111TH CONGRESS
1ST SESSION

S. 531

To provide for the conduct of an in-depth analysis of the impact of energy development and production on the water resources of the United States, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MARCH 5, 2009

Mr. BINGAMAN (for himself and Ms. MURKOWSKI) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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A BILL

To provide for the conduct of an in-depth analysis of the impact of energy development and production on the water resources of the United States, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Energy and Water Integration Act of 2009''.

SEC. 2. ENERGY WATER NEXUS STUDY.

(a) IN GENERAL.—Not later than 90 days after the date of enactment of this Act, the Secretary of Energy

(referred to in this Act as the ''Secretary''), in consultation with the Secretary of the Interior and the Administrator of the Environmental Protection Agency, shall enter into an arrangement with the National Academy of Sciences under which the Academy shall conduct an in-depth analysis of the impact of energy development and production on the water resources of the United States.

(b) SCOPE OF STUDY.—

(1) IN GENERAL.—The study described in subsection (a) shall be comprised of each assessment described in paragraphs (2) through (4).

(2) TRANSPORTATION SECTOR ASSESSMENT.—

(A) IN GENERAL.—The study shall include a lifecycle assessment of the quantity of water withdrawn and consumed in the production of transportation fuels, or electricity, to evaluate the ratio that—

(i) the quantity of water withdrawn and consumed in the production of transportation fuels (measured in gallons), or electricity (measured in kilowatts); bears to

(ii) the total distance (measured in miles) that may be traveled as a result of the consumption of transportation fuels, or electricity.

(B) SCOPE OF ASSESSMENT.—

(i) IN GENERAL.—The assessment shall include, as applicable—

(I) the exploration for, and extraction or growing of, energy feedstock;

(II) the processing of energy feedstock into transportation fuel;

(III) the generation, transportation, and storage of electricity for transportation; and

(IV) the conduct of an analysis of the efficiency with which the transportation fuel is consumed.

(ii) FUELS.—The assessment shall contain an analysis of transportation fuel sources, including—

(I) domestically produced crude oil (including products derived from domestically produced crude oil);

(II) imported crude oil (including products derived from imported crude oil);

(III) domestically produced natural gas (including liquid fuels derived from natural gas);

(IV) imported natural gas (including liquid fuels derived from natural gas);

(V) oil shale;

(VI) tar sands;

(VII) domestically produced corn-based ethanol;

(VIII) imported corn-based ethanol;

(IX) advanced biofuels (including cellulosic- and algae-based biofuels);

(X) coal to liquids (including aviation fuel, diesel, and gasoline products);

(XI) electricity consumed in—

(aa) fully electric drive vehicles; and

(bb) plug-in hybrid vehicles;

(XII) hydrogen; and

(XIII) any reasonably foreseeable combination of any transportation fuel

source described in subclauses (I) through (XII).

(3) ELECTRICITY SECTOR ASSESSMENT.—

(A) IN GENERAL.—The study shall include a lifecycle assessment of the quantity of water withdrawn and consumed in the production of electricity to evaluate the ratio that—

(i) the quantity of water used and consumed in the production of electricity (measured in gallons); bears to

(ii) the quantity of electricity that is produced (measured in kilowatt-hours).

(B) SCOPE OF ASSESSMENT.—The assessment shall include, as applicable—

(i) the exploration for, or extraction or growing of, energy feedstock;

(ii) the processing of energy feedstock for electricity production; and

(iii) the production of electricity.

(C) GENERATION TYPES.—The assessment shall contain an evaluation and analysis of electricity generation facilities that are constructed in accordance with different plant designs (including different cooling technologies such as water, air, and hybrid systems, and technologies

designed to minimize carbon dioxide releases) based on the fuel used by the facility, including—

(i) coal;

(ii) natural gas;

(iii) oil;

(iv) nuclear energy;

(v) solar energy;

(vi) wind energy;

(vii) geothermal energy;

(viii) biomass;

(ix) the beneficial use of waste heat; and

(x) any reasonably foreseeable combination of any fuel described in clauses (i) through (ix).

(4) ASSESSMENT OF ADDITIONAL IMPACTS.—In addition to the impacts associated with the direct use and consumption of water resources in the transportation and electricity sectors described in paragraphs (2) and (3), the study shall contain an identification and analysis of any unique water impact associated with a specific fuel source, including an impact resulting from—

(A) any extraction or mining practice;

(B) the transportation of feedstocks from the point of extraction to the point of processing;

(C) the transportation of fuel and power from the point of processing to the point of consumption; and

(D) the location of a specific fuel source that is limited to 1 or more specific geographical regions.

(c) REPORT TO SECRETARY.—Not later than 18 months after the date of enactment of this Act, the National Academy of Sciences shall submit to the Secretary a report that contains a summary of the results of the study conducted under this section.

(d) AVAILABILITY OF RESULTS OF STUDY.—On the date on which the National Academy of Sciences completes the study under this section, the National Academy of Sciences shall make available to the public the results of the study.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary such sums as are necessary to carry out this section.

SEC. 3. POWER PLANT WATER AND ENERGY EFFICIENCY.

(a) IN GENERAL.—To protect water supplies and promote the efficient use of water in the electricity produc-

tion sector, the Secretary, in consultation with the Secretary of the Interior and the Administrator of the Environmental Protection Agency, shall conduct a study to identify the best available technologies and related strategies to maximize water and energy efficiency in the production of electricity by each type of generation.

(b) GENERATION TYPES.—The study shall include an evaluation of different types of generation facilities, including—

(1) coal facilities, under which the evaluation shall account for—

(A) different types of coal and associated generating technologies; and

(B) the use of technologies designed to minimize and sequester carbon dioxide releases;

(2) oil and natural gas facilities, under which the evaluation shall account for the use of technologies designed to minimize and sequester carbon dioxide releases;

(3) hydropower, including turbine upgrades, incremental hydropower, in-stream hydropower, and pump-storage projects;

(4) thermal solar facilities; and

(5) nuclear facilities.

(c) REPORT TO CONGRESS.—Not later than 18 months after the date of enactment of this Act, the Secretary shall submit to the appropriate committees of Congress a report that contains a description of the results of the study conducted under this section.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary such sums as are necessary to carry out this section, to remain available until expended.

SEC. 4. WATER CONSERVATION AND ENERGY SAVINGS STUDY.

(a) DEFINITIONS.—In this section:

(1) MAJOR RECLAMATION PROJECT.—The term ''major Reclamation project'' means a multipurpose project authorized by the Federal Government and carried out by the Bureau of Reclamation.

(2) SECRETARY.—The term ''Secretary'' means the Secretary of the Interior, acting through the Commissioner of Reclamation.

(b) STUDY.—

(1) IN GENERAL.—In accordance with paragraph (2), to promote the efficient use of energy in water distribution systems, the Secretary shall conduct a study to evaluate the quantities of energy

used in water storage and delivery operations in major Reclamation projects.

(2) ELEMENTS.—In conducting the study, the Secretary shall—

(A) with respect to each major Reclamation project—

(i) assess and estimate the annual energy consumption associated with the major Reclamation project; and

(ii) identify—

(I) each major Reclamation project that consumes the greatest quantity of energy; and

(II) the aspect of the operation of each major Reclamation project described in subclause (I) that is the most energy intensive (including water storage and releases, water delivery, and administrative operations); and

(B) identify opportunities to significantly reduce current energy consumption and costs with respect to each major Reclamation project described in subparagraph (A), including, as applicable, through—

(i) reduced groundwater pumping;

(ii) improved reservoir operations;

(iii) infrastructure rehabilitation;

(iv) water reuse; and

(v) the integration of renewable energy generation with project operations.

(c) REPORT TO CONGRESS.—Not later than 18 months after the date of enactment of this Act, the Secretary shall submit to the appropriate committees of Congress a report that contains a description of the results of the study conducted under this section.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary such sums as are necessary to carry out this section, to remain available until expended.

SEC. 5. BRACKISH GROUNDWATER NATIONAL DESALINATION RESEARCH FACILITY.

(a) DEFINITIONS.—In this section:

(1) FACILITY.—The term ''facility'' means the Brackish Groundwater National Desalination Research Facility, located in Otero County, New Mexico.

(2) SECRETARY.—The term ''Secretary'' means the Secretary of the Interior.

(b) DUTY OF SECRETARY.—The Secretary shall operate, manage, and maintain the facility to carry out re-

search, development, and demonstration activities to develop technologies and methods that promote brackish groundwater desalination as a viable method to increase water supply in a cost-effective manner.

(c) OBJECTIVES; ACTIVITIES.—

(1) OBJECTIVES.—The Secretary shall operate and manage the facility as a state-of-the-art desalination research center—

(A) to develop new water and energy technologies with widespread applicability; and

(B) to create new supplies of usable water for municipal, agricultural, industrial, or environmental purposes.

(2) ACTIVITIES.—In operating, managing, and maintaining the facility under subsection (b), the Secretary shall carry out—

(A) as a priority, the development of renewable energy technologies for integration with desalination technologies—

(i) to reduce the capital and operational costs of desalination;

(ii) to minimize the environmental impacts of desalination; and

(iii) to increase public acceptance of desalination as a viable water supply process;

(B) research regarding various desalination processes, including improvements in reverse and forward osmosis technologies;

(C) the development of innovative methods and technologies to reduce the volume and cost of desalination concentrated wastes in an environmentally sound manner;

(D) an outreach program to create partnerships with States, academic institutions, private entities, and other appropriate organizations to conduct research, development, and demonstration activities, including the establishment of rental and other charges to provide revenue to help offset the costs of operating and maintaining the facility; and

(E) an outreach program to educate the public on—

(i) desalination and renewable energy technologies; and

(ii) the benefits of using water in an efficient manner.

(d) AUTHORITY OF SECRETARY.—The Secretary may enter into contracts or other agreements with, or make grants to, appropriate entities to carry out this section, including an agreement with an academic institution to manage research activities at the facility.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated such sums as are necessary to carry out this section, to remain available until expended.

SEC. 6. ENHANCED INFORMATION ON WATER-RELATED ENERGY CONSUMPTION.

Section 205 of the Department of Energy Organization Act (42 U.S.C. 7135) is amended by adding at the end the following:

''(n) WATER-RELATED ENERGY CONSUMPTION.—

''(1) IN GENERAL.—Not less than once during each 3-year period, to aid in the understanding and reduction of the quantity of energy consumed in association with the use of water, the Administrator shall conduct an assessment under which the Administrator shall collect information on energy consumption in various sectors of the economy that are associated with the acquisition, treatment, or delivery of water.

''(2) REQUIRED SECTORS.—An assessment described in paragraph (1) shall contain an analysis of water-related energy consumption for all relevant sectors of the economy, including water used for—

''(A) agricultural purposes;

''(B) municipal purposes;

''(C) industrial purposes; and

''(D) domestic purposes.

''(3) EFFECT.—Nothing in this subsection affects the authority of the Administrator to collect data under section 52 of the Federal Energy Administration Act of 1974 (15 U.S.C. 790a).''.

SEC. 7. ENERGY-WATER RESEARCH AND DEVELOPMENT ROADMAP.

(a) IN GENERAL.—Not later than 90 days after the date of enactment of this Act, the Secretary shall develop a document to be known as the ''Energy-Water Research and Development Roadmap'' to define the future research, development, demonstration, and commercialization efforts that are required to address emerging water-related challenges to future, cost-effective, reliable, and sustainable energy generation and production.

(b) REPORT.—Not later than 120 days after the date of enactment of this Act, the Secretary shall submit to the appropriate committees of Congress a report describ-

ing the document described in subsection (a), including recommendations for any future action with respect to the document.

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