

IOWA'S WIND POTENTIAL:

An Executive Summary of Iowa's Wind Resources to Reduce Carbon Emissions

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As a national wind energy leader, Iowa is on track to achieve its proposed carbon reduction goal in the Clean Power Plan, and is also well-positioned to help other states meet their reduction goals. Iowa can build and sell wind energy, infrastructure and services to other states, which means increased economic development and job opportunities for the Hawkeye State.

Iowa's Wind Potential for Addressing 111(d) Goals: The Potential for Tapping Iowa's Wind Resource to Reduce CO₂ Emissions, evaluates data and resources for the period 2015 to 2030 in light of the Environmental Protection Agency's (EPA) proposed Clean Power Plan. Key findings of the report, authored by wind industry experts Dan Turner, Ph.D., and Thomas A. Wind, P.E., are outlined below.

KEY FINDINGS

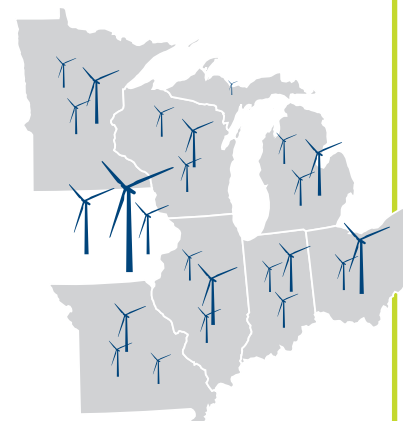
Iowa Is Well-Positioned to Use Wind Energy to Comply with the Clean Power Plan

- Iowa can achieve its proposed 16% carbon reduction goal by 2030 by building a modest amount of wind, an estimated 2,320 MW, and taking no other actions.
 - 1,212 MW of wind is already being built in Iowa and will be in service by 2016. Once these projects are completed, Iowa will be more than half way (52%) to meeting its proposed carbon reduction goal.
- To reach the remaining 1,110 MW of wind, an average of 74 MW of wind would need to be built per year between 2016 and 2030.
- Iowa could meet a more stringent carbon reduction goal by building wind energy alone and taking no additional actions. If Iowa's carbon reduction target was 30% instead of 16%, Iowa could comply with 4,300 MW of wind alone:
 - Since 1,213 MW of wind is already being built, an additional 3,097 MW of wind would be needed by 2030 to reach 4,310 MW.
 - An average of 207 MW/year of wind would need to be built between 2016 and 2030.

- Iowa has added 1,000 MW or more of wind per year in recent years and has the technical potential to build more than 570,000 MW of wind.
- From 2008 through 2015, Iowa will have added on average over 635 MW/year of new wind capacity.
- Iowa's CO₂ emission rate in 2005 was about 1,800 lbs./MWh. By the end of 2012 it was down to 1,552 lbs./MWh.

Iowa Can Help Other States Meet their Carbon Reduction Goals

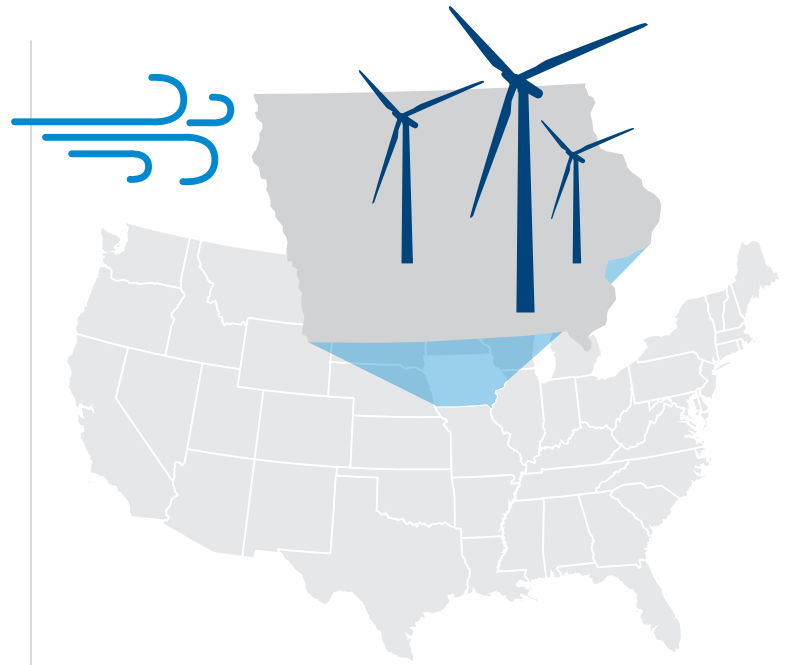
- Other Midwestern states, including Illinois, Indiana, Michigan, Missouri, Ohio and Wisconsin can use wind to comply with their carbon reduction targets.
 - For these six states to meet just 25% of their carbon reduction goals with wind alone, approximately 17,000 MW of additional wind would need to be built by 2030.
 - Meeting 100% of the goals in these six states and Iowa with wind would require about 71,000 MW of new wind.
- If other states choose to comply with carbon reduction goals by building wind generation within their borders, Iowa wind manufacturers and wind-related businesses could help meet an increased regional demand for wind turbines, components and services.
- Iowa could also help other states comply with carbon reduction goals by building and selling additional wind energy beyond what is needed to meet Iowa's state goal.
 - By building 7,500 MW of additional wind by 2030 (or an average of 500 MW of wind per year), Iowa could offer a carbon reduction of 15,000,000 metric tons. This could meet the entire reduction target for Missouri or Wisconsin.



– By building 15,000 MW of wind by 2030 (1,000 MW of wind added per year, on average), Iowa could offer a carbon reduction of 30,000,000 metric tons. This could meet 40% of the reduction targets for Illinois, Indiana, Missouri and Wisconsin combined.

The Wind Energy Industry Provides Economic Benefits to the State of Iowa

- Iowa's wind energy industry employs up to 7,000 people
- Capital investment from wind development in Iowa will total more than \$10 billion by the end of 2015.
- Landowners receive more than \$17 million annually in lease payments.
- Total increased assessed value of property for wind turbines in Iowa through 2013 is estimated to be \$2.6 billion.
- Iowa wind energy's ability to help other states achieve reduction goals will have a ripple effect of economic benefits to not only Iowa utility providers, but also Iowa supply chain and manufacturing businesses that support the wind industry across the country.
- Wind energy has low levelized cost. If cost of externalities not reflected in bills that consumers see (such as carbon tax or fluctuating gas prices) go up, electric rates for coal energy can go up significantly, while wind energy cost would remain stable.



BACKGROUND: THE CLEAN POWER PLAN AND IOWA

- By establishing state-specific carbon reduction goals, the proposed Clean Power Plan would cut 30% of the 2005 carbon levels from the country's existing electric power plants by 2030.
- States have flexibility and many available options to meet carbon reduction goals, including building carbon-free wind energy.
- Iowa's proposed goal is to meet a 16% carbon reduction from 2012 levels.
- Iowa is a leading wind energy producer, generating 28.5% of its electricity from wind. Moreover, Iowa still has tremendous untapped wind resources. Using wind energy to help Iowa achieve its 16% carbon reduction goal makes sense. Iowa has one of the best wind energy resources in the country, and wind generation in Iowa is often one of the lowest cost energy options in the state.

