



Solar Energy Industries Association Improvements to the American Clean Energy and Security Act

RPS Improvements

Goal

- Pass a national Renewable Portfolio Standard that is designed to encourage the growth of all forms of renewable energy, including all solar applications (utility-scale, distributed and solar hot water).

Asks

- 20% of the total RPS must be DG (wholesale and retail, non-specific to technology).
- Include solar thermal technology using the equivalency matrix developed and accepted in the EUⁱ.
- An additional policy lever is needed to ensure that the renewable energy potential in the southwestern U.S. can be harnessed to help meet RPS goals. Without such an incentive, utility-scale solar and other resources such as geothermal will not deploy to help our nation face the critical clean energy challenges ahead.
- No size distinction for DG, only distinguished by use of FERC jurisdictional interconnection limits.
- Limit wholesale DG to 10-20% of the total DG program.
- DG carve out should apply to state/regional percentage as well as to entire RPS.
- National net metering and a consistent, single, national interconnection standard (use IREC best practices model) must be a condition of REC trading.

REC Improvements

Asks

- Integrate existing REC tracking systems to reduce duplication and confusion, per REMA recommendations.
- Ownership of RECs:
 - Solar owners who financed with city-based loan programs still retain the REC.
 - For states that have no existing RPS, REC is owned by the solar system owner.
- All RECs should be fully tradable separate from electricity, no matter when placed in service.
- Mechanism to trade small quantities of RECs should be included:
 - Up-front payments for smaller PV systems using AZ model for states that lack existing incentive programs in trade for RECs.
 - The RPS should ensure that private aggregators may bundle and trade RECs from system owners who do not wish to sell to a utility.
- Penalties for non-compliance or ACP: inflation-adjusted fixed ACP that mirrors the contract term. The national ACP should be no lower than the median ACP of all RPS programs at the time of the bill's enactment, and no lower than any state's existing ACP. If the national RPS

- program's ACP is set at a regional level, all states in the region should set an identical ACP that is no lower than the highest existing ACP in the region.
- Duration /length of term of REC purchases:
 - 20 years is ideal
 - no less than 10
 - If nuclear becomes eligible in the RPS, require a time-value mechanism that rewards first-to-construct (not first-to-contract) generation.

Climate Improvements

Goal

- Climate title that optimizes deployment of all forms of solar technology by modifying existing bill programs and elements and adding additional provisions.

Asks

- **Allowances**
 - For energy generated from existing solar projects, the generator should receive 1 allowance for every 2 MW-hrs (electricity and solar thermal equivalent) generation.
 - For energy generated from new solar projects, the generator should receive 1 allowance for every 1 MW-hrs (electricity and solar thermal equivalent) generation.
 - The allowance allocation must apply to all scales of solar generation (DG to large-scale).
 - Solar thermal (i.e., solar water heating) must be credited, in a kw-hr thermal equivalent.
- **Auction Revenues**
 - Five percent (5%) of the allowance auction proceeds should go into a "Solar Technology Deployment Fund." Examples of how the fund could be used include: a South Western solar transmission project; rebates for solar thermal space heating and cooling; incentives for domestic manufacturing, or performance-based incentives, etc.
- **Market Barriers**
 - Any allowance value and/or auction proceeds that would flow to the states or utilities would be contingent upon the adoption of renewable energy best practices. Including:
 - Retail Net Metering (see text below)
 - Adoption of Interconnection standards (see text below)
 - Prohibition on restrictive covenants that hinder the use of renewable energy, such as solar collectors and panels (see text below)
 - Restrictions on permitting fees (see text below)

- **Preservation of State Programs**

- Any federal legislation incentivizing the deployment of solar energy should leave in place and not preempt any more robust state incentive programs

Transmission Improvements

Goal

Develop Green Power Superhighways. The structural barriers to transmission development that exist today must be overcome. Legislation is needed to provide new mandates, adequate resources, and specific timelines for action for federal agencies, such as the Federal Energy Regulatory Commission, the Department of Energy, and federal lands agencies.

The core elements of the Green Power Superhighways plan are:

- Interconnection-wide transmission planning;
- Interconnection-wide transmission cost allocation and certainty of cost recovery; and
- Streamlined siting processes.

This structure would apply only to new extra high voltage transmission lines and the renewable energy feeder lines that connect generators to the transmission grid.

Asks

Interconnection-Wide Transmission Planning

- Each interconnection should develop a comprehensive plan to identify where new transmission lines (or increased capacity on existing lines) are necessary to connect renewable energy resources to the grid.
- The plans should include both extra-high voltage transmission lines and the lower voltage feeder lines that are necessary to facilitate the development of Green Power Superhighways.
- Congress should provide FERC with adequate authority to establish a process for developing and approving these plans.

Interconnection-Wide Transmission Cost Allocation

- Ratemaking and cost recovery certainty should be provided to address the question of who should pay. Since all users benefit from a robust transmission grid and new supplies of carbon-free renewable power, regulatory policies must reflect that.
- Facilities identified in the interconnection-wide plan as necessary for the development of Green Power Superhighways should be eligible for broad, regional cost allocation. Specifically, FERC should allocate, based on electricity usage, the capital and operating costs of these transmission lines across all load-serving entities on an interconnection-wide basis.

Streamlined Siting Processes

- Substantial reform of the transmission siting process is required. The most effective model for siting is the full siting authority that is given to FERC over interstate natural gas pipelines.
- For Green Power Superhighways, the extra-high-voltage facilities defined in the regional plans would be subject to FERC approval and permitting. Separate siting approval at the state level would not be required.
- FERC would act as the lead agency for purposes of coordinating all applicable federal authorizations and environmental reviews with other affected agencies. As is the case for natural gas pipeline and hydroelectric facility permitting, FERC would be required to consider siting constraints based on habitat protection, environmental considerations, and cultural site protections identified by state agencies.

Bill text referenced above:

110th CONGRESS
1st Session, 110th Congress
H. R. 2848 (Mr. CARDOZA)

(Note: Identical language appears in Inslee net metering and interconnection legislation from last congress)

A BILL

To amend the Public Utility Regulatory Policies Act of 1978 to promote energy independence and self-sufficiency by providing for the use of net metering by certain small electric energy generation systems, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the 'Solar Opportunity and Local Access Rights Act'.

SEC. 2. NET METERING AND INTERCONNECTION STANDARDS.

(a) In General- Section 113 of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 2623) is amended by adding at the end the following:

`(d) Net Metering-

`(1) DEFINITIONS- In this subsection and subsection (e):

`(A) CUSTOMER-GENERATOR- The term 'customer-generator' means the owner or operator of a qualified generation unit.

`(B) ELECTRIC GENERATION UNIT- The term `electric generation unit' means--

`(i) a qualified generation unit; and

`(ii) any electric generation unit that qualifies for net metering under a net metering tariff or rule approved by a State.

`(C) LOCAL DISTRIBUTION SYSTEM- The term `local distribution system' means any system for the distribution of electric energy to the ultimate consumer of the electricity, whether or not the owner or operator of the system is a retail electric supplier.

`(D) NET METERING- The term `net metering' means the process of--

`(i) measuring the difference between the electricity supplied to a customer-generator and the electricity generated by the customer-generator that is delivered to a local distribution system at the same point of interconnection during an applicable billing period; and

`(ii) providing an energy credit to the customer-generator in the form of a kilowatt-hour credit for each kilowatt-hour of energy produced by the customer-generator from a qualified generation unit.

`(E) QUALIFIED GENERATION UNIT- The term `qualified generation unit' means an electric energy generation unit that uses as the energy source of the unit solar energy to generate electricity to heat or cool.

`(i) has a generating capacity of not more than 5,000 kilowatts;

`(ii) is located on premises that are owned, operated, leased, or otherwise controlled by the customer-generator;

`(iii) operates in parallel with the retail electric supplier; and

`(iv) is intended primarily to offset all or part of the requirements of the customer-generator for electric energy.

`(F) RETAIL ELECTRIC SUPPLIER- The term `retail electric supplier' means any electric utility that sells electric energy to the ultimate consumer of the energy.

`(2) ADOPTION- Not later than 1 year after the date of enactment of this subsection, each State regulatory authority (with respect to each electric utility for which the State

regulatory authority has ratemaking authority), and each nonregulated electric utility, shall--

` (A) provide public notice and conduct a hearing with respect to the standards established under paragraph (3); and

` (B) on the basis of the hearing, adopt the standard.

` (3) ESTABLISHMENT OF NET METERING STANDARD-

` (A) IN GENERAL- Each retail electric supplier shall offer to arrange (either directly or through a local distribution company or other third party) to make net metering available, on a first-come, first-served basis, to each of the retail customers of the retail electric supplier in accordance with the requirements described in subparagraph (B) and other provisions of this subsection.

` (B) REQUIREMENTS- The requirements referred to in subparagraph (A) are, with respect to a retail electric supplier, that--

` (i) rates and charges and contract terms and conditions for the sale of electric energy to customer-generators shall be the same as the rates and charges and contract terms and conditions that would be applicable if the customer-generator did not own or operate a qualified generation unit and use a net metering system; and

` (ii) each retail electric supplier shall notify all of the retail customers of the retail electric supplier of the standard established under this paragraph as soon as practicable after the adoption of the standard.

` (4) NET ENERGY MEASUREMENT-

` (A) IN GENERAL- Each retail electric supplier shall arrange to provide to customer-generators who qualify for net metering under subsection (b) an electrical energy meter capable of net metering and measuring, to the maximum extent practicable, the flow of electricity to or from the customer, using a single meter and single register.

` (B) IMPRACTICABILITY- In a case in which it is not practicable to provide a meter to a customer-generator under subparagraph (A), a retail electric supplier (either directly or through a local distribution company or other third party) shall, at the expense of the retail electric supplier, install 1 or more of those electric energy meters for the customer-generators concerned.

` (5) BILLING-

` (A) IN GENERAL- Each retail electric supplier subject to subsection (b) shall calculate the electric energy consumption for a customer using a net metering system in accordance with subparagraphs (B) through (D).

` (B) MEASUREMENT OF ELECTRICITY- The retail electric supplier shall measure the net electricity produced or consumed during the billing period using the metering installed in accordance with paragraph (4).

` (C) BILLING AND CREDITING-

` (i) BILLING- If the electricity supplied by the retail electric supplier exceeds the electricity generated by the customer-generator during the billing period, the customer-generator shall be billed for the net electric energy supplied by the retail electric supplier in accordance with normal billing practices

` (ii) CREDITING-

` (I) IN GENERAL- If electric energy generated by the customer-generator exceeds the electric energy supplied by the retail electric supplier during the billing period, the customer-generator shall be billed for the appropriate customer charges for that billing period and credited for the excess electric energy generated during the billing period, with the credit appearing as a kilowatt-hour credit on the bill for the following billing period.

` (II) APPLICATION OF CREDITS- Any kilowatt-hour credits provided to a customer-generator under this clause shall be applied to customer-generator electric energy consumption on the following billing period bill (except for a billing period that ends in the next calendar year).

` (III) CARRYOVER OF UNUSED CREDITS- At the beginning of each 12-month period, any unused kilowatt-hour credits remaining from the preceding year will carry over to the new 12-month period.

` (D) USE OF TIME-DIFFERENTIATED RATES-

` (i) IN GENERAL- Except as provided in clause (ii), if a customer-generator is using a meter and retail billing arrangement that has time-differentiated rates--

` (I) the kilowatt-hour credit shall be based on the ratio representing the difference in retail rates for each time-of-use rate; or

` (II) the credits shall be reflected on the bill of the customer-generator as a monetary credit reflecting retail rates at the time of generation of the electric energy by the customer-generator.

` (ii) DIFFERENT TARIFFS OR SERVICES- A retail electric supplier shall offer a customer-generator the choice of a time-differentiated energy tariff rate or a nontime-differentiated energy tariff rate, if the retail electric supplier offers the choice to customers in the same rate class as the customer-generator.

` (6) PERCENT LIMITATIONS-

` (A) 4 PERCENT LIMITATION- The standard established under this subsection shall not apply for a calendar year in the case of a customer-generator served by a local distribution company if the total generating capacity of all customer-generators with net metering systems served by the local distribution company in the calendar year is equal to or more than 8 percent of the capacity necessary to meet the average forecasted aggregate customer peak demand of the company for the calendar year.

` (B) 2 PERCENT LIMITATION- The standard established under this subsection shall not apply for a 12-month period in the case of a customer-generator served by a local distribution company if the total generating capacity of all customer-generators with net metering systems served by the local distribution company in the calendar year using a single type of qualified generation units (as described in paragraph (1)(D)(i)) is equal to or more than 4 percent of the capacity necessary to meet the forecasted aggregate customer peak demand of the company for the calendar year.

` (C) RECORDS AND NOTICE-

` (i) RECORDS- Each retail electric supplier shall maintain, and make available to the public, records of--

` (I) the total generating capacity of customer-generators of the system of the retail electric supplier that are using net metering; and

safety or performance that are in addition to those necessary to meet the standards and requirements referred to in subparagraph (A) and subsection (e).

^ (9) DETERMINATION OF COMPLIANCE-

^ (A) IN GENERAL- Any State regulatory authority (with respect to each electric utility for which the authority has ratemaking authority), and each nonregulated electric utility, may apply to the Commission for a determination that any State net metering requirement or regulations complies with this subsection.

^ (B) ORDERS- In the absence of a determination under subparagraph (A), the Commission, on the motion of the Commission or pursuant to the petition of any interested person, may, after notice and opportunity for a hearing on the record, issue an order requiring against any retail electric supplier or local distribution company to require compliance with this subsection.

^ (C) ENFORCEMENT-

^ (i) IN GENERAL- Any person who violates this subsection shall be subject to a civil penalty in the amount of \$500 for each day that the violation continues.

^ (ii) ASSESSMENT- The penalty may be assessed by the Commission, after notice and opportunity for hearing, in the same manner as penalties are assessed under section 31(d) of the Federal Power Act (16 U.S.C. 823b(d)).

^ (e) Interconnection Standards-

^ (1) MODEL STANDARDS-

^ (A) IN GENERAL- Not later than 1 year after the date of enactment of this subsection, the Commission shall publish model standards for the physical connection between local distribution systems and qualified generation units and electric generation units that--

^ (i) are qualified generation units (as defined in subsection (d)(1)(D) (other than clause (ii) of subsection (d)(1)(D)); and

^ (ii) do not exceed 2,000 kilowatts of capacity.

^ (B) PURPOSES- The model standards shall be designed to--

^ (i) encourage the use of qualified generation units; and

generating facilities that have a power production capacity of not greater than 5,000 kilowatts; and

(ii) consider the best practices for consumer-friendly contracts that are used by States or national associations of State regulators.

(B) LIABILITY OR INSURANCE- The contracts shall not require liability or other insurance in excess of the liability or insurance that is typically carried by customer-generators for general liability.'

(b) Conforming Amendment- Section 1262 of the Public Utility Holding Company Act of 2005 (42 U.S.C. 16451) is amended by striking paragraph (5) and inserting the following:

(5) ELECTRIC UTILITY COMPANY-

(A) IN GENERAL- The term 'electric utility company' means any company that owns or operates facilities used for the generation, transmission, or distribution of electric energy for sale.

(B) EXCLUSION- The term 'electric utility company' does not include an electric generation unit (as defined in section 113(d) of the Public Utility Regulatory Policies Act of 1978).'

SEC. 3. RELATIONSHIP TO STATE LAW.

Section 117(b) of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 2627(b)) is amended--

(1) by striking 'Nothing' and inserting the following:

(1) IN GENERAL- Except as provided in paragraph (2), nothing'; and

(2) by adding at the end the following:

(2) NET METERING AND INTERCONNECTION STANDARDS-

(A) IN GENERAL- Subject to subparagraph (B), no State or nonregulated utility may adopt or enforce any standard or requirement concerning net metering or interconnection that restricts access to the electric power transmission or local distribution system by qualified generators beyond those standards and requirements established under section 113.

(B) EQUIVALENT OR GREATER ACCESS- Nothing in this Act precludes a State from adopting or enforcing incentives or requirements to encourage qualified generation and net metering that--

(i) are in addition to or equivalent to incentives or requirements under section 113; or

“(ii) afford greater access to the electric power transmission and local distribution systems by qualified generators (as defined in section 113) or afford greater compensation or credit for electricity generated by the qualified generators.’.

SEC. 5. SOLAR ENERGY SYSTEMS BUILDING PERMIT REQUIREMENTS FOR RECEIPT OF COMMUNITY DEVELOPMENT BLOCK GRANT FUNDS.

Section 104 of the Housing and Community Development Act of 1974 (42 U.S.C. 5304) is amended by adding at the end the following new subsection:

“(n) Requirements for Building Permits Regarding Solar Energy Systems-

“(1) IN GENERAL- A grant under section 106 for a fiscal year may be made only if the grantee certifies to the Secretary that--

“(A) in the case of a grant under section 106(a) for any Indian tribe or insular area, during such fiscal year the cost of any permit or license, for construction or installation of any solar energy system for any structure, that is required by the tribe or insular area or by any other unit of general local government or other political subdivision of such tribe or insular area, complies with paragraph (2);

“(B) in the case of a grant under section 106(b) for any metropolitan city or urban county, during such fiscal year the cost of any permit or license, for construction or installation of any solar energy system for any structure, that is required by the metropolitan city or urban county, or by any other political subdivision of such city or county, complies with paragraph (2); and

“(C) in the case of a grant under section 106(d) for any State, during such fiscal year the cost of any permit or license, for construction or installation of any solar energy system for any structure, that is required by the State, or by any other unit of general local government within any nonentitlement area of such State, or other political subdivision within any nonentitlement area of such State or such a unit of general local government, complies with paragraph (2).

“(2) LIMITATION ON COST- The cost of permit or license for construction or installation of any solar energy system complies

with this paragraph only if such cost does not exceed the following amount:

`(A) RESIDENTIAL STRUCTURES- In the case of a structure primarily for residential use, \$500.

`(B) NONRESIDENTIAL STRUCTURES- In the case of a structure primarily for nonresidential use, 1.0 percent of the total cost of the installation or construction of the solar energy system, but not in excess of \$10,000.

`(3) NONCOMPLIANCE- If the Secretary determines that a grantee of a grant made under section 106 is not in compliance with a certification under paragraph (1)--

`(A) the Secretary shall notify the grantee of such determination; and

`(B) if the grantee has not corrected such noncompliance before the expiration of the 6-month period beginning upon notification under subparagraph (A), such grantee shall not be eligible for 5 percent of any amounts awarded under a grant under section 106 for the first fiscal year that commences after the expiration of such 6-month period.

`(4) SOLAR ENERGY SYSTEM- For purposes of this subsection, the term `solar energy system' means, with respect to a structure, equipment that uses solar energy to generate electricity for, or to heat or cool (or provide hot water for use in), such structure.'.

SEC. 6. PROHIBITION OF RESTRICTIONS ON RESIDENTIAL INSTALLATION OF SOLAR ENERGY SYSTEM.

(a) Regulations- Within 180 days after the enactment of this Act, the Secretary of Housing and Urban Development, in consultation with the Secretary of Energy, shall issue regulations--

(1) to prohibit any private covenant, contract provision, lease provision, homeowners' association rule or bylaw, or similar restriction, that impairs the ability of the owner or lessee of any residential structure designed for occupancy by 1 family to install, construct, maintain, or use a solar energy system on such residential property; and

(2) to require that whenever any such covenant, provision, rule or bylaw, or restriction requires approval for the installation or use of a solar energy system, the application for approval shall be processed and approved by the appropriate approving entity in the same manner as an application for approval of an

architectural modification to the property, and shall not be willfully avoided or delayed.

(b) Contents- The regulations required under subsection (a) shall provide that--

(1) such a covenant, provision, rule or bylaw, or restriction impairs the installation, construction, maintenance, or use of a solar energy system if it--

(A) unreasonably delays or prevents installation, maintenance, or use;

(B) unreasonably increases the cost of installation, maintenance, or use; or

(C) precludes use of such a system; and

(2) any fee or cost imposed on the owner or lessee of such a residential structure by such a covenant, provision, rule or bylaw, or restriction shall be considered unreasonable if--

(A) such fee or cost is not reasonable in comparison to the cost of the solar energy system or the value of its use; or

(B) treatment of solar energy systems by the covenant, provision, rule or bylaw, or restriction is not reasonable in comparison with treatment of comparable systems by the same covenant, provision, rule or bylaw, or restriction.

(c) Solar Energy System- For purposes of this section, the term 'solar energy system' means, with respect to a structure, equipment that uses solar energy to generate electricity for, or to heat or cool (or provide hot water for use in), such structure.

ⁱ Every square meter of solar thermal collectors are equivalent to a PV panel with a 700 watt capacity in terms of energy output.

Sunlight comes in one form: solar radiation, or insolation. When it strikes a PV panel, it is converted into electricity, with a conversion efficiency of 10 to 20 percent, depending on the type of PV (crystalline or amorphous). When it strikes a solar thermal collector, it is converted into heat, with a conversion efficiency of 70 to 80 percent, again depending on the type of collector and the climatic conditions where it is used. Since heat and electricity are both energy, but in different forms, they can be converted into one another. One kilowatt hour is equal to 3,413 British Thermal Units of heat energy. One BTU is the amount of energy required to heat one pound of water one degree from 60 to 61 degrees Fahrenheit.

So, since 64 square feet (or approximately 6 square meters) is a common size for a solar water heating system, its instantaneous efficiency is 0.7 kW per square meter (based on the convention established by the Europeans with SEIA as a signatory – see attached file) times 6 square meters, or 4.2 kW. Therefore, a 6 square meter solar water heating system produces approximately the same amount of energy as a 4

kW PV system when measured in the same way as PV panels are rated (based on their peak conversion efficiency).

It is also useful to know that it takes heat to make electricity – “Heat rate” is a measurement used in the energy industry to calculate how efficiently a generator uses heat energy. It is expressed as the number of BTUs of heat required to produce a kilowatt-hour of energy. Operators of generating facilities can make reasonably accurate estimates of the amount of heat energy in a given quantity of any type of fuel, so when this is compared to the actual energy produced by the generator, the resulting figure tells how efficiently the generator converts that fuel into electrical energy.

The most efficient electrical generators are gas turbines, with heat rates as low as 8,000 BTU/kWh:
<http://www.gas-turbines.com/specs/heatrt.htm>

Among the least efficient are coal fired generating units at 10,000 or 11,000 BTU/kWh:
<http://www.econsci.com/ear9801.html>