Summary and Analysis of S. 1462: American Clean Energy Leadership Act of 2009, As Reported

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Summary

As reported by the Senate Committee on Energy and Natural Resources, the six titles of S. 1462 are intended to address the energy security of the United States by promoting the development of clean energy technologies, improving energy efficiency, encouraging the development of domestic energy resources, promoting energy innovation and energy workforce development, improving the stability of U.S. energy markets, and informing energy strategies through a series of studies and reports. Some of these provisions build on similar or related provisions in the Energy Policy Act of 2005 (EPACT05, P.L. 109-58), the Energy Independence and Security Act of 2007 (EISA07, P.L. 110-140) and appropriations under the American Recovery and Reinvestment Act of 2009 (ARRA, P.L. 111-5).

This report compares S. 1462 with certain energy provisions in H.R. 2454, the American Clean Energy and Security Act of 2009, although there are substantial differences. H.R. 2454 is a broader bill that includes a greenhouse gas cap-and-trade system not found in the Senate Committee bill. (The energy provisions in S. 1462 are expected to be considered by the Senate when crafting its own greenhouse gas bill with input from other key committees.)

Title I of S. 1462 would promote the commercial deployment of clean energy technologies by modifying the Loan Guarantee Program and increasing Department of Energy's (DOE's) authority to offer additional financial incentives.

Title II promotes enhanced energy efficiency through a combination of policies that target manufacturing, appliances, buildings, and the electric grid.

Title III is intended to enhance U.S. energy security, according to the Committee Report, by addressing the issues of critical electric infrastructure and its vulnerability to cyber attack; nuclear waste disposal and reprocessing; additional petroleum storage; expansion of oil and gas leasing in certain offshore areas; development of renewable energy resources on public lands; large-scale and long-term geologic storage of CO_2; and reduction of the reliance of U.S. island territories on imported fossil fuels.

Title IV contains provisions for advancing energy innovation and workforce development, including a variety of energy research, development, demonstration, and commercial application activities; a Grand Energy Challenges Research Initiative to integrate basic and applied energy research programs; expanding and modifying several energy programs, including the Advanced Research Projects Agency—Energy; domestic vehicle battery manufacturing research; lightweight materials research and development; methane hydrate research and development; low-Btu gas and helium resources conservation; Arctic energy research, development, and deployment; and ultra-deepwater and unconventional natural gas and other petroleum resources R&D.

Title V contains several measures designed to stabilize the oil, natural gas, and electricity markets and to enhance energy security.

Title VI would provide direction and authorization for a number of studies and reports that would inform energy programs and policies.

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Introduction

The American Clean Energy Leadership Act of 2009 (ACELA, S. 1462), an energy policy bill reported out of the Senate Committee on Energy and Natural Resources on July 16, 2009, would expand the deployment of clean energy technologies, improve energy efficiency and energy security, encourage innovation and workforce development, and strengthen the monitoring functions over energy markets, according to the Committee (S.Rept. 111-48). This report provides a summary of the provisions under each of the titles and subtitles in the bill, and compares them with other relevant legislation. In particular, the report relates the provisions of S. 1462 to similar or identical provisions contained in the House-passed version of H.R. 2454, the American Clean Energy and Security Act of 2009 (ACES), and to spending or tax provisions contained in the American Recovery and Reinvestment Act of 2009 (ARRA, P.L. 111-5).

Although this bill is compared with certain energy provisions in H.R. 2454, substantial differences exist between the provisions of this bill and the energy provisions of the combined energy-climate change bill in the House. H.R. 2454 is a broader bill that includes a greenhouse gas cap-and-trade system not found in the Senate Committee bill. Instead, separate climate legislation is to be developed in the Senate Committee on Environment and Public Works and in the Senate Finance Committee. Climate change legislation developed in the Senate may or may not be combined with these energy provisions in S. 1462 to produce a package that might be conferenced with H.R. 2454. (For more details on the House bill, see CRS Report R40643, *Greenhouse Gas Legislation: Summary and Analysis of H.R. 2454 as Passed by the House of Representatives* , coordinated by (name redacted) and (name redacted).)

Several CRS analysts contributed to this summary and analysis of S. 1462; their names and contact information are located at the back of the report.

Key Provisions

The six titles of S. 1462 focus on clean energy technologies, energy efficiency, domestic energy resources, energy innovation and energy workforce development, the stability of U.S. energy markets, and a series of studies related to future energy strategies. Some of these provisions build on similar or related provisions in the Energy Policy Act of 2005 (EPACT05, P.L. 109-58), the Energy Independence and Security Act of 2007 (EISA07, P.L. 110-140), and appropriations under ARRA.

Title I would promote the commercial deployment of clean energy technologies by modifying the Loan Guarantee Program and increasing Department of Energy's (DOE's) authority to offer additional financial incentives. It would establish a Clean Energy Deployment Administration (CEDA), which would be a quasi-independent agency under the DOE. CEDA would use a Clean Energy Investment Fund to operate a broad program of lending and other incentives to stimulate the deployment of innovative and commercial clean energy technologies. In addition, the Federal Energy Regulatory Commission (FERC) would be given an expanded role and authority to coordinate the implementation of a national transmission infrastructure policy through regional plans, and to exercise federal eminent domain authority to ensure that land is available for siting transmission lines. This title would also establish a federal Renewable Energy and Energy Efficiency requirement for electric utilities that sell electricity to end users. Such utilities would have to obtain a percentage of their annual power supply from renewable energy or energy efficiency starting at 3% in 2011 and rising incrementally to 15% by 2021. It would provide for

research and analysis of the impact of energy production on U.S. water resources, and of the use of energy in the water sector. This provision is motivated by increasing awareness in Congress of the relationship between energy and water (the energy-water "nexus") whereby changes affecting one resource may directly influence the cost, availability, or quality of the other. Finally, this title would promote the deployment of advanced technology vehicles, especially electric and plug-in hybrid vehicles that reduce petroleum consumption and greenhouse gas emissions.

Title II promotes enhanced energy efficiency through a combination of policies that target manufacturing, appliances, buildings, and the electric grid. By providing government-backed loans to developers of energy-efficient technologies, the bill would accelerate the implementation of industrial and commercial applications of technologies or processes to enhance efficiency and U.S. industrial competitiveness, and would establish research and innovation programs to develop new energy-efficient manufacturing technologies. Energy and water efficiency of consumer products, industrial equipment, and lighting is promoted through improved testing processes and a more sophisticated application of the EnergyStar Program. Energy efficiency in buildings is addressed through improved model building codes and standards, a grant program for multifamily and manufactured housing efficiency improvements, establishment of training centers for development of building efficiency expertise, weatherization assistance for low-income persons, energy-efficiency retrofit programs, and mechanisms for encouraging energy efficiency in federal agencies. The efficiency of the electric grid would be enhanced by using smart grid technologies to reduce peak demand, according to an interagency plan, and directing the Federal Energy Regulatory Commission to establish a national interconnection standard.

According to the Senate Committee, Title III is intended to enhance U.S. energy security by addressing critical electric infrastructure, nuclear waste disposal, additional petroleum storage, expansion of oil and gas leasing in certain offshore areas, development of renewable energy resources on public lands, large-scale and long-term geologic storage of CO_2, and reduction of the reliance of U.S. island territories on imported fossil fuels. This portion of the bill provides for expedited procedures and mechanisms to mitigate a cyber threat to the nation's electric infrastructure. A National Commission on Nuclear Waste would be established to study alternative means of managing or disposing of spent nuclear fuel and waste from civilian nuclear plants; alternatives would include reprocessing of spent fuel. Preparations for physical or economic disruptions in petroleum supply would be enhanced by the establishment of a strategic reserve of refined petroleum products to complement the existing strategic reserve of crude oil. This section also expedites the conduct of an inventory of Outer Continental Shelf oil and gas resources, as directed in EPACT05, and would open portions of the eastern Gulf of Mexico to leasing. Title III also promotes the development of renewable energy resources on federal lands by modifying the permitting process, requiring a programmatic environmental impact statement for wind and solar development and establishing a series of field offices to manage the program. Provisions in this title provide for establishment of partnerships for 10 large-scale demonstration projects for geologic storage of CO_2 and would provide $10 billion per project for indemnification. Finally, Title III would establish the Affiliated Island Energy Independence Team to provide technical, programmatic, and financial assistance to the Commonwealth of Puerto Rico, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, and the United States Virgin Islands to reduce reliance on imported fossil fuels through increased efficiency and the use of indigenous clean-energy resources.

Title IV contains provisions for advancing energy innovation and workforce development. Provisions include authorizing funds for a variety of energy research, development,

demonstration, and commercial application activities; establishing a Grand Energy Challenges Research Initiative to integrate basic and applied energy research programs; improving a collection of energy programs, including the Advanced Research Projects Agency—Energy, domestic vehicle battery manufacturing research, lightweight materials research and development, methane hydrate research and development, low-Btu gas and helium resources conservation, Arctic energy research, development, and deployment, and ultra-deepwater and unconventional natural gas and other petroleum resources R&D. This title would provide a training program to build expertise for an energy workforce, and would support subsurface geosciences and engineering education and training programs.

Title V contains several measures designed to stabilize the oil, natural gas, and electricity markets and to enhance energy security. It would enhance the ability of the Energy Information Administration (EIA) to collect data about product ownership and inventories for oil and natural gas in the United States. This title would establish an office within EIA, along with an interagency working group on energy markets, to monitor prices of crude oil and refined petroleum product and to recommend any statutory authority that may be needed to oversee and regulate energy markets. The Federal Energy Regulatory Commission would be authorized to issue temporary emergency orders to suspend or modify tariff rates, terms, or conditions if necessary to protect electric consumers, and to issue cease-and-desist orders to prevent the manipulation of the electric or natural gas markets.

Title VI would provide direction and authorization for a number of studies and reports that would include assessing helium and potash resources, improving energy policy planning, addressing climate change in China and India, assessing the risk of international carbon leakage resulting from a cap-and-trade program, examining foreign fuel subsidies, assessing biofuel energy resources, reviewing the efficiency of electric generation facilities, evaluating the emissions of alternative transportation fuels, and identifying options for reaching specific goals in the reduction of U.S. dependence on foreign oil.

Brief Legislative History of S. 1462

The following legislative history is taken verbatim from the report of July 16, 2009, by the Committee on Energy and Natural Resources (S.Rept. 111-48):

> The text of the American Clean Energy Leadership Act was drawn from 6 bills introduced by the Chairman, 3 of which were cosponsored by the Ranking Republican Member, and 9 chairman's marks. The 6 bills introduced were:
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> S. 531, the Energy and Water Integration Act of 2009, introduced by Mr. Bingaman for himself and Ms. Murkowski on March 5, 2009, which became subtitle D of title I;
>
> S. 598, the Appliance Standards Improvement Act of 2009, introduced by Mr. Bingaman for himself and Ms. Murkowski on March 16, 2009, which became subtitle B of title II;
>
> S. 661, the Restoring America's Manufacturing Leadership through Energy Efficiency Act of 2009, introduced by Mr. Bingaman for himself, Ms. Collins, Ms. Stabenow, Ms. Snowe, Mr. Bayh, Mr. Brown, and Mr. Pryor on March 19, 2009, which became subtitle A of title II;
>
> S. 949, 21st Century Energy Technology Development Act, introduced by Mr. Bingaman for himself, Ms. Murkowski, Mr. Dorgan, Mr. Voinovich, Ms. Stabenow, Mr. Lugar, and Ms. Shaheen on April 30, 2009, which became subtitle A of title I;

S. 967, the Strategic Petroleum Reserve Modernization Act of 2009, introduced by Mr. Bingaman on May 4, 2009, which became subtitle C of title III; and

S. 1013, the Department of Energy Carbon Capture and Sequestration Program Amendments Act of 2009, introduced by Mr. Bingaman for himself, Mr. Barrasso, Mr. Dorgan, Mr. Tester, Mr. Bayh, Ms. Landrieu, Mr. Casey, and Mr. Voinovich on May 7, 2009, which became subtitle F of title III.

The nine chairman's marks were on: energy innovation and workforce; siting of interstate electric transmission facilities; nuclear waste management; cyber security; building efficiency; federal oil and natural gas development; renewable energy development on public lands; energy markets; and policy studies and reports. The Committee marked up the bill in 11 open business meetings on March 31, May 6, May 13, May 14, May 19, May 21, June 4, June 9, June 11, June 16, and June 17, 2009. The Committee considered 219 filed amendments (or divisions thereof), adopted 100, rejected 33, and 86 were either withdrawn or not offered. On June 17, the Committee ordered the legislation, as amended, favorably reported as an original bill.

Title I—Clean Energy Technology Deployment

Subtitle A—Clean Energy Financing[1]

Summary and Analysis of This Subtitle

A Clean Energy Deployment Administration (CEDA) would be established as a quasi-independent agency under the Department of Energy (DOE).[2] CEDA would use a Clean Energy Investment Fund to operate a broad program of lending and other incentives aimed at stimulating the deployment of both "innovative" and "commercial" clean energy technologies. Over a transitional period of 18 months, CEDA would absorb the existing DOE Loan Guarantee Program,[3] which was established by Title XVII of the Energy Policy Act of 2005 to support "innovative" energy technologies and was later expanded by ARRA to allow support for certain "commercial" energy technologies and transmission equipment.

Under the EPACT05 provisions, from August 2006 through September 2008, DOE issued five solicitations for loan guarantee projects. In July 2009, DOE issued two more solicitations, funded mainly by ARRA, for fast track (by the end of FY2011) renewable energy, electric power transmission, and leading edge biofuel projects.[4] DOE noted that it had "streamlined its processes to accelerate these new loan solicitations." The first loan guarantee under the program was issued September 4, 2009, to a solar panel manufacturer.[5]

[1] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov, and James Bickley, 7-...., [redacted]@crs.loc.gov.

[2] Senate staff indicate that the intent of the legislation is to establish CEDA with a status that would be similar to that of the Federal Energy Regulatory Commission (FERC).

[3] The Loan Guarantee Program is currently administered by DOE's Office of Chief Financial Officer (CFO).

[4] The solicitation was issued on July 29, 2009, http://www.lgprogram.energy.gov/press/072909.pdf

[5] The loan guarantee is for $535 million to Solyndra Corporation to support construction of a new manufacturing facility. The guarantee was announced on March 20, 2009. Upon a matching commitment of $198 million from Argonaut Private Equity, Solyndra was able to close on the loan guarantee. Ground-breaking took place on September (continued...)

In August 2009, Congress voted to use $2.0 billion of the ARRA appropriation to extend the "cash-for-clunkers" program, which encourages consumers to scrap old, inefficient cars and to buy new, efficient ones.

S. 1462 would modify the Loan Guarantee Program and increase DOE's flexibility to offer additional financial incentives. Two of the proposed changes have been particular subjects of debate. First, the bill addresses a limitation set by the Federal Credit Reform Act (FCRA).[6] Under the current Loan Guarantee Program, FCRA Sec. 504(b) requires new budget authority or other funding limits to cover the subsidy costs (the present value of estimated long-term costs to the government) that might result from any expansion of the portfolio of projects.[7] The Senate bill would exempt CEDA from the requirement for new budgetary authority to support loan guarantees, and instead would allow balances in the fund to cover the cost of loan guarantees. Opponents of the provision argue that it "would circumvent the appropriations process," would likely lead to an underestimate of costs, and could also "allow for potentially unlimited loan guarantees, disproportionately benefit more expensive and risky technologies, and fail to ensure that the cleanest technologies are prioritized."[8] Proponents counter-argue that "simply being in an appropriations process does not change the risk calculation," and that the bill "continues to require full accounting of risks and costs of CEDA loans and loan guarantees in exactly the same way that all loan and loan guarantee programs are currently handled." They emphasize that FCRA Sec. 503(d) would still apply, requiring annual reviews of "the performance of outstanding direct loans and loan guarantees to improve estimates of costs."[9]

Second, an issue affecting the debt financing structure surfaced in 2007 during DOE's rulemaking process for the current Loan Guarantee Program. The rule has been criticized for prohibiting a shared priority (pari passu) collateral structure for project debt. Under present DOE rules, the Department's guaranteed portion of the debt would have a first claim (lien position) on all assets of a project and any additional collateral pledged by the borrower. This means that any co-lenders of the unguaranteed portion of the project debt would be subordinated to the government-guaranteed debt. This situation has posed a deterrent to potential private sector co-lenders, according to industry groups. The Senate bill proposes to allow "pari passu" financing, wherein

(...continued)

4, 2009. http://www.energy.gov/news2009/7078.htm

[6] Title V of P.L. 101-508. Prior to FCRA implementation in FY1992, in any given fiscal year, the budgetary cost of a new loan or loan guarantee was reported as its net cash flow for that fiscal year. The entire amount of a new direct loan was recorded as an outlay. In contrast, a new loan guarantee was treated simply as a contingent liability and thus had no reported cost. Those cash flow measures did not accurately reflect the true cost of a loan or loan guarantee. The true cost of each instrument is its accrual cost, which reflects the full subsidy cost over the entire life of the loan or loan guarantee. Subsidy costs are calculated on a net present value basis and include defaults net of recoveries, interest subsidies, and fees. This accrual accounting places the cost of federal credit programs on a budgetary basis that is equivalent with other federal outlays. See CRS Report RL30346, *Federal Credit Reform: Implementation of the Changed Budgetary Treatment of Direct Loans and Loan Guarantees*, by (name redacted).

[7] Cornelius E. Tierney et al. Federal Accounting Handbook (2d Ed). Appendix: Federal Credit Reform. 2007.

[8] Union of Concerned Scientists et al. Untitled letter addressed to Members of the Senate Energy and Natural Resources Committee. June 16, 2009.

[9] Senate Committee on Energy and Natural Resources. Response to Criticisms of the Clean Energy Deployment Administration (CEDA) Contained in the June 16, 2009 "Group Letter" Addressed to Members of the Committee on Energy and Natural Resources. (undated)

DOE would take an equal lien position with other lenders in making claim to collateral for the debt.[10]

CEDA Goals, Structure, and Operations

The Secretary of Energy would be required to develop goals for clean energy technology deployment and provide short- and long-term numerical targets.[11] CEDA would be operated by an administrator and a board of directors that would have "substantial independence" within DOE. The Administrator would be directed to "enhance, but not displace, private markets, and to promote a self-sustaining portfolio of investments." A "direct support unit" would be created to issue loans, loan guarantees, letters of credit, insurance products, or other financial instruments. A loan loss reserve would be established to provide an internal mechanism for balancing risks and returns in the portfolio. An "indirect support unit" would aim to create financial products designed to leverage private sector participation and to aggregate private debt into more marketable products. Classifications and pricing structures may be created to provide transparency and efficiency. CEDA would be allowed to issue securities based on the debt it holds.[12]

Clean Energy Investment Fund

A Clean Energy Investment Fund would be established as a revolving fund in the Treasury for expenses needed to conduct the loan guarantee program. The purpose of the fund would be to "make the program stable over the long term and limit the need for annual appropriations." Fund resources would be available "without fiscal year limitation." Any combination of balances in the revolving fund, or payments by the borrower, could be used to cover the subsidy cost of a loan guarantee.[13] CEDA would be allowed to share the collateral risk by spreading it out in equal amounts with other lenders. Fees collected for administrative expenses would be required to be deposited in the Fund.

The existing functions and authorities of the DOE Loan Guarantee Program would be transferred to CEDA within 18 months after enactment.[14] At the same time, a direct appropriation of $10 billion would be transferred to the Fund. Fee payments could be retained in the fund for further use. To encourage the development of "breakthrough" technologies, CEDA would be directed to

[10] This provision appears in section 103(b)(3). DOE proposed to modify its loan guarantee regulations on August 7, 2009, to allow pari passu financing (74 Federal Register 39571).

[11] The Secretary would be required to revise the goals periodically, in response to changes in policy and advances in technology.

[12] Section 106(a)(2) would allow CEDA to "insure, purchase, and make commitments to purchase, any debt instrument associated with the deployment of clean energy technologies" and to "acquire, hold, and sell" any debt (or interest in the debt) associated with the deployment of clean energy technologies. CEDA would be empowered to "lend on the security of, and make commitments to lend on the security of, any debt that the Administration has issued or is authorized to purchase under this section." Based on the debt, it would be authorized to give security or guarantee; pay interest or other return; and issue notes, debentures, bonds, or other obligations or securities.

[13] This authority would be achieved by amending section 1702(b) of EPAct 2005 and by waiving section 504(b) of the Federal Credit Reform Act (FCRA, Title V of P.L. 101-508).

[14] The Loan Guarantee Program is currently administered by the Office of the Chief Financial Officer under the authority of the Secretary of Energy.

reduce fees, to "the extent compatible with sound business practices." All activities would be required to yield "an appropriate rate of return."

Comparison to Similar Provisions in H.R. 2454

There are three key differences between the two proposals: organizational structure, funding, and potential effect on technology. First, the House bill would establish CEDA as an independent corporation wholly owned by the federal government,[15] and it would modify the existing DOE Loan Guarantee Program but otherwise leave it in place.[16] In contrast, the Senate Energy Committee proposed that CEDA be established as an agency within DOE[17] and that CEDA and the Clean Energy Investment Fund absorb the entire DOE Loan Guarantee Program.[18]

Second, there are differences in how the fund would be structured and funded. Given CEDA's proposed status as an independent corporation, the House proposed that the Department of the Treasury would issue $7.5 billion in new authority for CEDA to issue "green" bonds to support the fund.[19] Raising funds from bond sales would not be consistent with the FCRA concept that funds be obtained through the appropriations process. In contrast, the Senate panel proposed that $10.0 billion be transferred from the Treasury and that subsidy costs be treated outside FCRA requirements.[20] Further, the Senate proposal would eliminate the FCRA requirement for new budgetary authority to support loan guarantees.[21] In a case where the project sponsors pay the subsidy cost, no appropriations would be required and, thus, there would be no cap on these loan guarantees.

Third, in comparison with the House bill, the Senate Energy proposal would allow greater support for nuclear power project development. The House proposal[22] would prohibit any single category of energy technology (including nuclear power) from receiving more than 30% of CEDA's total financial support. That restriction is expected to affect nuclear power projects more than others because those projects generally require a much larger capital investment and there are more nuclear projects currently proposed than other technology projects. There is no similar constraint in the Senate Energy bill.

[15] H.R. 2454, Section 186.

[16] H.R. 2454, Section 181. Further, Section 187 would forbid CEDA from providing direct or indirect support to projects receiving support from the Loan Guarantee Program.

[17] S. 1462, Section 105.

[18] S. 1462, Sections 107 and 103.

[19] H.R. 2454, Section 184. Section 106(a)(2) of the Senate Committee bill would empower CEDA to issue bonds and other debt instruments. However, that bill does not propose a specific bond issuance as the House bill did.

[20] S. 1462, Section 107.

[21] Section 103 of S. 1462 would waive section 504(b) of FCRA, which requires that loan guarantee ceilings be set in appropriation bills. Some have suggested that nuclear power facilities would be the main beneficiary of lifting that cap.

[22] H.R. 2454, Section 187.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

ARRA (§406) provided $6.0 billion for a "temporary program for rapid deployment of renewable energy and electric power transmission projects."[23] Also, up to $500 million of that total may be appropriated for "leading edge biofuels projects."[24] The $6.0 billion appropriation was expected to leverage more than $60 billion in loan guarantees, mainly to support renewable energy projects. In July 2009, DOE issued two solicitations, funded mainly by ARRA, to fast track (by the end of FY2011) those renewable energy, electric power transmission, and biofuel projects.[25] DOE noted that it had "streamlined its processes to accelerate these new loan solicitations."

In August 2009, Congress voted to use $2.0 billion of the ARRA appropriation for loan guarantees to extend the "cash-for-clunkers" program, which encourages consumers to scrap old, inefficient cars and to buy new, more-efficient ones.[26] In House floor debate over the measure, the House Speaker stated:

> I am concerned about the fact that that money [$2.0 billion] is taken from that [loan guarantee program] account, but it has not cost any opportunities for the program, because the timing is such that that [loan guarantee] money would be spent next year. I do hope, whether it's in the continuing resolution or some other step along the way, that those funds will be restored.[27]

The $2.0 billion transfer represents one-third of the total ARRA funding for the Loan Guarantee Program.

Subtitle B—Improved Transmission Siting[28]

Summary and Analysis of This Subtitle

The provisions of Title B relate to transmission policy, planning, and siting. The bill would establish a multi-faceted national transmission policy. The first principle listed is "support for the development of new renewable energy generation capacity," but there are numerous other objectives, including cost savings, reliability enhancement, reduced power plant emissions, and

[23] The $6.0 billion appropriation appears in the conference report (H.Rept. 111-16) on page 26 under the heading "Title XVII – Innovative Technology Loan Guarantee Program." The description of the special focus and temporary nature of the new $6.0 billion program appears under §406 on page 31.

[24] The provision specifies that the carve-out is for "[l]eading edge biofuel projects that will use technologies performing at the pilot or demonstration scale that the Secretary determines are likely to become commercial technologies and will produce transportation fuels that substantially reduce life-cycle greenhouse gas emissions compared to other transportation fuels.

[25] The solicitation was issued on July 29, 2009. http://www.lgprogram.energy.gov/press/072909.pdf

[26] The initial $1.0 billion was appropriated by the Consumer Assistance to Recycle and Save (CARS) Program, which was enacted as section 1301 of the Supplemental Appropriations Act, 2009 (P.L. 111-32). The $2.0 billion extension, which drew funding from the ARRA provision for loan guarantees, was enacted as Making Supplemental Appropriations for Fiscal Year 2009 for the Consumer Assistance to Recycle and Save Program (P.L. 111-47).

[27] *Congressional Record*, July 31, 2009, p. H9237. Parenthetical comments added for clarification.

[28] Prepared by Stan Kaplan, 7-...., [redacted]@crs.loc.gov.

maximizing "the contribution of demand side management (including energy efficiency and demand response), energy storage, distributed generation resources, and smart grid investments."

Transmission planning would be required to reflect these policy objectives. The bill would direct FERC to "coordinate regional [transmission] planning to ensure that regional plans are integrated into an Interconnection-wide transmission plan with respect to high-priority national transmission projects." "High-priority national transmission projects" are high-voltage lines or renewable feeder lines that are part of a regional transmission plan.

The siting provisions would give FERC the authority to site and permit "high-priority national transmission projects" that have been rejected or not timely acted on by state regulators. FERC's authority would extend to the Eastern and Western Interconnections, but not to the Texas Interconnection.[29] If a federally authorized project involves federal land, the Department of the Interior (DOI) would act as the lead agency for coordinating federal environmental and other reviews.

These provisions would constitute a substantial departure from historic transmission regulation, which has centered on state control of construction decisions. Although the states would retain transmission project permitting authority in the first instance, FERC's backstop siting authority would be broadened compared to the authority granted by the Energy Policy Act of 2005. Planning would be given a regional and national focus under the aegis of FERC. And transmission planning would be defined as a kind of integrated electric power planning, required to consider a range of alternatives to traditional central station power plant and transmission line construction. In respect to planning and construction, development of renewable energy projects would be a policy objective, but not the sole or even necessarily the primary objective.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

Title I, Subtitle F of the House bill (ACES), "Transmission Planning," includes policy, planning and siting provisions. The policy goals and planning processes are directed to focus primarily on facilitating the "deployment of renewable and other zero-carbon and low carbon" power sources. Other objectives are noted, such as power system reliability and cost effective service, but these are to be met in the context of the overarching goal of facilitating renewable/zero-carbon power deployment. FERC's role in the planning process is to be more one of facilitator than the directive role outlined in ACELA. FERC is given the authority to supersede state authority over transmission siting only in the Western Interconnection, and then only for projects that meet certain criteria, including "identified as needed in significant measure to meet demand for renewable energy."

[29] The electric power grid covering the contiguous states is divided into three units, which operate for the most part independently. The Texas Interconnection, also known as ERCOT, covers most of Texas. The Eastern Interconnection extends from the east coast to the edge of the Rockies. The Western Interconnection covers the balance of the contiguous states. These provisions also exclude Alaska and Hawaii.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

Title IV of Division A of ARRA appropriates $80 million to be used by DOE to support regional transmission planning. Sec. 406 of this title creates a "temporary [loan guarantee] program for rapid deployment of renewable energy and electric power transmission." Qualifying projects must be able to start construction no later than September 30, 2011.

Subtitle C—Federal Renewable Electricity Standard[30]

Summary and Analysis of This Subtitle

Sec. 132 of the Senate Committee bill would establish a federal renewable electricity standard (RES) for electric utilities that sell electricity to consumers (for purposes other than resale). Such utilities must obtain a percentage of their annual electricity supply from renewable energy sources or energy efficiency, starting at 3% in 2011 and rising incrementally to 15% by 2021.

Renewable sources are defined as wind, solar, geothermal, and ocean energy; biomass, landfill gas, qualified hydropower (i.e., incremental additions since 1992), marine and hydrokinetic energy, coal-bed methane, and qualified waste-to-energy. Other types of renewable energy resulting from innovative technologies may be qualified by the Secretary of Energy via a rulemaking.

The requirements are to be met by the annual submission of federal renewable energy credits (RECs), but up to 26.67% of the requirement may be met by energy-efficiency credits (EECs) in any one year (following a petition by a state's governor). Alternative compliance payments (ACPs) of 2.1 cents per kilowatt-hour are permitted *in lieu* of meeting the renewable electricity standard, with these payments going directly to the state in which the electric utility is located. Trading of RECs is permitted, and banking of RECs is allowed for up to three years; RECs are retired when submitted for compliance. EECs are awarded for electricity savings verifiably achieved by the electric utility's actions. The Secretary of Energy will provide guidelines and regulations for measurements and baseline definitions in the award of EECs. No EECs will be awarded for compliance with conservation or energy-efficiency standard programs.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

The structure and definitions of the Renewable Electricity and Energy Efficiency provisions in H.R. 2454 and S. 1462 are essentially the same with regard to eligible renewable energy technologies. Incremental hydropower added after 1992 can be considered renewable energy under the Senate version, as opposed to 1988 in the House version.

S. 1462 requires compliance with its renewable electricity standard to begin in 2011, one year earlier than the House version. The state of Hawaii is exempted from compliance in the Senate bill. The Senate requirement advances to a maximum of 15% renewable electricity (of which

[30] Prepared by Richard Campbell, 7-...., [redacted]@crs.loc.gov.

energy efficiency may constitute as much as 26.67%); the House requirement has a maximum of 20% renewable electricity, of which up to 25% may come from energy efficiency.

The implementing agency is designated as DOE in the Senate bill, while the House version has FERC implementing the provision. Retail electric suppliers may receive RECs for complying with a state RES by generating or buying renewable electricity under the Senate bill, but not in the House bill. The Senate Energy bill has no parallel provision to the House bill's recognition of renewable energy programs implemented by states that centrally purchase renewable energy.

The alternative compliance payment is 2.1 cents per kilowatt-hour (kwh) in the Senate Energy bill, compared with 2.5 cents per kwh in the House version. ACP funds can be used for non-renewable energy deployment or energy efficiency under the Senate Energy bill, with generation from nuclear, coal with carbon sequestration and storage, and electric vehicle deployment being eligible. Direct grants to customers to offset higher costs from the RES are also allowed by the Senate bill from ACP funds. The House does not allow for a waiver of RES requirements, while the Senate Energy bill allows for deferment due to extremes of weather or nature, to avoid utility rate incremental impacts of more than 4% in any year, or because of transmission constraints preventing delivery of service. There is no provision in the House bill for loans to help electric utilities comply with the RES.

The House bill increases the federal renewable energy purchase requirement beginning in 2012 to 6%, raising it to 20% by 2020, where it remains to 2039. The Senate Energy version stays with the lesser requirements in the Energy Policy Act 2005.

The House bill defines one renewable energy credit as representing one megawatt-hour of renewable electricity; a similar definition is assumed (but not specified) in the Senate Energy version. Both renewable energy and energy-efficiency credits can be traded in the Senate bill, while only renewable electricity credits can be traded in the House legislation. Triple credits are granted when electricity is provided through distributed generation (DG).

Definitions of distributed generation eligible for triple RECs differ between the two bills. The Senate Energy bill defines DG systems as being at or near a customer site, providing electric energy to one or more customers for purposes other than resale to a utility through a net metering arrangement. The House version defines DG as a facility that generates renewable electricity, primarily serving one or more electric consumers at or near the facility site, which is no larger than 2 megawatts at the time of enactment (or 4 megawatts after enactment), generating electricity without combustion. This rules out biomass or municipal solid waste combustion as eligible sources of DG. Both provisions require electricity generation, thus ruling out thermal applications (for example, hot water or steam systems). While not specifying a size limit on DG systems, the Senate only gives triple RECs to DG systems less than 1 MW; the House gives triple RECs to all eligible DG systems.

The two bills differ in the exclusions that would be allowed from the calculation of a utility's total annual electricity supply, called the "base quantity of electricity." This is the amount of annual electricity supply that the renewable energy and efficiency percentages would be applied to. By reducing the annual base quantity, the exclusions would also reduce the total amount of renewable energy and efficiency that would be required.

Both bills exclude existing hydro (except qualified hydro), nuclear capacity placed in service after the date of enactment, and the quantity of electricity in a CCS facility proportional to the amount

of greenhouse gases (GHGs) sequestered. The Senate Energy bill additionally excludes capacity of a municipal solid waste facility owned by, or sold under contract/rate order to, an electric utility, and nuclear power plant efficiency improvements and capacity additions made after the date of enactment.

Subtitle D—Energy and Water Integration[31]

Summary and Analysis of This Subtitle

Subtitle D provides for research and analysis of the impact of energy production on U.S. water resources, and of the use of energy in the water sector. The subtitle is motivated by increasing awareness in Congress of the relationship between energy and water (the energy-water "nexus"), whereby changes affecting one resource may directly influence the cost, availability, or quality of the other. To date, energy-water data collection and analysis have been mostly fragmented, anecdotal, or incomplete. In general, Congress has been seeking more information about energy-water relationships as an aid to developing more integrated energy and water policies.

Sec. 141 calls for a National Academy of Sciences study of the "energy-water nexus," which refers to the impacts on water resources of energy production, defined broadly to include both electric power and transportation fuels. Relevant water uses likely include cooling of electric power plants; hydroelectric power generation; irrigation water for biofuel crops; the use of water in oil and natural gas production (e.g., hydrofracturing); water requirements in fuel refining; and other water uses.

Sec. 142 would require the Secretary of Energy to identify water efficiency strategies and technologies in fossil-fuel-fired, solar thermal, and nuclear power generation. Taken together, these provisions would provide information on the water resource implications of changes in the nation's power generation portfolio in the context of volatile fossil fuel prices and policies to reduce U.S. greenhouse gas emissions.

Sec. 143 would require the Secretary of the Interior to study the energy used for storing and delivering water at major Bureau of Reclamation projects, and the identification of opportunities to reduce this consumption and its costs. Significant energy can be consumed in delivering water, especially in such states as California, where large quantities are lifted and transported long distances. No similar Bureau of Reclamation studies have been previously authorized or performed.

Sec. 144 directs the Secretary of the Interior to operate a federally constructed brackish groundwater desalination research facility in New Mexico. Previously, there had been consideration of having a nonfederal entity be the operator. The facility is charged with developing cost-effective desalination technologies for brackish and impaired groundwater in inland states, including the integration of desalination and renewable energy technologies and the desalination of water from oil and gas production. A significant barrier to greater adoption of desalination is the energy intensity of available technologies.

[31] Prepared by Nicole Carter, 7-...., [redacted]@crs.loc.gov, and Paul Parfomak, 7-...., [redacted]@crs.loc.gov.

Sec. 145 seeks to address a lack of data about energy use in the procurement, delivery, end use, and treatment of water to clarify linkages between energy efficiency and water efficiency in the United States. Few surveys or reports by federal agencies characterize water withdrawal or consumption at the level of specific end-uses such as clothes washing, landscape watering, or industrial process cooling use. Likewise, there are no systematic and comprehensive studies of energy used by water utilities for water withdrawal, delivery, treatment, or recycling. Consequently, the section requires the Department of Energy to develop a baseline of water use and water-related energy use across the U.S. economy that may ultimately be comparable to the end-use energy information available from the agency's Energy Information Administration.

Sec. 146 directs the Secretary of Energy to develop an energy-water roadmap defining future research and development efforts to address the energy-water nexus; a report to Congress describing the roadmap and recommended actions would be required within 120 days of enactment. This section builds on previous legislation calling for reports on the energy-water nexus and creation of a DOE energy-water program (e.g., P.L. 109-58 § 979).

Sec. 147 would require the Secretary of Energy to offer competitive technology demonstration grants focused on saving energy through water conservation in commercial, residential, and mixed-use development projects. The grants are intended to direct attention to new opportunities for energy efficiency that may be overlooked by programs focused on water savings only.

Sec. 148 would offer technical assistance for energy and water efficiency to rural drinking water and wastewater utilities, many of which may lack the resources to identify and pursue cost-effective savings opportunities on their own.

Sec. 149 mandates a study, led by the Department of Energy, examining industrial water use, peak energy use in water treatment and delivery, nonpotable (e.g., recycled) water, and energy "embedded" in water by water utilities. These aspects of the water-energy relationship are viewed as particularly lacking in market data and offering significant potential for both water and energy savings. Accordingly, the study would determine ways to promote the efficient use of water and energy.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

No similar provisions to Subtitle D are in H.R. 2454. However, the House bill (§215) would formally establish an existing agency-initiated WaterSense program at the U.S. Environmental Protection Agency. The program identifies and promotes water-efficient products, buildings, and landscapes that may reduce energy consumed for pumping, transporting, treating, and heating water. Although H.R. 2454 contains no provision similar to of S. 1462 on energy used by Bureau of Reclamation water projects, the House bill (§195) would require an update of an earlier multi-agency report on the potential for expanding hydroelectric power generation at federal water facilities.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

Although CRS was unable to identify uses by the Department of the Interior (DOI) or the Army Corps of Engineers of ARRA funds for the specific activities authorized by Subtitle D, activities

that could complement Subtitle D were funded. For instance, $13.5 million in DOI's ARRA funds was directed to constructing a new energy- and water-efficient building for Bureau of Reclamation regional operations in Boulder City, NV.

Subtitle E—Vehicle Technology Deployment[32]

Summary and Analysis of This Subtitle

Secs. 151 through 155 would establish grant programs and require federal studies in support of advanced technology vehicles, especially electric and plug-in hybrid vehicles. Most notably, Sec. 152 would require the Secretary of Energy to establish a program to provide grants to state and local governments for the demonstration and commercial application of plug-in hybrid vehicles. Funds would be used to carry out eligible programs, including support for vehicle purchases, installation of recharging infrastructure, and electric grid upgrades. Sec. 154 would establish a pilot program to provide grants for the demonstration of pre-commercial plug-in vehicles in the federal fleet, and for the installation of recharging infrastructure at federal facilities. Mandated studies would include a comprehensive analysis of energy use in light-duty vehicles by the National Academy of Sciences, an assessment of the necessary infrastructure to support electric vehicles, and a report to Congress with recommendations for establishing and adopting industry standards for electric drive transportation. In all cases, the bill authorizes "such sums as are necessary," as opposed to authorizing a specific amount of funding.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

H.R. 2454 would provide much more support for advanced vehicles than would S. 1462. Most notably, a significant share of allowances from H.R. 2454's cap-and-trade program would be allocated to support manufacturing of plug-in hybrid and other advanced vehicles. Distribution of these allowances would effectively make them grants to automakers and parts suppliers—including battery manufacturers—and could easily be worth $1 billion or more each year. Other support for advanced vehicles in H.R. 2454 includes an expansion of Energy Independence and Security Act's (EISA's) Advanced Technology Vehicle Manufacturing (ATVM) loan program, and new model standards that state regulatory authorities and non-regulated electric utilities may adopt. H.R. 2454 would authorize (but not require) the Secretary of Transportation to establish standards requiring automakers to produce flexible fuel vehicles (FFVs). H.R. 2454 would require the Environmental Protection Agency to establish greenhouse gas emissions standards for heavy-duty and non-road vehicles and engines, and would require states and metropolitan planning organizations (MPOs) to establish greenhouse gas emissions reduction plans.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

ARRA established a program of $2.0 billion for facility funding grants to manufacturers of advanced battery and battery system components. Covered activities include the production of

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lithium ion batteries, hybrid electrical systems, system components, and software. ARRA also appropriated $400 million in transportation electrification grants, and provided $300 million to provide grants to states, localities, and metropolitan transit agencies for the purchase of alternative fuel and advanced technology vehicles.

Title II—Enhanced Energy Efficiency

Subtitle A—Manufacturing Energy Efficiency[33]

Summary and Analysis of This Subtitle

DOE would be directed to help manufacturers increase the use of new technology to improve energy efficiency, stimulate economic growth, improve industrial competitiveness, and reduce GHG emissions, in preparation for a possible carbon-constrained global marketplace.

A DOE grant program is proposed that would support the formation of revolving loan programs that would be operated by partnerships among states, community development lenders, and private financial institutions.[34] The loans would help manufacturers increase energy productivity, enable production of clean energy technologies, and improve industrial competitiveness. A total of $1.5 billion is authorized, $500 million for each fiscal year from 2010 to 2012. The grants would go to lenders in the state partnerships, who would be responsible for ensuring a minimum 50% non-federal match. The short time frame of the authorizations for manufacturing plant upgrades would mean that industry would have to be prepared to quickly evaluate the costs and benefits of capital equipment decisions.

Another DOE cost-shared competitive grant program would be made available to state-industry partnerships to develop and deploy innovative energy-efficient industrial technologies and processes, with the goals of reducing energy use, pollution, and GHG emissions, while improving industrial cost competitiveness.[35] The federal portion of each grant would be capped at $500,000, and would require an equal or greater non-federal match.

DOE would be directed to establish additional Industrial Research and Assessment Centers (IACs) and to establish Centers of Excellence at the top-performing IACs for coordination with other federal agency programs that support manufacturing and building technology programs.[36]

Organizational changes at DOE and/or other federal agencies would be required under three provisions. First, R&D partnerships would be established between programs under the Office of Industrial Technologies (OIT) and other programs under the Office of Energy Efficiency and Renewable Energy (EERE) and the Office of Science (OS). Those partnerships would be focused on promoting transfer of "early stage" technology development and manufacturing capabilities to industry.[37] Second, an industry-government R&D partnership would be established within OIT, in

[33] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov, and Richard Campbell, 7-...., [redacted]@crs.loc.gov.

[34] This provision appears in Sec. 201 of the Senate Committee bill.

[35] This provision appears in Sec. 206 of the Senate Committee bill.

[36] This provision appears in Sec. 204(c) of the Senate Committee bill.

[37] This provision appears in Sec. 202 of the Senate Committee bill.

collaboration with the National Institute of Standards and other agencies, to help industry shift toward "sustainable" manufacturing and industrial processes.[38] Third, an advisory steering committee would be established to make recommendations on planning and implementation of OIT's programs.[39]

DOE planning activities and studies would be required by three provisions. First, DOE would be required to prepare an assessment of the energy and GHG emissions reduction potential of commercially available energy-efficiency technologies that are not yet widely deployed across energy-intensive industries.[40] Second, DOE would be directed to produce industry-specific technology road maps for a "Future of Industry" program aimed at further reducing energy intensity and GHG emissions.[41] Third, DOE would be required to arrange for the National Academy of Sciences to study opportunities and barriers to developing new manufacturing capabilities for producing "advanced" energy technologies. The study would focus on the development of a "clean technology supply chain" that would secure the domestic production of "high value" equipment and prevent its loss to overseas competitors.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

The Senate Committee bill's proposal to establish state revolving loan programs is identical to a provision in the House bill, except that the proposed authorization of $1.5 billion over three years is far less than the House bill's proposal to provide $30.0 billion over two years.[42]

Each bill also would support technology transfer and deployment through the use and expansion of "centers" at universities. The Senate Committee bill would expand the number of IACs and create "Centers of Excellence" at some of them to serve as sources of "best practices" for "sustainable" manufacturing, to conduct supply chain analysis, and to provide coordination among the IACs, other federal technology centers, and the national laboratories. The House bill has three provisions to expand or strengthen the centers with broader, but related, purposes.[43] First, "energy innovation hubs" would be established to promote deployment of clean energy technologies to support regional economic development, reduce GHG emissions, and support national technological leadership.[44] Second, "centers for energy and environment" would support industry, clean energy applications, and buildings technology deployment.[45] Those centers would include a training component. Third, "building assessment centers" would be created to support applications of new technologies and the development of training and education programs.[46]

[38] This provision appears in Sec. 205 of the Senate Committee bill.

[39] This provision appears in Sec. 208 of the Senate Committee bill.

[40] This provision appears in Sec. 203 of the Senate Committee bill.

[41] This provision appears in Sec. 204(b) of the Senate Committee bill.

[42] The provisions appear in Sec. 201 of the Senate Committee bill and Sec. 246 of the House bill.

[43] Sec. 172 of the House bill would support industry research collaborations and development of manufacturing processes, but those activities would take place under the ARPA-E program and would not be associated with the establishment or expansion of university-based "centers."

[44] This provision appears in Sec. 171 of the House bill.

[45] This provision appears in Sec. 174 of the House bill.

[46] This provision appears in Sec. 173 of the House bill.

In sum, this subtitle of the Senate Committee bill appears to be focused mainly on manufacturing and competitiveness. The House bill includes those aims, but within a broader context of more general goals for accelerated clean energy equipment deployment and the potential for clean energy industries to stimulate regional economic development.

The Senate Committee bill has seven provisions that do not appear in the House bill. All are described under the previous section. Those provisions include the innovation deployment grants,[47] organizational changes,[48] and the planning and study provisions.[49]

Similarly, the House bill has three provisions that do not appear in the Senate Committee bill.[50] First, an existing industrial standards program would be expanded to include plant energy-efficiency certification standards.[51] Second, DOE would be directed to create a monetary award program to spur innovation in thermal energy recovery by owners and operators of electric power plants and industrial facilities.[52] Third, the Department of Commerce would be directed to establish a clean energy manufacturing supply chain initiative to help manufacturers transition to the use of clean energy, reduce energy intensity, curb GHG emissions, and increase the use of innovative manufacturing technologies. That initiative would seem to closely complement the proposal, in both bills, for DOE to support the creation of state revolving loan programs to aid manufacturers.[53]

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

ARRA (Title IV) provided $2.0 billion for facility funding grants to manufacturers of advanced battery and battery system components. Covered activities include the production of lithium ion batteries, hybrid electrical systems, system components, and software. In a related action, the Continuing Resolution for FY2009 (P.L. 110-329) provided $7.5 billion to leverage a $25 billion loan program to retool facilities to produce fuel-efficient advanced technology vehicles.

ARRA (§1302) established a tax credit that can be used to re-equip, expand, or establish a facility that is designed to manufacture equipment that is used to produce renewable energy (solar, wind geothermal, and other), fuel cells, microturbines, energy storage systems for electric/hybrid vehicles, certain electric grid equipment, renewable fuels property, energy-efficiency technologies, smart grid equipment, plug-in hybrid vehicles, and equipment to capture and sequester carbon dioxide. ARRA allows up to $2.3 billion in credits to be allocated. JCT estimated the cost at $1.6 billion over 10 years.

[47] Section 206 of the Senate Committee bill.

[48] Sections 202, 205, and 208 of the Senate Committee bill.

[49] Sections §203, 204(b), and 207 of the Senate Committee bill.

[50] Those provisions, and the others in the House bill, are described in CRS Report R40643, *Greenhouse Gas Legislation: Summary and Analysis of H.R. 2454 as Passed by the House of Representatives* , coordinated by (name redacted) and (name redacted).

[51] This provision appears in Section 241 of the House bill.

[52] This provision appears in Section 242 of the House bill.

[53] This provision appears in Section 247 of the House bill. The proposal for revolving loan programs was described in the previous section.

Subtitle B—Improved Efficiency in Appliances and Equipment[54]

Summary and Analysis of This Subtitle

Energy-efficiency standards for certain appliances and equipment would be established or strengthened. Specifically, new standards would be legislated for portable light fixtures, certain lamps, and commercial furnaces. New procedures would be set in place to allow public requests to revise test procedures and to change efficiency standards. A rebate program would be established for energy-efficient motors. Studies would be undertaken on DOE compliance with legislated standards, the use of direct current in certain buildings, and an assessment of a proposed Energy Superstar category under the Energy Star program.

Over the past three decades, Congress has legislated efficiency standards for many types of appliances and given DOE authority to set standards by rulemaking for many others. As new energy-using technologies are brought into commercial use, opportunities continuously arise to establish efficiency standards for new categories of equipment. Also, new technologies, such as sensors and computer controls, may create opportunities to improve efficiency for devices where it may have previously been difficult or impossible. Further, as technologies advance, opportunities may arise to improve efficiency beyond the level where previous standards had been set. The provisions of the Senate bill address efficiency opportunities within each of those three categories.

The formation of federal appliance standards has historically taken place within a context of major tensions between industry concerns about regulation and state initiatives to set standards. When a variety of state standards emerged, industry tended to seek federal action to set a uniform national standard. Further, tensions between opponents and proponents of new federal standards have occasionally led to court disputes. For the most part, however, such tensions have been addressed through a collaborative process that brings together affected industries with proponents of new efficiency standards. That process, in turn, has often led to the resolution of major differences before legislative proposals are introduced. That appears to be the case with the standards proposed in the Senate Committee bill.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

The two bills have several identical and similar provisions for improving efficiency in appliances and equipment. There are identical lighting efficiency standards proposed for portable light fixtures, art work light fixtures, GU-24 base lamps, and incandescent reflector lamps. The bills also propose identical efficiency standards for commercial furnaces. Regarding motor efficiency, the two bills have identical provisions for rebates and market assessments. Both bills propose to revamp the DOE-EPA Energy Star Program. Each would require periodic updates of product eligibility criteria (every three years) and assessments of product compliance with criteria.[55] As points of difference, the Senate bill would call for an update of the cooperative agreement between the two agencies, while the House bill would seek an update of the rating system. Also,

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[55] Those provisions address a concern that technological improvements gradually erode the relative energy efficiency of products identified with the EPA Energy Star label.

the Senate bill calls for DOE to assume responsibility to implement an Energy Star program for solid state lighting equipment.

Five provisions in the Senate Committee bill do not appear in the House bill, of which two involve the standards-setting process and three call for studies. Regarding the standards process, the Senate Committee bill would establish a petition process to prescribe or amend test procedures for consumer and industrial products[56] and a 180-day response period for DOE to address any petition that seeks a rulemaking to amend an efficiency standard.[57] One proposed study calls for DOE and EPA to assess the feasibility of establishing a new "Energy Superstar" designation for products and buildings that make up about 5% of the most efficient products in a market.[58] A second study would examine the degree of compliance with energy-efficiency standards for appliances.[59] The third study would analyze the potential costs and benefits of requiring certain buildings to use high-quality direct current electricity instead of alternating current.[60]

Eleven provisions for appliance efficiency appear in the House bill, but do not appear in the Senate Committee bill. One of those provisions would revise the criteria for prescribing new or amended efficiency standards to include the estimated value of reduced emissions of carbon dioxide and other greenhouse gases.[61] The proposed criteria would require that the carbon output of each covered product be included on the mandatory EnergyGuide labels. Such a change in criteria would mark a major shift in the concept of appliance efficiency from being based solely on energy use to binding energy use and carbon displacement into a single metric.

Another House provision would establish incentives for manufacture and sale of "best-in-class" appliances.[62] Retailers would be rewarded with bonuses for increasing sales of highly (upper 10%) efficient building equipment, consumer electronics, and household appliances. Bounties would be established for retailers that replace and recycle inefficient appliances. Also, a bonus program would be created for manufacturers that develop new "superefficient best-in-class" products.

The other nine appliance provisions found only in the House bill include five that would legislate efficiency standards and four that would create programs or incentives. Two lighting standards would be set: one for outdoor luminaires and one for outdoor high-output lamps.[63] Three additional equipment standards would be set for water dispensers, portable electric spas, and commercial hot food holding cabinets.[64] Three water efficiency programs would be established: a Watersense program at EPA, a federal procurement program for water-efficient products, and an early adopter program for water efficiency incentives.[65] A residential wood stoves program would

[56] The provision for test procedures appears in Sec. 221 of the Senate bill.

[57] The provision for amending standards appears in Sec. 223 of the Senate bill.

[58] The Superstar provision appears in Sec. 232 of the Senate bill.

[59] The compliance provision appears in Sec. 229 of the Senate bill.

[60] The direct current provision appears in Sec. 230 of the Senate bill.

[61] The carbon standard provision appears in Sec. 213 of the House bill.

[62] The "best-in-class" provision appears in Sec. 214 of the House bill.

[63] Both outdoor lighting provisions appear in Sec. 211(a) of the House bill.

[64] All three equipment standards provisions appear in Sec. 212 of the House bill.

[65] The water efficiency provisions appear, respectively, in Secs. 215, 216, and 217 of the House bill.

be established to certify air pollution controls and provide incentives for replacing inefficient stoves.[66]

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

ARRA appropriated $300 million to EPA to support a program to provide consumers with rebates to buy energy-efficient Energy Star products to replace old appliances and help lower energy bills. The program was authorized by EPACT05 (Sec. 124), which directed DOE to fund rebate programs in eligible states to support residential end-user purchases of Energy Star products.

Subtitle C—Building Efficiency[67]

Summary and Analysis of This Subtitle

Building energy efficiency would be improved through updates in national model building energy codes for new construction, establishment of grant and finance programs, strengthening of certain requirements for federal agency energy use, creation of a voluntary energy performance information program, and establishment of a residential high performance zero-net-energy buildings initiative.

Achieving energy-efficiency improvements in a building is a much more complex undertaking than, for example, improving efficiency in an appliance.[68] The array of critical barriers to improving energy efficiency in buildings has been well documented.[69] In particular, the regional nature of building codes (e.g. houses in Minneapolis need more insulation than houses in Los Angeles) and other factors have made it impractical to set a single national building energy code. Instead, DOE has used its analytic capacity to develop model energy codes for residential and commercial buildings that states can adopt and adapt to local circumstances. The Senate Energy Committee bill would revamp the current model code processes, require regular future updates to the model codes, and provide incentives to states to employ the codes or equivalent alternatives. The bill also authorizes grants, financial support, and other initiatives to encourage improved efficiency in buildings.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

The two bills have several provisions that are similar and, in some cases, nearly identical. The Senate Committee bill's proposal to establish a program of updates in the national model building energy code is very similar to a provision in the House bill.[70] DOE would be required to update

[66] The provision for wood stoves appears in Sec. 218 of the House bill.

[67] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov.

[68] Recent developments of industry guidelines for "green building" construction and renovation have helped spur interest in advancing building energy efficiency codes.

[69] For a discussion of barriers, see CRS Report R40670, *Energy Efficiency in Buildings: Critical Barriers and Congressional Policy*, by (name redacted), (name redacted), and (name redacted).

[70] The provisions appear in Sec. 241 of the Senate bill and Sec. 201 of the House bill.

the residential and commercial codes every three years. For future updates, the target for nationwide energy savings would be set 30% higher than the baseline for updates in and after 2010, and then would rise to 50% for updates after January 1, 2016. All model code updates would be coordinated with updates of specified industry standards. Federal training and funding assistance would be available to states that adopt advanced building efficiency codes. States would be required to certify their code updates and code compliance with DOE. Overall, the Senate Committee and House building energy code provisions are similar, with some minor differences in timetables and administrative procedures. One difference is that the Senate bill would authorize appropriations of $100 million per year for five years, while the House bill would authorize such sums as necessary and provide funding from the auction of a share of allowances derived from a cap-and-trade program.

The Senate Committee bill's proposal to establish a program for the retrofit of existing buildings has several similarities to provisions in the House bill.[71] Both bills would direct EPA to establish a broad program of criteria and financial support for residential buildings and direct DOE to establish a parallel program for commercial buildings. There are some differences in the energy performance criteria and the structure of the financial assistance mechanisms, but the provisions are otherwise quite similar.

Four other policies and programs proposed in the Senate bill have nearly identical companions in the House bill: national energy-efficiency goals,[72] building and training and assessment centers,[73] energy savings performance contracts (ESPCs) for federal agencies,[74] and an implementation strategy for federal agency use of energy-efficient information and communication technologies.[75] Regarding a fifth policy for manufactured housing, the two bills have an identical provision for a low-income rebate, but the Senate bill includes additional provisions for innovation in manufactured and multifamily housing.[76]

Eight provisions in the Senate Committee bill do not appear in the House bill. A potentially major provision would establish a zero-net-energy initiative for residential buildings.[77] The goal is to reduce overall energy use while increasing the share of onsite renewable energy. Nearly $1 billion would be authorized over 11 years to support pilot programs, technical assistance, and other means to address the split incentives market failure,[78] technological challenges, and other barriers.

[71] The provisions appear in Secs. 262 and 266 of the Senate bill and Sec. 202 of the House bill.

[72] The proposed goals appear in Sec. 275 of the Senate bill and Sec. 272 of the House bill.

[73] The proposed centers appear in Sec. 243 of the Senate bill and Sec. 173 of the House bill.

[74] The ESPC proposals appear in Sec. 272 of the Senate bill and Sec. 251 of the House bill.

[75] The communication technology strategies appear in Sec. 277 of the Senate bill and Sec. 271 of the House bill.

[76] The manufactured housing provisions appear in Sec. 242 of the Senate bill and Sec. 203 of the House bill.

[77] Sec. 291 of the Senate bill.

[78] Misplaced, or split, incentives are transactions or exchanges in which the economic benefits of energy efficiency conservation do not accrue to the person who is trying to achieve energy savings. The terms have been used to describe certain classes of relationships, primarily in the real estate industry between landlords and tenants with respect to acquisition of energy-efficient equipment for rental property. When the tenant is responsible for the energy/utility bills, it is in the landlord's interest to provide least-first-cost equipment rather than more efficient equipment for a given level of desired service. There is relatively little incentive for the landlord to increase his or her own expense to acquire efficient equipment (e.g., refrigerators, heaters, and light bulbs) because the landlord does not bear the burden of the operating costs and will not reap the benefits of reducing those costs. This misplaced incentive is believed to extend to the commercial sector; however, most of the literature on misplaced incentives focuses on the residential sector. See William H. Golove and Joseph H. Eto. *Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency.* DOE. Lawrence Berkeley National Laboratory, 1996.

Three provisions (purchasing requirement, funding flexibility, and agency incentives) would address federal energy efficiency and renewable energy opportunities.[79] Two provisions (energy performance information and evaluation/verification assessments) would aim to improve the ability to monitor increases in building energy efficiency and the cost-effectiveness of programs.[80] Also, the Senate Energy Committee bill would reauthorize the DOE Weatherization and State Energy programs for FY2011 through FY2015.[81] The Weatherization Program would be authorized $1.7 billion per year and the State Energy Program would be authorized $250 million per year.

Several provisions in the House bill do not appear in the Senate Committee bill. In particular, 28 provisions make up a subtitle of the House bill entitled "Green Resources for Energy Efficient Neighborhoods." The provisions focus mainly on establishing a variety of programs, projects, standards, and incentives to support programs for energy-efficient mortgages and for selected programs at the Department of Housing and Urban Development (HUD). There are no similar provisions in the Senate bill.

One House provision would direct EPA to establish a building energy performance labeling program that would apply broadly to residential and commercial building markets.[82] The goal is to encourage owners and occupants to reduce energy use. EPA is required to consider existing programs, such as the Home Energy Rating System and DOE programs. Also, EPA is required to develop model performance labels for residential and commercial buildings and to use incentives and other means to spur the use of labels by public and private sector buildings. There is no similar provision in the Senate bill.

Eight other assorted provisions of the House bill cover tree planting programs, energy efficiency in data centers, solar energy building permits, residential solar equipment installations, community energy-efficiency flexibility, small community joint participation, low-income community energy efficiency, and consumer behavior research.[83] There are no similar provisions in the Senate bill.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

ARRA provided $5.0 billion for the DOE Weatherization Program, $3.1 billion for the DOE State Energy Program, and $3.2 billion for the DOE Energy Efficiency Block Grant program. Under the appropriation for DOE's Office of Energy Efficiency and Renewable Energy, the ARRA conference report (H.Rept. 111-16) included a carveout appropriation of $50.0 million for R&D on the energy efficiency of information and communication technologies. In the federal buildings sector, ARRA provided $4.5 billion to the General Services Administration to support a program of high performance green buildings in federal agencies. Certain appropriations for other agencies

[79] The federal provisions appear in Secs. 271, 273, and 278.

[80] The information provision appears in Sec. 281 and the evaluation/verification provision appears in Sec. 282.

[81] The Weatherization provision appears in sec. 251 and the State Energy Program provision appears in Sec. 255.

[82] The provision appears in Sec. 204 of the House bill.

[83] The provisions appear, respectively, in Secs. 205, 206, 208, 209, 262, 263, 264, and 265.

were targeted for building construction and other activities that could include building energy-efficiency measures.[84]

Subtitle D—Electric Grid[85]

Summary and Analysis of This Subtitle

Although this part of the bill is titled "Electric Grid," the actual focus of Subtitle D is peak demand management. Peak demands on an electric system—that is, the periods when demand is at its highest—tend to be short lived, but account for a disproportionate share of total system capacity and costs. Reducing peak demand, and improving the system load factor (i.e., the ratio between average and peak demand), can yield substantial cost savings.

Sec. 295 of the subtitle would establish a national policy for continuously improving load factors on electric power systems through 2030, and directs the Secretary of Energy to lead a combined government and industry effort to develop an action plan to achieve this goal. The plan is to be updated triennially and DOE is to make concurrent progress reports to Congress. However, the bill does not create (with the one exception discussed below) any new executive authority or legal requirements on utility systems that would mandate adoption of the action plan.

One of the approaches that can be used to reduce peak demand on a utility system is more use of generation located at a customer site, often referred to as "distributed generation." Sec. 296 of this subtitle would amend the Public Utility Regulatory Policies Act of 1978 to require the state regulatory authorities that oversee utilities, and self-regulating utilities (like many municipal systems) to consider adopting rules that would facilitate connecting small distributed generation sources to the power grid.[86]

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

ACES includes in Title I, Subtitle E, Sec. 144, a provision requiring utilities to establish peak demand reduction goals for 2012 and 2015. There is no penalty that applies if a utility fails to meet its goal.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

ARRA includes numerous provisions related to funding energy efficiency. See CRS Report R40412, *Energy Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)*, coordinated by (name redacted).

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[84] For more about those appropriations, see CRS Report R40412, *Energy Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)*, coordinated by (name redacted).

[85] Prepared by Stan Kaplan, 7-...., [redacted]@crs.loc.gov.

[86] The limit is initially 15 kilowatts of capacity with a possible adjustment in the future such that the rules would apply to customer-owned generation with a capacity of up to 50 kilowatts. These are very small units. By way of comparison, a small power plant would might have a capacity of 100,000 kilowatts.

Title III—Improved Energy Security

Subtitle A—Cyber Security of the Electric Transmission Grid[87]

Summary and Analysis of This Subtitle

This subtitle would give executive agencies new emergency authority to direct "any entity that owns, controls, or operates critical electric [power system] infrastructure" to take steps to block a cyber security "threat" or "vulnerability."

- A "cyber security threat" is imminent danger of a cyber attack on critical electric infrastructure. The Secretary of Energy would have authority to issue emergency orders to block such a threat.
- A "cyber security vulnerability" is a security weakness that exposes critical electric infrastructure to a cyber security threat. The Federal Energy Regulatory Commission would have authority to issue emergency orders to resolve such a vulnerability.

Reflecting the assumptions that cyber-security attacks on the electric power system could develop rapidly and be exceptionally dangerous to national security, prior notice is not required for such orders, and consultation with other agencies or industry is only required to the extent practicable. The Secretary of Energy is encouraged to consult and coordinate with appropriate officials in Canada and Mexico. Emergency orders by FERC or the Secretary would terminate after 90 days unless within the 90-day period FERC provides an opportunity for written comment and decides to affirm the order. No open hearing is required, and it appears that if the emergency measure is affirmed during the initial 90-day period it can continue indefinitely.

This provision would apply throughout the contiguous states. In the case of Alaska, Hawaii, and Guam, the Secretary of Defense (in consultation with DOE, the states, the territory, and industry) is to prepare a comprehensive plan defining the measures to be taken to protect the electric power supply to national defense installations in those areas from an imminent cyber security threat.

There are no similar provisions in the House-passed bill or in ARRA.

Subtitle B—Nuclear Energy[88]

Summary and Analysis of This Subtitle

In response to the Obama Administration's proposal to abandon the planned national nuclear waste repository at Yucca Mountain, NV, this subtitle would establish a National Commission on Nuclear Waste to make recommendations to Congress on alternative waste management strategies. The commission would consist of 11 members appointed by the President who are

[87] Prepared by Stan Kaplan, 7-...., [redacted]@crs.loc.gov.

[88] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov.

prominent in professions relevant to nuclear waste policy and who "shall be fairly balanced in terms of the points of view represented." Federal or state employees would not be eligible.

Alternative waste management strategies to be studied by the commission include deep geologic repositories, such as Yucca Mountain, long-term waste storage at nuclear power plants and other existing sites, regional storage facilities, and waste reprocessing and recycling technologies. The commission would also be required to analyze previous DOE efforts to develop nuclear waste sites, recommend financial incentives to potential host states and localities, and study alternative approaches to administering and financing the program.

The nuclear waste commission provisions in this subtitle would provide congressional direction to the Administration's proposed "blue ribbon" nuclear waste advisory panel included in the FY2010 DOE budget request. The budget request would eliminate further planning and development of the Yucca Mountain repository, but it would continue funding for consideration of the repository license application that is currently before the Nuclear Regulatory Commission. The House included $5 million for the Administration's blue ribbon panel in its version of the FY2010 Energy and Water Development Appropriations Bill (H.R. 3183). However, the House-passed bill specifies that the blue ribbon panel must "consider all alternatives for nuclear waste disposal," including Yucca Mountain, which the Administration wants to terminate. The Senate-passed version of the appropriations bill approves the full budget request but does not include any language on the proposed commission.

This subtitle of S. 1462 also includes a "sense of Congress" finding on the importance of nuclear energy and additional requirements for research and development of "an integrated, proliferation-resistant, spent nuclear fuel recycling or transmutation process."

No provisions in this subtitle are similar to any provisions in H.R. 2454, nor to any spending provisions in ARRA.

Subtitle C—Improving United States Strategic Reserves[89]

Summary and Analysis of This Subtitle

The Strategic Petroleum Reserve (SPR) comprises five underground storage facilities, hollowed out from naturally occurring salt domes in Texas and Louisiana. It is currently filled with crude oil to near its capacity of 727 million barrels. In the event that it is tapped, 4.4 million barrels can be drawn down initially, and enter into markets within about two weeks. The Energy Policy and Conservation Act (P.L. 94-163) authorized drawdown of the Reserve upon a finding by the President that there is a "severe energy supply interruption." Congress enacted additional authority in 1990 (Energy Policy and Conservation Act Amendments of 1990, P.L. 101-383), to permit use of the SPR for short periods to resolve supply interruptions stemming from situations internal to the United States.

The Senate legislation would make three major changes to the SPR program. It (1) would require that the SPR include 30 million barrels of refined product; (2) would transfer authority for a drawdown from the President to the Secretary of Energy; and (3) would amend the drawdown

[89] Prepared by Rob Bamberger, 7-...., [redacted]@crs.loc.gov.

authority to permit drawdown and sale in the event of a "severe energy market supply interruption" that has caused, or is expected to cause, "a severe increase" in prices.

The proposal to establish product reserves very likely stems from the sharp increase in the price of gasoline during 2008 that was attributed, in part, to a different market situation than has been the historic norm. In the past, inadequate supplies of refined products have had, as their principal cause, a shortage in crude supply, or uncertainty about crude supply that becomes reflected in market distribution. However, high prices in 2008 occurred in a setting where the supply of product was tight in some regions, even though crude itself was plentiful. Drawdown of the SPR is currently premised on crude oil supply, and not product supply or price.

The Senate report on the bill does not provide an explanation for the vesting of authority for a drawdown with the Secretary of Energy rather than the President. Some may believe that the Secretary might be inclined to call for a drawdown sooner than the President because the Secretary presumably has closer contact on energy-supply developments, or that a decision by the Secretary to call upon the SPR would be less freighted with political considerations. However, the reason for the change is unspecified.

The proposal to shift from premising drawdown on a "severe energy market supply interruption" instead of a "severe energy supply interruption" may be the most sweeping shift in the Senate bill provisions affecting the SPR. As has been noted, the current authorities authorize drawdown based upon crude supply. While a shortage of crude generally expresses itself in higher prices for both crude and products, many calls for tapping of the SPR when prices have spiked have brought the response that the SPR is not supposed to be used to respond to high prices. The Senate Committee bill's proposed change, if enacted, adds language permitting a drawdown of SPR oil if a "market supply interruption" has brought about high prices, or is expected to do so. Expressed another way, a drawdown can be initiated not just to respond to supply conditions "upstream" or "downstream," but to supply *and* price conditions.

If enacted, the legislation would require a report to Congress within 180 days describing what refined products would be acquired for the Reserve and how they would be acquired at minimal cost or disruption of markets. The report would be required to assess storage options (which would need to be above-ground) and "the anticipated location of existing or new facilities." Presumably, some analysis would need to be undertaken to identify regions that might be likeliest affected by incapacitation of normal product distribution, as well as seasonal differences in the refined product itself.

No similar provisions are included in H.R. 2454 or ARRA.

Subtitle D—Federal Oil and Gas Development[90]

Summary and Analysis of This Subtitle

Congress is currently debating how much of the outer continental shelf (OCS) should be open for oil and gas development. Opening up the OCS is seen by some as a way to increase domestic

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supply and improve U.S. energy security; others contend that OCS development has risks for the coastal environment and coastal communities, and that other options are available for energy security. The Gulf of Mexico Energy Security Act of 2006 (GOMESA, P.L. 109-432) placed nearly all of the eastern Gulf of Mexico under a leasing and drilling moratorium until 2022 but allowed leasing in designated portions of the eastern Gulf.

This subtitle would amend GOMESA to open the eastern Gulf of Mexico (EGoM) beyond 45 miles of Florida's coastline but also would open an area known as the Destin Dome, where there are existing leases located 25-30 miles offshore northwest Florida. Destin Dome leases are currently suspended until 2022 under GOMESA. All other areas within 45 miles of Florida's coastline in the EGoM would be remain under a moratorium until 2022.

The Minerals Management Service (MMS) conducts assessments of undiscovered technically recoverable resources (UTRR) on the U.S. OCS. The statistical certainty of these assessment estimates varies by region because of wide variations in the availability of geologic data. For example, the extensive exploration and production histories of the central and western Gulf of Mexico and southern California provide a comparatively greater amount of geologic data to use for assessments. In contrast, much of the remainder of the U.S. OCS has seen little exploration and production of oil and gas. Therefore, estimates of UTRR along the Atlantic Coast, much of the Pacific Coast, and coastal Alaska carry significant uncertainties.

To address the concerns over resource inventory uncertainty, this subtitle would amend Sec. 357 of EPACT05 and require a seismic inventory (using 2-D and 3-D seismic technology) of the oil and gas resources in the Atlantic, eastern Gulf of Mexico and Alaska regions of the OCS. A report from the Secretary of the Interior to Congress on the implementation (including an estimate of the costs) of the seismic inventory would be required. Funding would be authorized to carry out the inventory at $100 million each year for fiscal years 2010-2015 and $50 million each year for years 2016-2020.

The subtitle would also repeal royalty relief for shallow water deep gas and for deepwater oil and gas enacted under EPACT05 (Secs. 344 and 345), would require that the Director of the MMS be confirmed by the Senate, and would provide that, under certain terms and conditions, a high-pressure natural gas pipeline may be permitted by the Secretary of the Interior in specified non-wilderness areas within Denali National Park. This subtitle would amend the Trans-Alaska Pipeline Authorization Act (43 U.S.C. 1651 et seq.) to exempt the trans-Alaska pipeline from certain requirements, establish an Alaskan Office for OCS permit processing, and provide for the production of geothermal energy on oil and gas leases.

Currently, EISA Sec. 526 prohibits federal agencies from procuring alternative, synthetic, or nonconventional petroleum-based transportation fuels without contract provisions that limit the fuel's lifecycle greenhouse gases emission to those of equivalent conventional petroleum-based fuels. This provision has been interpreted as blocking federal purchases of oil-sand-derived petroleum imports from Canada, which have been a growing segment of U.S. fuel supplies. Sec. 356 of the Senate Committee bill would exempt federal purchases of oil-sand-derived fuel from the EISA requirement if such fuel were included in a general fuel contract that did not specifically call for unconventional fuel.

No similar provisions are included in H.R. 2454 or ARRA.

E—Public Land Renewable Energy Deployment[91]

Summary and Analysis of This Subtitle

This subtitle would establish Pilot Project Field Offices throughout the western United States and Alaska to improve federal permit coordination for renewable energy projects. The federal share of royalties from wind or solar energy production would be deposited in a special Treasury fund to be known as the "BLM Wind and Solar Energy Permit Processing Improvement Fund." A programmatic environmental impact statement (PEIS) would be required for solar power on public lands within one year, and a PEIS would be required for solar and wind power on National Forest Service land within 18 months of enactment of this legislation.

A study would be conducted by the National Academy of Sciences on the siting, development, and management of projects for the production of wind and solar energy. Matters to be addressed in the study would include the effectiveness of current laws and policies, the advantages and disadvantages of using rights of way (ROW) for wind and solar development, and the potential advantages and disadvantages of using a competitive or noncompetitive leasing system for wind and solar development. Also, the Secretary of the Interior would be required to establish a wind and solar leasing pilot program. The Secretary would make a determination not later than 30 months after the enactment of this legislation on whether to implement a leasing program for solar and wind power on public land.

Development of renewable energy such as solar and wind is currently governed by right-of-way authorities under Title V of the Federal Land Policy and Management Act of 1976 (FLPMA; 43 U.S.C. §§1761-1771). Some renewable energy advocates have argued that the current right-of-way regulations are insufficient for large-scale development of solar and wind power projects and associated electricity transmission lines (consisting of potentially thousands of acres). The extent of some of the environmental impacts of renewable energy production has been controversial, such as impacts on wildlife and on environmentally sensitive areas. Some have suggested that a leasing system would provide for better planning during the resource management planning (RMP) process for public land use and provide greater security of tenure for the potential wind or solar energy lessee. Others counter that a leasing system may not offer anything different from a ROW system.

For wind energy facilities on BLM lands, the BLM completed a final PEIS in January 2006.[92] This document supports land management plan amendments providing for wind energy development in the western states. On December 19, 2008, BLM issued its updated wind energy development policy. The BLM has authorized 206 rights-of-way for the development of wind on public land.

An updated solar energy development policy was published by the BLM on April 4, 2007. The agency continues to collaborate with DOE to prepare a PEIS to evaluate solar energy development on public lands, among other matters. A PEIS scoping report was completed in October 2008. On March 11, 2009, Interior Secretary Ken Salazar issued a Secretarial Order (3285) to make renewable energy a top priority of DOI. The order also established a

[91] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov.

[92] 71 *Fed. Reg*. 1768 (Jan. 11, 2006).

Departmental Task Force on Energy and Climate Change to identify zones on public land suitable for large-scale renewable energy development.[93] On June 30, 2009, the DOI and DOE announced the extension of the public comment period on solar energy in preparation of the PEIS to September 14, 2009, the opening of new solar permitting offices, and the availability of solar energy study area maps. There are 158 active solar project applications covering about 1.8 million acres of federal land.

Geothermal leasing on federal lands is conducted under the authority of the Geothermal Steam Act of 1970, as amended (30 U.S.C. §§1001-1028). Much of the nation's geothermal energy potential is located on federal lands. Increasing geothermal production on federal lands while mitigating environmental impacts has been a long-time policy issue. The BLM administers more than 500 geothermal leases, with 29 operating geothermal power plants having a total electric generation capacity of 1,275 megawatts (equivalent to a large nuclear power plant).[94] This subtitle would extend funding for implementation of the Geothermal Steam Act of 1970 through FY2020.

No similar provisions are included in H.R. 2454 or ARRA.

Subtitle F—Carbon Capture[95]

Summary and Analysis of This Subtitle

Subtitle F, Sec. 371 would amend EPACT05 to authorize the Secretary of Energy to enter into cooperative agreements to provide financial and technical assistance for as many as 10 projects to demonstrate large-scale integrated capture, transportation, and sequestration (also referred to as CCS) of carbon dioxide (CO_2) from industrial sources. The demonstration projects would focus on the sequestration stage of CCS to foster the commercial application of long-term geologic storage of CO_2, rather than on the capture stage of CCS and the development of carbon-capture technology.

To qualify for selection in a competitive process, the applicants would need to meet several requirements under Sec. 371, including:

- providing sufficient geological site information to establish that the proposed site is capable of long-term storage;
- possessing the land or interests in the land necessary for injection, storage, closure, and long-term stewardship of the geologic storage unit;
- possessing or having the reasonable expectation of obtaining all necessary permits and authorizations under federal and state laws and regulation; and
- agreeing to comply with a list of terms and conditions to ensure that the project complies with all requirements for constructing and operating injection wells,

[93] The Secretarial Order and a related agency news release are on the BLM website at http://www.doi.gov/news/09_News_Releases/031109c.html.

[94] U.S. Dept. of the Interior, *Kempthorne Launches Initiative to Spur Geothermal Energy and Power Generation on Federal Lands*, News Release, October 22, 2008, http://www.doi.gov/news/08_News_Releases/102208b.html.

[95] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov.

measuring and monitoring the CO_2 plume underground, plugging the wells, and meeting long-term care requirements for the site after injection has ceased.

A particular focus of Sec. 371 is on financial assurances provided by the operator during the injection, closure, and post-closure activities, and on indemnification offered by the Secretary of Energy for liability arising from a project in excess of liability covered by financial assurances maintained by the operator. First, the operator would need to maintain financial assurances during the post-injection closure and monitoring phase until the site is certified as closed by the Secretary. Second, the operator would need to maintain financial protection in a form and amount acceptable to the Secretary of Energy, to the Secretary (either of the Interior or of Agriculture) with jurisdiction over the land, and to the EPA Administrator. These assurances must be maintained until the project complies with site closure requirements over a period of at least 10 consecutive years after the plume of CO_2 has stabilized within the geologic storage unit after injection has ceased.

The legislation would require the operator to meet all the post-closure requirements, and maintain the financial assurances and protection, such as insurance, before the federal government would accept title and long-term stewardship responsibilities for the site. The post-closure requirements essentially ensure that the CO_2 plume and area of elevated pressure in the underground reservoir have ceased to change (e.g., the plume is no longer spreading, and the pressure in the formation is no longer increasing); CO_2 or displaced formation fluid is not leaking out of the reservoir and endangering underground sources of drinking water; and CO_2 or formation fluids are not expected to leak out of the reservoir in the future. Subject to the operator successfully meeting these requirements, the federal government may take title to the land or interest in the land necessary for monitoring, remediation, or long-term stewardship of the project site.

In addition to financial assurances provided by the operator, the legislation would authorize the Secretary of Energy to indemnify the operator from liability arising from a demonstration project that is in excess of the liability covered by the financial assurances and protections held by the operator. The legislation would authorize up to $10 billion of indemnification per project, but would not indemnify the operator from liability arising out of gross negligence or intentional misconduct. The Secretary would be authorized to collect a fee from the recipient of the indemnification agreement, in an amount equal to the net present value of payments made by the United States to cover liability under the indemnification agreement. The criteria for determining the amount of the fee would be established by regulation, taking into account the risk of an incident resulting in liability and other factors related to determining the hazard of operating a particular project.

The indemnification provision in the legislation is likely intended to address one of the perceived barriers to commercial-scale deployment of CCS: the risk and magnitude of liability from injecting CO_2 underground in a regulatory environment that is still a work in progress. Also, it is widely perceived that many of the fears and uncertainties associated with injecting industrial-scale quantities of CO_2 could be addressed by on-the-ground projects instead of theoretical modeling simulations—a learning-by-doing approach. Providing liability protection for the CCS demonstration phase could stimulate "early movers" to advance their projects.

Sec. 372 would authorize the Secretary of Energy, the Secretary of Transportation, and the EPA Administrator to establish a grant program for employee training at state agencies involved in permitting, management, inspection, and oversight of CCS projects. The section would authorize $10 million per year from FY2010 through FY2020.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

Sec. 114 of H.R. 2454 would establish a program to award grants, contracts, and assistance to support commercial-scale CCS demonstration projects at new plants or at plants retrofitted with carbon capture technology. The legislation would seek to support at least five commercial-scale demonstration projects over a 10-year period. In contrast to Sec. 371 of S. 1462, which would authorize cooperative agreements with the Secretary of Energy and funding from DOE, funding for CCS demonstration projects under Sec. 114 of H.R. 2454 would be provided through a corporation established by referendum among "qualified industry organizations." Also, funding for the demonstration projects under H.R. 2454 would come from an assessment on distribution utilities for fossil-fuel based electricity delivered to retail customers. Funding for demonstration projects under Sec. 371 of S. 1462 would presumably come from annual appropriations.

Another key difference is the emphasis in S. 1462 on the long-term storage component of CCS, as suggested by the provision providing for indemnification from liability and from the detailed requirements for injection, storage, closure, and post-closure, and the provision for assuming title and long-term stewardship by the federal government. Subtitle B of H.R. 2454—Carbon Capture and Sequestration—does not include similar provisions for indemnification, although Sec. 111 of Subtitle B calls for a report detailing a comprehensive strategy to identify key legal and regulatory barriers to commercial-scale deployment of CCS. Sec. 112 of Subtitle B in H.R. 2454 would amend the Clean Air Act to establish a certification and permitting process for CCS, and would require the EPA Administrator to promulgate regulations for CCS under the Safe Drinking Water Act, but neither provision discusses long-term liability, indemnification, or transfer of title and long-term stewardship of a project site to the federal government.

Lastly, Sec. 115 of H.R. 2454 would provide a financial mechanism for funding and deploying commercial-scale CCS technologies by distributing emission allowances under the cap-and-trade provisions to be used for CCS. In contrast, S. 1462 is limited only to demonstration projects and does not include revenues or allowances from a cap-and-trade program to support the projects.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

Of the $3.4 billion made available for CCS-related activities in ARRA, $50 million is available for site characterization activities in geologic formations. Site characterization would be an important factor in qualifying an applicant to receive funding and technical assistance for a demonstration project under Sec. 371 of S. 1462. Presumably the site characterization information garnered from activities funded with the $50 million in funding from ARRA would be made available to interested applicants to help them determine whether the proposed site would be capable of long-term geologic storage of CO_2.

Subtitle G—Island Energy[96]

Summary and Analysis of This Subtitle

DOE would be directed to establish a team of technical, policy, and financial experts to address the energy needs of each affiliated island (U.S. trust territory). DOE would be required to consider including representatives of regional utility organizations on the team. The team would be directed to provide technical, programmatic, and financial assistance to each island utility and government to develop and implement an energy action plan. Each plan would identify and implement the most cost-effective strategies to reduce dependence on fossil fuels, promote capacity development through education and training, and develop private-public partnerships. Starting one year after enactment, biannual reports to DOE would be required. Such sums as may be needed would be authorized.

DOE has previously provided energy resource assessments and planning assistance to island (U.S. trust territory) governments.[97] This provision would require that DOE provide a new round of planning and implementation assistance.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

The two bills have an identical provision.[98]

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

ARRA explicitly makes funding available to the U.S. trust territories for certain programs that might be able to contribute to the goals for reducing dependence on imported fossil fuels. In particular, funds were made available under the provisions for Department of Defense facilities, the DOE Weatherization Program, and the DOE State Energy Program.[99]

[96] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov.

[97] For additional background, see U.S. Congress. House. Committee on Interior and Insular Affairs. Energy planning and implementation in the U.S. insular areas: problems and policy options; together with the proceedings of the "Conference on Energy Planning and Implementation in the U.S. Insular Areas," May 1983. Committee Print No. 5, May 1984. 634 p.

[98] The provision appears in section 381 of the Senate bill and in Sec. 273 of the House bill.

[99] The funding for those programs is discussed in CRS Report R40412, *Energy Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)*, coordinated by (name redacted)

Title IV—Energy Innovation And Workforce Development

Subtitle A—Funding[100]

Summary and Analysis of This Subtitle

The purpose of this subtitle is to extend authorization for funding in the Department of Energy for research, development, demonstration, and commercial application activities established under Title IX of EPACT05. Authorization for funding for energy efficiency, distributed energy and electric energy systems and renewable energy would start at $2.0 billion for FY2010 and increases to $3.3 billion in FY2013. Authorization for nuclear energy would increase from $998 million in FY2010 to $1.6 billion in FY2013. Authorization for fossil energy would increase from $1.1 billion in FY2010 to $1.7 billion in FY2013. Authorization for the Office of Science would increase from $5.8 billion in FY2010 to $8.0 billion in FY2013. Total authorization for these four activities would be $14.6 billion in FY2013, compared to a total authorization of $7.3 billion for FY2009 under the Energy Policy Act of 2005, precisely doubling the authorization for these activities over four years.

The American Recovery and Reinvestment Act of 2009 (P.L. 111-5) provided $1.6 billion for the Office of Science without specifying how the appropriation should be spent. Appropriations were included in ARRA for the Office of Energy Efficiency and Renewable Energy ($16.8 billion), and for the Office of Fossil Energy ($3.4 billion), but those amounts were allocated for specific purposes.

Subtitle B—Grand Energy Challenges Research Initiative[101]

Summary and Analysis of This Subtitle

This subtitle would establish a new initiative within DOE to accelerate solutions to "grand energy challenges" by undertaking large-scale, multidisciplinary activities that include basic, applied, and engineering sciences, technology development, and other relevant disciplines. The grand energy challenges addressed by this initiative would include those described in the DOE Basic Research Needs Workshops, those described in two reports of the DOE Basic Energy Sciences Advisory Committee, and those described by the National Academy of Engineering in its report "Grand Challenges for Engineering." The grand energy challenges would be addressed by awarding grants to consortia composed of one or more institutions of higher learning, DOE national laboratories, federally funded research centers, private industry entities, and not-for-profit institutions, but including at least one non-federal entity. This subtitle includes authorization of appropriations for such sums as are necessary to carry out the section for each of fiscal years 2010 through 2019. The intent of this consortium approach is to bring to bear the resources of several key institutions to address the complex multidisciplinary challenges.

[100] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov.

[101] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov.

Subtitle C—Improvements to Existing Energy Research and Development Programs[102]

Summary and Analysis of This Subtitle

This subtitle would amend seven statutes with the intent of improving or extending some aspect of several energy research and development programs within the Department of Energy.

One provision would amend the America COMPETES Act (42 U.S.C. 16538) to allow ARPA-E to initiate and execute grants, contracts, cooperative agreements, and other transactions separate from the Department of Energy, and would authorize ARPA-E through 2020.

The subtitle would also amend the United States Energy Storage Competitiveness Act of 2007 (42 U.S.C. 17231) to create a vehicle battery manufacturing research program within DOE.

The third amendment would increase the amount of authorization for lightweight materials research and development from $80 million to $100 million in the Energy Independence and Security Act of 2007 (42 U.S.C. 17241).

The fourth would amend the Methane Hydrate Research and Development Act of 2000 (30 U.S.C. 2001) to include research on potential environmental impacts of methane hydrates, and would expand research for a variety of technological, environmental, developmental, and educational aspects of methane hydrate exploration and development. This amendment would also authorize such research through 2015, and would authorize $10 million per year for environmental monitoring associated with methane hydrate development.

The fifth amendment in this subtitle would create a research program at DOE to develop technologies for separating helium from low-BTU natural gas by amending EPACT05 (42 U.S.C. 16513(b)). The intent of the research would be to provide a supply of helium from low-BTU natural gas and to enhance the value of the natural gas.

The sixth amendment would revise the Department of Energy Organization Act (42 U.S.C. 7131) to establish an Office of Arctic Energy within DOE to address a variety of energy issues in the Arctic, including deployment of electricity-generating capabilities and promotion and development of enhanced oil recovery, heavy oil production, reinjection of carbon, extended drilling technologies, gas-to-liquids technologies, small hydroelectric facilities, and natural gas hydrates in the Arctic region. The Office of Arctic Energy would have funding authorized through 2012.

The last amendment in this subtitle would formally establish and name the Unconventional Domestic Natural Gas and Other Petroleum Resources Program, which would plan and conduct research and development through a grant process to research consortia, via an amendment to EPACT05. The authorization of appropriation for this program would be increased from $100 million to $350 million.

There are no similar provisions in H.R. 2454.

[102] Prepared by (name redacted), 7-...., [redacted]@crs.loc.gov.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

Appropriations within the ARRA that relate directly to the proposed amendments in this subtitle include $400 million for ARPA-E, $2.0 billion for grants for advanced battery/battery component manufacturing facilities, and $1.6 billion for the DOE Office of Science.

Subtitle D—Energy Workforce Development[103]

Summary and Analysis of This Subtitle

The importance of preparation for energy careers beginning in secondary schools would be recognized by Sec. 431 with the establishment of competitive grants for states to create or expand energy career academic programs. Appropriations authorized are $14 million for fiscal year 2009; $22.5 million for fiscal year 2010; and $30 million for fiscal year 2011.

Community colleges are seen as addressing a perceived decline of qualified workers in the energy workforce by using grant programs to expand and enhance educational capabilities for preparing students for careers in trades relevant to the energy industry. The program provides for renewable, competitive grants for as much as $500,000 each year to community colleges for up to five years in duration. DOE is also required to submit a study of energy workforce training programs funded by federal agencies, and plan for filling future needs. Additional funding of up to $100 million is authorized for fiscal years 2010 through 2015 for training in alternative energy technologies, energy efficiency, sustainable energy technologies, recycling and waste reduction, water and energy conservation, and other energy technologies.

Sec. 436 establishes direct hire authority for the Secretary of Energy upon a determination that there is a severe shortage of highly qualified scientists, engineers, or critical technical personnel in the agency. The Secretary is also permitted to establish compensation for these positions. No more than 40 such positions may be filled any one time. Compensation and term of employment for such employees must follow prescribed guidelines.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

Sec. 422 increases funding for Energy Worker Training by $25 million in the Workforce Investment Act of 1998.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

Title VIII of ARRA provides $500 million under Training and Employment Services for research, labor exchange, and job training projects preparing workers for careers in energy efficiency and

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renewable energy. Title IV also provided an additional $100 million for worker training in transmission grid modernization and related activities, such as the Smart Grid.

Subtitle E—Strengthening Education and Training in the Subsurface Geosciences and Engineering for Energy Development[104]

Summary and Analysis of This Subtitle

The Secretary of the Interior is directed to provide research funds for 10 years to assist development of academic programs producing workers for subsurface geosciences and engineering in energy (including geological carbon storage), petroleum, groundwater, economic geology, mining, and mineral and geological engineering. Technological developments are increasing the possibilities for developing energy resources in the deep earth once thought undevelopable (such as unconventional natural gas), and may provide future commercial opportunities for carbon sequestration. Skilled workers and technicians may increasingly be needed if long-term underground sequestration becomes the preferred mechanism for dealing with carbon captured from traditional fuels such as coal or natural gas.

No similar provisions are included in H.R. 2454 or ARRA.

Subtitle F—Miscellaneous[105]

Summary and Analysis of This Subtitle

Sec. 471 authorizes the Secretary of Energy to enter into transactions with public agencies, private organizations or other persons for purposes related to DOE's functions. The Secretary is to report to Congress on how this authority has been used. Sec. 473 is designed to protect the proprietary data of those contracted to perform studies for DOE.

DOE is directed to fund a program to demonstrate marine and hydrokinetic technologies, and evaluate the environmental effects of the technologies. Open standards are to be developed to facilitate the transfer of results to the public and incentivize industry compliance with these standards. Up to $250 million is authorized for each fiscal year from 2010 to 2021 for the program.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

Studies are required of CCS issues for geological sequestration sites in Sec. 113.

[104] Prepared by Richard Campbell, 7-...., [redacted]@crs.loc.gov.

[105] Prepared by Richard Campbell, 7-...., [redacted]@crs.loc.gov.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

ARRA provides $3.4 billion in R&D funding in DOE's Fossil Energy program, the majority of which was for CCS activities, including $20 million for geologic sequestration training and research and $10 million for unspecified activities.

Title V—Energy Markets[106]

Summary and Analysis of This Title

This title contains several measures intended to help stabilize the oil, natural gas, and electricity markets. The motivation for these provisions appear to be several disruptive events in the energy markets over the past decade, including the manipulation by Enron and others of the western electricity markets; wide and abrupt swings in the prices of natural gas, crude oil, and gasoline; and concern over the role of speculators and other financial players in the energy markets. The measures fall into three categories: information, analysis, and regulation. The information items, which are intended to promote stability by increasing market transparency, include the following:

- The Energy Information Administration (EIA, the statistical and analytical arm of the Department of Energy) would be directed to launch new programs to gather information on oil inventories held by the largest traders of oil contracts and on the oil and natural gas storage capacity in the United States.
- DOE would be directed to expand the existing Tariff Analysis Project,[107] an effort by the Lawrence Berkeley National Laboratory to collect and make easily available online information on retail electric rates.

Analytical measures, which are aimed at better understanding the role of financial players in the energy markets, include:

- EIA is directed to create a new Financial Market Analysis Office to "be responsible for analysis of the financial aspects of energy markets."
- The bill would establish a high-level Working Group on Energy Markets (including, among others, the Secretaries of Energy and the Treasury). The group's tasks would include "investigat[ing] the effect of increased financial investment in energy commodities on energy prices and … energy security"; recommending steps needed to prevent excessive speculation from destabilizing energy markets; reviewing international energy markets; and performing a study with accompanying recommendations for reform "of the factors that affect the pricing of crude oil and refined petroleum products," including the role of speculators.

The regulatory measures, which are potentially the most controversial, include:

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[107] The website for the existing program is located at http://tariffs.lbl.gov/.

- In the event of an "emergency" in wholesale electricity markets—where "emergency" means a disruption affecting reliability or causing "sudden and excessive price fluctuations"—FERC would have the authority to issue orders temporarily suspending existing tariffs and contracts. The maximum duration of such an order would be 30 days.
- FERC would be granted "cease and desist" authority to block actual or attempted illegal manipulation of the electricity or natural gas markets. This authority would also allow FERC to freeze the assets of the party at issue, the object being to prevent the party from "dissipating" its assets before it can be ordered to either pay fines or make restitution (this is an issue in a recent case before FERC).

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

Sec. 359 of Subtitle E, Title III, of H.R. 2454 gives FERC cease and desist authority with respect to natural gas markets. Unlike the provision in ACELA, the ACES provision applies to any violation of applicable law and regulation, not just cases of market manipulation.

There are no related provisions in ARRA.

Title VI—Policy Studies and Reports[108]

Summary and Analysis of This Title

This title would direct the completion of a number of policy studies and reports, summarized briefly here. Taken together, these studies are intended to provide Congress and other decision makers with improved information and understanding for the management of resources and formulation of policy.

Sec. 601 of this title would direct the U.S. Geological Survey to conduct a national assessment of helium resources, which are important for a variety of industrial and medical applications, with information on other gases associated with the helium.

Sec. 602 calls for an assessment and report on known and undiscovered potash deposits in the United States, and would include provisions for a drilling program and an evaluation of assessment methodologies. Potash is a general term applied to potassium oxide, potassium carbonate, and a variety of related potassium salts that go into fertilizer and the manufacture of glass.

Sec. 603 would amend the Department of Energy Organization Act (42 U.S.C. 7321) with the aim of improving national energy planning and strategies. The improved planning process would include input from relevant federal agencies and would examine federal policies that affect energy production, energy efficiency, reduction of air pollution, and the reduction, avoidance, or sequestration of greenhouse gases. This provision would require the National Academy of

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Sciences to participate in the planning process and would provide authorization of funding for such studies.

Sec. 604 acknowledges that international climate change strategies will depend in part on the actions of China and India, and that improved understanding of their actions will benefit strategies undertaken by the United States to help reduce global emissions of greenhouse gases. This section would establish an interagency task force to investigate and analyze national or subnational policies, programs, laws, regulations, incentive mechanisms, and other measures that might reduce energy use and greenhouse gas emissions in China and India. The report would include the current status of, and opportunities and recommendations for, research cooperation and technology deployment and trade, and would be submitted to Congress within six months of passage.

Under Sec. 605, carbon leakage is defined as a substantial increase in greenhouse gas emissions by a manufacturing facility located in a country without a greenhouse gas emission regulation commensurate to a cap-and-trade program, or an increase in emissions caused by an increase in the incremental cost of production in the United States as a result of a domestic cap-and-trade program. This section would require DOE, in consultation with other relevant federal agencies, to conduct a study that characterizes the relative risk of such carbon leakage and changes in output and investment in U.S. industrial sectors resulting from the implementation of a cap-and-trade program in the Unites States. The study is to include an assessment of price and trade elasticity of U.S. industries, as well as other economic indicators. DOE would also be directed to conduct a study evaluating the impact of potential measures that might be implemented to mitigate carbon leakage, including an analysis of measures used by other jurisdictions to reduce carbon leakage, the risk of carbon leakage from U.S. industries under potential prices of greenhouse gas emissions, and scenarios for international climate policy.

Sec. 606 would require the Secretary of Energy, in consultation with the Secretaries of State and Commerce, to conduct a study and report to Congress on the impact of foreign fuel subsidies on global energy supply and demand, and on the global economy, with associated recommendations for mitigating actions.

Sec. 607 would amend Sec. 201(b) of EPACT05 to require the Secretary of Energy, as part of the current requirement for an annual assessment of renewable energy, to assess the quantity of biomass needed for thermal applications, biofuels, and biomass-based electricity, the highest efficiency energy use of biomass resources, the requirements and costs associated with the deployment for each of these applications, and the market penetration for each renewable energy resource that could be accomplished by 2030.

Sec. 608 calls for a review to quantify the efficiencies of U.S. electric generation facilities. It would require identification of, among other things, the technologies that may be deployed to increase the efficiency of the electric generation facilities and any obstacles that could impede the deployment of those technologies.

Sec. 609 would require DOE, in cooperation with other relevant federal agencies, to evaluate the emissions from the use of alternative transportation fuels and fuel blends used in heavy-duty and light-duty diesel engines and in the aviation sector. The study would evaluate the effect of using alternative transportation fuels on air quality and public health. “Such sums as are necessary” are authorized for the study.

Sec. 610 includes findings expressing the vulnerability of the United States resulting from reliance on imported oil, and calls for "transformative steps to wean itself from its addiction to foreign oil." This section contains an explicit statement that it is the policy of the United States to reduce its dependence on foreign oil. An interagency task force composed of DOE and other relevant agencies would submit a report to Congress describing options for agency actions that would reduce forecasted U.S. oil consumption in stages by 10,000,000 barrels of oil per day by 2030. Recommended actions would be required to comply with the policy statement above, include only options directly related to reduced oil consumption, describe advantages and disadvantages for each option, and avoid increases in lifecycle greenhouse gas emissions above levels in effect on the date of enactment. Reports to Congress under this provision would be allowed to request additional legislative authority to implement recommendations. An annual report of progress would also be required.

Comparison to Similar Provisions in H.R. 2454, American Clean Energy and Security Act of 2009

H.R. 2454 contains a number of study provisions, but none are precisely the same as the studies mandated in this title. Studies proposed in this title would certainly inform some of the processes and programs established in H.R. 2454. For example, the assessment of national plans and policies for climate change mitigation in China and India in Sec. 604 of this title would directly support the requirement in H.R. 2454 that the EPA Administrator submit an annual report on the details of any greenhouse gas standards adopted by China and India. Likewise, the report on carbon leakage proposed in this title would support the efforts to address carbon leakage contained in Title IV of H.R. 2454.

Related Spending Provisions in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5)

ARRA contains several funding provisions for various energy and climate change programs, but none are precisely for the studies mandated here.

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