservation, electrify our energy system, and power our grid with renewable energy from wind, water and the sun. We face many challenges along the way, but our main problem is denial that we have a problem. Unfortunately, the biggest blinders are worn by "environmentalists," – both individuals and institutions, the Vermont Natural Resources Council among them – who don't really understand the fundamentals of energy and the dire straits that we are collectively in. Many people in this camp can't see the forest for the trees, and are now becoming allies to the opponents of wind farms, based on incorrect or incomplete information and emotional framing of the "big wind story." This is both sad and frustrating, because these opponents are some of the biggest storytellers of detrimental fictions I have seen. At a time like this, when our world is at a significant crossroads and must make a decision about how best to value, use and allocate our energy resources to meet our needs and transition to a new economy, we just don't have time for anything less than the truth.

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David Blittersdorf's **View from the Top** – April 2012

Our Love/Hate Relationship with China

The past decade has witnessed mass consumption on a scale unprecedented in world history, and the hard truth is that the western world has become dependent on China to manufacture more than half the stuff we consume. Why? Because Chinese companies employ workers for pennies, and are not subject to meaningful environmental protection laws. We're beholden to China because we've based our entire economic system on the idea of continuous expansion, and we've convinced ourselves we need stuff to be happy. More stuff equals more happiness and a supposedly healthier economy. Stuff that costs less enables us to buy more stuff, so we love Chinese goods because they are cheap. However, when I stop to think about it, I hate Chinese goods for this very reason. Take a good look at the ecological devastation of China's water, land and air, and the living and working conditions of China's industrial labor force, and it becomes heartbreakingly apparent that China's cheap goods are actually very expensive. It's just that the true human and ecological costs aren't part of the prices we pay. This kind of international trade is incompatible with human rights, fair employment, pollution control, global resource management, and business sustainability.

U.S. citizens must learn now how to restructure our lifestyles to use one-fifth of the energy and resources we currently consume, before we really hit the wall of fossil fuel resource depletion. Global trade must ramp down now, and significantly change its nature. We need to be happier with fewer, more durable things of higher quality, made near us with integrity and dignity, and which serve a function in our lives. We need to get good at fixing old stuff, instead of buying new stuff. To those who say this attitude is inherently elitist or isolationist, and incompatible with working-class needs or budgets in a global economy, I heartily disagree. It was once the root philosophy of the American way of life, before we became a nation of people whose leaders tell them to go shopping at times of national crisis. We need to get back to this moral code: limiting consumption, and use it as the basis for our future economic systems at home and abroad.

Instead, for the past 20 years, Americans have been "educating" the Chinese in how to become mass consumers with the goal of expanding our markets, and we have successfully sold them on the horrible idea of consumption as the path to happiness and well being. What a shame – because China's economic experiment, like that of the United States, is doomed to fail. Car ownership may offer a temporary sense of freedom for Chinese citizens, but as oil and other resources are depleted in the coming decades, it will become a symbol of the degradation of China's culture and ecosystems. One point-four billion people simply cannot all drive cars and consume at western levels without worldwide resource depletion and ecosystem collapse. I'm not saying the Chinese need to give up this idea while we continue to pursue it as a right – we need to give it up, also.

We Americans need to look in the mirror, and recognize that we are the problem: We consume more than 25% of the world's resources, despite being only 5% of the world's population. The United States will not be able to continue consuming at its current rate, simply because our planet can't support it. We must move to local, closed-loop systems in all areas of our lives: local organic food production, local renewable energy production, a transportation infrastructure based on a mass transit bus/rail

instead of individual vehicles, and electrification of our energy system to make this all work. Along the way, we must take drastic actions, such as permitting all SUV's to reduce the number sold. Unlimited individual economic "freedoms" to consume only make sense in a world where there will be unlimited resources forever, and such a world does not exist.

The United States can no longer engage in massive-scale world trade for items we don't really need, because this is too energy intensive and simply isn't sustainable. The Chinese want our way of life because we've convinced them that consumption is the road to happiness, but it's not; it's just an illusion propped up by empty economic theories. We have yet to figure that out, but the time is rapidly approaching when we will no longer be able to ignore it. When we do, this realization will change the way we live and do business. My hope is that we can make this change consciously, and enjoy a smoother road back to community, family, purposeful work, and all the other things which make life truly worth living - and, not coincidentally, aren't things at all.

David Blittersdorf is the President/CEO of AllEarth Renewables in Williston, VT - a company that specializes in the design, manufacture and installation of the grid-connected AllSun Tracker solar energy system. He is also the founder of NRG Systems in Hinesburg, VT.

David Blittersdorf's **View from the Top** – February 2012

Dateline New Zealand: Feeling the Heat

I was recently invited to visit New Zealand, and am writing now amidst the summer temperatures of February in the southern hemisphere. During this trip to one of the only countries to legislate itself a nuclear-free zone, I've been absorbing info on New Zealand's renewable energy economy, and considering the inherent wastefulness of burning fossil fuels to generate electricity.

We have a 200-year-old problem in the world of electricity production – the problem of large thermal losses experienced during the conversion of fossil, biomass or nuclear fuels into usable electrical energy. Almost all of the world's electricity is produced through combusting a resource. In power plants, these resources are consumed to heat water to make steam, which turns turbines to generate power. Nuclear fission reactors are simply large heaters to make steam. Likewise, almost all coal, oil, natural gas, wood chip and nuclear power plants boil water to move steam turbines, which rotate generators, thus producing electricity.

The problem is that the steam cycle is a huge energy waster. Sixty-seven percent – that's most of – the fuel burned in a power plant is wasted in surplus heat generation, which is usually not captured for use in any other way. This adds up to a mind-bending statistic: Over 30% of the total energy consumed in the U.S. is used as *part of the electricity-production process*. It's like we are taking two-thirds of our energy paycheck and setting it on fire. Cooling towers next to power plants evaporate vast amounts of fresh water to expel the waste heat of the steam cycle into the air. And in "hot dumping" this huge amount of energy, we allow it to be discharged into our ecosystems, requiring more resources to absorb and dissipate the thermal load. According to a November 2011 study by the Union of Concerned Scientists, almost half the fresh water in the USA is used to cool coal, nuclear and other fossil-fuel-burning power plants.

The top three energy sources that don't use the steam cycle are wind and solar renewable energy, plus hydropower. Instead of burning – and wasting – valuable resources to turn a generator's turbine, falling water and blowing winds produce electricity by rotating a generator directly. Solar power requires no generator turbines at all; solar photovoltaic silicon cells convert sunlight to electricity on the spot. Solar, wind and hydropower do not experience the same large thermal losses of traditional energy production methods. Modern wind turbines are up to 50% efficient in converting the blowing wind to electrical energy, with very little wasted heat. No heating our rivers, no need to use fresh water to carry thermal loads. These natural sources are all around us every day. Rivers tumble toward the sea, the wind blows and the sun shines. These real-time natural resources are truly renewable, because they are not depleted when used. We need to move quickly toward using *only these renewable resources* for our energy needs.

By contrast, fossil and nuclear fuels are *one-time, finite fuels*. These fuels were created over millions of years and are basically concentrated sunlight. It is tragic that these fuels are being burned so incredibly inefficiently when we can only use them once. Once burned, they are gone forever. It should be a crime to burn a non-renewable resource at such low efficiencies. At the end of the combustion process of the steam cycle, less than 35% of the original energy source is directly usable to us as electricity. The rest is gone forever – up in smoke, or steam. We need to drastically reduce our energy reliance on these sources, as

quickly as possible. The earth cannot provide us with enough of them to keep up with our use, and at the rate we are going, we will soon deplete them all to the point of diminishing returns.

Here in New Zealand, most electricity is produced by water via hydropower plants, but there are no nuclear power plants. New wind farms are being built to harness very strong winds. Solar also has a large untapped potential. Looking at this small island nation, I am impressed with what it has accomplished, despite – or perhaps because of – its relative isolation in an ocean at the bottom of the world. As I contemplate my upcoming flight home to the Green Mountain State, I wonder whether Vermont will similarly be able to lead, and become a model for how to do renewable energy right. I believe we must, and I have every hope we can.

David Blittersdorf is the President/CEO of AllEarth Renewables in Williston, VT – a company that specializes in the design, manufacture and installation of the grid-connected AllSun Tracker solar energy system. He is also the founder of NRG Systems in Hinesbury, VT.

David Blittersdorf's **View from the Top** – December 2011

'I Don't Wanna See It'

The debate over the aesthetics of renewables is one that I have avoided stepping into until now, because I believe that aesthetics are a matter of taste, and are therefore not a factor that should affect the much-needed update of our electrical infrastructure to rely more on distributed renewable energy. Beauty is famously in the eye of the beholder, but preparing ourselves to live in a world without ready access to fossil fuels or nuclear power is, to me, a "no-brainer." We need to do it. The urgency I feel is the result of peak oil. Either in my lifetime or my children's, as fossil fuels become harder and harder to find, steady supplies of gasoline, natural gas and heating oil will become prohibitively expensive or become disrupted. Our world needs to transition toward a new way of life that does not rely on fossil fuels, and Vermont should serve as a model for how this can be done, through a combination of conservation, efficiency, and a switch to distributed renewable energy.

However, aesthetics have become a bigger and bigger hodgepodge in the public debate over how to best accomplish this transition – particularly the proper siting of wind energy systems. My concern is that matters of taste are being used to muddle a clear consideration of the scientific data on the merits and capabilities of these technologies, and that people are allowing their personal emotions and desires to cloud their perception of what's important in the long term for the public good.

This was brought home to me recently at a roundtable discussion about wind energy in Vermont that was part of a December 3 conference hosted by the Vermont Energy and Climate Action Network. In this forum it seemed that a clear consideration of long-term public good was not part of the discussion, for the simple reason that "aesthetics" seemed to mean "my experience, my view, my Vermont." I was alarmed to be having a public discussion on the science of renewable energy with adults that whined, pouted and carried on like disappointed kids.

It is great for people to engage and be part of debates on our society's future. It is good and necessary to hear and address the concerns people have on producing renewable energy in our own state. However, everyone participating in such a debate has a duty to educate themselves from objective sources about the way in which we use electricity, and about what is actually feasible in terms of accomplishing this transition. My problem is that we are not having a debate based on factual information. The story that opponents to wind energy in Vermont make up is just that – a story unconnected to reality or facts. Here is their story: "Wind turbines produce hardly any electricity. They destroy the mountains. They destroy wildlife. Humans get sick from wind turbines. Nobody wants them. They do nothing to slow global warming. They don't help us to replace fossil and nuclear fuels. They are too big – put small ones in the valleys instead. Solar will solve everything. Someone else, somewhere else will provide the energy we need. We love and want windpower, just not here."

It has been easy for these narratives to catch hold among those resistant to change and unwilling to dig into the real science, economics and facts behind the technology. The truth: Wind and solar are the largest energy resources we have in our state, and large wind is one-third the cost of solar. The majority of Vermonters have a deep understanding that we have a social and moral responsibility to stop destroying the source of our life – our earth. This is as true for us in the beautiful Green Mountain State as it is for those living amidst the tar sands of Alberta, the shale-gas fracking wells of Pennsylvania, the coast of the Gulf, or the removed mountain tops of West Virginia. Vermonters understand the old ways don't work anymore.

They are willing to change and look out on our mountains to see wind energy there, and be proud that Vermont will lead the nation and the world to a sustainable, renewable energy future.

What would our state look like now, and how effective would its infrastructure be, if residents had blocked the installation of electric and telephone lines and gas stations in the early twentieth century? It would undoubtedly be beautiful, but in the way a national park is beautiful – Vermont would lack Vermonters. The only people able to live here would be those vacationers able to view lack of electricity as a temporary boon, a relief from normality, not a day-in, day-out reality. These elements of infrastructure are inarguably man-made, inarguably essential to our way of life, and many would say they are also ugly. However, we don't think about them. We look at our infrastructure and don't even see it. The benefit it brings is taken for granted, as is its existence in our landscape. How can installing wind turbines and solar panels, which harvest natural resources and are capable of being de-installed at the end of a long and productive working life, be considered more ugly or less useful than Vermont's several hundred gas stations? Even towns in the heart of the Green Mountains have power lines, telephone lines, heating oil tanks and gas stations – and each one of the latter holds hundreds of gallons of toxic fossil fuel transported halfway around the world to rest in an underground tank.

The future will be different than the past, and renewable energy installations will be more visible. We will see and live with solar on our roofs and in our yards, wind turbines near our communities and wind farms on our mountains. This is a natural transition updating Vermont's working landscape, which will still remain green and beautiful.

David Blittersdorf is the President/CEO of AllEarth Renewables in Williston, VT – a company that specializes in the design, manufacture and installation of the grid-connected AllSun Tracker solar energy system. He is also the founder of NRG Systems in Hinesburg, VT.

David Bittersdorf's **View from the Top** – October 2011

Energy "Target Fixation"

I'm feeling sad today, although I am usually a happy and optimistic person. For many years, I have had a vision for humanity's future in a world with real, physical limits to growth and energy consumption. The problem is that getting there requires a paradigm shift, a major change in how we operate. The status quo has got to go. What has worked for the past few centuries no longer works, now that it has become clear that fossil and nuclear fuels are not sustainable. I occasionally feel that it will be impossible for our society to embrace change at the rate required to make this transition, but nevertheless I feel the need to keep on talking about it.

So, at the risk of sounding like a street-corner prophet of the apocalypse, I'm here to say: The end is near. Or at least the end of the status quo as we've come to know it. The era of incredibly cheap fossil fuels is over. They are expensive to mine and move, not only financially but environmentally. For hundreds of years – since the start of the coal-powered Industrial Revolution in the 1790s – these fuels have enabled us to create the most complex, energy intensive society the world has ever experienced. But all of this is drawing to a close, or a big change. I know it in my gut, and I'm sure you feel it too – the future of energy is the defining issue of our age. Meanwhile, our leaders are mired in aging systems, floundering as they try to prop up our economic system by depleting our finite energy sources with imaginary money.

Our economic and financial system was conceived and runs on the assumption of infinite resources, but we are at a decision point regarding energy. Our #1 fossil fuel in usage and in practical value is oil. Over 40% of the world's energy usage is of extracted oil. Vermont's use of oil counts for more than 50% of our total energy consumption. Rather than thinking of how to reduce energy consumption and come up with other ways of living and working, it has been easier the past decade and more to go along with a flawed idea of how to fix our finances, and spend more on meaningless stuff as a way to grow our way out of our economic problems. But all of this is just happy hour, the last round of a carefree party before we hit the unyielding brick wall of resource limits.

It hurts when you run into an unyielding object at full speed. I discovered this when I was learning to hang glide on the sand dunes of Kitty Hawk, North Carolina. I took off and kept looking at a parked hang glider to my left in the landing zone with the intent to avoid it. I kept looking at that glider. Looking. Looking. I hoped to land away from it. But guess what? I ended up crash-landing right into it. The lesson in this case was to avoid mistakenly fixing on the wrong destination, because you always will go – or fly – right where you are looking. As a society, we're experiencing "target fixation" on a grand scale. We are looking at – and fixating on – fossil and nuclear energy as the only viable energy sources. We are not scanning the horizon and seeing the big picture on energy.

The conventional wisdom in energy is the status quo – fossil fuels and nuclear power – and we keep trying to make these sources work because it's all we see. We need to look away from what we're familiar with, scan for other seriously viable possibilities and then move towards them, innovating along the way. In my opinion, our situation calls for serious and immediate efforts toward energy conservation, energy efficiency and renewables. It will not always be comfortable. By insisting on this need for serious change and trying to implement it, I and many others are upsetting a lot of people. Opponents to wind and solar, and supporters of oil, gas, coal and nuclear are mad as hell. But that's OK. We are almost at the tipping point of dramatic change. I have been saddened by the persistence of the status quo, but I am also heartened by the collective will of everyone who is becoming educated about energy issues and becoming connected with a movement to change the way our world runs, and the type of energy it uses (8).

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David Blittersdorf's **View from the Top** – May 2011

A Light at the End of the Tunnel

Like much about the world today, our contemporary energy picture looks a bit dark. Over the past century, humanity has managed to make serious headway toward destroying the planet we call home; collectively, we seem to be unable to look at our actions and see the terrible damage we are inflicting on ourselves and our planet – or if we do see it, to act decisively toward a meaningful solution.

The recent nuclear disaster in Japan has now been ranked equal with that of Chernobyl. Many experts expect its true extent will continue to be revealed in future years; I grieve for the damage inflicted, but personally hope that it will become the trigger point that stops the worldwide expansion of nuclear power. Elsewhere, powerful forces are at work to continue the development of more nuclear power plants, including making the argument that nuclear is the only viable option to reduce atmospheric carbon and combat global climate change. But nuclear energy is fraught with major safety and waste disposal problems – problems we would continue to saddle on future generations. We need to shift to true renewables now as an energy source, and learn to live in a world where we make do with the energy they can provide.

Here in Vermont, we stand poised to fight for our state's rights and shut down Vermont Yankee. Its parent company Entergy is a powerful, untrustworthy corporation with the full backing of the U.S. nuclear industry, and it is ready to spend tens of millions on a legal battle suing the state of Vermont to keep Vermont Yankee running for 20 more years. Vermont Yankee is the same age and design as the Fukushima #1 plant in Japan. It too has tons of highly radioactive spent fuel rods stored in pools on top of its reactor. Just like the design of the Japanese facility, no thick concrete containment dome covers Vermont Yankee's reactor or its spent fuel rods.

Vermont Attorney General William Sarrull and Governor Peter Shumlin are leading this important effort to stop Entergy's halying and illegal behavior, as the company tries to back out of an agreement it signed to abide by the decision of the state legislature on whether it could extend operations past 2012. This court case is being watched closely by legal scholars and industry leaders across the U.S.A. and the world; I believe it is an important and critical effort to stop the "renaissance" of nuclear power. Civilian nuclear power plants are the number one source of material to build nuclear bombs. Let's review the roster of countries that are nuclear powers: In addition to the United States, that list includes India, Pakistan, the United Kingdom, France, China, Russia and North Korea. All of these nations produced the necessary materials for their nuclear arsenals by building and operating "peaceful" electricity-producing nuclear power plants – plants originally supported by the United States government starting with President Eisenhower via the 1950s "Atoms for Peace" program. Iran's nuclear

ambitions were supported by the U.S. in the 1970s, before the Shah of Iran was deposed. I believe geopolitics are too unstable an arena in which to be dabbling with a technology that could annihilate humanity. There is no place in our world for such a dangerous and toxic method of generating electricity.

Vermont has the ability to lead in this area, and it is our destiny to do so, to show the U.S. and the world there is a better way. A humane way, one by which we survive and prosper by quickly switching to renewable energy and decreasing our energy usage through conservation and efficiency. Vermont can do this. We are a small state, with vibrant communities that thrive at the local level, and community members who are seriously interested in creating local, reliable and safe alternatives to our current system. We have a progressive government: a new governor and a Democratic legislature that wants to lead the state (and nation) in a new direction. We must use all the tools and intelligence we have to send the nuclear power industry's bullies into retirement, and beyond that, we must prepare for an energy future where our main sources of power are the wind, the sun, running water and the earth's own natural geothermal heat.

Chief Seattle of the Squamish gave a speech in 1854 articulating the sentiment that we do not inherit the earth from our ancestors - we borrow it from our children. I would like to believe that we will find a way forward toward an energy future that brings us out of our dark days of dependence on fossil fuels. I can see a light at the end of the world's energy-issues tunnel, but I am not yet confident of its nature. For the sake of our children's children, we need to insure that this light is not the sickly irradiated glow of nuclear waste, nor the blindingly bright explosion of an atomic bomb, but rather pure sunlight. To me, the choice is clear as day.

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David Bittersdorf's **View from the Top** – February 2011

We Won the Energy Lottery – What Now?

It's tempting to sugar-coat the idea of energy policy change as optional or gradual – something we can debate at length, that will eventually be resolved by another generation. But the harsh truth is that our energy future will not include cheap, easy or abundant resources, and we need to adapt now to be prepared.

The lives and lifestyles of modern humans are built around the one-time energy lottery winnings of fossil and nuclear fuels. These fuels, including uranium, are physically extracted from the earth, transported, and burned in engines, furnaces or reactors. Collectively, these fuels are the result of millions and millions of years of solar energy that very slowly was transformed underground into coal, oil and natural gas. We are at the peak production points of many fuels and mineral resources, and peak oil has already happened. This means from here on out, prices are going up, and supplies are going down. In the two centuries spanning 1900 to 2100, we will use most of these **finite** energy sources, and when they're gone, they will be gone. Our energy situation is urgent, and requires honest, immediate planning for humanity's long-term future.

Vermont has a choice to make on the direction and speed of change in energy usage and production. We can continue to import and rely on the old finite fuels, or switch to an electric energy economy based on deep efficiency and local renewables. The short-term cost of renewables will ~~always~~ be higher than that of fossil fuels – renewable energy is free and abundant, but the equipment necessary to capture renewable energy from the wind, the sun or flowing water is not. Our current economic system continues to lowball the long-term value of renewables, and it is essential that we correct this miscalculation.

We must ask our legislators in Montpelier to push ahead and take a chance on renewables. Push them beyond their comfort zones. Ask them to support the policy positions of Renewable Energy Vermont, and take serious steps to develop strong efficiency measures and a renewable energy infrastructure in our state. As citizens, we must also educate ourselves about the facts surrounding renewable energy, and take a keen interest in becoming informed about what I believe is the most important issue before our society today. For example, it's important to know that we will never be able to replace all fossil fuels with renewables. Only with massive decreases in energy use by means of conservation and efficiency will we be able to power our modern lives with renewable energy.

Our future depends on renewables and efficiency measures. Our economy cannot survive long-term on finite energy sources, particularly given the rapidly increasing costs of those fuels, due to their depletion. Renewables and efficiency retrofitting create in-state manufacturing, installation and service jobs, and if a renewable energy

infrastructure were to be implemented in a serious way, this green industry would employ far more people than are currently supported by the fossil fuel industry.

It is not easy to face the reality that the easy, comfortable ways of producing and using energy are no longer the right ways. But if we fail to transition away from finite fuels, our society will be in big trouble, and the time to act is now.

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David Bittersdorf's **View from the Top** – November 2010

Statewide Solar Incentives

We need equality in statewide solar incentives. Vermont has 21 different electric utilities, some with coverage areas of a single town. Central Vermont Power Service is the largest overall by geographic area. Green Mountain Power is the only Vermont utility offering a solar production incentive — its SolarGMP program pays customers an additional \$0.06 per kWh generated by net-metered solar. If your normal electric rate is \$0.13 per kWh, GMP will credit you \$0.19 per kWh your solar device generates.

GMP's incentive program is a model for other utilities to follow — a win-win, it benefits the installation owner and helps reduce the utility's need to buy costly (or out-of-state) electricity on the open market during the busy summer months, when power demand peaks. The problem is that the SolarGMP program is only open to GMP customers. Vermont needs a statewide solar energy production incentive program administered by the state's various utilities. Production incentives encourage the proper siting of systems and reward owners who choose reliable systems that produce as promised, which in turn helps the renewable energy market overall.

To date, my company AllEarth Renewables has installed 1 MW of net metering systems in Vermont — 280 of our AllSun Trackers among more than 200 customers. As a direct result of the SolarGMP incentive, 80% of AER's customers are in GMP territory. For the same reason, VERG's new Solar Communities campaign concentrates only on towns within GMP territory — customers there have an extra reason to go solar: GMP customers have an advantage that isn't available to customers of other Vermont utilities.

Some may be concerned that if Vermont utilities adopt standard production incentives for solar, they will raise rates. Any such rate changes would be minimal. Right now, AllEarth Renewables leads the state in installed net-metered solar electric systems; our systems alone count for half of GMP's "10,000 Solar Panels in 1,000 Days" initiative launched in 2008. For GMP ratepayers supporting the SolarGMP 6-cent-per-kWh incentive, this has resulted in a cost of only 14 cents per GMP ratepayer per month, or an extra \$1.68 per year on each GMP ratepayer's bill — less than the cost of one fancy cup of coffee per year. According to a statewide survey conducted for Renewable Energy Vermont in 2006, more than 85% of Vermonters want to see more renewable energy sources in Vermont rather than fossil fuels like oil, coal and gas. I bet Vermont ratepayers are willing to finance the development of in-state renewable energy for such minimal amounts, and I'd argue that planning for our state's future energy security is well worth a few more cents per month.

I encourage Vermonters to contact their legislators and utilities to call for production-based solar incentives for net-metered installations. This tangible economic catalyst would benefit individuals with solar installations, the utilities, and the state's energy future; the cost to ratepayers is small considering what individuals, utilities and the community gain. Ramping up local renewables is essential for the coming post-peak-oil energy economy, when fossil fuel prices will become more volatile and energy costs will increase. We need practical ways of helping Vermont homeowners and businesses to take the step toward solar as soon as possible.

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David Hittersdorf's **View from the Top** – July 2010

"Clean" vs. Renewable Energy

"Clean energy" sounds so sweet, wholesome as Mom & apple pie. Who could be against "clean energy"? No one – I'm not. Truly renewable energy from wind, sun, water and the earth is as clean as it gets, and I've built my life's work around developing and supporting technologies that will allow us to harness these delightfully clean renewables.

But lately the clean energy waters have been muddied, as fossil-fuel and nuclear energy industries have been dumping their dirty laundry into the PR washing machine – or rather, the "spin" cycle of attempting to rebrand their industries as beneficial and helpful. The [American Clean Skies Foundation](#), an organization with direct ties to the natural gas industry, advocates that the U.S. increase consumption of that particular fossil fuel by developing it for transportation and building more natural gas power plants. The [Clean and Safe Energy Coalition](#) is a pro-nuke organization that tries to reframe the industry that brought us Three Mile Island and Chernobyl as safe, cheap, reliable – and above all, clean.

Why should we care why coal, nuclear, and the whole fossil-fuel industry are framing themselves as "clean"? Because they are dirty and bad for our world. Nuclear waste has a minimum shelf life of a thousand years, and we have no real plan to deal with it safely – the more nuclear power plants we have on our planet, the more waste we will have here, too. If storage canisters leak, the damage will be permanent. Anti-nuclear-proliferation and counterterrorism experts call explosives laced with radioactive nuclear waste "dirty bombs" because the radioactivity, once in the environment, is nearly impossible to clean up. Natural gas and coal are both carbon-based fossil fuels, and we get energy by burning them. Every aspect of their production and consumption is dirty – mining, storing, transporting, processing and combustion – but primarily they are dirty because consuming them releases carbon into the atmosphere.

There are not and will never be such things as "clean coal," "clean nuclear," "clean oil," and "clean natural gas." Saying something doesn't make it so, and we should not be tempted to put full-throttle development of true renewables on hold just because some existing technologies are marginally cleaner than the worst existing technologies. Many of the big multinational energy companies that have relied upon fossil fuels for years to drive profits are finally starting to understand that the future is wind, solar and other renewables, but these energy behemoths must sustain their current dirty business units by selling us the "clean energy" story.

Ultimately, the dirty energy industries wish to distract us from their role in the biggest social, environmental, political and economic problem our world now faces. Our unsustainable, fossil-fuel-based world has its accelerator foot pressed pedal to the metal,

and we need a way of easing up and applying the brakes. It is important to recognize when consumers are being misled with a "clean energy" label that is false in every major respect. Otherwise we get lulled into thinking that all is well, and that we do not have to worry about carbon, nuclear waste and limited supplies of energy.

I have hope, but we are engaged in a race against time to transition to a new economy of conservation, efficiency and renewable energy. Recurring energy and economic crisis will become the new norm, as we sort out what works and what does not. In this time of rapid change, we must be smart enough to act for the future as we break with what worked in the past, and learn to tell "clean" from dirty.

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David Blittersdorf's **View from the Top** – May 2010

Too Much Carbon

As individuals and as members of a modern industrial society, we must face up to a few simple facts. Energy shortage is driven by population growth, and the demand for fossil and nuclear fuels will shortly exceed the finite supply of those resources. If we don't acknowledge this, and act on that knowledge, our modern civilization as we know it will fail and collapse. Civilizations collapse when they exceed the carrying capacity of their environments. Jared Diamond's excellent book *Collapse: How Societies Choose to Fail or Succeed* goes into some detail showing how and when past cultures have fallen into decline. We are now living in the biggest experiment humans have ever conducted. Collapse is a 100% certainty unless we get beyond denial of our energy problems.

About 150 years ago, humanity won the biggest lottery our species had ever imagined: We tapped into fossil fuels, and our energy worries seemed to be over. First we mined coal, then oil, then natural gas, and the energy provided by these fuels enabled us to build the modern world as we know it. Now, almost 90% of the energy used worldwide comes from fossil fuels. However, we now know that there is a fixed amount of fossil fuels on our little earth. Coal is the most abundant, but has the highest carbon pollution and is the most destructive to our life support system. Peak oil production worldwide just happened a few years ago. Oil is the #1 fossil fuel (40% of world energy) and it is now in depletion – meaning that from here on out, there will be less and less available each year.

Just like lottery winners who end up bankrupt, we are using fossil fuels like a lottery winner spends cash: "Easy come, easy go." By 2050, most of the easily mined fossil fuel resources will be used up. In the question of energy consumption, we must wean ourselves from a diet of too much carbon – and transition to living on our weekly paychecks instead of the lottery winnings. This is a much smaller amount than we are used to. We need to reduce energy consumption 80% by 2050. Massive conservation, efficiency and a huge shift to renewable energy are required to help us do this. (Coincidentally, CO₂ needs to be reduced by 80% by the same deadline to reduce global warming, and fossil fuels produce all that carbon, so reducing energy consumption is also key for the environment.) Fossil fuel use must and will be reduced to 20% of present usage. Both large and small scale renewable energy resources like wind and solar are key ingredients in this equation. If we embrace this change, we will survive and be better off in a less energy intensive & more renewable-powered world. This is a requirement to survive – not an option.

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From:

Sent: Monday, April 08, 2013 6:02 PM

Subject: Financial Times: Germany admits it feels the RE pain in the wallet; election coming up; Merkel at risk

For nearly 20 years, any company interested in green energy has known exactly where the global epicentre of renewable power is located:

Europe.

But, as the third anniversary of the Greek bailout nears, a shift is afoot on the continent that gave the world its biggest carbon market, its most effective green electricity subsidies, and its first offshore wind farms. It is too early to call it a U-turn, let alone a permanent reversal.

But jitters are clearly growing about the cost of tackling climate change and building a green electricity infrastructure in the world's oldest industrial powers.

Early warning signs emerged late last year, when the EU gave in to an outcry from the US, China and others over its attempt to charge international airlines for their carbon pollution – delaying the EU's boldest move yet to extend its climate change rules to the rest of the world.

At around the same time, a €1.5bn scheme to help fund companies trying to build carbon capturing equipment collapsed, after governments wobbled over providing matching funds for projects.

But all this pales compared with the bombshell that emerged from Germany this year.

The EU's biggest economy has long been a champion of renewable power, a haven investors could depend on.

This made it a green leader well before it decided to phase out nuclear power after the 2011 Fukushima disaster in Japan, and drive its renewable generation up even further.

Though it is not very sunny nor even that windy, Germany now accounts for nearly half of Europe's solar power capacity and 30 per cent of its wind power.

Renewable power – mostly wind, solar and biomass – made up a formidable 22 per cent of Germany's electricity generation last year.

But, with the levy added to German power bills to help pay for this growth nearly doubling to €0.053 per kWh – and an election looming in September – environment minister Peter Altmaier has unveiled plans to freeze renewable subsidies for two years. He has also said future rises would be limited to 2.5 per cent a year after that.

Other proposals to reduce costs include a requirement for renewable generators to sell their electricity to buyers under long-term power purchasing agreements – a far less attractive option than the current system of selling power to the grid and getting paid a set tariff.

These new measures are supposed to take effect from August, but face so much political opposition that nothing may happen before the election.

Still, the consequences have been swift. One big municipal utility with substantial renewable investments, Munich's Stadtwerke München, has already suspended new clean power projects.

It is unlikely to be the last.

“Investors are scared,” Reed Smith's Stefan Schmitz told a recent Mergermarket conference of renewable

energy financiers in London. “A number of very big investors have already decided to pull out of the German market because of the uncertainty.”

This is not the first sign of a retreat on green subsidies in the EU.

Cash-strapped countries such as Spain, Italy and Portugal have already wound back their incentives.

That is not the end of it, either. Next week, Berlin will be at the centre of an equally significant test of EU green enthusiasm. Sometime around April 16, the European Parliament is due to vote on whether to prop up the EU’s problematic emissions trading system.

Prices have crashed to record lows over the past year as the bloc’s economic woes exacerbate one of the eight-year-old market’s biggest flaws: a glut of carbon allowances issued when it was launched.

An allowance to emit one tonne of carbon dioxide was worth nearly €30 five years ago. Now it costs about €4. Brussels has a stopgap plan to tighten it by temporarily withdrawing 900m allowances, but a non-binding vote on it last month only passed by a feeble three votes.

If the final vote next week fails, it will be a setback seized upon by carbon pricing opponents around the world. And one large reason the rescue plan is flailing is it has not been wholeheartedly backed by Germany. Ministers are divided and chancellor Angela Merkel has so far failed to decide the matter. This time a year ago, the idea that Europe’s flagship policy on climate change could be struggling because of German uncertainty would have seemed bizarre. Things are different in 2013.

Pilita Clark is the FT’s Environment Correspondent.



From: Leah Marsters

Sent: Monday, April 08, 2013 6:45 PM

Subject: Updated VPIRG EGSC response.docx

VPIRG Recommendations in Response to the EGSPC 3rd Draft Packaging of the Recommendations

The following comments are on behalf of the Vermont Public Interest Research Group (VPIRG) in response to the Energy Generation Siting Commissions 3rd draft packaging of the recommendations. VPIRG wants to thank the Commission for their time and hard work on such an important issue.

Founded in 1972, VPIRG is the largest nonprofit consumer and environmental advocacy organization in Vermont, with over 20,000 members and supporters. For nearly 40 years, VPIRG has brought the voice of average Vermont citizens to public policy debates concerning the environment, health care, consumer protection and democracy.

Overall, VPIRG believes that the direction of these recommendations is quite positive, and that many of the policy ideas have a lot of potential to improve our current process. However, within the 5 categories there are several specific points we have questions or concerns about. We have broadly outlined both the aspects we support and those we have concerns about below.

Increase Emphasis on Planning—

While moving towards meaningful planning is important, VPIRG has some concerns with the level of authority Regional Planning Commissions and Municipalities may have over the decision making of siting energy projects under these recommendations. We believe that both bodies should be involved in the planning process; however it must be ensured that there is no explicit or implicit local veto on a source of energy, or a specific project within a region or town. The concept of the public good must not be undermined by local planning.

The Public Service Departments roadmap for the Regional Planning Commissions planning process should include a clear and thorough review process to ensure that plans are in line with the State's Comprehensive Energy Plan renewable energy goals. Climate change being the most critical environmental issue of our time, the planning process should also give additional weight to technologies and projects based on their capacity to reduce climate emissions.

Further, regional and local input in the siting process should be considered fairly and on its merits. If we're serious about producing renewable energy, prioritization must be given to areas that have the greatest potential for renewable energy production. Any mapping done during the planning process should not dictate red or green light areas for where development may, or may not occur. The process for identifying the best locations for energy projects differs by technology, and the planning process and its outcomes should reflect that. We must ensure that we are not unintentionally closing the door on certain forms of renewable energy.

Simplify Tier System—

VPIRG believes in the importance of developing a comprehensive portfolio of renewable energy sources using a mix of technologies of all sizes. We believe that both small-scale renewable energy projects and utility-scale renewable energy projects are important players in Vermont's energy future.

We strongly support the Commission's recommendations around Tiers 1 and 2 that will make it easier and faster to build small-scale projects in communities around the state. However, as detailed in the other sections of these comments, we are concerned about the increased number of regulatory hurdles recommended for utility-scale projects, especially given that Vermont already has one of the toughest permitting processes in the Northeast.

Increase Opportunity for Public Participation—

Public participation is, and should be, an integral part of the siting process. VPIRG supports the strong emphasis on public involvement. However, as previously mentioned, we believe that it is important that the increased role of towns and communities does not lead to a local veto for any reason, given that the benefits of these projects extend far beyond the surrounding and host towns.

Improve the Siting Process for Increased Transparency and Efficiency—

VPIRG supports the direction of these recommendations, and does not have any comments at this time.

Ensure Adequate Environmental – and Other – Protection—

Maintaining high levels of environmental protection in the siting process is crucial. As mentioned before, VPIRG believes that with climate change being the most significant environmental issue we face today, a project's capacity to reduce climate emissions should be incorporated in determining the overall environmental impact.

VPIRG also appreciates, and supports the Commission's recommendation that peer reviewed studies be used in the development of any additional criteria—policy changes should be grounded in fact, and data.

Letter to Energy Generation Siting Commission regarding draft #3:

My name is Dr Teddi Lovko, I am an Internal Medicine M.D. currently practicing in Rutland, Vermont. I have read extensively on the effects of noise and health and in particular with how wind turbine noise affects people. I testified as an expert witness on this topic to the Public Service Board in the Lowell application.

It is very clear in the medical and scientific literature that noise is a public health issue that affects people's health and quality of life. This is settled science and no longer questioned by people knowledgeable in the field. Our current health department has also acknowledged this fact with regards to wind turbines. I would refer you to the WHO nighttime noise guideline paper of 2009 which cites hundreds of papers on the health effects of noise (unfortunately it did not cover health and noise issues regarding wind turbines and therefore not all of its recommendations apply equally to wind turbine noise).

Wind turbines create noise and have as expected created health problems for many people who have been exposed to this noise. Studies on wind turbines consistently show annoyance, stress, irritation, sleep disturbance and decreased quality of life. There is further evidence of increased prescription drug use, depression, anxiety and a multitude of other physical complaints. Thus as with other noise sources it is clear that wind turbine noise creates health problems. There is nothing unexpected or surprising about this. It is largely to be expected. There may be other aspects of wind turbines in addition to audible noise that may be exacerbating these health problems. What has perhaps been somewhat unexpected is that these adverse effects have occurred at noise levels somewhat lower than would be typical from most other noise sources. However once one begins to look at this issue more closely there are many factors which can account for these differences.

THE NOISE CHARACTERISTICS OF INDUSTRIAL WIND TURBINES AND HOW THEY ARE CURRENTLY BEING SITED MAKES ADVERSE HEALTH EFFECTS LIKELY AND EXPECTED.

(Some reasons why wind turbines are adversely affecting health at levels that might be ok for other noise sources).

- 1-Amplitude modulation. (The noise from wind turbines has been shown in both field and lab studies to be more noticeable and annoying than other sources of noise at the same level).
- 2-Large component of low frequency noise (low frequency noise associated with more problems regardless of source and bigger turbines create more low frequency noise and therefore are even more likely to exacerbate this issue).
- 3-Can produce noise for extended periods of time
- 4-Unpredictable starting and stopping of noise
- 5-May be even louder and more intrusive at night (where as most human noise sources are quieter at night).
- 6-"Factors that are consistently associated with negative community response are changes in noise exposure (ie., the introduction of new noise, or a noticeable change in noise loudness or quality), and increases in human-generated noise."-Oregon HIA. Industrial wind turbines create all of these issues making them more likely to create problems.
- 7- In rural settings with quiet background noise of ~25dbA, a 10dba increase would be perceived as twice as loud as ambient noise and a 20dba increase would be perceived as 4 times as loud as ambient noise. Thus residents in Vermont under the current noise standard of 45dBa will be hearing noise at ~4 times louder than the levels they had experienced prior and as shown above this noise is not only loud but has many other qualities that cause it to create annoyance and negatively impact quality of life.
- 7-Lack of control of noise source
- 8-Intrusiveness of noise into home

9-Studies on wind turbines have shown greater annoyance when placed in rocky and hill terrain.

10-Possible effects of infrasound???

11-Other issues???

Recommendation: These issues need to be taken into account when siting and noise standards are formulated. They currently are not and have led to facilities being 'compliant' with a noise standard that does not prevent health issues. Thus compliance has become uncoupled from its goal of preventing adverse health effects. The bottom line is wind turbines are being placed too close to people and the standards are not protective of public health. Vermont needs to create standards that take into account the unique aspects of turbine noise and placement in order to have standards that are truly protective of public health.

CURRENT NOISE STANDARD IN VERMONT IS NOT PROTECTIVE OF PUBLIC HEALTH

There are no studies or data on wind turbine noise to show or support that the current noise standard in Vermont (45dBa averaged over an hour) is protective of public health. There are numerous studies on wind turbines showing harm at these noise levels (see above for sample of some of the reasons this may be the case). The data cited by Dr Chen for the 45dBa standard is **NOT** based on noise from wind turbines and cannot be justified as being source for current regulations. Unfortunately, we now are seeing adverse health effects and noise issues in Vermont because of these poor standards.

1-Wind turbine studies consistently show problems (most commonly annoyance, stress and sleep disruption) increasing at levels above 35dBa.

2-"Typically, an increase in long-term noise levels of this magnitude (over 20dba) **is expected** to cause widespread annoyance, complaints and possibly threats of legal action."-Oregon HIA-emphasis mine. "The EPA and WHO suggest that long-term increases of 5dba or greater may result in community noise impacts. Other guidelines suggest that an increase of 5-10dba may be perceived as intrusive, and increase of 10-15dba may be noticeable and increases over 15dba may be objectionable or intolerable."-Oregon HIA.

The current noise standard employed by the PSB and endorsed by the VT Dept of Health is roughly 20dBa over ambient noise levels. Why is a noise standard that is expected to create problems acceptable?

4-See effects on sleep starting at 30-40dba

5-there are no published studies showing a lack of health problems or supporting current Vermont standards

Recommendations:

1-Need to improve sound standards to be truly protective of public health. This will likely be at around 35dBa or less depending on how measured (ex as Lmax, L 10 or other for example).

2-Any new standards need to be justified by the literature. Explanation should explain why one standard over another is chosen as there is still uncertainty at what levels problems will occur (but as mentioned it is pretty clear from data and real world experience including here in Vermont that current standard is not protective). Vermont says it wants to set example and be a leader in moving towards renewable energy. I suggest that Vermont also lead the way in doing so responsibly and not sacrificing the health of its citizens in doing so.

3-There should be time for public and professional comment on this issue before it is finalized

4-While your draft pays lip service to garnering public trust, there is little in the current draft (#3) that actually works toward that goal. This would be a real and meaningful way to gain some of that trust, develop transparency, and keep public informed.

CURRENT DEFINITION OF HEALTH EMPLOYED BY THE VERMONT DEPARTMENT OF HEALTH IS NOT PROTECTIVE OF PUBLIC HEALTH.

It is not clear what definition of health the VDH of health is using and what they consider a 'real' health

problem worthy of consideration or not. It is also not clear how they have come to their conclusions.

WHO definition of health: "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

Definition of Annoyance: " 'Annoyance' has been the term used to describe the community's collective feelings about noise ever since the early noise surveys in the 1950s and 1960s, although some have suggested that this term tends to minimize the impact. While 'aversion' or 'distress' might be more appropriate descriptors, their use would make comparisons to previous research difficult. It should be clear, however, that annoyance can connote more than slight irritation; it can mean a significant degradation in the quality of life. This represents a degradation of health in accordance with the WHO's definition of health."-Oregon HIA

-Dr Chen has seemed to dismiss annoyance as a health issue without supporting this stance. What should doctors who are seeing people suffering from noise tell their patients?

Recommendations:

- 1-Have VDH spell out explicitly what definition of health they are operating under.
- 2-Have them spell out exactly what issues are worthy of consideration from public health standpoint and which are not-and support their conclusions with the published literature. Current practices of saying annoyance or other problems are not physical or worthy of consideration is no way for the government to gain the public's trust and could be considered an abdication by the VDH of its duties.
- 3-This information should be made clear to the public

OTHER AREAS OF CONCERN:

1-Having PSB choose experts for issues is likely not going to alleviate concerns from those concerned about proposed projects as the PSB is under mandate to fill renewable energy goals. This may lead to perceived or actual conflicts of interest.

Recommendation:

Need to find other means of gaining expert testimony other than by command of PSB.

2-VDH recommends having the corporations deal with noise complaints. This will not build public trust as clearly the wind turbine industry has conflicts of interest on this issue.

Recommendation:

Need to have independent party or member of VDH handle noise issues. There should also be a uniform way to file complaints across all facilities and these issues should be monitored by the VDH or independent body. This will give people access to impartial party if they have problems and will allow for review of noise complaints across sites and help develop a data base to inform future health and siting issues.

3-"Long term stress from real or perceived environmental threats can increase risks for cardiovascular disease, endocrine disorders, reduced immune function, mental illness, and other negative health effects. Community conflict over controversial siting or environmental decisions may contribute to or exacerbate this stress, and thus increase risks of these negative health effects. Rural communities may be disproportionately impacted by community-level conflicts."-Oregon HIA.

Your current recommendations seem to exacerbate this issue by effectively telling communities that they do not have any meaningful say in the process as their (the town's) wishes can be overridden at any time. Even Gov Shumlin felt these facilities (industrial wind turbines) should not be placed where they are not wanted.

Recommendation:

Need to allow towns more power in the decision making process either for or against industrial wind projects as these projects are different from most other renewable energy projects in their large footprint, the community strife they can create, the way they can change the very nature of an area, and the adverse health effects they can impose on people on their property and within their homes.

Thank you for your time and consideration. I look forward to seeing your final draft and hope that you will make changes that substantively change the siting process for the better.

*References can be provided for all statements provided in this paper upon request. Also this is not intended to be complete assessment of all reported health effects such as on infra-sound, flicker etc.

Sincerely,
Teddi Lovko MD



From: Keith Dewey
Sent: Tuesday, April 09, 2013 1:48 AM

Subject: First Comments on EGSPC 3rd Draft 4/3/13 Packaging of the Recommendations

Dear Commissioners,

Please consider my attached review comments relative to your 3rd Draft Packaging of the EGSPC Recommendations.

The first attached file is a copy of Renewable Energy Vermont's review comments, which they have likely submitted under their own cover. I am FULL AGREEMENT with every comment in this REV comment letter.

In addition, I have attached a combined energy and environmental comparison chart (see "true cost chart.pdf") which I developed a few years ago showing most all of our energy choice options and their true societal costs. On this chart "green" is good and "red" is bad. It is quite graphically clear that renewables are far and away a better choice than traditional fuels (fossil and nuclear) in terms of both financial and environmental costs. The point is, why should we therefore put renewable generation development in Vermont through approval requirements beyond those required for the even more costly and environmentally damaging electricity generation sources?

Lastly, I have attached my comments in the document entitled "Which Future Energy Source Makes the Most Sense?" in an attempt to explain that large scale wind, and then solar, power are our best options in terms of cost/MW-Hr produced and total environmental impact! This points to the Recommendations idea that Tier 4 projects are the most environmentally impacting per MW-Hr and therefore requires the closest and longest PSB evaluation is, in fact, just the reverse!

After witnessing the absurd two-hour display of NIMBY nonsense and the expounding of half-truths about wind power at the Rutland Public Hearing last Wednesday, I am even more convinced that our global, national and statewide combined energy and environmental goals cannot be left to be administered by largely uninformed citizens who make up our Regional Planning and Town Planning Commissions. There is much evidence that anti-wind NIMBY's have block-voted in other NIMBY's in several potential Vermont project host towns in recent years, who then appoint other NIMBY's to be local Regional Planning Commission and Town Planning Board representatives and members in an effort to obstruct the wind projects. Giving these governmental bodies more leverage is a mistake in terms of the long-range public good of Vermonters and all living species... even those on the ridgelines. There is only a handful of us in Vermont who have even done the math as to how much clean, green electricity we will need to convert our transportation, industrial, commercial and residential sectors in order to halt our contribution to atmospheric CO2 and how fast we need to do it. I hate to say it, but these generation and siting decisions, in the context of their global importance, are far beyond any Regional Planning Commission or local Planning Board member I have ever met and should be made at the PSB level or higher, possibly even tied to national and international climate change and energy objectives.

As suggested after the Public Hearing by one of you, I will be submitting additional comments by the suggested deadline of Tuesday.

Sincerely,

Keith Dewey





April 8, 2013

To: Energy Generation Siting Policy Commission

Re: Draft Packaging of Recommendations dated April 3, 2013

Dear Commissioners,

Renewable Energy Vermont (REV) provides these comments for your review and consideration, and thanks you for the diligence, thoughtfulness and time that the Commission has volunteered throughout this process. REV represents more than three hundred businesses involved in all sizes and technologies of renewable generation projects – our comments are a compilation of the thoughts and experiences of numerous small and large-scale developers, including utilities.

Our comments are developed along the following framework:

1. The current process is fair, deliberate and allows significant debate and public input – although components of the process can and should be improved (e.g. transparency, clearer deadlines, etc.).
2. If the process is fair, what is it exactly that the Commission is being asked to achieve besides comparing different permitting approaches? If the “unspoken” goal is to lessen controversy regarding projects, this goal may not be achievable regardless of improvements in process – as it relates more to the role of the “common good”, and how different members of the public weigh benefits and costs to various actions.
3. If the recommendations proposed by the Commission move forward, REV politely requests additional changes regarding: tiered structure, potential funding categories, the need for more public input when future decision are made, the need for a “plan-do-check-act” process, etc.
4. Areas of support.

1. The current process IS fair, deliberate and allows significant debate and public input.

REV continues to uphold the fact that the current Section 248 process is complete, thorough, and allows for considerable public input – although stakeholders may not always be satisfied with the final determination made by the PSB. However, REV does agree that the process is costly, lengthy and not transparent enough.

There have been numerous comments made that the current process does not require enough “advance” notice and public outreach. Generally, REV does not agree with this viewpoint. For example, Green Mountain Power (GMP) first met with the Lowell Select Board 16 months prior to submitting a Section 248 application. In the year prior to submitting an application, GMP conducted the following outreach:

- Informational website www.kingdomcommunitywind.com
- 18 local meetings reaching ~200 people
- Presentations/discussions with Select Boards of Lowell, Irasburg, Craftsbury, Westfield, Albany, Jay and Eden. Offered to meet with Montgomery, Troy and Newport
- Presentation/discussion with Northeastern Vermont Economic Development Association
- Presentation/discussion with Lamoille County Regional Planning Commission
- Appearances on several regional radio talk shows
- Meetings with local editorial boards (Caledonian Record, Newport Daily Express and Barton Chronicle)
- Nov 5, 2009 Lowell community information meeting sponsored by GMP/VEC
- Two GMP-sponsored bus trips to operating wind farm in Lempster, NH, attended by more than 100 people
- On February 18, 2010, concerned citizens sponsored a community forum, which was attended by GMP
- On February 25, 2010, the Lowell Select Board sponsored a community meeting
- January – February 2010, VEC/GMP door-to-door outreach to Lowell residents
- March 2, 2010 Lowell town vote. 78% of registered voters participated, 342 in favor of the project, 114 against

Even with the above-list of public outreach prior to filing a Certificate of Public Good, individuals who did not wish to see the Lowell Wind project built have stated that the process was not “open” enough or allowed for enough public outreach.

Similarly, the Seneca Mountain Wind project, which after a year has still not received a determination regarding the construction of temporary meteorological towers, has completed the following public outreach:

- 5/10/12 – BBQ - Hawk Rock Cabin #1
- 5/23/12 – Newark Open House – Newark Street School Gym
- 5/24/12 – Brighton Open House – Brighton Town Hall Gym
- 5/29/12 – BBQ – Jill & Mike Mathers
- 6/19/12 – BBQ – Walker Mountain Camp Site – Newark
- 6/20/12 – Sheffield Wind Farm Project Tour
- 7/9/12 – Brighton Fire Department Presentation – Brighton Fire Department
- 8/2/12 – Vermont Fish and Wildlife Conservation Group Presentation –American Legion Hall, Brighton
- 10/3/12 – Wind Energy Panel Discussion - Brighton Town Hall Gym
- 11/3/12 – Newark Supporters Dinner – Burke Mountain Ski Area
- 11/14/12 – Brighton Supporters Dinner - American Legion Hall, Brighton
- **Note:** This list of events does not include any local town board meetings or regulatory meetings

From REV’s perspective, increasing the number of days of notification prior to filing a Section 248 permit will not improve public notification or outreach.

The issue has not been a lack of public notice, or public outreach, but rather a larger question of: what does the State do if a project is in the interest of the broader public good, but there are some local residents who do not want to see the project built? Unfortunately, REV suspects the increased advanced notice will only serve to “rally the troops” for or against a project earlier in the discussion stage – thereby likely only further solidifying the “camps” in which people find themselves (in support or against a project) – and will not necessarily improve the dialogue or outcome. The real issue is not the pre-notification period (for, in REV’s experience, most entities wait until the deadline to file comments, regardless of the length of time given to file comments), but rather the identification of clear guidelines regarding “go – no go” areas to build.

Ideally, the next step of this process would be for the Public Service Board to oversee an open, public process whereby relevant state agencies, RPCs, and stakeholders (including developers) participate in reviewing the specific site concerns as associated with technology type and size, to ultimately develop a draft set of guidelines regarding “go- no go” project criteria. This “go – no go”

criteria should be reassessed as new, scientific studies are completed so that the criteria remains relevant.

2. The Role of the Common Good

If there is an “unspoken” goal of lessening controversy regarding projects, this goal may or may not be achievable regardless of improvements in process – as it relates more to the role of the “common good”, and how different members of the public weigh benefits and costs from various actions. This brings the conversation to a more elevated, ethical level whereby there is a balancing act between how we value the common good for the benefit of the majority, compared to the concerns or questions of a few of the minority. As stated in *Issues in Ethics*:

“Commenting on the many economic and social problems that American society now confronts, Newsweek columnist Robert J. Samuelson wrote: “We face a choice between a society where people accept modest sacrifices for a common good or a more contentious society where groups selfishly protect their own benefits.” Newsweek is not the only voice calling for a recognition of and commitment to the “common good.” Daniel Callahan, an expert on bioethics, argues that solving the current crisis in our health care system--rapidly rising costs and dwindling access--requires replacing the current “ethic of individual rights” with an “ethic of the common good”[Appeals to the common good] “urge us to reflect on broad questions concerning the kind of society we want to become and how we are to achieve that society. They also challenge us to view ourselves as members of the same community and, while respecting and valuing the freedom of individuals to pursue their own goals, to recognize and further those goals we share in common.”¹

The question must remain whether we collectively want to see more positive outcomes in the following areas:

(1) climate change,²

¹ *Issues in Ethics* V5, N1 (Spring 1992). <http://www.scu.edu/ethics/practicing/decision/commongood.html>

² Numerous comments have been made regarding the fact that the sale of Renewable Energy Credits (“RECs”) means that Vermont’s renewable energy projects are not actually “renewable”. This is an oversimplification of how RECs work throughout the region, and how energy is utilized across the entire ISO-NE grid. For example, (1) many states allow for entities to pay into an “alternative compliance mechanism”, essentially paying a fee to meet the Renewable Portfolio Standard (RPS) requirements, rather than actually building renewable energy projects or reducing greenhouse gas emissions. (2) Vermont’s renewable projects do reduce the amount of traditional fuels

- (2) employment opportunities in Vermont resulting from construction and monitoring of projects, manufacturing of materials, etc.,
- (3) economic security
- (4) energy security
- (5) keeping dollars in state

And if we do want the above, then which sacrifices are acceptable, and at what levels?

The concerns that have been raised with regards to new, renewable generation projects include, but are not limited to:

- public health impacts
- cumulative impacts to the environment
- immediate aesthetic impacts (and whether/how this does or does not impact property values and tourism)
- other environmental impacts (water quality during and after construction, habitat fragmentation, etc.)

It is REV's opinion that impacts have been weighed and balanced through the Section 248 process.

Public health impacts regarding, specifically, wind projects are actually finding the opposite to be true³:

The findings indicate that negative health information readily available to people living in the vicinity of wind farms has the potential to create symptom expectations, providing a possible pathway for symptoms attributed to operating wind turbines. This may have wide-reaching implications. If symptom expectations are the root cause of symptom reporting, answering calls to increase minimum wind-farm set back distances is likely to do little to assuage health complaints.

required by the region, regardless of the sale of RECs. The issue of RECs, from REV's perspective, is secondary to the issue of how best to permit and process projects. The Legislature could choose to require utilities to retire all RECs in the state, yet it would be unlikely that the concerns from some individuals regarding renewable energy projects in Vermont would be abated. The issue of RECs is a separate issue from energy generation siting procedures and processes, and should be left as an area for further discussion by the State – though all parties should recognize that the impacts to RECs retirement may increase rates.

³ <http://www.desmogblog.com/2013/03/14/research-finds-wind-farm-health-concerns-probably-caused-anti-wind-scare-campaigns>

Cumulative impacts, as expressed in REV's last comment filing, should be viewed at the **macro**, cumulative level. In April of 2007, the Intergovernmental Panel on Climate Change, based on the work of some 2,500 scientists in more than 130 countries identified the following potential impacts resulting from climate change:

- *Sea level could rise between 7 and 23 inches (18 to 59 centimeters) by century's end, the IPCC's February 2007 report projects. Rises of just 4 inches (10 centimeters) could flood many South Seas islands and swamp large parts of Southeast Asia.*
- *Some hundred million people live within 3 feet (1 meter) of mean sea level, and much of the world's population is concentrated in vulnerable coastal cities. In the U.S., Louisiana and Florida are especially at risk.*
- *Glaciers around the world could melt, causing sea levels to rise while creating water shortages in regions dependent on runoff for fresh water.*
- *Strong hurricanes, droughts, heat waves, wildfires, and other natural disasters may become commonplace in many parts of the world. The growth of deserts may also cause food shortages in many places.*
- *More than a million species face extinction from disappearing habitat, changing ecosystems, and acidifying oceans.*
- *The ocean's circulation system, known as the ocean conveyor belt, could be permanently altered, causing a mini-ice age in Western Europe and other rapid changes.*
- *At some point in the future, warming could become uncontrollable by creating a so-called positive feedback effect. Rising temperatures could release additional greenhouse gases by unlocking methane in permafrost and undersea deposits, freeing carbon trapped in sea ice, and causing increased evaporation of water.⁴*

For REV, the “cumulative” impact of having four wind farms whereby 190 acres of impact to generate clean, renewable energy for an estimated number of 46,000 homes, resulting in the conservation of 5,608 acres elsewhere in Vermont (a result of the PSB Section 248 process) is one that the broader public should (and does, based on polling results) be proud of, embrace, and celebrate. Indeed, the

⁴ http://news.nationalgeographic.com/news/2004/12/1206_041206_global_warming_2.html

cumulative impact of having more wind, solar, hydro and bioenergy technologies should always be framed by the broader cumulative impact of climate change.

The role of ***aesthetic impacts***, REV considers in the same light as the cumulative impact, described above. Additionally, what constitutes “aesthetically pleasing” is a subjective experience, with many Vermonters finding the sight of clean renewable projects pleasing, for what these projects represent regarding climate change, while others find it unpleasant. This may explain why it has been impossible thus far to determine property value changes as a result of having a clean energy project viewable within the site of the property available for sale. Similarly, Italy, Denmark and other countries have constructed numerous wind farms – yet one would find it difficult to argue that tourism has been negatively impacted in these countries as a result of new renewable energy generation projects.

Other environmental impacts have been and should continue to be attended to and monitored during pre-, during and post-construction phases to minimize any potential localized impacts, and to encourage ongoing improvements in project development approaches as lessons are learned during the monitoring period.

3. REV suggested changes and rationale for those changes, based on April 3, 2013 draft recommendations

If the current draft recommendations move forward to the Governor and multiple legislative committees, REV politely requests the following changes, or that these be mentioned as areas of ongoing work by the Public Service Board via an open, public process so that all interested parties can participate (in keeping with the spirit of the EGSPC).

- i. *Tiered structure*: REV supports a tiered approach to permitting energy projects. However, REV suggests that the next step to this process be an open docket workshop process, overseen by the PSB, with all interested stakeholders, to assess the appropriate tiered structure. Specifically, the proposed tiered structure would ideally be based on technology and size. There are different concerns regarding total land used, the type of impact to the land, public health questions regarding siting, etc., that

suggest re-assessing the tiered structure so that it fits the type and size of project more appropriately than the currently proposed “MW” size. However, if this does not happen, REV strongly suggests that the second tier move to 5 MW, not 2.2 MW, so that it is in keeping with current ISO-NE triggers for project size to come under ISO-NE review.

- ii. *Potential Funding Criteria:* There is still no total cap to the total expected amount of funds expected from a variety of sources (bill back, franchise, application fee, etc.), from a developer. This places considerable risk to the developer and threatens the potential for obtaining project financing, as there is no final estimated amount of expenditure clarified for the developer. (Recommendations # 4, #9, #21, Annex 3).
- iii. *Ongoing stakeholder/public input:* In keeping with the EGSPC process, REV strongly requests that any future decisions or decision-making processes be open and available to stakeholders and the public for further review and input. This is particularly important when scientific expert opinion may differ regarding project impact and outcome. Examples include recommendations #1, #2, #5), #11 (checklist development), #17, #18, #19, #20, #21.
- iv. *“Plan-Do-Check-Act”:* REV strongly requests that there be a review period as to the net effects of any changes to the permitting process. Have changes that have been implemented resulted in improvements to the process? Have changes resulted in fewer projects moving forward in a slower timeframe? Questions that developers may provide, if the process is open and allows for ongoing improvement, include:
 - a. Recommendation #12: Concurrent filing may not always make sense in all cases and for all types of permits. It may depend upon the complexity of the project, what tier it is in, etc. – there needs to be some discretion available to the Board, the developer and other parties.
 - b. Recommendation #13: What types of consequences will be applied and how will these be defined?
 - c. Recommendation #19: What is the scope of this assessment, and why should it be done on a case-by-case basis?
 - d. Recommendation #21: What pre-construction activities are being referred to and why do they require third party monitoring? In general, this provision is very broad and onerous. Not every aspect of construction at every project should require 3rd party monitoring as

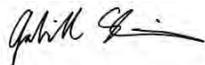
cost and timing can easily “spin out of control”. Rather, there should be a limited set of highly specific issues that may warrant 3rd party monitoring, and there should be more definition to the scope of this recommendation.

- v. *Review opportunities for communities to participate in renewable energy development:* In other countries, renewable energy projects have been supported more broadly by having a portion of the projects owned by communities. To the extent that the Vermont public and Legislature would be willing to fund and finance these projects, this could help to remediate some of the concern with renewable project development. Thus far, however, projects have required significant private capital investment – and until there is political will to support funding and financing community projects, there may be few opportunities for communities to benefit as fully as possible in renewable energy project development.

4. REV continues to strongly support:

Increasing the transparency and efficiency into the PSB process through an on-line system showing project status and requirements, streamlining smaller projects so that the PSB can spend more time assessing the costs and benefits of larger projects, providing clearer deadlines for decisions and notifications, and providing a capped amount of funding to the PSB for the PSB to manage, to allow for an increase in project transparency and efficiency.

Sincerely,



Gabrielle Stebbins

Executive Director

COMPARISON OF ELECTRICAL ENERGY AND ENVIRONMENTAL "TRUE COSTS"

| ELECTRICAL ENERGY AND ENVIRONMENTAL "TRUE COST" COMPONENT | LEGEND: ●●● = PROHIBITIVE COSTS ●● = HIGH COSTS ● = MODERATE COSTS ●●●● = LOW COSTS | | | RENEWABLE ENERGY SOURCES AND NEED REDUCTION | | | | | | | | | | | | | | | | | | | | |
|---|---|------|-------------|---|------------------|-------------------|---------------------------|------------------------------|--------|--------|--------|--------|----------|--------|--------|------------|--------|--------|----------------|--------|--------|---------------------|--------|--------|
| | TRADITIONAL NUCLEAR AND FOSSIL FUEL SOURCES | | | HYDROGEN (from electrolysis) | | | BIOMASS | | | WIND | | | SOLAR PV | | | HYDRO DAMS | | | MARINE / TIDAL | | | CONSERVE/EFFICIENCY | | |
| | NUCLEAR | COAL | NATURAL GAS | FUEL OIL | LP GAS / PROPANE | DIESEL / GASOLINE | HYDROGEN (from base load) | HYDROGEN (from electrolysis) | ENVIRO | ENERGY | ENVIRO | ENERGY | ENVIRO | ENERGY | ENVIRO | ENERGY | ENVIRO | ENERGY | ENVIRO | ENERGY | ENVIRO | ENERGY | ENVIRO | ENERGY |
| SUPPLY FUEL: | | | | | | | ●● | | | | | | | | | | | | | | | | | |
| FUEL COST PER KW-HOUR PRODUCED | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| EXTRACTION / MINING / DELIVERY | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| REFINING / PROCESSING | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| ELECTRIC CONVERSION ENERGY LOSSES | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| FUTURE DEMAND INFLATION | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| GENERATING SYSTEM / PLANT: | | | | | | | | | | | | | | | | | | | | | | | | |
| MANUFACTURING / CONSTRUCTION | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| STAFFING / CONSULTANTS (LONG TERM) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| OPERATION, MAINTENANCE & UPGRADES | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| OPERATIONAL INSURANCE / INSPECTION | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| ACCIDENT / THEFT INSURANCE (BY PLANT/PUBLIC) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| DECOMMISSIONING / TEARDOWN / CLEAN UP | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| FUEL USAGE: | | | | | | | | | | | | | | | | | | | | | | | | |
| AIR POLLUTION (CARBON DIOXIDE) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| AIR POLLUTION (OTHER CHEMICALS / HEAT / VAPOR / RAD) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| WATER POLLUTION (TOXINS / HEAT / EVAPORATION) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| ENVIRONMENTAL ACCIDENT REPAIR | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| FUEL STORAGE | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| REMAINING WASTE DISPOSAL / DELIVERY | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| FUEL & WASTE MONITORING / PROTECTION | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| ENERGY DELIVERY: | | | | | | | | | | | | | | | | | | | | | | | | |
| TRANSMISSION LINES (CENTRAL / DISTRIBUTED PLANTS) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| GRID OPERATION & MAINTENANCE | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| SOCIETAL IMPACTS: | | | | | | | | | | | | | | | | | | | | | | | | |
| GLOBAL ECOSYSTEM DAMAGE * | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| HEALTH (PUBLIC AND EMPLOYEES) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| SAFETY (PUBLIC AND EMPLOYEES / EMOTIONAL) * | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| ETHICS (CIVIL UNREST, MORALITY) * | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| TERRORISM POTENTIAL * | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| GOVERNMENTAL SUBSIDIES | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| POLLUTION TAXES (LIKELY IN NEAR FUTURE) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| ECONOMY (LONG-TERM INFLATIONARY IMPACT) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| JOBS (SHORT & LONG-TERM / CREATIVE / SOCIAL ENERGY) | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |
| AESTHETICS (NOISE, VIEW, ODOR) * | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● | ●● |

ALL FUEL SOURCES WHICH HAVE FIELDS WITH PROHIBITIVE FUTURE COSTS DUE TO UNRESOLVABLE ENVIRONMENTAL ISSUES (THOSE WHITE FIELDS WITH 3 RED DOTS) ARE NOT LONG-TERM 21ST-CENTURY ENERGY / ENVIRONMENTAL OPTIONS.

WHICH FUTURE ENERGY SOURCE MAKES THE MOST SENSE?

04/08/13 rev

With our state budget facing significant challenges and our global ecosystems being increasingly challenged by higher greenhouse gas levels, it is vitally important that we spend our limited first electric grid dollars in a way which best solves our urgent combined clean energy and environmental cleanup needs. This is not to say we will not need to later spend to develop all low-polluting renewable energy systems in order to resolve climate change, but it makes the most sense to initially get as far down the solution path with the least expensive and lowest polluting option to the point where electric grid balance and stability requires us to simultaneously shift our development to the other renewable energy source options as well. It makes common sense to diversify and limit our future clean energy mix to little more than 20 to 30% from any one renewable energy source option. It also makes sense to develop the one that yields the most energy and least environmental impact first.

Let's look at the math for each of our renewable and traditional fuel (fossil and nuclear) energy options using a brief hypothetical look at comparative energy and environmental costs, according to my current understanding using a single large scale 2.5 Megawatt (MW) wind turbine as a comparative benchmark.

In order for the future combined energy and environmental choices to be properly evaluated on an apples-to-apples basis by the Vermont Electric Generation Siting Policy Commission, it must be understood that creating evaluation criteria for the same amount of electric power generation should be less stringent, not more stringent, for generation options which are less expensive in terms of total true societal costs and at the same time have lower overall environmental impacts.

Large Scale Commercial or Community-Owned Wind:

A 2.5 MW large scale wind turbine producing an average of (2.5 MW x 33% capacity =) 0.825 MW-Hr and costs an average of about \$6.0M to build (infrastructure included) and is often projected to last at least 25 years without major component replacement. I would estimate operation and maintenance costs over that 25 year life cycle to be about \$1.0M, including staffing costs. The 33% capacity factor used in this calculation often exceed 35%, but the low, conservative number is used here to illustrate the virtue of large scale wind. The developers required decommissioning reserve fund costs (which would likely never occur due to our growing need for clean/green electricity) might be about \$150,000/turbine. The work would be fast and simple compared to dismantling a traditional fuel (uranium or fossil fuel) plant. The source "fuel" inflation rate would forever be ZERO.

The long-term environmental damage costs after construction completion would be mostly limited only to avian and bat population damages and the embodied energy required within continued O&M (Operation and Maintenance) needs. The initial construction footprint of the average 2.5 MW turbine is typically about 1 acre for the turbine pad area and another 2 to 4 acres for the required service road and infrastructure components, depending on specific site conditions. A significant portion of the roadway and power distribution acres typically already exist since the developers look for those site condition options in order to reduce costs. There are no continuing pollution or carbon costs. The fact that few long-term jobs are provided after project completion is not a negative, but a positive in terms of holding down future electric costs.

Ballpark Estimated 25-year Economic Costs: \$7.00M (hard and soft costs) + \$0 fuel costs

Ballpark Estimated 25-year True Societal Environmental Costs: 3 to 5 disrupted acres, minimal

wildlife damage and system supply pollution, no fuel supply damages

Small Scale Privately or Community-Owned Wind (Net Metered):

An equal amount of power output (0.825 MW-Hr) using small scale (assume 10 KW units) wind turbines would require a massive amount of small turbines, towers and guy wires and an equal amount of politically-charged and approved local permits. Many town plans already restrict tower heights to where it is nearly impossible to place small turbines the recommended 45 feet above the bonnets of trees that often grow to 80 foot high mature heights (125' tower heights are often required for a practical yield from a good wind site). A 10 KW small scale turbine would typically be located in lower wind speed areas than large scale turbines and therefore often have

capacity factors of less than 10%. Given those optimistic figures, it would take $(0.825 \text{ MW-Hr} \times 10 \text{ KW} \times 10\% =)$ 825 10KW wind turbines to equal one 2.5 MW turbine! If the installed cost of a 10 KW wind turbine is about \$40K, with an optimistic estimated \$10K in O&M costs over 25 years, the total cost to produce 0.825 MW-Hr for 25 years would be $(825 \text{ turbines} \times \$50\text{K} =)$ \$41.25M. A 10 KW turbine is a fairly large small wind device. The use of smaller units currently more commonly applied in residential use would yield even comparative higher costs and environmental impacts.

The long-term environmental damage costs after construction completion would be mostly limited only to avian and bat population damages and the embodied energy required within continued O&M needs. It is said that small turbines kill more birds and bats than large turbines due to greater RPM speeds, but I question that logic. Given the required guy wiring and erection area, each turbine would require 1 acre of land, plus occasional service access (Call it, 1/2 acre). That means creating the same power which a single 2.5 MW turbine would require $(825 \times 1.5 \text{ acres} =)$ 1,238 acres of environmental damage versus 3 to 5 acres for the one large turbine.

Ballpark Estimated 25-year Economic Costs: \$41.25M (hard and soft costs) + \$0 fuel costs
Ballpark Estimated 25-year True Societal Environmental Costs: 825 to 1,238 disrupted acres, minimal wildlife damage and system supply pollution, no fuel supply damages

Large Scale Commercial or Community-Owned Photovoltaic Solar:

An equal amount of power output (0.825 MW-Hr) using PV solar (assume 216 Watt panels) would require a massive amount of (assume 40" x 65" fixed panels @ 45 degrees above horizon) panels and a single project permit approval. A typical 216 watt PV solar panel in an ideal skydome condition (seldom achieved) can often yield 3.5 times its panel rating each day. That means a 216 watt panel will yield $((216 \text{ W} \times 3.5) / 24 \text{ hours/day} =)$ 31.5 Watt-Hrs, or .0000315 MW-Hr. In order to match the hourly output of a single 2.5 MW wind turbine, Vermonters would have to install 26,190 solar PV panels (@ 216 W each). If the current installed cost of large scale PV solar (with less expensive per panel rack systems) is assumed to be, optimistically, around \$3.25/Watt, with an estimated \$2K (per 10 KW) in total O&M costs (hired labor included) over 25 years, the total cost to produce 0.825 MW-Hr for 25 years would be $((26,190 \text{ panels} \times 216 \text{ W/panel} \times \$3.25/\text{W}) + (\$2\text{K} \times 825 \text{ KW}/10 \text{ KW}) \text{ O\&M cost} =)$ \$18.55M.

Given the 17.5 degree winter solstice sun angle here in Vermont, the spacing between fixed PV panel rows would require approximately $(46" / \tan 17.5 \text{ deg} =)$ 145.9", or 12.2 feet between PV panel rows. The flat land area required for each PV panel would be $((46" + 145.9") \text{ long} \times 40' \text{ wide} =)$ 7,676 Sq In, or 53.3 SF per panel. To equal the output of a single 2.5 MW turbine with solar panels we would therefore need $(26,190 \text{ panels} \times 53.3 \text{ SF} =)$ 1,395,953 SF, or $(43,560 \text{ SF} = 1 \text{ acre} =)$ 32.1 (assumed flat with 100% open skydome) acres versus the 3 to 5 acre figure for the large turbine. If the surrounding skydome is not 100% open due to tree blockage, assume approximately 5.6 acres would need to be cleared on each side of the solar array would also have to be cleared. Building shadows and other solar obstructions would be less apt to occur in large scale solar array applications because they would be clustered together in planned open areas or on top of large structures with open skydomes. Wildlife damage would be limited to the comparatively small toxic emissions used in manufacturing the solar components and assembly.

Ballpark Estimated 25-year Economic Costs: \$18.55M (hard and soft costs) + \$0 fuel costs
Ballpark Estimated 25-year True Societal Environmental Costs: 32 to 44+ disrupted acres, minimal wildlife damage and system supply pollution, no fuel supply damages

Small Scale Privately or Community-Owned Photovoltaic Solar (Net Metered):

An equal amount of power output (0.825 MW-Hr) using PV solar (assume 216 Watt panels) would require a massive amount of (assume 40" x 65" fixed panels @ 45 degrees above horizon) panels and a huge amount of local permits, again, complete with related local approval hurdles. A typical 216 watt PV solar panel in an ideal skydome condition (seldom achieved) can often yield 3.5 times its panel rating each day. That means a 216 watt panel will yield $((216 \text{ W} \times 3.5) / 24 \text{ hours/day} =)$ 31.5 Watt-Hrs, or .0000315 MW-Hr. In order to match the hourly output of a single 2.5 MW wind turbine, Vermonters would have to install 26,190 solar PV panels (@ 216 W each). If the current installed cost of PV solar is assumed to be, optimistically, around \$4.00/Watt, with an estimated \$2K (per 10 KW) in total O&M costs (hired labor included) over 25 years, the total cost to produce 0.825 MW-Hr for 25 years would be $((26,190 \text{ panels} \times 216 \text{ W/panel} \times \$4.00/\text{W}) + (\$2\text{K} \times 825 \text{ KW}/10 \text{ KW}) \text{ O\&M cost} =)$ \$22.79M.

Given the 17.5 degree winter solstice sun angle here in Vermont, the spacing between fixed PV panel rows would require approximately $(46" / \tan 17.5 \text{ deg}) = 145.9"$, or 12.2 feet between PV panel rows. The flat land area required for each PV panel would be $((46" + 145.9") \text{ long} \times 40' \text{ wide}) = 7,676 \text{ Sq In}$, or 53.3 SF per panel. To equal the output of a single 2.5 MW turbine with solar panels we would therefore need $(26,190 \text{ panels} \times 53.3 \text{ SF}) = 1,395,953 \text{ SF}$, or $(43,560 \text{ SF} = 1 \text{ acre}) = 32.1$ (assumed flat with 100% open skydome) acres. In small scale solar, the likelihood of all 26,190 panels being clustered in one array is tiny, therefore reality would require many, many more skydome clearance acres to be cleared. Building shadows and other solar obstructions would also impair electric production in densely populated areas. A factor of at least 3 should reasonably be applied to the number of required cleared acres with small scale solar versus large scale solar.

Ballpark Estimated 25-year Economic Costs: \$22.79M (hard and soft costs) + \$0 fuel costs
Ballpark Estimated 25-year True Societal Environmental Costs: 96 to 132+ disrupted acres,
minimal wildlife damage and system supply pollution, no fuel supply damages

Large Scale Commercial or Community-Owned Hydro (specifically, Hydro Quebec and the Deerfield-Connecticut River Valley Dams):

I have no knowledge related to the production and enviro costs of Hydro Quebec electricity, but it makes sense to me that things are less expensive Vermont makes it ourselves versus buying it from another party. It has been long rumored that Hydro Quebec lobbyists have been hanging around the Vermont Statehouse for some time discouraging Vermont from making their own renewable energy based power so they can later sell us theirs at a higher price. If we continue to operate on sleeping pills, like when we gave away the Deerfield-Connecticut River Valley hydro dams to TransCanada, or allow the NIMBY philosophy to reign, Vermont will be boxed in to buying expensive HQ power, especially when the reality of our future need for a mammoth amount of clean, green electricity for our transportation sector starts to sink in. In addition, it is only logical that as Canada's own demands and clean/green power ethics issues grow, they will keep their home-grown power for themselves and Vermont contract agreement costs will start to soar, if available at all. The other question Vermonters need to ask themselves is just how "green" is electricity from massive flooded areas in Quebec? Ethically, we should adopt the policy that us Vermonters should be willing to produce all of the electricity we consume ourselves and accept all of the true societal costs and impacts that go with it. I find it unethical and childish that the Vermont NIMBY's and original S.30 bill senate sponsors want their electricity to be produced elsewhere and out of sight and mind.

In general, it is my understanding that hydro power generally has the best payback rate of all renewable options under favorable conditions, with large scale wind being the second best option. This is due to the fact that the capacity factor percentage of use is the highest and the density of water is 16 times that of air and able to produce high levels of mechanical "work". The problem with considering large scale hydro as a future additional energy source for, and within, Vermont is the natural capacity of the state has already largely been fully developed. Our only option would be to buy back our existing capacity from TransCanada, a company not on good terms with the U.S. due to the Keystone XL pipeline insanity.

Ballpark Estimated 25-year Economic Costs: N/A for further in-state development.
More expensive & non-guaranteed supply out-of-state power purchases
Ballpark Estimated 25-year True Societal Environmental Costs: Minor for existing plants, large for new plants. Existing impacts controlled by out-of-state owners

Small Scale Privately or Community-Owned Micro Hydro (Net Metered):

Small scale hydro in Vermont is still largely an untapped resource in Vermont and should be a larger part of the total clean/green energy mix where the energy capacity is large enough to justify the system costs and environmental impacts. This is a very site-specific energy source which, given streams with year-round sufficient flow rates and operational head heights, can have very quick investment paybacks due to the high capacity factor of 24/7/364 running water. These systems are sometimes prone to high service O&M costs, but can be a good option for residential or small business power generation with only minor environmental impact. Vermont ANR permitting is required and can be difficult to comply with in certain situations. Because of all of the restrictions to its use and limited availability, this renewable energy option is a great choice, but will not be a major contributor to our statewide clean energy mix.

Ballpark Estimated 25-year Economic Costs: N/A. Total available quantities likely unable to match the 0.825 MW-Hr benchmark
Ballpark Estimated 25-year True Societal Environmental Costs: Minimal land disruption, very minimal wildlife damage and system supply pollution, no fuel supply damages

Large Scale Commercial or Community-Owned Tidal (I call it “Lunar”) Hydro:

Another largely untapped renewable energy source which will be an important future piece of our clean energy equation is what I call "lunar power", or tidal power. This, of course, cannot be part of Vermont's clean energy production portfolio since we have no ocean access, but hopefully it will soon be part of the New England NEPOOL electric mix of the future. If implemented on a large scale in the future, costs could be very attractive, but for Vermont they will be tempered by the added cost of new transmission lines from the east coast. There are obviously no promises as to the future availability and cost of this energy source to Vermont, but it will likely be a small part of our statewide clean, green energy mix in the future. The environmental impact, reliability and safety factors of this form of energy are still under investigation. Like hydro power, Vermont would have no control over the cost, availability and environmental impacts of this energy option.

***Ballpark Estimated 25-year Economic Costs: N/A for in-state development. \$0 fuel costs
More expensive(?) & non-guaranteed supply out-of-state power purchases***
Ballpark Estimated 25-year True Societal Environmental Costs: Likely minor impacts but yet to be determined. Existing impacts will be controlled by out-of-state owners

Efficiency and Conservation:

All of Vermont-based anti-wind power groups know they cannot gain public appeal without offering a clean, green alternative to wind power. One of the games they play is to say we don't need wind because we have efficiency and solar, which are both better than wind. First, no one disagrees with the virtues of efficiency, conservation and solar as a required part of our future combined energy/enviro solution, but the fact seems to escape their logic that you cannot run your refrigerator with "efficiency" and solar is gigantically more costly and environmentally damaging than large scale wind (see figures above). Yes, efficiency, conservation, and even human population control, are all items which should be at the top of our energy/enviro priority list. The problem is, our climate change issues have gotten so urgent that we need to execute a whole collection of “top priorities” all at once in order to address the entire problem with a workable solution. That means, despite the cost of efficiency, conservation and population control being our lowest cost problem solutions, we also need to simultaneously produce as much clean, green power as possible with the fewest initial dollars and the smallest overall environmental impacts. Ethically, we need to make it ourselves and live with the consequences which come from it. That means we need to urgently build the large scale wind power capacity portion of our future energy demand mix without any moratorium, delays or biases born from those who do not see the forest for the trees in terms of our combined energy/enviro future.

Ballpark Estimated 25-year Economic Costs: Lowest cost option, but does not produce energy
Ballpark Estimated 25-year True Societal Environmental Costs: No wildlife damage and minimal system supply pollution, no fuel supply damages

Large Scale Commercially-Owned Nuclear Electric Plant (specifically, Vermont Yankee):

If you do the hypothetical math exercise (don't try this at home!) of determining the cost of babysitting one spent fuel rod for 240,000 years until inert and safe at \$1/year with an annual inflation increase rate of only 1% results in a total cost which approaches infinity dollars for the purposes of human understanding. This makes the construction and continued use of the Vermont Yankee plant, on strictly an economic basis, one of the most insane things Vermont has ever done! In addition, we all know the cost and inflation rates are and will be much higher in reality. Vermont Yankee uses up about one spent fuel rod every two days in order to momentarily run everyone's toaster. Vermont uses about 700 MW of electricity on the average and about 1,000 MW at peak. Only about 38% of that comes from Vermont Yankee, so Vermont gets (38% x 700 =) 266 MW on the average from that plant. This amount can easily be replaced in the future with a well planned renewable energy and storage mix, but we need to get started immediately! We already have a good start on that project. We soon will have about 175 MW of renewable-sourced energy on-line.

Add to the security and safety costs of all those spent fuel rod casks sitting along the Connecticut River shore, the costs of the Vermont Yankee plant construction, renovations, repairs, permitting, O&M demands, limited-supply fuel, monitoring and testing, deliveries, decommissioning and countless other intangible costs and it is easy to see that this is not a sane energy choice. Add to that all of the environmental and geo-political risks. The decommissioning fund for the plant is now severely inadequate and, I predict, the final clean up figure will exceed \$1.2B (with a B) with Vermonters left to make up the difference once Entergy heads for the exits. If that wasn't troubling enough, the scenario still exists that if 9/11 United Flight 93 would have turned right and aimed for the spent rod pool building we likely would have lost habitability of the entire eastern U.S. and Quebec seaboard and part of the Atlantic coast for a couple hundred thousand years...

Pile on the massive environmental impacts of uranium fuel mining, refining, processing, trucking, accident and terrorist protection, high-concrete content nuclear plants, water demand and evaporation GHG impacts, river water temperature changes and toxin discharge, dry cask storage safety concerns, massive subsidies, large staff requirements and no real-world spent fuel rod disposal method and it is easy to see that "to cheap to meter" was a 1950's myth.

Ballpark Estimated 25-year Economic Costs: An amount too large for the human to comprehend
Ballpark Estimated 25-year True Societal Environmental Costs: Potentially beyond planetary limits

Large or Small Scale Commercially or Community-Owned Fossil Fuel-Fired Electric Plant:

As far as comparing large scale wind to fossil fuel fired electric production plants, the stupidity of using fossil fuel in terms of overall true societal costs should be self evident to any sane and intelligent person. Despite heavy bouts of denial, Most Americans now understand the reality of peak oil and human impact on climate change. As we slide on the downward side of the peak oil supply curve it is easy to see that we are now into ever-inflating fossil fuel costs, military supply struggles and an increasing frequency of supply disruptions. Add to the fuel cost, the real but often ignored, high cost of government subsidies, future carbon taxes, resource extraction, refining, delivery, manufacturing and electric production plant constructions and permitting, large staffs, plant O&M and decommissioning.

On top of that, the true societal cost of using fossil fuel should also include the intangible but real costs of severe storms, droughts, floods, food crop damage, health and other problems brought on by quickly accelerating climate change. Some would even include the cost of two Gulf region wars as part of the cost of maintaining American supply access to fossil fuel supplies. Even today, most American energy accounting balance sheets are not yet sophisticated enough to include these true societal costs as part of the real cost of fossil fuel. This is a massive mistake in our combined energy and environmental solution planning logic. We need to look at the real cost of electricity as being beyond just cost/KW-Hr retail rate listed on our electric bills.

Although electricity is not produced by burning gasoline, a 1998 study by the International Center for Technology Assessment illustrates my point similar to all fossil fuel electric production. The study estimated the true societal cost of gasoline as \$15.14 / gallon 15 years ago!... before Iraq, Afghanistan, Katrina, BP in the Gulf, Fukushima, Irene, Sandy and many other related true societal costs we all pay, but wrongly disconnect from what we think we pay per gallon or per KW-Hr (also see the video: <http://science.time.com/2011/06/28/the-real-price-of-gasoline>).

Some defenders of the present Vermont electric usage mix say that we only use oil and natural gas for a little over 1% of that total, but in reality, a significant portion of the approximate 18% of the energy we purchase from the New England NEPOOL grid is also generated by those polluting fossil fuels. This means we need to replace and/or work with the rest of New England to increase the amount of renewable energy used in order for Vermont to meet its goal of 90% renewable by 2050.

With inflating costs, upcoming supply shortages, very heavy environmental impacts and a need to return to 300 PPM of atmospheric CO₂ (presently at 395 PPM and growing at 2.7 PPM/year) as soon as possible, the use of fossil fuel in the Vermont overall energy mix no longer makes sense (see <http://thinkprogress.org/climate/2013/03/08/1691411/bombshell-recent-warming-is-amazing-and-atypical-and-poised-to-destroy-stable-climate-that-made-civilization-possible>). Also see the attached "True Cost Chart.pdf", a chart that graphically illustrates the folly of the continued use of fossil fuels in terms of economic and environmental costs. On the chart, green is good, red is bad. This underscores the discontinued use of fossil fuel for our transportation (35.5%), industrial (15.7%), commercial (19.4%) and residential (29.3%) sectors and the importance of our future energy conversion to clean and green electricity.

***Ballpark Estimated 25-year Economic Costs: Second highest, only to nuclear, in true overall costs
Ballpark Estimated 25-year True Societal Environmental Costs: Already beyond planetary limits***

Conclusions:

It is clear from the above listed costs that the best overall first choice for new energy production with the least environmental penalty is the use of LARGE SCALE COMMERCIAL OR COMMUNITY-OWNED WIND POWER.

In addition to the avoided future environmental costs, the advancement of renewable energy “fuel” of all types has the long-term inflation-resistant advantage of costing \$0/unit in 2013 and in the year 3013! The consequence of that to our long range economy cannot be under estimated.

It is often suggested by wind power opponents that solar is a better option than large scale wind because it is less expensive and has less environmental impact than wind. Although solar has to be a vital part of a sane future energy mix for Vermont, it is clearly not a better first choice over large scale wind power in a cash-strapped society with an unstable economy where our first investment dollars in green electricity need to provide the most clean power for the fewest dollars and in the fastest erection method possible.

It is also argued that renewable energy sources are not a good option versus fossil fuel or nuclear power because they are intermittent and therefore cannot be used as base load power. This is utter nonsense. Electric energy storage is not rocket science and has been used with reasonable conversion factors (often 30%) for over a century in systems such as water towers, reservoirs, large capacity batteries, hydrogen production through electrolysis, flywheels and other devices. The advancing technologies in this area are currently advancing on a daily basis and will be 100% ready for use by the time our total energy mix utilizes so much renewable energy that intermittency could be a problem. Currently, the variability of end-user demand is something which is handled routinely all of the time by the NEPOOL grid managers and is a greater overall variable than the fluctuation in renewable energy production. The advantage of building a logical balance of *all* renewable energy sources is that they (wind, sun, rain) seldom tend to generate power at the same time.

In summary, the brief analysis above underscores that it is illogical to create additional time or capacity obstacles to the development of future large scale renewable energy electric generation facilities in Vermont. Consequently, the Commission’s suggested four Tier evaluation system, where small scale Tier 1 projects receive the least scrutiny than Tier 4 projects may have the priorities exactly backwards. As illustrated above, all of the alternatives to large scale wind energy production have higher overall true societal energy and environmental costs. It therefore only makes logical sense that their review and permitting process should be less stringent than all other smaller and traditional fuel-based generation options.

Keith Dewey, AIA, LEED AP+ ^{BD&C}
Weston, Vermont



From: sandy reider [redacted]

Sent: Tuesday, April 09, 2013 9:25 AM

Subject: written testimony from Sandy Reider MD public hearing 4/8/13

(Whoops, here are the attachments I meant to send)

Please see attached copies of my testimony before the Senate Natural Resources committee 1/31/13 (a preamble to my over long testimony last night ... sorry about that), and my complete testimony from last night. My main point was to be that I recommend that the commission includes strict guidelines for setbacks for any proposed industrial wind projects.... setbacks that will protect all individuals from adverse health impacts.

Thanks for the way you have conducted these meetings.
Sincerely, Sandy Reider MD

SANDY REIDER MD



TESTIMONY AT PUBLIC HEARING ENERGY SITING COMMISSION 4/8/13

Good evening, thanks very much for taking the time to listen to myself and others regarding the siting of large industrial wind projects on our ridgelines. My name is Sandy Reider since graduation from Harvard Medical School in 1971 I have practiced clinical medicine more or less continuously here in VT in various capacities, for the past 19 years in a primary care setting here in Lyndonville. Because time is short, I would like to submit in writing the testimony I gave before the Senate Natural Resources Committee on Jan. 31. It summarizes my clinical experience and impressions regarding the health impacts on 6 individuals living in proximity to large wind turbines in the NEK. Tonight, I am going to take it as a given that these adverse effects are credible, and make some more general comments. Our Dept. of Health readily concedes that some individuals do indeed suffer from insomnia, headaches, dizziness, etc. and that these outcomes are due to “annoyance”, or stress. Based on my clinical observations and on some excellent on-site studies in the literature, I believe there is also a direct physiologic impact related to audible, and inaudible, “sound”. Like many controversial topics in medicine and science, a lot depends on what evidence one chooses to consider in drawing conclusions. In this instance the science is indeed in its infancy, and the health impacts of the acoustic energy produced by these turbines has not been adequately studied. So when the DOH states that there is no evidence, in this case it means literally there are no peer-reviewed studies that they have looked at that prove a direct effect. The saying “absence of evidence is not the same as evidence of absence” applies. Low frequency sound may well be important (it is my sickest wind patient never heard any sound whatsoever), but it has simply not been well studied, thus no evidence.

And, really what practical difference does it make if the adverse effects are direct physiologic ones or stress/annoyance related? A sick and suffering person is a sick and suffering person, period, end of story.

Almost all the studies in the literature are drawn from projects where the turbines are significantly smaller than the ones already generating power in the NEK. Indeed, in my clinical experience, even the 139 foot NPS 100 Kw turbines on Burke Mtn. and in Vergennes are capable of producing strong symptoms. What about Lowell and Sheffield turbines that are more than 3 times that size. And the turbines planned for the Seneca Mtn. project are bigger still, just shy of 500 feet. It is generally agreed that noise and vibration do increase with increasing turbine size, and at present we cannot predict with any accuracy how these turbines will perform in specific geographic locations, especially when they are clustered and the pressure waves become in phase and mutually reinforcing. What ever happened to the

precautionary principle? Once these towers and turbines are installed there is no going back.

The WHO's definition of health is the best I have seen and has stood the test of time. It states simply and eloquently that "health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." Is our DOH really doing its best to protect our health in the midst of this administration's push to industrialize our mountain ridges?

Guidelines for setbacks for these turbines have been inadequate, bordering on non-existent. I hope the commission's recommendations include generous setbacks that will protect the people in our rural communities. Ben Luce, professor at Lyndon State College and the most knowledgeable person I have encountered, suggests a minimum protective setback of 2.2 miles for these gigantic machines tough to achieve in a small state with the population distributed throughout Is Vermont really the right place for this?

THANK YOU.

SANDY REIDER MD



TESTIMONY SENATE ENERGY AND NATURAL RESOURCES COMMITTEE 1/31/13

Good morning, thanks very much for the opportunity to speak about some clinical observations regarding the health impacts of living in close proximity to large wind turbines.

My name is Sandy Reider since graduation from Harvard Medical School in 1971 I have practiced more or less continuously in VT in various capacities, most recently for the past 17 years in a primary care setting in Lyndonville.

In the brief time I have, I'd simply like to share some of my clinical observations and impressions regarding the health impacts related to living near these turbines and leave a review of the available science to others (parenthetically, I am delighted you will be hearing from Stephen Ambrose because it was his on site Falmouth, MA study that I selected to pass on to Commissioner Chen when he came to speak in Newark this past summer).

At this point I have seen 6 persons in my office with symptoms that seem to stem from these turbines, but for the sake of clarity and brevity, I will describe just one case in detail ... keeping in mind that the symptoms described by all those I have seen are quite similar and characteristic of what has become known, somewhat euphemistically, as Wind Turbine Syndrome.

This was my first patient who turned out to suffer from this syndrome, and I must say that it took a few months for us to connect the dots. He was a healthy 33 yo man who I had treated for several years and knew quite well. He had no preexisting medical problems, took no prescription meds, was happily married (no children), and had lived in his home for several years before a single NPS 162 foot wind turbine was installed in the late autumn of 2011, approximately 1800 feet from his residence. At the time of installation he paid no attention at all to the turbine and had no particular feelings about it one way or the other, aesthetic or otherwise. About 3 weeks after the installation he began to experience quite severe insomnia, something he had never dealt with before, and he had no clue why. He worked at home and spent most of his days as well as all nights there, unlike his wife who worked in Newport and was gone most days . He complained of abrupt waking 30-40 times a night, like a startle reflex, associated anxiety and panic. As a result he was almost never able to fall into a deep restful sleep, very distressing for someone used to sleeping soundly for 10-11 hours every night. Additionally he developed a kind of pressure headache, ringing in his ears, and slight dizziness, and nausea. These symptoms weren't constant but varied from day to day (eventually discovered to be related to wind speed and direction). His ability to concentrate diminished and it became difficult to get his work as a financial advisor done, as well as feeling irritable and somewhat depressed.

On his 3rd visit over 6-8 weeks during the spring of 2012, he quite emphatically declared that he was experiencing something called WTS. At the time I inwardly rolled my eyes, but after conducting some research, I decided it might just be possible. To test this hypothesis, he and his wife went on a 3 week vacation, and within 1-2 days of being away from home, ALL his symptoms resolved. On return, the same distressing sensations gradually returned. This amelioration when away was confirmed dozens of times ... he became aware that when the wind was coming out of the north or northwest he was particularly affected, and so arranged to sleep at a friend's house on those nights Generally he spent 3-4 nights away from home throughout the spring and summer of 2012, and on those nights felt and slept well. Interestingly, at no time at home did he actually hear any noise ... his distress was likely the reflection of very low frequency sound/vibration, sound below the audible range.

In trying to compare this to something in my own experience, the closest image that comes to mind is that of a teenager driving around in the spring with those big bass speakers in the trunk of his car a rhythmic thumping that can be sensed, and felt, from over a block away, while the rest of the higher frequency musical tones cannot be heard at all. Most patients have complained about audible noise as well as a rhythmic flickering shadow as the turbine blade crosses the sun, also the rhythmic flashing glare from the reflection of the sun on the blades (such flickering lights are known in the medical literature to precipitate seizures in susceptible individuals), and these are of course significant, but I have chosen to describe this case because so little attention has been given to inaudible low frequency vibration.

My patient was fortunate, he and his wife were able to afford to abandon their home, and they are now living happily far from any wind turbine and feeling quite well.

As I said, I have seen 5 other individuals with similar syndromes, and it easy to imagine how this state could easily presage more chronic illness depression, anxiety, high blood pressure, chronic headaches, the list goes on ... and all the pharmaceutical drugs that these maladies might eventually necessitate. I would be concerned for those whose nervous systems are sensitive and vulnerable infants and small children, children with ADHD or autism spectrum syndromes, those with preexisting ear problems or prone to motion sickness, and constitutionally nervous adults. I know you will hear stories this morning from Vermonters who have already been directly impacted, and they should be taken seriously, not dismissed and ignored by our politicians and health department. The old saw that a doctor's best teacher is his patient is true and obviously applicable here.

From a purely clinical perspective, the acoustic trauma produced by large wind turbines is real and significant, and that this makes the siting of these turbines especially critical. Keep in mind that the turbine affecting the person I described previously is only 160 feet high, whereas the turbines already spinning in Lowell and Sheffield are about 450 feet high, and those proposed for the Newark/Brighton/Ferdinand project are close to 500 feet. I note that a minimal setback of 1 mile from the nearest residence is specified in S.30 , but due to the great variety of atmospheric conditions and geography in VT, and after review of the literature, I suspect even this is inadequate to protect health.

I am surprised that in the bill there is no specific mention of the adverse health effects experienced by people living close to these turbines, though “quality of life” comes close. These health effects are more than annoyances, an intentionally misleading descriptor used in much of the industry literature to characterize the symptoms. A typical annoyance or nuisance might be something like black flies buzzing around your head, whereas these vibratory and acoustic effects are qualitatively and quantitatively different. Describing them as an annoyance intentionally minimizes their significance and is a disservice and demeaning to those who experience them. What about “chronic vestibulo-acoustic trauma syndrome” ... we certainly need better science, and more study is needed. I believe these health impacts should be specifically cited in the bill, with a recommendation directing the VT Department of Health to adopt a more direct, transparent, and proactive role in the public health issues raised by these huge turbines.

I fully support a moratorium on industrial wind development until we understand clearly the sacrifices we are asking of our citizens, and of the complex ecology of our sensitive and beautiful ridgelines.

Thank you.

SOME USEFUL (and brief) LINKS AND REFERENCES :

<http://www.vce.org/StephenAmbrose31Jan2013.pdf>

<http://www.vce.org/LuannTherrien.pdf>

<http://stopthesethings.com/2013/02/03/the-research-project-that-took-everyone-by-surprise-except-the-residents-of-waterloo/>

<http://stopthesethings.com/2013/02/01/now-finally-the-truth-laid-bare/>

http://www.cambridge.org/home/press_releases/display/item7244127/?site_locale=en_US

Wind Turbine Syndrome: a report on a natural experiment, by Nina Pierpont MD, PhD (not so brief, but informative)

Sandy Reider MD



From: Rebecca Ryan [redacted]
Sent: Tuesday, April 09, 2013 10:06 AM

Subject: Comments April 8 Public Comment ALAVT

Dr. Marcy commented on behalf of the Lung Association at last night's EGSPC public comment. I attached his statement. Thank again for your help and the opportunity, Rebecca

Rebecca Ryan | Director, Health Education and Public Policy | Vermont
American Lung Association of the Northeast

[redacted] | www.LungNE.org

Comments on EGSPC 2nd Draft Recommendations

I am Dr. Theodore Marcy of North Ferrisburgh, VT. I am a long time pulmonary physician who is an emeritus professor at the UVM College of Medicine. I am here before you as a leadership board member of the American Lung Association in Vermont, a board that I have been on since 1994.

I commend the commission on the work it has done to date. I have three suggestions for further improvement and clarification:

1. We are pleased that in item #19 you require public health impact assessments. We would ask that you emphasize the priority of these assessments by rewording the subtitle of this section (17-21) to: *“Ensuring Adequate Health, Environmental and Other Protections”*. Unfortunately, not all renewable energy projects are clean energy projects. The people of Vermont are its most important resource, and protecting their health should be a priority.
2. In that same vein, we ask that you specifically articulate in item # 6 under Simplified Tier System that the potential health impacts of a project be used as a criterion in classifying the appropriate tier for a project’s review process.
3. Finally, we ask that you specifically include use of a life-cycle analysis in item #20 that discusses understanding and measuring cumulative impact of a project. A life-cycle analysis accounts for all pollutants harmful to health that are generated in the production, transportation, use, and disposal of each energy product.

Thank you for the opportunity to provide comment, thank you for your service, and good luck in your work. Please also see the March 26th memo from Rebecca Ryan of the ALA in VT to your commission.

Theodore W. Marcy, MD MPH



From: Nancy Middleton

Sent: Tuesday, April 09, 2013 2:47 PM

Subject: Comments

My name is Nancy Middleton, I am a member of the Grafton Planning Commission and I have been a participant in local discussions of a proposed wind generation project in our community. In addition, I am well aware of the issue as experienced in other Vermont towns where wind generation is now in place or pending development. I am supportive of the points raised by Renewable Energy Vermont in their letter of April 8, 2013 to your Siting Commission. I encourage your Commission to understand that I am one of many who ask you to carefully consider each item of concern articulated by REV when making your recommendations to Governor Shumlin regarding future wind generation sitings in Vermont. I share their perspective and hope you will do likewise.

Regards,
Nancy Middleton

From: Chuck Reiss

Sent: Tuesday, April 09, 2013 2:53 PM

Subject: Input for the commission

Dear Commission Members,

I strongly support the position paper submitted by REV. Please add my name to the list of businesses that would like a reasonable approach to siting renewables in Vermont. Please take into consideration the points that have been presented in the REV letter. Thank you.

Chuck Reiss

Reiss Building and Renovation

From: Pamela Arborio

Sent: Tuesday, April 09, 2013 1:19 PM

Subject: Duplication Nation: New Report Identifies 82 Fragmented Federal Wind-Related Programs Costing Billions - Right Now - Tom Coburn, M.D., United States Senator from Oklahoma

http://www.coburn.senate.gov/public/index.cfm/rightnow?ContentRecord_id=5deed338-0ef7-44af-a97b-d14666045ce7

Docket #7867 Seneca Mountain Wind

With all due respect,

Please read this report relating to wind released and in the news today. The left hand obviously doesn't know what the right hand is doing but with this report questions will be raised as to the enormous expenditures being paid with no guidelines or communications between departments.

Will this stop the programs until a more effective way of handling IWT projects is developed?

Perhaps, we should all be tuned in to what happens from here.

Pam Arborio
Brighton, Vt.

From: Keith Dewey [redacted]
Sent: Tuesday, April 09, 2013 3:51 PM

Subject: Second Comments on EGSPC 3rd Draft 4/3/13 Packaging of the Recommendations

Dear Commissioners,

Please consider my second attached review comments relative to your 3rd Draft Packaging of the EGSPC Recommendations.

Sincerely,

Keith Dewey
Weston, Vermont

[redacted]

COMMENTS RELATED TO THE 4/3/13 EGSPC 3rd DRAFT PACKAGING OF THE RECOMMENDATIONS

04/08/13 rev

Dear Commissioners:

I would like to offer the following comments for your consideration while developing the final draft of your EGSPC Recommendations.

My comments center around general observations relating to the Vermont-wide topic of large scale renewable energy development and specifically large scale commercially or community-owned wind farms. If we are to call a "spade a spade", the establishment of your Commission centered mostly around wind power, so my comments are generally aimed at that topic.

To be incorporated in these comments is my full agreement with the 4/8/13 review comments previously submitted by Gabrielle Stebbins, Executive Director of Renewable Energy Vermont.

General Topic Observations.

The planning of New England and statewide energy needs has to be driven from the top down, and not overruled by the personal preferences of individual towns and regional planning commissions who could cause havoc with our overall energy security. Yes, local control sounds attractive to individuals with strong opinions and politicians looking for votes, but local communities and Regional Planning Commissions do not have the funding or expertise to define what is in the public good concerning the complex and brand new human task of correctly planning this vital combined energy and environmental transformation which will actually decide if humans survive or not. There is no more important task which humankind has ever faced. This should not be in the hands of Regional Planning Commissions and local Planning Commissions, or groups of townspeople whipped into an illogical frenzy by wind opposition groups peddling their fearful half-truths. Let's not let the inmates run the asylum.

No one is suggesting that project host communities should not be a voice in the planning process, but the final determination authority should remain with the Public Service Board in cases where the renewable energy resource exists and its use is in the best public interest similar to the past construction of hydro dams. The face of energy and environmental protection is changing and we will face sometimes hard choices. The PSB should have the authority to calculate the total amount of energy currently used in Vermont and the region, how much will be needed in the future as we transition nearly all of our transportation, commercial, industrial and residential energy usage to electricity, how to best meet those evolving needs with efficiency, conservation and renewable energy/storage systems, identify the best locations for those systems and implement their quick construction with an awareness of climate change and ecosystem urgency. This is no job for local towns, or even regional planning committees, and it is essential that the overall administration come from the most intelligent portion of our government.

To date, the existing PSB section 248 project review process has worked sufficiently. Minor problems have occurred in the development of the early wind farm projects (for example, no one thinks that the absurd base of tower #9 at Lowell Mountain should have ever been constructed), but in general, the process has worked well and is adequately improving. It is said by wind farm opponents that the process knows and cares nothing about the host communities or the personal concerns of individual citizens. Project development details are still reviewed by local planning boards and input is taken seriously. This subjective opinion by the wind opponents is simply not true. In short, if it ain't broke, there is no need to fix it.

Part of the motivation of the wind opposition groups is to create more review and approval hurdles for the wind power developers to exhaust their development funds. After years of obstructions, intentional delays, study committees and calls for more policy analysis by the Douglas Administration, it is time to finally address the urgency of climate change resolution and say no to this bill filled with more purposeful methods to obstruct.

The wind opposition suggestion to require all Act 250 criteria to be binding in the project review process is not necessary. Act 250 requirements are already included in the PSB review process. In my opinion, it is actually a good thing that all portions of Act 250 are not binding in that I feel a portion of this land use law, which has otherwise done very good things for the State of Vermont, is a bad statute.

The Vermont Senate should consider that some of us Vermonters think the aesthetic criteria contained within Act 250 is a bad law in that the "Quechee Rule", which rules on the adverse aesthetic judgment of whether a project is "shocking" and "offensive" to the "average person" or not has those three terms which are impossible to objectively define in a court of law. A wind turbine (or any other object) can never be objectively proved in a court of law as being either ugly or beautiful. This entirely subjective section of Act 250 has caused major problems across the state in the implementation of all kinds of projects for many, many years by allowing project permitting to be wrongly impacted by all kinds of fictitious and grudge-based problems fabricated by abutting project property owners for no good reason at all. The tool they often use is the 100% subjective and opinion-based Act 250 aesthetic ruling. This is a bad and troublesome portion of this land use law which should be soon challenged in court. The Siting Commission should never suggest the use of this gray-area criteria which would, in turn, be used as leverage to block a vital piece of our combined energy and environmental solution set which could be in the critical best interest of us all. Given the consequences of the accelerating consequences of climate change, we have higher objective-based priorities on which to concern ourselves. Seldom does the total aesthetic impacts (noise, visual, odor) of the alternative methods of generating the same amount of power from wind get considered in such judgments.

The goal of the wind opposition groups is clearly to include this Act 250 criteria and a binding requirement to obey the local town plan language in the project review process for the purpose of blocking wind farms, and possibly even large scale solar farms. This has long been a strategy of wind opposition groups within the state to pass this bill giving their groups the leverage to stop wind farm permits at the local level, ignoring all concern for the long range public good. The wind opposition groups have become quite skilled at generating fears using sensationalized half-truths within the local project host communities and causing illogical emotional and intellectual entrenchment among the citizens. Out of misplaced fear and a steady diet of outside reinforcement from the wind opposition groups, communities become battlegrounds and are torn apart mostly by the wind opposition groups generating intimidation against those who dare speak up in favor of wind power. The tension leads to negative feelings toward wind projects, often before the developers have had a chance to propose their project or creatively interact with the community about ways which the project may actually benefit them. This is a well orchestrated method of influence which explains how 69% of Vermonters, in a recent Castleton State poll, said they were in favor of wind power development in their own communities, yet often, whenever a wind farm is proposed in Vermont, the opposition groups set up camp and lead those townspeople to hate wind, block vote out the pro-wind Select Board members, appoint anti-wind Planning Commission members who, in turn alter the Town Plans with anti-wind language and try to get it to become binding by having your Commission recommend that it be part of your Recommendations. Lost in the discussion, however, is any true reference at all to the issue of climate change resolution. I know this strategy is a fact. I used to attend anti-wind group meetings and listened to their hired attorneys tell them how to make this strategy work! The pushes from these wind opposition groups for more local control are not about giving local citizens a voice, but about taking control of the discussion.

Some wind opponents suggest that we should not feel an obligation to produce clean, green energy within the boundaries of Vermont, but consider purchasing future green power from external sources like Hydro Quebec. This is faulty energy policy thinking when we consider Quebec will also soon be converting their transportation, industrial, commercial and residential space conditioning energy needs to green electricity and trying to avoid carbon taxes which are sure to come. At that point, they will surely keep the green power they produce for themselves, unless of course, Vermont wants to pay big dollars in short-term contracts for it because we failed to develop our own. Not a wise plan. These same wind opponents talk out of both sides of his mouth when they declare their outrage that new wind farms would require new transmission lines through the Northeast Kingdom, which is exactly what more Hydro Quebec power purchases would require.

I fear the final EGSPC recommendations may unfairly only focus on renewable energy generation plants, while electric generation using traditional fossil and nuclear fuels, biomass, trash burning or fuel/power delivery systems remain exempt from the rigors of these Recommendations. Additionally, it makes no sense to put wind farms through more environmental scrutiny than highly damaging forestry practices, ATV trails, water parks and massive ski areas.

It is my belief that the very existence of any society which does not nearly completely move away from combusting fossil fuel when creating energy within the next 40 years will be threatened by geo-political and military pressure from the rest of humanity due to environmental impact pressures. Which side of that line the U.S. and Vermont ends up on depends on the decisions we make now.

A lack of understanding of our future combined energy and environmental needs.

Many wind power opponents have stated that Vermont does not need to build more clean, green electricity into its portfolio because most of our greenhouse gas production does not come from our electrical consumption, but from our transportation, industrial, commercial and building space conditioning demands. This assumption based only on present conditions is shocking and an example of the long-range thinking which we need to avoid. This is precisely the reason we urgently need to develop more renewable energy sources! We have to convert all those usage sectors to carbon-free energy immediately and renewable energy is our best combined energy and environmental option to do it. On top of that, large scale commercial wind is the best of our solution options in terms of cost versus environmental impact. Assuming we all have working forebrains, why would we want to curb that as a reasonable portion of a sane future solution?

Evidently, many wind power opponents are unaware that there is a global energy revolution going on all around them. As an architect, I haven't designed a building that uses fossil fuel in over three years. Geothermal heat pumps with high COP's, quick-growth cycle carbon-neutral low emission biomass and other efficient electric-based systems are moving buildings into less fossil fuel and more electric usage. The automobile industry will be largely dominated with plug-in hybrids, EV's and electric drive train hydrogen fuel cell technology within 15 years. Mass transit growth will also center around electric locomotion systems. Efficiency gains are happening in all energy fields, but the greatest gains seem to center around electric use in areas like commercial lighting and industrial drive motors. The common denominator of most global energy will be electricity within 30 years. If Earth's ecosystems are to survive to a salvageable state, ALL of our future electric capacity demand upgrades will have to be 100% clean and green. The Recommendations from this EGSPC cannot fly in the face of that. The popular vote of local planners and citizens, often swayed by anti-wind group psychology, are not normally equipped to understand or render objective "determinative" verdicts on these broader public good issues.

Vermont currently uses an average of about 700 MW of power and about 1,100 MW at peak demand. And, yes, only up to 19% can presently be normally made using fossil fuel (1+% from in-state oil and natural gas and up to 18% from NEPOOL purchases, usually made from fossil fuels). But that clean electricity ratio is about tossed out the window once the electric demand skyrockets within the next small handful of years if we do not proactively start aggressively building clean electricity sources!

Back in 2005 (now 8 years ago), I did some back-of-the-envelope calculations using Vermont DMV car and truck data, rail and plane data, an efficiency improvement factor and some rough assumptions about what percentages may come from other forms of energy in order to get my arms around the reality of how much green electricity we will need in the future. The result was Vermont will need about 8.4 times as much electricity as it presently consumes, and in order to simultaneously solve our climate change problems, it all has to be clean and green. If we multiply 700 MW times 8.4, Vermont's part in climate change resolution will be to produce an average of 5,880 MW of 100% green energy. Needless to say, this will take an immediate NASA "man on the moon" type technology and infrastructure development effort by the entire world to meet this clean electricity demand using all of the renewable energy and storage options we have available to us. The longer we sleep, the harder the problem will get. In light of that, issuing overly demanding renewable energy generation siting requirements is utter insanity and in a sense, indirectly treasonous to future generations of all living species.

Mother Nature says we have no more time for this nonsense.

Some say climate change is not urgent or even a hoax. The huge majority of science-based institutions know that is not true. This energy planning issue goes far beyond the desired authority of a handful of Vermont NIMBY's and is now even directly related to the top concern of the Pentagon (see <http://climaterocks.com/2013/03/10/chief-of-us-pacific-forces-climate-change-top-threat>). With the planet now at 395 PPM of CO₂ and increasing 2.7 PPM last year, we have 22 months to shut down all global CO₂ production in order to avoid the 400 PPM of CO₂ mark (see <http://thinkprogress.org/climate/2013/03/08/1691411/bombshell-recent-warming-is-amazing-and-atypical-and-poised-to-destroy-stable-climate-that-made-civilization-possible>). Even if we halted all population growth and CO₂ pollution today, the carbon exhausted over the last 20 to 50 years (climatologists are still studying this projected time frame) will still continue to enter the GHG (Green House Gas) atmospheric mix. Where is Earth's climatic tipping point? Some think it has already happened, but have humans collectively become so neurotic that we should decide to stop trying to preserve the planet for future generations? A University of Leeds study (see <http://www.nbcnews.com/id/3897120>) in 2004 concluded that up to 37% of all living species on Earth will be extinct by 2050 if we stay on our present course of human-generated GHG production. Updated studies (see http://www.leeds.ac.uk/news/article/356/fossil_record_supports_evidence_of_impending_mass_extinction) from

2007 indicate the extinction level may even reach 50%. Once we reduce planetary biodiversity on a large scale we are all cooked... What price should we plug into the proposed siting restriction equation for that?

With the intensity and frequency of severe storms increasing each year due to our changing climate, I wonder how the wind opposition groups feel about writing checks to pay for 2 or 3 or 4 "Hurricane Irene"-level weather incidents each year? How about for the acid rain that destroys the very ridgeline ecosystems they say they are protecting when they say "no" to wind power and subsequently "yes" to the existing fossil fuel alternatives? The wind opponents always say our little clean energy contribution will not make a difference in the global climate change issue. Fix China or Detroit Edison first, they say, then we'll fix our internal problems. This is infantile and cowardly. If everyone tends their own business the problem will be collectively solved. China now makes more electricity from wind power than it does from nuclear plants (see www.earth-policy.org/data_highlights/2013/highlights35). Carbon taxes will soon pressure Midwest U.S. polluters to clean up their acts or lose their profits. As long as we can avoid the pitfalls of 18th-century thinkers in our government, the world will become a better and even wonderful, more peaceful and wealthy place through the use of clean and non-inflationary renewable energy production. Your final siting Recommendations should be in tune with those facts.

While America continues to dwell in the 20th-Century and drag its feet in hesitation, the rest of the world is already doing an "end run" around us and is busy building a clean energy infrastructure. Countries who are well on their way to building a green renewable energy base will soon competitively dominate the world economy. Those that do will deserve their spoils. Which fate will America and even Vermont suffer or enjoy?

Wind power works. Period.

The wind opposition groups always claim that large scale wind is intermittent and not worth the effort despite the fact that it already provides over 46,000 Vermont homes with all of their power. They also claim that renewable cannot be used as base load power because of intermittent generation and fossil fuel or nuclear generation plants will be needed anyway. This is nonsense. Energy conversion and storage is not rocket science, has already taken many working forms (stored kinetic energy in water towers and reservoirs or hydrogen generation using electrolysis, for example) for over a century and is only limited by scientific imagination, a national "can't do" attitude and the political will to enable. By the time New England grid instability becomes an issue due to the extensive use of renewables, the technology will already be in place and available. Some cite energy conversion losses (often around 30%) in these processes as negatives, yet the conversion losses in the embodied energy of the in-ground fossil fuel they herald often yields less than 3% of that total energy when they plug in their electric toothbrush. As a proper mix of renewable continues to be developed, instability from the use of any one energy source will continue to be less and less of a concern.

Many fears exist that we will end up building wind farms everywhere throughout Vermont. This is not a valid concern. The ridgeline wind potential has been studied and largely defined by the wind industry for decades. The studies analyzed and overlaid all of the project related issues which each potential site might offer and concluded that there are only about 20 or so potential wind farm sites in upper New England that make practical development sense in terms of practicality, minimal environmental impact and cost. Wind power beyond that filtered list of select sites is of no interest to wind developers. The issue at hand, however, is that we need to immediately develop those sites with a careful hand in order to address our combined energy and growing environmental problems across the entire globe.

Another shell game the wind opponents like to play is to say that the wind developers sell their REC's outside of Vermont so that the polluting power producers can continue to send their pollution our way. Most all of the wind developers in Vermont currently sell their REC's out of state in order to reduce the cost of power to their in-state rate payers, but the REC system is not the fault of the wind industry. All of the wind power produced within the state is currently contracted to be used within the state (by comparison, 62% of the power from Vermont Yankee is purchased out of state). Yes, it would be a good thing if the REC system could turn into a tax credit for clean energy producers and a simple carbon tax could be directly applied to all polluting power producers, but that will take some time. In the meantime, the simple fact remains that every Kilowatt made from a renewable energy source is a Kilowatt not made by using polluting or dangerous fuels.

Wind power is one of our healthiest energy options for humans, wildlife and environmental stewardship.

Wind developers are often painted by wind opposition groups as fanged, evil beast industrialists who are out to destroy everything on their way to big profits at the expense of the host communities. Because of my long-term

interest in city and regional planning, energy and the environment, I have gotten to know most of the potential wind developers in New England over the years, including the Cape Wind folks during my years on the Board of Directors of NESEA (Northeast Sustainable Energy Association) and the Executive Committee of the Vermont Chapter of the Sierra Club. Although no person or corporation is perfect or devoid of mistakes, I have found that nearly all of the people at these corporations are very sincere about their concerns for environmental stewardship, otherwise they would not even be involved with wind power development as a career. It has been my experience that they only have become defensive and interested in solely their own interests after the ugly anti-wind groups shower them with their poisonous attitudes and half truths about what they are trying to accomplish. The wind developers I know have purposefully worked hard to reuse existing access roads, transmission lines and other site infrastructure elements in order to save money, but to also reduce all environmental impacts relating to their projects. They also have been very willing to discuss collaborative and creative agreements with the host and viewshed communities because they are not only interested in a solid, long-term relationship with those communities, but because they are also generally good and intelligent people. The truth is, these people are normally good neighbors. From my experience, it is the cynical nature of a certain portion of the communities, fueled by the anti-wind groups, who break down the otherwise positive relationships with intimidation tactics. These are not the people who should be given a “determinative” voice in the areas of what is in the public good or to determine the sincerity of environmental stewardship from the wind developers. Smart wind developers care about the details of mountain aquifers, soil stability, water quality and deforestation too (see <http://barnardonwind.wordpress.com/2013/03/05/wind-farms-good-for-ground-water-too>). It is good business to do so. To date, the PSB has done a satisfactory job of evaluating and correcting those issues as appropriate on a project by project basis.

Although the wind opponents always promptly display photographs of wind farm road construction at the most visually disrupted point or a photo of the tower #9 layered base at Lowell Mountain which never should have been built, but they never show photos of Searsburg where the wind farm infrastructure now peacefully coexists with the site and wildlife or photos of the alternative mountaintop removals in West Virginia or fracking disasters in southwest... funny how that works. I always thought empathy was a proud Vermont character trait too.

The real truth is the pollution which wind turbines avoid actually saves bird and bat populations, contrary to the far greater impacts from house cats, pesticides and the grills of cars (see <http://barnardonwind.wordpress.com/2013/02/15/how-significant-is-bird-and-bat-mortality-due-to-wind-turbines>).

If the Commission is going to recommend stringent cost and environmental cost studies for large scale renewable energy generation facilities, it should also require equal third-party, mutually approved studies from the wind opposition groups relative to the *alternative* generation options. The opposition groups should also be asked to provide evidence that the composite aesthetic, habitat, ecosystem, public health, waterway, property value and other impact damages caused by all of the alternatives to saying “no” to large scale wind power are of lesser composite, long-term impact. These alternative generation options should also be evaluated on an apples-to-apples basis in terms of total environmental impact per energy unit produced and proved by the project opposition to be less total impact. The large scale wind opposition groups will head for the exits

The latest efforts from the anti-wind groups seem to be to downplay their subjective aesthetic bigotry by supplanting new concerns about health risks to people from wind turbine noise and infrasound. Although noise is a sincere concern, this issue has been enormously overplayed and debunked in countless recent medical studies (see <http://www.jsonline.com/news/opinion/science-proves-wind-energy-is-safe-0c8aejk-186395431.html>). In addition, Dr. Harry Chen, our own Public Health Commissioner, has testified and referenced countless assessments stating there are no demonstrated health risks directly caused by sound or infrasound created by wind turbines (the list of his references are too numerous to list here). The discussion has been complicated by instances where people have actually become sick, but are a result of the “nocebo effect”, which is the opposite of the placebo effect, where an outside stimulus actually convinces someone that the stimulus is having a negative, rather than a positive effect on their health. They in turn, can actually get sick from their belief system. Also, sound and noise can be two different things at the same acoustic level, were sound can have a positive effect and noise can have a negative effect, often depending on attitude. An example would be an ocean front beach house deck with repetitive wave “sounds” at 70 dBA which might be perceived as pleasant. A library whisper from 10’ away at 40 dBA might be considered by someone as a “noise”. The GMP testing at the KCW project has been consistently below the PSB mandated requirements, with only two minor hour long exceptions. The present PSB system is working. Infrasound can be a problem to human health at certain frequencies, but only if the power magnitude is sufficient. The magnitude generated by wind turbines and towers are said to be so low that this is not a realistic problem and is often exceeded by the infrasound generated by the wind turbines surroundings.

Blade shadowing, or flicker is another wind opposition group concern which often gets brought up in opposition to wind power. If we look at an issue like that logically, the concern makes no sense in terms of it being a major problem. The position of a turbine's blades constantly changes dynamically during the course of each day as the sun tracks across the sky, so the shadow of any object is only in one place for only a few minutes. In addition, the seasons change the angle of the sun in the sky, so no blade casts a shadow in the same spot more than once per day for several minutes and only for a brief period of days twice each year. The branches from a neighboring tree moving in the wind casts more of a flicker effect through a house window than any wind turbine blade. This is an example of the extreme bias against wind power that the wind opposition groups employ which does not even remotely equate to the impacts of some of the alternatives such as just the net total aesthetic impacts of electric generation from a centralized coal burning plant from resource extraction, to refining, to delivery, to burning, to waste disposal and long distance electric transmission. .

Property value loss absurdity.

One of the more bizarre requests of the wind opposition groups is the requirement of determined compensation to renewable energy production plant (i.e. large scale wind farms) host town property owners for losses in the value of their properties. This is another attempt, like aesthetics, to make an objective determination through the use of 100% subjective opinion where the assumption is predetermined to be negative. Property value is in the attitude of the evaluator (see <http://barnardonwind.wordpress.com/2013/02/19/property-values-evidence-is-that-if-wind-farms-do-impact-them-its-positively>) and can never objectively be proven one way or the other in a court of law. Despite much arm waving by a small collection of NIMBY's in New England, there is no evidence to their subjective claim that wind farms in general cause property value losses. In fact, a recent study by the University of New Hampshire Whittemore School of Business and Economics shows that there is no evidence to that effect in Lempster, New Hampshire, a recent project with all of the same elements found in other proposed Vermont sites. There should be no inference in the Commission's final Recommendations that wind farms will negatively impact future property values. In reality, because they represent icons of sanity and optimism to some people, may attract a local element of eco-tourism, become a source of pride and community identity, and the fact that living near a grid-stabilizing wind farm might help avoid a power outage from time to time might actually be contributing factors in the escalation of local property values. The overall tone of final Recommendations should not reflect negative assumptions about the aesthetic impacts of wind farms at all.

Other S.30 bill problems.

A general inference in these Recommendations suggests to me that Commission feels the existing 3-person Public Service Board project review process as being exclusionary to the local citizens and other interested parties and more authority should be given to the Region Planning Commissions. Unfortunately, I feel that is the wrong direction to push big picture decisions about energy and environmental issues where the RPC's in many potential wind farm host communities have been purposefully stacked with wind opponents for years. Holding funding as incentive for the RPC's to comply with PSB public good desires will likely not work in communities filled with wealthy NIMBY donors who can ignore the State money.

Let's look at the 21st-Century from 30,000 feet.

Ask yourself: Suppose Vermont passed a law with the virtuous requirement that all future energy consumption within the state had to be matched with an equal amount of energy production within the state, it all had to be 100% emissions free and we all had to accountably coexist with the environmental impact of our choices in-state. Now let's assume we require ourselves to complete the project within, call it 3 years, in order to halt our greenhouse gas output for the sake of our ecosystems. Would we pick large scale wind as one of our best and first options? Of course we would. Will your final EGSPC Recommendations be a help or an obstruction headache to our climate change resolution timeline?

Despite the EGSPC Public Hearing and propaganda blitz by the wind opposition groups, 69% of Vermonters are supportive of wind power development (see <http://www.vpirg.org/news/new-poll-shows-massive-public-support-for-wind-power-in-vermont-support-goes-up-when-its-in-the-neighborhood>) and only 18% are opposed. Within the younger age bracket polled, the split was even larger. Which group's best interests will your EGSPC Recommendations represent?

Keith Dewey, AIA, LEED AP+^{BD&C}
Weston, Vermont



From: Rob Pforzheimer
Sent: Tuesday, April 09, 2013 4:30 PM

Subject: Don't look for justice in Ontario's 'debate' on wind turbines

http://www.thestar.com/opinion/commentary/2013/04/09/dont_look_for_justice_in_ontarios_debate_on_wind_turbines.html

Don't look for justice in Ontario's 'debate' on wind turbines

It's wealthy corporate behemoths supported by the government against vulnerable people with limited financial resources.



DAVID COOPER / TORONTO STAR

Anti-wind-turbine groups converged on the convention centre in downtown Toronto last week to protest wind farms, a story largely ignored by the mainstream media. (April 3, 2013)

By: Anne McNeilly Published on Tue Apr 09 2013

EXPLORE THIS STORY

When there's social injustice, you don't expect large corporations, the provincial government and a union like the CAW to be climbing into bed together to ignore the problem. But slap a motherhood label on the issue, such as the so-called "[Green Energy Act](#)", and all of a sudden it's OK to ignore the very real hardships, both health and financial, happening to people in non-Liberal ridings.

What's more surprising about the wind-turbine debacle, though, is the relatively low media profile that Ontario residents who are being negatively affected by the monster machines are receiving. News outlets and publications usually lap up stories of social injustice. The problems associated with lead paint, urea-formaldehyde foam insulation, asbestos and cigarettes are all famous for the media attention they received that led to change.

But it was difficult even to find news stories last week about the wind turbine protest at the energy conference in downtown Toronto. People from across the province pooled their resources to hire buses to come to the city to try to draw attention to their plight. If there was a broadcast or a print story, I didn't hear or see it (a story on the protest did appear on thestar.com [here](#) - Ed.).

And despite public outrage and protests, the Canadian Auto Workers' union last week started operating a monster wind turbine, built with government subsidies, in its Port Elgin convention centre parking lot that violates the 550-metre Ontario setback regulations. Residents, particularly children, are already experiencing the sleepless nights, anxiety and migraines being experienced by others around the province. Who cares? Certainly not CAW president Ken Lewenza, who has secured a seat on the province's wind gravy train. When I recently suggested to a colleague who works on a documentary radio show in Toronto that the problems with turbines were worth a story, she responded: "I think they (wind turbines) are beautiful." And that was that. On one "side" of the wind-turbine debate are wealthy corporate behemoths supported by a government that removed the democratic rights of its citizens, without debate, to launch a misguided and ill-advised initiative that's going to cost taxpayers' into the billions. On the other "side," you have vulnerable Ontario residents with limited financial resources who have had their democratic rights trampled and monster industrial monsters rammed down their throats.

Many are sick, although they are having trouble getting urban residents to believe it, and many now own property where the value has been cut by as much as half. To ignore a situation where one "side" holds all the financial and political power while the other side struggles to make their voices heard, but not from lack of shouting and protesting, is a grave injustice.

So why are those who have found themselves living next to these industrial "farm" factories not getting more attention? Is it because of the greater good? If only that were true. Anyone who has done even five minutes of research knows that turbines are never going to solve the province's or the world's energy problems, despite the propaganda being spun by the wind companies and the province with its "Green Energy" Act, a brilliant piece of propaganda.

The fact is, is that the energy produced by turbines can't be stored and they produce a fraction, (an estimated 20 per cent or less) of what they are capable of at times of the year when their energy is most needed, winter and summer. The auditor general outlined last year how the province "[leapt before it looked](#)" into this billion-dollar boondoggle that's already costing taxpayers plenty.

A roundup of peer-reviewed health research, which is difficult to link to due to academic pay walls, from a variety of medical and science researchers can be found in the [August 2011, 31\(4\) issue of the Bulletin of Science, Technology and Society](#) August 2011, 31(4) issue of the Bulletin of Science, Technology and Society, and is easily available at any public or university library. In addition, the medical officer of health in Grey Bruce, Dr. Hazel Lynn, submitted a report to the Ministry Health in February that found that there is, indeed, a link between health and wind turbines. Hard data on how property values have been cut by as much as half can be found in a report done by Lansink property and appraisals here: <http://mlwindaction.org/2012/10/04/new-ontario-wind-turbine-property-value-analysis-ben-lansink-aaci-p-app-mrcs><http://mlwindaction.org/2012/10/04/new-ontario-wind-turbine-property-value-analysis-ben-lansink-aaci-p-app-mrcs>)

Curiously, or maybe not, is that when energy issues arise in Liberal ridings — a planned natural gas plant, for example, in Oakville, or offshore Toronto turbines that would have obstructed "the view" of Scarborough Liberals — the projects are quickly quashed. So far, Premier Kathleen Wynne, nicknamed McWynnty by those in turbine-infested locales, has had little to say beyond acknowledging, sort of, that there's maybe a problem and that municipalities should be more involved in the siting process for wind turbines. Well, yes.

Let's be clear. People forced to live beside wind turbines are emphatically not anti "green" energy — what they are opposed to are industrial machines that are ruining their lives, while the government, and the media, turn a blind eye to the problem.

Anne McNeilly is an assistant professor in the School of Journalism at Ryerson University who likes to vacation in Bruce County, at a place that is more than 550 metres from the nearest turbine.

From: Johanna Miller

Sent: Tuesday, April 09, 2013 4:43 PM

Subject: VNRC's Comments to the Siting Commission - 3rd Draft

My apologies for the delay in sending these comments. Please forward them on to commission members and, I hope, they can still be constructive in their thinking and deliberations.

Thanks for all you do and to the EGSPC for the opportunity to comment.

Best,

J

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Johanna Miller, *Energy Program Director and VECAN Coordinator*
Vermont Natural Resources Council
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The Vermont Natural Resources Council has worked for 50 years to protect Vermont's environment and give Vermonters a voice in development decisions that affect natural resources and their communities. We believe that developing renewable energy, both in Vermont and elsewhere, is necessary, that climate change is the most pressing environmental issue of our time and that a strategic but bold response is required in Vermont and across the globe.

We don't believe environmental protection and renewable energy development are mutually exclusive goals. We think Vermont can address potentially competing interests and advance clean energy projects efficiently while protecting the state's natural resources.

VNRC participates in state policy development and Section 248 proceedings at the Public Service Board. We also work closely with Vermonters at the local level. We were actively involved in the update of the Comprehensive Energy Plan, offering our own organizational comments as well as helping to lead the public engagement process to ensure that the on-the-ground perspective of Vermonters — including the state's network of 100-plus energy committees — informed the end result. We feel confident that Vermonters were heard in that process, and we support the ambitious goal of meeting 90 percent of the state's energy needs with renewable energy in 2050.

The 90 percent renewable by 2050 frame should guide our policy and decision making and must be met through an aggressive commitment to conservation and efficiency as well as developing and securing new, clean energy generation in Vermont and the region. That said, how we develop renewable energy matters. VNRC recognized the need to improve the process for siting and constructing energy facilities in Vermont, and we joined other conservation organizations in calling on Governor Shumlin to convene a commission to examine this very issue. Now that commission — the EGSPC — is wrapping up its significant charge.

We have appreciated the hard work of commission members, as well as the opportunity to comment previously. The commission has clearly worked to address issues raised by the public in its rigorous process, and VNRC appreciates that many of our own initial recommendations are reflected in some way in the current draft. Thank you for the opportunity to offer additional comments to the *"EGSPC 3rd Draft Packaging of the Recommendations — April 3, 2013."* Find our further thoughts and recommendations below.

Overarching Comments and Recommendations:

Broad Recommendation: We are concerned that the EGSPC's ambitious charge — under a compressed timeline — might not have offered sufficient time to research, analyze, synthesize

and distill the kinds of policy, program and practice recommendations Vermont needs to balance renewable energy development, natural resource protection and community concerns. We also think it's important that well-versed commission members lend their expertise and perspective on these issues into ensuing conversations about policy and practice changes. We therefore urge the EGSPC to cite their recommendations as concepts and potential policy or practice changes and recommend an implementation process to refine certain recommendations. We also urge the EGSPC to recommend an implementation committee comprised of key legislative leaders, relevant agency officials and willing, per-diem paid members of the EGSPC to create and participate in a summer and fall process that allows further revision to recommendations, as needed.

Broad Recommendation: As the EGSPC's recommendations currently reflect, we believe decisions for siting electrical generation should remain the purview of the Public Service Board; however, we believe that land use and natural resources issues are an important consideration in generation dockets before the PSB. Act 250 criteria should play a stronger role, and they need to be brought into the 21st century. While this may be part of the EGSPC's considerations in Recommendation #17, we believe it's important, and urge the EGSPC to specifically recommend updating the Act 250 the criteria to better protect natural resources, including addressing hydrology issues, fragmentation of habitat and forestland, as well as the reality of climate change — measuring, rewarding or penalizing greenhouse gas benefits or impacts.

In addition, the EGSPC should require greater specificity in the Section 248 process to understand how Act 250 criteria are considered and weighed against the public benefits of a project. There should be criteria to understand in what circumstances undue adverse impacts to natural resources can be approved to achieve public good benefits. We do not believe it is appropriate to approve projects that will have undue adverse impacts to the environment; and in the situation such projects are allowed to be approved, we need to understand under what conditions this would be allowed.

Broad Recommendation: VNRC urges the EGSPC to augment the use of bill-back as the primary revenue source for technical review of project impacts with a fee structure that provides a sufficient, sustainable funding stream to bolster the capacity and expertise available to the Agency of Natural Resources, Public Service Department and, potentially, Public Service Board. Greater resources, expertise and guidance is needed to evaluate projects, and their potential benefits and impacts. We believe directed funding that secures the staffing needed to balance important goals could improve the process and outcomes for all. Such a fee could be assessed on a Kw/Kwh or MW/MWh basis. These fees should be reasonable and not overburdensome to energy developers, but should create a funding stream to pay for essential state review, including potential studies and supplemental information needed to make good, informed, unbiased decisions.

Increase Emphasis on Planning Recommendations:

Several of the EGSPC's recommendations are aimed at improving protections for natural resources and local and regional interests. While VNRC supports a stronger and more specific role for regional planning, we have concerns about the lack of internal expertise and sufficient

staffing capacity at Regional Planning Commissions (RPCs). We also want Vermont to avoid duplicative efforts or create layers of bureaucracy that make things unnecessarily difficult.

Many RPCs lack the energy expertise, understanding of transmission and distribution issues and statewide context that is essential to energy decision-making. The PSD can and must play an important role in ensuring that regional plans are rooted in the fundamental realities surrounding grid constraint, transmission, distribution, siting and other important considerations, and it seems clear that the EGSPC recognizes this pivotal role, as well as that of the ANR, in the RPC planning process. VNRC recommends that if RPCs play a greater role in energy siting, and that regional plans are accordingly granted greater deference in §248 processes, that there be a clear expectation that regional plans make a reasonable provision for renewable energy development within each region (24 VSA Chapter 117 §4302 (c)(7) requires RPCs to “*encourage the efficient use of energy and the development of renewable energy resources*”). In addition, a process needs to be established to ensure state oversight (as was once envisioned through the council of regional commissions) to ensure regional plan conformance with this – and other – state planning and development goals set forth in §4202.

Simplify Tier System: Recommendations #5 and #6

While VNRC understands and supports the goal behind making improvements to Vermont’s existing tiered process, we have concerns about the potential consequences of the tiering system. Permit tiering systems can result in less environmental review than is necessary to protect resources. They can also be cumbersome, costly and bureaucratic. The state’s goal must be to advance projects but also to adequately protect natural resources. We appreciate the EGSPC’s recognition that this system will require further refinement by the PSD, PSB and ANR, and while we generally support the suggested tier sizes, we urge the EGSPC to:

- Recommend that ANR develop natural resource screening criteria that could, in certain circumstances, bump a project up or down the tiering system based on potential likelihood of natural resource issues. Want to develop a 2.5 MW project in an unutilized, flat field far from water or fragile natural resources? It could potentially be considered in Tier 2. Want to develop a 350 Kw solar array adjacent to or in a significant wetland? That might bump the project review up to a Tier 2 or 3. The goal would be to have natural resource realities serve as a more of a determinative criteria that could bump the project review up or down the tiers.
- Remove or strictly limit “self certification” opportunities for developers, which has been proven insufficient to protect natural resources when used for other types of permitting, and instead task the ANR to work in partnership with project developers to expedite the process and avoid natural resource issues.
- Recommend that new and updated standards and guidelines to address recognized impacts to environmental resources be mandatory. This would include provisions for mitigation and/or avoidance of certain types of impacts to natural resource features. Guidelines should go through rulemaking or statutory approval so they are enforceable.

Recommendations #7 and #8: VNRC recommends the EGSPC consider and recommend a public notification model similar to that used for the large groundwater withdrawal permit

process for Tiers 3 and 4 (and for certain Tier 2 projects, dependent upon potential likelihood of environmental impact). It's our understanding that, in many cases, robust public outreach related to project development is already happening. Formalizing the process could provide citizens a known opportunity and process to foster better, earlier discussions about the project and create an opportunity for questions to be answered outside of the permitting process, potentially reducing conflict. We suggest that the draft recommendations be amended to:

- Require that the applicant hold a public informational meeting about the project 30 days before an application is submitted, and ensure adequate public notice for tier 2 projects.
- Hold a second public information meeting once the application is complete.
- Hold a final public informational meeting on the draft permit.

Recommendations #17 and #20

The EGSPC's recommendations to charge the ANR with updating or creating new natural resource protection guidelines is important. Preventing damage to natural resources must be a commitment of the State of Vermont. This includes avoiding landscape-scale fragmentation, water quality impairments, impacts to wetlands and changes to hydrology. Avoiding significant water quality impacts is a complex challenge that requires holistic, integrated hydrology expertise and analysis. To address these issues VNRC urges the EGSPC recommend:

- The ANR use necessary or existing tools, such as its "Biofinder" resource inventory, to assist RPCs with regional energy planning and help guide large-scale energy facilities to areas with minimum impact. The ANR should also use the "Biofinder" or other tools to inform (and develop guidelines for) avoiding landscape-scale fragmentation.
- Specifically recommend the development of mandatory guidelines for mitigation and/or avoidance of certain types of impacts to natural resource features.
- Specifically recommend that the ANR develop integrated hydrology protocol to consider a comprehensive and integrated evaluation of potential impacts to water resources, including groundwater, rather than a piecemeal consideration of impacts on specific water features (e.g., wetlands, streams, riparian management).
- This also should include a hydrological and biological monitoring plan for Tier 3 and Tier 4 projects, and Tier 2 projects located in headwater watersheds.

Recommendation #21

- VNRC urges the EGSPC to clarify the tiers for which monitoring compliance is required and require it of all Tier 3 and Tier 4 projects, as determined necessary by the ANR. If, due to specific natural resource values, the ANR urges other specific tiered projects to undergo monitoring, these areas too should also be monitored.
- The EGSPC should charge the ANR to develop consistent monitoring protocols for specific resources (e.g., biomonitoring for streams, forest health).
- VNRC urges the EGSPC to recommend expanded enforcement capacity at DPS, or in conjunction with ANR/Natural Resources Board, for this monitoring process.
- As opposed to the bill-back funding mechanism, VNRC again recommends that the EGSPC charge the PSB with creating a fee structure that fairly but adequately raises the funding need to staff and/or monitor projects throughout the process.

ADD A RECOMMENDATION: #22

To bolster shared community benefits, the EGSPC should charge the PSD and PSB to work in partnership with utilities to establish guidelines for regional allocation of community benefits based on impact and turn those guidelines into “best practice” for projects in Tiers 3 and 4.

ADDITIONAL CONCERNS AND AREAS FOR IMPROVEMENT:

There are a few additional considerations and potential issues VNRC urges the EGSPC address including:

- Clarifying and eliminating ambiguity around deference given to ANR and agency permits that do not always align with §248 criteria (e.g. water).
- Deference should not prevent parties from challenging ANR decisions and rebutting and/or strengthening permit conditions with appropriate evidence.
- As mentioned before, clarifying how the PSB weighs the “public good” in its decision-making process. The EGSPC should, again, recommend specific 21st century updates to Act 250 (reflecting climate change issues and more, as noted above) and direct the PSB and PSD to better clarify how the “public good” is measured and applied, especially in relation to impacts on the natural environment. This should be revisited routinely by state agencies to reflect lessons learned from installed projects, hydrologic and other ecological science, as well as the most recent climate science.
- Avoiding conditions subsequent, i.e. the issuance of Section 248 permits with conditions that can be met after the project is issued a certificate of public good. This may be appropriate in limited situations, but all too often permits are issued with conditions that can be met at a later date, and parties cannot address the merits of whether the condition is adequate as part of the Section 248 hearing process.

Conclusion

We appreciate the EGSPC’s tireless efforts and dedication to helping Vermont address some of the complex — and controversial — issues that have intensified in the state over the last several years. There are many recommendations outlined in the *3rd Draft Packaging* that will help balance important, and sometimes competing, interests. It remains essential, however, that Vermont’s commitment to climate change is front and center in our policy making across the board. The potential negative impacts to natural resources, waterways, wildlife and communities from climate disruption are severe. We must modernize our response, our tools and our state staffing accordingly to ensure that, in this instance, we design and construct energy generation swiftly but in a manner that protects our water, natural resources and communities. We must also recognize the significant public benefits in clean energy generation and find ways to measure that in science-based, fair and forward-looking ways.

From: Pamela Arborio
Sent: Wednesday, April 10, 2013 9:53 AM

Subject: Fwd: Board of Governors (UTG) Meeting 2-11-13

I believe this recording was sent previously but I didn't see it in your records. Please, as busy as you are, the methods of wind developers should be of concern to you.

Pam Arborio
Brighton, Vt.

From: Pam Arborio
Date: March 2, 2013 11:59:35 AM EST

Subject: Fwd: Board of Governors (UTG) Meeting 2-11-13

Good day Sen. Benning,

This audio includes my introduction and the "proposal" that SMW and Eolian tried to tempt the UTG with. Both happen at the beginning of the recording so you don't have to listen to the entire thing but it is a little lengthy (rush me along if needed!). Please make sure you hear all of Chairwoman Barb Nolan's remarks at the end. A hard copy is being transcribed, I'll send it out to all when it's finished.

Thanks for everything,

Pam Arborio

From: Pamela Arborio
Sent: Wednesday, April 10, 2013 9:58 AM

Subject: Fwd: BOG-UTC 3/11/13

This is the second recording I sent previously for the siting Commission to listen to. Again, I believe the methods used and the interaction with the Board of Governors in the UTG is an important piece of your discovery.

Pam Arborio
Brighton, Vt.

Subject: Fwd: BOG-UTC 3/11/13

FYI

Second BOG meeting in March.

Begin forwarded message:

From: Pamela Arborio

Date: March 13, 2013 9:36:03 EDT

To:

Subject: Fwd: BOG-UTC 3/11/13

Subject: BOG-UTC 3/11/13

I DIDN'T QUITE CATCH THE BEGINNING BUT THEY START WITH A DISCUSSION RE. NOT USING A RECORDER FOR ALL MEETINGS.

From: Rob Pforzheimer
Sent: Wednesday, April 10, 2013 1:02 AM

Subject: How the Mafia turned clean energy into dirty money

<http://www.boiseweekly.com/boise/how-the-mafia-turned-clean-energy-into-dirty-money/Content?oid=2851881>

How the Mafia turned clean energy into dirty money

Many firms turned to middlemen calling themselves "facilitators." Able to procure approvals by tapping connections in local government, they became the gatekeepers of renewable energy. ...In 2011, facilitators demanded commissions as high as \$520,000 per megawatt. The Mafia has been able to earn even more by insisting companies that use its middlemen also hire its contractors. Green energy plants are also attractive investments for laundered cash.

April 9, 2013 by Justin Smith in Boise Weekly

If the 1970s mob classic "The Godfather" had been filmed today, you'd see giant wind turbines in the backdrop of scenes around Vito Corleone's hometown. They've sprouted by the dozen in western Sicily, part of a green-power boom fueled by government subsidies.

They wouldn't be out of place. Police have long suspected that much of the money has gone toward lining the pockets of figures such as Matteo Messina Denaro, the head of Cosa Nostra himself and Italy's most-wanted man.

Just how much money became clear last week with the seizure of almost \$2 billion in assets from a wind-power magnate believed to be Denaro's frontman.

A plumber and electrician, Vito Nicastrì amassed one of the largest wind and solar-power empires in Italy, earning him the nickname "lord of the wind." It included 46 companies, dozens of bank accounts, villas, apartments, yachts and fast cars - the largest group of assets ever confiscated in Italy and an alarming indicator of the extent of the Mafia's stake in clean energy.

One of the country's most promising sectors, the renewables industry has surged even as the rest of the economy ground to a halt. Developers built more wind and solar plants in 2012 than in any previous year and added 5,000 jobs to a country wracked with unemployment.

The boom is almost entirely due to what were, at their peak, the most generous renewable incentives in the world, says Andrea Gilardoni, an economist at Milan's Bocconi University. "They were so high that all kinds of people have become involved," he said. "Even cats and dogs can make money in this kind of climate."

The government has doled out more than \$75 billion to companies that produce wind and solar energy over the past six years, doubling and sometimes even tripling their revenues.

The bonanza prompted a gold rush for scores of energy companies that flocked to the country's south, one of the sunniest and windiest places in Europe - only to collide with Italian bureaucracy. Anyone hoping to build a wind or solar plant was met with reams and reams of red tape.

In one case, International Power required more than six years to get a medium-sized wind farm approved. The company, now owned by French GDF Suez, had to deal with more than 50 various agencies and departments, any one of which could have delayed the process further.

Many firms turned to middlemen calling themselves "facilitators." Able to procure approvals by tapping connections in local government, they became the gatekeepers of renewable energy and created a lucrative secondary market for certificates and approvals in which the Mafia has thrived.

Fees soared. In 2011, facilitators were demanding commissions as high as \$520,000 per megawatt. At that price, acquiring permissions for a wind farm the size of Corleone's would have cost more than \$10 million. The Mafia has been able to earn even more by insisting that companies that use its middlemen also hire its contractors. Green energy plants are also attractive investments for laundered cash: the Cosa Nostra and its affiliates are even thought to have constructed several plants themselves, such as one in the eastern Sicilian town of Mineo built by Nicastri.

On the anti-Mafia police's radar since 2007, he first came to attention when his name appeared on a handwritten note sent to Palermo boss Salvatore Lo Piccolo, who was later arrested. Over the next six years, they observed his meteoric rise from a modest businessman to one of the biggest players on the renewables market. Although the police have no evidence of direct contact between Nicastri and Messina Denaro, the investigator who led the record-breaking operation says his fortune would have been impossible without the knowledge and support of Sicily's most powerful crime boss.

"You can't operate in that context and with that volume of business unless you have certain connections," Arturo De Felice told reporters. De Felice touted the seizure as a major victory in the government's scorched earth campaign against the Mafia. It was only the latest in a series of sting operations that have put scores of businesses under sequester, from wind farms to grocery stores. But that won't stop the river of energy incentives Gilardoni and other experts suggest lies at the root of the problem.

Although Italy lags behind its neighbors in areas such as research spending and broadband internet, it's galloped ahead of the European Union's target for clean electricity. Italy generates more than 26 percent of its power from renewable sources, enough from wind energy alone to light up a city the size of Rome. Nevertheless, the subsidies keep coming, Gilardoni explains, because they're part of a bubble no one wants to pop.

"For a long time, banks were underwriting 60 percent to 70 percent of the cost of these installations," he says. "If those subsidies decreased, it would expose them to losses." Prime Minister Mario Monti has capped energy incentives at around \$13.5 billion per year, most of them paid through a surcharge on utility bills of which most Italians aren't even aware. At that pace, total subsidies to renewable energy will have cost Italian taxpayers a total of more than \$220 billion by 2020, when they're due to expire.

As police tackle renewable energy corruption, however, another front may be opening. Italy is so far behind in renewable heat generation, which only began receiving subsidies last year, it could still miss the EU's overall renewable energy target.

It's clear from UPC's (now First Wind) prefiled testimony in VT PSB docket 7156 that UPC/First Wind was operating as IVPC in Italy. Their former partner was Vito Nicastri, the "lord of the wind," mentioned in the above article and the link below Quoting UPC/First Wind Prefiled Direct Testimony - February 21, 2006, p.8/70:

"UPC Group is a group of related companies that have developed large scale wind farms in Europe. To date, **UPC Group has developed, financed, constructed, owned and operated over 635 MW of large-scale wind turbine generators in southern Italy and the islands of Sicily and Sardinia through a company called Italian Vento Power Company ("IVPC")** (www.ivpc.com). Certain principals of the UPC Group recently sold their ownership interests in holding companies that own the IVPC companies. In

conjunction with this sale, a new European subsidiary of UPC Group has been established and is pursuing several hundred megawatts of wind energy projects in Europe and North Africa, including additional projects in Italy".

[Ex-partner of Boston wind exec charged - Italians nab soccer club president in energy fraud](http://www.bostonherald.com/business/general/view.bg?articleid=1212055)

From: Rob Pforzheimer [redacted]

Sent: Wednesday, April 10, 2013 6:17 PM

Subject: Commissioners confirm damage to sleep and health * MEDIA RELEASE

FYI - Press Release from the Waubra Foundation

MEDIA RELEASE

VCAT Commissioners confirm evidence of damage to sleep and health from operating wind turbines

(see attached)

“There is evidence before the Tribunal that a number of people living close to wind farms suffer deleterious health effects. The evidence is both direct and anecdotal. There is a uniformity of description of these effects across a number of wind farms, both in southeast Australia and North America. Residents complain of suffering sleep disturbance, feelings of anxiety upon awakening, headaches, pressure at the base of the neck and in the head and ears, nausea and loss of balance.”
para 117

“In some cases the impacts have been of such gravity that residents have been forced to abandon their homes.”
para 118

“On the basis of this evidence it is clear that some residents who live in close proximity to a wind farm experience the symptoms described, and that the experience is not simply imagined”.



The Waubra Foundation.

Reg. No. A0054185H
ABN: 65 801 147 788

Contact: CEO Dr Sarah Laurie

MEDIA RELEASE

VCAT Commissioners confirm evidence of damage to sleep and health from operating wind turbines

“Victorian Civil Administrative Tribunal Commissioners, Mr M Wright QC and Mr A Liston have made the following remarks in orders given on 4th April, 2013.¹ Paragraphs 116 -118 of their orders state the following:

para 116

“There is evidence before the Tribunal that a number of people living close to wind farms suffer deleterious health effects. The evidence is both direct and anecdotal. There is a uniformity of description of these effects across a number of wind farms, both in southeast Australia and North America. Residents complain of suffering sleep disturbance, feelings of anxiety upon awakening, headaches, pressure at the base of the neck and in the head and ears, nausea and loss of balance.”

para 117

“In some cases the impacts have been of such gravity that residents have been forced to abandon their homes.”

para 118

“On the basis of this evidence it is clear that some residents who live in close proximity to a wind farm experience the symptoms described, and that the experience is not simply imagined”.

The Commissioners have made a pragmatic and carefully considered decision to wait until more information is available about the damage to sleep and health from the larger wind turbines similar to those being proposed at Infigen’s Cherry Tree Wind Development, and will reconsider the available evidence in six months time” stated the Waubra Foundation’s CEO, Dr Sarah Laurie. “They are obviously taking the health concerns very seriously, as they should be”.²

“AGL & New Zealand Government’s Meridian Macarthur Wind Development in Western Victoria provides the latest example of large industrial wind turbines negatively impacting on nearby residents’ sleep,

health and quality of life. Reports coming directly from residents at Macarthur already show adverse impacts on citizens of all ages,³ including infants, and at distances out to at least 6km from the 140 VESTAS V 112 3MW turbines. The wind development will be officially opened on Friday 12th April, 2013.

At least one family from Macarthur has completely abandoned their home due to sleep disturbance from wind turbine noise and several other neighbours take refuge away from their homes on a regular basis to prevent the cumulative impacts of turbine noise on sleep quality from completely destroying their health. These impacts were entirely predictable and the inevitable consequence of siting large industrial wind turbines too close to homes and workplaces”, she said.

Predictably, when asked about the damage to human health from wind turbines, the VESTAS CEO Ditlev Engel on ABC radio’s PM program stated in his interview with ABC journalist Sarah Clarke “we have never seen any evidence that that is true”.⁴ These comments are reminiscent of the denials of “Big Tobacco”, James Hardie, and the pharmaceutical company, which manufactured Thalidomide. The senior executives of all these corporations had evidence of the harm their products caused, but disputed it until the end.

VESTAS CEO Mr Engel is well aware of the evidence for damage to health from low frequency noise emitted by his company’s turbines, and the problems this poses for the wind industry globally. Indeed Mr Engel was instrumental in successfully lobbying the Danish Government Minister for the Environment to weaken the proposed guidelines regulating low frequency noise, to “protect Danish jobs”, which comes at the direct expense of the health of Danish citizens.⁵

This outcome provoked a very pointed public response from Professor Henrik Moller,⁶ a well respected Danish Acoustician, whose peer reviewed published research⁷ two years ago showed definitively that larger turbines emit more sound energy proportionately down in the lower frequencies. This predictably causes known sleep and health problems for the neighbours, just as is being reported at Macarthur and Waterloo wind developments in Australia, where VESTAS 3MW wind turbines have been used.

“This ongoing denial of the existing evidence of damage to human sleep and health is destroying the global wind industry’s social licence to operate”, said Dr Laurie. “We commend the VCAT commissioners for adopting a precautionary approach, just as the National Health and Medical Research Council advocated, based on the limited but compelling evidence of serious damage to long term physical and mental health.

“The Commissioners have clearly taken notice of the recent case series of Dr Bob Thorne,⁸ who found that neighbours to two Victorian wind projects after two years exposure to operating wind turbines had health indicators worse even than hospital inpatients. Some of those residents had abandoned their homes, because of the severity of their health and sleep problems.”

“We call on all respective State and Federal Governments, to take notice of this important recent legal development, and urgently facilitate properly conducted research, recommended by the first Federal Senate inquiry⁹ nearly 2 years ago, so that the VCAT commissioners and other planning jurisdictions do not continue to operate in what the VCAT Commissioners have described as a “knowledge vacuum”.

“The suffering of the residents at Macarthur and all the other wind developments where serious health damage is being reported must be fully and directly investigated objectively, with full spectrum acoustic measurements and concurrent clinical investigations, such as “in home” sleep studies.”

“The global wind industry is well aware of NASA research from 1985¹⁰ documenting the presence of wind turbine generated infrasound out to at least 10km”, Dr Laurie stated. There is no evidence that chronic exposure to these infrasound and low frequencies generated by large wind turbines is safe, despite the claims of the VESTAS CEO, and more engineering and health professionals speaking out publicly.¹¹ If this were a pharmaceutical, adequate safety tests would have been done before it was released onto the market. *Why are the rules relating to the health safety of the public different for the wind industry?*



References

1. Orders given by VCAT Commissioners Wright and Liston, on 4th April, 2013, in the matter of the proposed Cherry Tree Wind development. Orders can be accessed from: <https://www.wind-watch.org/documents/six-month-adjudgment-order-to-study-health-effects/>
2. Dr Laurie's statement of evidence to the Tribunal can be accessed from: <https://www.wind-watch.org/documents/statement-of-dr-sarah-elisabeth-laurie/>
3. See for example the following footage and links relating to Macarthur residents:
<http://www.castlemainian.com/new2/wind-farm-report-on-the-project/>
<http://stopthesethings.com/2013/02/13/a-voice-from-the-wilderness-of-macarthur-wind-farm/>
<http://stopthesethings.com/2013/02/10/open-mind-changed-mind-changed-world/> For footage of residents describing what it is like to live beside a poorly sited wind turbine development too close to residents elsewhere in Victoria, Australia, see
<http://stopthesethings.com/2013/03/24/cape-bridgewater-sonia/>
<http://stopthesethings.com/2013/04/04/cape-bridgewater-melissa-and-rikki/>
4. Interview between ABC Journalist Sarah Clarke and CEO of VESTAS Ditlev Engel on ABC radio's PM program, 9th April, 2013 <http://www.abc.net.au/pm/content/2013/s3733248.htm>
5. The successful lobbying letter from VESTAS CEO Ditlev Engel to the Danish Minister for the Environment, Karen Ellemann which resulted in a win for the wind industry at the direct expense of the health of Danish citizens <http://www.wind-watch.org/documents/letter-from-vestas-worried-about-regulation-of-low-frequency-noise/> . See also the following for further background: <http://www.epaw.org/media.php?article=pr6>
6. The reported comments of Professor Henrik Moller concerning the changes to the Danish regulations: <http://www.epaw.org/echoes.php?article=n71>
7. Moller & Pedersen "Low Frequency Noise from Large Turbines" J Acoustical Society America 2011 129: 3727 – 3744 <http://www.wind-watch.org/documents/low-frequency-noise-from-large-wind-turbines-2/>
8. Dr Bob Thorne's case series from two Victorian wind developments comprised his submission to the second Australian Federal Senate inquiry, and can be accessed from the following weblink directly: <https://www.wind-watch.org/documents/wind-farm-generated-noise-and-adverse-health-effects/>
9. The seven recommendations from the first Australian Federal Senate inquiry are reproduced in the orders from the VCAT Commissioners in the Cherry Tree decision at <https://www.wind-watch.org/documents/six-month-adjudgment-order-to-study-health-effects/>
10. Willshire, William 1985 NASA " Long Range Downwind Propagation of low frequency sound" <https://www.wind-watch.org/documents/long-range-downwind-propagation-of-low-frequency-sound/> For recent acoustic data from modern upwind turbines showing infrasound and low frequency noise propagation out to 8km see Fig 11 of Steven Cooper's report at <https://www.wind-watch.org/documents/are-wind-farms-too-close-to-communities/>
11. List of concerned professionals: <http://www.epaw.org/documents.php?article=ns53>

10th April, 2013

From: Rob Pforzheimer
Sent: Thursday, April 11, 2013 9:56 AM

Subject: Fairhaven official apologizes for turbine 'suffering'

Unlike Sheffield - "The town has not given up its authority over the health and welfare of its citizens,"

<http://www.southcoasttoday.com/apps/pbcs.dll/article?AID=/20130410/NEWS/304100335>

Fairhaven official apologizes for turbine 'suffering'

Murphy said he hopes to provide some relief for the 57 families who have filed complaints about the turbines at the wastewater treatment plant on Arsene Street, including the noise they generate. FAIRHAVEN — In a move that brought some in the audience to tears, Selectmen Chairman Charlie Murphy Tuesday night apologized to residents and called for a meeting of selectmen and the health board to discuss shutting down the town's two wind turbines at night.

April 10, 2013 12:00 AM

"I am sorry for all of your suffering and what you have been through," he said. "I realize that many of you tried to speak out and were denied a place on our agenda, and I thank you for your persistence." Said Murphy, "I feel everyone in town should get a good night's sleep."

About 10 members of Windwise, a group that opposes the turbines, attended the meeting and a few of them burst into tears at Murphy's announcement. It was not on the agenda and he said that neither Selectman Bob Espindola nor Selectman Geoffrey Haworth were aware that it was coming prior to the meeting.

Murphy's comments mark a significant change in the town leadership's opinion of the turbines, in part brought on by the April 1 town election in which Haworth ousted former Selectmen Chairman Brian Bowcock.

Haworth ran for office on a platform that he would be more willing to listen to turbine complaints than his opponent. Espindola, who won his seat in 2012, ran for office as the Windwise candidate.

Reached by phone Tuesday night, turbine developer Sumul Shah declined to comment.

At the meeting, Town Counsel Thomas Crotty said the town still has jurisdiction over the turbines despite not owning them.

"The town has not given up its authority over the health and welfare of its citizens," he said. He also cautioned the board not to "embroil" itself in a costly action and to work with Shah if possible.

Any decision regarding the turbines would need to be made by the Board of Health, which is currently in limbo because the results of its April 1 election remain unresolved.

From: Pamela Arborio [redacted]

Sent: Thursday, April 11, 2013 1:55 PM

Subject: Transmission troubles - News Features

<http://portland.thephoenix.com/news/76606-transmission-troubles/?page=1#TOPCONTENT>

From: Valerie Desmarais

Sent: Thursday, April 11, 2013 10:46 AM

Subject: Fw: biofinder map

Good Day,

I have attached the ANR Biofinder report. The highlighted area represents the land being considered by eolian energy for a 20+ turbine wind energy plant.

Considering the high scores it receives in component concentration of biodiversity in 13 categories as identified by the Vermont ANR, it appears that this is not a suitable site for industrial wind development.

Sincerely,

Valerie Desmarais

Burke, Vermont



| <u>Component</u> | <u>Acres</u> |
|--|--------------|
| A1 Surface Waters & Riparian Areas Lakes, ponds, rivers, & streams from the Vermont Hydrological dataset. Riparian area extent was modeled using Land Type Associations. | 2673.17 |
| L1 Habitat Blocks Areas of natural cover (mostly forest) surrounded by roads and development. These were prioritized for their biological value. | 4491.89 |
| L3 Rare Physical Landscapes Physical Landscape rarity based on biophysical characteristics (topography, geology and other physical conditions) and classed as Land Type Associations). | 2114.41 |
| L4 Representative Physical Landscapes Best examples of common physical landscapes based on biophysical characteristics (topography, geology and other physical conditions) and classed as Land Type Associations . | 2333.59 |
| L5 Connecting Lands (<2000ac) Assessment of the quality of functional connections among habitat vital to species long-term persistence. Smallest unit of the landscape-scale connectivity network, important for far-ranging animal species across the Northern Appalachians. | 32.46 |
| L7 Anchor Blocks (>10,000ac) Assessment of the quality of functional connections among habitat vital to species long-term persistence. Largest unit of the landscape-scale connectivity network, important to far-ranging animal species across the Northern Apalachians. | 4491.89 |
| L8 Riparian Connectivity Surface waters and riparian areas filtered by undeveloped land use that wildlife may use for movement. | 2668.2 |
| SN1 Rare Species Rare, threatened, and endangered plants and animals tracked by VFWD. Vernal pools where the rare Jefferson Salamander has been found. Bicknell's Thrush populations mapped to the extent of Montane Spruce Fir natural community boundary. | 683.66 |
| SN2 Uncommon Species Uncommon Species tracked by VFWD. | 214.64 |

**Component
Concentration**

- Tier 1 - Greatest
- Tier 2 - Very High
- Tier 3 - High
- Tier 4 - Moderate
- Tier 5 - Low
- Tier 6 - Insufficient data



| Component | Acres |
|--|--------------|
| SN3 Rare Natural Communities Rare natural communities tracked by VFWD. | 668.33 |
| SN4 Uncommon Natural Communities Uncommon natural communities tracked by VFWD. | 3877.51 |
| SN5 Common Natural Communities Excellent example (condition and size) of a common natural communities tracked by VFWD. | 169.32 |
| SN8 Wetlands All wetlands from Vermont Significant Wetland Inventory. | 1692.52 |

From: Annette Smith
Sent: Thursday, April 11, 2013 5:29 PM

Subject: Testimony on S.30 to House NRE, April 10, 2013

VCE, Annette Smith testimony to House Natural Resources and Energy Committee on S.30, April 10, 2013
http://vce.org/VCE_AnnetteSmith_S.30_HouseNRE_041013.mp3 (1 hr. 15 min.)

Handouts:

http://www.vce.org/WindIssuesMenu_Handout.pdf
http://www.vce.org/Renewables_GridIntegration.pdf

Dr. Teddi Lovko testimony to House NRE Committee on S.30, April 10, 2013
http://www.vce.org/Dr.TeddiLovko_HRNE_S30_041013.mp3 (45 minutes)

Annette Smith
Executive Director
Vermonters for a Clean Environment, Inc.



From: Rob Pforzheimer
Sent: Thursday, April 11, 2013 11:02 AM

Subject: Comparing the costs of intermittent and dispatchable electricity generating technologies

Documents <http://www.windaction.org/documents/38029>

Comparing the costs of intermittent and dispatchable electricity generating technologies

February 9, 2011 by Paul L. Joskow

Summary:

Economic evaluations of alternative electric generating technologies typically rely on comparisons between their expected life-cycle production costs per unit of electricity supplied. The standard life-cycle cost metric utilized is the "levelized cost" per MWh supplied. This paper demonstrates that this metric is inappropriate for comparing intermittent generating technologies like wind and solar with dispatchable generating technologies like nuclear, gas combined cycle, and coal. Levelized cost comparisons are a misleading metric for comparing intermittent and dispatchable generating technologies because they fail to take into account differences in the production profiles of intermittent and dispatchable generating technologies and the associated large variations in the market value of the electricity they supply.

ABSTRACT

Economic evaluations of alternative electric generating technologies typically rely on comparisons between their expected life-cycle production costs per unit of electricity supplied. The standard life-cycle cost metric utilized is the "levelized cost" per MWh supplied. This paper demonstrates that this metric is inappropriate for comparing intermittent generating technologies like wind and solar with dispatchable generating technologies like nuclear, gas combined cycle, and coal. Levelized cost comparisons are a misleading metric for comparing intermittent and dispatchable generating technologies because they fail to take into account differences in the production profiles of intermittent and dispatchable generating technologies and the associated large variations in the market value of the electricity they supply. Levelized cost comparisons overvalue intermittent generating technologies compared to dispatchable base load generating technologies. These comparisons also typically overvalue wind generating technologies compared to solar generating technologies. Integrating differences in production profiles, the associated variations in the market value of the electricity at the times it is supplied, and the expected life-cycle costs associated with different generating technologies is necessary to provide meaningful economic comparisons between them. This market-based framework also has implications for the appropriate design of procurement auctions created to implement renewable energy procurement mandates, the efficient structure of production tax credits for renewable energy, incentives for and the evaluation of electricity storage technologies and the evaluation of the additional costs of integrating intermittent generation into electric power networks.

INTRODUCTION AND SUMMARY

This paper makes a very simple point regarding the proper methods for comparing the economic value of intermittent generating technologies (e.g. wind and solar) with the economic value of traditional dispatchable generating technologies (e.g. CCGT, coal, nuclear). I show that the prevailing approach that relies on comparisons of the "levelized cost" per MWh supplied by different generating technologies, or any other measure of total life-cycle production costs per MWh supplied, is seriously flawed. It is flawed because it effectively treats all MWhs supplied as a homogeneous product governed by the law of one price. Specifically, traditional levelized cost comparisons fail to take account of the fact that the value (wholesale market price) of electricity supplied varies widely over the course of a typical year. The difference between the high and the low hourly prices over the course of a typical year, including capacity payments for generating capacity available to supply power during critical peak hours, can be up to four orders of magnitude (Joskow 2008). It is important to take wholesale market price variations into account because the hourly output profiles, and the associated market value of electricity supplied, of intermittent generating technologies and competing dispatchable generating technologies can be very different. Moreover, different intermittent generating technologies (e.g. wind vs. solar) also can have very different hourly production and market value profiles, and indeed, specific

intermittent generating units using the same technology (e.g. wind) may have very different production profiles depending on where they are located.³ Wholesale electricity prices reach extremely high levels for a relatively small number of hours each year (see Figure 1) and generating units that are not able to supply electricity to balance supply and demand at those times are (or should be) at an economic disadvantage. These high-priced hours account for a large fraction of the quasi-rents that allow investors in generating capacity to recover their investment costs (Joskow 2008) and failing properly to account for output and prices during these critical hours will lead to incorrect economic evaluations of different generating technologies.

In a nutshell, electricity that can be supplied by a wind generator at a levelized cost of 6¢/KWh is not "cheap" if the output is available primarily at night when the market value of electricity is only 2.5¢/KWh. Similarly, a combustion turbine with a low expected capacity factor and a levelized cost of 25¢/KWh is not necessarily "expensive" if it can be called on reliably to supply electricity during all hours when the market price is greater than 25¢/KWh.

I use a simple set of numerical examples that are representative of actual variations in production and market value profiles to show that intermittent and dispatchable generating technologies with identical levelized total costs per MWh supplied can have very different economic values due to differences in the economic value of the electricity they produce. I will also argue that the failure of life-cycle cost comparisons between intermittent and dispatchable generating technologies to yield meaningful comparisons of economic value does not plague comparisons between different dispatchable "base load" generating technologies for which levelized cost comparisons were originally developed and applied. This is the case because the economic value of the output produced by different dispatchable base load generating technologies is likely to be the same because their output profiles are likely to be the same. The extension and use of levelized cost comparisons to intermittent generation has been a mistake and tends implicitly to overvalue intermittent generating technologies compared to dispatchable alternatives.⁴ This problem is easily remedied by integrating generation output profiles for each technology with the associated expected market value of the output that will be supplied by each technology along with their respective lifecycle production costs.

Most of the current work on intermittent generating technologies, especially wind, has focused on the short-term network operating challenges and associated costs created by rapid swings in output, wide variations in output from one day to the next, and the difficulties of controlling output consistent with balancing supply and demand efficiently and meeting network reliability criteria, in the context of expected large scale entry of wind and/or solar generating capacity. That work assumes that large amounts of intermittent generating capacity will seek to be interconnected to transmission (or distribution) networks due to public policies aimed at promoting the rapid increase of intermittent renewable electricity supplies. It then examines the operational challenges and some of the additional costs that adding large quantities of intermittent renewable generation to the network entails. This work is reasonably well advanced. Though more needs to be done, the methods for evaluating these costs have matured and it seems to be fairly clear that while these short run network integration costs can be significant, they are typically a relatively small fraction of the total cost of intermittent generation.

This paper does not seek to extend the existing work on short-run network integration costs but focuses instead on a more basic set of questions. How do we properly measure the economic value of additional investments in intermittent generating technologies compared to dispatchable generating technologies before taking account of short run and long run network integration costs?⁶ Among other things, appropriate methods to answer this question are necessary: (a) to properly evaluate the costs and benefits of subsidies and mandates aimed at promoting certain intermittent generating technologies and (b) since the promotion of intermittent renewable technologies is often motivated by a desire to reduce CO₂ emissions, to properly measure the costs per ton of CO₂ avoided by policies that favor intermittent generating technologies like wind and solar. Applying more accurate evaluation frameworks makes it possible transparently to compare the cost of reducing CO₂ emissions using renewable energy subsidies and mandates with the cost of reducing CO₂ emissions in other ways (e.g. promoting energy efficiency, investments in nuclear power). Though it is not the focus of this paper, the proposed "market valuation" enhancement to levelized cost comparisons that I will propose also provides a consistent framework for evaluating the short run and long run technical and economic issues associated with integrating large amounts of intermittent generating technology into electric power networks as well since the resolution of these issues must take into account the output profiles of intermittent generating technologies as

well. Finally, I do not opine here on whether the policies for promoting renewable generating technologies are good or bad, but focus on the improving the methods for evaluating their costs and benefits.

Web link: <http://economics.mit.edu/files/6317>

Download File(s):

[Joskow Intermittent REVISED 2-10-11_CLEAN.pdf](#) (573.78 kB)

From:

Sent: Thursday, April 11, 2013 11:15 AM

Subject: It looks like wind turbine developers are trying to push an MOU to "develop" Seneca Mountain.

All,

It looks like wind turbine developers are trying to push an MOU to "develop" Seneca Mountain.

4/10/2013 Caledonian Record

Residents Concerned With LED's Role In Wind Development Amy Ash Nixon Staff Writer

NEWARK -- Residents, who tried to prohibit an industrial wind project, are concerned about the release on Monday of a Memorandum of Understanding between Lyndonville Electric Department (LED) and Seneca Mountain Wind (SMW), LLC - a wind project being proposed by two out of state developers.

The Memorandum of Understanding (MOU) will be presented to the Lyndonville Village Trustees Monday night, where LED Manager Ken Mason will seek permission to sign the MOU with the wind project developers.

For Noreen Hession, an opponent to the SMW project, the draft MOU raises two main questions, she said. "I thought we were told that a public utility [like LED] can use eminent domain for themselves to transmit power, but for a private company like SMW then LED has the option [not the requirement] to give them permission to use their transmission lines. So my question to LED is where in the statute are they reading that their cooperation at this level is required?"

Hession said her second question is, "What does the MOU give to SMW [and LED] that they don't already have?"

Hession responded to Mason in an e-mail, thanking him for releasing the draft of the MOU, and asking him and the trustees a handful of questions, mainly pertaining to LED's requirements to work with the would-be wind project developer under Rule 5.500 of the Vermont Public Service Board, which requires a publicly-held utility to cooperate with an energy generator such as the wind project now on the drawing board.

She asks, "Is LED legally required to do the permitting referenced in the draft MOU? Is LED legally required to allow SMW to use its existing right of ways?" She also presses LED for "What is meant by 'expanded rights of way?' " referenced in the MOU. "Under what conditions might we expect LED (and SMW) to use 'expanded rights of way?' "

Newark last September approved a revised town plan that bans industrial wind farms, an amendment built into the revised town plan by the planning commission, supported by voters at a special meeting, and supported by the town's select board. Brighton, through a poll of its residents and property owners, has taken a position against a wind project.

In Ferdinand, the Unified Towns and Gores Board of Governors has had several visits paid to it recently by SMW developers, seeking to discuss a host town agreement and payments directly to property owners as part of a courting happening there. The SMW project has been pared down in size from its original 90 MW size to 60 now, the developers have confirmed.

Kim Fried, chairman of Newark's Planning Commission, wrote to Mason late Monday evening, with the draft of the MOU between LED and SMW now public, saying he was "a little astounded by the contents of this document ... I thought I understood the basics of Rule 5.500 and the fact that LED had an obligation to cooperate with a proposed interconnect request, but this sounds like LED is taking on the role of a sub contractor to SMW, LLC."

Of the MOU noting that the agreement with SMW could be "potentially beneficial to LED," Fried asks, "Is this the incentive for LED to take on the burden of the above construction project? If so, has a financial analysis been completed? Is it available to the public?"

Fried stated, "I think that LED and the Trustees should not sign this MOU without serious consideration and revision. I also think that no further agreements should be signed until the issue of grid stability has been answered."

From: Rob Pforzheimer
Sent: Monday, April 15, 2013 9:29 AM

Subject: The dis-economies of wind power

The dis-economies of wind power <http://www.windaction.org/opinions/38057>

To produce useable wind-generated electricity, other obstacles must be overcome. Perhaps most importantly, wind power is intermittent ...Therefore, reliable back-up power generating facilities must be on hand and ready to fill in when wind generation is absent. These realities require duplicate capital investment and, to some extent, duplicate operating expenses.

April 14, 2013 by E. Tylor Claggett in Delmarva NOW

Wind power has been a part of the human experience for thousands of years and was a viable source of energy when alternatives were unavailable. During the last several decades, much attention has been given to this old stand-by as a way to produce environmentally friendly electrical power.

However, alternative forms of power to generate electrical energy are available and are much cheaper when all of the costs are taken into account. The reason hydro, coal, gas and nuclear sources have been predominate for generating electrical energy is they are cheaper. Low cost will prevail in markets free of artificial influences. Recently, the latest wind technology has evolved to generate with a direct current format, then convert to alternating current via inverters. This format avoids many of the mechanical difficulties of generating at 60 cycles per second (standard for the grid), such as 3,600-rpm generators being powered by much slower wind turbines through elaborate step-up gearing systems. Such gearing systems require constant maintenance and are significantly less than 100 percent efficient.

During the past few decades, inverters have enjoyed improved efficiencies, but they, too, are , not 100 percent efficient. This means a portion of the electricity generated by wind is lost in the conversion to alternating current, just like with gearing systems.

To produce useable wind-generated electricity, other obstacles must be overcome. Perhaps most importantly, wind power is intermittent, depending on whether the wind is blowing. Therefore, reliable back-up power generating facilities (plus the associated switch gear) must be on hand and ready to fill in when wind generation is absent.

These realities require duplicate capital investment and, to some extent, duplicate operating expenses. Consequently, it is an apples-to-oranges comparison when an installed megawatt of wind generation infrastructure is compared to an installed megawatt of conventional generation infrastructure. Another way to look at wind generation installations is as expensive, unreliable (intermittent) substitute fuel for conventional generation facilities.

In this writer's opinion, the proper apples-to-apples comparison is the total cost of wind-generated electrical energy compared to the value of the primary fuel (oil, gas, coal or whatever) displaced by wind-generated electricity. And to accommodate the unwanted production of greenhouse gases associated with fossil fuels, the estimated costs of these undesirable externalities can be subtracted from the cost of wind-generated electricity. If this is the accepted method for judging economic viability, wind power loses by multiples.

So, the question is how much, and for how long, is the public willing to pay to subsidize wind energy? Is the public willing to pay two and three times as much for a wind-generated kilowatt-hour than for a traditionally generated kilowatt-hour? Are they willing to do it forever?

I think not, especially if the public is aware of the many differences between conventionally generated and wind-generated electricity and it is properly informed of all of the costs of wind energy as well as the appropriate cost

E. Tylor Claggett is a professor of finance with Salisbury University's Perdue School of Business.

Web link: <http://www.delmarvanow.com/article/20130414/OPINIO...>

From: Jim Morey

Sent: Monday, April 15, 2013 11:14 AM

Subject: Further information for the Nat Res Com on Property Value Impacts of IWTs

Committee Members,

Thank you again for the opportunity to present information on the critical issue of Vermonter's property rights. I understand there are some continuing questions about the studies on the subject of property values. In this Email, I have reviewed some of the points I presented and expanded on some key points. I have attached the list of studies I cited, the follow-on presentation by Ben Hoen, the DOE contractor, suggesting review of property value actions and a property value guarantee format written by a real estate attorney in Hammond, New York.

The first study I referred to as quoted by wind developers is: **The Impact of Wind Power Projects on Residential Property Values in the United States**

The Federal DOE, Office of Renewable Energy, Wind Technologies Program paid for the study. They have a staff 1,700 people, all promoting these programs. The Lawrence Berkeley National Laboratory is a 100% government funded organization; Ben Hoen is a graduate student who had a grant to travel around the country and publish a report supporting the OREWTP.

This is claimed as a benchmark study as there are 7,459 transactions studied. Mr. Hoen's research was very limited on several crucial points-very few sales under 1 mile to towers (1.7%), less than 1% houses with Premium Views, less than 1% with Extreme Views of towers (Hoen's parameters-not mine), all of which apply to Windham and many Vermont towns. Most of his study was done in the south or west of the US, not New England-totally different population density, land values and real estate markets. Of the sales reviewed, 5258 were from Illinois west. His study is flawed by not considering properties that were bought out by developers, properties not sold at all and days on market due to wind farms, particularly low priced properties, properties with some land, etc. He is not an appraiser, not a professor. This study was published in Dec. 2009. In conclusions he states, "the analysis cannot dismiss the possibility that individual homes have been or could be negatively impacted"

Even he apparently suffered an attack of conscience, as in his May 5, 2010: **Impacts on Residential Property Values Near Wind Turbines:** presentation to NEWEEP, a DOE seminar series, he says on page 29, "Do these results imply that property value effects near turbines do not exist? NO." He also states, "So, given these results, are property values something stakeholders should be concerned about? OF COURSE!". On page 32, I quote "Property Value Risks Will Persist Unless They Are Measured, Mitigated and Managed" and "Offer some combination of neighbor agreements/incentives and/or property value guarantees (e.g. Dekalb County, IL) to nearby homeowners as are economically tenable and legally workable". When I asked Mr. Hoen about these statements on 11 January 2013, he replied he did not want to discuss them as "he had already got in enough trouble over them." Please see the attached presentation.

That the Wind developers and their associates have to refer to such a transparent attempt to prove a point, that is followed up in 6 months by disclaimers by the author is indicative of the quality of information supplied by their lobby. I would hope the House Committee looks more deeply into the reports from unbiased and professional sources as a basis for action. I recommend the studies by Professor Heintzelman of Clarkson University, which include data from 11,369 sales in northern New York. He has informed me that he would be willing to review these studies with state legislators. In addition, the reports of Mr. McCann, a certified appraiser are very complete, with a significant amount of background experience. I again offer to debate this information with the wind lobby's representatives.

I will close by mentioning a consideration of the fact that property and developmental rights are valuable commodities that have a history of being financially compensated in Vermont. The purchase of development rights by the Vermont Land Trust as conservation easements is noted as an example by the PSB on page 101 of the CPG for GMP's development on Lowell Mountain. The uncompensated taking of those rights by wind developers, degrading landowners ability to develop, or sell their property at full value is the heart of this controversy that must be Measured, Mitigated and Managed in our energy legislation.

Thank you for your consideration of the financial futures of hundreds of Vermonters.

Jim Morey
Wild-Life-Styles, Inc.



Impacts on Residential Property Values Near Wind Turbines:

An Overview of Research Findings and Where to Go From Here

Ben Hoen

Lawrence Berkeley National Laboratory

NEWEEP Webinar

May 5, 2010

This presentation was made possible in part by funding by the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Wind & Hydropower Technologies Program



Impacts on Residential Property Values Near Wind Turbines

- Wind Energy and Property Values
 - Overview of Subject
 - Previous Literature
 - Berkeley Lab Research
 - Other Disamenity Research
- Where To Go From Here



Proximity to and Views of Environmental (Dis)Amenities Can Impact Property Values



- This linkage is well studied generally, but not for wind facilities
- The home/land is often the largest asset in resident's portfolio
- Prior to wind facility construction, impacts (e.g., visual and auditory) to individual properties are difficult to quantify

Aesthetics and Property Values Rank as Key Concerns for Wind Stakeholders

“Aesthetic perceptions, both positive and negative, are the strongest single influence on individuals’ attitudes towards wind power projects.”
(Warren, 2005, p. 853)

US developers rank aesthetics & property values as the #1 and #3 concerns of those in opposition to wind development (Paul, 2006)

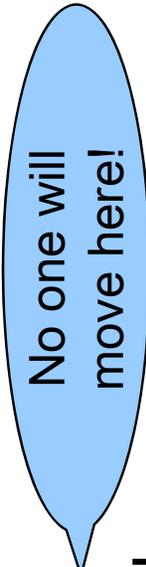
100% and 85% of those opposed to offshore wind development believe aesthetics and property values, respectively, will be adversely impacted
(Firestone et. al., 2007)

Having structures on the Vermont hilltops was considered a “big disadvantage” by the majority of those surveyed before the Searsburg, VT wind facility was erected (Palmer, 1997)



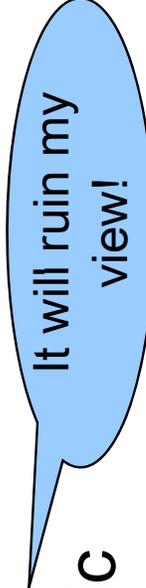
Property Value Concerns for Wind Energy Fall Into Three Potential Categories

1. Area Stigma: Concern that rural areas will appear more developed



No one will move here!

2. Scenic Vista Stigma: Concern over decrease in quality of scenic vistas from homes



It will ruin my view!

3. Nuisance Stigma: Concern that factors that occur in close proximity will have unique impacts



I won't be able to live in my home!

Each of these effects could impact property values;
none are mutually exclusive

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Relatively Few Existing Wind and Property Studies

- **Variety of methods used**, from surveys to sales analyses, with varying levels of sophistication
- **Results are diverse**, and in many instances unpersuasive due to limitations in data and methodology
- Variety of methods and sample type makes **comparisons between results difficult**

| Document Type Author(s) | Year | Number of Transactions or Respondents | Before or After Wind Facility Construction Commenced | Area Stigma | Scenic Vista Stigma | Nuisance Stigma |
|---|------|---------------------------------------|--|-------------|---------------------|-----------------|
| Homeowner Survey | | | | | | |
| Haughton et al. | 2004 | 501 | Before | - * | - * | |
| Goldman | 2006 | 50 | After | none | | |
| Firestone et al. | 2007 | 504 | Before | - * | - * | |
| Bond | 2008 | ~300 | After | | - ? | - ? |
| Expert Survey | | | | | | |
| Grover | 2002 | 13 | After | none | | none |
| Haughton et al. | 2004 | 45 | Before | - * | - * | |
| Khatri | 2004 | 405 | Before [‡] | - ? | | - ? |
| Goldman | 2006 | 50 | After | none | | none |
| Crowley | 2007 | 42 | After | none | none | none |
| Kielisch | 2009 | 57 | Before [‡] | | | - ? |
| Transaction Analysis - Simple Statistics | | | | | | |
| Jerabek | 2001 | 25 | After | | | none |
| Jerabek | 2002 | 7 | After | | | none |
| Starzinger et al. | 2003 | 24,000 | After | none | | |
| Beck | 2004 | 2 | After | | | none |
| Poletti | 2005 | 187 | After | none | | none |
| DeLacy | 2005 | 21 | Before [‡] | none | | |
| Goldman | 2006 | 4 | After | none | | |
| Poletti | 2007 | 256 | After | none | | none |
| McCann | 2008 | 2 | After | | | - ? |
| Kielisch | 2009 | 103 | After | | | - ? |
| Schneider | 2010 | 2,330 | Before | - * / none | | |
| Transaction Analysis - Hedonic Model | | | | | | |
| Jordal-Jorgensen | 1996 | ? | After | | | - ? |
| Hoehn | 2006 | 280 | After | | none | |
| Sims & Dent | 2007 | 919 | After | | | - * |
| Sims et al. | 2008 | 199 | After | | - / + * | |
| Hoehn, Wisser et al. | 2009 | 7,459 | After | none | none | none |
| "none" indicates the majority of the respondents do not believe properties have been affected (for surveys) or that no effect was detected at 10% significance level (for transaction analysis) | | | | | | |
| "- ?" indicates a negative effect without statistical significance provided | | | | | | |
| "- *" indicates statistically significant negative effect at 10% significance level | | | | | | |
| "- / + *" indicates positive and negative statistically significant effects at 10% significance level | | | | | | |
| ‡ Sales were collected after facility announcement but before construction | | | | | | |

Conclusions Drawn From Previous Literature on Wind Energy and Property Values

- Wind facilities have been **predicted to negatively impact property values** by some (e.g., Haughton; Firestone et al.), sometimes by as much as 24-43% (Kielisch)
- **Many experts** (e.g., appraisers, assessors, realtors) **have not experienced notable reductions** in value after construction (Grover; Goldman; Crowley)
- **Large impacts (e.g., >10%) have failed to materialize** when actual sales are investigated after construction (Poletti; Hoen; Sims & Dent; Sims et al.) **except for one study of land sales** (Kielisch)
- **Impacts**, to the degree that they exist, **are most likely very near turbines** (e.g., within ½ mile where they can be heard and seen) (McCann) and occur **after announcement but prior to construction** (Schnieder)



Limitations of Existing Research

- **Many studies have relied on surveys** of homeowners or real estate professionals, rather than quantifying real impacts based on market data
- **Most studies have relied on simple statistical techniques** that have limitations and that can be dramatically influenced by small numbers of sales transactions or survey respondents
- **Most studies have used small datasets** that are concentrated in only one wind project study area, making it difficult to extrapolate findings
- **Many studies have not reported the statistical significance** of their results, making it difficult to determine if those results are meaningful
- **Many studies have concentrated on Area Stigma**, and have ignored Scenic Vista and/or Nuisance Stigma
- **Only a few studies have included field visits** to homes to determine wind turbine visibility and collect other important information
- **Only two studies have been published** in peer-reviewed journals



Impacts on Residential Property Values Near Wind Turbines

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Berkeley Lab Research Approach Responds to Limitations of Previous Work

- **Conduct literature review** of previous wind / property value studies and wind facility public acceptance surveys, as well as potentially analogous studies on other disamenities (e.g. roads, power lines, power plants)
- **Collect large amount of data** on residential sales transactions occurring both pre- and post-construction surrounding a **representative sample** of wind facilities at **multiple locations** in the U.S.
- **Visit each home** to determine wind turbine visibility and to collect other important information about the home (e.g., the quality of the scenic vista)
- **Use multiple statistical models** to explore magnitude and statistical significance of potential effects, relying primarily on **hedonic model**
- **Test for the presence of all three stigmas** – Area Stigma, Scenic Vista Stigma, and Nuisance Stigma
- **Rigorously analyze** the data, culminating in an LBNL report and at least one journal paper



Berkeley Lab Project Involves Most Data-Rich and Comprehensive Analysis To Date

Research Questions

- 1) Is there evidence that views of turbines measurably affect sales prices?
- 2) Is there evidence that proximity to turbines measurably affect sales prices?
- 3) Do the results change over time, and are there other observable impacts?

Relevance

Provides stakeholders in siting/permitting processes greater confidence in the likely effects of proposed wind energy facilities, allowing greater consensus on often-contentious setback requirements, viewshed valuations and non-participating landowner arrangements.

Team

B. Hoen (Subcontractor to LBNL), R. Wiser (LBNL), P. Cappers (LBNL), M. Thayer (San Diego State University), G. Sethi (Bard College)

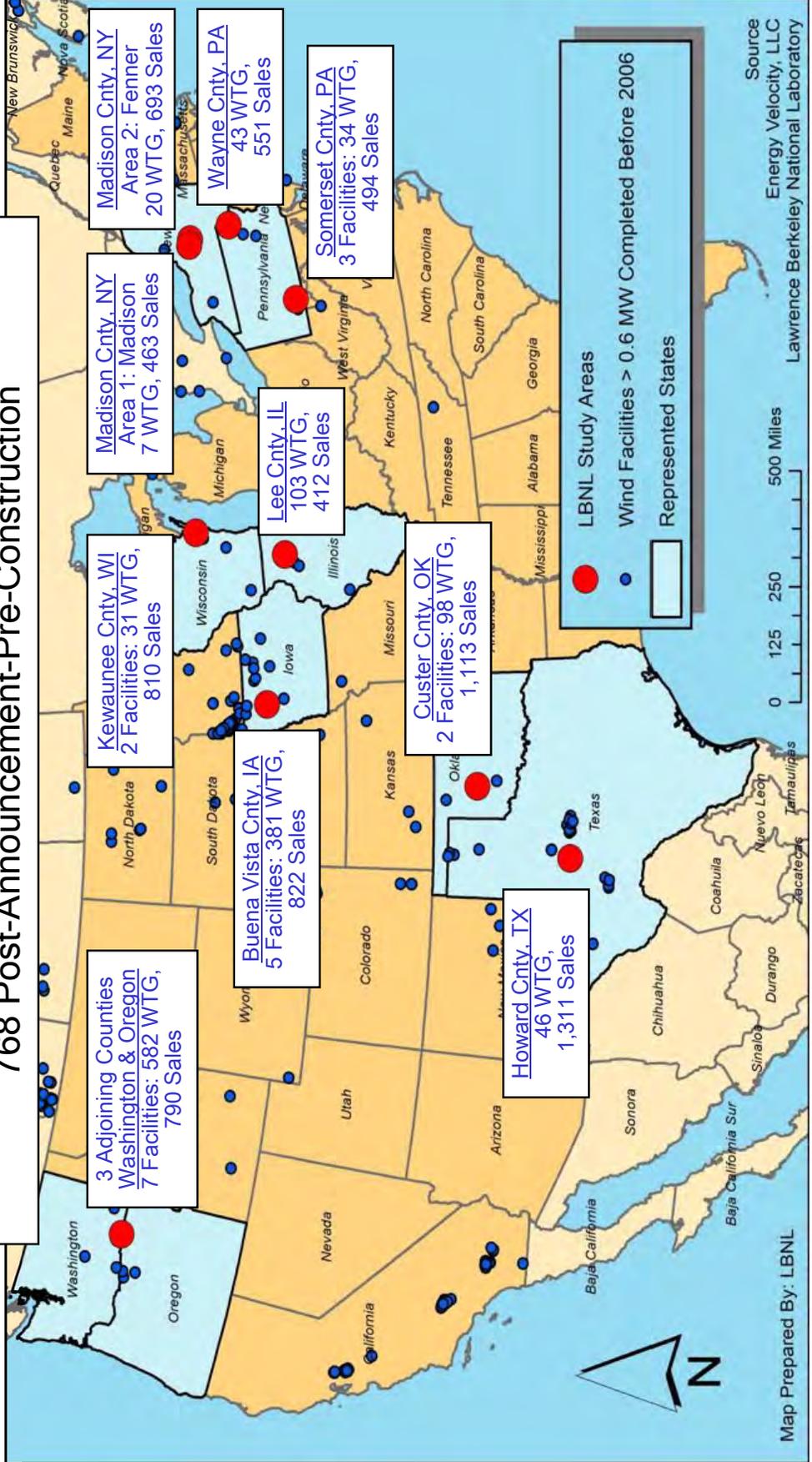
Funder

U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Wind & Hydropower Technologies Program



Collected Sales Data from 10 Study Areas Surrounding 24 Wind Facilities in 9 States

7,459 Residential Sales Transactions
 1,754 Pre-Announcement, 4,937 Post-Construction, and
 768 Post-Announcement-Pre-Construction



Research Relies on Hedonic Pricing Model in Addition to Other Models

What Is a Hedonic Pricing Model?

- **Well respected model** used by economists and real estate practitioners for over 40 years
- **Heterogeneous** residential sales data are used
- **Measures marginal price differences** between homes that vary by the variables of interest, after controlling for other characteristics
- **Controlling characteristics** include square feet, acres, bathrooms, fireplaces, age, condition and scenic vista of the home, location, etc.
- **Variables of interest** include view of turbines, distance from turbines, and development period (e.g. before or after construction began)
- **Estimates and significance levels** are important

Other Models Used in Analysis

Repeat Sales and Sales Volume Models

| | Coef. | SE | p Value | n |
|------------------------|---------|----------|---------|-------|
| Intercept | 7.62 | 0.18 | 0.00 | |
| Nbr_IN_SalePrice96_hat | 0.29 | 0.00 | 0.00 | 4,937 |
| AgeAtSale | -0.006 | 0.0004 | 0.00 | 4,937 |
| AgeAtSale_SqrD | 0.00002 | 0.000003 | 0.00 | 4,937 |
| Sqft_1000 | 0.28 | 0.01 | 0.00 | 4,937 |
| Acres | 0.02 | 0.00 | 0.00 | 4,937 |
| Baths | 0.09 | 0.01 | 0.00 | 4,937 |
| ExtWalls_Stone | 0.21 | 0.02 | 0.00 | 1,486 |
| CentralAC | 0.09 | 0.01 | 0.00 | 2,575 |
| Fireplace | 0.11 | 0.01 | 0.00 | 1,834 |
| FinBsmt | 0.08 | 0.02 | 0.00 | 673 |
| Cul_De_Sac | 0.10 | 0.01 | 0.00 | 992 |
| Water_Front | 0.33 | 0.04 | 0.00 | 87 |
| Cnd_Low | -0.45 | 0.05 | 0.00 | 69 |
| Cnd_BAyg | -0.24 | 0.02 | 0.00 | 350 |
| Cnd_Avg | Omitted | Omitted | Omitted | 2,727 |
| Cnd_AAyg | 0.14 | 0.01 | 0.00 | 1,445 |
| Cnd_High | 0.23 | 0.02 | 0.00 | 337 |
| Vista_Poor | -0.21 | 0.02 | 0.00 | 310 |
| Vista_BAyg | -0.08 | 0.01 | 0.00 | 2,857 |
| Vista_Avg | Omitted | Omitted | Omitted | 1,247 |
| Vista_BAyg | 0.10 | 0.02 | 0.00 | 448 |
| Vista_Prem | 0.13 | 0.04 | 0.00 | 475 |
| WAOR | Omitted | Omitted | Omitted | 519 |
| EXHC | -0.75 | 0.03 | 0.00 | 1,071 |
| OKCC | -0.44 | 0.02 | 0.00 | 476 |
| IABV | -0.24 | 0.02 | 0.00 | 605 |
| ILLC | -0.09 | 0.03 | 0.00 | 213 |
| WIKGDC | -0.14 | 0.02 | 0.00 | 725 |
| PASC | -0.31 | 0.03 | 0.00 | 291 |
| PAWC | -0.07 | 0.03 | 0.01 | 222 |
| NYMOC | -0.20 | 0.03 | 0.00 | 346 |
| NYMC | -0.15 | 0.02 | 0.00 | 469 |
| Post_Con_NoView | Omitted | Omitted | Omitted | 4,207 |
| View_Minor | -0.01 | 0.01 | 0.40 | 561 |
| View_Med | 0.02 | 0.03 | 0.58 | 106 |
| View_Sub | -0.01 | 0.07 | 0.94 | 35 |
| View_Extrem | 0.02 | 0.09 | 0.80 | 28 |
| Mile_Less_0_57 | -0.05 | 0.06 | 0.40 | 67 |
| Mile_0_57to1 | -0.05 | 0.05 | 0.30 | 58 |
| Mile_1to2 | 0.00 | 0.02 | 0.80 | 2,019 |
| Mile_3to5 | 0.02 | 0.01 | 0.23 | 1,923 |
| Mile_6to5 | Omitted | Omitted | Omitted | 870 |

"Omitted" = reference category for fixed effects variables
 "n" indicates number of cases in category when category = "1"

| Model Information | |
|--------------------------|----------------|
| Model Equation Number | 1 |
| Dependent Variable | LN_SalePrice96 |
| Number of Cases | 4937 |
| Number of Predictors (k) | 37 |
| F-Statistic | 442.8 |
| Adjusted R Squared | 0.77 |



To Test for Scenic Vista Stigma, Scenic Vista Itself Is Controlled For

They might pull in two directions



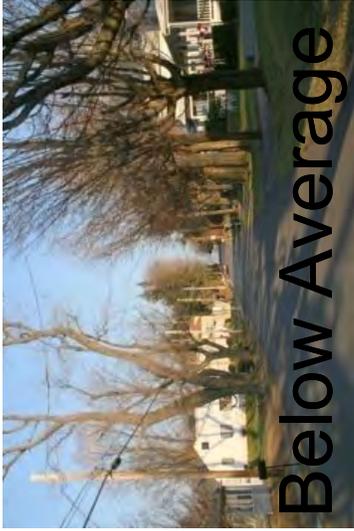
↑ \$

By separating out scenic vista,
a potential bias is removed from
measurements of the effects of
the view of wind turbines

↓ \$

Five Qualitative Ratings Are Used for Quality of Scenic Vista

Each home is given a scenic vista rating, based on field visits



Four Qualitative Ratings Are Used for Dominance of View of Wind Turbines

Each home is given a view of turbines dominance rating, based on field visits



To Test for Area and Nuisance Stigmas, Distance to Nearest Turbine at Time of Sale Is Determined

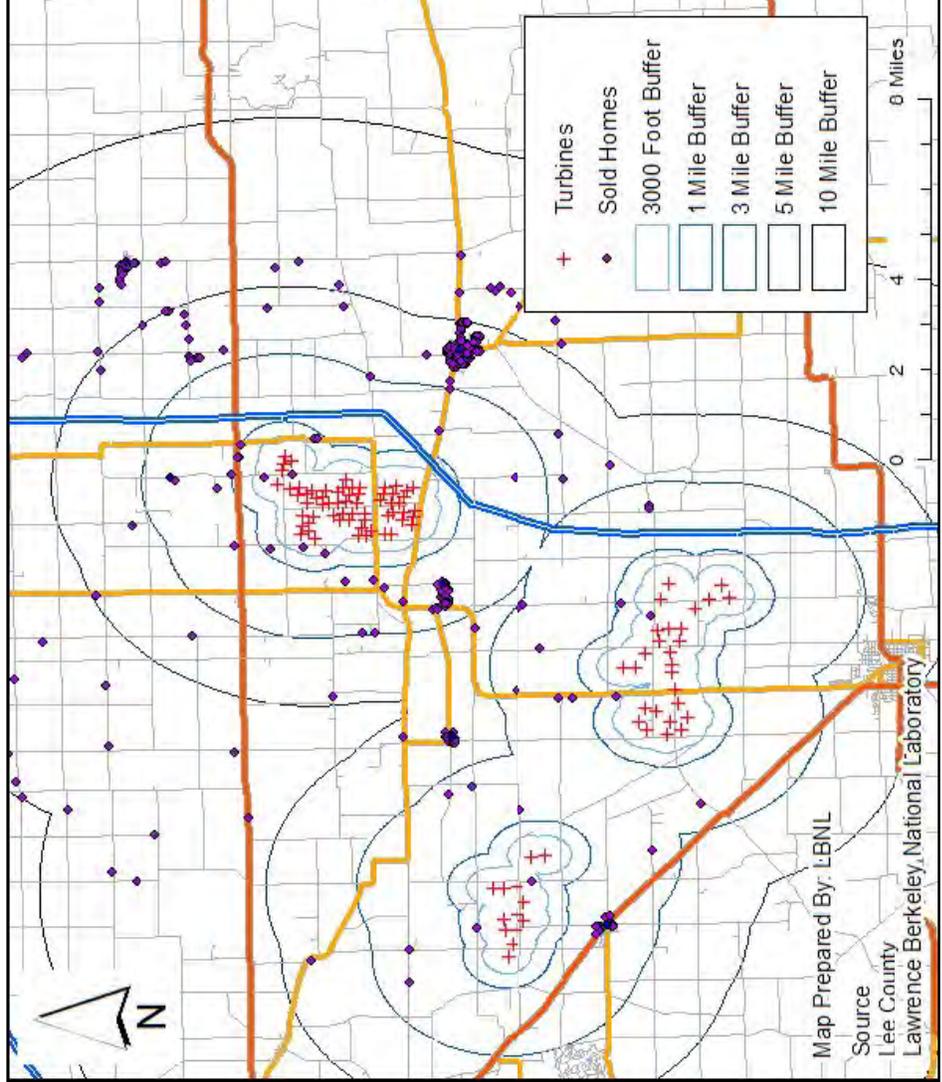
Five Distance Bands Are Created

Nuisance Stigma

- Inside of 3000 Feet
- Between 3000 Feet and 1 Mile

Area Stigma

- Between 1 and 3 Miles
- Between 3 and 5 Miles
- Outside of 5 Miles



“Sold Homes” include all homes sold both before and after construction of the wind facility



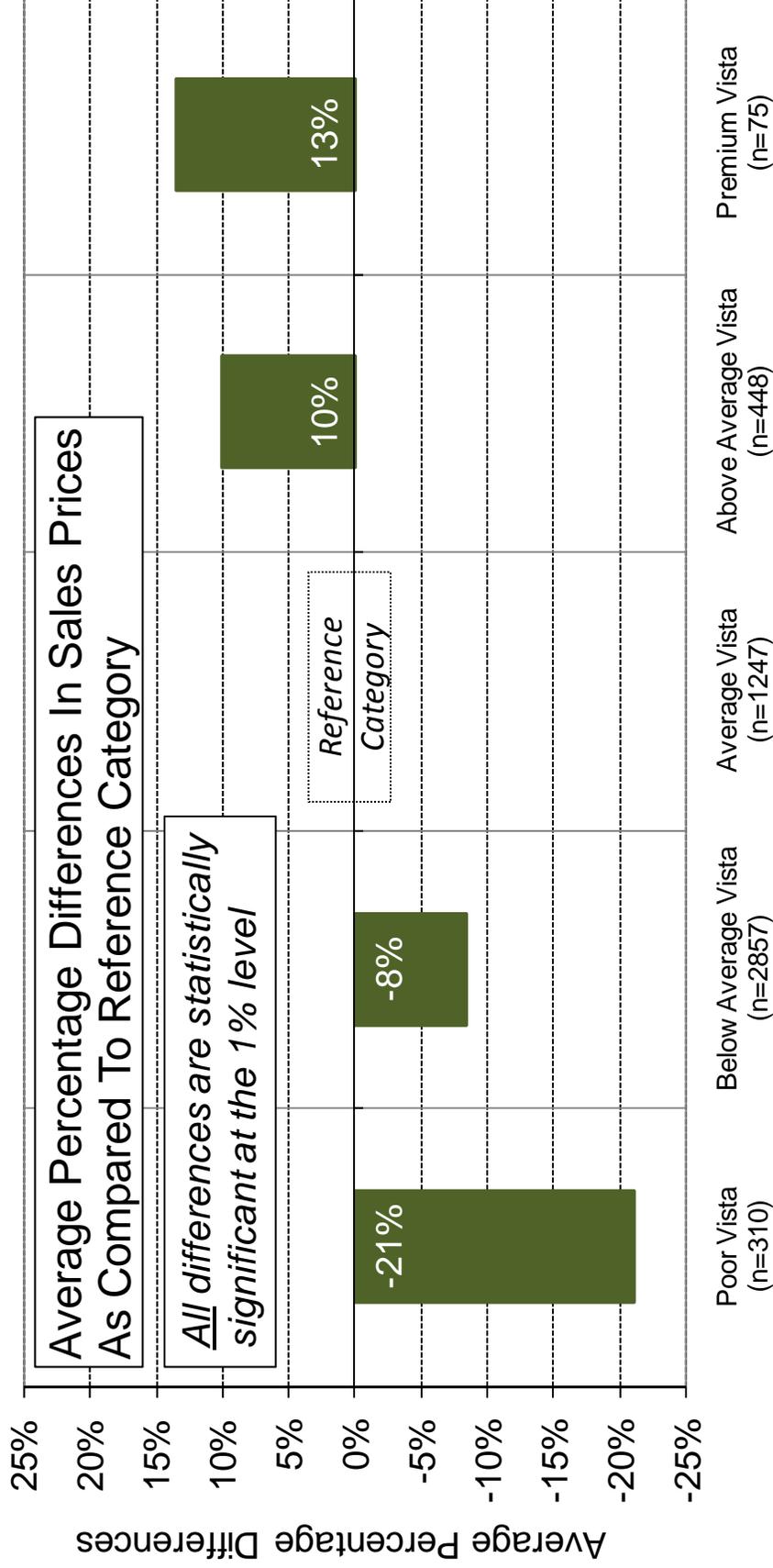
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Base Hedonic Model Results:

There Is Strong Statistical Evidence that the Quality of the Scenic Vista Affects Sales Prices

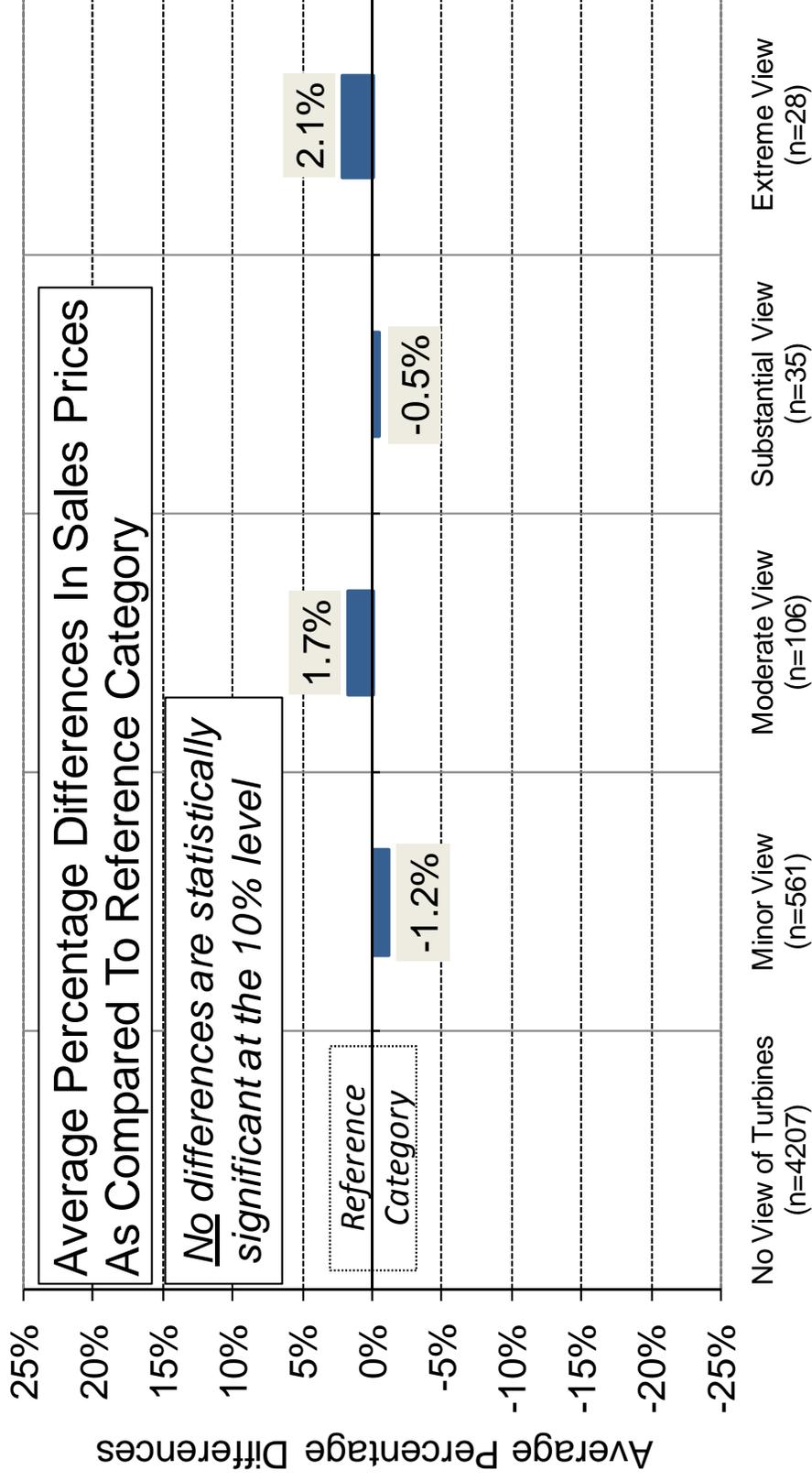


The reference category consists of transactions for homes with an Average Vista, and that occurred after construction began on the wind facility



Base Hedonic Model Results:

There Is a Lack of Statistical Evidence that the Dominance of the Views of Turbines Affects Sales Prices

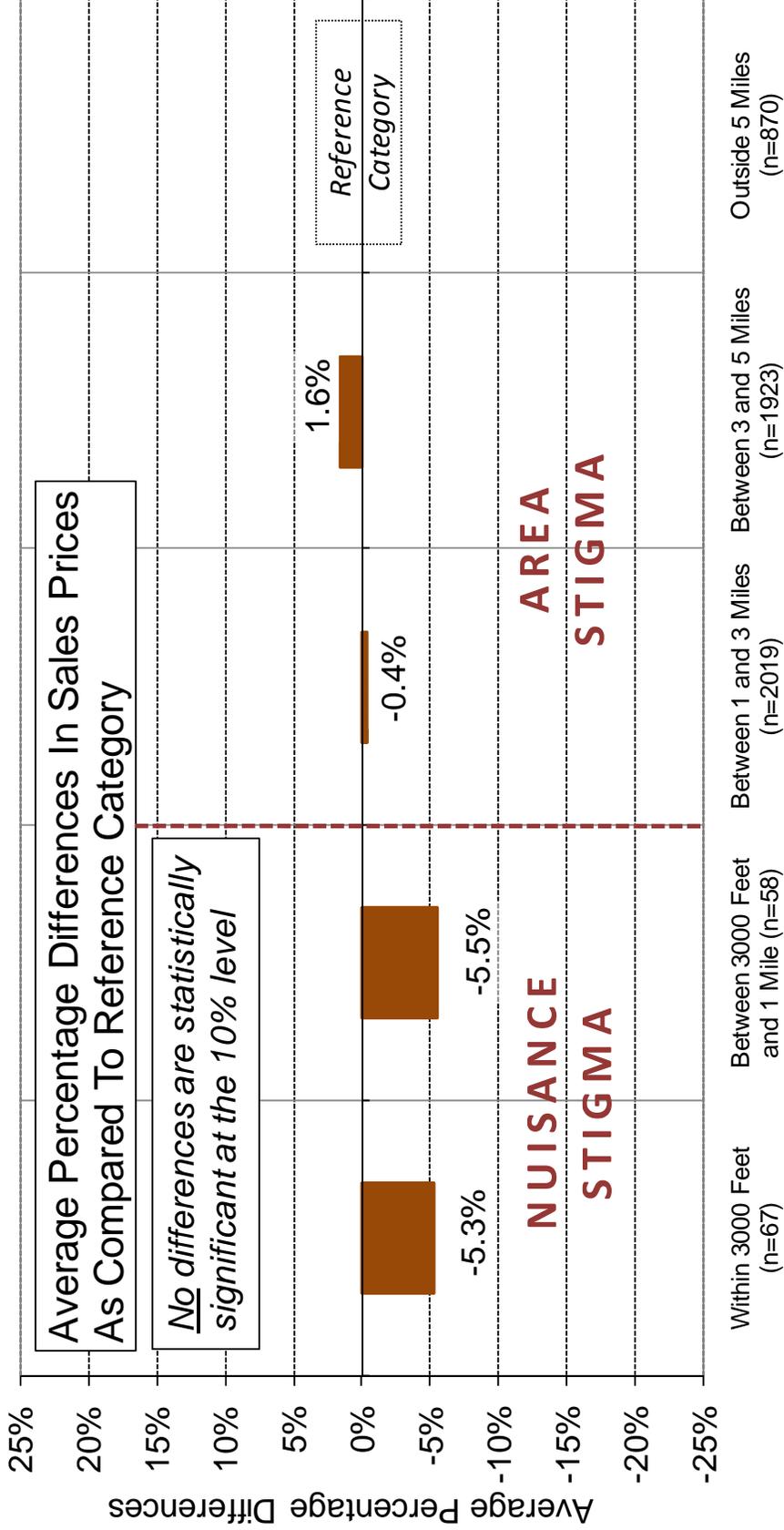


The reference category consists of transactions for homes without a view of the turbines, and that occurred after construction began on the wind facility



Base Hedonic Model Results:

There Is a Lack of Statistical Evidence that the Distance to the Nearest Turbine Affects Sales Prices

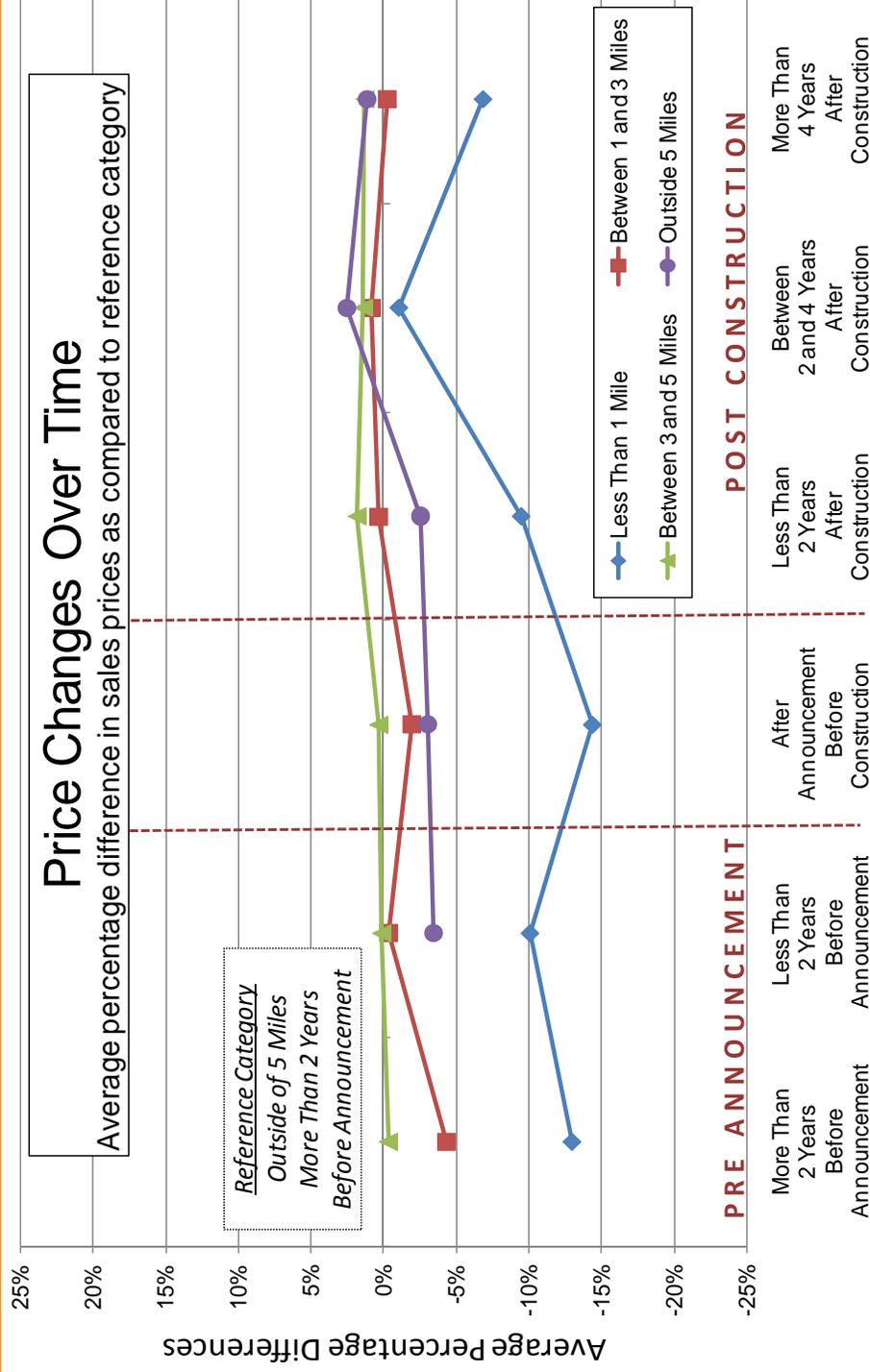


The reference category consists of transactions for homes situated more than five miles from the nearest turbine, and that occurred after construction began on the wind facility



Temporal Aspects Model Results:

Homes Nearest the Turbines Were Depressed in Value Before Construction and Appreciated and the Most After Construction While Homes Further Away Were Largely Unchanged Over Time

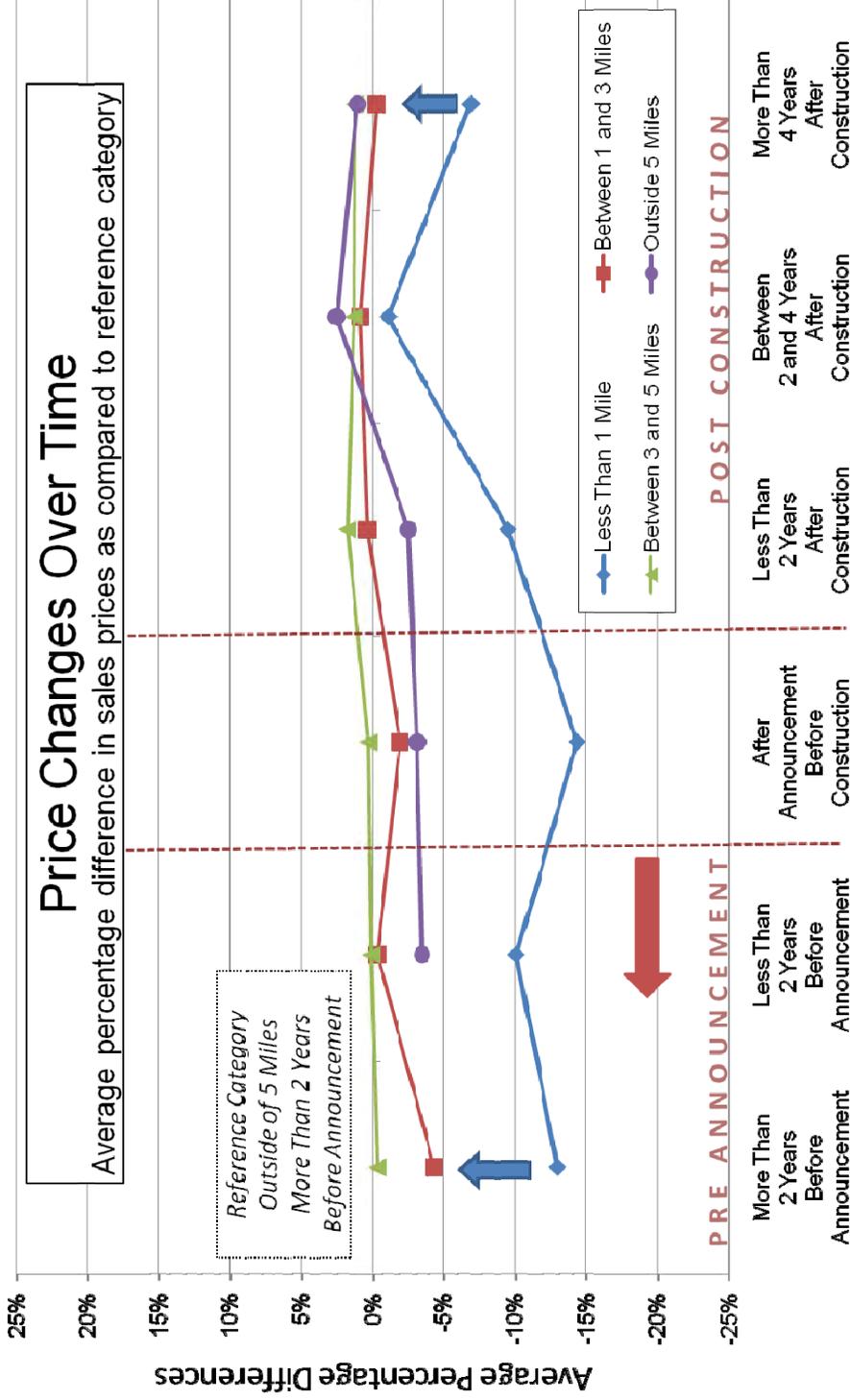


The reference category consists of transactions of homes situated more than five miles from where the nearest turbine would eventually be located and that occurred more than two years before announcement of the facility



Temporal Aspects Model Additional Sensitivity Results:

Potentially Sales Prices Are Affected in the Post Announcement Pre Construction Period and then Return to More Normal Levels Following Construction



The reference category consists of transactions of homes situated more than five miles from where the nearest turbine would eventually be located and that occurred more than two years before announcement of the facility



Conclusions Based on This Sample

- **Area Stigma:** There is an **absence of evidence** that sales prices of homes without views of turbines and further than one mile from the nearest turbine are stigmatized by the arrival of facility
- **Scenic Vista Stigma:** There is an **absence of evidence** that sales prices of homes with a view of the turbines are uniquely stigmatized even if that view is “dramatic”
- **Nuisance Stigma:** There is an **absence of evidence** that prices of sales occurring **after construction** of the facility for homes within a mile of the nearest wind turbine in this sample are affected and **some evidence** that sales occurring **prior to construction** are affected

“Absence of Evidence” does not equate to “Evidence of Absence”
But if effects do exist in this sample, they are either too small and/or too infrequent to result in any statistically observable effect

Impacts on Residential Property Values Near Wind Turbines

- Wind Energy and Property Values
 - Overview of Subject
 - Previous Literature
 - Berkeley Lab Research
 - Other Disamenity Research
- Where To Go From Here



Other Disamenity Research Have Conforming Results

| Disamenity | Study | Location | Percentage Change | Difference | Effect Limit |
|---|---------------------------|------------------------|---------------------------|------------------------------------|--------------|
| Crematory | Agee and Crocker (2008) | Rawlings, WY | -2% to -16%* | within a mile | |
| Superfund | Gayer et al. (2000) | Grand Rapids, MI | -4% to -6%* | within a mile | |
| Superfund | Kiel & Zabel (2001) | Woburn, MA | -15% | within a mile | |
| Groundwater Contamination Pre Remediation | Case et al. (2006) | Scottsdale & Tempe, AZ | -7% | in currently contaminated area | |
| Groundwater Contamination Post Remediation | Case et al. (2006) | Scottsdale & Tempe, AZ | no difference | in previously contaminated area | |
| Waste Transfer Station | Eshet et al. (2007) | Israel | -12% | within a mile | |
| Industrial - Superfund | Carroll et al. (1996) | Henderson, NV | -7% | within a mile | 2.5 miles |
| Lead Smelter | Dale et al. (1999) | Dallas, TX | -0.8% to -4% | within a mile | 2 miles |
| Power Plant | Davis (2008) | assorted | -3% to -5% | within 2 miles | |
| Landfill - High Volume | Ready (2005) | assorted | -13% | adjacent to landfill | 2 miles |
| Landfill - Low Volume | Ready (2005) | assorted | 0% to -3% | adjacent to landfill | 2 miles |
| Landfill | Reichert et al. (1992) | Cleveland, OH | -5% to -7% | within a few blocks | |
| Landfill | Thayer et al. (1992) | ? | -2% to -5% | within a mile | 4 miles |
| Transmission Line | Hamilton & Schwann (1995) | Vancouver, Canada | -6% | adjacent to tower | 330 feet |
| Transmission Line | Des Rosiers (2002) | Montreal, Canada | -10% | adjacent to tower | 150 feet |
| Road Noise | Batemen et al. (2001) | Glasgow, Scotland | -0.2% to -2% | increase of 5 dBA** | |
| Road Noise - 29 Study Review | Batemen et al. (2001) | assorted | 0% to -11% (2% median) | increase of 5 dBA** | |

* based on 2008 median house price (source: city-data.com)

** 10 dBA roughly represents the difference in noise between a busy road and a quiet street



Impacts on Residential Property Values Near Wind Turbines

- Wind Energy and Property Values
 - Overview of Subject
 - Previous Literature
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 - Other Disamenity Research
- Where To Go From Here



Where To Go From Here?

Do these results imply that property values effects near turbines do not exist? **NO!**

But rather, if effects do exist after construction, given current research, effects are likely to be relatively small and/or infrequent.

Further, where effects do exist in greater magnitude/frequency they are most likely to occur after announcement of the facility and prior to construction and in close proximity.

So, given these results, are property values something stakeholders should be concerned about?
OF COURSE!

Property Value Risks Will Persist Unless They Are Measured, Mitigated and Managed

Measure

Continue to Measure to Better Understand Effects,
to test the robustness of previous findings,
and explore nuances in effects (e.g., changes over time)

- Use other techniques (e.g., paired sales, surveys, appraisals)
- Use similar techniques with other data (e.g., new facilities)
- Test for other analogous effects (e.g., time on the market, sales volume)
- Publish results in journals

Modulate as knowledge and methods evolve!

Property Value Risks Will Persist Unless They Are Measured, Mitigated and Managed

Mitigate

Increase efforts to quantify risks for those living closest so as to reduce risk adverse actions, and **improve models** and resulting regulations

- Organize visits to other facilities; having discussions with nearby residents (both participating and non-participating);
- Model visual and audio aspects; Use video to better describe aesthetic impacts
- Improve models to better predict visual (e.g., via LIDAR) and audio impacts (e.g., take into account wind sheer).
- Adjust regulations and maximum sound limits to take into account meteorological conditions and sound output under all operating conditions

Modulate as knowledge and methods evolve!

Property Value Risks Will Persist Unless They Are Measured, Mitigated and Managed

Manage

Manage risks in the short term for homeowners through tenable/workable measures

- Offer some combination of neighbor agreements/incentives and/or property value guarantees (e.g., Dekalb County, IL) to nearby homeowners as are economically tenable and legally workable
- Conduct follow up studies (e.g., surveys, appraisals)
- Realize that cumulative impacts may exist
- Realize that real or perceived risks may increase/decrease as more/better information become available

For More Information...

See full report LBNL report

- <http://eetd.lbl.gov/ea/ems/re-pubs.html>

To contact the primary authors of report and me

- **Ben Hoen**, consultant to Lawrence Berkeley National Laboratory,
- **Ryan Wisner**, Lawrence Berkeley National Laboratory,

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**Property Value Resources sited in Testimony of M. James Morey to
Vermont State House Natural Resources Committee, April 9, 2013**

**Values in the Wind: A Hedonic Analysis of
Wind Power Facilities_**

Martin D. Heintzelman
March 3, 2011
Economics and Financial Studies
School of Business
Clarkson University

**Testimony to Adams County Board
Wind Turbine Setbacks**

June 8, 2010
Michael S. McCann, CRA

CASE STUDIES

**Diminution in Price
Melancthon and Clear Creek
Wind Turbine Analyses** October 2012

Lansink Appraisals and Consulting

Ben Lansink, AACI, P.App, MRICS Date:

**The Impact of Wind Power Projects
on Residential Property Values in the United States**

Ben Hoen, et al , December 2009

Lawerence Berkeley National Laboratory

**Impacts on Residential Property
Values Near Wind Turbines:**

NEWEEP Webinar
May 5, 2010

Ben Hoen, consultant to Lawrence Berkeley National Laboratory,



**Impact of the Lempster Wind Power
Project on Local Residential Property
Values**

January 2012

Matthew Magnusson, **MBA**,

Whittemore School of Business & Economics

University of New Hampshire



**RESIDENTIAL PROPERTY VALUE GUARANTEE AGREEMENT
TO BE INCLUDED IN ANY INDUSTRIAL WIND TURBINE
PERMIT ISSUED BY THE TOWN OF HAMMOND AND SHALL
BECOME A PART OF THE TOWN OF HAMMOND WIND LAW.**

This Residential Property Value Guarantee Agreement (“Agreement”) made and entered into on this ___ day of _____, 20___, by and between _____ State of New York and any successors in interest or ownership in part or in whole to any Industrial Wind Turbine Project within the Town of Hammond, hereinafter referred to as the (“Guarantor”) and _____ and _____ residing at _____, Hammond, New York, (“Property Owner/Owners”).

RECITALS

WHEREAS, Property Owners own eligible Property as described herein (“Property”). That property having a legal description located in the Town of Hammond, St. Lawrence County, New York, and being described as follows:

**SAID PROPERTY BEING LOCATED WITHIN A TWO (2) MILE
RADIUS OF ANY WIND TOWER, AS MEASURED FROM THE BASE OF THE
WIND TOWER AT GROUND LEVEL TO THE NEAREST PROPERTY LINE
OF THE RESIDENCE EXISTING AT THE TIME THIS PROPERTY VALUE
GUARANTEE AGREEMENT IS ENTERED INTO.**

WHEREAS, Guarantor has been granted a Permit by the Town of Hammond, St. Lawrence County, for the construction and operation of the _____, consisting of Wind Turbines on properties located in the Town of Hammond, St. Lawrence County, State of New York.

WHEREAS, Guarantor agrees to alleviate any concerns to the Citizens of Hammond, regarding the preservation of Property Values in the Town of Hammond, and

in consideration of the Town of Hammond granting to the Guarantor the right to construct and operate the _____ with Industrial Wind Turbines within the Guidelines of the Hammond Wind Law, and

WHEREAS, Property Owners are desirous of preserving the equity that they have in their Residential Properties prior to the construction and operation of the _____ Wind Farm that if the Property described herein is sold at a price less than the Asking Price as a result of proximity to the Wind Turbine, as determined by the Procedures contained herein, and the Guarantor will guarantee payment to the Property Owner/Owners of such difference.

IT IS AGREED AS FOLLOWS:

1. **EFFECTIVE DATE OF THE AGREEMENT:** This agreement shall become effective and binding on the Guarantor when signed by both parties, which must be entered into within **ONE HUNDRED EIGHTY (180) DAYS** from the Town of Hammond issuing a permit to a Wind Development Company referred to above as the Guarantor. A list of all potential Lease Agreements have been made known between the Land Owner and the Guarantor, however, the actual placement has not been determined by the Guarantor. If any new Lease Agreements are entered into by the Guarantor with any new property owner, then the neighboring property owner within a TWO (2) MILE radius of that landowner, will be notified by Certified Mail by the Guarantor. The Property Owner shall have **NINETY (90) DAYS** after receipt of said letter, to give notice to the Guarantor of their intent to enter into a Property Value Guarantee Agreement.
2. **ELIGIBILITY: EXERCISE OF GUARANTEE:** Any Individual, Sole Proprietorship, Corporation, Partnership, or Limited Liability Company, owning property that is within a TWO (2) mile radius of the base of any wind tower that is part of the Hammond Wind Project is covered by this Guarantee and described in Paragraph one above. This Guarantee is limited only to Real Property owners that own property in the Town of Hammond at the time that the Town of Hammond issues a Permit to any Wind Developer. A further definition of Property Owners shall include heirs and immediate family members of the Property Owner on the effective date above stated.
3. **QUALIFIED PROFESSIONAL APPRAISER and PROPERTIES TO BE USED AS COMPARABLES:** For the purpose of this Agreement, a Qualified Professional Appraiser shall mean a person who is licensed by the State of New York, not related to the Property Owner, who is not an employee or contractor of the Property Owner or Guarantor, and does not have a business relationship with the Property Owner or the Guarantor, and who is a member of at least one National Appraisal Association. All appraisal reports shall conform to the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institutes. All Real Estate

Comparables used in any Appraisal shall not be from the Town of Hammond, but shall be from the neighboring Town of Alexandria, where there are no Wind Farms due to the proximity of the local Maxon Air Field. Sales of like or similar properties sold up to 3 years prior to the date of the Appraisal can be used after taking into consideration an inflationary factor. If there are no Comparable Values in the Town of Alexandria, then the Appraiser can use land transfers from within a 50 mile radius of the Town of Hammond.

4. **AGREED TO ASKING PRICE:** The Asking Price is the value of the Property at the time that the Property Owner decides to sell, however, the listing of the real property, must take place within a **FIVE (5) YEAR PERIOD** from the entering into this Property Value Guarantee Agreement. The Asking Price of the property may be mutually agreed to by the Property Owners and the Guarantor. The Asking Price can be mutually amended by the Property Owners and the Guarantor at any time, subject to their mutual agreement.

5. **DETERMINATION OF ASKING PRICE BY APPRAISAL:** If the Parties are unable to agree upon the Asking Price of the Property prior to the Property Owner listing the Property for sale, then the Guarantor shall hire, at their expense a qualified professional appraiser presently doing business in Jefferson or Onondaga County, and shall notified the Property Owner of such appraiser. If the Property Owner objects to the Guarantor's choice of appraisers, it shall so state those objections, in writing, within THIRTY (30) DAYS of the notification of the choice of the appraisal, to Guarantor. In the event Property Owner reasonably objects, the Guarantor shall select an Appraiser with MAI Certifications and all selected Appraisers shall adhere to the following guidelines:

When a qualified professional appraiser is selected pursuant to Paragraph 5 above, he or she shall be instructed to determine the fair market value, which will become the ASKING PRICE, of the Property as follows:

- a. Assume that no wind energy center or commercial wind tower was located within a FIVE (5) mile radius.

- b. Utilize comparable properties, developed as the Property was developed as of the date of this Guarantee and located sufficient distance away from the Hammond Wind Project, within the Town of Alexandria, so that in the opinion of the appraiser, the selling price of that property was not influenced by the presence of the Hammond Wind Farm.

- c. Use both the Comparable Sale Method and the Cost Replacement Method in determining a Fair Market Value. If

there is wide difference between the Fair Market Value at the time of listing and the Cost Replacement Method, then the Cost Replacement Method shall be the controlling method, and shall be used as an Asking Price. The Standard Depreciation rates established by the Standards of Professional Appraisals Practice of the Appraisal Institute shall be used.

- d. Establish a fair market value, which is based upon the Property as developed on the date that the Town of Hammond issues a permit for a Hammond Wind Farm.
- e. Prepare a full narrative appraisal, which conforms to the Code of Professional Ethics and Standards of Professional Appraisals Practice of the Appraisal Institute.
- f. Prepare the Appraisal in full compliance with any and all state standards and state regulations which pertain to the preparation of an appraisal of the Property except those standards and regulations which conflict with these instructions, and
- g. The Appraiser shall note the condition of the premises, both interior and exterior, at the time of the appraisal.

If the Property Owner and the Guarantor accept the appraisal value, then such appraisal shall constitute the ASKING PRICE, and the Property Owners shall offer the above defined property for sale at no less than the agreed upon price.

If either the Property Owner or the Guarantor does not accept the appraisal value, then the non-accepting party may retain a second qualified professional appraiser, of its choice, to be paid for by the Guarantor. The second appraiser shall be given a copy of the first appraisal, and check said appraisal for accuracy, and then shall submit their appraisal for consideration by the parties. If the second appraiser shall be within 5 percent of the first appraiser, then the higher appraisal shall be the agreed upon ASKING PRICE. If the Guarantor or the Property Owner is unsatisfied with the value, then the party who is still unsatisfied with the ASKING PRICE, shall hire at its own expense, an MAI certified Appraiser to establish a value. In the event that the other party shall hire his or her own MAI certified Appraiser to establish a value, then the ASKING PRICE shall be the average between the two (2) Appraisals and the MAI certified appraisal. There shall be NO APPEAL from the value determined by the MAI Appraisals. There shall be no requirement for Discovery or Interrogatories by either party. There shall be no requirement for cost receipts by the Property Owner. The Property Owner shall give open inspection of the property within reasonable time periods, for any appraiser to inspect the property. Any request for inspections must be complied within 72 hours of the requested time period.

TIME LIMITS: The first and second appraisals shall be completed within 30 days of the property owner notifying the Guarantor of their intent to list their property for sale. The MAI appraisal must be completed within 75 days of the property owner notifying the Guarantor or Guarantor notifying the Property Owner of their dissatisfaction with the first two appraisals. The second appraisal can be eliminated if a MAI Appraiser is used for the second appraisal, at which time the ASKING PRICE shall be the average between the first appraisal and the MAI Appraisal.

6. LISTING WITH BROKER: Property Owners shall utilize the services of a New York State certified Real Estate Broker, with membership with the St. Lawrence County and Jefferson County Board of Realtors with access to the Multiple Listing Service for the St. Lawrence and Jefferson Counties. The selection of the Realtor shall be at the sole discretion of the Property Owner for the first SIX (6) months. If the property has not sold within that period, then the Guarantor shall have the option of selecting a Realtor for the balance of the time period, which shall be for THREE (3) MONTHS. The total number of days that a property shall be listed for prior to the Guarantor being obligated under this Property Value Guarantee Agreement shall be **270 DAYS**. The Realtor shall be paid the normal rate as established within St. Lawrence County and the commission rate shall not exceed 6% for residential properties. All commissions shall be paid by the Property Owner.

7. TERM OF LISTING: The Property Owner shall list the Property, at the ASKING PRICE, as determined in Paragraphs 4 or 5, or at a higher value. During the listing term, the Property Owners shall accept any offer of purchase for the ASKING PRICE, or any offer of purchase otherwise acceptable to the Guarantor. If the accepted price includes any concessions to the Buyer, i.e.: Payment of up to \$8,000.00 for Buyers costs for securing a mortgage or closing costs, then those costs shall be added to the ASKING PRICE and shall be reimbursed by the then Guarantor. (In this current market, it is a common procedure to add the Buyers costs to a contract so as to allow the Buyer to purchase the property with no money down.) If the \$8,000 is added to the ASKING PRICE, then the Guarantor shall not be responsible for the Buyers costs.

Said listing contract shall include: (a) that the Broker shall list the Property in the multiple listing exchange; (b) that the property will be so listed until the occurrence of either the (i) sale of the Property or (ii) expiration of a period of 270 days; (c) that the Broker shall not be entitled to any commission after the expiration of the listing contract, unless a Buyer that the Broker showed the property to, shall enter into a Contract with the Property Owner, within 180 days after the expiration of said listing.

The Property Owner shall cooperate with the Broker in obtaining a purchase offer pursuant to the terms set forth in the listing agreement and shall make, in good faith, all reasonable efforts necessary to conclude a sale pursuant to the said terms. **UNDER NO CIRCUMSTANCES SHALL THERE BE ANY VERBAL COMMUNICATION BETWEEN THE PROPERTY OWNER AND THE POTENTIAL PURCHASER.** There will be no anti-wind signs on the property listed for sale. Any requests for information regarding Wind shall be referred to the Guarantor for release of information.

- 8. OFFERS TO PURCHASE:** If the Property Owner accepts any offer of Purchase for the ASKING PRICE then in that event, Guarantor will have no financial liability to the Property Owner. No Furniture or items at the property shall be included in the Sales Contract other than appliances, drapes, and items attached to the dwelling. The Guarantor may be notified by telephone of any and all offers so that they will be able to make counter offers as listed in paragraph 9 below. The Guarantor shall also be notified in writing within 48 hours confirming any telephone communications with the Realtor or Property Owner.
- 9. GUARANTOR'S CONSENT TO PURCHASE:** Guarantor shall have the right to make counter offers on any offers of purchase which are below the ASKING PRICE, said counter offer being made within 48 hours of the submitted original offer or counter offers. In the event the purchaser accepts any such counter offer, or counter offers, made or requested by the Guarantor, or in the event the Guarantor otherwise consents to the sale of the Property below the ASKING PRICE, the Guarantor shall pay to the Property Owners, at closing, the difference between the ASKING PRICE and the sales price so established.
- 10. SALE WITH OR WITHOUT GUARANTOR'S CONSENT:** If the Property Owners have not received an offer of purchase at the ASKING PRICE within 270 days of listing the property for sale, or the Guarantor has not consented to the sale of the Property below the ASKING PRICE, the Property Owner may sell the Property at the highest offer of Purchase still pending or at the next good faith bona fide offer to purchase. The Property Owner shall notify the Guarantor, in writing of its intention to accept such offer. The Guarantor has 72 hours to notify the Property Owner of their intent to either accept the terms of the offer or to Purchase the Property at the ASKING PRICE. If the Guarantor elects to purchase the property, then said closing must take place within 30 days with the presentment of a Warranty Deed with lien covenant. If there should be a title defect, then the Guarantor shall give the Property Owner sufficient time to cure the defect or to Purchase Title Insurance, with said Title Insurance cost paid for by the Property Owner.
- 11. PROPERTY OWNER'S CLAIM:** If the property has sold for less than the ASKING PRICE, as determined herein, it shall make a claim to the

Guarantor, requesting payment for the difference between the ASKING PRICE and the SALES PRICE, after deducting Real Estate Commissions and normal costs associated with sale of real estate in St. Lawrence County. If the Guarantor does not make payment within 10 days of the sale, then the PROPERTY OWNER is shall be paid interest on said monies owed by the Guarantor at the rate of ONE (1) PERCENT PER MONTH, and shall be liable to the Property Owner for all costs incurred in collection, plus normal Attorney Fees incurred by the Property Owner. There is **NO APPEAL FROM THIS PROPERTY VALUE GUARANTEE AGREEMENT BY EITHER PARTY.**

12. GOOD NEIGHBOR AGREEMENT: If any Property Owner should enter into a so-called Good Neighbor Agreement, wherein they allow the placement of a Wind Turbine closer than 2 miles and/or if they should receive any compensation from the Wind Turbine Company, then they shall be excluded from this PROPERTY VALUE GUARANTEE PROGRAM unless the Guarantor waives this provision and allows the neighbor to enter into this Guarantee binding the Guarantor.

13. EXCLUSIVE OPTION OF ANY RESIDENTIAL PROPERTY OWNER LIVING WITHIN ANY CLOSE PROXIMITY TO A WIND TURBINE: If any Property Owner lives within TWO (2) MILES of any Wind Turbine Leaseholder or under consideration for a Wind Turbine Lease, now or in the future, and if that Property Owner desires to move from the Town of Hammond because a Wind Turbine is to be located within TWO (2) miles of his or her residence, measured from the corner of the Property Owner's residence to the wind turbine measured from the base of the turbine, then that Property Owner has a once in a lifetime right to be reimbursed for his real property and 5 acres surrounding that residence, at the then Appraised Value under the below described procedures, HOWEVER, this option cannot be used in conjunction with any future Guarantee of the Sale of a Residence:

- a. The Property Owner must notify the Guarantor within 90 days of the issuance of a permit for an Industrial Wind Farm, that they do not wish to live in the Town of Hammond with the existence of a Wind Turbine located on an existing leaseholder's property within a TWO MILE RADIUS of their dwelling.
- b. If the Guarantor should at any time later, decide to enter into any additional leases with neighboring landowners and to place a Wind Turbine closer than TWO (2) MILES to any Property Owners Residence, then this Property Owner shall have the same absolute right to claim under this Paragraph 13, regardless of whether they gave a previous notice to the Guarantor. The Guarantor is required to serve notice by Certified Mail to all Property Owners residing within a TWO (2) MILE RADIUS of any new Potential Leaseholders. The Property Owner must give notice by Certified Mail to the Guarantor within 90

days of receipt of their Certified Letter, stating that they desired to exercise this Exclusive Option.

- c. The Property Owner must have been the legal owner of the real property at the time that the Town of Hammond issued a permit to an Industrial Wind Turbine Developer.
- d. Prior to this **EXCLUSIVE OPTION TAKING PLACE**, the Property Owner and the Guarantor shall enter into 30 day cooling off period wherein the property owner is obligated to meet with the Guarantor, to discuss the entering into a Good Neighbor Program wherein the property owner would receive a monthly/annual payment and/or share in the revenue that the landowner with the industrial wind turbine would receive, making the adjoining landowner a recipient of the financial rewards of the industrial wind turbine program. If an agreement cannot be reached within this 30 day period, then the Property Owner and the Guarantor shall proceed to sub-paragraph e below.
- e. The Guarantor shall then consider the relocating of the proposed Wind Turbine so as not to be within a TWO (2) mile radius of the Property Owners residence. If the Turbine is moved so that it is not within a TWO (2) mile radius of the Property Owners Residence, then the Property Owner would no longer qualify under the Residential Property Value Guarantee Agreement. The Guarantor shall have 30 days in which to make this decision.
- f. If the Property Owner and the Guarantor are still unable to reach a mutually satisfactory resolution within 60 days of the Property Owner serving a Certified Letter to the Guarantor, then the Property Owner, at his sole expense, shall order ONE (1) MAI Appraisal from a Qualified Appraisal Company certified to prepare Trial Ready Appraisals within the State of New York to be completed within 90 days after the Property Owner and the Guarantor are unable to reach a resolution. The Value determined by the Appraisal Company shall be the cost replacement value after taking into consideration any depreciation under standard guidelines for Appraisals.
- g. If the Guarantor should not agree with the value, then the Guarantor has the right to order a second MAI Appraisal to be completed within 45 days of receiving the Property Owner's MAI Appraisal. These 2 Appraisals are to be added together, to be divided by 2, to determine an average value. If the Property Owner is not satisfied with the Guarantor's Appraisal, then he has the right to order a Third MAI Appraisal, at which time all THREE (3) Appraisals are to be added together, divided by 3, for an average value. The cost of the third appraisal shall be shared between the Property Owner and the Guarantor. This is the final value, and shall be the controlling value. There is no Appeal from this value. The Property Owner is to then present the Guarantor with a Warranty Deed with Lien Covenant, 40-Year Abstract and 10-year Tax Search. If there should be any defect

in Title, then the Property Owner has the option of curing the defect under normal New York State Bar Association standards or to provide Title Insurance against said defect. A closing date is to be set 30 days after the title is cured. The Property Owner is to vacate the property at closing and to leave the property in a broom clean condition. The Payment shall be made in Certified Funds at closing. If the Guarantor refuses to make this payment, then the Property Owner is entitled to interest at the rate of ONE (1) PERCENT per month from the date that the closing is scheduled, and to all reasonable Attorney Fees to enforce collection. There is **NO APPEAL FROM THIS PROVISION BY EITHER THE PROPERTY OWNER OR THE GUARANTOR.**

14. ASSIGNMENT OR TRANSFER: Neither this Agreement nor the rights under it may be assigned, conveyed, or otherwise transferred by the Property Owner. The Guarantee given by the Guarantor to guarantee the Property Value and to purchase the Property, is personal, and does not run with the land, however, said Agreement shall inure to the benefit of the Property Owners, their personal representatives, trustees, guardians, custodians or their heirs, but in all events, shall terminate after an arms length sale to a 3rd party. The Guarantee given by the Guarantor, shall continue and obligate any future transferee, assignee, purchaser or successor in interest or Bankruptcy.

15. APPLICATION OF LAW DISPUTES: This Agreement shall be construed consistent with the Law of New York. Disputes concerning the application or terms of this Agreement, include enforceability and collection, shall be subject to the Supreme Court of the State of New York.

Signed this ____ day of _____, 2011, between:

GUARANTOR:

By: _____

PROPERTY OWNER:

Property Address:

STATE OF NEW YORK)
COUNTY OF ST. LAWRENCE) SS:

On this _____ day of _____, 2011, before me, the undersigned, a Notary Public in and for said State, personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Notary Public

STATE OF NEW YORK)
COUNTY OF ST. LAWRENCE) SS.

On this _____ day of _____, 2011, before me, the undersigned, a Notary Public in and for said State, personally appeared _____ and _____, husband and wife, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledge to me that they executed the same in their capacity, and that their signatures on this instrument, the individual or individuals, or the persons upon behalf of which the individuals acted, executed the instrument.

Notary Public