

Calendar No. 428

111TH CONGRESS }
2d Session }

SENATE

{ REPORT
111-206

RENEWABLE ENERGY ENVIRONMENTAL
RESEARCH ACT OF 2009

R E P O R T

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND
TRANSPORTATION

ON

S. 2852



JUNE 14, 2010.—Ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE

89-010

WASHINGTON : 2010

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

JOHN D. ROCKEFELLER IV, West Virginia, *Chairman*

DANIEL K. INOUE, Hawaii	KAY BAILEY HUTCHISON, Texas
JOHN F. KERRY, Massachusetts	OLYMPIA J. SNOWE, Maine
BYRON L. DORGAN, North Dakota	JOHN ENSIGN, Nevada
BARBARA BOXER, California	JIM DEMINT, South Carolina
BILL NELSON, Florida	JOHN THUNE, South Dakota
MARIA CANTWELL, Washington	ROGER F. WICKER, Mississippi
FRANK R. LAUTENBERG, New Jersey	GEORGE S. LEMIEUX, Florida
MARK PRYOR, Arkansas	JOHNNY ISAKSON, Georgia
CLAIRE MCCASKILL, Missouri	DAVID VITTER, Louisiana
AMY KLOBUCHAR, Minnesota	SAM BROWNBACK, Kansas
TOM UDALL, New Mexico	MIKE JOHANNIS, Nebraska
MARK WARNER, Virginia	
MARK BEGICH, Alaska	

ELLEN DONESKI, *Staff Director*

JAMES REID, *Deputy Staff Director*

BRUCE ANDREWS, *General Counsel*

ANN BEGEMAN, *Republican Staff Director*

BRIAN HENDRICKS, *Republican General Counsel*

TODD BERTOSON, *Republican Senior Counsel*

Calendar No. 428

111TH CONGRESS }
2d Session }

SENATE

{ REPORT
{ 111-206

RENEWABLE ENERGY ENVIRONMENTAL RESEARCH ACT OF 2009

JUNE 14, 2010.—Ordered to be printed

Mr. ROCKEFELLER, from the Committee on Commerce, Science, and
Transportation, submitted the following

REPORT

[To accompany S. 2852]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 2852) to establish, within the National Oceanic and Atmospheric Administration, an integrated and comprehensive ocean, coastal, Great Lakes, and atmospheric research, prediction, and environmental information program to support renewable energy, having considered the same, reports favorably thereon without amendment and recommends that the bill do pass.

PURPOSE OF THE BILL

The purpose of S. 2852, the Renewable Energy Environmental Research Act of 2009, is to establish, within the National Oceanic and Atmospheric Administration (NOAA), an integrated and comprehensive ocean, coastal, Great Lakes, and atmospheric research, prediction, and environmental program to support renewable energy.

BACKGROUND AND NEEDS

Renewable energy is the most rapidly growing U.S. energy sector. Wind, solar, biomass, geothermal, and ocean and tidal energy hold promise of becoming a significant portion of the total U.S. energy supply. Most renewable energy sources depend on atmospheric and oceanic information. For example, the development of wind and solar energy farms depends on the spatial and temporal distribution of wind and solar resources and requires accurate wind

and cloud forecasts. Energy generation from ocean resources requires accurate mapping and prediction of waves and currents, while biofuel production depends on seasonal drought and temperature forecasts.

Improved atmospheric and oceanic research, observations, models, forecasts, and analysis tools designed specifically to support renewable energy development would accelerate the integration of renewable energy into our energy system and increase the economic viability of these projects. NOAA is responsible for the development and maintenance of national observation networks and operational weather forecasts to support the needs of industries; however, these networks and forecasts are not optimal for renewable energy and are insufficient to support this growing energy sector.

Electricity produced from wind energy is growing at a fast pace. The Department of Energy projects that as much as 20 percent of the nation's electrical supply could be provided by wind energy by 2030. To support wind energy, improved atmospheric research is necessary to: (1) develop wind-energy test beds to improve the fundamental understanding of mesoscale and local wind flows that are critical to wind-energy operations; (2) improve quantitative forecasts for mesoscale and local flows through better representation of physical processes at wind-turbine heights; (3) create a national reference data base with historical and real-time data, including data at the relevant turbine height; (4) develop and deploy new instruments and observational strategies, along with new data distribution and visualization tools; (5) develop seasonal forecast products that address regional wind energy potential; and (6) improve understanding of the impacts of wind farms on the environment, weather, and climate across a range of spatial and temporal scales.

Solar photovoltaic power and thermal power also depend on atmospheric and climate data. To support solar energy development, improved atmospheric and climate research is necessary, including: (1) acquisition of enhanced solar observations to help evaluate current and future solar resources for spatial and temporal variability; (2) development of solar test beds and observations networks; (3) improved understanding of clouds and cloud forecasts in models; (4) development and validation of surface solar radiation forecast products; (5) assimilation of current aerosol and albedo data into forecast models; (6) development of seasonal forecasts products that address regional solar energy potential; and (7) improved understanding of the impacts of concentrating solar power farms on the environment, weather, and climate across a range of spatial and temporal scales.

Ocean waves, currents, and tides, including the Tidal Loop Current in the Gulf of Mexico, carry immense amounts of energy. Companies in the United States and Europe are at the initial stages of developing devices that may efficiently convert waves, tides, and currents (collectively "ocean energy") into electrical power. The development of ocean power technologies depends upon deployment of substantial demonstration and commercial projects in nearshore areas. To date, very few pilot projects have been put in the water worldwide, and none have been fully tested for extended periods. As a result, there is little data on potential environmental impacts from project deployment, operation, maintenance, or decommissioning.

The development of marine renewables technologies can support our nation's efforts to expand renewable energy use. According to the Electric Power Research Institute, ocean renewable energy in the United States has the potential to supply some 400 terawatt hours of clean power annually, or roughly 10 percent of today's electric demand. The appeal of ocean renewable energy must be tempered by acknowledgment that deployment of devices to capture and convey ocean energy is likely to have impacts on the environment and coastal communities. For example, almost all ocean renewable energy technologies must be anchored to the ocean bottom, potentially impacting sedimentation processes and benthic resources. The nature of their impact and significance, especially from large-scale deployments, are essentially unknown at this point, so there is not enough information to weigh tradeoffs. Unless corrected, such uncertainty will impair the ability of regulatory agencies, states, developers, and other stakeholders to make necessary decisions. Further, developers are being asked to generate baseline data on the condition of various ocean resources. The resulting transaction costs are a barrier to development, and privately funded data collection is less likely to be publicly available to benefit sound management and ocean renewable energy as a whole.

Relevant, reliable public information on baseline marine ecosystem data and the environmental impact of ocean power could help reduce barriers to development as well as provide greater information for ocean management beneficial to States and the Federal government. The Federal government, particularly NOAA, and States could provide effective assistance by funding research on environmental baseline conditions and impact analysis that are likely to be common among the various technologies and projects. A common library of all available data, particularly data about the baseline condition of the ocean resources, would reduce the transaction costs faced by developers.

To address the serious need for improved atmospheric and oceanic research for renewable energy projects, this legislation would require NOAA to develop a plan and establish a comprehensive science program to provide targeted research, data, monitoring, observation and information products and services that support renewable energy and "smart grid" technology.

SUMMARY OF PROVISIONS

S. 2852 would establish a program at NOAA to support basic atmospheric and oceanic research specifically for renewable energy development and authorize funding for this purpose. The legislation would require NOAA to develop a plan to establish a comprehensive science program to support renewable energy development and delineate priorities for targeted research, data, monitoring, observation and other information products and services in support of renewable energy and "smart grid" technology. It would direct NOAA to develop the plan through public hearings and comments to make sure the agency is meeting the needs of the renewable energy industries.

The bill would require NOAA to develop and implement a plan that (1) develops observation systems and models to support renewable energy, (2) assesses marine renewable energy impacts on liv-

ing marine resources, (3) recommends best management practices for industry to avoid adverse effects in the marine and coastal environment, and (4) supports State programs to create special area management plans to promote renewable energy and public outreach. The bill would require Federal agencies to consider NOAA's data when making planning, siting, and permitting decisions for marine renewable energy. NOAA would be directed to create a renewable energy information library and data portal to make information publicly available.

The legislation would authorize \$100 million annually for each of fiscal years 2010 through 2014 and provide that up to 50 percent of funds would be available to educational institutions or states to carry out activities in support the program. Finally, the bill would permit NOAA to accept funds from any party to further the purposes of the legislation.

LEGISLATIVE HISTORY

Senators Begich and Snowe introduced the Renewable Energy Environmental Research Act of 2009 on December 9, 2009. Senators Bill Nelson and Hutchison are cosponsors. The Commerce, Science, and Transportation Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard hearings "The Blue Economy: The Role of the Oceans in our Nation's Economic Future" and "The Future of Ocean Governance: Building Our National Ocean Policy," addressed the need for this legislation. On December 17, 2009, the Committee met in open executive session and ordered S. 2852 reported without amendment.

ESTIMATED COSTS

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

JANUARY 6, 2010.

Hon. JOHN D. ROCKEFELLER IV,
Chairman, Committee on Commerce, Science, and Transportation,
U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for S. 2852, the Renewable Energy Environmental Research Act of 2009.

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.

S. 2852—Renewable Energy Environmental Research Act of 2009

Summary: S. 2852 would authorize the appropriation of \$100 million a year over the 2010–2014 period for a National Oceanic and Atmospheric Administration (NOAA) program to support the development of renewable energy through enhanced research and data distribution. Assuming appropriation of the authorized amounts, CBO estimates that implementing the legislation would

cost \$431 million over the 2010–2014 period and \$69 million after 2014. Enacting the legislation would not affect direct spending or revenues.

S. 2852 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 S. 2852 is shown in the following table. The costs of this legislation fall within budget function 300 (environment and natural resources).

	By fiscal year, in millions of dollars—					
	2010	2011	2012	2013	2014	2010–2014
CHANGES IN SPENDING SUBJECT TO APPROPRIATION						
Authorization Level	100	100	100	100	100	500
Estimated Outlays	49	85	97	100	100	431

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

S. 2852 would authorize the appropriation of \$100 million a year over the 2010–2014 period for a NOAA program to support the development of renewable energy. Of those amounts, up to \$50 million a year would be used to fund grants to states and universities to carry out activities that support the program. The bill also would direct NOAA to develop a research plan for the program and to establish a digital library that would allow the public online access to data and other resources to support renewable energy development. Finally, the bill would require NOAA to submit biennial reports to the Congress describing activities conducted under the program. Assuming appropriation of the authorized amounts, CBO estimates that implementing S. 2852 would cost \$431 million over the 2010–2014 period and \$69 million after 2014.

Intergovernmental and private-sector impact: S. 2852 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.

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported:

NUMBER OF PERSONS COVERED

S. 2852 would authorize NOAA to establish an integrated and comprehensive ocean, coastal, Great Lakes, and atmospheric research, prediction, and environmental information program to support renewable energy. It would not authorize any new regulations

and therefore would not subject any individuals or businesses to new regulations.

ECONOMIC IMPACT

The bill would authorize annual authorizations of \$100 million for each of fiscal years 2010 through 2014 for NOAA and direct that up to 50 percent of funds be available to educational institutions or states to carry out activities in support of the legislation. These funding levels are not expected to have an inflationary impact on the nation's economy.

PRIVACY

The reported bill would not have any adverse impact on the personal privacy of individuals.

PAPERWORK

S. 2852 would not increase paperwork requirements for the private sector.

CONGRESSIONALLY DIRECTED SPENDING

In compliance with paragraph 4(b) of rule XLIV of the Standing Rules of the Senate, the Committee provides that no provisions contained in the bill, as reported, meet the definition of congressionally directed spending items under the rule.

SECTION-BY-SECTION ANALYSIS

Section 1. Short Title.

This section would provide that the legislation may be cited as the Renewable Energy Environmental Research Act of 2009.

Section 2. Purpose.

This section would state that the purpose of the Act is to establish an integrated and comprehensive ocean, coastal, Great Lakes, and atmospheric research, prediction, and environmental information program to support renewable energy.

Section 3. Renewable Energy Research Plan.

This section would require the Administrator of NOAA to develop a plan based on comments and input from public hearings, and to conduct a review of scientific and industry information in support of renewable energy development. The plan would: (1) define requirements for a comprehensive science program; (2) identify and describe current data, programs, products, and services within NOAA relevant to renewable energy development; (3) provide research, data, monitoring, observation, and products to support renewable energy and smart grid technology; and (4) provide research data, monitoring, and other information, products, and services to inform renewable energy decisions concerning coastal and marine habitats and living marine resources. The Committee does not intend the creation of the plan or program to be established under section 4 to delay renewable energy projects currently under development.

In developing the research plan, the Committee expects the Administrator to seek public comments from Federal and State agencies, tribes, local governments, representatives of the private sector, and other parties interested in renewable energy observations, data, and use in order to improve NOAA's research products and services to more effectively support renewable energy development. The Committee intends the plan to guide development of the program to be established under section 4 and ensure that NOAA's climate, atmospheric, and marine research is developed in a coordinated manner and is beneficial and available to all Federal agencies and other entities engaged in efforts to consider ocean, coastal, or Great Lake sites for renewable energy development.

Section 4. Establishment of Research, Prediction, and Environmental Information Program.

This section would establish within NOAA an integrated and comprehensive ocean, coastal, Great Lakes and atmosphere research and operation program to support renewable energy development. The program would include: (1) coordinated climate, weather, and water research, monitoring, and observation to support renewable energy development and mitigate the impact of marine renewable energy development on marine ecosystems; (2) sustained operational weather, water, and climate products from research, observations and prediction outputs; (3) means of identifying biological and ecological effect of marine renewable energy development on living marine resources, the marine and coastal environment, marine dependent industries, and coastal communities; (4) strategies to address potential impacts of marine renewable energy; (5) information to characterize and minimize environmental impacts of marine renewable energy on living marine resources and the marine environment through robust baseline ecological characterization and data collection, adaptive management, and establishment of protocols for minimizing the environmental impacts of testing, developing, and deploying marine renewable energy devices, and recommendations for best management practices for industry; (6) support for States to develop marine special management plans to support renewable energy development and comprehensive digital mapping, modeling, and other geospatial information and services to support planning for renewable energy; and (7) provisions for public outreach.

This section would direct the program to collect, synthesize, and distribute data in a manner that can be used by marine resource managers, Federal and State agencies, and tribes responsible for making decisions about marine renewable energy projects. Also, this section would direct the Administrator to seek opportunities to facilitate and expand cooperation with private sector entities to develop and expand information services that serve the renewable energy industry.

With respect to the development of renewable energy on the Outer Continental Shelf, except for Ocean Thermal Energy Conversion, the Committee recognizes that the Department of the Interior has responsibility for granting leases, easements, or rights-of-way for energy and related purposes as specified under section 388 of Public Law 109-58. This legislation is not intended to revise or affect the current authority or responsibilities of any other Federal

agency. The Committee intends that the areas of research within NOAA's authority would be developed in a coordinated and comprehensive manner to support renewable energy development and would be available to all Federal agencies, States, Tribes, the private sector, and other entities engaged in efforts to consider ocean, coastal or Great Lakes sites for renewable energy development. The Committee expects the Administrator to consult and coordinate with these entities to ensure that the plan and research program support the needs of the renewable energy sector. Further, the Committee intends other Federal agencies and marine resource managers to use the biological and ecological data, information, and strategies developed by this program when making planning, siting, and permitting decisions for marine renewable energy.

Section 5. Biennial Reports.

This section would require NOAA to provide a report to the Senate Committee on Commerce, Science, and Transportation, the House of Representatives Committee on Natural Resources, and the House of Representatives Committee on Science and Technology that describes the activities carried out under the Act, recommendations for priority activities under the Act, and recommended funding levels for activities.

Section 6. Library.

This section would require NOAA to establish a renewable energy information library and data portal within one year after the date of enactment.

Section 7. Federal Coordination.

This section would require NOAA to coordinate activities with other Federal agencies.

Section 8. Agreements.

This section would allow the Administrator of NOAA to enter into agreements to carry out purposes of the Act.

Section 9. Authority to Receive Funds.

This section would allow the Administrator to accept, retain, and use funds from any party pursuant to an agreement for activities furthering the purposes of the Act.

Section 10. Use of Ocean Observing Offshore Infrastructure.

This section would allow the Administrator to execute a memorandum of understanding to use offshore platforms and infrastructure for meteorological and oceanographic observation sensors. NOAA would manage information collected by such sensors.

Section 11. Definitions.

This section would define the terms Administrator, Marine Renewable Energy, and NOAA.

Section 12. Authorization of Appropriations.

This section would authorize \$100 million for each of fiscal years 2010 through 2014 and direct NOAA to make up to 50 percent of

the funding available to educational institutions and States with approved coastal zone management plans.

Section 13. Savings Provision

This section would state that nothing in this Act shall be construed to supersede or modify the authorities or jurisdiction of any Federal or State agency in effect on the date of enactment of this Act.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the Committee states that the bill as reported would make no change to existing law.

