
WIND
CATCHERS

CHANGES IN PENNSYLVANIA'S ENERGY POLICIES NOT ONLY BODE WELL FOR THE ENVIRONMENT, THEY ALSO ARE HELPING TO PROVIDE BRIGHTER ECONOMIC FUTURES FOR REGIONS ACROSS THE STATE. BY JEFFERY FRASER PHOTOGRAPHY BY JOSHUA FRANZOS

Joe Satkovich hired on as a 19-year-old orders clerk at Bestform when the lingerie maker opened its Johnstown distribution hub in the early 1970s. He was there more than 25 years later when the family-owned company was sold to clothing conglomerate Vanity Fair Intimates. By 2004, he had risen in rank to supervisor of operations, and it was up to him to break the news to employees — many of them longtime co-workers and friends — that the distribution center was moving to the right-to-work state of Alabama, taking their union jobs with it. → If that wasn't wrenching enough, Satkovich, too, found himself staring into the abyss of unemployment as the doors to the plant closed for good. "I was drop-dead terrified," says the native of Windber, Cambria County. "I was 51 years old. Worked at Vanity Fair for 32 years. It was all I knew. I had no idea where I was going to go from there. Worst days of my life." → His dread did not last long. Vitoria, Spain–based Gamesa Corp., the world's second-largest maker of utility-grade wind-energy turbines, announced in the fall of 2004 plans to open its first U.S. manufacturing plant in Cambria County, near Ebensburg. Satkovich was among the first of 250 men and women the company hired for the factory.

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The wind turbine blades manufactured at the Gamesa plant in Cambria County represent one of the new sources of energy and employment in western Pennsylvania. Top left: Shift Production Manager, Joe Satkovich, stands next to finished turbine blades waiting to be shipped. Each blade is about 146 feet long and weighs about six tons. Left center: James Zebala and Brad Van Male, finishing operators at the plant, do a final inspection of the blades. Below: John Tims takes measurements before the final trimming of the blade, as co-worker Kelly Blair looks on.

Today, he supervises one of three around-the-clock shifts at the plant, which manufactures 146-foot carbon fiber turbine blades. "It was a life-saver," he says of his Gamesa job. "A very, very big relief."

Even before Satkovich's reversal of fortune was complete, the potential for that kind of scenario helped convince Pennsylvania lawmakers a few months after Gamesa's announcement to enact one of the most progressive alternative energy policies of any state in the nation.

Under Pennsylvania's Alternative Energy Portfolio Standards, power generated by alternative energy technologies must account for at least 18 percent of the electricity sold in the state by 2020. Eight percent is to be generated largely from renewable sources, such as wind, solar and biomass. Another 10 percent is to come from more mature alternative technologies, such as waste coal. The act received bipartisan support in the state House and Senate and was signed into law in November 2004 by Gov. Ed Rendell, whose administration lobbied hard for the measure.

It is expected to result in a cleaner, more diverse energy portfolio for Pennsylvania, which has stubbornly depended on fossil fuels, particularly coal-fired power plants, to generate its electricity. The state Department of Environmental Protection, for example, estimates that 9 million tons of the greenhouse gas carbon dioxide will be avoided each year once the portfolio standards are fully implemented. Most of that reduction would result from the development of renewable energy sources that today produce less than 1 percent of the electricity Pennsylvanians consume.

Wind, one of the most market-ready renewable energy sources in the state, is being counted on to produce a significant share of the state's alternative energy output.

Large, utility-grade turbines, like those made by Gamesa, capture the wind with three blades whose diameter roughly equals the length of a football field. These wind-facing blades and the housing — called a nacelle — where the turbine and generator reside are set atop a 500-foot tower. As the blades turn, they spin the shaft of a turbine that is connected to a generator, producing electricity that is fed through transmission lines into the utility power grid.

Reaction to their appearance ranges from their being an eyesore to ambivalence to seeing their presence as a thing of beauty. The soft swishing of their blades, often masked by the rush of ridge-top wind, has been recorded to be as low as 35 decibels at a distance of about 1,000 feet — no noisier than the hum of a kitchen refrigerator.

Because wind speed and strength vary, wind is not likely to become the chief energy source of utilities that need a reliable pool of electricity to tap during peak hours and seasons. But wind's potential to significantly contribute to that pool can be seen in several European nations, such as Spain, Germany and Denmark, where wind generates more than 20 percent of the electricity.

Pennsylvania's strongest, most reliable winds are found along its worn-round mountain ridges, such as those in Cambria and Somerset counties, where wind speed averages 15.7 to 16.8 mph at 164 feet. That's strong enough to earn the state a wind capacity rating of "good" by the U.S. Department of Energy, which ranks such things. While not at the level of that found in wind-whipped Central Plains states, Pennsylvania's wind resource, if fully tapped, could generate about 30 percent of the electricity consumed each year in the state, according to the statewide economic impact study.

The eight wind farms operating today produce enough power to satisfy the annual electricity needs of about 60,000 homes in Pennsylvania. The alternative energy portfolio calls for raising wind-energy production to levels that would provide 1 million homes with a year's worth of electricity — about one-fifth of all household accounts in the state.

Sounding a cautionary note about wind energy's advantages has been a recent study by the National Academy of Sciences that includes modest expectations for the effect that turbines will have on reducing pollution in the near future. The report projects that, particularly in less windy mid-Atlantic states like Pennsylvania, existing federal caps on sulfur dioxide emissions and anticipated regulations on nitrogen oxides will probably

do more to reduce these pollutants than wind turbines. Sulfur dioxide is known for causing acid rain, while nitrogen oxides contribute to smog. Where the impact might be more noticeable, according to the study, would be turbines' expected ability to slow the growth of coal-plant carbon dioxide in the environment by 4.5 percent over the next decade.

With the environmental benefits of cleaner energy providing a solid argument for the portfolio standards, those involved in convincing the legislature to enact the new policy say it was the added potential for economic gains that sealed the deal.

"It was very important for us to be able to point out that by developing clean energy, we not only clean our air and water, but we also create jobs, investment and taxes — that it sets up a virtuous cycle where you keep leap-frogging ahead to better environmental results and better economic results," says John Hanger, president and chief executive officer of Citizens for Pennsylvania's Future (Penn Future), an environmental advocacy organization.

PennFuture's three-year advocacy campaign for a new energy plan played a key role in coaxing bipartisan support for the measure. The environmental organization was one of two nonprofits supported by The Heinz Endowments that helped to reshape Pennsylvania's energy policy. The other was the Johnstown-based Community Foundation for the Alleghenies, which, with funding from the Endowments, commissioned an economic impact study that provided evidence of the jobs and investment that could be generated by growing a robust alternative energy industry.

"An important direction for us has been to promote wind, solar, landfill methane, biofuels and other emerging renewable sources of energy," says Caren Glotfelty, director of the Endowments' Environment Program. "Once the notion of the alternative energy portfolio standards was put in front of us, we saw that it made a lot of sense."

The economic impact study, released in March 2004, found alternative energies capable of generating not only electricity, but an estimated 3,500 new jobs statewide and billions of investment dollars — all while slightly lowering consumer energy costs.

"So many times, the argument for renewable energy was seen as sort of a 'green boutique' — a tangential pursuit of some who were interested in saving the planet, but who were not grounded in the real world," says Michael Kane, executive director of the Community Foundation for the Alleghenies. "We looked at the premise that applying new or under-used technology on a broad scale would lead to economic development. The study supported that premise very clearly."

And there is more to it than new jobs, says Kathleen A. McGinty, secretary of the state Department of Environmental Protection. "There is a triple-shot connection between alternative energy and economic vitality. In diversifying resources, we build a hedge against price spikes in any one of those resources. We keep energy dollars in the state, instead of the current situation where we hemorrhage $30 billion out of the state every year to buy fuel. And we use our policies and dollars strategically to attract some of the biggest, most profitable alternative energy manufacturing enterprises to our state to build factories and put people to work."

Not everyone was convinced that an alternative energy portfolio was in the best interests of the state's economy. The Pennsylvania Chamber of Business and Industry unsuccessfully urged the state legislature in 2004 to delay voting on the measure to allow time to more fully examine its impact on electricity costs, which the chamber feared would rise.

"What concerns me is when I hear people say that wind is cheaper than other sources, but we have to mandate it. That, to me, doesn't make common sense," says Gene Barr, the chamber's vice president of political and regulatory affairs. "We really don't know whether the technologies that have been mandated are going to be cheaper than the other technologies that are out there. Only time will tell. Our perspective is that they ought to compete in the marketplace to determine which one makes the most sense in satisfying our energy and environmental needs."

The economic impact study suggests that electric rates under the new energy standards could decline by about 1 percent across all consumer classes in the coming decades.

PENNSYLVANIA'S ALTERNATIVE ENERGY PORTFOLIO

In 2004, Pennsylvania joined a growing number of states in establishing "renewable portfolio standards." Such regulations require electricity suppliers and distributors to provide a certain percentage of electricity generated with renewable sources such as solar, wind and biomass. Under what Pennsylvania officials call "alternative energy portfolio standards," 8 percent of the electricity sold must be generated largely from renewable sources by 2020, while 10 percent has to come from more mature alternative technologies such as waste coal. The regulations are the first in the nation to incorporate energy conservation as part of the standards. Also included is a call for more efficient use of fossil fuels in the short run and use of traditional renewable resources such as large-scale hydroelectric power.

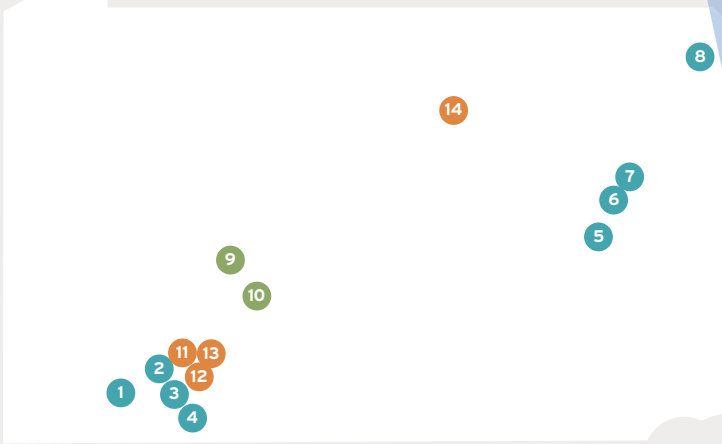
TIER 1

Pennsylvania's Alternative Energy Portfolio Standards Act establishes two categories of energy sources, requiring 8 percent of the state's electricity to be generated from Tier 1 sources and 10 percent from Tier 2 sources.

- Solar or photovoltaic cells, which are devices that convert light energy into electrical energy.
- Solar thermal devices, which involve making electricity directly from solar heat.
- Wind power.
- Low-impact hydropower, which includes any technology that produces electric power from moving water, provided that it does not adversely change the aquatic systems. It also must meet the certification standards established by the Low Impact Hydropower Institute and American Rivers Inc., or their successors; provide an adequate water flow for protection of aquatic life and for safe and effective fish passage; protect against erosion; and preserve cultural and historic resources.
- Geothermal energy, which is energy from heat inside the Earth.
- Biologically derived methane gas, which can include methane derived from organic materials from yard waste, such as grass clippings and leaves, food waste, animal waste and sewage sludge. This also includes landfill methane gas.
- Fuel cells, which are devices that take in hydrogen-rich fuel and oxygen and convert them into electricity and heat, with water as the waste product. The hydrogen can come from gasoline, natural gas, propane or methanol.
- Biomass energy, which is electricity generated from organic material from a plant grown for the purpose of being used to produce electricity. Biomass energy also can be generated from any solid non-hazardous, cellulosic waste material that is segregated from other waste such as tree trimmings or byproducts from agricultural sources, including orchard tree crops, vineyards, grain and legumes.
- Coal mine methane, which is gas from working or closed mines.

TIER 2

- Waste coal, which is the material that is left over from the mining process and has low energy value.
- Distributed generation systems, which are processes that generate electricity and thermal energy on a small scale.
- Large-scale hydropower, which involves the production of electric power by harnessing the hydroelectric potential of moving water, including pumped storage water that does not meet the requirements of low-impact hydropower.
- Municipal solid waste electricity, which is generated through municipal solid-waste incineration.
- Byproducts of the pulp and wood manufacturing processes, including bark, wood chips, sawdust and lignin.



WIND FARMING

Wind farms are gradually beginning to dot the Pennsylvania landscape. At left are the locations of existing wind-generation facilities and those under construction or consideration.

CURRENT OPERATING COMMERCIAL WIND GENERATION FACILITIES
(Total: 114 Turbines; 179 Megawatts)

1. Mill Run Wind Project
Mill Run, Fayette County
Online as of October 2001; (10) GE Wind 1500 Turbines; 15.0 Megawatts

2. Somerset Wind Power Project
Somerset, Somerset County
Online as of October 2001; (6) GE Wind 1500 Turbines; 9.0 Megawatts

3. Garrett
Garrett, Somerset County
Online as of May 2000; (8) Nordex Turbines; 10.4 Megawatts

4. Meyersdale Wind Power Project
Meyersdale, Somerset County
Online as of December 2003; (20) GE Wind 1500 Turbines; 30 Megawatts

5. Locust Ridge
Mahanoy City, Schuylkill County
Online as of 2006; (13) Gamesa 2 Megawatt Turbines; 26 Megawatts

6. Humboldt Industrial Park
Hazleton, Luzerne County,
Online as of December 1999; (2) Energy Unlimited Turbines; 0.13 Megawatts

7. Bear Creek
Bear Creek, Luzerne County
Online as of 2006; (12) Gamesa 2 Megawatt Turbines; 24 Megawatts

8. Waymart Wind Farm
Waymart, Wayne County
Online as of November 2003; (43) GE Wind 1500 Turbines; 64.5 Megawatts

FACILITIES UNDER CONSTRUCTION

9. Freedom Wind Energy
Patton, Cambria County
Expected to be online by 2008; (40) 2.4 Megawatt Turbines; 100 Megawatts

10. Allegheny Ridge Wind Farm
Cambria and Blair Counties
Expected to be online in 2007; (40) Gamesa 2 Megawatt Turbines; 80 Megawatts

PROPOSED FACILITIES

11. Stonycreek Windpower
Near Somerset, Somerset County
(36) 1800 Megawatt Turbines; 64.8 Megawatts

12. Keystone Wind Project
Somerset County
(16–30) Turbines; 25–30 Megawatts

13. Casselman Wind Power Project
Somerset County
(23) 1.5 Megawatt Turbines; 34.5 Megawatts

14. Laurel Hill Wind Energy Project
Jackson and McIntyre Townships, Lycoming County
Up to 47 Turbines; 75 Megawatts

Source: American Wind Energy Association, Wind Project Database

POWER SURGE

As early as 2001, Citizens for Pennsylvania's Future began campaigning for a new energy policy in the state that would accelerate development of alternative energies and expand markets for technologies ranging from wind power to waste coal gasification.

The Endowments, along with the Pew Charitable Trusts, helped to create the organization nearly a decade ago after an analysis of Pennsylvania's environmental nonprofits showed a need for an advocacy group with the depth of expertise and resources necessary to affect policy at the state level. Since 1998, the Endowments has awarded the nonprofit, also known as PennFuture, nearly $8 million for operating support and several of its initiatives.

PennFuture was one of two longtime Endowments grantees that played important roles in winning support for the state's Alternative Energy Portfolio Standards Act signed into law in 2004. The other was the Community Foundation for the Alleghenies, whose work includes managing the Penelec Sustainable Energy Fund and the Pennsylvania Green Business Initiative, projects that share the goal of introducing and developing sustainable energy technologies. The foundation has received $970,000 from the Endowments to support its alternative energy and green business programs.

Under the alternative energy portfolio law, 18 percent of the electricity sold in Pennsylvania by 2020 must come from alternative energy sources, including 8 percent from renewables, such as wind, solar and biomass, that today account for less than 1 percent of the electricity sales.

PennFuture's early efforts to rally support for such a policy included an information campaign aimed at the news media and policymakers, and urging the Rendell administration to make alternative energy a top priority. Later, the nonprofit worked with members of the state House and Senate to draft the alternative energy portfolio bill that became law.

The Community Foundation for the Alleghenies received Endowments' support to explore whether job growth and investment could be spurred by a policy that encouraged alternative energy development.

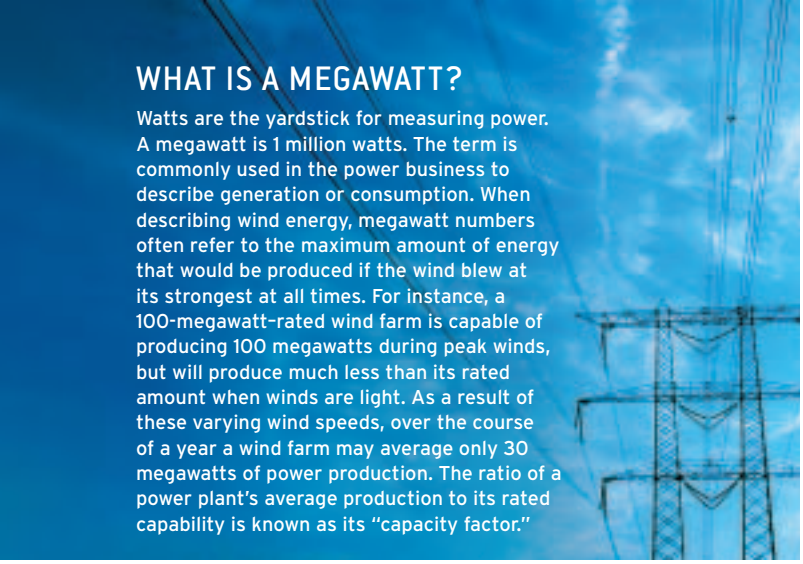
The Johnstown-based foundation commissioned Black & Veatch Corp. — a top engineering and consulting company with expertise in energy development — to study the economic impact of developing the potential of alternative energy technologies in Pennsylvania. The findings were influential in winning legislative support for the new energy standards that were also embraced by a number of businesses, including U.S. Steel, the largest consumer of electricity in the state.

The study estimated, for example, that through the next 20 years, the alternative energy policy would:

- Create 3,500 more jobs than the "business as usual" approach of developing all fossil fuel energy resources.
- Generate $7 billion more in economic activity.
- Reduce consumer energy costs by $1.8 billion, cutting the average residential bill by 46 cents a month and the monthly bills of commercial and industrial customers by $3.12 and $75.61, respectively.

Today, Pennsylvania is witnessing a surge in alternative energy investment. The highest-profile investment to date is Spain's Gamesa Corp., a leading wind power company, which made the state its North American headquarters and home to four manufacturing plants, including a wind turbine blade plant in Cambria County.

Other examples include construction of the nation's largest ethanol plants in Westmoreland County and the plans of another ethanol producer to build a plant in Clearfield County. A global leader in solar energy, Germany's Conergy AG, also has chosen Pennsylvania to be the North American headquarters of its renewable energy development and financing subsidiary, as well as the home of its East Coast solar engineering operations.



WHAT IS A MEGAWATT?

Watts are the yardstick for measuring power. A megawatt is 1 million watts. The term is commonly used in the power business to describe generation or consumption. When describing wind energy, megawatt numbers often refer to the maximum amount of energy that would be produced if the wind blew at its strongest at all times. For instance, a 100-megawatt-rated wind farm is capable of producing 100 megawatts during peak winds, but will produce much less than its rated amount when winds are light. As a result of these varying wind speeds, over the course of a year a wind farm may average only 30 megawatts of power production. The ratio of a power plant's average production to its rated capability is known as its "capacity factor."

Meanwhile, the state is experiencing a surge in alternative energy investment. And the poster child of that success is Gamesa, with its snow-white wind turbines that already cast long shadows atop the west-facing slopes of the Allegheny Ridge, less than 20 miles north of Johnstown.

The Spanish wind-energy company has invested $50 million and created 1,000 new jobs throughout Pennsylvania. The state is home to its North American headquarters and four manufacturing plants, including the blade plant in Cambria County—all lured away from Texas in 2004 with state and local economic incentives, aggressive leadership, widespread support and progressive energy policies. "We chose to come here because of all of the advantages Pennsylvania offered," says Richard Durina, who was the human resource manager for the Gamesa Ebensburg Blade Division at the time. "The governor and his green policy played an enormous role."

Although wind is considered one of the cleanest forms of energy, the turbines, with blades that generate speeds of up to 200 miles per hour at their tips, have raised concern among some wildlife advocates who argue that they pose a lethal threat to bats and birds, particularly ridge-soaring raptors.

"When you talk about green energy, the idea is to not harm things—to not eliminate the forests and sacrifice the species, especially those in migratory corridors," says Thomas Dick, a retired Johnstown-area veterinarian and founder of the Allegheny Plateau Audubon Society. "Turbines could be really useful to Pennsylvania, but they need to be sited properly."

As a step toward easing such concerns, the state signed a voluntary agreement with 12 wind-energy companies in April that calls for wildlife impact studies to be done before and after wind farms are built. In development is a set of best management practices to mitigate the threat turbines pose to bats, birds and other wildlife. The deal, one of the first of its kind in the nation, was drafted by a collaboration that included state and federal agencies, energy companies, and conservation and wildlife advocates, including Audubon Pennsylvania and PennFuture.

For Cambria County and adjacent Somerset County, Gamesa has been a welcome new neighbor. Although the 250 employees hired to work at the blade plant account for a fraction of the 64,000 men and women employed in the two-county metropolitan statistical area, wooing the company was another important step toward developing a new, diverse crop of technology- and defense-related firms that is revitalizing an economy that had been on life-support after the decline of the region's dominant industries, steel and coal. Unemployment skyrocketed in the two-county area in 1983, when 20 percent of its labor force was without jobs. By last December, the jobless rate had fallen to 5 percent, the lowest in nearly three decades.

The resurgence is largely attributed to a coordinated, aggressive campaign among county and municipal governments, business leaders and others to attract new businesses to the region—much like the efforts to win Gamesa, the new jobs it created and the money its employees spend locally on everything from staples to hotel rooms.

That campaign included locating suitable plant sites and offering local financial incentives and other support, such as helping the company find qualified workers. Gamesa also was given a $2 million, zero-interest loan for its Ebensburg plant from the MetEd Penelec Sustainable Energy Fund co-managed by the Community Foundation for the Alleghenies.

"We didn't care which site Gamesa wanted, we just wanted them here," says Linda Thomson, president of Johnstown Area Regional Industries. "This was a company we wanted in our region, and we made that message loud and clear."

In addition to jobs and investment, winning the competitive courtship of Gamesa gave the region a much-needed boost in confidence, Kane says. "It was a validation for our community that we could attract a major international company and that they saw in us the workforce and skill sets that they needed."

For his part, Joe Satkovich views the coming of Gamesa in simpler, more personal terms: "Opening this plant was a lot more fun than shutting down the last one I worked at." *h*