COSEIA
COLORADO SOLAR ENERGY INDUSTRIES ASSOCIATION

November 26, 2014

The Honorable Gina McCarthy
Administrator, United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

To Be Submitted via: A-and-R-Docket@epa.gov

RE: Docket ID No. EPA-HQ-OAR-2013-0602

Comments to the EPA and States on the Proposed Clean Power Plan Regulating Existing Power Plants Under Section 111(d) of the Clean Air Act

Dear Administrator McCarthy:

The Colorado Solar Energy Industries Association (COSEIA) would like to express our appreciation for the opportunity to provide input on the proposed Clean Power Plan regulating existing power plants under section 111(d) of the Clean Air Act (hereafter referred to as 111(d)).[1]

Solar energy emits zero pounds of greenhouse gas (GHG) emissions while generating affordable and reliable energy. As a cost-effective clean energy source, solar avoids a number of costs associated with fossil fuel resources. Further, solar enjoys widespread bi-partisan support from policymakers and the general public throughout the United States. As fossil energy production declines, solar energy will be available to help meet energy demands in a clean and sustainable manner. Therefore, COSEIA respectfully requests that the EPA adopt an approach to regulating GHG emissions under Section 111(d) of the Clean Air Act that recognizes the ability of solar to reduce GHG emissions from existing power plants and that promotes the increased deployment and use of solar energy.

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[1] The EPA released a memo to stakeholders requesting information on Sept. 23, 2013 titled, "Considerations in the Design of Program to Reduce Carbon Pollution from Existing Power Plants." Available at: http://www2.epa.gov/sites/production/files/2013-09/documents/20130923statequestions.pdf

The comments contained herein reflect the views of COSEIA and not the views of any individual member company. The following is an outline of these comments to the EPA.

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I. Introduction

1A1. About COSEIA

The Colorado Solar Energy Industries Association was founded in 1989, and in the 25 years since, COSEIA has led the industry to help solar energy become a vibrant part of Colorado's economy. COSEIA currently has more than 200 business members and we work to advance solar energy and remove market barriers through policy work at the Public Utilities Commission and the legislature. We do outreach and education work through our Solar Friendly Communities program aimed at local governments, and through organizing numerous events, including sponsoring Solar Power Colorado each February as the region's biggest solar conference.

COSEIA commissioned a detailed study of the environmental and economic impacts of solar energy in Colorado in the fall of 2013, done by the respected Solar Foundation. This study report has identified a number of benefits resulting from solar photovoltaic (PV) development in Colorado since 2007:

- Direct, indirect, and induced employment impacts of approximately 10,790 job-years (or full-time equivalents), leading to employee earnings of over $534.1 million;

- Total economic output of $1.42 billion;

- Aggregate state and local government tax revenues of between $34.1 million and $59.7 million, including property taxes ($3.1 million - $9.3 million), sales taxes ($18.7 million - $38.1 million), and income tax revenues of $12.3 million.

– Approximately $24.3 million in environmental benefits achieved through avoiding emissions of pollutants tied to conventional electricity production, and;

- Savings of nearly 300 million gallons of water, which would have otherwise been consumed as part of the electricity generation process

The United States has some of the richest solar resources in the world; nationally, the U.S. solar industry grew by 76% from 2011 to 2012.[2] In Colorado, beneficial solar policies have led to dramatic growth. In 2008, solar installations in the state jumped from 11.6 MW to 22.3 MW. Just three years later, Coloradoans installed more than four times as much solar, ultimately reaching nearly 250 MW of cumulative installed solar photovoltaic (PV) capacity by the first quarter of 2013. By late 2014, installed capacity is estimated at 380 MW. This phenomenal growth is the result of private investment, technological innovation, a maturing industry, customer demand, and smart federal and state policies.

1B1. Photovoltaics (PV)

Photovoltaic (PV) devices generate electricity directly from sunlight via an electronic process that occurs naturally in certain types of material, called semiconductors. Electrons in these materials are freed by solar energy and can be induced to travel through an electrical circuit, powering electrical devices or sending electricity to the grid. PV devices can be used to power anything from small electronics such as calculators and road signs up to homes and large commercial businesses.

PV technology can be applied in a number of different ways. The primary applications of PV solar are off-grid distributed PV, distributed PV, and utility PV. These applications are discussed in further detail below.

Applications of PV Solar

Off-Grid Distributed PV

Off-grid distributed PV systems route electrons through a solar regulator which charges a battery. From the battery, the power can be directly utilized by appliances that require 12 volts, or via an inverter for appliances that require 240 volts. These systems are not connected to the grid, but can be used to reduce the need for production from the grid.

While we do not advocate for off-grid distributed PV to be a part of the Best System of Emission Reductions, the EPA should encourage states to use off-grid distributed PV systems for compliance, as these technologies avoid the need for electricity from the grid. For example, off-grid distributed PV systems placed on roadside assistance emergency phone boxes, wireless security and surveillance cameras, communication towers, and street lighting systems all can be used to avoid the use of electricity from the grid.

[2] U.S. Solar Market Insight™ Year in Review: 2012. Executive Summary available at http://www.seia.org/cs/research/SolarInsight. Data for 2013 predicts a similar level of growth in 2013 over 2012 figures.

Distributed PV
Distributed generation (DG) refers to electricity that is produced at or near the point where it is used. Distributed solar energy can be located on rooftops or ground-mounted, and is typically connected to the local utility distribution grid. DG installations tend to be smaller than utility-scale arrays.[3] Due to the nature of proposed regulations, in these comments, DG only refers to solar that is connected to the grid and thus can lower carbon emission from affected EGUs.

Distributed PV is one of the fast growing applications of PV technology in the United States. As of the end of 2013, the total U.S. cumulative installed capacity of distributed PV was 6.3 GW_{dc}.[4] In Colorado, customers in Xcel Energy territory alone have installed more than 200 MW of distributed PV through its Solar*Rewards program. Other solar customers in municipal and Rural Electric Association territories have installed thousands of distributed solar rooftop systems.

In addition to reducing carbon emissions, DG can provide wholesale ancillary services in the same fashion as utility-scale assets and can also provide local ancillary services beyond what utility-scale assets are capable. These services include but are not limited to frequency regulation, frequency response, spinning and non-spinning reserves, voltage and reactive power support. DG can also provide incremental ancillary services on the local or distribution level. Local voltage support is critical to operating the distribution system within system constraints, and distribution system operators rely on a distributed set of voltage regulating equipment to provide that support. DG can augment and sometimes replace this equipment, providing real and reactive power support as identified by the distribution operator.

Utility PV
Utility-scale PV, or utility scale solar, refers to PV technology applied to the grid on a large-scale centralized basis. The defining features of utility-scale PV is that it constructed as a centralized power plant, it is larger in size than distributed PV (anywhere above 10 MW), it is not generally located near the source of consumption, and the electricity generated by utility-scale PV is usually sold to wholesale utility buyers rather than retail consumers. There are a number of characteristics unique to large-scale installations that make them attractive to utilities, including advanced operational characteristics, low cost, and long-term fixed pricing. In addition, utility-scale PV can provide a variety of ancillary services associated with traditional fossil sources including frequency regulation, dynamic voltage and power factor regulation, and ramp rate controls. Thus, when included as part of a balanced energy portfolio, utility-scale PV contributes to the stability and reliability of the grid. Further, utility-scale PV reduces carbon emissions from fossil units by reducing the amount of conventional generation that must be

[3] DG solar is also sometimes referred to as "behind the meter", although it does not have to be behind a meter. Different entities also classify the size of DG systems in various ways; for example, the EIA classifies DG solar as anything below 1 MW in size. The PURPA classification for DG solar classifies small DG as anything under or equal to 10 MW. SEIA/GTM Research classify DG solar as solar located on-site, or at the customer's end location.
[4] U.S. Solar Market Insight Q2 2014 report.

dispatched to meet electricity demand. As of the end of 2013, the total U.S. cumulative installed capacity of utility-scale PV was 7.3 GW_{dc}.[5]

1B2. Concentrating Solar Power (CSP)

CSP uses mirrors to concentrate the sun's thermal energy to produce steam and drive a conventional steam turbine to produce electricity. This solar generated electricity is then sold to wholesale utility buyers. CSP can be integrated with thermal energy storage, which allows energy to be stored for later use. In this way, CSP with thermal energy storage provides flexibility to grid operators, offering power that can be dispatched as needed, day or night. These large-scale installations are attractive to utilities because they include advanced operational characteristics, delivering large quantities of solar power at a low cost and long-term fixed pricing that provides a hedge against fuel volatility.

CSP plants utilize conventional steam turbine generators, like those of conventional plants, but use the sun as the source of heat instead of fossil fuels. This allows CSP plants to provide the ancillary services historically offered by conventional plants, such as frequency response, load following, spinning and non-spinning reserves as well as ramping. CSP reduces carbon emissions from affected EGUs by reducing the amount of conventional generation that must be dispatched to meet electricity demand and provide the aforementioned ancillary services. As of the end of Q2 2014, there are 1.47 GW_{ac} of CSP facilities operating in the U.S.[6]

1B3. Solar Heating and Cooling (SHC)

SHC technologies collect thermal energy from the sun and use this heat to provide hot water, space heating and cooling and pool heating for residential, commercial and industrial applications. These technologies displace the need to use electricity or natural gas.[7] The SHC industry currently has a goal of 300 GW_{th} of SHC by 2050. Deployment at this scale would provide enormous benefits for homeowners, businesses and taxpayers, and generate nearly 8 percent of the total heating and cooling needs in the U.S., resulting in nearly $100 billion annually in positive economic impacts.[8]

In Colorado, the 2012 Solar Thermal Roadmap projected development of 2,474 MW of solar thermal energy by 2030 with a rapid ramp up to 16,595 MW installed by 2050.

II. The EPA's Authority to Regulate Carbon Emissions from the Electric Sector

The EPA has authority to regulate air pollution, including GHG emissions, under the Clean Air Act. The EPA regulates criteria air pollutants, such as smog pollutants, through the National Ambient Air Quality

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[5] U.S. Solar Market Insight Report, 2013 Year in Review. Report available here: http://www.seia.org/research-resources/us-solar-market-insight
[6] U.S. Solar Market Insight Q2 2014 report.
[7] For more information: http://www.seia.org/policy/solar-technology/solar-heating-cooling
[8] Solar Heating and Cooling: Energy for a Secure Future. Full report available here: www.seia.org/shca

Standards (NAAQS) established under §110 of the Clean Air Act.[9] For air pollutants not covered by NAAQS, the EPA may control emissions through §111. To employ this authority, the EPA is required to take a number of procedural steps. The EPA must first make an endangerment finding that an air pollutant causes harm to health and the environment.[10] Next, the EPA must identify the categories of stationary sources that cause or contribute significantly to air pollution that endangers the public health and welfare.[11] The EPA must then control air pollution for new sources in the identified categories under §111(b).[12] Once new sources in the identified categories are controlled, the EPA must establish emission guidelines by which states regulate emissions from existing sources under §111(d).

The EPA has authority to regulate carbon emissions from EGUs under §111(d). In 2007, the U.S. Supreme Court in Massachusetts v. EPA, 549 U.S. 497 (2007) held that greenhouse gases (GHG), including carbon, are an air pollutant under the Clean Air Act. The EPA then conducted an endangerment finding and declared that GHG emissions, including carbon, endanger public health and welfare as a significant contributor to climate change. The EPA's finding was then confirmed in the Court's holding in American Electric Power Co. v. Connecticut, 131 S. Ct. 2527, 2537-2538 (2011), which held that a common law right to seek abatement of carbon-dioxide emissions from fossil fuel-fired plants was displaced by the EPA's authority to regulate carbon emissions under §111. The EPA then identified large coal and natural gas plants (the "covered sources" or "affected EGUs") as stationary source categories which contributed significantly to carbon pollution and should be controlled.[13] The EPA then properly proposed carbon emissions standards from new covered sources.[14]

Upon proposing emissions standards for carbon from new covered sources under §111(b), the EPA must issue emissions guidelines for states to reduce carbon emissions from existing sources under §111(d).[15] The emissions guidelines must be based on the best system of emission reduction that the EPA determines has been adequately demonstrated for the covered sources.[16] Each state must then create an implementation plan that includes a standard of performance for carbon emissions from existing sources in compliance with the EPA's emissions guidelines.[17]

[9] NAAQS standards have been set for sulfur dioxide, particulate matter, ozone, lead, carbon monoxide, and nitrogen dioxide. (http://www.epa.gov/air/criteria.html)
[10] This finding is available at: http://www.epa.gov/climatechange/endangerment/
[11] CAA Section 111(b)(1)(A)
[12] 42 U.S.C. §7411(b)(1)(B). EPA Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 FR 22392 (April 13, 2012) and 79 FR 1430 (January 8, 2014)
[13] TTTT Sources
[14] 40 CFR Part 60.
[15] 40 CFR 60.22(a)
[16] 40 CFR 60.21(e); CAA Section 111(a)(1)
[17] CAA Section 111(d)(1)

III. Comments on the EPA's Proposal for Regulating Carbon Emissions From Existing Sources Under Section 111(d)

The EPA issued a proposal for regulating carbon emissions from existing sources under §111(d) on June 15, 2014. The EPA issued its proposal after unprecedented public outreach. We applaud the EPA for its outreach efforts and supports the approach put forth in its proposal. While we support the framework put forth by EPA, we believe that there are necessary adjustments to be made before the rule is finalized to ensure that the required carbon reductions are reflective of the application of the best system of emission reduction to covered sources. The following are COSEIA's recommendations for improving the proposal to most effectively reduce carbon emissions from existing sources in compliance with §111(d) of the Clean Air Act.

A. Determination of the Best System of Emission Reduction

EPA proposes that the best system for reducing carbon emissions from existing power plants is a system-wide approach based on the application of four building blocks that include on-site measures and measures taken to shift generation away from carbon intensive units. These building blocks are: heat rate improvements; natural gas switching; renewable energy measures; and energy efficiency.[18] We agree with EPA's approach for determining the BSER.[19] Specifically, we agree with the EPA that renewable energy measures, and solar measures especially, are necessarily part of the BSER. However, we are also concerned that building block 3 (renewable energy measures) as it is currently calculated is incomplete because it does not contain current solar market data and it does not include distributed solar. Therefore, as it is currently written, EPA's proposal does not accurately reflect the emissions reductions achievable through application of the BSER. Indeed, solar energy is ready to play a much bigger role in building block 3.

B. Solar Energy Measures are Part of the Best System of Emission Reduction

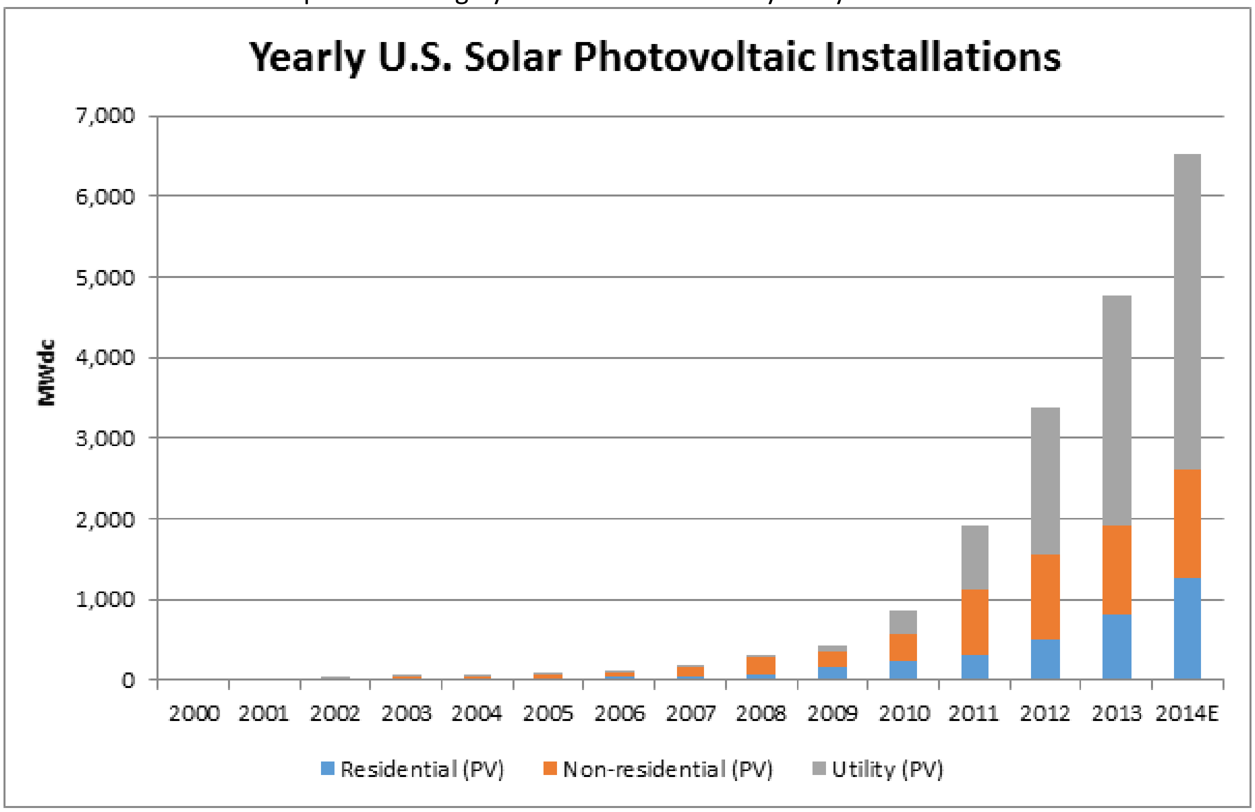
The EPA must include all forms of solar, including distributed solar, in its final determination of the BSER. Distributed solar, solar heating and cooling technologies, utility solar and CSP are all a system of emissions reduction that is technically feasible, is implemented at reasonable cost, is driving solar innovation, and does not negatively impact the electric system. Further, these forms of solar energy are adequately demonstrated to reduce emissions from covered sources. For these reasons, EPA must include solar as part of building block 3 in its determination of the best system of emissions reduction.

[18] 79 FR 34855

[19] The EPA proposes two alternatives to the four building blocks of the BSER. SEIA does not take a position on those two different approaches, but rather supports the use of measures taken at the plant as well as measures taken on the system to reduce carbon emissions from existing sources.

B1. Solar Energy Measures are Technically Feasible

- Solar energy systems are technically reliable, using commonly available standard parts, and are growing dramatically in popularity. In 2013, Colorado installed 56 MW of solar electric capacity, ranking it 10th nationally. The biggest share of solar installation in the state has come in the territory of Colorado's largest utility, Xcel Energy, where more than 19,800 distributed PV systems have been installed since 2007. The below graph shows the yearly U.S. solar PV installations, demonstrating the fact that solar energy is technically feasible.[20]
- Colorado has pioneered a community solar garden, or shared solar, model, and 6 MW of solar have been allotted to Xcel territory in each of the past three years. In addition, muncipal utilities such as Colorado Springs Utiltities and Rural Electric Associations including United Power and San Miguel Power Association have built or planned roughly 10 MW of community arrays.



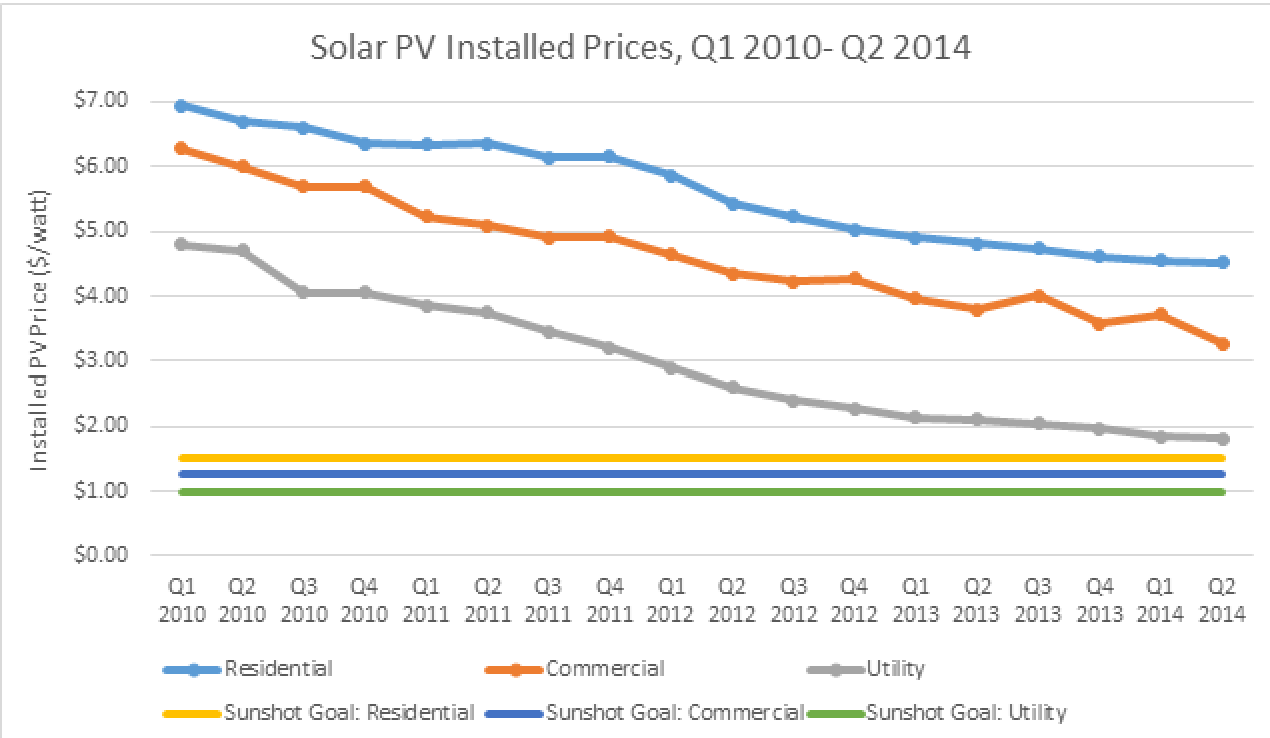
B2. Solar Energy Measures can be Implemented at a Reasonable Cost

Solar energy is already a cost-competitive emissions reduction technology and costs continue to decline rapidly. As of Q2 2014, the cost to install solar PV DG dropped by 8% over 2013 and 39% from 2010. Similarly, utility scale solar PV costs dropped by 14% over 2013 and 61% from 2010.[21] For distributed solar, the national weighted average residential PV installed system price for Q2 was $4.52/watt, which is 6% lower than 2013 and 33% lower than 2010. Further, the national weighted average of non-residential PV (commercial, industrial, gov't and non-profit) installed system price for Q2 was

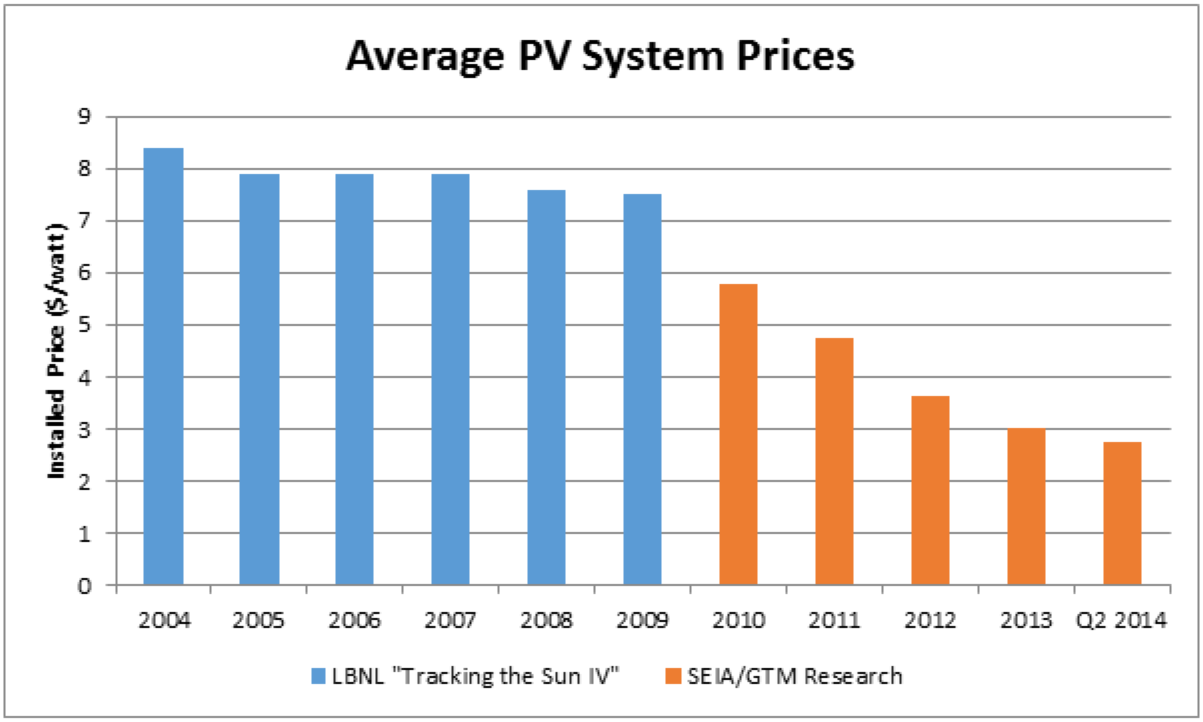
[20] SEIA/GTM Research *U.S. Solar Market Insight*
[21] U.S. Solar Market Insight Q2 2014 Report. Available at: www.seia.org/smi.

$3.26/watt, which is 14% lower than 2013 and 46% lower than 2010.[22] The estimated utility scale PV national installed system price for Q2 was $1.81/watt, which is 14% lower than 2014 and 61% lower than 2010 (as noted previously).[23] Between 2006 and 2013, the capacity-weighted average installed price of PV fell from $7.90/$W_{dc}$ to $2.59/$W_{dc}$.[24]

The two charts below help to illustrate these declining costs. The first chart shows quarterly cost declines by sector, while the second chart shows yearly blended average cost declines.



[22] Id.
[23] Id.
[24] Id.



In Colorado, the costs of installed solar energy is coming down even more than national averages. Xcel Energy will purchase electricity generated from the 156-MW Comanche Solar Project under a 25-year power purchase agreement with SunEdison at rates that are competitive with the long-term forecast for natural gas-fired generation.

The costs for distributed solar systems have come down dramatically as well and are below the national average in most of Colorado. These facts prove that solar energy measures can be implemented at a reasonable cost, and that cost should not be an impediment to including solar energy as part of the BSER.

B3. Solar Energy Measures Reduce Carbon Emissions

Solar energy is not a hypothetical way to reduce carbon emissions; solar energy generation significantly reduces carbon emissions today. Solar energy systems in the U.S. are expected to generate more than 20,000 gigawatt hours (GWh) in 2014.[25] With one GWh of solar generation eliminating 690 metric tons of CO_2 emissions, solar generation can be expected to avoid 13.8 million metric tons of CO_2 emissions in

[25] SEIA analysis based on data from SEIA/GTM Research U.S. Solar Market Insight: 2013 Year in Review

2014.[26] Specifically for distributed solar, existing DG PV capacity (as of June 2014) will generate 10,450,000 MWh/year and displace 7,206,000 MT of CO2 per year.[27]

Emission reductions resulting from solar deployment are certain to grow. In 2013 alone, the solar industry grew 53 percent over 2012, installing 5.2 GW of solar generating capacity. On average, a new solar project was installed in the U.S. every 4 minutes in 2013.[28] Solar energy accounted for 29 percent of new electric generation capacity installed in 2013.[29] An approximate 6.8 GW of new solar capacity is projected to come online in 2014.[30]

An increase in the amount of electricity produced from solar decreases the amount of electricity produced by fossil fuel power plants. While solar may not replace polluting sources on a 1:1 basis, due to the complexity of the grid and electric system, generally when solar is placed on the grid it displaces electricity production from a source that emits carbon pollution, often at a high rate, such as a simple-cycle natural gas generator.

Colorado's 2007 Climate Action Plan counts on solar energy to play a significant role in reaching the goal to reduce carbon emissions to 20 percent below 2005 levels by 2020. The state's Renewable Portfolio Standard, which was boosted twice after voters adopted it by referendum in 2004, calls for 30% of electricity from Investor Owned Utilities to come from renewable sources by 2020. Xcel Energy, the largest utility, is ahead of goals to meet this standard.

Other Colorado utilities have standards to meet as well. Electric Cooperatives serving more than 100,000 meters must meet a 20% renewable standard by 2020 while smaller coops and large municipal utilities must meet a 10% standard by then.

For Investor-owned utilities: 3% of retail sales by 2020 must come from Distributed Generation (as defined in law), of which, half must be "retail distributed generation" serving on-site load. For coops serving more than 10,000 meters, 1 percent must come from distributed generation, and for smaller coops, 0.75% of retail sales must come from distributed generation.

B4. Solar Energy Measures Promote Technological Development

Solar measures promote technological development. New solar technologies and efficiencies of solar panels are being continually developed. Colorado, as the home of the National Renewable Energy Laboratory(NREL), is a home of a great deal of innovation. Products developed at the Lab, ranging from

[26] For more information, see http://www.epa.gov/cleanenergy/energy-resources/refs.html
[27] Solar data from U.S. Solar Market Insight Q2 2014. See also: http://www.epa.gov/cleanenergy/energy-resources/refs.html
[28] U.S. Solar Market Insight 2013 Year in Review Report. Available at: www.seia.org/smi.
[29] U.S. Solar Market Insight 2013 Year in Review Report. Available at: www.seia.org/smi.
[30] SEIA analysis based on data from SEIA/GTM Research U.S. Solar Market Insight: 2013 Year in Review and EIA Electric Power Monthly, December 2013, Table ES3.

more efficient panels to ways to better integrate solar into the electrical grid, are constantly fueling new innovations in industry.

As one example, at the recent annual Industry Growth Forum hosted by NREL, nearly 400 investors, entrepreneurs, scientists and thought leaders shared ideas. The coveted "Best Venture'' award went to HiQ Solar. Judging brought together 30 finalists from a field of 150 applying clean energy technology companies to compete before a panel of experienced investor judges. Each company was graded on factors including the quality of the product, market, business model and team. HiQ's TrueString inverter is designed to reduce the cost of solar in 3-phase commercial PV installations.

Colorado is also home to innovation in solar "soft costs'', the non-hardware aspects of solar energy systems that now account for up to 60 percent of the cost of a rooftop system. COSEIA created and implemented "Solar Friendly Communities'' a program that includes a roadmap of 12 best practices to reduce permitting, inspection and other soft costs-- and certifies cities as solar friendly for achieving a certain amount of progress. Work such as this is critical to the U.S. Department of Energy's SunShot goals which aim to bring the cost of solar energy to be cost-competitive with traditional energy sources by 2020.

B5. As Part of a Balanced Energy Portfolio, Solar Brings Positive Benefits to the Electric Grid and Can Improve Grid Reliability

To absorb more solar energy into the electric grid, there are certain ways that the electric grid can be adapted. As part of a balanced energy portfolio, solar can improve grid reliability and provide benefits to the existing energy infrastructure, including reducing transmission losses and relieving congestion on the grid. There are several resources the EPA can look to for understanding how solar fits into the grid in terms of reliability and higher penetrations of renewable energy.[31]

Reliability and Transmission Benefits of Solar: Solar energy can be configured and operated to provide various reliability services and transmission benefits that will be essential to electric power system operations in conjunction with the state implementation of §111(d) regulations.

With supportive policies and standards in place, utility-scale solar PV can include advanced features that enable it to operate more like conventional power plants and actively contribute to the stability and reliability of a regional grid as part of a balanced energy portfolio.[32] Some of these features include voltage regulation, active power controls, ramp-rate power controls, fault ride-through, and frequency response controls. These capabilities are managed through the use of a plant-level controller specifically engineered to regulate real and reactive power output of the solar facility such that it behaves as a single large conventional generator, although within the limits dictated by the intermittent nature of the solar resource. These advanced features can enable solar PV to provide a state or region with additional system flexibility by responding to utility and independent system operator instructions.

[31] See the NREL Renewable Electricity Futures Study, available here: http://www.nrel.gov/analysis/re_futures/ See also the study "Integrating High Penetration Renewables: Best Practices from International Experience" available here: http://www.jisea.org/high_pen.cfm

[32] See "Grid-Friendly" Utility Scale PV Plants, First Solar at 3 and 13 (August 13, 2013).

CSP technologies employ conventional synchronous turbine generators and inherently possess valuable system reliability attributes, such as, but not limited to, active and reactive power support, dynamic voltage support and regulation, voltage control and some degree of inertia response. With the integration of thermal energy storage, CSP facilities can be fully dispatched by utilities and system operators, meaning that the plants are capable of ramping power output up and down to meet changing energy demand and supply, without material efficiency losses. CSP with storage plants can be a significant source of essential grid flexibility services, such as ramping, regulation, load following reserves and spinning reserves, which are critical to a reliable system. These services are typically provided by fossil-fired generators operating at sub-optimal heat rates, which may increase their emissions.

On an aggregated basis, utility-scale and distributed solar resources provide significant reliability and transmission benefits to a state or regional grid. Even if solar output varies at a few individual locations due to localized cloud coverage, when the sum of the solar installations in a geographic area is assessed, the variability is reduced and can be managed by the grid operator. In a recent study regarding the integration of wind and solar in PJM, General Electric International, Inc. (GE) found that PJM's large geographic footprint significantly reduced the magnitude of variability-related challenges as compared to smaller balancing areas.[33] GE noted that an individual solar plant's variability is significantly reduced when solar plants are aggregated and located in a geographically diverse manner throughout PJM.[34]

Further, targeted deployment of solar generation in congested areas can provide relief to transmission and distribution systems, defer costly transmission upgrades, and help maintain grid reliability. For example, unlike central station power plants, solar installed on-site does not experience transmission and distribution system losses, which can be as high as 7 percent on a utility distribution system and up to 20 percent at the time of system peak.[35] Similarly, utilities may site small utility-scale power plants in specific locations to ease congestion on a particular transmission line.

Finally, solar technologies that require transmission investment often do not require pipelines, coal transport or the associated production and processing infrastructure needed by coal and gas industries. This has the potential to save immense costs as the energy infrastructure in the U.S. ages and requires repairs.

Adapting to Changing Grid Operations: As renewable energy becomes a larger component of the electricity sector, the generation profile of the electric resources available throughout the day is changing. For example, solar and wind resources peak in terms of output at specific times depending on geography and other factors. While utilities previously sought to procure a least-cost mix of energy to meet a predictable load curve, the addition of renewable energy has spurred utilities and regulators to think differently about matching supply and demand.

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[33] See PJM Renewable Integration Study, General Electric International, Inc. at 12 (February 28, 2014) (GE Study).
[34] See Id. at 12 and 15.
[35] For more information, see the paper, "Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements" available at: www.raponline.org/document/download/id/4537

Utilities and policymakers are already addressing the changes to grid operations presented by increased renewable penetration. For example, in areas of an electric grid where the peak energy use is in the late afternoon or evening, solar systems can be configured to coincide with peak demand later in the day or be coupled with storage technologies to match their output to local power demand patterns. This can be done economically, if supported through appropriate policies, pricing options, and program offerings.[36] For a discussion of strategies to address the changes to grid operations presented by renewables, we recommend *Teaching the Duck to Fly*, a paper recently published by the Regulatory Assistance Project.[37]

Some stakeholders have expressed concerns that solar and wind energy can increase costs and energy system emissions due to an increased need to cycle conventional power plants in response to variable renewable output.[38] However, such claims have been proven to be overstated, and could largely be avoided through a balanced portfolio of complementary solar, wind and other clean energy resources. The Western Wind and Solar Integration study found that not only is a high renewable energy penetration achievable, but also that any increases in costs or emissions associated with increased cycling of fossil fuel power plants are nominal compared to the overall cost and emissions savings associated with reduced generation from fossil fuel power plants.[39] The PJM Renewable Integration Study reached a similar conclusion: any increased costs associated with increased cycling of conventional generators are dwarfed by the savings in fuel costs.[40]

B6. Solar Energy Measures are Adequately Demonstrated

The utilities that own the covered sources affected by the EPA proposed rule are already including solar measures as a way to comply with RPS policies, which are intended to diversify state energy portfolios and reduce carbon emissions. In many states solar technologies have reached grid parity, making the utilities' choice to install or purchase solar energy rather than conventional generation resources based solely on price. In some cases the interest in solar generation has created a backlog of applications for interconnection; in others, utilities have combined solar procurement with their long term resource planning and procurement due to the competitive nature of solar relative to natural gas and other generation.

Utilities are including solar measures through various approaches. For example, Colorado's largest utility, Xcel Energy, has installed 87 MW of utility-scale solar with an additional 170 MW planned. This includes solar projects which are being purchased for 25-year Power Purchase Agreements at rates

[36] See "Teaching the Duck to Fly: Integrating Renewable Energy," available here: http://www.raponline.org/featured-work/teach-the-duck-to-fly-integrating-renewable-energy
[37] Id.
[38] Western Wind and Solar Integration Study, available at: http://www.nrel.gov/electricity/transmission/western_wind.html (Citing cycling concerns at pg. vii)
[39] Western Wind and Solar Integration Study, available at: http://www.nrel.gov/electricity/transmission/western_wind.html
[40] PJM Renewable Integration Study, available at: http://www.pjm.com/~/media/committees-groups/committees/mic/20140303/20140303-pris-executive-summary.ashx

competitive with the long-term forecast for natural gas-fired generation. Through the Solar*Rewards program, more than 19,800 Colorado customers have installed PV systems, leading to more than 200 MW of distributed solar generation.

Clean Energy Collective, one of the pioneering solar garden developers based in Colorado, recently opened the 8th and 9th arrays in Colorado as part of Xcel Energy's Solar*Rewards Communities program. Combined, CEC's power contribution to the Xcel Energy grid is over 4 megawatts. CEC now operates 16 community solar projects in Colorado.

Other utilities also have ambitious solar energy programs. The city of Fort Collins municipal utility,for example, chose 20 projects totally 4.3 MW last winter as part of its Fort Collins Solar Power Purchase Program (SP3) . The objective of the SP3 is to procure new locally installed solar capacity to help meet the community's renewable energy commitments under the Colorado Renewable Energy Standard (RES). These projects will be located on a commercial customer's property with Utilities purchasing the electric output of the project under an extended contract. Fort Collins also has a small PV Rebate program which is so popular that the 2014 program "sold out'' in the spring when all 2014 rebate funds were reserved for 72 residential rebate requests. The utility is also selling shares in a Community Solar Garden.

Colorado Springs Utilities, another large municipal utility, has also found solar gardens popular. Before construction began this year, SunShare LLC sold all of the power that will be generated by a 2 MW solar garden. The Pikes Peak Library District, Security Water District and the University of Colorado at Colorado Springs joined the city of Manitou Springs and hundreds of individual consumers bought the power.

Numerous Rural Electric Associations (REAS) in Colorado also have solar programs. Several offer rebates for rooftop systems. Others have found success with community solar projects, including Holy Cross Energy, San Miguel Power Association and United Power.

These examples of utility ownership of solar highlight the fact that solar is adequately demonstrated, and that utilities consider solar projects to be not only a part of the best system of emission reduction, but part of prudent resource planning.

C. Determination of State Goals

Once the EPA determines the BSER that has been adequately demonstrated for the covered sources, it calculates the emission limitation achievable through the application of the BSER to the covered sources and sets the state target.[41] As discussed above, the BSER as proposed by EPA does not properly account for solar energy measures in terms of the emissions potential and the cost, and fails to include distributed solar energy entirely. Therefore, the state goals as set forth in EPA's proposal are inaccurate. The comments below discuss how the approaches to determining the solar inputs of the third building block should be adjusted to accurately account for solar energy as a part of the BSER.

[41] CAA Section 111(d)(1); LM 97

C1. The EPA should use the alternative approach with accurate solar data to determine the state goals.

COSEIA believes that the Alternative Approach, when adjusted, captures the emissions reductions achievable through application of the BSER to covered sources most effectively. The Alternative Approach is more accurate because the approach does not rely on one policy to determine the solar potential in a state, as the RPS approach does.[42] Thus the Alternative Approach would set a more realistic expectation of the amount of solar growth feasible that will create a balanced energy portfolio in each state.

The Natural Resource Defense Council (NRDC) engaged with ICF to run the Integrated Planning Model (IPM®), the same model that EPA uses, to reproduce EPA's RE Market Potential run based on the below solar energy recommendations, using up-to-date cost and performance assumptions for renewable energy technologies. The resulting national target for renewable generation nearly doubles from EPA's approaches, growing from 520-530 TWh to ~930 TWh. This clearly demonstrates that significantly higher levels of renewable energy are both technically and economically achievable, compared to the levels proposed in either of EPA's target-setting approaches. Based on these results, EPA should strengthen the contributions of renewable energy in its target-setting to accurately reflect the full potential that these technologies can have in reducing dangerous carbon pollution from the electricity sector.

The following adjustments should be made to the EPA's proposed rule to accurately include solar energy in the alternative approach; failure to make these adjustments would be arbitrary, as state goals would not reflect the emission limitations achievable through application of the BSER.

[42] There are numerous policies that are driving the growth of solar. For utility scale solar, there are several policy drivers at the federal and state level that play a key role in creating the foundation for continued increase in utility scale solar. At the federal level Modified Accelerated Cost Recovery System (MACRS) and the Investment Tax Credit (ITC) create the predictable tax environment necessary to foster investment in utility scale projects. At the state level, RPS policies have historically been the main driver for utility scale solar projects: as of March 2013, there are 29 states plus Washington, DC that have an RPS, while an additional 8 states have a renewable portfolio goal. As installed costs have dropped, state and local tax policies as well as utility procurement policies are playing an increasingly important role in the growth in utility scale solar projects. However, for distributed solar, the most important policy driver is the net metering policy. As of July 2013, there are 43 states plus Washington, DC that have adopted a solar net metering policy. This policy, in combination with the federal 30% investment tax credit, along with other state incentive programs such as rebate and loan programs have driven deployment in this sector. A state RPS with either a solar carve-out or a DG carve-out can be a driver of deployment; however, as of March 2013 only 16 states and Washington, DC have an RPS policy with this provision. See more at: http://www.dsireusa.org/documents/summarymaps/RPS_map.pdf; http://www.dsireusa.org/documents/summarymaps/net_metering_map.pdf; and http://www.dsireusa.org/documents/summarymaps/Solar_DG_RPS_map.pdf

C2. Exclude the technical potential benchmark from the alternative approach and rely on the IPM model results.

Within the alternative approach, the current proposed rule first establishes a technical potential benchmark that is used in combination with an IPM projected market potential. SEIA does not support the inclusion of the technical potential benchmark in setting a state's target. Instead, SEIA recommends that EPA rely solely on the IPM model when applying its alternative approach.

As the EPA notes in its proposal, applying NREL's technical potential for solar in each state to determine the state goals has limited value. In fact, SEIA believes that the technical potential is arbitrary because it shows the solar capacity that could be built in a given state without recognizing real-world limiting factors such as economic growth and grid constraints. Therefore, the EPA should not rely on NREL's technical potential for setting state goals.

The EPA should solely rely on the IPM model for setting the state targets. Unlike the technical potential, the IPM model takes into account the cost of building renewable generation, as well as grid conditions in a state and a number of other factors. In addition, the IPM model considers the resource potential that is considered by NREL's technical potential. SEIA believes that with the correct solar data inputs, the IPM model provides a realistic projection of solar energy potential at the state level that can be relied upon for setting state goals.

Further, there is precedent to rely solely on the IPM model for setting the renewable targets in each state under the alternative approach. The EPA currently uses the IPM model to analyze the impact of air emissions policies on the U.S. electric power sector such as the Clean Air Interstate Rule, Cross-State Air Pollution Rule (CSAPR), the Mercury and Air Toxics Standards (MATS), and the proposed Carbon Pollution Standards for New Power Plants.[43] The EPA also notes that "for the development of its latest power sector modeling platform, EPA has increased its external engagement with state air quality planning officials, power company representatives, regional transmission organizations, and others who have provided input on the data, assumptions, and structure of EPA's Power Sector Modeling Platform v.5.1,"[44] which shows that the model includes feedback from a variety of stakeholders, and can be used reliably to set the state targets for compliance.[45]

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[43] http://www.epa.gov/ttn/ecas/regdata/RIAs/111dproposalRIAfinal0602.pdf p. 3-3.
[44] http://www.epa.gov/powersectormodeling/
[45] "IPM is a multi-regional, dynamic, deterministic linear programming model of the U.S. electric power sector. It provides forecasts of least cost capacity expansion, electricity dispatch, and emission control strategies while meeting energy demand and environmental, transmission, dispatch, and reliability constraints. EPA has used IPM for over two decades to better understand power sector behavior under future business- as- usual conditions and evaluate the economic and emission impacts of prospective environmental policies. The model is designed to reflect electricity markets as accurately as possible. EPA uses the best available information from utilities, industry experts, gas and coal market experts, financial institutions, and government statistics as the basis for the detailed power sector modeling in IPM." http://www.epa.gov/ttn/ecas/regdata/RIAs/111dproposalRIAfinal0602.pdf p. 3-2.

C3. Use NREL's SolarDS to hard-wire distributed PV into the IPM model.

As demonstrated in the comments above, distributed PV meets the necessary requirements to be considered a part of the BSER. Distributed PV can be deployed at a reasonable cost, reduces emissions, is technically feasible, and is also adequately demonstrated. As distributed PV is a unique, customer-sited generation resource, it may be difficult to represent the technology in a wholesale power model such as IPM. Instead, it is more accurate to rely on separate modeling that fully accounts for market dynamics at the customer level. For example, NREL has developed the Solar Deployment System model (solarDS), a modeling complement to ReEDS which projects distributed PV installations by state based on system prices, retail rates, and consumer economics.[46]

In an analysis of the EPA Clean Power Plan performed by the Natural Resources Defense Council (NRDC)[47], NRDC utilized the DOE Sunshot distributed solar capacity projections from their -62.5% price scenario for input into the SolarDS model, which correspond with the level of prices and projection of prices seen in today's distributed solar markets. See Appendix D for these solar capacity projections from the Sunshot scenarios. NRDC also approximated a growth pathway between 2014 installed capacity and NREL's 2030 projections. The output of the solarDS model was then hard-wired into IPM to ensure that the effects on the grid and other generation options are captured. Meaning, the results of the solarDS were forced into the IPM model to build a certain GW amount of distributed solar in 2020. The IPM model then went through the same set of steps as the model would with other technologies (i.e. cost considerations, regulations, etc.).

The analysis by NRDC notes that using the -62.5% cost reduction scenario may be a conservative projection, as an October 2014 notice from the Sunshot program projects that distributed solar prices are still on track to meet the Sunshot goal (a full -75% reduction in price) by 2020, which would result in higher demand for distributed solar systems than in -62.5% projecion.[48] Second, NREL's analysis assumes no further price declines after 2020, when in fact many analysts expect that prices will continue to decline. Finally, the NRDC analysis does not assume any carbon price or incentives for renewable energy beyond those already in place in 2012.[49] Therefore, an analysis that includes an application of a $30/MWh cost reduction or similar incentive for zero-carbon technologies would lead to even higher levels of distributed solar deployment to achieve cost-effective emissions reductions.

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[46] See NREL's "The Solar Deployment System (SolarDS) Model: Documentation and Sample Results", available here: http://www.nrel.gov/docs/fy10osti/45832.pdf

[47] http://www.nrdc.org/

[48] U.S. DOE Sunshot, "Photovoltaic System Pricing Trends: Historical, Recent, and Near-Term Projections." October 2014. Copy available at: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0CC0QFjAC&url=http%3A%2F%2Fny-sun.ny.gov%2F-%2Fmedia%2FNYSun%2Ffiles%2FMeetings%2F2014-11-06%2FSunShot-Solar-Industry-Update.pdf&ei=W1dqVIzfO9W3yASv1oGIDg&usg=AFQjCNFhnGZs41wmZP0ch3ZWQbBBcb35TA&sig2=YfPjLEA6Hz_TNtkpn2SNrA&bvm=bv.79142246,d.aWw

[49] NREL's analysis assumed that the PTC and ITC expired in 2012 and 2016, respectively.

C4. Use the Sunshot -62.5% cost scenario as the cost input for solar in the IPM model.

The Alternative Approach's strengths lie in its use of technical and economic data to calculate the state renewable energy potential. However, the EPA has relied on outdated and incorrect data from the EIA, which contains several-year old cost and performance data and results in levelized costs for wind and solar which are 46% above current averages for each technology.[50] EPA's modeling should use the most reliable and up-to-date cost and performance assumptions available, which will provide a more accurate representation of the cost competitiveness of renewables and demonstrate that more renewables can be deployed at reasonable cost.

Based on data from the latest U.S. Solar Market Insight Report (Q2 2014), the costs for utility PV are at $1.81/watt, while the costs for residential and commercial PV (which together make up the distributed solar market) are at $3.92/watt and $2.39/watt, respectively. This places solar on track or close to meet the 2030 SunShot goals. Therefore, the Sunshot assumptions can be used as a trendline for 2030 solar costs.

The -62.5% Sunshot cost assumptions to use are: $1.50/watt for utility PV as in input directly into the IPM mode; $2.25/watt for residential DG PV and $1.88/watt for commercial DG PV for use with the -62.5% capacity projections as inputs directly for the solarDS model, which is then hard-wired into the IPM model.

C5. Update the generation/capacity data used in the IPM model for solar.

The IPM model base case should accurately depict the solar market today in order to give an accurate forecast for future solar deployment. The EPA can source data from a number of publicly available data sources to understand the solar potential from DG solar, utility PV, and CSP.[51] The EIA collects data on DG solar, utility PV and CSP capacity and generation through 4 separate forms: form 860, 861, 826, and 923.

These four EIA forms contain limited information about current solar capacity deployed. While the EPA relied on data from 2012 in the proposed rule, SEIA strongly encourages the EPA to use the latest available data before setting final targets. Given the rapid deployment of solar energy in recent years, the amount of existing solar capacity is now much higher than the end of 2012. Further, the EPA failed to account for distributed PV capacity reported in forms 826 and 861.

Given the shortcomings regarding the timing and limitations of EIA forms utilized, we submit that a more comprehensive estimation approach would present a more accurate picture of actual solar generation. We therefore recommend the following method for estimating the current generation from solar energy: the EPA should take the latest available data on solar capacity (both DG and utility) from EIA forms 860, 861 and 826 and multiply this capacity by the estimated generation per unit of capacity by state. These values are shown in Appendix A.

[50] NRDC calculation.

[51] There is very limited data on SHC. To assess the growing SHC market, we encourage Congress to instruct the EIA to collect SHC data again.

C6. Update the performance estimates used in the IPM model for solar.

The EPA used EIA data that does not reflect current performance estimates within the solar market. The solar performance estimates are based on the simple average of performance at each TMY3 weather station in each state as modeled using PVWatts in NREL's System Advisor Model (SAM). We recommend using the maximum capacity factor in each state, as utility scale developers will target the highest resource regions.

C7. Other approaches to setting the renewables portion to the state targets show double the amount of renewable energy potential using the correct data for renewable energy.

Other approaches to setting the renewables portion to the state targets, such as the Union of Concerned Scientists' (UCS) demonstrated renewables growth approach, show double the amount of renewable energy potential using the correct data for renewable energy. The UCS demonstrated growth approach would improve on the EPA's proposed approach by incorporating the following core components:

- Setting a national renewable energy growth rate benchmark based on demonstrated growth in the states from 2009 to 2013
- Assuming full compliance with current state RES policies, as set by law, that require certain percentages of electricity to come from renewable sources
- Accounting for actual and expected renewable energy growth between 2013 and 2017.

The UCS state-level renewable energy targets begin in 2017, the proposed start date for state implementation plans, and ramp up through 2030. To determine each state's 2017 generation levels, the UCS uses actual generation data from 2013 (the EPA's approach uses 2012 data) and adds projected generation from wind and utility-scale solar projects known to be under construction through 2016.

C8. Should the EPA default to the current approach (RPS approach) in setting state targets, several key changes must be made.

While SEIA is not in favor of the current approach (RPS approach), should the EPA default to this, there are two key changes that must be made: use the highest RPS in a region, and use 2030 RPS targets.

First, the EPA should use the highest RPS in a region to set the state targets, not the average RPS. The current approach groups states into 6 different regions and takes the average of the 2020 RPS goals for those states in that region and multiplies this by the total 2012 generation for the region. The EPA chose this RPS approach for two principal reasons: "First, in establishing the requirements, states have already had the opportunity to assess those requirements against a range of policy objectives including both feasibility and costs. … Second, renewable resource development potential varies by region, and the RPS requirements developed by the states necessarily reflect consideration of the states' own respective regional contexts."[52] The highest RPS goal in the region still fits within the principal reasons the EPA used, as the state will have weighed the feasibility and cost of the RPS policy against other policy

[52] Federal Register, Vol. 79 No. 117 Wednesday, June 18, 2014, p. 34866.

objectives, yet still arrived at the aggressive RPS goal. Furthermore, there are many instances where solar deployment has exceeded RPS deployment schedules, indicating that the RPS goal could have been more aggressive. For example, in New Jersey, Pennsylvania, Arizona, California and Massachusetts, solar has already exceeded the RPS goals. In Colorado, solar is on pace to exceed even the aggressive RPS goals. These aggressive goals are an indication that higher-levels of renewable energy deployment are viewed as possible in each respective region. Also, a recent report from former Senator Jeff Bingaman notes that only five of twenty-nine states have fallen below 90 percent of expected annual progress toward RPS targets.[53]

Secondly, the EPA should use 2030 RPS targets, not 2020 targets in setting the state goals. As the compliance period for the Clean Power Plan rule extends out to 2030, not 2020, selecting the RPS goals for 2020 severely limits the renewable energy potential for an entire decade. For example, the RPS goal for HI is set for 40% by 2030, compared to just 25% by 2020.[54] Minnesota also has a 10% solar target by 2030, in addition to other RPS goals.[55] Today, 2020 RPS goals are less than 6 years away, and by the time the rule is made final, less than 5 years away. Utilities are already planning for these RPS requirements in 2020 as part of their short-term planning processes. Selecting a 2030 RPS goal sends a clear message on the potential for a state to include renewables as part of a balanced state energy portfolio by 2030.

D. Compliance Issues

D1. We Support the EPA Proposal to Allow Existing Solar Measures to Count Towards Compliance, But Request that EPA Provide Clear Guidance on this in the Final Rule

We interpret the EPA's proposal regarding existing measures to mean that state measures which exist after the date of this proposal, June 18, 2014, can be used to drive emissions reductions during the compliance period (2020-2030). However, because building block 3 was factored into determination of the state goals, existing renewable energy measures and actions can count if implemented prior to June 18 2014. Therefore, MWh from renewable energy capacity installed pursuant to an existing measure or program any time prior to 2020 can be counted towards compliance during the compliance period (2020-2030) if the existing measure is included in a state's implementation plan. For example, if 1000 MW of solar capacity was installed in 2013 pursuant to an RPS and the state includes the RPS in its compliance plan, then emissions displaced by MWh from the 1000 MW of solar capacity during the compliance period (2020-2030) can count towards the state's 111(d) compliance requirements in that period.

We support the EPA's proposal. We agree that existing measures should be allowed to count during the compliance period, and can help states meet interim compliance goals set forth in the original proposal. SEIA believes that this is consistent with EPA's interpretation of the BSER as including measures taken by

[53] http://media.law.stanford.edu/organizations/programs-and-centers/steyer-taylor/State-Policy-Report-low-res.pdf
[54] http://energy.hawaii.gov/renewable-energy
[55] http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MN14R&re=1&ee=0

states to reduce emissions across the electric system. Further, this is consistent with the cooperative model promoted by Section 111(d) and the Clean Air Act, which provides states with significant flexibility in determining the best method for reducing emissions. Further, allowing states to count existing measures towards compliance recognizes the investment already made by states towards emission reduction, and will allow states to carry forward programs that are in motion without distorting current markets.

However, during the comment period there has been significant confusion regarding exactly which existing renewable energy measures can be counted towards compliance and when credit will be given. This confusion is already threatening potential emission reductions by slowing project development because states and EGUs are uncertain which actions will count towards compliance, and when these actions can count. Therefore, while we support the proposal put forth by EPA as interpreted above, we request that in the final rule the EPA more clearly state which actions can count towards compliance and when such actions count.

Furthermore, we propose that the EPA allow existing solar measures to receive a credit for a limited time prior to the start of the 2020 compliance period. We recommend that states should be allowed to get limited credit ("bank") for MWh generated prior to 2020. Specifically, states should be allowed to bank MWh generated from the date their SIP is submitted, and that those credits be eligible for compliance purposes for 36 months from the date of the start of the compliance period.

This approach is consistent with EPA's goal of compliance flexibility and EPA's rationale that states and EPA will need a few years to create and approve compliance plans prior to 2020. Further, limited banking after SIP approval ensures that only measures included in approved SIPs are used for compliance and incentivizes states to submit SIPs for approval in a timely manner. Limiting banking to 2-3 years is aligned with best practices of most RPSs and regional markets which allow banking for 2-3 years without significantly reducing overall state goals. However, some banking incentives early action and market momentum while reducing large fluctuations in the supply curve, which in turn will reduce compliance costs and increase the viability of building block 3 as a compliance option for states.

While SEIA supports limited banking, SEIA believes that unlimited banking or extended banking of emission reductions beyond a 3 year timeframe should not be permitted for states. Unlimited or extended banking damages the ability of the Clean Power Plan to "lock-in" long-term emissions reductions and systematic long-term changes by allowing states to increase actual emissions in compliance years. As stated above, some flexibility in this regard is warranted but extended or unlimited banking would undermine the effectiveness of the Plan. Additionally, extended or unlimited banking creates distortions in the market by allowing states and EGUs to choose not to create new renewables until late in the compliance period or only create new renewables early on. Both create significant uncertainty for renewable energy markets, which may increase compliance costs or lead to states failing to comply. Further, we are concerned that unlimited banking may lead to gaming, higher potential for double counting, and enforcement challenges if the EPA uncovers validation issues with MWhs generated many years prior.

Therefore, we support limited banking as outlined above.

D2. We support the approach put forth by the EPA regarding crediting states under building block 3.

SEIA supports the approach put forth by the EPA regarding crediting states under building block 3. In order to aid state compliance with 111(d) obligations, it would be most efficient and equitable for the EPA to model its approach after the best practices of existing state RPSs. Relying upon existing best practices and infrastructure will aid states in efficiently meeting their obligations, while making double-counting structurally impossible, thereby maintaining the integrity of the emissions reductions which will be achieved.

D3. States Should be Allowed to Enter into Regional Agreements to Budget Emissions.

The EPA should recognize that for some states, a regional budgeting approach will make more sense than using RECs for compliance. Therefore, states should also be allowed to enter into multi-state agreements that allow for emissions budgeting so long as the emission reductions are real, verifiable, and are not being claimed by another entity or state.

IV. Conclusion

The solar industry is one of the fastest growing industries in the United States. For all of the above reasons, we respectfully request that the EPA adopt an approach to regulating GHG emissions under Section 111(d) of the Clean Air Act in the manner discussed in these comments that promotes the increased deployment of solar energy.

Thank you for your consideration of our input, and we look forward to working with the EPA.
If you have any questions, please do not hesitate to contact me.

Respectfully,

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APPENDIX A: Estimated Generation per MW per Year by State

State	Estimated Generation per MW per Year MWh/MWdc/year[56]
AK	804
AL	1,338
AR	1,329
AZ	1,693
CA	1,587
CO	1,539
CT	1,194
DC	1,272
DE	1,265
FL	1,421
GA	1,354
HI	1,527
IA	1,205
ID	1,404
IL	1,227
IN	1,201
KS	1,425
KY	1,234
LA	1,344
MA	1,157
MD	1,272
ME	1,136
MI	1,151
MN	1,165
MO	1,304
MS	1,357
MT	1,286
NC	1,338
ND	1,223
NE	1,367
NH	1,146

[56] Simple average system performance of all TMY3 sites in each state.

NJ	1,257
NM	1,706
NV	1,615
NY	1,158
OH	1,161
OK	1,450
OR	1,271
PA	1,184
PR	1,525
RI	1,198
SC	1,386
SD	1,279
TN	1,316
TX	1,438
UT	1,560
VA	1,298
VT	1,126
WA	1,147
WI	1,186
WV	1,151
WY	1,474
Total	