

US EPA ARCHIVE DOCUMENT

January 2017

Basis for Denial of Petitions to Reconsider and Petitions to Stay  
the CAA section 111(d) Emission Guidelines for Greenhouse  
Gas Emissions and Compliance Times for Electric Utility  
Generating Units

**Appendix 1 — States' Progress and Trends**

U.S. Environmental Protection Agency

## INTRODUCTION

After the finalization of the Clean Power Plan (CPP) on August 3, 2015, most states began to make progress toward development of state plans to meet the requirements and towards actual CO<sub>2</sub> emission reductions from the power sector. The U.S. Supreme Court issued a stay of the Clean Power Plan on February 9, 2016. Many states subsequently stopped work on their plans, while some states decided to continue to develop their plans. In this Appendix, we have gathered information about the specific steps various states have taken since finalization of the CPP. These steps include voluntarily engaging with the EPA, conducting studies to better understand compliance options, initiating stakeholder engagement meetings, and working with neighboring states to explore opportunities for collaboration. As presented in the first part of this document, a large number of states have been working diligently with the EPA, each other, and interested stakeholders to identify the best strategies for them to achieve emission reductions from existing sources.

Further, many states have already achieved emission levels that would put them at or below emission levels consistent with the CPP goals in the early years of the program without any further investments beyond what they are already planning. A significant number of states are also on a path to meet their 2030 CPP goals. In the second part of this Appendix, we have compiled the data from several sources, including the most recent actual reported CO<sub>2</sub> emissions, to show that numerous states are expected to be at emission levels consistent with the CPP. Finally, we provide information about the models and data sources used to analyze state by state progress towards CPP compliance.<sup>1</sup>

## ACTIVE ENGAGEMENT BY STATES WITH EPA AND STAKEHOLDERS

In the six months following the EPA's finalization of the CPP, 35 states were actively engaging with the EPA on the CPP and had requested and/or participated in technical calls or meetings with EPA staff on the requirements of the CPP.<sup>2</sup> California was actively engaged with the EPA on state plan development, participating in weekly calls with technical staff. Thirty states were actively engaging with the public on the CPP, hosting public/stakeholder meetings and listening sessions as well as soliciting public comments on the Clean Power Plan and compliance options for the state.<sup>3</sup> At least one state was seeking public input explicitly on the choice between allowing for a Federal Plan and developing their own plan.<sup>4</sup>

## REGIONAL COLLABORATION

Since 2014 when the CPP was proposed, states have been meeting regionally to learn and exchange information about the Clean Power Plan, actively discussing and exploring the implications of various compliance pathways, including rate vs. mass and single state vs. multi state approaches. States have solicited technical and analytic support from regional conveners to inform their thinking on how to

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<sup>1</sup> See **Models and Data Sources** in this Appendix

<sup>2</sup> AZ; AR; CA; CO; CT; DE; GA; KS; IA; ID; IL; IN; KY; LA; MN; MO; MT; ND; NE; NJ; NM; NV; OH; OK; OR; PA; SC; SD; TX; UT; VA; VT; WV; TN; WI;

<sup>3</sup> AZ; AR; CA; CO; DE; GA; IN; IA; KS; MI; MN; MO; MT; NC; ND; NE; NM; NH; NV; OH; OK; OR; PA; SC; SD; TN; UT; VA; WA; WV

<sup>4</sup> Nevada Division of Environmental Protection. State of Nevada Department of Conservation & Natural Resources. 2015. *Public Stakeholder Meeting on EPA's Clean Power Plan: Development of Nevada's State 111(d) Plan to Reduce Carbon Emissions from Existing Fossil Fuel Power Plants*. Available at:

<http://ndep.nv.gov/docs/15/NV%20CPP%201st%20Public%20Stakeholder%20mtg.pdf>

proceed with CPP compliance. To date, at least twenty-eight states have participated in or attended exploratory regional discussions of the CPP.<sup>5</sup>

States met under several different regional umbrellas to discuss the Clean Power Plan and options for compliance. Northeastern states, for example, discussed Clean Power Plan compliance during Regional Greenhouse Gas Initiative Meetings. Duke University's Nicholas Institute for Environmental Policy Solutions hosted several meetings on the Clean Power Plan for southeastern states. Midwestern states created the regional group called the Midcontinent States Environmental and Energy Regulators Group (MSEER) and the Center for the New Energy Economy convened western states to discuss the Clean Power Plan. The Nicholas Institute and the Great Plain Institute (GPI) have convened discussions among states in the PJM service territory. Two examples below illustrate the type of activities and discussions that occurred at a regional level related to the Clean Power Plan.

One regional group is the Midcontinent States Environmental and Energy Regulators Group, or MSEER. In 2014, state environmental and utility regulatory officials from 14 states<sup>6</sup> within the Midcontinent Independent System Operator (MISO) wholesale electricity market came together to form MSEER—a “no regrets” effort by state officials to learn together, assess EPA’s proposed Clean Power Plan, and explore the full range of options for implementing CO<sub>2</sub> standards for existing power plants under the rule, including both state-by-state and multi-state approaches.

MSEER states participated in numerous meetings between 2014 and 2016, working together to compile and convey comments and/or questions to the EPA. For example, they submitted a letter to EPA in September 2014 requesting additional information about calculating mass-based goals as states were “interested in understanding whether multi-state coordination would reduce costs and bring other benefits to their states compared to a single-state approach.”<sup>7</sup> MSEER states submitted comments to EPA in November 2014 seeking “to give states flexibility in developing plans that include multi-state coordination.”<sup>8</sup>

MSEER states tasked the GPI and Bipartisan Policy Council (BPC) with helping them assess their Clean Power Plan implementation options with a specific focus on multi-state coordination and how such an approach might reduce compliance costs and bring other benefits to their states compared to a single-state approach. In April 2015, BPC and GPI staff co-authored a paper<sup>9</sup> to assist states in choosing a policy pathway for their state section 111(d) state plans, guiding states through the key considerations and walking through potential policy pathways.

These organizations also hosted at least two, large regional workshops for the MSEER states:

- June 5, 2015; Detroit Michigan; Highlights from the meeting:  
[http://www.betterenergy.org/sites/default/files/Midcontinent\\_States\\_Regional\\_Workshop\\_Highlights.pdf](http://www.betterenergy.org/sites/default/files/Midcontinent_States_Regional_Workshop_Highlights.pdf);

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<sup>5</sup> AR; AZ; CA; CO; CT; DE; FL; GA; IA; ID; IL; MA; MD; ME; MI; MN; MO; MT; NC; ND; NH; NM; NV; NY; OR; PA; RI; SC; SD; TN; UT; VT; WA; WY

<sup>6</sup> Arkansas, Illinois, Indiana, Iowa, Kentucky (observer only), Louisiana, Michigan, Minnesota, Mississippi, Missouri, Montana, North Dakota, South Dakota, and Wisconsin, as listed in <http://pubs.naruc.org/pub/539BA884-2354-D714-518C-FB52F67D3E6B>.

<sup>7</sup> <http://bipartisanpolicy.org/wp-content/uploads/sites/default/files/files/MSEER.pdf>

<sup>8</sup> <http://pubs.naruc.org/pub/539BA884-2354-D714-518C-FB52F67D3E6B>

<sup>9</sup> Bipartisan Policy Center. 2015. Choosing a Policy Pathway for State 111(d) Plans to Meet State Objectives. <http://bipartisanpolicy.org/wp-content/uploads/2015/05/Policy-Pathways-Paper.pdf>

- October 19, 2015: Meeting agenda to illustrate range of topics covered:  
<http://cdn.bipartisanpolicy.org/wp-content/uploads/2015/08/Agenda.pdf>

At the workshops, states received briefings on a wide range of issues, including detailed explanations of various aspects of the rule and information on how to design an emission trading program, and how a multi-state trading program would function. The June 2015 meeting yielded strong consensus around trading as a means to lower the costs of complying with CPP.<sup>10</sup>

In the October 2015 workshop, for example, participants reviewed detailed energy-economic modeling<sup>11</sup> of a wide range of policy options including the national, regional and state-level impacts of the following scenarios:

- 1) each state individually implements a rate-based trading system;
- 2) states implement a regional rate-based trading system;
- 3) each state individually implements a mass-based trading system; and
- 4) states implement a regional mass-based trading system.

In general, the modeling indicated that almost all MSEER states would benefit from participating in a regional trading program. At the time of the October 2015 meeting, many of the same groups that favored trading as a means to lowering costs in June seemed to lean toward a mass-based approach yet no final decisions had been made.<sup>12</sup>

Another regional collaboration to explore Clean Power Plan options was the Western States Clean Power Plan Initiative.<sup>13</sup> With the Center for the New Energy Economy (CNEE) as the convener, fourteen Western state environmental agencies and utilities engaged in a dialogue on the EPA's Clean Power Plan since June 2014. Participants in the initiative included:

- Western state and tribal environmental and air quality officials, state energy offices and state utility commissioners and staff<sup>14</sup>
- Western utility industry representatives
- Western regional organizations (WIEB, WECC, WESTAR, WGA)
- U.S. EPA Regions VIII, IX, and X

Initially, the environmental agencies and utilities were convened separately but over time, they began meeting collectively. There were several workshops hosted under the initiative.

For example, on May 12-13, 2015 CNEE hosted a Western Regional CPP workshop<sup>15</sup> that brought together state environmental and economic regulators, along with industry representatives to:

<sup>10</sup> <http://www.eenews.net/energywire/stories/1060019811/>

<sup>11</sup> Bipartisan Policy Center. 2015. The Final Clean Power Plan: Understanding the Options for the Midcontinent. <http://bipartisanpolicy.org/events/understanding-the-final-clean-power-plan-implications-for-implementation-in-the-midcontinent-states/>

<sup>12</sup> <http://www.eenews.net/stories/1060026570>

<sup>13</sup> <http://www.westernstate111dplans.com/>

<sup>14</sup> States in the Initiative include: Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming.

<sup>15</sup> Agenda and presentations available at <http://www.westernstate111dplans.com/documents/>

- 1) examine key technical and policy issues of importance to the West, including potential compliance pathways, and
- 2) prepare for the planning process.

A few months later, on September 10, 2015 the group held another workshop to inform the initial proposal process and Clean Power Plan implementation in the West.<sup>16</sup> CNEE submitted a summary of western state comments on the CEIP to EPA in December 2015.<sup>17</sup> They also submitted a letter summarizing western state comments on the Model Rule and Federal Plan to EPA on January 21, 2016.<sup>18</sup>

The most recent workshop was held on August 25-26, 2016.<sup>19</sup> Several analysts, including MJ Bradley & Associates and the Bipartisan Policy Center, presented CPP-related modeling results for the western states. While the MJB slides are not publicly available, the BPC Study showed that trading could provide a least cost option and expanded trading across more states would increase the benefits.<sup>20</sup>

## STATE CPP PLAN INTENTIONS FOLLOWING FINALIZATION OF THE CPP

Within 6 months after the finalization of the CPP, some states began to develop state plans and to express their intentions regarding submittal of initial and final Clean Power Plans. Two states, California and Pennsylvania, indicated intentions to submit a final plan that they intended to be approvable in 2016<sup>21</sup> while another state, Virginia, indicated its intention to submit a final plan in 2017.<sup>22</sup> At least twenty-five states suggested they would submit the initial submittal due in September 2016.<sup>23</sup> New Jersey indicated that it would not submit a plan at all.<sup>24</sup> Oklahoma Governor Mary Fallin issued an executive order restricting Oklahoma from developing a plan,<sup>25</sup> while Michael Teague, the state's secretary of Energy and

<sup>16</sup> <http://www.westernstate111dplans.com/documents/>

<sup>17</sup> <http://www.westernstate111dplans.com/wp-content/uploads/2013/06/CNEE-CEIP-Comments.pdf>

<sup>18</sup> <http://www.westernstate111dplans.com/wp-content/uploads/2016/01/CNEE-Comments-to-EPA-on-Federal-Plan-and-Model-Rules.pdf>

<sup>19</sup> <http://www.westernstate111dplans.com/western-states-energy-policy-workshop/>

<sup>20</sup> <http://www.westernstate111dplans.com/wp-content/uploads/2016/08/BPC-Modeling-Power-Sector-CPP-for-West-08232016-3.pdf>

<sup>21</sup> EE News. 2016. 2016 holds flurry of state planning, legal drama for Clean Power Plan.

<http://www.eenews.net/stories/1060030047>; North Carolina indicated an intent to submit a state plan that the provided only building-block-1 level reductions: NC Department of Environmental Quality. 2015. DEQ submits rule to EMC for addressing carbon emissions, announces backup plan.

[http://portal.ncdenr.org/c/journal/view\\_article\\_content?groupId=4711509&articleId=26626512](http://portal.ncdenr.org/c/journal/view_article_content?groupId=4711509&articleId=26626512).

<sup>22</sup> EE News. 2015. EPA's final climate rule made compliance easier for some state regulators, harder for others.

<http://www.eenews.net/climatewire/2015/10/21/stories/1060026662>.

<sup>23</sup> AL; AR; AZ; CO; GA; IA; ID; IL; KS; KY; MI; MN; MT; MO; ND; NM; NV; OH; OR; SC; SD; TN; UT; WA; WV; WY

<sup>24</sup> Politico. 2015. Responding to EPA official, DEP refuses to comply with power plan. <http://www.politico.com/states/new-jersey/story/2015/12/responding-to-epa-official-dep-refuses-to-comply-with-power-plan-029032>

<sup>25</sup> [https://www.ok.gov/triton/modules/newsroom/newsroom\\_article.php?id=223&article\\_id=15771](https://www.ok.gov/triton/modules/newsroom/newsroom_article.php?id=223&article_id=15771)

Environment, indicated at an October 2015 meeting that the state was “pretty well positioned” to comply with the rule and that the state would not allow a Federal Plan in Oklahoma.<sup>26</sup>

In anticipation of state plan submissions, several states passed legislation related to the development or review process. Specifically, three states passed legislation that authorized or clarified some aspect of plan development. For example, Illinois passed legislation to clarify the meaning of stationary source,<sup>27</sup> Kentucky legislation established procedures on creating a state plan<sup>28</sup> and Louisiana passed legislation authorizing the Department of Environmental Quality to create a plan.<sup>29</sup> Regarding legislative involvement in the plan development or review process, five states passed legislation requiring legislative approval of a state plan before submission to EPA,<sup>30</sup> four passed legislation requiring legislative review of or involvement with the state plan before submission to EPA,<sup>31</sup> and two states, Virginia and Texas, formed CPP Legislative Committees.

By early 2016, many states appeared to be leaning toward a mass-based approach. Most had expressed that they were considering or leaning toward trading/trading-ready options as shown in the graphic “States Considering Trading-Ready Approach.”<sup>32</sup>

### SAMPLING OF STATE PROGRESS ON THE CPP PLAN



After February, 2016, several states continued to make progress on the CPP. At least seven states held CPP stakeholder meetings<sup>33</sup> or CPP-related hearings<sup>34</sup> after February. On April 28, 2016, fourteen states that were continuing their efforts to develop a CPP state plan submitted a formal letter to EPA requesting technical assistance with CPP planning.<sup>35</sup>

Examples of some states’ progress is described below.

<sup>26</sup> [http://www.eenews.net/interactive/clean\\_power\\_plan/states/oklahoma](http://www.eenews.net/interactive/clean_power_plan/states/oklahoma)

<sup>27</sup> <https://legiscan.com/IL/bill/HB3341/2015>

<sup>28</sup> EE News. 2015. Ky. regulators walk tightrope on Clean Power Plan. <http://www.eenews.net/stories/1060014457>

<sup>29</sup> <http://www.legis.la.gov/Legis/BillInfo.aspx?i=225668>

<sup>30</sup> AR, KS, PA, TN, WV

<sup>31</sup> AZ, MN, MO, NE

<sup>32</sup> AZ, AR, CA, CO, CT, DE, GA, IA, LA, ME, MD, MA, MI, MN, MO, MT, NE, NH, NM, NY, ND, OH, OK, PA, RI

<sup>33</sup> AZ, DE, IA, MN, VA

<sup>34</sup> VA, WV

<sup>35</sup> States include: CA, CO, CT, DE, MA, MD, MN, NH, NY, OR, RI, VA, VT, WA; Letter is available at: [http://www.eenews.net/assets/2016/04/29/document\\_cw\\_04.pdf](http://www.eenews.net/assets/2016/04/29/document_cw_04.pdf)

## California

California became the first state to release for public review a draft proposal for complying with the Clean Power Plan on August 2, 2016.<sup>36</sup>

## Minnesota

From 2014-2016, Minnesota held one of the most comprehensive stakeholder outreach processes in the country, with utility companies and environmental advocacy groups, to lay the foundation for their CPP state plan. Their workgroup met at least eighteen times on a range of topics, including but not limited to: analysis, objections, considerations in choosing a pathway and trading options. All meeting notes and presentations are posted on the Minnesota Pollution Control Agency web page, *Clean Power Plan: Rulemaking in Minnesota*.<sup>37</sup>

The state also actively participated in regional discussions about the Clean Power Plan with the Midcontinent States Environmental and Energy Regulators,<sup>38</sup> Bipartisan Policy Center and Great Plains Institute.<sup>39</sup> The state went so far as to determine that they were favoring a trading-ready approach in an early outline of a state compliance plan sent to lawmakers.<sup>40</sup> In a letter dated September 22, 2016, Minnesota committed to continue planning for GHG reductions in a manner consistent with CPP requirements, and asked for more information on the model rule, leakage requirements, EM&V, tracking systems, trading limitations, reliability assessments, and requirements related to allocations and/or crediting.

## Pennsylvania

Once the proposed rule was released, Pennsylvania researched compliance options and received technical assistance through participation in the National Governors Association Policy Academy on the Clean Power Plan.<sup>41</sup> Once the Clean Power Plan was final, Governor Tom Wolf stated that his administration “is committed to making the Clean Power Plan work” for his state,<sup>42</sup> and pledging to submit their plan on time. The state undertook one of the most comprehensive stakeholder processes to gain input on their plan, holding fourteen listening sessions from September through November 2015.<sup>43</sup> Once the listening sessions were complete, the state began examining their compliance options in more detail and, according to DEP, was leaning toward a mass-based, single-state, trading ready plan. They began drafting a compliance blueprint<sup>44</sup> and announced their intention to submit a final compliance plan by 2016.<sup>45</sup>

## STATE LEVEL COMPLIANCE WITH CPP INTERIM TARGETS AND GOALS

The impacts of recent industry trends and market forces are evident in the progress that individual states have already made and continue to make to reduce CO<sub>2</sub> emissions from existing sources. A number of organizations have analyzed state-level emission data, on-the-books clean energy policies and commitments such as unit retirements, and other actions underway in each

<sup>36</sup> <https://www.arb.ca.gov/cc/powerplants/meetings/09222016/proposedplan.pdf>

<sup>37</sup> <https://www.pca.state.mn.us/air/clean-power-plan-rulemaking-minnesota>

<sup>38</sup> <http://bipartisanpolicy.org/wp-content/uploads/sites/default/files/files/MSEER.pdf>

<sup>39</sup> <http://www.eenews.net/energywire/2015/10/20/stories/1060026570>

<sup>40</sup> <http://insideepaclimate.com/climate-beat/states-minnesota-awaits-epa-trading-rules-advancing-esps-plan>

<sup>41</sup> InsideEPA/climate, March, 20, 2015

<sup>42</sup> InsideEPA/climate, August, 4, 2015

<sup>43</sup> <http://www.portal.state.pa.us/portal/server.pt/community/newsroom/14287?id=20831&typeid=1>

<sup>44</sup> <http://insideepaclimate.com/climate-beat/states-pennsylvania-has-begun-drafting-its-clean-power-plan-compliance-blueprint>

<sup>45</sup> <http://insideepaclimate.com/climate-beat/states-pennsylvania-sees-benefit-submitting-early-esps-plan>



state that will result in a lower-emitting power sector. Comparing the current emission trends on a state-by-state basis to CPP goals, we find that the great majority of states have already achieved 2022 interim target emission levels or are on track to meet those targets without any further investments. A significant number of states are also on a path to meet their 2030 goals. These state-level findings are consistent with nationwide analyses of the CPP conducted by the Bipartisan Policy Center, the Nicholas Institute for Environmental Policy Solutions, and others.

Below, we have compiled the data from four sources, including the most recent actual reported CO<sub>2</sub> emissions (last quarter of 2015 and first three quarters of 2016) to show the number of states expected to meet their mass emission levels contemplated under the CPP for 2022 (which, for convenience, we refer to as the states’ “proportional interim targets in 2022”) for and their 2030 CPP goals.<sup>46</sup> Tables 1 and 2 identify which states in the various analyses are projected to meet their proportional interim target in 2022 and final CPP goals in 2030 by continuing to follow through on existing commitments. These analyses projected future baseline state emissions (without the CPP) to compare against the CPP proportional interim targets in 2022 and final goals and concluded that a significant number of states are on a track consistent with their proportional interim targets/goals based on their on-the-books clean energy policies, planned retirements, and other commitments. The tables are followed by a discussion of the various sources and the methods they used to draw conclusions about the states’ projected emission levels. The models have different starting points and results depending on the fuel and technology input data and the measures, policies, and publicly announced commitments available at the time the studies were conducted.

**Table 1: States on Emission Trajectory Consistent with CPP Proportional Interim Target in 2022**

	2016 CO <sub>2</sub> Emissions (Estimated)	UCS “States of Progress”	MJ Bradley State Scenarios	EPA/IPM Base Case, 2020
Alabama	●	●	●	●
Arizona		●	●	
Arkansas	●		○	●
California	●	●	NA	●
Colorado		●	●	
Connecticut	●	●	NA	
Delaware	●	●	NA	●
Florida	●	●	●	●
Georgia		●	●	
Idaho	●	●	NA	●
Illinois	●		NA	●
Indiana	●		●	
Iowa	●		NA	●

<sup>46</sup> States do not have 2022 goals, but there are interim periods to define a glide path starting in 2022-2029. To determine if states were on a trajectory consistent with the CPP goals, we calculated the proportional reductions each year starting in 2022 to meet the 2030 CPP Goal. However, there is no regulatory requirement for states to demonstrate they are meeting a rate or mass goal in 2022.

Kansas	●		●	
Kentucky	●		○	●
Louisiana			●	●
Maine	●	●	NA	
Maryland	●	●	NA	●
Massachusetts	●	●	NA	●
Michigan	●		●	●
Minnesota		●	NA	
Mississippi	●	●	●	
Missouri	●	●	○	
Montana			●	
Nebraska	●		●	
Nevada	●	●	NA	●
New Hampshire	●	●	NA	●
New Jersey	●	●	●	
New Mexico		●	NA	●
New York	●	●	NA	●
North Carolina	●	●	●	●
North Dakota			●	
Ohio	●	●	●	
Oklahoma	●		●	●
Oregon	●	●	NA	●
Pennsylvania	●	●	NA	●
Rhode Island	●	●	NA	●
South Carolina	●	●	●	
South Dakota	●		●	
Tennessee		●	NA	
Texas	●		●	
Utah	●		●	
Virginia	●		NA	●
Washington	●	●	NA	●
Wisconsin			●	
West Virginia			○	
Wyoming			●	●

○ Achieves interim target under Additional “Incremental Action” scenario (See discussion of the MJ Bradley State Scenarios below for further explanation of this approach and assumptions.)

2016 CO<sub>2</sub> Emissions Estimated- The EPA used last quarter of 2015 and first three quarters of 2016 to represent full year of emissions data

Does not include the 3 tribes with affected sources

In Table 1 above, every one of the 47 states with CPP goals has been identified in at least one scenario as consistent with a current emission trajectory to meet its proportional interim target in

2022. Further, 41 states—87 percent-- are on track in more than one of the four analyses. That number would almost certainly been higher if the MJ Bradley State Scenarios had included all 47 states rather than just a subset. West Virginia is the one state that would require incremental action to put it on a path to achieve its proportional interim target in 2022, according to the available models we examined. In fact, 35 states are already demonstrating achievement of the proportional interim targets in 2022 by 2016. In addition, the 2016 data shows that total emissions from all states are below the total 2022 mass proportional interim target for all participating states (See Table 4). With interstate trading, the remaining states would likely be able to achieve their proportional targets without taking further action.

**Table 2: States on Emission Trajectory to Meet CPP Goals in 2030**

	2016 CO <sub>2</sub> Emissions (Estimated)	UCS “States of Progress”	MJ Bradley State Scenarios	EPA/IPM Base Case, 2030
Alabama				●
Arizona			●	
Arkansas	●		○	
California	●	●	NA	
Colorado			●	
Connecticut		●	NA	
Delaware	●	●	NA	●
Florida			●	
Georgia		●	●	
Idaho	●	●	NA	●
Illinois			NA	
Indiana			○	
Iowa			NA	
Kansas			●	
Kentucky			○	●
Louisiana			○	●
Maine	●	●	NA	
Maryland		●	NA	●
Massachusetts	●	●	NA	●
Michigan			●	
Minnesota		●	NA	
Mississippi			●	●
Missouri				
Montana			●	
Nebraska			●	
Nevada		●	NA	●
New Hampshire		●	NA	●
New Jersey	●	●	●	
New Mexico			NA	●
New York	●	●	NA	●

North Carolina	●		●	●
North Dakota				
Ohio			●	
Oklahoma	●		●	
Oregon		●	NA	●
Pennsylvania	●		NA	
Rhode Island	●	●	NA	●
South Carolina		●	●	
South Dakota	●		●	
Tennessee		●	NA	
Texas			●	
Utah			●	
Virginia			NA	●
Washington		●	NA	●
Wisconsin				
West Virginia			○	
Wyoming			●	

○ Achieves goal under Additional “Incremental Action” scenario (See discussion of the MJ Bradley State Scenarios below for further explanation of this approach and assumptions.)

2016 CO<sub>2</sub> Emissions Estimated- The EPA used last quarter of 2015 and first three quarters of 2016 to represent full year of emissions data.

Does not include the 3 tribes with affected sources.

As indicated in Table 2, a total of 40 states (85 percent) have been identified in one or another of the analyses shown as on track to meet their 2030 CPP goals based on their current emission trajectory and on-the-books policies and commitments. An additional two states would be on track to meet 2030 CPP goals with incremental action equivalent to the level of investment of their neighbors and two states were not analyzed in the MJ Bradley State Scenarios.

**Table 3: States Not on Emission Trajectory to Meet Goals in 2030 (in any of the 4 data sets)**

State	Latest year meeting target without incremental action	Latest year meeting goal with incremental action	Progress that planned actions will make towards compliance (UCS)	Progress that planned actions will make towards compliance (WRI)
Illinois	NA	NA	48%	NA
Indiana	2022	2030	22%	NA
Iowa	NA	NA	14%	NA
Missouri		2026	38%	90%
North Dakota	2022	2024	0%	NA
Wisconsin		2026	42%	63%
West Virginia		2030	19%	NA

“Incremental Action” scenario – deploying new investments at a rate comparable to their average neighbor

For four of these states, information that has become available after the above analyses were completed indicates that the states will make additional progress towards attaining their CPP goals. In Indiana, in November 2016, the Indiana utility NIPSCO announced it will be closing 848 megawatts (MW) of coal-fired capacity at the R.M. Schahfer Generating Station in Jasper County by 2023. The company also confirmed the retirement of the 603 MW coal-fired Bailly Generating Station. With this planned retirement, Indiana ranks third in the nation for coal retirements proposed since 2010, with 6.96 gigawatts of coal capacity either retired, refueled or proposed for retirement.<sup>47</sup>

In May 2016, Dynegy announced plans to phase out units one and three at the Baldwin coal-fired power plant in Baldwin, IL and unit two at the Newton coal-fired power plant in Newton, IL. The announcement comes just six months after Dynegy announced the planned retirement of its Wood River coal-fired power plant in Alton, IL.<sup>48</sup> In total, 2,800 MW of coal-fired generation from Illinois will be retired.<sup>49</sup>

In Iowa, in August 2016, the Iowa Utilities Board approved the largest renewable energy project in the state, MidAmerican Energy Company’s proposed “Wind XI” project. The \$3.6 billion proposed project allows MidAmerican to build up to 2,000 MW of new wind electric generation in Iowa.<sup>50</sup>

<sup>47</sup> <http://content.sierraclub.org/press-releases/2016/11/coal-friendly-indiana-3rd-nation-coal-plant-retirements>

<sup>48</sup> <http://content.sierraclub.org/press-releases/2016/05/sierra-club-statement-phase-out-units-dynegy-coal-fired-power-plants-illinois>

<sup>49</sup> [http://phx.corporate-ir.net/phoenix.zhtml?c=147906&p=irol-newsArticle\\_Print&ID=2164582](http://phx.corporate-ir.net/phoenix.zhtml?c=147906&p=irol-newsArticle_Print&ID=2164582)

<sup>50</sup> <https://iub.iowa.gov/sites/default/files/files/media/releases/2016/0826-Board-Approves-MEC-WindXI.pdf>

In North Dakota, in July 2016, Great River Energy (GRE) announced that it will retire its nearly 50-year old Stanton Station coal-fired power plant (189 MW) in early 2017.<sup>51</sup> In addition, North Dakota could add significant new wind energy capacity. In December 2016, Glacier Ridge Wind Farm received approval to construct a 179 MW wind farm in Barnes County, ND with the possibility of a second phase of construction in the future.

## MODELS AND DATA SOURCES

### 2016 CO<sub>2</sub> Emissions, Estimated

At the time that the state-by-state analysis of CO<sub>2</sub> emissions and CPP state goals was completed, state level emissions were available for the first three quarters of the year only. The data were not yet available for the fourth quarter of 2016. Consequently, the EPA estimated the full year CO<sub>2</sub> state level emissions. To approximate the unavailable data for the remainder of 2016, we used available historical data from Q4 2015. The emissions for each state was calculated by summing the first three quarters of 2016 combined with the fourth quarter of 2015 to estimate the CO<sub>2</sub> emissions for the full year. We consider this approach to be conservative and likely to err on the side of higher than actual emissions for the majority of the states.

We also considered but rejected a second approach for adjusting the data for 2016. This alternative approach calculated state level annual CO<sub>2</sub> emissions by determining the change in the first three quarters of 2016 relative to the first three quarters of 2015 and then multiplying the 2015 annual emissions by this change. In general, this alternative approach resulted in lower state level emissions for 2016 compared to the first approach. We decided to use the actual Q4 2015 data instead to avoid under-estimating the annual 2016 CO<sub>2</sub> state level emissions.

While there is no guarantee that emission levels will not rise in the future, 2016 serves as a demonstration that a large portion of states are already capable of generating electricity from lower emitting resources to meet demand without significant new investments or risks to system reliability. Further, as the industry trends discussion makes clear, future demand growth and/or replacement of retiring capacity is most likely going to be served by new lower or zero-emitting generation capacity. The increase in renewable energy capacity that will come about from the PTC/ITC extensions and reduced coal generation capacity from announced unit retirements will serve to curb potential emission increases in the future.

Some examples of recently announced coal unit retirements and/or new zero-emitting capacity additions that will result in lasting emission reductions in a number of states include the following:

- In August 2015, Entergy announced its plans to close the 1,700 MW White Bluff facility in Arkansas by 2028. The proposal comes as Entergy begins to invest in renewable energy capacity. Also in 2015, the utility announced the purchase of solar power from a

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<sup>51</sup> The Stanton Station plant represents the 237th coal-fired power plant to be retired nationwide since 2010. <http://content.sierraclub.org/press-releases/2016/07/great-river-energy-s-stanton-station-plant-retire-after-50-years-burning-coal>

large-scale solar facility planned for Stuttgart, Ark. -- the first utility-scale solar project in the state.<sup>52</sup>

- In July 2016, it was announced that the Colstrip plant in Colstrip, Montana has agreed to retire two units by no later than July 2022. This retirement will lead to the reduction of 5 million tons of carbon pollution each year.<sup>53</sup>
- In November 2016, Middle River Power filed a deactivation notice for the C.P. Crane coal-fired power plant with PJM Interconnection. The company plans to stop burning coal at the C.P. Crane plant in Maryland in June 2018.<sup>54</sup>
- In 2015, NRG in New York announced the permanent retirement of the Huntley coal-fired power plant in Tonawanda and mothballed the Dunkirk coal-fired power after years of unprofitable operations.<sup>55</sup>
- In November 2016, AEP committed to developing the largest clean energy project in Ohio history and responsibly phasing out 1,500 MWs of coal plants in the state. AEP's clean energy commitment aims to bring at least 900 megawatts of clean energy projects online in Ohio over the next four years. The projects include 400 megawatts of solar and 500 megawatts of wind, all to be sited in Ohio.<sup>56</sup>
- In November 2016, Northern Indiana Public Service Company committed to closing 848 megawatts of capacity at the R.M. Schahfer Generating Station in Jasper County, Indiana by 2023. NIPSCO also confirmed the retirement of the 603 MW Bailly Generating Station along Lake Michigan's southern shoreline in its 20-year energy plan, which was filed with the Indiana Utility Regulatory Commission. With this proposed retirement, Indiana ranks third in the nation for coal retirements proposed since 2010, with 6.96 gigawatts of coal capacity either retired, refueled or proposed for retirement. Only Ohio (10.09 GW) and Illinois (7.21 GW) have retired or proposed to retire more coal capacity than Indiana.<sup>57</sup>
- In October 2016, PSEG announced plans to close the Hudson and Mercer Generating Stations -- their two remaining coal-fired power plants in New Jersey. The plants will retire on June 1, 2017.<sup>58</sup>
- In May 2016, Dynegy Inc. announced plans to shut down units one and three at the Baldwin Power Station in Baldwin, IL and unit two at the Newton Power Station in Newton, IL over the next year. An additional 500 MW are targeted for shutdown, and a final determination is likely later this year. Earlier in the year, Dynegy had announced the

<sup>52</sup> <http://content.sierraclub.org/press-releases/2015/08/cleaner-air-coming-arkansas-entergy-announces-phase-out-white-bluff-coal>

<sup>53</sup> <http://content.sierraclub.org/press-releases/2016/07/colstrip-units-1-and-2-retirement-final-5-million-tons-carbon-pollution-end>

<sup>54</sup> <http://content.sierraclub.org/press-releases/2016/11/cp-crane-coal-fired-power-plant-files-deactivation>

<sup>55</sup> <http://content.sierraclub.org/press-releases/2016/11/governor-moves-forward-coal-transition-funding>

<sup>56</sup> <http://content.sierraclub.org/press-releases/2016/11/puco-approves-next-steps-largest-clean-energy-project-ohio-history>

<sup>57</sup> <http://content.sierraclub.org/press-releases/2016/11/coal-friendly-indiana-3rd-nation-coal-plant-retirements>

<sup>58</sup> <http://content.sierraclub.org/press-releases/2016/10/njs-hudson-and-mercer-coal-plants-retire>

465 MW Wood River Power Station would also retire. In total, 2,800 MW of generation from Illinois will be curtailed.<sup>59</sup>

### Union of Concerned Scientists Analysis, “States of Progress”

In August 2015, the Union of Concerned Scientists published its independent “States of Progress” analysis concluding that most states are on track to meet their CPP goals with existing commitments and policies. Commitments included carbon caps, mandatory renewable electricity and energy efficiency standards, announced coal plant retirements, and bringing on line nuclear power plants currently under construction. UCS looked at the percentage towards their goal that each state was on the path to achieve for both rate and mass-based goals due solely to the existing measures. They found that 21 states were already on track to meet or surpass their 2022 goals and 16 states were on track for 2030. We note that the number of states could be higher since a number of states not included in the 21 are already achieving their interim goals as of this past year.

In addition, this UCS analysis did not include other types of mandatory state measures and programs, apart from EERSs, that could advance energy efficiency. They also did not explicitly incorporate emissions trading which would allow states to take advantage of low-cost emissions reductions outside their borders, nor does the analysis account for the potential emission reduction benefits from the EPA’s proposed Clean Energy Incentive Program. In this respect, the analysis is conservative in its projections because it is highly likely that states will take advantage of lower-cost trading to comply. Finally, the UCS analysis does not include the effects of the PTC/ITC extensions for renewable energy, which were announced at the end of 2015 and are expected to drive even more new RE capacity to be added. Also, more recent announcements of RE additions and coal capacity retirements such as the one by NIPSCO in Indiana and Entergy in Arkansas were not factored into the modeling and could change the outcomes for some states.

The full analysis can be found on the Union of Concerned Scientists website:

[http://blog.ucsusa.org/jeremy-richardson/most-states-well-on-the-path-to-comply-with-final-clean-power-plan-844?\\_ga=1.92319005.1865542341.1482868068](http://blog.ucsusa.org/jeremy-richardson/most-states-well-on-the-path-to-comply-with-final-clean-power-plan-844?_ga=1.92319005.1865542341.1482868068)

### MJ Bradley State Scenarios

The study conducted by MJ Bradley and Associates for the Environmental Defense Fund in December 2015 examined the 27 movant states involved in the CPP litigation and whether existing and planned investments would reduce emissions sufficiently to comply with the CPP in 2022 or beyond. The analysis explored how compliance with the CPP would be impacted by 1) deploying planned new builds such that emission reductions are maximized; 2) meeting renewable and efficiency requirements already required by state law or regulation, and similarly assuming that those clean resources are deployed to displace high-emitting generation; and 3) factoring in announced retirements. In 2022, 23 of the 27 states would be able to comply with the CPP and in 2030, 18 states would comply under the “Planned Investment” scenarios.

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<sup>59</sup> [http://phx.corporate-ir.net/phoenix.zhtml?c=147906&p=irol-newsArticle\\_Print&ID=2164582](http://phx.corporate-ir.net/phoenix.zhtml?c=147906&p=irol-newsArticle_Print&ID=2164582)



If states were not meeting the CPP goal, MJ Bradley then looked at what would happen if a state took incremental action equivalent to their average neighbor. Specifically, the “Incremental Action” scenario looked at new generation based on the state’s neighbor’s average historical new construction of wind, solar and NGCC between 2010-2015 and energy efficiency opportunities at a level equivalent to the average of the state’s neighbors. MJ Bradley found that with incremental actions, all states would be in compliance in 2022 and four additional states would be in compliance with the CPP in 2030.

Similar to the UCS analysis above, the MJ Bradley scenarios do not include the effects of the PTC/ITC extensions for renewable energy nor did it allow for interstate trading for compliance. When the movant states were allowed to access emission reductions within any of the movant states through trading, all 27 states were found to be able to comply through 2030. Also, more recent announcements of RE additions and coal capacity retirements such as the one by NIPSCO in Indiana and Entergy in Arkansas were not factored into the modeling and could change the outcomes for some states.

The full analysis can be found at the following:

<http://blogs.edf.org/climate411/files/2016/09/MJB-study-on-CPP-compliance.pdf>

IPM Base Case v.5.15

The EPA uses the Integrated Planning Model (IPM) to analyze the projected impact of environmental policies on the electric power sector in the 48 contiguous states and the District of Columbia. Developed by ICF Consulting, Inc. and used to support public and private sector clients, IPM is a multi-regional, dynamic, deterministic linear programming model of the U.S. electric power sector. It provides forecasts of least-cost capacity expansion, electricity dispatch, and emission control strategies for meeting energy demand and environmental, transmission, dispatch, and reliability constraints.

Base Case v.5.15 is a projection of electricity sector activity that takes into account federal and state air emission laws and regulations whose provisions were either in effect or enacted and clearly delineated at the time the base case was finalized. In addition, IPM v.5.15 accounts for two non-air federal rules that affect EGUs-- Cooling Water Intakes (316(b)) Rule and Combustion Residuals from Electric Utilities (CCR), both promulgated in 2014. The recent PTC/ITC extensions were not taken into account in this version of the model.

The state level emission results for the Base Case 2020 and 2030 run years were used for comparison with proportional interim targets in 2022 and CPP goals 2030.

Documentation for IPM Base Case v.5.15 can be found on the EPA’s website:

[https://www.epa.gov/sites/production/files/2015-08/documents/epa\\_base\\_case\\_v.5.15\\_incremental\\_documentation\\_august\\_2015.pdf](https://www.epa.gov/sites/production/files/2015-08/documents/epa_base_case_v.5.15_incremental_documentation_august_2015.pdf)

**Table 4: 2016 Estimated and IPM Modeled Baseline CO<sub>2</sub> Emissions for 2020 and 2030**

State	Est. 2016 (short tons)	IPM BC 2020 (short tons)	2022 Mass Target (short tons)	IPM BC 2030 (short tons)	2030 Mass Goal (short tons)
Alabama	64,738,053	58,427,057	68,581,836	55,229,061	56,880,474

Arizona	37,863,531	39,511,785	36,488,833	41,950,099	30,170,750
Arkansas	29,959,484	36,656,843	37,461,918	38,044,563	30,322,632
California	35,307,745	54,634,831	55,038,046	55,292,544	48,410,119
Colorado	39,113,240	38,121,791	37,241,669	39,927,780	29,900,396
Connecticut	7,555,356	7,819,591	7,754,956	7,143,407	6,941,522
Delaware	3,099,590	2,067,470	5,524,126	1,281,305	4,711,824
Florida	114,643,222	122,443,236	123,317,068	113,763,352	105,094,703
Georgia	60,080,847	61,305,697	56,291,624	64,111,638	46,346,846
Idaho	1,368,985	1,078,821	1,656,607	1,256,329	1,492,855
Illinois	72,611,780	75,112,620	83,788,272	76,170,436	66,477,156
Indiana	89,166,120	104,669,332	95,887,348	103,469,553	76,113,834
Iowa	26,617,506	29,684,986	31,713,035	29,435,074	25,018,136
Kansas	26,599,295	41,894,916	27,916,981	41,369,085	21,990,825
Kentucky	74,926,550	61,624,505	80,055,000	62,744,802	63,126,121
Louisiana	49,308,888	31,655,308	43,693,391	30,898,155	35,427,022
Maine	1,571,471	3,718,956	2,309,516	3,569,868	2,073,942
Maryland	14,884,841	16,342,909	18,197,145	14,142,850	14,347,627
Massachusetts	11,480,174	12,392,303	13,742,197	11,276,126	12,104,746
Michigan	56,077,423	54,837,037	59,161,223	48,358,252	47,544,063
Minnesota	30,002,906	30,734,556	28,437,534	31,561,548	22,678,368
Mississippi	27,441,729	30,264,190	29,924,847	24,176,172	25,304,337
Missouri	66,761,261	84,692,626	70,186,881	84,984,370	55,462,884
Montana	16,970,580	20,612,466	14,373,112	20,614,770	11,303,107
Nebraska	22,869,155	33,841,418	23,206,065	34,024,114	18,272,738
Nevada	14,319,706	13,558,138	15,530,374	12,942,098	13,523,583
New Hampshire	4,065,240	3,937,924	4,596,636	3,937,924	3,997,579
New Jersey	16,586,068	21,255,051	18,749,719	19,327,490	16,599,744
New Mexico	17,511,145	12,177,632	15,382,429	12,110,602	12,412,601
New York	29,306,397	28,314,559	36,661,943	24,004,062	31,257,428
North Carolina	50,059,904	48,856,544	63,402,534	40,475,269	51,266,233
North Dakota	32,101,196	31,846,545	26,555,267	32,412,401	20,883,231
Ohio	81,361,371	103,946,835	92,146,648	100,103,534	73,769,805
Oklahoma	36,243,591	43,872,962	49,387,181	43,282,675	40,488,199
Oregon	8,962,102	4,979,063	9,378,818	6,662,170	8,118,653
Pennsylvania	85,343,024	106,682,061	110,195,679	100,307,788	89,822,307
Rhode Island	2,922,629	2,981,490	3,908,577	2,986,107	3,522,224
South Carolina	28,195,161	32,534,982	32,275,118	31,556,530	25,998,967
South Dakota	2,952,793	4,703,265	4,402,668	4,761,088	3,539,481
Tennessee	35,696,448	44,738,549	35,534,240	44,396,875	28,348,396
Texas	225,035,057	241,247,965	229,870,160	238,909,544	189,588,841
Utah	26,770,508	35,445,732	29,641,959	36,967,661	23,778,193

Virginia	31,459,319	26,433,868	32,341,444	23,128,417	27,433,111
Washington	10,981,113	3,827,287	12,834,306	6,560,261	10,739,172
West Virginia	69,740,401	81,968,280	65,265,675	81,743,812	51,325,341
Wisconsin	45,081,660	47,182,368	34,870,717	47,983,436	27,986,988
Wyoming	47,166,976	38,302,536	40,192,698	38,494,625	31,634,412
<b>47 States</b>	<b>1,882,881,541</b>	<b>2,032,938,884</b>	<b>2,015,074,020</b>	<b>1,987,849,622</b>	<b>1,643,551,519</b>

World Resources Institute State Fact Sheets

For three of the states not achieving the CPP goals in any scenario—Missouri, Illinois and Wisconsin—the World Resources Institute took an in-depth look at how they could meet their CPP goals using existing clean energy policies and infrastructure. The fact sheets examined how states can reduce CO<sub>2</sub> emissions from their existing power plants by following through on their clean energy policies, like energy efficiency and renewable energy targets, and making better use of existing infrastructure, like fuller utilization of unused capacity at natural gas plants and increasing efficiency at existing coal plants. WRI did not analyze the other three states in the Table 3.

WRI concluded that Wisconsin can get 63 percent of the reductions required under the CPP by taking the following practical steps:

- Continuing the Focus on Energy program: Through this program, the state has adopted annual electricity savings targets of about 0.8 percent of sales through 2018.
- Maintaining the existing renewable portfolio standard beyond 2015: Requires 10 percent of the electricity sold by investor-owned utilities to come from renewable sources.
- Increasing the use of existing natural gas plants. Running existing combined cycle plants at 75 percent could cut additional emissions.
- Increasing coal plant efficiency. Adopt low-cost operational improvements and best practices at existing coal plants.<sup>60</sup>

They also determined that Missouri can get 90 percent of the reductions required by taking the steps described below:

- Meeting voluntary energy efficiency goals: The Missouri Public Service Commission set efficiency benchmarks that reach 1.9 percent of electricity sales in 2019 and subsequent years.
- Meeting the existing renewable energy standard: Requires 15 percent of the electricity sold by investor-owned utilities to come from renewable sources by 2021.
- Increasing the use of existing natural gas plants. Combined cycle plants generated less than one-fourth of the electricity they were capable of producing in 2012. Running existing plants at 75 percent could cut emissions further.
- Increasing coal plant efficiency. Low- and no-cost operational improvements and best practices at existing coal plants could cut emissions further.<sup>61</sup>

<sup>60</sup> <http://www.wri.org/publication/how-wisconsin-can-meet-its-clean-power-plan-targets>

<sup>61</sup> <http://www.wri.org/publication/how-missouri-can-meet-its-clean-power-plan-targets>

Illinois could meet—or even exceed—its mass-based emission targets by adjusting or removing the spending cap on efficiency while increasing the target to achieve about 20 percent cumulative energy savings by the end of 2025 and increasing the renewable energy standard to 35 percent of the state’s sales by 2030, in line with the state’s bipartisan Clean Jobs Bill. Doing so would cut CO<sub>2</sub> emissions by 76 percent below 2012 levels by 2030.

WRI also published fact sheets for Michigan, Pennsylvania, and Virginia as part of this series.

**Michigan:** WRI found that Michigan is well-positioned to meet its CPP standards—it can get 98 percent of the reductions required under its mass-based emission target with its existing clean energy policies. Michigan can make up the small remaining gap—and even exceed its targets—by making better use of existing infrastructure. According to the WRI evaluation, combined cycle plants generated less than one-fourth of the electricity they were capable of producing in 2012. Running existing plants at 75 percent could cut emissions further.

**Pennsylvania:** By following through on its existing EE and RE policies and making better use of the state’s fossil power plants, Pennsylvania can reduce its existing power plant emissions 13 percent below 2012 levels by 2030, more than half way to the state’s 25 percent reductions target. By expanding the state’s clean energy targets after the initial targets are met in 2020-2021, and making better use of its existing fossil fleet, Pennsylvania can reduce existing power plant emissions 46 percent below 2012 levels by 2030.

**Virginia:** Virginia’s power plants have already reduced their CO<sub>2</sub> emissions by 22 percent between 2005 and 2012, due in large part to using more natural gas and less coal, as well as lower overall electricity generation. While electricity demand is projected to rise in the coming years, capitalizing on existing clean energy opportunities can allow the state to surpass its CPP mandate. The state has already locked in one-third of the total reductions needed through planned actions like scheduled coal plant retirements and investments in renewables and efficiency.

## SOURCES OF DATA REGARDING STATE CPP PLAN-RELATED ACTIVITY

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