# FEDERAL REGULATION OF COAL-FIRED ELECTRIC POWER PLANTS TO REDUCE GREENHOUSE GAS EMISSIONS

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> *It will be of little avail to the people, that the laws are made by men of their own choice, if the laws be so voluminous that they cannot be read, or so incoherent that they cannot be understood; if they be repealed or revised before they are promulgated, or undergo such incessant changes that no man, who knows what the law is to-day, can guess what it will be to-morrow. Law is defined to be a rule of action; but how can that be a rule, which is little known, and less fixed?*
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> *Another effect of public instability is the unreasonable advantage it gives to the sagacious, the enterprising, and the moneyed few over the industrious and uniformed mass of the people. Every new regulation concerning commerce or revenue, or in any way affecting the value of the different species of property, presents a new harvest to those who watch the change, and can trace its consequences; a harvest, reared not by themselves, but by the toils and cares of the great body of their fellow-citizens. This is a state of things in which it may be said with some truth that laws are made for the few, not for the many.*
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> *James Madison, The Federalist No. 62 (Feb. 27, 1788).*

This article focuses on legal developments since mid-2011 relating to the control of both carbon dioxide ($CO_2$) and conventional pollutants from coal-fired electric power plants. It deals as briefly as possible with pre-2011 issues that are discussed in the author's numerous publications over the past decade dealing with climate change.[1]

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[1] Prior publications by the author on this subject include: *The Intersection of Climate Change and Clean Air Act Stationary Source Programs*, 43 ARIZ. ST. L.J. 901 (2011); *Federal Control of Greenhouse Gas Emissions*, 40 ENVTL. L. 1261 (2010); *Controlling Greenhouse Gases from Highway Vehicles*, 31 UTAH ENVTL. L. REV. 309 (2011); *Electric Power in a Carbon Constrained World*, 34 WM. & MARY ENVTL. L. & POL'Y REV. 821 (2010); *Federal Control of Carbon Dioxide Emissions: What Are the Options?*, 36 B.C. ENVTL. AFF. L. REV. 1 (2009); *Controlling Greenhouse Gas Emission from Mobile Sources—Massachusetts v. EPA*, 37 ENVTL. L. REP. (Envtl. Law Inst.) 10,535 (July 2007); *State and Federal Command and Control Regulation of Emissions from Fossil-Fuel Electric Power Generating Plants*, 32 ENVTL. L. 369 (2002); and *Global Warming*, 31 ENVTL. L. REP. (Envtl. Law Inst.) 10,253 (Mar. 2001).

TABLE OF CONTENTS



## I. INTRODUCTION

Sources of $CO_2$ emissions in the United States (U.S.) have faced potential regulation since the U.S. signed the United Nations Framework Convention on Climate Change (FCCC) on October 15, 1992.[2] Although the treaty was nonbinding, it called for developed countries to reduce their greenhouse gas emissions (GHG) to 1990 levels by the year 2000.[3] In 1997, the Kyoto Protocol to the FCCC required developed nations (designated Annex I nations), to reduce their anthropogenic GHG emissions of six greenhouse gases (GHGs), expressed as $CO_{2e}$,[4] by at least 5 percent below 1990 levels by 2008–2012.[5] These reductions

[2] *See* U.N. Framework Convention on Climate Change, *opened for signature* May 9, 1992, 1771 U.N.T.S. 107 (entered into force Mar. 21, 1994), *available at* http://treaties.un.org/doc/publication/UNTS/Volume%201771/v1771.pdf.

[3] *Id.* at art. 4.

[4] Carbon dioxide equivalent is the amount of carbon dioxide by weight emitted into the atmosphere that would produce the same estimated radiative forcing as a given weight of another radiatively active gas. Carbon dioxide equivalents are computed by multiplying the weight of the gas being measured (for example, methane) by its estimated global warming potential (which is 21 for methane). Defined at *Glossary of Climate Change*

were to be implemented using domestic laws of the ratifying nations.[6] Developing nations (designated Non-Annex I nations) had no obligations to reduce emissions during the covered period, which ended in 2012. On February 16, 2005, the Kyoto Protocol entered into force after Russia became the 127th nation to ratify the Protocol.[7] However, the U.S. never ratified the Protocol.

Each year, the parties to the Protocol meet to deal with the many unresolved issues left for future negotiations.[8] For the past several years, the annual meetings have been concerned with the need to draft a replacement protocol because the compliance targets expire in 2012.[9] However, the effort is not going well.[10] The sixteenth Conference of the Parties to the FCCC was held in Cancun, Mexico in December 2010, which had some success but failed to achieve the progress needed to slow the increase in GHG atmospheric concentrations.[11] The seventeenth Conference of the Parties in Durban, South Africa, which ended December 11, 2011, resulted in little progress. The parties agreed to develop a protocol, or another legal instrument with legal force, by 2015 that can be implemented beginning in 2020 and also agreed to temporarily extend the Kyoto Protocol.[12] However, the developed nations and the developing nations are so divided in their views that a binding agreement to reduce emissions is unlikely to be produced anytime in the foreseeable future.[13]

From 1990 to 2009, the developed nations subject to Kyoto Protocol targets decreased their $CO_2$ emissions by 14.7 percent, but the U.S. increased emissions by

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*Terms*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/climatechange/glossary.html (last visited Jan. 13, 2012).

[5] Kyoto Protocol to the U.N. Framework Convention on Climate Change, arts. 3–5, *opened for signature* Mar. 16, 1998, 1997, 2303 U.N.T.S. 162 (entered into force Feb. 16, 2005) [hereinafter Kyoto Protocol] (the GHGs are $CO_2$, $CH_4$, $N_2O$, HFCs, PFCs and $SF_6$), *available at* http://treaties.un.org/doc/publication/UNTS/Volume%202303/v2303.pdf.

[6] *Id*. at arts. 4–7, 12 & 16–18.

[7] JOHN R. JUSTUS & SUSAN R. FLETCHER, CONG. RESEARCH SERV., IB89005, GLOBAL CLIMATE CHANGE, SUMMARY (2004); *see also* Kyoto Protocol, *supra* note 5.

[8] *See generally* Arnold W. Reitze, Jr., *Federal Control of Greenhouse Gas Emissions*, 40 ENVTL. L. 1261, 1263 (2010).

[9] Eric J. Lyman & Dean Scott, *Progress Possible at Durban, Delegates Say; U.N. Officials Downplay Summit Expectations*, 42 ENV'T REP. (BNA) 2664 (Nov. 25, 2011).

[10] For a detailed analysis of COP-16, see PEW CENTER ON GLOBAL CLIMATE CHANGE, SIXTEENTH SESSION OF THE CONFERENCE OF THE PARTIES TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE AND SIXTH SESSION OF THE MEETING OF THE PARTIES TO THE KYOTO PROTOCOL (2010), http://www.pewclimate.org/docUploads/cancun-climate-conference-cop16-summary.pdf.

[11] *See, e.g.*, Erika Rosenthal, *Cancun Conference Results in Critical Steps Forward*, UNEARTHED: THE EARTHJUSTICE BLOG (Dec. 15, 2010, 6:46 PM), http://earthjustice.org/blog/2010-december/cancun-conference-results-critical-steps-forward.

[12] Doug Obey, *Negotiators in Durban Buy Time for Future Climate Change Deal*, CLEAN AIR REP., Dec. 22, 2011, at 29.

[13] Dean Scott, *Divisions Remain over Kyoto Extension in Upcoming U.N. Climate Talks, Stern Says*, 42 ENV'T REP. (BNA) 2665 (Nov. 25, 2011).

6.7 percent and Canada increased emissions by 20.4 percent.[14] Emissions from emerging economies such as China and India more than doubled from 1990 to 2008.[15] In 2008 an estimated 26 percent of the global $CO_2$ emissions were attributable to international trade activities as developed nations became increasingly reliant on developing nations for manufactured goods.[16] In 2010, atmospheric levels of $CO_2$, nitrous oxide, and methane all increased over the record levels registered in 2009, with $CO_2$ levels reaching 386.8 parts per million.[17] The Kyoto Protocol has failed to arrest the growth of GHG emissions, and unless a catastrophic event occurs, international law is unlikely to result in GHG restrictions being imposed on domestic industries. Meanwhile, the National Oceanic and Atmospheric Administration (NOAA) reported that 2010 was the warmest or second warmest year on record, depending on the analytical method used; 2011 was cooler but was well above the thirty-year average.[18]

Most efforts to control GHGs in the U.S. focus on $CO_2$, which was responsible for 82.83 percent of U.S. GHG emissions in 2009.[19] Over 94 percent of the $CO_2$ is emitted from fossil fuel combustion,[20] and electric power generation is responsible for more than 41 percent of $CO_2$ emissions from fossil fuels.[21] For this reason, most observers believe the electric power industry will eventually face new and more stringent GHG emission control requirements. Moreover, emissions of methane, the second most important GHG, are increasing because of the expansion of the natural gas industry, which means the life-cycle climate change impacts

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[14] INT'L ENERGY AGENCY, IEA STATISTICS: $CO_2$ EMISSIONS FROM FUEL COMBUSTION HIGHLIGHTS 13 tbl.1 (2011), *available at* http://www.iea.org/co2highlights/co2highlights.pdf.

[15] *Fossil Fuel Carbon Dioxide Emissions Up by 29 Percent Since 2000*, SCIENCE DAILY (Nov. 17, 2009), http://www.sciencedaily.com/releases/2009/11/091117133504.htm.

[16] Dean Scott, *Developed Nations Stabilize Emissions by Importing More Goods, Study Says*, 42 ENV'T REP. (BNA) 928 (Apr. 29, 2011).

[17] Dan Pruzin, *Accelerated Rise in Greenhouse Gases in 2010 Reported by U.N. Weather Agency*, 42 ENV'T REP. (BNA) 2629 (Nov. 25, 2011).

[18] Leora Falk, *NOAA Says 2010 Among Warmest on Record; Pew Links Climate, Harsh Weather Frequency*, 42 ENV'T REP. (BNA) 1449 (July 1, 2011); Alan Kovski, *NOAA Report Describes La Nina Impacts as Dominant Complication for 2011 Climate*, 43 ENV'T REP. (BNA) 1811 (July 13, 2012).

[19] STACY C. DAVIS ET AL., OAK RIDGE NAT'L LABORATORY, TRANSPORTATION ENERGY DATA BOOK 11-4, tbl.11.3 (30th ed. 2011), *available at* http://cta.ornl.gov/data/tedb30/Edition30_Full_Doc.pdf (calculated from data).

[20] U.S. EPA, 430-R-11-005, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2010 ES-4 tbl.ES-2 (2012), *available at* http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2012-Main-Text.pdf (last visited June 25, 2012) (calculated from data).

[21] *Id*. This is also more than 39 percent of total $CO_2$ emissions. *Id.*

from producing natural gas to replace coal could nullify the environmental benefits of gas-fired electric generation.[22]

With the failure of the GHG control efforts at the international level, advocates of GHG controls turned to Congress for assistance in creating domestic legislation to control GHG emissions. To date, only one bill has passed in the House of Representatives, and no bill has survived in the Senate. H.R.2454, the Clean Energy and Security Act of 2009 (Waxman-Markey), passed in the House on June 26, 2009. It was a comprehensive bill, but was known primarily for its cap-and-trade program. It died in the Senate because of its cost, its perceived adverse economic impact, and its income redistribution features.[23] At this time, cap-and-trade federal legislation appears to have no possibility for enactment.[24] Instead, most Republicans and some Democrats seek to limit or delay the United States Environmental Protection Agency's (EPA's) exercise of authority over GHGs.[25]

On April 7, 2011, the House approved H.R.910 to block EPA's rules to limit GHGs from power plants and other stationary sources.[26] No Republicans voted against the bill and nineteen Democrats supported it, including Jim Matheson (D-Ut.).[27] In the Senate, Minority Leader Mitch McConnell (R-Ky.) offered an amendment to S.493 that would block all current and future EPA regulation of GHGs. It received fifty of the sixty votes needed to pass, with four Democrats voting for the legislation.[28] Senator James Inhofe (R-Ok.) introduced S.482, legislation similar to the McConnell amendment.[29] On April 14, 2011, Congress approved a plan for government funding that cut EPA's budget by 16 percent or $1.6 billion, which significantly reduced federal energy efficiency and renewable energy programs.[30] On July 12, 2011, the House Appropriations Committee

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[22] *House Oversight Panel Chairman Issa Probes EPA's Methane Measures*, CLEAN AIR REP., Dec. 22, 2011, at 25.

[23] *See generally* Tom Mounteer, *Obama Administration Efforts to Control Stationary Source Greenhouse Gas Emissions Through Rulemaking*, 41 ENVTL. L. REP. (Envtl. Law Inst.) 11,127, 11,128–29 (Dec. 2011).

[24] *See generally* Arnold W. Reitze, Jr., *Electric Power in a Carbon Constrained World*, 34 WM. & MARY ENVTL. L. & POL'Y REV. 821, 910 (2010).

[25] *See, e.g.*, S. 228, 112th Cong. § 4 (2011) (Sen. Barrasso R-Wyo.) (which would block regulation of GHGs under any existing law); S. Amdt. 244 to S. 493, 112th Cong. (2011) (Sen. McConnell R-Ky.) & S. 482, 112th Cong. (2011) (Sen. Inhofe R-Okla.) (which would strip EPA of GHG authority); H.R. 910, 112th Cong. (2011) (Rep. Upton R-Mich.) (which would block EPA rules to limit GHG emissions).

[26] Dean Scott, *House Passes Bill to Scrap EPA Authority; Measure Gets Support from 19 Democrats*, 42 ENV'T REP. (BNA) 736 (Apr. 8, 2011).

[27] *Id*.

[28] Ari Natter, *Senate Rejects Amendments Blocking EPA Climate Authority; Critics Vow Retry*, 42 ENV'T REP. (BNA) 737 (Apr. 8, 2011).

[29] Dean Scott, *Battles Ahead on EPA Climate Authority as Agency "Skirts the Law," Barrasso Says*, 42 ENV'T REP. (BNA) 1048 (May 13, 2011).

[30] Amena H. Saiyid, *Congress Approves FY 2011 Spending Bill That Would Cut EPA Budget by $1.6 Billion*, 42 ENV'T REP. (BNA) 815 (Apr. 15, 2011).

amended a fiscal year 2012 appropriations bill to prevent EPA from regulating mobile sources of GHGs and to cut EPA's funding by 18 percent from current spending.[31] These bills are only a few of the many legislative efforts by Republicans, with the support of some Democrats, to prevent the federal government from regulating GHGs.[32] In addition, conservative members of Congress have targeted environmental laws as the scapegoat for failed policies of both political parties that contributed to the nation's economic woes. On February 13, 2012, President Obama proposed a fiscal year 2013 budget for EPA that would be a $105 million decrease from FY2012, with most of the decrease coming from the Agency's waste water and drinking water funds, but the climate change research program would receive an increase in its budget.[33] If Republicans and Democrats cannot agree on deficit control measures, the Budget Control Act requires mandatory reductions in discretionary programs, which will result in additional steep cuts to EPA's budget.[34]

## II. EPA'S REGULATION OF GHGS.

With efforts to enact new legislation to deal with GHG emissions going nowhere, EPA is trying to use its existing authority to regulate GHG emissions. EPA's efforts involve two parallel tracks. The Agency is seeking to regulate GHGs using the Clean Air Act (CAA), and it is working to impose more stringent environmental standards on the conventional pollutants emitted by fossil-fuel electric power plants. This second approach is becoming the most important control effort. The regulatory climate is discouraging investment in new or modified coal-burning power plants while encouraging the closing of old plants that have high emissions of conventional pollutants.

In 2007, the U.S. Supreme Court in *Massachusetts v. EPA*, a case involving motor vehicle emissions, ruled that GHGs were pollutants[35] based on the definition found in the CAA.[36] Although the Court's decision created a challenging regulatory problem for EPA, an argument in support of the decision is that the U.S. has the wealth to address climate change issues, and given the Nation's per capita use of energy, U.S. leadership is needed if the international community is to respond affirmatively to work to stabilize atmospheric $CO_2$.

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[31] Amena H. Saiyid, *House Panel Moves to Strip EPA Authority over Greenhouse Gases, Other Pollutants*, 42 ENV'T REP. (BNA) 1593 (July 15, 2011).

[32] Heather M. Rothman & Jessica Coomes, *House Republican Agenda Includes Effort to Block EPA Air Pollution, Climate Rules*, 42 ENV'T REP. (BNA) 2001 (Sept. 9, 2011).

[33] Patrick Ambrosio, *Budget Request Has Increases for States but Reduces Water Infrastructure Funds*, 43 ENV'T REP. (BNA) 413 (Feb. 17, 2012).

[34] Aaron Lovell, *Activists Brace for EPA Budget Cuts as "Supercommittee" Fails*, CLEAN AIR REP., Nov. 24, 2011, at 37.

[35] Massachusetts v. EPA, 549 U.S. 497, 532 (2007).

[36] Clean Air Act § 302(g), 42 U.S.C. § 7602(g) (2006).

EPA originally did not want the responsibility for regulating GHGs because there is no cost-effective pollution control technology to control $CO_2$.[37] Moreover, nothing the U.S. does will effectively control the increase in ambient concentrations of $CO_2$ because developing nations have become the major source of these emissions. It is projected that global $CO_2$ emissions will increase 43 percent from 2008 to 2035 with about half the growth in energy use occurring in China and India.[38] With U.S. per capita GHG emissions more than six times that of China in 2000 and more than twelve times that of India, these developing countries are unlikely to sacrifice their economic growth in order to reduce GHG emissions.[39] In addition, the world's population is now over 7 billion and growing by about 77 million a year.[40] Population growth and economic growth is the engine driving GHG emissions.[41]

The Massachusetts case held GHGs were pollutants under the CAA. To regulate motor vehicle emissions, three additional requirements had to be met: 1) a GHG must endanger public health or welfare; 2) appropriate cost-effective control technology must exist; and 3) adequate time to comply must be provided.[42] EPA made its endangerment finding on December 15, 2009.[43] EPA promulgated its light-duty vehicle rule on May 7, 2010, aimed at reducing $CO_2$ through mandated fuel efficiency requirements.[44] This regulation made $CO_2$ a regulated pollutant

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[37] *See generally* Arnold W. Reitze, Jr., *Controlling Greenhouse Gas Emissions from Mobile Sources—Massachusetts v. EPA*, 37 ENVTL. L. REP. (Envtl. Law Inst.) 10,535 (2007).

[38] Lynn Garner, *EIA: Energy-Related Global Carbon Emissions to Rise 43 Percent by 2035 from 2008 Level*, 42 ENV'T REP. (BNA) 2129 (Sept. 23, 2011).

[39] KEVIN A. BAUMERT ET AL., WORLD RESOURCES INST., NAVIGATING THE NUMBERS: GREENHOUSE GAS DATA AND INTERNATIONAL CLIMATE POLICY 22 fig.4.1 (2005), *available at* http://pdf.wri.org/navigating_numbers_chapter4.pdf.

[40] *World POPClock Projection*, U.S. CENSUS BUREAU, http://www.census.gov/population/popclockworld.html (last visited Jan. 4, 2012).

[41] For example, U.S. population in 1990 was 249,438,712. *Historical U.S. Population Growth*, NEGATIVE POPULATION GROWTH, U.S. CENSUS BUREAU, http://www.npg.org/facts/us_historical_pops.htm (last visited Jan. 4, 2012). The population on January 5, 2012 was estimated at 312,801,791. *U.S. PopClock Projection*, U.S. CENSUS BUREAU, http://www.census.gov/population/www/popclockus.html (last visited Jan. 4, 2012). This is a 25 percent increase. Further, the net electricity generation in the U.S. increased from 3,037.8 billion KWhr in 1990 to 4,120.0 KWhr in 2010. *Total Energy: Annual Energy Review* tbl.8.2a, U.S. ENERGY INFO. ADMIN. (Oct. 19, 2011), http://205.254.135.7/totalenergy/data/annual/showtext.cfm?t=ptb0802a. This is an increase of 35.62 percent. Thus, assuming consumption per capita has not changed, 71 percent of the increased demand for electricity in the U.S. may be attributed purely to population increase.

[42] Clean Air Act § 202(a)(1)–(2), 42 U.S.C. § 7521(a)(1)–(2) (2006).

[43] Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) (to be codified at 40 C.F.R. ch. I).

[44] Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 75 Fed. Reg. 25,324 (May 7, 2010) (to be codified at 40 C.F.R.

under the CAA, which triggers the applicability of many provisions of the CAA that apply to stationary sources, including coal-fired electric power plants, which are the most important stationary source of these emissions. On June 26, 2012, the D.C. Circuit upheld EPA's endangerment finding and its GHG vehicle regulations.[45]

### *A. GHG Reporting*

EPA promulgated its regulation for mandatory reporting of GHG emissions on October 30, 2009,[46] based on its authority under CAA §§ 114 and 208.[47] The regulation includes monitoring, recordkeeping, verification and reporting requirements for emissions of GHGs. EPA has a mandatory reporting program based on CAA § 412 that is primarily applicable to twenty-five megawatt or larger electric power plants.[48] The 2009 rule expanded the reporting requirements to an estimated 13,000 facilities that release an estimated 85–90 percent of U.S. GHGs.[49] The rule became effective on December 29, 2009.[50] It applies to fossil fuel suppliers, industrial gas suppliers, and direct GHG emitters if they emit 25,000 metric tons of GHGs or more a year expressed as $CO_{2e}$.[51] Facilities in identified categories must report even if emissions are below 25,000 tons of $CO_{2e}$.[52] This includes electric power plants subject to the Acid Rain Program, including those owned by the federal and municipal governments, and those located in Indian

pts. 85, 86 & 600, and 49 C.F.R. pts. 531, 533 & 536–38); s*ee generally* Arnold W. Reitze, Jr., *Controlling Greenhouse Gases from Highway Vehicles*, 31 UTAH ENVTL. L. REV. 309 (2011).

[45] Coalition for Responsible Regulation, Inc. v. EPA, No. 09-1322 (D.C. Cir. June 26, 2012).

[46] Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,260 (Oct. 30, 2009) (to be codified at 40 C.F.R. pts. 86, 87, 89, 90, 94, 98, 1033, 1039, 1042, 1045, 1048, 1051, 1054 & 1065).

[47] 42 U.S.C. §§ 7414, 7542 (2006).

[48] Clean Air Act § 412, 42 U.S.C. § 7651K (2006). EPA has developed a comprehensive inventory of environmental data on electric power systems based on information supplied to EPA, the Energy Information Administration (EIA), and the Federal Energy Regulatory Commission (FERC); this comprehensive inventory is known as the Emissions & Generation Resource Integrated Database (eGRID). *See Clean Energy: eGRID FAQ*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/cleanenergy/ energy-resources/egrid/faq.html (last updated Oct. 24, 2011).

[49] EPA, FACT SHEET: MANDATORY REPORTING OF GREENHOUSE GASES (40 CFR PART 98) (2011), *available at* http://www.epa.gov/climatechange/emissions/downloads09/ FactSheet.pdf (EPA estimates that there are 10,152 covered facilities.); Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. at 56,363 tbl.VII-1.

[50] Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. at 56,260.

[51] *Id*. at 56,264.

[52] *Id*. at 56,267.

Country.[53] About 1,108 electric generation facilities are subject to the reporting requirements.[54] The GHG rule is found at 40 C.F.R. Part 98. Subpart A includes the general provisions. Subpart C deals with general stationary combustion sources (which include electricity generators). Finally, Subpart D deals with electric generation sources that are subject to the Acid Rain Program, as well as other electricity-generating sources that are required to monitor and report $CO_2$ mass emissions year round based on 40 C.F.R. Part 75.[55] The federally required reports must be submitted electronically using EPA's e-GGRT tool, which is accessed through EPA's web page.[56] Preliminary data is becoming available. Utah for example has sixty-one large emitters and 83 percent of the GHGs are emitted by fourteen power plants.[57] Two of these plants, the Intermountain Power Plant near Delta, UT and the Hunter facility in Castle Dale, UT, are among the top 100 GHG emitters in the nation.[58]

Since EPA promulgated its GHG reporting rule in October 2009, it has released a steady stream of proposed and final regulations interpreting and clarifying the rule. On April 12, 2010, EPA proposed reporting requirements for electric cogeneration units.[59] On August 11, 2010, EPA promulgated a proposed rule that makes extensive technical changes and corrections to the GHG reporting rule.[60] Additional technical changes were made on December 17, 2010.[61] On October 6, 2010, the White House Council on Environmental Quality issued guidance for federal agencies and departments to meet their GHG reporting requirements covered by Executive Order 13,514.[62] On October 28, 2010, EPA

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[53] *Id*. at 56,260 tbl.1.

[54] *See id*. at 56,363 tbl.VII-1. On July 16, 2010, the Council for Environmental Quality released draft guidance for GHG emissions reporting for federal agency operations. *See* Notice of Availability, 75 Fed. Reg. 41,452 (July 16, 2010).

[55] 40 C.F.R. § 98.40 (2012).

[56] Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. at 56,268. The e-GGRT system became operational on Sept. 30, 2011 for 2010 reports. *See* EPA, *supra* note 49, at 1.

[57] Judy Fahys, *Inventory: Power Plants Biggest Source of Greenhouse Gases*, SALT LAKE TRIB., Jan. 13, 2012, at A1, *available at* http://www.sltrib.com/sltrib/politics/53288830-90/climate-emissions-facilities-gas.html.csp?page=1.

[58] *Id*.

[59] Mandatory Reporting of Greenhouse Gases, 75 Fed. Reg. 18,455 (proposed rule amendment Apr. 12, 2010) (to be codified at 40 C.F.R. pt. 98).

[60] Mandatory Reporting of Greenhouse Gases, 75 Fed. Reg. 48,744 (proposed Aug. 11, 2010) (to be codified at 40 C.F.R. pt. 98).

[61] *See* Mandatory Reporting of Greenhouse Gases, 75 Fed. Reg. 79,092 (Dec. 17, 2010) (to be codified at 40 C.F.R. pt. 98).

[62] *Federal Sustainability Initiatives: Guidance for Federal Greenhouse Gas Accounting and Inventories*, COUNCIL ON ENVTL. QUALITY, http://www.whitehouse.gov/administration/eop/ceq/sustainability/fed-ghg (last visited Mar. 1, 2012).

revised parts of the GHG reporting rule to correct technical and editorial errors.[63] On December 1, 2010, GHG reporting requirements were extended to include injection and geological sequestration of $CO_2$.[64]

On March 18, 2011, EPA extended the date for GHG reporting for the year 2010 to September 30, 2011 for twenty-nine industrial categories because of delays in the development of the Agency's electronic reporting software.[65] EPA also delayed the date for first-reporting for twelve additional categories until 2012[66] and pushed back the date for reporting for coal-fired power plants to 2012.[67] Other reporting has been delayed until 2014.[68] On November 29, 2011, EPA allowed additional time for reporting to several industry sectors.[69]

Data submitted under a claim that it is CBI is protected under the provisions of 40 C.F.R., Part 2, Subpart B. However, CAA section 114(c) denies CBI treatment for emissions data. This has led to efforts by industry to obtain CBI treatment for the underlying inputs to the 40 C.F.R. Part 98 emissions equations. On May 26, 2011, EPA issued a final confidentiality determination for data obtained from thirty-four additional industrial sectors subject to the GHG reporting rule.[70] On August 25, 2011, EPA postponed implementing certain aspects of the GHG reporting rule because of concern for the trade secret issues.[71] On January 10, 2012, EPA proposed another CBI-proposed rule that affects reporting of GHGs by certain Part 98–industry categories including electric bulk power transmission and

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[63] *See* Mandatory Reporting of Greenhouse Gases, 75 Fed. Reg. 66,434 (Oct. 28, 2010) (to be codified at 40 C.F.R. pts. 86 & 98) (technical corrections clarifying other amendments to provisions of the greenhouse gas reporting rule).

[64] Mandatory Reporting of Greenhouse Gases: Injection and Geologic Sequestration of Carbon Dioxide, 75 Fed. Reg. 75,060, 75,062 (Dec. 1, 2010) (to be codified at 40 C.F.R. pts. 72, 78 & 98).

[65] Regulation Extending the Reporting Deadline for Year 2010 Data Elements Required Under the Mandatory Reporting of Greenhouse Gases Rule, 76 Fed. Reg. 14,812 (Mar. 18, 2011) (to be codified at 40 C.F.R. pt. 98).

[66] EPA, *supra* note 49.

[67] *See, e.g.*, Mandatory Reporting of Greenhouse Gases: Technical Revisions to the Electronics Manufacturing and the Petroleum and Natural Gas Systems Categories of the Greenhouse Gas Reporting Rule, 76 Fed. Reg. 56,010, 56,020 (proposed Sept. 9, 2011) (to be codified at 40 C.F.R. pt. 98).

[68] *EPA Rejects Activists' Call to Scrap Confidential GHG Data Reporting Delay*, CLEAN AIR REP., Sept. 1, 2011, at 22.

[69] *EPA Issues Rule to Allow More Time for Greenhouse Gas Reporting*, CLEAN AIR REP., Dec. 8, 2011, at 23.

[70] *See, e.g.*, Confidentiality Determinations for Data Required Under the Mandatory Greenhouse Gas Reporting Rule and Amendments to Special Rules Governing Certain Information Obtained Under the Clean Air Act, 76 Fed. Reg. 30,782 (May 26, 2011) (to be codified at 40 C.F.R. pt. 2).

[71] Change to the Reporting Date for Certain Data Elements Required Under the Mandatory Reporting of Greenhouse Gases Rule, 76 Fed. Reg. 53,057, 53,060–61 (Aug. 25, 2011) (to be codified at 40 C.F.R. pt. 98).

control facilities.[72] On March 12, 2012, the Council on Environmental Quality issued draft revisions to guidance for federal agencies concerning the reporting of GHG emissions.[73] The large number of regulatory changes in the CBI requirements for the GHG reporting program makes it important to monitor EPA's website.[74]

### *B. $CO_2$ as a Criteria Pollutant.*

CAA § 108(a) directs the Administrator of EPA to list air pollutants "which may reasonably be anticipated to endanger public health or welfare."[75]After listing a pollutant, the Administrator must issue an air criteria document within twelve months and simultaneously publish a proposed primary National Ambient Air Quality Standard (NAAQS) to protect public health and a secondary NAAQS to protect public welfare.[76]

If EPA adopted a NAAQS to control $CO_2$ with a numerical value lower than the present $CO_2$ atmospheric concentration, the entire country would be in nonattainment. A costly program to control $CO_2$ emissions would need to be developed. But the atmospheric concentration of $CO_2$ is nearly uniform worldwide and no U.S. program could achieve the standard because emissions from developing nations, especially China, are growing rapidly.[77]

If a NAAQS value less stringent than the present $CO_2$ atmospheric concentration was selected, the entire nation would be in attainment, and significant effort to reduce $CO_2$ would not be needed. Major sources that were new or modified would be required to participate in an expensive and time-consuming Prevention of Significant Deterioration (PSD) program with no realistic expectation that the atmospheric concentration of $CO_2$ would be reduced.

GHGs are not criteria pollutants at this time.[78] Therefore, no area can be in nonattainment, although sources in nonattainment areas for other criteria pollutants can expect to have GHG requirements imposed in CAA permits. It makes no sense to make GHGs criteria pollutants, although that does not necessarily preclude such

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[72] Proposed Confidentiality Determinations for Data Elements Under Mandatory Reporting of Greenhouse Gases Rule, 77 Fed. Reg. 1434, 1436 (proposed Jan. 10, 2012) (to be codified at 40 C.F.R. pt. 98).

[73] Avery Fellow, *White House Proposes Updated Guidance for Tracking Federal Agency Emissions*, 43 ENV'T REP. (BNA) 655 (Mar. 16, 2012).

[74] *Confidential Business Information*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/climatechange/emissions/CBI.html (last updated Apr. 25, 2012).

[75] 42 U.S.C. § 7408(a)(1)(A) (2012).

[76] Clean Air Act § 109(a)–(b) (2012), 42 U.S.C. § 7409(a)–(b) (2012).

[77] *See* Elisabeth Rosenthal, *China Increases Lead as Biggest Carbon Dioxide Emitter*, N.Y. TIMES, June 14, 2008, at A5, *available at* http://www.nytimes.com/2008/06/14/world/asia/14china.html.

[78] *See National Ambient Air Quality Standards (NAAQS)*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/air/criteria.html (last updated May 1, 2012).

an action. But, at this time there is no credible effort to create a GHG NAAQS for any GHG.

### *C. New Source Performance Standards*

The CAA § 111 provides for emission standards to be established for industrial categories based on the capabilities of existing technology.[79] There is no emission threshold for triggering the applicability of New Source Performance Standards (NSPS) therefore, almost all changes to existing facilities potentially can trigger NSPS applicability, although the absence of cost-effective $CO_2$ emission control technology hampers the use of this section. Under section 111, EPA may impose standards of performance, but in doing so has to consider costs, non-air quality health and environmental impacts, and energy requirements.[80]

The CAA directs the Administrator to review and, if appropriate, revise NSPS at least every eight years.[81] Environmentalists seek to have GHG requirements included in revised NSPS, but industry advocates, and their Congressional supporters, resist these efforts. Now that $CO_2$ is a regulated pollutant, it will be difficult for EPA to avoid adding $CO_2$ requirements for NSPS that are scheduled for revision.

On April 18, 2012, EPA released NSPS and national standards for hazardous air pollutants for the oil and natural gas sector.[82] This final rule is applicable to the production phase of the natural gas and oil industry and the related storage and processing. It is aimed primarily at reducing by nearly 95 percent the volatile organic compounds (VOCs) released from natural gas wells that are hydraulically fractured. The production and processing of natural gas is responsible for nearly 40 percent of U.S. methane emissions, which are GHGs that are twenty times as potent as $CO_2$.[83] Methane emission reductions are expected to be a co-benefit of reducing VOC emissions from new and modified wells. The rule, however, does not regulate $CO_2$ emissions.

On September 9, 2010, EPA promulgated NSPS and National Emission Standards for Hazardous Air Pollutants (NESHAP) for the Portland Cement Industry, without including GHG standards in the NSPS.[84] The regulations were

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[79] Clean Air Act § 111, 42 U.S.C. § 7411 (2006).

[80] Clean Air Act § 111(a), 42 U.S.C. § 7411(a).

[81] Clean Air Act § 111(b)(1)(B), 42 U.S.C. § 7411(b)(1)(B).

[82] Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, 77 Fed. Reg. 49489 (Aug. 16, 2012).

[83] U.S. ENVTL. PROTECTION AGENCY, OVERVIEW OF FINAL AMENDMENTS TO AIR REGULATIONS FOR THE OIL AND NATURAL GAS INDUSTRY, FACT SHEET, http://www.epa.gov/airquality/oilandgas/pdfs/20120417fs.pdf.

[84] *See* National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry & Standards of Performance for Portland Cement Plants, 75 Fed. Reg. 54,970 (Sept. 9, 2010) (to be codified at 40 C.F.R. pts. 60 & 63).

challenged in the D.C. Circuit by industry and environmentalists.[85] The court upheld the NSPS, but remanded the NESHAP rule.[86] The court held that EPA's decision to collect additional data before it proposes GHG NSPS means that there is no final agency action to be reviewed.[87]

In May 2011, EPA announced it was releasing a final rule amending the NSPS for stationary diesel engines, but the rule does not include GHG emission limits.[88] On November 17, 2011, environmental groups sued EPA seeking to force it to establish NSPS for methane and other pollutants that are emitted from coalmines.[89] On October 14, 2011, EPA proposed NSPS review for Nitric Acid Plants.[90] EPA discusses the possibility of regulating the GHG nitrous oxide ($N_2O$), but is not proposing standards at this time. The Agency, however, is encouraging control technologies for $NO_x$ that also control $N_2O$.[91]

Various states and environmental organizations filed petitions challenging EPA's failure to establish GHG limits in the NSPS for fossil fuel electric power plants.[92] On December 30, 2010, EPA announced a proposed settlement agreement establishing a schedule that would require NSPS for fossil fuel power plants to be proposed by July 26, 2011 and a final rule to be promulgated by May 26, 2012.[93] In the first two permits issued October 18, 2011, by Region IX and on November 10, 2011, by Region VI, EPA imposed limits based on pounds per megawatt hour for $CO_2$ and $CO_2$ limit based on BTU heat input per kilowatt hour.[94]

On March 27, 2012, EPA announced its long-awaited proposed NSPS to control GHG emissions from electric generating units (EGUs).[95] The 257-page

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[85] *See* Portland Cement Ass'n v. EPA, 665 F.3d 177 (D.C. Cir. 2011).

[86] *Id*. at 194.

[87] *Id*. at 193–94.

[88] *See* Standards of Performance for Stationary Compression Ignition and Spark Ignition Internal Combustion Engines, 76 Fed. Reg. 37,954 (June 28, 2011) (to be codified at 40 C.F.R. pts. 60, 1039, 1042, 1065 & 1068).

[89] Jessica Coomes, *Environmental Groups Sue to Force EPA to Set Emissions Standards for Coal Mines*, 42 ENV'T REP. (BNA) 2623 (Nov. 25, 2011) (citing WildEarth Guardians v. EPA, No. 1:11-cv-02064 (D.D.C. Nov. 17, 2011) (settlement signed by both parties)).

[90] *See* New Source Performance Standards Review for Nitric Acid Plants, 76 Fed. Reg. 63,878 (proposed Oct. 14, 2011) (to be codified at 40 C.F.R. pt. 60).

[91] *Id*. at 63,880.

[92] *See* Petition for Review, New York v. EPA, No. 06-1148 (D.C. Cir. Apr. 27, 2006) (including California, Connecticut, Maine, New Mexico, Massachusetts, Oregon, Rhode Island, Wisconsin, D.C., and New York).

[93] Proposed Settlement Agreement for Clean Air Act Citizen Suit, 75 Fed. Reg. 82,392 (EPA notice Dec. 30, 2010).

[94] Dawn Reeves, *First EPA-issued GHG Permits Impose Tighter Emission "Averaging" Times*, CLEAN AIR REP., Dec. 22, 2011, at 5.

[95] *See* EPA, EPA-HQ-OAR-2011-0660, STANDARDS OF PERFORMANCE OF GREENHOUSE GAS EMISSIONS FOR NEW STATIONARY SOURCES: ELECTRIC UTILITY GENERATING UNITS (Mar. 27, 2012) (pre-publication notice to be published in the Fed. Reg.).

proposal limits the $CO_2$ emissions from new electric power plants greater than 25-megawatt electric (MWe) emissions to 1000 pounds of per megawatt hour (MWhr) of electricity output. The standard is based on the emissions produced by a natural gas combined cycle (NGCC) facility. EPA does not expect any coal-fired EGU will be able to meet this standard without using carbon capture and storage (CCS) for approximately 50 percent of its $CO_2$ emissions averaged over thirty years. The proposed regulation will not apply to existing EGUs whose emissions increase due to the installation of pollution controls for conventional pollutants or to sources with complete construction permits at the time of the proposal if they commence construction within twelve months.

A MWhr is equal to 3.413 million BTU of energy.[96] One hundred pounds of a mid-range Ohio coal has a BTU value of 1.482 million BTU;[97] it contains 82.2 pounds of carbon[98] that will react with atmosphere oxygen to produce 301 pounds of $CO_2$.[99] Therefore 332 pounds of coal is the maximum amount of coal that can be burned to produce one MWhr of electricity and remain within EPA's $CO_2$ limit. This amount of coal has 4.92 million BTU. To obtain a MWhr of electricity and remain within EPA's NSPS mandate, an electric power plant will need to have a thermal efficiency of 69.37 percent.[100] This is well above the efficiency of even the most efficient coal-fired power plants, which means new coal-fired plants cannot be built unless they sequester some of the carbon.

Assuming natural gas is approximately 90 percent $CH_4$ and 5 percent $C_2H_6$,[101] 100 pounds of gaseous fuel contains 71.5 pounds of carbon.[102] This will, after combustion, produce about 262 pounds of $CO_2$.[103] Methane, the principal component of natural gas, has a BTU value that ranges from 23,879 to 21,520 per pound.[104] A MWhr is equivalent to 3.413 million BTU.[105] Using a mid-range value of 22,700 BTU means that a MWhr is the energy equivalent of 150 pounds of natural gas, which will produce 372 pounds of $CO_2$. A facility could combust 403 pounds of natural gas per MWhr and stay within EPA's limit for $CO_2$. Thus a natural gas facility would need a thermal efficiency of about 37 percent to meet the proposed rule's requirement.

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[96] BABCOCK & WILCOX CO., STEAM, ITS GENERATION AND USE app. 10-A10 (37th ed. 1960), *available at* http://www.gutenberg.org/ebooks/22657.

[97] *Id*. at 2-9 tbl.11.

[98] *Id*. at 2-9.

[99] Carbon has an atomic weight of 12.01. Oxygen has an atomic weight of 15.9994; therefore, the amount of carbon in $CO_2$ is approximately12/44.

[100] 3.413/4.92.

[101] *See* BABCOCK & WILCOX CO, *supra* note 96, at 4-8. (Natural gas from different localities will have different concentrations of $CH_4$, some over 90 percent, some significantly less than 90 percent). *Id.* at Table 50.

[102] 90 x 12/16 + 5 x 24/30.

[103] 71.5 x 44/12.

[104] BABCOCK & WILCOX CO, *supra* note 96, at 4-2 tbl.1.

[105] *Id.* at app. 10-A10

An electric power plant will be able to meet the proposed emission standard using natural gas combined cycle (NGCC) technology. Such a facility uses the exhaust gas temperature from the combustion turbine of approximately 1000 degrees F to produce high-temperature steam that drives a separate turbine. Combustion turbines have peak performance efficiencies in the mid-30 percent range, and steam turbines can be used to produce electricity at an efficiency in the upper 30 percent range. The combined efficiency of a combined cycle plant using natural gas is approximately 59 percent.[106]

This proposed regulation can be expected to be the target of both the coal and the fossil-fueled electric power industry. Environmental interests can be expected to seek more control of existing plants that are modified. Thus, the battle will continue.

### *D. Hazardous Air Pollutants*

The CAA limits emissions of hazardous air pollutants (HAPs) from new and existing sources pursuant to CAA § 112. It requires the maximum degree of reductions that are achievable after considering costs, non–air quality health and environmental impacts, and energy requirements using technology-based controls known as "MACT" standards.[107] Section 112(b)(1) lists 189 hazardous pollutants to be regulated; $CO_2$ is not on the list.[108] EPA may add or remove substances from the list.[109]

GHGs do not directly injure human health at the concentrations found in the ambient air.[110] Section 112(b)(2) requires the health effects to come from "inhalation or other routes of exposure" and then goes on to list effects such as carcinogenicity.[111] These health effects are all the result of direct exposure.[112] Thus, GHGs differ from the extensive list of chemicals that are required to be regulated by CAA section 112.[113] However, the Administrator is required to add a substance to the list if it may reasonably be anticipated to have adverse

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[106] This is based on 35 percent turbine efficiency plus 0.37 (efficiency of the steam cycle) times 0.65 (the percentage of heat remaining in the exhaust), which produces an overall efficiency of 59 percent.

[107] Clean Air Act § 112(d), 42 U.S.C. § 7412(d) (2006). Maximum Achievable Control Technology (MACT) standards for source categories are found in 40 C.F.R. § 63 (2006).

[108] 42 U.S.C. § 7412(b)(1) (2006).

[109] *Id.*

[110] E-mail from Thomas M. Sullivan, Chief Counsel for Advocacy, U.S. Small Bus. Admin., to Stephen L. Johnson, Adm'r, EPA, & Susan E. Dudley, Adm'r of the Office of Info. and Regulatory Affairs, U.S. Office of Mgmt. and Budget 4 (July 8, 2008), *available at* http://www.reginfo.gov/public/postreview/SBA_GHG_ANPR.pdf.

[111] *Id.*

[112] *See id.*

[113] Clean Air Act § 112(b), 42 U.S.C. § 7412(b) (2006).

environmental effects.[114] GHGs would appear to meet this test based on the statute's broad definition of adverse environmental effect.[115] The statute requires the maximum degree of reductions that is achievable after considering costs, non-air quality health and environmental impacts, and energy requirements using technology-based controls known as "MACT" standards.[116] The absence of technology-based controls that meet this test may explain why there does not appear to be any serious effort to add GHGs to the list of hazardous air pollutants. Nevertheless, EPA on December 15, 2009, found that GHGs threaten the public health and welfare and contribute to GHG air pollution, which threatens public health and welfare.[117] Whether this finding could be used to regulate $CO_2$ under section 112 and whether such an action could survive judicial review is unknown at this time.

If $CO_2$ is designated a HAP, CAA section 112's requirements would be triggered by the emission of 10 tons of $CO_2$ per year.[118] This threshold would be reached by burning about 1000 gallons of petroleum-based fuel and would make almost every home in the United States a major hazardous emissions stationary source. This would mean that an operating permit would be required for nearly every furnace in the country. It will also require that MACT standards applicable to industrial categories that emit $CO_2$ will be needed.

### *E. Construction Permits*

Prevention of Significant Deterioration (PSD) permits are required for major new or modified facilities.[119] Beginning January 2, 2011, such permits are required to include GHG requirements. To assist state and local permitting authorities, EPA on November 10, 2010, made available the PSD and Title V Permitting Guidance for Greenhouse Gases (Guidance), which was updated in March 2011 by a guidance that had a limited number of clarifying edits.[120] The Guidance provides that PSD and Title V requirements apply to GHG emissions. This includes compelling a major $CO_2$ source that is seeking a PSD permit to use the best available control technology (BACT). EPA does not prescribe GHG BACT requirements, but emphasizes the importance of BACT options that improve

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[114] Clean Air Act § 112(b)(3)(B), 42 U.S.C. § 7412(b)(3)(B) (2006).

[115] Clean Air Act § 112(a)(7), 42 U.S.C. § 7412(a)(7) (2006).

[116] Clean Air Act § 112(d), 42 U.S.C. § 7412(d) (2006).

[117] Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) (to be codified at 40 C.F.R. ch. I).

[118] Clean Air Act § 112(a)(1), 42 U.S.C. § 7412(a)(1) (2006).

[119] Clean Air Act § 165, 42 U.S.C. § 7475(2006).

[120] *See* EPA OFF. OF AIR QUALITY PLAN. & STANDARDS, EPA-457/B-11-001, PSD AND TITLE V PERMITTING GUIDANCE FOR GREENHOUSE GASES (2011) [hereinafter EPA'S PERMITTING GUIDANCE].

energy efficiency.[121] EPA expects permitting authorities to continue to use the five-step, top-down analysis for determining the applicable BACT technology.[122] EPA has produced "white papers" providing technical information useful for determining what is BACT. The papers cover seven industrial sectors including electric generating units.[123]

The threshold of 100/250 tons per year (tpy) of any pollutant that triggers the PSD program will be reached by millions of sources, rather than the 150,000 stationary sources presently subject to regulation.[124] EPA has been issuing about 280 permits a year. If GHG emissions trigger PSD requirements, EPA and the states may be required to handle permit applications from 41,000 new and modified facilities in 2010. These permits would need to be issued within eighteen months after receipt of a complete application.[125]

To control the number of permits that will need to be issued for GHG emission sources, EPA promulgated the "tailoring" rule on June 3, 2010.[126] The rule subjects GHG sources to the PSD permitting program if their emissions exceed specified GHG thresholds. The first step began on January 2, 2011, for major sources that are subject to the PSD permitting program because they are new or modified. They must comply with the PSD program if they have $CO_{2e}$ emissions of 75,000 tpy or more. Such sources will also need operating permits with GHG requirements, but no sources are subject to permitting requirements solely because of GHG emissions during the first step.

The second step began July 1, 2011 and runs until June 30, 2013. PSD permitting requirements will apply to new sources with GHG emissions of at least 100,000 tpy even if they do not exceed the PSD permit threshold for other pollutants. For existing sources, modification will trigger PSD requirements if they emit 75,000 tpy of GHGs, even if they do not significantly increase emissions of other pollutants.[127]

The third step involves another rulemaking to conclude no later than July 1, 2012.[128] On July 3, 2012, EPA released its step three rule saying, "at this time it is

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[121] *Id*. at 29. *See also* Steven D. Cook, *EPA Issues Guidance to States, Localities on Controls for Greenhouse Gas Sources*, 41 ENV'T REP. (BNA) 2504 (Nov. 12, 2010).

[122] EPA'S PERMITTING GUIDANCE, *supra* note 120, at 17.

[123] *See e.g.*, EPA OFF. OF AIR QUALITY PLAN. & STANDARDS, AVAILABLE AND EMERGING TECHNOLOGIES FOR REDUCING GREENHOUSE GAS EMISSIONS FROM COAL-FIRED ELECTRIC GENERATING UNITS (2010), *available at* http://www.epa.gov/nsr/ghgdocs/electricgeneration.pdf.

[124] Steven D. Cook, *Carbon Dioxide Regulation Under Air Act Would Affect 1.2 Million Sources, Group Says*, 39 ENV'T REP. (BNA) 1871 (Sept. 19, 2008); Steven D. Cook, *Air Regulators to Endorse Strong Role for Clean Air Act in Climate Program*, 39 ENV'T REP. (BNA) 2168 (Oct. 31, 2008).

[125] Clean Air Act §503(c), 42 U.S.C. §7661B(c) (2006).

[126] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514 (June 3, 2010) (to be codified at 40 C.F.R. pts. 51, 52, 70 & 71).

[127] *Id*. at 31,523.

[128] *Id*. at 31,525.

not appropriate to apply PSD and Title V permitting requirements to additional, smaller sources of GHG emissions."[129] Sources having $CO_{2e}$ emissions of less than 50,000 tpy will not be required to obtain permits before 2016. EPA's tailoring rule was upheld by the D.C. Circuit in *Coalition for Responsible Regulation v. EPA*.[130] EPA defended its tailoring rule based on the "absurd results" and the "one-step-at-a time" doctrines, claiming it is impossible to issue millions of permits with the resources available to the Agency.[131]

EPA is not requiring GHG limits if the permits are approved prior to January 2, 2011, even if the permit is not effective until after January 2, 2011, because of a delayed effective date or an appeal to the Environmental Appeals Board.[132] On November 3, 2011, environmentalists filed a lawsuit in the Ninth Circuit challenging EPA's decision to exempt the Avenal Natural Gas Plant in California from meeting GHG limits and stricter $NO_2$ NAAQS because the plant applied for a construction permit long before the new rules took effect.[133] EPA in its proposed NSPS for EGUs also exempts sources with complete construction permits at the time of the proposal if they commence construction within twelve months.[134] About fifteen projects are included in this exemption, but many of these coal-fired plants may not be built because financing is difficult to obtain, the costs of complying with new regulations applicable to conventional pollutants is high, and it may be cost effective to shift to using natural gas.[135] Any natural gas-fired EGUs that have received PSD permits but have not commenced construction by the date of this proposal should be able to meet the NSPS. However, even with an exemption from the NSPS, these sources will be constrained in their emissions of $CO_2$ by other requirements of the CAA, including the requirements EPA eventually promulgates under CAA section 111(d) that will apply to existing sources.[136]

EPA's approach is to have case-by-case determinations made by the permitting authority. On December 30, 2010, EPA announced it was withdrawing

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[129] *EPA Defends Plan to Retain Existing GHG Permit Thresholds in Final Rule*, CLEAN AIR REP., July 19, 2012.

[130] Coalition for Responsible Regulation, Inc. v. EPA, No. 09-1322 (D.C. Cir. June 26, 2012). *See Appeals Court Assigns Panel for Bulk of Suits over Climate Rules*, CLEAN AIR REP., Nov. 10. 2011 at 17 [hereinafter *Appeals Court Assigns Panel*].

[131] *See Appeals Court Assigns Panel*, *supra* note 130.

[132] *EPA Review of Kansas Utility Permit Could Test Application of GHG Limits*, ENVTL. POL'Y ALERT, Dec. 29, 2010, at 30.

[133] *Activists Sue over Exclusion of GHG, $NO_2$ Limits from Avenal Permit*, CLEAN AIR REP., Nov. 10, 2011, at 35.

[134] Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392, 22421 (Apr. 13, 2012).

[135] *Id*. at 22,422. Since 2009 only one coal-fired power plant has been constructed in the U.S. It is Southern Company's Kemper County Project, which uses CCS that is funded by DOE. *Id*. *See generally* discussion *infra*.

[136] Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,425.

approval of twenty-four state PSD programs to the extent they apply to GHG-emitting sources below the thresholds in the Tailoring Rule.[137] This allows both states with delegated programs and states that have their own rules in an approved State Implementation Plan (SIP) to limit permits to the higher Tailoring Rule threshold. EPA also issued a SIP call on December 13, 2010, requiring thirteen states to submit SIP revisions by December 1, 2011, showing their PSD programs would apply to GHG sources.[138] EPA also established a Federal Implementation Plan (FIP) on December 30, 2010.[139] EPA is in the process of approving some of the revised SIPs, but Texas has refused to comply.[140] EPA announced on December 23, 2010, that it would issue GHG emissions permits for new and modified sources in Texas.[141] In 2011, EPA's Region VI reviewed the first two major source PSD permits involving GHG limits.[142] Texas is suing EPA in the D.C. Circuit in a challenge to the GHG limits in the FIP, and on October 1, 2011, the court allowed environmental organizations to intervene.[143] Chase Power Development's 1,300-megawatt coke-fired Las Brisas Center at Port of Corpus Christi, Texas is seeking to avoid GHG controls and has filed suit in the D.C. Circuit challenging EPA's takeover of the GHG permitting program in Texas.[144]

In South Dakota, an application by Hyperion for a construction permit to build a petroleum refinery and integrated gasification combined cycle-power plant led to a detailed analysis of the BACT choices by the state's Department of Environment and Natural Resources (DENR), which resulted in DENR approving

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[137] Limitation of Approval of Prevention of Significant Deterioration Provisions Concerning Greenhouse Gas Emitting-Sources in State Implementation Plans, 75 Fed. Reg. 82,536 (Dec. 30, 2010) (to be codified at 40 C.F.R. pt. 52).

[138] Action to Ensure Authority to Issue Permits Under the Prevention of Significant Deterioration Program to Sources of Greenhouse Gas Emissions: Finding of Substantial Inadequacy and SIP Call, 75 Fed. Reg. 77,698 (Dec. 13, 2010) (to be codified at 40 C.F.R. pt. 52).

[139] Action to Ensure Authority to Issue Permits Under the Prevention of Significant Deterioration Program to Sources of Greenhouse Gas Emissions: Federal Implementation Plan, 75 Fed. Reg. 82,246 (Dec. 30, 2010).

[140] Ronda L. Moore, *Permitting for Greenhouse Gases: Federal Standards and State Battles*, 42 TRENDS 12 (ABA Sec. of Env't, Energy & Resources Newsl.) (2011), *available at* http://www.americanbar.org/content/dam/aba/publications/trends/2011/Trends_Issue_Nov_Dec_2011.authcheckdam.pdf.

[141] Steven D. Cook, *EPA to Issue Permits in Texas for New, Modified Sources of Greenhouse Gases*, 41 ENV'T REP. (BNA) 2844 (Dec. 31, 2010).

[142] *EPA Region VI Reviewing First Two Texas GHG Permit Applications*, CLEAN AIR REP., Sept. 15, 2011.

[143] Texas v. EPA, No. 10-1425 (D.C. Cir. filed Dec. 30, 2010); *see also Activists Win Role in Texas Suit Against Greenhouse Gas Permit Rule*, CLEAN AIR REP., Nov. 10, 2011, at 34.

[144] Dawn Reeves & Stuart Parker, *Texas Coke Plant May Be Key Test for EPA Takeover of State GHG Permits*, CLEAN AIR REP., Nov. 24, 2011, at 34; Andrew Childers, *Texas Power Plant Among Those Suing EPA over Carbon Dioxide Performance Standards*, 43 Env't Rep. (BNA) 1542 (June 15, 2012).

Hyperion's design because GHG emissions per barrel of refined product were equivalent to the best performing plant.[145] DENR rejected additional controls, and specifically rejected requiring carbon capture and sequestration.[146] A revised PSD permit was issued on September 15, 2011.[147]

A proposed Russell City Energy Co. 600 MW natural gas-fired combined-cycle power plant in California became the first source in the nation to voluntarily have GHG emissions subject to BACT requirements when its PSD permit included numeric values for $CO_{2e}$ emissions based on energy efficiency determinations.[148] The first facility to have GHG requirements in a PSD construction permit occurred on January 27, 2011, when the Nucor Corporation received a permit from Louisiana Department of Environmental Quality for its direct reduced iron facility.[149] The Sierra Club and the Louisiana Environmental Action Network filed an administrative petition on May 3, 2011, asking EPA's administrator to reject the Title V and PSD permit because a limit on natural gas consumption does not qualify as BACT for GHGs.[150] On March 23, 2012, EPA disapproved Nucor's operating permit for reasons unrelated to its GHG requirements.[151] On June 22, 2012, Louisiana filed suit in the Fifth Circuit challenging EPA's rejection.[152]

In Iowa the Department of Natural Resources issued a permit on May 16, 2011, to allow MidAmerican Energy Company's George Neal South Power Plant to install pollution controls at an existing plant. The permit restricts $CO_2$ emissions to 2,588 pounds per megawatt hour, which will not require the plant to significantly reduce emissions beyond its current emissions.[153] EPA also supports a Michigan permit for the Wolverine Power Supply Cooperative in Michigan issued on June 29, 2011, that has weak and cursory BACT requirements related to GHG

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[145] *Publications: First GHG Permits Issued by State Regulatory Agencies*, VINSON & ELKINS (Mar. 21, 2011), http://velaw.com/resources/FirstGreenhouseGasPSDPermits IssuedStateRegulatoryAgencies.aspx.

[146] *Id*.

[147] *Hyperion Energy Center: Air Quality*, S.D. DEP'T OF ENV'T & NAT. RESOURCES, http://denr.sd.gov/hyperionaqmain.aspx (last visited Jan. 3, 2012).

[148] *California Issues First Utility Permit Limiting Greenhouse Gases with BACT*, CLEAN AIR REP., Oct. 28, 2010, at 10.

[149] Dawn Reeves, *EPA Sets High Bar for GHG Limits in First 2011 Permit, Prompting Worries*, CLEAN AIR REP., Feb. 17, 2011, at 30.

[150] Dawn Reeves, *Activists Urge EPA to Oppose First GHG Permit for Failing to Meet BACT*, CLEAN AIR REP., May 12, 2011, at 10.

[151] Stuart Parker, *EPA Sidesteps Key Policy Disputes in Rejection of First GHG Air Permits*, CLEAN AIR REP., Apr. 12, 2012 at 8.

[152] Jacqueline Baylon, *Louisiana Files Suit over EPA Rejection of First State-Issued GHG Permits*, CLEAN AIR REP., July 19, 2012, at 15.

[153] Dawn Reeves, *EPA Backs First Coal Plant GHG Permit Without Strict Emission Limits*, ENVTL. POL'Y ALERT, June 15, 2011, at 31.

emissions.[154] That permit was upheld by a Michigan Circuit and has been appealed by environmentalists to the Michigan Court of Appeals.[155]

A controversy between state permit authorities and EPA is whether the BACT requirement allows EPA to require numeric limits for GHGs in a state issued permit.[156] After EPA's Region VIII objected to a permit being issued by Utah, the state added numeric GHG limits to a permit issued to PacificCorp to build its Lake Side Natural Gas-fired Power Plant although the permit set limits on GHG emissions well above the expected level of GHG emissions, and the company does not need to take any additional steps to control emissions.[157]

### *F. Operating Permits*

Operating permits are required for major sources as well as sources subject to NSPS or the HAP regulations.[158] Now that EPA's GHG rule for mobile sources is finalized, operating permits will be required to consider $CO_2$ emissions during the permitting process. For facilities that are subject to operating permit requirements, $CO_{2e}$ requirements will be added beginning July 1, 2011. Facilities that do not have an operating permit will be required to obtain one if emissions exceed 100,000 tpy of $CO_{2e}$ even if they emit no other pollutants.[159] This will require states to process a massive increase in first-time permit applications and renewal applications beginning July 1, 2011.[160] An owner or operator of an existing major source has twelve months to submit a Subchapter V application if the source is not already a permit holder.[161] EPA has indicated that it will ensure that permits will be issued beginning in 2011 for new and modified sources, even in states resisting implementing the GHG permitting program.[162]

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[154] *Id*. *See also* Dawn Reeves, *Environmentalists Challenge First Coal Plant Permit to Include GHG Limits*, CLEAN AIR REP., Oct. 13, 2011, at 7.

[155] Dawn Reeves, *Activists Appeal Ruling Upholding First Coal Plant with GHG Permit Limits*, CLEAN AIR REP., Apr. 26, 2012, at 9.

[156] Dawn Reeves, *Utah GHG Permit May Serve as Test of EPA BACT Guidance Requirements*, CLEAN AIR REP., Apr. 28, 2011, at 27.

[157] Dawn Reeves, *Utah Agrees to Include GHG Limit in Power Plant Permit to Appease EPA*, CLEAN AIR REP., May 26, 2011, at 32.

[158] 42 U.S.C. § 7661(2) (2006).

[159] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,524 (June 3, 2010) (to be codified at 40 C.F.R. pts. 51, 52, 70 & 71).

[160] Reconsideration of Interpretation of Regulations that Determine Pollutants Covered by Clean Air Act Permitting Programs, 75 Fed. Reg. 17,004 (Apr. 2, 2010) (to be codified at 40 C.F.R. pts. 50, 51, 70 & 71).

[161] Clean Air Act §503(c), 42 U.S.C. §7661B(c) (2006).

[162] Steven D. Cook, *EPA Says It Will Ensure Permitting in States Resisting Regulatory Program*, 41 ENV'T REP. (BNA) 2300 (Oct. 15, 2010).

## III. EPA'S REGULATION OF CONVENTIONAL AIR POLLUTANTS FROM ELECTRIC POWER PLANTS

### *A. Criteria Pollutants*

Four of the six criteria pollutants (particulate matter, ozone, nitrogen dioxide and sulfur dioxide), for which national ambient air quality standards (NAAQS) have been promulgated, are produced in large quantities, directly or indirectly, from the combustion of fossil fuels at stationary sources.[163] All four of these NAAQS, have become more stringent in the past five years, and some have pending revisions that may further increase their stringency.[164] In addition, EPA is increasingly relying on modeling over monitoring, which critics contend is more likely to predict non-compliance with a NAAQS.[165] After EPA modifies a NAAQS, states are required to submit revised state implementation plans (SIPS), which often results in the imposition of more stringent emission requirements on stationary sources.[166] Moreover, EPA can issue "SIP calls" requiring upwind states to revise their SIPs to reduce emissions that EPA finds are significantly contributing to downwind nonattainment or are interfering with maintenance of NAAQS in another state.[167]

#### *1. The Particulate Standard*

In 1971 a NAAQS for particulate matter (PM) was promulgated.[168] It regulated particulates up to 45 micrometers in diameter called Total Suspended Particulates (TSP). In 1987, EPA changed the particulate standard to regulate only particles less than ten microns in diameter ($PM_{10}$).[169] In 1997, EPA promulgated a PM final rule to add two standards for particulates less than 2.5 microns in diameter ($PM_{2.5}$).[170] However, in 1999, in *American Trucking Ass'n v. EPA*, the

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[163] *See generally* Reitze, *supra* note 24.

[164] NAAQS are found at 40 C.F.R. pt. 50 (2012).

[165] Stuart Parker, *Industry Seeks EPA-Led Modeling "Summit" to Resolve NAAQS Concerns*, CLEAN AIR REP., Dec. 8, 2011, at 7.

[166] *See generally* Arnold W. Reitze, Jr., *Air Quality Protection Using State Implementation Plans—Thirty-Seven Years of Increasing Complexity*, 15 VILL. ENVTL L.J. 209, 229–30 (2004).

[167] Clean Air Act § 110(k)(5), 42 U.S.C. § 7410(k)(5) (2006).

[168] National Primary and Secondary Ambient Air Quality Standards, 36 Fed. Reg. 8186 (Apr. 28, 1971) (to be codified at 40 C.F.R. pt. 410).

[169] Revisions to the National Ambient Air Quality Standards for Particulate Matter, 52 Fed. Reg. 24,634 (July 1, 1987) (to be codified at 40 C.F.R. pt. 50); these revisions were upheld in Nat. Resources Def. Council v. EPA, 902 F.2d 962 (D.C. Cir. 1990), *cert. denied*, 498 U.S. 1082 (1991).

[170] National Ambient Air Quality Standards for Particulate Matter, 62 Fed. Reg. 38,652, 38,654 (July 18, 1997) (to be codified at 40 C.F.R. pt. 50). The standards were 15 $\mu g/m^3$, for the annual three-year average of the arithmetic mean $PM_{2.5}$ concentrations from

D.C. Circuit vacated the coarse particulate standard holding that EPA cannot use $PM_{10}$ as an indicator to regulate coarse particles in the $PM_{10}$ to $PM_{2.5}$ range.[171] The case was subsequently reversed in part and remanded by the Supreme Court in *Whitman v. American Trucking Ass'n*,[172] but the Court did not change the D.C. Circuit's holding concerning the particulate NAAQS.

EPA promulgated a more stringent particulate standard on October 17, 2006.[173] The $PM_{2.5}$ annual average was left at 15μg/$m^3$ (microgram per cubic meter) but the 24-hour standard was lowered from 65μg/$m^3$ to 35 μg/$m^3$. For $PM_{10}$ the Agency did not change the 24-hour 150 mg/$m^3$ standard. On April 25, 2007, EPA published a rule that sets out the procedures states must use to control emissions from power plants and other industrial facilities that emit fine particulates.[174] The rule contains guidelines to assist states in showing that they have adopted all reasonably available control measures. States must meet the $PM_{2.5}$ standard as soon as possible, but no later than 2015.

On February 24, 2009, the D.C. Circuit upheld the course particulate standard, but remanded the annual fine particulate standard because EPA failed to explain adequately why the 15 microgram per cubic meter standard is "requisite to protect public health."[175] The court also remanded the secondary NAAQS for fine PM because EPA unreasonably concluded that the NAAQS was adequate to protect public welfare from adverse effects on visibility. On May 28, 2010, EPA made a finding that twenty-nine states failed to submit SIPs to satisfy the 24-hour $PM_{2.5}$ NAAQS, which started the process needed for federal enforcement.[176] Subsequently, lawsuits by environmentalists were brought to force EPA to take action against states that are not complying with the 2006 $PM_{2.5}$ NAAQS.[177]

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single or multiple community-oriented monitors, and 65 μg/$m^3$, based on the three-year average of the 98th percentile of the 24-hour $PM_{2.5}$ concentrations at each population-oriented monitor within an area. The existing 24-hour $PM_{10}$ standard was revised to 150 μg/$m^3$ using the 99th percentile of the 24-hour $PM_{10}$ concentration at each monitor within an area.

[171] Am. Trucking Ass'n, Inc. v. EPA, 175 F.3d 1027 (D.C. Cir. 1999), *rev'd in part*, 531 U.S. 457 (2001).

[172] Whitman v. Am. Trucking Ass'n, Inc., 531 U.S. 457 (2001).

[173] National Ambient Air Quality Standards for Particulate Matter, 71 Fed. Reg. 61,144 (Oct. 17, 2006) (to be codified at 40 C.F.R. pt. 50).

[174] Clean Air Fine Particle Implementation Rule, 72 Fed. Reg. 20,586 (Apr. 25, 2007) (to be codified at 40 C.F.R. pt. 51).

[175] Am. Farm Bureau Fed'n v. EPA, 559 F.3d 512 (D.C. Cir. 2009).

[176] Finding of Failure to Submit Section 110 State Implementation Plans for Interstate Transport for the 2006 National Ambient Air Quality Standards for Fine Particulate Matter, 75 Fed. Reg. 32,673, 32,676 (June 9, 2010) (to be codified at 40 C.F.R. pt. 52).

[177] *Activists Win Stay of Suit to Force EPA Deadline on Particulate Air Plans*, CLEAN AIR REP., Apr. 14, 2011, at 35.

On May 18, 2011, EPA promulgated a final rule that ended the use of coarse particles as a surrogate for fine particles.[178] The rule also terminated the use of coarse particles as a surrogate for states that administer their own PSD programs.[179] In November 2011, EPA said it was planning to retain its coarse particulate matter air standard, but EPA did not address whether it would propose tightening the fine particulate standard.[180] When EPA promulgates more stringent NAAQS it usually results in an increased number of nonattainment areas, which leads to SIP revisions that require emission sources to meet more restrictive emission standards. In addition, EPA may extend the size of the nonattainment area to include outlying "exurban" counties. An important lawsuit concerning this practice is *ATK Launch Systems, Inc. v. EPA* that was argued in the D.C. Circuit on January 24, 2012.[181] It involves Box Elder and Tooele Counties in Utah challenging their inclusion in the Salt Lake Air Quality Control Region based on EPA's analysis of nine factors: emissions data, air quality data, population density and degree of urbanization, traffic and commuting patterns, expected urban growth, weather, topography and geography, jurisdictional boundaries, and degree of existing emissions controls. On February 24, 2012, the D.C. Circuit upheld EPA's nine-factor test and denied the petition for review.[182] On June 15, 2012, EPA announced proposed revisions to the PM standard with a more stringent fine particulate primary standard in the 12 to 13 micrograms per cubic meter range, which is below the present 15 micrograms per cubic meter standard. EPA also proposed a fine particulate secondary standard to protect visibility. The Agency expects to finalize the rule by December 14, 2012.[183]

*2. The Ozone Standard*

To control photochemical oxidants, EPA promulgated ozone NAAQS in 1971 limiting the hourly average to 0.08 parts per million (ppm) of total photochemical oxidants, not to be exceeded more than one hour per year.[184] On February 8, 1979,

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[178] Implementation of the New Source Review (NSR) Program for Particulate Matter Less Than 2.5 Micrometers ($PM_{2.5}$), Final Rule to Repeal Grandfather Provision, 76 Fed. Reg. 28,646 (May 18, 2011) (to be codified at 40 C.F.R. pt. 52).

[179] *Id*.

[180] *EPA Plan to Retain $PM_{10}$ Standard Divides GOP on Legislative Response*, ENVTL. POL'Y ALERT, Nov. 2, 2011, at 17.

[181] *EPA Fights Lawsuit over Method for Designating PM Nonattainment Areas*, CLEAN AIR REP., Nov. 10, 2011, at 9; ATK Launch Systems, Inc. v. EPA, No. 10-1004 (D.C. Cir. Feb. 24, 2012), *available at* http://law.justia.com/cases/federal/appellate-courts/cadc/10-1004/10-1004-2012-02-24.html.

[182] ATK Launch Systems, Inc. v. EPA, 669 F.3d 330 (D.C. Cir. 2012).

[183] Andrew Childers, *EPA Proposes New Health Standard for Fine Particulates, Plus Visibility Standard*, 43 ENV'T REP. (BNA) 1601 (June 22, 2012).

[184] National Primary and Secondary Ambient Air Quality Standards, 36 Fed. Reg. 8186 (Apr. 28, 1971) (to be codified at 40 C.F.R. pt. 410).

the primary and secondary standards were revised to a less stringent 0.12 ppm (235 $\mu g/m^3$) one-hour ozone standard.[185]

On July 18, 1997, EPA replaced the one-hour primary standard for ozone with an eight-hour standard of 0.08 ppm based on the three-year average of the annual fourth-highest daily maximum eight-hour average $O_3$ concentrations measured at each monitor within an area.[186] On February 27, 2001, in *Whitman v. American Trucking Ass'n*, the U.S. Supreme Court held that EPA's action was unreasonable and remanded the implementation strategy to EPA.[187] On March 26, 2002, the D.C. Circuit upheld EPA's selection of the 0.08 ppm numerical value for the eight-hour-average ozone NAAQS.[188]

On March 27, 2008, EPA promulgated an eight-hour ozone standard of 0.075 parts per million (ppm).[189] The NAAQS has not yet been fully implemented, but EPA was in the process of making the ozone standard more stringent. On January 19, 2010, EPA proposed an eight-hour primary standard in the range of 0.060 to 0.070 ppm and a secondary standard for the three-month ozone season of a weighted hourly concentration from 8:00 a.m. to 8:00 p.m. within the range of 7 to 15 ppm.[190] On September 2, 2011, President Obama rejected EPA's proposed rule.[191] This means EPA will now implement the 2008 standard.[192] It is expected that fifty-two areas will be designated nonattainment for ozone.[193] Litigation has commenced in the D.C. Circuit with environmentalists seeking to force EPA to promulgate a stringent standard and industry, and some states claiming the 2008

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[185] Revisions to the National Ambient Air Quality Standards for Photochemical Oxidants, 44 Fed. Reg. 8202 (Feb. 8, 1979) (to be codified at 40 C.F.R. pt. 50). This less stringent ozone standard was upheld in Am. Petroleum Inst. v. Costle, 665 F.2d 1176 (D.C. Cir. 1981).

[186] National Ambient Air Quality Standards for Ozone, 62 Fed. Reg. 38,856 (July 18, 1997) (to be codified at 40 C.F.R. 50).

[187] Whitman v. Am. Trucking Ass'n, Inc., 531 U.S. 457 (2001).

[188] Am. Trucking Ass'n, Inc. v. EPA, 283 F.3d 355 (D.C. Cir. 2002), *rev'd in part*, 531 U.S. 457 (2001).

[189] National Ambient Air Quality Standard for Ozone, 73 Fed. Reg. 16,436 (Mar. 27, 2008) (to be codified at 40 C.F.R. pts. 50 & 58).

[190] National Ambient Air Quality Standard for Ozone, 75 Fed. Reg. 2938 (proposed Jan. 19, 2010) (to be codified at 40 C.F.R. pts. 50 & 58).

[191] Stuart Parker, *Daily News: Obama Decision to Kill Stricter Ozone NAAQS Shifts Focus to 2008 Limit*, (Sept. 2, 2011), http://insideepa.com/201109022374625/EPA-Daily-News/Daily-News/obama-decision-to-kill-stricter-ozone-naaqs-shifts-focus-to-2008-limit/menu-id-309.html.

[192] Jessica Coomes & Andrew Childers, *Administration Drops Reconsideration of Stricter Air Quality Standards for Ozone*, 42 ENV'T REP. (BNA) 1965 (Sept. 6, 2011); Jessica Coomes & Andrew Childers, *Jackson Says EPA Required to Implement Bush Administration Standard for Ozone*, 42 ENV'T REP. (BNA) 2117 (Sept. 23, 2011).

[193] Andrew Childers & Jessica Coomes, *EPA Predicts 52 Areas Will Not Attain National Air Quality Standard for Ozone*, 42 ENV'T REP. (BNA) 2118 (Sept. 23, 2011).

NAAQS is too strict.[194] On May 14, 2012, EPA promulgated a final rule tightening the requirements for states to impose stricter emission controls on industry.[195]

*3. The $NO_2$ Standard*

In 1971, an annual standard of 0.053 parts per million (100 micrograms per cubic meter), annual arithmetic mean for $NO_2$ was established. This standard remains unchanged in 2011.[196] On February 9, 2010, EPA published a final rule establishing an additional one-hour primary standard for $NO_2$ of 0.10 ppm.[197] That standard requires modeling that makes it difficult for facilities to demonstrate their emissions will not be exceeded under worst-case conditions. EPA on August 1, 2011, proposed a secondary standard for nitrogen oxides that is identical to the one-hour primary standard, but is continuing to study the need for additional protection of sensitive aquatic ecosystems from continuing acidic depositions.[198] It plans to issue a final standard by March 20, 2012.[199] At this time the more stringent $NO_2$ NAAQS is not being implemented because EPA first needs to create an extensive new monitoring network. Thus EPA has classified all areas of the country as "unclassifiable" for the stricter primary standard, which delays classification until 2016 or 2017 and the compliance deadline is going to be 2021 or 2022.[200] However, there is currently no evidence that any location in the country violates the more stringent primary standard.[201] On July 17, 2012, the D.C. Circuit upheld the 2010 one-hour $NO_2$ NAAQS.[202]

*4. The $SO_2$ Standard*

The 1971 sulfur dioxide ($SO_2$) standard established the primary NAAQS for sulfur oxides measured as $SO_2$ as: (a) 80 micrograms per cubic meter (0.03 ppm.) annual arithmetic mean, and (b) 365 micrograms per cubic meter (0.14 ppm.)

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[194] Mississippi v. EPA, No. 08-1200 (D.C. Cir. filed May 23, 2008). *See also* Jessica Coomes, *EPA Defends Ozone Standards in Court, Says Scientific Evidence Was Considered*, 43 ENV'T REP. (BNA) 1745 (July 6, 2012).

[195] Stuart Parker, *EPA Tightens Ozone Control Requirements After Scrapping Bush-Era Rule*, CLEAN AIR REP., May 24, 2012 at 11.

[196] National Primary and Secondary Ambient Air Quality Standards, 36 Fed. Reg. 8186 (Apr. 28, 1971) (to be codified at 40 C.F.R. pt. 410).

[197] Primary National Ambient Air Quality Standard for Nitrogen Dioxide, 75 Fed. Reg. 6474 (Feb. 9, 2010) (to be codified at 40 C.F.R. pts. 50 & 58).

[198] Secondary National Ambient Air Quality Standards for Oxides of Nitrogen Dioxide and Sulfur, 76 Fed. Reg. 46,084 (proposed Aug. 1, 2011) (to be codified at 40 C.F.R. pt. 50).

[199] *Id.*

[200] *EPA Finds All States "Unclassifiable" For New Nitrogen Dioxide Standard*, CLEAN AIR REP., July 21, 2011, at 21.

[201] *Id.*

[202] American Petroleum Institute v. EPA, 684 F.3d 1342, (D.C. Cir. 2012).

maximum 24-hour concentration not to be exceeded more than once per year.[203] In 1972, the D.C. Circuit struck down the annual secondary air quality standard for sulfur dioxide.[204] EPA then revoked the $SO_2$ annual secondary standard on September 14, 1973.[205] The short-term secondary standard of 1,300 micrograms per cubic meter (0.5 ppm) maximum three-hour concentration that is not to be exceeded more than once per year was not changed.

On May 22, 1996, EPA announced that revisions of the NAAQS for sulfur oxides were not appropriate, aside from several minor technical changes.[206] On January 30, 1998, in *American Lung Ass'n v. EPA*, the D.C. Circuit remanded this decision not to promulgate a more stringent national standard, because the Administrator failed to adequately explain her conclusion that no public health threat exists.[207]

On June 22, 2010, EPA promulgated a new short-term, one-hour sulfur dioxide standard of 75 parts per billion using a three-year average of the 99th percentile of the yearly distribution of the daily maximum concentrations.[208] This tightened standard will impose additional significant costs on electric power companies with coal-fired power plants.[209]

### *B. New Source Performance Standards*

EPA signed a final rule on June 8, 2011 that amends the NSPS for stationary diesel and conventional engines, such as those used to generate electricity for compressors and pumps to include more stringent controls of $NO_x$, PM, and hydrocarbons.[210]

On April 13, 2012, EPA promulgated proposed new source performance standards (NSPS) to limit $CO_2$ emissions from new electric generating units (EGUs) greater than 25 megawatt electric (MWe), located in the continental United States.[211] The standards are based on the emissions produced by a natural gas combined cycle (NGCC) facility. EPA does not expect any coal-fired EGU to meet this standard without utilizing carbon capture and storage (CCS) technology

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[203] Reorganization and Republication, 36 Fed. Reg. 22,369 (Nov. 25, 1971).

[204] Kennecott Copper Corp. v. EPA, 462 F.2d 846 (D.C. Cir. 1972).

[205] National Primary and Secondary Ambient Air Quality Standards, 38 Fed. Reg. 25,678 (Sept. 14, 1973).

[206] National Ambient Air Quality Standards for Sulfur Oxides (Sulfur Dioxide)—Final Decision, 61 Fed. Reg. 25,566 (May 22, 1996).

[207] Am. Lung Ass'n. v. EPA, 134 F.3d 388 (D.C. Cir. 1998).

[208] Primary National Ambient Air Quality Standard for Sulfur Dioxide, 75 Fed. Reg. 35,520 (June 22, 2010).

[209] Andrew Childers, *EPA Establishes First Hourly Air Standard for Sulfur Dioxide, Revokes Other Standards*, 41 ENV'T REP. (BNA) 1221 (June 4, 2010).

[210] Standards of Performance for Stationary Compression Ignition and Spark Ignition Internal Combustion Engines, 76 Fed. Reg. 37,954 (June 28, 2011).

[211] Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22,392 (Apr. 13, 2012).

to prevent 50 percent or more of the $CO_2$ emissions from being released to the atmosphere. As discussed *infra* II.C the proposed rule limits the $CO_2$ emissions from new electric power plants to 1000 pounds of $CO_2$ per megawatt hour (MWhr) of electricity output. Because of the lack of data for EGUs, EPA did not propose $N_2O$ or $CH_4$ emission limits or an equivalent $CO_2$ emission limit.[212]

EPA, in establishing the level of stringency for the proposed NSPS, considered the emissions during startup and shutdown periods, and concluded the proposed NSPS would apply at all times, including during startups and shutdowns.[213] The proposed NSPS also will apply during malfunctions, but EPA is proposing to allow an affirmative defense to civil penalties for exceeding emission limits caused by malfunctions if the defendant meets the requirements for an affirmative defense as found in 40 C.F.R. § 60.10042. The affirmative defense is available only where the event that caused the excess emissions meets the definition of malfunction found in 40 C.F.R. § 60.2. The requirements aim to ensure that the malfunction is corrected, emissions are minimized, and future malfunctions are prevented.[214]

EPA had previously promulgated revised NSPS for $SO_2$, $NO_x$,and PM from EGUs on February 27, 2006.[215] The NSPS for traditional pollutants has been modified by the mercury and air toxics standards for power plants promulgated on February 16, 2012, which is discussed *infra* II.D.

### *C. Prevention of Significant Deterioration*

The PSD construction permit program requires new or modified major sources to use the best available control technology (BACT).[216] BACT requirements must be at least as stringent as the applicable NSPS, thus they can potentially become more stringent when the proposed NSPS, discussed *infra* III.B, is finalized.[217] However, BACT is site specific and is established for each facility.[218] Court decisions have held that BACT requirements cannot be used to force an applicant to redesign a proposed facility.[219] A recurring issue for the electric power industry is whether integrated gasification combined cycle (IGCC) technology is BACT that can be required to obtain a PSD construction permit. This issue has been discussed in this author's prior publications, and remains

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[212] *Id.* at 22,404.

[213] *Id.* at 22,408.

[214] *Id*. at 22,408.

[215] Standards of Performance for Electric Utility Steam Generating Units, 71 Fed. Reg. 9,866 (Feb. 27, 2006)

[216] Clean Air Act § 165(a)(4), 42 U.S.C. § 7475(a)(4) (2006); *see generally* Arnold W. Reitze, Jr., *New Source Review: Should It Survive?,* 34 ENVTL. L. REP. (Envtl. Law Inst.) 10,673 (2004).

[217] Clean Air Act § 169(3), 42 U.S.C. § 7479(3).

[218] *Id*.

[219] *See* Sierra Club v. EPA, 499 F.3d 653, 657 (7th Cir. 2007).

unresolved,[220] but at this time it would appear that IGCC does not meet the regulatory definition of BACT.[221] However, if the proposed NSPS for EGUs are finalized in a form similar to those proposed, it is unlikely that new coal burning facilities will be built.

Visibility protection in PSD areas is another duty of EPA under the CAA that has the potential for significantly increasing the costs of operating some electric power plants, if the plants need to comply with more stringent haze reduction requirements.[222] EPA's haze reduction requirements[223] require some existing sources to install best available retrofit technology (BART).[224] BART requirements can increase the costs of operating fossil-fueled facilities, especially older plants, and may make them uneconomical to operate. For example, EPA proposed BART control for the forty-five-year-old Four Corners Power Plant located on Navajo tribal land within New Mexico. Arizona Public Service Company then announced it would shut down three coal-fired units and install additional pollution controls at two other units at the Four Corners Power Plant near Farmington, New Mexico in order to comply with BART requirements for $NO_x$ control.[225] On February 11, 2011, EPA proposed more stringent controls for the Four Corners plant.[226] In Oklahoma the state planned to allow facilities to switch from coal to natural gas to comply with EPA's regional haze program, but EPA rejected the plan because the compliance date of 2026 was too long. Oklahoma is suing EPA and is seeking legislation to overturn the Agency's decision.[227] On July 2, 2012, EPA promulgated a federal implementation plan and disapproved Arizona's state implementation plans that restricted emissions from the Cholla Power Plant, the Apache Generating Station, and the Coronado Generating Station because the $NO_x$ limits were not adequate to protect visibility.[228]

Several lawsuits filed by environmentalists in March 2011[229] seek to impose requirements on other stationary sources to protect visibility in pristine areas.[230] In

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[220] Arnold W. Reitze, Jr., *Federal Control of Greenhouse Gas Emissions*, 40 ENVTL. L. 1261, 1306 (2010).

[221] 40 C.F.R. § 52.21(b)(12).

[222] Clean Air Act § 169A–169B, 42 U.S.C. § 7491–7492 (2006).

[223] Regional Haze Regulations, 64 Fed. Reg. 35,714 (July 1, 1999).

[224] Clean Air Act § 169A(b)(2)(A), 42 U.S.C. § 7491(b)(2)(A) (2006).

[225] William H. Carlile, *Arizona Utility Plans Partial Shutdown of Four Corners Plant to Reduce Emissions*, 41 ENV'T REP. (BNA) 2561 (Nov. 19, 2010).

[226] William Carlile, *EPA Proposal Would Reduce Emissions from Four Corners Plant, Improve Visibility*, 42 ENV'T REP. (BNA) 320 (Feb. 18, 2011).

[227] Bobby McMahon, *Oklahoma Pursues Lawsuit, Bill to Overturn EPA Rejection of Haze Plan*, CLEAN AIR REP., Apr. 28, 2011, at 26; *Oklahoma Sues EPA over Agency Rejection of Regional Haze Plan*, CLEAN AIR REP., June 9, 2011, at 38.

[228] William H. Carlile, *EPA Takes Steps to Limit Emissions of Pollutants From Arizona Power Plants*, 43 ENV'T REP. (BNA) 1746 (July 6, 2012).

[229] Stuart Parker, *EPA Seen Favoring State Haze Plans with Strict Coal-Fired Utility Controls*, CLEAN AIR REP., Mar. 31, 2011, at 19.

New Mexico the control of haze created by emissions from the San Juan Generating Station near Farmington has led to a battle between EPA and New Mexico over the appropriate BART technology. EPA demands selective catalytic reduction to control $NO_x$, but New Mexico prefers selective non-catalytic reduction, which meets EPA's visibility rules for a tenth of the cost.[231] EPA published a FIP on September 21, 2011, but the state is challenging it in the Tenth Circuit.[232] EPA is also working to force more stringent emissions controls through the haze program in Colorado, Montana, North Dakota, and Arkansas.[233] The regional haze program is years behind schedule, but in November 2011 EPA agreed to a proposed consent decree that will require the Agency to approve haze SIPs or impose FIPs for numerous states by November 15, 2012.[234]

### *D. Hazardous Air Pollutants*

EPA can impose significant costs on fossil-fueled sources through the imposition of more stringent control of hazardous air pollutants (HAPs).[235] Of the thirty-three chemicals listed for control under EPA's Urban Air Toxics Strategy, most are emitted from fossil fuel electric generating plants.[236] Nationwide electric power plants are responsible for 49 percent of the air toxics released from industrial sources.[237] Most of the inhalation health risk comes from arsenic and chromium emissions, but EPA also is concerned about mercury, hydrogen chloride, hydrogen fluoride, and dioxins emissions.[238]

On May 18, 2005, EPA promulgated the Clean Air Mercury Rule (CAMR), which capped mercury emissions from about 500 new and existing power plants

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[230] Clean Air Act § 169A(b)(1)(A), 42 U.S.C. § 7491(b)(1)(A) (2006); *see* Dawn Reeves, *Environmentalists Petition Other Agencies in Bid for Strict EPA Haze Limit*, CLEAN AIR REP., Mar. 18, 2010, at 34.

[231] William H. Carlile, *EPA Finalizes Federal Plan to Control Emissions from New Mexico Power Plant*, 42 ENV'T REP. (BNA) 1809 (Aug. 12, 2011).

[232] Stuart Parker, *EPA Haze Plan for North Dakota Echoes Contested Strict New Mexico SIP*, CLEAN AIR REP., Sept. 29, 2011, at 19.

[233] Stuart Parker, *Activists Claim Success in Fights with States, EPA for Strict Haze Plans*, CLEAN AIR REP., Aug. 18, 2011, at 14.

[234] *EPA Agrees to Deadlines for Decisions on Long-Overdue State Haze Plans*, CLEAN AIR REP., Nov. 24, 2011, at 19; Stuart Parker, *EPA Regional Haze Emission Program Faces Legislative, Legal Challenges*, CLEAN AIR REP., Dec. 22, 2011, at 12.

[235] *See* 40 C.F.R. pt. 63 (2012).

[236] National Air Toxics Program: The Integrated Urban Strategy, 64 Fed. Reg. 38,706, 38,715 tbl.1 (EPA notice July 19, 1999).

[237] Jessica Coomes, *Ohio, Pennsylvania, Florida Top List of States with Most Toxics Emitted from Power Plants*, 42 ENV'T REP. (BNA) 1631 (July 22, 2011).

[238] Regulatory Findings on the Emissions of Hazardous Air Pollutants from Electric Utility Steam Generating Units, 65 Fed. Reg. 79,825, 79,826 (EPA notice Dec. 20, 2000).

with about 1,300 generating units, based on CAA §111.[239] In February 8, 2008, the D.C. Circuit held that EPA's removal of electric generating units (EGUs) from the CAA section 112 list violated section 112(c)(9), which requires EPA to make specific findings. "Because coal-fired EGUs are listed sources under section 112, regulation of existing coal-fired EGUs' mercury emissions under section 111 is prohibited."[240] This led the court to invalidate both the delisting of EGUs and the CAMR.[241]

EPA proposed MACT standards for coal-fired and oil-fired power plants on May 3, 2011.[242] EPA was required to issue a MACT standard for coal-fired and oil-fired power plants by November 16, 2011,[243] which was extended until December 16, 2011,[244] to replace the rule vacated by the D.C. Circuit in 2007.[245] On December 16, 2011, EPA signed a MACT-based rule imposing mercury and air toxics standards on power plants.[246] The MACT standards apply to EGU larger than twenty-five megawatts that burn coal or oil to generate electricity for sale or distribution through the national grid.[247] There are about 1,100 existing coal-fired units and 300 oil-fired units at about 600 power plants that are subject to this rule.[248] Existing and new coal-fired generating units have numerical limits for mercury emissions, PM (as a surrogate for toxic non-mercury metals including arsenic, chromium and nickel), and hydrogen chloride (HCL) (as a surrogate for toxic acid gases). Existing and new oil-fired EGUs have numerical limits for PM, HCL, and HF. However, there are provisions for alternative numeric emission standards for certain subcategories of power plants.[249] There are also work practice standards for coal-fired and oil-fired power plants to control emissions of organic

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[239] Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. 28,606 (May 18, 2005) (to be codified at 40 C.F.R. pts. 60, 72, 75).

[240] New Jersey v. EPA, 517 F.3d 574, 578 (D.C. Cir. 2008).

[241] *Id*. at 583–84.

[242] 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, 76 Fed. Reg. 24,976 (proposed May 3, 2011) (to be codified at 40 C.F.R. pts. 60 & 63).

[243] This is based on a consent decree of April 15, 2010 in Am. Nurses Ass'n v. Lisa Jackson, No. 08-2198, (D.D.C. Apr. 15, 2010); *see* Molly Davis, *District Court Order Could Bolster EPA in Pursuit of Power Plant MACT*, CLEAN AIR REP., Apr. 29, 2010, at 20.

[244] Bobby McMahon, *EPA Stalls Utility MACT Until December, Fights Industry Bid for Year Delay*, CLEAN AIR REP., Oct. 27, 2011, at 6.

[245] Nat. Resources Def. Council v. EPA, 489 F.3d 1250 (D.C. Cir. 2007).

[246] National Emission Standards for Hazardous Air Pollutants, 77 Fed. Reg. 9,304 (Feb. 16, 2012) (EPA subsequently announced corrections to the rule on Apr. 19, 2012).

[247] *Mercury and Air Toxics Standards (MATS): Basic Information*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/mats/basic.html (last updated April 10, 2012).

[248] National Emission Standards, 76 Fed. Reg. 24,976.

[249] *Id*.

air toxics, including dioxin/furan.[250] The new rule also modifies the NSPS for fossil-fueled EGUs to included revised numerical emission limits for PM, $SO_2$, and $NO_x$.[251] Existing sources have three years to comply with the rule, and an additional year can be granted by state permitting authorities if needed for installation of control equipment.[252]

EPA predicted that the MACT rule will result in the generation capacity for pulverized coal plants being reduced by about ten gigawatts (gW), and the generating capacity of combined-cycle natural gas plants will increase by about eight gW.[253] It is worth noting that Massachusetts imposes emission standards on mercury and other power plant toxic pollutants that are more stringent than the standards imposed by EPA, and the Massachusetts standards are being met with no adverse impacts on the reliability of the electric power grid.[254] Nevertheless, the mercury and air toxics rule is being challenged in the D.C. Circuit in at least thirty lawsuits brought by industry, environmentalists and twenty-four states.[255]

### *E. Interstate Transport*

The CAA provides for the regulation of interstate transport of air pollutants, although the statute's programs are primarily focused on the control of intrastate air pollution. The most comprehensive interstate approach is the program used to regulate $SO_2$ found in Subchapter IV of the CAA.[256] Another section, CAA § 126, provides EPA authority to control major sources, or a group of stationary sources, in upwind states to prevent releasing air pollution that may significantly contribute to levels of air pollution in excess of a NAAQS in another state.[257] This CAA section has not played a major role in controlling interstate air pollution,[258] but may have more significance in the future. For example, on October 31, 2011, EPA finalized its approval of New Jersey's petition to limit a Pennsylvania utility's emissions by approving a combination of emission limits for the facility to control $SO_2$ emissions.[259] Air pollutants carried beyond a state's boundary may also be regulated using the "SIP Call" provision in CAA § 110(k)(5), which allows EPA to

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[250] *Id*.

[251] *Id*.

[252] *Id*.

[253] Bobby McMahon, *EPA Data Predicts Utility MACT Will Not Spur Growth in Renewable Power*, CLEAN AIR REP., Mar. 31, 2011, at 4.

[254] Jessica Coomes & Bebe Raupe, *EPA Asked to Consider Cumulative Effect Air Rules Will Have on Utilities, Economy*, 42 ENV'T REP (BNA) 1862 (Aug. 19, 2011).

[255] Jessica Coomes, *25 Additional Lawsuits Challenge EPA on Mercury, Air Toxics Rules for Utilities*, 43 ENV'T REP. (BNA) 1005 (Apr. 20, 2012).

[256] *See* Clean Air Act §§ 401–416, 42 U.S.C. §§ 7651–7651o (2006).

[257] Clean Air Act § 126(b), 42 U.S.C. § 7426(b) (2006).

[258] *See* ARNOLD W. REITZE, JR., STATIONARY SOURCE AIR POLLUTION LAW 111 (2005).

[259] *EPA Grants New Jersey Petition Seeking Pennsylvania Utility Emission Cuts*, CLEAN AIR REP., Nov. 10, 2011, at 24.

seek revisions to a SIP if it does not adequately deal with air pollutants being transported to a downwind state.[260]

On May 12, 2005, EPA promulgated the Clean Air Interstate Rule (CAIR) to replace Subchapter IV's $SO_2$ cap-and-trade program and the SIP Call's $NO_x$ trading program with a program that applied to twenty-eight eastern states and the District of Columbia.[261] It provided for tradable emission allowances to be issued by EPA that would cap emissions to be given to the regulated states, which would then allocate them to specific sources.[262] The CAIR was challenged in the D.C. Circuit, which vacated the rule on July 11, 2008.[263] Subsequently, the D.C. Circuit on December 23, 2008, remanded the case to the EPA without vacatur.[264] This allowed CAIR's emissions trading program to continue until replaced.[265]

On August 8, 2011, EPA promulgated the Cross-State Air Pollution Rule (CSAPR).[266] It replaced the CAIR rule and is applicable to twenty-seven states. It limits $NO_x$ and $SO_2$ emissions in order to reduce ambient levels of ozone and $PM_{2.5}$. It also proposed summer restrictions for $NO_x$ in six Midwest states, which would add Oklahoma to the list of regulated states, and finalized the change on December 15, 2011.[267] The rule angered many states and industry because the final rule differed in coverage and stringency from the proposed rule.[268] EPA almost immediately began to consider changes, and sent a new final rule to OMB on November 15, 2011, which would expand the scope of the CSAPR, but would modestly increase the emissions budgets for many states.[269] Texas, however, would have its $SO_2$ emissions budget increased by 29 percent.[270] CSAPR also faced

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[260] 42 U.S.C. § 7410(k)(5); *see also* the SIP call regulations at 40 C.F.R. pt. 97 (2012).

[261] Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the $NO_x$ SIP Call, 70 Fed. Reg. 25,162 (May 12, 2005) (to be codified at 40 C.F.R. pts. 51, 72–74, 77, 78 & 96).

[262] *Id*. at 21,165.

[263] North Carolina v. EPA, 531 F.3d 896, 929–30 (D.C. Cir. 2008).

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

[265] Andrew Childers, *EPA Contests Lawsuit Seeking to Change Method for Granting Allowances Under CAIR*, 41 ENV'T REP. (BNA) 359 (Feb. 19, 2010).

[266] Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals, 76 Fed. Reg. 48,208 (Aug. 8, 2011) (to be codified at 40 C.F.R. pts. 51, 52, 72, 78 & 97).

[267] Jessica Coomes, *OMB Reviewing Final Rule That May Expand Compliance with Cross-State Pollution Rule*, 42 ENV'T REP. (BNA) 2559 (Nov. 18, 2011); Bobby McMahon, *EPA Boosts Oklahoma Air Transport Rule Credits Due To Reliability Fears*, CLEAN AIR REP., Dec. 22, 2011, at 13.

[268] Jessica Coomes, *EPA Said to Consider Increasing Emission Budgets in Cross-State Rule*, 42 ENV'T REP. (BNA) 2231 (Oct. 7, 2011).

[269] *EPA Sends Final Rule Expanding Utility Emissions Trading Rule to OMB*, CLEAN AIR REP., Nov. 24, 2011, at 5; Bobby McMahon, *EPA Changes to Air Transport Rule Fail to Quell Industry, State Criticisms*, ENVTL. POL'Y ALERT, Oct. 19, 2011, at 9.

[270] Jessica Coomes, *State's Sulfur Dioxide Budget Would Rise 29 Percent Under EPA Proposal*, 42 ENV'T REP. (BNA) 2321 (Oct. 14, 2011).

opposition from states because EPA based the rules emissions budget reduction requirements on a state's "significant contribution," but some states were required to reduce emissions below their significant contribution while other states did not have mandated emission reductions that would eliminate their "significant contributions."[271] The CSAPR became the target of more than fifty lawsuits, which were consolidated in the D.C. Circuit as *EME Homer City Generation v. EPA*.[272] Many upwind states oppose the rule, but Mid-Atlantic and Northeastern states intervened in support of EPA.[273] August 21, 2012, the D.C. Circuit ruled that the transport rule exceeded EPA's authority and ordered EPA to continue to administer the less stringent 2005 CAIR. The court said the vacated rule required upwind states to reduce emissions by more than their "significant contribution" to downwind state's nonattainment. Moreover, EPA erroneously issued federal implementation plans when the states should have been given the opportunity to issue state plans.[274] However, while the electric power industry has been quick to challenge more stringent pollution control efforts, one-third of the nation's coal-fired power capacity has yet to install $SO_2$ scrubbers, which is a technology that has been available for more than thirty-five years.[275] Plants without scrubbers generate only 42 percent of the nation's electricity, yet produce 73 percent of the $SO_2$ emissions.[276]

### *F. Operating Permits*

Environmental organizations are seeking to force existing plants to close by challenging the renewal of CAA chapter V operating permits granted by the states and by seeking to enforce the provisions of existing operating permits.[277] EPA is also beginning to seek to limit GHG emissions in the negotiations during

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[271] Bobby McMahon, *EPA Faces Challenges to Key Definition Underpinning Air Transport Rule*, CLEAN AIR REP., Sept. 29, 2011, at 6.

[272] EME Homer City Generation, L.P. v. EPA, No. 11-1302 (D.C. Cir. filed Dec. 30, 2011), *available at* http://www.epa.gov/crossstaterule/pdfs/CourtDecision.pdf; *see EPA Transport Rule Faces Suits from More Than Half of Regulated States*, ENVTL. POL'Y ALERT, Oct. 19, 2011, at 11.

[273] Bobby McMahon, *Northeast States Vow to Curb Interstate Air Pollution "Once and for All"*, ENVTL. POL'Y ALERT, June 27, 2012, at 13.

[274] EME Homer City Generation, L.P. v. EPA, 2012 WL 3570721 (D.C. Cir. Aug. 21, 2012).

[275] Andrew Childers, *EPA's Sectorwide Rules for Power Plants Aim to Provide More Certainty for Industry*, 42 ENV'T REP. (BNA) 317 (Feb. 18, 2011).

[276] *Today in Energy Archive: Coal Plants Without Scrubbers Account for a Majority of U.S. Emissions*, U.S. ENERGY INFO. ADMIN. (Dec. 21, 2011), http://205.254.135.7/todayinenergy/detail.cfm?id=4410.

[277] Stuart Parker, *Activists Shift Legal Strategy to Force GHG Limits at Existing Coal Plants*, CLEAN AIR REP., Dec. 9, 2010, at 3; Tripp Baltz, *EPA to Review Permits for Coal-Fired Plants Issued by Colorado to Settle Citizen Lawsuit*, 41 ENV'T REP. (BNA) 2672 (Dec. 3, 2010). *See, e.g.*, N.Y. Public Interest Group v. Johnson, 427 F.3d 172 (2d Cir. 2005); Sierra Club v. EPA, 557 F.3d 401 (6th Cir. 2009).

enforcement actions involving traditional pollutants. For example, on February 4, 2010, EPA announced a consent decree with Conoco-Phillips to have methane controls at natural gas compressor stations and at wellheads.[278]

## IV. RESOURCE CONSERVATION AND RECOVERY ACT REQUIREMENTS

In addition to new regulations under the CAA, EPA seeks to control the more than 140 million tons of coal ash generated by the electric power industry.[279] This ash containing heavy metals includes fly ash, bottom ash, boiler slag, and flue gas desulfurization sludge.[280] The ash is sent to more than 1,000 ponds and landfills.[281] EPA data shows there are 181 "significant hazard coal ash dams in 18 states."[282] EPA is considering regulating coal ash as hazardous waste under the Resource Conservation and Recovery Act (RCRA).[283] A proposed rule promulgated on June 21, 2010,[284] includes two options: 1) regulating coal ash as hazardous waste under RCRA subtitle C, or 2) regulating coal ash as non-hazardous under RCRA subtitle D, but requiring existing impoundment ponds to install liners and landfills to have groundwater monitoring.[285] If the final rule treats coal ash as hazardous waste, according to EPA, the rule would cost an estimated $1,474 million a year to implement, but the additional cost would only be $587 million if the ash were regulated under RCRA's subtitle D.[286] In response, Congress considered legislation (H.R. 2273) that would prohibit EPA from regulating coal ash as hazardous waste.

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[278] Dawn Reeves, *EPA Region VIII Using Enforcement to Drive GHG Limits at Natural Gas Sites*, 21 CLEAN AIR REP., Mar. 4, 2010; *see also* Andrew Childers, *EPA Agrees to Review Operating Permit for Coal-Fired Power Plant, Settling Lawsuit*, 41 ENV'T REP. (BNA) 720 (Apr. 2, 2010).

[279] Pat Ware, *State Regulation of Coal Ash Weak, Fails to Protect Public Health, Report Says*, 42 ENV'T REP. (BNA) 1876 (Aug. 19, 2011).

[280] *Id*.

[281] *Id*.

[282] *Wisconsin Coal Ash Spill Prompts New Activist Calls for EPA Regulation*, ENVTL. POL'Y ALERT, Nov. 16, 2011, at 5.

[283] 42 U.S.C. § 6921 *et seq.* (2006).

[284] Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities, 75 Fed. Reg. 35,128 (proposed June 21, 2010) (to be codified at 40 C.F.R. pts. 257, 261, 264, 265, 268, 271 & 302.

[285] *See Coal Combustion Residuals—Key Differences Between Subtitle C and Subtitle D Options*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/epawaste/nonhaz/industrial/special/fossil/ccr-rule/ccr-table.htm (last updated Apr. 3, 2012).

[286] Avery Fellow, *Study: Coal Ash Rule Would Add $105 Billion to Cost of New Transportation Infrastructure*, 42 ENV'T. REP. (BNA) 2069 (Sept. 16, 2011); Charlotte E. Tucker, *Meetings at OMB on Coal Ash Proposal Reflect Complexity, Potential Impact of Rule*, 41 ENV'T REP. (BNA) 163 (Jan. 22, 2010); Dawn Reeves, *Despite Neutral Proposal, EPA Seen Preferring Hazardous Coal Ash Rules*, ENVTL. POL'Y ALERT, May 5, 2010, at 3.

The House approved this bill on October 14, 2011, in a 267 to 144 vote.[287] However, the bill is unlikely to survive the legislative process.[288] Democrats in the Senate are working to provide an alternative to the Republican-backed approach.[289]

## V. CLEAN WATER ACT REQUIREMENTS

Electric power plants are responsible for nearly half of the water withdrawn in the United States.[290] The Clean Water Act regulates thermal power plant cooling water intake structures to protect aquatic ecosystems.[291] On April 20, 2011, EPA promulgated proposed standards for cooling water intake structures that withdraw at least two million gallons of cooling water a day.[292] The proposed rule is applicable to an estimated 1,260 existing facilities, including about 670 power plants.[293] This rule is potentially one of the most costly of the regulatory rules pending for the electric power industry.[294] The rule favors the use of closed-cycle cooling systems that are utilized by 53 percent of the electric generating capacity in the U.S.[295] However, EPA decided to allow regulators to require the best available technology, which requires costs to be considered, rather than mandating closed-loop systems advocated by environmentalists.[296] On June 11, 2012, EPA published information on its cooling system regulations,[297] EPA plans to finalize the standards by June 27, 2013.[298]

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[287] *House Votes to Block EPA Coal Ash, Boiler Toxic Emissions Rules*, CLEAN AIR REP., Oct. 27, 2011, at 28.

[288] *Id*.

[289] Bobby McMahon, *Baucus Leading Imminent Democratic Push to Address EPA Coal Ash Rules*, ENVTL. POL'Y ALERT, Mar. 21, 2012, at 6.

[290] *Today in Energy Archive: Over Half the Cooling Systems at U.S. Electric Power Plants Reuse Water*, U.S. ENERGY INFO. ADMIN. (Nov. 17, 2011), http://205.254.135.7/todayinenergy/detail.cfm?id=3950.

[291] Clean Water Act § 316(b), 33 U.S.C. § 1326(b) (2006).

[292] National Pollutant Discharge Elimination System—Cooling Water Intake Structures at Existing Facilities and Phase I Facilities, 76 Fed. Reg. 22,174 (proposed Apr. 20. 2011) (to be codified at 40 C.F.R. pts. 122 & 125).

[293] *Id*.

[294] *Despite Industry Fear, EPA Readies Study on Cooling Water Rule's Benefits*, ENVTL. POL'Y ALERT, Feb. 9, 2011, at 17.

[295] U.S. ENERGY INFO. ADMIN, *supra* note 290.

[296] Nick Juliano, *EPA Utility Rules' Flexibility Could Ease Fears of Regulatory "Train Wreck"*, ENVTL. POL'Y ALERT, Apr. 6, 2011, at 40; John Heltman, *EPA Appears to Back Industry Bid to Ease Cooling Water Rule Compliance*, ENVTL. POL'Y ALERT, Nov. 2, 2011, at 28.

[297] National Pollutant Discharge Elimination System—Proposed Regulations, 77 Fed. Reg. 34,315 (June 11, 2012).

[298] *Cooling Water Intake Structures—CWA §316(b)*, U.S. ENVTL. PROTECTION AGENCY, http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/index.cfm (last updated June 24, 2012).

## VI. CONCLUSION

Environmental organizations have had considerable success at preventing new fossil-fueled facilities from being constructed by using environmental laws to delay or block permits from being issued. Moreover, the uncertainties surrounding the construction permit process and the time required to obtain a permit allow interveners to extract significant concessions from permit applicants in return for dropping a challenge.[299]

In 2007 fifty-nine proposed coal projects were canceled, abandoned, or put on hold, and twenty-five more were added in 2008.[300] In 2009, at least twenty-one plants were added to the list of proposed plants that are unlikely to be constructed, and seven electric power plants were going to be phased out.[301] In 2010, fifteen coal-fired power plant projects were canceled, abandoned, or put on hold.[302] This included Utah's Sevier Plant, which switched to natural gas, and the Green River plant, which appears unlikely to move forward.[303] Three more coal-burning plants were canceled in 2011.[304] On August 24, 2010, the Tennessee Valley Authority announced that nine of its fifty-nine coal-fired electricity-generating units were going to be retired.[305] This was subsequently expanded in a settlement agreement to require at least eighteen units to be retired.[306] American Electric Power on June 9, 2011, said it would retire 25 percent of its coal-fired generating capacity.[307] Duke Energy on August 11, 2011, said it was retiring 20 percent of its coal-fired capacity.[308] On October 4, 2011, Ameren Corporation announced it would close its generating facilities in Meredosia, Illinois and Hutsonville, Illinois primarily due to the cost of complying with the Cross-State Air Pollution Rule.[309]

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[299] *See* Reitze, *supra* note 24.

[300] *Coal Plants Cancelled in 2008*, SOURCEWATCH, http://www.sourcewatch.org/index.php?title=Coal_plants_cancelled_in_2008 (last modified May 25, 2012, 18:02).

[301] *Coal Plants Cancelled in 2009*, SOURCEWATCH, http://www.sourcewatch.org/index.php?title=Coal_plants_cancelled_in_2009 (last modified May 25, 2012, 18:02).

[302] *Coal Plants Cancelled in 2010*, SOURCEWATCH, http://www.sourcewatch.org/index.php?title=Coal_plants_cancelled_in_2010 (last modified May 25, 2012 18:03).

[303] *Id*.

[304] *Coal Plants Cancelled in 2011*, SOURCEWATCH, http://www.sourcewatch.org/index.php?title=Coal_plants_cancelled_in_2011 (last modified May 25, 2012, 18:03).

[305] Steven D. Cook, *TVA to Retire Nine Coal-Fired Generators, Plans Shift to Nuclear, Gas, and Efficiency*, 41 ENV'T REP. (BNA) 1928 (Aug. 27, 2011).

[306] Andrew M. Ballard, *Federal Court Gives Final Approval to TVA Pollution Control Settlement*, 42 ENV'T REP. (BNA) 1496 (July 8, 2011).

[307] Jessica Coomes, *AEP Says Compliance with EPA Rules Would Cut 25 Percent of Coal-Fired Capacity*, 42 ENV'T REP. (BNA) 1327 (June 17, 2011).

[308] Andrew M. Ballard & Bebe Raupe, *Duke Energy Plans to Retire 20 Percent of Coal-Fired Generating Capacity by 2015*, 42 ENV'T REP. (BNA) 1864 (Aug. 19, 2011).

[309] Christopher Brown, *Missouri Utility to Close Two Power Plants; Compliance with Cross-State Air Rule Cited*, 42 ENV'T REP. (BNA) 2233 (Oct. 7, 2011).

Dominion Virginia Power is considering closing its Chesapeake Energy Center and closing one unit at the Yorktown Power Station and converting the other unit to natural gas.[310] Dominion Resources announced it would close its State Line Generating Station in northwest Indiana early in 2012 because of environmental and economic considerations.[311] Other power companies that have coal-fired power plants, such as Southern Company and Detroit Edison expect to close down facilities in order to comply with EPA's rules.[312] However, the average age of the plants being retired is fifty-five years, and between 1999 and 2004 the electric power industry added 177 gW of new generating capacity, which is significantly more than the capacity being retired.[313] The U.S. Energy Information Administration (EIA) says that 49 gW of coal-fired electric generating capacity are likely to be retired by 2020.[314] This is one-sixth of the existing coal-fired electric capacity, but is only 5 percent of the nation's electric generating capacity. EIA expects 175 of the nation's 1,387 coal-fired generators to be retired between 2012–2016, which is four times greater than the retirements in the preceding five-year period.[315]

For decades Congress has allowed the electric power industry to avoid CAA requirements applicable to new or modified facilities by allowing existing plants to be "grandfathered." There are 340 gW of coal-fired electric power capacity in the U.S. Of this generating capacity, 103 gW have no environmental controls and 58 gW lack scrubbers to control mercury emissions.[316] Many of these old facilities have successfully avoided the imposition of the emission limitations applicable to new or modified facilities.[317] EPA's interstate transport rule and HAP rule, previously discussed, according to industry, could force 60 gW of the 340 gW of coal-fired electric power generation capacity to close and another 100 gW to make substantial new investment in order to comply.[318] However, the Congressional Research Service says only old, inefficient plants will close.[319] Nevertheless,

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[310] Jeff Day, *Dominion Eyes Renewable, Nuclear Energy, Fewer Coal Plants to Meet 2026 Demand*, 24 ENV'T REP. (BNA) 1982 (Sept. 9, 2011).

[311] Michael Bologna, *Dominion Announces Plans to Close Aging Indiana Coal-Fired Plant in 2012*, 42 ENV'T REP. (BNA) 2623 (Nov. 25, 2011).

[312] Dawn Reeves, *Coal Utilities' Closure Plans Signal Push to Extend EPA Rule Compliance*, CLEAN AIR REP., June 23, 2011, at 26.

[313] Andrew Childers, *Report Predicts Few Power Plant Closures from Pending EPA Transport, Toxics Rules*, 41 ENV'T REP. (BNA) 2838 (Dec. 31, 2010).

[314] *Projected Retirements of Coal-Fired Power Plants*, U.S. ENERGY INFORMATION ADMINISTRATION, (July 31, 2012), http://www.eia.gov/todayinenergy/detail.cfm?id=7330#.

[315] *27 Gigawatts of Coal-Fired Capacity to Retire over the Next Five Years*, U.S. ENERGY INFORMATION ADMINISTRATION, (July 27, 2012), http://www.eia.gov/todayinenergy/detail.cfm?id=7290.

[316] Andrew Childers, *Analysis Says EPA Emission Rules Could Shutter Coal-Fired Power Plants*, 41 ENV'T REP. (BNA) 2352 (Oct. 22, 2010).

[317] *See generally* Reitze, *supra* note 8, at 193.

[318] *Id*.

[319] Dawn Reeves, *CRS Report Seeks to Debunk Allegations of EPA Utility Rules "Train Wreck"*, ENVTL. POL'Y ALERT, Aug. 24, 2011, at 44; *see also* Dawn Reeves, *Utility*

retrofitting hundreds of power plants to comply with the new regulations discussed in this paper without compromising the reliability of the electricity delivery system will be a challenge.[320]

The pending rules that will impact the coal-fired electric power generators are creating a backlash because of their costs, the projected job losses,[321] and the potential adverse effect on the reliability of the electric grid.[322] For this reason, EPA's rules on emissions from electric power plants are the target of many members of the House and Senate.[323] The regulation of the electric power industry is part of the national political gridlock. Many Republicans as well as some coal-state Democrats are using the current recession as an excuse to prevent or roll back regulations to protect public health, while many Democrats seem unconcerned about the adverse impacts of costly environmental regulations. Moreover, the premise that stringent government regulation is responsible for the economic recession ignores the collapse of the housing bubble and the risky behavior of the financial services industry that resulted from too little effective regulation. Nations such as China, India, and Brazil, which have had high economic growth for the past five years, are countries that are considered to have far less business-friendly governments than the United States.[324] Nevertheless, protecting the environment while protecting jobs and the economy is a challenge that can be expected to dominate the discourse concerning environmental law.

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*Group Projects Fewer Closures over Longer Period from EPA Rules*, CLEAN AIR REP., Dec. 8, 2011, at 19.

[320] Stuart Parker, *EPA Utility Rules Prompt New Reliability Concern over Plant Retrofits*, CLEAN AIR REP., Dec. 8, 2011, at 21.

[321] *Lawmakers Cite Job Loss Claims in Opposition to Slew of EPA Air Rules*, ENVTL. POL'Y ALERT, Oct. 6, 2010, at 8.

[322] *Key Adviser Floats EPA-DOE Plan to Address Reliability Impacts of Rules*, ENVTL. POL'Y ALERT, Nov. 3, 2010, at 34.

[323] Dean Scott & Steven D. Cook, *EPA Greenhouse Gas, Air Pollution Rules Likely Targets if Republicans Take Over House*, 41 ENV'T REP. (BNA) 2381 (Oct. 22, 2010).

[324] *See* Stephen Gandel, *The Deregulation Myth. Ignore the Rhetoric: Nations with More Rules Grow Faster*, TIME, Nov. 14, 2011, at 14.