Comments on the Proposed

Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units

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Provided By

American Council On Renewable Energy (ACORE)

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A special thanks to ACORE's Power Generation and Infrastructure Advisory Committee and Member Working Group on Carbon Pollution Emission Guidelines for Existing Stationary Sources for their expertise and guidance in the development of these comments.

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Table of Contents

The American Council On Renewable Energy (ACORE) is pleased to submit the following comments in response to the United States Environmental Protection Agency's (USEPA) Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (Clean Power Plan, CPP).

ACORE, a 501(c)(3) non-profit membership organization, is dedicated to building a secure and prosperous America with clean, renewable energy. ACORE seeks to advance renewable energy through finance, policy, technology, and market development.

Executive Summary

ACORE commends the USEPA for recognizing the importance of renewable energy generation in the Clean Power Plan to reduce carbon and other emissions from existing power plants. The proposed rule, with a number of critical improvements, can significantly reduce carbon emissions from existing power plants by enabling the continued growth of clean, cost-effective, reliable renewable energy generation.

Over the past five years, renewables have been the fastest growing sector in US power generation, responsible for 37% of all new capacity since 2008. Renewable energy is cost-competitive in many markets and increasingly so in others. This is due to a combination of industry cost reduction and effective state and federal policy – both of which are on trend to continue in the coming decades. For example:

- Since 2008, solar costs have declined by more than 80%, and wind has declined by more than by more than 40%.
- Since 2004, more than $300 billion has been invested in the U.S. clean energy market, including $36 billion in 2013 alone. Estimates project that over $268 billion will be invested in just wind and solar between now and 2026.
- Thirty-seven states and the District of Columbia have enacted renewable energy standards or goals, providing investors and developers with important long-term, market demand targets. RPS policies have been a successful and low-cost tool, resulting in more than 50 GW of non-hydro renewable energy generation.
- The 11 states that produce more than 7% of their electricity from renewable energy have seen their electricity prices fall by 0.37% over the last five years, while all other states have seen their electricity prices increase by 7.79%.

The Clean Power Plan gives states an opportunity to harness their unique renewable resources to achieve pollution reduction targets while creating economic growth and a more reliable and resilient electric grid. However, USEPA's assumptions for the growth of renewable energy significantly understate the potential of this resource to scale up and generate a much greater share of our nation's power. It is important to accurately factor in the economic potential of renewable energy to ensure Clean Power Plan targets for emission reductions are achieved most efficiently and private investment is optimized to lower the cost of renewable energy infrastructure. Otherwise, the rule can foster short-sighted or inefficient capital investment decisions in other generation resources which forego the maximum emissions reductions possible. These investment decisions in operational assets with long lifespans can have lasting impact and need to be made based on the most accurate information possible. A number of USEPA's assumptions and proposals fall short in giving states the tools and incentives necessary to deploy low-cost renewable solutions.

ACORE suggests the following improvements to the proposed rule, each of which is explained in more detail in the following comments:

- The proposed rule's interim emission goal requires most of the emission reductions to take place in 2020 or shortly thereafter and creates a "compliance cliff" that biases decision making against renewable energy, which often requires longer lead times for investment, development, and policy planning. The rule should be improved by modifying the interim compliance goal to create a less abrupt "glide path" for the states, which will allow the right policies to be put in place to incentivize the adoption of renewable energy and allow states to meet their 2030 emission goals through the expanded use of renewable energy.

- The proposed rule's calculation of renewable energy targets on a regional basis – the average in a particular region – often minimizes renewable energy's potential, whether or not a state currently has an RPS in place. The rule should be improved by setting state-specific goals based on the highest RPS in the region or recognizes the potential for renewable energy unique to each state.

- The proposed rule does not allow credit to states that have already installed high levels of renewable energy and does not incentivize states to continue building out their renewable energy generation. The rule should be improved by giving states credit for early action and should further incentivize those states to meet their emission reduction goals through even greater amounts of renewable energy.

- The proposed rule assumes a low growth rate for renewable energy. The rule should be improved by adopting a growth rate for renewable energy that reflects renewable energy's demonstrated and accelerating growth over the past ten years, which is the market reality. This growth is proof of renewable energy's ability to scale up and provides a substantial amount of new generation to meet low-carbon power demands.

- The proposed rule does not account for existing hydropower facilities and/or the expansion of hydropower resources as part of the renewable energy building block (Building Block 3). The rule should be improved by correctly accounting for present hydropower generation and hydropower generation's projected growth.

- The proposed rule does not provide any guidance as to how renewable energy would be considered under a Federal Implementation Plan (FIP) for those states which are unable or unwilling to submit a satisfactory State Implementation Plan (SIP). A FIP should significantly rely on renewable energy given renewable energy's demonstrated cost-competitiveness with other types of generation and renewable energy's ability to dramatically lower carbon emissions, create jobs, foster private investment, and drive technological innovation.

- The proposed rule does not provide adequate guidance to states seeking to expand the role of renewable energy or signal what renewable energy policies could or should be included as part of a SIP. The rule should be improved by providing the states a menu of policy options that have been demonstrated to increase renewable energy deployment. ACORE has included in our comments a menu of policy options that have been applied successfully in states today, which

can efficiently and cost-competitively foster private-sector investment and deployment of renewable generation at increasing scale.

By addressing these matters, USEPA can help states harness their unique renewable resources to reduce carbon emissions while ensuring a more reliable, resilient, and affordable power supply. The Clean Power Plan presents an unparalleled opportunity to reinvigorate our nation's power sector and economy by sending the correct long-term policy signals. USEPA should ensure it is giving states the tools and incentives to ensure the Clean Power Plan is a success.

Cleaner and Cheaper: Renewable Energy Can Supply Increasing Amounts of Cost-Competitive, Reliable, Clean Power

1. Renewable Energy Is Increasingly Low-Cost Energy

Renewable electricity sources have experienced tremendous growth over the last two decades. As a result, key renewable electricity technologies experienced dramatic cost reductions, as innovation, competition, and certain national and state policies accelerated large-scale renewable energy deployments and continual efficiency increases across the entire supply chain. The exponential growth of renewable energy is both a cause and a product of rapidly falling costs. A positive feedback loop emerged, whereby the falling cost of renewable energy has led to increased deployment of these resources, which has led to further decreasing costs as economies of scale and further efficiencies are realized.

As has been the case with every other energy industry sector, as the renewable energy market has increased in scale, costs have come down. A combination of technology improvements, market scale, and stiff global and local competition engendered these predictable results, but these results have occurred at an even faster rate than most had projected. A closer look shows that wind and solar costs have come down at a much faster rate than conventional sources and over a period of significant but much less scale. As the renewable energy market continues to increase in scale, even more cost reduction is a confident expectation.

Clean Energy Moves Toward Grid Parity: Energy Technology Scale vs. Energy Cost

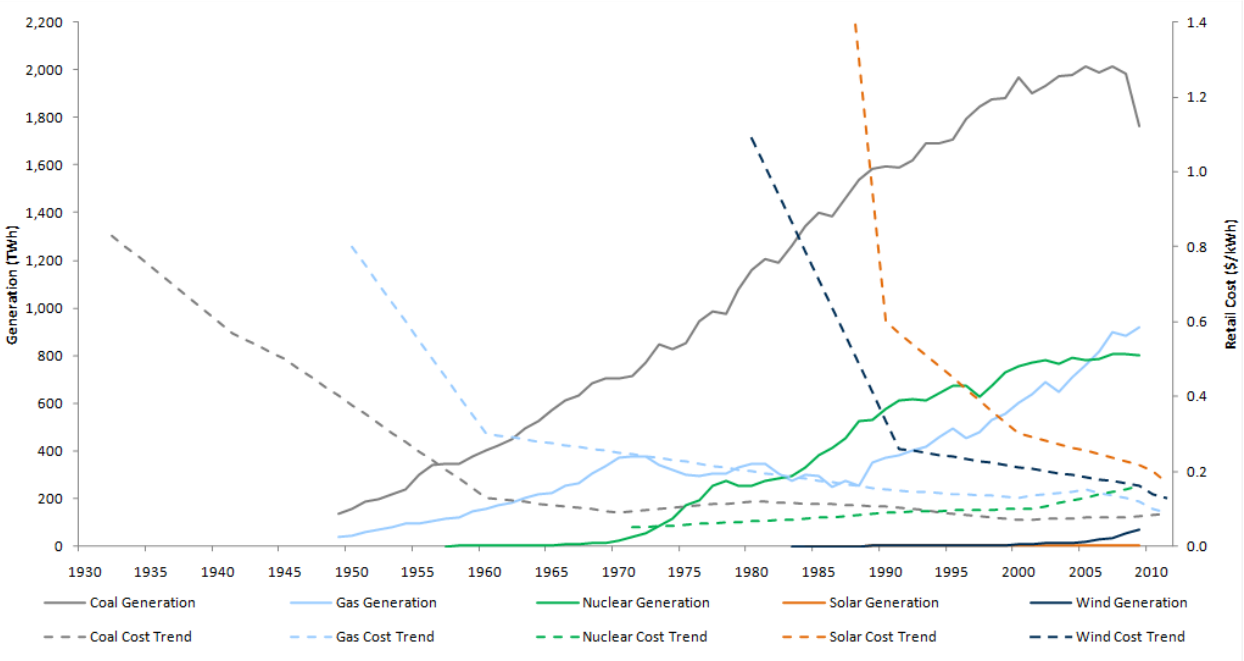


Image: Hudson Clean Energy Partners
Sources: EIA MIT American Energy Independence; NREL; Cooper; Hudson estimates.

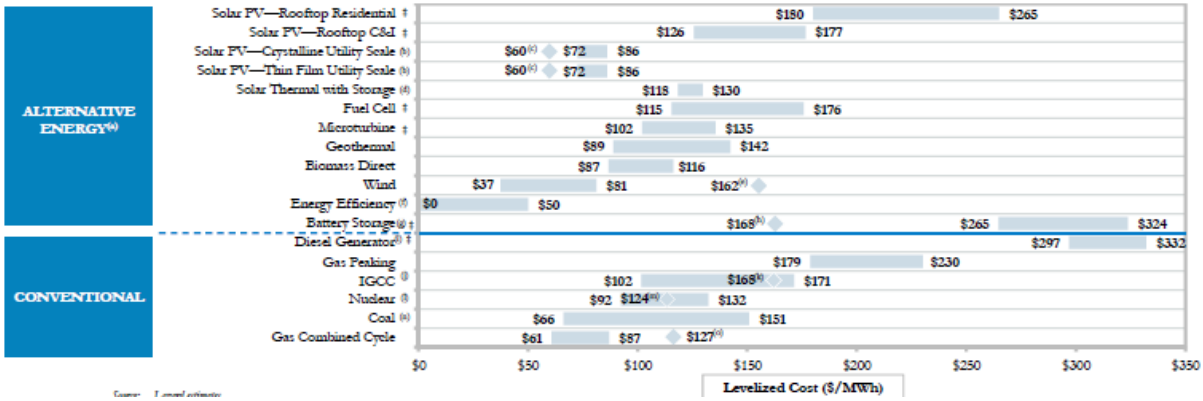
On a levelized-cost basis, wind and solar are now cheaper or approaching cost competitiveness with new conventional sources of power (see chart below). U.S. wind power generation in 2013 was roughly 40% cheaper than in 2008. The cost of solar power has decreased 80% in five years. Installed costs for utility-scale solar generation dropped by 30% in 2012 alone.[1] The costs of renewable energy sources have fallen so low that renewable energy is now often cheaper than coal and even natural gas, and long-term power purchase agreements have locked in these low rates for 20 or more years.[2]

Looking ahead, increasing scale and system improvements can continue to drive costs down for all renewable energy resources while all forecasts suggest conventional energy costs will continue to rise over time.

[1] Solar Energy Industries Association and GTM Research, *U.S. Solar Market Insight Report – 2012 Year in Review – Executive Summary*, 2013.
[2] Diane Cardwell, New York Times, *Solar and Wind Energy Start to Win on Price vs. Conventional Fuels*, Nov. 23, 2014, *available at* <http://nyti.ms/1Fhr5AG>.

Unsubsidized Levelized Cost of Energy Comparison

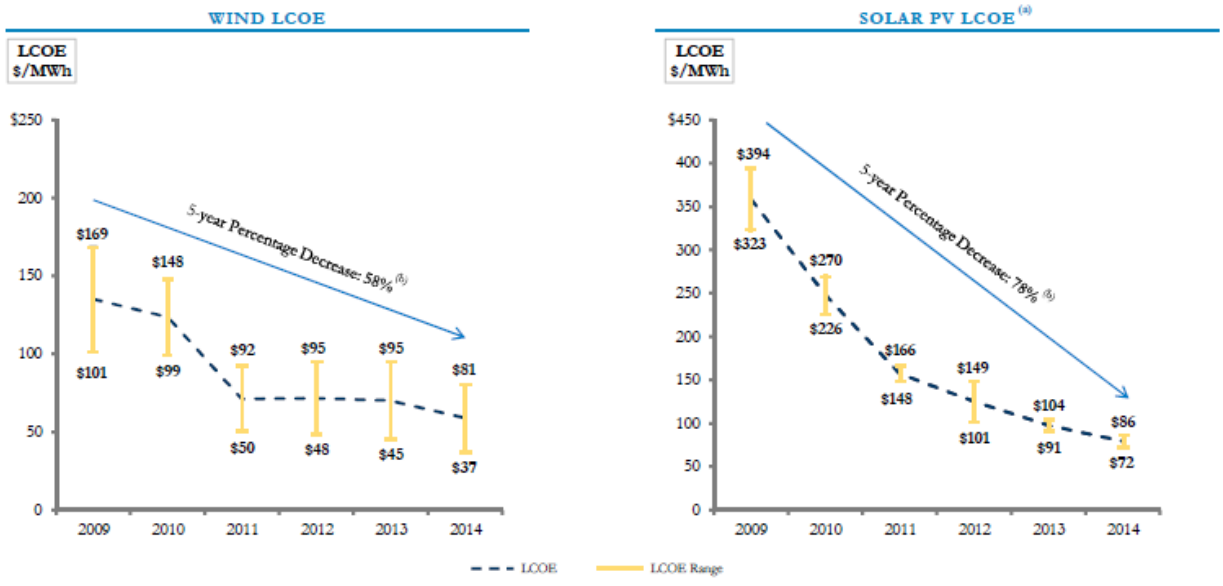
Certain Alternative Energy generation technologies are cost-competitive with conventional generation technologies under some scenarios; such observation does not take into account potential social and environmental externalities (e.g., social costs of distributed generation, environmental consequences of certain conventional generation technologies, etc.) or reliability-related considerations (e.g., transmission and back-up generation costs associated with certain Alternative Energy generation technologies)



Most renewable energy technologies also significantly benefit from having zero fuel costs. As a result, renewable resources are typically dispatched first, and they displace the most expensive power plant that otherwise would have operated. Because that is almost always the least efficient fossil-fired power plant, adding renewable energy significantly reduces fossil fuel energy costs, as well as, directly related carbon pollution. As a result, the 11 states that produce more than 7% of their electricity from renewable energy have seen their electricity prices fall by 0.37% over the last 5 years, while all other states have seen their electricity prices increase by 7.79%.[3] This suggests that high levels of renewable energy constrain energy prices and do not lead to price increases as critics charge.

Levelized Cost of Energy—Wind/Solar PV (Historical)

Over the last five years, wind and solar PV have become increasingly cost-competitive with conventional generation technologies, on an unsubsidized basis, in light of material declines in the pricing of system components (e.g., panels, inverters, racking, turbines, etc.), and dramatic improvements in efficiency, among other factors



[3] American Council on Renewable Energy, *The Outlook for Renewable Energy in America: 2014*.

2. Renewable Energy Has Been Proven at Scale

The proposed rule significantly understates the role renewable energy can play as a cost-competitive and significant part of U.S. power capacity and supply. Clean Power Plan modeling predicts non-hydro renewable energy generation would reach a mere 9% of total generation in 2030 based on the addition of 2 GW per year of new renewable power generation each year from 2016 to 2030.[4] Based on projected market growth rates even without the Clean Power Plan, U.S. non-hydro renewable energy capacity is expected to increase from a 2013 level of 7% to nearly 33% in 2030.[5] The industry has also been installing renewable energy capacity at much greater annual levels than 2 GW per year, including 16 GW in 2012 alone.[6] Other industry analysis also suggests that with implementation of effective policies, renewable energy generation can supply as much as 80% of U.S. power needs in 2050 with existing technologies, at costs in line with a strategy to reduce emissions to mitigate risks associated with climate change, while modernizing the U.S. grid system.[7] While the deployment of renewable energy is expected to significantly grow over the coming years, the Clean Power Plan could serve as an important signal to the nation's energy markets on the most cost-effective energy mix to achieve emissions reduction targets while ensuring a reliable supply of power capacity and generation. The proposed rule should be rebalanced to harness greater amounts of renewable energy, a cost-competitive, reliable and abundant domestic resource of high-quality, virtually emissions-free power.

Since 2008, renewable energy is the fastest growing source of new electrical generation in the U.S., responsible for 37% of all new capacity. In 2012, more than 49% of all new power generation came from renewable energy sources, more than any other source, including natural gas.[8] To date in 2014, the percentage of renewable energy generation has increased to more than 53% of all new power generation.[9] Renewable energy generation capacity now exceeds 190 GW and the impressive growth of renewable energy is expected to continue; more than 12 GW of wind power, 6 GW of solar power, 2.5 GW of geothermal is to be constructed in 2014. There is also 65 GW of proposed hydropower projects at various stages of the regulatory process, and numerous opportunities exist to expand the use of biomass and municipal solid waste combustion which combined, already generate more than 3,400 MW of electricity.[10]

This growth in renewables is forecast to continue.

- Approximately 13,000 MW of wind power will be installed in 2014. There is now over 61,946 MW of installed wind capacity in the United States and over 46,300 wind turbines.[11] Wind power is presently on pace to supply 20% of the total U.S. electrical supply by 2030.[12]

[4] Bloomberg New Energy Finance, *EPA Clean Power Plan – State Abatement by Simulation and by the Book*, July 29, 2014, 5.
[5] *Id.*
[6] Federal Energy Regulatory Commission, Office of Energy Projects, *Energy Infrastructure Update*, December 2012.
[7] John Jimison and Bill White, *America's Power Plan, Transmission Policy: Planning for and Investing in Wires*, 2014.
[8] Office of Energy Projects, *Energy Infrastructure Update*, December 2012.
[9] Office of Energy Projects, *Energy Infrastructure Update*, July 2014.
[10] American Council on Renewable Energy, *The Outlook for Renewable Energy in America: 2014*.
[11] American Wind Energy Association, *U.S. Wind Industry Second Quarter 2014 Report*, July 2014.
[12] American Council on Renewable Energy, *The Outlook for Renewable Energy in America: 2014*, 7.

- The U.S. solar industry is on pace to install over 6,600 MW of solar power in 2014, an increase of 33% over 2013. In total, solar power is forecast to grow to between 15-18% of total U.S. power production by 2030, an increase of 2,600% from 2013 capacity levels.[13]

- As of 2013, 3,442 MW of geothermal power was on-line. There is approximately 1,000 MW of planned capacity additions at existing plants and 3,100 MW of new geothermal resources presently under development. The National Renewable Energy Laboratory (NREL) estimates that there are over 30 GW of undiscovered geothermal resources in the U.S.[14]

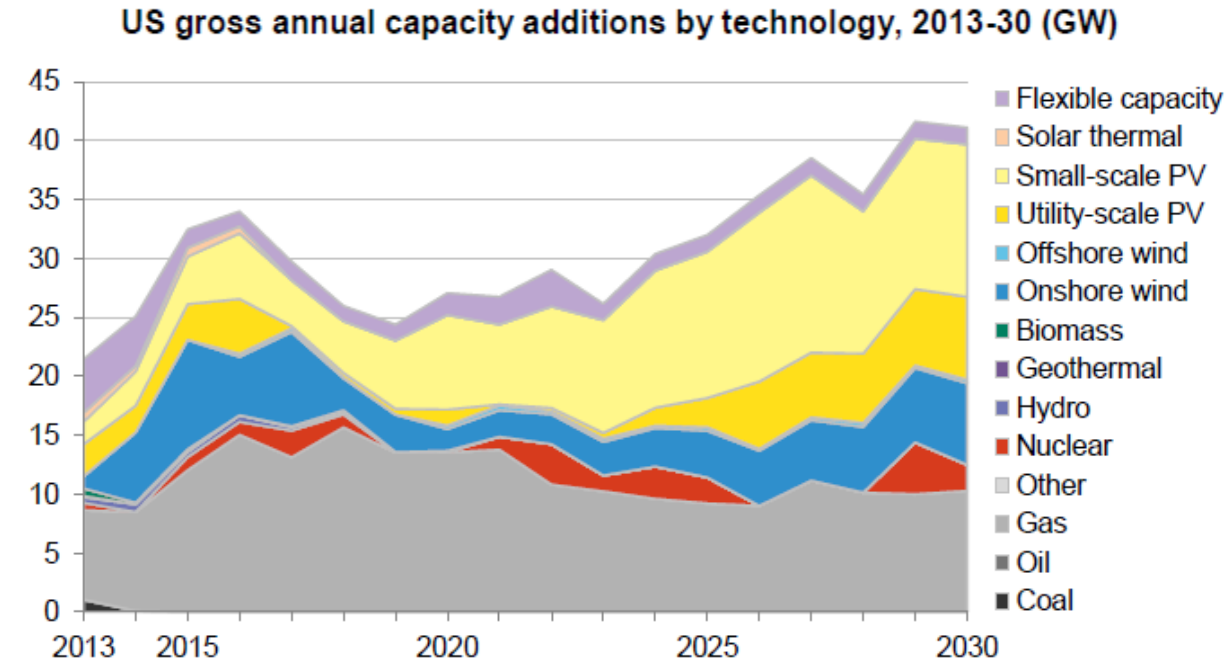
- Hydropower is presently the largest renewable energy source in the U.S. Estimates are that hydropower could supply an additional 60 GW by 2025 through increased capacity at existing power stations and adding generation facilities at the over 80,000 unpowered dams across the U.S.[15][16]

- Biomass power generation is experiencing substantial growth, adding 750 MW of new generation in 2013. NREL and others estimate that biomass power could generate up to 35 GW of power and provide 19% of U.S. electrical generation capacity by 2030.[17]

- There are 84 waste-to-energy facilities in the U.S. These facilities produce 2,554 MW of electricity. NREL estimates that waste-to-energy could produce approximately 10 GW of power by 2030, a four-fold increase from present levels.[18]

As the following graph illustrates, renewables are expected to scale up through 2030 with significant new gas capacity added.

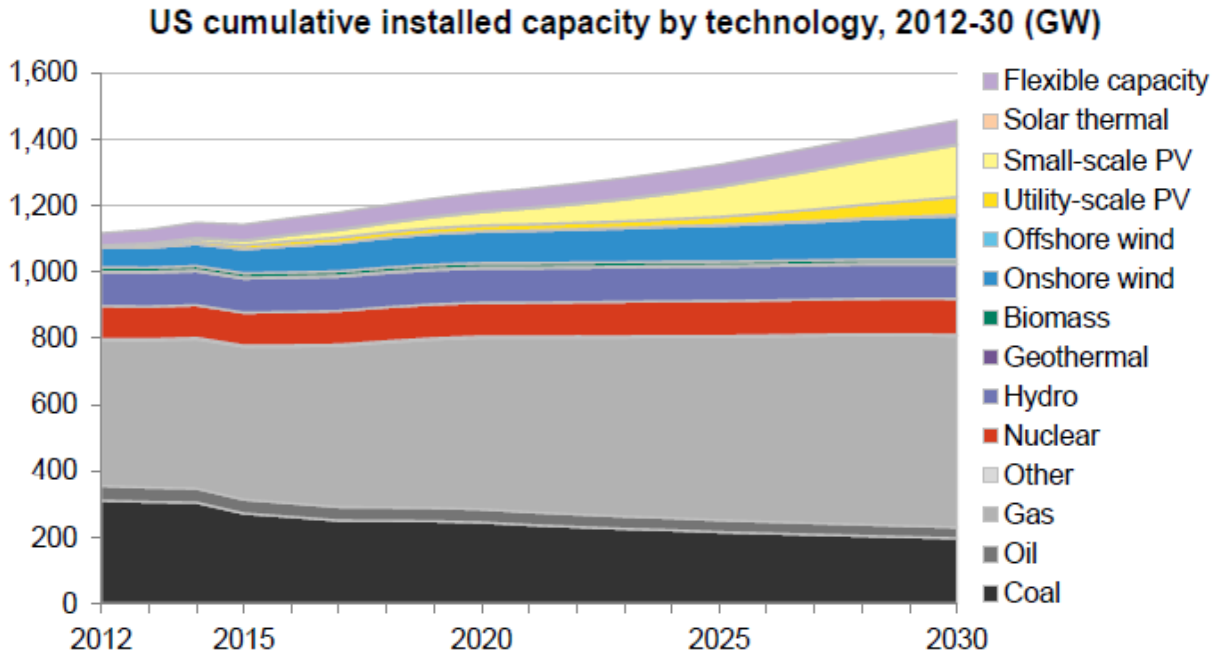
[13] Bloomberg New Energy Finance, *2030 Market Outlook*, *Americas*, June 20, 2014, 22-24.
[14] National Renewable Energy Laboratory, *Renewable Electricity Futures Study*, Vol. 2, 2012.
[15] National Hydropower Association, *Hydropower: For A Clean Energy Future*, 2014.
[16] For example, the New York City Department of Environmental Protection recently announced plans to electrify a dam at just one of its nineteen reservoirs which will produce 14 MW of electricity. NYCDEP Press Release, Sept. 16, 2014, *available at* <http://goo.gl/IgIpJZ>.
[17] National Renewable Energy Laboratory, *Renewable Electricity Futures Study*, Vol. 2, 2012.
[18] *Id*.



Source: Bloomberg New Energy Finance. Note: Figure excludes retirements.

As the following graph indicates, present estimates are that renewable energy will comprise 22% - 29% of total U.S. generation capacity by 2030 (up from today's 14%).[19,20] This far exceeds USEPA's estimate of renewable energy's potential and is, itself, a conservative estimate when compared with findings that renewables could supply 80% of the U.S. generation capacity by 2050.[21] Renewable energy is proving capability and capacity to supply the electricity the U.S. needs to grow our economy and ensure our security.

[19] Bloomberg New Energy Finance, *2030 Market Outlook*, *Americas*, June 20, 2014, 23.
[20] Citi, *Energy Darwinism II*, September 25, 2014, 13.
[21] National Renewable Energy Laboratory, *Renewable Electricity Futures Study*, 2012.

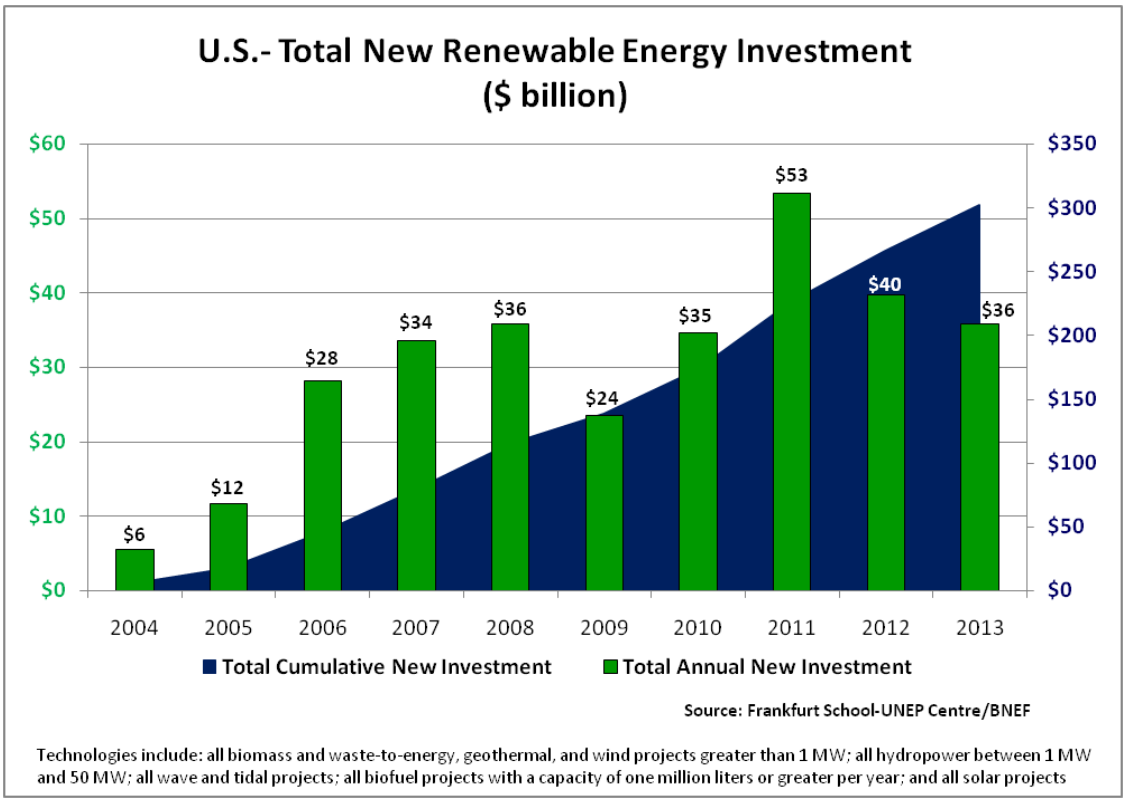


Source: Bloomberg New Energy Finance

3. Private Sector Investors See Value and Growth in Renewable Energy

The combination of increasing cost-competiveness and policy is fostering massive renewable energy private-capital investment. Private-sector investment in the U.S. renewable energy sector has grown significantly over the last ten years in response to state market demand policies and federal tax credits, including the production tax credit (PTC), investment tax credit (ITC), and the 1603 Treasury grant. Since 2004, more than $300 billion has been invested in the U.S. clean energy market, including $36 billion in 2013 alone.[22,23] Looking forward, estimates project over $268 billion will be invested in just wind and solar between now and 2026.[24] However, despite this significant growth in investment, policy uncertainties related to the off-and-on again federal tax credits have hampered investments; with policy certainty, even more would have been invested. As a result of this policy uncertainty, the financial industry is responding with a variety of funding mechanisms to raise the needed capital for renewable energy. As the sector matures, renewable energy is increasingly seen as its own asset class by institutional investors with many opportunities for positive investment returns and attractive yields in today's low-rate environment.[25]

[22] U.S. Partnership for Renewable Energy Finance, *Renewable Energy Finance, Market & Policy Overview*, April 2014.
[23] American Council on Renewable Energy, *Strategies to Scale-Up U.S. Renewable Energy Investment*, 2013.
[24] Bloomberg New Energy Finance, *2030 Market Outlook*, *Americas*, June 20, 2014, 20-21.
[25] KPMG Global Energy Institute, *Green Energy 2014, Renewable Energy M&A in The United States and Canada*, 2014, 5, 8.



One such funding mechanism is a YieldCo. A YieldCo enables developers to raise the needed capital to acquire assets (generally through an IPO), while shifting renewable power generation to a pure-play dividend-oriented company that provides stable, long-term cash flow to investors.[26] To date, three YieldCos have been created in the U.S. and have raised $1.097 billion in funds.[27,28] Several other YieldCos are in the planning stages and are expected to be active acquirers of renewable energy projects.

Another funding mechanism is a Green Bond, which provides financing for renewable energy projects. Green Bond sales have grown from $3 billion in 2012 to $14 billion in 2013 to $20 billion in just the first half of 2014, a new record.[293031] In recognition of this growing market, several large financial institutions jointly issued Green Bond Principles designed to provide guidance to issuers and encourage transparency and disclosure in the rapidly growing Green Bond market.[32]

[26] An example is NRG Yield, Inc. which sold 19.6 million shares and raised $431 million in its IPO. NRG Yield, Inc. holds 1.3 GW of solar and wind assets. To date, shares of NRG Yield, Inc. have appreciated over 120% and yields over 2.5%. Other YieldCos are also showing positive returns for investors.
[27] KPMG Global Energy Institute, *Green Energy 2014, Renewable Energy M&A In The United States and Canada*, 2014, 8.
[28] Bloomberg New Energy Finance, *Global Trends in Renewable Energy Investment 2014*, 45.
[29] U.S. Partnership for Renewable Energy Finance, *Renewable Energy Finance, Market & Policy Overview*, April 2014.
[30] Bloomberg New Energy Finance, *Global Trends in Renewable Energy Investment 2014*, 46-47.
[31] The Economist, *Green Grows the Market*, July 5, 2014.
[32] Green Bond Principals, 2014, Voluntary Process Guidelines for Issuing Green Bonds, *available at* http://www.jpmorganchase.com/corporate/Corporate-Responsibility/document/Green_Bonds_Principles.pdf

Yet another funding mechanism is a green bank, such as those in several states. Eleven states now have green banks in place or are in consideration. While no two green banks are exactly alike, their purpose is to expand the renewable energy market by using attractive interest rates and other financing products to leverage money from the private sector and fill the gap for smaller scale projects that are often excluded from commercial financing.[33]

States have a variety of funding options to establish a green bank. In Connecticut and New York, for example, each state's green bank was partially funded by proceeds from the sale of emission credits from the Regional Greenhouse Gas Initiative (RGGI). Thus, a state could establish a green bank using proceeds from a carbon tax, sale of emission credits, or other levied fees, such as a surcharge on utility bills. The green bank can then leverage public funds by attracting much greater private investment to clean energy and efficiency projects and recycle public capital so as to expand green investment and hold taxpayers harmless. On October 2, 2014, for example, the New York Green Bank announced its first transactions using credit enhancements, loan loss reserves and loan bundling to leverage approximately $800 million in clean energy investments.

Other possible private-sector funding mechanisms involve the expansion of existing investment vehicles to allow them to invest in renewable energy projects. Specifically, Real Estate Investment Trusts (REITs)[34] can be expanded to allow them to hold renewable energy assets. This would require several legal changes to allow REITs to use the ITC, realize related depreciation deductions, and re-define "real estate" to include renewable energy assets (presently the subject of proposed IRS rulemaking, *see* IRS-2014-0015-0024). These legal changes will allow REITs to deploy their capital to acquire renewable energy assets while continuing to provide tax-advantaged returns for investors.[35]

Master Limited Partnership (MLPs)[36] may also be expanded to allow them acquire renewable energy resources as part of their income generating holdings or allow formation of pure renewable energy MLPs. MLPs have a long history of successfully driving private investment in oil and gas resources. Expanding the role of MLPs would accelerate the growth of renewable energy by opening up a whole new pool of investors to the sector. The deep and liquid MLP investor base would result in competitive costs of debt and equity compared to what is available to renewable energy projects today. In addition, MLPs would provide a new and appealing way for utilities to invest in renewable energy projects that would produce a higher rate of return than holding the renewable energy asset within the utility entity.[37]

[33] Fortune, *A $1 billion Bet on Clean Energy*, Sept. 1, 2014.

[34] Real Estate Investment Trusts (REITs) allow retail investors the opportunity to invest in commercial real estate. A REIT acquires real estate in a number of ways and provides tax-advantaged returns to investors holding shares in the REIT.

[35] American Council on Renewable Energy, *Strategies to Scale-Up U.S. Renewable Energy Investment*, 2013, 35-36.

[36] An MLP is a business structure that is taxed as a partnership, but has ownership interests of a corporation, including publicly-traded stock, liquidity, limited liability, and dividends. The funding advantages of corporations and tax advantages of partnerships make MLPs highly attractive to private investments and MLPs can access a lower-cost capital than traditional financing methods.

[37] Bill Ritter, The Wall Street Journal, *Let's Even the Playing Field for Renewable Energy*, September 30, 2014.

4. Renewable Energy Generation Creates Jobs and Economic Growth

The renewable energy industry is creating thousands of new jobs each year. The wind-power industry employs over 80,000 workers in the U.S.,[38] a number that can double with the right policies.[39] The U.S. solar industry employed 142,698 Americans as of November 2013, a 19.9% growth in employment since September 2012.[40] The geothermal industry supports over 20,147 jobs.[41] America's biomass and waste-to-energy industries provide 25,000 jobs nationwide.[42,43] As renewable energy continues to expand, more jobs will be created. The opportunity to deploy technologies at scale allows companies to invest in large-scale manufacturing, shipping, assembly and other supply operations, all of which add a mix of jobs. States that adopt robust renewable energy policies as part of their SIPs will reap these employment gains.

At the same time, the need to compete to succeed in deployment, as developers typically must do to satisfy utilities' requirements under a state RPS, creates powerful incentives to increase efficiencies, lower costs, and improve performance. In turn, the prospect of a growing market attracts innovators, entrepreneurs and venture capitalists seeking to profit from additional cost-reducing and performance-enhancing technological and business model innovations. Even the most prosaic aspects of the production system – from material manufacturing to shipping, marketing, permitting and construction management – face growing competitive incentives to increase productivity and performance while lowering costs for domestic suppliers, developers and ultimately, U.S. business and household customers.

5. Renewable Energy Deployment Is Driving the Development of a Modernized Grid System

Renewable energy can drive technological developments in the nation's power grid. According to one study, up to $2 trillion needs to be invested in the nation's power grid by 2030.[44] This opportunity should be used to build a modern, intelligent, responsive, and resilient power grid that will be able to integrate renewable energy sources, distributed generation, and effectively use intelligent business processes to more seamlessly move renewable energy from production areas to load areas. This will require the use of new and existing technologies to build a truly 21st Century power grid. Investments in intelligent and advanced grid technologies can allow for better load management, system resilience, easier maintenance, increased consumer choice, and enhanced safety and security.[45] While these advanced grid technologies and intelligent business processes may not substitute for certain new capital investments, such as lines to increase transfer capacity between Independent System Operators (ISOs)/Regional Transmission Organizations (RTOs) or lines to access large remote renewable resources, they do allow grid operators to get the most out of every existing line, every new line, and the transmission network as an integrated system.

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[38] U.S. Partnership for Renewable Energy Finance, *Renewable Energy Finance, Market & Policy Overview*, April 2014.
[39] Environmental and Energy Study Institute, *Fact Sheet: Jobs in Renewable Energy and Energy Efficiency*, 2013.
[40] The Solar Foundation, *National Solar Jobs Census, 2013*.
[41] Environmental and Energy Study Institute, *Fact Sheet: Jobs in Renewable Energy and Energy Efficiency*, 2013.
[42] Biomass Power Association, *Fact Sheet: Biomass Basics*.
[43] Environmental and Energy Study Institute, *Fact Sheet: Jobs in Renewable Energy and Energy Efficiency*, 2013.
[44] The Brattle Group, *Transforming America's Power Industry*, *The Investment Challenge 2010-2030*, 2008.
[45] International Renewable Energy Agency, *Smart Grids and Renewables*, *A Guide for Effective Deployment*, 2013.

Renewable energy is also driving technological developments in energy storage systems (ESS).[46,47] ESS technologies are key to addressing the variability of renewable resources not managed by intelligent systems by allowing power to be stored and then deployed as needed, thereby foregoing the need for fossil-fuel powered back-up generation facilities. Similarly, ESS could also provide critical backup power to the grid in times of peak usage or outages without the need for fossil-fired backups. According to one study, distributed solar with ESS (batteries) is already at grid parity in Hawaii, and will reach grid parity in all regions of the country by 2030.[48] ESS also improves the reliability of the grid, aids the development of microgrids, and can provide critical emergency power during outages and natural disasters.[49] The Department of Energy has set a conservative estimate of 5 GW of new storage by 2022 and expects the ESS industry to grow by several billion dollars.[50] Others have found that the potential for 47 GW (including 25 GW of battery storage) of ESS by 2030.[51]

6. State Are Proving that Renewable Energy Works

Several states have achieved a high penetration of renewable energy due to a combination of strong state-level policies and marketplace response. These states are enjoying robust growth in their renewable energy sectors with corresponding job growth and private investments. These states are also developing innovative policies to modernize their electrical systems and marketplaces for the 21st Century.

Texas is the nation's largest wind market with an installed capacity of 12,755 MW, 8.3% of the state's capacity. On ERCOT, the main Texas grid, wind energy provided 9.9% of 2013 electricity. Texas established a renewable portfolio standard (RPS) in 1999, and it was amended in 2005. The present RPS provisions require 5,880 MW of renewable energy by 2015. The state also has a target of reaching 10,000 MW of renewable capacity by 2025, a target that the wind industry met in 2010. In addition, Texas established Competitive Renewable Energy Zones (CREZ) and supported the build out of transmission lines to harvest and efficiently deliver to load centers the state's considerable wind resources.[52] Analysis has demonstrated that due to the zero marginal cost for fuel, the merit order power costs for consumers have been made lower by wind generation.[53]

Arizona is home to the world's largest solar parabolic trough plant. With its molten salt thermal energy storage system, the facility produces 280 MW of electricity. Arizona is also home to the world's largest solar PV system, which produces 290 MW of electricity. Together, the two facilities produce enough electricity to power more than 140,000 homes. Arizona is also the nation's second largest residential solar market with 1,563 MW of installed capacity.[54] Almost half of that capacity – 734 MW – was installed in 2013 alone.[55] Unfortunately, a new per kilowatt hour charge on net metering systems has

[46] Climate Wire, *U.S. Utility Unveils Largest Battery System in North America*, September, 24, 2014.
[47] Climate Wire, *Liquid Battery Breakthrough Could Enable Grid-Scale Energy Storage*, September 25, 2014.
[48] Rocky Mountain Institute, *The Economics of Grid Defection*, February 2014.
[49] U.S. Department of Energy, *Grid Energy Storage*, December 2013
[50] *Id.*
[51] Citi, *Energy Darwinism II*, September 25, 2014, 14.
[52] American Council on Renewable Energy, *Renewable Energy in the 50 States: Southeastern Region*, 2013, 28-29.
[53]
[54] American Council on Renewable Energy, *Renewable Energy in the 50 States: Western Region*, 2014, 9-10.
[55] Solar Energy Industries Association, *State Solar Policy: Arizona Solar*, *available at*: http://www.seia.org/state-solar-policy/arizona

depressed installations in 2014. Arizona is nonetheless an example of what a state can achieve when the most effective and efficient state-level policies are in place.

New York is making a concerted effort to develop its clean energy economy. The state has a significant amount of installed wind and solar generation capacity and is also one of the nation's top generators of electricity from hydropower, landfill gas, and municipal solid waste. Together, these resources produced 7,207 MW of power and support 266,000 jobs.[56] With its diverse array of incentives, New York is well positioned to further increase its market share of the renewable energy industry. For example, the state's new Green Bank aims to leverage private-sector capital to finance renewable energy projects and spur economic development.

New York is also putting in place innovative policies designed to grow New York's renewable energy market, as well as modernize its grid and increase energy efficiency. This effort, called the Renewable Energy Vision, is designed to create market-based incentives for the deployment of renewable energy, smart grids, and energy efficiency.[57] Under the proposal, regulated utilities would still maintain operational control of the grid, but would be compensated for investments based on certain performance metrics, rather than capital investment. Utilities would have an explicit directive to procure more resources from individual customers and third-party companies providing solar, storage, combined heat and power, microgrids and energy efficiency services. Rather than simply valuing the build-out of more centralized power plants, as regulators have traditionally done, New York has decided to value environmental performance and network efficiency, and then let competition flourish under that broad framework.[58] While this plan is still being refined, it could serve as a model for states seeking to integrate renewables and energy efficiency programs.

Kansas was the last of the 30 states to adopt an RPS. Kansas' RPS requires its utilities to meet 20% of their peak demand with renewables by 2020. Well on its way to meeting this standard, Kansas doubled its renewable capacity in 2012 and now has over 3,000 MW of installed renewable energy. Not surprisingly given Kansas' location, wind power has been the main source of this expansion. The expansion of wind power generated over $3 billion in investments in the state and the wind power industry now employs more than 13,000 Kansans. Several large wind manufacturing companies have located facilities in Kansas. Kansas projects its wind power generation capacity could grow to 7,000 MW by 2030, attracting additional investment and generating more jobs. Moreover, Kansas' RPS has proven to be economical with a recent study finding that the cost of Kansas' RPS comprised just 0.21 cents of the 9.55-cent average retail price of electricity across the state. [5960] Although a recent effort was made to repeal Kansas' RPS, this effort failed due, in part, to a poll that found that 91% of Kansans support using renewable energy.[61]

California is another example of what can achieved with focused, certain policies underpinning renewable energy. California leads the nation in generation capacity from geothermal, biomass, solar PV, and solar thermal electric projects, while placing second in wind and hydropower generation capacity. The high penetration of renewable energy is largely due to California's ambitious RPS that

[56] American Council on Renewable Energy, *Renewable Energy in the 50 States: Northeastern Region*, 2014.
[57] New York Clean Energy Fund Proposal, Case 14-M-0094.
[58] New York Public Service Commission, *Reforming the Energy Vision*
[59] E&E EnergyWire, *Kansas Flirts With Repeal of Renewable Energy Standard*, March 27, 2014.
[60] Kansas Department of Commerce, *Alternative Energy*,
<http://www.kansascommerce.com/index.aspx?NID=468>
[61] E&E EnergyWire, *Kansas Flirts With Repeal of Renewable Energy Standard*, March 27, 2014.

requires 33% of its electricity to be generated by renewable sources by 2020.[62] California is well on its way to meeting this standard, as its investor-owned utilities presently produce 22.7% of their power from renewable sources, thereby satisfying 74% of the 2020 RPS.[63] This high level of renewable energy has created jobs and driven investments. According to the Bureau of Labor Statistics, 360,245 Californians are employed in Green Goods & Services Jobs and over $14.5 billion has been invested in renewable energy in the last 2 years alone.[64]

The progress in these states is not only impressive but illustrative. States that have recognized the growing role of renewable energy and adopted the corresponding policies have experienced remarkable growth in both renewable energy and their economies. This can be replicated across the country if USEPA gives states a strong signal to choose renewable energy to meet their reductions under this proposed Plan.

Needed Improvements to the Proposed Rule

1. **The Proposed Rule's Interim Compliance Goals Should Be Revised**

The proposed rule sets an interim goal that must be met over a three-year average during the 2020-2029 timeframe. The interim emission goals require significant emission reductions and require a majority of states to make 50-70% or more of their total reductions during this period. In order to meet their interim goals, a number of states will need to make these reductions in the early years of this plan, possibly by 2020. This "compliance cliff" could result in a number of marginally effective outcomes. Transitioning from existing carbon-emitting Electric Generating Units (EGUs) to truly clean power will require time to support and build modern infrastructure and for states to adopt and implement the appropriate clean energy policies. Thus, the rule should be improved by revising the 2020 interim compliance goal.

The economic viability of existing coal EGUs, when considering the cumulative results of other emerging USEPA regulations (MATS, CSAPR, 1-hr SO2 NAAQS, CWA 316(b), and ash rules) coupled with the interim compliance checkpoints, may create reliability concerns. These concerns will likely be addressed by shifting generation to existing natural gas combined cycle (NGCC) units and/or the construction of new NGCC units with economic lives that far exceed 2030, cementing gas dependency regardless of the economics of zero-carbon generating sources.[65] While natural gas and renewable energy generation can complement with natural gas ramping capability balancing variable renewable generation and renewables helping address gas price volatility, the sudden retirement of coal-fired EGUs combined with the lack of sufficient natural gas infrastructure in most states could lead to resource adequacy risks and high power prices. While these outcomes can be avoided by the deployment of cost-effective renewable energy, the early compliance target overlooks the timeline, which may be needed to construct these cost-effective resources at the necessary scale.

[62] American Council on Renewable Energy, *Renewable Energy in the 50 States: Western Region*, 2014.
[63] California Public Utilities Commission, *available at* http://www.cpuc.ca.gov/PUC/energy/Renewables
[64] American Council on Renewable Energy, *Renewable Energy in the 50 States: Western Region*, 2014.
[65] Moreover, new NGCC plants are effectively unregulated under the proposed 111(b) regulations for new power plants. Therefore, a scenario could arise where more new gas plants are built and, in conjunction with a higher capacity factor at existing NGCC plants, actually increase overall carbon emission thereby defeating the goals of this plan.

The interim compliance period may also prevent states from adopting the most strategic policies to encourage the build out of renewable energy sources because the interim compliance period disallows the amount of time needed by legislative bodies to enact the correct policies (as discussed herein the "tool kit" section). A number of state legislatures are not in session or have shortened or budget-only sessions in 2016 during crucial months leading up to USEPA's deadline for SIPs submittals. In 2016 for example, four states do not convene their legislatures and four more have only budget sessions. In addition, at least eight states have required legislative approval for SIPs.[66] Even if the proper policies are put in place, the interim compliance period does not allow sufficient time for the construction of new cost-competitive renewable energy facilities, and, more importantly, the critical expansion and improvement of the electrical grid needed to more easily integrate increasing levels of renewable energy and to deliver this energy from remote sites to load centers.

In addition, many states will likely delay designing an implementation plan until all legal challenges to the proposed rule are resolved. As a result, there could be a forced rush to comply created by the compliance cliff. This will likely result in the immediate retirement of existing coal EGUs and, due to immediate reliability concerns caused by these retirements, substituting other slightly lower emitting fuels in their place. This compliance rush could result in thoughtful renewable energy policies being ignored or abandoned. Such a rush also places ratepayers at risk as the price of substitute fuels; which is, if history is any lesson, is likely to dramatically increase as a single source of energy. In contrast, renewable energy has the advantage of zero fuel costs, which actually constrains electricity rates and protects ratepayers.

The rule should be improved by revising the 2020 interim compliance goal. The modification of the interim compliance goals would allow states to implement a more flexible compliance glide path taking into account their generation mix, reliability needs, emission target, renewable resources, and other factors. States would still be required to comply with the 2030 limits but would do so at a rate that is appropriate for each state. As an alternative, the USEPA could set a straight-line compliance target that requires states to meet a steadily decreasing emission target but smoothes out reductions over the ten-year period rather than front-loading the reductions as in the present, proposed rule. Such an approach allows time for the adoption of effective, thoughtful renewable energy integration policies, as well as the construction of grid infrastructure, adaptation of technology and business processes and renewable energy facilities at a scale that can provide generation to more effectively address all reliability concerns created by the retirement of existing coal-fired EGUs.

2. <u>The Regional RPS Approach Should Be Revised To Maximize Renewable Energy's Potential</u>

The USEPA emissions reduction framework can be potentially very effective. The agency astutely looked outside the fence line to determine its state-by-state calculations for carbon emissions goals. However, USEPA's assumptions for renewable energy does not adequately account for present state policies that are driving the large-scale adoption of renewable energy.

The primary state policy driving the adoption of renewable energy is the renewable portfolio standard (RPS). As USEPA correctly notes, these standards vary greatly among the states in both timing and amounts. In order to estimate the amount of renewable energy expected to be deployed in a state in 2030 as part of Building Block 3, the proposed rule first creates six regions. The RPSs of the states in each region are then averaged using 2020 as the baseline requirement year to calculate each region's

[66] Colorado State University, *A State Planning Guide for Clean Air Act Section 111(d),* June 2014.

renewable energy potential. USEPA assumes that all states in each region (whether or not they have an RPS) can achieve by 2030 the average of the 2020 requirements of the region.[67] While this level of renewable energy deployment is feasible, as structured, the proposed building block fails to account for the growth in renewables and apparently assumes that most states will fail to meet their own targets for renewable energy.

This regional RPS approach forces an averaging down effect, whereby many states' regional RPSs project to fall well below their own statutory, legislated RPS. USEPA's averaging down results in at least 17 states failing to meet their own renewable portfolio standards under the proposed rule. This outcome is not supported by the actual progress states are making toward meeting their RPSs.[68] Full compliance with all state RPSs through 2030 requires the construction of 3.5 GW of renewable generating capacity per year,[69] yet the renewable energy industry is presently on a 2014 pace to install about 18 GW of renewable power. This market appetite is reflected by the facts that that renewable energy generation comprised 53% of all new 2014 power generation to come on-line to date, and renewable energy is the fastest growing source of new generation.[70] This market force will clearly continue as states rapidly build out renewable energy resources in order to comply with their own RPS goals.

The problem with the regional averaging approach is further demonstrated by the fact that 7 states' actual 2013 renewable energy generation already exceeds the USEPA's renewable energy targets for 2030. USEPA is therefore assuming that no further growth of renewable energy will occur in these states. This is clearly not the case as these states continue to deploy renewables to meet and exceed their RPSs for the profitable economic benefits the projects deliver.

The best approach is to assume full compliance with existing state RPSs by 2030 and hold states to their RPS goals rather than averaging down to a regional RPS. Such an approach recognizes the decisions of state legislatures and their policy choice to deploy renewable energy resources. Equally, the approach also increases the amount of renewable energy in Building Block 3 to more accurately reflect present state policies and those policies effect on renewable energy deployment; as well as, renewable energy's proven ability to significantly reduce or eliminate carbon emissions.

For states without an RPS, the regional averaging down approach is also problematic. The majority of non-RPS states are clustered in the same regions. As a result, their calculated regional RPS is much lower than surrounding regions that contain states with RPSs. In fact, in two regions (the Southeast and South Central), the regional RPS goal is based upon a single state's RPS (North Carolina and Kansas, respectively). The flaw in the regional approach is that it does not adequately account for the renewable energy potential in states without an RPS. For example, Florida has the third highest solar potential of all the states and could, with the proper policy, significantly expand their use of solar far beyond the

[67] USEPA Clean Power Plan, Technical Support Document, *GHG Abatement Measures*, June 10, 2014.
[68] USEPA notes that state compliance levels are increasing with a weighted average compliance rate of 95.2% in 2011 despite increasing RPS obligations. This demonstrates the unreasonableness of USEPA's approach in which it assumes that compliance rates will drastically fall through the use of regional averaging. *See* USEPA Clean Power Plan, Technical Support Document, *GHG Abatement Measures*, June 10, 2014, 4-3.
[69] U.S. Partnership for Renewable Energy Finance, *Ramping Up Renewables: Leveraging State RPS Programs Amid Uncertain Federal Support*, July 2012.
[70] Office of Energy Projects, *Energy Infrastructure Update*, July 2014.

southeast regional 10% level assumed by the proposed rule.[71] USEPA notes that several non-RPS states have above-average biomass and solar potential, but assumes that these resources will not be used to full potential. As states with an RPS are presently demonstrating, renewable energy is capable of being deployed at ever increasing rates and scale, with lower costs for consumers and able to satisfy more demanding RPSs than the regional RPSs envisioned under the proposed rule. Ironically, the non-RPS states are effectively being rewarded for not choosing to adopt an RPS and for enabling renewable energy goals that do not reflect renewable energy's potential in their states.

A more effective approach is to calculate a renewable energy target for each non-RPS state based upon its present renewable energy deployment levels, the recent growth rates for renewable energy in each state, and, importantly, each state's actual renewable energy potential. Such an approach ought to take into account the recent growth rates of renewable energy deployment in states with similar potential renewable energy resources.

3. States Should be Given Credit for Early Action

The proposed rule fails to adequately recognize states for early action to generate renewable power. A number of states have already taken significant steps to reduce their carbon emissions through the adoption of RPSs, regional carbon trading programs, and other programs. These states deserve to receive credit for these early actions in setting their emission reduction targets. Such credit, ought not relax the requirement to continue to reduce their emissions. In fact, the rule ought to require levels of emissions reductions from these states but not the questionable large reductions relative to other states that have not begun integrating their renewable energy resources.

Also an issue, the rule uses 2012 as a baseline for calculating carbon emissions but the interim compliance period does not begin until 2020. This actually suggests that the potential carbon emissions reductions during 2012 to 2020 is not properly encouraged. There is no question that states with RPSs (and even those without) will continue to expand their use of renewable energy during this period; however, the rule does not offer credit for doing so. Crediting emission reductions secured between 2012 and 2020 through the use of renewable energy and energy efficiency encourage states to act earlier and more rapidly move strategic emission reductions forward in time.

The rule should be revised to provide credit for early action taken by states prior to 2012 and from 2012 to 2020. States could receive extra credit for early action in generating renewable energy power and receive extra credit for exceeding their renewable energy targets. This approach rewards those states which have led in renewable energy deployment and also incentivizes those states to invest more and earlier in low- and no carbon energy, regardless of technology for renewable energy generation.

4. The Proposed Rule Should More Accurately Account for Growth in Renewable Energy

The proposed rule's low growth rate for renewables should be corrected as the present calculation runs counter to what is actually occurring. USEPA notes that full compliance with state RPSs requires 3-5 GW

[71] At the other end of the spectrum is South Dakota, which does not have an RPS but is grouped in a region with several RPS states. While lacking an RPS, South Dakota already exceed USEPA's projected 2030 renewable energy goal. Several other non-RPS states will likely exceed their 2030 goals before their SIPs are submitted. The rule thus wrongly assumes that little to no renewable energy will be built in these states between now and 2030 despite their obvious renewable energy resources.

of renewable energy deployment annually through 2020 and 2-3 GW through 2030. The industry is already far exceeding these numbers, which USEPA recognizes, and deployed more than 6 GW annually from 2007-2012 and 16 GW in 2012.[72] By using 2012 as the baseline in conjunction with the artificially low regional targets, the proposed rule fails to capture the recent rapid growth in renewable energy deployment. This failure to capture the marketplace realities vastly underestimates the amount of renewable energy that can be deployed by 2030. A more accurate projected growth rate would assume present, documented deployment levels to continue and increases in accordance with historical trends. Such a position would eclipse the unusually conservative growth rates envisioned by the proposed rule.

5. The Proposed Rule Should Account for Existing and New Hydropower

USEPA specifically excluded hydropower from the definition of renewable energy for purposes of Building Block 3. USEPA claims that inclusion of hydropower generation would distort the proposed approach by assuming future development potential of large hydroelectric capacity in other states.[73] USEPA's approach should be changed and hydropower should receive equitable treatment as a critical renewable energy source within Building Block 3. Moreover, new hydropower projects should be encouraged but hydropower should be considered in addition to other renewable energy sources.

One way to improve the equitable treatment of hydropower under the proposed rule is to treat hydropower similar to "at-risk" and "under construction" nuclear power as part of Building Block 3. Hydropower production could be considered "at risk" because in the next five years, 6,000 MW of non-federal hydropower licensed by the Federal Energy Regulatory Commission (FERC) will be up for re-licensing. When looking forward to the next ten years of re-licensing activity, that number of megawatts more than doubles to more than 12,000 MW.[74] Hydropower supplies reliable, carbon-free electricity and states and markets must be encouraged to keep optimized hydropower capacity on-line into the future.

With respect to "under construction" hydropower, many new hydropower projects will begin construction or be brought on-line prior to 2030. Since 2009, FERC has licensed 609 MW of new hydropower capacity and there are presently 65,000 MW of proposed hydropower projects in various stages of regulatory approval. While some of these projects may not be approved, the facts demonstrate the potential for new hydropower construction across the country. This is further demonstrated by the fact that only 3% of the nation's 80,000 dams are used for electric power production. A 2012 Department of Energy study found that more than 12,000 MW of capacity could be added to the nation's non-powered dam infrastructure. Two-thirds of that capacity can be developed solely at selected 100 unpowered dams. Efficiency upgrades are also being performed on aging dams to increase power output.[75]

6. State and Federal Implementation Plans Should Include Use of Renewable Energy

Under the proposed rule, USEPA will craft a federal implementation plan (FIP) for a state that is unable or unwilling to submit a satisfactory SIP. As part of a state's strategy, a FIP should use high levels of renewable energy in crafting state compliance with emission goals. Renewable energy continues to grow as a share of our nation's overall electricity portfolio. Such scale-up continues to drive down costs,

[72] *Id.* at 4-3.
[73] USEPA Clean Power Plan, Technical Support Document, *GHG Abatement Measures*, June 10, 2014, 4-5.
[74] American Council on Renewable Energy, *Outlook for Renewable Energy: 2014,* 32.
[75] *Id.* at 32-33.

increase sector efficiencies, provide tens of thousands of jobs for U.S. workers, and foster billions of, mostly private, investments dollars. As the only low-cost, zero-carbon power source, renewable energy is not only be able to meet this country's power needs but will allow the states to efficiently and economically achieve their carbon reduction targets set forth in the proposed Clean Power Plan.[76]

7. The Proposed Rule Should Provide Sufficient Guidance to States on Interstate Production and Use of Renewable Energy

In the proposed rule, USEPA provided limited guidance for how states can chose to incorporate renewable energy resources into their individual SIPs beyond citing the maximum renewable potential for each state. USEPA also provided no guidance on the use and trading of renewable energy credits (RECs) as a means of compliance. Left unanswered by the proposed rule is whether a state can only take credit for renewable energy facilities located within a state's borders or whether a state may comply by obtaining power through long-term power purchase agreements of out-of-state power or RECs. As this is already a common practice by states seeking to comply with their RPSs, this practice should also be specifically defined and allowed in the final rule.

Furthermore, in contrast to rule making under Section 110 of the Clean Air Act (CAA) USEPA has not provided a model SIP for states or offered any guidance as to the policies allowed in a SIP. Guidance should detail how states can diversify and de-carbonize their energy portfolios with renewable energy, which provides the greatest long-term benefit to public health, national security, and our economy. In order for states to achieve the most cost-effective zero-carbon solutions, ACORE provides in our comments the following necessary elements of a model solution and requests that USEPA provide further guidance in its supporting documents so that states can effectively take into consideration all aspects of zero-carbon solutions when developing individual SIPs.[77]

ACORE's Suggested Solution: A State "Toolkit" for Increased Renewable Energy Deployment to Cost-Effectively Achieve Clean Power Plan State Targets

In the proposed rule, USEPA wisely affords states broad flexibility in meeting emissions reduction targets. Renewable and conventional energy resources and the nation's power markets vary region to region, and states have been important innovators in harnessing these resources and advancing strategies to diversify their power supply, ensure reliability, achieve affordability and eliminate carbon pollution. As USEPA recognizes, states have adopted a range of policies and renewable energy goals that have the effect of reducing emissions, generally through the use of RPSs.

States can most cost-effectively achieve Clean Power Plan 2030 carbon emission reductions through deployment of greater levels of renewable power generation. Renewable energy is virtually emissions-free, the least expensive option resource in many markets today and, as with most maturing but technologically enabled industries, and costs continue their downward trend. States can achieve their

[76] "The CO2 emitted from biomass-based fuels combustion does not increase atmospheric CO2 concentrations, assuming the biogenic carbon emitted is offset by the uptake of CO2 resulting from the growth of new biomass." USEPA, Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program, 74 FR 24904, 25,039 (May 26, 2009).

[77] As part of this further guidance from USEPA, ACORE recommends that USEPA provide the states with mass-based emission limits in the final rule and allow states to choose between rate-based and mass-based standards. This will foster inter-state collaboration and solutions.

Clean Power Plan targets while also realizing a host of additional benefits, including a 21st Century modern grid, a more modern diverse power supply, greater energy independence, more secure energy supply, new private sector investment, economic growth, and a growing mix of quality jobs. Effective state policies are essential to deploy greater levels of renewable energy and leverage the capital and ingenuity of the renewable energy industry.

Federal tax incentives for renewable energy have been an important complement to state policies in support of the growth of renewable electricity generation in the U.S. The federal PTC and ITC have helped reduce the up-front cost of capital-intensive new project development and construction. These policies encourage significant private sector finance. While renewable energy systems are fully cost-competitive in certain markets and increasingly so elsewhere, the fair and equal energy tax credits remain important to incentivize private capital formation and investment. Federal policies have also helped to level the playing field between renewable and conventional energy resources, which enjoy at least 12 permanent tax treatments.[78]

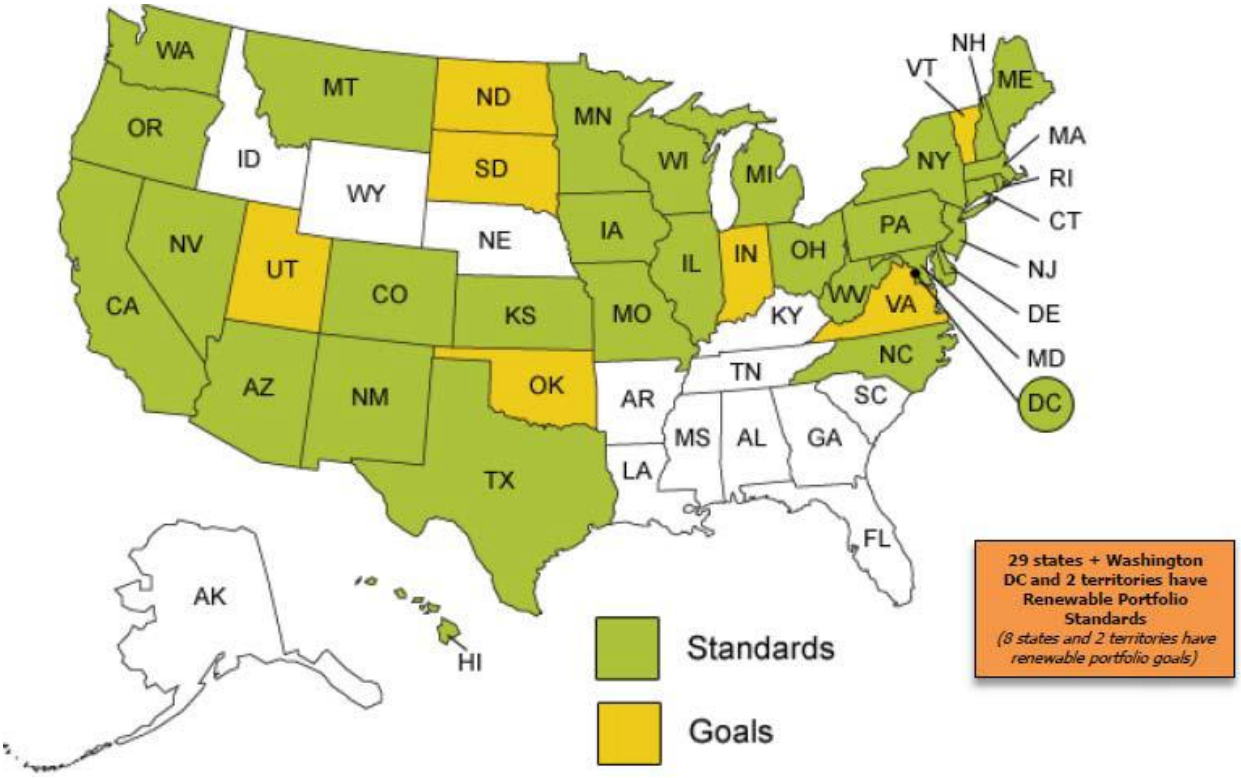
Federal policy support assists states in achieving their renewable energy goals and is still vital to maintain renewable energy market momentum. A myriad of federal and state fiscal, regulatory and other policies serve to support conventional energy development. Such policy support for renewable energy is nothing that has not previously been provided to the energy technologies of the past[79] or is presently provided to incumbent, non-renewable energy industries.

1. Increase and Broaden RPS Targets

States play a leading role in encouraging investment and deployment of renewable energy, primarily through renewable portfolio standards (RPS). Thirty-seven states and the District of Columbia have enacted renewable energy standards or goals. State RPS policies have provided investors and developers with important long-term, market demand targets. RPS policies have been a successful and low-cost tool with more than 68% of renewable energy generation in the U.S. (~51 GW) occurring in states with RPS policies at a cost of less than 2% of electric rates in states with RPS policies.[80] However, to achieve Clean Power Plan targets through greater use of cost-competitive renewable energy, RPS policies need to be increased and broadened, possibly to more states and to more utility segments. Thirteen states presently do not have RPS policies, and in some states not all utilities are covered by existing policies. In the aggregate, all future requirements under existing RPS policies only amount in the range of 3.5 GW of new renewable energy power each year through 2030[81] (ACORE-US PREF), well below what the US renewable energy industry can deploy.

[78] *See* Speech of the Honorable Charles Grassley, November 20, 2014, Congressional Record, p. S.6173-174.
[79] "60 Years of Energy Incentives: Analysis of Federal Expenditures for Energy Development," The Nuclear Energy Institute, October 2011, 10.
[80] National Renewable Energy Laboratory and Lawrence Berkley National Laboratory, *A Survey of State-Level Cost and Benefit Estimates of Renewable Portfolio Standards*, May 2014.
[81] U.S. Partnership for Renewable Energy Finance, *Ramping Up Renewables: Leveraging State RPS Programs Amid Uncertain Federal Support*, June 2012.

States with Renewable Standards or Goals



Source: Energy Information Administration

With increased and stronger RPS policies, the US renewable energy industry can finance and install increasing amounts of power generation. Renewable energy additions have averaged approximately 10 GW per year since 2008,[82] including more than 16 GW in 2012 (FERC) or 49% of all new capacity that year.[83] The ability of the industry to ramp up generation is virtually unlimited.

A number of states on a bipartisan basis have already taken action to increase or strengthen their RPS policies. In 2009, California's Governor issued an executive order increasing the state's RPS target from 20% by 2010 to 33% by 2020. In Colorado, the state legislature in 2007 modified the state's RPS program (from a 2004 ballot initiative) to include a higher target; the 2007 modifications also added separate renewable energy requirements for electric cooperatives, which previously had been omitted from the state's RPS mandate. In 2010, the Colorado legislature again increased the state's RPS target, to its present level of 30% by 2020. In 2012, the Maryland legislature enacted a bill accelerating compliance deadlines for the state's solar carve-out (including changing the ultimate 2% target date from 2022 to 2020). In 2013, Minnesota increased its RPS to 40% and New Jersey in 2010 converted its significant RPS target to a capacity requirement (versus a percent of generation).

[82] National Renewable Energy Laboratory and Lawrence Berkley National Laboratory, *A Survey of State-Level Cost and Benefit Estimates of Renewable Portfolio Standards*, May 2014.
[83] Federal Energy Regulatory Commission, Office of Energy Projects, *Energy Infrastructure Update*, December 2012.

ACORE suggests elements from state RPS design and grid control area policy be synthesized to present best practices that facilitate renewable energy development, with a particular emphasis on leveraging private sector financing. For states with existing RPS policies, states can make their RPS targets more robust by aligning with the timeline of the Clean Power Plan through 2030 and raise overall and increase annual RPS targets. ACORE suggests infrastructure development under these state-level RPS programs is essential and offers best-practice strategies to increase demand in a financeable, most cost-effective manner:

- **Provide a Long-term, Predictable, Stable Market Signal:** State programs should include specific, realistic and long-term objectives that require increasing amounts of renewable energy generation over the baseline case of business-as-usual. Targets should be stable, ramp up steadily over time, and not be subject to sudden or uncertain shifts. A predictable, stable market that decreases risk for investors necessarily requires long-term credibility in renewable energy policy. This stabilizing effect also lowers the cost of capital for developers, producing cheaper power and reducing the need for public incentives over time.

- **Encourage Long-term Contracting with Credit-Worthy Counter-Party:** An RPS should encourage long-term contracting by utilities. Long-term power purchase agreements (PPAs), generally for 10 to 30 years, can help create market security sought by project developers and their financiers. Renewable portfolio standard implementation experience shows that programs have been the most successful when developers have been able to secure long-term contracts with credit-worthy counter-parties.

- **Encourage the Use of Renewable Energy Credits**: Expanding inter-state trade in Renewable Energy Credits (RECs) may be another cost-effective means to meeting higher RPS targets. Each state has the discretion to choose what level of RPS compliance it will allow through out-of-state RECs. Given the potential effects of increased interstate REC trading on local distributed generation, implementing this option may require coordinated regional action.

- **Supporting Utility-Scale, Wholesale, and Customer-Sided Distributed Generation:** Utility confidence in securing cost recovery supports long-term contracting and project finance. Utilities must have confidence that their cooperation with RPS requirements will not result in financial penalty or loss. Prudently incurred compliance costs by utilities should be recovered in electricity rates that are allocated fairly across all utility customers. This will ensure that the costs and benefits of development are spread and shared equitably. Implementation of policies by regulators to encourage utility ownership of renewable energy assets would send a strong market signal to finance markets. In addition, decoupling the sale of electrons from allowed profits would sever the strong disincentive that exists for third-party investment in customer-owned, distributed generation.

  Utilities can also efficiently procure distributed generation resources via feed-in tariff contracts, which are standard offer, fixed price, long-term power purchase agreements. In addition, a FERC order in 2011 regarding implementation by the California Public Utilities Commission of a feed-in tariff to support development of combined heat and power generation (134 FERC ¶ 61,044 (2011) (January 20, Order Denying Rehearing) paves the way for even greater use of feed-in tariffs to meet state RPS and other policy objectives. In this order FERC found the concept of a multi-tiered avoided cost rate structure to be consistent with the avoided cost rate

requirements set forth in the Public Utilities Regulatory Policy Act (PURPA) and its subsequent regulations. This ruling affords states greater ability to establish feed-in tariff rates at levels that would support private investment, including in renewable energy generation.

- **Addressing Project Development (*i.e.* Interconnection) and Operational Risks:** Aside from contracting, the most effective state policies also address other deployment risks in order to provide greater market certainty. Long-term contracting provides a major step in financial certainty and once that is in place, the next areas of risk then shift to consideration of project development and operational risk. In particular, interconnection risk and transparency in operations have simple solutions when paired with long-term contracting policy solutions. With regard to interconnection risk, mitigation in the form of a guaranteed interconnection if the PPA meets the standardized requirements of the long-term contracting program would be helpful. With respect to transparency in operations, making the contract price known and certain, making the contract duration follow the long-term financing (10-20 years), and operating a procurement system that is clear and easy to participate in (preferably a first-come, first-serve approach) are means to help the renewable developer achieve certainty in interconnection and operation, thereby reducing risk.[84]

- **Enforcing Compliance:** A state policy should have strong compliance enforcement mechanisms to ensure targets are achieved. An Alternative Compliance Payment (ACP) is often used to support compliance with current RPSs. An ACP effectively establishes a market ceiling for the price paid for renewable energy. If set below the cost of renewable energy, market participants would likely pay the ACP amount rather than invest in actual renewable energy production. This effect can be mitigated in the regulatory process by establishing different standards for rate recovery covering the utility's fixed and variable costs, i.e. providing greater certainty of cost recovery for energy procurement versus the ACP alternative.

  The ACP level will also influence the kind of renewable energy developed. Renewable energy technologies are at different stages of development, serve varying market needs, and often are at different price points. Many states have established carve-outs or other mechanisms to develop a broader array of resources with ACPs set at points to move a particular market class (e.g. wind or solar) or segment (e.g. residential or commercial). In certain states, ACP payments are paid into a renewable energy fund that will facilitate capital deployment to renewable energy initiatives. To the extent a state policy has carve-outs for specific technologies, ACP policies should also direct capital to those specified technologies when ACP payments are triggered.[85] The effect of a wide variation in treatment by technologies is to funnel financing into proven technologies that are treated the same across state borders.

- **Integrated Resource Planning**: States with a deregulated wholesale power markets have the ability to engage in integrated resource planning, while also benefitting from a competitive generation market, allowing a wide amount of latitude for RPS design. These states may have the benefit of proscribing procurement policy that spurs renewable energy development while also taking advantage of deep wholesale markets. Many states allow the procurement of

[84] John Farrell, *CLEAN v SRECS - Finding the More Cost-Effective Solar Policy,* Institute for Local Self-Reliance, October 2011.

[85] See New Hampshire recommendations on APC funds distribution: http://www.puc.nh.gov/Sustainable%20Energy/RPS/RPS%20Review%202011.pdf

renewable energy to count toward RPS requirements if it is delivered into the RTO, ISO, or other organized market. In theory, the deep wholesale market for procurement allows several utilities to aggregate their demand for renewable energy and provide a consistent source of demand for renewable energy development. A renewable energy developer in a large wholesale market can then theoretically sell into multiple states with RPS requirements if they allow delivery into the market to count.

2. <u>Use Effective Renewable Energy Procurement Market-Based Approaches</u>

- **Reverse Auction Mechanisms:** Renewable energy projects of different sizes require different procurement regimes. To encourage continued cost reductions in large-scale projects 20 MW and above, more states might procure renewable energy contracts via reverse auction mechanisms (RAMs), such as the ones already in place in several states. RAMs are intended to encourage developers to build projects in the highest-capacity regions. Generally, utilities solicit developers to bid in projects at the lowest $/MWh price. International experience suggests that (1) RAMs are successful at encouraging developers to build in the highest-capacity locations; and (2) RAMs – particularly if implemented without adequate pre-screening criteria – may succeed in elicit low-cost bids, only to see many of these bids fail to be built as the contract prices leave developers without sufficient incentive to build the project to completion.

- **Wholesale Distributed Generation - Feed-In Tariff Programs:** One often neglected market segment is wholesale distributed generation: projects of 1-20 MW in size that – rather than off-setting customer usage (as is the case with residential solar PV) – generate power on the utility-side-of-the-meter and sell at wholesale rates to either a utility or electricity retailer. Feed-in tariffs which offer standard, fixed price, long-term power purchase agreements. While the offered price in such programs is usually determined up-front, FITs may then later be adjusted as the market responds. Such programs are particularly promising for promoting the growth of "wholesale distributed generation," meaning distributed generation of 1-20 MW in size.

- **Continued Growth of Residential Distribution Generation:** States and utilities can leverage homeowners' own capital and promote distributed generation by continuing or implementing effective net metering policies and by providing performance-based incentives.

    - **Net metering**: this policy allows owners of distributed generation systems (such as rooftop PV) to sell excess power back to the grid, generally for the full retail price. In place in 43 states, these policies have contributed substantially to the growth of residential solar in the U.S. and have provided value and benefits to the home or facility net metered and the grid system.

    - **Performance-based incentives (PBI)**: Programs that offer homeowners an upfront rebate on the cost of distributed generation technologies (with the dollar size of the rebate linked to the kW size of the system) have been highly successful at promoting growth of rooftop solar PV in the U.S. As the cost of rooftop PV systems continues to decline, however, some states have transitioned away from upfront, capacity-based rebates toward performance-based incentives (PBI). As opposed to providing a $/kW rebate when the system is purchased, PBIs offer a $/kWh incentive as an installed system actually generates electricity. PBIs can reduce expenses for states and utilities while continuing to support deployment of residential solar systems.

3. Expand and Improve Transmission Infrastructure - Enhance Access to Renewable Energy Resources

Greater amounts of power generation from renewable energy requires expansion of transmission infrastructure to transport power from where it is produced to the load. State public utility commissions (PUCs) can affect the cost of bringing new renewable generation online by improving rules for transmission cost-allocation. In many states the sites with the highest-class renewable resources are remote from load centers and unconnected to the bulk transmission grid. Under typical cost-recovery rules, new generation projects must pay to construct their own interconnection (called a tie-line). For location-constrained renewable sites, however, the cost of such lines can be very substantial – deterring new investment. Developers are reluctant to build projects with no guaranteed transmission; transmission owners are reluctant to build new lines without assurance of demand from generators.

California and Texas have pioneered solutions to this problem with California's Location Constrained Resource Interconnection Facility (LCRIF) program and Texas' Competitive Renewable Energy Zones (CREZ). Essentially, these programs incentivize the construction of new transmission lines to designated resource-rich areas. By enabling development of projects that otherwise may be uneconomic, these programs offer a creative way to support development of renewable resources at the lowest cost. Other states might adopt similarly innovative programs to support interconnection of location-constrained renewable resources.

- **Create Competitive Renewable Energy Zones:** A competitive renewable energy zone (CREZ) is generally a remote geographic area where renewable generation facilities will be constructed. In conjunction with setting up a CREZ, the required transmission upgrades to deliver the renewable energy generated to load areas are defined. Once the needed transmission upgrades are identified, the state public utility commission provides the necessary approvals for their construction. A bill creating a CREZ should grant a PUC specific authority to extend transmission construction to relieve congestion and transmit renewable energy to load centers and could allow utilities to include capital costs for transmission facilities not yet in service in their rates.

- **Reduce the Time Needed for Planning, Building, and Siting Transmission:** The average time it takes to build a new high voltage transmission line is in the range of a decade or longer for most planning regions. For lines crossing multiple planning regions, balancing areas, RTOS's markets or state boarders, the time to construction is expected to be much longer. A relatively painless first step for accelerating transmission siting would be to maximize the potential for joint use of existing rights-of-way for other transmission functions. The U.S. is crisscrossed by railroads and highways that already take up land. These existing rights-of-way could provide dual service as routes for new bulk-power transmission lines. Such dual usage could not only offer additional revenues to land owners, but also cut down on land-owner objections.

- **Maximize the Use of Present Infrastructure:** States could encourage the maximization of present transmission infrastructure by seeking approval from FERC and NERC for dynamic line ratings. Dynamic line rating much more precisely matches the transfer capacity of high voltage lines to their actual operating environment in real time, increasing their transfer capacity by 10-20 percent or more. Dynamic line ratings would increase transmission capacity of existing lines at extremely low cost and provide line owners with the maximum return on their investment.

4. Modernize and Improve Utility and Power Market Systems – Performance-Based Regulations

Changing market dynamics of the utility and power market systems, including technological innovations like smart grid, intelligent business processes, distributed generation and other elements empowering consumers; cost-competitive variable and other renewable energy resources; and the need to upgrade and modernize the nation's power market, transmission and distribution systems, require an updated policy framework to spur necessary private sector investment and development. Utilities continue to play an important but often a changing role. This framework should support the financial integrity of utilities which act as providers of last resort, wholesale procurement that reflects a portfolio of short, medium and long term contracts financially hedged, and transparency at the wholesale and retail levels. The framework should also promote competitive wholesale markets and grid resiliency through the deployment of distributed and demand response resources and ancillary services. The framework needs to ensure resource diversity, energy information standardization and ease of access, subject to privacy and security requirements. Appropriate market price signals are essential for success and continued innovation.

States should move away from rate-of-return utility regulation models. The use of performance-based regulations gives utilities the freedom to innovate or call on others for specific services. States should separate the financial health of the utility from the volume of electricity the utility sells. In conjunction, states should ensure that all markets (*e.g.* energy, ancillary services, and capacity) and market-makers (*e.g.* utilities) include both demand- and supply-side options. All options — central and distributed generation, transmission, efficiency, and demand-response — should compete with one another to provide electricity services. Performance-based regulations could also employ electricity markets to align incentives with the desired outcomes, such as rewarding greater operational flexibility.

As part of the transition away from fossil fuels, states should implement debt equivalency rules which can allow PPAs used in the transitioning process to earn an equity return, thereby making the transition away from the fossil fuels much more economically attractive for a utility.

Wholesale power markets, whether vertically integrated, regulated, or publicly-owned monopoly utilities, can also be better aligned to support a growing and large share of renewable energy. Regulators and market operators have a number of cost-effective, market-based options to manage more base-load and variable energy resources. By consolidating balancing areas into larger operating areas, improving and utilizing weather forecasting, and decreasing the intervals between resource commitment and dispatch decisions, greater levels of renewables can be effectively integrated. With a greater share of renewables, markets need to recognize the value of resource flexibility and the growing opportunity for customer loads to respond to market conditions. ACORE and others recommend the pricing of operating reserves be sharpened to more efficiently reflect short-term mismatches between supply and demand, allowing responding loads to participate in energy and ancillary service markets. As the share of renewables grows, the system will require both adequate resources as well as a flexible resource portfolio. Market administrators need to factor these elements into their forecasts and forward markets to ensure resource flexibility is considered at the point of initial investment.[86]

[86] Mike Hogan, *America's Power Plan, Power Markets: Aligning Power Markets to Deliver Value*, 2014, 4-15.

5. Create State Green Banks

States green banks can address many of the market gaps in private sector renewable energy finance and be most helpful in accelerating private sector investment in the clean energy sector. The mission of state green banks as we have seen in New York State and Connecticut, would be to provide various types of credit supports to stimulate private sector investment in breakthroughs, including in more established renewable energy technologies. Many breakthrough technologies fall into a commercialization gap commonly described as the *valley of death*, because they are too capital intensive for venture capital, yet too risky for private equity, project or corporate debt financing. More established technology projects, such as wind and solar farms, have been plagued by the high cost of capital caused by credit constraints in the debt and tax equity markets.

State green banks focused on more established technologies, like commercial wind, solar, biomass, geothermal and other technologies, would address the short-term challenges of the present credit limitation of the tax equity market, accelerate conventional renewables deployment in the near term, and help ensure sufficient depth to the renewable project finance market. Additionally, the lower credit risks for a portfolio of these technologies would allow state green banks to maximize leverage and private-sector financing on an aggregate level.

State green banks can have a variety of financial tools at its disposal, including equity or quasi-equity instruments, letters of credits, insurance products, and secondary market supports. In addition, they would have the ability to charge revenue-generating fees or take equity or convertible debt stakes in lieu of credit subsidy costs. This would greatly diversify the type of renewable energy projects green banks could support and allow them to become a self-sustaining entity.

Conclusion

ACORE commends USEPA for including renewable energy in the Clean Power Plan to reduce emissions from existing power plants. We believe that with the improvements suggested above, the proposed rule can significantly reduce carbon emissions from existing power plants by enabling the continued growth of clean, cost-effective, reliable renewable energy generation. We look forward to working with USEPA on a final rule and working with states to find the most flexible and effective ways to deploy additional low-cost, reliable renewable generation in the years to come.