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NEXUS OF ENERGY AND WATER FOR SUSTAINABILITY ACT

DECEMBER 10, 2014.—Ordered to be printed

Ms. LANDRIEU, from the Committee on Energy and Natural
Resources, submitted the following

R E P O R T

[To accompany S. 182]

The Committee on Energy and Natural Resources, to which was referred the bill (S. 1971) to establish an interagency coordination committee or subcommittee with the leadership of the Department of Energy and the Department of the Interior, focused on the nexus between energy and water production, use, and efficiency, and for other purposes, having considered the same, reports favorably thereon with an amendment and recommends that the bill, as amended, do pass.

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 “Nexus of Energy and Water for Sustainability Act of 2014” or the “NEWS Act of 2014”.

SEC. 2. DEFINITIONS.

In this Act:

(1) **COMMITTEE OR SUBCOMMITTEE.**—The term “Committee or Subcommittee” means the Committee on the Nexus of Energy and Water for Sustainability (or the “NEWS Committee”) or the Subcommittee on the Nexus of Energy and Water for Sustainability (or the “NEWS Subcommittee”), whichever is established by section 3(a).

(2) **DIRECTOR.**—The term “Director” means the Director of the Office of Science and Technology Policy.

(3) **ENERGY-WATER NEXUS.**—The term “energy-water nexus” means the links between—

(A) the water needed to produce fuels, electricity, and other forms of energy; and

(B) the energy needed to transport, reclaim, and treat water and wastewater.

(4) **GRAND CHALLENGES.**—The term “Grand Challenges” means the 21st Century Grand Challenges program coordinated by the Office of Science and Technology Policy.

(5) **NSTC.**—The term “NSTC” means the National Science and Technology Council.

(6) **RD&D ACTIVITIES.**—The term “RD&D activities” means research, development, and demonstration activities.

SEC. 3. INTERAGENCY COORDINATION COMMITTEE.

(a) **ESTABLISHMENT.**—The Director shall establish either a committee or a subcommittee under the NSTC, to be known as either the Committee on the Nexus of Energy and Water for Sustainability (or the “NEWS Committee”) or the Subcommittee on the Nexus of Energy and Water for Sustainability (or the “NEWS Subcommittee”), to carry out the duties described in subsection (c).

(b) **ADMINISTRATION.**—

(1) **CHAIRS.**—The Secretary of Energy and Secretary of the Interior shall serve as co-chairs of the Committee or Subcommittee.

(2) **MEMBERSHIP; STAFFING.**—Membership and staffing shall be determined by the NSTC.

(c) **DUTIES.**—The Committee or Subcommittee shall—

(1) serve as a forum for developing common Federal goals and plans on energy-water nexus RD&D activities;

(2) not later than 1 year after the date of enactment of this Act, and biannually thereafter, issue a strategic plan on energy-water nexus RD&D activities priorities and objectives;

(3) promote coordination of the activities of Federal departments and agencies on energy-water nexus RD&D activities, including the activities of—

(A) the Department of Energy;

(B) the Department of the Interior;

(C) the Corps of Engineers;

(D) the Department of Agriculture;

(E) the Department of Defense;

(F) the Department of State;

(G) the Environmental Protection Agency;

(H) the Council on Environmental Quality;

(I) the National Institute of Standards and Technology;

(J) the National Oceanic and Atmospheric Administration;

(K) the National Science Foundation;

(L) the Office of Management and Budget;

(M) the Office of Science and Technology Policy; and

(N) such other Federal departments and agencies as the Director or the Committee or Subcommittee consider appropriate; and

(4)(A) coordinate and develop capabilities and methodologies for data collection, management, and dissemination of information related to energy-water nexus RD&D activities from and to other Federal departments and agencies ; and

(B) promote information exchange between Federal departments and agencies—

(i) to identify and document Federal and non-Federal programs and funding opportunities that support basic and applied research, development, and demonstration proposals to advance energy-water nexus related science and technologies;

(ii) if practicable, to leverage existing programs by encouraging joint solicitations, block grants, and matching programs with non-Federal entities; and

(iii) to identify opportunities for domestic and international public-private partnerships, innovative financing mechanisms, information and data exchange, and Grand Challenges.

(d) **REVIEW; REPORT.**—At the end of the 10-year period beginning on the date on which the Committee or Subcommittee is established, the Director—

(1) shall review the activities, relevance, and effectiveness of the Committee or Subcommittee; and

(2) submit to the Committee on Energy and Natural Resources of the Senate and the Committees on Science, Space, and Technology, Energy and Commerce, and Natural Resources of the House of Representatives, a report describing the results of the review conducted under paragraph (1) and a recommendation on whether the Committee or Subcommittee should continue.

SEC. 4. CROSSCUT BUDGET.

Not later than 30 days after the President submits the budget of the United States Government under section 1105 of title 31, United States Code, the Director of the Office of Management and Budget shall submit to the Committee on Energy and Natural Resources of the Senate and the Committees on Science, Space, and Technology, Energy and Commerce, and Natural Resources of the House of Representatives, an interagency budget crosscut report that displays at the program-, project-, and activity-level for each of the Federal agencies that carry out or support (including through grants, contracts, interagency and intraagency transfers, multiyear and no-year funds) basic and applied RD&D activities to advance the energy-water nexus related science and technologies—

- (1) the budget proposed in the budget request of the President for the upcoming fiscal year;
- (2) expenditures and obligations for the prior fiscal year; and
- (3) estimated expenditures and obligations for the current fiscal year.

PURPOSE OF THE MEASURE

The purpose of S. 1971 is to establish an interagency coordination committee or subcommittee under the National Science and Technology Council, co-chaired by the Secretary of Energy and the Secretary of the Interior, to focus on the nexus between energy and water production, use, and efficiency.

BACKGROUND AND NEED

Vast amounts of water are used every day to produce vital fuels and to cool power plants in the United States. Without this water supply, most of our electricity would cease flowing and our economy and other essential functions would come to a complete stop. At the same time, a great deal of electricity is needed to treat, transport and convey water across the country—not only to support economic growth and well-being, but also to sustain basic life. These inseparable links of “water for energy” and “energy for water” comprise the energy-water nexus.

Congress has long recognized the inextricable linkage and mutual dependence of energy and water. Section 979 of the Energy Policy Act of 2005 directed the Secretary of Energy to carry out a research and development program on energy-related issues associated with the provision of adequate water supplies and on water-related issues associated with the provision of adequate supplies and efficient use of energy, and to assess the effectiveness of existing programs of the Department of Energy and other federal agencies to address energy-water nexus issues. Similarly, the Secure Water Act, subtitle F or title IX of the Omnibus Public Land Management Act of 2009, recognized the need for systematic data-gathering on the nation’s water resources to ensure sufficient quantities of water to support energy production, authorized water conservation grant programs within the Bureau of Reclamation, directed the Secretary of Energy to assess water supplies needed to generate hydroelectric power at federal power marketing administration projects, and enhanced collection of data on water by the United States Geological Survey. The Government Accountability Office has also issued several reports on the energy-water nexus and called for better coordination of federal programs addressing the energy-water nexus. GAO, *Energy-Water Nexus: Coordinated Federal Approach Needed to Better Manage Energy and Water Tradeoffs*, GAO-12-880 (Sept. 2012).

S. 1971 is needed to provide better coordination, management, and streamlining of science and technology research, development,

and demonstration activities related to the energy-water nexus across the Federal Government by establishing a coordinating mechanism within the Cabinet-level National Science and Technology Council, which is the principal office within the executive branch for coordinating science and technology policy across the Federal Government.

LEGISLATIVE HISTORY

S. 1971 was introduced by Senator Murkowski on January 29, 2014. Senators Landrieu, Wyden, Schatz, Baldwin, and Udall of New Mexico are cosponsors. The Subcommittee on Water and Power held a hearing on S. 1971 on June 25, 2014 (S. Hrg. 113-428). At its business meeting on November 13, 2014, the Committee ordered S. 1971 favorably reported with an amendment in the nature of a substitute.

COMMITTEE RECOMMENDATION

The Senate Committee on Energy and Natural Resources, in open business session on November 13, 2014, by a voice vote of a quorum present, recommends that the Senate pass S. 1971, if amended as described herein. Senator Barrasso asked to be recorded as voting no.

COMMITTEE AMENDMENT

During its consideration of S. 1971, the Committee adopted an amendment in the nature of a substitute, which clarifies the role of Congress in determining how long the Nexus of Energy and Water for Sustainability Committee or Subcommittee will continue to exist and makes technical corrections.

SECTION-BY-SECTION ANALYSIS

Section 1 provides that the Act may be cited as the “Nexus of Energy and Water for Sustainability Act of 2014” or the “NEWS Act of 2014.”

Section 2 defines key terms.

Section 3(a) establishes the Nexus of Energy and Water for Sustainability Committee or Subcommittee under the National Science and Technology Council. Subsection (b) designates the Secretary of Energy and the Secretary of the Interior as co-chairs of the Committee or Subcommittee. Subsection (c) lists the duties of the Committee or Subcommittee, which include: serving as a forum for developing goals and plans on energy-water nexus research, development, and demonstration activities; issuing biannual strategic plans on energy-water nexus research, development, and demonstration activities priorities and objectives; facilitating data collection, management, and dissemination of information related to energy-water nexus research, development, and demonstration activities; promoting information exchange; and identifying opportunities for public-private partnerships. Subsection (d) requires the Director of the Office of Science and Technology Policy to review the activities, relevance, and effectiveness of the Committee or Subcommittee ten years after it is established, to report the results of the review, and to recommend whether the Committee or Subcommittee should continue.

Section 4 requires the development and submission of a crosscut budget by the Office of Management and Budget to the Senate Committee on Energy and Natural Resources and the House Committees on Science, Space, and Technology, Energy and Commerce, and Natural Resources.

COST AND BUDGETARY CONSIDERATIONS

The Congressional Budget Office estimate of the costs of this measure has been requested but was not received at the time the report was filed. When the Congressional Budget Office completes its cost estimate, it will be posted on the Internet at www.cbo.gov.

REGULATORY IMPACT EVALUATION

In compliance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee makes the following evaluation of the regulatory impact which would be incurred in carrying out S. 1971.

The bill is not a regulatory measure in the sense of imposing Government established standards or any economic responsibilities on private individuals and businesses.

No personal information would be collected in administering the program. Therefore, there would be no impact on personal privacy.

Little, if any, additional paperwork would result from the enactment of S. 1971.

EXECUTIVE COMMUNICATIONS

The statements of the witnesses from the Department of Energy and the Department of the Interior at the Subcommittee on Water and Power hearing on S. 1971 on June 25, 2014 follow:

STATEMENT OF TOM ISEMAN, DEPUTY ASSISTANT SECRETARY FOR WATER AND SCIENCE, DEPARTMENT OF THE INTERIOR

Chairman Schatz, Ranking Member Lee and members of the Subcommittee, I am Tom Iseman, Deputy Assistant Secretary for Water and Science at the Department of the Interior (Department). Thank you for the opportunity to testify on S. 1971, Nexus of Energy and Water for Sustainability Act of 2014. The Administration has not completed its review of S. 1971 in conjunction with the report issued by the Department of Energy last week, entitled *The Energy-Water Nexus: Challenges and Opportunities* (U.S. Department of Energy 2014). The bill would create a Committee or Subcommittee on Energy-Water Nexus for Sustainability under the National Science and Technology Council (NSTC), co-chaired by the Secretary of Energy and Secretary of the Interior. The Department has a number of existing programs that address many of these energy-water nexus issues, some of which are summarized below.

Founded in 1879, the USGS is the Nation's largest water, earth, and biological science and civilian mapping agency. The USGS collects, monitors, analyzes, and provides scientific understanding about natural resource conditions, issues, and problems. The USGS provides impar-

tial scientific information on the health of our ecosystems and environment, the water and energy resources we rely on, and the impacts of climate and land-use change. With a diversity of scientific expertise, the USGS carries out large-scale, multi-disciplinary investigations and provides scientific information to resource managers, planners, and other customers.

Reclamation owns and operates water projects that promote and sustain economic development within the 17 western States. The mission of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. Since it was established in 1902, Reclamation has constructed more than 600 dams and reservoirs including Hoover Dam on the Colorado River and Grand Coulee on the Columbia River. Reclamation is the largest wholesaler of water in the country, delivering water to more than 31 million people, and providing one out of five western farmers with irrigation water for 10 million acres of farmland across the United States. Reclamation is also the second largest producer of hydroelectric power in the United States, and provides significant amounts of renewable energy to customers throughout the West.

EXISTING PROGRAMS AT THE DEPARTMENT OF THE INTERIOR

The Department recognizes the importance of the energy-water nexus and supports a closer level of communication and coordination between the Department of the Interior, Department of Energy and the broader federal community. The Department of the Interior appreciates the Committee's leadership on the energy-water nexus issue. Energy and water issues intersect across a range of Interior activities, including hydropower generation, energy development, electricity generation, and water treatment, distribution, and conservation. Interior has a variety of programs that address the energy-water nexus, including USGS monitoring systems and research programs (including the National Water Census), Reclamation Basin Studies, and WaterSMART Grants. Understanding the value of interagency coordination, Interior has partnered with the Department of Energy and the Department of the Army (working with the U.S. Army Corps of Engineers) through a 2010 Memorandum of Understanding (MOU) to collaboratively address a host of energy-water nexus issues related to hydropower. By coordinating efforts, the signatory agencies have completed a number of projects that promote sustainable hydropower development, including hydropower resource assessments, unit-dispatch optimization systems, climate change studies, integrated basin-scale opportunity assessments, and funding opportunities to demonstrate new small hydropower technologies.

The Department is committed to integrating energy and water policies to promote the sustainable use of all resources, including incorporating water conservation cri-

teria and the water/energy nexus into the Department's planning efforts. On June 9, 2014, the Department announced that Reclamation will make \$17.8 million in WaterSMART Water and Energy Efficiency Grants available to 36 new and ongoing projects in the Western United States for activities such as conserving and using water more efficiently, increasing the use of renewable energy, improving energy efficiency, encouraging water markets, and carrying out activities to address climate-related impacts on water. Reclamation also announced that it will make \$1.8 million available for comprehensive water basin studies conducted jointly with state and local partners in the Upper Red River Basin in Oklahoma, Upper Deschutes River Basin in Oregon, and Missouri River Headwaters Basin in Montana. These announcements support the President's Climate Action Plan by providing tools for states and water users to create water supply resilience to meet future water and energy demands in the face of a changing climate.

Water and Energy Efficiency Grants and Basin Studies are part of the Department's WaterSMART Program. WaterSMART Grants provide cost-shared funding to States, tribes, and other entities with water or power delivery authority for water efficiency improvements, with additional consideration given to proposals that include energy savings as a part of planned water efficiency improvements. Water management improvements that incorporate renewable energy sources are also prioritized for WaterSMART Grant funding. These grants directly address the energy-water nexus and provide a concrete means of implementing on-the-ground solutions to energy-water issues. The FY 2014 Water and Energy Efficiency Grant projects are expected to conserve more than 67,000 acre-feet of water annually and 22.9 million kilowatt-hours of electricity—enough water for more than 250,000 people and enough electricity for more than 2,000 households. Basin Studies are collaborative studies, cost-shared with non-Federal partners, which analyze how climate change may affect water supply, demand and operations in the future and identify adaptation strategies to address imbalances in water supply and demand.

In addition to long-standing USGS efforts in water supply and availability and in energy resource assessments and research, which provide an essential foundation for understanding issues related to the energy-water nexus, the USGS participates in a number of interagency efforts. The USGS has been working with the Energy Information Administration (EIA) since 2010 to improve estimates of water withdrawals¹ and consumptive use associated with cooling water at thermoelectric generating plants across the Nation. Cooling water for such plants is the largest sector of water withdrawals in the United States, at 49%

¹Withdrawals are defined as water removed from the ground or diverted from a surface-water source for use.

of all water withdrawals nationwide, according to USGS Circular 1344, Estimated Use of Water in the United States in 2005. A recent USGS report, Methods for Estimating Water Consumption for Thermoelectric Power Plants in the United States (Scientific Investigations Report 2013–5188), documents the model that the USGS developed with the assistance of the EIA for estimating electric generating plant water withdrawals and consumptive use, which are currently not consistently reported. This ground-breaking model, which incorporates the heat budget of each of the approximately 1,300 thermoelectric generating plants that rely on water for cooling, can be used both to estimate current and historical water use and to forecast future water use with different plant configurations and cooling water technologies.

In addition to the efforts above, the FY 2015 President's Budget requests an additional \$2 million for the USGS to provide water use grants to States that will increase availability and quality of water use data including data related to water used for energy. These grants would provide financial resources, through State water resources agencies, to improve the availability and quality of water use data that they collect and would integrate those data with the USGS Water Census. Funding provided to States through these grants would be targeted at improvements to water use data collection and integration that will be of the greatest benefit to a national assessment of water availability and use. As the energy sector is a primary user of water, increased availability of water use information related to energy will be an important part of this effort.

In mid-April 2014, the USGS released an expanded and updated version of the USGS oil, gas, and geothermal Produced Waters Database and Map Viewer; the revised database contains nearly 100,000 new samples from conventional and unconventional well types, including geothermal. The availability of more samples and more types of analyses will help farmers determine the quality of local produced water available for possible remediation and reuse, will enable local and national resource managers to track the composition of trace elements, and will help industry plan for waste-water injection and recycling.

The Powder River Basin in northern Wyoming and southern Montana has experienced a rapid expansion in the development of coalbed natural gas. About 90 billion liters of water were produced annually in the Wyoming portion of the Basin between 2002 and 2011 as part of the extraction process. The produced waters are moderately saline and have high proportions of sodium relative to calcium and magnesium, thus rendering the waters unsuitable for irrigation without treatment. USGS studies have examined the environmental impacts of different disposal options. Results indicated that infiltration impoundments had the potential to contaminate underlying fresh groundwater supplies, but that with specific treatment the produced waters could be used in subsurface drip irrigation

operations that minimized potential for groundwater contamination and provided beneficial use of the waters to enhance agricultural production in this semiarid region.

Other Departmental programs and activities relate directly to the energy-water nexus, including hydropower development, water treatment and desalination, pumping and water delivery, BLM energy permitting, and USGS research on energy resources and induced seismicity. We are happy to provide the Committee with additional information on these programs as needed.

S. 1971, NEXUS OF ENERGY AND WATER FOR SUSTAINABILITY
ACT OF 2014

Section 3 of S. 1971 requires the Director of the Office of Science and Technology Policy to establish either a Committee or Subcommittee on Energy-Water Nexus for Sustainability under the NSTC, co-chaired by the Secretary of Energy and Secretary of the Interior. The Committee or Subcommittee is directed to: (1) serve as a forum for developing common federal goals and plans on energy-water nexus issues; (2) promote coordination of the related activities of several federal departments and agencies identified in the bill; (3) coordinate and develop capabilities for data collection, categorization, and dissemination of data from and to other federal departments and agencies; and (4) engage in information exchange between federal departments and agencies.

Section 4 of S. 1971 requires the Director of the Office of Management and Budget to submit to Congress a report that includes an interagency budget crosscut that: (1) displays the budget proposed for the upcoming fiscal year, including any interagency or intra-agency transfer, for each of the federal agencies that carry out energy-water nexus projects and (2) identifies all federal and state expenditures since 2011 on energy-water nexus projects. The report to Congress would also provide a detailed accounting of all funds received and obligated by all Federal and State agencies with energy-water implementation responsibilities during the previous fiscal year and list all energy-water nexus projects to be undertaken in the upcoming fiscal year, with the federal portion of funds for those projects.

The Department appreciates the Committee's leadership and the opportunity to strengthen capabilities to address the energy-water nexus. Given the breadth and many facets of this issue, we support close collaboration with the DOE and other Federal agencies. Moving forward, we would like to continue working with the Committee on preliminary concerns regarding the details of the collaborative structure and reporting provisions on issues related to the nexus of energy and water. The Department supports interagency collaboration and information sharing to support sound decision-making, leverage resources, and reduce duplication. But, the Administration believes this can be done through more effective and efficient collaboration

and program management, rather than an unduly and potentially ineffective reporting requirement.

If enacted, it is the Department's view that the committee or subcommittee created under S. 1971 should focus its attention on key vulnerabilities where there is an appropriate federal role and capability to have a positive impact. It is the Department's view that that focus should be on data gaps associated with water use and availability.

Water availability, severe drought, and long-term climate trends have always posed a significant risk to energy development and electric generation. This is one of the broad, systemic risks at the core of the energy-water nexus. Decreased water availability, prolonged drought, and more pronounced climate trends could increase that risk and require the use of accelerated adaptation strategies.

The Department supports the type of coordination and data exchange encouraged under S. 1971 and is already undertaking a number of steps to do so as discussed in the testimony above. Such efforts could help close existing gaps, increasing our understanding of water supply availability to benefit water and energy decision makers.

If enacted, S. 1971 may present challenges to the Department. The Department would need to evaluate whether the commitments and reporting requirements in the bill may require additional resources to carry them out. Additionally, while S. 1971 allows for the coordination of federal activities, the Department would like to stress the importance of providing the scientific community with autonomy to design and execute studies. Finally, States play the key role in allocating and administering water, and they must be a partner in energy-water efforts. S. 1971 does not address the important relationships with states and the private sector, where significant work on energy-water nexus projects is accomplished. Finally, as drafted, it is unclear to the Department what qualifies as an "energy-water nexus project" under S. 1971.

CONCLUSION

In conclusion, the Department shares the Committee's goals to promote coordination between Federal agencies as it relates to the energy-water nexus. We appreciate the leadership of this Committee in engaging Federal agencies. The Department has numerous programs in place that encourage coordination not only within the Federal Government, but as public-private partnerships. The Federal Government has a role in providing leadership and tools to address the challenges of imbalance between supply and demand. Sustainable water supplies and energy use are important parts of a stable economic base, employment continuity, and smart growth.

I would be pleased to answer any questions the Subcommittee may have.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the Committee notes that no changes in existing law are made by the bill, S. 1971, as ordered reported.

