

## ISSUE BRIEF

# THE CLEAN POWER PLAN: KEEPING CLIMATE PROGRESS ON TRACK

*Projected clean energy growth will give the power sector a head start on meeting new carbon pollution limits*

## SUMMARY

Since 2005, the U.S. power sector—the largest source of carbon pollution in America—has reduced its carbon emissions by 20 percent.<sup>1</sup> These reductions have been made possible through federal and state support for renewable energy and energy efficiency, rapidly falling costs for wind and solar technologies, improved air pollution standards, and low natural gas prices. A spate of recent industry and governmental analyses project that renewable energy will continue to grow and may even double by 2021 (see Figure 1), reducing emissions even further and putting the power sector in an excellent position to meet the carbon-cutting goals of the U.S. Environmental Protection Agency's (EPA) Clean Power Plan (CPP), which places America's first-ever limits on carbon pollution from power plants.

The downward trend in emissions is good news, but the long-term, business-as-usual trajectory is less certain without the right policies in place. Fortunately, the CPP is on deck and ready to build on this solid head start, ensuring that urgently needed carbon reductions will continue into the next decade.

## BACKGROUND

Climate change, driven by carbon pollution, is causing more frequent and extreme droughts, floods, and storms that are disrupting businesses, agriculture, and daily life from coast to coast. The largest source of this pollution in the United States is fossil fuel-fired power plants. In 2015, the EPA finalized the CPP, its groundbreaking plan to address this source of carbon pollution.

The CPP sets flexible, achievable emissions limits on coal- and natural gas-fired power plants, providing a reasonable framework for power companies and states to cut carbon pollution from the power sector. Nationwide, the CPP is projected to reduce annual emissions by 32 percent (compared with 2005 levels) by 2030. This plan helps to

limit some of the worst impacts from climate change and bolsters U.S. leadership in combating climate change.

The CPP was developed under the auspices of the Clean Air Act, one of America's bedrock environmental laws. It was finalized on August 3, 2015, but the U.S. Supreme Court unexpectedly suspended its implementation in February 2016, until pending litigation is completed. The EPA will defend the plan before the U.S. Court of Appeals for the District of Columbia Circuit sitting *en banc*—that is, before all of the court's active judges—on September 27, 2016. Many industry, government, and legal experts expect that when the legal dust settles, the CPP will be upheld well before it is scheduled to take effect in 2022.

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## CLEAN ENERGY MOMENTUM IS LAYING THE GROUNDWORK FOR THE CLEAN POWER PLAN

A spate of recent industry and governmental analyses all project that U.S. renewable energy will grow significantly and may even double by 2021 (see Figure 1). This growth in clean, renewable energy will put the power industry in an excellent position to meet—or even exceed—the plan’s carbon-cutting goals.

The wind and solar industries have experienced remarkable growth over the past decade, due to a combination of falling technology costs and critical support from state and federal policies. According to the investment firm Lazard, the cost of generating electricity from new onshore wind turbines has fallen 61 percent since 2009; the cost of electricity generated from solar panels has fallen 82 percent in the same time period.<sup>2</sup>

The multi-year extension of the Production Tax Credit for wind energy and the Investment Tax Credit for solar energy, which Congress passed and the president signed in December 2015, is another factor behind the expected growth of the renewable energy industry.<sup>3</sup> These credits encourage investment by providing important near-term certainty for the renewable energy industry.

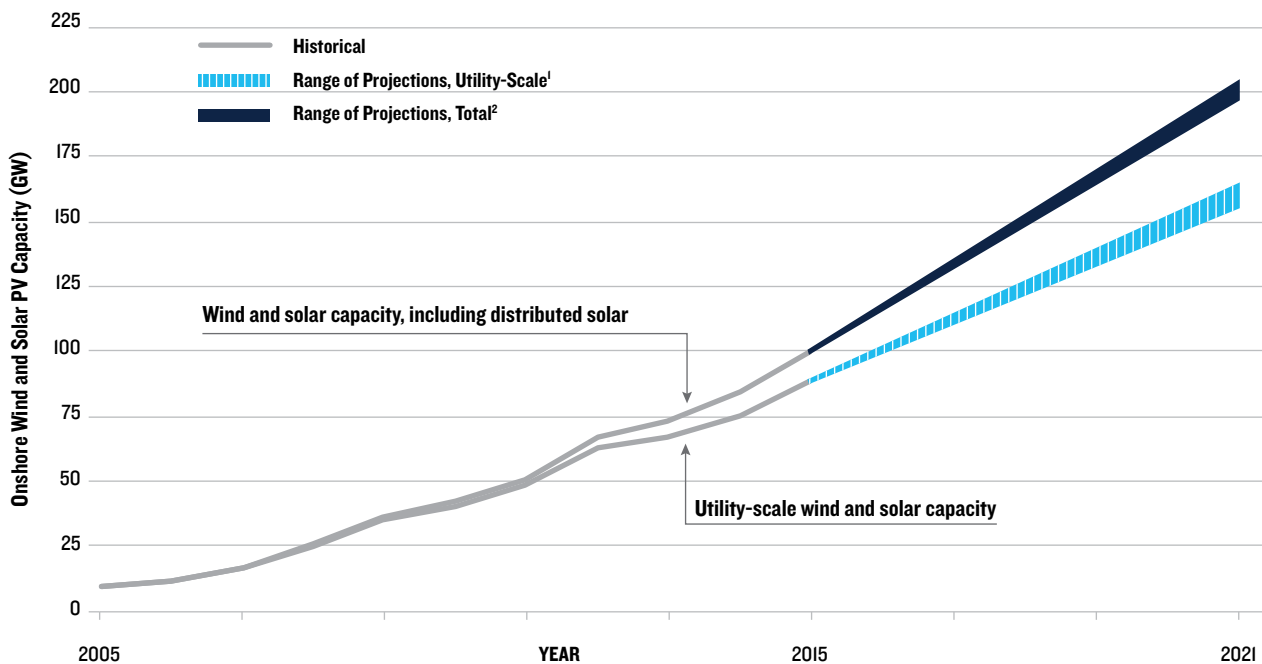
Even as natural gas prices reach historical lows, wind and solar technologies are increasingly competitive in the marketplace.<sup>4</sup> Demand for clean electricity is growing on many fronts, particularly as states strengthen their renewable portfolio standards.<sup>5</sup> Investment appetite for clean energy assets is also expanding, both in the United States and around the world.<sup>6</sup>

Examining all of these trends, including the extension of the renewable energy tax credits, with varied assumptions and analytical tools, four recent analyses from Rhodium Group (RHG), the National Renewable Energy Laboratory (NREL), Bloomberg New Energy Finance (BNEF), and M.J. Bradley and Associates (MJBA) paint a strikingly similar picture: Renewable energy will continue its strong growth for the next six years, with capacity expected to nearly double from 2015 levels by 2021.<sup>7,8,9,10</sup>

As a result, carbon pollution from the power sector will likely be close to the CPP’s initial requirements for 2022. MJBA’s analysis estimates that power sector carbon emissions under its updated Reference Case (or “business as usual”) will be much lower in 2020 than originally projected (e.g., in prior MJBA analysis).<sup>12,13</sup> In other words, meeting the reductions required by the CPP will be easier than was expected when the plan was finalized in 2015, as shown in Figure 2.

**FIGURE 1: PROJECTED WIND AND SOLAR CAPACITY<sup>11</sup>**

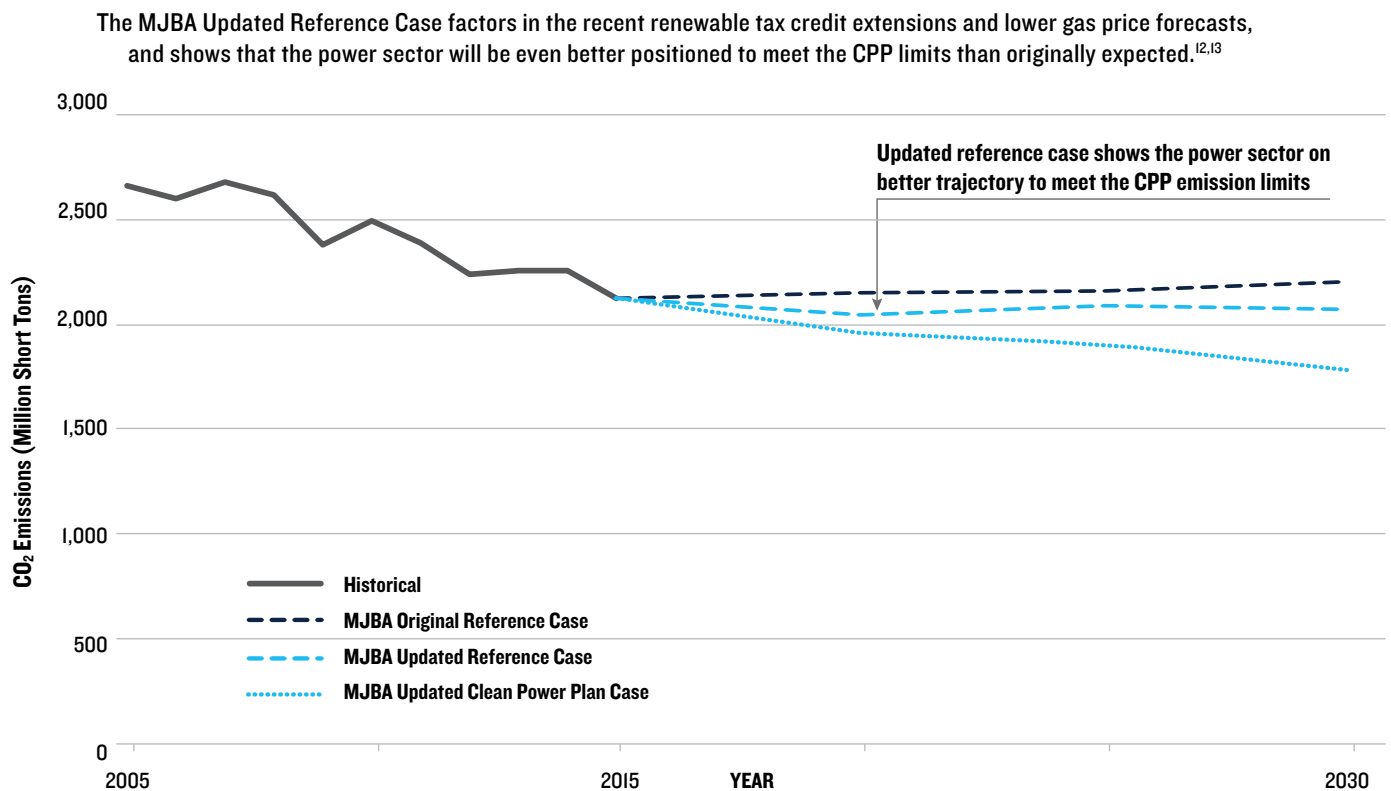
According to analyses from several sources, renewable energy capacity is projected to nearly double by 2021, from 2015 levels.



[1] Utility-scale wind and solar capacity projections are derived from RHG,<sup>7</sup> NREL,<sup>8</sup> BNEF,<sup>9</sup> and MJBA.<sup>10</sup>

[2] Total wind and solar projections are derived from NREL<sup>8</sup> and BNEF,<sup>9</sup> which included distributed solar forecasts in their analyses.

**FIGURE 2: PROJECTED POWER SECTOR CARBON EMISSIONS**



## STATES AND POWER COMPANIES SHOULD CONTINUE TO PRIORITIZE CLEAN ENERGY INVESTMENTS

Clean energy and efficiency are smart investments for states and utilities. Several states have recently taken steps to ambitiously strengthen their renewable portfolio standards,<sup>14</sup> and power companies across the country are expanding the use of wind and solar energy in their generation fleets.<sup>15</sup>

While the near-term outlook for renewable energy is bright, the forecast becomes less clear in the longer term. Each of the four recent reports projects strong growth for wind and solar electricity through 2021. After 2021, however, without additional policy drivers, the analyses indicate that the renewable energy development rate may slow down as the tax credits expire, particularly if gas prices remain low.<sup>16</sup>

Despite the uncertainty in the analyses, there are a number of reasons states and utilities should continue to support and prioritize investment in clean energy through the next decade and beyond. Investing in clean energy and efficiency will protect customers from fuel price volatility. Wind and solar power, unlike natural gas and coal, have no fuel costs, and installation costs are falling rapidly. A recent study by Lawrence Berkeley National Laboratory found that in 2013 alone, renewable portfolio standards (RPSs) across the

country saved customers up to \$1.2 billion from reduced wholesale electric prices and \$1.3 to \$3.7 billion from lower natural gas prices (as a result of lower demand for natural gas across the power sector). Additionally, the non-market benefits of renewable energy are considerable. The same study estimated that RPSs supported nearly 200,000 renewable energy-related jobs, provided \$5.2 billion worth of health benefits through improved air quality, and resulted in global climate benefits of \$2.2 billion.<sup>17</sup>

Finally, in addition to positioning utilities and states to meet the CPP's emissions reduction targets, we will need to continue to strengthen our investments in clean energy and reduce our carbon emissions even further after 2030. The United States can and must build on the progress of the CPP and accelerate its efforts to cut carbon emissions from the power sector if we are to achieve our longer-term climate goals. Investing in clean energy, including wind, solar, and energy efficiency programs, provides a low cost pathway to meeting or exceeding the CPP's goals, while providing a range of health and market benefits for electricity customers and positioning the power sector to further reduce emissions. NRDC encourages states to update and strengthen their efficiency and renewable energy standards to maximize benefits as they transition to a clean energy future.

## THE CLEAN POWER PLAN IS A CRITICAL AND NECESSARY STEP IN OUR CLIMATE PROGRESS

Carbon emissions from the power sector are widely expected to decline in the near future, as favorable economics drive investment in clean, renewable wind and solar energy. But these market-driven reductions are neither guaranteed nor permanent. By setting the first-ever limits on carbon pollution from power plants through flexible, achievable targets, the CPP will reinforce these positive near-term trends and help ensure that much-needed carbon reductions are maintained and strengthened over the long term.

The impacts of climate change are intensifying and demonstrate that we must continue to take ambitious steps to protect our climate. The Clean Power Plan will help spur continued development and innovation in renewable energy and energy efficiency, accelerating America's progress toward a clean energy future.

### ENDNOTES

- 1 Energy Information Administration, "Monthly Energy Review," March 2016, [www.eia.gov/totalenergy/data/monthly/](http://www.eia.gov/totalenergy/data/monthly/).
- 2 Lazard, "Levelized Cost of Energy Analysis 9.0," November 2015, [www.lazard.com/perspective/levelized-cost-of-energy-analysis-90/](http://www.lazard.com/perspective/levelized-cost-of-energy-analysis-90/).
- 3 Congress extended the renewable energy tax credits as part of the Consolidated Appropriations Act of 2016. The Production Tax Credit for onshore wind projects was extended at its full value of 2.3 cents/kWh through the end of 2016; it will then phase down to 80 percent of its full value in 2017, 60 percent in 2018, and 40 percent in 2019. The Investment Tax Credit for solar projects has been extended at its full value of 30 percent of project investment costs through the end of 2019; it will drop to 26 percent in 2020 and 22 percent in 2021. Without additional legislation, the PTC will expire after 2019, and after 2022, the ITC will drop to 10 percent of investment costs for utility-scale and commercial projects and will expire for residential projects.
- 4 Advanced Energy Economy Institute, "Competitiveness of Renewable Energy and Energy Efficiency in U.S. Markets," June 2015, [info.aee.net/competitiveness-of-renewable-energy-and-energy-efficiency-in-us](http://info.aee.net/competitiveness-of-renewable-energy-and-energy-efficiency-in-us).
- 5 Lawrence Berkeley National Laboratory, "U.S. Renewable Portfolio Standards: 2016 Annual Status Report," April 2016, [emp.lbl.gov/sites/all/files/lbnl-1005057.pdf](http://emp.lbl.gov/sites/all/files/lbnl-1005057.pdf).
- 6 United Nations Environment Programme and Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investment 2016," March 2016, [fs-unep-centre.org/publications/global-trends-renewable-energy-investment-2016](http://fs-unep-centre.org/publications/global-trends-renewable-energy-investment-2016).
- 7 Rhodium Group, "Renewable Energy Without the Clean Power Plan," February 2016, [rhg.com/notes/renewable-energy-without-the-clean-power-plan](http://rhg.com/notes/renewable-energy-without-the-clean-power-plan). Note: Scenario represented in Figure 1 is "Extenders Only" case, with RHG's baseline gas price and technology cost assumptions. RHG does not include distributed solar capacity in its modeling.
- 8 National Renewable Energy Laboratory, "Impacts of Federal Tax Credit Extensions on Renewable Deployment and Power Sector Emissions," February 2016, [www.nrel.gov/docs/fy16osti/65571.pdf](http://www.nrel.gov/docs/fy16osti/65571.pdf). Note: Scenario represented in Figure 1 is "Base Gas Price Ext" with and without NREL's inclusion of distributed solar PV capacity. This scenario includes the Clean Power Plan.
- 9 Bloomberg New Energy Finance, "Impacts of Tax Credit Extensions for Wind and Solar," December 2015, [about.bnef.com/white-papers/impact-of-tax-credit-extensions-for-wind-and-solar/](http://about.bnef.com/white-papers/impact-of-tax-credit-extensions-for-wind-and-solar/). Note: The projections represented in Figure 1 are BNEF market projections, both with and without distributed solar PV capacity.
- 10 M.J. Bradley and Associates, "Summary of IPM Modeling Results with ITC/PTC Extension", June 2016, <http://www.mjbradley.com/reports/updated-modeling-analysis-epas-clean-power-plan>. Note: Scenario represented in Figure 1 is MJBA Reference Case A, without the impacts of incremental energy efficiency. MJBA does not include distributed solar PV capacity in its modeling.
- 11 The projections encompass a range due in part to key methodological differences, including differences in natural gas price forecasts. The chart presents a stylized range based on a linear interpolation between 2015 levels and the 2021 levels projected in each analysis, i.e. assuming a constant annual build-out. In the analyses (and in reality), annual build levels are expected to fluctuate. For more details on the results as well as differences in input assumptions and methodologies among the studies, please see the details provided in each individual report.
- 12 M.J. Bradley and Associates, "Summary of IPM Modeling Results with ITC/PTC Extension", June 2016, <http://www.mjbradley.com/reports/updated-modeling-analysis-epas-clean-power-plan>. Note: Scenarios represented in Figure 2 ("Updated Reference Case and Updated Clean Power Plan Case") correspond to the MJBA Reference Case A and the Mass-based, Existing + New, National trading scenario with 1% energy efficiency.
- 13 M.J. Bradley and Associates, "Modeling Analysis of EPA's Clean Power Plan," January 2016, [www.mjbradley.com/reports/modeling-analysis-epas-clean-power-plan](http://www.mjbradley.com/reports/modeling-analysis-epas-clean-power-plan). Note: Scenario represented in Figure 2 ("Original Reference Case") corresponds to Reference Case A, without incremental energy efficiency.
- 14 Lawrence Berkeley National Laboratory, "U.S. Renewables Portfolio Standards: 2016 Annual Status Report," April 2016, <https://emp.lbl.gov/sites/all/files/lbnl-1005057.pdf>.
- 15 SNL Energy, "Major Utilities Planning Big Boosts to Renewables Investments," May 6, 2016, [www.snlenergy.com](http://www.snlenergy.com) (subscription required).
- 16 See endnotes 7-10. Rhodium Group and NREL (references 7 and 8, respectively) examine the impacts of varying natural gas price forecasts on renewable energy deployment. Rhodium Group also examines the combined impacts of natural gas price forecasts and wind and solar technology cost trajectories.
- 17 Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory, "A Retrospective Analysis of the Benefits and Impacts of U.S. Renewable Portfolio Standards," January 2016, [www.nrel.gov/docs/fy16osti/65005.pdf](http://www.nrel.gov/docs/fy16osti/65005.pdf).