

## The Round-A-Bouts of Wind Energy

By Kathleen Kiely

PORTSMOUTH, R.I. \_\_\_ Three hundred and fifty boarding and day students walk from one dark wooden building to another while they laugh and joke with their friends. Boys wearing blazers and ties jokingly punch each other and laugh as they watch a pretty group of girls walk by in bright blouses, skirts, and boots -- the girls are more concerned about their hair blowing in the wind than the boys watching them. Faculty and staff smile and create pleasant small talk with students as they pass each other. Not one person seems to notice the gleaming white wind turbine towering over the Portsmouth Abbey & School campus.

Sun bounces off of the 164 foot tapered tubular steel tower and reflects onto the cars and trucks sitting idle in an adjacent parking lot. The three 77 foot carbon fiber blades gyrate atop the tower as the rotor turns them at a constant 28.5 revolutions per minute. The blades slice past the tower creating a shadow and a loud whooshing noise with each pass.

The Administration Building at Portsmouth Abbey has dark wood paneling lining the walls inside. A fountain bubbles in the lobby as you head into the building. Lining the walls are paintings of the school and framed signatures of students who have graduated in years past. Current students walk in and out collecting their packages and letters from home. Some students head up the dark stairs to meet with the staff whose offices run around the edges of the second floor. Three conference rooms sit idle and dark on the first floor as everyone walks up the stairs. Some students meander up the stairs, lean against the dark wooden railing that edges the halls, and stare down at the first floor with their eyes glazed over, preoccupied by something else, and hardly notice the people downstairs bustling by, saying a quick hello to every person they pass. Outside of the glass windows, no one notices the flicker of a shadow in the trees, the tip of a white blade poking out from behind a building. The turbine is still spinning.

Through the window, a short man in a red jacket, blue jeans, and brown shoes is jogging through the campus. He is heading for the Administration Building, but he occasionally whips his head over his shoulder, looking in the direction of the turbine. The 56-year-old man knows he is late for our meeting and the lines on his forehead show he is generally concerned that I was kept waiting for 24 minutes. One can't help but notice Paul Jestings. There is no blazer or vest, he is casual wearing blue jeans, and his hands are caked in dirt. The only thing that seems to match every other person and building on



Wind turbines are not a technology you can simply install, plug in, and walk away while it creates electricity. Some media and television shows such as "Turbine Cowboys" on the Weather Channel, would suggest that wind turbines are relatively easy to deal with, but that is not the case. Permits need to be obtained, service contracts need to be reviewed, financial models must be created, and safety factors must be looked at.

turbine, plus another 25 percent as a safety factor, so if it ever fell over or blew over, it wouldn't crush anybody's home or whatever. The town I went to was pushing for a 75 percent safety zone. I thought, how did you come up with that? I couldn't figure it out. I guess the town only had 75 feet so they were just working with what they had."

There are other methods of creating clean, affordable energy and if people are stretching the rules or the project has the potential to injure someone, then perhaps wind energy is not the right way to go. While Paul was on the Governor's Task Force for Renewable Energy in the State of Rhode Island he discussed making regulations to stop small towns from making their own rules when it came to wind turbines. He was striving for a set of basic regulations that everyone could follow. Some towns oppose wind turbines and make regulations so difficult that it is nearly impossible to install a turbine. Other towns are so desperate for money that they will have hardly any regulations when it comes to installing a turbine. There needs to be a middle ground.

"Does your town hate wind turbines because you've got a bunch of snooty people that don't want to block their view of the bay? Or the other way around where towns skip regulations and lower the safety zone range. You should not have a 75-foot fall range. I mean that is the most absurd thing," said Paul.

The regulations that Paul would have created with the Governor's Task Force would have created statewide regulations for wind turbines. This way towns would not be ignoring major safety issues or adding impossible regulations to stop the production of wind turbines.

When Portsmouth Abbey & School installed their Vestas turbine they understood that they were purchasing a turbine from one of the best wind turbine companies in the world. The Abbey had to submit an entire plan to Vestas outlining what they were planning.

"We had to give Vestas a plan to show them our property, our interconnection study, how we were going to run our campus, our campus loads, our financial model, our insurance, and all of these things they wanted to see," said Paul. "They could easily say 'I'm going to sell turbines to anyone who's got the million dollar to buy one.' Well you get three people putting them up there with a shoestring and a prayer and throwing them up on a farm saying, 'Throw a little bit of sand in the ground because we don't need cement or a real foundation. We're just gonna put it up there because there's no regulation. We're just gonna put it up because we're gonna make it work and we're

An important part of making the turbine successful is National Grid and a solid maintenance contract. National Grid is important because the Grid distributes the

changed every 5,000 miles. It's the same thing with the wind turbine. It needs to be maintained and I think that people are not told that when they're buying them. There is an annual maintenance cost to them that you should keep in mind when you're purchasing one."

## The Facts

According to the U.S. Department of Energy, as of June 2012 there was 49,802 megawatts of wind power produced by the United States. Most of the wind power comes from Texas and other midwestern states, while Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Nevada, North Carolina, South Carolina, and Virginia were producing none. Each year the United States produces more and more energy from wind power.

Here in Rhode Island, the state has 14 wind turbines. Rhode Island is currently planning an offshore wind project that will place them as the first state in the nation to have an offshore wind farm.

According to Dr. Loren Byrne, Assistant Professor of Biology and Environmental Science, at Roger Williams University, sustainability is "The pursuit towards making long lasting, healthy societies that are supported by resource rich environments that provide valuable ecosystem services."

Prof. Byrne went on to say that the general consensus is that we want to increase human well-being around the planet.

"If we agree we want there to be that sort of future, and don't want the human species to go extinct, or have widespread famine, or war, or whatever other problems are emerging -- energy use being a big one -- then we need to start changing the way we do business."

"Cape Spin! An American Power Struggle" is a film about the Cape Wind Project discusses both sides of the Cape Wind story. At the end of the film they offer a potential solution called the "third way."

"The third way is a small scale community of renewables," said Pro2 ( ) - Tf [ (p). 45 0 0 400820 (P)



also be emitted which can be several thousand times more potent than carbon dioxide. When someone is going to calculate a carbon footprint they are looking at carbon dioxide, methane, nitrous oxide and perhaps other gasses depending on what process they look at.

According to "How Bad Are Bananas? The Carbon Footprint of Everything," the total impact on climate in the United States is carbon dioxide (85 percent), methane (8





The Protocol places a heavy emphasis on developed nations and fails to include developing nations. The world's leader in producing greenhouse gases are China, the United States, and Russia. In 2012, Japan rejected the treaty in an attempt to pre

Windmills were developed in Persia during the 7th century. The windmills were not stable and were easily damaged during periods of high wind speeds. The Persian windmills were horizontal windmills, they had a horizontal axis and the blades rotated on a vertical plane. During the Middle Ages, people started utilizing wind power and began using windmills for mechanical tasks such as, water pumping, grinding grain, sawing wood, and powering tools. The Dutch are still famous for their windmills and the windmill is still considered a national icon. At a point in Dutch history, 800 to 1,000 windmills were serving the power needs of the people in Amsterdam. Windmills during the time had four blades and were built on posts so the entire windmill could be turned when the direction of the wind changed.

Similar to wind turbines in the 21st century, windmills also came with controversy when they started spreading in Europe. For the first time the working class citizens in Europe were realizing that they could produce work without manpower. This idea frightened many in the upper class society because the working class would no longer be at their mercy for jobs and money. The working class could produce goods and services much easier and the upper class would have a more difficult time controlling them. The upper class was not in support of the change, but regardless windmills spread from country to country until there were thousands across Europe.

Once the Industrial Revolution began, the need for wind power decreased. Fossil fuels were cheap to extract, easy to transport, and easy to use. Wind power was temperamental and could not always be a reliable source for powering tools, let alone a home. Wind was no longer used to power sails on a boat; engines took over offering people a quicker method to travel and trade. This is still true today.

There is a difference between windmills and wind turbines. A windmill is used as a "mill." There are more blades on a windmill because they are needed to produce more torque to

those who installed turbines. The "California wind rush" brought thousands of wind turbines to the state, particularly in the Altamont Pass, San Geronio Pass, and Tehachapi. With the rise of the Reagan administration came the collapse of the wind rush as the Reagan administration withdrew federal tax credits in the early 1980s.

Since the 1980s wind power technology has evolved into a technology that is much more reliable. Wind power is considered cost efficient by most, but some critics argue that without government incentives, wind power would not generate enough power to make a significant financial gain. Wind turbines are also considered much quieter than they were during the wind rush and studies are now completed before erecting a wind turbine to ensure that the area around the turbine will not be affected.

As of 2012, a 50 kilowatt wind turbine has a tower that stands about 25 meters high and a rotor diameter of about 15 meters. A 1,000 kilowatt wind turbine has a tower of about 70 meters high and a rotor diameter of about 60 meters. A 5,000 kilowatt turbine has a tower of about 100 meters and a rotor diameter of about 112 meters. To put the size of the turbines into perspective, the Washington Monument stands at 170 meters.

### Aquidneck Island Windmill History

Among the three islands located in Narragansett Bay is Aquidneck Island -- this is the largest of the group and it was actually originally known as Rhode Island. Today, the modern island is divided into three towns including Portsmouth, Middletown and Newport. When settlers first came to Aquidneck Island, the only means of power were manual labor, animals, tide mills, watermills, and windmills. The island was known for its use of windmills. As of 2012, there are still two of the old windmills standing.

to the Portsmouth Abbey turbine and have the power generated by the turbine go directly back to the town. At the end of the planning process, the town decided to sell all of the power generated by the turbine back to National Grid.

"The state [Rhode Island] wants to be at 16 percent renewable energy by 2020 and this is contributing to it," said Crosby. "I think it's the future for all of us."

## FAA

There are many permitting processes that need to happen before a wind turbine is erected. The Federal Aviation Administration controls all structures greater than 200 feet high. The FAA works with individuals to complete a study that tests potential turbine sites. The FAA has a job to "ensure the safety of aircrafts and efficient use of the airspace."

Nancy Kalinowski said in an address before the House Armed Services Committee:



"We weren't going to do this as a science project," said Talipsky. "If we weren't going to make money on it, it was going to be a no-starter."

Dan Force, a Portsmouth resident, lives next to the wind turbine. Force voted in support of the wind turbine, but he did not expect the turbine to be spinning in his front yard.

"I voted thinking it [wind turbine] was going in the site near the middle school, the primary location," said Force. "At the last minute it was determined that they couldn't put the turbine there because the FAA said that the wind turbine, that size, was too close to the Newport County Airport. That was when they decided to go with the secondary location by the high school."

Donna Olszewski, a Portsmouth resident, has been living in her home by Portsmouth High School for 16 years. Donna was in full support of the wind turbine when the idea was being shared, but when the turbine finally made its way up her street she knew she was in trouble.

"We knew we would hear the sound," said Donna. "In summer you can't keep your windows open because you really hear it [wind turbine]. We have to use a fan or an air conditioner to drown out the sound. For some reason the noise of the air conditioner and the fan is more constant, like a white noise, where the turbine gets louder and softer as the blades pass."

Not only is the noise an issue, but shadow flicker is a concern for many people who live close to wind turbines. Shadow flicker occurs when the sun is behind the turbine and the  
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window to drown out a noise is gone because of a wind turbine that sits a mere 740 feet from her house. The turbine controls the home she has lived in for 16

If the turbine were to continue spinning and generating electricity, it would feed the power out to the line that was down. The wire may look like a dead wire, but in reality the turbine is keeping that wire live.



“Turbines are very good for rural farmers,” said Longeteig. “With the drought this year many of them were able to keep their land because of the money coming in with the wind turbine.”

There are many government programs that help these rural farmers install wind turbines. The Rural Energy for America Program assists agricultural producers and small rural businesses. According to the United States Department of Agriculture, both agricultural producers and small rural businesses are guaranteed both loans and grants that help eligible participants install renewable energy systems. Along with installing these renewable energy systems, the loans and grants go into the maintenance of the systems.

The program is comprised of the Renewable Energy System and Energy Efficiency Improvement Guaranteed Loan and Grant Program, The Energy Audit and Renewable Energy Development Assistance Grant Program, and The Feasibility Studies Grant Program. Each of these programs assists participants with construction, audits, and feasibility studies.

The programs to assist agricultural producers and small rural businesses are not the only government incentive to building a turbine. Every state has their own programs to encourage or discourage people from installing wind turbines. Some states attempt to squeeze past regulations so they can make money, while other states put up so many regulations that it's impossible to install a turbine.

Wind energy and other methods of sustainable energy play an important role in this declining economy. Many of the incentives for wind power, such as investment tax credits, production tax credits, and the \$1,603 cash grant will expire at the end of the year.

President Obama spoke during the Presidential Town Hall Debate in 2012 and announced that he supported wind power as well as other sustainable energy sources. President Obama said that he is making sure traditional methods of energy are being implemented as well as doubling the production of clean energy. He has also come out and said that he will renew some of the incentives for wind energy.

Congressman David Cicilline of Rhode Island spoke at Roger Williams University during





the pitch of the blades. All of these data are needed to ensure that the power being generated is produced safely and efficiently.

The control system sits at the base of the wind turbine, but a steel ladder runs straight up through the center of the turbine tower, allowing maintenance workers to reach the nacelle and the rotor.

Paul Jestings, the Director of Operations at Portsmouth Abbey, turned on his shiny white Ford F-150, drove past the hockey rink, turned up a small dirt road, and parked





"Hey can you come over to the turbine?" asked Paul. Paul looked at me and said, "I'm just talking to one of my guys."

The radio finally answered him, "Why, you gonna jump?"

Paul chuckled to himself. "Nah, it's too close to Friday."

A few moments later the pulley on the outside of the turbine was moving and a red rope was being lifted to the top of the wind turbine. Paul grabbed the rope, clipped his carabiner on to the top of the wind turbine, and handed me his radio.

"You can be my assistant," said Paul. "I need you to feed me the rope."

Paul slowly got down on his stomach and did an army crawl out to the edge of the turbine where the broken light was located. The red rope dragged along behind him as he reached his destination. Paul pulled out his iPhone and stretched it over the light to take a picture. He took a look at it and placed it back in his pocket.

"The FAA bracket broke," said Paul. "It must have been from Hurricane Sandy. Those were custom brackets too."

Paul pulled out a piece of rope with two carabiners out of his pocket. He attached one

Although Paul does not have to climb the turbine regularly, he understands what it takes to climb the turbine.

"How are your arms doing?" asks Paul. "I bet you thought it would be all legs, but it's your arms and shoulders that will be hurting tomorrow."

He was right.

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