

# WIND POWER SOLUTIONS

INNOVATIVE APPROACH TO REDUCING OPERATING COSTS



## **PERFORMANCE SERVICES, INC. IS THE LARGEST FULL SERVICE GUARANTEED ENERGY SAVINGS CONTRACT PROVIDER IN THE STATE OF INDIANA.**

Performance Services has provided demand-side energy and renovation solutions for educational and institutional facilities for over a decade and has a proven track record of reducing energy costs and enhancing learning and working environments. More recently, Performance Services has developed supply-side solutions for customers, constructing the state's first community wind project, assisting public schools in securing Clean Renewable Energy Bonds, and developing Purdue Energy Park wind farm in west central Indiana. Founded in 1998, Performance Services has a staff of talented energy and design engineers, registered architects, project managers, control technicians, performance assurance engineers, and business development professionals. Performance Services is dedicated to providing customers with the best combination of design and energy engineering, project installation, system optimization, and ongoing support services.

The following pages will inform school corporations, universities, local governments and healthcare facilities of the opportunities, benefits, and considerations involved with participating in a community wind project.

To learn more about Performance Services, Inc. and its Wind Power Solutions, visit [www.performanceservices.com](http://www.performanceservices.com).



## WIND POWER TRENDS

Wind energy is emerging as one of the most significant sources of renewable energy in the 21st century. Performance Services is working to provide public schools, universities, local governments and healthcare facilities in Indiana access to this clean, low impact electricity source. Wind energy is quickly becoming a viable solution to offset building costs and generate revenue. Whether a building owner connects a turbine to its facilities to reduce operating costs or chooses to sell the energy back on the grid, a wind facility can save and generate millions of dollars over the project life. These savings can enhance the financial stability of schools, universities, cities and hospitals by allowing more dollars to be kept in the classroom and in operating budgets.

Investment in wind energy in the United States has surged over the last decade. In 2001, there was just more than 4,000 megawatts (MW's) of installed wind generating capacity in the country, a figure that grew to more than 40,181-MW's by 2010. Electricity from wind is far less expensive than it was 30 years ago and cost competitive with coal-powered electricity. Furthermore, wind does not have fuel costs or lead to external costs to the environment and public health like other forms of electricity generation.

Indiana is no exception to the nationwide wind energy boom. Indiana's ease and access to major highways, adequate line capacity, and proximity to large load centers is attracting wind projects to the state, further reinforcing Indiana as the "Crossroads of America." Indiana currently has over 1,339 MW's of installed wind power capacity, up from 200-MW's in 2008, making it one of the fastest growing states for wind energy generating capacity. In the last year alone there has been unprecedented growth in the wind industry with 8,000 MW's under construction. Indiana has a prime opportunity to take advantage of the increase in wind development. Much of northern Indiana boasts average wind speeds of 7.0 meters per second or more, measured at a height of 80 meters, making for excellent wind turbine efficiency and electricity generating potential.

**"ENERGY EFFICIENCY AND CLEAN, RENEWABLE ENERGY WILL MEAN A STRONGER ECONOMY, A CLEANER ENVIRONMENT, AND GREATER ENERGY INDEPENDENCE FOR AMERICA."**

-- U.S. DEPARTMENT OF ENERGY,  
NATIONAL RENEWABLE ENERGY LABORATORY 2009



## COMMUNITY WIND

Performance Services is on the cutting edge of the emerging community wind industry and is one of few firms in Indiana capable of providing utility-scale wind power solutions to schools and universities. The community wind movement has grown over the last several years because customers are beginning to see the significant benefits of wind energy. Constructing a community wind facility often makes sense because it can generate millions of dollars in revenue over the life of the project. Depending on the financing structure and the size of the turbine, a community wind facility can begin generating positive net revenue immediately and can have a payback period of less than 10 years.

As part of the wind energy offering, Performance Services also provides educational benefits. The decision to bring wind energy to a public school corporation creates an opportunity to enhance the renewable energy curriculum in a new, relevant, and exciting way. Performance Services worked with teachers during the community wind school project at Randolph Eastern School Corporation (RESC) to research and develop classroom lesson plans and a K-12 wind curriculum map for the school corporation. The K-12 curriculum map includes Indiana academic standards and revised 2011-2012 Indiana science standards. Wind curriculum adds a valuable educational component to community wind projects and ensures that students benefit in the classroom.

For a community wind project to be successful, key criteria must be present. These criteria include:

- Significant local wind resource
- Adequate land availability for required setbacks
- Large or consolidated facilities
- Support of local utility provider

Performance Services will help each customer identify these criteria and determine the viability of community wind in their area.

For a video describing community wind, please visit: [www.performanceservices.com/services/wind\\_power](http://www.performanceservices.com/services/wind_power)

**Over the last year, Performance Services installed Indiana's first 'behind the meter' community wind project in Akron, IN.**

### PROJECT HIGHLIGHTS:

- One utility-scale 900 kW turbine, owned by Tippecanoe Valley School Corporation
- The turbine is estimated to generate over 2,300,000 kWh's of electricity annually, enough to power 250 homes
- Project is expected to offset 70% of electrical utility costs.

# COMMUNITY WIND PROJECT TIMELINE



MAY 2011

## CEREMONIAL GROUNDBREAKING

Left to right: Hal Hoffman (TVSC board member), Bryan Murphy (TVSC board member), Randy Head (Indiana State Senator), Tim Thoman (PSI President), Brett Boggs (TVSC Supt), Dave O'Brien (TVSC board member), Rod Eaton (TVSC board member), Mark Wise (TVSC board member)



AUGUST 2011

## SITE EXCAVATION AND FOUNDATION WORK



SEPTEMBER 2011

## ARRIVAL OF TURBINE BLADES



OCTOBER 2011

## ASSEMBLY OF NACELLE



OCTOBER 2011

## BASE TOWER SECTION INSTALLATION



OCTOBER 2011

## LIFTING OF THE BLADES



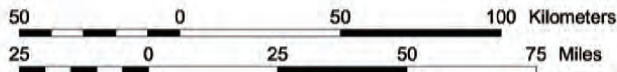
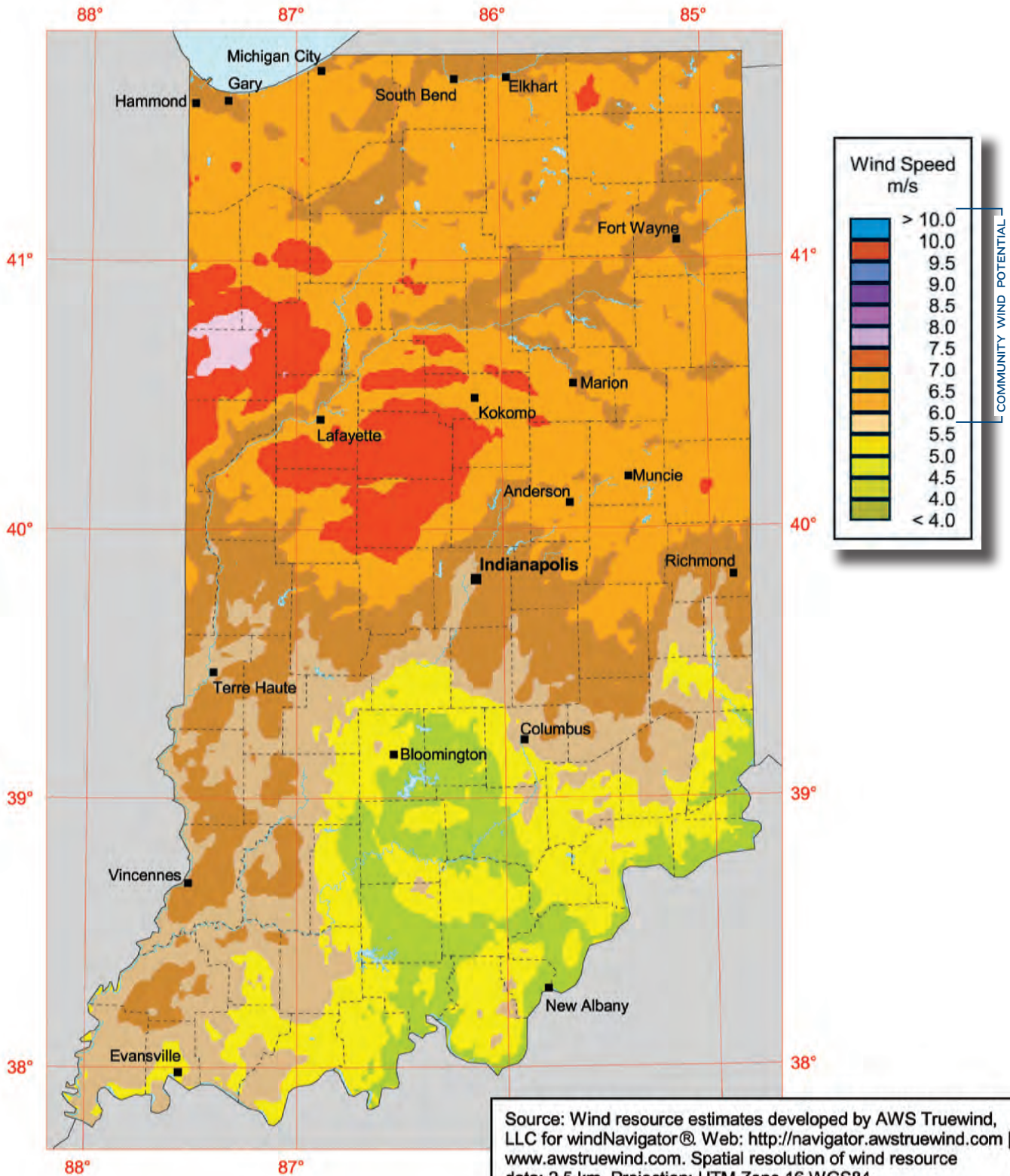
DECEMBER 2011

## CONSTRUCTION AND COMMISSIONING COMPLETE

"PERFORMANCE SERVICES DEMONSTRATED THE EXPERTISE THAT WE NEEDED WHEN WE BEGAN TO LOOK AT WIND ENERGY. THEY ALSO WORKED VERY DILIGENTLY TO ESTABLISH A SENSE OF TRUST WITH THE SCHOOL BOARD AND ADMINISTRATION TO MAKE SURE THAT WE HAD ALL THE INFORMATION WE NEEDED TO MAKE A GOOD DECISION."

--BRETT BOGGS, SUPERINTENDENT  
TIPPECANOE VALLEY SCHOOL CORPORATION

# INDIANA - ANNUAL AVERAGE WIND SPEED AT 80m





## RESULTS-DRIVEN PROCESS

Performance Services understands all of the steps involved in creating a successful wind power facility, which include:

### 1. WIND FEASIBILITY STUDY

Performance Services analyzes wind data sets to determine the strength of the wind resource, prevailing wind direction, efficiencies and output potential of different wind turbines, and optimal turbine placement.

### 2. CONTRACTS WITH LANDOWNERS

Performance Services will work with customers interested in community wind to determine land needs.

### 3. ENVIRONMENTAL IMPACT STUDIES

Prior to any wind project, Performance Services conducts all appropriate studies to assess the potential impact a wind farm might have on wildlife, sensitive ecosystems, and land use.

### 4. STATE AND LOCAL PERMITS AND ORDINANCES

Once all the necessary groundwork has been laid for a wind facility project, Performance Services obtains all appropriate permits and ensures compliance with all state and local laws, regulations, and ordinances.

### 5. CONSTRUCTION

Depending on the size of a wind facility project, the construction and deployment phase can take between 3-6 months for community wind. Performance Services works with the most experienced and professional construction firms to ensure that each wind project is constructed in a timely and cost effective manner.

### 6. COMMISSIONING

Finally, the wind turbines are commissioned and made operational. Most turbines come with a warranty of at least two years. Performance Services also makes a long term commitment to its customers to ensure that the equipment works properly and that the full savings/revenue potential is realized.

WIND  
FEASIBILITY  
STUDY

CONTRACTS  
WITH  
LANDOWNERS

ENVIRONMENTAL  
IMPACT  
STUDIES

PERMITTING

CONSTRUCTION

COMMISSIONING

# FREQUENTLY ASKED QUESTIONS

## HOW MUCH DOES COMMUNITY WIND ENERGY COST?

The installed cost of constructing a 900 kW wind facility is estimated not to exceed \$2.5 million. Beyond purchase and construction costs, operating and maintenance costs range between \$10,000 and \$15,000 per year.

## HOW BIG IS A WIND TURBINE?

For community wind, the total height for a typical turbine is about 321-feet high with the blade vertical. Each blade on the turbine is about 89-feet in length.

## WHAT KIND OF SOUND DOES A WIND TURBINE MAKE?

Wind turbines generate sound when air sweeps across the blades, but as long as appropriate setbacks are implemented, the sound of the wind itself is generally louder than the turbine. The noise level of your home's HVAC system likely exceeds the noise level of the turbine.

## HOW SAFE IS WIND ENERGY?

Wind power is one of the safest forms of electricity generation available. Transmission lines from the turbines are usually buried underground so there is no risk of line collapse, and a sophisticated computer system controls the direction of the rotor and automatically shuts down the turbine when wind speeds are too strong. Modern turbines are also equipped with redundant braking systems to ensure the safety and protection of the turbine.

## WHAT ARE THE POTENTIAL IMPACTS ON THE ENVIRONMENT AND WILDLIFE?

Studies have shown that wind turbines have very little effect on wildlife. Performance Services conducts all applicable environmental and wildlife studies, and if there is a concern, the project is adjusted to be as low impact as possible.

## HOW RELIABLE IS ELECTRICITY FROM WIND?

Wind turbines use proven technology that has been in use for over 60 years. Performance Services only uses proven and reliable equipment to ensure long term performance and reliability. Further, Indiana has sufficient transmission capacity and infrastructure which provides attractive locations to develop and install wind energy.

## HOW DO I PAY FOR A WIND TURBINE?

There are several financial structures to consider. Some options include general obligation bonds, lease-rental bonds, Build America Bonds, and Clean Renewable Energy Bonds. The needs, goals, and financial position of the customer will help determine which option is most beneficial.

## HOW DO I GET STARTED?

If you are interested in pursuing wind energy, we are happy to meet with you to help determine which type of project is most beneficial to your community. Contact us for more information:

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## INDIANA'S FLAGSHIP WIND PROJECT

Performance Services initiated wind farm development projects in 2009 when the company began site development studies and land lease agreements with private land owners in Tippecanoe County, Indiana. Initial wind studies at this location indicate some of the best wind energy generation potential in the state. Originally destined for private land, the original name of the acquired acreage was "Performance Park" and was located north of Purdue University's Animal Science and Research Education Center property. With a commitment to serving schools and universities, PSI approached Purdue University about collaborating on a commercial wind park project.

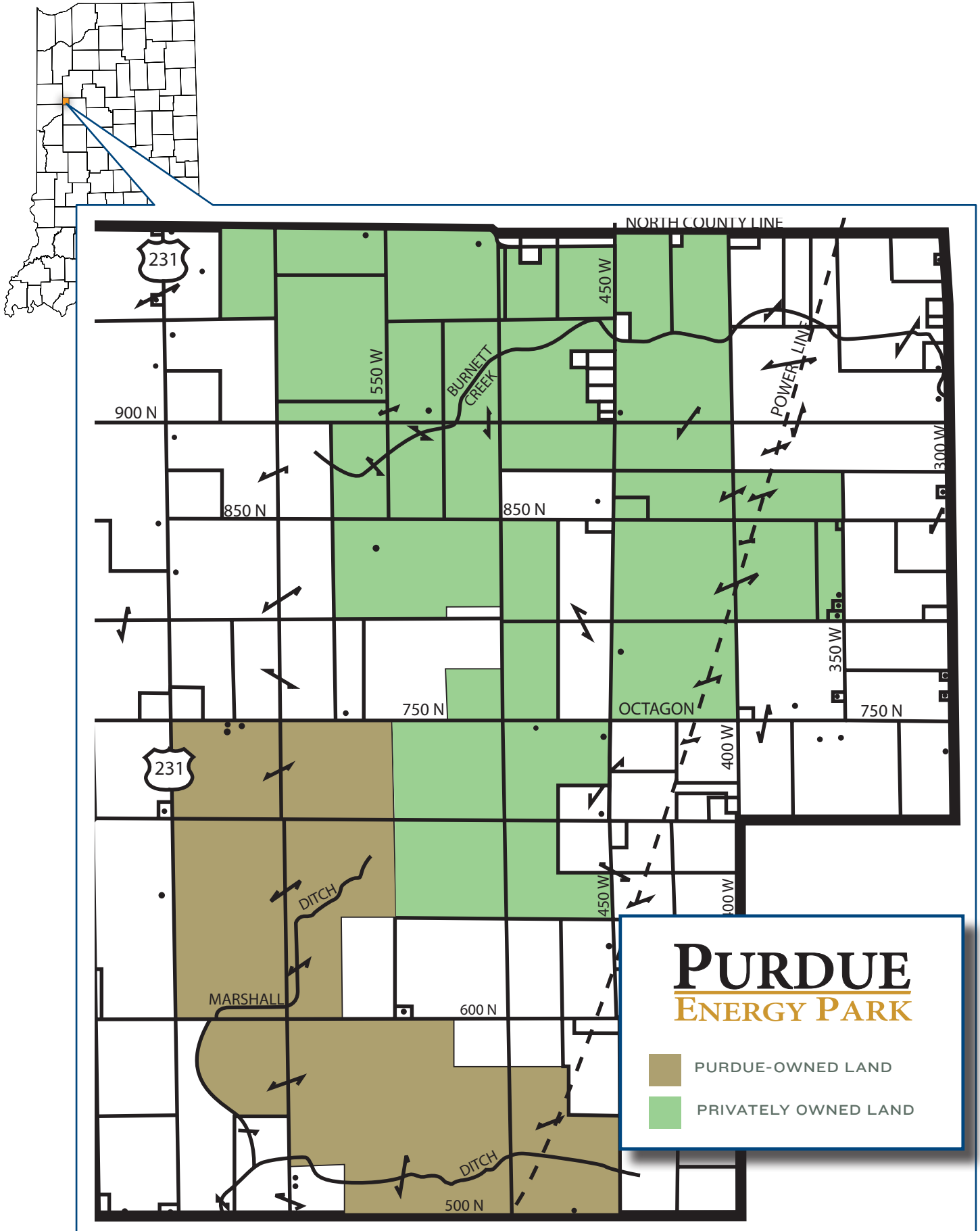
On February 4, 2011, the Purdue University Board of Trustees approved a land lease agreement as part of the commercial wind energy park development project. This partnership between Purdue University, Purdue Research Foundation and Performance Services will create Indiana's first wind project with an Indiana-based developer and the nation's first large scale wind farm with turbines available for full scale university-based research. Identified as a 'true scientific destination' for researchers around the world, Purdue Energy Park is expected to attract up to \$30 million each year in sponsored research.

Once completed, Purdue Energy Park project will include 50 2-MW turbines on approximately 5,300 acres of land. Each turbine is estimated to generate more than 6,000,000 kWh's of electricity per year that can be sold to utility companies and represents enough electricity to power 25,000 homes in a single year. To provide educational benefits as part of the wind park development, Performance Services will work with project partners on the creation of a new welcome and innovation center, where the public and students can learn about wind and other forms of renewable energy. The wind farm is expected to be operational in one to two years.

### PROJECT MILESTONES

- Power Purchase Agreement
- Grid Interconnection Agreement
- Indiana Utility Regulatory Commission (IURC) Approval
- Tippecanoe County Permitting Process
- Remaining Environmental Studies

# PURDUE ENERGY PARK LOCATION IN TIPPECANOE COUNTY



Performance Services is a design-build engineering company that specializes in constructing and renovating schools and renovating universities and healthcare facilities to deliver optimal environments through both the Guaranteed Energy Savings Contract and Design-Build procurement methods. Innovative wind power and geothermal are an integral part of the energy services portfolio. The company has provided energy solutions to customers since 1998 and is the leading qualified service provider of guaranteed energy savings projects and ENERGY STAR labeled schools in Indiana. To learn more, contact us at [www.performanceservices.com](http://www.performanceservices.com).



Design-Build | Guaranteed Savings Contracts | Geothermal | Wind Power

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