111TH CONGRESS
1st Session
HOUSE OF REPRESENTATIVES
REPORT
111–344

ENERGY AND WATER RESEARCH INTEGRATION ACT

DECEMBER 1, 2009.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. GORDON of Tennessee, from the Committee on Science and Technology, submitted the following

R E P O R T

together with

ADDITIONAL VIEWS

[To accompany H.R. 3598]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 3598) to ensure consideration of water intensity in the Department of Energy's energy research, development, and demonstration programs to help guarantee efficient, reliable, and sustainable delivery of energy and water resources, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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89–006

I. BILL

The amendment is as follows:
Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Energy and Water Research Integration Act".

SEC. 2. INTEGRATING ENERGY AND WATER RESEARCH.

(a) IN GENERAL.—In carrying out the energy research, development, and demonstration programs and projects of the Department of Energy, the Secretary of Energy shall—

(1) seek to advance energy and energy efficiency technologies and practices that would—

(A) minimize freshwater withdrawal and consumption;

(B) increase water use efficiency; and

(C) utilize nontraditional water sources with efforts to improve the quality of that water;

(2) consider the effects climate variability and change may have on water supplies and quality for energy generation and fuel production; and

(3) improve understanding of the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States.

(b) DELAY OR DISRUPTION.—In carrying out subsection (a), the Secretary shall ensure that no program or project of the Department of Energy is unnecessarily delayed or disrupted.

(c) SPECIFIC CONSIDERATIONS.—In carrying out subsection (a), the Secretary shall consider, as appropriate—

(1) new advanced cooling technologies for energy generation and fuel production technologies;

(2) performance improvement of existing cooling technologies and cost reductions associated with using those technologies;

(3) innovative water reuse, recovery, and treatment in energy generation and fuel production;

(4) technology development for carbon capture and storage systems that utilize efficient water use design strategies;

(5) technologies that are life-cycle cost effective;

(6) systems analysis and modeling of issues relating to the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States;

(7) technologies to treat and utilize produced waters discharged from oil, natural gas, coalbed methane, and mining activities;

(8) advanced materials for the use of nontraditional water sources for energy generation and fuel production;

(9) biomass production and utilization and the impact on hydrologic systems;

(10) technologies that reduce impacts on water from energy resource development;

(11) increases in energy efficiency of water distribution and collection systems; and

(12) technologies for energy generation from water distribution and collection systems.

(d) INTERAGENCY COLLABORATION AND NONDUPLICATION.—In carrying out the energy research, development, and demonstration programs of the Department of Energy in accordance with this section, the Secretary shall, where appropriate, work collaboratively with other Federal agencies operating related programs and avoid duplication.

(e) INTRA-AGENCY COORDINATION AND NONDUPLICATION.—In carrying out the energy research, development, and demonstration programs of the Department of Energy in accordance with this section, the Secretary shall coordinate and avoid dupli-

cation of activities across programs and projects of the Department, including with those of the National laboratories.

(f) RELEVANT INFORMATION AND RECOMMENDATIONS.—In carrying out the energy research, development, and demonstration programs of the Department of Energy in accordance with this section, the Secretary shall consider and incorporate, as appropriate, relevant information and recommendations, including those of the National Water Availability and Use Assessment Program under section 9508(d) of the Omnibus Public Land Management Act of 2009 (42 U.S.C. 10368(d)).

(g) REPORTS.—Not later than 1 year after the date of enactment of this Act, and at least once every 2 years thereafter, the Secretary shall transmit to Congress a report on findings and activities under this section.

(h) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy for carrying out this section $60,000,000 for each of the fiscal years 2011 through 2015.

SEC. 3. ENERGY-WATER ARCHITECTURE COUNCIL.

(a) IN GENERAL.—The Secretary of Energy, in coordination with other relevant Federal agencies, shall establish an Energy-Water Architecture Council to promote and enable improved energy and water resource data collection, reporting, and technological innovation. The Council shall consist of—

(1) representation from each Federal agency that conducts research related to energy and water resource data; and

(2) non-Federal members, including representatives of research and academic institutions and industry, who have expertise in technologies and practices relating to the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States.

(b) FUNCTIONS.—The Council shall—

(1) develop data collection and data communication standards and protocols for the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States;

(2) make improvements to Federal water use data to increase understanding of trends in energy generation and fuel production;

(3) utilize information from existing monitoring networks to provide nationally uniform water and energy use and infrastructure data; and

(4) conduct annual technical workshops, including at least one regional workshop annually, to facilitate information exchange among Federal, State, and private sector experts on technologies that encourage the conservation and efficient use of water and energy.

(c) REPORTS.—Not later than 1 year after the date of enactment of this Act, and at least once every 2 years thereafter, the Council, through the Secretary of Energy, shall transmit to the Congress a report on its findings and activities under this section.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy for carrying out this section $5,000,000 for each of the fiscal years 2011 through 2015.

SEC. 4. LIMITATION ON FEDERAL REGULATIONS.

Nothing in this Act shall be construed to allow the establishment of regulations by the Federal Government that would infringe or impair the use of water by State, tribal, or local governments.

SEC. 5. MANDATES.

Nothing in this Act shall be construed to require State, tribal, or local governments to take any action that may result in an increased financial burden to such governments by restricting the use of water by such governments.

II. PURPOSE OF THE BILL

The purpose of H.R. 3598 is to ensure consideration of water intensity in the Department of Energy's energy research, development and demonstration programs where appropriate, and to help assure efficient, reliable and sustainable delivery of energy and water resources.

III. BACKGROUND AND NEED FOR THE LEGISLATION

According to the National Science and Technology Council Committee on Environment and Natural Resources' Subcommittee on Water Availability and Quality report, A Strategy for Federal

Science and Technology to Support Water Availability and Quality in the United States, there is a need for coordinated science and technology efforts to better understand water supply and demand in the United States. In addition, the Committee understands the Department of Energy will issue a draft energy-water research roadmap outlining a number of research and development challenges in this area. Finally, the recent Government Accountability Office report, Electricity and Water: Improvements to Federal Water Use Data Would Increase Understanding of Trends in Power Plant Water Use, underscores the need for improvements in federal water use data to help increase the understanding of trends in power plant water use.

Energy and water are directly linked. Water is essential for energy generation and fuel production—it is used in energy resource extraction, refining, processing, transportation, hydroelectric generation, thermoelectric power plant cooling and emissions scrubbing. Equally important is the energy needed for water pumping, treatment, distribution and end-use requirements. Furthermore, climate variability and demand growth affect both our water and energy resources. Accordingly, it is important to recognize this interdependency and develop technologies and adopt practices that allow us to manage these resources effectively. Thermoelectric power, oil, natural gas, oil shale, and renewable energy, including solar power and biofuels, are all important areas for energy and water research integration.

Thermoelectric Power: Water is a critical resource in the thermoelectric power industry. The primary purpose for water withdrawal in the industry is cooling. Thermoelectric power generation uses a variety of fuel sources including coal, nuclear, oil, natural gas, and the steam portion of gas-fired combined cycle plants. The United States Geological Survey (USGS) estimates that thermoelectric generation accounts for approximately 136 billion gallons per day of freshwater withdrawals, ranking only slightly behind agricultural irrigation as the largest source of freshwater withdrawals in the United States.[1] According to the National Energy Technology Laboratory Director's testimony before the Senate Energy and Natural Resources Committee earlier this year, nuclear power plants consume approximately 40 percent more water than equivalent contemporary sub-critical pulverized coal (PC) plants and natural gas combined cycle plants consume approximately 60 percent less than PC plants.

As our population grows, our demand for water continues to rise while supplies become scarcer. In water-stressed areas of the United States, power plants will increasingly compete with other sectors of the economy and end-users for water resources. In addition, energy and water-related regulatory policy may add to the challenge of operating our existing power plants and permitting new thermoelectric power plants.

In discussing water use at thermoelectric power plants, it is necessary to make a distinction between water withdrawal and water consumption. Water withdrawal represents the total water taken from a water source or reservoir, such as a lake or river. Water

[1] Feeley, Thomas J. et al, 2006, "Department of Energy/National Energy Technology Laboratory's Power Plant-Water R&D Program," Pittsburgh, PA.

consumption measures the amount of water withdrawal that is not returned to the source. Freshwater consumption for thermoelectric uses appears low at only three percent when compared with other use categories such as irrigation, which is responsible for 81 percent of water consumed. Still, at that consumption rate, thermoelectric power plants consumed more than 3 billion gallons per day.[2] Given that the energy-water relationship is already under strain, the Department of Energy's National Energy Technology Laboratory (NETL) is developing advanced technologies targeted at reducing freshwater withdrawal and consumption associated with thermoelectric power generation.

Oil, Gas and Oil Shale: Initial extraction of oil and gas does not require a great deal of water, but as oil deposits are depleted, enhanced oil recovery (EOR) techniques are applied to extract additional oil from existing wells. These techniques often involve injection of water or steam into the well to extract the additional resource. In 1995, the American Petroleum Institute estimated that oil and gas operations generated 18 billion barrels of produced water and estimated that over 70 percent of the produced water is recycled and used for EOR. The Department of Energy estimates that conventional petroleum refineries consume one gallon of water for each gallon of oil refined. Additional water is needed for cooling during the refining process. DOE also estimates that the U.S. has 500 billion to 1.1 trillion barrels of oil in the form of oil shale deposits. Recovery of these deposits could consume two-to-five gallons of water per gallon of refinery-ready oil, according to DOE.

Renewables: The use of water in the extraction and processing of petroleum-based transportation fuels is relatively small compared to the electric-generating industry. However, similar to fossil and nuclear technologies, many renewable energy technologies use water in the generation process. The Department's Office of Energy Efficiency and Renewable Energy has started to address these issues through their Industrial Technologies Program (ITP) as well as through studies and research activities in individual renewable energy technology programs. Concentrating solar thermal, geothermal and biomass combustion are all renewable technologies which generate power through conventional heat-engine operating cycles, which are generally water intensive. One area of research funded by ITP is the organic rankine cycle (ORC), which can improve recovery of waste heat in industrial processes and be used in solar thermal and geothermal operations. An ORC uses an organic fluid instead of steam to power a high-efficiency turbine, thereby reducing water use and increasing energy efficiency. Additional efficiency gains can be achieved for solar thermal and geothermal technologies if power plants forgo wet cooling technologies for the more expensive dry cooling technologies, similar to fossil power plant technologies.

Biofuel production has come under significant scrutiny for its use of water. From feedstock production to final conversion to a liquid transportation fuel, biofuels have a significant impact on water resources. Dedicated energy crops grown specifically for energy production can be very water intensive if irrigation is necessary for

[2] Feeley, Thomas J. et al, 2007, "Water: A Critical Resource in the Thermoelectric Power Industry," Department of Energy, National Energy Technology Laboratory, Pittsburgh, PA.

sufficient yields. On the other hand, low-value woody biomass, algae, agriculture residues or other organic waste streams used as feedstocks for energy production biomass have a much smaller demand for water. Additionally, water is used in several other processes during conversion, but the biorefining process is modest compared to the water applied and consumed in growing the plants used to produce the biofuels. According to a 2007 Sandia National Laboratories report, a traditional dry mill corn-ethanol facility uses four gallons of water per gallon of ethanol produced (gal/gal).[3] A new study by the Argonne National Laboratory has shown that this number has significantly decreased over time.[4] Technologies being researched such as gasification and pyrolysis may also help to decrease the need for water in biofuels production.

As future demands for energy and water continue to grow, the reliability of our energy and water supplies is likely to be an increasing challenge. As water use decisions become more difficult a comprehensive research, development and demonstration strategy would help to ensure we are well-equipped to prevent energy and water supply disruptions.

H.R. 3598 authorizes research addressing these issues by directing the Secretary of Energy to integrate energy-related water issues into energy research, development and demonstration programs at the Department of Energy.

IV. SUMMARY OF HEARINGS

Subcommittee hearing—"Technology Research and Development Efforts Related to the Energy and Water Linkage"

On Thursday, July 9, 2009, the Subcommittee on Energy and Environment held a hearing on the role of the federal government and industry in developing technologies designed to address the inextricable link between our energy and water resources and how deployment of such technologies could help to avoid resource supply disruptions.

There were five witnesses: (1) Dr. Kristina Johnson, Undersecretary of Energy for the U.S. Department of Energy (DOE); (2) Ms. Anu Mittal, Director of Natural Resources and Environment at the U.S. Government Accountability Office (GAO); (3) Dr. Bryan Hannegan, Vice President of Environment & Generation at the Electric Power Research Institute (EPRI); (4) Mr. Terry Murphy, President of SolarReserve, LLC; and (5) Mr. Richard L. Stanley, Vice President of the Engineering Division at GE Energy.

During the discussion period, the Members and witnesses discussed the varied opportunities and limitations for modifying water use in energy production. They identified several major themes including the relationship of carbon emissions with both water and energy, a need for collaborative research and development among industry, academia, domestic federal programs, and other nations, the distinction between water use and water consumption (loss), economic considerations of new energy policies, and the need for simultaneous research on water and energy due to their interdepend-

[3] Pate, R., et al, 2007, "Overview of Energy-Water Interdependencies and the Emerging Energy Demands on Water Resources," Sandia National Laboratories, Los Alamos, NM.

[4] Wu, May, 2008, "Analysis of the Efficiency of the U.S. Ethanol Industry 2007," Center for Transportation Research, Argonne National Laboratory, delivered to Renewable Fuels Association.

ency. Other topics included projected national population growth and accompanying demand for water and energy, uses for grey water, existing energy plant retrofits, a national goal for water reuse, energy storage technologies and the Smart Grid, water use in biomass crop production, gas turbine efficiency, water demands with carbon capture and sequestration at coal plants, water desalinization, industry enthusiasm for new technologies, water use in cooling nuclear power plants, emissions trading schemes, and job creation.

Dr. Kristina M. Johnson, Under Secretary of Energy at the Department of Energy. Dr. Johnson explained the importance of considering climate change effects as we make decisions about our energy and water resources. She also discussed the Department's policy priorities, including energy conservation, development of renewables and advancing technologies that make our power plants operate more efficiently.

Ms. Anu Mittal, Director, Natural Resources and Environment at the Government Accountability Office (GAO). Ms. Mittal provided a preview of two GAO reports due later this year. One report covers water use in power generation and the second report addresses water use in biofuel production. She stated that GAO had identified a number of research needs at all stages of the biofuels lifecycle from cultivation to conversion and distribution. She underscored the need to improve federal data collection efforts through the Energy Information Administration (EIA). Specifically, she recommended that EIA collect and report data on power plants' use of advanced cooling technologies and alternative water sources, and further recommended that the U.S. Geological Survey restart its efforts to collect data on power plant water consumption and make the data on use of alternative water sources readily available.

Dr. Bryan Hannegan, Vice President, Environment & Generation for the Electric Power Research Institute. Dr. Hannegan stated that in the future we will be living in a carbon-constrained world and a water-constrained world because of climate variability, economic growth, and increasing demand for those resources. He discussed the water use at thermoelectric power generation plants, including future water use anticipated should carbon capture and storage technologies be deployed broadly. He described existing and advanced cooling technologies and operation practices available today and the challenges and benefits with deployment of these technologies and strategies.

Mr. Terry Murphy, President of SolarReserve. Mr. Murphy stated that solar-based electricity will be instrumental in achieving our renewable energy production goals. He provided an overview of concentrating solar thermal technologies and explained hybrid cooling technologies. He also noted that the cost of new technologies should not be overlooked.

Mr. Richard L. Stanley, Vice President, Engineering Division with GE Energy. Mr. Stanley noted that the nexus between power generation and water usage is one of the world's most complex and critical public policy challenges. He offered four recommendations to the Committee: greater investments in water reuse technologies, federal support for research, development and demonstration of high-efficiency gas turbine technology, increased research in system integration of desalination processes and additional research on

large-scale demonstration of ORC technology for waste heat recovery.

The following related hearings were also held in the 110th and 111th Congresses:

On March 4, 2009, a hearing titled: 21st Century Water Planning: The Importance of a Coordinated Federal Approach.

On July 23, 2008, a hearing titled: A National Water Initiative: Coordinating and Improving Federal Research on Water.

On May 14, 2008, a hearing titled: Water Supply Challenges for the 21st Century.

On October 30, 2007, a hearing titled: Research To Improve Water-Use Efficiency and Conservation: Technologies and Practices.

V. COMMITTEE ACTIONS

On September 17, 2009, Committee Chairman Bart Gordon introduced H.R. 3598, the Energy Water Research Integration Act, which was referred to the Committee on Science and Technology.

Subcommittee markup

On September 30, 2009, the Subcommittee on Energy and Environment met to consider H.R. 3598, The Energy Water Research Integration Act. The Subcommittee considered the following amendments:

1. Mr. Gordon offered a manager's amendment. The amendment proposed to make technical corrections, clarify the intent of the bill and incorporate suggestions from witnesses and minority staff. The amendment was agreed to by voice vote.

2. Mr. Inglis offered an amendment to require the Secretary of Energy to review the report of the National Water Availability and Use Assessment Program under section 9508(d) of the Omnibus Public Land Management Act of 2009 (42 U.S.C. 10368(d)) before providing Congress with a narrowly focused research and development strategy for implementing Section 2 of the bill. The amendment was withdrawn.

H.R. 3598, as amended, was agreed to by voice vote.

Mr. Baird moved that the Subcommittee favorably report H.R. 3598, as amended, to the Full Committee. The motion was agreed to by voice vote.

Full committee markup

On October 7, 2009, the Science and Technology Committee met to consider three pieces of legislation, including H.R. 3598, The Energy and Water Research Integration Act. The Committee considered the following amendments:

1. Mr. Gordon offered a manager's amendment. The amendment proposed to make technical corrections, clarify the intent of the bill and incorporate suggestions from witnesses and minority staff. The amendment was agreed to by voice vote.

2. Mr. Hall offered an amendment to modify Section 2 to require the Secretary to develop an "Energy Water Research and Development Roadmap" to define research, development, demonstration, and commercialization efforts related to the energy-water nexus. The amendment provides ten specific considerations for the Roadmap for which the Secretary shall establish milestones. In addition,

the amendment requires the Secretary to implement the Roadmap in carrying out energy research, development, and demonstration programs at DOE. Finally, the amendment changed the authorization level to $30 million over five years. The amendment was withdrawn.

3. Ms. Dahlkemper offered an amendment to add two items to the list of specific considerations in the legislation. The amendment would require the Secretary to consider increases in the energy efficiency of water distribution and collection systems and to consider technologies for energy generation from water distribution and collection systems. The amendment was agreed to by voice vote.

4. Mr. Smith offered two amendments en bloc. The amendment adds two additional sections to the legislation clarifying that nothing in the Act, "shall be construed to allow the establishment of regulations by the Federal Government that would infringe or impair the use of water by State, tribal, or local governments," and that nothing in the Act "shall be construed to require State, tribal, or local governments to take any action that may result in an increased financial burden to such governments by restricting the use of water by such governments." The amendment was agreed to by voice vote.

5. Ms. Johnson offered an amendment to add "natural gas" as a specific consideration under Section 2(b)(7). The amendment was agreed to by voice vote.

6. Mr. Broun offered an amendment to add a new section to the bill that would require the Secretary to review a report from the National Water Availability and Use Assessment Program, conduct a study in consultation with EPA, and provide to Congress a "narrowly focused research and development strategy" before implementing Section 2 of the bill. The amendment was defeated by voice vote.

7. Ms. Biggert offered an amendment to strike Section 3 ("Energy-Water Architecture Council") from the bill. The amendment was defeated by voice vote.

H.R. 3598, as amended, was agreed to by voice vote.

Mr. Tonko moved that the Committee favorably report H.R. 3598, as amended, to the House with the recommendation that the bill do pass. The motion was agreed to by voice vote.

VI. SUMMARY OF MAJOR PROVISIONS OF THE BILL

H.R. 3598 requires the Secretary of Energy to integrate water-related research into the DOE's existing energy and energy efficiency research, development and demonstration programs and projects to help assure efficient, reliable and sustainable delivery of our energy and water resources.

Generally, the bill authorizes $60 million annually in Fiscal Years 2011 through 2015 to advance energy and energy efficiency technologies and practices that would minimize freshwater withdrawal and consumption, increase water use efficiency, and utilize nontraditional water sources in energy production. The Secretary also is directed to consider the effects climate change may have on water supplies and quality for energy generation and fuel production. In addition, the Secretary is directed to improve the understanding of the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the

United States. Additionally, when conducting research the Secretary will coordinate with other agencies to reduce duplication of activities. The Secretary will also consider relevant information and recommendations when carrying out the energy-water research and report back to Congress not later than one year and at least once every two years thereafter on its findings and activities.

In carrying out the Department's energy research, development and demonstration programs the Secretary should consider the following specific areas, where appropriate: (1) new advanced cooling technologies for energy generation and fuel production technologies; (2) performance improvements in existing cooling technologies and cost reductions associated with using those technologies; (3) innovative water reuse, recovery, and treatment in energy generation and fuel production; (4) efficient water use design strategies and technology development for carbon capture and storage systems; (5) technologies that are life-cycle cost effective; (6) systems analysis and modeling of issues relating to the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the U.S.; (7) technologies to treat and utilize produced waters discharged from oil, coalbed methane and mining activities; (8) advanced materials for the use of nontraditional water sources for energy generation and fuel production; (9) biomass production and the impact on hydrologic systems; (10) reduction of water resource impacts of fossil fuel resource development; (11) increases in energy efficiency of water distribution and collection systems; and (12) technologies for energy generation from water distribution and collection systems.

H.R. 3598 also authorizes $5 million annually to the Secretary of Energy to coordinate with other relevant federal agencies to establish an Energy-Water Architecture Council (EWAC) for the purposes of providing improved energy and water resource data collection, reporting and technological innovation. EWAC will be led by the DOE but will involve non-federal representatives, including representatives from research and academic institutions and industry who have expertise in technologies and practices relating to the energy required to provide water supplies and the water required to provide reliable energy supplies. The functions of EWAC include: (1) developing data collection and data communication standards and protocols, (2) making improvements to federal water use data, (3) utilizing information from existing monitoring networks to provide nationally uniform water and energy use and infrastructure data, and (4) conducting annual technical workshops and at least one regional workshop annually.

VII. SECTION-BY-SECTION ANALYSIS

Sec. 1. Short title

Section 1 states that this Act may be cited as the "Energy and Water Research Integration Act."

Sec. 2. Integrating Energy and Water Research

Section 2(a) establishes the overall objectives of the DOE's integration of energy-related water research into its existing energy research, development and demonstration programs and projects.

Section 2(b) ensures that the Secretary shall not unnecessarily delay or disrupt programs or projects.

Section 2(c) identifies 12 specific areas of consideration for the Secretary as he integrates water-related research into the Department's existing energy and energy efficiency research, development and demonstration programs.

Section 2(d) calls for interagency collaboration and nonduplication when carrying out research, development and demonstration programs and projects of this section.

Section 2(e) calls for intra-agency collaboration and nonduplication when carrying out research, development and demonstration programs and projects of this section.

Section 2(f) requires the Secretary to consider and incorporate, as appropriate, relevant information and recommendations when carrying out the research, development and demonstration programs and projects of this section.

Section 2(g) requires the secretary to report back to Congress not later than one year and at least once every two years thereafter on its findings and activities under this section.

Section 2(h) authorizes to be appropriated to the Secretary of Energy $60 million for each of the fiscal years 2011 through 2015 to carry out this section.

Sec. 3. Energy-Water Architecture Council

Section 3(a) directs the Secretary of Energy to coordinate with other relevant federal agencies to establish an Energy-Water Architecture Council (EWAC) for the purposes of providing improved energy and water resource data collection, reporting, and technological innovation. EWAC will be led by DOE, but include non federal representatives, including representatives from research and academic institutions and industry who have expertise in the area of energy-water nexus.

Section 3(b) lays out the following functions of EWAC: (1) developing data collection and data communication standards and protocols; (2) making improvements to federal water use data; (3) utilizing information from existing monitoring networks to provide nationally uniform water and energy use and infrastructure data; and (4) conducting annual technical workshops and at least one regional workshop annually.

Section 3(c) requires that the Council, through the Secretary of Energy, transmit to Congress not later than one year after the date of enactment of this Act, and at least once every two years thereafter, a report that describes its findings and activities under this section.

Section 3(d) authorizes to be appropriated to the Secretary of Energy $5 million for each of fiscal years 2011 through 2015 to carry out this section.

VIII. COMMITTEE VIEWS

H.R. 3598, the Energy Water Research Integration Act, as amended, is designed to address the challenges related to increasing demands on our energy and water resources. H.R. 3598 will provide important research and development to meet specific technical challenges occurring at the nexus of energy and water. This nexus refers to the numerous connections between the energy re-

quired to provide water supplies and the water required to provide reliable energy supplies and all ancillary and otherwise related activities. The legislation builds on the recommendations from five House Science and Technology Committee hearings on water and several reports from the National Academies, the Government Accountability Office, the National Science Technology Council, and the Department of Energy (DOE).

The Committee is disappointed in the DOE's delay in finalizing the Energy Water report required under Section 979 of the Energy Policy Act of 2005 (P.L. 109–58). The report was due two years after enactment and has yet to be received by Congress. This report as well as other relevant information and recommendations on the energy water nexus should be considered when the Secretary carries out research under this bill.

The Committee believes that it is vital that the DOE take water considerations into account as part of the Department's strategic thinking on energy research, development, and demonstration. The Committee notes the work already in progress at the department related to the energy-water nexus, specifically at the National Energy Technology Laboratory (NETL). This work is commendable, but as identified by witness testimony only the beginning of the activities that DOE should undertake in the energy-water nexus. The intention of the Committee is for the Secretary to have the discretion to incorporate energy-water nexus research into programs and projects which the Secretary considers appropriate.

Specific consideration should be given to technologies, practices and areas of research outlined in the bill. One specific consideration the Secretary should pay attention to is the life-cycle cost effectiveness of a technology. To develop realistic assessments of all the benefits and impacts on the efficiency with which the country uses water to produce electricity, the Committee believes DOE needs a more accurate analysis of the full life-cycle cost of technologies—from resource extraction, power plant construction, power plant operations, and through water returns—to determine the demand and quality of water for energy generation. The Committee does not mean the life-cycle cost of a single technology that is a part of a larger system to produce energy. Other technologies which need more explanation when carrying out research include energy generation technologies that can be installed in water distribution and collection systems. Both water and sewer systems are designed to maximize the use of gravity. In both systems applications may also include pressurized ("force") lines, typically for only part of the circuit of the flow from source to ultimate consumption. Additionally, there are many gravity-enabled energy generation opportunities that can and should be explored in water collection and distribution systems.

The Committee notes the lack of common standards for energy-water information technology (IT), specifically related to measurement, evaluation and reporting. Witness testimony at past Science and Technology hearings provided evidence that an overlay of an effective IT management system could result in an annual water savings of 30 to 50 percent. The Committee believes that there is much to be gained from a water information technology initiative through partnerships with the IT industry. The end goal of such

a partnership would be the development and deployment of a common platform: a national "smart water grid."

H.R. 3598 creates an "Energy-Water Architecture Council" (EWAC) that will facilitate the collaboration of industry, academia, and the federal government in improving energy and water resource data collection, reporting, and technological innovation. The Committee received testimony from multiple witnesses on the importance of bringing together the Federal Government and industry to improve energy and water resource technology innovation and data collection. The Committee recognizes the successes of the GridWise Architecture Council (GWAC) and encourages DOE to utilize the model of GWAC in the implementation of H.R. 3598. EWAC has been designed to function like GWAC, which has successfully brought industry and government together to work on a huge issue like grid modernization.

IX. COST ESTIMATE

A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science and Technology prior to the filing of this report and is included in Section X of this report pursuant to House Rule XIII, clause 3(c)(3).

H.R. 3598 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that sums authorized under the bill are appropriated, H.R. 3598 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

X. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

OCTOBER 19, 2009.

Hon. BART GORDON,
Chairman, Committee on Science and Technology, House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 3598, the Energy and Water Research Integration Act.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Jeff LaFave.

Sincerely,

DOUGLAS W. ELMENDORF.

Enclosure.

H.R. 3598—Energy and Water Research Integration Act

Summary: H.R. 3598 would authorize the appropriation of $325 million over the 2011–2015 period for the Department of Energy (DOE) to attempt to enhance energy and water-use efficiency in the agency's research, development, and demonstration programs. Assuming appropriation of the authorized amounts, CBO estimates that implementing the legislation would cost $221 million over the 2011–2014 period and $104 million after 2014. Enacting H.R. 3598 would not affect direct spending or revenues.

H.R. 3598 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would impose no costs on state, local, or tribal governments.

Estimated cost to the federal government: The estimated budgetary impact of H.R. 3598 is shown in the following table. The costs of this legislation fall within budget function 250 (general science, space, and technology).

	By fiscal year, in millions of dollars—					
	2010	2011	2012	2013	2014	2010–2014
CHANGES IN SPENDING SUBJECT TO APPROPRIATION						
Authorization Level	0	65	65	65	65	260
Estimated Outlays	0	36	55	65	65	221

Basis of estimate: For this estimate, CBO assumes that H.R. 3598 will be enacted early in fiscal year 2010 and that the authorized amounts will be appropriated for each fiscal year. Estimated outlays are based on historical spending patterns for similar DOE programs.

H.R. 3598 would authorize the appropriation of $60 million a year over the 2011–2015 period for DOE to coordinate research, development, and demonstration activities that promote energy and water-use efficiency. The bill also would authorize the appropriation of $5 million a year over the 2011–2015 period to establish the Energy-Water Architecture Council to improve the collection and reporting of data on energy and water resources. Finally, the bill would require DOE and the Council to submit biennial reports to the Congress describing the activities of their programs. Assuming appropriation of the authorized amounts, CBO estimates that implementing the bill would cost $221 million over the 2011–2014 period and $104 million after 2014 assuming appropriation of the authorized amounts.

Intergovernmental and private-sector impact: H.R. 3598 contains no intergovernmental or private-sector mandates as defined in UMRA and would impose no costs on state, local, or tribal governments.

Estimate prepared by: Federal Costs: Jeff LaFave; Impact on State, Local, and Tribal Governments: Ryan Miller; Impact on the Private Sector: Amy Petz.

Estimate approved by: Theresa Gullo, Deputy Assistant Director for Budget Analysis.

XI. COMPLIANCE WITH PUBLIC LAW 104–4

H.R. 3598 contains no unfunded mandates.

XII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

The Committee on Science and Technology's oversight findings and recommendations are reflected in the body of this report.

XIII. STATEMENT ON GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause 3(c) of House rule XIII, the goal of H.R. 3598 is to ensure consideration of water intensity in the Department of Energy's energy research, development and demonstration pro-

grams where appropriate, and to help assure efficient, reliable and sustainable delivery of energy and water resources.

XIV. CONSTITUTIONAL AUTHORITY STATEMENT

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 3598.

XV. FEDERAL ADVISORY COMMITTEE STATEMENT

H.R. 3598 does not establish nor authorize the establishment of an advisory committee, pursuant to 5 U.S.C. App.

XVI. CONGRESSIONAL ACCOUNTABILITY ACT

The Committee finds that H.R. 3598 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

The bill is not intended to preempt any state, local, or tribal law.

XVIII. EARMARK IDENTIFICATION

H.R. 3598 does not contain any congressional earmarks, limited tax benefits, or limited tariff benefits as defined in House rule XXI, clause 9.

XIX. COMMITTEE RECOMMENDATIONS

On October 7, 2009, the Committee on Science and Technology favorably reported the Energy and Water Research Integration Act by voice vote, and recommended its enactment.

XX. ADDITIONAL VIEWS OF REPRESENTATIVES RALPH M. HALL, F. JAMES SENSENBRENNER, PAUL C. BROUN, JUDY BIGGERT, MARIO DIAZ-BALART, DANA ROHRABACHER, RANDY NEUGEBAUER, BOB INGLIS, MICHAEL T. MCCAUL.

While we are wholeheartedly supportive of the intention of H.R. 3598 which is to ensure consideration of water intensity in the Department of Energy's research, development and demonstration (RD&D) programs and to help assure efficient, reliable and sustainable delivery of energy and water resources, we still have a few concerns with the bill as currently written.

First, we are concerned that the bill, as passed out of Committee, could produce an unnecessary burden on the Department of Energy (DOE) in that the bill applies to all energy RD&D programs of the Department. The bill does not allow the Secretary to apply the requirements of the bill to only the appropriate programs and projects. It does not allow proper discretion on his part.

Second, the bill does not require the Secretary to take into account, prior to implementation, various "roadmaps" and reports that specifically deal with the energy-water nexus as it relates to energy production in the U.S. which we believe would help focus the research and the dollars to the areas that need it most.

An amendment was offered and withdrawn during the full committee markup by Ranking Member Hall. Chairman Gordon was gracious to offer to work with us prior to bringing the bill to the House Floor with the goal of incorporating parts of Ranking Member Hall's amendment into the bill. We do appreciate the changes that were included in the Manager's Amendment at our suggestion. Our goal with this amendment was to improve upon the underlying bill by giving the Secretary more guidance, discretion, and direction in how to carry out this necessary research.

The amendment included a Roadmap, the recommendations of which would help guide RD&D. The amendment directed the Secretary to develop an Energy-Water Research and Development Roadmap to define RD&D and commercialization efforts at DOE. The Roadmap would follow the same guidelines laid out in the underlying bill and generally take into account the same specific considerations incorporated in the underlying bill.

The amendment also included mutually agreed upon language that was included in the Chairman's manager's amendment on: collaboration, utilization of information, and reporting requirements.

After receiving the roadmap, the amendment required the Secretary to implement the findings in such a way that would deliver the most "bang for the buck" by directing RD&D to those programs at DOE that are identified as the most energy and water intensive and that have the greatest potential to lessen freshwater withdrawal, increase water use efficiency, and utilize nontraditional water sources.

Congress under previous legislation required the DOE to submit a similar report and reports from the Subcommittee on Water Availability and Quality and the National Academies of Science are currently available on this issue. We did not see this roadmap language as intending to replace any work previously done or to ignore the work that could be forthcoming, but instead intended for

the Roadmap in this amendment to incorporate these different reports and thus be an authoritative document that can serve as a "one stop shop" for the energy/water nexus research needs. To that end, the timelines set forth for the Roadmap in this amendment would not have delayed implementation of the RD&D, as it mirrors the Chairman's language which starts in FY 2011, and the Roadmap was to be developed within 6 months of enactment.

The amendment also would have cut the five-year authorization from $300 million to $150 million. The electric power industry released a report two years ago that proposed a research and development program on the energy/water nexus that would cost $37.5 million over a 10-year period. The R&D program proposed would address at least 3 of the special considerations outlined in the underlying bill and in the amendment. We realized that the electric power industry would not be the only energy sector that would be affected, so a comprehensive R&D program would be more costly for everyone than what this industry report called for. Furthermore, we understand that the Chairman's intent may be to establish a program that is more aggressive than industry may propose on its own. Even with all these considerations, the authorization level included in the amendment is an order of magnitude greater than the industry report. If the roadmap were to have been done correctly, and there would truly be collaboration and cooperation within the Department and between Federal agencies, a funding level of $30 million per year should have been more than sufficient to address the needs of this bill.

In addition to two minority amendments that were accepted, there were two that were defeated by voice vote. One would have removed the requirement to establish the Energy-Water Architecture Council. We felt that this council is unnecessary as it is duplicative of other groups currently in existence. The worst possible scenario is us setting up a situation in which we have different groups developing parallel standards and data collection methods for the energy-water nexus that may be very difficult to combine. Such a task would involve some level of data manipulation, which could very well lead to a loss of scientific integrity of the findings. We have worked very hard in this committee to avoid duplicative efforts just like this.

The second amendment rejected would have required the Secretary to review a report of the National Water Availability and Use Assessment Program, conduct a study in consultation with EPA, and provide to Congress a narrowly focused research and development strategy before implementing section two of the bill. This amendment would have provided guidance on where the research was needed most to address the energy/water nexus issue.

We did not attempt to block passage of the bill out of Committee as we do feel this is an important issue, and we are hopeful that our concerns will be addressed through continued dialogue as we move through the legislative process.

RALPH M. HALL.
F. JAMES SENSENBRENNER, JR.
PAUL C. BROUN.
JUDY BIGGERT.
MARIO DIAZ-BALART.

DANA ROHRABACHER.
RANDY NEUGEBAUER.
BOB INGLIS.
MICHAEL T. MCCAUL.

XXI: PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT ON H.R. 3598, ENERGY AND WATER RESEARCH INTEGRATION ACT

WEDNESDAY, SEPTEMBER 30, 2009

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT,
COMMITTEE ON SCIENCE,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:00 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Brian Baird [Chairman of the Subcommittee] presiding.

Chairman BAIRD. Good morning. The Subcommittee will now come to order.

Pursuant to notice, the Subcommittee on Energy and Environment meets to consider the following measures: H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009;* H.R. 3585, the *Solar Technology Roadmap Act;* and H.R. 3598, the *Energy and Water Research Integration Act.* Today we will consider these there bills that cover a wide range of topics in this subcommittee's purview.

First, the Subcommittee will consider my bill, H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009.* As we heard in this subcommittee two weeks ago, rapid overproduction of algae can have devastating effects on aquatic plant and animal life and human health. Unfortunately, despite years of research, the frequency and duration of the harmful algal blooms and hypoxia are on the rise, and affecting more of our coastlines and inland waters. This bill directs the National Oceanic and Atmospheric Administration to implement research strategies and plans to better understand and respond to these blooms and hypoxic events. I look forward to discussing the bill more when we call it up for consideration.

Our third bill will be H.R. 3585. We are changing the order slightly in order for Chairman Gordon to make an Energy and Commerce markup, so our third bill will be H.R. 3585, the *Solar Technology Roadmap Act,* authored by the Space and Aeronautics Subcommittee Chair, Ms. Gabrielle Giffords. This bill instructs the Department of Energy to create a comprehensive and updatable roadmap for solar research, development and demonstration activities with strong private and public input. This roadmap will be critically important to using our limited research dollars as effectively as possible in harnessing the truly immense solar resources we have in the U.S.

Then our second bill will be H.R. 3598, the *Energy and Water Research Integration Act,* authored by the Full Committee Chairman, Mr. Bart Gordon. A little over a year ago, the Chairman began a comprehensive review of our federal research and technology development efforts to improve utilization of our precious water re-

sources. The Committee has since held five hearings and passed out of the House three bills pertaining to this important topic. We now look forward to hearing from Chairman Gordon on this next installment, which addresses the critical linkage between our nation's energy and water resources and directs the Department of Energy to better integrate water into existing federal efforts in this field.

The three bills we have before us today target several important research needs. I thank you all for your attendance and participation this morning, and I look forward to a productive markup.

I recognize Mr. Inglis to present his opening remarks.

[The prepared statement of Chairman Baird follows:]

PREPARED STATEMENT OF CHAIRMAN BRIAN BAIRD

I welcome everyone to this morning's Energy and Environment Subcommittee markup.

Today we will consider three bills that cover a wide range of topics in this subcommittee's purview.

First, the Subcommittee will consider my bill, H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009.* As we heard in this subcommittee two weeks ago, rapid overproduction of algae can have devastating effects on aquatic plant and animal life and human health.

Unfortunately, despite years of research, the frequency and duration of the harmful algal blooms and hypoxia are on the rise, and affecting more of our coastlines and inland waters. This bill directs the National Oceanic and Atmospheric Administration to implement research strategies and plans to better understand and respond to these blooms and hypoxic events. I look forward to discussing the bill more when we bring it up for consideration.

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This roadmap will be critically important to using our, limited research dollars as effectively as possible in harnessing the truly immense solar resources we have in the U.S.

Finally, we will take up H.R. 3598, the *Energy and Water Research Integration Act,* authored by the Full Committee Chairman, Mr. Bart Gordon. In the last Congress the Chairman announced his intention to undertake a comprehensive review of our federal research and technology development efforts to improve utilization of our precious water resources. We have since held five hearings and passed out of the House three bills pertaining to this important topic.

We now look forward to hearing from Chairman Gordon on this next installment which addresses the critical linkage between our nation's energy and water resources, and directs the Department of Energy to better integrate water into existing federal efforts in this field.

The three bills we have before us today target several important research needs. I thank you all for your attendance and participation this morning, and I look forward to a productive markup.

Mr. INGLIS. Thank you, Mr. Chairman. Today we address three pieces of legislation that aim to improve the health of our environment, our investment in solar energy and impact of energy use and development on water resources.

The first bill we will look at is the *Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2009.* It will advance efforts at the federal level to reduce the negative impact that algal blooms have on the environment. Every summer we hear stories about the impact of runaway algae growth on local air quality, animal deaths and environmental quality. Not only do these blooms impact recreation, they burden marine, commerce and human health. This legislation will promote a better understanding

of algal blooms and will help us effectively prevent and respond to blooms and hypoxia.

Second, we will discuss the *Solar Technology Roadmap Act.* This bill aims to increase the strength of our domestic solar technology industry through a coordinated research and development program and public-private partnerships. It also requires industry, academia and government researchers to develop a long-term roadmap that will advance our clean energy alternatives. I hope we can ensure the roadmap is not focused on technology options we are already aware of but also emphasizes cutting-edge advancements that will define the future of solar power.

Finally, we turn to the *Energy and Water Research Integration Act,* which directs the Department of Energy to take into consider energy-related water issues in research, development and demonstration projects. While I agree with the intent of the bill, I am concerned that this only reframes existing DOE priorities and ignores the large role that water resource information should play. I am looking forward to working together to improve the bill.

Thank you again, Mr. Chairman, and I look forward to addressing this legislation.

Chairman BAIRD. Thank you, Mr. Inglis. Members may place statements for the record at this point.

We will now consider H.R. 3598, the *Energy and Water Research Integration Act.* I recognize Chairman Gordon to talk about his bill. Chairman Gordon.

Chairman GORDON. Thank you, Chairman Baird. Let me first say to you, Chairman Baird and Ranking Member Inglis, you have been the workhorse Subcommittee for our committee. These are three more excellent bills. I know it takes a lot of time from other work you have to do but, you know, you are fortunate to have an outstanding staff to help you with this, but it really does, I think, help us to have better product when we go through a subcommittee process rather than just do everything at the Full Committee level. It allows us to have more input from the Minority, from outside folks and we just get better bills, and again, I thank you. You have really been, as I say, the workhorse of our committee.

Now, concerning this bill, to meet our future demands for both energy and water, we will need to better understand the linkage between these two important resources. Energy is needed to pump, treat and transport water while large quantities of water are used to develop energy supplies. H.R. 3598, the *Energy and Water Research Integration Act,* seeks to address the nexus of our energy and water resources by requiring the Secretary to integrate water-related issues into the Department's existing energy efficiency and energy technology research, development and demonstration programs. The bill authorizes $60 million annually for five years for this research. Additionally, H.R. 3598 creates an Energy-Water Architecture Council that will facilitate the collaboration of industry, academia and the Federal Government in improving energy and water resource data collection, reporting and technological innovation. The bill authorizes $5 million annually to the Secretary of Energy for five years for this purpose. After five Committee hearings on water including one specifically related to the energy-water nexus, this legislation is a result of serious investigation by the

Committee. H.R. 3598 has been informed by the witnesses' testimonies and reports from the national academies, the Government Accountability Office, the National Science Technology Council and the Department of Energy. This legislation provides additional tools in a national effort to address the growing problems related to supply and quality of water and energy and augments the interagency coordinating effort laid out in my other bill, H.R. 1145, the *National Water Research and Development Initiative Act of 2009.*

I encourage all my colleagues on the Subcommittee to join me in this effort and support H.R. 3598. Let me also say to Mr. Inglis, I duly noted your earlier concerns and certainly want to continue to work with you as we go from the Subcommittee to the Full Committee level. As always, you make constructive suggestions to make good bills better.

Thank you, Mr. Chairman.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

Thank you, Mr. Chairman.

To meet our future demands for both energy and water we will need to better understand the critical linkages between these two important resources. Energy is needed to pump, treat, and transport water, while large quantities of water are used to develop energy supplies.

H.R. 3598, the *Energy and Water Research Integration Act,* seeks to address the nexus of our energy and water resources by requiring the Secretary to integrate water-related issues into the Department's existing energy efficiency and energy technology research, development and demonstration programs. The bill authorizes $60 million annually for five years for this research.

Additionally, H.R. 3598 creates an "Energy-Water Architecture Council" (EWAC) that will facilitate the collaboration of industry, academia, and the Federal Government in improving energy and water resource data collection, reporting and technological innovation. The bill authorizes $5 million annually to the Secretary of Energy for five years for this purpose.

After five Committee hearings on water, including one specifically related to the energy-water nexus, this legislation is the result of serious investigation by the Committee. H.R. 3598 has been informed by witness testimonies and reports from the National Academies, the Government Accountability Office, the National Science Technology Council, and the Department of Energy.

This legislation provides additional tools in a national effort to address the growing problems related to supply and quality of water and energy, and augments the interagency coordination effort laid out in my other bill, H.R. 1145, the *National Water Research and Development Initiative Act of 2009.*

I encourage all my colleagues on the Subcommittee to join me in this effort and support H.R. 3598.

Chairman BAIRD. Thank you, Mr. Chairman, and I just want to commend you. You know, I would not be surprised at all if historians will look back, and if this last century was the century of oil, this next century may be the century of water, and you are, as always, well ahead of the curve on that issue and on the nexus and I applaud you for this legislation and the series of bills you have authored on this topic.

I would now recognize Mr. Inglis to present any remarks on the bill.

Mr. INGLIS. Thank you, Mr. Chairman, both Mr. Chairmen.

So as more and more of our communities experience water stress and our population continues to grow, the energy-water nexus is increasingly important. Managers of electricity generation facilities, refineries, mines and industrial facilities are painfully aware of what constrained water resources can mean for their operations. To

ensure that we make the best decisions about future energy infrastructure and technology, DOE should take into account ways to manage water demands and energy production. It is reassuring to know that several programs have already been addressing this need. Still, our water resource problems are predicted to become more severe and more work needs to be done. As DOE continues its efforts to ensure that our energy demands—continues to ensure that they should focus not only on new technology and innovation but on water resource issues at the regional and local level.

The 2009 *Omnibus Lands Management Act* includes several reports on water resource issues. Relying on this information will ensure that DOE focuses their resources in the most efficient way possible to make the most progress in areas most at risk. I intend to offer an amendment along these lines, Mr. Chairman, and I thank you for the time.

[The prepared statement of Mr. Inglis follows:]

PREPARED STATEMENT OF REPRESENTATIVE BOB INGLIS

As more and more of our communities experience water stress and our population continues to grow, the energy-water nexus is increasingly important. Managers of electricity generation facilities, refineries, mines, and industrial facilities are painfully aware of what constrained water resources can mean for their operations.

To ensure that we make the best decisions about future energy infrastructure and technology, DOE should take into account ways to manage water demands in energy production. It's reassuring to know that several programs have already been addressing this need. Still, our water resource problems are predicted to become more severe, and more work needs to be done.

As DOE continues its efforts to ensure that our energy demands, they should focus not only on new technology and innovation, but on water resource issues at the regional and local level. The 2009 *Omnibus Lands Management Act* includes several reports on water resource issues. Relying on this information will ensure that DOE focuses their resources in the most efficient way possible to make the most progress in areas most at risk. I intend to offer an amendment along these lines.

Chairman BAIRD. Do other Members wish to be recognized? If not, I will ask unanimous consent that the bill is considered as read and open to amendment at any point and that the Members proceed with the amendments in the order of the roster. Without objection, so ordered.

The first amendment on the roster is a manager's amendment offered by Chairman Gordon. Are you ready to proceed with your amendment, Chairman Gordon?

Chairman GORDON. I have an amendment at the desk.

Chairman BAIRD. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3598, amendment number 033, offered by Mr. Gordon of Tennessee.

Chairman GORDON. The manager's amendment makes a series of changes throughout H.R. 3598 to clarify the intent of the legislation and to incorporate recommendations from witnesses. In addition, this amendment is the product of good suggestions put forth by the Minority, and we thank you for those insightful comments.

Section 2 of H.R. 3598 is an amendment to clarify that the intent of the bill is to integrate water-related issues into the Department's existing energy efficiency and energy technology research, development and demonstration programs. The bill is not meant to create a new program at DOE or involve every program within the agency.

Section 3 of the bill is amended to ensure that the Energy and Water Architecture Council includes a wide variety of non-federal members with expertise across the energy-water spectrum. Furthermore, this section is modified to clarify that the council will bring informed government, academic and industry stakeholders to the table to begin talks about what a smart water grid would entail.

Based on witnesses' recommendations, the manager's amendment modifies Section 3 to allow for regional as well as national technical workshops. Regional workshops will allow for a greater range of potential stakeholder participation and bring focus to region-specific issues and solutions.

This amendment is a result of good suggestions from our Minority and witnesses from past Science and Technology Committee hearings, and I ask my colleagues to support the amendment.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

The manager's amendment makes a series of changes throughout H.R. 3598 to clarify the intent of the legislation and to incorporate recommendations from witnesses. In addition, this amendment is the product of good suggestions put forward by the Minority, and we thank you for those insightful comments.

Section 2 of H.R. 3598 is amended to clarify that the intent of the bill is to integrate water-related issues into the Department's existing energy efficiency and energy technology research, development and demonstration programs.

This bill is not meant to create a new program at DOE or involve every program within the agency.

Section 3 of the bill is amended to ensure that the Energy and Water Architecture Council includes a wide variety of non-federal members with expertise across the energy-water spectrum. Furthermore, this section is modified to clarify that the Council will bring informed government, academic, and industry stakeholders to the table to begin talks about what a "Smart Water Grid" would entail.

Based on witness recommendations, the manager's amendment modifies Section 3 to allow for regional, as well as, national technical workshops. Regional workshops will allow for a greater range of potential stakeholder participation and bring focus to region specific issues and solutions.

This amendment is the result of good suggestions from our Minority and witnesses from past Science and Technology Committee hearings. I ask my colleagues to support the amendment.

Chairman BAIRD. I thank the Chairman. Is there further discussion on this amendment or the bill? Dr. Bartlett.

Mr. BARTLETT. This may be an appropriate place for a question that I have. As you are aware, the Federal Government generally defers to the states primacy on allocation of surface water and groundwater within their jurisdiction. Historically, water quantity and allocation decisions, including water efficiency incentives, have been State matters whereas water quality has been the purview of the Federal Government, the majority of water supply planning and water quantity regulations affirmed by State and local entities. Given that water rights and usage authority and decisions generally reside with states and localities, could water-related R&D project requirements, energy-water systems analysis and associated modeling efforts necessitate greater involvement by State and local agencies in DOE-sponsored project approval or operations? And if so, what would that involvement entail?

Chairman GORDON. Mr. Bartlett, that is a very good question, and I am going to yield to staff for a good answer here. Who would like to take that on?

COUNSEL. I definitely think that there would be greater involvement from the states and we would encourage more collaboration on those individual technologies.

Chairman GORDON. I think the thrust, Dr. Bartlett, is to look for best ideas from all areas and so I think these workshops would certainly allow for that additional input.

Mr. BARTLETT. Thank you very much. Traditionally, the Federal Government has been involved only in water quality where quantity and distribution have been State and local entity decisions, and I just wanted to make sure that this legislation is not going to preempt that traditional division of responsibilities.

Chairman GORDON. Well, it is certainly not to—if the gentleman would yield, the effort is not to usurp that but rather to provide them with additional information so they can make those decisions.

Mr. BARTLETT. Thank you very much. Thank you.

Chairman BAIRD. Ms. Biggert.

Ms. BIGGERT. Thank you, Mr. Chairman, and I do want to say that I really support the intent of this bill. I just have a couple questions. Number one, as introduced, the bill requires the Secretary of Energy in carrying out each of the energy R&D programs of the DOE to advance energy and energy efficiency technologies and practices and incorporate an appropriate host of requirements, and one, for example, would be to incorporate new advanced cooling technologies for energy generation and fuel production technologies. Does that mean for every R&D program at DOE new advanced cooling technologies would need to be utilized? And would these technologies be those DOE is seeking to demonstrate on a commercial scale? And would these technologies be those DOE is seeking to demonstrate that industry developed that were unable to penetrate the market and would the cost of installation be considered a determining factor?

Chairman GORDON. If the gentlelady would yield, the legislation specifically gives the Secretary the discretion. It is not a mandate to incorporate in all areas of research, just where appropriate.

Ms. BIGGERT. Okay. Would these technologies be those DOE is seeking to demonstrate on a commercial scale?

Chairman GORDON. Again, once again that is to the discretion of the Secretary where they think it would be appropriate and beneficial.

Ms. BIGGERT. So there is no talk of what we would be thinking that the Secretary would consider like would the cost of the installation be a determining factor?

Chairman GORDON. I would certainly think that that would be a factor that the Secretary would have to take into account. There is limited dollars to go around.

Ms. BIGGERT. Was there any change in the manager's amendment language to address what seems like a broad mandate placed on the Department to develop the research, development and demonstration program?

Chairman GORDON. Well, once again, it says it does not require it to be integrated in every project but rather leaves that to the discretion of the Secretary, and I would assume the Secretary recognizing there are limited funds would certainly take that into consideration.

Ms. BIGGERT. Okay. Then with the creation of the Energy-Water Architecture Council in Section 3, it seems to be a laudable goal but do you think that it duplicates efforts made by other Department agencies and the private sector? It seems that other bodies created under prior statutes including the *Secure Water Act* are addressing many of these issues and that DOE already participates in these group efforts.

Chairman GORDON. If the gentlelady would yield, this is directly from a recommendation that was made by industry, by the government, by different academies. We took their good ideas and placed it here. I think if they thought it was a duplication, that they would not have made those recommendations.

Ms. BIGGERT. But I think it should be noted that the technical workshops seem to duplicate the efforts made on behalf of these issues by the private sector including those industrial groups so maybe they want to switch and not——

Chairman GORDON. Well, I think the private sector would like to have a direct conduit to getting their recommendations into federal policy.

Ms. BIGGERT. Would the $5 million per year in authorization be used to pay for the putting on these technical workshops?

Chairman GORDON. Yes. What we have found is that if you—and what we, you know, tried to do in a variety of ways is recognize that there are limited resources, whether it is water, different areas, nanotechnology. You know, we are trying to set up coordination between the various federal agencies to better use that money. We find that if you do not give an authorization and they have to use their existing administrative expenses or funds, they simply don't do as good a job. They shortchange it. And so that was the purpose, yes, to cover the cost of those regional meetings.

Ms. BIGGERT. So you think that these workshops would be more informative than those held at the annual meetings and conferences sponsored by the industry and the investment groups?

Chairman GORDON. Well, I think a couple of things. One, they will be a—this will be a way for them not just to talk among themselves but also be able to talk to policy-makers, which is something that I think they will want to do. Secondly, I think that it is important—some of the water problems in Arizona are different than the water problems in New York or Tennessee. So I think it is important that we have the regional meetings so that again part of what we are trying to do is gather information so that communities can make good decisions and that water problems simply differ in different regions of the country.

Ms. BIGGERT. And just quickly, Section 3 states that the Energy-Water Architecture Council is to promote and enable improved energy and water resource data collection, reporting and technological innovation. Does this mean that the technological innovation is in water resource data collecting and reporting?

Chairman GORDON. This is where it would be directly related to energy production, that nexus again that we discussed between water and energy.

Ms. BIGGERT. And then if appropriations are provided under Section 2D, how would the funds be distributed and allocated among the DOE's RD&D activities?

Chairman GORDON. Once again, that would be a matter of discretion with the Secretary.

Ms. BIGGERT. Okay.

Chairman BAIRD. I thank the gentlelady.

Ms. BIGGERT. Thank you. I yield back.

Chairman BAIRD. Time is expired. Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I just would like to follow up on the comments and questions of Dr. Bartlett and support his view on this. The Great Lakes states are very, very nervous about dryer states trying to steal the water from the Great Lakes and the issue that Dr. Bartlett raised is right on point, that the Federal Government has no control over the distribution of the water that the states control, just the quality of it, and I want to make sure that is clearly in the record. Thank you.

Chairman BAIRD. Thank you, Dr. Ehlers. Are there other Members wishing to be recognized on the amendment?

If no, the vote occurs on the amendment. All in favor will say aye. Those opposed, no. The ayes have it and the amendment is agreed to.

The second amendment on the roster is an amendment offered by the Ranking Member, Mr. Inglis. Are you ready to proceed with your amendment, Mr. Inglis?

Mr. INGLIS. Yes, Mr. Chairman, I have an amendment at the desk.

Chairman BAIRD. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3598, amendment number 1015, offered by Mr. Inglis of South Carolina.

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain the amendment.

Mr. INGLIS. Thank you, Mr. Chairman.

Clemson University's Restoration Institute recently launched Intelligent River, a real-time observation system that supports monitoring and management of 154 miles of the Savannah River along the banks of South Carolina's shores. The project started with the intent of monitoring river health but real-time information has piqued the interest of local stakeholders who can use it to more efficiently manage water withdrawal and discharges during periods of water stress. This information is also a powerful input for long-term investment decisions in water use technologies. The public lands bill that went into law earlier this year directed the Department of Interior to conduct a water census. This census will provide information on water quality, availability, flow, use and storage and it will generate models and predictive tools to guide water use decisions. All of this information is intended to help us effectively manage competing water interests and future decisions, similar to, as I was mentioning, what the Clemson University's Restoration Institute has been doing.

My amendment would require DOE to take into account the information coming out of the water census in carrying out the directives of this bill. This will improve DOE's resource investment with full awareness of what regions and research areas emphasize the most. I understand that delaying the start of this program may be undesirable, so I will withdraw my amendment at this time. I hope

that we can work at the staff level in advance of the Full Committee markup to ensure that this important information is incorporated into DOE's decision-making, and Mr. Chairman, I also want to use this time, if I may, to ask some questions of counsel that basically what we are after here is to get this water census coming and so the question is whether to sort of work into this bill some sort of delay until that water census is here because I was just mentioning this Savannah River study really has turned up some interesting things, and so the directive now to the DOE may be premature in light of that water census coming. There is also some angst on this side that you have already heard here about how you do this to make these directives but then pull back and give the Secretary discretion. So this bill as drafted has a series of "shalls" and then it says "as necessary." So it is a little bit—we are in a quandary about how you draft that. We want you to do this but we want to give you discretion, which I think that the Chairman of the Full Committee is right to want to give the Secretary discretion but we also want them to act, so it is a hard balance here to figure out whether you direct and then give discretion or how you do that. So some questions for counsel that may get at some of this and prepare us for working hopefully in a collaborative way between here and Full Committee to figure out how to address this water census issue, number one, and number two, how do you direct the DOE but then give them the ability to have discretion. So the first question, is any of this work currently being done by DOE and has there been an assessment of that work already being done on a project-by-project basis?

COUNSEL. This bill was developed with the knowledge that some of this work is going on at DOE. We have looked at several of the projects that have been funded. We have not done an assessment of every single project that all the different programs at DOE has included energy and water nexus information in.

Mr. INGLIS. And in fact, we asked that question of DOE and we got sort of a two-page summary but not a real comprehensive list of what they are doing, so perhaps when we are in Full Committee we can get some help from you on that, on getting from DOE a more complete answer.

Chairman GORDON. If the gentleman would yield, I might add to that. I think certainly the census is an important document and we need to get that, but we know the general report is going to say that there are limits to water availability. Now, we want to get into regions and things of that nature but we know it is going to be the basic bottom line is that there are those limitations and so I think that it would not be best or I don't think necessary to wait for that to come back to go ahead and get started with this energy-water nexus research. The sort of what you might say stop and start is recognition is recognition of two things, one, that we do have limited resources, and two, we want to use those best, and so that is why we want to be able to allow the Secretary where needed, you know, to use those limited resources and again to coordinate those activities without imposing additional mandates that they are not going to have the funds for.

Mr. INGLIS. Let us see. In fact, Mr. Chairman, I think my time is up, but I am——

Chairman GORDON. I would yield my time to Mr. Inglis to continue with his good questions.

Mr. INGLIS. Thank you, Mr. Chairman. That is helpful. The second question here is, how will this new requirement impact the progress of DOE's projects and demonstrations? Can we expect delays? Will DOE be required to incorporate new technologies? In other words, DOE is already doing some projects and demonstrations. We surely wouldn't want any delays. Do we have any idea how this new requirement might, these "shalls" with discretion impact those existing projects?

COUNSEL. Well, the program doesn't start until 2011, so it will not impact any of the existing projects.

Mr. INGLIS. That is helpful. And the third question, how can we ensure that progress in water use efficiency made by individual projects or programs is communicated to interested parties in DOE and relevant agencies? In other words, how can we avoid duplication of this research?

COUNSEL. Just to clarify, do you mean within the agency?

Mr. INGLIS. I guess it is between agencies. DOE and relevant agencies are doing some projects and programs and we are wondering how we are going to avoid duplication.

COUNSEL. Sir, there is a section that specifically addresses the interagency collaboration to make sure that the agencies will be talking to each other as they go forward.

Mr. INGLIS. And how about within DOE?

COUNSEL. We have discussed several issues with the Department of Energy and they have told us that they are already coordinating this research. For example, NETL is already talking to EERE.

Mr. INGLIS. So just to sort of summarize here, between here and Full Committee we hope we can work together to figure out a couple things. One is, how to anticipate the water census and all that we are going to get out of that. Second is, how to work with this thing about telling the Secretary to do something but then pulling up from that directive to say "as appropriate," which I believe it is appropriate to pull up from the directive a little bit because we do want them to have discretion, otherwise why would you have a secretary if you could have a computer instead of a secretary. And so we have to figure out how to work that in legislation. The other thing, the third sort of area that I would add of concern is, you know, I am a commercial real estate agent, I am not in Congress, and sometimes I have this misfortune of having to do a residential closing, and the residence is for clients that you can't say no to so you do these residential closings and you end up with a stack of inane paper. The only documents that are important at a residential closing are the note, the mortgage, the title insurance policy and the survey. That is it. The rest of it is totally inane. Oh, I am sorry, the HUD one is important because it shows where the money goes. But you get these affidavits about why you live where you live. I mean, I once had an affidavit where I had to get a client to sign saying that they lived in South Carolina but worked in Georgia and so I came up with—I decided to have some fun with it and had a whole series of whereas's, I bear a great love and affection for the State of Georgia because I was born there, and I went through this whole series of things, sent it to the bank and they

thought it was fine. I mean, it was all tongue and cheek but the point is that you get somebody to check off this list and it is meaningless. It is just another scrap of paper that is stuck in the file. We want to make—I think the Chairman here wants to do real serious work with this water stuff but we want to do in this directive to the Secretary have some kind of directive but also give him discretion but not end up with a useless piece of paper where they are checking off something and system-wide they are checking off this little piece of paper and putting this affidavit of residency in the file. Nobody cares about it. They didn't even look at it. They didn't read my silly whereas's that I put in there. You know, they didn't notice that I was making fun of them. And so we don't want that kind of setup and that is what we are—we want to do serious work because this is a serious issue about water and I know that is the Chairman's goal and we want to try to help get there between here and Full Committee.

I don't have any other questions. Thank you, Mr. Chairman.

Chairman BAIRD. Thank you, Mr. Inglis. I appreciate both the spirit and the content of the questions and I understand you have withdrawn the amendment.

Is there further comment on the amendment? If no, the vote occurs on the amendment. Oh, right, he has withdrawn it. Thank you.

If no, the vote is on the bill, H.R. 3598, as amended. All those in favor will say aye. All those opposed will say no. In the opinion of the Chair, the ayes have it.

I recognize myself to offer a motion. I move that the Subcommittee favorably report H.R. 3598 as amended to the Full Committee. Furthermore, I move that staff be instructed to prepare the Subcommittee report and make necessary technical and conforming changes to the bill in accordance with the recommendations of the Subcommittee.

The question is on the motion to report the bill favorably. Those in favor will signify by saying aye. Opposed, no. The ayes have it, and the bill is favorably reported. Without objection, the motion to reconsider is laid upon the table. Members will have two subsequent calendar days in which to submit supplemental Minority or additional views on the measure.

With that, I thank my colleagues for their input and the outstanding staff for their work on this legislation, and with that, this markup stands adjourned.

[Whereupon, at 11:15 a.m., the Subcommittee was adjourned.]

Appendix:

H.R. 3598, SECTION-BY-SECTION ANALYSIS, AMENDMENT ROSTER

I

111TH CONGRESS
1ST SESSION

H. R. 3598

To ensure consideration of water intensity in the Department of Energy's energy research, development, and demonstration programs to help guarantee efficient, reliable, and sustainable delivery of energy and water resources.

IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 17, 2009

Mr. GORDON of Tennessee introduced the following bill; which was referred to the Committee on Science and Technology

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A BILL

To ensure consideration of water intensity in the Department of Energy's energy research, development, and demonstration programs to help guarantee efficient, reliable, and sustainable delivery of energy and water resources.

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 Research Integration Act".

SEC. 2. INTEGRATING ENERGY AND WATER RESEARCH.

(a) IN GENERAL.—In carrying out each of the energy research, development, and demonstration programs of the Department of Energy, the Secretary of Energy shall—

(1) seek to advance energy and energy efficiency technologies and practices that would—

(A) minimize freshwater withdrawal and consumption;

(B) increase water use efficiency; and

(C) utilize nontraditional water sources with efforts to improve the quality of that water;

(2) consider the effects climate change may have on water supplies and quality for energy generation and fuel production; and

(3) improve understanding of the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States.

(b) SPECIFIC CONSIDERATIONS.—In carrying out subsection (a), the Secretary shall incorporate, as appropriate—

(1) new advanced cooling technologies for energy generation and fuel production technologies;

(2) performance improvement of existing cooling technologies and cost reductions associated with using those technologies;

(3) innovative water reuse, recovery, and treatment in energy generation and fuel production;

(4) efficient water use design strategies and technology development for carbon capture and storage systems;

(5) technologies that are life-cycle cost effective;

(6) systems analysis and modeling of issues relating to the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States;

(7) technologies to treat and utilize produced waters discharged from oil, coalbed methane, and mining activities;

(8) advanced materials for the use of nontraditional water sources for energy generation and fuel production;

(9) biomass production and the impact on hydrologic flow; and

(10) reduction of water resource impacts of fossil fuel resource development.

(c) INTERAGENCY COLLABORATION.—In carrying out the energy research, development, and demonstration pro-

grams of the Department of Energy in accordance with this section, the Secretary shall, where appropriate, work collaboratively with other Federal agencies operating programs related and relevant to such programs.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy for carrying out this section $60,000,000 for each of the fiscal years 2011 through 2015.

SEC. 3. ENERGY-WATER ARCHITECTURE COUNCIL.

(a) IN GENERAL.—The Secretary of Energy, in coordination with other relevant Federal agencies, shall establish an Energy-Water Architecture Council to promote and enable improved energy and water resource data collection, reporting, and technological innovation. The Council shall consist of—

(1) representation from each Federal agency that conducts research related to energy and water resource data; and

(2) non-Federal members, including representatives of research and academic institutions and industry, who have expertise in research, development, demonstration, and technology transfer relating to the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States.

(b) FUNCTIONS.—The Council shall—

(1) develop and adopt data collection and data communication standards and protocols for the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States;

(2) make improvements to Federal water use data to increase understanding of trends in power plant water use;

(3) integrate existing monitoring networks to provide nationally uniform water and energy use and infrastructure data; and

(4) conduct an annual technical workshop to facilitate information exchange among Federal, State, and private sector experts on technologies that encourage the conservation and efficient use of water and energy.

(c) REPORTS.—Not later than 1 year after the date of enactment of this Act, and at least once every 2 years thereafter, the Council, through the Secretary of Energy, shall transmit to the Congress a report on its findings and activities under this section.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of En-

ergy for carrying out this section $5,000,000 for each of the fiscal years 2011 through 2015.

○

SECTION-BY-SECTION ANALYSIS OF
H.R. 3598, THE ENERGY AND WATER
RESEARCH INTEGRATION ACT

Section 1: Short Title - "Energy and Water Research Integration Act"

Section 2: "Integrating Energy and Water Research" requires that the Secretary of Energy recognize the link between our energy and water resources and integrate energy-related water issues into the Department's existing research, development and demonstration programs. As part of that authority DOE shall 1) advance technologies and practices that help use our energy and water resources more efficiently and effectively, 2) consider the effects climate change may have on our energy and water resources, and 3) improve the understanding of the energy required to provide water supplies and the water required to provide reliable energy supplies. The bill authorizes $60 million annually for this section for FY 2011–FY 2015.

Section 3: "Energy-Water Architecture Council" (EWAC) directs the Secretary of Energy, in coordination with other relevant federal agencies, to establish EWAC to provide improved energy and water resource data collection, reporting and technological innovation. EWAC will be led by DOE, but include representatives from industry and academic institutions who have expertise in technologies and practices relating to the link between our energy and water resources. The bill authorizes $5 million annually to the Secretary of Energy for five years (FY 2011–2015) to carry out this section.

COMMITTEE ON SCIENCE AND TECHNOLOGY
ENERGY AND ENVIRONMENT
SUBCOMMITTEE MARKUP
September 30, 2009

AMENDMENT ROSTER

H. R. 3598, the *Energy and Water Research Integration Act*

No.	Sponsor	Description	Results
1	Mr. Gordon (Manager's Amendment)	Makes several technical and clarifying changes to the bill. Amends Section 2 ("Integrating Energy and Water Research") to require that the Secretary "research, develop, and demonstrate" the specific considerations listed in Section 2(b) in carrying out the Department of Energy's research, development, and demonstration programs. Amends Section 3 ("Energy–Water Architecture Council") to require that non-Federal Energy-Water Architecture Council (EWAC) members have expertise in "technologies and practices" relating to the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States. Also amends Section 3 to require that the EWAC make improvements to Federal water use data to increase understanding of trends in "energy generation and fuel production."	Agreed to by voice vote
2	Mr. Inglis	Adds a new section to the bill stating that prior to implementation of Section 2 of the bill ("Integrating Energy and Water Research"), the Secretary of Energy "shall review the report of the National Water Availability and Use Assessment Program under section 9508(d) of the Omnibus Public Land Management Act of 2009 (42 U.S.C. 10368(d)) and provide to Congress a narrowly focused research and development strategy for carrying out the activities included in section 2 for the Department of Energy that, based on the availability and use of water, would seek to advance energy and energy efficiency technologies and practices."	Withdrawn

AMENDMENT TO H.R. 3598

OFFERED BY MR. GORDON OF TENNESSEE

Page 2, line 21, strike ''incorporate'' and insert ''research, develop, and demonstrate''.

Page 3, line 21, strike ''flow'' and insert ''systems''.

Page 4, lines 21 and 22, strike ''research, development, demonstration, and technology transfer'' and insert ''technologies and practices''.

Page 5, line 2, strike ''and adopt''.

Page 5, lines 8 and 9, strike ''power plant water use'' and insert ''energy generation and fuel production''.

Page 5, line 10, strike ''integrate'' and insert ''utilize information from''.

Page 5, line 13, strike ''an annual technical workshop'' and insert ''annual technical workshops, including at least one regional workshop annually,''.

☒

AMENDMENT TO H.R. 3598

OFFERED BY MR. INGLIS OF SOUTH CAROLINA

At the end of the bill, add the following new section:

SEC. 4. REPORT TO CONGRESS.

Prior to implementation of section 2, the Secretary of Energy shall review the report of the National Water Availability and Use Assessment Program under section 9508(d) of the Omnibus Public Land Management Act of 2009 (42 U.S.C. 10368(d)) and provide to Congress a narrowly focused research and development strategy for carrying out the activities included in section 2 for the Department of Energy that, based on the availability and use of water, would seek to advance energy and energy efficiency technologies and practices.

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XXII: PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 3598, ENERGY AND WATER RESEARCH INTEGRATION ACT

WEDNESDAY, OCTOBER 7, 2009

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
Washington, DC.

The Committee met, pursuant to call, at 10:38 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Bart Gordon [Chairman of the Committee] presiding.

Chairman GORDON. Good morning, everyone. The Committee will come to order. Pursuant to notice, the Committee on Science and Technology meets to consider the following measures: H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* H.R. 3585, the *Solar Technology Roadmap Act,* and H.R. 3598, the *Energy and Water Research Integration Act.*

First, we will consider a bill by the Subcommittee's Chairman, Brian Baird, and co-authored by Research and Science Education Ranking Member, Dr. Ehlers. H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* seeks to address the devastating effects that the rapid overproduction of algae can have on aquatic plant and animal life and human health.

The bill directs the National Oceanic and Atmospheric Administration to implement research strategies to better understand and respond to algal blooms and hypoxic events.

Next, we will consider H.R. 3585, the *Solar Technology Roadmap Act,* authored by the Space and Aeronautics Subcommittee Chair, Ms. Gabrielle Giffords. This bill instructs the Department of Energy to coordinate with public and private sector entities in developing a comprehensive, updated roadmap for solar research, development and demonstration activities in the United States.

This roadmap will be a critical tool in utilizing limited research dollars as effectively as possible to harness the truly immense solar resources we have in the United States.

Finally, we will take up H.R. 3598, the *Energy and Water Research Integration Act.* In the last Congress, this committee undertook a comprehensive review of federal research and technology development efforts focusing in on improving utilization of our precious water resources. We have since held five hearings and passed out of the House three bills pertaining to this important topic.

H.R. 3598, in which we will address the critical linkage between our nation's energy and water resources by directing the Department of Energy to better integrate water into existing federal energy research efforts.

The three bills we have before us today target several important research needs. And as always, we appreciate the Minority offering a number of valuable ideas and suggestions, and we have worked

hard to incorporate almost all of them in an effort to improve these bipartisan bills.

I now recognize Mr. Hall to present his opening remarks.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

Good Morning. Today the Committee will consider three bills reported last week from the Energy and Environment Subcommittee.

First, we will consider a bill by the Subcommittee's Chairman, Dr. Baird, and co-authored by the Research and Science Education Ranking Member, Dr. Ehlers. H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* seeks to address the devastating effects that rapid overproduction of algae can have on aquatic plant and animal life and human health.

The bill directs the National Oceanic and Atmospheric Administration to implement research strategies to better understand and respond to algal blooms and hypoxic events.

Next, we will consider H.R. 3585, the *Solar Technology Roadmap Act,* authored by the Space and Aeronautics Subcommittee Chair, Ms. Gabrielle Giffords. This bill instructs the Department of Energy to coordinate with public and private sector entities in developing a comprehensive, updatable roadmap for solar research, development, and demonstration activities in the U.S.

This roadmap will be a critical tool in utilizing limited research dollars as effectively as possible to harness the truly immense solar resources we have in the U.S.

Finally, we will take up my bill, H.R. 3598, the *Energy and Water Research Integration Act.* In the last Congress this committee undertook a comprehensive review of federal research and technology development efforts focused on improving utilization of our precious water resources. We have since held five hearings and passed out of the House three bills pertaining to this important topic.

With H.R. 3598 we address the critical linkage between our nation's energy and water resources by directing the Department of Energy to better integrate water into existing federal energy research efforts.

The three bills we have before us today target several important research needs. As always we appreciate the Minority offering a number of valuable ideas and suggestions, and we have worked hard to incorporate almost all of them in an effort to improve these bipartisan bills.

Despite this, I see that the Minority will have a number of amendments. While it is unfortunate these concerns could not be resolved before the markup I look forward to a healthy debate on the amendments, and supporting these bills for final passage.

I thank you all for your attendance and participation this morning, and I look forward to a productive markup.

I now recognize Mr. Hall to present his opening remarks.

Mr. HALL. I thank you, Mr. Chairman, and today, as you have pointed out, we are marking up H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* H.R. 3585, the *Solar Technology Roadmap Act,* and H.R. 3598, the *Energy and Water Research Integration Act.* I would like to thank you, Mr. Chairman, and thank your staff for working with us, working with the Minority, working with us on these bills and you helped us address as much as possible our concerns. Unfortunately, we were not able to come to an agreement on all of our concerns but I realize that that can't always be the case. I will elaborate on these when the bills are brought up for amendment. We will have amendments that address those areas of the bills that we feel still need some attention, and particularly in the solar and energy and water bills. I do hope that the Chairman and other Members of this committee will give our amendments thoughtful consideration as we feel they are intended to improve the bills and enhance support for them.

With that, I yield back the balance of my time.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Today, we are marking up H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* H.R. 3585, the *Solar Technology Roadmap Act,* and H.R. 3598, the *Energy and Water Research Integration Act.* I would like to thank you, Mr. Chairman, and thank your staff for working with us, working with the Minority, working with us on these bills and you helped us address as much as possible our concerns. Unfortunately, we were not able to come to an agreement on all of our concerns but I realize that that can't always be the case. I will elaborate on these when the bills are brought up for amendment. We will have amendments that address those areas of the bills that we feel still need some attention, and particularly in the solar and energy and water bills. I do hope that the Chairman and other Members of this committee will give our amendments thoughtful consideration as we feel they are intended to improve the bills and enhance support for them.

Chairman GORDON. Members may place statements in the record at this point.

[The prepared statement of Mr. Mitchell follows:]

PREPARED STATEMENT OF REPRESENTATIVE HARRY E. MITCHELL

Thank you, Mr. Chairman.

Today we will mark up H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act,* H.R. 3585, the *Solar Technology Roadmap Act,* and H.R. 3598, the *Energy and Water Research Integration Act.*

I would like to take a moment to speak about H.R. 3585, the *Solar Technology Roadmap Act,* legislation which I believe is critical in order to spur further research and development of solar technology.

We're lucky in Arizona to enjoy over 300 days of sunshine. We have a real opportunity to brighten our state's future by investing in solar energy research and technology.

As solar technology advances, I believe that Arizona will be a leader in clean, alternative energy production. Refocusing our energy production on alternative sources such as solar is critical for our national security and the environment.

Moreover, investing in solar energy is vital to Arizona's economy.

With the help of solar tax credits, Abengoa Solar and Arizona Public Service are developing the world's largest solar energy plant outside of Gila Bend. The Solana solar generating station will create 1,500 to 2,000 jobs and provide clean, emission-free energy for 70,000 homes. Solana is expected to ultimately spur $1 billion in economic development.

H.R. 3585, the *Solar Technology Roadmap Act,* would take us one step further toward making large scale solar energy production a reality. Specifically, this legislation would establish a Solar Technology Roadmap Committee tasked with creating a Solar Technology Roadmap to evaluate near-term, mid-term, and long-term research, development, and demonstration needs in solar technology. This committee would include stakeholders in the solar industry to provide insights on the deployment of this technology.

I urge my colleagues to support this important measure, and at this time, I yield back.

Chairman GORDON. We will now consider H.R. 3598, the *Energy and Water Research Integration Act.* I recognize myself for five minutes to describe the bill.

The country faces immense challenges with increased demand on our energy and water resources. H.R. 3598 will provide us with new tools to meet specific technical challenges occurring at the nexus of energy and water.

The bill requires the Secretary to consider water-related issues in the Department's existing energy efficiency and energy technology research programs. It does not create a new program at the DOE.

Additionally, H.R. 3598 creates an Energy Water Architecture Council that will facilitate the collaboration of industry, academia,

and the Federal Government in improving energy and water resources, data collection, reporting, and technological innovation.

This legislation is the product of recommendations from five Committee hearings on water, several reports from the national academies, the Government Accounting Office, the National Science Technology Council, and the Department of Energy.

I encourage my colleagues on the Committee to join me in this effort and support H.R. 3598.

I now recognize Mr. Hall to present any remarks to the bill.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

The country faces immense challenges with increased demand on our energy and water resources. H.R. 3598 will provide us with new tools to meet specific technical challenges occurring at the nexus of energy and water.

The bill requires the Secretary to consider water-related issues in the Department's existing energy efficiency and energy technology research programs. It does not create a new program at the DOE.

Additionally, H.R. 3598 creates an "Energy-Water Architecture Council" (EWAC) that will facilitate the collaboration of industry, academia, and the Federal Government in improving energy and water resource data collection, reporting, and technological innovation.

This legislation is the product of recommendations from five Committee hearings on water and several reports from the National Academies, the Government Accountability Office, the National Science Technology Council, and the Department of Energy.

I encourage all my colleagues on the Committee to join me in this effort and support H.R. 3598.

Mr. HALL. Thank you, Mr. Chairman, and we agree with you. The energy water interaction is a very important issue that needs to be taken into consideration and addressed by the DOE and other relevant agencies. And we believe your bill is a very good starting point.

However, we think there is certain parts of the bill that we find to be potentially overly burdensome to DOE and could do more harm than good. In particular, the bill as it currently is written and it is written in the manager's amendment, would place an additional energy water requirement on every energy research development demonstration program and project of the Department of Energy.

Now, this could include the gamut of programs from fossil energy to ARPA-E to EERE, to name just a few. We remind, I guess ourselves, that we are always concerned that moving forward with such requirements prior to gathering the proper background data and information such as a comprehensive assessment of which programs and projects will be affected may lead to negative, unintended consequences. We suggest language that would give the Secretary discretion as to which programs and projects would be affected, but that was unfortunately not accepted.

As well, we feel that the council is unnecessary as it is duplicative of other groups currently in existence. The worst possible scenario is us setting up a situation in which we have different groups developing parallel standards, data collection methods for the energy water interaction may be very difficult to combine.

Such a task would involve some level of data manipulation, which could very well lead to a loss of scientific integrity of the findings.

Mr. Chairman, we have worked very hard in this committee to avoid duplicative efforts exactly like this. I believe streamlining an organization is one of the main motivations for the *National Water Research and Development Initiative Act* that was passed on the Floor earlier this year.

I have an amendment to this bill that could address our concerns while incorporating the intent of your bill, Mr. Chairman. As well we will have other amendments from our side that we hope you will consider and accept as an improvement to your bill.

And with that I yield back the balance of my time.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Thank you Mr. Chairman. We agree with you that the energy/water intersection is an important issue that needs to be taken into consideration, and addressed by the DOE and other relevant agencies, and we believe that your bill is a good starting point. However, there are certain parts of your bill that we find to be potentially overly burdensome to the DOE and could do more harm than good. In particular, the bill, as it is currently written, and as it is written in the manager's amendment, would place an additional energy/water requirement on every energy research, development, and demonstration program and project of the Department of Energy. This could include the gamut of programs from Fossil Energy to ARPA–E to EERE to name just a few. We remain concerned that moving forward with such requirements prior to gathering the proper background data and information, such as a comprehensive assessment of which programs and projects will be affected, may lead to negative unintended consequences. We suggested language that would give the Secretary discretion as to which programs and projects would be affected, but that was, unfortunately, not accepted.

As well, we feel that the council is unnecessary as it is duplicative of other groups currently in existence. The worst possible scenario is us setting up a situation in which we have different groups developing parallel standards and data collection methods for the energy-water interaction that may be very difficult to combine. Such a task would involve some level of data manipulation, which could very well lead to a loss of scientific integrity of the findings. Mr. Chairman, we have worked very hard in this committee to avoid duplicative efforts just like this. I believe streamlining and organization was one of the main motivations for the *National Water Research and Development Initiative Act* that was passed on the House Floor earlier this year.

I have an amendment to this bill that could address our concerns while incorporating the intent of your bill, Mr. Chairman. As well, we will have other amendments from our side that we hope you will consider and accept as an improvement to your bill.

With that I yield back the balance of my time.

Chairman GORDON. Does anyone else wish to be recognized?

Then I ask unanimous consent that the bill is considered as read and open to amendment at any point and that the Members proceed with amendments in the order of the roster.

Without objection, so ordered.

The first amendment on the roster is a Chairman's—manager's amendment offered by the Chair. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3598, amendment number 005, offered by Mr. Gordon of Tennessee.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize myself for five minutes to explain the amendment.

The manager's amendment makes a series of changes throughout H.R. 3598 that are the result of good suggestions put forward by

the Minority staff, and we thank you for those insightful comments.

Section 2 of H.R. 3598 is amended to ensure that the Secretary of Energy minimizes wasteful spending of taxpayer dollars by collaborating and coordinating with other agencies and within the programs of the Department to avoid duplication of research efforts.

The amendment makes certain that the Secretary shall not unnecessarily delay or disrupt programs or projects at the Department.

The amendment also includes a requirement that the Secretary report the findings and activities of the research back to Congress not later than 1 year after the date of enactment.

Some areas of specific technology considerations were clarified, including technology development of carbon capture and storage, the technologies that will mitigate impacts on water from energy resource development. This amendment strengthens the bill and adds the oversight necessary to ensure that the Department addresses the critical connection between energy and water.

We thank the Minority for more than 20 suggestions that we have included in this amendment and underlying bill. I ask my colleagues to support this amendment.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

The manager's amendment makes a series of changes throughout H.R. 3598 that are the result of good suggestions put forward by the Minority staff, and we thank you for those insightful comments.

Section 2 of H.R. 3598 is amended to ensure the Secretary of Energy minimizes wasteful spending of taxpayer dollars by collaborating and coordinating with other agencies and within the programs of the Department to avoid duplication of research efforts.

The amendment makes certain that the Secretary shall not unnecessarily delay or disrupt programs or projects of the Department. The amendment also includes a requirement that the Secretary report the findings and activities of the research back to Congress not later than one year after the date of enactment.

Some areas of specific technology considerations were clarified, including technology development for carbon capture and storage and technologies that will mitigate impacts on water from energy resource development.

This amendment strengthens the bill and adds the oversight necessary to ensure that the Department addresses the critical connection between energy and water. We thank the Minority for the more than 20 suggestions that we have included in this amendment, and in the underlying bill.

I ask my colleagues to support this amendment.

Chairman GORDON. Is there further discussion on this amendment?

Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, I would like to thank you and your staff for your willingness to work with us on your new bill. You did do that, and while I am pleased with and also thank you for the changes that were made, I am a little disappointed that we couldn't work out. I would like to have had all the changes we asked for, but we were hoping we could work out a few more.

In particular, one suggestion was made to add the words, as you remember, "as appropriate," to the end of section two, "in general" statement. We felt that this was necessary in order to make clear that this bill is not intended to apply to every energy research and

development demonstration program of the Department of Energy as it now reads. We feel that the Secretary should have more discretion when applying this bill to current and future R&D programs.

I yield back.

Chairman GORDON. Thank you, Mr. Hall. Just to, again, to point out, the Minority received I think it was in March the sort of an outline for this bill, and three weeks ago received the bill, and we had gone through a Subcommittee markup on it.

Your amendment we did not receive until I think 4:30 last night, and so I think—so we did not have time to fully digest it. As the day has gone along, I think it is fair to say that the Minority, Majority staff have been able to see that we are in sync on many, many areas and that we want to continue to work with you to try to clarify that language that we both agree upon.

And I think, again, you had some suggestions. We just did not have time to digest them, but as the day has gone along it appears that we do have much——

Mr. HALL. I appreciate it, and I worked on that sucker all day yesterday and more this morning about 4:15. I brought it, directly brought it over here and hand-carried it to you.

Chairman GORDON. Well, thank you for your promptness.

If there is no more discussion, then the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it, and the amendment is agreed to.

The second amendment on the roster is an amendment offered by the Ranking Member, Mr. Hall. Are you ready to proceed with your amendment?

Mr. HALL. I am. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3598, amendment number 016, offered by Mr. Hall of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

And I recognize the gentleman for five minutes to explain his amendment.

Mr. HALL. I thank you, Mr. Chairman. I won't take—probably won't take the five minutes. I am actually not going to offer my amendment since we really haven't had a chance to discuss the idea before now, and I understand that.

However, I would like the opportunity to speak on it just a minute or to give you the general idea and then request that we work together to address the concerns have—which my amendment attempts to alleviate, and we will have some time to do that.

As I said earlier, the Energy Water Interaction is a very important issue that needs to be taken into consideration and addressed by the DOE and other relevant agencies. Our goal with this amendment was to improve upon your bill by giving the Secretary a little more guidance, a little more discretion, and maybe a little more direction on how to carry out this necessary research.

Like Ms. Giffords' solar technology roadmap bill, we would start with a roadmap and then use its recommendations to help guide

RD&D. This amendment would direct the Secretary to develop an energy water research and development roadmap to define research, development, demonstration, and commercialization efforts at DOE. The roadmap would follow the same guidelines laid out in the Chairman's bill and generally take into account the same specific considerations that are incorporated in the Chairman's bill.

Additionally, the Secretary would have to lay out technological milestones for each of the considerations listed in the bill.

The amendment also includes mutually-agreed-upon language that was included in the Chairman's manager's amendment on collaboration, utilization of information, and reporting requirements. After receiving the roadmap, the Secretary is then required to implement the findings into a way that would deliver the most, I guess, bang for the buck by directing RD&D to those programs at DOE that are identified as the most energy and water-intensive and that have the most potential to lessen fresh water withdrawal, increase water use efficiency, and utilize non-traditional water sources.

We understand that the DOE has been required to submit a similar report to Congress under previous legislation. There are currently available reports from the Subcommittee on water availability and quality and the National Academies of Science on the issue. We do not see this roadmap language as intended to replace any work that has previously been done or to ignore the work that could be forthcoming but instead intend for the roadmap in this amendment to be an authoritative document that can serve as a one-stop shop for the energy water nexus research needs which incorporates these different reports.

And to that end the timeless and timelines set forth by the roadmap in this manner would not delay implementation of the R&D as it mirrors the Chairman's language, which starts in fiscal year 2011. And the roadmap is to be developed some six months of an enactment.

This amendment would also cut the five-year authorization from $60 million a year for five years to $30 million a year for five years. The electric power industry released a report two years ago that proposes a research and development program on the water energy nexus that would cost $3.75 million a year for 10 years. The R&D program proposed would address at least three of the special considerations outlined in the Chairman's bill and in my amendment.

I realize that the electric power industry is not the only energy sector that is affected, so a comprehensive R&D program would be more costly for everyone than what this industry report calls for.

Furthermore, I understand that the Chairman's intent may be to establish a program that is more aggressive than industry may propose on its very own. Even with all these considerations the authorization level included in my amendment is an order of magnitude much greater than the industry report. If the roadmap is done correctly and there truly is collaboration and cooperation within the Department and between federal agencies, the funding level of $30 million per year should be more than sufficient to address the needs of this bill.

And I yield back unless somebody wants a second reading.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Thank you, Mr. Chairman. I'm actually not going to offer my amendment, since we really haven't had a chance to discuss the idea before now. However, I would like the opportunity to speak on it, to give you the general idea, and then request that we work together to address the concerns as have which my amendment attempted to alleviate.

As I said earlier, the energy/water interaction is an important issue that needs to be taken into consideration, and addressed by the DOE and other relevant agencies. Our goal with this amendment is to improve upon your bill by giving the Secretary a little more guidance, discretion, and direction in how to carry out this necessary research.

Like Ms. Giffords' Solar Technology Roadmap bill, we would start with a Roadmap and then use its recommendations to help guide RD&D. This amendment would direct the Secretary to develop an Energy–Water Research and Development Roadmap to define research, development, demonstration, and commercialization efforts at DOE. The Roadmap would follow the same guidelines laid out in the Chairman's bill and generally take into account the same specific considerations that are incorporated in the Chairman's bill. Additionally, the Secretary would have to lay out technical milestones for each of the considerations listed in the bill.

The amendment also includes mutually agreed upon language that was included in the Chairman's manager's amendment on: collaboration, utilization of information, and reporting requirements.

After receiving the roadmap, the Secretary is then required to implement the findings in such a way that would deliver the most "bang for the buck" by directing RD&D to those programs at DOE that are identified as the most energy and water intensive and that have the most potential to lessen freshwater withdrawal, increase water use efficiency, and utilize nontraditional water sources.

We understand that the DOE has been required to submit a similar report to Congress under previous legislation, and that there are currently available reports from the Subcommittee on Water Availability and Quality and the National Academies of Science on this issue. We do not see this roadmap language as intending to replace any work that has previously been done or to ignore the work that could be forthcoming, but instead intend for the Roadmap in this amendment to be an authoritative document that can serve as a "one-stop shop" for the energy/water nexus research needs which incorporates these different reports. To that end, the timelines set forth for the roadmap in this amendment would not delay implementation of the RD&D, as it mirrors the Chairman's language which starts in FY 2011, and the Roadmap is to be developed within six months of enactment.

This amendment would also cut the five-year authorization from $60 million a year for five years to $30 million a year for five years. The electric power industry released a report two years ago that proposes a research and development program on the water/energy nexus that would cost $3.75 million a year for 10 years. The R&D program proposed would address at least three of the special considerations outlined in the Chairman's bill and in my amendment. I realize that the electric power industry is not the only energy sector that is affected, so a comprehensive R&D program would be more costly for everyone than what this industry report calls for. Furthermore, I understand that the Chairman's intent may be to establish a program that is more aggressive than industry may propose on its own. Even with all these considerations, the authorization level included in my amendment is an order of magnitude greater than the industry report. If the roadmap is done correctly, and there truly is collaboration and cooperation within the Department and between federal agencies, a funding level of $30 million per year should be more than sufficient to address the needs of this bill.

I yield back.

Chairman GORDON. Thank you, Mr. Hall. As I mentioned earlier, the manager's amendment included 20 good suggestions from the Minority. I think that we are in sync on much of what you are talking about here. We just have not had the time to go through it, and as always, we will continue to work with you to perfect and improve this bill.

Mr. HALL. Thank you, sir.

Chairman GORDON. Does the gentleman wish to withdraw the amendment?

Mr. HALL. I guess so.

Chairman GORDON. Our third amendment on the roster is the amendment offered by the gentlelady from Pennsylvania. Ms. Dahlkemper, are you ready to proceed with your amendment?

Ms. DAHLKEMPER. Yes, I am, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3598, amendment number 003, offered by Ms. Dahlkemper of Pennsylvania.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentlelady for five minutes to explain the amendment.

Ms. DAHLKEMPER. Thank you, Chairman Gordon, Ranking Member Hall, and fellow Members.

H.R. 3598, the Energy and Water Research Integration Act, is a very timely bill which takes strong steps to see that we make better use of both our energy resources and our water resources. It does so by coordinating our efforts to consider the use of water when we produce energy, as well as the energy demands of supplying water. I applaud Chairman Gordon for his leadership in this important initiative and once again, dealing with the important and challenging topic of water resource planning.

I believe conservation of water and energy are complimentary components of any plan to ensure that both are available in adequate supply to our nation's households and businesses. Clearly, we cannot afford to waste either.

My amendment requests the Secretary of Energy, when carrying out energy research, development, and demonstration projects to consider increases in energy efficiency of water distribution and collection systems and to consider technologies for energy generation from water distribution and collection systems as appropriate.

Thank you, and I yield back the remainder of my time.

Chairman GORDON. Thank you, Ms. Dahlkemper. More importantly thank you for—this is a very good amendment to this bill, and we are killing two birds with one stone. Thank you.

Does anyone else wish to be recognized?

If there is no further——

Mr. HALL. Chairman.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. And I thank you. I commend my colleague on her work on this bill, however, I am not certain I am interpreting the gentlelady's amendment correctly, and I may have a question or so to ask.

The first provision would increase the energy efficiency of water distribution and collection systems and—is my time up?

Chairman GORDON. No, sir.

Mr. HALL. I will ask you this question. Does this mean that the Department of Energy is meant to do R&D on water distribution and collection systems?

Ms. DAHLKEMPER. It means that they are going to look at this as one of the parameters that is going to be considered as this goes forward when they are, you know, incorporated as appropriate for the project.

Mr. HALL. And do you feel that this is within their purview?

Ms. DAHLKEMPER. Yes, I do.

Mr. HALL. Are you currently doing—are they currently doing any R&D in this area? If you know.

Ms. DAHLKEMPER. I am not exactly sure what they are doing in this area. I am just saying that needs to be——

Mr. HALL. Okay.

Ms. DAHLKEMPER. —something they look at as they go forward.

Mr. HALL. Yeah, and I think that is reasonable, and I thank you for that.

The second provision would require the Secretary to consider technologies for energy generation from water distribution and collection systems.

Ms. DAHLKEMPER. Uh-huh.

Mr. HALL. The way I am reading it it sounds like you are describing putting turbines into the sewage system and getting energy out of it. Is this correct? Is that correct?

Ms. DAHLKEMPER. Well, I think that is one of the new technologies that could be looked at, and that is what I am saying. It should be considered that we might allow water systems to actually generate renewable electricity from normal water and waste water pipelines.

Mr. HALL. What are the implications you ran into of putting turbines inside highly-pressurized, enclosed pipe systems? I know you did a study or had a study done on it.

Ms. DAHLKEMPER. I had a study done?

Mr. HALL. Someone did that gave you the information to write the bill from.

Ms. DAHLKEMPER. Well——

Mr. HALL. We line people up in those chairs out there, you know.

Ms. DAHLKEMPER. Sure. Sure. Well, I know that there is am application being used on inline turbine generated energy from hydropower, moving water, and this is the type, I think——

Chairman GORDON. Would staff like to add some additional information to this question?

COUNSEL. Could you just clarify it? Are you asking about what companies are already doing this?

Mr. HALL. No. Just what problems are putting turbines—it seems to me——

Ms. DAHLKEMPER. What problems there are.

Mr. HALL. —there would be problems inside those highly-pressurized, enclosed pipe systems.

COUNSEL. That is exactly why the research is needed to look at this technology and see what is going to be the effects of it.

Mr. HALL. That is a good answer.

Mr. BARTLETT. Would the gentleman yield?

Mr. HALL. About as good an answer as I—well, sure.

Mr. BARTLETT. Would the gentleman yield?

Mr. HALL. I don't want to, but I will.

Mr. BARTLETT. Okay. Thank you. I would just like to ask if this sewage is in the pipes under pressure because it is being pumped?

COUNSEL. The company that this technology is being looked at—the company right now that is looking at this technology both

pumps waste water as well as other kinds of water. So right now they are looking to see what would be the impacts of that.

Mr. BARTLETT. If this water is running downhill, you will get some energy from it. If you are putting this in a pipe that is being pressurized by a pump, you ain't going to get no energy because whatever—you will lose energy because the energy you will get from that is going to be less than the energy—this is the second law of thermo-dynamics, which you will not violate.

So unless this stuff is running downhill, you are not going to get any energy from this. Just putting it in a pressurized pipe that is being pumped by a pump, you are going to have to put a whole lot bigger pump on the other end, which is going to consumer more energy than you are going to get out of your little turbine in the flow. Am I wrong?

COUNSEL. Not—I don't believe so, not in that example. No.

Mr. BARTLETT. Then you could only use sewage that is running downhill. Is that my understanding?

COUNSEL. That is why the research is needed. Yes.

Mr. BARTLETT. Okay. Thank you.

Mr. HALL. Do I still have the time?

Chairman GORDON. Yes, sir, Mr. Hall.

Mr. HALL. I don't know how we could hardly make it run uphill. Would the gentlelady be amenable to one thing? That is providing a little further clarification in report language? You will have a chance to do that, and we all get help——

Ms. DAHLKEMPER. I would be glad to. I just think we need to study, you know, where we have a potential resource.

Mr. HALL. Ensure that others don't misinterpret.

Ms. DAHLKEMPER. If we have it well-evaluated, and that is what the purpose of this is, too, to evaluate this to really see if there is a potential.

Mr. HALL. I think that would help my questions on it, and I appreciate it, and I thank you. I yield back.

Chairman GORDON. Is there further discussion on the amendment?

If no, the vote occurs on the amendment. All in favor, say aye. Oppose, no. The ayes have it. The amendment is agreed upon.

I understand that, Mr. Smith, you are going to combine amendment four and five.

Mr. SMITH OF NEBRASKA. With unanimous consent I do request that they be considered en bloc.

Chairman GORDON. Without objection, the Clerk report the amendments.

The CLERK. Mr. Chairman, these are en bloc amendments by Mr. Smith of Nebraska on amendment on H.R. 3598, amendment number 006 and 007.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendments.

Mr. SMITH OF NEBRASKA. Thank you, Mr. Chairman. I will try to make this quick.

These amendments I am offering today are very straightforward clarifications. One clarifies the bill should not be the basis for any new federal regulations regarding State, local, or tribal use of water. The other states this bill shall not be used to increase the financial burden on State, local, and tribal governments by restricting their water use.

The purpose of this legislation is to ensure water and energy usage are considered in existing DOE research programs and support research furthering the continuing availability of both water and energy. These are certainly laudable goals.

Unfortunately, the bill makes three references which could be construed to lead to more regulations.

One, the modeling of issues relating to energy required to provide water supplies, another, the interagency collaboration section which may impact the Bureau of Reclamation and its customers, and the third one, the Energy Water Architecture Council, which is charged with developing data collection standards and protocols for the energy required to provide water supplies.

My amendments ensure the legislation accomplishes only its stated intent and cannot be read to restrict the use of water or energy by State and local governments. Any regulatory reading could contradict the existing jurisdiction and oversight of local stakeholders.

As a Representative of a District which leads in two water energy-intensive industries, agriculture and biofuels, and where water quantity is problematic, I am very sensitive to these issues. I appreciate the Chairman and my fellow Committee Members for sharing the concerns, those concerns, and believe if the intent of this bill is to simply improve data collection, then certainly there should be no concern with this amendment.

Thank you, and I yield back the balance of my time.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF REPRESENTATIVE ADRIAN SMITH

Mr. Chairman, I ask unanimous consent for my two amendments to be considered en bloc.

Mr. Chairman and Members of the Committee,

The two amendments I am offering today are simple, good government clarifications to the bill. One clarifies this bill should not be the basis for any new federal regulations regarding State, local, or tribal use of water. The other states this bill shall not be used to increase the financial burden on State, local, or tribal governments by restricting their water use.

The purpose of this legislation is to ensure water and energy usage are considered in existing Department of Energy research programs and support research furthering the continued availability of both water and energy. These are laudable goals.

Unfortunately, this bill makes three references which could be construed to lead to more regulations:

- "modeling of issues relating to the energy required to provide water supplies";
- The "Interagency Collaboration" section, which may impact the Bureau of Reclamation and its customers; and
- The Energy-Water Architecture Council, which is charged with developing "data collection standards and protocols for the energy required to provide water supplies."

My amendments ensure this legislation accomplishes only its stated intent, and cannot be read to restrict the use of water or energy by State and local govern-

ments. Any regulatory reading could contradict the existing jurisdiction and oversight of local stakeholders.

As the Representative of a District which leads in two water and energy intensive industries—agriculture and biofuels—and where water quantity is problematic, I am very sensitive to these issues. I appreciate the Chairman and my fellow Committee Members for sharing those concerns, and believe if the intent of this bill is to simply improve data collection, then my colleagues should have no problems with adopting this amendment.

Thank you, Mr. Chairman. I yield back the balance of my time.

Chairman GORDON. Mr. Smith, it is my understanding that our staffs have collaborated and that there is maybe some language tweaking that needs to be done, and if you are in agreement with that, then we would gladly accept your amendments.

Mr. SMITH OF NEBRASKA. Thank you very much.

Chairman GORDON. If there is no further discussion——

Mr. HALL. Mr. Chairman.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. I have no further questions.

Chairman GORDON. Then the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The sixth amendment on the roster is an amendment offered by the gentlelady from Texas, Ms. Johnson. Are you ready to proceed with your amendment?

Ms. JOHNSON. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3598, offered by Ms. Eddie Bernice Johnson of Texas, amendment number 087.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentlelady for five minutes to explain the amendment.

Ms. JOHNSON. Thank you very much, Mr. Chairman, and Ranking Member, for considering this amendment.

The amendment to H.R. 3598 addresses the section called "Specific Considerations." This part of the bill provides specific items for the research program that the Secretary of Energy should consider supporting.

For example, new advanced cooling technologies for energy generation are listed. Technologies that are life cycle cost effective are also listed.

My amendment would state that a specific consideration should also include technologies to treat and utilize produced waters discharged from oil, natural gas, coal bed methane, and mining activities.

Texas is a state that is rich in natural gas resources, and I would like to ensure that research supported by this program would also include water that may be used during the exploration and mining for natural gas. As you know, I chair the Subcommittee on Water Resource and Environment on the Transportation and Infrastructure Committee, and research on water and energy production is an issue focus of mine. I am glad to see this committee's interest

in energy and water, and I believe that H.R. 3598 will enable the Department of Energy to support some vital areas of research.

Again, my amendment would only add that initial consideration, which would include technologies to utilize, produce waters that are discharged from natural gas mining activities, and I want to thank Chairman Gordon and Ranking Member Hall for considering my amendment. I urge its passage and yield back the balance of my time.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman and Ranking Member, for considering this amendment.

The amendment to H.R. 3598 addresses the section called, "Specific Considerations."

This part of the bill provides specific items for the research program that the Secretary of Energy should consider supporting.

For example, new advanced cooling technologies for energy generation are listed.

Technologies that are life cycle cost effective are also listed.

My amendment would add an additional Specific Consideration: technologies that minimize impacts to the natural environment.

Protection of our natural resources is critically important, especially in the context of energy generation.

When we do not plan carefully for deployment of large-scale energy generation systems where water is involved, we can see devastating environmental impacts.

Not long ago, I visited the place in Tennessee where the coal ash spill occurred.

It will take many years before that beautiful area is restored.

Mr. Chairman, you know that I am the Chair of the Environment and Water Resources Subcommittee of the Committee on Transportation and Infrastructure.

Research on water and energy production is an issue focus of mine.

I am very glad to see this committee's interest in these issues, and I believe that H.R. 3598 will open research funds at the Department of Energy to some vital areas of research.

Again, my amendment would add that the technologies that are researched and developed, as part of this program, would minimize environmental harms.

I want to again thank Chairman Gordon and Ranking Member Hall for considering my amendment.

I urge its passage and yield back the balance of my time.

Chairman GORDON. Is there further discussion on the amendment?

Mr. HALL. Mr. Chairman, we think it is a good amendment. We support it.

Chairman GORDON. If there is no further discussion on the amendment, then the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

If Mr. Broun is prepared, we are going to temporarily skip over amendment seven and go to amendment eight.

Mr. BROUN. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3598, offered by Mr. Broun of Georgia, amendment number 142.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain the amendment.

Mr. BROUN. Mr. Chairman, thank you for the time and consideration of my amendment. In my home District I would like to say

we have three main issues; water, water, and water. Up until the recent flooding that Georgia experienced, my home state and most of the southeast was experiencing what most people would kindly call a prolonged drought. In fact, some even call it a century-long drought.

The Savannah River, which runs all along the eastern border of my District in the State of Georgia, is not only a key economic driver for the region as the Chairman can attest, but is the lynchpin around which entire cities are based. And I know that Georgia is not alone in our constant struggle with the usage and protection of our water resources.

Just about every state from Florida to California and Arizona to Maine has dealt and is dealing with their very own local and regional water issues. It is because water is a vital and ever-increasing role in our country, including in our energy production, which is what this legislation is designed to address.

I am asking the Committee to incorporate my amendment. Earlier this year this Congress passed the *Omnibus Public Land Management Act.* Among the many provisions and protections included in this legislation was the National Water Availability and Use Assessment Program. This program tasks the United States Geological Survey with assessing the availability and use of the Nation's water resources. This study would help us gain a clearer understanding of the status of our water resources and the land use, water use, and natural climatic trends that affect them.

The goal of this program is to improve our ability to forecast water availability for future economic and environmental uses. Simply put the assessment will help characterize how much water we have now, how water availability is changing, and how much water we can expect to have in the future.

The amendment that I have offered would delay the implementation of section two of the underlying bill until the USGS has completed their study and reported back to Congress their findings. The findings to be brought forward in this study will give the Secretary of Energy a well-defined, narrowly-focused template to carry out section two of H.R. 3598.

Mr. Chairman, I strongly believe that water is one our greatest resources, and we should do all that we can to utilize it when possible but guard against waste and abuse at all times. It is my hope that the pending USGS study will set out a pathway to help us accomplish those goals, and my amendment asks this committee to delay any new water-based energy research and development studies until this report has been submitted to Congress.

Thank you, Mr. Chairman, and I yield back the balance of my time.

[The prepared statement of Mr. Broun follows:]

PREPARED STATEMENT OF REPRESENTATIVE PAUL C. BROUN

Mr. Chairman, again thank you for the time and consideration of my amendment.

In my home District, I like to say we have three main issues: water, water and water.

Up until the recent flooding that Georgia experienced, my home state and most of the southeast, was experiencing what most people would kindly call a prolonged drought.

The Savannah River, which runs all along the eastern border of my District and the State of Georgia, is not only a key economic driver for the region, as the Chairman can attest, but it is the lynchpin around which entire cities are based.

And I know that Georgia is not alone in our constant struggle with the usage and protection of our water resources.

Just about every state from Florida to California, and Arizona to Maine has dealt and is dealing with their very own, local and regional water issues.

And it is because water's vital and ever increasing role in our country, including in our energy production which is what this legislation is designed to address, I am asking the Committee to incorporate my amendment.

Earlier this year, this Congress passed the *Omnibus Public Land Management Act*.

Among the many provisions and protections included in this legislation, was the National Water Availability and Use Assessment Program.

This program tasked the United States Geological Survey with assessing the availability and use of the Nation's water resources.

This study would help us gain a clearer understanding of the status of our water resources and the land-use, water-use, and natural climatic trends that affect them.

The goal of this program is to improve our ability to forecast water availability for future economic and environmental uses.

Simply put, the assessment will help characterize how much water we have now, how water availability is changing, and how much water we can expect to have in the future.

The amendment I have offered would delay the implementation of Section 2 of the underlying bill until the USGA has completed their study and reported back to Congress their findings.

The findings to be brought forward in this study will give the Secretary of Energy of well-defined, narrowly focused template to carry out Section 2 of H.R. 3598.

Mr. Chairman, I strongly believe that water is one of our greatest resources and we should do all we can to utilize it when possible, but guard it against waste and abuse at all times.

It is my hope that the pending USGA study will set out a pathway to help us accomplish those goals, and my amendment asks this committee to delay any new water-based energy research and development studies until this report has been submitted to Congress.

Thank you Mr. Chairman, and I yield back the balance of my time.

Mr. BAIRD. [Presiding] I thank the gentleman. Are there other Members on our side that wish to be recognized?

If not, I will recognize myself briefly for a response on behalf of Chairman Gordon. The gentleman's point is important. Certainly we need to understand the availability of various water resources, and there are studies underway, but it doesn't necessarily mean that we have to wait for those studies before we can move forward with this legislation.

There is ample information now about volumes of water that are available. There is an urgent need because just some of the numbers of some of the major energy projects whether they are certain solar projects or carbon sequestration, et cetera, we need, I think, to move this legislation forward rather than waiting because we are using that water right now, and the more we wait, the more water is getting used, and I think we can move forward with both.

So I would respectfully urge defeat of this amendment.

Mr. Hall looks like he has something to offer, and I will recognize Mr. Hall for five minutes.

Mr. HALL. I agree with the Chairman, and I yield back.

Mr. BAIRD. Are there others wishing to comment on this?

If no, the vote occurs on the amendment. All those in favor will say, aye. Those opposed, no. In the opinion of the Chair the no's have it. The no's have it.

We will go back to the seventh amendment now on the roster, an amendment offered by the gentlelady from Illinois, Ms. Biggert. Ms. Biggert, are you ready to proceed with your amendment?

Ms. BIGGERT. Yes, I am. I have an amendment at the desk.

Mr. BAIRD. The Clerk will report the amendment, please.

The CLERK. Amendment to H.R. 3598, offered by Ms. Biggert of Illinois, amendment number 009.

Mr. BAIRD. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentlelady for five minutes to explain the amendment.

Ms. BIGGERT. Thank you, Mr. Chairman. My amendment would strike the Energy Water Architecture Council in section three of this bill.

While the concept is a laudable goal, it seems to me that it duplicates work done by other federal departments, agencies, and the private sector. The other bodies were created under prior statutes including the Secure Water Act and are working on these issues and DOE already participates in such group efforts.

In fact, we found over 30 groups involved in water research ranging from State, regional, and privately-coordinate entities. The need for a new council isn't necessary when the infrastructure already exists. Section 2C of the text specifically calls for interagency collaboration at the direction of the Secretary. I think that that serves as a better foundation from which the same goals could be achieved but without the extra layer of bureaucracy.

I support your efforts, you know, to better coordinate and plan for water use and availability in the energy sector through H.R. 3598, but I am not sure that another energy water research group is the best use of the scarce research dollars that we have.

And I would urge support for my amendment and yield back.

[The prepared statement of Ms. Biggert follows:]

PREPARED STATEMENT OF REPRESENTATIVE JUDY BIGGERT

Mr. Chairman, my amendment would strike the Energy-Water Architecture Council in Section 3 of this bill.

While the concept is a laudable goal, it seems to duplicate work by other federal departments, agencies and the private sector.

It seems that other bodies created under prior statutes, including the *Secure Water Act,* are working on these issues and DOE already participates in such group efforts.

In fact, we found over 30 groups involved in water research—ranging from State, regional and privately coordinated entities.

The need for a new council isn't necessary when the infrastructure already exists. Section 2–C of the text specifically calls for interagency collaboration at the direction of the Secretary. I think that serves as a better foundation from which the same goals could be achieved—but without the extra layer of bureaucracy.

Mr. Chairman, I support your efforts to better coordinate and plan for water use and availability in the energy sector through H.R. 3598. But I'm not sure another energy-water research group is the best use of scarce resource dollars.

Thank you.

Mr. BAIRD. I thank the gentlelady. Are there Members on our side wishing to comment?

If not, I will recognize myself for five minutes. Ms. Biggert, I appreciate the concern about duplication of effort. I think it is something we all share, however, in hearings on this topic we heard

from a number of agencies and witnesses suggesting that the precise function of this bill and this section of the bill looking at this nexus between energy and water is not duplicated currently by other agencies or other studies to our knowledge in vis-à-vis that nexus per se.

And as such while the general principle of trying to avoid duplication makes sense, we don't believe that is applicable in this particular case and hence, with regret I would urge defeat of the amendment.

Mr. Hall I think had wanted to clarify his position on the prior amendment. Mr. Broun, you will want—I apparently had baffled my colleague with my eloquent rhetoric, and he believed he was supporting something he wasn't supporting. So I will give him a chance to clarify.

Mr. HALL. Yeah. Thank you, Mr. Chairman. I don't know if I ought to move to reconsider the vote which the vote was taken and then support to Mr.—Dr. Broun. You bragged on him up until the last three words.

Mr. BAIRD. That was my strategy.

Mr. HALL. And I didn't——

Mr. BAIRD. I learned it from a Texan.

Mr. HALL. —I wasn't properly listening. I support Dr. Broun on this and almost any amendment he has, and I thank you for your fairness. Thank you.

Mr. BAIRD. Mr. Broun.

Mr. BROUN. Mr. Chairman, I just—Mr. Hall and I are—have—I have the utmost respect for Mr. Hall, and he and I never are going to have any problems, even if we disagree on something. We will be very—I will still have respect for him, and I appreciate him bringing that forward and clarifying that——

Mr. BAIRD. In this case he agreed with you.

Mr. BROUN. —just for the record. Yes, he did. So—but thank you, Mr. Hall, and thank you, Mr. Chairman.

Ms. BIGGERT. Mr. Chairman, would you yield?

Mr. BAIRD. I actually think Mr. Hall has the time, so he would yield to you, but he also wants to speak to Mr.—to this amendment as well. So, Mr. Hall controls the time here.

Mr. HALL. Mr. Chairman, I think this amendment will remove the Energy Water Architecture Council from the bill, and this council is redundant of other groups from, I guess from doing the same work in developing standards and data collection methods.

This type of duplication is what this committee has been trying to eliminate in almost every bill we move through here. Keeping the council in the bill would contradict almost everything we have been working so hard to avoid. I urge my colleagues to support this amendment to strike this section, and I yield to Ms. Biggert.

Ms. BIGGERT. Biggert.

Mr. HALL. Yes, ma'am.

Ms. BIGGERT. Thank you, Mr. Ranking Member Hall. I would just like to actually ask unanimous consent to submit for the record the existing water research programs of which is three pages with the 30 that I talked about.

Mr. BAIRD. Without objection.

[The information follows:]

EXISTING WATER RESEARCH PROGRAMS

- State Water Resources Research Institute Program—Plans, facilitates, and conducts research to aid in the resolution of State and regional water problems. Promotes technology transfer and the dissemination and application of research results. Provides for the training of scientists and engineers through their participation in research. Provides for competitive grants to be awarded under the *Water Resources Research Act.*
- Water and Energy Technology Team (WETT) at Lawrence Berkeley National Laboratory encompasses efforts to: Better understand the fundamental science, applied technology, and economics of the water/energy nexus, focusing on the interaction between human and natural systems; Develop new technologies, practices, and approaches for working with key players involved throughout the water/energy interrelationship; In an integrated and comprehensive manner, compare the technical feasibility and economic efficiency of newly developing technologies, practices, and policies to existing ones; and Optimize and test new technologies, practices, and policies that promote water and energy sustainability.
- Ground Water Protection Council—Forum held on water/energy sustainability in conjunction with its 2009 Annual Forum. Co-sponsored by the U.S. Department of Energy.
- Water Information Coordination Program (WICP)—Ensures collaborative efforts among federal agencies to improve water information for decision making about natural resources management and environmental protection.
- Universities Council on Water Resources (UCOWR)—Facilitates water-related education at all levels in order to promote meaningful research and technology transfer on contemporary and emerging water resources issues, compile and disseminate information on water problems and solutions, and inform the public about water issues with the objective of promoting informed decisions at all levels of society. UCOWR holds an annual conference that provides a forum to explore key and timely topics of interest to water resources researchers and educators.
- American Water Works Association (AWWA)—AWWA is entering into a partnering agreement with the WaterSmart Innovations conference and plans to co-sponsor the 2009 event scheduled for October 7–9, 2009.
- Cooperative Water Program—the primary federal science agency for water-resource information. USGS monitors the quantity and quality of water in the Nation's rivers and aquifers, assesses the sources and fate of contaminants in aquatic systems, develops tools to improve the application of hydrologic information, and ensures that its information and tools are available to all potential users.
- National Streamflow Information Program—Provides stream flow information and understanding required to meet local, State, regional, and national needs.
- Groundwater Resources Program—Provides the objective scientific information and develops the interdisciplinary understanding necessary to assess and quantify the availability of the Nation's groundwater resources.
- Hydrologic Research and Development (HRD) Program—Provides the primary support for the National Research Program in the hydrologic sciences and for the Water, Energy, and Biogeochemical Budgets program.
- Water Environment Federation—A not-for-profit association that provides technical education and training for thousands of water quality professionals who clean water and return it safely to the environment. WEF events include conferences, webcasts, and seminars.
- UCSB Forum on Energy and Water Sustainability—Western Forum on Energy & Water Sustainability will bring together policy-makers, researchers, energy and water utilities, as well as other important stakeholders, to generate a dialogue that can provide a pathway for concrete solutions: technical, economic, social and political. Topics include Technological solutions to increase water use efficiency: state-of-the-art solutions that can be implemented today, or in the near- or long-term provided there are breakthroughs in technology or policies that support their development.
- National Water-Quality Assessment Program (NWQA)—Provides an understanding of water-quality conditions; whether conditions are getting better or worse over time; and how natural features and human activities affect those conditions.

- U.S. Department of Agricultural—Natural Resources and Conservation Services—NRCS West National Technology Support Center hosts a team of technical specialists that cover a broad range of water quality and quantity issues.
- Southern Regional Water Program—Prioritized current water quality needs and established multi-state implementation teams to address seven major Focus Areas.
- Pacific Northwest Regional Water Program
- WaterEnergy—A reseller for water treatment and energy conservation solutions.
- Toxic Substances Hydrology Program—Provides objective scientific information on environmental contamination to improve characterization and management of contaminated sites, to protect human and environmental health, and to reduce potential future contamination problems.
- Water Research Foundation—An international, non-profit organization that sponsors research to enable water utilities, public health agencies, and other professionals to provide safe and affordable drinking water.
- National Water Research Institute—Sponsors projects and programs focused on ensuring safe, reliable sources of water now and for future generations.

State

- Texas Commission on Environmental Quality (TCEQ)
- Texas Environmental Flows Science Advisory Committee—Serves as an objective scientific body to advise and make recommendations to the Environmental Flows Advisory Group on issues relating to the science of environmental flow protection and develop recommendations to help provide overall direction, coordination, and consistency.
- University of Arizona's Department of Civil Engineering and Engineering Mechanics were recently awarded a $2 million grant from the National Science Foundation to research energy water reuse and supply systems.
- Sandia National Lab, Energy-Water Nexus in Michigan
- Santa Clara Valley Water District, California—Hosted the Department of Water Resources Energy Workshop to help Bay Area water and wastewater agencies identify opportunities for saving energy without impeding water service to customers.
- Texas A&M University in Qatar has recently established a major program called the Qatar Sustainable Water and Energy Utilization (QWE). The program will establish a center of scientific and technical excellence dedicated to support Qatar in addressing pressing water and energy problems.
- Water Information Program provides water information to the communities of Southwest Colorado.
- Colorado Energy Research Institute of the CO School of Mines—Maintains liaison with the state to identify important regional energy and energy-related minerals problems, including their relationship to the use of the waters of the states.
- Connecticut—the Office of Policy and Management—Prepares state-wide or inter-regional plans for the physical, social, and economic development of the state. The plan may include land use and water considerations and as well as energy capabilities and requirements.
- California—The Nevada County Water Agency—Contracts with the U.S., State of CA, any municipality, district, public or private corporation, or any person in the sale or acquisition of water for the purpose of conserving and transporting waters for beneficial uses and purposes, including the generation of electric energy.
- West Virginia—Creates the Division of Energy as a State agency under the Department of Commerce. The division holds public hearings and meetings to receive input regarding proposed energy policies and development plans that address efficiency of energy use, traditional and alternative energy, water as a resource and a component of energy production, energy distribution systems, the sighting of energy facilities, the increased development and production of new and existing domestic energy sources, increased awareness of energy use on the environment and the economy, energy infrastructure, the

development and implementation of renewable, clean, technically innovative and advanced energy projects.

- Institute of Water Research (IWR) at Michigan State University—Provides timely information for addressing contemporary land and water resource issues through coordinated multi-disciplinary efforts using advanced information and networking systems.
- Florida—Department of Environmental Protection, The Office of Water Policy—The office addresses statewide water management issues in coordination with the water management districts and other agencies. Examples include water plans for the DEP and water management districts, minimum flows and levels for the state's water resources, and regional water supply planning.
- California Sustainability Alliance, Water Energy Committee—Evaluates the potential energy, water, and carbon and other societal benefits that could be achieved by displacing higher energy water supplies in Southern California with local recycled water supplies.

Ms. BIGGERT. Thank you.

Mr. HALL. I yield back my time.

Mr. BAIRD. Thank you. Are there any others wishing to comment on the amendment?

If no, the vote occurs on the amendment. All those in favor, say aye. Those opposed, no. In the opinion of the Chair the no's have it. The no's have it.

Are there any other amendments?

If no, then the vote occurs on the bill.

Mr. BILBRAY. Mr. Chairman.

Mr. BAIRD. Mr. Bilbray it sounds like.

Mr. BILBRAY. While the Chairman isn't here, I figured I would compliment him for——

Mr. BAIRD. Would someone get the Chairman?

Mr. BILBRAY. I just don't—I don't want us to go by this bill without pointing out that one of the things this bill does well, it ties energy and water supply together. Too often they are divided, and I just hope those of us that always talk about water remember that we always talk about the liquid stuff, but in reality if we are going to have safe drinking water, it is more important to have clean, cost-effective electricity than to have fresh water available, you know, in a natural form. The fact is if you do not have clean, inexpensive electricity, you can't either transport that water that you have or you can't create it locally.

And so this nexus of tying the two together is absolutely essential, and I hope to see that this comes out, and we talk about the way we can use different technologies, but a great example is the fact that in San Diego we are pumping massive amounts of water from 500 miles away, though we have just now rebuilt our nuclear power plant in San Onofre, nobody even thinks about why we don't go to peak production with a zero emission technology like nuclear. We are on off—because they said, well, what are you going to do with the power with off peak?

What we could do is deceleration and eliminate all of the impact of pumping and transporting and digging the canals, but no one is taking the two and sticking them together, and I think this technology can do that. This technology can go beyond that and look at things like the fact of why are we using fresh water to sequester and carbon footprints when we got the algae technology that can grow in saltwater and be able to sequester the emissions from our power plants or from other locations.

So by putting these two things together I think is really a great step, and I hope every time somebody in this committee talks about water, we always remember, but where is going to be the clean, inexpensive electricity to be able to pump the water and create the water, and I think this committee will help do it.

Thank you very much, Mr. Chairman.

Mr. BAIRD. Point well taken, and of course, the bill works in the opposite direction as well. As we look for alternative energy sources we need to look at the water impacts of those sources. And so I think the gentleman's points are well taken.

Any other comments?

If not then, the—did we actually have the vote? The vote occurs on the bill, H.R. 3598, as amended. All those in favor will say, aye. All those opposed, no. In the opinion of the Chair the ayes have it.

I recognize Mr. Tonko to offer a motion.

Mr. TONKO. Yes. Mr. Chair, I move that the Committee favorably report H.R. 3598 as amended to the House with the recommendation that the bill do pass. Furthermore, I move that the staff be instructed to prepare the legislative report and make necessary technical and conforming changes and that the Chair take all necessary steps to bring the bill before the House for consideration.

Mr. BAIRD. Thank you, Mr. Tonko. The question is now on the motion to report the bill favorably. Those in favor of the motion will signify by saying, aye. Opposed, no. The ayes have it, and the bill is favorably reported.

Without objection, the motion to reconsider is laid upon the table. Members will have two subsequent calendar days in which to submit supplemental, Minority, or additional views on the measure.

I want to thank the Members for their attendance and the staff on both sides for their good work. This concludes our Committee markup.

[Whereupon, at 3:55 p.m., the Committee was adjourned.]

Appendix:

H.R. 3598 AS AMENDED, AMENDMENT ROSTER

H.R. 3598, AS AMENDED BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT ON SEPTEMBER 30, 2009

SECTION 1. SHORT TITLE.

This Act may be cited as the "Energy and Water Research Integration Act".

SEC. 2. INTEGRATING ENERGY AND WATER RESEARCH.

(a) IN GENERAL.—In carrying out each of the energy research, development, and demonstration programs of the Department of Energy, the Secretary of Energy shall—

(1) seek to advance energy and energy efficiency technologies and practices that would—

(A) minimize freshwater withdrawal and consumption;

(B) increase water use efficiency; and

(C) utilize nontraditional water sources with efforts to improve the quality of that water;

(2) consider the effects climate change may have on water supplies and quality for energy generation and fuel production; and

(3) improve understanding of the energy required to provide water supplies and the water re-

quired to provide reliable energy supplies throughout the United States.

(b) SPECIFIC CONSIDERATIONS.—In carrying out subsection (a), the Secretary shall research, develop, and demonstrate, as appropriate—

(1) new advanced cooling technologies for energy generation and fuel production technologies;

(2) performance improvement of existing cooling technologies and cost reductions associated with using those technologies;

(3) innovative water reuse, recovery, and treatment in energy generation and fuel production;

(4) efficient water use design strategies and technology development for carbon capture and storage systems;

(5) technologies that are life-cycle cost effective;

(6) systems analysis and modeling of issues relating to the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States;

(7) technologies to treat and utilize produced waters discharged from oil, coalbed methane, and mining activities;

(8) advanced materials for the use of nontraditional water sources for energy generation and fuel production;

(9) biomass production and the impact on hydrologic systems; and

(10) reduction of water resource impacts of fossil fuel resource development.

(c) INTERAGENCY COLLABORATION.—In carrying out the energy research, development, and demonstration programs of the Department of Energy in accordance with this section, the Secretary shall, where appropriate, work collaboratively with other Federal agencies operating programs related and relevant to such programs.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy for carrying out this section $60,000,000 for each of the fiscal years 2011 through 2015.

SEC. 3. ENERGY-WATER ARCHITECTURE COUNCIL.

(a) IN GENERAL.—The Secretary of Energy, in coordination with other relevant Federal agencies, shall establish an Energy-Water Architecture Council to promote and enable improved energy and water resource data collection, reporting, and technological innovation. The Council shall consist of—

(1) representation from each Federal agency that conducts research related to energy and water resource data; and

(2) non-Federal members, including representatives of research and academic institutions and industry, who have expertise in technologies and practices relating to the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States.

(b) FUNCTIONS.—The Council shall—

(1) develop data collection and data communication standards and protocols for the energy required to provide water supplies and the water required to provide reliable energy supplies throughout the United States;

(2) make improvements to Federal water use data to increase understanding of trends in energy generation and fuel production;

(3) utilize information from existing monitoring networks to provide nationally uniform water and energy use and infrastructure data; and

(4) conduct annual technical workshops, including at least one regional workshop annually, to facilitate information exchange among Federal, State, and private sector experts on technologies that en-

courage the conservation and efficient use of water and energy.

(c) REPORTS.—Not later than 1 year after the date of enactment of this Act, and at least once every 2 years thereafter, the Council, through the Secretary of Energy, shall transmit to the Congress a report on its findings and activities under this section.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy for carrying out this section $5,000,000 for each of the fiscal years 2011 through 2015.

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COMMITTEE ON SCIENCE AND TECHNOLOGY
FULL COMMITTEE MARKUP
OCTOBER 7, 2009

AMENDMENT ROSTER

H.R. 3598, the *Energy and Water Research Integration Act*

No.	Sponsor	Description	Results
1	Mr. Gordon (Manager's Amendment) (005)	Makes several technical and clarifying changes to the bill. Amends Section 2 ("Integrating Energy and Water Research") to specify that the Secretary shall ensure that no program or project of DOE is unnecessarily delayed or disrupted in carrying out subsection (a). Amends Section 2 to add two items to the list of specific considerations. Further amends Section 2 to add new subsections on Interagency Collaboration and Nonduplication, Intra-Agency Coordination and Nonduplication, Relevant Information and Recommendations, and Reports.	Agreed to by voice vote.
2	Mr. Hall (016)	Amends Section 2 ("Integrating Energy and Water Research") to require the Secretary to develop an "Energy Water Research and Development Roadmap" to define research, development, demonstration, and commercialization efforts related to the energy-water nexus. Provides ten specific considerations for the Roadmap for which the Secretary shall establish milestones. Requires the Secretary to submit the Roadmap to Congress not later than nine months after the date of enactment, and requires the Secretary to update the Roadmap no later than 3 years after the date of enactment. Requires the secretary to implement the Roadmap in carrying out energy research, development, and demonstration programs of DOE. Authorizes $30,000,000	Offered and withdrawn.

		for each of the fiscal years 2011 through 2015 to carry out this section.	
3	Ms. Dahlkemper (003)	Amends Section 2 to add two items to the list of specific considerations.	Agreed to by voice vote.
4	Mr. Smith (006)	Adds a new section which states that nothing in the Act "shall be construed to allow the establishment of regulations by the Federal Government that would infringe or impair the use of water by State, tribal, or local governments."	Offered en bloc with Smith (007) and agreed to by voice vote.
5	Mr. Smith (007)	Adds a new section which states that nothing in the Act "shall be construed to require State, tribal, or local governments to take any action that may result in an increased financial burden to such governments by restricting the use of water by such governments."	Offered en bloc with Smith (006) and agreed to by voice vote.
6	Ms. Johnson (087)	Amends Section 2 to add "natural gas" to the list of items in subsection (b)(7).	Agreed to by voice vote.
7	Mr. Broun (142)	Adds a new section to the bill which requires the Secretary to review a report of the National Water Availability and Use Assessment Program, conduct a study in consultation with EPA, and provide to Congress a "narrowly focused research and development strategy" before implementing section 2 of the bill.	Defeated by voice vote.
8	Ms. Biggert (009)	Strikes Section 3 ("Energy-Water Architecture Council") from the bill.	Defeated by voice vote.

AMENDMENT TO H.R. 3598

OFFERED BY MR. GORDON OF TENNESSEE

Page 1, line 5, strike "each of".

Page 1, line 6, insert "and projects" after "programs".

Page 1, line 16, insert "variability and" after "climate".

Page 2, after line 2, insert the following new subsection (and redesignate the subsequent subsection accordingly):

(b) DELAY OR DISRUPTION.—In carrying out subsection (a), the Secretary shall ensure that no program or project of the Department of Energy is unnecessarily delayed or disrupted.

Page 2, lines 4 and 5, strike "research, develop, and demonstrate" and insert "consider".

Page 2, lines 13 through 15, amend paragraph (4) to read as follows:

(4) technology development for carbon capture and storage systems that utilize efficient water use design strategies;

Page 3, line 4, insert "and utilization" after "production".

Page 3, lines 6 and 7, amend paragraph (10) to read as follows:

(10) technologies that reduce impacts on water from energy resource development.

Page 3, line 14, redesignate subsection (d) as subsection (h).

Page 3, lines 8 through 13, strike subsection (c) and insert the following new subsections:

(d) INTERAGENCY COLLABORATION AND NONDUPLICATION.—In carrying out the energy research, development, and demonstration programs of the Department of Energy in accordance with this section, the Secretary shall, where appropriate, work collaboratively with other Federal agencies operating related programs and avoid duplication.

(e) INTRA-AGENCY COORDINATION AND NONDUPLICATION.—In carrying out the energy research, development, and demonstration programs of the Department of Energy in accordance with this section, the Secretary shall coordinate and avoid duplication of activities across programs and projects of the Department, including with those of the National laboratories.

(f) RELEVANT INFORMATION AND RECOMMENDATIONS.—In carrying out the energy research, development, and demonstration programs of the Department of Energy in accordance with this section, the Secretary shall consider and incorporate, as appropriate, relevant information and recommendations, including those of the National Water Availability and Use Assessment Program under section 9508(d) of the Omnibus Public Land Management Act of 2009 (42 U.S.C. 10368(d)).

(g) REPORTS.—Not later than 1 year after the date of enactment of this Act, and at least once every 2 years thereafter, the Secretary shall transmit to Congress a report on findings and activities under this section.

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AMENDMENT TO H.R. 3598

OFFERED BY MR. HALL OF TEXAS

Page 1, line 4, through page 3, line 17, amend section 2 to read as follows:

SEC. 2. INTEGRATING ENERGY AND WATER RESEARCH.

(a) IN GENERAL.—Not later than 6 months after the date of enactment of this Act, the Secretary of Energy shall develop a document to be known as the Energy-Water Research and Development Roadmap (in this Act referred to as the ''Roadmap''), to define research, development, demonstration, and commercialization efforts that—

(1) advance energy and energy efficiency technologies and practices that would—

(A) lessen freshwater withdrawal and consumption;

(B) increase water use efficiency; and

(C) utilize nontraditional water sources;

(2) consider the effects climate may have on water supplies and quantity for energy generation and fuel production; and

(3) improve the understanding of the energy required to provide water supplies and the water required to provide energy supplies.

(b) SPECIFIC CONSIDERATIONS.—In developing the Roadmap under subsection (a), the Secretary shall evaluate and establish appropriate milestones for—

(1) new advanced cooling technologies for energy generation and fuel production technologies;

(2) performance improvement of existing cooling technologies and cost reductions associated with using those technologies;

(3) innovative water reuse, recovery, and treatment in energy generation and fuel production;

(4) carbon capture and storage systems that utilize efficient water use design strategies and technologies;

(5) technologies that are life-cycle cost effective as part of an integrated system;

(6) technologies to treat and utilize produced waters discharged from oil, coalbed methane, and mining activities;

(7) advanced materials for the use of nontraditional water sources for energy generation and fuel production;

(8) biomass production and utilization and the impact on hydrologic systems;

(9) technologies to reduce to water consumption related to energy resource development; and

(10) any other area of the energy-water nexus that the Secretary deems appropriate for inclusion into the Roadmap.

(c) INTERAGENCY COLLABORATION.—In carrying out the development of the Roadmap in accordance with this section, the Secretary shall, where appropriate, work collaboratively with other Federal agencies operating related programs and avoid duplication.

(d) INTRA-AGENCY COLLABORATION.—In carrying out the development of the Roadmap in accordance with this section, the Secretary shall coordinate and avoid duplication of activities across programs and projects of the Department of Energy, including with those of the National laboratories.

(e) NONGOVERNMENTAL PARTICIPATION.—In carrying out the development of the Roadmap in accordance with this section, the Secretary shall consult and coordinate with a diverse group of representatives from research and academic institutions and industry who have expertise in technologies and practices relating to the energy required to provide water supplies and the water required

to provide reliable energy supplies throughout the United States.

(f) UTILIZATION OF INFORMATION.—In carrying out the development of the Roadmap in accordance with this section, the Secretary shall consider and incorporate, as appropriate, the recommendations of relevant reports including, the National Water Availability and Use Assessment Program under section 9508(d) of the Omnibus Public Land Management Act of 2009 (42 U.S.C. 10368(d)).

(g) SUBMISSION TO CONGRESS.—Not later than 9 months after the date of enactment of this Act, the Secretary shall submit to the appropriate committees of Congress a report describing the Roadmap.

(h) UPDATING THE ROADMAP.—Not later than 3 years after the date of enactment of this Act, the Secretary shall utilize relevant reports produced by other Federal Government agencies, academia, or industry to update the Roadmap. Not later than 6 months after updating the Roadmap, the Secretary shall submit a report to Congress describing the changes from the initial Roadmap.

(i) IMPLEMENTATION.—

(1) IN GENERAL.—The Secretary shall implement the Roadmap, as provided in this subsection,

in carrying out energy research, development, and demonstration programs of the Department of Energy.

(2) APPLICATION TO PROJECTS.—Not later than 3 months after the submission of the report to Congress in subsection (g), the Secretary shall as appropriate initially apply the Roadmap to projects—

(A) identified as the most energy and water intensive; and

(B) with the most potential to—

(i) lessen freshwater withdrawal and consumption;

(ii) increase water use efficiency; and

(iii) utilize nontraditional water sources.

(3) DELAY OR DISRUPTION.—In carrying out paragraph (2) the Secretary shall ensure no program or project of the Department is unnecessarily delayed or disrupted.

(4) REPORTS.—Not later than 1 year after the date of enactment of this Act, and at least once every 2 years thereafter, the Secretary shall transmit to Congress a report on its findings and activities under this section.

(j) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy for carrying out this section $30,000,000 for each of the fiscal years 2011 through 2015.

AMENDMENT TO H.R. 3598

OFFERED BY MS. DAHLKEMPER OF PENNSYLVANIA

Page 3, line 5, strike ''and''.

Page 3, line 7, strike the period and insert a semicolon.

Page 3, after line 7, insert the following new paragraphs:

(11) increases in energy efficiency of water distribution and collection systems; and

(12) technologies for energy generation from water distribution and collection systems.

☒

AMENDMENT TO H.R. 3598

OFFERED BY Mr. Smith of NE

At the end of the bill, add the following new section:

SEC. 4. LIMITATION ON FEDERAL REGULATIONS.

Nothing in this Act shall be construed to allow the establishment of regulations by the Federal Government that would infringe or impair the use of water by State, tribal, or local governments.

☒

AMENDMENT TO H.R. 3598

OFFERED BY MR. SMITH OF NEBRASKA

At the end of the bill, add the following new section:

SEC. 4. MANDATES.

Nothing in this Act shall be construed to require State, tribal, or local governments to take any action that may result in an increased financial burden to such governments by restricting the use of water by such governments.

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AMENDMENT TO H.R. 3598

OFFERED BY MS. EDDIE BERNICE JOHNSON OF TEXAS

Page 2, line 22, insert "natural gas," after "discharged from oil,".

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AMENDMENT TO H.R. 3598

OFFERED BY Mrs. Biggert (IL)

Page 3, line 18, through page 5, line 11, strike section 3.

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AMENDMENT TO H.R. 3598

OFFERED BY MR. BROUN OF GEORGIA

At the end of the bill, add the following new section:

SEC. 4. REPORT TO CONGRESS.

Prior to implementation of section 2, the Secretary of Energy shall—

(1) review the report of the National Water Availability and Use Assessment Program under section 9508(d) of the Omnibus Public Land Management Act of 2009 (42 U.S.C. 10368(d));

(2) conduct a study in consultation with the Administrator of the Environmental Protection Agency to identify advanced technologies and related processes to maximize water and energy efficiency in the production of electricity by each type of generation; and

(3) provide to Congress a narrowly focused research and development strategy for carrying out the activities included in section 2 for the Department of Energy that, based on the availability and use of water, would seek to advance energy and energy efficiency technologies and practices.

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