The Economic Impact of Iowa's Wind Potential to Meet Carbon Reduction Goals

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As a national wind energy leader, Iowa is on track to achieve its carbon reduction goal in the Clean Power Plan. The state is also well-positioned to benefit from helping other states meet their reduction goals. Iowa can lead by building additional wind energy to meet its carbon reduction goal, and sell excess wind energy, infrastructure and services to other states to meet their goals.

More wind energy in Iowa means increased economic development and job creation for the Hawkeye State. Depending on the amount of wind installed in Iowa between 2016 and 2030, the state could **average 483 to 6,424 new wind-related jobs** each year. During the peak year of wind turbine installation, **as many as 10,992 jobs could be created for that final year of deployment**. The majority of the jobs are in Iowa's wind energy manufacturing sector to build or supply wind turbines and components, followed by wind farm construction, wind farm operations and land leasing.

A recently released report evaluated four scenarios for using wind energy in Iowa to comply with the Environmental Protection Agency's (EPA) Clean Power Plan as well as to help other states comply.

The report, *Iowa's Wind Potential for Addressing 111(d) Goals: The Potential for Tapping Iowa's Wind Resource to Reduce CO_2 Emissions*, was authored by wind industry experts Dan Turner, Ph.D., and Thomas A. Wind, P.E and released in May 2015.

Following the release of this report, Dave Swenson, an associate scientist in the Department of Economics at Iowa State University, conducted an economic impact analysis of the four wind energy scenarios. ***Economic Impacts of Wind Energy Development in Iowa: Four Scenarios*** **includes the job creation, economic output, labor income, and value added from adding wind generation in Iowa from 2016 to 2030**.

Iowa's Wind Potential and Economic Impacts: Four Scenarios

The following summarizes a range of economic impacts given each of the potential scenarios. The results contain temporary annual impacts (manufacturing and installation related) and permanent impacts (operating the completed facilities and leasing their sites). Throughout the deployment cycle for each scenario, the temporary impacts will account for nearly 80 percent or more of the jobs in each year. In the 16th year (2031), only the permanent jobs remain in the Iowa economy.

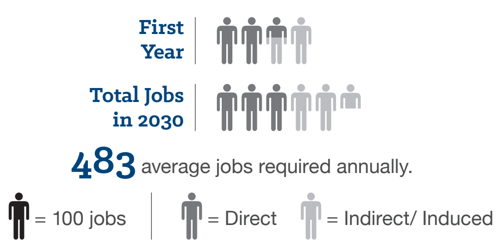
Scenario 1:

Iowa installs just over 1,000 MW of wind to help meet its carbon reduction goal with wind energy.

1,110 MW of wind are installed between 2016 and 2030. An annual average of about 74 MW of wind is added each year from 2016 to 2030.*

Jobs

In the first year, **395 jobs are created**, including 232 direct jobs and 163 indirect/ induced jobs. This grows to **558 jobs** in 2030 (305 direct, 253 indirect/ induced), the last year of construction. The average of jobs required annually is **483**.



Additional Impacts

In the first year, the labor income totals more than **$21 million**. This grows to more than **$30 million** by 2030. Value added to the economy starts at **$41 million** in the first year and grows to **$140 million** by the final year. Total output starts at **$78 million** and grows to **$215 million** in the final year.

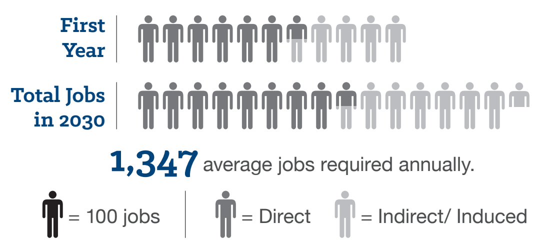
Scenario 2:

Iowa installs just over 3,000 MW of wind to help meet its carbon reduction goal with wind energy.

3,100 MW of wind are installed between 2016 and 2030. An annual average of about 207 MW of wind is added each year from 2016 to 2030.*

Jobs

In the first year, **1,100 jobs are created**, including 648 direct jobs and 453 indirect/ induced jobs. This grows to **1,554 jobs** by 2030 (849 direct, 704 indirect/ induced), the last year of construction. The average of jobs required annually is **1,347**.



Additional Impacts

In the first year, the labor income totals more than **$59 million**. This grows to more than **$84 million** by 2030. The value added to the economy starts at **$113 million** and grows to more than **$390 million** by the final year. Total output starts at **$217 million** and grows to **$601 million** in the final year.

** Specific amounts of wind were modeled to account for recent wind developments and possible compliance and target scenarios.*

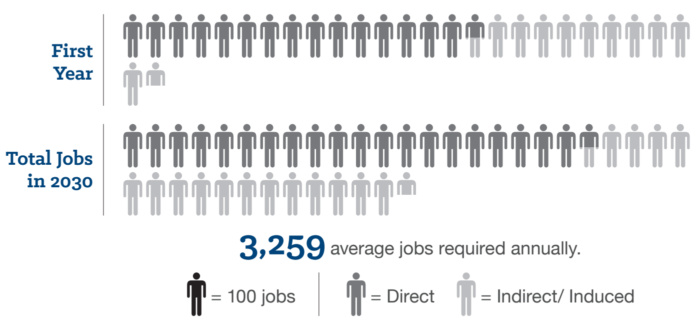
Scenario 3:

Iowa installs 7,500 MW of wind to help other states comply with their carbon reduction goals.

An annual average of 500 MW of wind is added each year from 2016 to 2030.

Jobs

In the first year, **2,663 jobs are created**, including 1,567 direct jobs and 1,097 indirect/ induced jobs. This grows to **3,759 jobs** by 2030 (2,055 direct, 1,704 indirect/ induced), the last year of construction. The average of jobs required annually is **3,259**.



Additional Impacts

In the first year, the labor income totals more than **$143 million**. This grows to more than **$203 million** by 2030. The value added to the economy starts at more than **$274 million** and grows to more than **$945 million** by the final year. Total output starts at **$524 million** and grows to **$1.45 billion** in the final year.

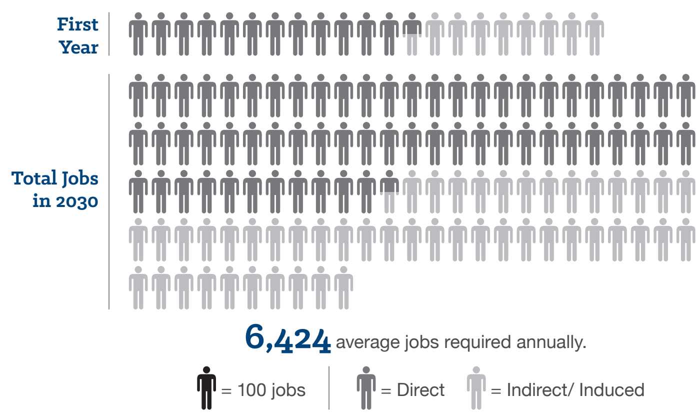
Scenario 4:

Iowa installs 15,000 MW of wind to help other states comply with their carbon reduction goals.

An increasing annual amount of wind is added each year from 2016 to 2030. In 2016, 400 MW is added and by 2030 1,600 MW is added.

Jobs

In the first year, **2,130 jobs are created**, including 1,253 direct jobs and 877 indirect/ induced jobs. This grows to **10,992 jobs** by 2030 (6,142 direct, 4,850 indirect/ induced), the last year of construction. The average of jobs required annually is **6,424**.



Additional Impacts

In the first year, the labor income totals more than **$114 million**. This grows to more than **$594 million** by 2030. The value added to the economy starts at **$219 million** and grows to more than **$2.1 billion** by the final year. Total output starts at **$419 million** and grows to **$3.56 billion** in the final year.

Methodology summary

The methodology and major assumptions are described in detail in the full report. The economic impact analysis was conducted using an input-output model (IMPLAN) of the Iowa economy and the four wind energy deployment scenarios in the *Iowa's Wind Potential* report. All results in dollars are in constant 2016 dollar amounts. **Job** results are annualized jobs for the many different types of industrial activity that are stimulated. **Labor income** includes wage and salary payments as well as benefits. **Value** added includes all labor income plus payments to investors and indirect tax payments. Value added is the equivalent of gross domestic product (GDP). Total **output** is the value of industrial productivity over the course of year.

Direct values (e.g., direct jobs) are driven by wind energy equipment procurement, wind energy construction, wind operations, and land leasing for wind turbines. Indirect values are driven by the direct firms' intermediate inputs, such as supplies, utilities, agricultural or manufactured inputs, transportation, services, and more. Induced values are driven by household spending by the workers in the direct and indirect industries. Total values are the sum of direct, indirect and induced values.

This analysis only modeled job impacts in Iowa from wind turbines installed in Iowa. The analysis did not examine jobs that could be created in Iowa to build or supply wind turbines that are installed in other states.