Renewable Energy and Economic Potential in Iowa, Kansas, Nebraska, South Dakota

Center for Rural Affairs, August 2009

The most important issue awaiting action by this Congress for rural development in Iowa, Kansas, Nebraska and South Dakota is renewable energy legislation.

Expanding production of renewable electricity to 20% of the nation's electrical generation has the potential to create a large number of new jobs in the rural Midwest and Great Plains, according to unpublished analysis from the US Department of Energy, National Renewable Energy Laboratory. The analysis projects that Kansas would gain nearly 3,100 long-term jobs in operations and maintenance of wind farms, Nebraska over 3,500 jobs, South Dakota over 3,900 jobs and Iowa over 9,000 jobs. Nationally, the analysis projects, 1.75 million FTE construction phase jobs and 1.6 million new, permanent operational phase jobs would be created.

In addition, Kansas is projected to gain over 23,000 short-term constructions jobs averaging one year in duration, Nebraska nearly 26,000, South Dakota over 29,000 and Iowa over 63,000 short-term construction jobs.

The state-by-state projections were prepared in conjunction with the Laboratory's report *20% Wind by 2030,* but never formally published. Those projections forms the basis for the state facts sheets included in this report. The projections are available from the National Renewable Energy Laboratory or the Center for Rural Affairs.

The analysis did not project jobs created in individual counties. Nevertheless, a review of the wind resource maps published in *20% Wind by 2030* demonstrates that the four states' best wind resources are widely dispersed primarily in their non-metropolitan counties.

In each of these states, more than two-thirds of non metropolitan counties lost population from April 2000—July 2008, according to the most recent *Population Estimates* of the US Census Bureau. As a group, rural counties in these states have per capita incomes far below those in the states' metropolitan counties.

State	Total Jobs Construction Phase	Total Jobs Operational Phase	Total Jobs
Iowa	63,401	9,011	72,412
Kansas	22,683	3,093	25,776
Nebraska	25,988	3,558	29,546
South Dakota	27,284	3,916	31,200
Total	139,356	19,578	158,934

Table 1. Total new jobs (direct, indirect and induced) for construction and operational phases of wind energy production

State	Landowner Payments (per year)	Property Tax Revenue (per year)	Local Economy Benefit—construction (per year)	Local Economy Benefit—operational (per year)	Total Economic Effect (per year)
Iowa	$ 53.0	$ 89.6	$3.125 B	$ 758.6	$4.026 B
Kansas	$ 19.0	$ 20.8	$1.167 B	$ 271	$1.477 B
Nebraska	$ 21.0	$ 31.0	$1.345 B	$ 312	$1.709 B
South Dakota	$ 21.5	$ 39.3	$1.300 B	$ 317	$1.677 B
Total	$114.5	$180.7	$6.937 B	$1.658 B	$ 8.889 B

Table 2. Total economic effects (direct, indirect and induced) for construction and operational phases of wind energy production

Notes: 1) dollars are in millions, unless otherwise noted (B = billion); 2) the construction phase one to two years, so construction phase benefit to local economies is divided in half to make that figure comparable with other per year figures; 3) totals are rounded to the million dollar figure

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Wind development offers a rare opportunity to reinvigorate these rural counties by creating new jobs that pay well. Long-term jobs in maintenance and operation of wind farms average over $20 per hour, Jobs and Economic Development Impact Model (JEDI).

Whether the potential for wind energy to revitalize the rural areas of these four states is realized depends in large measure on the fate of federal renewable energy legislation, especially in the United States Senate. There, the *American Clean Energy Leadership Act* has stalled after being weakened to gain passage by the Energy and Natural Resources Committee.

The Act would facilitate development of a national interstate electric transmission grid to move electricity from areas that have the resources for renewable production to areas with high demand. It would be tailor-made for moving wind from the wind rich Great Plains to the nation's population centers. The costs of developing the grid would be shared among all beneficiaries, including both electricity producers and consumers.

The bill also includes a critically important Renewable Electricity Standard. It would ostensibly require that 12 percent of the nation's electric generation come from renewable sources, including wind, solar, geothermal, new hydroelectric, biomass and landfill generation, by the year 2021.

However, a National Renewable Energy Laboratory study, *Comparative Analysis of Three Proposed Federal Renewable Electricity Standards,* concludes that the legislation would effectively require renewable production of less than 10 percent of nation's electricity by the year 2021. That is less renewable electricity production than the study projects in its baseline, which assumes that Congress takes no action to promote renewable production of electricity.

There is likely to be an effort to raise the standard when the *American Clean Energy Leadership Act* comes before the full Senate, and it will likely be described as an environmental measure. And in many respects it is. But to rural people in Iowa, Kansas, Nebraska and South Dakota, it is unprecedented once-in-a-lifetime federal legislation to create genuine economic opportunity and a better future in their communities.

The following pages will take a deeper look at the job creation, economic impact, and wind resources in each of the select states.

Iowa

Renewable electricity in the form of wind energy development means increased economic opportunity in rural Iowa. A U.S. Department of Energy Study (*20% Wind by 2030*) concluded that ramping up wind generation to 20 percent of the nation's electricity would create nearly 9,000 long-term jobs in Iowa and over 63,000 jobs lasting one to two years resulting from wind turbine construction. Many jobs would be in rural Iowa, where opportunities to create new jobs are limited. And many of these jobs are good jobs. A typical wind turbine maintenance job, for example, pays over $20/hour, *Jobs and Economic Development Impact Model, National Renewable Energy Laboratory.*

In addition, expanding wind generation is projected to increase property tax revenues by $89.6 million annually for Iowa schools and local governments. Iowa landowners are projected to receive additional lease payments of $53 million annually.

What is the economic impact of wind energy in Iowa?

Increasing the national wind power capacity to 20% is projected to increase Iowa wind generation capacity to 19,909 megawatts and make Iowa a major wind exporter. Iowa has exceptional wind resources, the tenth greatest overall potential among the states for wind energy production, according to the U.S. Department of Energy.

The expansion of wind electric generation would generate substantial direct, indirect, and induced economic benefits for Iowa. Direct benefits include jobs, land lease payments, and increased tax revenues. Indirect and induced benefits result from local spending due to increased demand for goods and services. Economic benefit drivers include the use of local construction companies, the presence of in-state component suppliers, local wage structures, local property tax structures, and operation and maintenance expenditures. Economic impacts could be further enhanced through the development of a local wind supply, installation, and maintenance industry within the state.

The following charts show some of the economic impact on Iowa, if the state were to develop 19,909 MW wind energy by 2030. Data for this analysis was compiled by the National Renewable Energy Laboratory (NREL). Direct impacts result from investment in the planning, development, and operation of new wind facilities. Beneficiaries include landowners, construction workers, operation and management staff, turbine manufacturers, and project managers. Indirect impacts reflect payments made to businesses that support the wind facility and include: banks, component suppliers, and manufacturers of equipment used to install and maintain the facility. Induced benefits result from increased spending by the direct and indirect beneficiaries.

Jobs created in Iowa from 19,909 MW of new wind development by 2030
Wind energy's economic "ripple effect"

	Direct Impacts	Indirect and Induced Impacts	Total Impact
New jobs during construction phase (1-2 years)	33,194	30,200	63,401
New jobs during operational phase—long term jobs (20+ years)	5,220	3,791	9,011

Economic Impacts to Iowa from 19,909 MW of new wind development by 2030
Wind energy's economic "ripple effect"

	Direct Impacts	Indirect and Induced Impacts
Payment to Landowners per year	$53 Million	
Local Property Tax Revenue per year	$89.6 Million	
Benefit to local economy (construction phase 1-2 years)	$3.75 Billion	$2.5 Billion
Benefit to local economy (operational phase 20+ years)	$422.6 Million/year	$336 Million/year

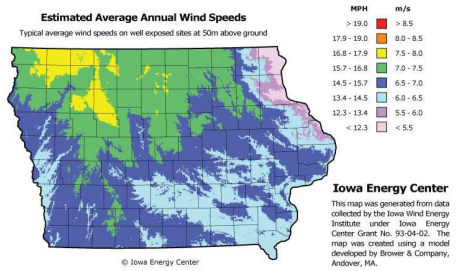
Iowa

What are some of the benefits of wind energy in Iowa?

If wind energy deployment gradually increases to 20% of the nation's electricity over the same time period, 47 trillion gallons of water will be consumed. This would result in a saving of 4 trillion gallons; an 8% reduction in water consumption. Of the 4 trillion gallons of water saved nationally, 41% (1.64 trillion will be in Iowa and the Midwest/Great Plains. (DOE 20% Wind Energy by 2030).

Where is the best wind potential in Iowa?

The National Renewable Energy Laboratory (NREL) reports as of January 1, 2009, Iowa has the installed capacity to produce nearly 3,000 MW. Major areas of excellent wind resource are found throughout much of northwestern Iowa with scattered areas in the eastern part of the state. Significant areas of good to excellent wind resource are located in southwestern Iowa and extend to north-central Iowa. This map indicates that Iowa has significant wind resources consistent with utility-scale production. This map can be found at http://www.energy.iastate.edu/Renewable/wind/maps/annual.htm.



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Iowa ranks 10th in the United States for ***potential*** wind energy output and 2nd in the United States for ***current*** wind energy output. Iowa has more than 400 wind turbines with total nameplate capacity of more than 423 MW. This is enough power to generate electricity for more than 130,000 homes per year and avoid more than 1.3 million tons of carbon dioxide emissions annually.

Manufacturing in Iowa

A second report, *Iowa's Road to Energy Independence*, by Blue Green Alliance, focuses solely on manufacturing jobs for various types of renewable energy. The report identifies the counties in Iowa with the greatest potential for creating new manufacturing jobs from development of wind. This is an estimate of potential job creation in manufacturing, rather than a projection.

It should be noted that though manufacturing jobs are less likely than direct construction jobs to be located in the primarily rural areas in which turbines would be constructed, the report still shows that nearly **40%** of the potential manufacturing jobs are in rural Iowa.

County * non-rural county	Jobs	County * non-rural county	Jobs
Clinton	210	Lee	229
Delaware	19	Appanoose	90
Des Moines	164	Polk*	131
Black Hawk*	759	Marshall	14
Dubuque*	492	Muscatine	115
Pottawattamie*	466	Sioux	145
Linn*	82	Marion	87
Woodbury*	354	Page	110
Scott*	197	Cedar	102
Jefferson	310		

For more information, please contact John Crabtree, Center for Rural Affairs, johnc@cfra.org or 402-687-2103, ext. 1010

Kansas

Renewable electricity in the form of wind energy development means increased economic opportunity in rural Kansas. A U.S. Department of Energy Study (*20% Wind by 2030*) concluded that ramping up wind generation to 20 percent of the nation's electricity would create nearly 3,100 long-term jobs in Kansas and over 22,000 jobs lasting one to two years resulting from wind turbine construction. Many jobs would be in rural Kansas, where opportunities to create new jobs are limited. And many of these jobs are good jobs. A typical wind turbine maintenance job, for example, pays over $20/hour, *Jobs and Economic Development Impact Model, National Renewable Energy Laboratory.*

In addition, expanding wind generation is projected to increase property tax revenues by $19 million annually for Kansas schools and local governments. Kansas landowners are projected to receive additional lease payments of $20.8 million annually.

What is the economic impact of wind energy in Kansas?

Increasing the national wind power capacity to 20% is projected to increase Kansas wind generation capacity to 7,158 megawatts and make Kansas a major wind exporter. Kansas has exceptional wind resources, the third greatest overall potential among the states for wind energy production, according to the U.S. Department of Energy.

The expansion of wind electric generation would generate substantial direct, indirect, and induced economic benefits for Kansas. Direct benefits include jobs, land lease payments, and increased tax revenues. Indirect and induced benefits result from local spending due to increased demand for goods and services. Economic benefit drivers include the use of local construction companies, the presence of in-state component suppliers, local wage structures, local property tax structures, and operation and maintenance expenditures. Economic impacts could be further enhanced through the development of a local wind supply, installation, and maintenance industry within the state.

The following charts show some of the economic impact on Kansas, if the state were to develop 7,158 MW wind energy by 2030. Data for this analysis was compiled by the National Renewable Energy Laboratory (NREL). Direct impacts result from investment in the planning, development, and operation of new wind facilities. Beneficiaries include landowners, construction workers, operation and management staff, turbine manufacturers, and project managers. Indirect impacts reflect payments made to businesses that support the wind facility and include: banks, component suppliers, and manufacturers of equipment used to install and maintain the facility. Induced benefits result from increased spending by the direct and indirect beneficiaries.

Jobs created in Kansas from 7,158 MW of new wind development by 2030
Wind energy's economic "ripple effect"

	Direct Impacts	Indirect and Induced Impacts	Total Impact
New jobs during construction phase (1-2 years)	11,471	11,212	22,683
New jobs during operational phase—long term jobs (20+ years)	1,805	1,288	3,093

Economic Impacts to Kansas from 7,158 MW of new wind development by 2030
Wind energy's economic "ripple effect"

	Direct Impacts	Indirect and Induced Impacts
Payment to Landowners per year	$19 Million	
Local Property Tax Revenue per year	$20.8 Million	
Benefit to local economy (construction phase)	$1.35 Billion	$984 Million
Benefit to local economy (operational phase)	$152 Million/year	$119 Million/year

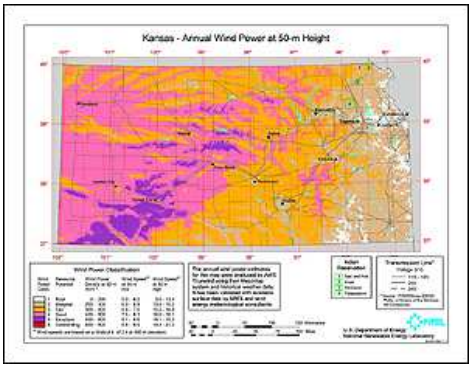
Kansas

What are some of the benefits of wind energy in Kansas?

If wind energy deployment gradually increases to 20% of the nation's electricity over the same time period, potentially, four trillion gallons of water will be conserved. Kansas and the Midwest/Great Plains would see a water consumption savings of 1.64 trillion gallons nationally. (DOE 20% Wind Energy by 2030).

Where is the best wind potential in Kansas?

The National Renewable Energy Laboratory (NREL) reports as of January 1, 2009, Kansas has the installed capacity to produce 921 MWh (megawatt hours). Major areas of good wind resource are found throughout much of western Kansas with scattered areas in the eastern part of the state. Significant areas of excellent wind resource are located in southwestern Kansas and extend to north-central Kansas. Population centers located close to excellent resource areas include Garden City, Great Bend and Dodge City (the nation's windiest city according to the National Climatic Data Center). The best wind resource areas are typically located on elevated terrain features, whereas the lowest wind resource are generally located in valleys and basins with relatively low elevations.



This map indicates that Kansas has significant wind resources consistent with utility-scale production. (The darker the color the greater the potential.) This map can be found at www.windpoweringamerica.gov/images/windmaps/ks_50m_800.jpg

Manufacturing in Kansas

A second report, *Component Manufacturing: Kansas' Future in the Renewable Energy Industry*: by the Renewable Energy Policy Project 2008, focuses solely on manufacturing jobs for various types of renewable energy. The report identifies the counties in Kansas with the greatest potential for creating new manufacturing jobs from development of wind. This is an estimate of potential job creation in manufacturing, rather than a projection.

It should be noted that though manufacturing jobs are less likely than direct construction jobs to be located in the primarily rural areas in which turbines would be constructed, the report still shows that nearly 60% of the potential manufacturing jobs are in rural Kansas.

County * non-rural county	Jobs	County * non-rural county	Jobs
Saline	161	Crawford	14
Johnson*	462	Reno	30
Sedgwick*	1097	Ford	368
Ellis	41	Neosho	8
Wyandotte*	125	Franklin	203
Baron	672	Cowley	161
Montgomery	2	McPherson	124
Crawford	14	Republic	94
Reno	30	Butler	97
Ford	368	Anderson	62

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Nebraska

Renewable electricity in the form of wind energy development means increased economic opportunity in rural Nebraska. A U.S. Department of Energy Study (*20% Wind by 2030*) concluded that ramping up wind generation to 20 percent of the nation's electricity would create nearly 3,100 long-term jobs in Nebraska and over 25,000 jobs lasting one to two years resulting from wind turbine construction. Many jobs would be in rural Nebraska where opportunities to create new jobs are limited. And many of these jobs are good jobs—typical wind turbine maintenance job, for example pays over $20/ hour, *Jobs and Economic Development Impact Model, National Renewable Energy Laboratory.*

In addition, expanding wind generation is projected to increase property tax revenues by $31 million annually for Nebraska schools and local governments. Nebraska landowners are projected to receive additional lease payments of $21 million annually.

What is the economic impact of wind energy in Nebraska?

Increasing the national wind power capacity to 20% is projected to increase Nebraska wind generation capacity to 7,880 megawatts and make Nebraska a major wind exporter. Nebraska has exceptional wind resources, the sixth greatest overall potential among the states for wind energy production, according to the U.S. Department of Energy.

The expansion of wind electric generation would generate substantial direct, indirect, and induced economic benefits for Nebraska. Direct benefits include jobs, land lease payments, and increased tax revenues. Indirect and induced benefits result from local spending due to increased demand for goods and services. Economic benefit drivers include the use of local construction companies, the presence of in-state component suppliers, local wage structures, local property tax structures, and operation and maintenance expenditures. Economic impacts could be further enhanced through the development of a local wind supply, installation, and maintenance industry within the state.

The following charts show some of the economic impact on Nebraska, if the state were to develop 7,880 MW wind energy by 2030. Data for this analysis was compiled by the National Renewable Energy Laboratory (NREL). Direct impacts result from investment in the planning, development, and operation of new wind facilities. Beneficiaries include landowners, construction workers, operation and management staff, turbine manufacturers, and project managers. Indirect impacts reflect payments made to businesses that support the wind facility and include: banks, component suppliers, and manufacturers of equipment used to install and maintain the facility. Induced benefits result from increased spending by the direct and indirect beneficiaries.

Jobs created in Nebraska from 7,880 MW of new wind development by 2030
Wind energy's economic "ripple effect"

	Direct Impacts	Indirect and Induced Impacts	Total Impact
New jobs during construction phase (1-2 years)	12,876	13,112	25,988
New jobs during operational phase—long term jobs (20+ years)	2,047	1,511	3,558

Economic Impacts to Nebraska from 7,880 MW of new wind development by 2030
Wind energy's economic "ripple effect"

	Direct Impacts	Indirect and Induced Impacts
Payment to Landowners per year	$21 Million	
Local Property Tax Revenue per year	$31 Million	
Benefit to local economy (construction phase 1-2 years)	$1.49 Billion	$1.2 Billion
Benefit to local economy (operational phase 20+ years)	$167 Million/year	$145 Million/year

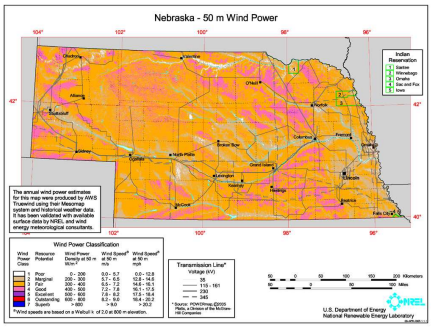
Nebraska

What are some of the benefits of wind energy in Nebraska?

If wind energy deployment gradually increases to 20% of the nation's electricity over the same time period, potentially, four trillion gallons of water will be conserved. Nebraska and the Midwest/Great Plains would see a water consumption savings of 1.64 trillion gallons nationally. (DOE 20% Wind Energy by 2030).

Where is the best wind potential in Nebraska?

Major areas of good wind resource are found throughout much of Nebraska except the extreme eastern fringe (such as Lincoln eastward to the Missouri River). Transmission lines either traverse or are located in close proximity to many of these good wind resource areas. Significant areas of excellent wind resource are imbedded within some of the good wind resource areas, such as the excellent areas located southwest of Norfolk, west of Valentine, west of Chadron, and south of Scottsbluff. The best wind resource areas are typically located on elevated terrain features, whereas the lowest wind resource are generally located in valleys and basins with relatively low elevations.



This map indicates that Nebraska has significant wind resources consistent with utility-scale production. (The darker the color the greater the potential.) This map can be found at www.windpoweringamerica.gov/images/windmaps/ne_50m_800.jpg

Financing and credit

A Community Based Energy Development (C-BED) project is defined as a new wind energy project that meets the following ownership criteria:

- Projects with more than 2 turbines: No single qualified owner owns more than 15% of the project with 33% of the power purchase agreement to the qualified owners or to the local community.
- Projects with 1-2 turbines: The project is owned by one qualified owner or more with at least 33% of the power purchase agreement flowing to the owners or to the local community.

In May 2007, Nebraska established that community-based energy developments (C-BED) projects are exempt from the sales and use tax. The Rural Community Based Development Act encourages electric utilities to enter into power purchase agreements with C-BED developers.

Early in 2008, the Nebraska Public Power District's Board of Directors unanimously revised its strategic plan on renewable energy, and because of the cost of wind-powered generation compared with other renewable generation, there will likely continue to be an emphasis on wind-powered generation.

The future for wind in Nebraska

Nebraska is poised over the next few years to become a national leader in wind power generation. The available wind resources are among the best in the country, and public officials have expressed strong interest in promoting wind energy as a way to boost the state's economy, aid landowners and produce clean energy. Yet, to date, very little of this opportunity has been realized. As of December 2008, there are about 74 MW of wind power has actually been installed. Nebraska ranks 6th in terms of wind energy *potential* and fourth in land most suitable for wind development. However, Nebraska is but only 22nd in actual *installed* wind capacity.

For more information, please contact John Crabtree, Center for Rural Affairs, johnc@cfra.org or 402-687-2103, ext. 1010

South Dakota

Renewable electricity in the form of wind energy development means increased economic opportunity in rural South Dakota. A U.S. Department of Energy Study (*20% Wind by 2030*) concluded that ramping up wind generation to 20 percent of the nation's electricity would create nearly 3,100 long-term jobs in South Dakota and over 27,000 jobs lasting one to two years resulting from wind turbine construction. Many jobs would be in rural South Dakota, where opportunities to create new jobs are limited. And many of these jobs are good jobs. A typical wind turbine maintenance job, for example, pays over $20/hour, *Jobs and Economic Development Impact Model, National Renewable Energy Laboratory.*

In addition, expanding wind generation is projected to increase property tax revenues by $39 million annually for South Dakota schools and local governments. South Dakota landowners are projected to receive additional lease payments of $21.5 million annually.

What is the economic impact of wind energy in South Dakota?

Increasing the national wind power capacity to 20% is projected to increase South Dakota wind generation capacity to 8,060 megawatts and make South Dakota a major wind exporter. South Dakota has exceptional wind resources, the fourth greatest overall potential among the states for wind energy production, according to the U.S. Department of Energy.

The expansion of wind electric generation would generate substantial direct, indirect, and induced economic benefits for South Dakota. Direct benefits include jobs, land lease payments, and increased tax revenues. Indirect and induced benefits result from local spending due to increased demand for goods and services. Economic benefit drivers include the use of local construction companies, the presence of in-state component suppliers, local wage structures, local property tax structures, and operation and maintenance expenditures. Economic impacts could be further enhanced through the development of a local wind supply, installation, and maintenance industry within the state.

The following charts show some of the economic impact on South Dakota, if the state were to develop 8,060 MW wind energy by 2030. Data for this analysis was compiled by the National Renewable Energy Laboratory (NREL). Direct impacts result from investment in the planning, development, and operation of new wind facilities. Beneficiaries include landowners, construction workers, operation and management staff, turbine manufacturers, and project managers. Indirect impacts reflect payments made to businesses that support the wind facility and include: banks, component suppliers, and manufacturers of equipment used to install and maintain the facility. Induced benefits result from increased spending by the direct and indirect beneficiaries.

Jobs created in South Dakota from 8,060 MW of new wind development by 2030
Wind energy's economic "ripple effect"

	Direct Impacts	Indirect and Induced Impacts	Total Impact
New jobs during construction phase (1-2 years)	13,813	13,471	27,284
New jobs during operational phase—long term jobs (20+ years)	2,177	1,739	3,916

Economic Impacts to South Dakota from 8,060 MW of new wind development by 2030
Wind energy's economic "ripple effect"

	Direct Impacts	Indirect and Induced Impacts
Payment to Landowners per year	$21.5 Million	
Local Property Tax Revenue per year	$39.3 Million	
Benefit to local economy (construction phase 1-2 years)	$1.52 Billion	$1.08 Billion
Benefit to local economy (operational phase 20+ years)	$171 Million/year	$146 Million/year

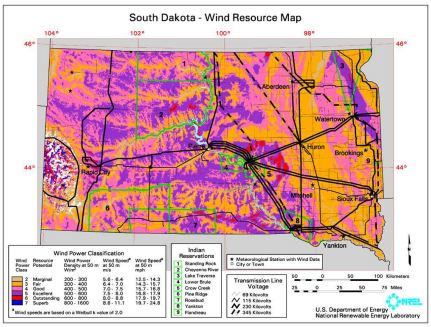
South Dakota

What are some of the benefits of wind energy in South Dakota?

If wind energy deployment gradually increases to 20% of the nation's electricity over the same time period, potentially, four trillion gallons of water will be conserved. South Dakota and the Midwest/Great Plains would see a water consumption savings of 1.64 trillion gallons nationally. (DOE 20% Wind Energy by 2030).

Where is the best wind potential in South Dakota?

According to the American Wind Energy Association, South Dakota has the fourth best wind in the country. Good to excellent wind resource areas are located throughout the state. Prominent excellent-to-outstanding resource areas are located on the hills east of Pierre, the ridges in south-central South Dakota near the Nebraska border, and hills near Rapid City. Ridge crest locations in the Black Hills can also have excellent wind resource.



This map indicates that South Dakota has significant wind resources consistent with utility-scale production. (The darker the color, the greater the potential.)

South Dakota has the fourth greatest potential for wind energy, but is ranked 20th nationally by installed capacity. South Dakota has the wind potential to power 50% of the nation's electrical demands, yet few are taking advantage of it. South Dakota has 10 projects producing 288 MW of wind energy and one project of 25 MW is currently under construction. Of these projects, all are rural

South Dakota is poised over the next few years to become a national leader in wind power generation, with the wind potential to power 50% of the nation's electrical demands. The available wind resources are among the best in the country, and public officials have expressed strong interest in promoting wind energy as a way to boost the state's economy, aid landowners and produce clean energy. Yet, to date, very little of this opportunity has been realized. As of January 2008, there are about 4,000 MW of wind power under development in South Dakota. However, only 188 MW of wind energy has actually been installed. South Dakota will likely produce enough energy from wind to meet most RES proposed statewide or nationally.