DIRECT TESTIMONY OF JON BOONE

BEFORE THE PUBLIC SERVICE COMMISSION OF MARYLAND

APPLICATION BY SYNERGICS WIND ENERGY LLC FOR A

CERTIFICATE OF PUBLIC CONVENIENCE & NECESSITY

TO CONSTRUCT A 47 MW WIND POWER FACILITY

IN GARRETT COUNTY, MARYLAND

July 25, 2005 CASE NO. 9008

Renewable energy (hydropower, for example) can have horrendous impacts on fish and wildlife. But I can think of no proposed project more devastating to fish, wildlife, and the local economy than plunking a wind farm in the middle of Nantucket Sound.
—Ted Williams, Audubon Magazine (May 5, 2004).

Q. PLEASE STATE YOUR NAME AND ADDRESS?

A. Jon Boone

503 East Alder Street

Oakland, Maryland 21550

Q. WHAT IS THE PURPOSE OF AND RATIONALE FOR YOUR TESTIMONY IN THIS CASE?

A. I oppose this application for a CPCN and recommend that the PSC deny it. There is strong and I believe compelling evidence Synergics' project at Roth Rock will cause much more trouble than it is worth. Although the Applicant promises to the make the air cleaner by displacing toxins from the combustion of fossil fueled power-generating facilities, such windplants in the uplands of the eastern United States will have the same nugatory effect on air pollution and global warming as the removal of a few drops of water would have in emptying a large tub that is continuously being filled. Belief that more forty-story wind plants here will reduce fossil fuel combustion below current levels is demonstrably false, given our increasing demand for electricity. That generous subsidies for windpower are *not* indexed to reductions in fossil fuel emissions—the raison d'etre of windpower-- is a clear recognition of its limitations. Consequently, this windplant will obligate the state's rate and tax payers to spend more without receiving any of the promised health benefits in exchange.

More than 2000 wind turbines spread over nearly 300 miles of forested ridgeline like the ones proposed here would not displace one 1600 MW coalplant. The industry as a whole produces nominal electricity to avail itself of massive tax avoidance mechanisms for a few investors at the expense of tax and rate payers. It is best seen as an Enronesque delivery system for tax shelters, for it was Enron that pioneered the tax shelter as a commodity and, before its demise, owned and operated the nation's largest stock of windplants (most of which General Electric purchased during Enron's bankruptcy). Moreover, this particular multi-million dollar capital project will not bring many local jobs or add much local revenue. It will kill significant wildlife and mock Garrett County's Heritage Plan, which calls for the protection of Backbone Mountain as a natural heritage resource. It will reduce property values in the viewshed and cause significant disturbances for those who live nearby.

In short, it represents yet another extraction industry seeking to exploit the people and resources of Appalachia while delivering no meaningful product, relying upon unsubstantiated claims, an uninformed public and press, and the gullibility of those seeking easy solutions to complex problems. Many who live in Garrett County resent the pillage of our mountains, the destruction of wildlife, and the devaluation of property that will follow in the wake of this project. I read nothing in the developer's application and

supplemental emendations or in subsequent testimony from Synergics' team that assuages my concerns about the havoc this project would visit upon the county. I'm now convinced industrial-scaled wind projects sited on Appalachian ridgetops are anathema to informed environmentalism, as well as responsible economics and public policy.

Those involved with public policy implementation should work hard to make informed decisions that reveal, then limit or eliminate, negative consequences. The history of environmentalism is essentially the effort to restrain corporate excess and mitigate the unanticipated undesirable effects of wishful thinking. The history of the Public Service Commission began in just this spirit, with the goal of protecting energy consumers. Unfortunately, the PSC budget today is derived from the industries it regulates, raising the specter of conflict of interest.

My intention with this commentary is not only to challenge the claims this Applicant has made about his product, but also challenge the Public Service Commission to do so as well. It will serve the public to know what consequences, if any, obtain for promises made and not fulfilled, as well as to learn how any benefits, if substantiated, compare with a range of costs. The PSC should carefully investigate and evaluate all aspects of this application, aware of the "horse and barn door" difficulties inherent in correcting problems that may emerge down the road. Generally, if something seems too good to be true, it almost always is. Informed, rational public policy should not be about wishful thinking, political cronyism, or the timely delivery of production tax credits.

Q. WHAT IS YOUR BACKGROUND?

A. As a life-long environmentalist, I know the dangers of heavy reliance upon fossil fuel combustion. A few years ago, I hoped windpower, since it does not directly emit greenhouse gases into the air, might fulfill its promise to reduce the region's coal mining and significantly improve air quality. But after an earlier MDPSC windplant application experience (Case No. 8938) , where I focused primarily on wildlife concerns, I have done more research, from which I gained much wider context about the industry and its potential to displace fossil fuels in the production of electricity—knowledge the PSC should have sought in the first place before deciding anything.

Nearly 30 years ago, I helped found the North American Bluebird Society to undo the damage resulting from well-meaning but ill-considered decisions made 100 years previously. During my lifetime, I have witnessed countless examples of this kind of damage. Seventy years ago, hydroelectric dams exemplified renewable, "clean" energy initiatives; today, they are known to be so environmentally destructive that many are being dismantled—at taxpayer expense. The indiscriminate use of DDT cost us dearly, although it did help in the fight against malaria. The encouraging effort to restore the Bald Eagle and Peregrine Falcon after the chemical's broad usage was banned has cost millions of public dollars. And now here we are with the swash, buckle, and spin of the windpower industry, with its often pretentious environmentalism and relatively feckless energy production.

My interest in birds and nature began in childhood, and I have nourished that interest with considerable reading and observation over many years. I know the avifauna of the targeted area as well as anyone, spending much time there in recent years studying the nesting behavior of, to give but one example, the state-endangered Mourning Warbler. Although my interest in birds is that of a passionate amateur, I nonetheless have written about the nesting cycle of the Golden-crowned Kinglet (finding the first kinglet nest in Maryland) as well as a number of other articles on the history and effectiveness of field guides. I also lecture on the subject of Garrett County birds, and often take groups of people around the countryside for intimate looks at the way birds make their living in various county habitats. I knew and corresponded with Roger Tory Peterson, the famed naturalist, and I am now a consultant for the Roger Tory Peterson Institute in Jamestown, New York. I continue to be informed and inspired by perhaps this country's most renowned ornithologist, Chandler S. Robbins, who has studied migratory birds in the mountains of Maryland for nearly 60 years.

My work on this subject is a public service. My sole interest is enlightened public policy. Neither I nor any members of my family own property in the proposed viewshed of this project—and the facility would not be visible at our place of residence. Although I belong to Friends of Backbone Mountain, a Garrett County group of about 200 people dedicated to the protection of Backbone Mountain as a natural heritage resource, I accept no funding from any source on this wind issue. While I consult with members of Friends of Backbone Mountain, I am not bound by any directives from the organization. By

profession, I am a retired university administrator and now am a painter, often using the forms of nature to inspire my work. In recent years, I've written extensively on the Dutch artist, Johannes Vermeer. This is the second windpower application I have reviewed.

Q. WHAT ARE YOUR SPECIFIC AREAS OF CONCERN ABOUT THIS HEARING AND THE APPLICATION?

A. I'm uneasy about the precedent-setting nature of these early wind applications. The intervenors in this case should help broaden the scope and rigor of review beyond the rather cursory analysis of previous cases. That the PSC sanctioned an expedited review in the earlier cases, short-circuiting a considered examination of the many issues at play in a new technology, and chose not to notify nearby property owners individually, the people most affected by propinquity to a massive windplant, are matters of major concern. At the very least, the public meeting for this hearing in Garrett County should provide ample time for comment and be held in a venue appropriate to accommodate the many people who will want to be heard. As the only resident of Garrett County involved directly in this hearing, I hope to bring a citizen's perspective, while seeking clear responses about this project's costs to and benefits for the public.

Either directly or with supporting documents, the Applicant has stated his windplant (1) will lessen dependence on foreign oil; improve air quality by mitigating the production of fossil-fueled power plants; improve the health of Maryland residents; (2) provide electrical power for 13,000 to 33,000 homes (with a 40 MW facility); and (3) add significant revenues to Garrett County's economy. In addition, the Applicant has stated (4) his technology would not pose significant risk to wildlife, nor (5) alter the landscape in perceptible ways, nor decrease the value for surrounding properties, nor introduce disturbances that might jeopardize the right of neighbors to quietly enjoy their property. Conversely, he barely mentions the extraordinary subsidies that taxpayers provide, although these are clearly the motivating reason for the application. Finally, the developer contends that (6) decommissioning of the turbines is a non-issue.

Each of these claims, as well as any increased taxpayer or ratepayer obligations that may result due to the project, should be scrutinized and interrogated with great care to determine their validity.

Q. ARE YOU CONCERNED ABOUT CONTINUED RELIANCE ON FOSSIL FUELS? IF SO, WHY DON'T YOU WHOLEHEARTEDLY ENDORSE RENEWABLE WIND ENERGY?

A. Yes! Power to supply our demand for electricity now comes primarily from the combustion of fossil fuels like coal, with poisonous consequences. Because windpower does not emit toxins into the air and its source of energy is recurrent, it offers the promise of a clean, renewable alternative to fossil fuels, along with a reduction in the significant environmental problems fossil fuels cause. Indeed, the understandable desire to reduce the toxins that reliance on fossil fuel combustion cause, as well as the wish to eliminate

such draconian extraction techniques for coal as strip mining and mountaintop removal, has enabled windpower advocates to make strong gains in recent years.

The quest for renewable energy has had a long contrapuntal history. A few hundred years ago, timber seemed inexhaustible, but our demand made short work of the supply. Coal, too, is renewable, but again, our demand will at some time overrun supply—and our meager lifespan won't extend the tens of millions of years necessary to replenish it. A few generations ago, hydroelectric dams were all the rage. Although these do produce a lot of electricity from a renewable source, they are so environmentally damaging that many are now being dismantled, at taxpayer expense.

The central problem with harnessing any form of energy is that enormous energies are wasted in the process of producing and channeling a relatively small amount (a phenomenon described by the Second Law of Thermodynamics). Hydroelectric dams, for example, transformed whole ecosystems, but the resulting supply of electricity was only a small percentage of the total energy within the ecosystem before the dams were built. This "loss" of energy was really the loss of valuable natural dynamics that previously functioned to maintain wetlands and mitigate erosion.

Windpower, too, has this inherent difficulty. There are significant losses—direct and indirect-- in the process of producing wind energy at industrial scales, which I will detail throughout this commentary. But because time seems to be running out on fossil fuels and the lure of non-polluting windpower is so seductive, otherwise sensible people are now promoting windpower initiatives at any cost with nearly idolatrous fervor, without investigating potential negative consequences-- and with no apparent knowledge of even recent environmental history.

Q. WHY DON'T YOU THINK WINDPLANTS SUCH AS THE PROPOSED WILL LESSEN DEPENDENCE ON FOREIGN OIL IN THE REGION, AS CLAIMED?

A. Wind only generates electricity. Electricity generation is only part of our energy production. *Sixty percent of the nation's energy use does not involve the making of electricity.* Allegheny Power, the major electricity provider in the region including Western Maryland, reports that oil accounted for 1% of the resources used to generate its power in 2004. Nationwide, this figure is less than 5%. Coal and gas-fired power plants do pollute the air with toxic hydro-carbons. But the sheer volume of automobile exhaust combined with home heating demand are major contributors to the problem It is folly to suggest that thousands of wind turbines blanketing the mountains of the region would do anything of significance to mitigate these other energy forces evidently contributing to the warming of the planet. It would take 100 windplants like the one Synergics proposes, spread over nearly 300 miles of ridgetop, to generate as much electricity as one 1600 megawatt coal plant. Even if industrial wind generated ten percent of the nation's electricity, it would not staunch the fossil fuel emissions involved in accelerating global warming, given our nation's increasing energy consumption and given that wind can only intermittently (about 30 percent of the time) address the electricity portion of the problem.

Q. DO YOU THINK WINDPLANTS SUCH AS THE PROPOSED WILL REDUCE/DISPLACE THE MINING/BURNING OF FOSSIL FUELS IN THE REGION, AS CLAIMED?

A. *It would take thousands of these clean-energy, landscape-marring machines to generate only a slice of the region's power needs. Consider a recent Department of Energy Study. It shows that nationwide, moving to 10 percent renewable energy would still see coal burning increase substantially—because of rapidly growing electrical demand.*
—Tom Horton, staff environmental writer of the weekly column, On the Bay, The Baltimore Sun: "Wind farms a problem, too," February 27, 2004.

Wind technology in the uplands of this region stands little chance of displacing fossil fuel extraction efforts or reducing its consumption, given our increasing rate of electricity demand. Wind machinery has problems accessing and controlling its source of power. Because of the intermittent nature of wind velocity, sometimes it is not strong enough to generate power and other times it is too strong to be commercially tapped. The industry has attempted to increase its effectiveness by making taller machines and targeting them on high ridges with excellent wind potential. Nonetheless, because of its intermittency, wind technology will require back-up from other, often "dirty" power sources for the time it does not operate or works at sub-optimal levels.

A wind turbine is designed to generate optimal electrical power relative to its size, shape, ability to withstand stresses, rotor sweep and efficiency, and location, among other conditions. The wind needs to blow eight to fourteen miles an hour before a turbine will produce electricity, and a turbine is programmed to shut down when the wind velocity exceeds 50 or 55 miles per hour to prevent harm to its gears. If the wind were to blow at a sufficiently consistent velocity all the time and the turbine never broke down, the turbine would be operating at 100 percent of its capacity potential over a year's time--its **Rated Capacity**. However, because the wind is intermittent and volatile, and the turbines at various times require maintenance, they *actually* will produce electricity only some of the time. Using a combination of considerations, such as meteorological testing, weather history, the history of turbine effectiveness, among others, energy experts assign a **Capacity Factor** for each turbine model, which predicts the amount of electricity a turbine will actually produce in a year. *No existing windplants located in the PJM region have achieved a capacity factor of more than 30 percent. (Attachment A)* This means that 70 percent of the time they are not producing electricity. Consequently, a windplant rated at 47 MWs, for example, will generate electricity in the neighborhood of 12-15 MWs (25-30 % of its rated capacity).

Other power sources, such as coal or nuclear, also don't work all of the time either, and must be supplemented by power sources that are working. The electricity grid has a complex monitoring system for predicting and maintaining its supply. Electricity must balance the rate of production with the rate of consumption at all times. *A fundamental problem with supplying electricity is that electricity cannot be stored at industrial levels.*

Once generated, electricity must be delivered and consumed immediately. However, power sources like coal and nuclear are rarely volatile when producing their yield and produce electricity at about 75-80 percent of their rated capacities. The volatile, extremely unpredictable nature of wind resource makes its technology different from other power sources not only in degree but in kind.

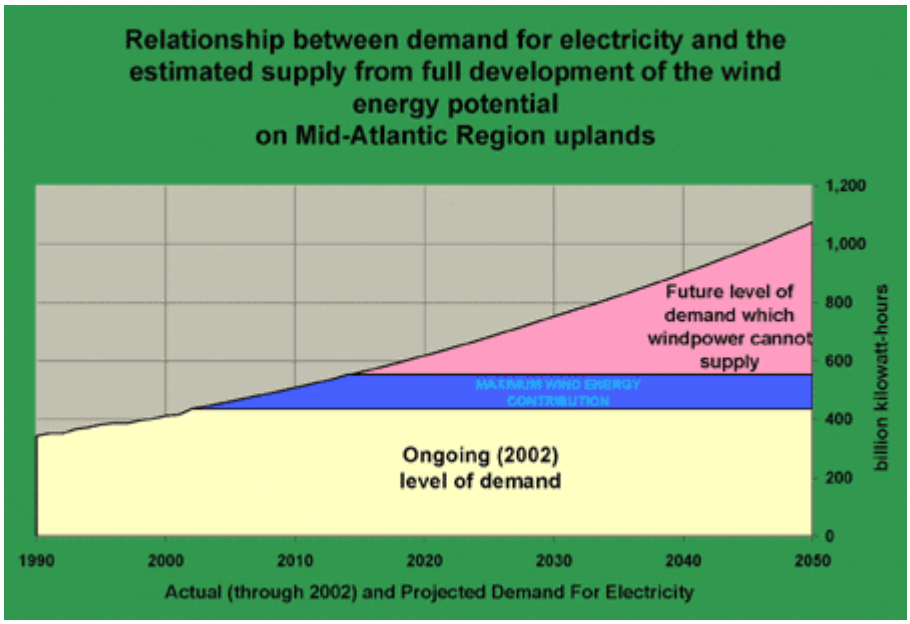
The intermittent nature of wind energy might not pose a problem to the region's electricity grid at present levels. However, increasing the percentage of wind energy to higher levels would require significant and expensive technological modifications to the grid and to the various transmission systems out to the end user. It would also present major challenges for the grid's management.

This may not be a substantial concern until wind energy becomes a major contributor to the electricity grid, adding, say, two or three percent to the total electricity supply. A "Wind Report 2004" by E-On/Netz, one of Germany's largest electric grid operators, confirms this analysis, adding many other "price" caveats: given the intermittent and volatile nature of the wind, both the mechanics of grid operation and transmission technology would have to be retooled—at substantial cost—to back up wind generation. In fact, if wind energy increased to provide, say, just a small percentage of the power for the PJM grid, primarily fossil-fueled generating plants would have to fire up to levels of 80 percent to function as a "shadow" back up service. This report also confirms that wind utilization rates rarely achieve 30 percent, that is, they don't work more than 70 percent of the time (*Attachment P*).

Since other windplants struggle to achieve a 30 percent capacity factor, it is unclear how Synergics has arrived at its claim of 38 percent (down from an earlier claim of nearly 60 percent—the theoretical maximum!). The developer still does not disclose how this capacity will be achieved, and has refused to provide any wind energy measurement data. The PSC should require these wind measurement data to be made public.

With a generous 30 percent capacity factor, *more than 2000 giant 2.5 MW turbines are needed to equal the annual production of one 1600 MW coal plant* (i.e., Mt. Storm, West Virginia). Even if we placed huge wind machines at *all* the good wind sites possible in the uplands east of the Mississippi River (a region with only 5% of the wind energy potential of the continental US) *(Attachment B)*, this would still not reduce the mining or burning of coal, given that our demand for electricity will likely nearly double in 30 years. In fact, *wind technology works least when the need is greatest— summer peak demand, when the wind is typically not very active. At the nearby Mountaineer wind facility, the capacity factor during summer months averages less than 15 percent—half of the average annual capacity factor.*

Consider the following graph showing the relationship between demand for electricity and the potential of windpower to meet it in the uplands of the Mid-Atlantic region.



This region comprises all or most of six states and Washington, DC. It's ridges have less than one percent of the nation's wind energy potential. Moving from left to right, the upward curve on the graph represents the demand for electricity which is expected to increase in the region at a conservative projection rate of two percent each year into the foreseeable future. Present supply comes from the PJM Interconnection, the world's largest grid operator, which taps a variety of power sources-- primarily fossil fuels, with negligible contributions from wind.

However, *if* (and this is a most improbable if) the wind industry could immediately exploit *all* the wind potential available in the region's uplands, *saturating* it with 30,000 huge turbines functioning at a capacity factor of 30 percent (see the table below), then it could produce enough electricity to supply about one-fourth of the *present* level of demand. In the graph, this hypothetical supply from wind is represented in blue atop the ongoing level of demand. But note, in about 15 years, our increased rate of demand will absorb any yield produced by windpower, necessitating additional energy sources to supply it. Unless wind turbines fill up the Chesapeake Bay and are constructed off the ocean's shore, the projected additional future power sources will not come from wind, for the industry will be tapped out on land. As the graph rather dramatically shows, wind energy development of the region's uplands—at its realistic maximum-- will not result in a net reduction of greenhouse gases or cut the present rate of the burning of coal and other fossil fuels. The very best case scenario for windpower in the Mid-Atlantic region is that future wind energy development will only slightly lessen the rapidly increasing rate in the growth of demand for electricity from "dirty" power sources.

The claim Synergics makes about its potential wind energy production may seem impressive. However, a million hamsters churning treadmills will also produce electricity. But what's the point? In this larger scheme, Synergics' comparatively minuscule power production would immediately be engulfed by increasing demand. The boast that its plant would be an important first step in the direction of a comprehensively effective windpower system is therefore unsupportable.

STATE	RENEWABLE ENERGY SOURCES[1]				TOTAL OF RENEWABLE ENERGY SOURCES (million kwh)	% TOTAL FROM WIND	NUMBER OF INDUSTRIAL WIND TURBINES TO GENERATE WIND POTENTIAL[3]
	Geothermal Potential (million kwh)	Landfill Gas Potential (million kwh)	Clean Biomass Potential (million kwh)	Wind Potential[2] (on-shore) (million kwh)			
DC	0	0	0	0	**0**	0	**0**
Delaware	0	123	561	4,806	**5,490**	88%	**1,219**
Maryland	0	515	2,333	5,640	**8,489**	66%	**1,431**
New Jersey	0	1,374	482	15,327	**17,182**	89%	**3,888**
Pennsylvania	0	1,748	9,969	67,894	**79,611**	85%	**17,223**
Virginia	0	1,098	11,669	13,366	**26,132**	51%	**3,391**
West Virginia	0	0	5,323	9,764	**15,087**	65%	**2,477**
TOTAL	**0**	**4,858**	**30,337**	**116,797**	**151,991**	**77%**	**29,629**

1. Source information is from a national report entitled - Generating Solutions: How States Are Putting Renewable Energy Into Action - A Report of the US PIRG Education Fund and the State Public Interest Research Groups. February 2002. ["This report examines 21 states and their potential for electricity generation from renewable resources using state-of-the-art technology." Estimates of amount of electricity possible for energy sources were based on studies by government (mainly National Renewable Energy Laboratory), industry and the Union of Concerned Scientists (UCS).] Amount of electricity is shown as Million kilowatt-hours. See: http://www.uspirg.org/reports/generatingsolutions2_02.pdf

2. Union of Concerned Scientists estimate based on a state breakout of data developed for Doherty, Julie P., "U.S. Wind Energy Potential: the Effect of the Proximity of Wind Resources to Transmission Lines," Monthly Energy Review, Energy Information Administration, February 1995. Includes class 3 and higher windy land area within 20 miles of existing transmission lines, excluding all urban and environmentally sensitive areas, 50% of forest land, 30% or agricultural land, and 10% of range land.

3. Number of modern industrial wind turbines is calculated by dividing each state's Wind Potential by the average amount of electricity annually generated by a 1.5-MW turbine. An "average" 1.5-MW turbine produces only about 30% of its rated capacity each year (i.e., Capacity Factor = .30), so its annual output would be about 4 million kilowatt-hours (1,500 kw *.30 * 8760 hrs/yr).

4.

Q. DO YOU THINK THE PROPOSED PROJECT WILL IMPROVE AIR QUALITY AND THE PUBLIC HEALTH?

A. No. Unfortunately, the demand for electricity will be so great over the next thirty years that additional coal plants are likely to be built. Florida Power and Light, the nation's third largest electric utility company, now owns over one-half of the wind energy facilities in the US. Moreover, AES Corporation, which operates a coal-burning power plant at Cumberland, Maryland, has recently joined with US WindForce (which has several approved and planned projects in West Virginia and Maryland), lending its financial backing to wind energy development in the region. US WindForce is the most ambitious developer of wind energy in the Alleghenies. Here is a weblink to the announced collaboration with AES, an international owner of mostly fossil fueled powerplants: http://www.aes.com/aes/index?page=news&reqid=609530&print=Y.

Such "equity investments" between wind and coal will likely grow in number, as the former industry reaps the cachet of association with a major electricity producer while the latter gathers in the use of wind's generous tax avoidance shelters and its reputation as a green energy source. The irony of these partnerships should not be lost on the PSC.

Unless we have a major change of political direction, fossil fuel combustion, and the toxins it emits into the air, will increase in the future, contributing to such dire statistics as the rate of asthma doubling every five years. The wind industry will not itself alter this circumstance. Only when the public insists upon implementing appropriate standards and newer equipment to increase efficiency, as well as conservation measures that reduce per capita consumption demand, will air quality improve. Indeed, because of some of these measures residual to the last Administration, which mandated newer, more efficient coal-burning technology, air quality in the region has actually improved in recent years.

Altogether, the wind industry in the uplands of the eastern US is not an answer to the concerns about global warming, energy independence, air pollution, or public health.

Q. DO YOU THINK THE PROPOSED SYNERGICS WINDPLANT WILL POWER 13,00-33,000 HOMES, AS INITIALLY CLAIMED BY THE APPLICANT IN VARIOUS ACCOUNTS?

A. No. And here's why. Let's return to the concept of the capacity factor mentioned earlier, examining whether, as the original application indicated, a proposed 40 megawatt windplant would generate enough electricity to power 13,000 homes, let alone 33,000. A megawatt (MW) is one million watts or one thousand kilowatts (KW). According to the Department of Energy, the average home consumes 12,000 KW hours of electricity annually* (not the low 9000 average KW hours Synergics postulates). Using this estimate, one can rather easily obtain a reasonable annual projection for the number of homes this windplant can power. The following example assumes the Applicant's initial 24 turbine windplant with 400-foot tall turbines, each rated with a potential of 1.65MW and a generous capacity factor of 30 percent:

1.65 MW x 30% efficiency = .50 MW (or 500 KW)
500 KW x 24 hours x 365 days = 4, 380,000 KW hours per year per turbine
4,380,000 KW x 24 turbines = 105,120,000 KW hours annual plant output
105,120,000 KW / 12,000 KW hours average household use per year* = 8760 homes powered annually.

Consequently, a 40 MW windplant would power less than 9,000 homes annually. With 19- 420 foot turbines, each at a rated capacity of 2.5 MW, generating 15 MWs annually, as would be the case in Synergics' revised scheme, and using the same calculus, only about 10,400 homes could be "powered" by Synergics' proposed facility. Even this overstates the case significantly, however. Because electricity from wind is inherently intermittent and volatile, it would really "serve" those homes where the occupants were willing to have electricity only when the wind was blowing in the right speed range—or for them to invest in an expensive battery storage system. Seen in this light, windpower would service *no* homes in any conventional sense of that term's use. A 47 MW windplant may produce about 15 million watts annually for the grid, but this is not the same as saying it will service any particular sector. And it is a figure which should be seen in context. The *Mid-Atlantic region requires from the PJM grid about 470 billion KW hrs to supply many millions of households, with residential usage increasing two percent each year—far more than the tiny fraction of a percent Synergics would contribute to the grid. Synergic's possible contribution of 125 million KW hrs for l0,400 households would be so statistically negligible as to be meaningless in terms of cleaner air and improved health—less than two-tenths of one percent.*

*The wind industry often uses a decade-old low end projection of 9,000 showing only direct household use. The conservative 12,000 projection assumes that the average household requires a reasonable baseline of public, community-related infrastructure electricity to operate in society—hospitals, schools, courthouses, traffic lights, etc—in order to function.

Q. DO YOU BELIEVE THE PROPOSED PROJECT WILL ADD SIGNIFICANT REVENUES TO THE LOCAL ECONOMY OF GARRETT COUNTY, AS CLAIMED?

A. No. Promised "windfall" revenue is tantalizing. However, Garrett County relies heavily upon tourism attracted to the region's scenic natural beauty. The lure of additional revenue without any apparent cost often blinds authorities to the problems created by development which will diminish the natural beauty at the heart of the economy.

Garrett County has no ordinances for taxing a windplant in ways commensurate with the capital value of the proposed windplant. This developer's claims about what his windplant will pay in taxes are in need of clarification; for there are assurances Garrett County would receive about $750,000 in the first year alone. The PSC staff should evaluate these claims, examining, among other things, how the equipment section of the county's business personal property tax applies. Nowhere is it made clear what the assessed value of each turbine will be for tax purposes. The developer suggests a 30 year

life, which seems meaningless in light of the federal depreciation schedule allowed.

For the first two windplants operating in Somerset County, PA, the average per turbine tax payment in 2003 was only $528, a combined property tax payment of $7, 388 (fide County Commissioner Pamela Tokar-Ickes) on machines that cost nearly $50 million to install . Moreover, another Florida Power and Light windplant in Thomas, West Virginia (Mountaineer Wind) has purportedly paid $93,000 over several years after a capital outlay of over $70 million—and this after much delay and a lot of negative press (Judy Rodd, Citizens for Responsible Windpower, Personal Communication). These companies had promised to contribute many hundreds of thousands of dollars in local taxes. Synergics will not be taxed as a public utility. Indeed, it is not clear what taxes it would be obliged to pay. With knowledgeable tax accountants, a developer will undoubtedly look to protect its investors, not a local economy hundreds of miles away from its corporate offices. What penalties apply if Garrett County does not receive promised revenues? Evidently, none.

Since this project will lease private land, the county will receive little additional property tax. Wind leases are typically written to favor the developer, restricting the owner's use of the land for up to 35 years and devaluing it significantly (a major problem for those in need of emergency funds). Turbine leases also may allow abandoning all equipment to the property owner, providing little or no indemnification for any decommissioning, removal, or restoration costs. And they often include noise and other "nuisance" easements, holding the developer harmless from legal responsibility if his machines create such nuisances.

Income generated from turbine lease agreements varies widely. Synergics claims that lease income will range from $4,000-$6,000 annually per turbine, although it is not clear how this estimate was derived. It is also not clear what effect five fewer turbines will have on promised wind leases. An examination of a lease from another wind company reveals provision for an initial, one-time payment (from $500 to $1,000) to reserve a turbine lease and pledges a minimum annual rental income of about $1500 per turbine against a small percentage of the power the turbines actually produce, generating at maximum about $2500 per turbine. The PSC should interrogate this claim carefully to protect wind lessors, especially in light of Synergics' reduction in the capacity factor of its machines. Moreover, if a wind lessor does not reside locally, the local economy will not benefit from any increased income tax.

Very few permanent jobs will likely be created— perhaps a couple of low wage maintenance employees. According to a report by the National Renewable Energy Lab on windplant jobs, the national average is one maintenance employee for every 12-15 turbines. A 20 turbine windplant in Meyersdale, Pennsylvania now employs only two maintenance employees. The claim here that four permanent jobs will be created appears generous. But even if it were true, this is a very small return relative to a $40 -50 million capital project.

During construction, a few local security guards and some local earth moving crews may be hired for a few months, while the bulk of construction will probably be completed by non-local labor, since many huge turbines are actually manufactured in Europe(often as subcontracts to US firms like GE) with warranties likely serviced by the manufacturer and its employees. A recent study by the Iowa Department of Natural Resources on the "Top of Iowa" windplant showed that, of the 200 total construction jobs, only 20 were local—and all disappeared within six months.

Synergics has overstated the general local economic benefits by counting the full price of goods and services, rather than value added. Generally, a large part of the price paid to a local supplier has to be paid by that supplier to another agent, in this case likely to be a party outside the local area. This price is part of the local supplier's cost of acquiring the goods (for example, the purchase of fuel, wiring, cement) the local supplier is reselling to the windplant. The only portion of the price paid by the windplant that should be tallied is the difference between the local supplier's cost and the price he charges—that is, the value added portion—which in any case would be extremely small in Garrett County, as most goods will be purchased elsewhere for this wind facility.

Q. DO YOU BELIEVE THE APPLICANT'S CLAIM THAT HIS TECHNOLOGY IS SAFE FOR WILDLIFE BASED UPON HIS EXPERTS' RISK ASSESMENT?

A. Science is the disinterested search for the objective truth about the material world. – Richard Dawkins

Theories crumble, but good observations never fade.—Harlow Shapley

The less one knows about the universe, the easier it is to explain.—Leon Brunschvicg

Good public policy requires those who make claims about the safety of their product to substantiate those claims *before* introducing it into the environment, deferring to what Rachel Carson called the precautionary principle. Industry funded research is always suspect. Experts who work for an industry should submit their research and resulting conclusions for independent, peer-reviewed analysis. Science insists upon conclusions which account for all the evidence, not selective pieces which fit the convenience of a developer's agenda. *Post* construction studies are extremely problematic.

This is surely the principal reason that the US Fish and Wildlife Service guidelines call for a three year preconstruction analysis before a permit such as that which Synergics seeks is granted. And the presumption seems to be that if those studies show significant risk, then the project would be denied. As is the case presently at Altamont Pass, California, where windplants have killed thousands of birds annually for many years (prompting a law suit by the Center for Biological Diversity), who is going to shut down a $40 million + capital facility after it is up and running, even if later studies verify it kills significant wildlife?

Others at this hearing will likely bring forward critical commentary about the claims of wildlife safety that this developer and his team make. I will limit my remarks to the following.

If this project really were a grand first step in the mitigation of fossil fuel emissions, making the air cleaner and our society less “vulnerable from imported energy sources” (although it will do neither), the prospect it will likely kill thousands of birds and bats (and create hardship for other wildlife as well) might be justifiable, although the small population of some of these species makes them extremely vulnerable.

The Roth Rock firetower area is the only place where Mourning Warblers have been consistently found to nest in the state in recent years. Three years ago, I located four nests there, some through serendipity, others by watching the adults carry food. One of those nest locations was destroyed a few years ago because Synergics cleared three acres of forest habitat to erect a meteorological device. Last season, I heard only two singing Mourning Warblers in the area, but did not seek out their nesting sites. Although I’m aware this is a bird that frequents cut-over, disturbed habitat, I’m also aware it does not tolerate intrusion; it is a most cautious bird characterized by its “skulking” behavior. I

have little doubt that a windplant at the scale proposed here will eliminate the Mourning Warbler as a nesting species at this locale, especially since even the revised proposal would erect wind turbines in the midst of the bird's known nesting locations. Perhaps, as Paul Kerlinger, Synergics' avian expert suggests, it won't affect the species' regional or global population levels. But it very likely will purge the Mourning Warbler as a resident nester in the state. And if this happens, how does Synergics propose to compensate the state for this resource loss?

Dr. Kerlinger's avian risk study mocks the scientific method. Scientists are not just experts; they work in an analytic process characterized by rigorously evaluated *if* this, *then* that experimental "conditionals" constructed from hypotheses. Analysis of this kind is supposed to have predictive power because it comprehensively considers the many variables individually-- and then works to understand how they integrate to create "regularities"—patterns with a certain outcome. These predictable outcomes—and the processes used to achieve them—are then scrutinized by other scientists for validation in a process known as independent peer review. A particular experiment, however honestly and intelligently conducted, can yield the "wrong" answer for a variety of reasons. This is why experiments must be checked by other scientists, using other instruments, other conditions, even other ideas.

On the basis of only two walks in the woods at a time (July) well after spring and before fall migration when most nesting birds are generally quiet because they are feeding young out of the nest, Kerlinger makes predictive assessments about the quantity and quality of bird-life in the area. His technical area of expertise resides in birds of prey, not passerines like *Oporornis* warblers. Moreover, his recitation both of the literature and personal contacts used as part of his evaluation protocol is highly selective. In a way favorable to his client, he mischaracterizes conversations he had with representatives of the Maryland Ornithological Society and with Chandler S. Robbins, the area's most knowledgeable ornithologist who has been studying birds there for over 50 years. He invokes the "broad front theory"of migration to justify his statements that birds won't fly low enough or don't follow the contours of the ridge sufficient to collide with his employer's large turbines, in full knowledge there are significant exceptions to the application of this theory. In conditions of fog and low clouds (which abound in the spring and fall around the Garrett County mountains), night migrating neotropical songbirds in large numbers are sometimes forced to fly low enough to encounter 420 foot tall structures atop a 3200 foot ridge. Rather than modifying the broad front theory to accord with all observations, however, Kerlinger continues to invoke it as some sort of sacred text, somehow uncontaminated by reality . This is the antithesis of the scientific method. His tactics here seem similar to those Cinderella's step-sisters employed to create the illusion their outsized feet really did fit that damned slipper.

The radar study to which Kerlinger refers in his testimony as evidence supporting the broad front theory's explanatory power is not the only such study extant. Yet he does not mention these other studies. Recent radar reconnaissance at proposed industrial windplant locations atop the mountains of Vermont (see the Direct Testimony to the State of

Vermont Public Service Board [Docket No. 6911] of Adam Kelly, Vice President of Research and Development, DeTect, Inc, explaining how DeTect used radar to investigate bird activity atop East Mountain, Vermont on behalf of the Vermont Agency of Natural Resources, Department of Fish and Wildlife) and West Virginia (see the recent Arnett study submitted by other intervenors) demonstrate that hundreds of thousands of migratory birds and bats fly low enough to collide with huge turbines, placing them at risk—especially in times of fog and low clouds. This is the case with buildings, cell towers, even fire towers which are along a migratory route. The taller the turbines, the larger the threat. These studies also give evidence that ridges here in the Allegheny Highlands may in fact channel migrating birds and bats, a phenomenon which Dr. Robbins has previously testified he has witnessed. In 2003, a developer-funded mortality study that Kerlinger conducted over a several week period at a West Virginia windplant revealed that over 2,000 birds and bats had been killed during fall migration in that span. Independent experts have doubled that mortality figure to more than 4,000, concluding that Kerlinger's accounting methodology was deficient.

In previous windplant testimony, Kerlinger initially said (inaccurately) the Backbone ridge had relatively few migrating birds passing over, and then used an apples to orangutans comparison, citing statistics (only two or three birds killed per turbine) derived from western turbines averaging about 150 feet tall and located in fields not known for significant avian migration—stating these should be comparable to 400 foot turbines located on prominent forested ridges in areas well known as a major avian flyway. This kind of comparison is no basis for credible prediction, which is the purpose of scientific analysis.

Given the evidence of bodies on the ground in California and West Virginia, wind industry pundits like Kerlinger have now begun to admit that wildlife mortality may be higher than they had expected. But not high enough for him to recommend against building windplants in risky areas, since, although the wildlife mortality at these sites may be significant, and may indeed eliminate one species from nesting in the state, it may not be "biologically significant," threatening any species with extinction, as if the scientific community had agreed to a clear definition of the meaning of "biologically significant." These protean rationales are clearly intended to suit the needs of a desperate client rather than provide a scientific explanation of complex wildlife dynamics.

I believe strongly that the many windplants targeted for Garrett County and the surrounding area (*Attachment C*) represent a staggering challenge—a semi-annual gauntlet-- for migratory wildlife, which in their cumulative aspect may one day be responsible for slaughtering millions of birds and bats.

The montane forest fragmentation for this project alone will create hardship for a variety of wildlife and plants, as Kerlinger admitted in 2002 in his assessment of a much smaller but similarly situated windplant in Searsburg, VT: "Fragmentation of forests via wind turbine erection can impact interior nesting birds in an adverse manner. The size and number of wind power developments in the future are also of concern with respect to

habitat loss and fragmentation. This may become the primary ecological consideration in future wind power developments in these habitats."{An Assessment of the Impacts of Green Mountain Power Corporation's Wind Power Facility on Breeding and Migrating Birds in Searsburg, Vermont, July 1996-July 1998, http://www.nrel.gov/docs/fy02osti/2859.pdf)].

Kerlinger's observation about the threat from fragmentation is not unique. The scientific literature extensively documents concerns for wildlife due to the harm such forest fragmentation as Synergics contemplates will cause. Forest fragmentation has basically two components: the loss or reduction of habitat and the breaking of remaining habitat into smaller, more isolated patches. Among the negative effects of fragmentation on particular species are: the elimination of some species due to chance events; increase in isolation among species populations due to a reduction of their ability to move about the landscape; reduction in local population sizes sometimes leading to local extinctions; and disruption of ecological processes. For the forest as a whole, roads and maintenance of roads and infrastructure are known to have a number of negative effects, ranging from barriers to immigration and emigration, corridors for introduction of native predators and competitors, as well as avenues allowing the spread of non-native, invasive species.

The clearing of wide corridors for miles along the crests of forested mountain ridges to construct and operate utility-scale wind turbines will be a major contributor to forest fragmentation and loss of forest interior habitat (existing more than 100 meters from a clearing) within our region. High elevation forest interiors like Roth Rock offer optimum habitat conditions for the survival of certain species-- and it is the type of habitat most easily destroyed by development, a fact Dr. Kerlinger should know very well. To provide some sense of the devastation that will obtain with Synergics' project, I am attaching some photographs (*Attachment N)* that document various stages in the construction of the Cefn Croes windplant in Wales, with 39-1.5 MW turbines on an upland plateau. For a more complete documentation of this project, consult: http://www.users.globalnet.co.uk/~hills/cc/gallery/index.htm#photos.

To my knowledge, Kerlinger has never submitted his avian wind risk assessments for independent peer reviewed evaluation. The PSC, however, should be very suspicious about such sponsored "research." The PSC should work to develop a process for independently assessing conflicting claims made by experts involving very specialized knowledge. This is not something that should be adjudicated in an adversarial forum. "Truth" does not necessarily lie in the middle between two points of view.

Adequate preconstruction study does not mean that, because such study is made, therefore windplants should be built. Rather, any studies should be made to determine whether or not they should be built at all. Consider the FDA model for risk assessment. I will continue to demand more preconstruction studies not only as predictors of risk; but also as a means of assessing whether the risk is defensible. This is where a peer review panel of independent experts should come in--since the resultant cost-benefit analysis would require a fairly high level of sophistication and expertise over many areas of knowledge.

Q. IS IT TRUE THAT YOU HAVE REFUSED TO RELEASE IMPORTANT RADAR STUDIES THAT MIGHT DEMONSTRATE HOW SAFE WIND TECHNOLOGY IS FOR MIGRATORY WILDLIFE, AS THE APPLICANT AND HIS REPRESENTATIVES HAVE STATED?

A. Synergics' representatives continue to maintain that I and others are refusing to release important field studies that might demonstrate how safe wind technology is for migratory wildlife. This is a lie. Here is the truth.

Since I was one of those responsible for getting those studies done in the first place, the charge is more than ironic. The company involved, Clipper Windpower, insisted on a non-disclosure condition which it alone imposed on those studies. Clipper had agreed to do this study only at the request of the PSC hearing examiner in order to induce the various intervenors to settle. As an intervenor in the Clipper hearing, I was aghast at the idea of such "secrecy." Nonetheless, Clipper insisted that it would not agree to fund those studies unless *all* intervenors signed agreements that the *studies not be released until after the wind turbines were operating.* I reluctantly agreed to do so only after I became convinced that, if we did not, the PSC would likely approve Clipper's application anyhow—and no studies would be done at all. The need for data seemed paramount at the time, even if it were revealed after the fact.

The Applicant has known for many months that *all* the intervenors would be pleased to release those studies in the following way: Clipper must admit in writing that it insisted on the non-disclosure nature of the studies; the reports must be released *for independent peer review* in their entirety, including all data, without restriction; and they must not be used to excuse the need for additional research to map the complex mosaic involved in wildlife migration over the Allegheny ridgetops. I published these conditions in all the local papers months ago. To date, I have not had any response from Clipper —and certainly not from Synergics.

I'm confident these reports will demonstrate, as similar recent research already has, that massive windplants constructed atop mountains in areas well known for wildlife migration pose an unacceptable risk to birds and bats. At the same time, this important issue should not distract from other threats posed by this industry –devaluation of property, destruction of heritage views, and noise/light disturbances to nearby residents.

Q. DO YOU THINK THE ROTH ROCK PROJECT WILL ALTER THE VIEWSHED IN THE TARGETED AREA?

A. The photo below depicts the Meyersdale windplant sited atop a prominent ridge.

375 Foot Turbines Over Meyersdale, PA

As Synergics own simulated photographs show, this project will transform the viewscape —and it will do so for many miles. Still photographic representations do not do the visual experience full justice, however. One must see a windplant to observe that the turbine blades are often in motion at differing angles and speeds-- and hear pulsing noise, like jet engines roaring on a runway, over distances more than a mile away. These turbines will simply take the 3200 foot ridge away from the viewing experience. Contrary to this developer's assertion that his machines will disappear into the mountains at distances beyond four miles, they will be a very visible presence for many miles more, as is the case at Meyersdale. But Synergics' turbines, with the diameter of their rotors longer than a football field and total height of over 416 feet, will be even more visible than the turbines at Meyersdale. The sweep of the blades will be 50 percent or more greater than the 1.65 MW turbines Synergics initially proposed, creating an incredible visual vortex, with an aspect much like a wind amusement park. Although some people find these turbines attractive, most have no a priori concept of the scale and scope involved. Imagine, by way of comparison to the visual intrusion, that someone, through a series of boom boxes, was loudly and perpetually playing rap music (or any form of generally unpopular music) throughout the Pleasant Valley viewshed. Most people, even politicians, understand the need to restrain such an exuberant expression of one's personal aesthetics. Such civic restraint should also apply in the visual arena. Synergics' proposed turbines are not like a new tie or suit or even automobile. They will be quite literally an in-your-face presence to thousands of people, many of whom will find them repellent.

Q. BUT WHAT DOES IT MATTER IF THE RIDGETOP'S APPEARANCE IS SIGNIFICANTLY ALTERED WITH INDUSTRIAL DEVELOPMENT?

A. I'm a strong advocate of wind farms on the high seas. But there are appropriate places for everything. We wouldn't put one of these in Yosemite, and I think environmentalists are falling into a trap if they think the only wilderness areas worth preserving are in the West. The most important are the ones close to our cities, where the public has access to them. And Nantucket Sound is a wilderness, which people need to experience. I always get nervous when people talk about privatizing the commons. In this case, the benefits of the power extracted from Nantucket Sound are far outweighed by the other values our communities derive from it.
—Robert Kennedy Jr., E Magazine (November/December 2003).

In April, 2003, Garrett County adopted a Heritage Plan that, among many other features, recognizes Backbone Mountain as a key natural heritage resource. The Plan assures that the most significant features of the county's past and rural way of life—heritage resources-- will be preserved and bequeathed in stewardship to future generations. This is not to say development cannot take place along the Backbone ridge, for some already has. But the clear intent of the Plan would prohibit industrial development that greatly altered the mountain's appearance. [*Attachment D*: I've excerpted the Heritage Plan and attached it to this testimony. The entire document is available from the Garrett County Office of Planning and Zoning and may be read at the county library.]

The mountains of Maryland are one of the state's compelling natural resources, with vistas inspiring reminders of the importance of wilderness and the special place natural beauty has in our culture. As the state's most prominent, longest mountain, Backbone represents this idea perfectly, and this is the reason for its special status within the county Heritage Plan. However, this project, as proposed, would be a jarring, discordant visual assault, with more towers scrapping the sky in this rural county than there are in Baltimore City (there are only several buildings in the city which exceed the height of these turbines). The scale of this project would visually take the mountaintop away. This is not personal aesthetic judgment, but rather one focusing upon heritage considerations and the public's right to determine modifications to that heritage. Synergics' turbines are not bucolic Dutch windmills and its development infrastructure is not a "farm."

In July, 2004, the Maryland Heritage Areas Authority (MHAA), a unit within the Department of Housing and Community Development, approved the Heritage Plan, formally recognizing Garrett County as a Recognized Heritage Area (RHA). The next stage of this process involves crafting a detailed management plan that will describe how the county will implement and support the RHA. When this step is concluded and approved, the county will be designated a Certified Heritage Area (CHA) and will be eligible for state technical and financial assistance to support the CHA, such as grants for operating assistance, capital and non-capital project support, and marketing, as well as low interest loans and tax credits.

The Heritage Plan, while rooted in historic preservation, is nonetheless a practical recognition of the importance of heritage tourism. "Garrett County receives over 500,000 visitors annually from outdoor-related activities and other related tourism activities." (Page 4.15 of the Heritage Plan) People are attracted to unspoiled views of nature and want to participate in it. Industrial strength windplants threaten this idea.

Elizabeth Cole, an administrator for the Project Review and Compliance Section of the DHCD, has already notified Synergics (her letter accompanied the application) about the need to identify and evaluate historic properties that "may be affected by the project and to develop measures to avoid, reduce or mitigate any adverse effects on significant historic properties." Doing this requires a range of activity. Under Section 106 of the National Historic Preservation Act of 1966, this is a formal requirement for all such applications requiring federal or state permits. Garrett County's Heritage Plan adds yet another dimension to this process.

In its 2003 decision granting a CPNC for Clipper Windpower (Case No. 8938), the PSC made a number of incorrect assumptions about that project's impact on the Garrett County landscape, agreeing with the developer that his turbines "will blend in with the landscape in the background beyond 4 miles [and that] The visual impact will not be significant because the project will be intermittently shielded by terrain and vegetation which will reduce visibility from highways and roads." Moreover, the PSC also inaccurately concluded that "The project will have minimal visual impact on existing residences in the vicinity of the project site because the area has been extensively logged and farmed and the existing landscape has been modified by electrical power lines, communication towers, and roads." And "Each turbine will be framed in the front and back by existing vegetation." All these claims are false for that project-- and for the Synergics project as well, in light of the visibility of the smaller Meyersdale, Pennsylvania windplant.

Q. WHAT DO YOU RECOMMEND THE PSC DO ABOUT RATIONALIZING THE SYNERGICS PROPOSAL WITH THE GARRETT COUNTY HERITAGE PLAN?

A. The PSC *and* the Power Plant team within DNR should understand the implications of this project for Garrett County's Heritage Plan—not just for Garrett County but also for the residents of the entire state and even the tri-state region. Backbone Mountain's majesty should be protected as a reminder of the importance of nature in our lives. There are many design standards and guidelines staff can use for this process. In order to give others involved with this hearing an understanding of the craft involved, I'll list some of them in the next paragraph. But all should be mindful of the difficulties for any design prophylactic to soften and mitigate the effects of such a Goliath facility. The inherent incompatibility of mammoth industrial wind factories targeted for areas that pride themselves on their natural beauty makes for a hard, perhaps impossible, fit. Industrial scaled turbines are probably beyond any reasonable scheme's abilities to integrate that scale into a visual harmony with the environment, let alone disguise their intrusion into a historic view.

At a minimum, siting guidelines for wind turbines require mapping areas of high wind potential together with sensitive natural areas (including national/state/regional parks and scenic areas; gardens and designed landscapes; recreational and wild lands; and lands that promote biodiversity and scientific interest). Buffer zones should be established around areas of high sensitivity. Regional capacity studies should be done that include the cumulative effects on natural heritage sites, visual impact, wildlife/habitat, and local recreational and economic opportunities. See: Scottish Natural Heritage: Guidance for Onshore Wind Farms (www.snh.org.us/pdfs/polstat/ar-ps01.pdf) and Scottish Natural Heritage: Cumulative Effect of Windfarms (www.snh.org.us/pdfs/polstat/cgw.pdf).

Attached is a draft *(Attachment E)* of a Wind Energy Conversion System Ordinance recently approved by Shawano County supervisors in Shawano County, WI. A citizens advisory committee crafted this ordinance after holding more than 50 meetings in the last year and a half before bringing the ordinance to the Planning, Development and Zoning Committee. Shawano County had been targeted for industrial wind development, and the citizens there, aware of problems with the technology, demanded preconstruction regulations and testing protocols that would protect its public viewshed, mitigate noise and other nuisances, clarify local tax revenues, indemnify against inadequate decommissioning funds, and a range of other important considerations. The PSC and the state's Power Plant Research Program should consider this ordinance carefully, reviewing it for siting standards Maryland could adopt before granting any CPCN to the wildcat wind industry.

Since industrial windplants sited along the uplands of the East won't really achieve the claims made for them, perhaps the PSC should encourage developers to consider smaller scaled, locally distributed auxiliary wind energy systems. These offer the prospects of local conservation as well as give design standards a chance to work. Here, individuals and small businesses would be encouraged to build windpower systems at an appropriate scale through tax credits and other subsidies, rather than making them available mainly to industrial wind developers. Small turbines (towers less than 120 feet) could provide power directly to users and any excess power could enter the grid. See: Siting a Wind Turbine on Your Property (www.state.vt.us/psb/application_forms/PSB_wind.pdf).

There is also the reality of rich wind potential in the deep oceans, and I believe, if it really wants to engage the issue of fossil fuel consumption in a meaningful way, the wind industry must get serious about tapping this vast resource, after first doing the necessary studies to ensure the safety of wind technology for marine life. Here is where the taxpayer supported subsidies for wind could perhaps be justified, for the promise of the industry might actually then be aligned with its ability to really deliver on it—without encountering the difficulties inherent with onshore development.

Q. DO YOU BELIEVE SYNERGICS' PROJECT WILL DEVALUE PROPERTY IN THE AREA?

A. Yes. While looming windplants are a relatively recent phenomenon in the East, there is increasing evidence that the closer one resides to them, the lower one's property value falls. The premiums paid for the serenity of natural views can no longer be justified in an area surrounded by huge turbines. The Pleasant Valley viewshed is one of the most beautiful natural areas in the state, filled with family farms and framed by misty mountains. Those who feel that a single wind structure is beautiful should visit Meyersdale to see how the 2750 foot mountain there seems to disappear with 375 ft. wind machines on top (one can see these 15 miles away on a clear day). Note, too, the four acres of clear-cut around each turbine (*Attachment F*).

One of the most validated real estate precepts is the idea that significant natural views have premium value, and intrusions which restrict that view erode value. Realtors doing business near windplants in the western United States and in Europe understand that property will sell for between ten and thirty percent less than previous market value, depending upon how close it is to the windplant. The few "studies" which appear to support the claim that windplants don't devalue property are extremely flawed in fact and methodology, often surveying people and evaluating property miles away from a wind site, then "averaging" these results with properties adjacent to windplants.

Q. WHAT DO YOU THINK ABOUT THE REPP STUDY THAT THE APPLICANT HAS PRESENTED, WHICH SEEMS TO INDICATE THAT WINDPLANTS DO NOT DIMINISH PROPERTY VALUES?

A. The Renewable Energy Policy Project (May, 2003) study that Synergics offers on behalf of the claim that its project will not diminish property values contains serious methodological flaws:

1. The study covers just ten projects, only one of which comes close to the size and scope of Synergics' project—and this site (Madison County, NY—the Fenner Site), with 20 1.5 MW turbines situated on farm fields—not atop prominent ridgelines-- interestingly showed significant decreases in property values.

2. The time frame of the study was so short that even the study's authors were compelled to state the data was insufficient to offer compelling conclusions.

3. The study did not verify whether individual properties had a direct view of the windplants, making the use of the term "viewshed" something of a misnomer in this context, since the viewshed properties were actually all properties within a five mile radius of the turbines regardless of whether they had a direct line of sight. To mitigate this problem, the researchers conducted phone interviews with tax assessors and other local authorities to get estimates on the number of properties in the defined viewshed that *might* have had views of the turbines.

However, under scrutiny, many of these estimates proved inaccurate.

4. The analysis used in this study did not incorporate distance from a wind facility as a variable or weighting factor, so that a viewshed property sale five miles away from a windplant counted the same as one a quarter mile away. It is at least plausible that if windplants do have an effect on property values, it would be strongest close to the turbines and decline with distance. Simple geometry suggests that the majority of properties in the area of a five mile circle are likely to be fairly distant from the wind development: 64% of the area of this circle is three miles or more from the center – and only 4% lies within the first mile. Though properties are not necessarily distributed evenly about the landscape, and property values conceivably can be affected by other things in the vicinity, the REPP study confuses substantially the proportion of properties that either have only a distant view of wind turbines or no view at all.

5. The study relied on average rates of sale prices before and after the windplant construction and between viewshed properties and properties in a comparison group. Therefore, if one calculates that sale prices among viewshed properties increased $50/month faster than sale prices in the comparison group, then it makes a difference whether the statistical uncertainty in the point estimate is plus or minus $25/month or $500/month. The former leads to a conclusion that the wind development unlikely had a negative effect on property values while the latter intimates that the data are inconclusive – there could be a large negative impact, a large positive impact or no impact at all. These "smoothed" average sale prices against a very small time variable creates a regression analysis that is, for prediction purposes, almost beside the point, suggestive of nothing.

The REPP "study," although its basic methodological approach holds considerable promise, is severely flawed. To say, as Synergics does, that the study demonstrates its proposed windplant will have no effect on property values, that it may in fact enhance them, is disingenuous. George Sterzinger, the executive director of the REPP, admitted as much in response to critics who stressed the study contained no proof that windplants were the reason for changes in property values. "We have no idea," he said, noting that the REPP did not have time or money to answer that question. (Cape Cod Times, June 20, 2003). Sterzinger further agreed that the study's findings have to be applied carefully to different situations.

There are very few windplants in the world, let alone in the United States, with turbines over 400 feet tall placed on such a prominent ridgeline. Consequently, there will be no "comparable" facility "yardstick" by which appraisers can measure the impact in Garrett County for predictive purposes. And without knowing about the various nuisances this kind of windplant will produce, the problems for credible prediction increase even more.

Q. CAN YOU CITE STUDIES DEMONSTRATING THAT WINDPLANTS SUCH AS SYNERGICS IS PROPOSING WILL LIKELY DEVALUE PROPERTY?

A. In 2001-2002, the Moratorium Committee of Kewaunee County, Lincoln Township, Wisconsin compared property sales prices to assessed values before and after the construction of two wind energy facilities, each having relatively small .65 MW turbines. An assessor reported that property sales (vs. 2001 assessed values) declined by 26% within one mile and by 18 % more than one mile of the wind project. The Moratorium Committee also sent anonymous survey forms to 310 property owners, of whom 223 responded. These responses were then grouped based upon proximity to the windplants.

The survey results found that 74% of respondents would not build or buy within ¼ mile, 61% within ½ mile and 59% within 2 miles of the windplants. In fact, a large percentage stated that they would not buy a home within 5 miles of the turbines. The windplant's offer to purchase neighboring homes for demolition--to create an "additional buffer for the windmills"--came immediately following the release of a noise study showing the Lincoln wind turbines increased the ambient noise level signnificantly, depending on wind conditions, etc. [See *Attachment G* for the Lincoln Township Moratorium Committee' Report]

.A 1996 Danish report, *Social Assessment of Wind Power-Visual Effect and Noise from Windmills- Quantifying and Valuation,* contained a survey of 342 people living close to windplants. The accompanying survey found 13% of people in the area considered wind facilities a nuisance and would be willing to pay 982 DKK per year to have them leave. A survey of house sale prices showed a 16,200 DKK lower price near a single wind turbine and a 94,000 DKK lower price near windplants versus similar houses located in other areas.

In October, 2003, the Beacon Hill Institute, as part of a study of the proposed Cape Wind project in which hundreds of 430 foot turbines were to be located five miles off shore from Cape Cod in Nantucket Sound, contacted 45 real estate professionals operating in towns around the Sound, asking them about the anticipated effects of the wind power project on property values. Forty-nine percent of these realtors expected property values within the region to fall if the Cape Wind power plant was erected, while most of the rest said they didn't know. [Jonathan Haughton, Douglas Giuffre, and John Barrett, *Blowing in the Wind: Offshore Wind and the Cape Cod Economy*, Beacon Hill Institute at Suffolk University, October 2003, pp. 16-17]

The BHI study also surveyed 501 home owners in the six towns that would be most affected by the Cape Wind project . Sixty-eight percent of these said that the turbines would worsen the view over Nantucket Sound 'slightly' or 'a lot'.[BHI study, page 14] On average, they believed that Cape Wind would reduce property values by 4.0%. Those with waterfront property believed that it would lose 10.9% of its value. The study concluded that, based on the loss of property value expected by home owners, the total loss in property values resulting from the construction of Cape Wind would be $1.35

billion, a sum substantially larger than the approximately $800 million cost of the project itself.[BHI study, page 4]

As the study noted, any reduction in property values would, in turn, lead to a fall in property tax collections in the affected towns; the drop in these tax collections would be $8 million annually. If the tax rates were raised to maintain revenue, this would shift some of the property tax burden off waterfront residents (whose property values would fall the most) and on to the (less affluent) island residents.[BHI study, pages 4, 5]

In the home owner survey, in response to the statement: "It is important to protect an uninterrupted view of Nantucket Sound," 76% strongly agreed, 18% somewhat agreed, 3% were neutral, 2% somewhat disagreed, and 1% strongly disagreed.[BHI study, page 28] It's worth noting that of the home owners surveyed, 94% did *not* have homes with a view of the Sound; [BHI study, page 32] 76% were not members of a conservation or environmental organization.[BHI study, page 34]. Their main reasons for living in the area were the 'beauty of the region,' 'the beaches,' and 'the ocean views.'[BHI study, page 31].

Russell Bounds, one of Garrett County's leading realtors in large property transactions, has already lost sales in the area of proposed windplants (*Attachment H*). He has stated that huge industrial windplants "would be devastating not only to the real estate values in the Pleasant Valley viewshed, especially to neighboring properties, but would also negatively affect the entire county economy, since so much of that economy is tied up with tourism drawn by the county's natural views."(Personal communication, February 27, 2005.) Mr. Bounds has recently testified that, over the last several years, he has had at least 25 people who expressed interest in buying land in the area targeted by wind developers. However, when he advised them about the plans for the wind facilities, not one of those people expressed any further interest.

In a May 16 statement of concern I sent the PSC about this case, I submitted as an attachment a DVD, Life Under a Windplant, made this past January documenting life near large wind installations for residents in Meyersdale, Pennsylvania, as well as for residents along the outskirts of Berlin, a small town a few miles north of Meyersdale. [Since I have already made this available to all parties on the Service List of this case, I will not include it formally in this presentation, although you may refer to it as *Attachment I.*] The DVD features interviews with three people—Todd Hutzell (738 Main Street, Rockwood, Pa 15557), Rodger Hutzell (327 Ridge Road, Meyersdale, PA 15552), and Karen Ervin (561 Ridge Road), who all live nearly a mile from the 20-375 foot turbines Meyersdale Wind facility; with Helen Gallagher (343 Meyers Ave. Meyersdale, Pa 15552), who lives nearly three miles away; with Susan Wilson (2250 Juniper Lane, Rockwood, PA 15557); and with Russell Bounds, the aforementioned Garrett County realtor. It also shows views of the Meyersdale facility from various vantages, as well as views of the 340 foot tall Somerset Wind facility located in farm fields outside Berlin, with images of two properties there that were sold in 2002 for considerably less than market value.

According to witnesses and deed records, Somerset Wind LLC (incorporated in Delaware with offices in Texas—an Enron spawn), in order to discourage lawsuits brought by owners who felt that Somerset's wind turbines were disturbing the quiet enjoyment of their property, bought these properties near Berlin for fair market value—one in May, 2002 from Keith Sarver, 308 Beachley Hill Road, for $101,049, reselling it in August to Robert and Tomalee Will, (who had leased their land to the wind company in the first place) for $20,000—*20 percent of the previous sale price!* The other property was owned by David Sass, 322 Beachley Hill Road. In May, 2002, Somerset Wind purchased the Sass property for $104,447, selling it in August to Jeffrey Ream, for $65,000—*62 percent of the purchase price!*

The prices Somerset Wind in Pennsylvania paid for these properties were comparable to prices paid for similar properties in the area and in line with the price previous buyers had paid. Although the properties were assessed for tax purposes at around $20,000 (as of 1997), they initially had sold for fair market value at $80,000 and $74,000 respectively—in 1998 and 1997. The quotes of the prices listed in the documentary are those listed in the deeds, which are public records. And the reason the developer bought the properties in the first place was to forestall a lawsuit brought on because of the very real nuisances that the windplant created.

The new owners, moreover, signed a "memorandum of non-disturbance easement agreement," which absolves the wind company from liability for what the owners might regard as wind turbine-caused nuisances such as "noise, lights, air movement, odor, dust, vibration, traffic, obstruction of view, [and] light or air currents."

Let's be clear about the difference between the assessed value for tax purposes of these properties and the fair market value involved in the purchase. It is virtually a universal verity that tax assessments for property lag well behind the current market value. The price Somerset Wind paid for both properties was well within the average range of comparable market prices. Clearly, Somerset Wind was willing to pay this price to head off a nuisance suit. And the price it sold the properties for should be instructive as to the company's assessment of their worth, given such proximity to the windplant and the exculpatory non-disturbance easement agreements in the new deed.

Both the Meyersdale windplant site and the project area proposed by Synergics involve a forested prominent ridgetop; both sites have similar ridge shape, orientation and elevation differences to east and west sides; both sites have Class 3-5 wind; both sites have residences located within a mile of the ridgetop. The Meyersdale windplant installed 20 1.5 MW wind turbines manufactured by NEG Micon, which involve 72m rotor diameters and have the nacelle mounted on an 80-m hub height; whereas Synergics plans to install on a much more elevated ridge 19- 2.50 MW wind turbines with an 80 -85m hub height and 82-100 m rotor diameters—much larger machines that likely have no substantial functional history.

The burden of proof that problems at the proposed Roth Rock facility would not be

similar to or worse than the Meyersdale windplant rests with the Applicant.

Q. WHAT NUISANCES ARE OFTEN ASSOCIATED WITH WINDPLANTS LIKE THE ONE SYNERGICS PROPOSES?

A. Tall wind turbines in concert with each other, especially those sited on prominent ridgetops, create profound noise reverberations extending out for more than a mile, sounding like "a boot tumbling in a dryer" or the revving of jet engines on a runway. It is very difficult to predict noise levels in the mountains compared to flat land. Noise levels will be amplified in some areas and diminished in others depending on the shape of the terrain, the wind direction, the changes in wind velocity, and so on. The impact on people also depends on whether wind turbines operate in synchronization and whether the noise "beats" or throbs. This also depends on wind direction and velocity. Who will get bombed? Who knows? That is likely very hard to predict. The travel of sound waves and their behavior is similar to the way water waves travel. Most of us have seen how water behaves when waves enter into a gap or a split or channel of rocks in the ocean. The waves travel inward and pile up-and-up as they become restricted by the channel. The more the channel narrows, the greater the piling of the wave. Sound behaves in the same way. The more it piles up, the louder it gets. A letter from Meyersdale resident Bob Laravee, who lives 3,000 feet from the windplant, documents how he measured the noise over a 48 hour period (*Attachment J*). The results "showed an average reading of about 75 decibels during that period." "According to the EPA, noise levels above 45dB(A) disturb sleep and most people cannot sleep above noise levels of 70 dB(A)."

The noise reproduced in *Life Under a Windplant* has not been altered in any way; Laravee's measurements give some context to the DVD's recorded noise. Noise from European windplants is a notorious and well-documented nuisance there. The wind industry is very aware of this problem but often tries to "hide" it by taking visitors by day directly under the turbines where there is typically little noise or by conducting tours from May-September when wind speeds are typically lower.

Turbine noise is so irritating and disconcerting that it often causes people to seek medical attention, as Rodger Hutzell had to do. Wind leases typically contain "noise easements" to protect the company from liability. Somerset Wind insisted upon such conditions for those who leased their properties for wind turbines, e.g., such as those leases which Don and Jamye Paul and Richard and Barbara Holland signed, whose properties help comprise the windplant near Berlin.

A leading acoustical researcher of the noise problem, G.P. van den Berg of the University of Groningen in the Netherlands, believes loud aerodynamic sounds are generated when the moving propeller blade passes the turbine tower mast, creating sound pressure fluctuations. Such fluctuations may not be great from an individual turbine, but when several turbines operate "nearly synchronously, the pulses…may occur in phase," significantly magnifying the sound. Van den Berg also notes a "distinct audible difference

between the night and daytime wind turbine sound at some distance [more than one mile] from the turbines"—a finding consistent with the experiences of Meyersdale residents. (Both quotes were taken from G.P. van den Berg, Effects of the Wind Profile at Night on Wind Turbine Sound: *Journal of Sound and Vibration* (November 2004) 277:955-970.)

The PSC and the DNR Power Plant team should insist upon acoustical field research to assess this noise phenomenon at the Meyersdale windplant, requiring independent measurements and interviewing nearby residents. The PSC and the DNR Power Plant experts should recognize the need to verify Synergics' claim that its windplant would average 45 dB. This "average" would not mean much if it were applied, say, to residents living next door to Merriweather Post Pavilion during a rock concert. And it will not mean much to the residents of Garrett County, either—who are used to the enjoyment of a quiet landscape. Perhaps appropriate staff from the PSC and DNR, along with Synergics, should attend the First International Conference on Wind Turbine Noise in Berlin, Germany on October 17 and 18, 2005. Organized by INCE/Europe in collaboration with the European Acoustics Association, the conference will address: "Wind Turbine Noise: Perspectives for Control" (*Attachment O*).

Attached (*Attachment K*), please find a noise testing protocol for windplants that was recently approved as part of the Shawano County wind ordinance. Both the PSC and the Power Plant Research group should strongly consider adopting this standard to protect citizens from windplant noise. To repeat, this county in Wisconsin had been targeted for industrial wind development, and the citizens there, aware of problems with the technology, vowed to protect the public by establishing regulations and testing protocols that the wind industry and enabling agencies now must follow.

Q. ASIDE FROM NOISE, WHAT OTHER NUISANCES ARE OFTEN ASSOCIATED WITH WINDPLANTS LIKE THE ONE SYNGICS PROPOSES?

The Applicant has admitted that *interference with television reception* may occur, stating that it was a problem relatively easy to fix—but did not say how or at whose expense. The following weblink contains a March, 2004 BBC report, "The Impact of Large Buildings and Structures (Including Wind Farms) on Terrestrial Television Reception"--see: http://www.bbc.co.uk/reception/factsheets/docs/buildings.pdf. "Wind turbines affect reception up to a maximum distance of 5km" is one of the key sentences in the report.

Lightning and power surges. Wind turbines themselves may cause irregularities in the power supply as wind speed changes. Within the power grid, supply and demand must always be balanced; there is no storage of electricity on this scale. When the wind dies, there is less power (brown-out) until a plant using a more reliable resource powers up to increase production. When the wind gusts, there may be power surges. Residents living near the installation in Meyersdale, which came on-line in December 2003, have had to replace stove elements and small appliances due to power surges which started at that time. Residents of Lincoln Township, Wisconsin, near a wind installation noticed an increase in power surges associated with lightning strikes in their area after the turbines

went on-line in June 1999. [Two computers protected by surge protectors and a TV set, all in different houses, were simultaneously "fried" one evening when lightning struck a nearby wind turbine tower.]
Shadow Flicker and Strobe Lighting. When turning with the sun behind them, turbine blades cast moving shadows across the landscape and into houses in ways that may affect surrounding properties at a considerable distance; these are commonly described as a strobe effect within houses that can be difficult to block out. "Some people lose their balance or become nauseated from seeing the movement. As with car or sea sickness, this is because the three organs of position perception (the inner ear, eyes, and stretch receptors in muscles and joints) are not agreeing with each other: the eyes say there is movement, while the ears and stretch receptors do not. People with a personal or family history of migraine, or migraine-associated phenomena such as car sickness or vertigo, are more susceptible to these effects. The strobe effect can also provoke seizures in people with epilepsy." (Nina Pierpoint, PhD, MD in a personal conversation. Dr. Pierpoint was formerly a clinical professor of pediatrics at Columbia, University and is now in private practice in Malone, New York).

Shoddy site construction practices can also cause serious erosion problems, especially if built along steep slopes. There is much documentation about how *turbine blades throw bolder-sized ice* that has accumulated on the blade surface during winter. There are documented—and very dangerous—fires caused by malfunctioning turbine equipment.

Q. HAVE YOU HEARD THE APPLICANT CHARGE THAT LOCALS WHO OPPOSE WINDPLANTS ARE NYMBYS?

A. Yes. One of the most persistent hypocrisies from corporate wind and its supporters is the accusation that locals who resist the industry are selfishly holding back progress—the NOT IN MY BACKYARD factor. However, many politicians who vote to enable industrial wind do so fully aware that windplants will be built in someone else's back yard, realizing they would not survive the political backlash if one were constructed in their own district. Wind investors—and most politicians who enable them—live hundreds of miles away from the results of their handiwork. While there are many areas of good wind potential available, the industry focuses on rural, often economically depressed areas which don't have much money or political influence. In Maryland, for example, the Chesapeake Bay has the best overall wind potential (*Attachment L*).

Yet this particular wind developer, surely aware of the political repercussions that would ensue, avoids Bay installations—his own backyard-- preferring instead to target Appalachia with the traditional methods of neo-colonialism. He has publicly stated that the choice people will have about an improved environment is between his project in the hinterlands of Maryland and dirty coalplants. He does not demonstrate how this is a one-and-not-the-other situation, of course, while also neglecting to mention how much revenue he expects his company will make. The sanctimonious concern for environmental improvement, which will not obtain with this windplant, obscures the evident desire for profit.

As I have shown in this testimony, there are many legitimate reasons for locals to be concerned about the effects of a massive windplant in their neighborhood.

Q. WOULD YOU DISCUSS YOUR CONCERNS ABOUT TAXPAYER/RATEPAYER SUBSIDIES FOR THE WIND INDUSTRY?

A. In *Life Under a Windplant*, Karen Ervin of Meyersdale continually asks, "Who Benefits?" from the massive windplant around her town. Not her. And not her town.

On a per kilowatt hour basis, wind is among the most heavily subsidized sources of industrialized power in the nation. In response to a long term and very sophisticated lobbying effort, Congress has re-authorized substantial subsidies for wind energy development, including an accelerated double declining capital depreciation schedule and extraordinary investment and production tax avoidance shelters. Taxpayers must underwrite losses to the public treasury to support these subsidies, while the state's electricity consumers are likely to pay more in their utility bills, since Maryland and nineteen other states have passed renewable portfolio standards requiring each state to purchase a percentage of its electricity from renewable power sources. In Maryland, it's 7.5 percent. The Maryland Public Interest Research Group (MaryPIRG) estimates that the wind industry will generate nearly seventy percent of this targeted goal. In effect, this legislation obligates utility companies doing business in the state to purchase much of that electricity from the wind and hydro-electric industries – both of which cause environmental destruction.

Such government support will provide a stable, predictable, fairly long term investment armature—all perfectly legal—to minimize risk. What companies like Synergics require to make the strategy work is a lot of land. If that commodity is brought on line, any other risks to the company would doubtless be handled through insurance. Insurance is available to wind energy companies to protect them even if their turbines supply insufficient power to meet contractual obligations.

One should not mind a company making money in this way, provided it delivers on what it promises. But since the promises Synergics makes are for meaningfully cleaner air, less pollution, less reliance on foreign oil, the company simply cannot deliver on them. Its pretentious environmentalism and sanctimonious concern for the public health too often diverts attention from the *business* of wind energy.

How much money is involved? Let's examine three of the financial mechanisms wind developers such as Synergics can use to artificially enhance their bottom line and shelter income by avoiding usual corporate tax obligations—(1) the federal five year double declining accelerated capital depreciation schedule; (2) the federal production tax credits, good for ten years, at a current rate of 1.8 cents per kW hour produced; and (3) the state's Renewable Portfolio Standards.

1. Assuming that the assessed capital cost of Synergics' plant will be $40 million, the company can depreciate its capital value as follows: $8 million in the first year (20 %); $12.8 million in the second year (32%); $7.68 million in the third year (19.2%); $4.608 million each in the fourth and fifth years (11.52 percent); and $2.304 million in the sixth

year (5.76 percent). This front-loaded depreciation schedule has enormous tax sheltering advantages, especially to wealthy corporations in search of one. And if Synergics sells its facility to another company after the accelerated depreciation allowance had been used, the new owner would also be able to put these generous depreciation benefits to work as well. The incentive here to "trade back and forth" is enormous. Who guards consumers against this kind of caprice?

2. Federal production tax credits remain front and center for wind developers and their investors, today giving the industry tax credits worth 1.8 cents for each kilowatt hour it produces. If Synergics' 47 MW windplant produces about 125 million KW hours annually (each 2.50 MW turbine would yield about 6.5 million KW hours a year, assuming a 30% capacity factor), it would generate about $23 million in tax credits over the ten year period allowed by the production tax legislation. If indeed this windplant powered about 10,400 homes a year, the total subsidy, underwritten by taxpayers, would be about $2,200 for each household powered! Of course, if Synergics' windplant, if built, actually realizes a 38 percent capacity factor, these numbers would be modified accordingly.

3. Maryland's RPS law virtually guarantees wind companies doing business in the state a customer, and will create an artificial demand for thousands of massive wind turbines in the region. Of the various "renewable sources" of power, the only practical industrial source of renewable energy in the foreseeable future is wind, principally because hydroelectric energy is not going to expand in the region. Landfill gas is relatively limited in quantity and availability. The cost of electricity produced by wind is regulated by "market forces" outside the regulatory authority of the PSC—within fairly generous bounds set by the RPS standards. Any seller becomes insulated from market forces when a government dictates that buyers must buy the seller's product or service. This is precisely what happens when a state law like the RPS mandates that a certain portion of an electric utility's electricity be produced from a particular source. The government-preferred seller no longer has to compete with others offering products or services that would satisfy the same buyer's requirement but at a lower price. Moreover, in this case the cost of electricity would be regulated by "market forces"outside the regulatory authority of the PSC—within fairly generous bounds set by the RPS standards. "Market rates" means whatever the market will bear (in this case an artificial market). Market rates contrasts with "regulated rates" that are set by regulators like the PSC.

No one knows the true long term costs per KWhr of electricity from today's wind turbines. All claims about these costs are based on untested assumptions, particularly because there has not been enough long term experience with today's large wind machines to know:

How long they will last (i.e., their useful lifetime)?
How much electricity they will produce (i.e., capacity factor)?
How much their performance will deteriorate over time?
What their maintenance, repair and replacement costs will be as facilities age?

Yet, all of these factors must be known to make a valid claim about the actual costs of electricity from wind turbines. In fact, none of the turbines now being installed (especially 2.50 MW turbines) have been in operation long enough to provide actual data. Synergics is assuming that its turbines will last 30 years and that its capacity factor is accurate for the targeted site, which would yield a particular "overnight" kilowatt hour capital cost. If, however, its turbines last only 10 years (or were abandoned after 10 years because all the tax benefits had been captured, performance had deteriorated, or maintenance costs became prohibitive), the overnight capital cost would be twice as much. This simple example deals only with the useful life of a wind turbine. It ignores all the other factors that would actually have to be taken into account, such as cost of capital; maintenance, repair and replacement costs; cost of other equipment and facilities such as substation, transmission, control and data acquisition, and more. Also, if the capacity factor did not achieve 38% or if performance deteriorated over time (e.g., fouling of blades), calculations would yield even higher costs per kilowatt hour.

What all of this suggests is that Synergics will be hard pressed to stick with any firm notion of the higher cost it will likely charge to utilities, which in turn will surely pass those costs back to consumers. The European experience demonstrates that the cost of wind energy is twice the cost of conventional power sources. According to "The Costs of Generating Electricity," by Phil Ruffles (Chairman of the Study Steering Group) from the Royal Academy of Engineering in London, March, 2004, wind energy will cost as much as a third more than other sources. The report factored in a number of cost issues surrounding each fuel. For example, for coal, the cost of mitigating CO2 emissions was added as a significant negative value. The factor driving the cost of wind was the intermittency problem, that is, the cost of providing "stand by" generation, while assuming a very generous capacity factor of 35 percent. The bottom line: coal fuel's current and future costs (on a pence per kilowatt basis) on average—3.33 and 3.28 respectively (page 31). For onshore windplants, the costs were 5.35 and 4.68 respectively, nearly 35 percent of which was for standby generation (page50).

A very recent study ("All In, Wind Power is Not Cheap" [*Attachment Q*) from Canaccord Capital Corporation, one of Canada's leading investment firms, found that "Wind power costs range from $67 to $105 a megawatt, including a return on capital, compared with all-in operating costs of $34 for coal, $47 for nuclear power and $53 for hydro." Moreover, the report states further that the "capital cost of installing a megawatt of wind power is about $1.7 million," with low utilization rates pushing the real cost to "almost $5 million, compared with $1.3 million and $2 million for each utilized megawatt for coal and gas-fired plants."

The captive market in Maryland that wind now enjoys because of the Renewable Standards will also surely drive the price of wind energy up vis-à-vis electricity prices from conventional power plants.

Altogether, publicly funded tax avoidance schemes reimburse wind energy developers as much as two-thirds of the capital cost of each $1.65 million wind turbine [presentation on

December 15, 2004, by Ed Feo to the Renewable Energy Resources Committee of the American Bar Association], with many states creating incentives to cover on average an additional ten percent of these costs. Windplant owners can use these tax shelters, or sell them, or enter into "equity partnerships" with other companies—all to reduce their corporate tax obligations by tens of millions each year, as the Marriott Corporation did a few years ago with a similar clean energy scheme, within a year reducing its corporate tax obligations from 36 to 6 percent— and a nearly $100 million reduction to the federal treasury (See "The Great Energy Scam: How a Plan to Cut Oil Imports Turned Into a Corporate Giveaway," Time Magazine, October 13, 2003).

The Florida Power and Light Group, the parent of FPL Energy, paid no income tax in 2002 and 2003, according to Citizens for Tax Justice (CTJ), despite having a profit of $2.2 billion during those years. The FPL Group made large investments in wind energy deployment during those years, and now claims to be the nation's leading wind energy producer.[Citizens for Tax Justice, "Bush Policies Drive Surge in Corporate Tax Freeloading; 82 Big U.S. Corporations Paid No Tax in One or More Bush Years," September 22, 2004]. It is now the parent company of Meyersdale Wind and the Mountaineer Wind Energy Center, both of which have provided virtually no local taxes to date.

These costs to the Treasury, which are borne by average taxpayers and ratepayers, don't appear to be worth the meager benefits accruing to less than a handful of full time employees and to undisclosed, likely very meager amounts of annual lease payment to a very few property owners -- much less to reduce the tax obligations of corporations.

Q. WOULD YOU PLEASE ADDRESS YOUR CONCERNS ABOUT THE DECOMMISSIONING PROCESS IN THIS CASE.

A. Today, thousands of earlier, smaller, inactive turbines litter the landscape, abandoned after investors had secured their profits and tax subsidies. *Attachment M* is a copy of Paul Gipe's eight year old article about decommissioning wind turbines in California. Mr. Gipe is a nationally known advocate for responsible wind development. At that time, he wrote that the costs to remove the non-operating turbines still standing in California could exceed $100,000,000. It's important to note that many of these defunct turbines stand just 30 feet high; they are not the giants proposed or being built now.

Gipe reported that to remove just one 0.5-megawatt turbine in Bushland, Texas, the cost was $325,000 to restore the site to agricultural use. Restoration is important because, as Gipe points out, there are site reclamation responsibilities as well as turbine removal that should be addressed. By themselves, the concrete "pads" into which Synergics' turbines will be anchored will cost a lot of money to remove.

The Maryland Energy Administration, working with the PSC, has recently negotiated procedures on an *ad hoc* basis for decommissioning two windplants. While this is a good start, a number of problems remain. Agency staff should have investigated the matter in the way Gipe did, rather than relying upon the developers estimates of removal costs and salvage value.

The good news is that each of the two approved windplants in the state must establish an escrow account held by a third party. However, in the Clipper Windpower case, the bad news is that the escrow account will not be fully funded for 25 years. The negotiated estimate of the cost of decommissioning each turbine was $23,000 (the net cost—less salvage value)—only 1.5 percent of the construction costs. But without documentation of the salvage value, even this figure is questionable. Moreover, if these turbines remain inactive for one year, then the PSC requires them to be decommissioned. But the windplant owner may request an extension from the PSC. Finally, the negotiated agreements were silent about requiring public notice to property owners. As mentioned previously, these newer skyscraper-sized turbines provide little historic information about their useful life. If Synergics 2.50 MW turbines do indeed achieve a useful life of 30 years, as claimed, how can anyone estimate what the salvage value will be in 30 years? (See the Gipe article.)

Synergics has not disclosed any details of its lease/easement contracts with property owners. The PSC has supported other wind developers who have sought to abandon all their equipment to the property owners, compensating them with a bond worth a maximum of $2,000 and stating that the value of salvage will help the property owners recover the remaining portion of removal costs. But if the salvage is worth so much, why aren't the wind companies themselves cashing in? And what might happen if a property lessor, at the end of the contract term, wished to end the arrangement while the turbines were still in operation? Would any escrow account be then used to remove those

turbines? Paul Gipe raises serious questions about the adequacy of the funding for turbine removal and site restoration heretofore sanctioned by the PSC.

The PSC should investigate this issue with much more rigor than it has. It should demand that any liabilities, such as abandoned equipment, be cleaned up by the Applicant or the responsible agent at the time of abandonment. The present situation is a game of "dodge ball," pretending that the company's liabilities will be mitigated but not really assigning any effective means to do so. The PSC should also note the ways in which the Shawano County wind ordinance handles this problem (see page 9):

> 3.2.13 Abandonment, Removal and Site Restoration Plan Required: The applicant shall submit a removal and site restoration plan and removal and site restoration plan cost estimate to the Shawano County PD and Z Committee for its review and approval. The restoration plan shall identify the specific properties it applies to and shall indicate removal of all materials above and below ground; road repair costs, if any; and all re-grading and re-vegetation necessary to return the subject property to the condition existing prior to establishment of the wind energy facility. The restoration shall reflect the site-specific character including topography, vegetation, drainage, and any unique environmental features and shall be completed within one year. The plan shall include a certified estimate of the total cost (by element) of implementing the removal and site restoration plan.
>
> 3.2.14 Abandonment Liability: Signed and notarized legal document stating the landowner will be held liable for removal of the wind turbine(s) should the owner or operators' LLC (or other corporate distinction) become liquidated or the posted bond not be sufficient to cover the costs associated with removal.

Q. WHAT CONCLUSIONS HAVE YOU DRAWN ABOUT THE ADEQUACY AND RELIABILITY OF THE CLAIMS THIS APPLICANT HAS MADE IN THE PROCESS OF SEEKING A CPCN FROM THE MDPSC?

A. Throughout this commentary, I raise concerns about promises made and not fulfilled. In its proposal, Synergics promises:

- a 30 year turbine life;
- only .67 acre clearing per turbine;
- turbine efficiency at 38% of rated capacity;
- significantly increased local revenue;
- no property devaluation or viewshed degradation;
- no decommissioning cost to be borne by landowners or the public;
- "acceptable" nuisance levels (noise, shadow flicker);
- little or no adverse impact to wildlife;
- improved air quality due to its operation;
- improved public health due to its operation;
- decreased dependence upon foreign oil.

I believe the Applicant has failed to make the case for every one of these claims. However, the issue at hand is not necessarily what I believe: the real reason for concern is what will happen if the requested permit is approved and none or few of the claims are later realized? Who will monitor and report any failure? And to whom would those reports be delivered? Will any penalties accrue if these claims are not met? Who will be responsible to remedy a problem?

Wind companies are well aware of the problems their technology creates; it is very likely Synergics, as other wind energy developers have done, may acknowledge many of the problems it says are not by-products of their installation by including various exculpatory "nuisance" easements in its "confidential" turbine leases. People who may experience problems because of the windplant, including adjacent owners whose property may be degraded and devalued, will have to seek a remedy in the courts—at their time and expense. The PSC should do everything possible to avoid this circumstance. This project is Synergics' first venture in windplant technology, and Garrett County should not suffer

from a long learning curve.

In pursuit of a financial bonanza, the wind industry fiercely resists any federal or state regulation guiding windplant installation. To protect their investment potential, eliminate the perception of negative effects, and neutralize critics, wind developers have unleashed a sophisticated public relations campaign permeated with false and misleading claims, appealing to those hoping for the benefits of a safer, more healthful alternative to the mining and burning of fossil fuels. This campaign has helped build a political alliance attractive to many politicians, who give the impression their bills will result in improved public policy without resorting to unpopular conservation measures and expensive regulations to promote efficiency, reinforcing the comfort of the status quo-- especially for the coal industry as it buys "equity partnerships" in windpower. The same politicians bestow government-sponsored financial incentives wind investors seek. This cycle exemplifies much that is problematic about national and state policies, where corporate lobbyists influence lawmakers to gain financial reward at the expense of public well being. And enabling agencies, along with seemingly disinterested departments involved in natural resource protection, are headed by political appointees. This zeal for profit and the politicization of public policy too often override responsible citizenship and stewardship. All this plays out against the backdrop of neo-colonialism, where the people and politicians of affluence exploit the people and resources of the hinterlands to maintain the illusion of "progress."

Given substantial government-induced subsidies (and I believe probable increases for rate payers) that will benefit a relatively few investors who seek tax avoidance opportunities at the expense of average tax and rate payers; given the relatively small amounts of electricity (meaningless, really in the larger effort to reduce the effects of global warming) that will be produced; given the various nuisances likely to be generated in the vicinity of the facility; given the evident violation that will occur to Garrett County's Heritage Plan; and given the likely adverse impacts on wildlife, I can think of few initiatives more worthy of the sobriquet "irresponsible development."

Throughout, I have documented reasonable concerns and doubts about Synergics' project. Perhaps there are laws and regulatory measures which would severely penalize wind developers for making claims they did not deliver once their facility was built. But, if so, I don't know of them. It is incumbent on the Applicant to substantiate and validate the many claims he makes—and it is the duty of the PSC not to a issue a certificate of public "convenience and necessity" until it is *certain* (1) the developer can deliver on all of them and (2) it has determined an enforceable set of sanctions, prepared to shut the plant down and order its decommissioning if major problems ensue.

Q. AS AN ENVIRONMENTALIST, WHY DO YOU BELIEVE WINDPLANTS LIKE THE KIND SYNDERGICS PROPOSES ARE PROBLEMATIC?

A. Our society has much the same dependence upon power from fossil fuel combustion as a three pack a day Marlboro smoker has with nicotine. Although each gets a "lift" from the experience, the mounting evidence for both demonstrates dire health and quality of life risks resulting from the behavior. Industrial windplants like Synergics are to the reduction of dependence on fossil fuels as the smoker who seeks to mitigate the dangers of smoking by switching to three daily packs of Marlboro Lites.

If the wind industry were fully deployed in the uplands of the Mid-Atlantic region, with thousands of windplants like the one Synergics is proposing, coalplants will still be puffing away despite all the gigantic wind turbines permeating the landscape and killing wildlife, destroying culturally significant viewsheds, devaluing nearby property, while creating major nuisances for proximate neighbors. And, because of the region's relentlessly increasing demand for electricity, likely resulting in the combustion of ever larger amounts of fossil fuels, the air quality will likely deteriorate, people would be getting sicker as a result--while paying more in rates and taxes. I submit this is not enlightened public policy.

The only humane short-range solution to the problems of global warming and air quality must combine effective conservation efforts with much higher efficiency standards—heavy lifting indeed for the most wasteful culture in the history of the planet. The wind industry, as it targets huge powerplants along the uplands of our region, is a placebo solution to these problems, distracting from the necessary level of discourse—and political action-- for achieving genuinely functional responses.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

Attachments:

A. Wind Capacity Factor Charts

B. Map of US Wind Electricity Potential

C. Actual and Potential Regional Windplants

D. Garrett County Heritage Plan Excerpts

E. Shawano County, WI Wind Ordinance

F. Meyersdale, PA WindPlant Clearcut Photo

G. Lincoln Township Moratorium Committee Excerpt

H. Russell Bounds' Letter

I. Life Under a Windplant DVD—See May 17 Statement of Concerns to PSC

J. Robert Laravee's Letter

K. Shawano County, WI Measurement Protocol for Windplant Noise

L. MD Wind Potential Map

M. Paul Gipe Report

N. Photographs Documenting Construction of Cefn Croes Windplant in Wales

O. Announcement of First International Wind Conference

P. EON "Wind Report 2004"

Q. News Account from the Globe and Mail (July 18, 2005) of the Canaccord Capital Corporation. I am working on obtaining a copy of the entire report.