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**Submission to the U.S. House
Energy and Commerce Committee**

**Responses to Questions on the Design Elements of a
National Renewable Portfolio Standard**

June 15, 2007

Submitter's Name/Affiliation: Jonathan Pershing, World Resources Institute
Contact: 10 G Street NE, Washington, DC 20002
Email: jpershing@wri.org
Phone: (202) 729-7720

1. Purpose of portfolio standards proposals

a) Do you believe that adopting one or more Federal “portfolio-standard” requirements applied to sources of retail electricity, mandating that a given percentage of the power sold at retail come from particular sources, is an advisable Federal policy? Why or why not?

Informed by its research and analysis, the World Resources Institute (WRI) supports a national RPS. WRI is a global environmental think tank that goes beyond research to find practical ways to protect the Earth and improve people's lives.

Since 2000, WRI's Green Power Market Development Group has been actively engaged in renewables purchasing. The Green Power Market Development Group is a unique commercial and industrial partnership dedicated to building corporate markets for renewable energy. Group members include Alcoa Inc., Dow, DuPont, General Motors, Georgia-Pacific LLC, Google Inc., IBM, Interface, Johnson & Johnson, FedEx Kinko's, Michelin North America Inc., NatureWorks LLC, Pitney Bowes, Staples, and Starbucks. The Green Power Market Development Group has witnessed significant development in the market for renewables in states with renewable portfolio standards, and, as a result, has frequently benefited from lower green power prices. Based on WRI's research and our experience in the market through that collaborative, we believe an RPS can offer significant economic and environmental benefits.

Nevertheless, several questions frequently raised when considering a national RPS highlight public misperceptions.

- *Wouldn't an RPS be expensive for consumers?* No. DOE estimates have consistently shown that a national RPS is likely to reduce or have minimal impacts on energy expenditures due to lower demand for natural gas.¹ The Union of Concerned Scientists has found that a 15 percent national RPS would reduce expenditures on both electricity and natural gas by \$16.4 billion compared to “business as usual.”²
- *Since many states have already implemented their own standards, wouldn't a national RPS be redundant?* No. Existing state renewable portfolio standards cover only 45 percent of U.S. power sales and 53 percent of the U.S. population.³ A federal RPS would expand the use of renewable power nationally without limiting the ability of states to set their own standards above and beyond federal requirements.
- *Would a federal RPS unfairly redistribute wealth from states with few renewable resources to states with abundant renewable resources?* No. Renewable resources can be found in every region of the country. Solar is abundant in the Southwest; biomass in the Pacific-Northwest, Northeast and Southeast; geothermal in the intermountain west; and wind in the Great Plains and East coast. Furthermore, our existing fossil fuel-dependency is what leads to wealth transfers between states. 80 percent of natural gas comes from 6 states, 60 percent of U.S. coal comes from states with 2 percent of U.S. population, and Texas, California and Alaska are responsible for 56 percent of U.S. crude oil production.⁴

b) Is it appropriate for Government to impose generation-source conditions or energy savings requirements on load-serving utilities in order to serve public-policy purposes such as promotion of renewable energy production, energy efficiency, and reduction of carbon emissions? Why or why not?

Yes. Addressing the threat of global warming is an important public responsibility for the federal government. Generation-source conditions are one effective tool in doing so and should not be ignored.

European feed-in tariffs have led to dynamic growth of renewables and have given foreign renewable energy companies competitive advantages over American business. The renewable portfolio standard offers a unique opportunity for America to regain its leadership in this important and growing global market.

c) If you favor such a policy, how would you define its specific purpose?

Any federal portfolio standard should recognize the unique benefits of clean, safe and domestic renewable energy sources. Although the primary purpose of a national portfolio standard would be to reduce greenhouse gas (GHG) emissions from electricity production, important secondary benefits of promoting the competitiveness of select renewable resources over more mature energy sources include:

- *Improved environmental quality.* Unlike fossil fuels, renewable sources of energy emit little or no emissions of greenhouse gases, mercury, particulate matter, sulfur dioxide, nitrogen oxides, or other pollutants.
- *Domestic job growth and investment in rural communities.* Some estimates indicate that a national RPS would generate between 190,000 and 350,000 high-paying U.S. jobs in equipment manufacturing, installation, and maintenance—more than would be created by fossil fuel projects.⁵ In particular, rural America will benefit from this economic growth since many renewable resources are located in remote locations.
- *Increased energy security.* Since renewable resources are widely available throughout the United States, a national RPS would make the United States more energy independent. Furthermore, the security threat of large-scale disruption of power supplies would be reduced by the possible distributed generation of renewables power.
- *Stabilized electricity rates.* Renewable electricity is not subject to the volatile price fluctuations that fossil fuels frequently experience. As a result, corporate and residential electricity rates would become more stable and predictable.

For example, in 2001 IBM signed a five-year fixed-price contract with Austin Energy to purchase wind-generated electricity. Austin Energy was able to offer this fixed-price option with wind power sales due to their decreased susceptibility to volatile natural gas prices. Since Austin Energy passed this stability on to their customers, IBM, as well as other residential and corporate consumers, has received a significant hedge against fluctuations in natural gas prices. Because natural gas prices have remained high, IBM now expects to save

more than \$60,000 per year. Although only a select few utilities have offered such unique pricing, significant growth in the renewables sector, as would be mandated under a federal RPS, could increase price stability across the national market.⁶

- *Reduction in the price of natural gas*, a vital raw material for U.S. chemical manufacturing and other industries. The U.S. Department of Energy (DOE) forecasts that a national RPS would lower electric utility demand for natural gas over the next 15 to 20 years relative to “business as usual,” thereby alleviating price pressure on this resource.⁷ The Union of Concerned Scientists estimates that the reduced price pressure resulting from a 15 percent RPS would save consumers a total of \$6.4 billion on their natural gas bills through 2030.⁸
- *Growth opportunities for many industries*. An RPS would stimulate demand for wind turbines, solar power system components, and other advanced technologies that are developed and manufactured by U.S. companies.

d) If Congress were to adopt an economy-wide policy mandating reductions in emissions of greenhouse gases, including the electricity industry, would such a portfolio standard policy remain necessary or advisable?

Although an economy-wide cap on greenhouse gas emissions would encourage a shift away from GHG intensive sources of energy, such a policy would not guarantee the secondary benefits offered solely by renewables. America could miss out on the important local environmental and economic benefits of increased renewable power generation if emissions reductions are achieved by increased nuclear generation, carbon capture and sequestration, or cuts in other sectors.

e) What analysis has been done of any portfolio standards requirement you endorse to demonstrate:

i. Its economic costs to consumers, nationally, and in various regions, in electricity rates?

Targets and timetables ranging from 10 to 20 percent by 2020 have been evaluated by a variety of organizations and agencies including the Lawrence Berkeley National Laboratory, the Union of Concerned Scientists, and the Energy Information Administration. These analyses have consistently shown that a national RPS would lower consumer energy bills. For example, the Union of Concerned Scientists has found that a 15 percent national RPS would reduce expenditures on both electricity and natural gas by \$16.4 billion compared to “business as usual” while a 20 percent RPS would save consumers \$10.8 billion.⁹

ii. Its benefits in greenhouse gas emission reductions?

As per our response to question 1.e.i., the World Resources Institute is familiar with a wide variety of analyses which consider targets ranging from 10 to 20 percent by 2020. In regards to greenhouse gas emissions, UCS projects that a 15 percent RPS would reduce

carbon emissions by 180 million metric tons annually through 2030 while a 20 percent RPS would reduce carbon emissions by 263 million metric tons annually.¹⁰

iii. Its implications for electricity reliability, security, and grid management?

The understanding of the implications of power generation from renewable sources on electricity reliability, security and grid management has come a long way in the past five years. Studies by the International Energy Agency have shown that moderate levels of intermittent renewable resources can be easily integrated into most grids with minimal additional costs.¹¹

Furthermore, renewables are easily deployable, modular and offer unique peak shaving benefits.¹² Solar PV and solar thermal generate the most power during the middle of the day when air conditioning loads typically drive peak demand. This can reduce stress on the transmission and distribution system and the need to turn on expensive peak generation resources, which can help reduce cost and improve reliability for all consumers.

iv. Its implications for jobs and economic development?

In its analysis of possible renewable portfolio standards, the Union of Concerned Scientists has shown that a national RPS would generate between 190,000 and 350,000 high-paying U.S. jobs in equipment manufacturing, installation, and maintenance—more than would be created by fossil fuel projects.¹³

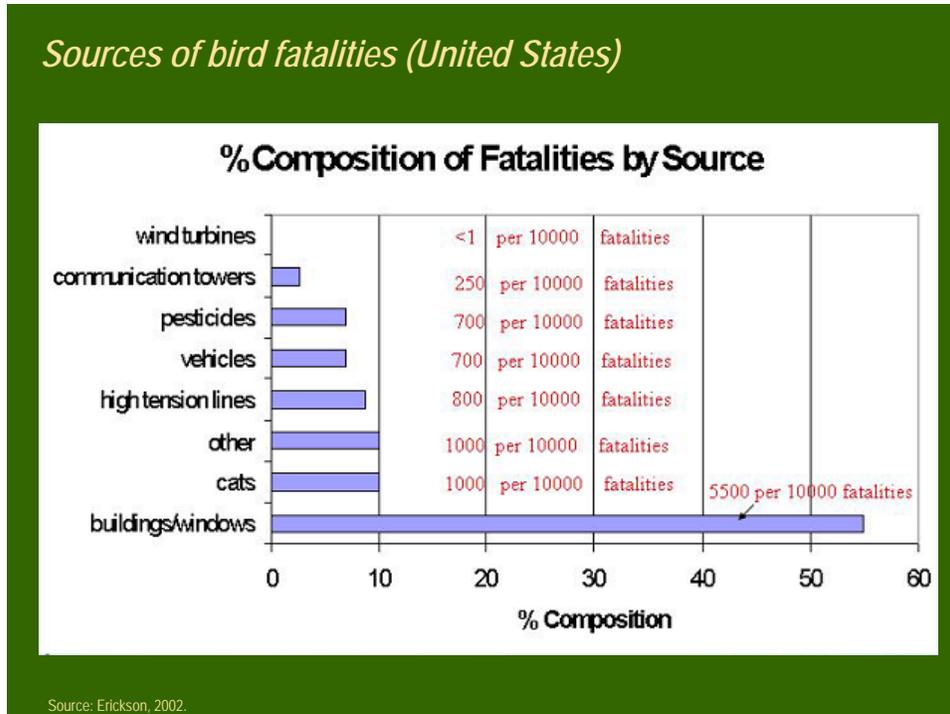
v. Its implications for utility capital investment?

Renewable energy technologies can be a vital part of least cost capital planning for utility transmission and distribution systems and can help reduce T&D constraints and power outages. For example, in 2003 PacifiCorp developed an integrated resource plan that identified significant investment in wind energy as part of the “least cost” plan to meet growing demand on their system. Lawrence Berkeley National Lab has released a study that shows western utilities are increasingly looking at renewable energy technologies as part of their integrated resource plans and have become increasingly comfortable with renewable energy technologies.¹⁴ Furthermore, many renewable energy technologies are modular by design and can be better matched against uncertain demand forecasts.

vi. Other relevant factors?

The Union of Concerned Scientists has estimated that a 20 percent RPS would displace the need for 1.9 billion short tons of coal and 9.6 trillion cubic feet of natural gas by 2030. The health impacts of this shift should not be overlooked. Mercury, particulate matter, sulfur dioxide, and nitrogen oxide emissions would all be significantly reduced as a result of this switch to emissions free energy sources.¹⁵

Wildlife conservationists have frequently cited impacts on bird and bat populations as an argument against growth of the wind industry. Since wind power is expected to provide much of the expected growth in renewables associated with an RPS, it is important to recognize that improvements in turbine design and new siting practices have significantly reduced the amount of avian fatalities. Put in perspective, the impact of wind turbines on bird populations is quite minimal.



2. Portfolio inclusions and exclusions

a) What is the principle that should determine inclusion or exclusion of any energy source from an adopted portfolio standard? (ie, excludes all fossil-fired generation, includes all generation that emits no GHG, excludes all generation below given energy-conversion efficiency, etc.)

The renewable portfolio standard offers a unique opportunity to improve the sustainability and diversity of the American energy supply. As a result, guiding principles should evaluate more than the life-cycle GHG emissions of an energy source. Health impacts, environmental impacts and security implications should all be important considerations in the structuring of an RPS. The fact that a specific form of power generation emits no GHG emissions or is fueled by renewable resources should not guarantee inclusion in an RPS.

b) What generation sources for retail electricity supplies (including efficiency offset) should be included and should be excluded from any mandatory portfolio requirement that is adopted? Please provide your reasons for excluding any sources.

In order to capture all of the benefits offered by a national RPS, particular attention must be paid to selecting eligible resources. Although power from a particular energy source is labeled renewable or reduces greenhouse gas emissions, it may pose unique environmental risks. Wind, geothermal, solar electric, solar thermal, and landfill gas are eligible resources in the vast majority of state RPS policies. Biomass fuels are also usually eligible, but limiting them to the following would minimize environmental impacts:

- Forest-related resources such as mill residues, pre-commercial thinning, slash, and brush, except those from national parks or other protected areas
- Agricultural wastes
- Plants grown exclusively as fuel for electricity production such as switchgrass and miscanthus
- Solid wood waste that does not contain chemically treated or painted wood products (which would release halogenated organic compounds and other chemicals hazardous to human health if burned or combusted)
- The biomass portion of co-fired power generation units.¹⁶

Because of environmental impacts and the maturity of the technology, power from large hydroelectric facilities is usually not eligible. However, the following exceptions may have lower environmental effects:

- Advanced hydropower: Electricity generated by the ocean, waves, currents or tides
- Low impact hydropower: Electricity generated by a facility certified by the Low Impact Hydropower Institute
- Preferential hydropower: The additional electricity generated by efficiency improvements or capacity additions at an existing hydropower facility, or new hydropower capacity added to an existing impoundment not otherwise viewed a good candidate for removal.¹⁷

Electricity from nuclear, coal, oil, and natural gas power plants are not eligible for renewable portfolio standards since their fuels are finite and not by definition renewable. Furthermore, since these fuel sources carry environmental costs beyond global warming, they should not be explicitly supported by a national portfolio. Likewise, municipal solid waste (MSW) is not usually eligible for the RPS since 30 to 40 percent of combustible MSW consists of non-renewable materials including plastics.¹⁸ In addition, burning MSW can release chemicals hazardous to human health including heavy metals, hydrochloric acid, and dioxins.¹⁹

Energy efficiency standards can be a further tool to change market dynamics and address the nation's energy problems. However, many states have found that these standards benefit from separate treatment.

c) To the extent that multiple renewable energy sources and efficiency or other sources are eligible for inclusion, should any tiers among them or separate sub-requirements be adopted?

Certain energy sources included under an RPS would offer unique benefits not fully recognized by the energy market. For example, solar photovoltaics (PV) offer distributed generation and peak-shaving benefits, yet their cost compared to other renewables would mean that a national RPS would do little to encourage investment in the technology. States such as New Jersey have recognized this and introduced solar PV “carve-outs” in their state standards to ensure that some of the unique benefits of solar PV are realized by the energy market.

Such sub-requirements would become even more critical if the scope of the standard were expanded to include power from non-renewable but GHG neutral power sources or energy efficiency improvements. Since such inclusion would reduce the ability of the power sector to realize the secondary benefits of an RPS, a sub-requirement for significant growth in environmentally benign renewable technologies would be essential.

d) Should there be any distinction between existing and new sources of generation eligible for inclusion in the portfolio? If so, what would be the threshold date for eligibility?

In 2005, hydro power supplied 6.5 percent of domestic power while other renewables supplied 2.3 percent.²⁰ WRI believes that the effectiveness of an RPS is determined by the *growth* of the renewable power sector rather than *absolute* percent achieved. The “green-e” standard, the premiere certification program used by voluntary buyers in the United States, cites changes in regulation and PURPA requirements as part of the consideration for their “new” renewables cut off. Given that many states have put RPS programs in place and would seek to allow those investments to “count”, policymakers may want to consider all renewables developed as of 2003 or 2004 – the date when most RPS state-builds commenced. However, a date for eligibility cannot be determined without considering the cumulative target. For an earlier date which captures the investments made in the past 5 years, policymakers may seek to increase the total mandated share of renewable production by one or two percent. This would reinforce state efforts, reward forward thinking utilities, and provide the same ultimate growth in renewable markets.

e) Would the electricity equivalent of useful thermal energy from eligible sources be credited against the requirement? Why or why not?

The World Resources Institute's Green Power Market Development Group has recognized the important role which renewables can play in the supply of thermal energy. Landfill gas and biomass can frequently supply cheap carbon neutral thermal energy in regions where few other resources are available. Nevertheless, the scale of thermal energy as a portion of the portfolio standard should be taken into account when setting targets.

f) To the extent energy efficiency is included:

i. How would the required savings be measured and verified?

There are widely recognized standards for monitoring and verifying the performance of individual energy efficiency projects and determining their resulting electricity savings. The WRI/WBCSD GHG Protocol – which has developed guidelines for estimating the GHG emissions benefits of energy efficiency projects – references two sets of standards: The Efficiency Valuation Organization's *International Performance Measurement and Verification Protocol* (IPMVP), and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers' (ASHRAE) *Guideline 14-2002*.

Standards for evaluating the savings associated with energy efficiency programs (as opposed to individual projects) are less well-established. However, various state and federal agencies have built up a wealth of knowledge about best practices for implementing and evaluating such programs. Useful guidance may be found in the forthcoming *Model Energy Efficiency Program Impact Evaluation Guide* to be published by the U.S. Environmental Protection Agency under its National Action Plan for Energy Efficiency.

ii. Against what base consumption period (historic or projected)?

To some extent this depends on the type of project or program being implemented. Energy efficiency measures undertaken in conjunction with the construction of new facilities or installations will necessarily require projected baselines. Measures that retrofit existing facilities or installations can rely on historical baselines. In both cases, energy consumption baselines must be adjusted to reflect actual monitored conditions. Standards for estimating adjusted consumption baselines can be found in the IPMVP and ASHRAE guidelines referenced above.

For the purposes of a portfolio standard, it is not necessary to employ projected, hypothetical "business as usual" (BAU) baselines for energy consumption. Instead, projections about BAU deployment of energy-efficiency measures should be incorporated into the overall portfolio targets.

3. Percentage requirement and timing

a) What target percentage of total retail power deliveries should be achieved by the required portfolio?

Establishing a long-term, legally binding target is important for ensuring renewable energy supply. The experience of the World Resources Institute's Green Power Market Development Group indicates that financial institutions will not finance renewable energy projects at competitive rates unless long-term power contracts—at least 10 years—are in place. A target of 15 or 20 percent renewable power by 2020, for example, would provide investors with the predictability and security required for project lending at reasonable rates.

The optimal percentage requirement for a national RPS depends upon the included energy sources. At least 15 percent of U.S. power should be supplied by renewable resources (not including existing large-hydro) by 2020. If existing hydro power were included in the standard, this would have to be accompanied with a higher target. Similarly, the inclusion of power from existing renewable generation and non-renewable but GHG neutral power sources would necessitate correspondingly higher targets.

b) What is the target year for reaching the ultimate mandated portfolio percentage?

Please see response to question 3a.

c) Should there be a straight-line, accelerating, or other form of “ramp-up” to the ultimate target percentage?

The World Resources Institute recognizes that, although regulatory flexibility is important, some interim targets will be needed. The specifics of these interim targets depend on the structure and final goals of the renewable portfolio standard.

d) Should there be any “off-ramps” or other built-in automatic changes in requirements as a function of contingencies? If so, what should they be? (e.g., price or cost thresholds, contingencies for natural or climate conditions, lack of adequate transmission, etc.)

Non-compliance penalties, as discussed in response to question six, would create automatic cost thresholds.

4. Relationship to State Portfolio Standards and utility regulation

a) Should an adopted Federal portfolio standard set:

- i. A minimum standard, allowing States to set or maintain higher targets?*
- ii. A preemptive standard, prohibiting States to set higher or different targets?*
- iii. Merely a mandate for a standard, allowing States to set their own targets at any level?*
- iv. Merely a given percentage target, allowing States to elect generation or efficiency sources eligible to meet it?*

v. A standard applying only to States without prior portfolio requirements, grandfathering all prior standard programs?

The World Resources Institute is in the process of conducting research on federal partial preemption of state environmental policies. We will submit this report as soon as it is completed to help inform this important debate.

b) Can and should State regulatory agencies be required to pass through the costs of complying with Federal portfolio standards requirements in retail rates?

Retail rates should be allowed to show the full costs and benefits of a Federal portfolio standard.

5. Utility coverage

Having the national RPS apply to all retail electricity suppliers selling power in the 50 states would maximize the policy's ability to meet its economic, security, and environmental objectives. Exempting suppliers based on size, type of ownership, or other parameters would undermine these goals. For instance, waiving requirements for publicly-owned retail electricity suppliers and for rural electric cooperatives would exempt 26 percent of all U.S. electricity generation.²¹ Furthermore, exempting electricity suppliers on economic grounds is unnecessary since interstate REC trading would provide them with a flexible, cost-effective means of meeting the RPS targets.

a) Should any retail sellers of electricity be exempt from the portfolio requirement? (e.g., municipal utilities, rural cooperatives, utilities selling less than a minimum volume of power, unregulated marketers in States with competitive retail markets, etc.)

Please refer to the general response to question five.

b) Should any standard apply to wholesale power markets or sales?

Please refer to the general response to question five.

c) Should there be any basis for discretionary exemptions of certain States or utilities?

Please refer to the general response to question five.

6. Administration and enforcement

To be effective, a national RPS would need credible non-compliance penalties for retail electricity suppliers that fail to meet a given year's target. The penalty in the Texas RPS – the lesser of \$50 or two times the average trade value of RECs for the compliance year – has been particularly effective²² and could serve as a model for a national RPS.

Such a penalty would be sufficient to deter non-compliance yet ensure that the cost of satisfying the portfolio standard does not become excessive.

a) Should a Federal Government entity enforce the requirement and decide on any exemptions?

Federal oversight, in conjunction with some state-based reporting mechanism will be required. WRI has not conducted research on this topic.

i. If so, which one? (e.g., the EPA, DOE, FERC, new office or entity?)

Congress should review the most appropriate entity to oversee this program. WRI has not conducted research on this topic.

ii. If not, should enforcement be delegated to the States or to regional transmission or electric-system-operation entities?

N/A

b) How should Federal and State enforcement be coordinated in States with their own portfolio requirements?

This important topic has not been thoroughly evaluated by WRI's research.

c) What penalties should apply for failure of utilities to meet the percentage mandate?

Please refer to the general answer to question six.

7. Credits and trading

a) Should tradable credits for qualifying generation be utilized as the mechanism for establishing compliance?

Yes.

b) Should credit trading be permitted or required on a national basis in order to achieve least-cost compliance with the portfolio standards?

Allowing retail electricity suppliers to purchase renewable energy certificates (RECs) from any renewable power generator or facility in the United States would reduce the cost of compliance. A REC is proof that one megawatt-hour (1,000 kilowatt-hours) of electricity generated from eligible renewable resources was produced and delivered to the

power grid. Under a national RPS, retail electricity suppliers would submit RECs sufficient to meet the RPS. The experience of GPMDG members in the voluntary market has demonstrated that interstate trading can dramatically lower the cost of RECs. This is because a national REC market stimulates competition between renewable power generators throughout the country and allows buyers to access RECs from regions where renewable power generation is most cost-competitive.²³

c) Should there be a cap on credit values to limit costs?

If the enforcement mechanism is properly structured, an explicit limit on REC prices would not be necessary to limit costs. Under the Texas standard, the penalty for non-compliance is the lesser of \$50 or two times the average trade value of RECs for the compliance year. As a result, RECs would never rise above \$50. If a more flexible policy was desired, non-compliance penalties could always be equal to two times the average trade value of RECs. Such a mechanism would prevent price spikes, yet allow controlled price increases in order to retain the incentive to accelerate investment in renewables when capacity is lagging below targets.

d) As between a utility purchaser and a qualifying power generator, to whom should the portfolio standard credits be initially allocated?

Renewable energy credits typically are not *allocated*. Instead, they are *issued* to qualified power generators based on the quantity of power generated.

e) What relationship, if any, should portfolio standard credits have to other State and Federal credit trading programs for SO₂, greenhouse gases, or biofuels?

Although a renewable portfolio standard would help regulated entities achieve compliance under other Federal trading programs, these standards should be considered complimentary and not interchangeable. For this reason, no direct linkages between the trading programs would be needed.

f) What requirements, if any, would there be concerning the length of contracts for qualifying generation and ownership of credit rights?

Generators and REC purchasers should have the ability to determine the length of their contracts.

¹ Energy Information Administration, “Impacts of a 15-Percent Renewable Portfolio Standard”, (Washington DC: Energy Information Administration, 2007). And: Energy Information Administration. “Analysis of a 10-percent Renewable Portfolio Standard,” Report #: SR/OIAF/2003-01. (Washington, DC: U.S. Department of Energy, 2003).

² Union of Concerned Scientists. “Renewing America’s Economy – 20% by 2020 Renewable Electricity Standard.” (Washington, DC: Union of Concerned Scientists, 2005).

³ Energy Information Administration, “Electric Power Annual”, (Washington DC: Energy Information Administration, 2005).

⁴ Energy Information Administration, Annual Coal, Natural Gas and Petroleum Reports, (Washington DC: Energy Information Administration, 2005).

⁵ Union of Concerned Scientists. “Renewing America’s Economy – 20% by 2020 Renewable Electricity Standard.” (Washington, DC: Union of Concerned Scientists, 2005).

⁶ For more information, see Craig Hanson, *The Business Case for Using Renewable Energy*, (Washington DC: The World Resources Institute, 2005).

⁷ Energy Information Administration. “Analysis of a 10-percent Renewable Portfolio Standard,” Report #: SR/OIAF/2003-01. (Washington, DC: U.S. Department of Energy, 2003).

⁸ Union of Concerned Scientists,. “Fact Sheet: A 20 Percent National Renewable Electricity Standard Will Save Consumers Money and Reduce Global Warming Emissions.” (Washington, DC: Union of Concerned Scientists, 2007).

⁹ Union of Concerned Scientists. “Renewing America’s Economy – 20% by 2020 Renewable Electricity Standard.” (Washington, DC: Union of Concerned Scientists, 2005).

¹⁰ Union of Concerned Scientists,. “Fact Sheet: A 20 Percent National Renewable Electricity Standard Will Save Consumers Money and Reduce Global Warming Emissions.” (Washington, DC: Union of Concerned Scientists, 2007).

¹¹ International Energy Agency, “Variability of Wind Power and Other Renewables: Management Options and Strategies”, (Paris: International Energy Agency, 2005).

¹² <http://www.asrc.cestm.albany.edu/research/energy2.htm>

¹³ Union of Concerned Scientists. “Renewing America’s Economy – 20% by 2020 Renewable Electricity Standard.” (Washington, DC: Union of Concerned Scientists, 2005).

¹⁴ Mark Bolinger and Ryan Wiser, "Utility Integrated Resource Planning: An Emerging Driver of New Renewable Generation in the Western United States" Paper LBNL-59239, (Berkeley: Lawrence Berkeley National Laboratory, 2005).

¹⁵ Union of Concerned Scientists. 2005. “Renewing America’s Economy” and “Renewing America’s Economy – 20% by 2020 Renewable Electricity Standard.” Washington, DC: Union of Concerned Scientists.

¹⁶ “Co-firing” is the combustion of multiple fuels, such as sawdust and coal, to heat a boiler.

¹⁷ Preferential hydropower does not include additional electricity generated as a result of operational changes to an existing facility not directly associated with efficiency improvements or capacity additions.

¹⁸ U.S. Environmental Protection Agency, “Municipal Solid Waste in the United States: 2005 Facts and Figures,” Table ES-4. Washington, DC: U.S. Environmental Protection Agency.

¹⁹ U.S. Environmental Protection Agency, “Compilation of Air Pollutant Emission Factors, AP-42, Vol. I, CH 2.1: Refuse Combustion.” (Washington, DC: U.S. Environmental Protection Agency).

²⁰ <http://www.eia.doe.gov/fuelelectric.html>

²¹ Energy Information Administration, “Electric Sales and Revenue – 2005”, Table 10, November 2006.

²² Ryan Wiser, “Design and Implementation Experience with State RPS Policies”, Presentation at the New York DPS RPS Proceeding, April 7, 2003.

²³ For more information, see Hanson, C. and V. Van Son. *Renewable Energy Certificates: An Attractive Means for Corporate Customers to Purchase Renewable Energy*. (Washington, DC: World Resources Institute, 2003).



**WORLD
RESOURCES
INSTITUTE**

10 G Street, NE
8th Floor
Washington, DC 20002
USA
+1-202-729-7600
fax +1-202-729-7610
<http://www.wri.org>

June 15, 2007

Honorable John Dingell
Committee on Energy and Commerce
2125 Rayburn House Office
Building, Washington, DC 20515

Dear Chairman Dingell:

Thank you for this opportunity to provide input to the Energy and Commerce Committee on questions concerning the design elements of a national renewable portfolio standard. We appreciate the efforts of the Committee to address the accelerated deployment of renewable energy and look forward to further engagement with you and your staff as you continue to explore the design of various energy and climate policy options for the United States. Please don't hesitate to contact us with any further questions you may have.

Very Best Wishes,

Jonathan Pershing
Director, Climate and Energy Program
World Resources Institute



**WORLD
RESOURCES
INSTITUTE**

10 G Street, NE
8th Floor
Washington, DC 20002
USA
+1-202-729-7600
fax +1-202-729-7610
<http://www.wri.org>

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Honorable Rick Boucher
Committee on Energy and Commerce
2125 Rayburn House Office
Building, Washington, DC 20515

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Jonathan Pershing
Director, Climate and Energy Program
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