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Renewable Energy: Tax Credit, Budget, and Electricity Restructuring Issues

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Renewable Energy: Tax Credit, Budget, and Electricity Restructuring Issues

SUMMARY

In the 106th Congress, debate over renewable energy programs was focused on the FY2001 budget request, the Clinton Administration's Climate Change Technology Initiative (CCTI), and proposals for restructuring the electricity industry. Energy security, a major driver of federal energy efficiency programs in the past, came back into play as oil and gas prices rose late in the year 2000.

Also, worldwide emphasis on environmental problems of air and water pollution and global climate change, and the related development of clean energy technologies in western Europe and Japan especially, emerged in the 106th Congress as important influences on renewable energy policymaking.

The Clinton Administration viewed renewable energy as the key part of its energy supply policy, both for environmental and technology competitiveness reasons.

The FY2001 request for the Department of Energy's (DOE's) Renewable Energy Programs was $454.8 million, an increase of $92.6 million (32%) over the FY2000 level. This included $409.5 million for DOE's Office of Energy Efficiency and Renewable Energy (EERE) and $47.1 million to be managed by the Office of Science (OS). (See Table 2 at the end of this brief.)

The FY2001 Energy and Water Appropriations bill that funds DOE's Renewable Energy Programs was incorporated into P.L. 106-377 (H.R. 4635; H.Rept. 106-988). It replaced H.R. 4733 (H.Rept. 106-907), which had been vetoed.. The law provides $422.1 million (including $47.1 million managed by OS). The law provides $32.8 million, or 7%, less than the FY2001 request.

Relative to the FY2000 funding level, the law provides an increase of $59.9 million, or 17%, in current dollar terms. This includes $13.6 million more for Electric/Storage, $8.8 million more for Photovoltaics, $7.5 million more for Biofuels-Power, $7.0 million more for Wind, $6.7 million more for Biofuels-Transportation, and $3.0 million more for Geothermal.

In the 106th Congress, several electricity industry restructuring bills proposed to eliminate the Public Utility Regulatory Policies Act (PURPA), which requires utilities to purchase power from qualified renewable energy providers. PURPA has been key to the growth of renewable power facilities. Bills in the 106th Congress that intended to ensure a continuing role for renewables in this industry included some combination of renewable energy portfolio standard (RPS), public benefits fund (PBF), and/or an information disclosure requirement that supports green power. Some states and electric utility companies have already instituted such measures. Debate in the 106th Congress focused on whether there should be a federal role in restructuring generally and in creating incentives for renewables specifically.

MOST RECENT DEVELOPMENTS

On October 27, President Clinton signed into law P.L. 106-377 (H.R. 4635; H.Rept. 106-988), which includes the FY2001 Energy and Water Appropriations bill that funds the DOE Renewable Energy Program. The law adopts funding levels approved in a previous bill, H.R. 4733, which had been vetoed by President Clinton because the bill "failed to fund [adequately] efforts to research and develop non-polluting sources of energy through solar and renewable technologies that are vital to America's energy security." The Conference report (H.R. 4733; H.Rept. 106-907) was approved by the Senate on October 2 and by the House on September 28. The report recommended $422.1 million for the DOE Renewable Energy Program.

(The FY2001 budget request documents are available on DOE's web site [http://www.cfo.doe.gov/budget/01budget/index.htm].)

BACKGROUND AND ANALYSIS

Renewable Energy Concept

Renewable energy is derived from resources that are generally not depleted by human use, such as the sun, wind, and water movement. These primary sources of energy can be converted into heat, electricity and mechanical energy in several ways. There are some mature technologies for conversion of renewable energy such as hydropower, biomass, and waste combustion. Other conversion technologies, such as wind turbines and photovoltaics, are already well-developed, but have not achieved the technological efficiency and market penetration which many expect they will ultimately reach. Although geothermal energy is produced from geological rather than solar sources, it is often included as a renewable energy resource and this brief treats it as one. Commercial nuclear power is not considered to be a renewable energy resource. (For further definitions of renewable energy, see the National Renewable Energy Laboratory's web site information on "Clean Energy 101" [http://www.nrel.gov/clean_energy/].)

Contribution to National Energy Supply

According to the Energy Information Administration's (EIA's) *Short-Term Energy Outlook, April 1999*, renewable energy resources supplied about 6.7 Q (quadrillion Btu's or quads) of the 94.4 Q the nation used in 1998, or about 7.2% of national energy demand. More than half of renewable energy production takes the form of electricity supply. Of this, most is provided by utility hydropower. However, in 1998, declining hydroelectric availability led to a 0.33 Q, or 5%, drop in national renewable energy use and it is projected to result in a further 0.13 Q, or 2%, drop in 1999. Industrial use of renewables, supplied primarily by biofuels, accounts for most of the remaining contribution.

After more than 20 years of federal support, some note that renewable energy has neither achieved a high level of market penetration nor a growing market share among other energy

sources. A recent review of renewable energy studies by Resources for the Future, *Renewable Energy: Winner, Loser, or Innocent Victim?*, concludes that the lower-than-projected market penetration and flat market share are due primarily to declining fossil fuel and electricity prices during this period. In contrast, however, it notes that the costs for renewable energy technologies have declined by amounts equal to or exceeding those of earlier projections. Further, it says that the declining price of electricity is likely to continue moving the cost threshold for renewable energy downward, making it difficult for renewables to capture a larger share of the electricity market.

EIA's 1999 *Annual Energy Outlook* projects that current policies would yield an 0.8% average annual increase through 2020, resulting in a 22% total increase in renewable energy production. This would amount to about 6.8% of the projected 119 Q total demand in 2020. (Detailed breakdowns of renewable energy use appear in EIA's *Renewable Energy Annual 1998* and *Renewable Energy Issues and Trends 1998*.)

Role in Long-Term Energy Supply

Our Common Future, the 1987 report of the World Commission on Environment and Development, found that "energy efficiency can only buy time for the world to develop 'low-energy paths' based on renewable sources..." Although many renewable energy systems are in a relatively early stage of development, they offer the world "a potentially huge primary energy source, sustainable in perpetuity and available in various forms to every nation on Earth." It suggested that a Research, Development, and Demonstration (R,D&D) program of renewable energy projects is required to attain the same level of primary energy that is now obtained from a mix of fossil, nuclear, and renewable energy resources.

The *Agenda 21* adopted at the 1992 United Nations Conference on Environment and Development (UNCED) concluded that mitigating urban air pollution and the adverse impact of energy use on the atmosphere — such as acid rain, global warming, and climate change — requires an emphasis on "clean and renewable energy sources." A 1996 report by the President's Council on Sustainable Development, *Energy and Transportation*, called for raising the renewable energy share of U.S. energy supply to 12% in 2010 and 25% in 2025.

History

The oil embargo of 1973 sparked a quadrupling of energy prices, major economic shock, and the establishment of a comprehensive federal energy program to help with the nation's immediate and long-term energy needs. During the 1970s, the federal renewable energy program grew rapidly to include basic and applied R&D, and joint federal participation with the private sector in demonstration projects, commercialization, and information dissemination. In addition, the federal government instituted market incentives, such as business and residential tax credits, and created a utility market for non-utility produced electric power through the Public Utility Regulatory Policies Act (P.L. 95-617).

The subsequent failure of the oil cartel and the return of low oil and gas prices in the early 1980s slowed the federal program. Despite Congress's consistent support for a broader,

more aggressive renewable energy program than any Administration, federal spending for these programs fell steadily through 1990. Lacking a sustained, long-range policy from the Administration, Congress first took a major initiative in 1974. Until 1994, Congress led policy development and funding through legislative initiatives and close reviews of annual budget submissions. FY1995 marked a noteworthy shift, with the 103rd Congress for the first time approving less funding than the Administration had requested. The 104th Congress approved 23% less than the Clinton Administration request for FY1996 and 8% less for FY1997. However, funding turned upward again during the 105th Congress and in the 106th Congress. (A detailed description of DOE programs appears in DOE's *FY2001 Congressional Budget Request*, DOE/CR-0068, v. 3, February 2000.)

From FY1973 through FY1998, the federal government spent about $11.7 billion (in 1999 constant dollars) for renewable energy R&D. Renewable energy R&D funding grew from less than $1 million per year in the early 1970s to over $1.3 billion in FY1979 and FY1980, then declined steadily to $136 million in FY1990. Spending rose from FY1991 to FY1995, declined in FY1996 and FY1997, then rose again in FY1998, reaching $275 million in 1999 constant dollars.

This spending history can be viewed within the context of DOE spending for the three other major energy R&D programs: nuclear, fossil, and energy efficiency R&D. From FY1948 through FY1972, in 1999 constant dollars, the federal government spent about $22.4 billion for nuclear (fission and fusion) energy R&D and about $5.1 billion for fossil energy R&D. From FY1973 through FY1998, in 1999 constant dollars, the federal government spent $43.2 billion for nuclear, $21.1 billion for fossil, $11.7 billion for renewables, and $8 billion for energy efficiency. Total energy R&D spending from FY1948-FY1998 reached $111.5 billion, including $66 billion, or 59% for nuclear, $26 billion, or 23%, for fossil, $12 billion, or 11%, for renewables, and $8 billion, or 7%, for energy efficiency.

Tax Credits

The Energy Tax Act of 1978 (P.L. 95-618) created residential solar credits and the residential and business credits for wind energy installations; it expired on December 31, 1985. However, business investment credits were extended repeatedly through the 1980s. Section 1916 of the Energy Policy Act of 1992 (EPACT, P.L. 102-486) extended the 10% business tax credits for solar and geothermal equipment indefinitely. Also, EPACT Section 1914 created an income tax "production" credit of 1.5 cents/kwh for electricity produced by wind and closed-loop biomass systems. P.L. 106-170 expanded this credit to include poultry waste and extended it through December 31, 2001.

Public Utility Regulatory Policies Act

The Public Utilities Regulatory Policies Act (P.L. 96-917) required electric utilities to purchase power produced by qualified renewable power facilities. Under PURPA, the Federal Energy Regulatory Commission (FERC) established rules requiring that electric utilities purchase power from windfarms and other small power producers at an "avoided cost" price based on energy and capacity costs that the utility would otherwise incur by generating the power itself or purchasing it elsewhere. However, to receive avoided cost payments, each renewables facility must file for, and obtain, qualifying facility (QF) status from FERC. EIA's *Renewable Energy 1998: Issues and Trends* (p. 4-5) reports that, by the end of 1996,

nonutility renewable power capacity reached 17,200 MW, of which 12,600 MW came from QFs, including 3,420 MW of small hydropower facilities. These renewable power facilities generated nearly 90 billion kwh, of which 69 billion kwh was produced by QFs, including about 12 billion kwh of small hydropower. Thus, in 1996, QFs accounted for about 73% of nonutility renewable power capacity and about 76% of nonutility renewable power generation. QFs provided about 1.8% of national electric capacity and about 2.2% of national electricity generation.

DOE's Strategic and Performance Goals

The Government Performance and Results Act (GPRA, P.L. 103-62) requires each federal agency to produce and update a strategic plan linked to annual performance plans. DOE's active *Strategic Plan* was issued in 1997. On February 18, 2000, DOE issued a new *Draft Strategic Plan*. Renewable energy objectives and strategies appear under strategic goal #1 "Energy Resources." On March 30, 2000, DOE released its *Accountability Report*, which assesses the results of DOE's performance goals for FY1999. In the *DOE Annual Performance Plan for FY2001*, strategic objective ER2 aims to "Promote reliable, affordable electricity supplies that are generated with acceptable environmental impacts." Goals for 2010 include: triple non-hydro renewable generating capacity, increase distributed power to 20% of new annual capacity additions, and complete one million solar roofs. Two related performance goals for FY2001 are: increase non-hydro generating capacity to 9.3 million kilowatts, and install 20,000 solar roofs, bringing the total to 90,000 solar roofs installed. Six other FY2001 performance goals involve thin film photovoltaics, small dish concentrating power systems, a Kalina Cycle geothermal demonstration plant, testing of biomass gasification cofiring with coal, wind hybrid control technology, and demonstration of electric torch hydrogen production without carbon dioxide. Also, in April 2000, the Office of Energy Efficiency and Renewable Energy (EERE) released a strategic plan, *Clean Energy for the 21st Century*. Further, in early 2000, the National Academy of Public Administration issued *A Review of Management in the Office of Energy Efficiency and Renewable Energy* and the National Research Council issued *Renewable Power Pathways: A Review of the U.S. Department of Energy's Renewable Energy Programs*.

CCTI Tax Credits

The Clinton Administration's Climate Change Technology Initiative (CCTI) for FY2001 proposed several tax incentives for renewable energy production and equipment. First, it proposed an extension and broadening of the electricity production tax credit. This included a 2.5-year extension of the 1.5 cent/kwh wind energy and closed-loop biomass production tax credit from its current expiration date of December 31, 2001, through June 30, 2003. It would also have broadened the credit to include open-loop biomass from forest and agricultural residues, through 2005. Further, it would have created a 0.5 cent/kwh credit for cofiring biomass with coal, through 2005, and a 1.5 cent/kwh credit for using methane from landfills to generate electricity, through 2006.

Second, the CCTI proposed a 15% investment tax credit for consumers and businesses. For photovoltaic rooftop systems, the credit would have been limited to $2,000 and applied

through 2007. For solar water heaters, the credit would have been limited to $1,000 and applied through 2005. Business taxpayers would have had to choose between this credit and the existing 10% investment tax credit for solar water heaters.

Third, CCTI proposed an accelerated 15-year depreciation schedule for distributed power equipment at industrial sites with a rated capacity under 500 kilowatts (or 12,500 pounds per of steam). This incentive was focused primarily on energy efficient system equipment, but may also have applied to renewable energy-powered generation equipment.

The Clinton Administration had estimated the impacts of CCTI credits on revenue at the Department of the Treasury. This is shown in the table below:

Table 1. CCTI Tax Credits: Projected Revenue Reduction at Treasury Department
($ millions)

	FY2001	Total
Production Credits (wind, biomass, landfill)	91	976
Solar Investment Credits	9	132
Accelerated Depreciation (all equipment)	1	10
Total	101	1,118

Source: White House Fact Sheet on CCTI Tax Incentives. February 3, 2000.

In the first session of the 106th Congress, there was debate over the recently enacted extension of the wind and closed-loop production tax credit. Extension supporters, such as the American Wind Energy Association, said the credit brings renewable energy costs down, improving competitiveness and enabling industry to improve technology to drive costs down even further. In contrast, opponents, such as the Cato Institute, contended that the production credit has not been successful at encouraging investment and thus its drain on the Treasury is not cost-effective.

At the end of the first session, budget negotiators for the FY2000 Consolidated Appropriations Act (P.L. 106-113) agreed to enact H.R. 1180, which included in Section 507 an energy production tax credit extension for wind and closed-loop biomass, and added a new credit for poultry waste, for 2½ years, retroactive to June 30, 1999, and effective through December 31, 2001. Section 507 of H.R. 1180 incorporated an amended version of the credit extension proposed in S. 1792. H.R. 1180 was enacted into law (P.L. 106-170). The energy production tax credit for wind and certain biomass equipment had expired on June 30, 1999.

In 1992, EPACT Section 1914 established an income tax "production" credit of 1.5 cents/kwh (adjusted for inflation) to be paid to businesses for electricity produced by wind and closed-loop biomass systems (biomass used solely for power production). The credit applies to energy produced from new facilities for the first 10 years.

Also, DOE funds a separate Renewable Energy Production Incentive (REPI) that was created with the parallel purpose of encouraging renewable energy use by state and local

governments and by non-profit electric cooperatives. Unlike the tax credit, this incentive must be funded annually, through the appropriations process.

FY2001 DOE Budget

President's Request

The FY2001 budget request for the Renewable Energy Program " ... will contribute to strengthening the Nation's energy security, providing a cleaner environment, enhancing global sales of U.S. energy products, and increasing industrial competitiveness and federal technology transfer. The solar and renewable energy program was a major component of the Clinton Administration's activities to address global climate change," according to the Appendix to the U.S. Government's FY2001 Budget (p. 403). In accordance with that policy, DOE proposed to boost solar and renewables funding to $456.6 million — an increase of $100.0 million (32%) over the FY2000 level. This included $409.5 million for DOE's Office of Energy Efficiency and Renewable Energy (EERE), an increase of $100.0 million, and $47.1 million for the Office of Science, which was the same as for FY2000. The EERE amount included $31.7 million more for biofuels, $16.1 million more for photovoltaics, $18.0 million more for wind, $10.2 million more for electric and storage programs, and $7.7 million more for international renewable energy programs.

Under the Biofuels Program, $12 million was sought for the new Integrated Bioenergy Technology Research and Technology Initiative. Its goal is the co-production of power, fuels, chemicals, and other bio-based products from crops, trees, and wastes. This initiative follows from President Clinton's August 1999 Executive Order 13134, Developing and Promoting Biobased Products and Bioenergy. It aims "to develop a comprehensive national strategy, including research development and private sector incentives, to stimulate the creation and early adoption of technologies needed to make biobased products and bioenergy cost-competitive in large national and international markets." Also, the Biofuels Program sought an $8.3 million increase for ethanol production, which was focused on converting agricultural and forestry residues to ethanol and electric power.

Under the Wind Program, most of the requested increase was for three new programs: $5 million for a new "Wind Powering America" initiative, which would accelerate use through regionally-based partnership strategies; $5 million for a new "Regional Field Verification" program, which would competitively bid 3-5 projects aimed at unique regional siting, technical, or market barriers; and $4 million for the "International Clean Energy Initiative," which was focused on competitively bid partnerships to enhance wind energy and wind-hybrid systems use in developing countries.

Under the Photovoltaic Program, basic research would have increased by $8.4 million, mainly for work on large area thin films, multi-junction concentrator cells, and other topics that could lead to major cost reductions. This appeared to be a response to falling U.S. world market share in 1998. Also, the request sought an increase of $1.5 million for the Million Solar Roofs Initiative.

Under the Electric Energy and Storage Program, $8.0 million of the requested increase aimed to ensure and enhance electric power system security and reliability. Of this, a $5.5 million increase targeted development of power electronics technology, which would be used to develop rapid (real-time) measurement and control systems. Also, a $2.5 million increase focused on competitive bids for distributed power systems, which would have included interconnection and control technology for fuel cells, photovoltaics, and other distributed power equipment.

The International Renewable Energy Program aims to support the U.S. International Joint Implementation Initiative (USIJI), equipment exports, and a new "International Clean Energy Initiative (ICEI)." The Program request included $5.5 million for ICEI, which would have focused on regional renewable energy resource assessments that could be integrated into country energy plans and a strategy for private sector partnerships. Also, a $2.2 million increase for USIJI would have encouraged private sector "clean energy" projects and support national action plan preparation in developing countries as a way of seeking "meaningful participation" in the United Nations Framework Convention on Climate Change.

Energy and Water Appropriations Bill, FY2001

On June 28, the House passed H.R. 4733, the Energy and Water Appropriations bill for FY2001. The House Appropriations Committee recommended $352.8 million (including $47.1 million for programs under the Office of Science) for the DOE Renewable Energy Program. In contending that the Renewable Energy Program request did not merit a large funding increase, the House Appropriations Committee's report cited funding constraints, a lack of sufficient program justifications, and a critique of Program management by the National Academy of Public Administration. However, voice vote approval of the Salmon/Udall/Boehlert/Kaptur amendment (H.Amdt.920, A006) added $40 million, bringing the House-passed total to $392.8 million. Relative to the FY2000 appropriation, the House level would have provided an increase of $30.6 million, or 8%, in current dollar terms.

On September 7, the Senate approved $444.1 million. Seven floor amendments created earmarks for various renewable energy programs, but none modified the level of appropriations recommended by the Senate Appropriations Committee (S.Rept. 106-395). Relative to the House level, the Senate would have provided an increase of $53.6 million, or 14.0%, in current dollar terms.

Climate Change

Since 1988, the federal government has accelerated programs that study the science of global climate change and created programs aimed at mitigating fossil fuel-generated carbon dioxide (CO_2) and other human-generated emissions. (For more details, see the CRS electronic briefing book on Global Climate Change at [http://www.congress.gov/brbk/html/ebgcc1.html].) The Clinton Administration had identified renewable energy as a significant part of the strategy for curbing carbon dioxide and other greenhouse gas emissions. This was reflected in its CCTI proposals for increased renewable energy R&D spending, tax credits, and other policy mechanisms at DOE and other agencies.

The federal government funds programs for renewable energy as a mitigation measure at DOE, EPA, the Agency for International Development (AID), and the World Bank. The latter two agencies have received funding for renewable energy-related climate actions through Foreign Operations appropriations bills.

Because CO_2 contributes the largest share of greenhouse gas emission impact, it has been the focus of studies of the potential for reducing emissions through renewable energy and other means. DOE's 1997 report by five national laboratories entitled *Scenarios of U.S. Carbon Reductions: Potential Impacts of Energy Technologies by 2010 and Beyond* estimated the possible emissions impact from renewables. Also known as the *Five-Lab Study*, it estimated that the development and use of cellulosic biofuels could curb from 12 million to 17 million tons of carbon (MtC). Further, it estimated that, with a $50/metric ton carbon tax, renewable energy electric power technologies (mainly wind energy and biomass cofired with coal) could reduce CO_2 emissions by 25 to 50 MtC. However, for the longer-term beyond 2010, the *Five-Lab Study* concluded that renewables could make a much larger contribution to CO_2 reduction.

On March 25, 1999, the Senate Committee on Energy and Natural Resources held a hearing on *Economic Impacts of the Kyoto Protocol*. It focused on contending views of potential costs to implement the 7% reduction in U.S. greenhouse emissions called for in the Protocol. Also, EPA, DOE, and DOE's Energy Information Administration (EIA) testified at an April 14, 1999, House Science Committee hearing, *Fiscal Year 2000 Climate Change Budget Authorization Request.* EIA contended that the CCTI provisions would provide minimal reduction in greenhouse emissions. In contrast, EPA and DOE stressed the urgency of action, noting that CCTI provisions would provide immediate savings in energy, costs, and emissions.

S. 882, introduced April 27, 1999, proposed R&D funding increases for renewable energy and other energy technologies as a partial alternative to the CCTI. It would have provided $200 million per year over 10 years to accelerate development of energy efficiency, fossil energy, nuclear energy, and renewable energy R&D. Through this means, the bill focused on a long-term strategy for curbing greenhouse gas emissions.

Except for biofuels and biopower, wherever renewable energy equipment displaces fossil fuel use, it will also reduce carbon dioxide (CO_2) emissions, as well as pollutants that contribute to water pollution, acid rain, and urban smog. In general, the combustion of biomass for fuel and power production releases CO_2 at an intensity that may rival or exceed that for natural gas. However, the growth of biomass material offsets this release. Hence, net emissions occur only when combustion is based on deforestation. In a "closed loop" system, biomass combustion is based on rotating energy crops, there is no net release, and its displacement of any fossil fuel, including natural gas, reduces CO_2 emissions.

On August 12, 1999, President Clinton issued Executive Order 12124 on biobased products and bioenergy. The main stated purpose is to increase the market competitiveness of these products, while reducing air pollution and greenhouse gas emissions. Additionally, a council would be created, charged with creating a strategic plan with national goals for bioenergy development and use.

Electric Industry Restructuring

In the 106th Congress, several electricity industry restructuring bills proposed to eliminate the Public Utility Regulatory Policies Act (PURPA), which has been key to the growth of renewable power facilities. Bills intended to ensure a continuing role for renewable energy sources were introduced in the 106th Congress that include some combination of a renewable energy portfolio standard (RPS), a public benefits fund (PBF), and/or an information disclosure requirement that supports "green" pricing and marketing of renewable power. Some states and electric utility companies have already instituted such measures.

Debate was focused on whether there should be a federal role in restructuring generally and in creating incentives for renewables specifically. The Clinton Administration's bill, "Comprehensive Electricity Competition Plan," introduced by request as S. 1047 and H.R. 1828, included elements of all three policies described above. Also, H.R. 2050 set provisions for renewables, which were defined to include solar, wind, geothermal, and biomass power, but it excluded all forms of hydropower. *Inside Energy* of July 26, 1999, reported (p. 5-6) that on July 23, Chairman Barton of the House Commerce Subcommittee on Energy and Power released a proposed bill outline that excluded a renewable energy portfolio standard, but included in its place an incentive for owners or operators of "qualified renewable energy facilities."

On May 13, 1999, FERC issued a proposed rule to create voluntary regional transmission organizations (RTOs). Comments from several "green" groups argued that the proposal should have addressed access and pricing barriers for renewables and that RTOs be required to provide data needed to verify green marketing claims, track information disclosure requirements, and monitor compliance with state RPS provisions. In contrast, the Edison Electric Institute expressed concern about RTOs becoming too powerful, especially in assessing RPS's.

More details about the debate over renewable energy provisions in federal legislation to restructure the electric power industry are described in CRS Report RS20270 on *Renewable Energy and Electricity Restructuring.* (For a discussion of broader electricity restructuring issues, see CRS Electronic Briefing Book on *Electricity Restructuring* at [http://www.congress.gov/brbk/html/ebele1.html] and CRS Issue Brief IB10006, *Electricity: The Road to Restructuring*.)

LEGISLATION

P.L. 106-60, H.R. 2605

FY2000 Energy and Water Development Appropriations bill. Senate bill reported (S.Rept. 106-58) June 2, 1999. Passed Senate, June 16. House bill reported (H.Rept. 106-253) July 23. Passed House, amended (H.Amdt. 350), July 27. Conference Committee reported (H.Rept. 106-336) September 27. Approved in House September 27. Approved in Senate September 28. Signed into law September 29.

P.L. 106-170, H.R. 1180

Work Incentives Act. Section 507 extends the production tax credit for wind and closed loop biomass, and it adds a new credit for poultry waste. This section was derived as an amendment of S. 1792 that was incorporated in conference. Conference reported (H.Rept. 106-478) November 17. Passed Senate November 19. Signed into law December 17, 1999.

P.L. 106-377, H.R. 4635

Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies and Energy and Water Development Appropriations bill for FY2001. Incorporates H.R. 5483 by reference. Conference reported (H.Rept. 106-988) October 27. Passed House, passed Senate, and signed into law October 27, 2000.

H.R. 1465 (Salmon)/S. 1634 (Allard)

Residential Solar Energy Tax Credit Act. Creates 15% credit for photovoltaics and solar water heating equipment. House bill introduced April 15, 1999; referred to Committee on Ways and Means. Senate bill introduced September 24, 1999; referred to Committee on Finance.

H.R. 2050 (Largent)

Electric Consumers' Power to Choose Act. Provides for a more competitive electric power industry. Would create production tax credit for renewable energy and establish a Renewable Portfolio Standard (RPS) that may begin on January 1, 2005, and would sunset in 2015. Introduced June 8, 1999; referred to Committee on Commerce, and to the Committees on Ways and Means, Transportation and Infrastructure, and Resources.

H.R. 2380 (Matsui)

Energy Efficient Technology Tax Act. Amends Internal Revenue Code to create tax incentives for energy efficiency and renewable energy measures. Introduced June 29, 1999; referred to Committee on Ways and Means.

H.R. 2819 (M. Udall)

Biomass Research and Development Act. Promotes R&D for using biomass as fuel and industrial product. Introduced September 8, 1999; referred to Committee on Science. Subcommittee on Energy and Environment held hearing October 28.

H.R. 4035 (Gekas)

National Resource Governance Act. Establishes a Commission to study options for achieving energy self-sufficiency by 2010, including a focus on renewables. Introduced March 27, 2000; referred to House Commerce Committee, Subcommittee on Energy and Power.

H.R. 4733 (Packard)

FY2001 Energy and Water Appropriations Bill. Reported (H.Rept. 106-693) June 23. Passed House, amended, June 28. Senate Appropriations Committee reported July 18; written report (S.Rept. 106-395) issued Aug. 30. Passed Senate, amended, September 7. Conference Report (H.Rept. 106-907) issued September 27; House approved September 28. Senate approved October 2. President vetoed October 7.

H.R. 5483 (Packard)

FY2001 Energy and Water Appropriations Bill. Introduced October 18, 2000. Incorporated by reference into H.R. 4635 October 27, 2000.

S. 882 (Murkowski)

Energy and Climate Policy Act of 1999. Establishes new Office of Global Climate Change at DOE and authorizes $2 billion over 10 years to fund renewable energy and other energy technology programs. Introduced April 27, 1999; referred to Committee on Energy and Natural Resources. Hearing held March 30, 2000.

S. 935 (Lugar)/H.R. 1827 (Ewing)

National Sustainable Fuels and Chemicals Act. Senate bill introduced April 30, 1999; referred to Committee on Agriculture. Reported (S.Rept. 106-179) October 8. Passed Senate, amended, February 29, 2000. In House, referred jointly to Committee on Agriculture and Committee on Science. House bill introduced Sept. 9, 1999; referred jointly to Committee on Agriculture and Committee on Science. Science Subcommittee on Energy and Environment held hearing October 28, 1999.

S. 1003 (Rockefeller)

Alternative Fuels Promotion Act. Provides increased tax incentives for the purchase of alternative fuels and electric vehicles and for other purposes. Introduced May 11, 1999; referred to Committee on Finance.

S. 1047 (Murkowski)/H.R. 1828 (Bliley)

Comprehensive Electricity Competition Act (The Clinton Administratration ‘s proposed bill). Senate bill introduced May 13, 1999; referred to Committee on Energy and Natural Resources. Hearings held June 29 and July 15, 1999, and April 11, April 13, and April 27, 2000. House bill introduced May 17, 1999; referred to Committee on Commerce, and to the Committees on Resources, Agriculture, Transportation and Infrastructure, and the Judiciary. Commerce Subcommittee on Energy and Power held hearings June 17 and July 22, 1999.

S. 1369 (Jeffords)

Clean Energy Act. Creates incentive for renewable energy and other measures under electricity restructuring. Introduced July 14, 1999; referred to Committee on Energy and Natural Resources.

S. 1776 (Craig)

Climate Change Energy Policy Response Act. Support alternative energy policies, regulation, R&D, and deployment of renewable energy technologies to help curb greenhouse gas emissions. Introduced October 25, 1999; referred to Committee on Energy and Natural Resources. Hearing held March 30, 2000.

S. 2557 (Lott)

National Energy Security Act of 2000. Contains provisions on hydropower and tax credits for renewable energy equipment and power production. Introduced May 16, 2000; placed on Senate calendar. Motion to proceed passed September 22.

CONGRESSIONAL HEARINGS, REPORTS, AND DOCUMENTS

U.S. Congress. Senate. Committee on Appropriations. Subcommittee on Energy and Water. DOE FY2001 Budget Request. Hearing held April 11, 2000.

U.S. Congress. Senate. Committee on Energy and Natural Resources. Electricity Legislation (S. 1369). Hearing held April 11, 2000.

U.S. Congress. Senate. Committee on Energy and Natural Resources. Subcommittee on Energy Research, Development, Production, and Regulation. Climate Change: S. 882 and S. 1776. Hearing held March 30, 2000.

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Table 3. DOE Renewable Energy Budget for FY1999-FY2001
($ millions)

Program	FY1999 Apprn.	FY2000 Apprn.	FY2001 Request	FY2001 House	FY2001 Senate	FY2001 Conf.
Solar Buildings	3.6	2.0	4.5	4.0	4.5	4.0
Photovoltaics	70.6	67.0	81.5	75.8	76.5	75.8
Concentrating Solar Power	16.8	15.4	15.0	13.8	14.0	13.8
Biofuels - Total	72.1	72.0	101.9	79.6	91.4	86.2
Biofuels/Utility Power	30.8	32.5	47.8	33.5	47.6	40.0
Biofuels/Transportation	41.2	39.5	54.1	46.2	43.8	46.2
Wind	34.1	33.0	50.1	36.9	43.6	40.0
Production Incentive	4.0	1.5	4.0	3.9	4.0	4.0
Solar Program Support	0.0	5.0	6.5	2.0	3.0	4.0
International Renewables	6.3	4.0	11.5	6.0	6.0	5.0
NREL (incl. construction)	3.9	1.1	1.9	4.0	4.0	4.0
Geothermal	28.2	24.0	27.0	27.0	28.0	27.0
Hydrogen	22.0	25.0	22.9	22.0	31.0	27.0
Small Hydro	3.2	5.0	5.0	3.4	5.5	5.0
Renew. Amer. Indian Res.	4.8	4.0	5.0	2.0	6.6	6.6
Electric/Storage	40.9	38.4	47.9	41.9	59.0	52.0
Program Direction	18.1	17.7	18.2	18.2	18.0	18.7
Dept. Energy Management	0.0	0.0	5.0	2.0	2.0	2.0
RENEWABLES, Subtotal	332.3	315.1	407.8	343.4	397.0	375.0
Reductions/Prior Year/Increase	-1.0	0.0	0.0	0.0	0.0	0.0
RENEWABLES, Adjusted	331.3	315.1	407.8	343.4	397.0	375.0
OS/Photovoltaics Rsch.	2.9	2.8	2.8	2.8	2.8	2.8
OS/Biomass-Biofuels	27.2	26.7	26.7	26.7	26.7	26.7
OS/Wind	0.3	0.3	0.3	0.3	0.3	0.3
OS/Solar Photoconversion	14.5	14.3	14.3	14.3	14.3	14.3
OS/Hydrogen	3.0	3.0	3.0	3.0	3.0	3.0
OS/Subtotal	47.9	47.1	47.1	47.1	47.1	47.1
RENEWABLES, with OS	380.2	362.2	454.8	390.5	444.1	422.1
RENEWABLES with OS, Adjusted	379.2	362.2	454.8	390.5	444.1	422.1

Source: H.Rept. 106-988; H.Rept. 106-907; S.Rept. 106-395; H.Rept. 106-693; DOE FY2001 Cong. Budget Request, v. 3; Feb. 2000.