PRESIDENTIAL EXECUTIVE ACTION: UNILATERALLY CHANGING THE WORLD'S CRITICAL TECHNOLOGY AND INFRASTRUCTURE

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ABSTRACT

Can the President, through executive action with no approval of Congress whatsoever, change the world? Declared President Obama: "If Congress won't act soon to protect future generations, I will." What is considered the second most important invention in history—electricity—has had its legal regulation and technological foundation fundamentally changed by unilateral executive action in the past two years. As a result of this unilateral executive action, critical technology and modern society are changing fundamentally.

This is not without legal challenge: Shortly after the Obama Administration announced its Clean Power Plan, House of Representatives Speaker John Boehner announced that he and others would file a lawsuit against President Obama for unconstitutional use of Presidential directives. Litigation takes time; the court challenge progresses. Addressing both constitutional and administrative issues, this Article examines the core legal "flex" of executive power within the contours of U.S. constitutional governance.

This Article examines pivotal executive actions taken through the "back door" with no legislative concurrence, and some legislative disapproval, to affect the supply of power in America and climate change. Unilateral executive action is

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changing fundamental technology for the second most important invention in history. Losing 20 percent of its market share in an administrative heartbeat, unilateral executive branch environmental regulation and interpretation is now constricting coal combustion from its historical position supplying more than half of all U.S. electric power less than five years ago, to a rapidly plunging minority share. This fundamentally alters the United States' environment and climate. This Article explores the law and nuances enwrapping how the United States regulates the second most important invention in history, and how it changes the foundation of the American economy.

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[I]f Congress won't act soon to protect future generations, I will. I will direct my Cabinet to come up with executive actions we can take, now and in the future, to reduce pollution, prepare our communities for the consequences of climate change, and speed the transition to more sustainable sources of energy.[1]

I. HOW TO CHANGE THE WORLD—UNILATERALLY

How far outside the constitutional "box" can the President, through legal executive action with no approval of Congress, change critical law—which then changes the world? This legal question is before the courts now that President Obama has pledged to work around Congress by exercising unilateral executive action.[2] Unilateral executive action has fundamentally changed the technology of electricity—the second most important invention in history.[3] Once supplying more than half of all U.S. electric power through burning coal,[4] executive action is constricting coal use to a fast-sinking minority share of electric power production, losing 20 percent of its market share in an administrative heartbeat and continuing to plunge.[5] This is fundamentally changing U.S. power infrastructure and the legal approach to climate change.

The permissible extent of executive action is a major legal question. In 2014, the Supreme Court, reversing a D.C. Circuit decision, upheld executive

1. President Barack Obama, Remarks by the President in the State of the Union Address (Feb. 12, 2013), https://www.whitehouse.gov/the-press-office/2013/02/12/remarks-president-state-union-address.

2. *Id.*; Associated Press, *States, Industry Groups Sue to Block Obama's 'Clean Power' Plan*, NBC NEWS (Oct. 23, 2015), http://www.nbcnews.com/business/energy/states-industry-groups-sue-block-obamas-clean-power-plan-n450216.

3. *See* James Fallows, *The 50 Greatest Breakthroughs Since the Wheel*, THE ATLANTIC (Nov. 2013), http://www.theatlantic.com/magazine/archive/2013/11/innovations-list/309536/. Electricity finished behind only the movable-type printing press, and is essential to operate seven of the other "top 50" inventions of all time: The Internet, computers, air-conditioning, radio, television, the telephone, and semiconductors. *Id.*

4. U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2013 WITH PROJECTIONS TO 2040, at 39–40 (2013), http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf.

5. Coral Davenport, *Obama to Take Action to Slash Coal Pollution*, N.Y. TIMES (June 1, 2014), http://www.nytimes.com/2014/06/02/us/politics/epa-to-seek-30-percent-cut-in-carbon-emissions.html?_r=0; Jim Snyder & Tim Loh, *Coal's Worst Fear Affirmed in Analysis of Obama Climate Plan*, BLOOMBERG BUS. (May 22, 2015), http://www.bloomberg.com/news/articles/2015-05-22/obama-effort-to-control-emissions-may-double-coal-plant-closures.

environmental action.[6] But in 2015, the Supreme Court, again reversing a D.C. Circuit decision, overturned executive environmental action.[7] This Article examines the "flex" of executive power within the structure of Constitutional governance and the core issue of how the economy is powered.

Executive action on the environment and climate change now bypasses Congress.[8] Part II of this Article sets the stage with the science and physics of electricity, a legal "intangible" thing in American law, which now is at the core of climate change. Part III examines the pivotal executive actions recently exercised with no legislative concurrence and some legislative disapproval, radically constraining carbon dioxide (CO_2) emissions related to the production of electricity, and ongoing legal challenges to these actions. Part IV analyzes recent Environmental Protection Agency (EPA) unilateral executive actions that affect the use of basic power technology and their legal challenge. Part V analyzes unilateral executive actions taken to affect atmospheric emissions other than CO_2 but which impact climate change and the future. Part VI places in legal context and draws comparative conclusions about each of these recently exercised executive actions fundamentally changing what has been deemed the second most important invention in history after the wheel.

This Article starts with the climate, science, and power.

II. CLIMATE CHANGE AND POWER

A. *Climate Change*

Climate change is a significant global issue. After the last 800,000 years of greenhouse gas (GHG) levels hovering between 175–250 part per million (ppm) in the atmosphere, they have now increased to 400 ppm.[9] The earth is

6. EPA v. EME Homer City Generation LP, 134 S. Ct. 1584, 1609 (2014).

7. Michigan v. EPA, 135 S. Ct. 2699, 2712 (2015).

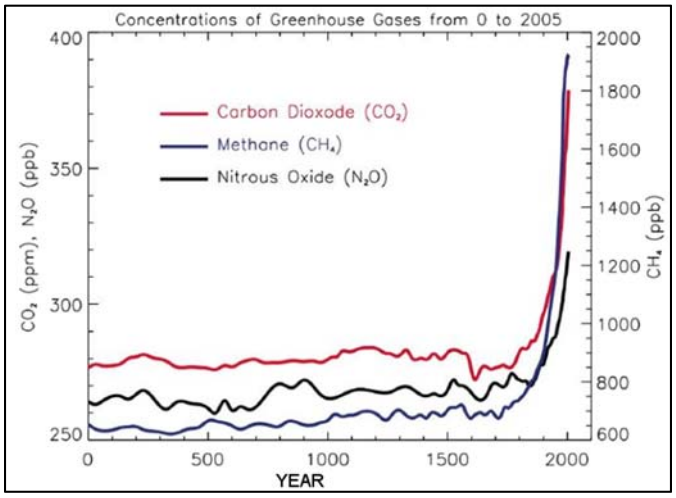
8. *See* Peter Baker & Coral Davenport, *Using Executive Powers, Obama Begins His Last Big Push on Climate Policy*, N.Y. TIMES (May 31, 2014), http://www.nytimes.com/2014/06/01/us/politics/obama-sets-the-stage-for-curbing-emissions.html?_r=0.

9. Jessica Blunden, *2013 State of the Climate: Carbon Dioxide Tops 400 ppm*, CLIMATEWATCH MAG. (July 13, 2014), http://www.climate.gov/news-features/understanding-climate/2013-state-climate-carbon-dioxide-tops-400-ppm; *see* AMERICAN METEOROLOGICAL SOCIETY, STATE OF THE CLIMATE IN 2014, at xvi (Jessica Blunden & Derek S. Arndt eds., 2015).

warming and the sea level is rising.[10]

> GHG annual emissions increased about seventy percent between 1970 and 2004, with the combustion of fossil fuels accounting for seventy percent of total GHG emissions, electric power generation responsible for forty percent of these CO_2 emissions, and coal-fired electric power generation accounting for about seventy percent of the emissions in this sector.[11]

Figure 1[12]



"Global energy-related emissions are expected to increase approximately 57

10. *Rising Temperatures*, WORLD WILDLIFE FOUND., http://wwf.panda.org/about_our_earth/aboutcc/problems/rising_temperatures/ (last visited Oct. 30, 2015) [hereinafter *Rising Temperatures*]; *Sea Level Rise*, WORLD WILDLIFE FOUND., http://wwf.panda.org/about_our_earth/aboutcc/problems/rising_temperatures/sea_levels/ (last visited Oct. 30, 2015).

11. Steven Ferrey, *Corporate Energy Responsibility: International and Domestic Perspectives on Supply and Demand in the New Millennium*, 25 FORDHAM ENVTL. L. REV. 84, 85–86 (2015) [hereinafter Ferrey, *Corporate*]; Joëlle de Sépibus, *The Liberalisation of the Power Industry in the European Union and its Impact on Climate Change: A Legal Analysis of the Internal Market in Electricity* 2–4 (Swiss Nat'l Ctr. of Competence in Research, Working Paper No. 2008/10, 2008), http://phase1.nccr-trade.org/images/stories/publications/IP6/de_Sepibus_EU_libCC_final.pdf.

12. *Rising Temperatures*, *supra* note 10; CONCENTRATIONS OF GREENHOUSE GASES FROM 0 TO 2005, http://assets.panda.org/img/original/faq_2_1_fig_1.jpg (last visited Nov. 4, 2015). For full-color versions of figures visit www.drakelawreview.org.

percent from 2005 to 2030."[13] At current rates of energy development, energy-related CO_2 emissions in 2050 would be 137 percent of their current levels under the existent pattern.[14] And it is estimated that life as the earth knows it would fundamentally change with the consequent warming of the climate.[15]

The International Panel on Climate Change 2014 report concludes that to maintain world warming below 2 degrees Celsius, there must be a 40 to 70 percent reduction of GHG emissions from 2010 levels by 2050.[16] The World Bank released a report predicting global temperatures could rise by 7.2 degrees Fahrenheit by the end of the century, or sooner, if the international community does not realize current modest commitments to curb emissions.[17] CO_2 emissions grew 5.9 percent in 2010 reaching 9.1 GtC (33.5Gt CO_2), overshadowing a 1.4 percent decrease in CO_2 emissions in 2009.[18]

"The combustion of coal represented more than half of the growth in emissions . . . ."[19] Countries' recent pledges to fight climate change by cutting their CO_2 emissions[20] are unlikely to affect global increases in coal use and emissions. According to the International Energy Agency, global demand

13. U.S. GOV'T ACCOUNTABILITY OFFICE, INTERNATIONAL CLIMATE CHANGE PROGRAMS: LESSONS LEARNED FROM THE EUROPEAN UNION'S EMISSIONS TRADING SCHEME AND THE KYOTO PROTOCOL'S CLEAN DEVELOPMENT MECHANISM 48 (2008), http://www.gao.gov/assets/290/283397.pdf.

14. WILLIAM C. RAMSAY, ENERGY TECHNOLOGY PERSPECTIVES: SCENARIOS AND STRATEGIES TO 2050, at 7 (2006), http://www.unece.lsu.edu/biofuels/documents/2007July/SRN_020.pdf.

15. *See Climate Change: Threats and Impacts*, THE NATURE CONSERVANCY, http://www.nature.org/ourinitiatives/urgentissues/global-warming-climate-change/threats-impacts/ (last visited Nov. 4, 2015).

16. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2014 SYNTHESIS REPORT 20, 82 (2015).

17. *See New Report Examines Risks of 4 Degree Hotter World by End of Century*, THE WORLD BANK (Nov. 18, 2012), http://www.worldbank.org/en/news/press-release/2012/11/18/new-report-examines-risks-of-degree-hotter-world-by-end-of-century.

18. Justin Gillis, *Carbon Emissions Show Biggest Jump Ever Recorded*, N.Y. TIMES (Dec. 4, 2011), http://www.nytimes.com/2011/12/05/science/earth/record-jump-in-emissions-in-2010-study-finds.html.

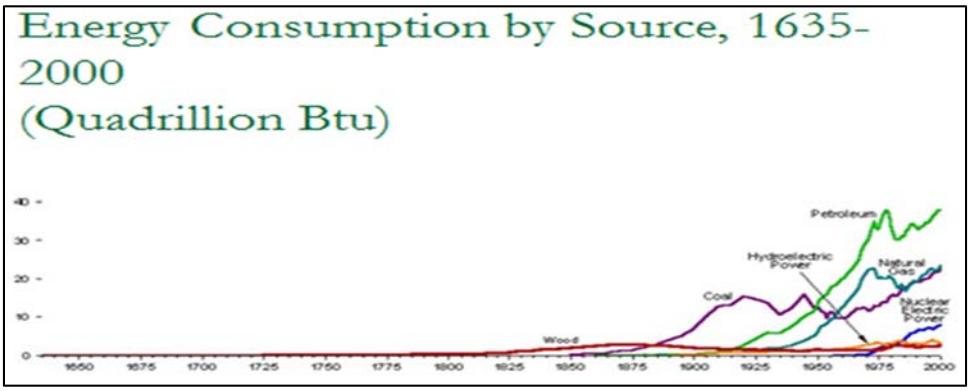
19. *Id.*

20. Arthur Neslen, *150 Countries Pledge to Curb Carbon Emissions*, THE GUARDIAN (Oct. 13, 2015), http://www.theguardian.com/environment/2015/oct/13/150-countries-pledge-to-curb-carbon-emissions.

makes coal the fastest-growing fossil fuel still and will rise 2.1 percent annually, driven mainly by China, India, and other expanding Asian economies.[21]

The role of coal is significant in history. Figure 2 below illustrates the use of different energy sources from the year 1635 to 2000.[22] During the past 150 years, coal has been the dominant energy source for half of this period, and the only energy source consistently among the top three energy sources during the entire period of industrialization over the past 150 years.[23] Since its harnessing approximately 135 years ago, electricity was originally generated by hydropower and coal-fired power.[24]

Figure 2[25]



21. Rick Mitchell, *IEA Says Climate Pledges Won't Halt Global Growth in Coal Demand to 2019*, 45 ENV'T REP. (BNA) 3640 (Dec. 15, 2014).

> India, averaging 5 percent annual coal demand growth, should pass the United States as the world's second-biggest coal consumer by 2019. . . China, the world's biggest producer and importer of coal, should see coal demand grow 2.6 percent, or 100 million tons, per year to 2019, assuming it maintains an annual gross domestic product growth rate of about 7 percent . . . .

Id.

22. STEVEN FERREY, UNLOCKING GLOBAL WARMING TOOLBOX 34 fig.3-3 (2010) [hereinafter FERREY, UNLOCKING]; *see also infra* Figure 2.

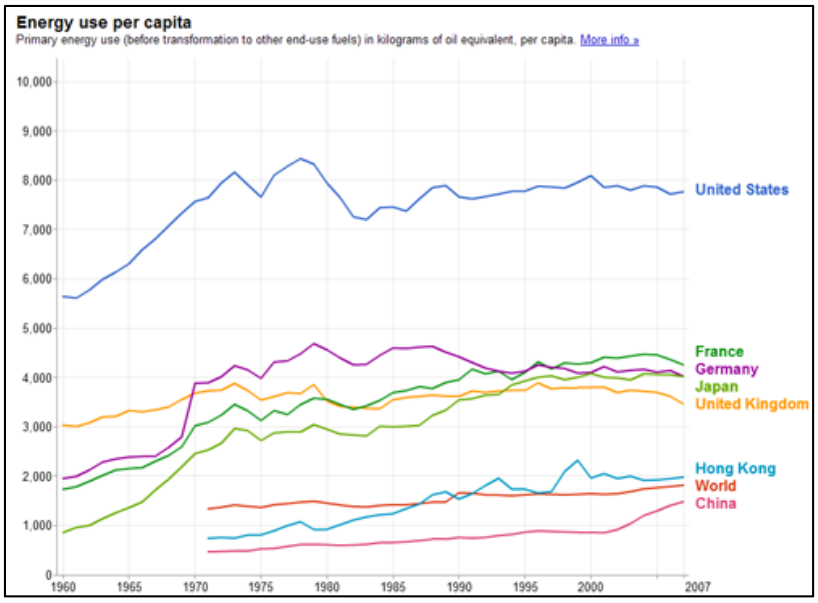
23. *See* FERREY, UNLOCKING, *supra* note 22.

24. *See A Brief History of Coal Use,* U.S. DEP'T OF ENERGY, http://www.fe.doe.gov/education/energylessons/coal/coal_history.html (last visited Nov. 4, 2015); *Hydropower: Going With the Flow*, NAT'L GEOGRAPHIC, http://environment.nationalgeographic.com/environment/global-warming/hydropower-profile/ (last updated Feb. 12, 2013).

25. FERREY, UNLOCKING, *supra* note 22.

Within the United States, this is a significant amount of energy. Figure 3 below illustrates that the United States uses approximately twice the energy per capita compared to many other countries in the world.[26] And having the third largest population in the world, this is a significant amount of U.S. energy.[27]

Figure 3[28]



26. *Energy Use*, THE WORLD BANK, http://data.worldbank.org/indicator/EG.USE.PCAP.KG.OE/countries/1W?display=default (last visited Jan. 26, 2016); Max Fisher, *It's Official: Western Europeans Have More Cars Per Person Than Americans*, THE ATLANTIC (Aug. 14, 2012), http://www.theatlantic.com/international/archive/2012/08/its-official-western-europeans-have-more-cars-per-person-than-americans/261108/; *see also* Robert Wilson, *Population Growth: Addressing the Real Problem*, ENERGY COLLECTIVE (Oct. 2, 2013), http://theenergycollective.com/robertwilson190/281991/population-growth-addressing-real-problem.

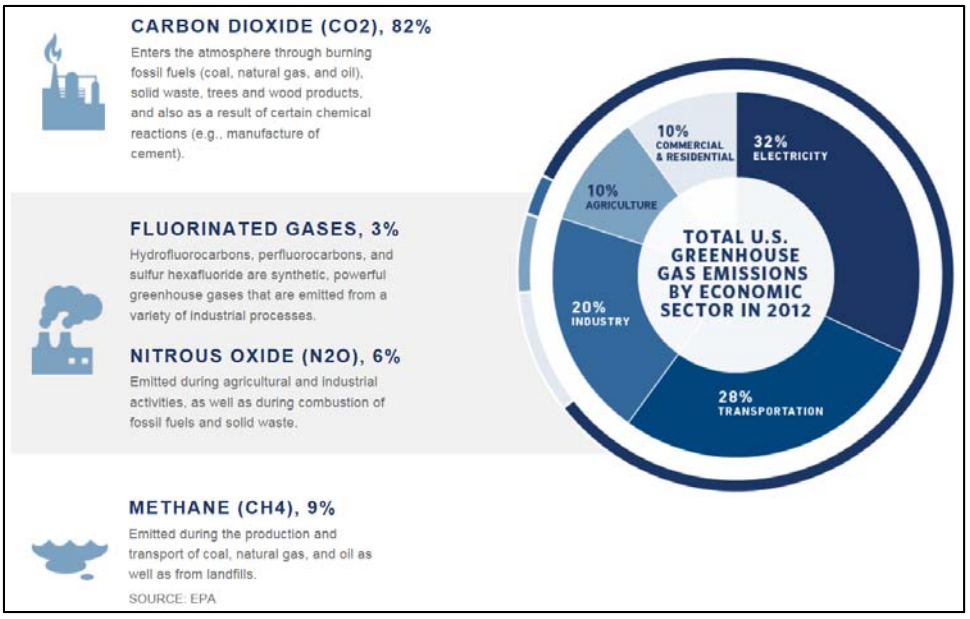
27. UNIV. OF MICH., CTR. FOR SUSTAINABLE SYS., U.S. ENERGY SYSTEM FACTSHEET (Oct. 2014), http://css.snre.umich.edu/css_doc/CSS03-11.pdf; *The World Factbook: Country Comparison: Population*, CIA, https://www.cia.gov/library/publications/the-world-factbook/rankorder/2119rank.html (last visited Nov. 4, 2015).

28. Fisher, *supra* note 26.

B. *Electric Buzz*

"Electricity production accounts for less than 5 percent of U.S. economic activity, yet is held responsible for approximately one-quarter of emissions of criteria air pollutants."[29] Figure 4 below illustrates that with CO_2 constituting 82 percent of all GHG emissions in the United States, the electric production sector of the economy exceeds transportation, agriculture, industry, and the commercial and residential sectors of the economy in the emission of GHGs.[30] Of the six primary GHGs, the electric power sector directly or indirectly emits CO_2 and methane.[31]

Figure 4. Sources of U.S. GHGs[32]



29. Ferrey, *Corporate*, *supra* note 11, at 84–85; *see Sources of Greenhouse Gas Emissions: Electricity Sector Emission*, EPA [hereinafter *Electricity Sector Emission*], http://www3.epa.gov/climatechange/ghgemissions/sources/electricity.html (last visited Jan. 26, 2016).

30. *See Climate Change and President Obama's Action Plan*, WHITE HOUSE [hereinafter *Obama's Action Plan*], https://www.whitehouse.gov/climate-change (last visited Jan. 27, 2016); *see also infra* Figure 4.

31. *See Electricity Sector Emissions*, *supra* note 29.

32. *Obama's Action Plan*, *supra* note 30.

Figure 5 below shows that the electric sector dominates emissions of the primary GHG, CO_2, compared to the transportation sector, which emits CO_2 from vehicles, and the commercial, residential, and industrial sectors, which emit CO_2 in heating buildings and in manufacturing.[33] Power plants emit more GHGs than any other stationary source category in the United States, generating approximately 40 percent of all anthropogenic CO_2 emissions in the United States.[34]

Figure 5[35]

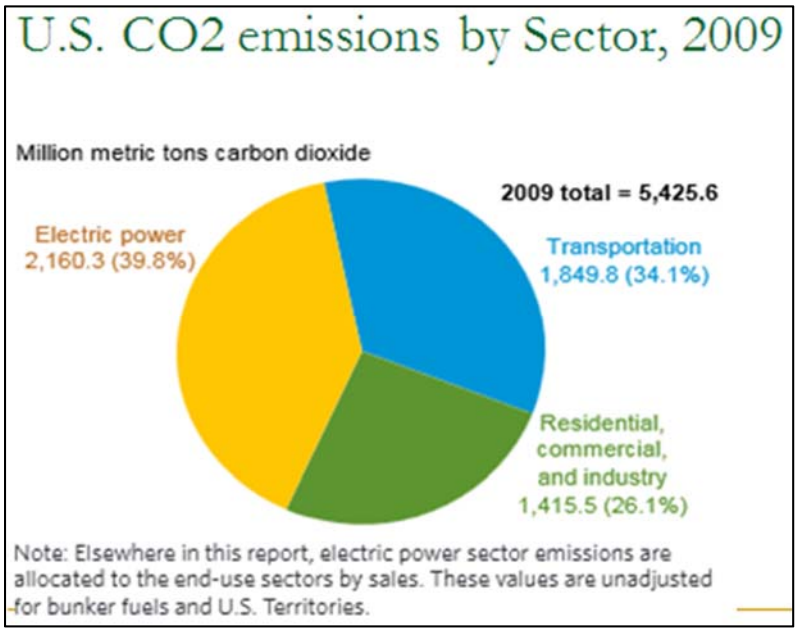


Figure 6 below combines electric, transportation, and other energy and displays CO_2 compared to other greenhouse gases. For context, the majority

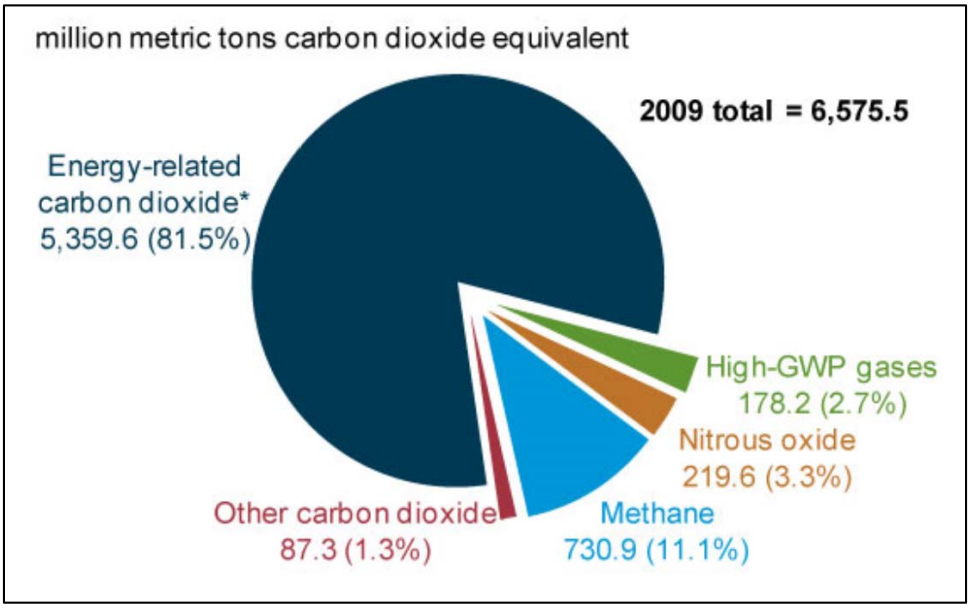
33. *See Electricity Sector Emission*, *supra* note 29; EMISSIONS OF GREENHOUSE GASES IN THE U.S., U.S. ENERGY INFO. ADMIN. 2 (2011), http://www.eia.gov/environment/emissions/ghg_report/ghg_overview.cfm; *see also infra* Figure 5.

34. *See* Standards of Performance for Greenhouse Gas Emissions for new Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392, 22,395 (proposed April 13, 2012) (to be codified at 7 C.F.R. pt. 60); *Overview of Greenhouse Gases: Carbon Dioxide Emissions*, EPA, http://www3.epa.gov/climatechange/ghgemissions/gases/co2.html (last visited Nov. 4, 2015).

35. *Emissions of Greenhouse Gases in the U.S.*, *supra* note 33.

of energy produced in the United States is derived from fossil fuels.[36] The Congressional Research Service concluded that "in 2013, fossil fuels accounted for 78.5% of U.S. primary energy production."[37] Table 1 below shows the breakdown of this fossil-fuel use. The remaining, non-fossil-fuel, primary-energy production was attributed to "nuclear electric and renewable energy resources, with shares of 10.1 percent and 11.4 percent, respectively."[38]

Figure 6. U.S. Greenhouse Gas Emissions, 2009[39]



Coal and natural gas are supplying an approximately equal share of U.S. energy supply.[40] However, while natural gas is used both for electricity

36. *What is U.S. Electricity Generation by Energy Source?*, U.S. ENERGY INFO. ADMIN., http://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3 (last updated March 31, 2015).

37. MOLLY F. SHERLOCK & JEFFREY M. STUPAK, CONG. RESEARCH SERV., R41953 ENERGY TAX INCENTIVES: MEASURING VALUE ACROSS DIFFERENT TYPES OF ENERGY RESOURCES, at Summary (2015), http://www.fas.org/sgp/crs/misc/R41953.pdf.

38. *Id.*

39. EMISSIONS OF GREENHOUSE GASES IN THE U.S., *supra* note 33.

40. Chris Cassar, *Nationwide, Electricity Generation From Coal Falls While Natural*

production and for building heating,[41] coal is used primarily for electricity production.[42] Currently, the electric system relies primarily on coal-fired resources: In the United States there are 511 coal-powered plants,[43] and "[c]oal-burning produces about 40 percent of the electricity used by Americans."[44] "Coal is the chief source of electricity in 22 states and creates a majority of the electrical power in 14 states."[45]

Table 1. Primary Energy Production by Source (2013)[46]

Source	Quadrillion Btu[a]	Percent of Total
Fossil Fuels		
Coal	20.0	24.4%
Natural Gas	25.0	30.5%
Crude Oil	15.8	19.3%
Natural Gas Plant Liquids	3.5	4.3%
Nuclear		
Nuclear Electric	8.3	10.1%
Renewable Energy		
Biomass[b]	4.6	5.6%
Hydro-Electric Power	2.6	3.1%
Wind	1.6	1.9%
Solar/PV	0.3	0.4%
Geothermal	0.2	0.3%
Total	81.9	100%

Gas Rises, U.S ENERGY INFO. ADMIN. (Oct. 7, 2015), http://www.eia.gov/todayinenergy/detail.cfm?id=23252 (stating that monthly U.S. electricity generation data showed that "natural gas fuel[ed] 35.0% of total generation to coal's 34.9%"); *see also infra* Table 1.

41. U.S. DEP'T OF ENERGY, FOSSIL ENERGY STUDY GUIDE: NATURAL GAS 1 (2014), http://energy.gov/sites/prod/files/2014/02/f8/HS_NatGas_Studyguide_draft2.pdf.

42. *See* U.S. DEP'T OF ENERGY, FOSSIL ENERGY STUDY GUIDE: COAL 1 (2013), http://energy.gov/sites/prod/files/2013/04/f0/HS_Coal_Studyguide_draft1.pdf.

43. John Myskens, Dan Keating & Samuel Granados, *Mapping How the United States Generates its Electricity*, WASH. POST (July 31, 2015) [hereinafter Myskens et al., *Mapping*], http://www.washingtonpost.com/graphics/national/power-plants/.

44. Joby Warrick, *White House Set to Adopt Sweeping Curbs on Carbon Pollution*, WASH. POST (Aug. 1, 2015), https://www.washingtonpost.com/national/health-science/white-house-set-to-adopt-sweeping-curbs-on-carbon-pollution/2015/08/01/ba6627fa-385c-11e5-b673-1df005a0fb28_story.html.

45. Myskens et al., *Mapping*, *supra* note 43.

46. SHERLOCK & STUPAK, *supra* note 37, at 4.

Therefore, in this position of dominant usage for electricity and greatest CO_2 emissions per unit of power generated, it is understandable why coal is the primary target for federal CO_2 reduction strategies to meet a 32 percent reduction at both the federal and state levels.[47] Coal has been the dominant source of electric production in the United States, and the world, since the first harnessing of electricity 135 years ago.[48] And causing a substantial part of this coal-fired power to disappear using only the unilateral legal tools of the executive branch, without legislation, may require some executive branch prestidigitation.[49] However, a fundamental and unprecedented diminution of coal use in the constellation of U.S. power technology is occurring.[50] This is fundamental change regarding one of the most important technologies in the United States and all countries across the globe.[51]

Efforts in Congress to enact carbon control failed in 2009 and 2010.[52] Nonetheless, without any action of the legislative branch to make new law, U.S. GHG emissions have declined.[53] Some of this is due to the recession in demand for power[54] and decreasing prices of natural gas (an alternative fossil fuel to coal for power generation).[55] But a significant amount of this is from

47. *See* Warrick, *supra* note 44; *infra* Part III.A.

48. *See* JAMES G. SPEIGHT, THE CHEMISTRY AND TECHNOLOGY OF COAL 13 (3d ed. 2013); *see also supra* Figure 2.

49. *See* Michael Grunwald, *5 Reasons Obama's Transformative Power Plan Won't Transform Anything*, POLITICO (May 26, 2015), http://www.politico.com/agenda/story/2015/05/obama-transformative-energy-power-plan-000016.

50. *See* Wendy Koch, *EPA Seeks 30% Cut in Power Plant Carbon Emissions by 2030*, USA TODAY (June 3, 2014), http://www.usatoday.com/story/money/business/2014/06/02/epa-proposes-sharp-cuts-power-plant-emissions/9859913/.

51. *See* Fallows, *supra* note 3.

52. Ryan Lizza, *As the World Burns*, THE NEW YORKER (Oct. 11, 2010), http://www.newyorker.com/magazine/2010/10/11/as-the-world-burns.

53. EPA, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2013, at ES-4, fig.ES-1 (2015), http://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf (showing that despite a slight increase in 2013 as compared to 2012, total U.S. GHG emissions have fallen since 2007); Lindsay Abrams, *U.S. Greenhouse Gas Emissions Are at a 20-Year Low*, SALON (Apr. 17, 2014), http://www.salon.com/2014/04/17/u_s_greenhouse_gas_emissions_are_at_a_20_year_low/.

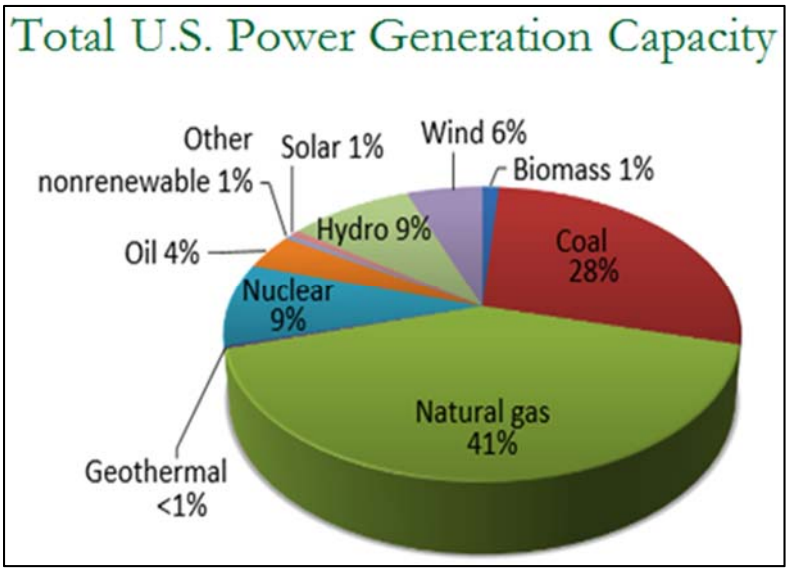
54. *See* Sarah Zielinski, *Recession, Not Fracking, Drove a Drop in U.S. Carbon Emissions*, SMITHSONIAN MAG. (July 21, 2015), http://www.smithsonianmag.com/science-nature/recession-not-fracking-drove-drop-us-carbon-emissions-180955972/?no-ist.

55. EPA, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–

unilateral executive action under Article II of the Constitution and Article III Judicial Branch determinations upholding much of it to date.[56] Largely absent is the Legislature acting under Article I of the Constitution.

In the last five years, natural gas and renewable energy power-generating capacity are beginning to supplant coal generation[57] as shown in Figure 7 below.

Figure 7[58]



Time is an element. Choices made today about the types, features and location of long-lived power infrastructure will impact climate change for generations. Four-fifths of the total energy-related CO_2 emissions permitted

2012, at 2-3 (2014), http://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2014-Main-Text.pdf.

56. *See* Koch, *supra* note 50.

57. *See Natural Gas, Renewables Projected to Provide Larger Shares of Electricity Generation*, U.S. ENERGY INFO. ADMIN. (May 4, 2015), http://www.eia.gov/todayinenergy/detail.cfm?id=21072.

58. *Density of Power Plants by Operating Capacity: Continental United States*, SNL ENERGY (July 9, 2014), http://www.snl.com/Global_Financial_Analysis_Infographics.aspx (compiling Global Economic Analysis Infographics, including numerous energy-sector related infographics).

to be emitted by 2035 in the so-called "450 Scenario"[59] to keep climate change in manageable dimension are already locked-in by existing capital stock, including power stations, buildings, and factories.[60] Without further action by 2017, the energy-related infrastructure in place at that time would generate all the CO_2 emissions allowed in the "450 Scenario;" under this scenario, the world temperature increase would be limited to 2 degrees by 2035.[61]

According to a recent Organisation for Economic Co-operation and Development (OECD) report examining policy challenges for the next 50 years, unless CO_2 emissions are reduced, climate change could curb global gross domestic project (GDP) by 1.5 percent by 2060 and by nearly 6 percent in south and southeastern Asia.[62] The International Energy Agency "presents evidence that the [estimated $44 trillion] in additional investment needed to decarbonise the energy system in line with [their plus "2 degree scenario"] by 2050 is more than offset by over [$115 trillion] in fuel savings—resulting in net savings of [$71 trillion]."[63]

III. EXECUTIVE ACTIONS TARGETING CO_2

"President Obama's actions have pushed executive power beyond all limits and created what has been characterized as an 'uber-presidency.'"[64]

There are recent executive branch actions, with resultant 2014 court

59. *See* INT'L ENERGY AGENCY, 450 SCENARIO: METHOD AND POLICY FRAMEWORK 1 (2014), http://www.worldenergyoutlook.org/media/weowebsite/2014/Methodologyfor450Scenario.pdf.

60. INT'L ENERGY AGENCY, WORLD ENERGY OUTLOOK 2012, at 3 (2012), http://www.iea.org/publications/freepublications/publication/english.pdf.

61. *Id.*

62. OECD ECONS. DEP'T, SHIFTING GEAR: POLICY CHALLENGES FOR THE NEXT 50 YEARS 1 (2014), http://www.oecd.org/eco/growth/Shifting%20gear.pdf.

63. INT'L ENERGY AGENCY, ENERGY TECHNOLOGY PERSPECTIVES 2014: HARNESSING ELECTRICITY'S POTENTIAL 8 (2014), http://www.iea.org/Textbase/npsum/ETP2014SUM.pdf (stating that "all costs and prices are in real 2012 USD, i.e. excluding inflation"). "Even with a 10% discount rate, the net savings are more than USD 5 trillion." *Id.*

64. *See* Andrew Rudalevige, *The Letter of the Law: Administrative Discretion and Obama's Domestic Unilateralism*, 12 THE FORUM 29, 38 (2014) (quoting *Enforcing the President's Constitutional Duty to Faithfully Execute the Laws: Hearing Before the H. Comm. on the Judiciary*, 113th Cong. 63 (2014) (statement of Bob Goodlatte, Chairman)).

decisions upholding,[65] and 2015 court decisions questioning, their legality.[66] These executive actions do not single out coal-fired generation, but they disproportionately affect permissible and diminished emissions from coal generation of electric power.[67] While not applying to coal exclusively, each of the executive actions regarding CO_2 emissions will affect and restrict use of coal for power generation more than other sources.[68]

This is because coal-powered generation emits more of the regulated and targeted air emissions than other fuels in the electric-power industry.[69] "Coal is the most carbon-intensive fossil fuel . . . releas[ing] approximately 29% more carbon per unit of energy than does oil, and 80% more carbon than does natural gas."[70] Coal-fired power plants also emit significantly more sulfur dioxide (SO_2), nitrogen oxides (NO_x), and particulate matter (PM), three of the six Clean Air Act EPA-regulated criteria pollutants, per megawatt hour (Mwh) generated compared to natural-gas and oil-fired plants, with existing coal units yielding greater emissions per unit of energy produced than newer coal technologies.[71] Coal-fired power also is disproportionately targeted by unilateral executive action because the EPA encourages states to exercise discretion to target electric power and coal-fired power generation to achieve National Ambient Air Quality Standards (NAAQS) Clean Air Act compliance.[72] Coal-fired power-generation units also emit more hazardous air emissions, such as mercury, compared to other fossil-fuel plants.[73] The Congressional Research Service noted that "[c]oal is an inherently 'dirty' fuel. Burning it produces SO_2, NO_x, PM, mercury, acid gases, and other pollutants, in greater abundance than other fossil fuels."[74]

65. *See* EPA v. EME Homer City Generation LP, 134 S. Ct. 1584, 1609 (2014).

66. *See* Michigan v. EPA, 135 S. Ct. 2699, 2712 (2015).

67. JAMES E. MCCARTHY & CLAUDIA COPELAND, CONG. RESEARCH SERV., EPA'S REGULATION OF COAL-FIRED POWER: IS A "TRAIN WRECK" COMING 16 (2011), https://www.fas.org/sgp/crs/misc/R41914.pdf (finding that coal-fired plants were expected to be the focus of the EPA's regulations because coal accounts for the majority of the GHG emissions coming from the electric power industry).

68. *See id.*

69. *Id.*

70. STEVEN FERREY, LAW OF INDEPENDENT POWER § 6:22 (34th ed. 2014) [hereinafter FERREY, INDEPENDENT POWER].

71. *Id.*

72. *See infra* Part III.A.

73. EPA, REDUCING TOXIC POLLUTION FROM POWER PLANTS: EPA'S PROPOSED MERCURY STANDARDS 2 (2011), http://www3.epa.gov/mats/pdfs/presentation.pdf.

74. MCCARTHY & COPELAND, *supra* note 67, at 5.

A. *CO_2 Emission Regulation*

On June 2, 2014, the U.S. Environmental Protection Agency, under President Obama's Climate Action Plan, proposed a common-sense plan to cut carbon pollution from power plants.[75]

The Obama Administration is moving through unilateral executive action toward 32 percent reduction of annual CO_2 emissions by 2030, compared to a baseline of 2005 emission levels, with a glide path toward this goal to be in place by 2022.[76] In the interim, the EPA is cutting NO_x, PM, and SO_2 emission limits, which with coal-power generation are all related to combustion of the fuel.[77] The EPA estimates that this will cost private-power generators approximately up to $8.8 billion.[78]

The EPA has issued a series of regulations affecting criteria pollutant NAAQS; tightening regulation of interstate air pollution, coal-ash, and mercury; and CO_2 limitations on new and existing fossil-fuel-fired power plants.[79] A summary time line of recent EPA regulations effective from 2008 to 2017 disproportionately affecting use of coal, and their timetables, is shown in Figure 8.

75. *Fact Sheet: Clean Power Plan Overview*, EPA, http://www2.epa.gov/cleanpowerplan/fact-sheet-clean-power-plan-overview (last visited Nov. 4, 2015).

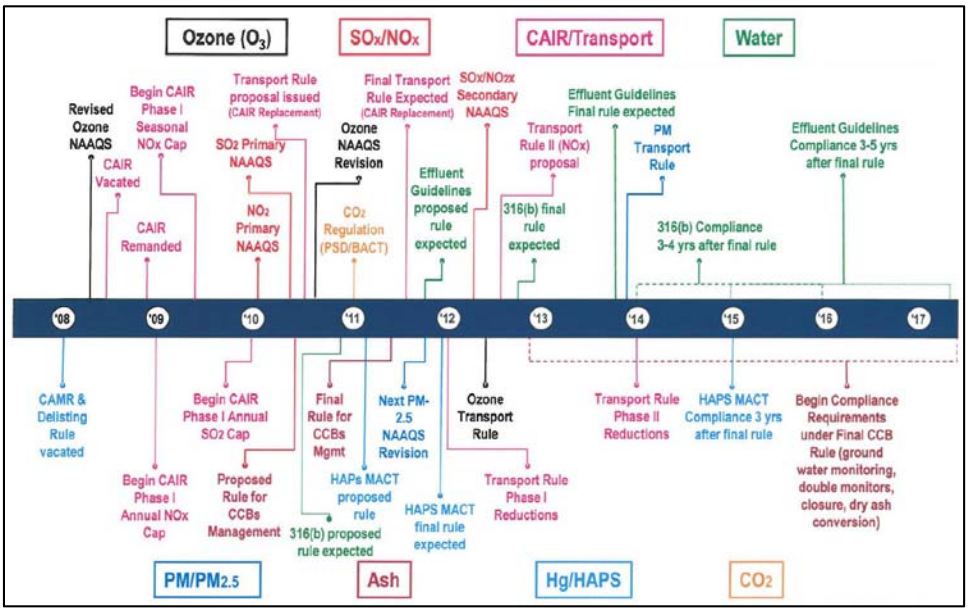
76. Clean Power Plan, 80 Fed. Reg. 64662 (Oct. 23, 2015); *see also* Juliet Eilperin & Steven Mufson, *EPA Proposes Cutting Carbon Dioxide Emissions From Coal Plants 30% by 2030*, WASH. POST (June 2, 2014), https://www.washingtonpost.com/national/health-science/epa-to-propose-cutting-carbon-dioxide-emissions-from-coal-plants-30percent-by-2030/2014/06/01/f5055d94-e9a8-11e3-9f5c-9075d5508f0a_story.html.

77. *See Basic Information*, EPA, http://www3.epa.gov/airtrends/sixpoll.html (last visited Nov. 4, 2015).

78. *Fact Sheet: Clean Power Plan Benefits*, EPA, http://www2.epa.gov/cleanpowerplan/fact-sheet-clean-power-plan-benefits (last visited Nov. 4, 2015).

79. *See* MCCARTHY & COPELAND, *supra* note 67, at 2.

Figure 8. Likely Timeline for Environmental Regulatory Requirements[80]



The EPA has exercised a firm hand over what is typically discretionary for the states regarding control of power sector emissions.[81] For example, with attainment of NAAQS, federal law provides states complete discretion under State Implementation Plans (SIPs) as to how states achieve and maintain required NAAQS.[82] As long as the math works to achieve compliance at the macro-level by the required date, the micro-detailed choices inside the compliance thresholds are left to state discretion.[83] The EPA only has discretion to veto a SIP if the macro-level math does not compute, regardless of the micro-level choices made by the state to achieve

80. *Id.* Figure 8 operates on two levels, showing the scope of regulations in the United States: (1) the rectangles grouping the areas of regulation and (2) the individual regulations.

81. *See* Jason Blacksberg, F. Joseph Dausch, Elaine K. Inman & Craig J. Gabriel, *Environmental Crimes*, 38 AM. CRIM. L. REV. 607, 658 n.322 (2001) (describing the ways in which the EPA controls state discretion in regulating emissions).

82. *See* STEVEN FERREY, ENVIRONMENTAL LAW: EXAMPLES & EXPLANATIONS 187 (6th ed. 2013) [hereinafter FERREY, ENVIRONMENTAL LAW].

83. *Id.*

compliance.[84]

As part of achieving SIP compliance, the EPA issues Alternative Control Technique documents (ACTs) for all sources with emissions of NO_x larger than 25 tons per year (tpy), as a guide for Reasonably Achievable Control Technology (RACT) on existing stationary sources.[85] The EPA also issues Control Technique Guidelines (CTGs) regarding RACT techniques for volatile organic compound (VOC) emissions.[86] Courts have noted that EPA guidance on ACTs and CTGs for RACT are only "informal suggestions."[87] While not required to follow the CTGs or ACTs, these do a significant part of the design work for the states, and ACTs describe what techniques EPA will generally approve.[88]

While states have discretion to follow the CTGs and ACTs or develop their own techniques to control emissions, these place significant pressure on the states to do what the EPA's CTGs and ACTs suggest to expedite state SIP approval by EPA.[89] If disapproved, the EPA eventually can impose a Federal Implementation Plan (FIP),[90] and there can be loss of federal highway funds.[91]

Of note, there is no federal legislation which regulates CO_2 emissions from any particular source, including power generation facilities.[92] Executive branch EPA regulations now are attempting to regulate CO_2 emissions for the first time.[93]

84. *Id.*

85. *See* FERREY, INDEPENDENT POWER, *supra* note 70, § 6:92.

86. *Id.*

87. *See, e.g.*, Citizens for a Better Env't v. Costle, 515 F. Supp. 264, 278–79 (N.D. Ill. 1981).

88. FERREY, INDEPENDENT POWER, *supra* note 70, § 6:92.

89. *Id.*

90. *Id.*; *see* 42 U.S.C. § 7410(c) (2012); *see also* N.R.D.C. v. Browner, 57 F.3d 1122, 1124 (D.C. Cir. 1995).

91. 42 U.S.C. §§ 7506, 7509(b)(1); FERREY, INDEPENDENT POWER, *supra* note 70, § 6:92.

92. *See* FERREY, ENVIRONMENTAL LAW, *supra* note 82, at 248.

93. *See Clean Power Plan For Existing Power Plants*, EPA, http://www2.epa.gov/cleanpowerplan/clean-power-plan-existing-power-plants (last visited Nov. 4, 2015); *infra* Sections III.B, C.

B. *CO_2 Regulation from New Power Generation Sources*

"The centerpiece of the plan is the announcement that the US Environmental Protection Agency (EPA) will regulate greenhouse gas emissions from existing power plants . . . ."[94]

In June of 2013, "President Obama issued a Presidential Memorandum directing the EPA to work expeditiously to complete carbon pollution standards for the power sector."[95] In response, the EPA released the Clean Power Plan, which proposed to regulate carbon emissions from new and existing power plants.[96] The EPA states that its authority to issue these new standards and regulations comes from Section 111 of the Clean Air Act.[97] Section 111(d) of the Act regulates existing sources that are not regulated under other sections of the Act.[98] Section 111(d) differs from 111(b) of the Act as it requires states to create EPA guided "standards of performance for existing sources."[99] Section 111(d) cannot be used to regulate existing sources unless Section 111(b) has already established new source performance standards, for new or modified sources.[100]

The EPA proposed new executive branch regulations for new CO_2-emitting power plants under Section 111(b) of Clean Air Act, to which Best

94. Dana Nuccitelli, *President Obama Acts on Climate Change by Enforcing the Law*, THE GUARDIAN (June 25, 2013), http://www.theguardian.com/environment/climate-consensus-97-per-cent/2013/jun/25/climate-change-carbon-emissions-president-obama-epa.

95. *Regulatory Actions*, EPA, http://www2.epa.gov/cleanpowerplan/regulatory-actions (last updated Aug. 3, 2015).

96. *Fact Sheet: Clean Power Plan Overview*, *supra* note 75.

97. *Regulatory Actions*, *supra* note 95; *see* 42 U.S.C. § 7411 (2012).

98. 42 U.S.C. § 7411(d). Section 111(d) has been used only five times because most other categories of sources are addressed in other sections of the Clean Air Act. *See Hearing on EPA's Proposed 111(d) Rule for Existing Power Plants: Legal and Costs Issues Before the Subcomm. on Energy and Power of the H. Comm. on Energy and Commerce*, 114th Cong. 1 (2015) (statement of Allison D. Wood, Partner, Hunton & Willams LLP).

99. *Compare* 42 U.S.C. § 7411(d), *with* § 7411(b); *see Regulatory Actions*, *supra* note 95.

100. *See* 42 U.S.C. § 7411(d). The EPA stresses that Section 111(d) provides a broad grant of power to address flexibly air pollutants that are not identified as criteria pollutants. *See Regulatory Actions*, *supra* note 95. "Each state has the flexibility to choose how to meet the goal using a combination of measures that reflect its particular circumstances and policy objectives." *Fact Sheet: Clean Power Plan Framework*, EPA, http://www2.epa.gov/cleanpowerplan/fact-sheet-clean-power-plan-framework (last updated May 11, 2015).

System of Emission Reduction (BSER) applies, and which would effectively make impossible conventional coal-burning power technology for new plants.[101]

> EPA determined that carbon capture and storage ("CCS") is an "adequately demonstrated" technology for [BSER] . . . . [New Source Performance Standards] (NSPS) must be based on BSER, taking into account costs, environmental impact, and energy requirements. The proposed "New Source Rule" issued by EPA for comment establishes separate performance standards for new coal and gas-fired power plants:
>
> - 1,100 lbs of CO_2/MWh of electricity produced for new coal plants (on a 12 operating month rolling basis)
> - 1,000 lbs CO_2/MWh for new gas-fired facilities with a heat input exceeding 850 MMBtu/h (250 MW)
> - 1,100 lbs CO_2/MWh for new gas-fired facilities with a heat input between 250 MMBtu/h (73 MW) and 850 MMBtu/h (250 MW).[102]

101. Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 1430, 1433 (Jan. 8, 2014). The EPA had previously proposed CO_2 emission standards for new power plants in 2012 but withdrew the proposed rule after notice and comment in order to revise the proposed rule. *See* 77 Fed. Reg. 22,392, 22,392 (proposed Apr. 13, 2012); 79 Fed. Reg. 1352, 1352 (Jan. 8, 2014) (withdrawing proposal).

102. FERREY, INDEPENDENT POWER, *supra* note 70, § 6:7.20.

> There are at least three approaches to carbon capture: pre-combustion (conversion of carbon in the fuel to CO_2, with removal prior to combustion); post-combustion (separating dilute CO_2 from flue gas after combustion); and oxy-combustion (using nearly pure oxygen—rather than air—as the oxidant to produce a flue gas consisting mainly of CO_2 and water vapor). Based on comparison to a reference case of NGCC without CCS, the cost of an avoided metric ton of CO_2 emissions ranged from a $65.32– $142.27.

Id. § 6:7.20 n.35 (citing NAT'L ENERGY TECH. LAB., CARBON CAPTURE APPROACHES FOR NATURAL GAS COMBINED CYCLE SYSTEMS 107 (2010), http://www.netl.doe.gov/File%20Library/Research/Energy%20Analysis/Coal/C_Capture_NGCC_20101220.pdf). "Facilities deploying CCS technology can filter and capture CO_2 from the emission waste stream and pump it into geologic formations or use it to extract coal-bed methane or oil in depleted or diminished oil reservoirs. EPA cites four projects currently under development that will deploy some type of CCS." FERREY, INDEPENDENT POWER,

"With a regulatory threshold 40% lower than current 'best-in-class' coal turbine technologies now available on the market, these new regulations will in effect require the addition of partial or full CCS technologies for new coal-fired generating facilities."[103] "This is a level that conventional coal-fired electric generation will not be able to meet, generating about 1770 lbs CO_2/MWh."[104] Coal technologies typically employ steam turbines,[105] while gas-fired plants can employ simple cycle turbines.[106]

> There is an express exemption for simple cycle turbines. The proposed rule effectively exempts new gas-fired power plants, which emit approximately 700 lbs CO_2/MWh. The proposed rule exempts peaker plants, oil-fired plants, although they emit more CO_2 than gas-fired plants, Combined Heat and Power (CHP)/ cogeneration facilities even though they can emit more CO_2 than gas-fired plants; and smaller generating facilities of less than 25 MW of generation capacity, although they also can emit more CO_2 per unit of power produced than gas-fired plants.[107]

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supra note 70, § 6:7.20 n.36; *see* Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units 79 Fed. Reg. at 1474–75. "A 'new source' does not include existing sources undertaking modifications or reconstructions, and certain projects currently under development." FERREY, INDEPENDENT POWER, *supra* note 70, § 6:7.20 n.37.

103. FERREY, INDEPENDENT POWER, *supra* note 70, § 6:7.20. "EPA calculated that a new coal plant without CCS would emit approximately 1700 lbs of CO_2/MWh. The national average is 2,200 lbs CO_2 /MWh." *Id.* at n.38; *see EPA Regulation of Greenhouse Gas Emissions From New Power Plants*, CTR. FOR CLIMATE & ENERGY SOLS., http://www.c2es.org/federal/executive/epa/ghg-standards-for-new-power-plants (last visited Nov. 4, 2015).

104. FERREY, INDEPENDENT POWER, *supra* note 70, § 6:7.40 n.9 (citing Seth Hilton, *The Impact of California's Global Warming Legislation on the Electric Utility Industry*, 19 ELECTRICITY J. 10, 14 (2006)); *see also* FERREY, UNLOCKING, *supra* note 22, at 101 n.14.

105. FERREY, INDEPENDENT POWER, *supra* note 70, § 2:7.

106. *Id.* § 2:8.

107. *Id.* § 6:7.20 (footnotes omitted).

> The rule would require combustion turbine units (defined as including both simple cycle and combined cycle units) with a heat input rating greater than 850 MMBtu/hr to meet an emissions standard for CO_2 of 1,000 lbs/Mwh, whereas combustion turbine units with a heat input rating at or below that threshold would have to meet an emissions standard of 1,100 lbs. CO_2/Mwh.

Id. § 6:7.20 n.39.

> Operating with less than 33% capacity factors, a stationary combustion turbine

The Clean Air Act Prevention of Significant Deterioration (PSD) requirements cover "major sources" that potentially can emit 100 or 250 tons of the relevant pollutant annually and require qualifying facilities to obtain a permit.[108] Applying the 250 tpy amount to CO_2 emissions would increase the number of covered sources under one program from 280 to more than 81,000.[109]

The U.S. Supreme Court in *Utility Air Regulatory Group v. EPA* (*UARG*) upheld these EPA rules in part, although limiting the scope of discretion afforded the EPA to take action.[110] The Supreme Court struck the EPA's resurrection and application of its so-called "tailoring rule," with which the EPA attempted to arbitrarily increase the statutory threshold by exempting all facilities less than 100,000 tpy of CO_2; instead, the Court allowed the EPA the discretion to apply air regulation to any sources which had the potential to emit greater than 250 tpy.[111] Discovering new authority to regulate, as well as new rationale not grounded in law, was not a sufficient foundation for new regulatory authority; as the Court stated, "When an agency claims to discover in a long-extant statute an unheralded power to regulate 'a significant portion of the American economy,' we typically greet its announcement with a measure of skepticism."[112] The Supreme Court further stated:

> Were we to recognize the authority claimed by EPA in the Tailoring Rule, we would deal a severe blow to the Constitution's separation of powers. Under our system of government, Congress makes laws and the President, acting at times through agencies like EPA, "faithfully

> is not subject to the emissions standard unless it "was constructed for the purpose of supplying, and supplies, one-third or more of its potential electric output and more than 219,000 MWh net-electrical output to a utility distribution system on a 3-year rolling average basis."

Id. § 6:7.20 n.40.

108. Util. Air Regulatory Grp. v. EPA, 134 S. Ct. 2427, 2435 (2014). "To qualify for a permit, the facility must not cause or contribute to the violation of any applicable air-quality standard . . . and it must comply with emissions limitations that reflect the [BACT] for 'each pollutant subject to regulation under' the Act." *Id.* (first citing 42 U.S.C. § 7475(a)(3)(2012); then quoting 42 U.S.C. § 7475(a)(4)).

109. Coal. for Responsible Regulation v. EPA, 684 F.3d 102, 114 (D.C. Cir. 2012), *aff'd in part, rev'd in part by Util. Air Regulatory Grp.*, 134 S. Ct. at 2449.

110. *See Util. Air Regulatory Grp*., 134 S. Ct. at 2449.

111. *Id.* at 2445.

112. *Id.* at 2444 (quoting FDA v. Brown & Williamson Tobacco Corp., 529 U.S. 120, 159 (2000)).

> execute[s]" them. The power of executing the laws necessarily includes both authority and responsibility to resolve some questions left open by Congress that arise during the law's administration. But it does not include a power to revise clear statutory terms that turn out to not work in practice.[113]

The U.S. Supreme Court held that the EPA cannot unilaterally exercise greater than delegated executive authority to rewrite or refashion parts of congressional environmental statutes: "EPA's interpretation is . . . unreasonable because it would bring about an enormous and transformative expansion in EPA's regulatory authority without clear congressional authorization."[114]

The Court concluded that EPA's interpretation of the Act was neither compelled nor permissible and invalidated EPA's tailoring rule arguments on the grounds that it purported to amend the statute:

> We conclude that EPA's rewriting of the statutory thresholds was impermissible and therefore could not validate the Agency's interpretation of the triggering provisions. An agency has no power to "tailor" legislation to bureaucratic policy goals by rewriting unambiguous statutory terms. Agencies exercise discretion only in the interstices created by statutory silence or ambiguity; they must always "'give effect to the unambiguously expressed intent of Congress.'"[115]

The Court held that the federal government cannot extend regulation to otherwise uncovered sources, including power-generation sources, which are not otherwise regulated entities.[116] The *UARG* decision affords no

113. *Id.* at 2446 (quoting U.S. CONST. art. II, § 3) (citations omitted). In ruling against the EPA's Tailoring Rule argument, the Court:

> [R]eaffirm[ed] the core administrative-law principle that an agency may not rewrite clear statutory terms to suit its own sense of how the statute should operate. EPA therefore lacked authority to "tailor" the Act's unambiguous numerical thresholds to accommodate its greenhouse-gas-inclusive interpretation of the permitting triggers. Instead, the need to rewrite clear provisions of the statute should have alerted EPA that it had taken a wrong interpretive turn.

Id.

114. *Id.* at 2444.

115. *Id.* at 2445 (quoting Nat'l Ass'n of Home Builders v. Defs. of Wildlife, 551 U.S. 644, 655 (2007)).

116. *Id.* at 2444.

additional legal deference to agency regulations designed to address CO_2.[117] The *UARG* Court required the Executive Branch to interpret existing law within expected norms: "[A]gencies must operate 'within the bounds of reasonable interpretation.'"[118]

But the basic limitation on emissions from new coal-fired and other plants was not disturbed by the Court and remains in place.[119] The Executive Branch is allowed to extend CO_2 regulation to stationary power plants.[120] "Under the Clean Air Act, California, Washington, and Oregon adopted similar quantitative emission performance standards for new coal plants."[121]

C. *Regulation of CO_2 from Existing Power Generation*

"[Former U.S. Vice President] Al Gore said the new rules were 'the most important step taken to combat the climate crisis in our country's history.'"[122]

1. *New Executive Branch Regulations*

Under Section 111(d) of the Clean Air Act, the EPA proposed rules restricting CO_2 emissions from existing, rather than new, power plants.[123]

117. *See id.* at 2249.

118. *Id.* at 2442 (quoting Arlington v. FCC, 133 S. Ct. 1863, 1868 (2013)).

119. *See* FERREY, INDEPENDENT POWER, *supra* note 70, § 6:7.20.

120. *See id.*

121. *Id.*

> California established a 1,100 lbs. CO_2/MWh standard for new and existing baseload generation owned by or under long-term contract to publicly owned utilities. Washington established a 1,100 lbs. CO_2/MWh standard for baseload electric generation that began operating after June 1, 2008, in state. Oregon established a 1,100 lbs. CO_2/MWh standard for coal- and natural gas-fired baseload generating units, and prohibited utilities from entering into long-term purchase agreements for baseload electricity with out-of-state facilities that do not meet that standard.

Id. at n.42.

122. Suzanne Goldenberg, *Obama Unveils Historic Rules to Reduce Coal Pollution by 30%*, THE GUARDIAN (June 2, 2014), http://www.theguardian.com/environment/2014/jun/02/obama-rules-coal-climate-change (quoting former U.S. Vice President Al Gore).

123. Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662, 64,663 (proposed Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60).

The final rule was published on October 23, 2015.[124] The EPA received 2.5 million comments in preparing the regulation under which each state will be required to develop standards of performance to limit CO_2 emissions from existing fossil-fuel-fired generating facilities.[125] Seventeen "state attorneys general filed comments highlighting 'numerous legal defects'" and system reliability issues "in the EPA's proposal to regulate power plant emissions under Section 111(d) of the Clean Air Act."[126] Environmental justice advocates told the EPA that the "proposed carbon dioxide limits for power plants does not emphasize equity and offers too much flexibility to states."[127] In response, the 2015 final EPA rules call for consideration of environmental equity and low-income community involvement in the development of state plans.[128]

The EPA determines differentially the BSER based on each state's mix of individual existing generating sources as a statewide lbs/MWh emission rate.[129] The "New Source Rule" issued by EPA establishes separate performance standards for new coal- and gas-fired power plants.[130] Coal-fired steam cycle plants are required to meet a standard of 1,400 lbs CO_2/Mwh,[131] while natural gas turbines must meet a standard of 1,000 lbs CO_2/

124. *Id.* A final rule for new, modified, and reconstructed sources was published the same day. Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. at 64,510 (proposed Oct. 23, 2015) (to be codified at 40 C.F.R. pts. 60, 70, 71, & 98).

125. EPA, REGULATORY IMPACT ANALYSIS FOR THE PROPOSED STANDARDS OF PERFORMANCE FOR GREENHOUSE GAS EMISSIONS FOR NEW STATIONARY SOURCES: ELECTRIC UTILITY GENERATING UNITS, EPA-4521R-13-003, 1-1 (2013), http://www2.epa.gov/sites/production/files/2013-09/documents/20130920proposalria.pdf.

126. Patrick Ambrosio, *Comments Show Split in State Support for EPA Proposed Power Plant Rule*, 45 ENV'T REP. 3499 (BNA) (Dec. 2, 2014). "The comments were signed by attorneys general from the following states: Alabama, Florida, Georgia, Indiana, Kansas, Louisiana, Michigan, Montana, Nebraska, North Dakota, Ohio, South Carolina, South Dakota, Utah, West Virginia and Wyoming." *Id.*

127. Rachel Leven, *Power Plant Carbon Rule Lacks Equity, Environmental Justice Advocates Tell EPA*, ENERGY & CLIMATE REP. (BNA) (Oct. 1, 2014).

128. *See* 80 Fed. Reg. at 64,674–76.

129. *Id.* at 64,664.

130. *See* 80 Fed. Reg. at 64,512. A "new source" does not include existing sources undertaking modifications or reconstructions, and certain projects currently under development. *See id.*; *EPA Regulation of Greenhouse Gas Emissions From New Power Plants*, *supra* note 103.

131. 80 Fed. Reg. at 64,513.

Mwh.[132] This is a level that existing coal facilities, with heat rates in the realm of 1770 lbs CO_2/Mwh, will not meet individually without purchasing or obtaining emission credits from other sources.[133]

This requires states flexibly to determine how to reduce CO_2 emissions.[134] In various states, this is up to a 50 percent cut in carbon intensity of existing generation.[135] States have freedom to use a mass-based or rate-based calculation and can come up with a multi-state plan.[136] This will allow state plans that administered CO_2 controls "outside the fence" of the affected project's metes and bounds.[137] What is required is for a state to hit an assigned state emission average for electricity production.[138] States can comply by:

- Achieving a 2.1–4.3 percent improvement for coal plant operational heat rates;[139]
- Utilizing more dispatch of lower-carbon natural gas facilities in lieu of coal facilities;[140] and
- A greater reliance on renewable power generation technologies.[141]

132. *Id.* at 64,515.

133. *See* 80 Fed. Reg. at 64,709; *see also* FERREY, INDEPENDENT POWER, *supra* note 70, at § 6:7.40 n.9.

134. Paul DeCotis, *What the Clean Power Plan Means for You & How to Tackle Building a Compliance Strategy*, ENERGY BIZ (Nov. 7, 2014), http://www.energybiz.com/article/14/11/what-clean-power-plan-means-you-how-tackle-building-compliance-strategy.

135. *Id.*

136. *Id.* For a discussion on rate- and mass-based limits for emissions, see David Doniger & Derek Murrow, *Understanding the EPA's Clean Power Plan*, NRDC (Aug. 11, 2015), http://switchboard.nrdc.org/blogs/ddoniger/understanding_the_epas_clean_p.html; *Fact Sheet: Energy Efficiency in the Clean Power Plan*, EPA, http://www2.epa.gov/cleanpowerplan/fact-sheet-energy-efficiency-clean-power-plan (last visited Nov. 4, 2015).

137. JONATHAN L. RAMSEUR, CONG. RESEARCH SERV., R43652, STATE CO_2 EMISSION RATE GOALS IN EPA'S PROPOSED RULE FOR EXISTING POWER PLANTS 6 (2014), http://nationalaglawcenter.org/wp-content/uploads//assets/crs/R43652.pdf.

138. *Id.*

139. *See* Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662, 64,745 (proposed Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60).

140. *Id.* at 64,745–47.

141. *Id.* at 64,747–48.

Between the rule's promulgation in 2014 and final rule issuance in 2015, the EPA ramped up the degree of shift in CO_2 emissions and changed aspects to try to provide it a more solid legal defense.[142] This included more time for state compliance with a two-year delay for states filing required plans from 2016 to 2018, and a two-year delay in the first year of required CO_2 reductions, from 2020 to 2022.[143] The EPA's final regulation indicates that the goal of this rule is to substitute gas for coal in the generation of electricity.[144] The EPA increased how much CO_2 emissions will have to be brought down from the 2005 baseline in the next 15 years from the 30 percent proposed to 32 percent in the final rule.[145]

The EPA eliminated energy efficiency as one of four compliance building blocks to reduce CO_2 emissions, leaving improvement of coal-fired facility heat rates, substitution of natural gas instead of coal electric facility operation, and construction of more renewable energy.[146] The EPA shifted to a plant-by-plant CO_2 emission level/MWh generated for state calculations.[147] If a state refuses to submit a plan—which several governors have said they will[148]—or the EPA rejects a plan, the EPA will restrict fossil-fuel facility CO_2 emissions of each plant in the state.[149] The EPA's rule specifies that the "book life" of a coal plant is 40 years, and that each of the 50 states in their compliance filings should consider not running older plants under this rule.[150] The EPA utilizes a planning assumption that states and independent system operators (ISOs) should take natural gas combustion turbines, whose history demonstrates that they can operate at 91 percent availability but which are running only at a national 40 to 50 percent capacity factor, and increase those to a 75 percent capacity factor to displace coal-

142. *Id.* at 64,662. EPA published a 280-page preamble to its 24-page 2015 final rule on the Clean Power Plan, which regulates future CO_2 emissions from existing fossil fuel-fired power plants. *See generally id.*

143. *Id.* at 64,669.

144. *Id.* at 64,665.

145. *Id.*

146. *See id.* at 64,667.

147. *See id.* Coal-fired steam cycle plants must meet a 1,305 lbs. CO_2/Mwh limit, while natural gas combustion turbines must meet 771 lbs. CO_2/Mwh limit by 2030 operations. *Id.*

148. *See, e.g.*, Alan Neuhauser, *6 Governors Threaten to Defy Obama's Clean Power Plan*, U.S. NEWS & WORLD REP. (July 10, 2015), http://www.usnews.com/news/articles/2015/07/10/6-governors-threaten-to-defy-epa-clean-power-plan.

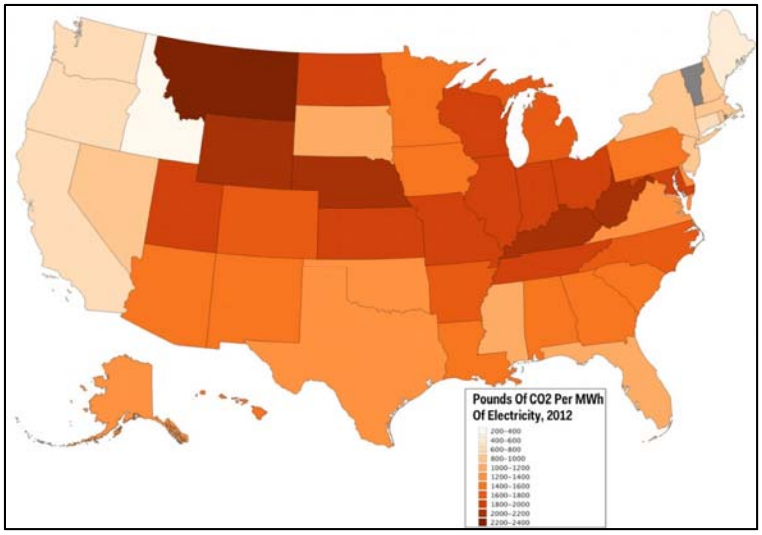
149. 80 Fed. Reg. 64,708–09.

150. *Id.* at 64,872.

fired power.[151] The EPA also included bankable CO_2 credits for renewable energy that starts construction after the state plan is submitted by 2018 and prior to compliance requirements in 2022.[152]

If this regulation is upheld after litigation,[153] which has now commenced, it could dramatically affect the frequency of dispatch orders for coal plants, which is key to whether they are operated in the future.[154] Since the regulations set different levels of CO_2 emissions per state based on existing carbon intensity of state power sector emissions in 2012,[155] Figure 9 shows the relative degree of GHG emissions by state, with the darker shading illustrating the greater GHG emissions.[156]

Figure 9[157] GHG Emissions, 2012



151. *Id.* at 64,799.

152. *Id.* at 64,669.

153. *See, e.g.*, Alan Neuhauser, *Mess of Lawsuits Set to Challenge Clean Power Plan*, U.S. NEWS & WORLD REP. (Oct. 23, 2015) [hereinafter Neuhauser, *Mess*], http://www.usnews.com/news/articles/2015/10/23/mess-of-lawsuits-set-to-challenge-clean-power-plan.

154. *See Proposed Clean Power Plan Rule Would Reduce Coal Production, Especially in the West*, U.S. ENERGY INFO. ADMIN. (June 10, 2015), http://www.eia.gov/todayinenergy/detail.cfm?id=21592.

155. Andy Kiersz & Brett Logiurato, *Here's How Obama's New Carbon Rules Affect Each State*, BUS. INSIDER AUSTL. (June 3, 2014), http://www.businessinsider.com.au/epa-state-carbon-goals-2014-6.

156. *See infra* Figure 9.

157. Kiersz & Logiurato, *supra* note 155.

2. *Executive Branch Unilateral Interpretation of its Own Powers*

Of note, the recent Supreme Court *UARG* opinion, applied to new sources of fossil-fuel generation, casting doubt on going "beyond the fence line" as an option with this new plan rather than regulating specific emission sources for CO_2 at the plant.[158] It specifically references other court holdings that best available control technology (BACT) pollution controls cannot be used to force fundamental redesign of the proposed source and that the EPA's current BACT guidance for greenhouse gases contemplates that only pollutants emitted on-site by the source can be regulated.[159]

Recently, the Supreme Court held that federal agencies have discretion to determine the substantive scope of their own authority.[160] Under the Senate version of Section 111(d) of the Clean Air Act, if a source category is regulated under the Clean Air Act's hazardous air pollutant provision embodied in Section 112, other pollutants emitted by that source category are excluded from regulation under Section 111(d).[161] In contrast, under the House version of Section 111(d), it is only the pollutants regulated under Section 112 that are exempt from regulation under Section 111(d).[162] This presents a case of first impression when the new regulation is challenged.[163]

In the original Clean Air Act amendments in 1970, Section 111(d) authorized the EPA to establish a program for state regulation of existing sources within a source category when the EPA sets an NSPS technology-based BSER standard for new and modified stationary sources in that

158. *See* Util. Air Regulatory Grp. v. EPA, 134 S. Ct. 2427, 2447–48 (2014).

159. *Id.* For the 111(d) existing source rule, the statute requires the best system of emission reduction (BSER), rather than BACT, and although the former is determined by EPA, and the latter by the states subject to the Clean Air Act, both are similarly economically determined emission standards. *See* FERREY, ENVIRONMENTAL LAW, *supra* note 82, at 192, 199, 203.

160. City of Arlington v. FCC, 133 S. Ct. 1863, 1868 (2013).

161. Avi Zevin, *Dueling Amendments: The Applicability of Section 111(d) of the Clean Air Act to Greenhouse Gases* 4 (Inst. for Policy Integrity, N.Y.U. Sch. Of Law, Working Paper No. 2014/5, 2013), http://policyintegrity.org/files/publications/2014-5_Zevin.pdf.

162. *Id.*

163. *See* Neuhauser, *Mess*, *supra* note 153. The D.C. Circuit has already dealt with some petitioners "champing at the bit to challenge" the rules, but the court dismissed the claim because at the time it was only a proposed rule and thus the court did not have the authority to review the claim. *In re* Murray Energy Corp., 788 F.3d 330, 333–34 (D.C. Cir. 2015).

category.[164] The 1990 Clean Air Act amendments contained different Senate and House versions of amendments to Section 111(d) that were combined without clear reconciliation in the final enacted version of the amendments.[165] The Senate amendment was a technical amendment regarding NSPS criteria pollutant regulation without substantive change;[166] the House amendment made the same technical change and added that Section 111(d) could not be applied to a category of sources regulated under Section 112, which regulates hazardous air pollutants unrelated to the criteria pollutants.[167] Both versions are included in the final amendments.[168] Neither is inconsistent with the other, as far as the basic technical provision.[169]

Because both were included in the final bill, canons of statutory construction would give full intended interpretation to all words included in a final legislative version.[170] The plaintiffs in *In re Murray Energy Corporation* argued that a rulemaking to regulate the same sources under both Sections 111(d) and 112 was ultra vires because the amended Act prohibits statewide regulation under the former and direct source regulation under the latter.[171] Though the EPA admitted that this is one interpretation of the statute, it argued that this interpretation could not be the intent of Congress, because if it were, then Section 111(d) would be almost completely useless, as "over 100 source categories, covering the full range of American industry, have been regulated under section 7412 in regard to some hazardous pollutant."[172]

The EPA contended that it had the discretion, pursuant to the *Chevron* doctrine, to choose one version and ignore the other.[173] The EPA went on to

164. *See* Clean Air Act Amendments of 1970, Pub. L. No. 91-604, § 111(d), 84 Stat. 1684 (codified at 42 U.S.C. § 7411 (1970)).

165. *See* Zevin, *supra* note 161, at 32–33.

166. *See* Jody Freeman & David B. Spence, *Old Statutes, New Problems*, 163 U. PA. L. REV. 1, 39–40 (2014).

167. *See id.*

168. *See id.*

169. *See id.*

170. *See id.* at 40.

171. Final Opening Brief of Petitioner at 19, *In re* Murray Energy Corp., 788 F.3d 330 (2015) (No. 14-1112, 14-1151), 2015 WL 1022477, at *19.

172. Brief for Response to Petition at 25, *In re* Murray Energy Corp., 788 F.3d 330 (2015) (No. 14-1112) (citing 40 C.F.R. pt. 63).

173. Final Brief for Respondents at 52–53, *In re* Murray Energy Corp., 788 F.3d 330 (2015) (No. 14-1112, 14-1151), 2015 WL 1022486, at *52–53.

explain that prior to 1990, the EPA plainly was able to regulate existing sources using Section 111(d).[174] It argued that the 1990 amendments did not mention a concern that sources would be doubly regulated, it only prohibited the double-regulation of pollutants using Section 111(d).[175]

The litigation in *In re Murray Energy Corporation* over Section 111(d) was dismissed in June of 2015 by the D.C. Circuit because the EPA rule was not final at that time, and thus the court lacked the authority to rule on its legality.[176] Because power plants as a category, and specifically coal-fired power plants, are regulated under Section 112, this issue is still an interesting fit as to which interpretation controls and whether the EPA has authority to issue these proposed regulations.[177] This first wave of claims highlight a footnote Justice Ruth Bader Ginsburg included in her majority opinion in the U.S. Supreme Court decision in *American Electric Power Co. v. Connecticut*: "EPA may not employ § 7411(d) if existing stationary sources of the pollutant in question are regulated under the national ambient air quality standard program, §§ 7408–7410 [of the Clean Air Act], or the 'hazardous air pollutants' program, § 7412."[178]

From its promulgation in 1970 through current time under Section 112 of the Clean Air Act, EPA regulates emission of all toxic pollutants emitted from power plants.[179] Regulating a plant for hazardous air pollutants under Section 112 of the Act, thus, under one interpretation, could bar the EPA from issuing CO_2 standards under Section 111(d) now through executive action.[180] If states do not comply, federal implementation plans (FIPs) can be imposed on the states by EPA.[181] Executive agency interpretations

174. *See id.* at 42–43.

175. *See id.* at 43–44.

176. *In re* Murray Energy Corp., 788 F.3d 330, 334 (2015) ("[A] proposed rule is just a proposal. In justiciable cases, this Court has the authority to review the legality of final agency rules. We do not have authority to review proposed agency rules.").

177. The EPA asserts in the preamble, and in the legal memorandum supporting the proposed rule, that this conflict creates an ambiguity that the agency may resolve and the agency is entitled to deference under *Chevron*. *See* 80 Fed. Reg. 64,662, 64,719 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60).

178. Am. Elec. Power Co. v. Connecticut, 131 S. Ct. 2527, 2537 n.7 (2011) (citing 42 U.S.C. § 7411(d)(1) (2012)).

179. *Summary of the Clean Air Act*, EPA, http://www.epa.gov/laws-regulations/summary-clean-air-act (last updated Nov. 17, 2015).

180. STANLEY ABRAMSON, ET. AL, LAW OF ENVIRONMENTAL PROTECTION § 24:68 (West 2015).

181. 80 Fed. Reg. at 64,696.

technically do not have the effect of law,[182] but as set forth herein, the interpretation and the degree of enforcement of interpretations can have profound effect on the regulated sectors of the economy, such as on energy supply.[183] Other federal circuits concur:

> Changes in course . . . cannot be solely a matter of political winds and currents. The Administrative Procedure Act requires that the pivot from one administration's priorities to those of the next be accomplished with at least some fidelity to law and legal process. Otherwise, government becomes a matter of the whim and caprice of the bureaucracy, and regulated entities will have no assurance that business planning predicated on today's rules will not be arbitrarily upset tomorrow.[184]

3. *EPA Executive Conflicts with FERC*

Since NSPS BSER for each state under the EPA's proposed amendments will be determined by the EPA based on the mix of each state's individual existing generating sources in a statewide lbs/MWh emission rate, in various states this would implement up to a 50 percent cut in carbon intensity of generation.[185] States have freedom to use a mass-based or rate-based calculation and can come up with a multi-state plan.[186]

"This is a level that conventional coal-fired electric generation will not be able to meet, [with new coal plants] generating about 1770 lbs. CO_2/MWh."[187] The conflict between energy generation requirements and environmental limitations flared up in recent congressional testimony in hearings on proposed EPA amendments to regulate carbon emissions from existing fossil-fuel-fired power plants using Section 111(d) of the Clean Air Act.[188] With all of the Federal Energy Regulatory Commission (FERC)

182. *See* United States v. Mead Corp., 533 U.S. 218, 227–228 (2001).

183. *See, e.g.*, 80 Fed. Reg. at 64,928 (discussing the economic, employment, and compliance costs associated with the Clean Power Plan for existing facilities).

184. N.C. Growers' Ass'n v. United Farm Workers, 702 F.3d 755, 772 (4th Cir. 2012) (Wilkinson, J., concurring).

185. *See* DeCotis, *supra* note 134.

186. 80 Fed. Reg. at 64,667.

187. FERREY, INDEPENDENT POWER, *supra* note 70, § 6:7.40 n.9 (citing Seth Hilton, *The Impact of California's Global Warming Legislation on the Electric Utility Industry*, 19 ELECTRICITY J.10 (2006)).

188. Lynn Garner, *FERC Commissioners Split on Party Lines Over EPA's Carbon Rule for Power Plants*, ENERGY AND CLIMATE REP. (BNA) (July 29, 2014). "The EPA

commissioners testifying, Commissioner Tony Clark predicted "a jurisdictional train wreck" between the Clean Air Act regulation of carbon emissions and the Federal Power Act requirement for FERC to maintain electric system reliability.[189]

FERC Commissioner Philip Moeller testified that the environmental approach for emissions reductions from power plants was "an enforcement regime that would be awkward at best, and potentially very inefficient and expensive."[190] Commissioners Moeller and Clark called the proposed EPA carbon regulations a fundamental change in energy markets injecting environmental factors into how power plants are allowed to run.[191] "The commissioners also expressed general support for the concept of adding a[n energy operational] 'safety valve' to the rule in the event of a power emergency or other threat to the grid."[192]

This illustrates that federal agencies on both sides of this tension, FERC and EPA, are still not talking much to each other on these executive agency conflicts: "Under questioning, [Acting FERC Chair Cheryl] LaFleur said the EPA did not ask FERC for assistance in preparing technical documents on resource adequacy and reliability that supports the rulemaking."[193] Then Acting Chair "LaFleur said she had one meeting with EPA officials in February to discuss their proposal. That was followed by five EPA and FERC staff meetings, she said. The other commissioners said they had no consultations with the EPA."[194]

Commissioner Moeller testified that because of the rule, "there would be a shift from traditional [executive agency] economic dispatch to environmental dispatch."[195] The FERC commissioners "agreed on the

said its proposal could reduce carbon dioxide emissions from the existing fleet of power plants by 30 percent from 2005 levels by 2030, at a cost to the power industry of $5.4 billion to $8.8 billion." *Id.*

189. *Id.*

190. *Id.* Commissioner "Moeller stated that the biggest challenge in implementing the proposed rule is that electricity markets are interstate in nature," while EPA has a state-by-state approach for emissions reductions. *Id.*

191. *Id.*

192. *Id.*

193. *Id.* Four of the five FERC Commissioners had not been approached at all by the EPA in promulgating the new rule to restrict operation of power plants to reduce carbon emissions. *Id.*

194. *Id.*

195. *Id.*

pressing need to build more natural gas pipeline capacity to accommodate increased reliance on natural gas-fired generation."[196] Commissioners "Moeller and Clark expressed skepticism with the EPA's assumption that enough natural gas pipelines will be built over the next five to 10 years to allow natural gas-fired generation to replace thousands of megawatts of retiring coal generation."[197]

D. *RGGI State Executive Orders Reduce CO_2 Allowances*

Even though the federal government does not regulate GHGs, despite the indirect measures which accomplish similar CO_2 reductions,[198] the states recently have enacted "cap-and-trade" regulation focused on regulating climate-warming gas emissions in these states.[199] The Regional Greenhouse Gas Initiative, (RGGI)[200] and California's Global Warming Solutions Act of 2006 (A.B. 32) carbon regulation program[201] both adopted cap-and-trade programs. The RGGI in originally 10,[202] and now nine,[203] eastern states regulates its cap-and-trade allowances only for CO_2 emissions from power plants larger than 25 Mw.[204] California's A.B. 32 regulates all carbon emissions from all major industries in the state.[205] The RGGI is the paradigm for multi-state regional cooperation to now meet the administration's Clean Power Plan limitation on future state CO_2 emissions.[206]

The RGGI is more limited than California's A.B. 32 in covered entities and industries, the range of GHG chemical emissions controlled, and the

196. *Id.*

197. *Id.*

198. *See supra* Part III.A–C.

199. FERREY, INDEPENDENT POWER, *supra* note 70, § 6:138.

200. *Id.* § 6:7.30; REGIONAL GREENHOUSE GAS INITIATIVE, ABOUT THE REGIONAL GREENHOUSE GAS INITIATIVE 1 (2015) [hereinafter RGGI, ABOUT], http://www.rggi.org/docs/Documents/RGGI_Fact_Sheet.pdf.

201. California Global Warming Solutions Act of 2006, CAL. HEALTH & SAFETY CODE § 38500 (West 2015); FERREY, INDEPENDENT POWER, *supra* note 70, § 6:7.40.

202. *See id.* § 6:7.30.

203. RGGI, ABOUT, *supra* note 200, at 1.

204. *Id.*

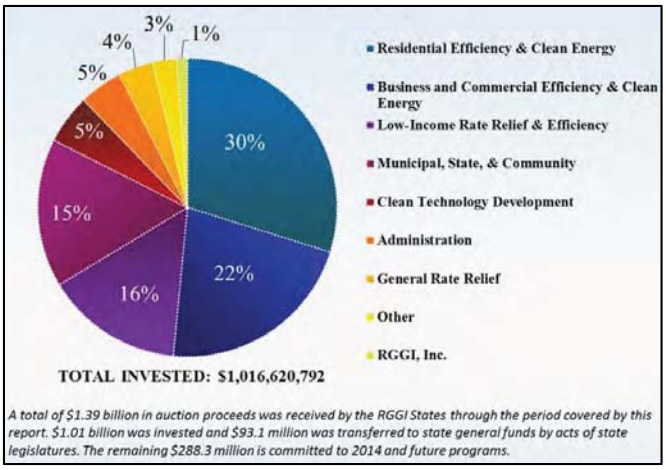
205. *See* CAL. HEALTH & SAFETY CODE § 38501 (West 2015); *see also Assembly Bill 32 Overview*, CAL. AIR RESOURCES BOARD, http://www.arb.ca.gov/cc/ab32/ab32.htm (last visited Nov. 11, 2015).

206. *See supra* Part III.C. The Clean Power Plan final rule references RGGI as one option for states to adopt to meet the new regulatory requirements. 80 Fed. Reg. 64,662, 64,888 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60).

amount of emissions targeted and controlled: the RGGI controls only CO_2 while the A.B. 32 controls all six GHGs; and the RGGI controls only larger electric generation facilities while the A.B. 32 controls, in three phases, electric generation and all other larger industrial emitters of GHGs, including transportation fuels.[207] Both RGGI and A.B. 32 carbon credits are tradable.[208]

For the first time in U.S. history, under both programs, sources must purchase their emission allowances at auction.[209] This raises significant revenue for the states from these auction proceeds.[210] The amount and use of these auction proceeds for RGGI states is shown in Figure 11.[211] Although the proceeds are required to be devoted to energy-related purposes, some of the states have siphoned some of these funds away for unrelated purposes.[212]

Figure 11[213]



207. NRDC, CAP-AND-TRADE PROGRAM: KEY COMPONENT OF CALIFORNIA'S PATH TO CLEAN ENERGY UNDER AB 32, at tbl.2 (2012) [hereinafter NRDC, CAP-AND-TRADE PROGRAM], http://www.c2es.org/docUploads/calif-cap-trade-01-14.pdf.

208. *See id.*

209. *See* FERREY, UNLOCKING, *supra* note 22, at 82–83; NRDC, CAP-AND-TRADE PROGRAM, *supra* note 207, at 2.

210. *See* FERREY, UNLOCKING, *supra* note 22, at 82–83; NRDC, CAP-AND-TRADE, *supra* note 207, at 2.

211. REGIONAL GREENHOUSE GAS INITIATIVE, INVESTMENT OF RGGI PROCEEDS THROUGH 2013, at 7 (2015) [hereinafter RGGI, INVESTMENT], http://www.rggi.org/docs/ProceedsReport/Investment-RGGI-Proceeds-Through-2013.pdf.

212. *See id.*

213. *Id.* at fig.4.

In California, there has been litigation regarding the amount of money raised and its legal expenditure.[214] Other Western[215] and Midwestern[216] states initiated—but since postponed or abandoned—global warming gas regulation.

The RGGI carbon compliance requirements commenced in January 2009 in 10 Northeastern states.[217]

> CO_2 emissions from power plants in the region were capped at then-current levels, and the cap would remain in place until 2015. RGGI states would then begin the process of incrementally reducing emissions, with the goal of achieving a 10% reduction by 2019, which recently was amended to make it 45% more demanding at an earlier year.[218]

214. *See generally, e.g.*, Joint Ruling on Submitted Matters, Cal. Chamber of Commerce v. Cal. Air Bd., (No. 34-2012-80001313), (Cal. Super. Ct., Nov. 12, 2013), Morning Star Packing Co. v. Cal. Air Bd., No. 34-2013-80001464 (Cal. Super. Ct., Apr. 16, 2013).

215. The Western Climate Initiative is a group of seven western states and four Canadian provinces that planned to release a carbon restriction program to cut GHG emissions 15 percent below 2005 levels. *Western Climate Initiative*, CTR. FOR CLIMATE & ENERGY SOLUTIONS, http://www.c2es.org/us-states-regions/regional-climate-initiatives/western-climate-initiative (last visited Nov. 11, 2015). Six of the seven states withdrew in 2011, "leaving California alone in this now-unitary consortium, along with the four observing Canadian provinces. Nothing was accomplished in its four years of existence." FERREY, INDEPENDENT POWER, *supra* note 70, § 6:7.40.

216. These states include Iowa, Illinois, Kansas, Michigan, Minnesota, and Wisconsin, as well as the Canadian province of Manitoba. Dean Scott, *Midwestern States to Draw Up Model Rule by End of 2008 to Implement Cap-and-Trade*, 39 ENV'T REP. 343 (BNA) (Feb. 22, 2008). The three states of Indiana, Ohio, and South Dakota opted out of this scheme and are now observers. *Id.*; Nora Macaluso, *Midwest States to Commence Work on Details of Regional Climate Strategy*, 38 ENV'T REP. 2556 (BNA) (Nov. 30, 2007).

217. REGIONAL GREENHOUSE GAS INITIATIVE, REGIONAL GREENHOUSE GAS INITIATIVE MODEL RULE 13 (2008), http://www.rggi.org/docs/Model%20Rule%20Revised%2012.31.08.pdf [hereinafter RGGI, MODEL RULE]; *see also* REGIONAL GREENHOUSE GAS INITIATIVE, CO_2 EMISSIONS FROM ELECTRICITY GENERATION AND IMPORTS IN THE 10-STATE REGIONAL GREENHOUSE GAS INITIATIVE: 2009 MONITORING REPORT 2 (2011), http://www.rggi.org/docs/Documents/Elec_monitoring_report_11_09_14.pdf.

218. Steven Ferrey, *Courts Cap the "Trade": Regulation of Competitive Markets When Courts Overturn State and Federal Cap-and-Trade Regulation*, 117 W. VA. L. REV. 681, 717–18 (2014) [hereinafter Ferrey, *Courts Cap*]; *see also* Memorandum of Understanding from the Regional Greenhouse Gas Initiative 2–3 (Dec. 20, 2005), http://www.rggi.org/docs/mou_final_12_20_05.pdf ("The regional base annual CO_2

The RGGI regional CO_2 cap was reduced from 165 million annual tons allowed to 91 million tons.[219]

The RGGI states raised approximately $2.2 billion of RGGI-auction proceeds through August 2015.[220] With the newly amended RGGI standards creating a smaller amount of annual emissions allowances, this restricted supply drove up the auction price for acquiring CO_2 allowances immediately by 150 percent from $2 to $5 per ton.[221] Since coal produces approximately twice as many tons of CO_2 as natural gas per unit of electricity generated,[222] this changed executive agency standard places immense pressure on coal unit operation within these nine states.

"There was a successful suit in 2010 against New York's RGGI cap-in-trade carbon regulation."[223]

> This suit was brought by an independent cogeneration project which had carbon compliance obligations imposed on it. In 2009, Indeck Energy, the owner of a New York cogeneration power facility, sued the state of New York regarding the constitutionality of its RGGI carbon regulation program . . . . New York quickly settled the suit, granting plaintiffs complete relief and not imposing any of approximately $3 million annual additional costs on the specific wholesale market

emissions budget will be equal to 121,253,550 short tons.") [hereinafter Memo of Understanding]; REGIONAL GREENHOUSE GAS INITIATIVE, PRESS RELEASE: STATES REACH AGREEMENT ON PROPOSED RULES FOR THE NATION'S FIRST CAP-AND-TRADE PROGRAM TO ADDRESS CLIMATE CHANGE 2 (Aug. 15, 2006), http://www.rggi.org/docs/model_rule_release_8_15_06.pdf; Gerald B. Silverman, et al., *Majority of States in Regional Initiative in early Stages of Implementing 'Model Rule*,' 4 ENV'T REP. 1797 (BNA) (June 14, 2013).

219. *The RGGI CO2 Cap*, RGGI, https://www.rggi.org/design/overview/cap (last visited Nov. 11, 2015).

220. *See* RGGI, ABOUT, *supra* note 200, at 1. Cumulatively from 2008 to 2013, 62 percent of RGGI funds were used for energy efficiency, 8 percent for renewable energy, 15 percent to reduce consumer rates, and 9 percent for greenhouse gas abatement, as determined in the RGGI's analysis through 2013. RGGI, INVESTMENT, *supra* note 211, at 3.

221. *See* RGGI, INC., CO_2 ALLOWANCES SOLD FOR $5.02 IN 24TH RGGI AUCTION 1–2 (2014), http://www.rggi.org/docs/Auctions/24/PR060614_Auction24.pdf.

222. FERREY, INDEPENDENT POWER, *supra* note 70, § 6:7.

223. Ferrey, *Courts Cap*, *supra* note 218, at 717 (2014). "In a suit against the state of New York's RGGI program in 2009, New York's quick settlement had Consolidated Edison Company agreeing to pay the cogeneration project for the cost of its additional carbon allowances through the end of their pre-existing long-term contracts." *Id.* at 718 n.263.

> plaintiffs, rather than let the court address the legality of its state program. The settlement had Consolidated Edison Company and its ratepayers agree to pay the cogeneration project for the cost of its additional carbon allowances through the end of their pre-existing long-term contracts.[224]

New York's "implementation of the RGGI carbon cap-and-trade program was challenged in an additional suit, which was dismissed on procedural grounds without reaching the merits."[225] In this complaint, *Thrun v. Cuomo*, "New York ratepayers argued that the [RGGI] program, which was never passed by the legislature, was improper if only implemented [unilaterally by executive agency] regulation."[226] This complaint was denied procedurally on lack of standing, as the New York ratepayers' injuries were not distinct from injuries of the general public.[227] The decision was affirmed in 2013 because the claims were either time-barred or moot, despite the fact that the court assumed that the plaintiffs did have standing to bring the suit.[228]

New York was not the only RGGI state where a suit was filed:

> There was a successful suit alleging that Massachusetts renewable energy tradable energy credits under capped incentives violated the Constitution. The program was successfully challenged on Constitutional grounds in 2010 by TransCanada Power, the owner of a Maine wind project. The suit alleged that Massachusetts's limitation on eligible Solar Renewable Energy Credits (SRECs) as well as issuance of long-term power purchase contracts only to Massachusetts companies both discriminated against out-of-state renewable energy projects in violation of the dormant Commerce Clause of the U.S. Constitution.
>
> After stating that it had confidence in its position, Massachusetts immediately settled the litigation so as to avoid a court decision, providing that TransCanada would be eligible for these programs.[229]

224. *Id.* at 718 (citations omitted).

225. *Id.* at 719; *see* Thrun v. Cuomo, No. 4358-11, at 2–3, 7 (N.Y. Sup. Ct. 2012).

226. Ferrey, *Courts Cap*, *supra* note 218, at 719 (citing Geoffrey Craig & Gail Roberts, *Lawsuit Disputes Legality of New York Participation in RGGI, Citing Lack of Legislative Approval*, ELECTRIC UTIL. WK., July 4, 2011, at 10).

227. *See Thrun*, No. 4358-11, at 4.

228. Thrun v. Cuomo, 976 N.Y.S.2d 320, 322 (N.Y. App. Div. 2013).

229. Ferrey, *Courts Cap*, *supra* note 218, at 728; *see* Complaint, Transcanada Power Mktg., Ltd. v. Bowles, No. 4:10-cv-40070-FDS (D. Mass. April 16, 2010), http://www.ohiogreenstrategies.com/documents/transcanada.pdf; Partial Settlement Agreement,

At best, unilateral state executive regulatory actions regarding CO_2 emissions from existing power generation facilities have not had robust success in the courts on the merits, succeeding typically only with procedural defenses of standing, mootness, and failure to differentiate personal injury.[230]

IV. EXECUTIVE REGULATION OF THE INTERSTATE MOVEMENT OF POLLUTANTS

A. *CAIR EPA Regulation of Upwind Pollution Transport*

The Clean Air Interstate Rule (CAIR), promulgated by the EPA in 2005, required 27 upwind states to "reduce or eliminate the impact of upwind sources on out-of-state downwind nonattainment of NAAQS for" SO_2 and NO_x.[231] "CAIR was intended to reduce or eliminate the impact of upwind sources on attainment of particulate and smog NAAQS in downwind states."[232] Figure 15 below illustrates the Eastern states affected by the EPA CAIR regulations for NO_x, SO_2, and ozone precursor emissions and illustrates the eastern and northern interstate drift of air pollutants that CAIR and the Cross-State Air Pollution Rule (CSAPR) are designed to address.[233] States comply by restricting fossil fuel-fired power plant emissions.[234]

Transcanada Power Mktg., Ltd. v. Bowles, No. 4:10-cv-40070-FDS https://web.archive.org/web/20110102021153/http://www.mass.gov/Eoeea/docs/doer/renewables/solar/Settlement-Agreement.pdf.

230. *See supra* notes 216–228 and accompanying text.

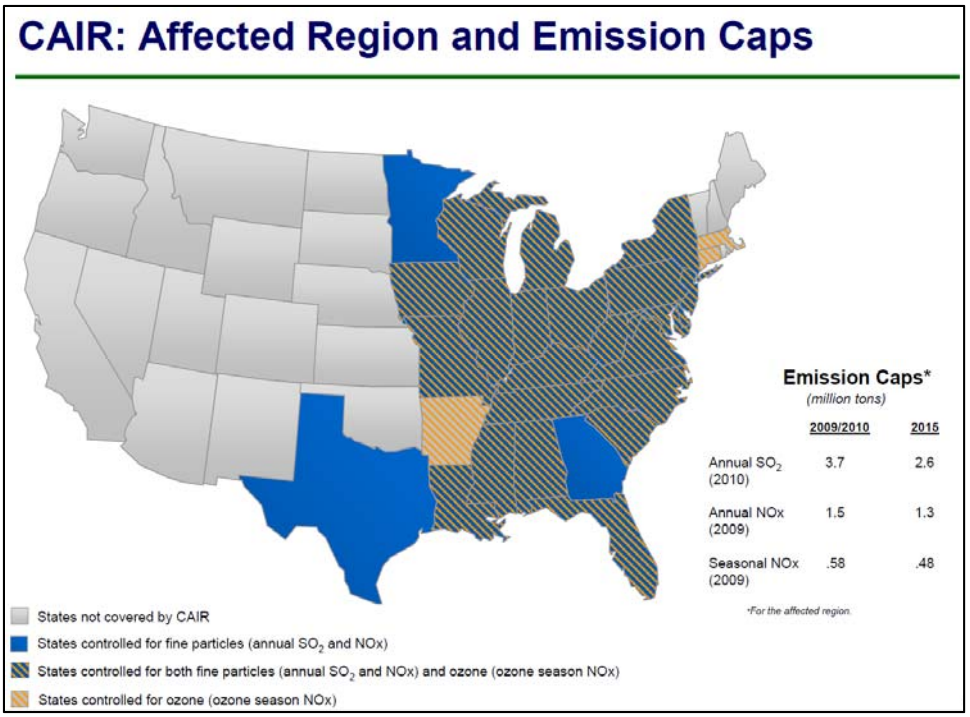
231. North Carolina v. EPA, 531 F.3d 896, 903 (D.C. Cir 2008), *modified*, 550 F.3d 1176 (D.C. Cir. 2008). NO_x and SO_2 were reduced via the 1997 annual and 24-hour fine particle ($PM_{2.5}$) and 1997 8-hour ozone NAAQS. *See* EPA, FACT SHEET: THE CROSS-STATE AIR POLLUTION RULE: REDUCING THE INTERSTATE TRANSPORT OF FINE PARTICULATE MATTER AND OZONE 3 (2011) [hereinafter EPA, CSAPR FACT SHEET], http://www3.epa.gov/crossstaterule/pdfs/CSAPRFactsheet.pdf.

232. Ferrey, *Courts Cap*, *supra* note 218, at 691.

233. *See* EPA, REDUCING POWER PLANT EMISSIONS FOR CLEANER AIR, HEALTHIER PEOPLE, AND A STRONG AMERICA 11 (2005) [hereinafter EPA, REDUCING POWER], http://archive.epa.gov/airmarkets/programs/cair/web/pdf/cair_final_presentation.pdf; *see also infra* Figure 15.

234. *Cutting Carbon Pollution in America*, THE WHITE HOUSE, http://www.whitehouse.gov/energy/climate-change (last visited Nov. 12, 2015).

Figure 15[235]



"The designated states were to revise their SIPs to include control measures that would sufficiently reduce their emission of these pollutants. CAIR also instituted an interstate trading program for SO_2 and NO_x that would govern all upwind pollutants not already addressed by an approved SIP."[236]

The very first cap-and-trade based approach to emissions regulation in the United States was the Acid Rain Program (ARP) of the 1990 Clean Air Act.[237] "Aimed at lowering acid rain and improving public health, the ARP

235. EPA, REDUCING POWER, *supra* note 233.

236. Ferrey, *Courts Cap*, *supra* note 218, at 691; *see* EPA, THE CLEAN AIR ACT IN A NUTSHELL: HOW IT WORKS 4–5 (2013), http://www2.epa.gov/sites/production/files/2015-05/documents/caa_nutshell.pdf.

237. *See* Ann E. Carlson, *Iterative Federalism and Climate Change*, 103 NW. U. L. REV. 1097, 1142–43 (2009).

set up a cap-and-trade approach to regulate the amount of [SO_2] and [NO_x] emissions."[238] The ARP is generally seen as being successful, and according to a 2002 EPA study, "SO_2 emissions from power plants were 9% lower than 2000 levels and 41% lower than 1980 levels."[239] NO_x emissions continued a similar downward trend, posting a "13% reduction in 2002 from 2000 levels, and a 33% decline from 1990 levels."[240] The ARP was effective, as a 2007 Progress Report noted that SO_2 emission levels were well below projected levels when the ARP came into effect as producers emitted "8.95 million tons in 2007, well below the emissions cap of 9.5 million tons."[241]

When legally challenged:

> The first flaw found by the D.C. Circuit in CAIR was the regional trading system. CAIR allowed states to trade their emissions allowances regionally, which the court found violated section 110(a)(2)(D)(i)(I) of the Clean Air Act, the so-called "good neighbor" provision. The good neighbor provision "prohibits sources '*within the State*' from 'contribut[ing] significantly to nonattainment *in . . . any other State*.'" CAIR violated this provision because it allowed sources in one state to purchase unused allowances from another state in the region to continue polluting in large amounts that contributed significantly to a downwind state's non-attainment. The cap-and-trade system did not guarantee that each state would prohibit sources "*within the state* [from] contribut[ing] significantly to nonattainment in . . . *any* other state" because CAIR theoretically allowed one source to maintain or increase its pollution levels, thereby doing nothing to stop it from violating the good neighbor provision.
>
> The D.C. Circuit stated that CAIR was flawed because it ignored the "interfere with maintenance" language in section 110(a)(2)(D)(i)(I) of the Clean Air Act. Section 110(a)(2)(D)(i)(I) requires state SIPs to prohibit sources from interfering with a downwind state's maintenance of air standard attainment. CAIR did not independently address the "interfere with maintenance" provision because the EPA intended to

238. Ferrey, *Courts Cap*, *supra* note 218, at 684; *see* EPA, CAP AND TRADE: ACID RAIN PROGRAM RESULTS 1 (2002) [hereinafter EPA, ACID RAIN], http://www.epa.gov/capandtrade/documents/ctresults.pdf.

239. Ferrey, *Courts Cap*, *supra* note 218, at 684 (citing EPA, ACID RAIN, *supra* note 238).

240. EPA, ACID RAIN, *supra* note 238; Ferrey, *Courts Cap*, *supra* note 218, at 684.

241. EPA, ACID RAIN AND RELATED PROGRAMS: 2007 PROGRESS REPORT 1–2 (2007), http://www2.epa.gov/sites/production/files/2015-08/documents/2007arpreport.pdf.

> apply the maintenance provision in conjunction with the "significantly contribute" provision in an effort to avoid giving greater weight to what the EPA called the "potentially lesser environmental effect" addressed by the "maintenance" provision. However, the court found that CAIR's failure to attribute independent significance to this additional language in section 110(a)(2)(D)(i)(I) was an unlawful nullification of that language.
>
> The court also held that the EPA's allocation of state emission budgets for SO_2 and NO_x were "arbitrary and capricious" in violation of the Administrative Procedure Act because the agency did not adequately explain how the budgets relate to the goals sought by the "good neighbor" provision. In order for the EPA to cap state emissions according to the "good neighbor" provision, the EPA must show that the chosen cap relates to, and makes measurable progress towards, the objectives of the "good neighbor" provision. The court found that the EPA did not provide any evidence to show how the budgets it allocated related to the objectives in section 110(a)(2)(D)(i)(I).
>
> The D.C. Circuit stuck this cap-and-trade regulation as "arbitrary and capricious," "not otherwise in accordance with the law," and "fundamentally flawed." . . . The EPA's state apportionment decisions were found to be "fundamentally flawed," unfair, and had to be redone "from the ground up" because they allowed upwind sources to purchase tradable allowances rather than actually reduce their pollution and contribute to congressional requirements to have emission sources within the state measurably reduce pollution. The court also struck CAIR on procedural grounds finding that the EPA failed to adequately explain how it determined state emissions budgets and to address provisions of the Clean Air Act that it was required to enforce independently.[242]

Although stricken by the D.C Circuit Court, CAIR remains in place under court order until the EPA implements the CSAPR[243] as set forth below.

242. Ferrey, *Courts Cap*, *supra* note 218, at 691–93 (quoting North Carolina v. EPA, 531 F.3d 896, 906–08, 929 (D.C. Cir. 2008)) (citations omitted).

243. North Carolina v. EPA, 550 F.3d 1176, 1178 (D.C. Cir. 2008).

B. *CSAPR Executive Branch Regulation of Upwind Pollution Upheld by Supreme Court in 2014*

"After CAIR cap-and-trade was stricken in 2008 by the D.C. Circuit Court of Appeals, the EPA issued and substituted [CSAPR] addressing interstate air transport of SO_2 and NO_x contributing to ground-level ozone and fine particle pollution from fossil fuel-fired power plants in 27 Eastern states."[244]

CSAPR, promulgated pursuant to the "good neighbor provision" of the Clean Air Act,[245] requires "27 states in the eastern half of the United States to significantly improve air quality by reducing power plant emissions that cross state lines and contribute to ground-level ozone and fine particle pollution."[246]

CSAPR focused on attainment and maintenance of the 1997 Ozone NAAQS, 1997 $PM_{2.5}$ NAAQS, and 2006 $PM_{2.5}$ NAAQS in reducing NO_x and SO_2.[247]

> CSAPR requires significant reductions in SO_2 and NO_x, Hazardous Air Pollutants including mercury from electric power, and certain $PM_{2.5}$ precursor emissions, with intrastate and limited interstate trading. SO_2 is a precursor to $PM_{2.5}$ formation and NO_x is a precursor to both ozone and $PM_{2.5}$ formation. This rule is part of a suite of other state and federal rules that, together, would result in power plant emissions reductions of 73% for sulfur dioxide (SO_2) and 54% for nitrous oxide (NO_x). The EPA estimates that if all affected power plants were in full compliance with CSAPR, "[a]pproximately 70% of the power generated from coal-fired power plants [in states covered by the rule would] come from units with state-of-the-art SO_2 controls," and roughly 50% of that power would "come from units with state-of-the-art NO_x controls."[248]

244. Ferrey, *Courts Cap*, *supra* note 218, at 698; *see* Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals, 76 Fed. Reg. 48,208, 48,216 (Aug. 8, 2011) (to be codified at 40 C.F.R. pt. 51); *Cross-State Air Pollution Rule*, EPA, http://www3.epa.gov/crossstaterule/ (last visited Nov. 12, 2015).

245. *Interstate Air Pollution Transportation*, EPA, http://www.epa.gov/airmarkets/interstate-air-pollution-transport (last updated Jan. 27, 2016).

246. EPA, CSAPR FACT SHEET, *supra* note 231, at 1.

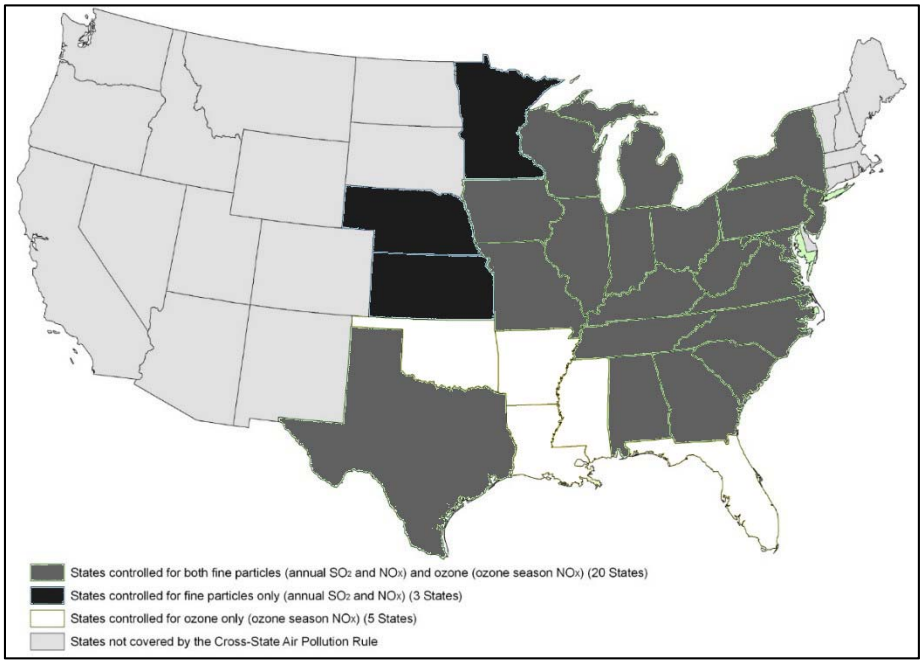
247. *Id.* at 3.

248. Ferrey, *Courts Cap*, *supra* note 218, at 687–88 n.38 (quoting EPA, CSAPR FACT SHEET, *supra* note 231, at 4) (citations omitted); *see also* FERREY, INDEPENDENT POWER, *supra* note 70, § 6:97.

Coal is the most significant source of these pollutants in power generation.[249] Most coal plants do not have these controls now.[250]

"The Clean Air Act affords states a period of time to submit a new or revised SIP after the EPA sets emission standards. If the state fails to submit a timely or sufficient SIP, the EPA may enforce a Federal Implementation Plan (FIP)."[251] The states affected by CSAPR are shown in Figure 16.[252]

Figure 16[253]



The D.C. Circuit Court "struck CSAPR because of its flawed method

249. *See supra* Part II.

250. EPA, CSAPR FACT SHEET, *supra* note 231, at 1–2.

251. Ferrey, *Courts Cap*, *supra* note 218, at 698; *see* 42 U.S.C. § 7410(a), (c)(1) (2012).

252. *Large Map of Transport Rule States*, EPA, http://www3.epa.gov/airtransport/CSAPR/statesmap.html (last updated February 27, 2013) [hereinafter *Map of Transport Rule States*]; *see infra* Figure 16.

253. *Map of Transport Rule States*, *supra* note 252.

for determining the emission reduction obligation imposed on states."[254]

> CSAPR imposed an FIP on the states before they could file an SIP and have it reviewed as to adequacy. The EPA argued that states are obligated to comply with [NAAQS] and the "good neighbor" provision simultaneously, and that the regulated states had failed to submit an appropriate SIP, entitling the EPA to enforce an FIP.
>
> The D.C. Circuit court found the EPA's argument flawed because the "good neighbor" provision requires the EPA to determine a state's reduction obligation before requiring the state to comply with it. . . . By finding that the states had failed to file a sufficient SIP to comply with their obligations under CSAPR, the EPA attempted to define "the target *after* the States' chance to comply with the target ha[d] already passed." The Clean Air Act allows the federal government to set national standards but it allows states the right to choose the means by which they attain those standards. The court concluded that the EPA crossed this federalism barrier by forcing states by default to conform to an FIP without giving them the opportunity to file an SIP.
>
> The court also struck CSAPR because of its flawed method for determining the emission reduction obligation imposed on states.[255]

To first establish if a state would be subject to CSAPR, the EPA determined if an "upwind State's contribution to [a] downwind area exceeded a numerical 'air quality threshold'—that is, downwind areas that EPA modeling predicted would not attain, or absent regulation would not maintain, the NAAQS."[256] The EPA then applied a cost-based standard that asked "how much pollution each upwind State's power plants could eliminate if the upwind State's plants applied all controls available at or below a given cost per ton of pollution reduction."[257]

> The cost-per-ton did not take into consideration how much pollution each upwind state contributed to each downwind state, as determined in the first step.
>
> . . . [T]he cost-based standard used to determine an upwind state's

254. Ferrey, *Courts Cap*, *supra* note 218, at 699; *see* EME Homer City Generation, L.P. v. EPA, 696 F.3d 7, 15–19 (D.C. Cir. 2012), *rev'd*, 134 S. Ct. 1584 (2014).

255. Ferrey, *Courts Cap*, *supra* note 218, at 698–99 (internal citations omitted) (quoting *EME Homer*, 696 F.3d at 33).

256. *EME Homer*, 696 F.3d at 15 (citing Transport Rule, 76 Fed. Reg. at 48,236).

257. *Id.* at 16–17.

obligation was impermissibly flawed, according to the circuit court, because the EPA may not force a state to reduce its emissions beyond those that significantly contribute to a downwind state's nonattainment or those that interfere with the maintenance of a downwind state's attainment. By forcing all contributing upwind states to impose all control measures within the cost-per-ton-of-pollution standard, the EPA was forcing states to reduce insignificant emissions—emissions that did not significantly contribute to a downwind state's nonattainment or maintenance of attainment.

The court also found that CSAPR forced upwind states to share the burden of other upwind states' significant contributions downwind. The D.C. Circuit stated that "the 'significance' of each upwind State's contribution cannot be measured in a vacuum, divorced from the impact of the other upwind States. Rather, the collective burden must be allocated among the upwind States in proportion to the size of their contributions to the downwind State's nonattainment."

. . . After the court reemphasized that the EPA has a duty to "ratchet back" the upwind states' obligation if it determines that the collective reductions of upwind states would reduce emissions beyond what is necessary for downwind states to attain NAAQS, the D.C. Circuit acknowledged that this proportionality may not always be possible and that the EPA was entitled to some leniency on this issue.

. . . The D.C. Circuit struck the CSAPR cross-state rule, in part, because it did not defer to SIPs and state discretion in implementation under the federalism split authority of the Clean Air Act. By imposing an FIP before states had the opportunity to submit an SIP, the EPA violated fundamental principles of federalism.

. . . The court took a "hard look" and held that one level of government cannot cross the federalist line of its jurisdiction "down the rabbit hole." EPA asked the Supreme Court for certiorari, and was opposed in this motion by 14 states, while nine states supported certiorari. The Supreme Court granted certiorari.

In a 6-2 opinion, the Supreme Court reversed the D.C. Circuit's holding in April 2014, reaffirming deference to agency discretion in devising Clean Air Act regulations, as per Chevron. The Court noted that "[t]he statute therefore calls upon the Agency to address a thorny causation problem: How should EPA allocate among multiple contributing upwind States responsibility for a downwind State's excess pollution?" The Court allowed the EPA leeway to devise its air control

> scheme for interstate cross-state pollution. The majority opinion denominates the allocation choices EPA made as "sensible," "equitable," "efficient" and "making good sense," citing *Chevron*.
>
> The Court concluded that the EPA must give states a reasonable opportunity to allocate their emission budgets before issuing FIPs. The Clean Air Act was held to mandate SIP compliance with the "good neighbor" provision, which requires SIPs to "contain adequate provisions . . . prohibiting . . . any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will . . . contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any . . . [NAAQS]." . . .
>
> The Supreme Court's dissenting opinion, agreeing with the lower court's majority, concluded that "[t]oo many important decisions of the Federal Government are made nowadays by unelected agency officials exercising broad lawmaking authority, rather than by the people's representatives in Congress. . . . Today, the majority approves [an] undemocratic revision of the Clean Air Act."[258]

This dissent echoes strands of the non-delegation doctrine.[259] This case did not end the contest: The Utility Air Regulatory Group then challenged the EPA's "technical revisions to the cross-state rule, including revis[ed] emissions budgets for 13 states."[260]

> The Clean Air Act scheme has been interpreted "as erecting a statutory "federalism bar" that "prohibits EPA from using the SIP process to force States to adopt specific control measures." If an SIP would result in compliance with EPA standards, the EPA may not question the choices of the state as to how it complies with them. Moreover, the EPA cannot condition its approval of SIPs on the adoption of specific control measures by states. States have the "first-implementer role," while EPA "is relegated . . . to a secondary role."[261]

258. Ferrey, *Courts Cap*, *supra* note 218, at 699–702 (citations omitted).

259. *See* FERREY, ENVIRONMENTAL LAW, *supra* note 82, at 42–43.

260. Andrew Childers, *Challenges Remain Despite Supreme Court Decision Reinstating EPA Cross-State Rule*, DAILY ENVTL REP. (BNA) (Apr. 30, 2014), http://www.bna.com/challenges-remain-despite-n17179890025/.

261. Ferrey, *Courts Cap*, *supra* note 218, at 702–03 (quoting *EME Homer*, 696 F.3d at 28–29 (2012); Train v. Nat. Res. Def. Council, 421 U.S. 60, 79 (1975)).

"The federalism line, demarcating state and federal power to administer environmental laws, is an important new subtext to many of these environmental battles on air."[262] CSAPR survived on appeal,[263] and CAIR is stricken but in place in the interim.[264] CSAPR, compared to CAIR in geographic coverage, picked up four other states immediately west of the Mississippi River and north of Texas, but deleted the six New England states, which have no downwind states to pollute through interstate drift of pollutants, given prevailing winds.[265] So CAIR has served as the interim place-holder for CSAPR to regulate interstate pollution emissions.[266] And together, they represent the most recent court interpretation of the discretion of executive branch action.

V. UNILATERALLY ALTERING LEGAL STANDARDS, METRICS, AND TECHNOLOGY

A. *How Much: New National Ambient Air Quality Standards*

The EPA reviews its primary—each of the air standards for the six criteria pollutants—NAAQS, every five years.[267] The last reviews were:

- 2008: Lead[268]
- 2010: Primary air standards for NO_x[269] and SO[270]
- 2011: CO[271]
- 2012: Secondary NO_2 and SO_2,[272] PM[273]

262. *Id.* at 702.
263. *EME Homer*, 134 S. Ct. at 1610.
264. *See supra* note 243 and accompanying text.
265. *Compare* Figure 15, *with* Figure 16.
266. *See supra* note 243 and accompanying text.
267. 42 U.S.C. § 7409(d) (2012).
268. *National Ambient Air Quality Standards (NAAQS)*, EPA, http://www3.epa.gov/ttn/naaqs/criteria.html (last visited Nov. 12, 2015).
269. *Id.*
270. *Id.*
271. *Id.*
272. *Nitrogen Dioxide (NO_2) and Sulfur Dioxide (SO_2) Secondary Standards*, EPA, http://www3.epa.gov/ttn/naaqs/standards/no2so2sec/index.html (last visited Nov. 12, 2015).
273. *National Ambient Air Quality Standards (NAAQS)*, *supra* note 268.

- 2015: Ozone[274]

The EPA, in 2014, "identified 14 areas in six states [that are] not meeting the 2012 national ambient air quality standard for fine particulate matter . . . of 12 micrograms per cubic meter," and will "designate those areas as nonattainment areas."[275] In 2013, the EPA "tightened the annual, health-based national ambient air quality standard for fine particles, which had been set at 15 micrograms per cubic meter."[276] The EPA retained its daily $PM_{2.5}$ standard of 35 micrograms per cubic meter (μg/m3) set in 2006.[277] Under this, five states (Pennsylvania, Ohio, Illinois, Iowa, and California) recommended a total of 15 nonattainment areas (including 39 whole or partial counties). In terms of adjusting power output to re-achieve compliance, coal-fired power plants emit more PM than other plants per unit of power produced.[278]

Ozone is the primary air pollutant of concern in the United States; a new ozone ambient air rule was published in October 2015 to lower the standard from 75 ppb to 70 ppb.[279] The EPA's Clean Air Scientific Advisory Committee (CASAC) in June 2014 concluded that there was scientific evidence to change the ozone standard to a tighter 60–70 ppb standard, and recommended a standard less than 60 ppb to maintain the required adequate margin of safety.[280] While the EPA exercises the ultimate decision authority,

274. EPA, OVERVIEW OF EPA'S UPDATES TO THE AIR QUALITY STANDARDS FOR GROUND-LEVEL OZONE 1 (2015), http://www3.epa.gov/ozonepollution/pdfs/20151001overviewfs.pdf.

275. Patrick Ambrosio, *14 Areas Don't Meet Air Quality Standard For Fine Particulates, EPA Says in Proposal*, 45 ENV'T REP. 2517 (BNA) (Aug. 28, 2014) [hereinafter Ambrosio, *14 Areas*]. "Those areas include Cleveland, the Los Angeles-South Coast Air Basin and the San Joaquin Valley." *Id.* EPA revised the annual primary $PM_{2.5}$ NAAQS to 12 μg/m3 from the previous level of 15 μg/m3 on Dec. 14, 2012. EPA, REVISED AIR QUALITY STANDARDS FOR PARTICLE POLLUTION AND UPDATES TO THE AIR QUALITY INDEX (AQI) 1 (2012) [hereinafter EPA, AQI], http://www3.epa.gov/airquality/particlepollution/2012/decfsstandards.pdf.

276. Ambrosio, *14 Areas*, *supra* note 275.

277. EPA, AQI, *supra* note 275.

278. *See* FERREY, INDEPENDENT POWER, *supra* note 70, § 6:11.

279. *See* National Ambient Air Quality, 80 Fed. Reg. 65,292, 65,292 (proposed Oct. 26, 2015) (to be codified at 40 C.F.R. 50, 51, 52, 53, and 58); *see also Regulatory Actions*, EPA, http://www3.epa.gov/ozonepollution/actions.html (last visited Nov. 12, 2015).

280. Letter from the Clear Air Scientific Advisory Committee to the Honorable Gina McCarthy, Administrator, EPA, at ii (June 26, 2014), http://yosemite.epa.gov/sab/sabproduct.nsf/5EFA320CCAD326E885257D030071531C/$File/EPA-CASAC-14-004+unsigned.pdf.

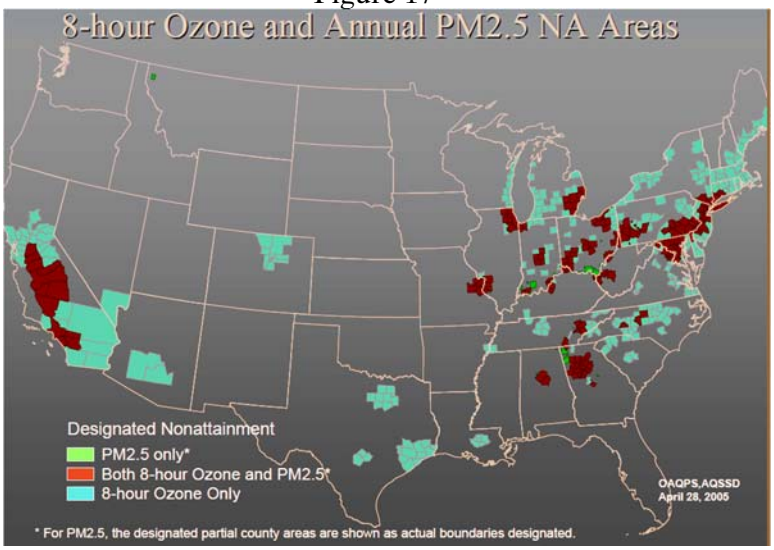
when the EPA's decision differs from the CASAC's recommendation, it must provide an explanation.[281] One court found that the CASAC's prior recommendation to have the standard "lowered from 0.080 ppm to no greater than 0.070 ppm" due to "overwhelming scientific evidence" was not a sufficiently clear statement to bind the EPA.[282]

In *Mississippi v. EPA*, this statement did not show that the CASAC believed that adverse health effects were in fact likely to happen above 0.070 ppm:

> Had CASAC reached a scientific conclusion that adverse health effects were likely to occur at the 0.070 ppm level, EPA's failure to justify its uncertainty regarding the existence of adverse health effects at this level would be unacceptable . . . , [b]ut we were unable to determine whether CASAC reached any such scientific conclusion.[283]

Those counties in the eastern half of the United States violating either the ozone or particulate matter NAAQS are shown in Figure 17.

Figure 17[284]



281. *See* Am. Farm Bureau v. EPA, 559 F.3d 512, 528 (D.C. Cir. 2009) (concluding that the EPA failed in the final rule to adequately explain its reason for not accepting the CASAC's recommendation); *see* 42 U.S.C. § 7607(d)(3) (2012).

282. *See* Mississippi v. EPA, 744 F.3d 1334, 1356 (D.C. Cir. 2013).

283. *Id.* at 1357.

284. RON MEYERS, EPA, FINE PM TEST METHOD 2 (2009), http://www.epa.gov/ttn/

The stricter ozone standard affects power plants upwind of, or in, the counties already not in compliance, and those that will be re-designated as noncompliance under the stricter rule.[285] In a recent opinion, a federal court of appeals noted the great deference due an administrative agency in charge of implementing a standard, and "stressed that the agency had broad leeway in deciding how much of a scientific margin of safety was sufficient."[286] The court disclaimed any role in refereeing disputes among experts and had "discretion to reassess evidence based on its own judgment."[287] However, "[w]here there is scientific evidence as a critical part of the [executive branch administrative] record, such as from an [EPA scientific] advisory committee, if the agency disagrees with its advisory committee, it 'must give a sound scientific reason for its disagreement.'"[288]

And these changing scientific assessments of the impact of emission requirements do not bode well for coal-fired power generation technologies,

emc/methods/m202doc16.pdf.

285. 80 Fed. Reg. at 65,292; *see* Maria Gallucci, *Obama Ozone Rule: EPA to Make it Harder for Factories, Power Plants to Emit Smog Pollution*, INT'L BUS. TIMES (Sept. 30, 2015), http://www.ibtimes.com/obama-ozone-rule-epa-make-it-harder-factories-power-plants-emit-smog-pollution-2121052; Amy Harder, *EPA Sets Stricter Standard for Ozone*, WALL ST. J. (Oct. 1, 2015), http://www.wsj.com/articles/epa-to-set-stricter-air-pollution-standard-for-ozone-1443715727.

286. Ferrey, *Courts Cap*, *supra* note 218, at 730; *see* Mississippi v. EPA, 723 F.3d 246, 254, 265 (D.C. Cir. 2013) *amended and superseded by rehearing*, 744 F.3d 1334 (D.C. Cir. 2013).

> In 2008, EPA set both the primary and secondary ozone standards at 75 parts per billion, averaged over an 8-hour period. The EPA also issued a secondary air quality standard for ozone (designed to protect public welfare), which was the same as the primary standard. The court also stated that that EPA did not have to show that old standards were wrong due to errors or new evidence, in order to modify them. The court said that EPA had failed to give a clear enough explanation for making the secondary standard equal to the primary standard, and had failed to state explicitly what level of protection was "requisite to protect the public welfare."

Ferrey, *Courts Cap*, *supra* note 218, at 730 n.350 (quoting *Mississippi*, 723 F.3d at 274).

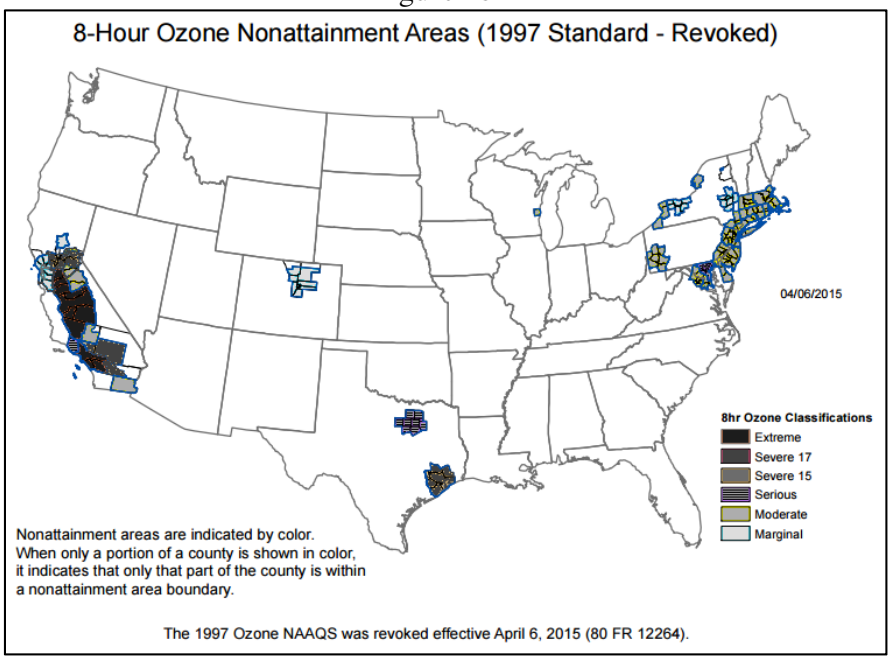
287. *Id.* at 730 (citing *Mississippi*, 723 F.3d at 265).

288. *Id*. (quoting *Mississippi*, 723 F.3d at 267). "An independent health panel created under the federal Clean Air Act recommended that a more protective ozone health standard was justified. The EPA need not always be as health-protective as its scientists recommend." Ferrey, *Courts Cap*, *supra* note 218, at 730 n.352 (citing *Mississippi*, 723 F.3d at 265).

which are the high end of such power technologies.[289]

Figure 18 shows the extent of noncompliance in various counties and states with existing ozone NAAQS, designated by the category of ozone non-attainment.[290] Ozone is the criteria pollutant for which the largest number of regions of the United States are most significantly out of compliance in non-attainment.[291] Eight states now are not meeting the recently current 75 ppb 8-hr standard for ozone emission.[292] Five additional states will not meet 75 ppb ozone emissions by 2018 without more controls on major emission sources (Connecticut, New York, New Jersey, Pennsylvania, and Maryland).[293]

Figure 18[294]



289. *See* Devin Henry, *Coal Company Sues Over 'Destructive' EPA Ozone Standards*, THE HILL (Oct. 26, 2015), http://thehill.com/policy/energy-environment/258129-coal-company-sues-over-epa-ozone-standards.

290. *See infra* Figure 19.

291. *8-Hr. Ozone (2008) Nonattainment Area/State/County Report*, EPA (Oct. 1, 2015), http://www.epa.gov/airquality/greenbook/hnca.html.

292. *See id.*

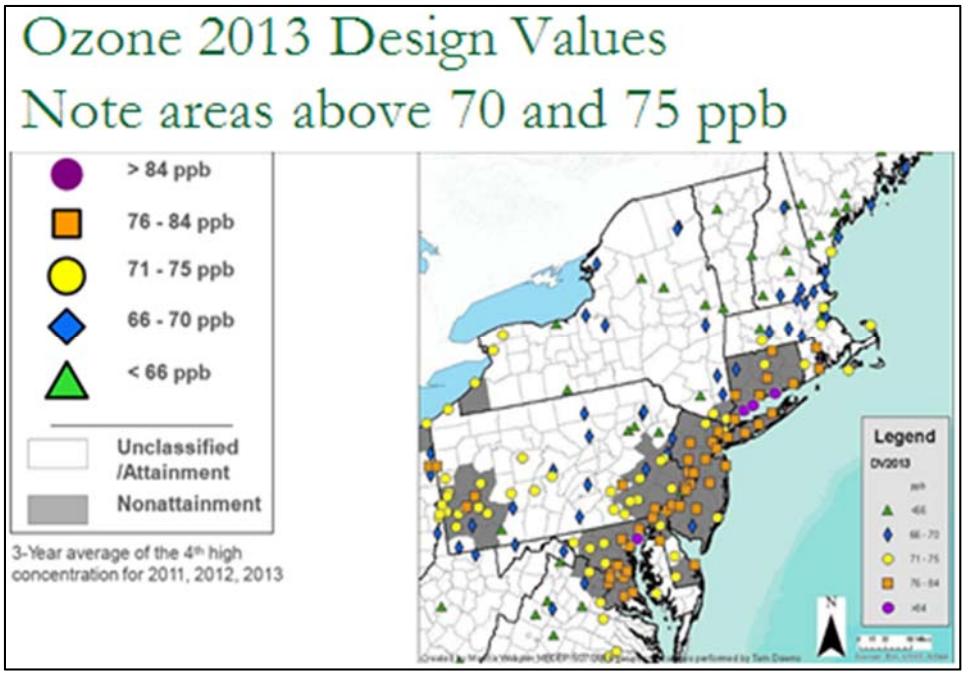
293. *See id.*

294. *8-Hour Ozone Nonattainment Areas*, EPA, http://www.epa.gov/airquality/greenbook/map/map8hr.pdf (last visited Jan. 24, 2016).

Figure 19 is a current and more detailed snapshot of the situation in the North Atlantic region of the United States of the original 13 colonies, showing:

- which air sampling points pursuant to the Clean Air Act are able to satisfy the current 75 ppb standard (other than the purple and orange nodes) and
- which now in compliance would be re-designated as not in compliance with the new NAAQs for ozone lowered to 70 ppb (the yellow nodes).

Figure 19



The Ozone Transport Commission covers 12 states and D.C., which must now submit new RACT-compliant state implementation plans to reduce ozone precursors.[295] Ozone precursors are emitted by all power

295. OZONE TRANSP. COMM'N, CHARGE TO THE STATIONARY AND AREA SOURCE COMMITTEE TO PURSUE POTENTIAL STRATEGIES IN 2015 FOR REGIONAL ATTAINMENT OF OZONE NATIONAL AMBIENT AIR QUALITY STANDARDS 1 (2014), http://www.otcair

plants, but none more per unit of power generated than coal facilities do.[296]

B. *Where: New 2014 Data Requirements Rule Proposed*

An EPA concern is that there are too few sampling stations and under-monitoring of actual pollution levels is occurring in supposed attainment areas.[297] Location is changing; for sampling stations and under-monitoring regarding the 2010 standard for SO_2 in attainment areas (which is a major emission source of coal-fired plants), the EPA is tightening requirements for monitoring and compliance.[298] In 2014, the EPA proposed a new Data Requirements Rule (DRR) in which the EPA will require new monitors by January 2017 in more relevant monitoring locations and consequent re-designation of air quality attainment areas as non-attainment.[299]

The EPA will monitor every source with the potential to emit greater than 2,000 tpy, which will include 89 percent of sources (including all coal plants), with approximately 900 sources in the densest area in the eastern United States.[300] The EPA will require states to monitor the air in the vicinity of power plants that choose to still operate.[301] This potentially could cause regions around large particulate-emitting power generation sources to be re-designated as non-attainment, resulting in pressure on particular coal units to operate less or shut down.[302] The final rule was published in August 2015.[303]

By monitoring air nearer to high-emitting power plants, monitored ambient air quality will yield more polluted samples of air to comprise the

.org/upload/Documents/Formal%20Actions/SAS%20Charge_Final.pdf.

296. *See supra* Part II.

297. *See* Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS), 80 Fed. Reg. 51,052, 51,053 (Aug. 21, 2015) (to be codified at 40 C.F.R. pt. 51).

298. *See id.* at 51,052.

299. Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS), 79 Fed. Reg. 27,446, 27,446 (proposed May 13, 2014) (to be codified at 40 C.F.R. pt. 51); *see* 80 Fed. Reg. at 51,054; EPA, FACT SHEET: FINAL DATA REQUIREMENTS RULE FOR THE 2010 1-HOUR SULFUR DIOXIDE (SO_2) PRIMARY NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS) 2 (2015), http://www3.epa.gov/airquality/sulfurdioxide/pdfs/so2_drr_fs_081215.pdf.

300. *See* 80 Fed. Reg. at 51,061.

301. *Id.* at 51,053.

302. *See id.* at 51,083.

303. *Id.* at 51,052.

composite average for the region.[304] Without anything changing, the same air, in the future sampled closer to operating power plants, will be found to average more pollutants. This could cause more regions of the country that contain fossil-fired power plants to descend into non-attainment with the NAAQS. To re-achieve the required attainment, state SIPs will impose stricter RACT requirements on the operation of existing power plants to achieve criteria pollutant level requirements.[305] Here again, coal plants will become a primary target for compliance through restrictions and greater expense of operation.[306]

C. *Mercury and the Air Toxics Standard (MATS)*

Mercury (Hg) is a naturally occurring element.[307] The most significant way humans release mercury into the environment is through burning coal.[308] Mercury is a pollutant that is regulated as a toxic chemical by the Clean Air Act.[309]

> In 2000, the EPA determined that mercury emitted by electric generation units (EGUs) was a Hazardous Air Pollutant (HAP) and therefore regulated EGUs' emissions of mercury under section 112 of the Clean Air Act. Four years into this determination, the EPA decided it would be more effective to regulate EGUs with a cap-and-trade system under section 111 of the Clean Air Act and proceeded to remove EGUs from the list of HAPs in section 112.[310]

1. *Early Mercury Challenges*

> Section 112 of the Clean Air Act allows the EPA to delist a HAP only if the agency determines that "emissions from no source in the category or subcategory concerned . . . exceed a level which is adequate to protect public health with an ample margin of safety and no adverse environmental effect will result from emissions from any source." The EPA did not meet this standard when it removed EGUs from the

304. *See id.* at 51,054.

305. *See* FERREY, INDEPENDENT POWER, *supra* note 70, § 6:91.

306. *See id.*

307. *Basic Information About Mercury*, EPA, http://www2.epa.gov/mercury/basic-information-about-mercury (last updated Oct. 19, 2015).

308. *Id.*

309. 42 U.S.C. § 7412 (2012).

310. Ferrey, *Courts Cap*, *supra* note 218, at 689.

> section 112 list, which was the basis for the court striking this alternative cap-and-trade system.[311]

By regulating mercury under Section 112 of the Clean Air Act, there is a challenge that the EPA is thus precluded from later attempting to regulate such existing power plants for CO_2 emissions under Section 111(d) of the Act, which the EPA is now proposing to do.[312]

> The court [in *New Jersey*] rejected each of the EPA's three arguments in support of its administrative action. The agency first argued that its action was appropriately within its administrative discretion under the *Chevron* standard of agency deference, which requires the court to analyze the EPA's decision by first asking "whether Congress has directly spoken to the issue." If Congress did directly speak to the issue, then the EPA does not have interpretive discretion and must follow Congress's manifested intent. If Congress did not speak directly to the issue, then the court moves to the second step, which asks "whether the agency's answer is based on a permissible construction of the statute." The second step allows for significant agency discretion in interpreting the EPA's authority.
>
> The EPA argued that the second *Chevron* step was applicable in this case because section 112(c)(9)—which contains the instructions for removing a HAP from section 112—is made ambiguous by section 112(n)(1), which states: "[I]f EPA makes a determination under section 112(n)(1)(A) that power plants should not be regulated at all under section 112 . . . [then] this determination *ipso facto* must result in removal of power plants from the section 112(c) list."
>
> The EPA argued that this language allowed it to bypass the section 112(c)(9) delisting requirements if it determined that power plants should be regulated by another section of the Clean Air Act. The court disagreed, finding that section 112(n)(1)(A) is not applicable after the EPA has listed a pollutant as a HAP, and therefore, there was no ambiguity. As such, the first step of the *Chevron* standard applied and the EPA was bound to satisfy the delisting requirements set forth in section 112(c)(9) of the Act.
>
> The EPA also argued that an agency has the inherent authority to reverse an earlier administrative determination or ruling if it has a

311. *Id.* (quoting 42 U.S.C. § 7412 (2012)); *see* New Jersey v. EPA, 517 F.3d 574, 581–82 (D.C. Cir. 2008).

312. *See s* Part III.C.

> principled basis for doing so. According to the court, the agency could have reversed its decision to regulate EGUs under section 112 prior to listing them, but after listing EGUs it may not reverse its decision because Congress expressly limited the EPA's ability to delist HAPs.
>
> Finally, the EPA argued that because it had previously removed HAPs from the list without satisfying the requirements of section 112, it should not be estopped from doing so in this instance. The D.C. Circuit quickly dispatched this argument by stating, "[W]e do not see how merely applying an unreasonable statutory interpretation for several years can transform it into a reasonable interpretation."[313]

An executive agency does not acquire immunity for reversing position once it has done so.[314]

> Many in the regulated community expressed concern about the environmental regulations' likely impact on electric grid reliability, and they claimed that many electricity generating plants would be forced to shut down in order to avoid individual non-compliance and fines, risking larger electric system reliability. Indeed, FERC deemed some of the affected units poised for permanent or temporary shutdowns after promulgation of the rule as reliability-critical to maintain successful grid operation.[315]

313. Ferrey, *Courts Cap*, *supra* note 218, at 689–91 (quoting Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837, 842–43 (1984)); *New Jersey*, 517 F.3d at 582–83 (quoting F.J. Vollmer Co. v. Magaw, 102 F.3d 591, 598 (D.C. Cir. 1996)).

314. *See New Jersey*, 517 F.3d at 583.

315. Steven Ferrey, *Broken at Both Ends: The Need to Reconnect Energy and Environment*, 65 SYRACUSE L. REV. 53, 71–72 (2014) [hereinafter Ferrey, *Broken*]; *see also, e.g.*, *EPA Rules Continue to Raise Electric Reliability Concerns*, REPUBLICAN NEWS (Nov. 30, 2011), http://www.energy.senate.gov/public/index.cfm/republican-news?ID=85051768-67b4-4200-b7b3-c3989ef2db3f; Neela Banerjee, *Obama Faces a Battle on Air Rules*, L.A. TIMES (Dec. 22, 2011), http://articles.latimes.com/2011/dec/22/nation/la-na-epa-mercury-20111222. These rules are expected to primarily affect power plants over 50 years old and it is estimated that it could eliminate eight percent of the nation's coal-fired electricity supply, as well as approximately 500 or more power plants which would likely need to be idled temporarily during the next few years to install pollution controls that would bring them into compliance with MATS and CSAPR. *See Cleaner Power Plants*, EPA, http://www3.epa.gov/mats/powerplants.html (last visited Nov. 13, 2015); *Majority of Coal Plants in MATS Compliance*, ENVIRO.BLR.COM (Apr. 8, 2014), https://enviro.blr.com/environmental-news/air/hazardous-air-pollutants/Majority-of-coal-plants-in-MATS-compliance/.

2. *MATS*

One set of new executive action air regulations, designed to restrict emissions further from the use of coal, showed the impact of regulations on the long infrastructure lead times in the electric power industry, even when the rule was later stricken by the Supreme Court.[316] The new Mercury Air Toxic Standards (MATS) promulgated by the EPA were estimated to "avert up to 11,000 premature deaths, 4,700 heart attacks, and 130,000 asthma attacks every year."[317] "The final rule sets standards for all hazardous air pollutants . . . emitted by coal- and oil-fired electric generating units . . . with a capacity of 25 megawatts or greater."[318] Any existing source would have about four years to comply with the new MATS, and then, under the Clean Air Act, could be granted an additional year by its state.[319]

While eventually challenged on appeal to the Supreme Court,[320] for over four years many coal-fired facilities, not knowing the regulation would eventually be overturned, complied with the regulation.[321]

> MATS . . . [was] specifically aimed at reducing power plants' emissions of toxic air pollutants rather than criteria pollutants, including arsenic, chromium, nickel, hydrochloric acid and hydrofluoric acid, in addition to mercury. There [was] some accommodation, in terms of time rather

316. *See* Michigan v. EPA, 135 S. Ct. 2699, 2712 (2015); Suzanne Goldenberg & Raya Jalabi, *US Supreme Court Strikes Down Obama's EPA Limits on Mercury Pollution*, THE GUARDIAN (June 29, 2015), http://www.theguardian.com/environment/2015/jun/29/supreme-court-air-pollution-epa-coal-plants.

317. *Healthier Americans*, EPA, http://www3.epa.gov/mats/health.html (last updated Nov. 19, 2015).

318. *Basic Information*, EPA, http://www.epa.gov/mats/basic.html (last updated Nov. 19, 2015); *see* National Emission Standards for Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 Fed. Reg. 9304 (Feb. 16, 2012) (to be codified at 40 C.F.R. pts. 60 & 63). This affects larger coal plants, if coal is greater than 10 percent of fuel input, and the unit is greater than 25 Mw capacity, produces electricity for sale, and supplies more than one-third of its potential output to any utility power distribution system, unless its annual capacity factor is less than 8 percent of rating (i.e. only used for peaking purposes). *See* 77 Fed. Reg. at 9309.

319. *Id.*

320. *Michigan*, 135 S. Ct. at 2704.

321. *See* Goldenberg & Jalabi, *supra* note 316 ("According to data compiled by SNL Energy, many generators in the US complied with the mercury and toxics compliance, despite the possibility that the court would strike down the rule.").

> than actual emission reduction, for impacts on electric grid reliability. The rule provide[d] existing large electricity generation facilities four years to achieve full compliance, with an additional year available to the power plants which FERC deem[ed] electric "reliability-critical" to maintain adequate voltage in the nation's bulk power system or for emergency start to meet system crises. MATS further provid[ed] that if a source cannot come into compliance within the time frame allowed, EPA w[ould] determine, on a case-by-case basis, whether and to what extent it w[ould] assess individual fines or penalties for noncompliance.[322]

In 2014, the D.C. Court of Appeals upheld the EPA's MATS regulation.[323] Having been upheld, and much of the four years for compliance having already expired, many coal-fired power generators in the nation either complied or delisted their plants to shut down rather than comply.[324] What made the rule somewhat controversial is that the co-benefits associated with $PM_{2.5}$ reductions comprised the overwhelming majority of all benefits attributed to the MATS regulations by EPA;[325] $PM_{2.5}$ is already otherwise heavily regulated by the EPA.[326] The EPA designed the rule, in part, to achieve through executive action $PM_{2.5}$ emissions reductions that it could not lawfully compel using provisions of the Act authorizing direct regulation of $PM_{2.5}$.[327]

The D.C. Circuit Court of Appeals found that the action was not arbitrary and capricious because the EPA demonstrated a reasonable connection between its actions and the record of decision, and it was

322. Ferrey, *Broken*, *supra* note 315, at 71; *see* FERREY, INDEPENDENT POWER, *supra* note 70, § 6:31.

323. *See generally* White Stallion Energy Ctr., LLC v. EPA, 748 F.3d 1222 (D.C. Cir. 2014), *rev'd*, *Michigan*, 135 S. Ct. at 2699.

324. *See* Goldenberg & Jalabi, *supra* note 316.

325. Susan E. Dudley, *OMB'S Reported Benefits of Regulation: Too Good to be True?*, REGULATORY REFORM 29 (2013), http://object.cato.org/sites/cato.org/files/serials/files/regulation/2013/6/regulation-v36n2-4.pdf.

326. *See Particulate Matter*, EPA, http://www3.epa.gov/airquality/particlepollution/ (last visited Nov. 13, 2015); White Stallion Energy Center LLC, et al. v. Environmental Protection Agency *(EPA) (12-1100)*, U.S. CHAMBER LITIGATION CENTER, http://www.chamberlitigation.com/white-stallion-energy-center-llc-et-al-v-environmental-protection-agency-epa-12-1100 (last visited Nov. 14, 2015) [hereinafter White Stallion].

327. *See* White Stallion, *supra* note 326.

accorded *Chevron* deference.[328] Judge Kavanaugh, concurring in part and dissenting in part, agreed with the industry petitioners that the EPA unreasonably excluded cost considerations and economic impacts when determining whether Maximum Achievable Control Technology (MACT) regulation of power plant HAPs was "appropriate and necessary."[329] The NAAQS provisions specifically do not provide for cost considerations.[330] By contrast, for MACT regulation of power plant HAPs as relevant with MATS, pursuant to §112(n)(1)(A) of the CAA, has more flexible language on "appropriate and necessary" regulation.[331]

When the D.C. Circuit Court upheld MATS applying to existing coal- and oil-fired electric generating units, it relied in part upon Supreme Court precedent in *Whitman v. American Trucking Association* establishing that the EPA is under no obligation to consider costs in establishing HAPs under other provisions of the Clean Air Act that similarly fail to mention cost as a relevant consideration.[332] On that issue the court split, but the majority deferred to the EPA's technical judgment.[333] This issue proceeded on appeal

328. *White Stallion Energy Ctr.*, 748 F.3d at 1234.

329. *Id.* at 1261 (Kavanaugh, J., concurring in part and dissenting in part). The dissent by Judge Kavanaugh stated that the majority over-read the ruling in *Whitman v. American Trucking Ass'n, Inc.* by ignoring the important difference between how the Clean Air Act provisions govern NAAQS rulemaking and the MACT regulation of power plant HAPs. *Id.* at 1265–66 (Kavanaugh, J., concurring in part and dissenting in part). *Whitman* stated that the EPA may not take costs into consideration when setting NAAQS. Whitman v. Am. Trucking Ass'n, Inc., 531 U.S. 457, 467 (2001).

330. 42 U.S.C. §§ 7408(a), 7409(b)(1) (2012). What this means is that if an air pollutant is emitted by "numerous or diverse mobile or stationary sources" and the associated air pollutant is "reasonably . . . anticipated to endanger public health or welfare," then pursuant to Section 108(a) of the CAA, the EPA must establish NAAQS for those pollutants, and pursuant to Section 109(b) of the CAA, those standards must be "requisite to protect public health" with "an adequate margin of safety." 42 U.S.C. §§ 7408(a), 7409(b)(1).

331. *Id.* § 7412(n)(1)(A); *see White Stallion Energy Ctr.*, 748 F.3d at 1230–31; *History*, EPA, http://www3.epa.gov/airquality/powerplanttoxics/history.html (last visited Nov. 13, 2015). This requires the EPA to study and issue a report on the public health hazards anticipated to occur as a result of power plant HAP emissions, and then apply MACT regulation "if" the Administrator finds such regulation is "appropriate and necessary," which is not defined. 42 U.S.C. § 7412(n)(1)(A).

332. *White Stallion Energy Ctr.*, 748 F.3d at 1238–39.

333. *Id.* at 1239–40. This included challenges to the EPA's determination of what was achievable by the best performing 12 percent of sources (i.e., the "MACT floor") and the supporting data. *Id.* at 1247–48.

to the Supreme Court by a coalition of more than 20 states.[334]

"During oral arguments, several members of the Court were critical that the EPA's cost-benefit analysis for the MATS rule—which attributed billions of dollars in annual public health benefits to" the reduction of $PM_{2.5}$ and other pollutants—regulated under other sections of the Clean Air Act to the MATS mercury standards, "even though the agency could only quantify between $4 million and $6 million in benefits to reductions of hazardous air pollutants," a fraction of one percent of the "benefits."[335] The EPA claimed long-term benefits of $37–90 billion annually, without providing any statistical basis or medical proof.[336] The Supreme Court overturned MATS because the EPA is required to "consider cost—including, most importantly, cost of compliance—before deciding whether regulation is appropriate and necessary" because "[o]ne would not say that it is even rational, never mind 'appropriate,' to impose billions of dollars in economic costs in return for a few dollars in health or environmental benefits."[337]

The Supreme Court held that "[i]n addition, 'cost' includes more than the expense of complying with regulations; any disadvantage could be termed a cost."[338] Of note, the Clean Power Plan also counts a very large amount of co-benefits from reduction of other than the targeted CO_2, and counts many international climate benefits in proportion to relatively limited domestic climate benefits, evaluated against substantial future domestic compliance costs.[339]

Even though eventually stricken and remanded by the Supreme Court in 2015, this did not reach the Supreme Court until the end of the EPA's

334. Michigan v. EPA, 135 S. Ct. 2699, 2705–06 (2015). The Court granted certiorari to and consolidated three separate petitions filed by the Utility Air Regulatory Group, the National Mining Association, and 23 states. *Id.* at 2706. Fifteen states supported the EPA's MATS regulation before the Court. *See generally* Brief in Opposition, Michigan v. EPA, 135 S. Ct. 2699 (2015) (No. 14-46, 14-47, 14-49), 2014 WL 5338150.

335. Patrick Ambrosio, *Supreme Court Remands EPA Mercury Rule for Failing to Consider Cost to Power Plants*, DAILY ENVTL. REP. (BNA) (June 30, 2015), http://www.bna.com/supreme-court-remands-n17179928911/.

336. *Michigan*, 135 S. Ct. at 2706.

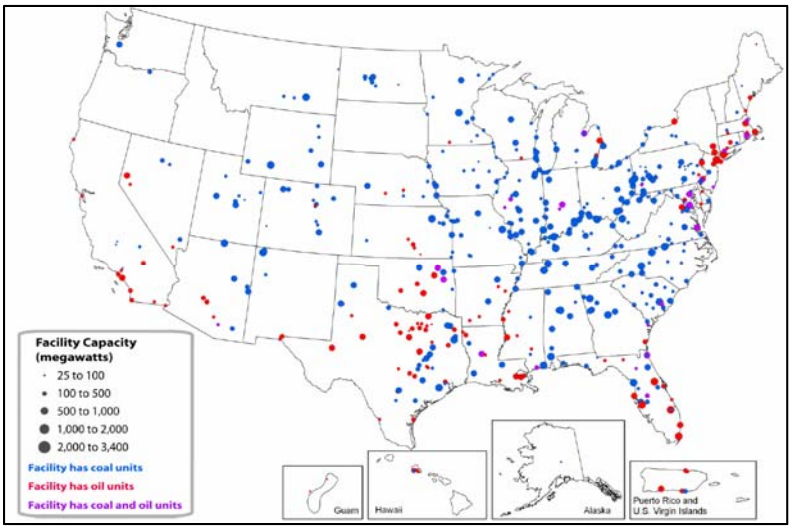
337. *Id.* at 2707, 2711.

338. *Id.* at 2707.

339. *See* Andrew M. Grossman, Michigan v. EPA*: A Mandate for Agencies to Consider Costs*, 2015 CATO SUP. CT. REV. 281, 306–07 (2015).

specified four-year compliance period.[340] And with the D.C. Circuit having previously upheld the regulation, many coal-fired facilities had to comply with the restriction, not knowing that it would be stricken eventually by the Supreme Court.[341] Through this fate of timing, the unilateral EPA MATS regulation achieved its purpose, although eventually rejected by the Supreme Court.[342] In the most capital-intensive industry in the United States, with very long lead times to alter power generating equipment, even an executive action later stricken by the Supreme Court can achieve its objective.[343] Figure 20 illustrates where MATS-affected, coal-fired units nationwide.

Figure 20[344]



VI. SOLITARY CONFINEMENT: EXECUTIVE ACTION ALONE

Unilateral executive action to limit various air emissions is transforming fundamental power technology from use of coal as its primary

340. *See* Goldenberg & Jalabi, *supra* note 316.

341. *See id.*

342. *See id.*

343. *See id.*

344. EPA, THE TOXICS RULE FACILITIES (2011), http://www.epa.gov/airquality/powerplanttoxics/pdfs/20111221facilitiesmap.pdf.

input to natural gas and renewable energy in the United States, particularly during the past five years.[345] Wind is now the predominant new power generation source, growing in share of power generation each year.[346] And there has been a significant transition from coal to natural gas among fossil fuels used for power in the United States.[347] Recently, new EPA rules bypass Congress, relying on the President's unilateral executive authority.[348]

"The [U.S.] Energy Information Administration (EIA) reports that 60 gigawatts of [existing] coal-fired capacity will be shuttered by 2020. Ninety percent of this coal capacity retirements will occur by 2016."[349]

> At the end of 2012 there were 1,308 coal-fired generating units in the United States, totaling 310 GW of capacity. In 2012 alone, 10.2 GW of coal-fired capacity was retired, representing 3.2% of the 2011 total. . . . Units that retired in 2010, 2011, or 2012 were small, with an average size of 97 megawatts (MW), and inefficient, with an average tested heat rate of about 10,695 British thermal units per kilowatthour (Btu/kWh). In contrast, units scheduled for retirement over the next 10 years are larger and more efficient: at 145 MW, the average size is 50% larger than recent retirements, with an average tested heat rate of 10,398 Btu/kWh.[350]

345. *See* Karl Mathiesen, *Gas Surges Ahead of Coal in US Power Generation*, THE GUARDIAN (July 14, 2015), http://www.theguardian.com/environment/2015/jul/14/gas-surges-ahead-of-coal-in-us-power-generation; Steven Mufson, *New EPA Rule on Greenhouse Gases the Latest Blow to King Coal*, WASH. POST (Aug. 1, 2015), https://www.washingtonpost.com/business/economy/new-epa-rule-on-greenhouse-gases-the-latest-blow-to-king-coal/2015/08/01/c8bd3936-3791-11e5-9739-170df8af8eb9_story.html; Ari Phillips, *Coal's Slow Demise as a Power Source Leads to Role Reversal With Natural Gas*, THINK PROGRESS (July 14, 2015), http://think progress.org/climate/2015/07/14/3680250/natural-gas-more-electricity-than-coal-for-first-time/.

346. *Energy Dept. Reports: U.S. Wind Energy Production and Manufacturing Reaches Record Highs*, U.S. ENERGY DEP'T (Aug. 6, 2013), http://energy.gov/articles /energy-dept-reports-us-wind-energy-production-and-manufacturing-reaches-record-highs.

347. *See* Mathiesen, *supra* note 345.

348. *See* Goldenberg, *supra* note 122.

349. Michael Bastasch, *Report: EPA Regulations to Accelerate Coal Plant Shutdowns*, THE DAILY CALLER (Feb. 14, 2014), http://dailycaller.com/2014/02/14 /report-epa-regulations-to-accelerate-coal-plant-shutdowns/.

350. *AEO2014 Projects More Coal-Fired Power Plant Retirements by 2016 than Have Been Scheduled*, U.S. ENERGY INFO. ADMIN., http://www.eia.gov/todayinenergy /detail.cfm?id=15031 (last updated Mar. 10, 2014).

"U.S. coal-fired generating capacity will fall from 310 gigawatts in 2012 to 262 gigawatts in 2040, according to EIA—a 15 percent decrease in the country's coal-fired capacity."[351] "Standard & Poor's estimated that 40–75 GW of coal-fired power generation units may be shut by 2020 . . . ."[352] Utilities have already "announced permanent shutdowns of 27 [GW]."[353] Eighteen percent of the closures expected by the end of 2015 will be offset by natural gas-generated power.[354] A portion of these shutdowns are attributed to an indirect effect of the MATS, even though it was recently overturned and remanded by the Supreme Court in 2015.[355]

Shortly after the EPA announced the Clean Power Plan, former House Speaker John Boehner announced that he intended to file a lawsuit against President Obama for unconstitutional use of presidential directives.[356] He is one in a significant queue of those suing over unilateral executive branch action on air quality issues: The EPA defended on average about 155 law suits each year from 1995 to 2010, with 59 percent involving its actions or inactions under the Clean Air Act.[357] It is still to be determined the degree to which these challenges will succeed, and, as with MATS, it is unclear whether this litigation will proceed too slowly to alter compliance of owners of power plants with the changing face of power generation.[358] Moving forward, the impact of executive agency EPA regulations and court orders

351. Bastasch, *supra* note 349.

352. Naureen S. Malik & Harry R. Weber, *Breathing Clean Air Will Come at a Cost as U.S. Utility Bills Are Predicted to Surge*, ENERGY & CLIMATE REP. (BNA) (Oct. 29, 2015). 20,000 Mw of coal plants operated at 38 percent of capacity for the first half of 2014 and will shut permanently by the end of 2015. *Id.*

353. *Id.*

354. *Id.* There are projected to be replaced by approximately 4,000 Mw of natural gas-generating capacity. *Id.*

355. *See Planned Coal-Fired Power Plant Retirements Continue to Increase*, U.S. ENERGY INFO. ADMIN. (Mar. 20, 2014), http://www.eia.gov/todayinenergy/detail.cfm?id=15491; Timothy Cama & Lydia Wheeler, *Supreme Court Overturns Landmark EPA Air Pollution Rule*, THE HILL (June 29, 2015), http://thehill.com/policy/energy-environment/246423-supreme-court-overturns-epa-air-pollution-rule.

356. Paul Kane, *Boehner Plans to File Lawsuit Against Obama Over Use of Executive Orders*, WASH. POST (June 25, 2014), http://www.washingtonpost.com/politics/boehner-plans-to-file-lawsuit-against-obama-over-use-of-executive-orders/2014/06/25/a352b860-fc8c-11e3-932c-0a55b81f48ce_story.html.

357. U.S. GOV'T ACCOUNTABILITY OFFICE, ENVIRONMENTAL LITIGATION: INFORMATION ON CASES AGAINST EPA AND FWS AND ON DEADLINE SUITS ON EPA RULEMAKING 8–9 (2015), http://www.gao.gov/assets/680/671846.pdf.

358. *See supra* notes 354–57 and accompanying text.

interpreting them will be significant:[359]

- The 2014 U.S. Supreme Court decision upholding the Clean Air Act for new sources emitting CO_2[360] will curtail new coal-fired generation.[361]
- While it is now undergoing extensive legal challenge,[362] if upheld by the courts, the EPA's limit on existing facility CO_2 emissions proposed pursuant to Section 111(d) of the Clean Air Act will cause many of the smaller and less efficient coal plants to close.[363]
- While coal plants emit NO_x as an ozone precursor, the new lower NAAQS standard for ozone will cause additional areas of states to lose attainment with Clean Air Act requirements.[364] There will be significant EPA pressure for states to apply EPA CTGs and ACTs, which discourage continued operation of coal-fired power plants.[365]
- The 2014 U.S. Supreme Court decision upholding CSAPR[366] places additional EPA pressure on upwind states to decrease their emissions of $PM_{2.5}$, NO_x, and ozone, particularly from coal-fired plants.[367]
- The lowering of the NAAQS for ozone throws additional areas of states into non-attainment for ozone emissions.[368] This will put additional pressure on coal-fired power plants and large industrial coal-fired facilities.[369]
- The RGGI's tightening of CO_2 emissions on all large electric

359. *Clean Air Act Cases*, CTR. FOR CLIMATE AND ENERGY SOLS., http://www.c2es.org/federal/courts/clean-air-act-cases (last visited Nov. 13, 2015) (detailing the implications from the case law in this area).

360. Util. Air Regulatory Grp. v. EPA, 134 S. Ct. 2427, 2449 (2014).

361. *See supra* Part III.B.

362. *See, e.g.*, Neuhauser, *Mess*, *supra* note 153.

363. *See supra* Part III.C.1.

364. *See supra* Part V.A.

365. *See supra* Part V.A.

366. EPA v. EME Homer City Generation, L.P., 134 S. Ct. 1584, 1610 (2014).

367. *See supra* Part IV.B.

368. *See supra* Part III.D.

369. *See supra* Part III.D.

generation plants in nine North Atlantic states has resulted in an approximate doubling of the cost of allowances to emit CO_2, which puts additional pressure on fossil-fuel-fired power plants.[370] All of the states in the RGGI region dispatch plants based on day-ahead price bids for the cost of plant operation.[371] As these CO_2-related operating costs go up, coal-fired plants will be less economically attractive to operate.[372]

- Compliance with the MATS, even though recently overturned by the Supreme Court,[373] already affected coal plant operations by specifically targeting mercury, which is associated with coal combustion, and not with natural gas consumption.[374]
- The EPA science advisory committee recommends a substantial lowering of the ozone NAAQS, which would throw a significant number of additional regions into non-attainment with required air standards and put pressure on high-ozone emitting coal-fired power plants.
- The EPA requires adjustment of sampling stations and protocol to more accurately register SO_2 emissions from power plants.[375] Coal-fired power plants are the source of SO_2 emissions among the constellation of power generation facilities.[376]

Unilateral executive action on environmental air regulation is changing the fundamental technology for one of the most important inventions in history. The courts have a varied, but critical, record as to how they evaluate discretion exercised by the executive branch on air emission standards and the resultant impact on power generation.[377] Air regulation is a key wedge on choice of electric technology and infrastructure,[378] and it is being

370. *See supra* Part V.C.
371. *See id.*
372. *See id.*
373. Michigan v. EPA, 135 S. Ct. 2699, 2711–12 (2015).
374. *See supra* Part V.C.2.
375. *See supra* Part V.A.
376. *See supra* Part V.C.
377. *See generally, e.g.*, *Michigan*, 135 S. Ct. at 2699; Util. Air Regulatory Grp. v. EPA, 134 S. Ct. 2427 (2014); EPA v. EME Homer City Generation, L.P., 134 S. Ct. 1584 (2014).
378. *See supra* Part II.

accomplished by one branch of government unilaterally, circumventing the traditional process of multi-branch governance checks and balances.[379]

Executive action lacks in permanence and increases potential volatility what it adds in ease.[380] While one administration may justify new executive action as filling a gap left by an inactive legislative branch, important policy advances through executive action are at perennial risk when there are changes in the executive branch.[381] The next administration can have different views of each program subject to executive action, which can be torqued in a different direction during different administrations to, again, change the critical foundation of American power.[382] Volatility in regulatory structure does not align with long-term capital investment horizons for electric power infrastructure necessary to maintain system reliability.[383] However, executive action already is making substantial changes in the second most important invention in history since the wheel: electricity.[384]

379. *See* Stephanie Condon, *Is Obama Overstepping His Bounds with Executive Actions?*, CBS NEWS (Jan. 28, 2014), http://www.cbsnews.com/news/is-obama-overstepping-his-bounds-with-executive-actions/.

380. *See* Jeff Shesol, *Power Up: Obama's Executive-Order Agenda*, THE NEW YORKER (Jan. 29, 2014), http://www.newyorker.com/news/daily-comment/power-up-obamas-executive-order-agenda.

381. *See* Jaime Fuller, *Executive Actions: An Increasingly Common way for Congress to Hate Presidents*, WASH. POST (Nov. 17, 2014), https://www.washingtonpost.com/news/the-fix/wp/2014/11/17/executive-actions-an-increasingly-common-way-for-congress-to-hate-presidents/.

382. *See* Mark Koba, *Executive Orders Coming? Here's How They Work*, CNBC (Jan. 28, 2014), http://www.cnbc.com/2014/01/28/executive-orders-what-they-are-and-how-they-work.html.

383. *See* Garner, *supra* note 188.

384. *See supra* Part III; Fallows, *supra* note 3.