To provide for the conduct of an 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 2011”.
SEC. 2. DEFINITION OF SECRETARY.

In this Act, the term "Secretary" means the Secretary of Energy.

SEC. 3. ENERGY WATER NEXUS STUDY.

(a) IN GENERAL.—Not later than 90 days after the date of enactment of this Act, 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(A) IN GENERAL.—The study shall include a lifecycle assessment of the quantity of water withdrawn and consumed in the production of transportation fuels, or electricity used as a fuel source, to evaluate the ratio that—

(i) the quantity of water withdrawn and consumed in the production of transportation fuels (measured in gallons), or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 kilowatt-hours);
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;

(bb) plug-in hybrid vehicles; and

(cc) hydrogen; and

(XII) any reasonably foreseeable combination of any transportation fuel source described in subclauses (I) through (XI).

(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.

SEC. 4. POWER PLANT WATER AND ENERGY EFFICIENCY.

(a) IN GENERAL.—To protect water supplies and promote the efficient use of water in the electricity production 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 alternative technologies and related strategies to optimize 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 (including an assessment of any region-specific factor, such as water availability and energy reliability, that should be considered in evaluating the results).

SEC. 5. RECLAMATION WATER CONSERVATION AND ENERGY SAVINGS STUDY.

(a) DEFINITIONS.—In this section:

(1) RECLAMATION PROJECT.—The term “Reclamation project” means a 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 Reclamation projects.

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

(A) assess and estimate the annual energy consumption associated with the Reclamation projects; and

(B) identify—

(i) the Reclamation projects that consume the greatest quantity of energy; and

(ii) the aspect of the operation of each Reclamation project described in clause (i) that is the most energy intensive (including water storage and releases, water delivery, and administrative operations); and

(C) identify opportunities to significantly reduce current energy consumption and costs with respect to each Reclamation project described in subparagraph (B), 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, including an estimate of the quantity of renewable energy potentially available for generation from reclamation projects.

SEC. 6. DESALINATION RESEARCH.

(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 research, 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 (including the disposal of desalination concentrated wastes) in an environmentally sound manner;

(D) an outreach program to create partnerships with States, academic institutions, private entities, local public agencies, 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 manage, operate, or otherwise carry out this section, including an agreement with a local or regional academic institution or a consortium of institutions to manage research activities at the facility.

(e) REAUTHORIZATION.—Section 8 of the Water Desalination Act of 1996 (42 U.S.C. 10301 note; Public Law 104–289) is amended by striking “2011” each place it appears in subsections (a) and (b) and inserting “2016”.

SEC. 7. 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 used in association with the use of water, the Administrator shall conduct an assessment under which the Administrator shall collect information on energy use in various sectors of the economy that are associated with the procurement, treatment, or delivery of water.

“(2) REQUIRED SECTORS.—An assessment described in paragraph (1) shall contain an analysis of
water-related energy use 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. 8. 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.—

(1) In general.—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 describing the document described
in subsection (a), including recommendations for any future action with respect to the document.

(2) INCLUSIONS.—The report described in paragraph (1) shall include a review of existing research, development, and demonstration programs within the Department of Energy to determine which programs should include water use considerations.

SEC. 9. ENERGY-WATER CLEAN TECHNOLOGY GRANT PROGRAM.

(a) DEFINITIONS.—In this section:

(1) ELIGIBLE ENTITY.—The term “eligible entity” means—

(A) an eligible unit of local government;

(B) an Indian tribe; and

(C) a water or wastewater agency of a State or local government or other public agency.

(2) ELIGIBLE UNIT OF LOCAL GOVERNMENT.—The term “eligible unit of local government” has the meaning given the term in section 541 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17151).

(3) INDIAN TRIBE.—The term “Indian tribe” has the meaning given the term in section 4 of the

(b) **Grant Program.**—In accordance with subsection (c), the Secretary may carry out a competitive grant program under which the Secretary may provide grants to eligible entities to demonstrate the deployment of technologies that reduce the consumption of, or conserve, energy supplies through energy savings and water conservation activities in commercial, residential, and mixed-use development projects.

(c) **Requirements.**—

(1) **Provision of Assistance.**—In carrying out the program under subsection (b), the Secretary shall provide assistance to eligible entities that carry out projects that—

(A) have the potential to be replicated in other locations;

(B) are of sufficient size to demonstrate deployment of the project at scale; and

(C) are likely to accelerate and expand investment in cost-effective technologies that demonstrate sustained reductions in energy consumption or conservation of energy supplies, including the deployment of renewable energy and water reuse technologies.
(2) PRIORITIZATION.—In selecting eligible entities under paragraph (1), the Secretary shall give priority to each eligible entity that carries out a project that has the potential to create sustained energy reductions that are greater than 50 percent for the project development, as compared to similar project developments that do not include the technology used by the project that is the subject of the demonstration.

(3) COST-SHARING.—Each demonstration activity carried out under a project under this program shall be subject to each cost-sharing requirement described in section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352).

(4) PUBLIC-PRIVATE PARTNERSHIPS.—The Secretary shall provide a grant under this section only to an eligible entity that uses a public-private partnership to design and carry-out the project of the eligible entity.

(5) LIMITATION ON FUNDS.—Funds provided through a grant made by the Secretary under this section shall not be used by the recipient eligible entity for any operation or maintenance cost of the eligible entity.
(6) REPORT.—The Secretary shall require each eligible entity that receives a grant from the Secretary under this section to submit to the Secretary on a date not later than 1 year after the date on which the eligible entity completes the project of the eligible entity a report that contains a description of—

(A) the estimated reductions in water use achieved by the project of the entity;

(B) the reductions in energy consumption achieved by the project of the entity;

(C) the comprehensive environmental benefits achieved by the project of the entity; and

(D) the manner by which each reduction or benefit described in subparagraphs (A) through (C) compare to the original estimates of the eligible entity.

SEC. 10. RURAL WATER UTILITIES ENERGY AND WATER EFFICIENCY PROGRAM.

As soon as practicable after the date of enactment of this Act, the Secretary shall establish and carry out a program similar to, and consistent with, the national rural water and wastewater circuit rider program established under section 306(a)(22) of the Consolidated Farm
and Rural Development Act (7 U.S.C. 1926(a)(22)) (including the authority to make grants)—

(1) to provide on-site technical assistance to rural drinking water and wastewater utilities (including utilities serving an Indian tribe (as defined in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b))); and

(2) to improve energy efficiency, identify and develop alternative and renewable energy supplies, and conserve water in the operation of rural drinking water and wastewater utilities.

SEC. 11. COMPREHENSIVE WATER USE AND ENERGY SAVINGS STUDY.

(a) In General.—As soon as practicable after the date of enactment of this Act, in consultation with other Federal agencies and appropriate entities, and incorporating available governmental and nongovernmental data as appropriate, the Secretary shall conduct a comprehensive study to determine the interrelated nature of water and energy use (including energy consumption in water-related processes and the manner by which to reduce water-related energy consumption) to promote the efficient use of water and energy.

(b) Required Components.—
(1) IN GENERAL.—In conducting the study under subsection (a), the Secretary shall include each component described in paragraphs (2) through (5).

(2) INDUSTRIAL WATER.—In accordance with paragraph (1), the Secretary shall—

(A) assess the annual industrial water use of the United States through a comparison, as the Secretary determines to be appropriate, of the differences in usage among—

(i) various regions of the United States;

(ii) industry types and processes; and

(iii) the use of in-plant waste treatment facilities; and

(B) identify opportunities to reduce significantly industrial energy consumption and associated costs through the use of—

(i) water management strategies;

(ii) water conservation using technologies in existence as of the date of enactment of this Act; and

(iii) reused water, particularly with respect to industrial energy applications.
(3) **PEAK DEMAND.**—In accordance with paragraph (1), the Secretary shall identify options to reduce energy use by water treatment and delivery systems during peak electric demand periods, including through—

(A) the use of increased water storage facilities;

(B) the aggregation of water system utility accounts;

(C) the installation of supervisory control and data acquisition systems; and

(D) improvements made to primary and secondary water and wastewater treatment.

(4) **NONPOTABLE WATER SOURCES.**—In accordance with paragraph (1), the Secretary shall identify and assess—

(A) the applications and uses for nonfreshwater sources of water supply in industrial, commercial, and residential applications; and

(B) the potential energy conservation that may result from the use of nonfreshwater supplies, including—

(i) recycled and reclaimed water;

(ii) produced water; and
(iii) other nontraditional water sources.

(5) Embedded energy.—In accordance with paragraph (1), to facilitate an understanding of the potential energy savings associated with water conservation and efficiency, the Secretary shall assess and estimate the quantity and type of energy consumed in the procurement, transport, and treatment of water supplies and wastewater that serve industrial, commercial, and residential uses, including variations relating to differences in geography and types of supply and wastewater processes.

(c) Report.—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—

(1) the results of the study conducted by the Secretary under this section; and

(2) the means by which to incorporate, and the benefits of incorporating, the results of the study into related reports prepared by the Secretary.