SOAR
SAVE OUR ALLEGHENY RIDGES
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As President of **Save Our Allegheny Ridges (SOAR)**, I represent hundreds of people across Pennsylvania who understand the negative impacts of industrial wind energy to our forested mountains and migratory corridors. We also recognize that wind energy has a limited potential to reduce carbon emissions and reduce fossil fuel usage. Members of SOAR support renewable energy, if sited correctly, but we recognize its limitations and negative impacts on our wildlife, environment, and human communities. The bottom line is this: Pennsylvania has very few areas where industrial wind development is appropriate, or even effective.

The illusion of industrial wind projects in Pennsylvania as a clean and green, reliable energy source is hard to dispel. Most people don't realize that an industrial wind facility is a power plant that has numerous negative impacts on both wildlife and humans.

Wind turbine manufacturers recommend a safety zone with a radius of at least 1300 feet, and that children be prohibited from standing or playing near the structures. (1) Yet, many of the Wind Ordinances adopted by Pennsylvania Townships have setbacks to roads, or to the property line of a non-participating landowner that violate this safety recommendation (Fact Sheet 1). Township supervisors are ill prepared to understand and effectively deal with the siting issues of industrial wind projects. Most townships are concerned that a strict ordinance will lead to a lawsuit, so setbacks and noise restrictions are minimal and do not adequately protect the township residents or critical habitat areas.

Wind turbines contain hundreds of gallons of oil, which have ignited, or the oil spills and potentially pollutes groundwater. Blade damage is common and blade fragments have been hurled hundreds of feet. Ice throw can damage buildings and vehicles, not to mention injure people. Wind turbines collapse, explode, and catch on fire.

Industrial wind facilities must be recognized as visually intrusive on the landscape – the degree of intrusiveness is subjective – but even wind project directors recognize that turbines dominate the landscape – it is hard to hide something that is over 400 feet tall, with moving blades, a blinking light, and situated on a mountain or high plateau. Turbines require approximately 2 acres of clearing around each one. There are wide clearings between turbines that fragment

forests. A new substation is often constructed. The total impact of forest fragmentation is very significant. The forest is permanently transformed into a patchwork of wide clearings and scattered areas of industrial equipment. Transmission lines are also built, or existing ones upgraded. Turbines kill birds and bats – a significant concern. Turbines produce noise and cause shadow flicker. The amount of electricity produced by turbines is limited, unreliable, costly, and does not directly benefit the local community where the project is built.

Industrial wind turbines do not reduce oil consumption. Less than 2% of the oil in the U.S. is used in the production of electricity (2) – and most of that is heavy residual oil not suitable for other uses. Our addiction to oil will not be cured by supporting wind power.

Pennsylvania has limited wind resources – we rank 22 out of 50 states, as our winds are rated poor, marginal, or fair. The push for wind is driven not by the wind resource, itself, but the Renewable Portfolio Standards, the tax incentives, and huge subsidies. Plus, Pennsylvania has many miles of transmission lines. Our state is a net exporter of electricity (30% of our electricity is exported) and many of the states that buy our electricity want to purchase wind-generated electricity to meet their Renewable Portfolio Standards. The Renewable Portfolio Standards, subsidies, and tax incentives drive the push for wind in Pennsylvania.

According to the PJM Interconnection - a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia, and which manages the high-voltage electric grid and market, Pennsylvania has 15 operating wind projects, with many more locations being studied or under construction. (Fact Sheet 2)

With all this in mind, it is imperative that we take steps to protect sensitive environmental areas, so development does not destroy critical wildlife and their habitats. Other energy producers must complete extensive site evaluations and environmental impact studies. The construction of a landfill requires an environmental impact study. In Pennsylvania, however, wind projects are only regulated via the National Pollution Discharge Elimination System (NPDES) through DEP. This permitting does not recognize that sites with a high risk to migrating wildlife should be avoided. The voluntary guidelines on the state and federal level are not sufficient to protect our precious natural resources. We need regulations and designations that make specific areas off-limits to wind development in Pennsylvania.

Wildlife Mortality

We know that wind projects on forested ridges in Pennsylvania kill thousands of bats, yet companies like Gamesa and Iberdrola are pushing to build wind projects on forested ridges that serve as important habitats for both birds and bats. Gamesa is trying to obtain a takings permit, so they can build the Shaffer Mountain wind project in an area where the federally endangered Indiana bat lives and reproduces.

Timber rattlesnakes are a candidate for threatened or endangered status in Pennsylvania. Wind projects often destroy den sites, the habitat is degraded, or snakes killed outright. Iberdrola wants to build the Dunning Mountain Wind project, which will degrade 2 – 3 miles of prime rattlesnake habitat.

The threatened Allegheny wood rat is imperiled even more by wind development on our forested mountains. Habitat loss is exacerbated by wind development and will lead to even greater

threats to this species. The proposed project in Huntingdon Co. will devastate intact forest habitats required by the wood rat and other forest species.

Wind developers maintain that turbines kill very few birds, but massive projects in migratory flyways are likely to kill significant numbers of birds. Studies on golden eagles in the Altamont Wind project in California show that the risk to raptor mortality is very high and this risk occurs at other wind projects throughout the U.S. The Allegheny Front has been recognized in PA as an Important Bird Area, because of its importance to migratory golden eagles and other raptors. This important wildlife corridor should be off-limits to wind development.

Industrial Wind Turbines in Lake Erie will be harmful to humans, fish, birds, and beneficial insects. The construction of the turbine foundations and electric cables will stir up huge quantities of long buried and undisturbed pollutants (lead, mercury, arsenic, etc). Evidence exists that fish will avoid these huge machines that put out vibrations and low frequency sound. Waterfowl, shorebirds, nocturnal migrating neotropical songbirds, and raptors will be at risk. Huge numbers of Monarch butterflies and dragonflies cross Lake Erie and will be killed by the turbines, as will the mayflies that breed in Lake Erie, which are a vital food source for fish. Some bats also migrate across Lake Erie. There is tremendous data available right now to rule out constructing industrial wind turbines in Lake Erie because of the danger they will cause to wildlife.

Humans will lose that beautiful unbroken scenic view of Lake Erie and the famous sunsets Erie is known for. Property values of residences and cottages along the shoreline will fall dramatically and that will cause the very high tax assessments to drop. Water systems will be in danger of drawing in those stirred up pollutants. The loss of tourism (swimming, bird watching) and fishing will more than offset the very few jobs created by IWT. The loss of a Great Lake - Lake Erie - will be tragic.

Years of scientific data have identified areas that are critical for wildlife. Why is all this data being ignored? A few years of pre- or post- construction studies by consultants who are paid by the wind companies are wholly inadequate. This data is not peer-reviewed, the studies are too narrow in scope and sequence, and the information is not available for public scrutiny.

Forest Fragmentation Equals Extinction

Scientific studies show that forest fragmentation equals extinction. As part of the NPDES permitting process, the Pennsylvania Natural Diversity Inventory checks for rare species, but not rare habitats. A case in point is the Locust Ridge wind project in Schuylkill County. This project (a total of 62 turbines) was constructed in a globally rare dwarf oak barrens habitat. The Nature Conservancy had already designated this area as a "top priority" for protection, but the lack of siting restrictions allowed this project to fragment a critical conservation habitat. (3) A new substation and over 10 miles of wide clearings critically fragmented the dwarf oak barrens.

Wind companies do plant a wildlife seed mix along the cartway, but this low cover does not replace the forest. An intact forest is needed by many species at risk. The more we carve up the forest into little pieces, the easier it is for predators and invasive plants to proliferate, thereby decreasing the sustainability. It is also important to understand that the edge effect extends well beyond the actual clearing for roads, turbines, and substations. Some scientists feel that this slicing and dicing of our forests and natural habitats is the biggest of all environmental problems. Wind companies justify this destruction because they say wind reduces carbon emissions. But what will it matter? There won't be any habitats or species left to save if we keep carving up our

forests. Fragmentation cuts off wildlife from critical habitat, food supplies, security, reproduction, and genetic diversity. Eventually they disappear.

Impacts to the Human Community

Quiet rural areas are transformed into industrial wind projects. Some people are not bothered by this change, while others are. The landscape surrounding one's home provides a "sense of place" that brings security. When huge towers with whirling blades dominate the landscape and noise pervades their homes, people feel violated. Their sense of security and well-being is lost. Noise, shadow flicker, and property devaluation are the biggest problems that residents face when a wind project is built.

A lawsuit in Blair County was just settled in early June against the Allegheny Ridge Wind project, built by Gamesa. Excessive noise, shadow flicker, and other nuisances were so disruptive to a family that it affected their health. One of the biggest issues was the low frequency noise. The actual settlement is confidential, so no details have been released. (4) Low frequency noise does not affect everyone, or every house, but it has become a significant problem to wind project residents around the world. There are numerous court battles over noise and its debilitating impact on human health. Reliable studies have documented the health issues, but because people react differently to noise, and because this type of noise is hard to document, the issue is very hard to resolve. Subsequently, setbacks requiring turbines be far enough away from houses are somewhat successful. Rick James, acoustical engineer, recommends a 1.2 mile setback in his research report. (5) The minister of energy for Ontario has proposed that wind turbines be set back 1,800 feet from any residence and at least 3,000 feet if turbines are producing more than 106 dBA of noise at their base.

The dBA scale, however, does not measure the low-frequency noise—sound that vibrates relatively slowly and is low on the scale of sounds audible to the human ear. It travels farther and penetrates walls and windows more efficiently than high-frequency noise, making it hard to block out. A car blasting its bass stereo next to you at the stoplight—that's low-frequency sound. Many houses can not block that type of frequency, so it disturbs the occupants, disrupting everyday living and sleep. According to the World Health Organization, low-frequency sound can accentuate the negative health impacts of noise, and even sounds below 30 dBA can disturb sleep. (6)

Peer-reviewed medical research on wind turbines and noise impacts show that wind turbine noise is a significant problem to many people who live near wind projects. Reports by Dr. Nina Pierpont (7) and Dr. Michael Nissenbaum (8) show that wind turbine noise can be a debilitating problem to residents. Additionally, there are many cases where people have had to sell their homes to the wind developer, or have even walked away from their homes because they were no longer liveable. The wind industry is ignoring a rising tide of complaints and research and lawsuits that show wind turbine noise is a very real and significant problem.

Wind companies counteract noise concerns during pre-construction by modeling sound studies that do not take into account the complex noise profiles and the low frequency sounds associated with wind turbines. When wind companies have been asked to verify the accuracy of their pre-construction sound studies by showing data from actual post-construction noise studies, they simply reply that those types of studies have not been conducted. Consequently, there is no way to determine the accuracy of the pre-construction studies that are used to show compliance with noise limitations in municipal wind ordinances.

Of course, the leasee needs to understand that they lose control over their land, as they cannot sue over shadow flicker or noise. Leases that I have examine show that the landowner, in reality, becomes subject to whatever the wind company wants to develop on their property.

Ice throw is another problem. Many projects have warning signs, as huge daggers of ice may damage vehicles and buildings that are too close to turbines. Traditional hunting areas are now off-limits, yet the wide clearings and roads invite illegal ATV traffic. Vandalism is an on-going problem.

There have been numerous studies conducted on wind projects and their impact on property values. Many of the studies that have found no impact, have been shown to be flawed. I have personally talked to local realtors who state wind projects decrease property values and make it much more difficult to sell. Common sense would tell us that most people do not want to live near a wind project.

Power Density – Huge Appetite

Robert Bryce points out in his book, Power Hungry, that it may be fashionable to promote wind energy, but wind energy fails when it comes to power density. Our society depends on energy sources that produce a lot of power from small amounts of real estate. This is a key problem with wind. It requires huge amounts of land in order to generate meaningful amounts of power. Wind is a prime example of energy sprawl.

We just don't have the vast open spaces here in Pennsylvania, like we see in the mid-west. We need to hold onto what we have, to protect it for biodiversity, which protects our health, too. We also need to develop reliable, relatively cheap energy, with a small footprint. Wind power requires 45 times as much land to produce a comparable amount of power as nuclear. We can't afford to waste land and ruin natural resources for a fickle energy source like wind.

It will take thousands of 2.0 MW turbines to generate just 10% of Pennsylvania's annual electricity demand in 2030. Hundreds of miles of forested ridgeline reduced to roads and wide clearings: another slice and dice job. Turbines need to be spaced a specific distance apart from each other to prevent turbulence.

The lack of wind resource results in low capacity factors for wind energy. Our research, based on data obtained from the Federal Regulatory Energy Commission (FERC), shows that Pennsylvania's nuclear power plants are reliable and dependable – their capacity factors are over 90%. Coal power plants are also reliable. It will require tens of thousands of wind turbines to equal their output. See Fact Sheet 3. The fatal flaw with wind, however, is that it is unreliable. The capacity factors of wind projects in Pennsylvania hover around 30% or less. See Fact Sheet 4. Wind turbines don't produce electricity when the wind blows too hard, or when it is calm. There are numerous days in the PJM grid where wind produces very little or no electricity. Remember, the PJM grid covers 13 states, and only 0.0259% was generated by wind on August 23, 2009. This snapshot is repeated many times during the summer – the wind just doesn't blow very much.

Wind projects have a low power density, but a huge appetite for steel and concrete. A 2008 report to the President's Council of Advisors on Science and Technology, authored by Dr. Peterson, a nuclear engineering professor at the Univ. of California, showed that each megawatt of wind power has a concrete requirement 9.6 times greater than a nuclear power plant, and requires 11.5 times more steel. (10) Wind companies translate these figures into job

opportunities for the community. The Shaffer Mountain wind project touts that millions of dollars will be spent on local concrete and gravel, without admitting that the intensive requirements for these resources will cause more pollution.

Our society needs energy sources with the highest possible density and that significantly reduce carbon dioxide emissions. Unfortunately, wind does not fit either of these two requirements.

Wind is simply the wrong beast to harness for our energy needs. Look at Texas. It tops the charts in the U.S. for having the most installed wind generation in the United States for the last 3 years. Texas installed over 8,000 MW from wind by 2009, but ERCOT – the Texas equivalent to our PJM grid, considered only 8.7% of installed wind capacity to be dependable during peak demand. From a huge number of installed capacity for wind, Texas counts on just 1% of wind energy to enter the generation grid. (11)

Why are we allowing industrial wind companies to destroy our forested ridges – the oldest mountains in the United States – and their wildlife for an energy source that is unreliable? Why are we turning the Earth's wild places and wild waters into industrial zones for an energy source that is ineffective? Why are we destroying the very nature of rural America by installing industrial power plants that don't deliver?

I have been immersed in wind energy studies for the past 5 years and I've never found any factual evidence that wind significantly reduces carbon dioxide. As I am writing this, I wait to hear from a Pennsylvania university (St. Francis), and an environmental group (Penn Future), both of which have agreed to supply actual data to verify the claim that wind energy significantly reduces carbon dioxide. I have yet to receive any data. I am not a scientist, I'm a retired environmental science and biology teacher, and a lifelong learner of the natural world. I used to support wind energy until I learned about its dirty secrets. One such secret is that the claims of carbon dioxide reduction are based on computer models, not real time data. Actual studies show that fossil fuel conventional plants are required for baseload generation and do not burn as efficiently when wind comes on line. Consequently, researchers have found that the penetration of wind into the grid may actually increase pollution when natural gas turbines are ramped up to back wind's fickle contribution to the grid. (12)

I don't like the fact that our state and federal wildlife agencies are pandering to the wind companies. Thousands of birds and bats are being killed at wind projects, but wind companies aren't being prosecuted for killing eagles or bats because federal and state agencies are looking the other way. It is time to admit that there are better energy power sources than wind energy and that critical habitats and migratory corridors in Pennsylvania should be off-limits to wind development. It is time to protect our communities from noise, shadow flicker, and visual blight. We can't afford to waste precious tax dollars on huge subsidies for wind. Let's support effective energy production that will deliver reliable, carbon-free energy without destroying our wildlife and wild places.

Literature Citations

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3. A Natural Areas Inventory of Schuylkill County, PA 2003 The Nature Conservancy http://www.naturalheritage.state.pa.us/CNAI_Download.aspxI
4. http://www.altoonamirror.com/page/content.detail/id/530477.html?nav=742
5. http://www.windaction.org/documents/17229
6. Guidelines for Community Noise, edited by Berglund et al, published by the World Health Organization, 2000
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12. http://www.masterresource.org/2010/02/wind-integration-incremental-emissions-from-back-up-generation-cycling-part-v-calculator-update/

Fact Sheets

1. Wind Turbine Ordinance Comparisons
2. Interconnection Requests to PJM
3. PA Power Plant Comparisons

Suggested Reading:

Bryce, Robert. Power Hungry. 2010. Perseus Books Group.
Etherington, John. The Wind Farm Scam. 2009. Stacey International.

Fact Sheet 1 Wind Turbine Ordinance Comparisons – prepared by **Save Our Allegheny Ridges** www.saveouralleghenyridges.org 11/13/09

Ordinances	Set-back to Civil Struct-ures	Setback to Partic. Occ. Bldg	Setback to Non-partic. Occ. bldg	Setback to Property Line	Setback to Historic & Natural Site	Noise	Separate permit/ Turbine	Permit Fee	Length of Permit	Notice of Application to Adjacent Property Owners	Agency Approval
PA Model 2006	Omitted	1.1 x turbine height	5 x hub height	1.1 x turbine height	Omitted	55 dbA to non-participating residence	Omitted	TBD	Omitted	Omitted	Omitted
Bedford T.[1] Bedford Co. 10/2007	Omitted	1.5 x turbine height	5x hub height + 1.5 t ht	1.5 x turbine height	2000' historic structures & resources	45dbA to occupied bldg of non-part landowner	No	See fee schedule	25 yrs	Yes - only adjacent owners	Yes
E. St. Clair[1] Bedford Co. 5/2007	Omitted	1.5 x turbine	5 x hub height	1.5 x turbine	Omitted	45 dBA at occ bldg of non-part	No	See Fee Schedule	Omitted	Yes	Omitted
Napier T.[1] Bedford Co. 2007	2500'	1000'	2500 ft.	2000'	Omitted	45dbA to non-participating residence	Yes	$2000/MW	30 yrs	Within 2500' of boundary	PA Fish and Game only
Snake Spring[1] Bedford Co.	2500'	1.1 x total height	2500 ft.	2x total height	None	See Note #13 (p. 10 of ordinance)	Yes	$1500/MW	15 yrs	Structure within 2500' of turbine	Yes
South Woodbury[1] Bedford Co. 2007	Omitted	1.5 x turbine height	5 x Hub Height	1.5 x Turbine Height	2000' to historic resource	45dbA to occupied bldg of non-participating	No	See fee schedule	25 yrs	Yes - only adjacent owners	Yes
W. Providence Bedford Co. 4/2008	2,500'	1,500 ft.	2,500 ft.	2,000 ft.	2,500 ft. to resource	45 dBA at non-part prop line	Yes	$2,500/MW	15 yrs.	Yes – all prop within 2,500 ft.	Yes
Antis T. Blair Co. 2006	2500'	1000'	2500 ft.	1000'	2500' to structure	45dbC at property line of non-part residents	Yes	$1500/MW	30 yrs	Within 2500' of boundary	Yes
Frankstown Blair Co. 2006	2000'	600' (no less than 1.1x total height	2000 ft.	1.1x total height	Omitted	45 dbA to non-participating residence	Yes	$1500/MW	30 yrs	Within 2000' of boundary	Omitted
Logan T.[2] Blair Co. 2006	Zoning	1.5 x turbine height	2500 ft.	1.5 x turbine height	Horseshoe Curve: 3000'	45dbA to non-participating residence	See SALDO	See fee schedule	Zoning	Omitted	Omitted
Tyrone T.[1] Blair Co. 2006	Omitted	2500'	2500 ft.	1000'	2000' to structure or landmark	"Reasonable measures"	No	See fee schedule	See SALDO	Omitted	Yes

Ordinances	Set-back to Civil Struct-ures	Setback to Partic. Occ. Bldg	Setback to Non-partic. Occ. bldg	Setback to Property Line	Setback to Historic & Natural Site	Noise	Separate permit/ Turbine	Permit Fee	Length of Permit	Notice of Application to Adjacent Property Owners	Agency Approval
Portage T.[1] Cambria Co. 2005	2000'	600' (no less than 1.1x total height)	2000 ft.	1.1x total height	Omitted	45dbA to non-participating residence	Yes	$1500/MW	30 yrs	Within 2000' of boundary	Omitted
Haines T.[1] Centre Co.	Zoning	2500'	2500 ft.	2500'	2500' to structure	45dbA to 2000'	No	See fee schedule	Zoning	Omitted	2500' from IBA
Rice T.[1] Luzerne Co. 2007	Zoning	1,500 ft.	1,500 ft.	1,500 ft.	Omitted	55 dBA at site prop line	See zoning	See zoning	See zoning	Omitted	Env. Impact Statement
Potter Co. 2008	Omitted	Omitted	5 x total height or 1,750 ft whichever is greater	Non-part prop – 1,000 ft.	Omitted	5 dB (A &C) above ambient sound at non-part prop line	Yes	$500/permit	15 yrs	Yes	Setback approval required
Somerset Co.[3] 1998			Tower height + 100 ft.			Omitted	See SALDO	See SALDO			
Allegheny T.[1] Somerset Co. 2007	Omitted	1.5 x turbine height	5 x hub height	1.5 x turbine height	Omitted	55 dBA at occ bldg of non-part	Yes	$500/permit	20 yrs.	Omitted	Omitted
Shade T.[1] Somerset Co. 2006	Omitted	1.5 x the turbine height	1.5 x the turbine height	3 x hub height of non-part LO	Omitted	45 dB to property line of non-part landowner	No	$2500/app.	Omitted	Omitted	Omitted
Quemahoning Township[1] Somerset Co. 2009	Omitted	Omitted	Omitted	4x hub height to non-part LO	Omitted	45 dBA to property line 60dBC to property line ****Pre-construction noise studies are required**	No	To Be Determined	Omitted	Omitted	Omitted

Ordinances	Set-back to Civil Struct-ures	Setback to Partic. Occ. Bldg	Setback to Non-partic. Occ. bldg	Setback to Property Line	Setback to Historic & Natural Site	Noise	Separate permit/ Turbine	Permit Fee	Length of Permit	Notice of Application to Adjacent Property Owners	Agency Approval
Elder T.[1] Cambria Co. 8/2006	2,000 ft.	1.1 x total height	2500 ft.	1.1x total height	Omitted	45dBA to residence of non-participating landowner	No	$1500/MW	30 yrs	Omitted	Omitted

[1]Contact the township office for a copy of the Wind Ordinance
[2]See Chapter 27: Zoning, page 95 "Wind Energy Facilities" on the website
[3]Click on "Somerset Co. SALDO Regulations –d) Article IX – XII"
Navigate to pages 7 - 10

SALDO – Subdivision and Land Use Ordinance

Important Note: As wind projects increase in Pennsylvania, many townships are enacting greater setbacks to protect non-participating landowners. Noise and Shadow flicker are the most common negative impacts to communities.

Ordinances include provisions for landowners to sign setback waivers, thus negating a developer's argument that setbacks will kill a project. Wind developers usually compensate landowners who sign waivers, thus they can benefit financially, if they waive the setbacks. This gives more landowners an opportunity to benefit from the wind projects.

Dr. Nina Pierpont, medical expert on health impacts caused by wind projects and acoustic expert Rick James recommend that wind projects be located at least 1 mile from occupied dwellings.

Township officials are finding that it is much easier to regulate setbacks, than it is to rectify noise issues after the projects are in operation.

Fact Sheet 2 Interconnection Requests for Generation Powered by Wind in Pennsylvania as of 5/10/2010 Prepared by Laura Jackson mljackson2@embarqmail.com

Queue	Name	Location	Details	County	Developer	Project Name	MW	Status	Schedule
B14/K18	Garrett	Garrett	8, 1.3 MW	Somerset	FPL	Arnold 115kV	10.4	In-Service	1/1/1999
B28_W08/K20	Mill Run	Sprngfld T, Stewart T	10, 1.5MW	Fayette	Horizon/ PPM Energy	Mill Run 25 kV	15	In-Service	4/1/2002
D05/K21	Waymart W. F.	Moosic Mtn. Canaan, Clinton T.	43, 1.5MW 6.5 miles	Wayne	FPL	East Carbondale 69kV	64.5	In-Service	12/1/2003
E13/K22	Somerset	Somerset	6, 1.5 MW	Somerset	FPL	Somerset 22.86kV	9	In-Service	1/1/1999
G21/K23	Meyersdale	Summit T. Allegheny Front	20, 1.5MW	Somerset	FPL	Myersdale North	30	In-Service	12/3/2003
L18	Bear Creek	Bear Creek T.	12, 2.0MW	Luzerne	BB, Iberdrola SA	Bear Creek	24	In-Service	2/26/2006
N14_O46_P03	Locust Ridge	Mahanoy E. Union T	13, 2.0MW	Schuylkill	Iberdrola SA	Frackville-Hauto #3 69kV	26	In-Service	6/1/2006
N39	Allegheny Ridge	Portage Lilly	40, 2.0MW	Cambria, Blair	BB Iberdrola	Johnstown-Altoona 230kV	80	In-Service	12/15/2006
I13/K13	Forward Wind Power	Ridge Rd. Shade T	12, 2.0MW 2, 1.5MW	Somerset	Edison Mission	Hooversville 115kV	29	In-Service	9/1/2007
K02	Laurel Hill	Se of Liberty; Jackson T, McIntyre T	47, 1.5MW	Lycoming	Catamount	East Towanda/Moshannon 30kV	70.5	LITIGATION SUSPENDED	11/15/2008
L13	Casselman Wind Project	Rockwood	23, 1.5MW	Somerset	PPM Atlantic	Rockwood	40	In-Service	12/31/2007
N32	South Chestnut Wind Power Project	Wymps Gap	24, 2.1MW	Fayette	Atlantic Wind	Gans 138kV	60	Under Construction	12/31/2007
N36		Ulysses T., Hector T.	80	Potter	AES Headwaters Wind LLC	Gold-Sabinsville 115kV	50	Under Construction	11/1/2008
O17	Stoneycreek	Somerset		Somerset	Generation Resources	Somerset-Allegheny 115kV	65	ACTIVE	4/1/2008
O18	Highland W.F.	Krayn/Dunlo Adams T.	25, 2.5MW	Cambria	Krayn Wind LLC	Salix-Claysburg (Krayn) 115kV	62.5	Partially In-Service	3/1/2008
O19		Somerset		Somerset	PPM Energy	Somerset 115kV	33	Under Construction	9/1/2008
O28	Penobscot Mtn./Crystal Lake	Bear Creek T.	34, 1.5MW	Luzerne	PA Windpower	Jenkins-Harwood #2 69kV	51	LITIGATION SUSPENDED	9/30/2006
O38	North Allegheny	Lilly Portage T.	25, 2.0MW	Cambria	Gamesa Energy	Johnstown-Altoona 230kV	50	In-Service	11/20/2007

Queue	Name	Location	Details	County	Developer	Project Name	MW	Status	Schedule
O39	Mahantango Mtn.	Mifflin T	28, 2.0MW	Dauphin	Mahantango Wind, LLC (Gamesa)	Sunbury-Dauphin 69kV	56	SUSPENDED*	12/15/2007
O40		Near Pine Grove		Schuylkill	Gamesa	Pine Grove-Frailey 69kV	44	SUSPENDED*	12/15/2007
O48_R40	Lookout W.F.	s. of Berlin	18, 2.0 MW	Somerset	Edison Mission	Hays Mill-Lookout 115kV	36	In-Service	12/31/2007
O52		Genesee		Potter	Invenergy Wind	Gold-Potter Co 115kV	50	SUSPENDED*	11/1/2007
O56	Dunning Mtn. Wind Project	Evitts Mtn Bedford		Bedford	Iberdrola Renewables	Osterburg East 115kV	125	SUSPENDED*	12/31/2007
O59		Ulysses Hector T		Potter	AES Keystone	Gold 115kV	99	ACTIVE	12/31/2007
O60		4 mi e. of Berlin, s. of White Horse Rd.	3, 1.8MW	Somerset	Borough of Berlin	Berlin 23kV	5.4	Under Construction	7/15/2007
O70		Drums	62, 2.0MW	Luzerne	Gamesa	Susquehanna-Harwood	124	SUSPENDED*	12/15/2007
O72	Shaffer Mtn. Wind Farm	Central City Allegheny Front	30, 2.0MW	Somerset /Bedford	Shaffer Mtn. Wind (Gamesa)	Hooversville-Central City	60	SUSPENDED*	11/30/2007
P01		Rock Run ATV Park n. of Patton		Cambria	Freedom Wind Energy	Westover-Madera 115kV	65	SUSPENDED*	10/31/2007
P22				Cambria		Johnstown-Altoona 230kV	50	ACTIVE	11/20/2007
P28				Wyoming		Mehoopany 115kv	150	Under Construction	11/1/2007
P45A				Wayne		Thompson 115kV	120	ACTIVE	12/1/2009
P47	Armenia Mtn.			Bradford/Tioga		Mansfield-S. Troy115kV	100	In-Service	12/31/2007
P60	Stony Creek	Allegheny Front		Somerset	E.ON	New Baltimore115kV	60	In-Service	9/1/2007
Q24				Potter		Gold-Sabinsville 115kV	101	ACTIVE	11/30/2008
Q25				Fayette		Donegal-Iron City 138kV	80	Under Construction	12/15/2008
Q27	Locust Ridge II			Schuylkill		Frackville-Shennandoah69kV	100	In-Service	12/31/2007
Q28				Schuylkill		Eldred-Frackville230kV	220	SUSPENDED*	12/31/2008
Q34				Somerset		Garrett 115kV	100	Under Construction	11/31/2008
Q36	Sandy Ridge	Allegheny Front		Blair/Centre	Gamesa	TyroneN.-Phillisburg115kV	50	Under Construction	12/31/2008

Queue	Name	Location	Details	County	Developer	Project Name	MW	Status	Schedule
Q40				Clinton		Renovo – Lock Haven	40	ACTIVE	6/29/2006
Q53	Chestnut Flats	Logan Township		Blair	Gamesa	Summit-West Fall 115kV	38	**Under Construction**	12/15/2008
Q58				Northumberland		Sunbury-Susquehanna	100	ACTIVE	12/31/2008
Q62				Bedford		Saxton-Snake Spring 115kV	100	ACTIVE	7/1/2008
Q72				Tioga/Bradford		Mansfield-S. Troy 115kV	110	ACTIVE	11/30/2008
R05				Wayne		Thompson 115kV	50	ACTIVE	12/1/2009
R09				Cambria		Summit-Claysburg 115kV	48	ACTIVE	12/15/2007
R32				Cambria		Salix-Claysburg 115kV	75	ACTIVE	9/1/2008
R43				Schuylkill		Frackville-Hauto#3	20	**Under Construction**	12/31/2006
R45				Tioga		Mansfield-Tower Hill 115kV	70	ACTIVE	11/30/2008
R53				Schuylkill		Stanton-Brookside69kV	60	ACTIVE	11/11/2008
R92				Clearfield		DuBois 115 kV	70	ACTIVE	1/31/07
S11				Cambria		Seward-Tower 115kV	70	ACTIVE	3/5/2007
S20				Schuylkill		Pine Grove-Fishbach 69kV	50	**SUSPENDED***	3/19/2007
S42				McKean		Eldred-Fairview	18	**SUSPENDED***	5/15/2007
S44				Mifflin		Mifflin County	110	ACTIVE	5/18/2007
S49				Bedford		Bedford 115 kV	203	ACTIVE	5/24/07
S65				Cambria		Cambria	85	ACTIVE	7/19/2007
T27				Somerset		Hyndman 34kV	60	ACTIVE	9/7/2007
T37				Schuylkill		Hegins	150	ACTIVE	9/14/2007
T39				Potter		Coudersport 46kV	18	ACTIVE	9/14/2007
T100				Bradford		Grover-E. Towanda	200	ACTIVE	11/12/2007
T121				Potter		Potter 115kV	120	ACTIVE	12/28/2007
U1-038				Centre		Milheim	50	ACTIVE	2/29/2008
U1-050				Clearfield		Clearfield	200	ACTIVE	3/25/2008
U1-051				Clearfield		Clearfield	130	ACTIVE	3/25/2008
U2-015						Harwood-E. Palmerton	100	ACTIVE	5/23/2008

Queue	Name	Location	Details	County	Developer	Project Name	MW	Status	Schedule
U2-016						Grover 230kV	85	ACTIVE	5/23/2008
U2-055						Karthaus-Milesburg 230kV	89	ACTIVE	6/27/2008
U2-069						Frackville	56	**Under Construction**	7/21/2008
U2-073				Somerset		Frostburg	200	ACTIVE	7/23/2008
V2-019						Mansfield-S. Troy 115kV	101	ACTIVE	6/18/2009
V3-018						Towanda 115kV	75	ACTIVE	8/24/2009
V3-030				Cambria		St. Benedict-Patton 46kV	32	ACTIVE	8/31/2009
V3-042						Thompson 115kV	84	ACTIVE	9/2/2009
V3-057						Letort	3	**Under Construction**	10/16/2009
W1-012						Millheim-Brush Jct 45kV	50	ACTIVE	2/12/2010
W1-015		Shade Gap		Huntingdon	E.ON	Shade Gap 115kV	70	ACTIVE	2/19/2010

Note: The Suspended Status does not mean the project is cancelled, but that the project has been delayed for various reasons.

A detailed, interactive spreadsheet with more information, is on the SOAR website: http://www.saveouralleghenyridges.org

Fact Sheet 3

10 Largest Power Plants in Pennsylvania And Number of Wind Turbines Needed to Provide Equivalent Annual Output of Electricity (kWh)

Facility Name	Capacity (MW)	Fuel Type	Annual Capacity Factor	# Wind Turbines To Equal Output*	# Miles Ridgecrest Covered+
Limerick	2,276	Nuclear	97%	3,680	526
Peach Bottom	2,304	Nuclear	93%	3,571	510
Bruce Mansfield	2,741	Coal	77%	3,518	503
Susquehanna	2,596	Nuclear	79%	3,418	488
Beaver Valley	1,847	Nuclear	86%	2,647	378
Homer City	2,012	Coal	75%	2,515	359
Conemaugh	1,872	Coal	79%	2,465	352
Keystone	1,872	Coal	75%	2,340	334
Hatfields Ferry	1,728	Coal	56%	1,613	230
Brunner Island	1,559	Coal	76%	1,975	282

* 2 MW turbines at 30% annual capacity factor

\+ 7 industrial turbines per mile

Data prepared by Dan Boone for Save Our Allegheny Ridges www.saveouralleghenyridges.org

Fact Sheet 4 # PROOF THAT WIND DOESN'T WORK IN PA

-Developed by Save Our Allegheny Ridges www.saveouralleghenyridges.org
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PERCENT CAPACITY FACTORS FOR A SAMPLE OF PA WIND PROJECTS

Year	ARWF 80 MW	LR 26 MW	Forward 29.4 MW	Lookout 37.8 MW	Casselman 34.5 MW	Somerset 9 MW	Meyersdale 30 MW	North A*	Garrett 10.4 MW	Mill Run 15 MW
2007	N/A	29.39	N/A	N/A	N/A	25.66	28.01	?	7.33	N/A
2008	27.59	30.66	N/A	N/A	26.62	25.39	28.8	?	7.8	27.87
2009	25.63	30.71	16.49	N/A	30.87	23.75	29.02	?	9.04	28.96

ARWF: ALLEGHENY RIDGE WIND FARM
LR: LOCUST RIDGE
? NORTH A: NORTH ALLEGHENY WIND LLC was purchased by Duke Energy and is not listed under that name in FERC. Has it been renamed?
N/A: Data inconclusive due to turbine blade failure OR data was submitted during testing phase

The Capacity Factor is determined by dividing the amount of power produced by a plant by the amount of power it is capable of producing. A 2 MW turbine is capable of producing 2 MW, but it never does.

It is important to explain that the most important aspect of power is effective capacity – or capacity value. Some natural gas units have capacity factors less than 10%, as they only operate during peak demand.

This ability to respond on demand is known as the effective capacity--or capacity value. AND THIS IS, IN THE FINAL ANALYSIS, THE VALUE WORTH COMPARING. *Economists who compare the cost of wind projects with the cost of conventional plants, without pegging those costs to value received, do a great disservice.*

If two people bought toasters for $50 each--and the first toaster worked perfectly as expected each day for years without a hitch, while the second toaster almost never worked as expected, their value is comparable only by the wide contrast in performance. In a sane world, the second toaster would have been returned within a week--and labeled as a lemon. Wind provides only desultory, dyspeptic energy, not modern power performance.

Wind has an effective capacity of zero. Capacity "credits" for wind are only a statistical "projection." For any given future time, no one can be sure of how much wind will be available. The first toaster described above produces an effective capacity of 99.999% and a capacity credit (based on its history of use) of over 99.9%.

The second toaster may have a capacity credit of 10%--but one can never be sure when the one in ten times it might work properly will happen. So it has an effective capacity of zero. (Toaster Analogy developed by Jon Boone)