

Federal Support for the U.S. Wind Power Industry

Worldwide the wind power industry is driven by various types of government support, which range from tax credits to incentive policies like feed-in tariffs.¹¹¹ These incentives have been much larger in several foreign countries than in the United States, which has helped to spur the manufacturing of wind turbines in Europe and Asia.

In Europe, feed-in tariffs¹¹² are among the policy tools that have been used to promote wind power, and have been credited by industry advocates like the European Wind Energy Association¹¹³ with driving renewable energy growth particularly in Denmark, Spain, and Germany. However, faced with current fiscal realities, including a global recession and large budget deficits, some European countries have reduced their wind power feed-in tariffs and are taking a more critical look at their renewable energy policies.¹¹⁴ For instance, in 2010, Spain announced it would reduce its wind subsidies by 35% from January 1, 2011 to January 1, 2013.¹¹⁵ What these changes might mean for European manufacturers, and their overseas production strategies, remains to be seen. As many of the largest European manufacturers are already export oriented and rank among the largest and most competitive manufacturers in the world the impact might be limited.

¹⁰⁸ More information about the Export-Import Bank's Environmental Exports Program can be accessed at <http://www.exim.gov/products/policies/environment/success.cfm>.

¹⁰⁹ Export-Import Bank of the United States, "Clipper Windpower Transaction is Named Ex-Im Bank Deal of the Year," press release, March 11, 2010, <http://www.exim.gov/pressrelease.cfm/4EB6A01A-B9E1-FABF-D9409670AEB9668D/>.

¹¹⁰ Export-Import Bank of the United States, "Gamesa is Named Ex-Im Bank's Renewable-Energy Exporter of the Year," press release, March 29, 2011, <http://www.exim.gov/pressrelease.cfm/032C7631-BE53-FF36-5BDBAFD2E3943DA8/>.

¹¹¹ A comprehensive overview of policy instruments used by various governments to promote renewables, including wind power, can be found on the Renewable Energy Policy Network site at <http://www.ren21.net/RenewablesPolicy/PolicyInstruments/tabid/5608/Default.aspx>.

¹¹² A feed-in tariff, or FIT, is a renewable energy policy that typically offers a guarantee of payments to project owners for the total amount of renewable energy they produce; access to the grid; and stable, long-term contracts (15-20 years). For more information see workshop presentation, Renewable Energy Feed-in Tariffs: An Analytical View, by Toby Couture, May 28, 2009. http://www.energy.ca.gov/2009_energy/policy/documents/2009-05-28_workshop/presentations/01_Couture_Feed-in_Tariff_Wkshop_May_28_09.pdf.

¹¹³ European Wind Energy Association, *Support Schemes for Renewable Energy, A Comparative Analysis of Payment Mechanisms in the EU*, 2002, p. 31, http://www.ewea.org/fileadmin/ewea_documents/documents/projects/rexpansion/050620_ewea_report.pdf.

¹¹⁴ At least three studies have raised questions about the costs associated with Europe's support of its renewable energy sectors. A report by a Spanish academician, Dr. Gabriel Calzada, *Study of the Effects on Employment of Public Aid to Renewable Energy Sources*, argued that Spain's policies were an economic failure and cost many jobs. Another report by a Danish think tank, CEPOS, *Wind Energy: The Cost for Denmark*, also pointed to the costs of subsidizing Denmark's wind power industry. A third report by the German think tank, Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI), *Economic Impacts from the Promotion of Renewable Energies: The German Experience*, argues that aid by the German government for wind power is now three times the cost of conventional electricity.

¹¹⁵ Ben Backwell, "Subsidies to be Cut for Spain's Wind and Thermal Solar Sector's," *Recharge News*, July 5, 2010.

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Production Tax Credit Investment Tax Credit Advanced Manufacturing Tax Credit I603 Cash Grant in Lieu of Tax Credits

I705 Loan Guarantee Program Bonus Depreciation Schedule

Expiration Deadlines for Wind Generation/Manufacturing Projects

December 31, 2012

December 31, 2012

Capped at \$2.3 billion; 100% Allocated

December 31, 2011 (begin construction) December 31, 2012 (placed in service)

September 30, 2011 (commence construction)

December 31, 2011 for 100% first-year bonus depreciation December 31, 2012 for 50% bonus

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China's Renewable Energy Law, which took effect in 2006, is one measure that has driven growth in the domestic market.¹¹⁶ China introduced a feed-in tariff for wind power generation in 2009.¹¹⁷ The Chinese government also implemented various policies to encourage the development of local manufacturing and technology development.¹¹⁸

In the United States, various federal policies also have been instrumental in the development of a domestically-based wind power sector, including:

- the production tax credit (PTC)/Investment Tax Credit (ITC), which will expire at the end of 2012;
- an advanced energy manufacturing tax credit (MTC), which reached its funding cap in 2010 (no additional funds were allocated to continue with the MTC);
- the Section 1603 Treasury Cash Grant Program, which requires that wind projects begin construction by December 31, 2011 and be placed in service by December 31, 2012; and
- the Section 1705 Loan Guarantee Program for commercial projects, which includes manufacturing facilities that employ "new or significantly improved" technologies.

The wind industry asserts that a national renewable electricity standard (RES) is needed to create long-term stability and to continue to attract investment in new turbine production facilities.

Table 5 provides an overview of selected federal programs affecting the U.S. wind power industry.

Table 5. Selected Energy Programs Affecting the U.S. Wind Industry

Source: Wind Energy Manufacturers Association, Supply Chain Issues from Tier 1 Suppliers and Component Makers, <http://www.slideshare.net/LeslieFeen/supply-chain-issues-from-tier-1-suppliers-and-component-makers-wind-power-manufacturing-amp-supply-cha>

¹¹⁶ For a detailed discussion of China's green energy policies, see CRS Report R41287, *China and the United States—A Comparison of Green Energy Programs and Policies*, by Richard J. Campbell.

¹¹⁷ GWEC, *Global Wind Report Annual Market Update 2010*, April 2011, pp. 30-33, <http://www.gwec.net/index.php?id=180>.

¹¹⁸ Eric Martinot, *Renewable Power for China: Past, President and Future*, 2010, p. 6, http://www.martinot.info/Martinot_FEP4_prepub.pdf.

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- a. The taxpayer who presumably is the owner of the relevant wind power project placed in service prior to December 31, 2012 can opt for a 30% ITC in lieu of the PTC. The 30% ITC for small commercial wind energy property extends through December 31, 2016.
- b. The taxpayer owning the relevant wind power project can opt for a 30% cash grant from the U.S. Department of Treasury instead of a PTC, then select a one-time cash grant instead of tax credits.

Production Tax Credit (PTC)/Investment Tax Credit (ITC)

The PTC, the main policy tool in the deployment of U.S. wind power, was first adopted during the administration of President George H.W. Bush as part of the Energy Policy Act of 1992 (P.L. 102-486). It has been a significant driver of the recent growth of the U.S. wind industry. In each of the years during which the PTC lapsed (2000, 2002, and 2004), meaning that it expired prior to being renewed, the level of additional deployed wind capacity slowed or collapsed when compared to the previous year's total: 93% in 2000, 73% in 2002, and 77% in 2004 (see **Figure 6**).¹¹⁹ Yet, when the PTC incentive was extended in 2004, 2007, and 2009, the industry responded positively, increasing wind power capacity compared to the previous year. 2010 was an exception to this trend with a drop in wind capacity of nearly 50% from 2009, even with the PTC in place.

Figure 6. History of the Production Tax Credit

By Annual Capacity Additions, 1999-2010

Source: AWEA, *Production Tax Credit, What is the Production Tax Credit?*

Congress provided a three-year extension of the PTC through December 31, 2012, as part of the American Recovery and Reinvestment Act. The PTC provides an inflation-adjusted per kilowatt-hour (kWh) income tax benefit over the first ten years of a wind project's operations, which in 2010 was 2.2 cents per kWh, and is a critical factor in financing new wind farms. In order to qualify, a wind farm must be completed and start generating power while the credit is in place, which would be by the end of 2012.¹²⁰ The stimulus bill also allows wind project developers to

¹¹⁹ AWEA, *Production Tax Credit, What is the Production Tax Credit?*, p. 1, http://www.awea.org/_cs_upload/issues/federal_policy/7785_1.pdf.

¹²⁰ Ibid.

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select to receive a 30% investment tax credit (IRC §48) in place of the PTC if the projects are placed in service prior to the end of 2012.¹²¹

AWEA advocates for a long-term extension of the PTC to encourage long-term investment in the industry, which it claims would allow for continued growth of domestic turbine manufacturing. The Governors' Wind Energy Coalition has called for a seven-year extension of the PTC.¹²² Given the uncertainty about the continuation of the PTC beyond 2012, along with other tax benefits, some in the industry have begun to refer to 2013 as "the valley of death."¹²³ They worry that industry support programs will end without any replacement policies.

Advanced Energy Manufacturing Tax Credit (MTC)

The Advanced Energy Manufacturing Tax Credit, also referred to as Section 48C of the Internal Revenue Code, was authorized in Section 1302 of American Recovery and Reinvestment Act.¹²⁴ The MTC provided a 30% credit for companies for investments in new, expanded, or reequipped clean energy domestic manufacturing facilities built in the United States. Wind, solar panels, and electric vehicle batteries were among the 183 projects funded through the MTC before reaching its cap of \$2.3 billion in 2010. The Obama Administration has requested another \$5 billion for the 48C tax program. An extension of the MTC has been proposed through the Security in Energy and Manufacturing Act of 2011 (S. 591), or SEAM Act. It includes one significant change from the original MTC; higher priority would be given to facilities that manufacture—rather than assemble—goods and components in the United States.¹²⁵

Fifty-two wind manufacturing projects were awarded \$364 million in tax credits under the MTC program.¹²⁶ Beneficiaries included many manufacturers that were already active, or that had announced that they intend to open new facilities, in the United States. Selected manufacturers of

wind turbines, blades, towers, and gears that received tax credits under the 48C program are listed in **Appendix C**.

¹²¹ Internal Revenue Service Notice 2009-52, Election of Investment Tax Credit, Coordination with Department of Treasury Grants for Specified Energy Property in Lieu of Tax Credits, <http://www.irs.gov/pub/irs-drop/n-09-52.pdf>.

¹²² Letter from Governor's Wind Energy Coalition to The Honorable Barak Obama, President of the United States, July 20, 2011, <http://www.governorswindenergycoalition.org/assets/files/President%20Obama%20Wind%20Energy%20Letter%20%28July%2024,%202011%29.pdf>.

¹²³ Gloria Gonzalez, *U.S. Renewables Industry Searches for More Tax Breaks as Grants End*, Wind Energy Manufacturers Association, June 20, 2011, http://wema.membershipsoftware.org/blog_home.asp?Display=98.

¹²⁴ For more information see White House, *Fact Sheet: \$2.3 Billion in New Clean Energy Manufacturing Tax Credits*, January 8, 2010, <http://www.whitehouse.gov/the-press-office/fact-sheet-23-billion-new-clean-energy-manufacturing-tax-credits>.

¹²⁵ "SEAM Act Will Build U.S. Wind Supply Chain Says Industry Group," *Industry Week*, May 12, 2010, http://www.industryweek.com/articles/seam_act_will_help_build_u-s-_wind_supply_chain_says_industry_group_21813.aspx?SectionID=2.

¹²⁶ White House, *The Recovery Act: Transforming the American Economy Through Innovation, Promoting Clean, Renewable Energy: Investments in Wind and Solar*, <http://www.whitehouse.gov/recovery/innovations/clean-renewable-energy>.

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Other Wind-Related Programs

Tax benefits for wind projects include accelerated tax depreciation and bonus depreciation; the latter allowed wind farm owners to write off more than 50% of the capital costs of building a wind farm in 2008, 2009, and 2010. The 2010 Tax Act¹²⁷ increased the first-year bonus depreciation to 100% for new qualified property acquired and placed in service between September 8, 2010 and December 31, 2011, rather than 50% for the qualifying property. Bonus depreciation drops to the lower 50% rate in 2012.¹²⁸

Another ARRA incentive is a grant system administered by the U.S. Treasury Department. In lieu of tax credits, wind projects can receive a cash payment of up to 30% of the qualified capital costs. The Section 1603 Treasury cash grant program allows developers to opt for a cash payment instead of a tax break. To qualify, construction must begin by December 31, 2011.¹²⁹ Wind projects under construction by year-end 2011 must be placed in service by December 31, 2012. Many in the wind industry are crediting the grants for keeping the sector healthy during the 2008 and 2009 recession.¹³⁰ A detailed discussion of the Section 1603 program can be found in CRS Report R41635, *ARRA Section 1603 Grants in Lieu of Tax Credits for Renewable Energy: Overview, Analysis, and Policy Options*, by Phillip Brown and Molly F. Sherlock.

The Section 1705 loan program, a temporary ARRA program, administered by the Department of Energy is another financing program which authorizes loan guarantees for certain renewable energy projects, including wind projects. The program expires on September 30, 2011. So far, 32 projects have been completed or received conditional commitments; five were wind generation or wind manufacturing projects. The combined wind commitments totaled \$1.6 billion, comprising 9% of the \$18.8 billion in 1705 program funding.¹³¹ The Caithness Shepherds Flat wind generation project, which upon completion will be the largest onshore wind farm in the world, received a \$1.3 billion loan.¹³² GE will manufacture the wind turbines. Loan guarantees were also extended to three other wind generation projects: Kahuku Wind Power, Granite Reliable, and Record Hill Wind.(see **Table 6**). One wind manufacturing project—an expansion of the Nordic Windpower assembly plant in Idaho—received a conditional commitment of \$16 million in 2009.

Nordic planned to design and manufacture an innovative two-bladed utility-scale wind turbine at the Idaho facility, but in late 2010, Nordic Windpower announced that it would relocate its production facilities to Kansas City, MO, to be closer to its market. ¹³³ To receive the loan guarantee the project must be under construction by September 30, 2011.

¹²⁷ The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (P.L. 111-312) was signed by President Obama on December 17, 2010.

¹²⁸ Ryan Wiser and Mark Bolinger, *2010 Wind Technologies Market Report*, Lawrence Berkeley National Laboratory, June 2011, p. 61.

¹²⁹ Criteria for the start of construction are detailed in a U.S. Treasury guidance document, which can be found on the Treasury Department's 1603 Grant Program website at <http://www.treasury.gov/initiatives/recovery/Pages/1603.aspx>.

¹³⁰ Mark Bolinger, Ryan Wiser, and Naim Darghouth, *Preliminary Evaluation of the Impact of the Section 1603 Treasury Grant Program on Renewable Energy Deployment in 2009*, Ernest Orlando Lawrence Berkeley National Laboratory, April 2010, p. ii, <http://eetd.lbl.gov/ea/emp/reports/lbnl-3188e.pdf>.

¹³¹ Solar generation or solar manufacturing comprised the overwhelming majority (85%) of the 1705 loan guarantee projects funded at \$15.9 billion by the Department of Energy. A list of the 1705 Loan Program projects can be found at https://lpo.energy.gov/?page_id=45.

¹³² Department of Energy, "DOE LPO Finalizes Deal on the world's Largest Wind Project to Date," press release, December 17, 2010, <https://lpo.energy.gov/?p=1955>.

¹³³ According to the Department of Energy, Nordic's wind turbine, which uses two blades, represents a significantly (continued...)

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ProjectTechnology

Nordic Wind Windpower Manufacturing USA, Inc.

Caithness Wind Shepherds Flat Generation

Granite Reliable Wind Generation

Kahuku Wind Wind Power, LLC. Generation

Record Hill Wind Wind Generation

Loan Guarantee Amount

\$16 million

\$1.3 billion \$135.8 million \$117 million \$102 million

Date of Agreement

July 2009

October 2010 June 2011 July 2010 August 2011

Location Status

ID Conditional Commitment

OR Closed

NH Conditional Commitment

HI Closed ME Closed

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Table 6. 1705 Loan Guarantees for Wind Generation and Manufacturing Projects

Source: U.S. Department of Energy, Loan Programs Office, https://lpo.energy.gov/?page_id=45 Notes: The 1705 loan guarantee program expires on September 30, 2011.

State Renewable Portfolio Standards

State renewable portfolio standards (RPS) are also credited with encouraging the growth of the U.S. wind energy industry. As of June 2011, mandatory RPS programs existed in 29 states and the District of Columbia.¹³⁴ A portfolio standard creates demand for renewable energy by requiring companies that sell electricity to retail customers to obtain a specified share of their electricity from renewable generation.¹³⁵ The U.S. wind industry has long called for a national standard to increase investor confidence in the sector's long-term prospects. No such measure has passed Congress, although national renewable standards have been passed by the Senate on three occasions and by the House of Representatives once.¹³⁶

Conclusion

The expansion of U.S. wind power generation will depend, at least in part, on government policy decisions. If state and federal governments continue to support wind generation, manufacturing of wind generating equipment in the United States is likely to increase. The production costs of U.S. plants that make turbine components appear to be competitive with those in other countries, and

(...continued)

improved technology that would be more reliable and less costly to manufacture, install, operate, and maintain than competing systems.

¹³⁴ U.S. Department of Energy, *2010 Wind Technologies Market Report*, June 2010, p. 62. ¹³⁵ U.S. Environmental Protection Agency, *Renewable Portfolio Standards Fact Sheet*, April 2009.

http://www.epa.gov/chp/state-policy/renewable_fs.html ¹³⁶ To read more about the debate over a National Renewable Electricity Standard see CRS Report R41493, *Options for*

a Federal Renewable Electricity Standard, by Richard J. Campbell.

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the difficulty and expense of transporting very bulky products over long distances serves as an obstacle to import competition.

Nonetheless, there are several obstacles that may impede the expansion of wind energy manufacturing in the United States. One is the history of policy-induced boom-and-bust cycles in wind energy investment, which may lead wind turbine manufacturers and component suppliers to conclude that future U.S. demand for their products is too uncertain. Another significant challenge affecting the sector's future is the availability of adequate transmission for power generated by wind farms. Most wind farms are located at a distance from the urban areas where most electricity is consumed, and a shortage of transmission capacity could hamper wind farm creation or expansion. Congress may wish to evaluate the seriousness of transmission issues in the context of other federal efforts to support wind generation.

The structure of the wind manufacturing industry is also likely to undergo significant change. As is typical in budding industries, a large number of companies now compete in wind manufacturing. Mergers and failures are likely to lead to consolidation as the sector matures. As this report describes, competition in the wind turbine sector from new Asian entrants will likely become more significant in future years, but it is unclear whether many of these companies have the technological abilities and financial resources to become significant players in the market.