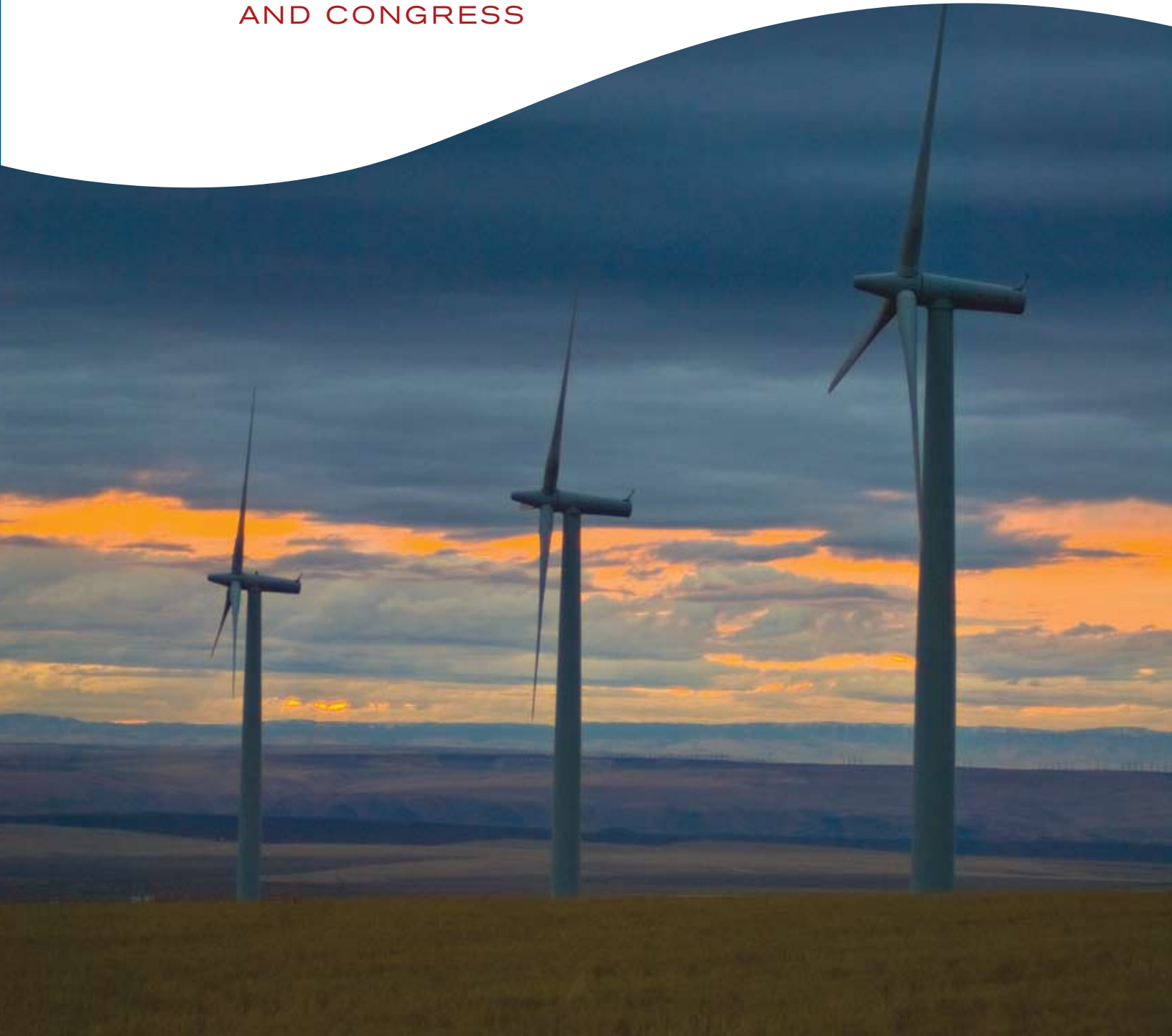


WIND ENERGY FOR A NEW ERA



AN AGENDA
FOR THE NEW PRESIDENT
AND CONGRESS



AMERICAN WIND ENERGY ASSOCIATION

American Wind Energy Association

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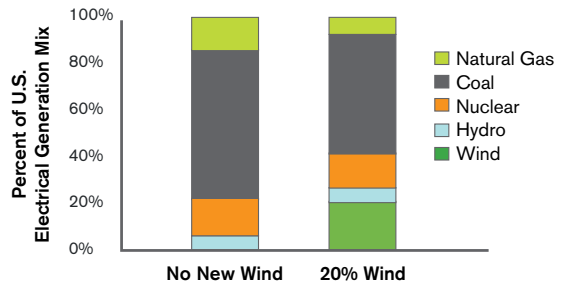
AWEA is the national trade association of America's wind energy industry, with more than 1,600 member companies, including global leaders in wind power and energy development, wind turbine manufacturing, component and service suppliers, and the world's largest wind power trade show. AWEA is the voice of wind energy in the U.S., promoting renewable energy to power a cleaner, stronger America.

20% Wind Energy By 2030

20% Wind Energy By 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply, a report released in May 2008 by the U.S. Department of Energy, concludes that the U.S. possesses sufficient and affordable wind resources to obtain at least 20% of its electricity from wind. No technological breakthroughs are required and the costs would be modest. But the benefits are substantial. Achieving the 20% wind vision will dramatically cut greenhouse gas emissions, reduce electricity costs, foster long-term price stability, promote our energy security, and support hundreds of thousands of new American jobs.

The 20% report is the driver of the wind industry's proposed agenda for the new President and Congress.

20% Wind Vision: Impact on U.S. Electrical Generation Mix in 2030



Building to 20% wind power in 2030 would reduce electric utility natural gas consumption by 50%, reduce electric utility coal consumption by 18%, and avoid the construction of 80 GW of new coal power plants. Source: U.S. Department of Energy, 20% Wind Energy By 2030

Benefits of Achieving the 20% Wind Energy by 2030 Vision

Environment:

- ▶ Reduces carbon dioxide emissions from the electric sector 25% by 2030, the equivalent of taking 140 million vehicles off the road, and nearly single-handedly keeps electric sector emissions at today's levels while helping meet growing electricity demand.
- ▶ Reduces water consumption in the electric sector by 4 trillion gallons between 2007 and 2030 (or 17% in 2030), with nearly one-third of this reduction occurring in the arid Western states.
- ▶ Does not contribute to acid rain, urban smog, mercury contamination, or other toxic pollution associated with the extraction, transport, and combustion of fossil fuels.

Economy:

- ▶ Directly stimulates 150,000 domestic jobs in wind turbine manufacturing, installation, operations, maintenance, and management.
- ▶ Indirectly generates 350,000 domestic jobs in support of the wind industry, including steel workers, electrical manufacturing workers, accountants, lawyers, and additional positions related to increased local spending.
- ▶ Pays rural land owners more than \$600 million a year by 2030 through lease payments that range from \$2,000 to \$4,000 per megawatt annually.
- ▶ Increases property tax revenue in rural communities by as much as \$1.5 billion annually by 2030. These funds can be and are being allocated to schools, infrastructure, medical centers, and other public services.

U.S. Energy Security:

- ▶ Generates electricity from a domestic, safe, and inexhaustible source.
- ▶ Reduces natural gas demand by 50% in the electric sector and 11% overall, relieving supply and price pressure in the domestic natural gas market and potentially reducing future need for imported liquefied natural gas from the Middle East, Russia, or other areas.
- ▶ Potentially reduces U.S. reliance on foreign oil by generating electricity that can be used for plug-in hybrid vehicles.

Sound Economic Investment:

- ▶ Requires an initial investment of \$43 billion, just 2% more than meeting future projected energy demand without any new wind energy. Calculated over time, this expense amounts to about an additional 50 cents per month on an average household electricity bill.
- ▶ Provides fuel cost savings, economic investments, emission reductions, and other benefits valued at \$200 billion, including:
 - \$128 billion consumer savings from displacement of variable-priced natural gas-fired generation with fixed-price wind power, according to supplemental analysis.¹
 - \$98 billion in consumer savings through reduced exposure to carbon regulation costs, depending on the stringency and timing of future carbon regulation, according to supplemental analysis.²

Executive Summary

A new approach to energy offers a clear path to a more secure and prosperous future and a more livable world. Increased use of wind, solar, and other renewable energy sources will spur economic growth, create high-quality American jobs, enhance our national security, protect consumers from price spikes or supply shortages associated with global fuel markets, and dramatically reduce the pollution that is warming the planet.

Wind energy is already a clean, mainstream source of electric power and a major force for economic growth. In 2008, the United States became the largest generator of wind power in the world, producing enough electricity to power more than 5 million homes. In 2007, wind power provided 35% of the nation's new electric generating capacity and contributed critical growth to the hard-pressed U.S. manufacturing sector. Since the beginning of 2007, more than 50 wind industry manufacturing plants have been opened, expanded, or announced, creating many thousands of permanent, high-paying American jobs in a difficult economic climate.

And that is just the start. In May 2008, the U.S. Department of Energy released a major report documenting the potential for wind energy to provide at least 20% of the nation's electricity by the year 2030. Wind power at this level would support 500,000 jobs¹, save consumers \$128 billion through lower natural gas prices², and cut greenhouse gas emissions as much as taking 140 million automobiles off the road. No technological breakthroughs are required for wind power to reach this level. All that is needed are supportive government policies that reflect a long-term national commitment to clean, home-grown renewable energy.

This report offers an in-depth review of the key national policies needed to support the growth of wind energy consistent with the 20% vision. A brief summary of those policies follows.

“A green, renewable energy economy isn't some pie-in-the-sky, far-off future – it is now. It is creating jobs – now. It is providing cheap alternatives to \$140-per-barrel oil – now. And it can create millions of additional jobs, an entire new industry, if we act – now.”

Barack Obama

June 24, 2008, Las Vegas, Nevada



Key National Policies Needed to Achieve 20% Wind Power

National Renewable Electricity Standard

1 A national renewable electricity standard (RES) – also known as a renewable portfolio standard – would, for the first time, signal a long-term, national commitment to expand the use of renewable energy in the U.S. Utilities in every state would obtain a minimum percentage of their electricity from renewable sources by a certain date or purchase tradable credits for renewable electricity produced elsewhere. This vital incentive would drive new and greater investment in domestic wind industry manufacturing. Twenty-eight states already have RES policies, which have been effective and economical incentives for the development of wind and other renewable energy sources. A national policy would streamline this uneven patchwork and bring renewable energy benefits to all parts of the country. A national RES should call for 25% of the nation's electricity to come from renewable energy by 2025. An aggressive near-term target, such as the 10% by 2012 objective called for in the Obama-Biden *New Energy for America* plan, is essential to ensure rapid deployment of renewables. The target levels should increase incrementally in the years that follow.

Renewable Energy Production Tax Credit

2 The renewable energy production tax credit (PTC), a credit of 2.1 cents per kilowatt-hour, is the primary federal incentive for wind energy and has been essential to the industry's growth. Other electricity generation technologies have their own forms of federal support, often permanent in tax law, so wind power would be disadvantaged in the absence of a PTC or other comparable incentive.

Still, there are two significant problems with the PTC. First, it offers little benefit in an adverse financial climate, where demand for a tax credit is limited. The renewable energy sector is seeking changes to the structure of the credit that make it possible to fully realize its value, particularly in a down market, and allow participation by a broader pool of investors.

Second, the credit has routinely been extended for only one-year or two-year terms, and has been allowed to expire on three separate occasions -- in 1999, 2001, and 2003. The uncertainty of this on-again, off-again pattern has discouraged companies from making long-term, sizeable investments in wind power manufacturing and development. An extension of at least five years would, for the first time, provide the wind energy industry with the policy stability that other energy industries have long enjoyed.

Lastly, small wind systems, used to power homes, farms, and small businesses, are ineligible for the PTC and instead rely on a federal investment tax credit. This credit needs to be adjusted to remove the cost caps, which greatly reduce its effectiveness.

Federal Renewable Energy Transmission Policy

3 Perhaps the biggest obstacle to the long-term growth of wind power and other renewables in the U.S. is the lack of available transmission. Simply put, we don't have enough transmission capacity to deliver electricity from the rural, windy areas where it is generated most abundantly and cost-effectively to the populated areas where most electricity is consumed. The wind industry supports federal policies that would bring about the construction of a high-voltage interstate transmission highway system for renewable energy, as envisioned in DOE's 20% wind report. Our agenda includes federal legislation, regulatory initiatives by the Federal Energy Regulatory Commission and the Department of Energy, and federal financial support. The cost would be an increase in annual transmission investment from approximately \$8 billion today to \$11 billion, but this investment would quickly be offset by lower electricity costs and reduced fuel costs, and would lead to greater energy independence.

National Climate Change Legislation

4 As the most readily deployable source of carbon-free electricity generation, wind power is uniquely positioned to contribute to the global warming solution, especially in the early years of the climate protection effort when few other options are available. Generating 20% of U.S. electricity from wind would be the climate equivalent of removing 140 million vehicles from the roadways. But that potential will not be realized unless climate legislation provides an economic incentive to switch to clean energy sources. Under a cap-and-trade system, any method of distributing emission allowances must include a fair allocation to renewable energy. In addition, climate legislation must include an aggressive near-term goal, such as a 15% to 20% carbon dioxide emissions reduction by 2020, in order to promote a near-term shift to renewable energy and get the quick start on greenhouse gas emissions reductions scientists tell us is needed. Finally, a portion of the revenues generated by auctioning allowances should be used to finance key renewable energy priorities, including a renewable energy production incentive, a new interstate transmission highway system, training for the growing renewable industry workforce, incentives for manufacturers, and research and development. For small wind systems, climate legislation should also include consumer rebates and incentives for states, utilities, and manufacturers.

Wind Power Project Siting Policies

5 Federal agencies have a key part to play in developing our renewable energy potential because of their role in the siting of wind projects and new transmission lines, especially on federal lands. Proposals for responsibly-sited renewable energy projects on federal lands (including offshore waters) should be prioritized and federal agencies should create review processes that are streamlined, transparent and timely, with permitting and review capabilities that are scaled up as needed to meet demand. In addition, the President should direct the Department of Defense, the Federal Aviation

Administration, and the Department of Homeland Security to adopt a cooperative approach to resolving possible conflicts between wind projects and radar operations. Each federal agency should be asked to plan how it will use its authority to facilitate the growth of wind power and other renewable energy sources.

Federal Research & Development and Wind Program Funding

6 Federal funding for wind energy research and development (R&D) and other programs is inadequate, especially when compared with funding levels for other fuels and energy sources. The DOE wind program currently receives about \$50 million annually, which is well below its all-time high of \$63 million appropriated in Fiscal Year (FY) 1980. In comparison, the annual R&D budget for nuclear power is over \$960 million, while coal receives nearly \$500 million, solar receives over \$160 million, and biomass receives roughly \$200 million. The overall program budget for DOE's Office of Energy Efficiency and Renewable Energy for FY 2008 was over \$1.7 billion. The wind industry recommends increasing the annual funding level for wind R&D and other programs to \$217 million over the course of the next three to five years. Most of this funding should be directed to DOE's Office of Energy Efficiency and Renewable Energy's wind program.

Conclusion: A Rare Opportunity

With the right policies in place, wind power can make a major contribution in the effort to protect the planet's climate, while spurring tens of billions of dollars in economic investment, supporting hundreds of thousands of new American jobs, making America more independent and secure, and saving consumers more than \$100 billion.

Let's act – now – to put the right policies in place.

Federal Renewable Energy Transmission Policy

Transmission of wind power from windy rural areas, where it is generated, to population centers, where it is demanded, is the wind industry's biggest long-term growth barrier. There are two separate but related needs: expanding America's transmission infrastructure to establish a green interstate transmission highway system and securing a more coherent national electrical grid comprised of coordinated regional operations.

The lack of transmission infrastructure is already limiting generation development in many areas. The existing long lines for access to transmission lines, termed interconnection queue logjams, are largely a symptom of that constraint. Transmission plans are currently in progress to connect approximately 35,000 more megawatts (MW) of wind power to the electrical grid over the next five years, or 7,000 MW per year. With a concerted effort to build transmission, wind development could well exceed that installment rate over the longer term.

To achieve the proposed transmission expansion for the 20% wind vision, DOE's report says that 19,000 miles of high capacity lines will be required, at a cost of just over \$20 billion in net present value, if spread out over the time period (or \$60 billion, in undiscounted terms, if spent right now). Completion of such an effort would allow 16,000 MW per year of wind power development. To build the large interstate lines that are needed to achieve this vision, policies will need to address allocating the costs across utilities, easing siting challenges, promoting interconnection-wide planning, and providing assurance of retail electric rate recovery.

Coordinated regional grid operations will be needed to integrate wind energy into power systems, and to promote reliability of the bulk power system. Today, America's electricity grid is divided into 140 separate "balancing areas," each of which must balance among available electricity generation options to ensure that electricity demand within the area is met. This highly balkanized system greatly complicates the difficulty of integrating variable resources like wind power into our electricity grid. If these small balancing areas can be expanded to allow operation on a larger regional basis, wind energy will be less variable because it can be aggregated across many areas, and system operators will have access to hundreds of generators that can be turned up or down in response to load and wind variation. Some areas, like Texas, the Midwest, and the Northeast have vastly improved system

operations through regional grid operations structures over the last decade. But solutions also need to be found for the Northwest and the Interior West, and continued improvements need to be made in the South Central and the Midwest.

Today there is no national commitment to enhancing our transmission infrastructure or achieving regional grid operations. Renewable energy has only recently emerged as a major driver of electric industry infrastructure and operational changes. Policymakers are rapidly becoming aware of the need for transmission expansion to advance greenhouse gas emissions reductions and renewable energy goals. Legislative proposals by Senator Harry Reid (D-NV) and Representative Jay Inslee (D-WA), along with hearings on transmission and renewables in both the Senate and House, have changed the political dynamic on Capitol Hill. In 2008, the DOE 20% wind report, the Pickens Plan, North American Electric Reliability Corporation (NERC) reports, and a number of electric industry white papers and policy proposals have fundamentally changed the national transmission policy landscape.

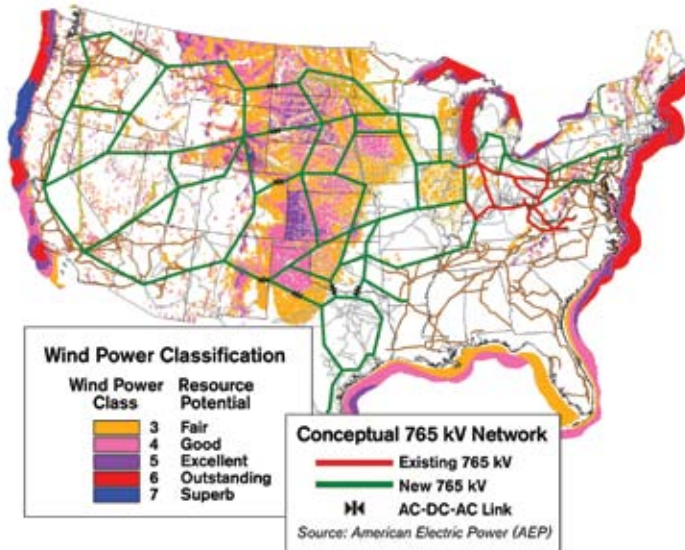
Key Recommendations on Renewable Energy Transmission Policy

Legislative Actions

Congress should pass legislation that provides more authority for the Federal Energy Regulatory Commission (FERC) and Department of Energy (DOE) to advance the development of a green interstate transmission highway system.

This legislation should include a regulatory structure for extra-high-capacity interstate transmission lines and feeder lines into renewable resource areas. The structure should include interconnection-wide transmission planning, broad regional cost allocation, and federal backstop transmission siting. The legislation should also include actions for federal utilities such as the Western Area Power Administration to promote renewable electricity resource development, reduce "seams" between the federal systems and neighboring utility grids, acquire renewable energy and renewable energy certificates on behalf of the federal government, and develop renewable energy integration programs.

Conceptual Transmission Expansion Plan



American Electric Power designed this transmission expansion plan, a conceptual design to accommodate 400 gigawatts of wind power.

[Congress should pass legislation that promotes regional grid operations.](#)

Legislation should direct the FERC, the NERC, and the electric industry to evaluate and pursue means of improving regional grid operations.

Such an effort is particularly important in the Interior West and Northwest, areas that do not have Regional Transmission Organizations (RTOs). Congress could require studies, provide "Sense of Congress" statements, and provide directives for FERC to consider the most efficient and reliable means of integrating large volumes of renewable energy.

Administrative Actions

[The President and Congress should establish as a national priority the development of a green interstate transmission highway system and regional grid operations.](#)

There are many actions that FERC and DOE can take within existing authorities, but they need a cohesive national commitment in which to work. The President and Congress can create this national commitment.

[FERC should promote transmission infrastructure expansion and regional grid operations.](#)

FERC can promote sound investments in transmission infrastructure through a shift from reactive to proactive transmission planning, broad regional cost allocation, encouraging participation in RTOs, promoting regional transmission planning, extending the time horizons of transmission plans that access resources that are limitless and concentrated in certain known locations, planning that assumes non-zero carbon values, and planning that incorporates committed generation projects from interconnection queues.

FERC can promote regional grid operations by encouraging RTO participation, merging and enlarging balancing areas, implementing short-term spot energy markets, expanding the use of more efficient transmission services such as conditional firm service and dynamic line ratings, ensuring non-discriminatory ancillary services charges and interconnection standards, and eliminating "pancaked" transmission rates.

[DOE should advance transmission infrastructure expansion and improve wind integration into power system operations.](#)

DOE can advance infrastructure by designating National Interest Electric Transmission Corridors to wind-rich areas, and financially supporting Governors' regional transmission planning efforts. DOE can employ the Western Area Power Administration to develop renewable energy in its territory, integrate operations with neighboring markets, eliminate "pancaked" transmission rates, offer more efficient transmission products, and develop transmission infrastructure.

DOE can help with wind integration into power system operations by continuing to support the highly successful System Integration Program, which helps utilities with analysis and data to plan for increasing levels of variable generation integration.



NOTES

Background: 20% Wind Energy by 2030:

¹ National Renewable Energy Laboratory. *Power System Modeling of 20% Wind-Generated Electricity by 2030*. June 2008; Number reflects mid-case secondary natural gas savings from 20% Wind (2006 dollars).

² *Ibid*; Number reflects mid-case carbon savings from 20% Wind (2006 dollars) and assumes a \$21.8/ton carbon cost.

Executive Summary:

¹ U.S. Department of Energy. *20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply*. May 2008.

² National Renewable Energy Laboratory. *Power System Modeling of 20% Wind-Generated Electricity by 2030*. June 2008; Number reflects mid-case secondary natural gas savings from 20% Wind (2006 dollars).

Renewable Electricity Standard:

¹ A March 2007 analysis conducted by energy research firm Wood Mackenzie, *Impact of a Federal Renewable Portfolio Standard*, found that a 15% renewable electricity by 2020 standard would save consumers more than \$100 billion. It is anticipated that the 25% RES would create an even more substantial consumer savings.

² Energy Information Administration. *Energy and Economic Impacts of Implementing Both a 25-Percent Renewable Portfolio Standard and a 25-Percent Renewable Fuel Standard by 2025*. August 2007.

PHOTO CREDITS

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November 2008