

## Calendar No. 313

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SENATE

{ REPORT  
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### 10 MILLION SOLAR ROOFS ACT

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FEBRUARY 7, 2012.—Ordered to be printed  
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Mr. BINGAMAN, from the Committee on Energy and Natural Resources, submitted the following

### R E P O R T

[To accompany S. 1108]

The Committee on Energy and Natural Resources, to which was referred the bill (S. 1108) to provide local communities with tools to make solar permitting more efficient, 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:

1. On page 10, lines 5 through 7, strike “section 641(p)(3) of the Energy Independence and Security Act of 2007 (42 U.S.C. 17231(p)(3))” and insert “section 399A(i)(1) of the Energy Policy and Conservation Act (42 U.S.C. 6371h-1(i)(1))”.

#### PURPOSE

The purpose of the S. 1108 is to make solar permitting more efficient, with the goal of installing 10 million distributed solar energy systems by December 31, 2020, by providing grants to local governments that adopt best practices for solar permitting.

#### BACKGROUND AND NEED

Despite the various state and federal financial incentives available to homeowners, such as the 30 percent federal tax credit in place through 2016, financing the cost of a residential photovoltaic (PV) and solar hot water heating systems remains challenging. Like other renewable energy technologies, the cost structure of solar energy systems is front-loaded with a high initial investment, followed by modest maintenance expenses, and zero fuel costs. While the tax credit provides a significant consumer incentive by

reducing the overall system price, it does not fully address the key barrier to adoption—high upfront capital cost.

Installation and permitting costs may account for up to forty percent of the total upfront capital cost of rooftop PV systems. Reducing these non-hardware costs by standardizing and streamlining local permitting processes, updating local planning and zoning codes, and improving standards for connecting rooftop solar systems to the electric grid may dramatically reduce the installed cost of rooftop solar systems.

The Department of Energy has established an ambitious program, known as the SunShot Initiative, to reduce the total cost of solar energy systems by 75 percent. This reduction would make PV systems cost competitive with other forms of energy without subsidies by the end of the decade. In addition to supporting solar research and technology development, the SunShot Initiative seeks to reduce installation and permitting costs by encouraging local governments to standardize and streamline their permitting process. S. 1108 provides a stationary basis and direction for the Department's efforts by directing the Secretary to establish a grant program to encourage local governments to adopt best practices for solar permitting.

#### LEGISLATIVE HISTORY

S. 1108 was introduced by Senator Sanders on May, 26, 2011 and is cosponsored by Senators Boozman, Bingaman, Coons, Shaheen, Whitehouse, Lautenberg, and Feinstein. The Committee on Energy and Natural Resources held a legislative hearing on S. 1108 on July 12, 2011. The Committee held a business meeting on December 15, 2011 and ordered S. 1108 to be favorably reported with an amendment.

#### COMMITTEE RECOMMENDATION AND TABULATION OF VOTES

The Committee on Energy and Natural Resources, in open business session on December 15, 2011, by majority vote of a quorum present, recommends that the Senate pass S. 1108, if amended as described herein.

The rollcall vote on reporting the measure was 13 yeas, 8 nays, as follows:

Yeas	Nays
Mr. Bingaman	Mr. Manchin
Mr. Wyden*	Mr. Barrasso*
Mr. Johnson	Mr. Risch*
Ms. Landrieu*	Mr. Lee*
Ms. Cantwell	Mr. Paul*
Mr. Sanders	Mr. Coats
Mrs. Stabenow	Mr. Hoeven*
Mr. Udall	Mr. Corker*
Mrs. Shaheen	
Mr. Franken	
Mr. Coons	
Ms. Murkowski	
Mr. Portman*	

\*Indicates vote by proxy.

## COMMITTEE AMENDMENT

During its consideration of S. 1108, the Committee adopted an amendment under section 399A(i)(1) of the Energy Policy and Conservation Act (42 U.S.C. 6371h1(i)(1)) as the source of funds for the offset. The amendment substitutes the authorization of appropriations for energy sustainability and efficiency grants to subsection 3(i), which offsets such funds as may be appropriated to carry out S. 1108 by reducing amounts authorized to be appropriated under section 641(p)(3) of the Energy Independence and Security Act of 2007 (42 U.S.C. 17231(p)(3)).

## SECTION-BY-SECTION ANALYSIS

*Section 1.* Sets forth the short title.

*Section 2* defines key terms used in the bill.

*Section 3(a)* directs the Secretary to establish a program to provide competitive grants, challenge grants, or both, to local governments or consortia of local governments that have adopted or offer a commitment to adopt best practices for solar permitting for properties located in the United States.

Subsection (b) directs the implementation of the program described in subsection (a). Paragraph (1) requires the Secretary to provide voluntary certification and recognition for local governments that have adopted best practices for solar permitting. Paragraph (2) requires the Secretary to design criteria for awarding competitive grants, challenge grants, or both, that would promote greater standardization, efficiency, and uniformity for solar energy permitting across jurisdictions and would require that grants are awarded: only to local governments or consortia of local governments that have adopted or offer a commitment to adopt best practices for solar permitting and have provided quantitative metrics to measure success; to a diversity of geographic locations and population sizes; and with preference for grant recipients that have partnered with States, public utility commissions, or other stakeholders to adopt or enhance standards and policies to overcome barriers to distributed generation. Paragraph (3) authorizes competitive grant funds to be used for: training or development of materials, tools, or information to make the local permitting process for solar energy systems more standardized, efficient and less expensive; solar energy system deployment projects or programs to pilot new permitting strategies or processes; and other programs or projects to achieve the training, development, and deployment objectives, determined by the Secretary. Paragraph (4) authorizes challenge grants funds to be used for solar energy system deployment projects and programs to pilot new permitting strategies or processes.

Subsection (c) authorizes the Secretary to rescind grant funds from any recipient that is unable to implement the steps necessary to adopt the best practices for solar permitting.

Subsection (d) establishes a non-federal cost match not to exceed fifty percent for grant recipients.

Subsection (e) authorizes the Department of Energy to use up to 5 percent of the funds made available for each fiscal year for administrative expenses. Grant recipients are permitted to use funds up to 5 percent for administrative expenses.

Subsection (f) directs the Department of Energy to consult with the Department of Treasury and grant recipients to ensure that each program carried out by the grant recipient under section 3 is coordinated with other applicable incentive or financing programs of the Federal Government or any other applicable program.

Subsection (g) establishes the national goals of installing distributed solar energy systems on not less than 10,000,000 properties located in the United States and to achieve cost reductions in the price of solar energy that are consistent with the SunShot Initiative of the Department of Energy by December 31, 2020.

Subsection (h) requires submission of reports. Paragraph (1) requires that 270 days after enactment of this Act, the Department of Energy issue a report to Congress detailing recommendations necessary through this and other programs to meet the goals established in subsection (g). Paragraph (2) requires that not later than 2 years after the date on which funds are first made available, the secretary shall submit to Congress a report that contains a description of the progress of grant recipients in implementing and maintaining best practices for solar permitting.

Subsection (i), as proposed to be amended by the committee amendment, offsets funds appropriated to carry out section 3 by reducing amounts authorized to be appropriated for energy sustainability grants under section 399A(i)(1) for the Energy Policy and Conservation Act (42 U.S.C. 6371h–1(i)(1)). Section 399A(i)(1) authorizes appropriation of \$250 million for fiscal year 2013. Subsection (i) authorizes such sums as may be appropriated to carry out section 3, up to \$50 million for each of fiscal years 2012 through 2016, to be offset by reducing amounts authorized to be appropriated under section 399A(i)(1) by up to \$250 million in fiscal year 2013.

#### COST AND BUDGETARY CONSIDERATIONS

The following estimate of costs of this measure has been provided by the Congressional Budget Office.

##### *S. 1108—10 Million Solar Roofs Act of 2011*

Summary: S. 1108 would direct the Secretary of Energy to establish a grant program to support efforts by state and local governments to develop best practices to use in permitting certain solar energy projects. Assuming appropriation of the authorized amounts, CBO estimates that implementing S. 1108 would cost \$109 million over the 2012–2017 period. Pay-as-you-go procedures do not apply to this legislation because it would not affect direct spending or revenues.

S. 1108 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA).

Estimated cost to the Federal Government: The estimated budgetary impact of S. 1108 is shown in the following table. The costs of this legislation fall within budget function 270 (energy).

	By fiscal year, in millions of dollars—						2012–2017
	2012	2013	2014	2015	2016	2017	
CHANGES IN SPENDING SUBJECT TO APPROPRIATION							
Authorization Level .....	0	0	50	50	50	0	150

	By fiscal year, in millions of dollars—						
	2012	2013	2014	2015	2016	2017	2012–2017
Estimated Outlays .....	0	0	14	26	37	32	109

Basis of estimate: S. 1108 would authorize the appropriation of \$50 million annually over the 2012–2016 period for the Secretary of Energy to make grants to state and local governments to support efforts to standardize and improve the efficiency of local permitting processes for solar energy projects with less than one megawatt of capacity. The bill would specify terms and conditions for the use of such grants and require the Secretary of Energy to report to the Congress on the program’s impact.

To carry out those activities, S. 1108 would authorize the Secretary to use funds already authorized to be appropriated under section 399A of the Energy Policy and Conservation Act. That provision authorizes appropriations totaling \$250 million in each of fiscal years 2012 and 2013 for grants and loans to local governments and other public institutions for a variety of energy-related activities; no funds are authorized for those purposes in later years. Thus, relative to current law, S. 1108 would authorize no net increase in funding in 2012 and 2013 but would effectively authorize the appropriation of \$50 million in each of fiscal years 2014 through 2016. Assuming appropriation of those amounts, CBO estimates that resulting spending would total \$109 million through 2017, with \$41 million in additional spending occurring in later years.

Pay-As-You-Go Considerations: None.

Intergovernmental and private-sector impact: S. 1108 contains no intergovernmental or private-sector mandates as defined in UMRA. Local governments would benefit from grants authorized in the bill. Any costs to those governments would be incurred voluntarily as conditions of federal assistance.

Estimate prepared by: Federal Costs: Megan Carroll; 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 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. 1108.

The bill is not a regulatory measure in the sense of imposing Government established standards or significant 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.

Applying for grants authorized by S. 1108 may impose some additional paperwork on the local governments and consortia of local governments applying for the grants, and will require grant recipients to submit implementation plans and certify how the funds will be used. The Committee does not expect these additional paperwork burdens to be substantial in either time or financial cost.

## CONGRESSIONALLY DIRECTED SPENDING

S. 1108, as ordered reported, does not contain any congressionally directed spending items, limited tax benefits, or limited tariff benefits as defined in rule XLIV of the Standing Rules of the Senate.

## EXECUTIVE COMMUNICATIONS

The views of the Administration on S. 1108 are included in the testimony from the Department of Energy received by the Committee at its July 12, 2011, hearing, which is set forth below:

STATEMENT OF STEVEN G. CHALK, DEPUTY ASSISTANT SECRETARY FOR RENEWABLE ENERGY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY

Chairman Bingaman, Ranking Member Murkowski and Members of the Committee, thank you for the opportunity to discuss the Department of Energy's (DOE's) solar and geothermal energy programs. Today, I am pleased to discuss the Department's perspective and answer questions related to the Department of Energy Administrative Improvement Act (S. 1160), the 10 Million Solar Roofs Act of 2011 (S. 1108) and the Geothermal Exploration and Technology Act of 2011 (S. 1142). However, the Administration is still reviewing these bills and we do not have a position on any of them at this time.

## SOLAR TECHNOLOGY

We thank the committee and the sponsors of this legislation for your strong leadership on solar technologies over the years. The Department has set an ambitious goal for solar energy with the SunShot Initiative (SunShot)—to reduce the total costs of solar energy systems by about 75 percent so that they are cost competitive with other forms of energy without subsidies before the end of the decade. In 2012, under SunShot, the Department will support solar research across the development pipeline, from basic photovoltaic (PV) cell technologies to manufacturing scale-up to total system development.

Reducing the total installed cost for utility-scale solar electricity to roughly 6 cents per kilowatt hour without subsidies will result in rapid, large-scale adoption of solar electricity across the United States. Reaching this goal will help re-establish American technological leadership, improve the nation's energy security, and strengthen U.S. economic competitiveness in the global clean energy race.

SunShot takes a unique approach to developing solar energy. Historically, solar investments focused on achieving incremental efficiency improvements to solar cells and arrays. SunShot focuses on reducing the installed cost of the system as a whole, including non-technical barriers. In addition to investing in improvements in cell technologies and manufacturing, the SunShot Initiative also focuses on steps to reduce installation and permitting costs, which ac-

count for 40 percent of the total installed system price of solar electricity.<sup>1</sup> This includes efforts to streamline and digitize local permitting processes and to develop codes and standards that ensure high performance over the approximately 20-year lifetime of residential solar products. Decreasing the installed cost of solar is one of the key goals of SunShot.

As the United States is the world's largest consumer of electricity and, at the same time, has the largest solar resource of any industrialized country, SunShot is well-positioned to help the Nation realize the significant benefits from the wide-scale use of solar energy. SunShot underscores solar energy's benefits to the United States and will have multiple positive impacts for the country, including:

- Achieving solar energy cost parity with baseload energy rates. Attaining a total installed system cost of utility solar equivalent to the wholesale cost of electricity from fossil fuels (\$0.06 per kWh) would likely result in rapid and large-scale adoption of solar electricity across the United States.

- Increasing solar photovoltaic market share. As recently as 1995, the United States manufactured 43 percent of the world's PV materials, whereas today our manufacturers are only responsible for 6 percent.<sup>2</sup> Expanding the use of solar will help boost the U.S. solar manufacturing industry while driving innovation and providing long lasting, domestic jobs to support global PV demand that will represent a multibillion dollar industry.

- Reducing greenhouse gas emissions—Solar technologies have the potential to significantly reduce the amount of conventional fossil-based electricity generation necessary, which in turn would reduce the amount of greenhouse gases emitted into the atmosphere.

Recently, as part of ongoing Market Transformation activities, DOE announced a Funding Opportunity Announcement (FOA) which we are calling the “Race to the Rooftop” to help standardize, streamline and digitize the permitting process, while improving interconnection and net metering standards, increasing access to financing, and updating planning and zoning codes. This national competition engaging teams of local and state governments along with utilities, installers, and nongovernment organizations, will help standardize processes, cut upfront fees and paperwork, and reduce the overall costs associated with permitting and installation, making it easier and cheaper for homeowners, businesses, and their local communities to deploy solar energy. The standardization and uniformity of local permitting efforts under the “Race to the Rooftop” are similar to the challenge grant provision in the 10 Million Solar Roofs Act, which calls for applicants to develop best practices for solar permitting.

<sup>1</sup> [http://www1.eere.energy.gov/solar/sunshot/pdfs/dpw\\_white\\_paper.pdf](http://www1.eere.energy.gov/solar/sunshot/pdfs/dpw_white_paper.pdf)

<sup>2</sup> PV News (2/1993, 3/2001, 3/2006) and Navigant Consulting (2/2011).

The proposed legislation, S. 1108, employs a bottom-up approach so that local teams can identify approaches best-suited for them. A bottom-up approach, coupled with a preference for applicants that have partnered with states, public utility commissions, or other stakeholders, could allow for local and regional variability while still increasing the speed and scale of installation across large geographic areas. This approach could also allow states to expand existing state programs that have been effective in promoting rooftop solar installations.

#### GEOHERMAL TECHNOLOGY

The Department is committed to developing and deploying a portfolio of innovative technologies for clean, domestic geothermal power generation. Geothermal energy is a baseload energy resource with a small environmental footprint and emits little to no greenhouse gases.

Despite geothermal's enormous potential, in 2010, only 15 MW of new geothermal power generation was added to the grid in the United States. There are two principal barriers facing the geothermal industry: the high cost and risk of exploration and most of the identified hydrothermal resources have already been developed.

Drilling costs represent approximately 42 percent of geothermal project development costs, and financing costs are significantly higher for exploratory drilling than for plant construction.<sup>3</sup> Removing the obstacles to exploratory drilling is vitally important to increasing our geothermal power generation capacity. In many cases, geothermal resources have no surface expression, leaving our nation's hydrothermal potential—estimated at 30 GWe by the U.S. Geological Survey—untapped and inaccessible. Exploratory drilling could also identify resources for enhanced geothermal systems (EGS), which have the potential to produce 16,000 GWe of power in a wide range of geographic areas throughout the U.S.<sup>4</sup>

Under the American Recovery and Reinvestment Act of 2009 (Recovery Act), DOE invested \$97.3 million in 24 hydrothermal exploration projects, at which 34 exploration wells are planned. It is expected that from these wells, 400 MW of new resources will be confirmed by 2014.

DOE is also funding seven EGS demonstrations. At Desert Peak, Nevada, the initial stages of reservoir stimulation were successfully completed—a critical milestone in creating an enhanced geothermal reservoir.

DOE supports projects in low temperature geothermal resources as well. For example, DOE is working with industry to develop and field test a variable phase turbine which has the potential to generate 30 percent more power from low temperature geothermal resources than current power conversion technologies, at a lower cost.

<sup>3</sup>[http://www.nrel.gov/applying\\_technologies/pdfs/46022.pdf](http://www.nrel.gov/applying_technologies/pdfs/46022.pdf).

<sup>4</sup>Augustine, Young, and Anderson, *Updated U.S. Geothermal Supply Curve*, National Renewable Energy Laboratory and US Department of Energy, February, 2010, <http://www.nrel.gov/docs/fyl0osti/47458.pdf>.



DOE's National Geothermal Data System (NGDS) effort is a distributed information system for data sharing in its second year of development, which will enable the availability of comprehensive and accurate data to facilitate geothermal development. The NGDS is scheduled to be fully operational in August 2014, at which time it will make geothermal data from major geothermal centers, DOE-funded geothermal projects and state geological surveys or universities publicly available.<sup>5</sup>

Geothermal heat pumps (GHPs) for building applications also face barriers impeding greater marketplace adoption: high initial cost associated with the installation of the ground loop heat-exchanger, lack of consumer knowledge in GHP benefits, and limitations in GHP design and business planning infrastructure. DOE is developing a roadmap that will serve to strategically direct activities in geothermal heat pumps.

Through the Recovery Act, DOE currently funds 26 projects deploying geothermal heat pumps. \$24M of the \$58M Recovery Act funds allocated to GHPs have been spent in 15 states in both new and retrofit applications. Two projects are completed and several more are already providing data for performance analysis. The Recovery Act projects incorporate innovative business and financial strategies and/or GHP technologies and applications designed to overcome the initial cost premium that has prevented GHPs from being directly cost-competitive with other HVAC technologies, and from gaining wider marketplace acceptance.

DOE currently has projects in many of the areas identified for further RD&D and commercial application in S. 1142, including district heating and cooling at large institutions, use of hot water in shaft mines, combined GHP-solar PV and desiccant projects, and use of carbon dioxide as a refrigerant fluid for heat exchange.

The Department is also addressing other obstacles to geothermal development such as delays in the siting and permitting process which increase overall project costs and could further strain economics. Currently, it takes approximately seven years for a new geothermal project to move from exploration to power generation.

While the Administration is still reviewing the bill, there are serious technical concerns that would need to be addressed. Any new program should be consistent with applicable laws, and structured to mitigate risks and costs to the taxpayer.

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<sup>5</sup> NGDS data sources include: DOE Geothermal Data Repository (Boise State University); Energy & Geoscience Institute (University of Utah); Geo-Heat Center (Oregon Institute of Technology); Stanford Geothermal Program (Stanford University); Great Basin Science Sample and Records Library (University of Nevada, Reno); SMU Geothermal Laboratory (Southern Methodist University); and state geological surveys represented by Arizona Geological Survey and the American Association of State Geologists (AASG).

S. 1160—DEPARTMENT OF ENERGY ADMINISTRATIVE  
IMPROVEMENT ACT

S. 1160 proposes a variety of changes intended to improve the administration of the Department of Energy. The Department is still reviewing this bill and does not have a position on it at this time. However, I will address Sections 4, 6, and 7 as they relate to the Department's current authority.

*Section 4*

Section 4 of S. 1160 concerns the administration of the Department's "Other Transactions" (OT) Authority. Section 4 is similar in many respects to DOE's current OT Authority, which is codified at Section 646(g) of the DOE Organization Act (42 U.S.C. 7256(g)). However, there are some important differences.

Currently, the Department has two kinds of OT Authority: Research OT Authority and Prototype OT Authority. Research OT Authority is used to carry out a public purpose of support or stimulation (e.g., RD&D projects). By contrast, Prototype OT Authority is used for the pre-acquisition development of technology prototypes. Such prototypes are used to evaluate the technical or manufacturing feasibility or utility to DOE's mission of a particular technology, process, concept, end item, or system.

Section 4 provides DOE with permanent and independent OT Authority similar to the authority Congress provided the Defense Department in 1991. However, the precise scope of DOE's OT Authority is left undefined in S. 1160.

Additionally, Section 4 of S. 1160 requires the Secretary to determine that "the use of a standard contract, grant, or cooperative agreement for the project is not feasible or appropriate" before the Department's OT Authority can be used. Section 4 restricts the delegation of this authority to officials "appointed by the President and confirmed by the Senate."

*Section 6 and 7*

Section 6 of S. 1160 provides the Secretary with direct hire authority for "highly qualified scientists, engineers, or critical technical personnel" for two years following the enactment of the Act. Similarly, Section 7 provides the Secretary with special hiring and pay authority for persons with "expertise in an extremely high level in a scientific or technical field." The Secretary's authority under Section 7 is permanent, but not more than 40 persons may be hired under this authority at any time.

Sections 6 and 7 are analogous to Sections 621(b) and (d) of the DOE Organization Act (42 U.S.C. § 7231(b)-(d)). Section 621(b), which expired after four years, allowed the Secretary to appoint 311 scientific, engineering, and administrative personnel without regard to civil service laws and to fix their compensation at "super grades" (formerly

GS-18, now Executive Level IV). Section 621(d), which is still in effect, authorizes the Secretary to appoint 200 scientific, engineering, professional, and administrative staff without regard to civil service laws, but subject to a GS-18 pay cap (now Executive Level IV).

Additionally, Congress granted the Department's ARPA-E program special hiring authority. The Director of ARPA-E has the authority to make appointments of scientific, engineering, and professional personnel "without regard to the civil service laws," "fix the basic pay of such personnel" up to Level II of the Executive Schedule, and provide "additional payments" up to a certain cap.

#### CONCLUSION

In conclusion, I would like to again thank this Committee for its leadership in supporting both solar and geothermal energy technologies.

It is important to tap valuable assets like solar and geothermal energy to continue growing our economy to expand the Nation's clean energy portfolio and energy security.

I would be pleased to address any questions the Committee might 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 S. 1108, as ordered reported.

