THE AESTHETIC DISSONANCE OF INDUSTRIAL WIND MACHINES

1. Windpower's Aesthetic Chic

Demand for electricity will likely increase two percent each year into the far future, nearly doubling the current rate in thirty years.[1] Power to supply it now comes primarily from combustion of fossil fuels like coal, with poisonous consequences.[2] 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 they generate. Indeed, the understandable desire to reduce the toxins caused by reliance on fossil fuel combustion, as well as 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 a long contrapuntal history. A few hundred years ago, timber seemed inexhaustible, but our demand made short work of the supply for energy production. 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.[3] 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 in the process of producing wind energy at industrial scales, as the furor about erecting 130 large wind turbines in Nantucket Sound suggests 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, without investigating potential negative consequences-- and with no apparent knowledge of even recent environmental history. Some see in the shape of wind turbines the very symbol of "conspicuous nonconsumption," despite evidence that they rather conspicuously betoken rapacious consumption. And many have scorned those who oppose windplants near their communities as NIMBYs who selfishly oppose progress.

In fact, Yuriko Saito recently wrote an essay, "Machines in the Ocean: The Aesthetics of Wind Farms," in order to provide an aesthetic anodyne for such NIMBYism. The crux of her argument lies in the following conditional: *if* huge wind turbines offer the potential to offset the combustion of fossil fuels at least partially responsible for endangering our world, *then* they deserve an aesthetic cachet that would foster a more public acceptance. Although this aesthetic may stem solely from a regard for their physical form, it is much more likely to be a sufficient—and aesthetically compelling-- quality flowing from

performing a desirable function, perhaps analogous to the aesthetic acceptance of such structures as the Golden Gate Bridge. The bulk of her essay is a search for the right aesthetic justification for windplants sited in the ocean as well as for those onshore. But for her conditional to work, she must unequivocally demonstrate industrial windpower is both benign and effective.

She does not.

Having assumed the best about windpower, she sets out on her course, along the way considering a range of recent aesthetic ideas and artifacts. Saito's analysis steers between two lines of thought about the most appropriate aesthetic justification for the "object/phenomenon in question." Using Allen Carlson's terminology, she asks whether the turbines' intrinsic, or "thin," qualities, such as color, shape, texture are sufficiently pleasing to warrant aesthetic merit in themselves as objects of art. Conversely, she investigates whether "thick" life values may apply, such as placing windplants in the context of their "environmental significance." In either direction, her methods seem similar to those Cinderella's step-sisters employed to create the illusion their outsized feet really did fit that damned slipper.

Attempting analogies with art, she muses about Christo and de Maria, concluding that though their work really doesn't compare with industrial windplants, it still offers the prospect that "human constructs can enhance the aesthetics of the landscape"—as if anyone disagreed with this general proposition (it's always the devil in those blasted details…). After reviewing an assortment of "guidelines" for windplant siting, none of which seem very effective, she launches a lengthy discussion about "civic environmentalism" and the "aesthetics of sustainability." Here she mentions David Orr's recent work on the nature of design, which calls for "a higher order of beauty" that causes "no ugliness somewhere else or at some later time," linking this idea to Robert Thayer's insistence on making sustainable designs highly visible in order to tout their environmental civic value. In this context, she poetically celebrates a "wind farm" as "'appropriate' or 'congruent' with its surrounding, because not only does it not pollute the air or water nor harm creatures, but because it also is gratefully accepting and deriving maximum benefit out of the site-specific gift nature is providing – wind and open space. And we can witness this nature's gift at work in the movement of the blades."

2. Devils in the Details

While one should appreciate Prof. Saito's concern for the environment and her desire to render the tools of sustainable energy production as aesthetically pleasing forms, one does unfortunately encounter subversive problems with basic matters of fact at virtually every level of discourse in her essay, starting with a rather glaring omission: more than 60 % of the nation's energy consumption does not even involve electricity.[4] Without much investigation, she declares that the Cape Cod wind imbroglio is merely NIMBYism wrought by an impoverished aesthetic. She simply regurgitates disinformation from the industrial wind camp about new technology inoculating giant wind factories against their ability to harm wildlife. She assures that newer wind technology will not cause significant disturbances to nearby residents. And with the phrase, "Very few people dispute the

environmental benefits of wind energy," she embraces the implication that windpower, if pervasively deployed, would be an effective alternative to fossil fuel combustion. None of these notions is true, at least not for most industrial-scaled windplants planned for the uplands and offshore of the eastern United States, given that this region has only five percent of the nation's wind potential.

These windplants will contribute only a small and diminishing percentage of the region's total electricity needs because they will produce only "a piddling amount of electricity" relative to our demand.[5] Given our appetites for consumption, windpower even at industrial scales is so feckless that more than 2500 1.5MW turbines (each about 400 feet tall) spread over 300 miles of upland habitat would not equal the power generated by one 1600MW coalplant.[6] Moreover, radar and other recent studies suggest that industrial windplants erected on high forested ridges in areas well-known for avian migration may have already killed tens of thousands birds and bats, dwarfing the mortality toll at the infamous windplants at Altamont Pass, California.[7] If the wind industry were fully deployed in the uplands of the eastern United States, coalplants would still be puffing away despite the many thousands of gigantic wind turbines permeating the landscape and killing wildlife, destroying culturally significant viewsheds, devaluing nearby property, and creating major nuisances for those who live nearby. Because the air would be getting dirtier, people would be getting sicker while paying more in rates and taxes. [8]

This is what is at stake near Cape Cod—and why people there are so upset. This is the kind of development that causes environmentalists like Audubon's Ted Williams, a noted debunker of get-rich energy schemes, to comment, "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." [9]

The informed public, especially nearby residents, correctly views these colossal wind machines as the worst of Rube Goldbergesque charlatanism, made possible only because of taxpayer-supported government subventions that make wind, on a per kilowatt hour basis, one of the most heavily subsidized sources of industrialized power in the nation. [10] The temptation for virtually risk-free investment profit, without any siting restraints, is overwhelming. At the same time, many of the negative effects of irresponsible windplant implementation are now far removed from the everyday lives and experiences of wind investors and their legion of supporters. Those who would grow richer from these wind "constructs," and the politicians who enable them, live hundreds of miles away, while accusing those who oppose them as NIMBYs—a nifty bit of hypocrisy Saito apparently fails to grasp. Contrary to her assertions about their popularity in Europe, gigantic windplants are now being exiled from land there and targeted for deep waters to protect the viewshed as well as the people who would be victimized by the nuisances industrial turbines cause.[11]

Saito cites Thayer's idea of promoting a new aesthetic sensibility by making "embodiment of sustainable design fully visible and accessible, contrary to our usual tendency to hide signs of technology." Where is her sense of history? Her arguments on behalf of the aesthetic chic of the wind industry mirror those made a hundred years ago for hydroelectric. My, my…. Weren't we all in thrall to the aesthetics of the Grand

Coolee Dam? Of course, these visually prominent power delivery systems were soon found to be so environmentally dysfunctional that no one outside third world countries is building them anymore. And one should note here, with as much of a sense of irony one can muster in this post ironic world, that the Sierra Club was literally founded when John Muir opposed the building of the Hetch-Hetchy Dam for "aesthetic" reasons; he did not want the valley's special viewshed sacrificed on the alter of sustainable design. One wonders what Thayer would think of the Hetch-Hetchy as an "essential marker along the road to a more sustainable world."

Saito has succumbed to easy speculation, avoiding the hard work necessary to document her contention that industrial windpower is both effective and environmentally benign. Bridging matters of epistemology with commensurate notions of aesthetics is difficult enough, even when sufficient context has been established. Melding form with function--finding the proper aesthetic integration between the natural and built environments, between what Jane Austin called "wildness and artifice"—is one of the greatest human challenges. Yes, our reliance on fossil fuels continues to endanger the planet, and we should, sooner than later, find better energy solutions. But the wind industry, as it is presently incarnated in the eastern US, is at best a placebo, giving only the illusion of progress. Prof. Saito's undiscriminating ruminations give comfort to this extravagant fraud. Those who would lead discussions about aesthetics in the marketplace of energy production—and here one should applaud her pluck—should grip their reality with a firm reliance on fact and the very best methodologies if they are to have any hope of influencing better public policy. As it is, however, wind developers will simply use her essay to justify wrecking havoc. And politicians will use her ideas to distract from the necessary level of discourse—and political action-- for achieving genuinely functional responses to our energy mess.

Industrial scaled windplants comprise a large number of permanent, volume-intensive, skyscraper-sized machines arranged in a phalanx along many miles of terrain. If sited on forested ridges, each turbine requires a minimum clear-cut of four acres and miles of access roads. These are not bucolic Dutch windmills and they're not "farms" in any meaningful sense of that term, despite the industry's attempts to pervert language for its own ends. Falling for one of the industry's oldest descriptive deceptions, Saito refers to the "260-foot turbines" Cape Wind proposed for its project in Nantucket Sound. But this is only the tower height. After the addition of propeller blades with a radius of more than 135 feet, and other equipment, each turbine would actually "stand 426 feet in total height and would rotate 15-16 times per minute."[12]"Windscraper" may be a more appropriate term for these machines. Today, in places like California, many thousands of earlier, much smaller, no longer functioning turbines litter fields along the landscape, abandoned after investors had secured their profits when their tax credits ran out.[13]

One or two contemporary windscrapers may have a space-age, Brancusi-meets-von Braun appeal. Several of them might look imposing looming up over a museum or anchoring a section of a large city, as the Eiffel Tower does. Still, they are so huge that the city of Cleveland has no buildings that match their height, while Pittsburgh has only one. Moreover, an industrial windplant, with lots of these turbines, is not static. Imagine a cluster spread over many miles, mindful that turbine blades are often in motion at

differing angles and speeds. Expect to hear pulsing noise, like jet engines roaring on a runway, at decibel levels and low impulse noise that injures health over distances more than a mile away.[14] Further imagine this development surrounding an area like the Antietam Battlefield or over a national park ridgeline or any area notable for its natural beauty. If you do, you might well find yourself on the side of those "NIMBYs" in Cape Cod, especially when you understand that such windplants in the East will have the same affect 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.

An invidious aesthetic transformation occurs when one or two rather elegant wind turbines are joined by many others across the skyline. Perhaps one should compare this process to the threshold mechanics involved in the new scientific discipline known as "emergence." If enough simple wind patterns join together at just the right time at a given threshold, a hurricane will emerge. Similarly, the phenomenon that emerges out from the clustering of many individual turbines takes on a different, much more problematic aesthetic identity. Unlike Wallace Stevens's "jar" upon a hill in Tennessee that "made the slovenly wilderness/Surround that hill," industrial windplants will make the hills (and, off Cape Cod, the Sound itself) seem to disappear, transforming nature into a mechanized energy amusement park, all in the misguided hope of supporting the most wasteful culture in the history of the planet.[15] So much for David Orr's precepts. Although images of strip mines and polluting smokestacks are anathema to aesthetic values and public health, at least they represent meaningful energy production.

Gargantuan windplants have no counterpart in art or, with possibly one exception, in the artifacts of history. Consequently, there is little context for evaluating them as *objets d'art*. Richard Serra's monumental sculptures look cuddly by comparison, and the intimate landscape meditations of Andrew Goldsworthy and Maya Linn offer only unbridgeable contrast. The Great Pyramid is rooted in discrete space, as is the Eiffel Tower and other large buildings. The skyline of such cities as New York does inspire a sense of affinity with its dynamics and noise, but it appears too compressed as it hovers over the landscape. The Great Wall of China covers comparable ground but its height is not overwhelming. Christo's landscape "events" are by design ephemeral. Transmission lines are far too short. Expansion bridges such as the Verrazano and Golden Gate, while colossal and extensive, appear as stable, unified structures. Even those green, renewable architectural wonders of yore, hydroelectric dams, seem confined to particular space, though, like windplants, they affect many miles of surrounding habitat.

Perhaps only the US highway system has the scope and scale to match the aesthetic pretensions for industrial windpower. It certainly has transformed the landscape, as well as much of the culture, penetrating into nearly every aspect of life on the continent. Moreover, its functional success has allowed it to become part of the accepted natural background, much in the way Prof. Saito hopes for the machines of windpower. People generally take the interstates for granted these days. Still, despite its ubiquity, the American highway system should present many "thick value" difficulties for philosophers of aesthetics. These difficulties were rather artfully exposed by Godfrey Reggio in his film, Koyaanisqatsi. Here, Reggio shows our highways as foreboding corridors of frenetic technology in service to unbridled consumption, scarring the earth with terrifying

consequence for no compelling reason. He could just as well have been documenting industrial windpower, pointing out similarities with factory farms and noting how each corrupts the economy, diminishes the ecosystem, and blights the landscape.

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. This zeal for profit now too often overrides responsible citizenship.

3. Deus Ex Machina for Windpower Aesthetics?

With careful architectural craft, construction of smaller scaled, locally distributed auxiliary wind projects would pose significantly less environmental risk. These could be erected in certain locations in ways that might have aesthetic promise. But this, in the word of one wind developer, would likely be uneconomic.[16] And there's the rub. To be sufficiently economic to justify contemporary expectations for private investment, these wind machines must have enormous scale.

The wind industry in the uplands of the eastern US is not even a partial answer to the problems of air pollution and global warming. However, a more effective case for windpower as a force mitigating fossil fuel consumption exits in the upper Midwest, although in doing so one should be careful not to pit one region of the country against another. But it does make sense to put the technology as close as possible to abundant sources of power. For example, North Dakota, South Dakota and Kansas combined have nearly 33 percent of the nation's potential for on-shore wind energy, according to the American Wind Energy Association. [17] What they lack are accessible transmission lines.

National policy could redirect incentives for wind companies to go where the wind really is, subsidizing the construction of transmission lines to support fields of large wind turbines in areas of excellent wind potential, then building high voltage direct current lines running from "hub" areas where many windplants could download power and route it to demand centers like Chicago and Denver. This will not pay for itself; but it could be done with less federal subsidy and considerably more energy yield than the helter-skelter approach now in play. Stringent siting standards must apply to avoid wildlife and habitat destruction, loss of important natural and historically significant views, property devaluation, along with noise and other nuisances that could result from indiscriminately

sited windplants. Equally important in this scenario, *tax incentives for industrial windplants and their distribution networks should be indexed directly to reductions in the mining and burning of fossil fuels*. This is not now the case.

Locating factory farm windplants anywhere on land may create so many problems over so many issues the effort may prove to be more trouble than it is worth. To begin making a significant difference, the nation would require millions of windscrapers positioned at optimal wind locations. However, the European experience with only a fraction of these kinds of numbers has been so problematic that many future windplants there are planned far offshore—and out of sight—especially in the Netherlands and Germany. Robert Kennedy Jr, the environmentalist, is "a strong advocate of wind farms on the high seas," although he demands adequate preconstruction testing to assure safety to marine life. The deep oceans do have the world's greatest wind potential; placing millions of wind turbines there could substantially offset fossil-fueled electricity generation. Prof. Saito would then face a formidable task in making the case for their aesthetic value, since they would resemble a network of oil rigs floating and spinning over the waves. But with a heavy impasto of contextual rationale, she might well pull it off.

The history of environmentalism chronicles the effort to restrain corporate excess and mitigate the unintended consequences of uninformed decisions wrought by wishful thinking. The public and its political representatives should take the time to learn about the wind industry in this context. Aesthetic philosophers would do better for wind initiatives by emphasizing an optimal fit with the environment rather than attempting to provide round-hole, square-peg rationales for maximal profit bloat.

A responsible wind calculus mindful of onshore aesthetic considerations would insist upon

- Appropriate siting criteria (architectural landscape standards and methods do exist), environmental review, natural resource oversight, and full public participation at every level, especially at the beginning of the process.

- Development which steers away from little-disturbed natural areas like contiguous forested ridgetops and toward settled areas such as fields and strip mines.

- Site planning which does not intrude upon culturally and environmentally important natural views or disturb nearby residents.

Above all, none should continue to drink from the well of wishful thinking. Industrial scaled wind complexes in the eastern United States offer no real response to the threat of global warming – and only token gestures for improving air quality. A much more meaningful action would redirect the substantial tax subsides available for wind energy to fund conservation and efficiency incentives, for these would have a far greater impact in reducing the effects of fossil fuel combustion and toxic emissions responsible for endangering the world. Those who would fashion and foster aesthetic iconography for these would merit much praise.

Endnotes

[1] Total electricity sales are projected to increase at an average annual rate of 1.9 percent, from 3,481 billion kilowatt hours in 2003 to 5,220 billion kilowatt hours in 2025 (Figure 66). From 2003 to 2025, annual growth in electricity sales is projected to average 1.6 percent in the residential sector, 2.5 percent in the commercial sector, and 1.3 percent in the industrial sector. Annual Energy Outlook , 2005 Energy Information Agency, Department of Energy. www.eia.doe.gov/oiaf/aeo/electricity.html.

[2] According to the annual notice of Allegheny Power, a utility company serving Western Maryland, these energy sources were required to generate electricity for the PJM (Pennsylvania, New Jersey, Maryland) region from Jan.1, 2004-Dec. 31, 2004: coal—53%; gas—7%; oil—1%; nuclear—37%; renewable energy—2.3%, of which hydroelectric generated 1.4%. Nationwide, fossil fuels provide close to 70 % of the electrical power.

[3] See the Second Law of Thermodynamics. In any energy conversion, such as electric energy into light, much of the energy is "wasted" because it is dissipated into the environment. It is not "lost," for that would violate the First Law of Thermodynamics. For an excellent concise discussion of this law, see Isaac Asimov's New Guide to Science, Basic Books, Inc, New York, 1984, pp. 398-399.

[4] Actually, more than 60% of fossil fuel use is for other than electricity. In the United States, we use about 98 quadrillion (quads) of energy (measured in terms of heat, British Thermal Units [BTUs]) annually. (One BTU equals 0.293 Watt-hours.)About a third of that produces electricity and from that we derive about 11 quads worth of electricity that we generally turn into heat, whether as the product of lighting, or as real heat, cooking, heating water, etc., for residential, commercial, and public sector use. Aside from heating, transportation in all its many forms is of course a major user of fossil fuels. For more information, consult www.eia.doe.gov. This Department of Energy website is a panoply of facts, charts, and projections helpful in understanding our energy circumstance.

[5] The trouble with wind farms is that they have a huge spatial footprint for a piddling little bit of electricity…." –Sir Martin Holdgate, former chairman of the British Renewable Energy Advisory Group.

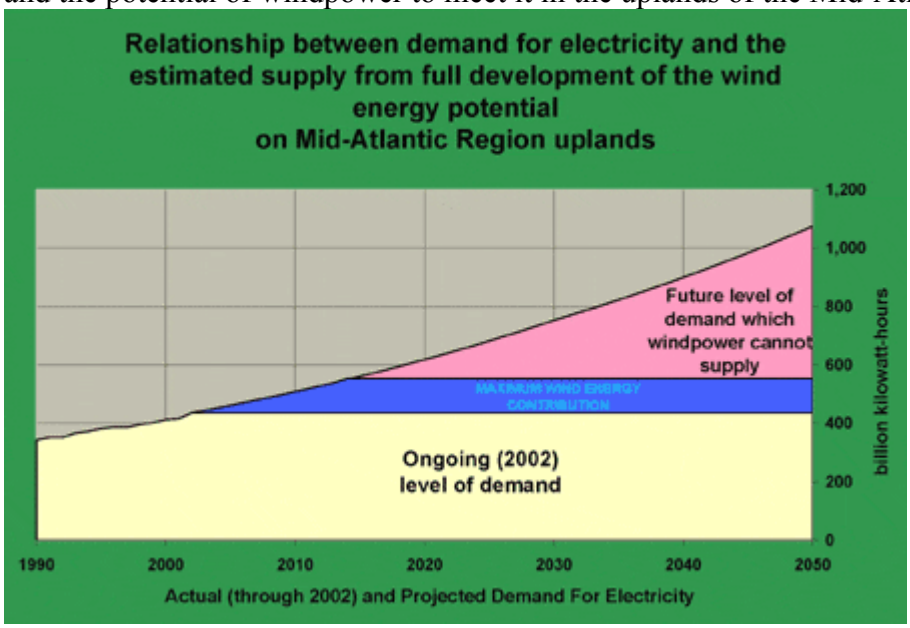
[6] For a more general discuss of the relative fecklessness of industrial wind production, see www.stopillwind.org, and click on Misleading Industry Claims. Consult especially Claims 4 and 3, "Windplants are highly efficient and provide power for significant numbers of homes," and "Windplants will reduce the mining/burning of fossil fuels and lessen dependence on foreign oil."

[7] The avian mortality due to windplants along Altamont Pass near San Francisco has been well-documented for years, leading to a very prominent lawsuit filed by various environmental groups. Less well known are recent studies using radar in Vermont and West Virginia. Read the Direct Testimony 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. Mr. Kelly stated that over 300,000 nocturnal migrants were found to be passing over a mountain-top low enough to collide with huge wind turbines that a wind developer wants to erect at that location. See State of Vermont Public Service Board, Petition of EMDC, LLC (East Haven Wind) for a certificate of public good. Docket No. 6911.

Also, see the study, "Relationship between Bats and Wind Turbines in Pennsylvania and West Virgina: An Assessment of Fatality Search Protocols, Patterns of Fatality, and Behavioral Interactions with Wind Turbines." Edwin B. Arnett, Bat Conservation International Technical Editor and Project Coordinator. A Final Report Prepared for the BATS AND WIND ENERGY COOPORATIVE. Over a six week period from August 1-September 13, 2004, the average number of bat fatalities at the two windplant locations, after correcting for dead bats that collided with wind turbines removed by scavengers or missed by searchers, was estimated to be between 1,164 and 2,900. Immediately after the publication of these figures, the wind industry stated it was withdrawing from further study protocols, but would continue to look for a bat deterrent even as it plans to erect hundreds of new windplants along similar terrain.

[8] 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.



The uplands of this region, comprising Maryland, Delaware, Pennsylvania, New Jersey, Virginia, the District of Columbia, and much of West Virginia, have little more than one-half of 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 that is widely expected to increase in the region at a rate of two percent each year into the foreseeable future. Supply for the present (since 2002) and ongoing level of demand comes from a variety of power sources, primarily fossil fuels, with negligible contributions from wind.

However, *if* the wind industry (and this is a most improbable "if") could immediately exploit *all* of the wind potential available in the uplands of the region, saturating it with 30,000 huge turbines optimally functioning at a capacity factor of 30 percent, 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 now 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 in this area of the US will not reduce levels 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 depress the rapid growth in demand for electricity from "dirty" power sources.

[9] Ted Williams, *Audubon* Magazine (May 5, 2004).

[10] Twenty states and the District of Columbia have approved Renewable Portfolio standards requiring utilities doing business in those areas to purchase a percentage of their power from renewable sources, most of which will come from the wind industry, in effect giving it a guaranteed customer and ensuring higher prices for its product—as is the case in Europe. In addition, wind developers enjoy production tax credits that provide 1.9 cents of tax sheltering opportunity (next year) for every kilowatt hour they produce. At the same time Congress has also provided generous double declining depreciation allowances that allow repayment of the capital investment in less than six years. 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 and currently leading the nation in windplant holdings, 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 in West Virginia, both of which have provided virtually no local taxes to date.

[11] The US wind industry portrays European windplants as models of success, when it fact, especially in recent years, vociferous complaints about nuisances such as noise have been joined with government studies about their ineffectiveness. Germany, which has the most extensive network of wind turbines on the continent, plans future facilities in the deep oceans. The Netherlands, with relatively few modern giant turbines, also recognizes the problem. According to the Eyewitness Travel Guide for Holland (DK Publishing, Inc, 2003), "There are now plans to put these [wind turbines] in the sea so that the skyline is not spoiled." For more on the problems with electricity production and wind, especially in the supposedly model nation for wind development, Denmark, see for example: (1) Nordel's Grid Group, Non Dispatchable Production in the Nordel System, May 2000, (2) Sharman, Hugh (Hals, Denmark), Letter to Financial Times (London), May 24, 2005, explaining that electric customers in Denmark get about 4% of their electricity from wind, not the 20% often claimed, and (3) E.ON Netz, Wind Report 2004. http://www.eon

[12] "Each turbine would stand 426 feet in total height and would rotate 15-16 times a minute." http://www.massenergy.com/Wind.html.

[13] See Paul Gipe, Removal and Restoration Costs in California: Who Will Pay? Windstats Newsletter (Vol. 10, No.2), Spring 1997.

[14] 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.)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 nearby windplant 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.)

[15] Below is a recent photograph taken several miles away from four of the twenty 375 foot wind turbines atop a 2700 foot ridge over the town of Meyersdale, PA. But the height and elevation are only part of the story. The differentially moving propeller blades dominant the visual experience, taking away the sense of the mountain itself.

375 Foot Turbines Over Meyersdale, PA

[16] Kevin Rackstraw for Clipper Windpower, Inc. Maryland Public Service Commission evidentiary hearing, January 7, 2003 for Case No. 8938. See pp. 114-121 of the transcript hearing.

[17]