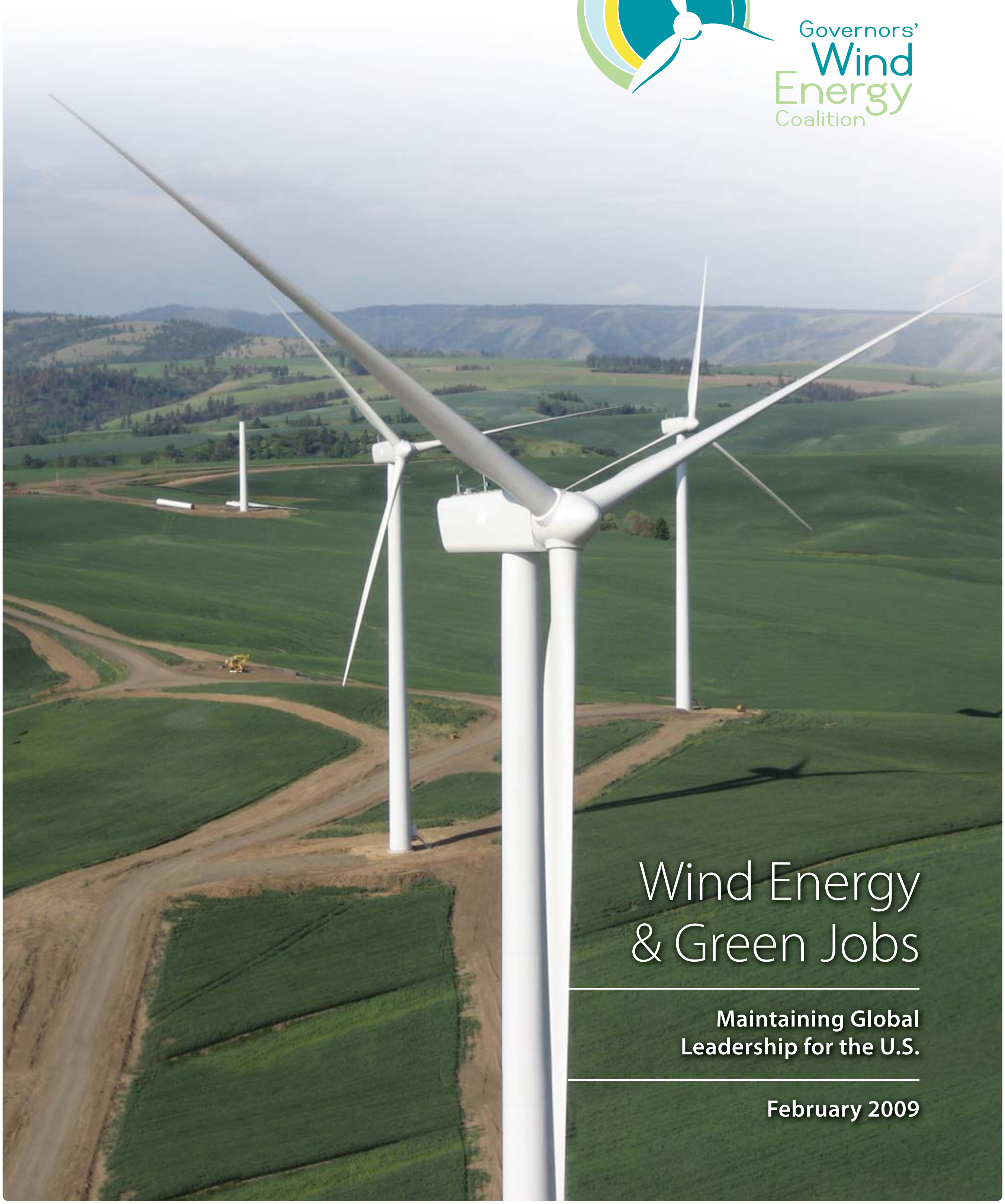
Governors' Wind Energy Coalition



Wind Energy & Green Jobs

Maintaining Global Leadership for the U.S.

February 2009

Executive Summary

The Governors' Wind Energy Coalition is a bipartisan group of 23 of the nation's governors dedicated to expanding development of wind resources to meet America's domestic energy demands in an environmentally responsible manner—while reducing the nation's dependence on imported fuel sources. The Governors' Wind Energy Coalition (GWC) members recognize that wind energy is now a bright spot in the struggling U.S. economy, supporting thousands of jobs while bolstering regional economic development across the country.

Co-chaired by Iowa Governor Chet Culver and Minnesota Governor Tim Pawlenty, the GWC is a collaboration designed to maximize the economic and environmental benefits of wind power. Through coordinated multi-state efforts, GWC undertakes initiatives designed to encourage sound federal and state policies to manufacture and install wind turbines, and transmit and distribute wind generated electricity.

The good news is that the United States surpassed Germany in 2008 to become the global leader in wind power installations, generating enough carbon-free electricity from domestic wind farms to power close to 7 million American homes.

Wind power's recent growth spurt in the U.S. has accelerated job creation in the manufacturing sector, where the share of domestically manufactured wind turbine components has grown to almost 50 percent in 2008. Wind turbine and turbine component manufacturers announced, added or expanded 70 new facilities in the past two years, including over 55 in 2008 alone. The American Wind Energy Association (AWEA) estimates that approximately 85,000 people currently are employed by the domestic wind industry.

The bad news is that wind power still provides less than 2 percent of total U.S. electricity consumption. Without new federal policies and investments in research and development and construction of new transmission lines, this "green jobs" success story may have a more familiar unhappy ending.

GWC's efforts are strengthened by a report released in May 2008 by the U.S. Department of Energy (DOE), entitled ***20% Wind Energy by 2030***. The principal finding of this comprehensive report is that the U.S. possesses ample wind resources to provide 20 percent of the country's total electricity consumption by 2030 at an affordable price for rate payers.

If the U.S. can meet the goal of 20 percent wind power by 2030, more than 500,000 direct, indirect and induced jobs could be supported across the country.

More than 150,000 workers would be directly employed by the wind industry on an annual basis. Over 100,000 indirect jobs would be supported in associated industries (e.g., accountants, lawyers, steel workers and electrical manufacturing) and over 200,000 more jobs would be generated through increased local spending on products and services.

Among the other economic benefits this level of wind power development would create throughout the country are the following:

- Consumers could save $128 billion through lower natural gas prices.
- Annual property tax revenues for local governments would surge by more than $1.5 billion.
- Rural landowners—typically ranches and farms—would enjoy "wind royalties," annual payments that could exceed $600 million.

All told, the total net present value of economic activity generated by the 20 percent national wind energy goal could exceed $440 billion through the year 2030, according to the 2008 DOE report.

This report profiles the economic development benefits of five states that are members of GWC: California, Colorado, Iowa, Minnesota and Oregon. But DOE projects that under the ***20% Wind Energy by 2030*** scenario, all states would enjoy substantial economic development benefits. Furthermore, all U.S. consumers would enjoy lower natural gas costs, cleaner air and increased availability of fresh water supplies.

In order to meet the full economic development potential from wind energy, GWC endorses the following policies:

- **Adopt a National Renewable Electricity Standard of 20 percent Renewable Energy by 2030**
- **Support construction of New Interstate Electric Transmission "Smart" Grid**
- **Expand U.S. Department of Energy's Work with States and the Wind Industry to Accelerate Innovation**
- **Adopt a Long-Term Production Tax Credit for Wind Energy**

Governors' Wind Energy Coalition

www.GovernorsWindEnergyCoalition.org

Wind Energy: A Key to Job Growth & Economic Strength

The United States surpassed Germany in 2008 to become the global leader in wind power installations, generating enough carbon-free electricity from domestic wind farms to power close to 7 million American homes.[1]

These wind farms not only generate clean electricity, they generate significant numbers of well-paying jobs. The American Wind Energy Association (AWEA) estimates that approximately 85,000 people currently are employed by the domestic wind industry. If one includes direct, indirect and induced jobs, that employment number could reach a total of 500,000 by 2030, if the right mix of policies and programs are put into place today.[2]

Wind power still provides less than 2 percent of the nation's electricity. Without new federal policies and investments in research and development and construction of new transmission lines, this "green jobs" success story may have a more familiar unhappy ending. Wind power has been hampered by inconsistent federal policies: a short-sighted approach to tax incentives; a patchwork of state policies; and a lack of adequate planning for and construction of new transmission lines. Long term federal policy, such as a national Renewable Electricity Standard (RES) and a 10-year extension of the Production Tax Credit (PTC), is necessary to bring the wind power into the mainstream.

At a time when bad economic news seems to be the status quo, the wind power industry stands out as an inspiring "green jobs" success story. Wind power can lead the way on the green jobs front, helping to achieve the nation's goal of reviving the U.S. economy with clean energy technologies.

State of Colorado – Vestas

Vestas is the world's leading manufacturer of wind turbines. Based in Denmark, a country that obtains more than 20 percent of its total electricity from wind power, Vestas has been developing, selling, installing and providing service and maintenance to wind turbines for almost 30 years.

In a clear sign of the times, Vestas is now locating four different factories in the state of Colorado. Just three years ago, there was not a single wind-related manufacturing business in the state. The Danish turbine company is making Colorado the center of its manufacturing operations due to high expectations about demand for its wind turbines in the US market. All together, Vestas plans to sink over $680 million into Colorado's economy, which is expected to generate a total of over 2,500 jobs by the end of 2010.

Here is a summary of key features of these factories:

Windsor: This 400,000 square foot facility will employ 650 workers and will make 1,800 blades annually. Vestas was offered about $4 million in government grants, tax rebates and job-training funds.

Pueblo: This $50 million factory will be the world's largest tower factory and is expected to be fully operational by mid-2010. It will employ around 500 workers and have an annual processing capacity of 200,000 metric tons of steel, corresponding to 900 wind turbine towers annually.

Brighton: Vestas will build two factories in Brighton, an investment of $350 million. A blade manufacturing facility will employ 650 people and produce 1,800 blades annually. The nacelle assembly plant will employ 700 workers and produce 1,400 nacelles annually.

Why the Governors' Wind Energy Coalition?

The Governors' Wind Energy Coalition (GWC) is a bipartisan group of 23 of the nation's governors dedicated to expanding development of wind resources to meet America's domestic energy demands in an environmentally responsible manner—while reducing the nation's dependence on imported fuel sources. GWC members recognize that wind energy is now a bright spot in the struggling U.S. economy, supporting thousands of jobs while bolstering regional economic development across the country.

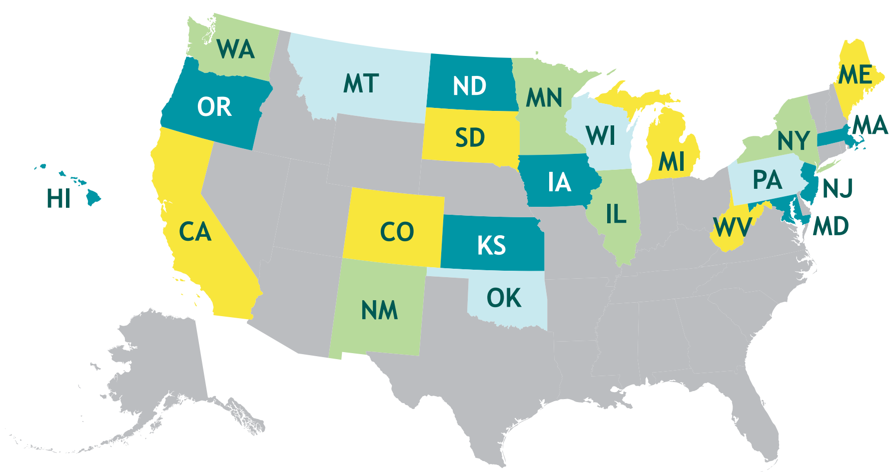
The Governors' Biofuels Coalition proved that if state leaders focus their attention on a particular goal, they can have an immense impact. For example, Iowa added $8 billion to the state's economy through investments in biofuels, creating 50,000 jobs in the process. Today, Iowa actually produces more biofuels than the state's consumption of gasoline, positioning the state as a net exporter of cleaner burning biofuels.

Co-chaired by Iowa Governor Chet Culver and Minnesota Governor Tim Pawlenty, the GWC is a collaboration designed to maximize the economic and environmental benefits of wind power. Through coordinated multi-state efforts, GWC undertakes initiatives designed to encourage sound federal and state policies to manufacture and install wind turbines, and transmit and distribute wind generated electricity. GWC will demonstrate the value and communicate the benefits of wind energy to consumers, energy companies, financial markets and other policy makers. The goal of the coalition is to support the entire value chain of companies and organizations responsibly bringing wind energy resources to market and to catalyze infrastructure investments to expand wind power capacity across the entire U. S.

GWC gives its members a unified national voice to help make wind power a cornerstone of the nation's future national energy strategy. Wind power offers a case study of how the U.S. can strategically rebuild our economy with the green technologies needed to combat global climate change and to fuel sustainable economic growth.

Membership

The Coalition's co-chairs are Iowa Governor Chet Culver and Minnesota Governor Tim Pawlenty. The Coalition currently has 23 member governors, including:

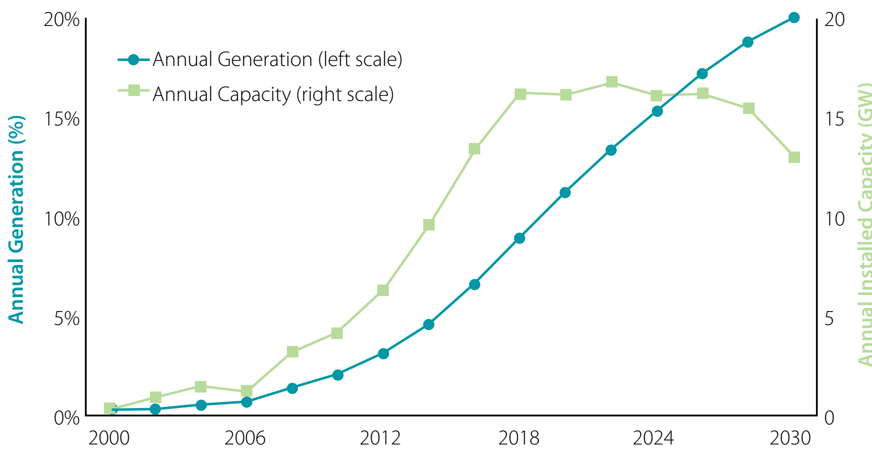


Iowa ▮ Gov. Chet Culver – Co-Chair
Minnesota ▮ Gov. Tim Pawlenty – Co-Chair

California ▮ Gov. Arnold Schwarzenegger
Colorado ▮ Gov. Bill Ritter
Hawaii ▮ Gov. Linda Lingle
Illinois ▮ Gov. Pat Quinn
Kansas ▮ Gov. Kathleen Sebelius
Maine ▮ Gov. John Baldacci
Maryland ▮ Gov. Martin O'Malley
Massachusetts ▮ Gov. Deval Patrick
Michigan ▮ Gov. Jennifer Granholm
Montana ▮ Gov. Brian Schweitzer
New Jersey ▮ Gov. Jon Corzine
New Mexico ▮ Gov. Bill Richardson
New York ▮ Gov. David Paterson
North Dakota ▮ Gov. John Hoeven
Oklahoma ▮ Gov. Brad Henry
Oregon ▮ Gov. Ted Kulongoski
Pennsylvania ▮ Gov. Edward Rendell
South Dakota ▮ Gov. Mike Rounds
Washington ▮ Gov. Christine Gregoire
West Virginia ▮ Gov. Joe Manchin, III
Wisconsin ▮ Gov. Jim Doyle

20% Wind Energy by 2030

GWC's efforts are strengthened by a report released in May 2008 by the U.S. Department of Energy (DOE), entitled ***20% Wind Energy by 2030***. The principal finding of this comprehensive report is that the U.S. possesses ample wind resources to provide 20 percent of the country's total electricity consumption by 2030 at an affordable price for rate payers and with immense economic and environmental benefits for the whole country. The cost for each U.S. household to reach this goal is just 50 cents per month before accounting for offsetting benefits such as avoiding carbon emissions or reducing natural gas demand. No major technological breakthroughs in wind turbine technology are necessary to meet this target. Raw materials such as copper and fiberglass are also of ample supply to support this level of wind farm development over the next two decades.



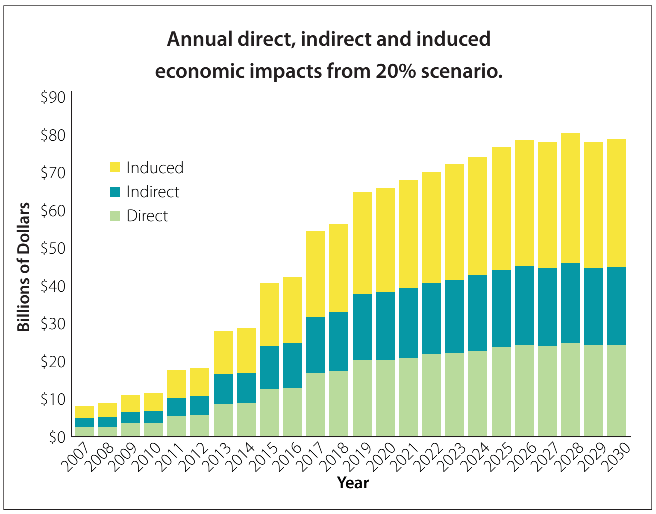
Prescribed annual wind technology generation as a percentage of national electricity demand from Laxson, Hand, and Blair (2006) and corresponding annual wind capacity installation for 20% Wind Scenario from WindDS model.

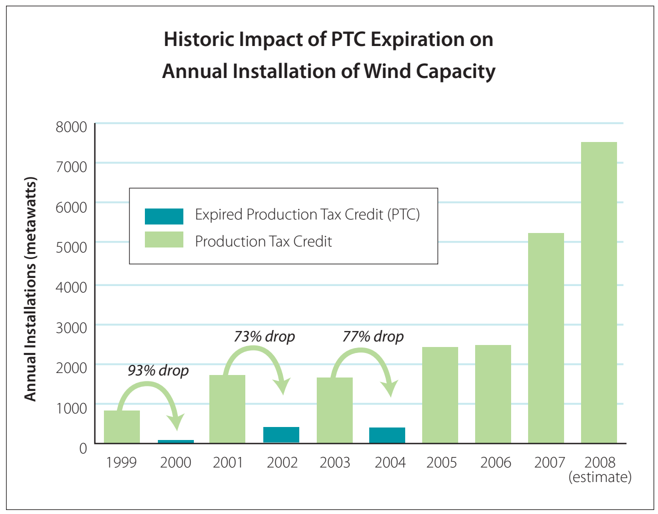
Wind Can Save Eastern U.S. Consumers $12 Billion Annually

Released in February 2008, the Joint Coordinated System Plan (JCSP) of grid operators in the Eastern U.S. examined the cost of reaching the 20 percent wind energy supply goal for the Eastern U.S. and discovered that consumers would save $12 billion annually.[3] The capital costs for these grid upgrades would be recovered within seven years. The resulting "smart" grid would not only help the environment, but reduce the risks of rolling blackouts, the study concluded.

If the U.S. can meet the goal of 20 percent wind power by 2030, more than 500,000 direct, indirect and induced jobs could be supported across the country.

More than 150,000 workers would be directly employed by the wind industry on an annual basis. Over 100,000 indirect jobs would be created in associated industries (e.g., accountants, lawyers, steel workers and electrical manufacturing) and over 200,000 more jobs would be generated through increased local spending on products and services. Consumers could save $128 billion through lower natural gas prices. Annual property tax revenues for local governments would surge by more than $1.5 billion. And rural landowners—typically ranches and farms—would enjoy "wind royalties," annual payments that could exceed $600 million. All told, the total net present value of economic activity generated by the 20 percent national wind energy goal could exceed $440 billion through the year 2030, according to the 2008 DOE report.





This on-again, off-again pattern has discouraged companies from making long-term, sizeable investments in wind power manufacturing and development.

The amount of clean non-polluting electricity generated by this fleet of wind turbines would reach 300,000 MW and would cut electricity sector greenhouse gas emissions contributing to global climate change by 25 percent.

The impact would be the equivalent of taking 140 million automobiles off the nation's highways and roads. Natural gas consumption would be reduced by 11 percent while 4 trillion gallons of water consumed by fossil fuel power plants for cooling could be diverted to other higher uses.

At present, 28 states have already enacted an RES, which has been a prime driver behind the U.S. ascension to the world's wind power top spot. What is remarkable is that the U.S. achieved its global leadership status despite inconsistent federal support. For example, while Congress extended federal tax credits for the solar energy industry for 8 years in 2008, the wind industry only received a one year extension of a federal PTC. Given consistent long-term support, the wind industry could become an even larger source of "green jobs" and a critical component of the nation's economic recovery.

The economic stimulus legislation signed into law in February 2009 did include an extension of federal PTC for wind power of 2.1 cents per kilowatt-hour for three more years, but that is not enough. Other policies supported by GWC still need to be put in place before the U.S. can maximize the employment and environmental benefits linked to achieving the 20 percent wind energy by 2030 goal. The purpose of this report is to illustrate the broad range of economic development impacts that accrue to states from an aggressive build-out of some of the best wind resources in the world. This report also lays out GWC's policy agenda in the conclusion.

2008: A Banner Year for the U.S. Wind Power Industry

The massive growth in 2008 swelled the nation's total wind power generating capacity by 50 percent and channeled an investment of some $17 billion into the economy.[4]

The U.S. wind energy industry shattered all previous records in 2008 by installing 8,358 megawatts (MW) of new generating capacity. For the last two years in a row, wind power was the number one source of new electric generating capacity in the U.S., beating out natural gas, coal and all other competing power sources.

The U.S. was the global leader in wind power in the 1980s, largely due to the pioneering efforts of California. In 1986, California alone featured over 90 percent of the world's total wind power capacity. But over the next two decades, the rest of the world caught up and surpassed California and, until recently, the rest of the U.S.

Whether the U.S. can maintain its newly acquired global leadership mantle is still an open question. China doubled its previous installed capacity in 2008 by adding about 6,300 MW, bumping its national total to 12,200 MW of wind power capacity.[5] The Chinese government has chosen wind energy as one of its lead responses to the global economic downturn, and has established a formal program to encourage domestic turbine manufacturing. At current growth rates, China is well on its way to overtake Germany and Spain to reach second place in total wind power capacity in 2010 and to be a major supplier of turbines and components to the global market, setting itself up for a showdown with the U.S. in the years to come.

Worldwide wind capacity installations totaled more than 27,000 MW in 2008, a 36 percent increase over 2007 capacity additions. The U.S. total installed wind power capacity now stands at 25,170 MW. Here are the respective wind power capacity totals for the top five U.S. states:

Texas (7,116 MW)

Iowa (2,790 MW)

California (2,517 MW)

Minnesota (1,752 MW)

Washington (1,375 MW)

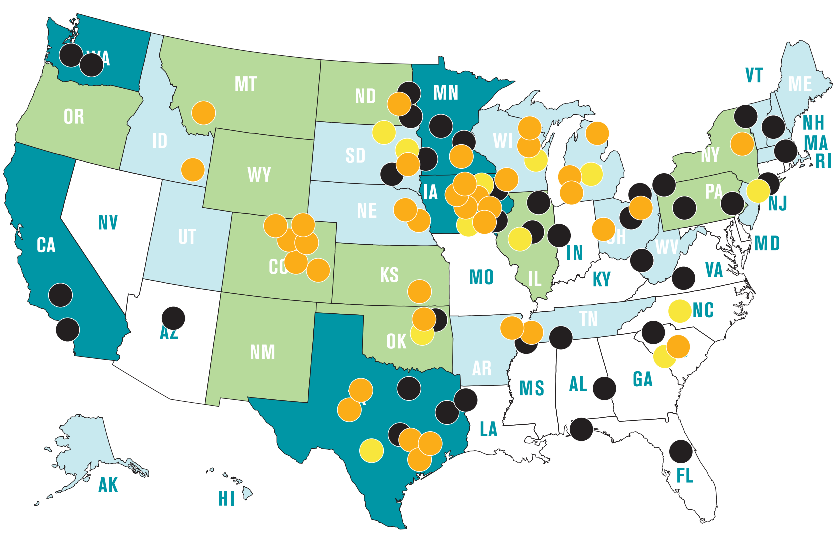
Oregon moved into the "Gigawatt Club" of states with more than 1,000 MW of installed wind capacity—a club that now also includes Colorado—and Iowa surpassed California to nab the No. 2 slot behind Texas, the national leader on wind power. About 85,000 people are directly employed in the wind industry today, up from 50,000 just one year ago. These green collar jobs come in a variety of occupations: turbine component manufacturing; construction and installation of wind farms; wind farm operations and maintenance (popularly known as "wind smiths"); legal and marketing services and more.

Up until recently, the vast majority of wind industry manufacturing jobs were concentrated in Europe. Germany, Denmark and Spain, for example, export more than half of their wind-related manufacturing output. Prior to 2005, the U.S. imported more than 70 percent of major wind turbine components for domestic wind projects. That prevalent trend of the U.S. outsourcing manufacturing jobs to other countries is now reversing itself in the case of the wind industry.

Wind power's recent growth spurt in the U.S. has accelerated job creation in the manufacturing sector, where the share of domestically manufactured wind turbine components has grown to almost 50 percent in 2008. Wind turbine and turbine component manufacturers announced, added or expanded 70 new facilities in the past two years, including over 55 in 2008 alone. Those new manufacturing facilities will create 13,000 new direct jobs. Clearly, the huge opportunity of the U.S. market has attracted new manufacturers from overseas, outweighing the risk of unstable federal policies toward wind power. A stable federal policy framework that can reduce risk for new wind component manufacturers would lead to an explosion of domestic manufacturing and the corresponding thousands of new green jobs.

Other than U.S.-based General Electric, none of the seven largest global wind turbine manufacturers had plants in the U.S. prior to 2005. Today, six of the seven top global turbine producers now have at least one manufacturing facility located in the U.S.

Wind Power Jobs: Revitalizing Our Domestic Manufacturing Base



Wind generation capacity installed (megawatts, MW*)	**Manufacturing facilities** (existing or announced)
> 1000 MW	Online Prior to 2007
> 100 MW	Online, Expanded or Announced in 2007
< 100 MW	Online, Expanded or Announced in 2008

* One MW generated enough electricity to power the equivalent of 250-300 average homes.

Faribault – Minnesota Moventas

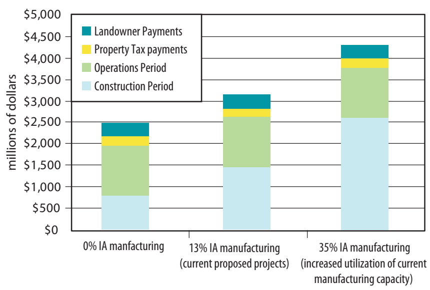
Finland-based gearbox manufacturer Moventas is building a 75,000-square-foot North American assembly and distribution facility in Faribault, Minnesota as part of a $145 million worldwide expansion program. Set to open in October 2009, the initial 90 workers will have average annual salaries of $44,000. Over the next decade, factory employment could grow to 200 or 300 jobs. Incentives offered to Moventas to locate in Faribault include $600,000 in municipal infrastructure upgrades, $3.2 million in county incentives and a $500,000 state grant.

Muncie – Indiana Brevini USA

Brevini USA, the U.S. subsidiary of an Italian wind turbine manufacturer, located a new facility to make gearboxes in Munice, Indiana. Brevini USA is investing more than $60 million to retrofit an existing 60,000-square-foot building and will add 150,000 square-feet of manufacturing space at the site in 2010. The facility will create about 450 permanent local jobs with annual salaries averaging more than $46,000.

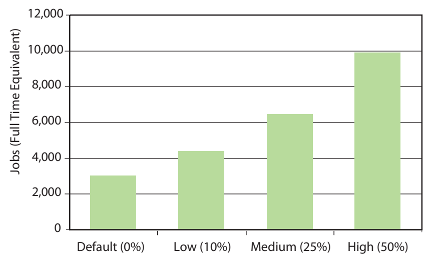
Another study by NREL came upon this startling discovery. If a state can increase local manufacturing of wind turbines and components by just 10 percent, it can boost statewide economic benefits during construction by 68 percent.[6] The parts comprising the wind turbines themselves constitute as much as 85 percent of the total costs of a wind farm. If 50 percent of the components of a wind farm can be manufactured locally, construction period economic impacts could increase by 341 percent due to increased local manufacturing activity within the state.

Total economic development impacts in IOWA (2,400 MW of development)



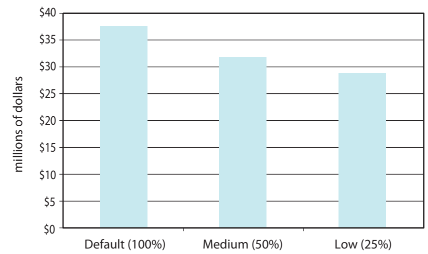
Economic development benefits for Iowa with different levels of local manufacturing

Jobs sensitivity to increased manufacturing in MICHIGAN



Construction Period Jobs Impacts in Michigan from increased reliance on local manufacturing (1000 MW of wind power)

Annual economic impacts in KANSAS



Implications of declining reliance on local labor for wind plant O&M on 1,000 MW of wind power

Despite the good news that the U.S. is now the world's top producer of wind power, some dark clouds have appeared on the horizon. At the end of 2008, financing for new projects and orders for turbine components slowed to a trickle. Layoffs also began to hit the wind turbine manufacturing sector. "The U.S. wind energy industry's performance in 2008 confirms that wind is an economic and job creation dynamo, ready to deliver on the President's call to double renewable energy production in three years," said AWEA CEO Denise Bode. "At the same time, it is clear that the economic and financial downturn has begun to take a serious toll on new wind development. We are already seeing layoffs in the area where wind's promise is greatest for our economy: the wind power manufacturing sector."

This downturn is due, in part, to our current declining economy and a subsequent dampening in demand for electricity. But the downturn can also be attributed, in part, to a flaw in U.S. federal policy support for renewable energy resources such as wind power. The federal PTC and state RES programs have been the winning combination for encouraging wind power in the U.S. The PTC is designed to be a tax credit charged against investment income. As a result, large investors who pay a lot of taxes on investment income (commonly referred to as having a large "tax appetite") have been the primary users of the PTC. About fifteen big investment houses, insurance companies and banks have been the traditional "tax partners" for new wind farms. Many of these firms—AIG, Lehman Brothers and Wachovia—have had serious financial problems and have temporarily lost their tax appetite. With no investment partners, financing for new wind projects in the U.S. has ground to a halt.

The new economic stimulus program sets up a short term fix: a new DOE program will offer grants in lieu of tax credits for two years. But in the long run, we need better policy design. Financial incentives also need to be more user-friendly and more democratic, attracting small and large investors alike to the new clean energy economy. By diversifying the base of investors, the U.S. can foster greater market stability and financial innovation in the wind power sector.

Case Study: Clipper Wind in Cedar Rapids, Iowa

Over the past three years activity levels noticeably changed on Bowling Street Southwest in Cedar Rapids, Iowa. A huge manufacturing facility that sat dormant for several years after the Rockwell Goss manufacturing plant closed in the late 1990s is now back in production, delivering commercial-scale wind turbines to power U.S. homes and businesses.

Founded in 2002 in California, Santa Barbara-based Clipper Windpower opened its expansive 330,000 square foot Iowa plant in 2005 to assemble its 2.5 MW Liberty wind turbine, which stands as tall as a 30-story building and sweeps the area of a football field. Just one of these wind turbines can power about 700 average American homes.

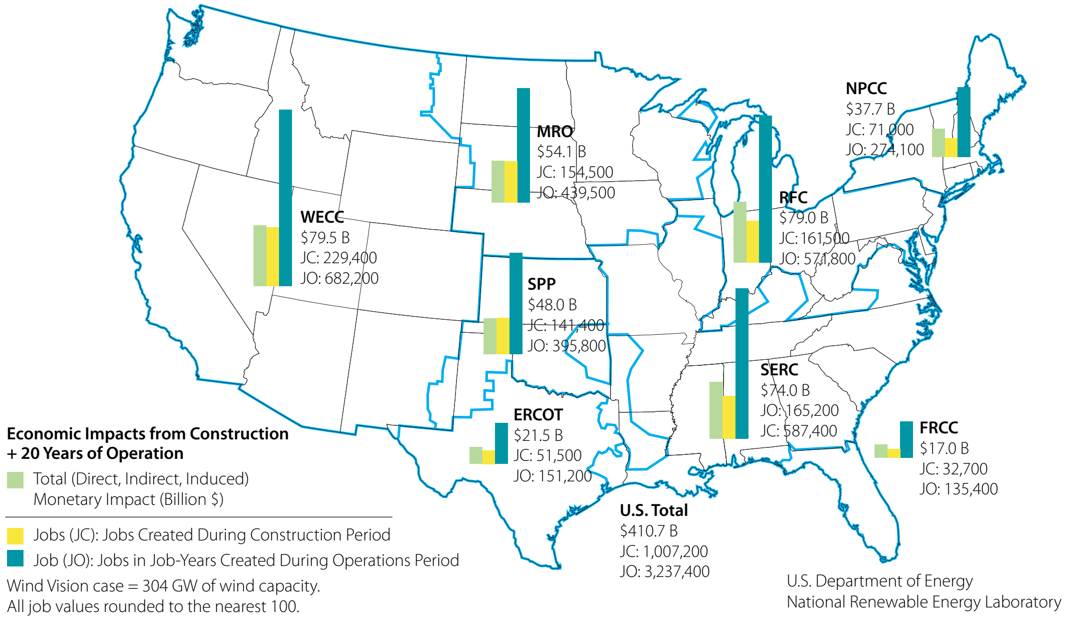
Originally built in the 1960's, the Cedar Rapids plant has been used for a variety of heavy-industry activities, including the manufacture of huge printing presses more than 30 feet tall. Bob Loyd, Clipper's Cedar Rapids plant manager, has over 30 years of industrial experience in the region, having managed the facility for 15 years during its printing press era. Similar to wind turbines, these printing presses were comprised of a large number of different interrelated components and a complex multi-shaft, high-precision geared power transmission. Gear grinding, in fact, was one of the in-house activities at the time.

Workers here assemble the wind turbine's main gear, drive train and electronic components, all housed by a nacelle. Parts and assemblies are shipped to the Cedar Rapids facility from nearby Illinois and Wisconsin, as well as Poland and Brazil. All told, 80,000 individual parts come together to make one Clipper turbine. Once transported to the construction site, the nacelle is lifted to the top of the tower where three rotor blades are then bolted to the drive train inside.

Iowa was chosen as the site for Clipper's manufacturing operation due to its 'heartland' location, which offers convenient rail facilities to service US customers, an abundance of skilled factory workers and encouragement from Iowa's economic development initiatives.

The workforce has grown from 30 to nearly 400 skilled workers at the end of 2008. But in early 2009, production has slowed and Clipper Wind was forced to reduce its global workforce by about 90 employees. "Notwithstanding this difficult economic time, the future outlook for wind energy and other renewables remains strong—particularly in the U.S." says Doug Pertz, Clipper Wind CEO.

20% Wind Electricity by 2030 – Economic Impacts by NERC Region



Wind Energy and Green Jobs Stimulate the Economy

The U.S. DOE estimated the amount of green jobs that could be created from attaining a fifth of the nation's total electricity from wind power. Additional analysis by the National Renewable Energy Lab employing their Jobs and Economic Development Impacts (JEDI) model (see Appendix for a description of the methodology) is included in this report describing the economic benefits attached to wind power in greater detail for five representative states. The five states selected are all members of GWC and are among the leaders in wind power development: California, Colorado, Iowa, Minnesota and Oregon. Long term modeling by DOE suggests that these states will host a substantial share of new wind power development in the 2030 time frame, but will not be the only beneficiaries.

The JEDI model estimates employment opportunities all along the supply chain, from manufacturing, shipping and construction, to operations and maintenance, with additional estimates of indirect and induced jobs. The map above sums up the employment and economic impacts projected by the JEDI model for the "20 percent by 2030" goal.

From a national perspective, the JEDI model estimates the following accumulative economic gains from a national commitment to wind resources of the U.S.:

- Forty-six states will experience major wind energy development and the associated jobs and economic benefits by 2030.
- Cumulative economic activity from construction alone for all three categories (direct, indirect and induced) would exceed $944 billion by 2030.
- The construction sector would experience the largest employment gains, followed by the operations sector and then the manufacturing sector.
- An average of 250,000 workers would be employed by the wind industry annually from 2007 until 2030. These employment figures include 70,000 full-time annual construction-related sector positions and 22,000 full-time *direct* manufacturing jobs.[7]
- Manufacturing employment would peak in 2026, with 32,000 employees directly serving both land-based and offshore wind projects.
- By 2030, employment in the operations and maintenance sectors (direct, indirect and induced) would reach 215,000 workers. Of this aggregate total, an estimated 28,000 workers would be directly employed in wind farm operations and maintenance, while 48,000 workers would be subcontractors and other providers of utility services.

continued page 12

Economic Impact of Wind Power

Drilling deeper into the data, here is a summary of the "ripple effect" of economic activity associated with increased reliance upon wind power for five different GWC states:

CALIFORNIA

Economic Impacts From the 20% Vision
16,694 MW new Onshore and Offshore development

Wind energy's economic "ripple effect"

DIRECT IMPACTS
Landowner Revenue:
- $42 M/yr

Local Property Taxes:
- $138 M/yr

Construction Phase:
- 27,000 new jobs
- $3.8 B to local economies

Operational Phase:
- 3,830 new long-term jobs
- $385 M/yr to local economies

INDIRECT & INDUCED IMPACTS
Construction Phase:
- 28,000 new jobs
- $3.2 B to local economies

Local Property Taxes:
- $138 M/yr

Operational Phase:
- 3,430 local jobs
- $400 M/yr to local economies

TOTALS CONSTRUCTION + 20YRS
Total economic benefit = $22.8 billion
New local jobs during construction = 55,000
New local long-term jobs = 7,000

Construction Phase = 1 - 2 years
Operational Phase = 20+ years

COLORADO

Economic Impacts From the 20% Vision
2,507 MW new development

Wind energy's economic "ripple effect"

DIRECT IMPACTS
Landowner Revenue:
- $6.7 M/yr

Local Property Taxes:
- $27.6 M/yr

Construction Phase:
- 3,523 new jobs
- $473 M to local economies

Operational Phase:
- 560 new long-term jobs
- $53 M/yr to local economies

INDIRECT & INDUCED IMPACTS
Construction Phase:
- 3,070 new jobs
- $326 M to local economies

Operational Phase:
- 453 local jobs
- $50 M/yr to local economies

TOTALS CONSTRUCTION + 20YRS
Total economic benefit = $2.9 billion
New local jobs during construction = 6,593
New local long-term jobs = 1,013

Construction Phase = 1 - 2 years
Operational Phase = 20+ years

IOWA

Economic Impacts From the 20% Vision
19,909 MW new development

Wind energy's economic "ripple effect"

DIRECT IMPACTS
Landowner Revenue:
- $53 M/yr

Local Property Taxes:
- $90 M/yr

Construction Phase:
- 33,200 new jobs
- $3.7 B to local economies

Operational Phase:
- 5,220 new long-term jobs
- $420 M/yr to local economies

INDIRECT & INDUCED IMPACTS
Construction Phase:
- 30,200 new jobs
- $2.5 B to local economies

Operational Phase:
- 3,800 local jobs
- $336 M/yr to local economies

TOTALS CONSTRUCTION + 20YRS
Total economic benefit = $21 billion
New local jobs during construction = 63,000
New local long-term jobs = 9,000

Construction Phase = 1 - 2 years
Operational Phase = 20+ years

MINNESOTA

Economic Impacts From the 20% Vision
9,942 MW new development

Wind energy's economic "ripple effect"

DIRECT IMPACTS
Landowner Revenue:
- $26.5 M/yr

Local Property Taxes:
- $28 M/yr

Construction Phase:
- 14,500 new jobs
- $1.9 B to local economies

Operational Phase:
- 2,300 new long-term jobs
- $210 M/yr to local economies

INDIRECT & INDUCED IMPACTS
Construction Phase:
- 15,200 new jobs
- $1.5 B to local economies

Operational Phase:
- 1,800 local jobs
- $180 M/yr to local economies

TOTALS CONSTRUCTION + 20YRS
Total economic benefit = $11.2 billion
New local jobs during construction = 29,000
New local long-term jobs = 4,000

Construction Phase = 1 - 2 years
Operational Phase = 20+ years

OREGON

Economic Impacts From the 20% Vision
7,991 new Onshore and Offshore development

Wind energy's economic "ripple effect"

DIRECT IMPACTS
Landowner Revenue:
- $21 M/yr

Local Property Taxes:
- $69 M/yr

Construction Phase:
- 11,800 new jobs
- $1.5 B to local economies

Operational Phase:
- 1,900 new long-term jobs
- $170 M/yr to local economies

INDIRECT & INDUCED IMPACTS
Construction Phase:
- 12,800 new jobs
- $1.2 B to local economies

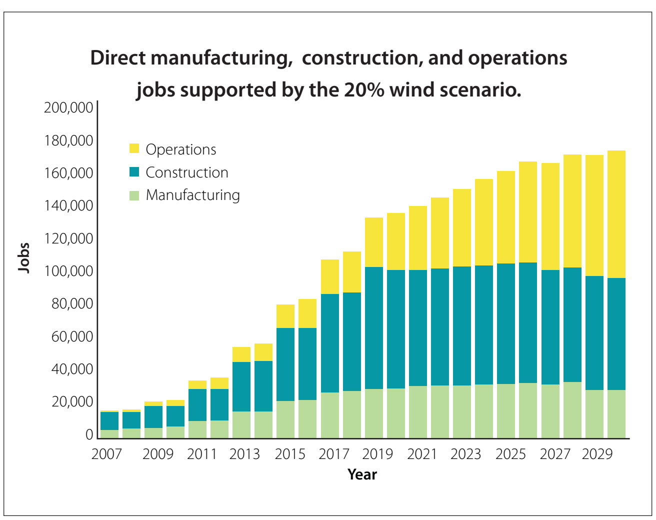
Operational Phase:
- 1,850 local jobs
- $170 M/yr to local economies

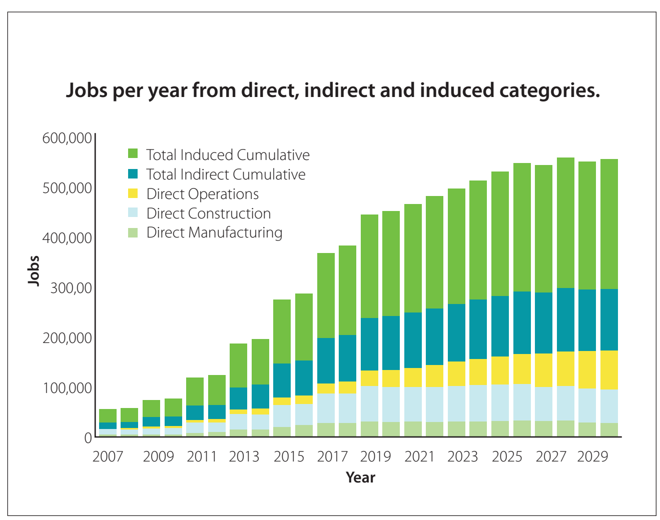
TOTALS CONSTRUCTION + 20YRS
Total economic benefit = $9.6 billion
New local jobs during construction = over 24,000
New local long-term jobs = over 3,700

Construction Phase = 1 - 2 years
Operational Phase = 20+ years

It is important to note that states with few wind resources will also benefit from a major expansion of wind power capacity in two other important ways. First, much of the employment potential of wind power lies in the manufacturing stage. From a manufacturing perspective, wind turbines are similar to trucks and tractors and other heavy equipment. They support a supply chain of conventional component suppliers, such as makers of ball bearings, wires, computer controls and software. Many of these suppliers are existing industries that will benefit from a diversified and growing market for their products.

A further benefit to states will be in the ancillary benefits that wind power can generate. Analysis by the Energy Information Administration (EIA) has shown that increasing production from renewable resources such as wind power in response to a federal RES will reduce demand for, and the corresponding cost of, natural gas, which then delivers economic benefits to the U.S. as a whole.





Fairless Hill, Pennsylvania – Gamesa Corporation

As many as 7,000 workers once populated a 2,500-acre U.S. Steel manufacturing facility in Fairless Hill, Pennsylvania. Employment started declining in 1982 and after steady downsizing, only 100 employees were left in 2001. Then along came the Spanish company Gamesa Corp., which built a new $34 million factory on 20 acres of the old U.S. Steel site in 2006. The factory employs over 500 workers to manufacture towers, blades and assembles nacelle components.

Newton, Iowa – TPI Composites

For decades, Newton, Iowa, current population 16,000, was home of Maytag, the familiar manufacturer of household appliances. But in 2007, the Maytag factory shut down, leaving 1,800 long-time employees without a job. Desperate to lure new industries, city officials attended a conference hosted by the American Wind Energy Association and convinced TPI Composites, a manufacturer of wind turbine blades for General Electric, to consider locating a new factory in Newton. Less than a year later, TPI Composites opened the doors to its $56 million, 316,000 square foot facility. The initial workforce numbers 500, with a strong likelihood of further expansion in the near future.

Grand Forks, North Dakota – LM Glasfiber

When Danish wind turbine blade manufacturer LM Glasfiber decided to expand into the US market in the year 2000, it helped lift the city of Grand Forks, North Dakota out of local economic slump. The city was still suffering from the aftermath of a devastating flood in 1997. The opening of the LM Glasfiber plant brought over 500 well paying jobs to town. Since then, Forbes magazine ranked Grand Rapids as 28th best small metropolitan area to do business.

Alpena, Michigan – ATI Casting

ATI Casting Service, a foundry that produces grey and ductile iron castings for wind turbines, recently reopened a closed auto industry foundry in Alpena, Michigan that had been a long-time source of 200 local jobs. The new $15 million casting facility has already hired 150 locals and hopes to expand as markets for its components in the U.S. grow over time.

Ephrata, Washington – Katana Summit

Katana Summit located a wind turbine tower manufacturing plant in Ephrata, Washington and quickly revitalized the region's railroad freight activity. Rail shipments have increased from 40 to 380 loads per year since the tower manufacturer came to town. The company spent approximately $11 million to expand a facility now capable of shipping out 150 turbine towers per year. It employs about 150 workers, pays up to $7 million in annual wages and contributes $47,000 annually in local building tax revenue.

Conclusion

As a bipartisan group of governors from diverse regions of the nation, members of the GWC share a common concern that our dependence on imported energy sources puts the nation's energy, economic and environmental security at risk. The GWC pledges to work with the Administration and Congress to achieve one of the principal goals identified during the recent presidential campaign—energy independence. GWC believes increasing the role that wind energy plays in meeting our energy needs is one of the best options to respond to this pressing challenge.

Wind energy is clean abundant, and affordable. The Upper Midwest has often been called the "Saudi Arabia" of wind power. The entire Great Plains offers ideal opportunities for building wind farms to meet the nation's growing appetite for wind power. Both West and East Coasts also offer cost-effective wind energy resources. With the right mix of federal and state policies, GWC aims to help spur strategic private sector investments to meet the 20 percent wind energy by 2030 goal. Working toward this goal would spur new investments that can help stabilize our states' and nation's economy, reduce consumer energy costs, reduce dependence on imported fossil fuels and shrink the nation's trade deficit and carbon footprint, while simultaneously creating thousands of green jobs.

Transmission Lines
Voltage (kV)

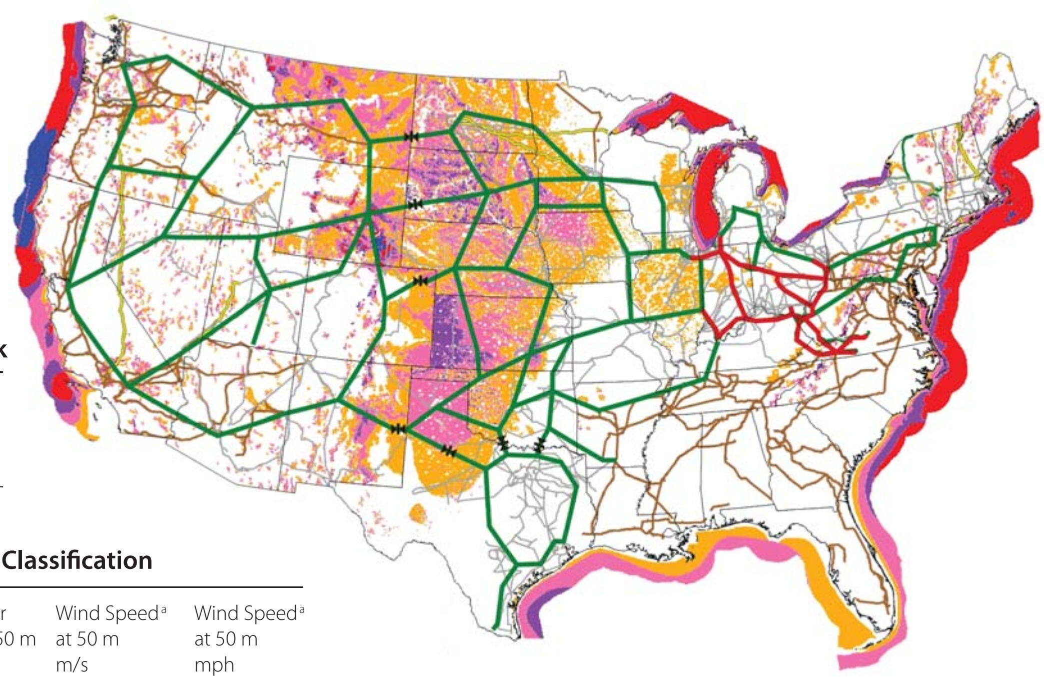
- 234 - 499
- 500 - 699
- 700 - 799
- 1000 (DC)

Source: POWERmap, powermap.platts.com. ©2007 Plats, a division of the McGraw-Hill Companies

Conceptual 765 kV Network

- Existing 765 kV
- New 765 kV
- AD-DC-AC Link

Source: American Electric Power (AEP)



Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m2	Wind Speed[a] at 50 m m/s	Wind Speed[a] at 50 m mph
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.0 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

[a] Wind speeds are based on a Weibll k value of 2.0

This map shows the wind resource data used by the WinDs model for the 20% Wind Scenario. It is a combination of high resolution and low resolution datasets produced by NREL and other organizations. The data was screeded to eliminate areas likely to be developed onshore due to land use or environmental issues. In many states, the wind resource on this map is visually enhanced to show the distribution on ridge crests and other features.

Congress and the Administration should consider a number of policy options to rapidly expand wind power:

Adopt a National Renewable Electricity Standard

GWC recommends the adoption of a national Renewable Electricity Standard (RES) to require utilities to provide a minimum of 20 percent of their electricity from renewable sources (such as wind and solar) by 2030. We believe the certainty and stability provided by such a national standard would lower the overall costs of wind development to electricity consumers.

Support Construction of New Interstate Electric Transmission "Smart" Grid

The U.S. will never fully develop our states' rich domestic wind resources without major improvements to the electric transmission system. National policy is needed to provide incentives for transmission developers and state agencies to collaborate in the siting and construction of a modern "smart" transmission grid. Implementing a smarter grid will also substantially increase the overall reliability of America's power system, further reducing electricity costs to consumers.

Expand U.S. Department of Energy's Work with States and the Wind Industry to Accelerate Innovation

Wind power technology is one of the best near-term economic development opportunities for all U.S. states. The manufacturing and assembly of wind turbine systems can revitalize the ailing U.S. manufacturing sector, opening up new lucrative green markets here and for export abroad. The GWC looks forward to expanding partnerships with the federal government and key wind industry stakeholders in order to maintain and ultimately advance the U.S. wind industry's relative competitive advantage in the global energy economy.

Adoption of a Long-Term Production Tax Credit for Wind Energy

This production tax credit (PTC) has been the primary federal incentive for wind energy over the last decade. While the GWC applauds the 3-year extension of this PTC in the federal stimulus law, a five year extension would have been better and a 10-year extension ideal. A longer-term policy would send the right signal to the marketplace that the U.S. wind market is committed to a sustained large-scale investment in wind power technology. The recent history of short-term extensions of the PTC can no longer be the norm and should be avoided in order to provide certainty to manufacturers and developers seeking to do business in the U. S.

Appendix A: NREL's Job Methodology

The ***20% Wind Energy by 2030*** job estimates were performed by the National Renewable Energy Laboratory (NREL). Their Jobs and Economic Development Impacts (JEDI) model serves as the foundation for the economic development benefit calculations cited in this report. This estimate of the amount of new wind power necessary to come on-line by 2030 to meet the 20 percent target did not assume that policies, such as the production tax credit included in the federal stimulus package, are in place. These projections also did not model the impacts of any regulations on carbon emissions.

However, this projection did assume the following: advances in domestic manufacturing of wind turbine components; training, labor, and materials for installation of wind farms and operations and maintenance (O&M) functions; and improvements in wind technology and electric power system infrastructure.

The JEDI model used to calculate potential economic and employment benefits that would accrue from this level of wind power penetration was first developed in 2002. The original goal was to demonstrate the state and local economic development impacts associated with developing wind power plants in the U. S. Subsequent enhancements made the model capable of performing county, regional and national job creation projections, too.

JEDI estimates future economic development impacts, including direct employment in the wind power sector. But JEDI also estimates the increase in overall economic activity associated with the construction and operating phases of new wind farms.

Another NREL model, called WinDS, was used to generate annual wind power installations for the ***20% Wind Energy by 2030*** report. The WinDS model shows that an annual installation rate of about 16 gigawatts per year (GW/year) reached by 2018 could result in generation capacity capable of supplying 20 percent of the nation's electricity demand by 2030. This annual installation rate is affected by the quality of wind resources selected for development as well as future wind turbine performance. Sustaining a 16 GW/year installation rate for wind power beyond 2030 would accommodate the repowering of aging wind turbine equipment as well as increased electricity demand, so that the nation's electricity demand would continue to be met by 20 percent wind.

The JEDI model evaluates three separate kinds of economic development impacts:

Direct impacts: On-site or immediate effects created by investment in a new wind project. In the JEDI model used for the ***20% Wind Energy by 2030*** report, the construction phase includes the on-site jobs of the contractors and crews hired to construct the plant as well as their managers and staffs. Direct impacts also include jobs at the manufacturing plants that build the turbines as well as the jobs at the factories that produce the towers and blades.

Indirect impacts: Increases in economic activity that occurs when a contractor, vendor or manufacturer receives payment for goods or services and in turn is able to pay others who support their business. This includes the banker who finances the contractor and the accountant who keeps the contractor's books, as well as the steel mills, electrical part manufacturers and suppliers of other necessary materials and services.

Induced impacts: Changes in wealth that result from spending by people directly and indirectly employed by the wind farm. For example, when plant workers and other local workers receive income from expenditures related to the plant, they in turn purchase food, clothing and other goods and services from local businesses.

These three categories of employment gains would be spread out throughout the country, even in places such as the southeast which, generally speaking, does not feature adequate wind resources for local wind farm development. But both existing and new factories operating there can help serve the national wind power market.

The JEDI spreadsheet-based model for wind is free and available to the general public. It can be downloaded from the Wind Powering America website: www.windpoweringamerica.gov.

Endnotes

1 American Wind Energy Association, "Wind Energy Grows by Record 8,300 MW in 2008," Washington, DC, January 27, 2009.

2 U.S. Department of Energy, 20% Wind Energy by 2030, (DOE/GO-1-2008-2567), Washington, DC, May 2008.

3 Joint Coordinated System Plan 2008: www.jcspstudy.org.

4 American Wind Energy Association, Wind Energy for a New Era: **www.NewWindAgenda.org**

5 "US and China in Race to the Top of the Global Wind Industry," Global Wind Energy Council, February 2, 2009: **www.gwec.net**

6 Eric Lantz and Suzanne Tegen, Variables Affecting Economic Development of Wind Energy, National Renewable Energy Laboratory (NREL/CP-500-43506), Boulder, CO, July 2008.

7 This conservative estimate of manufacturing jobs only includes those workers considered to be employed by factories manufacturing the major wind turbine components. It does not include any of the indirect manufacturing related jobs (component and materials suppliers like fiberglass or steel manufacturing), which are a major source of employment. According to some estimates, the wind power manufacturing sector as a whole has already exceeded this 22,000 job estimate from the JEDI model.

Governors' Wind Energy Coalition

www.GovernorsWindEnergyCoalition.org
402-651-2948

Co-chair representatives' contact information:

Roya Stanley
Iowa Office of Energy Independence
Lucas State Office Building
321 East 12th Street
Des Moines, Iowa 50319
Roya.Stanley@iowa.gov
Phone: 515-281-0187

Josh Gackle
Office of the Governor
130 State Capitol
St. Paul, MN 55155
Joshua.Gackle@state.mn.us
Phone: 651-296-3391

Staff contact information:

Larry Pearce
402-651-2948
larry@governorscoalition.org

David Terry
703-395-1076
dterry@governorscoalition.org