

FEDERAL CONTROL OF GREENHOUSE GAS EMISSIONS

By

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This Article discusses the efforts of the United States to control greenhouse gas (GHG) emissions, primarily carbon dioxide (CO₂), through international negotiations, new domestic legislation, and by using the Clean Air Act. The focus is on developments in 2009 and 2010. At the international level, the Article advocates limiting negotiation to the twenty nations responsible for eighty percent of the world's GHG emissions. The Article evaluates the major bills introduced in Congress dealing with climate change and concludes they are costly, complex, and intrusive income redistribution measures. The Article then discusses the use of existing laws in an extensive regulatory and litigation-driven effort to reduce CO₂ emissions.

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I. INTRODUCTION

Global atmospheric concentration of carbon dioxide (CO₂) in preindustrial times was about 280 parts per million (ppm); in 2009 it was 386.3 ppm.¹ From 2000 to 2007 the growth in CO₂ emissions was 3.5% per year.² In 2007 the increase in atmospheric CO₂ was 2.2 ppm, which is above the 2.0 ppm average annual increase for the previous decade.³ This increase in the concentration of CO₂ and other greenhouse gases (GHGs), primarily methane and nitrous oxide (NO_x) from anthropogenic sources, is believed to be making the planet warmer.⁴ Precursor gases—carbon monoxide, NO_x, and nonmethane volatile organic compounds—contribute indirectly to global warming.⁵ Sulfate aerosols, which are small particles or liquid droplets that often are produced by sulfur dioxide (SO₂) emissions, can affect the absorptive characteristics of the atmosphere and have a climate cooling effect.⁶ Several classes of halocarbons containing fluorine, chlorine, and bromine also are GHGs.⁷ These are known as chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, halons (which are halocarbon compounds containing bromine), and sulfur hexafluoride.

In 2008, United States CO₂ emissions were 5921.2 million metric tons (mmt).⁸ In addition, 567.6 mmt of methane CO₂ equivalent (CO₂e), 318.2 mmt of NO_x CO₂e, and much smaller amounts of the other GHGs were

¹ Carbon Dioxide Info. Analysis Ctr., Oak Ridge Nat'l Lab., Recent Greenhouse Gas Concentrations, http://cdiac.esd.ornl.gov/pns/current_ghg.html (last visited Nov. 20, 2010); see also Bert Bolin, *The Carbon Cycle*, SCI. AM., Sept. 1970, at 124, 131–32 (discussing the historical build up of atmospheric CO₂ levels and predicting future increases).

² Dean Scott, *Global Carbon Concentrations Accelerating at Almost Four Times Growth Rate of 1990s*, 39 Env't Rep. (BNA) 1967, at 1967 (Oct. 3, 2008). For a discussion of increased CO₂ concentrations in the atmosphere, see Leora Fair, *Carbon Dioxide, Methane Concentrations Increased in 2007, NOAA Index Shows*, 39 Env't Rep. (BNA) 853, at 853 (May 2, 2008).

³ Scott, *supra* note 2, at 1967.

⁴ See, e.g., F. Sherwood Rowland, *Atmospheric Changes Caused by Human Activities: From Science to Regulation*, 27 ECOLOGY L.Q. 1261, 1287 (2001) (explaining how greenhouse gases (GHGs) cause temperature increases).

⁵ U.S. ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2008, at 5–3 (2010), available at http://www.epa.gov/climatechange/emissions/downloads10/US-GHG-Inventory-2010_Report.pdf.

⁶ *Id.* at ES-2, 1–5.

⁷ *Id.* at 1–2.

⁸ *Id.* at ES-4 tbl.ES-2.

emitted.⁹ Since 1990 methane and NOx emissions have decreased, but CO2 emissions have increased by an annual average of 0.85%.¹⁰ CO2 emissions from fossil fuel combustion sources accounts for 94.16% of the total CO2 emissions.¹¹ Thus, fossil fuel combustion control is the focus of GHG control in the United States. Electric power generators produced 39.91% of the CO2 in 2008; the transportation sector produced 30.15%.¹² However, because GHG emissions diffuse quickly, the worldwide atmospheric concentration of these gases is nearly constant,¹³ thus an effective response must involve many nations.

II. THE INTERNATIONAL LEGAL RESPONSE TO CLIMATE CHANGE¹⁴

The 1992 the United Nations Conference on Environment and Development (UNCED), popularly known as “Earth Summit,” took place in Rio de Janeiro, Brazil, where 178 nations attended.¹⁵ The Rio meeting produced Agenda 21, an 800-page document divided into four sections and covering forty subjects, that was to be a blueprint for environmental and development policy for the coming decades.¹⁶ Most developed countries pushed an environmental agenda, but developing countries were primarily concerned with economic development. This dichotomy in the views of nations continues today, which makes agreement on the appropriate efforts to deal with climate change difficult.

The UNCED produced the Framework Convention on Climate Change (FCCC) to deal with climate change, which was the first international agreement to address climate change.¹⁷ Developed countries, including the United States, were to lower emissions of the GHGs that are not subject to the Montreal Protocol to 1990 levels by the year 2000 on a nonbinding basis.¹⁸ The FCCC does not classify GHGs as “pollutants” but defines them as

⁹ *Id.* at ES-5 to -6, tbl.ES-2.

¹⁰ *Id.* at ES-4 to -5, tbl.ES-2 (value calculated from tbl.ES-2).

¹¹ *Id.* at ES-4, tbl.ES-2 (value calculated from tbl.ES-2).

¹² *Id.* at ES-4, tbl.ES-2 (values calculated from tbl.ES-2). The 100 largest U.S. electric power producers own about 2200 power plants. They produce 89% of the nation's electricity and generate 87% of the sectors CO2 emissions. CHRISTOPHER VAN ATTEN ET AL., BENCHMARKING AIR EMISSIONS OF THE 100 LARGEST ELECTRIC POWER PRODUCERS IN THE UNITED STATES 1, 3 (June 2010), available at <http://www.nrdc.org/air/pollution/benchmarking/2008/benchmark2008.pdf>.

¹³ U.S. ENVTL. PROT. AGENCY, CLIMATE CHANGE INDICATORS IN THE UNITED STATES 14–17 (2010), available at http://www.epa.gov/climatechange/indicators/pdfs/ClimateIndicators_full.pdf.

¹⁴ The material in this Part is a synopsis of material covered in greater detail in Arnold W. Reitze, Jr., *Global Warming*, 31 *Envtl. L. Rep.* (Envtl. Law Inst.) 10,253, at 10,257–61 (Mar. 2001).

¹⁵ Nicholas A. Robinson, *Implementing Agenda 21 Internationally Through Environmental Law*, in *AGENDA 21: EARTH'S ACTION PLAN* xiv, xxi (Nicholas A. Robinson ed., 1993).

¹⁶ See United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3–14, 1992, *Agenda 21*, U.N. Doc.A/CONF.151/26/Rev.1 (Vol. I) Annex II (Jan. 1, 1993), available at <http://www.un.org/esa/dsd/agenda21/>.

¹⁷ United Nations Framework Convention on Climate Change, May 9, 1992, 1771 U.N.T.S. 107 (prescribing the commitments each country will make addressing climate change).

¹⁸ *Id.* art. 4(2)(b).

“those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and reemit infrared radiation.”¹⁹

The United States Senate unanimously approved the FCCC on October 7, 1992, with the understanding that the FCCC did not create legally binding targets or timetables for limiting GHG emissions and the Administration would not agree to amendments or protocols to the treaty that create a binding emissions reduction commitment without subsequent Senate approval.²⁰ President George H.W. Bush signed the treaty on October 13, 1992,²¹ and on March 21, 1994, the FCCC entered into force after the required fifty countries ratified it.²² By 2009 the FCCC had been ratified by 192 countries.²³

A. Evolution of the Framework Convention on Climate Change

After the FCCC entered into force, the Parties to the agreement began to meet each year to deal with climate change issues. In 1995, the first Conference of the Parties (COP) to the FCCC took place in Berlin. At the Second Conference of the Parties (COP-2) in Geneva, the United States for the first time indicated it was willing to have legally binding targets to cap CO₂ emissions in the United States.²⁴

The Third Conference of the Parties (COP-3), held December 1–10, 1997, in Kyoto, Japan, produced the Kyoto Protocol to the United Nations FCCC (Kyoto Protocol or Protocol). The Protocol divides nations into Annex I and non-Annex I countries.²⁵ The developed nations are designated Annex I nations, which includes the Organization for Economic Cooperation and Development (OECD) nations as of 1992, the nations of Eastern and Central Europe, and the European states of the former Soviet Union.²⁶ The non-Annex I nations are developing nations.²⁷ The Kyoto Protocol calls for GHG

¹⁹ *Id.* art. 1(5).

²⁰ ARNOLD W. REITZE JR., *AIR POLLUTION CONTROL LAW: COMPLIANCE AND ENFORCEMENT* 422 (2001).

²¹ JOHN R. JUSTUS & SUSAN R. FLETCHER, CONG. RESEARCH SERV., IB 89005, *GLOBAL CLIMATE CHANGE* 10 (2006).

²² Thomas E. Drennen, *Environmental Diplomacy: Negotiating More Effective Global Agreements by Lawrence E. Susskind* Oxford University Press, 1994, 201 pp., 2 IND. J. GLOBAL LEGAL STUD. 345, 347 (1994) (reviewing LAWRENCE E. SUSSKIND, *ENVIRONMENTAL DIPLOMACY: NEGOTIATING MORE EFFECTIVE GLOBAL AGREEMENTS* (1994)).

²³ United Nations Framework Convention on Climate Change, *Feeling the Heat*, http://www.unfccc.int/essential_background/feeling_the_heat/items/2913.php (last visited Nov. 20, 2010).

²⁴ Organization Summary, *Environmental Law Alliance Worldwide (E-LAW)*, 8 COLO. J. INT'L ENVTL. L. & POL'Y 127, 158 (1997).

²⁵ Kate M. Joyce, *U.S. Energy Policy Since September 2001*, 15 FORDHAM ENVTL. L. REV. 31, 40 (2004).

²⁶ Clare Breidenich et al., *The Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 92 AM. J. INT'L L. 315, 317 (1998).

²⁷ Caleb W. Christopher, *Success by a Thousand Cuts: The Use of Environmental Impact Assessment in Addressing Climate Change*, 9 VT. J. ENVTL. L. 549, 561 (2008) (explaining that non-Annex I nations are developing nations who report GHG inventories annually but are not

reductions from thirty-eight nations and the countries comprising the European Community that are the Annex I nations.²⁸ At Kyoto, the Annex I Parties agreed to reduce their anthropogenic CO₂ emissions of the six GHGs listed in Annex A by at least five percent below 1990 levels by 2008–2012.²⁹ The United States agreed to a seven percent reduction, the European Union agreed to an eight percent reduction, and Japan agreed to a six percent reduction of GHGs.³⁰ These reductions are to be implemented using domestic laws of the ratifying nations.³¹

Non-Annex I nations have no obligations to reduce emissions during the covered period that ends in 2012.³² Each developed nation determines how to measure its compliance and reports its emissions to international authorities.³³ Each developed nation may offset its emissions by expanding its forests or by using specified market mechanisms described below.³⁴ The goal of the Kyoto Protocol is to have developed nations reduce their use of fossil fuels, but there is no effective mechanism to assure compliance.³⁵ Many of the details concerning program development and compliance were left for future determination.³⁶

At the Fourth Conference of the Parties (COP-4) held in Buenos Aires in 1998, the United States signed the Kyoto Protocol.³⁷ However, because the Protocol was strongly opposed by many senators, the Clinton administration did not submit the Protocol to the Senate for ratification.³⁸ The Senate

currently required to make GHG reductions, while Annex II nations are a subset of Annex I nations, which must financially assist developing nations in meeting GHG reduction goals).

²⁸ See Kyoto Protocol to the United Nations Framework Convention on Climate Change, Annex B, Dec. 11, 1997, 2303 U.N.T.S. 214 (hereinafter Kyoto Protocol).

²⁹ *Id.* art. 3 (the GHGs are CO₂, methane, NO_x, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride).

³⁰ *Id.* art. 3, Annexes A & B.

³¹ *Id.* arts. 4, 6, 12, 17.

³² *Id.* art. 3.

³³ *Id.* arts. 5, 7.

³⁴ *Id.* art. 2; see *infra* note 36.

³⁵ *Id.* arts. 2.1.a, 2.2 & 17.

³⁶ See *id.* arts. 16–17. An important part of the Kyoto Protocol is the provisions for market-based mechanisms to reduce the developed nations' costs of meeting required emissions reductions. *Id.* art. 6. These "flexibility" mechanisms allow the transfer of greenhouse emission reduction obligations between nations to encourage reductions where costs are lowest. *Id.* arts. 6, 12, 16. There are three mechanisms: 1) joint implementation, which allows a developed country to sponsor a project in another developed country in return for part, or all, of the emission reduction credit that results from the project; 2) the clean development mechanism, which allows a developed country to finance emissions reductions in a developing country that is a Party to the Protocol in exchange for credit for the reduced emissions; 3) the international emissions trading system, which allows nations to buy or sell allowances to emit GHGs. *Id.* The details necessary to implement these market mechanisms were left for future clarification. See, e.g., Annie Petsonk, *The Kyoto Protocol and the WTO: Integrating Greenhouse Gas Emissions Allowance Trading into the Global Marketplace*, 10 DUKE ENVTL. L. & POL'Y F. 185, 190 (1999) (noting detailed rules regarding emission units were set to be elaborated and adopted in 2000).

³⁷ See Amy Royden, *U.S. Climate Change Policy Under President Clinton: A Look Back*, 32 GOLDEN GATE U. L. REV. 415, 455, 458 (2002).

³⁸ See Jonathan Remy Nash, *Null Preemption*, 85 NOTRE DAME L. REV. 1015, 1021–22 (2010) ("[I]t was with near unanimous senatorial opposition that President Clinton declined to submit

opponents' primary rationale for opposing the Protocol was the projected adverse economic costs of implementing its mandated GHG emissions limits.³⁹ Eighty-three countries plus the fifteen member states of the European Union signed the Protocol between March 16, 1998 and March 15, 1999 including all but two Annex I Parties, indicating their acceptance of the text and intent to become Parties.⁴⁰ To enter into force, the Protocol had to be ratified (or adopted, approved, or acceded to) by fifty-five Parties to the Convention, including Annex I Parties accounting for fifty-five percent of CO₂ emissions from this group in 1990.⁴¹ By May 2002, the European Union had ratified the Kyoto Protocol.⁴² On February 16, 2005, the Kyoto Protocol entered into force after Russia became the 127th nation to ratify the Protocol.⁴³

No major development occurred at the Fifth Conference of the Parties (COP-5) in 1999, in Bonn, Germany.⁴⁴ The Sixth Conference of the Parties (COP-6), which met in 2000 at The Hague, led to the Bonn Accords dealing with finances; the flexibility mechanisms; compliance; and land use, land-use change, and forestry.⁴⁵ At the 2001 Seventh Conference of the Parties (COP-7) meeting in Marrakesh, Morocco, the parties adopted the Marrakesh Accords, which concerned emission credits for various actions involving third parties, that were a compromise designed to placate Japan and Russia.⁴⁶ Japan refused to agree to legally binding consequences for

the Kyoto Protocol . . . for ratification." (footnotes omitted)). In July 1997, the United States Senate sent the unanimous Byrd-Hagel resolution to the Clinton Administration that stated the Senate would not ratify a protocol that did not require substantive third world participation or that would damage the U.S. economy. S. Res. 98, 105th Cong. (1997); *see also* Frank H. Murkowski, *The Kyoto Protocol Is Not the Answer to Climate Change*, 37 HARV. J. ON LEGIS. 345, 353-54 (2000) (outlining scope of Byrd-Hagel resolution). On October 20, 1999, President Clinton signed the Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Act, 2000, Pub. L. No. 106-74, 113 Stat. 1047 (1999), which contains the "Knollenberg" funding restriction that bars EPA from proposing or issuing rules, regulations, decrees, or orders to implement the Kyoto Protocol. *See id.* at 1080.

³⁹ Mitchell F. Crusto, *All That Glitters Is Not Gold: A Congressionally-Driven Global Environmental Policy*, 11 GEO. INT'L ENVTL. L. REV. 499, 511 (1999).

⁴⁰ Status of Ratification of the Kyoto Protocol, United Nations Framework Convention on Climate Change, http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php (last visited Nov. 21, 2010).

⁴¹ Kyoto Protocol, *supra* note 28, art. 25.

⁴² Press Release, European Union, European Union Ratifies the Kyoto Protocol (May 31, 2002), available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/02/794&format=PDF&aged=1&language=EN&guiLanguage=en>.

⁴³ JOHN R. JUSTUS & SUSAN R. FLETCHER, CONG. RESEARCH SERV., IB 89005, GLOBAL CLIMATE CHANGE 13 (2006).

⁴⁴ *See* Conference of the Parties to the Framework Convention on Climate Change, Oct. 25–Nov. 5, 1999, *Report of the Conference of the Parties on Its Fifth Session*, U.N. Doc. FCCC/COP/1999/6, para. 22 (Dec. 21, 1999), available at <http://www.ceeindia.org/greenhousegases/c5.pdf>.

⁴⁵ Jon Hanks et al., Int'l Inst. Sustainable Dev., *Summary of the Resumed Sixth Session of the Conference of the Parties to the UN Framework Convention on Climate Change: 16-27 July, 2001*, 12 EARTH NEGOTIATIONS BULL., July 30, 2001, at 1, 4–5, available at <http://www.iisd.ca/download/pdf/enb12176e.pdf>.

⁴⁶ Emily Boyd et al., Int'l Inst. Sustainable Dev., *Summary of the Seventh Conference of the Parties to the UN Framework Convention on Climate Change: 29 October–10 November 2001*,

noncompliance with a ratified Kyoto Protocol, and the consequences of noncompliance was left to be resolved in the future.⁴⁷ Negotiations concerning how best to implement the Kyoto Protocol continued in New Delhi, India in 2002, at the Eighth Conference of the Parties (COP-8), which produced the Delhi Declaration that reaffirmed development and poverty eradication were overriding priorities in developing countries, but it did not call for specific actions.⁴⁸

The Ninth Conference of the Parties (COP-9) in Milan, Italy, in 2003, did not result in an agreement on anything of significance.⁴⁹ The Tenth Conference of Parties (COP-10) in 2004 in Buenos Aires, Argentina, resulted in decisions on a variety of issues including land-use, forestry, and technology transfer.⁵⁰ It included plans to launch an emissions trading program in the European Union, which led to the European Countries creating the EU Emissions Trading System to regulate CO₂ emissions from about 12,000 facilities.⁵¹ The Eleventh Conference of the Parties (COP-11) to the FCCC and the First Meeting of the Parties to the Kyoto Protocol (MOP-1) were held in Montreal in 2005. The MOP-1 meeting of 157 countries (but not the United States or Australia), met with the COP-11 meeting of the 189 countries that participate in the FCCC. The conference ended with an agreement to begin discussions on post-2012 commitments and an agreement by the United States to participate in a dialogue on how to combat climate change.⁵²

12 EARTH NEGOTIATIONS BULL., Nov. 12, 2001, at 1, available at <http://www.iisd.ca/download/pdf/enb12189e.pdf>. The Accords emphasize that the three flexibility mechanisms—JI, an emissions trading system, and a CDM—do not create a “right, title or entitlement to emit” and parties must demonstrate that their use of the mechanisms is “supplemental to domestic action,” which must be “a significant element” for meeting each country’s target for emissions reductions. Nevertheless, the Accords do not impose limits on the extent to which the flexibility mechanisms can be used to meet emissions targets. CLIMATE CHANGE SECRETARIAT, A GUIDE TO THE CLIMATE CHANGE CONVENTION AND ITS KYOTO PROTOCOL, 27 (2002), available at <http://unfccc.int/resource/process/guideprocess-p.pdf>; see also Mary Anne Sullivan, *Kyoto Wasn’t Last Gasp Even Without the Protocol, Greenhouse Gas Regulation Is Coming Here*, LEGAL TIMES, June 10, 2002, at 30.

⁴⁷ *Kyoto Negotiators Reach 11th-Hour Accord; Pact Ready for Ratification by Governments*, 24 Int’l Env’t Rep. (BNA) 1009, at 1009 (Nov. 21, 2001).

⁴⁸ Emily Boyd et al., Int’l Inst. Sustainable Dev., *Summary of the Eighth Conference of the Parties to the UN Framework Convention on Climate Change: 23 October–1 November 2002*, 12 EARTH NEGOTIATIONS BULL., Nov. 4, 2002, at 1, 13, available at <http://www.iisd.ca/download/pdf/enb12209e.pdf>.

⁴⁹ María Gutiérrez et al., Int’l Inst. Sustainable Dev., *Summary of the Ninth Conference of the Parties to the UN Framework Convention on Climate Change: 1–12 December 2003*, 12 EARTH NEGOTIATIONS BULL., Dec. 15, 2003, at 1, 16, available at <http://www.iisd.ca/download/pdf/enb12231e.pdf>.

⁵⁰ Int’l Env’t Law Comm., *International Environmental Law: 2004 Annual Report*, in ENVIRONMENT, ENERGY AND RESOURCES LAW: THE YEAR IN REVIEW 2004, at 69, 70–71 (Marla E. Mansfield et al. ed., 2005).

⁵¹ Kyle W. Danish, *The Effect of the Kyoto Protocol on U.S. Companies*, 36 Trends (ABA), Mar.–Apr. 2005, at 8, 8.

⁵² Eric J. Lyman, *U.N. Conference Agrees to Open Discussions on What Will Follow Initial Five-Year Period*, 36 Env’t Rep. (BNA) 2565, at 2565 (Dec. 16, 2005); see also Eric J. Lyman, *Conference Participants Note Increasing Attention on Adaptation as Weather Worsens*, 36 Env’t

The Twelfth Conference of the Parties (COP-12) and the MOP-2 meetings took place in Nairobi, Kenya in 2006.⁵³ The participating countries pledged to review the effectiveness of the Kyoto Protocol in 2008 and take “final action” on several initiatives, including the establishment of an adaptation fund to help developing nations prepare for the effects of global warming.⁵⁴ The parties decided to defer action on whether carbon capture and storage technologies should be eligible under the clean development mechanism.⁵⁵

The Thirteenth Conference of the Parties (COP-13) and the Third Meeting of the Parties to the Kyoto Protocol (MOP-3) were held in December 2007 in Bali, Indonesia.⁵⁶ Australia had ratified the Kyoto Protocol, which left the United States as the only major industrialized nation that is not a party to the Protocol.⁵⁷ At the meeting, the European Union members continued to pressure the United States to make specific commitments to reduce GHG emissions, and the United States continued to resist.⁵⁸ The developing nations continued to seek more assistance in the form of technology and financial assistance.⁵⁹ A significant development was the agreement on the process to be used for the climate change adaptation fund that is administered by the Global Environment Facility with the World Bank acting as trustee.⁶⁰ The initial allocation to the fund was \$67 million that came from a two percent levy on transactions related to the Clean Development Mechanism, but it is far less than is needed to effectively deal with adaptation in the developing world.⁶¹ The meeting led to developing nations, for the first time, agreeing to consider taking “measurable, reportable and verifiable” mitigation actions.⁶²

Rep. (BNA) 2566, at 2567 (Dec. 16, 2005) (discussing EU suggestion that post-2012 adaptation should play a larger role relative to mitigation); Eric J. Lyman, *Agreement on Carbon Capture, Storage May Set Stage for Formal U.N. Recognition*, 36 Env't Rep. (BNA) 2567, at 2567–68 (Dec. 16, 2005) (describing agreement reached on points related to carbon capture and storage).

⁵³ SUSAN R. FLETCHER & LARRY PARKER, CONG. RESEARCH SERV., RL 33826, CLIMATE CHANGE: THE KYOTO PROTOCOL AND INTERNATIONAL ACTIONS 14 (2007).

⁵⁴ Dean Scott, *Delgates at U.N. Conference OK Review of Kyoto Protocol, Agree on Adaptation Fund*, 29 Int'l Env't Rep. (BNA) 909, at 909 (Nov. 29, 2006).

⁵⁵ *Id.* at 910.

⁵⁶ United Nations Framework Convention on Climate Change, United Nations Climate Change Conference in Bali, <http://unfccc.bali.org/unfccc/event/climate-change/cop-13-and-cop/mop-3.html> (last visited Nov. 21, 2010).

⁵⁷ United Nations Framework Convention on Climate Change, *supra* note 40.

⁵⁸ Richard Lloyd Parry, *US Rejects Climate Guidelines at Bali Conference*, TIMES (LONDON), Dec. 13, 2007, available at <http://www.timesonline.co.uk/tol/news/environment/article3042430.ece>.

⁵⁹ Andrew C. Revkin & Thomas Fuller, *Climate Plan Looks Beyond Bush's Tenure*, N.Y. TIMES, Dec. 16, 2007, at A1.

⁶⁰ Doug Obey, *Deal on Adaptation Funds Hailed as Key 'Breakthrough' of Bali Talks*, 18 CLEAN AIR REP. (Inside EPA), no. 26, Dec. 27, 2007, at 12, 12.

⁶¹ Daniel Pruzin, *Intergovernmental Panel Elects New Board, Adopts Program for Next Assessment Report*, 39 Env't Rep. (BNA) 1823, at 1823 (Sept. 12, 2008).

⁶² Conference of the Parties to the Framework Convention on Climate Change, Bali, Indon., Dec. 3–15, 2007, *Report on the Conference of the Parties on its Thirteenth Session, Part Two: Action Taken By the Conference of the Parties at its Thirteenth Session*, U.N. Doc. FCCC/CP/2007/6/Add.1 para. 1.b.ii (Mar. 14, 2008).

The content of a treaty to replace Kyoto after 2012 was the primary topic discussed at the Fourteenth Conference of the Parties (COP-14) and the Fourth Meeting of the Parties to the Kyoto Protocol (MOP-4), held at Poznan, Poland in December 2008. The Parties voted to make the adaptation fund operational beginning January 1, 2009.⁶³ They voted to update the technology transfer program, and they approved a forestry incentive program known as Reducing Emissions from Deforestation in Developing Countries (REDD).⁶⁴ The meeting failed to reach an agreement on whether to include carbon capture and sequestration in the Clean Development Mechanism.⁶⁵ Since the meeting was held in the last month of the Bush Administration, the important decisions concerning U.S. involvement were left for the 2009 meeting.⁶⁶ The Parties hoped a new agreement to replace the Kyoto Protocol would be concluded at the Fifteenth Conference of the Parties (COP-15) and the Fifth Meeting of the Parties to the Kyoto Protocol (MOP-5) to be held in Copenhagen, Denmark on December 7–18, 2009.

At the Fifteenth Conference of the Parties (COP-15) and the Fifth Meeting of the Parties to the Kyoto Protocol (MOP-5) in Copenhagen, December 7–18, 2009, negotiators attempted to finalize a new agreement dealing with mitigation, adaptation, technology, and finance. The United States announced it would agree to a target of a seventeen percent reduction in GHG emissions by 2020 from 2005 levels, which was significantly less than other developed nations were advocating.⁶⁷ China would not agree to cuts, but said it would reduce its carbon intensity, although this would allow its emissions to increase.⁶⁸

Carbon intensity is the ratio of CO₂ emissions to economic output. Carbon intensity is the amount of CO₂, expressed in metric tons (mt), released per thousand U.S. dollars of gross domestic product (GDP).⁶⁹ It is not related to CO₂ emissions per capita. Developing nations often have high carbon emissions per dollar of GDP and low carbon emissions per capita. The carbon intensity in 2006 ranged from 6.77mt in Ukraine, 6.27mt in Uzbekistan, 4.83mt in Iran to 2.85mt in China, 1.80mt in India, 0.24 mt in Japan, and 0.52mt in the United States.⁷⁰ If the developing countries expand their GDP, the potential increase in carbon emissions is tremendous, but while their increased emissions would seriously impact the world's climate

⁶³ Eric J. Lyman, *Climate Change Talks End with Mandate to Draft Next 'Kyoto,' but Many Goals Unmet*, 39 Env't Rep. (BNA) 2492, at 2492 (Dec. 19, 2008).

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ Dean Scott et al., *Negotiators Hope U.N. Talks in Poland Will Yield Draft Text for Post-Kyoto Deal*, 39 Env't Rep. (BNA) 2382, at 2383–84 (Nov. 28, 2008).

⁶⁷ Dean Scott & Eric J. Lyman, *As Hope for Binding Climate Deal Fades, Copenhagen Aims to Be Springboard to 2010*, 40 Env't Rep. (BNA) 2733, at 2733 (Nov. 27, 2009).

⁶⁸ *Id.* at 2734.

⁶⁹ Daniel Abebe & Jonathan S. Masur, *International Agreements, International Heterogeneity, and Climate Change: The "Two Chinas" Problem*, 50 VA. J. INT'L L. 325, 360 (2010).

⁷⁰ ENERGY INFO. ADMIN., INTERNATIONAL ENERGY ANNUAL 2006, at tbl.H.1gco2 (2008), available at <http://www.eia.doe.gov/iea/carbon.html> (click on "H.1gco2" link).

their emissions intensity could decrease.⁷¹ China's support of a carbon intensity reduction is similar to the 2002 proposal by President George W. Bush in his Clear Skies and Global Climate Change Initiative,⁷² which called for a voluntary effort to reduce carbon intensity eighteen percent by 2012.⁷³

This was not an important proposal because in the United States carbon intensity peaked in 1917 and has declined an average of 1.5% per year without governmental effort.⁷⁴ U.S. CO₂ emissions decreased from 533,000mt per \$1 billion of economic output in 1997 to 426,000 mt per \$1 billion in 2007, adjusted for inflation.⁷⁵ Thus, doing nothing while pretending to be concerned for the environment has been a response to environmental problems at both the domestic and international level of government.

COP-15 ended without an agreement. The negotiations were hampered by strong disagreements among developed and developing nations. Three oil-producing nations—Bolivia, Nicaragua, and Venezuela—were identified as working to prevent an agreement.⁷⁶ The only result of any significance was a nonbinding accord⁷⁷ reached by the United States, China, India, Brazil, and South Africa that was then subject to input from about two-dozen world leaders that won formal recognition as a political (but not legal) agreement.⁷⁸ The accord was opposed by many Group 77 (G-77) nations, which are developing countries.⁷⁹ It calls for limiting the global temperature rise to below two degrees Celsius, a commitment by developed countries to help

⁷¹ See KEVIN A. BAUMERT ET AL., WORLD RES. INST., NAVIGATING THE NUMBERS: GREENHOUSE GAS DATA AND INTERNATIONAL POLICY 27 (2005); see also Christopher Flavin, *Slowing Global Warming*, in STATE OF THE WORLD 1990, at 19 (Linda Starke ed., 1990) (discussing declining energy intensities in many national economies); Jonathan Watts, *China Means Business with First-Ever Carbon Emissions Targets*, ENVIRONMENT BLOG (Nov. 27, 2009 12:15 GMT), <http://www.guardian.co.uk/environment/blog?page=25> (noting that China's carbon intensity reduction targets slows the rate of carbon emission growth but does not reduce emission levels).

⁷² Compare Scott & Lyman, *supra* note 67, at 2734, with Press Release, The White House, President Announces Clear Skies & Global Climate Change Initiatives (Feb. 14, 2002), available at <http://georgewbush-whitehouse.archives.gov/news/releases/2002/02/print/20020214-5.html>.

⁷³ JUSTUS & FLETCHER, *supra* note 43, at 8; see also Climate VISION, Welcome to Climate VISION, <http://www.climatevision.gov> (last visited Nov. 21, 2010) (discussing the government's climate change policy); U.S. Dep't of State, Climate Change, <http://www.state.gov/g/oes/climate/index.htm> (last visited Nov. 21, 2010) (discussing the U.S. Department of State's global climate change policy).

⁷⁴ David G. Victor, Editorial, *Weak on Warming*, WASH. POST, Feb. 19, 2002, at A15.

⁷⁵ Leora Falk, *Report Says More Energy-Efficient Economy Led to Smaller Increase in Carbon Emissions*, 41 Env't Rep. (BNA) 938, at 938 (Apr. 30, 2010).

⁷⁶ Stephen Gardner, *EU to Continue With Climate Goals, Denies Being Sidelined in Copenhagen Negotiations*, 41 Env't Rep. (BNA) 45, at 45 (Jan. 1, 2010).

⁷⁷ See Conference of the Parties to the Framework Convention on Climate Change, Copenhagen, Den., Dec. 7–19, 2009, *Part Two: Action Taken by the Conference of the Parties at Its Fifteenth Session*, U.N. Doc. FCCC/CP/2009/11/Add.1 (2009), available at <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf>.

⁷⁸ Eric J. Lyman & Dean Scott, *Delegates Reach Agreement in Copenhagen but Look to 2010 for Resumption of Talks*, 41 Env't Rep. (BNA) 40, at 40 (Jan. 1, 2010); Steven D. Cook, *China, India Agree to Attach Their Names to Copenhagen Greenhouse Accord*, 41 Env't Rep. (BNA) 543, at 543 (Mar. 12, 2010).

⁷⁹ Lyman & Scott, *supra* note 78, at 40.

developing countries with mitigation actions, and developing measurement, reporting and verification guidelines, but there are no mandates.⁸⁰ The accord has no GHG reduction targets. Each country is to develop reduction targets using 1990 or 2005 as a baseline.⁸¹ The accord calls for a \$30 billion fund to support mitigation efforts in poor countries between 2010 and 2012, and the fund is to increase to \$100 billion a year by 2020,⁸² but no source of the money is identified. As of late July 2010 the fund had \$21 million, which came primarily from the levy on Clean Development Mechanism projects.⁸³ President Obama pledged to reduce GHG emissions by seventeen percent from a 2005 baseline by 2020, but his pledge is not binding on Congress.⁸⁴ The efforts to negotiate a new agreement to replace Kyoto will continue with the Sixteenth Conference of the Parties (COP-16) scheduled to meet in Cancun, Mexico, November 29 to December 10, 2010.⁸⁵

B. The Weaknesses of the International Law Approach

Population growth and an increased standard of living are the major factors contributing to higher atmospheric CO₂ concentrations.⁸⁶ World CO₂ emissions from fossil fuel combustion have more than quadrupled since 1950,⁸⁷ and the world's population has increased 268% since 1950.⁸⁸ Population stabilization should be an important component of any program that attempts to deal with climate change issues, but a policy to stabilize the

⁸⁰ Elliot Diringer et al., Pew Center on Global Climate Change, Summary: Copenhagen Climate Summit, <http://www.pewclimate.org/international/copenhagen-climate-summit-summary> (last visited Nov. 21, 2010).

⁸¹ See Scott Barrett, *Copenhagen: Yet Another Giant Beginning with an Uncertain End*, YALE GLOBAL ONLINE, Dec. 21, 2009, <http://yaleglobal.yale.edu/content/copenhagen-yet-another-giant-beginning-uncertain-end> (discussing how the Accord allows countries to select a base year); United Nations Framework Convention on Climate Change, Appendix I – Quantified Economy-Wide Emissions Targets for 2020, <http://unfccc.int/home/items/5264.php> (last visited Nov. 21, 2010) (listing base years for Annex I parties).

⁸² Diringer et al., *supra* note 80.

⁸³ Eric J. Lyman, *EU Says Wealthy Nations Should Submit Formal Climate Aid Pledges to United Nations*, 41 Env't Rep. (BNA) 1759, at 1759 (Aug. 6, 2010).

⁸⁴ John M. Broder, *Obama Offers Targets to Cut Greenhouse Gas*, N.Y. TIMES, Nov. 26, 2011, at A1.

⁸⁵ Nacha Cattani, *Top U.N. Climate Official Says Future Accord Could Affect Limited Countries' Commitments*, 41 Env't Rep. (BNA) 1639 (July 23, 2010); Eric J. Lyman, *De Boer Says Climate Change Treaty Unlikely to Be in Place Until Late 2011*, 41 Env't Rep. (BNA) 783, at 783 (Apr. 9, 2010); Eric J. Lyman et al., *In Aftermath of Copenhagen Conference, Delegates Say It Is Time to Rethink U.N. Role*, 41 Env't Rep. (BNA) 44, at 44 (Jan. 1, 2010); Dean Scott & Eric J. Lyman, *Expectations Scaled Back for Mexico Talks in Hopes of Avoiding Replay of Copenhagen*, 41 Env't Rep. (BNA) 372, at 372 (Feb. 19, 2010).

⁸⁶ Arnold W. Reitze, Jr., *Federal Control of Carbon Dioxide Emissions: What Are the Options?*, 36 B.C. ENVTL. AFF. L. REV. 1, 72 (2009).

⁸⁷ See Carbon Dioxide Info. Analysis Ctr., Global Fossil Fuel Carbon Emissions – Graphics, <http://cdiac.ornl.gov/trends/emis/glo.html> (last visited Nov. 21, 2010).

⁸⁸ Negative Population Growth, Total Midyear World Population: 1950-2050, http://www.npg.org/facts/world_pop_year.htm (last visited Nov. 21, 2010) (showing that world population in 1950 was 2,555,982,611 and is estimated to be 6,840,423,256 in 2010. The annual increase in 2010 is estimated at 75,755,042).

United States or the world's population is not usually part of the discussion of GHG emissions reduction.⁸⁹

Developed nations (Annex I nations) contributed about seventy-two percent of the total accumulated CO₂ in the atmosphere due to releases between 1950 and 2000.⁹⁰ However, the percentage of the world's CO₂ emissions contributed by the United States and other Annex I nations is declining because developing nations are expanding both their populations and per capita use of energy. The United States, which in 2006 moved from the world's largest CO₂ contributor to second place, behind China, is the third most populated nation; with 4.54% of the world's population it uses 21% of the world's energy. It emits 20.22% of the world CO₂,⁹¹ and 19% of the world's GHGs.⁹² The United States emitted 19.78mt of CO₂ per person in 2006; China emitted 4.58mt and Brazil 2.01mt.⁹³ However, much of sub-Saharan Africa had per capita CO₂ emissions of less than 0.5mt and Chad had per capita emissions of 0.02mt.⁹⁴ Qatar had per capita emissions of 61.19mt and the United Arab Emirates had emissions of 35.05mt, but nearby Yemen had per capita CO₂ emissions of 0.84mt.⁹⁵ In 2000 developing countries were responsible for 39% of the GHG emissions released by the top 20 emitters.⁹⁶ The role of developing countries is somewhat larger if you calculate carbon emissions to include emissions attributable to land use changes. Industrialized countries were responsible for 48.4% of the CO₂ emissions, based on fossil fuel combustion emissions in 2000, but they were responsible for only 39.2% if GHG emissions in CO₂ equivalents include estimates of GHG releases based on changes in land use.⁹⁷

A major weakness of the Kyoto Protocol is its failure to address the growth in emissions from developing countries, including China, India, and

⁸⁹ Arnold W. Reitze, Jr., *Population, Consumption and Environmental Law*, 12 NAT. RESOURCES & ENV'T, no. 1, Summer 1997 at 89, 89.

⁹⁰ LARRY PARKER & JOHN BLODGETT, CONG. RESEARCH SERV., RL 32721, GREENHOUSE GAS EMISSIONS: PERSPECTIVES ON THE TOP 20 EMITTERS AND DEVELOPED VERSUS DEVELOPING NATIONS 3 (2008), available at <http://www.fas.org/sgp/crs/misc/RL32721.pdf>.

⁹¹ See *id.* at 5 (noting that share of emissions attributed to Annex I countries is declining); U.S. ENERGY INFO. ADMIN., TOTAL CARBON DIOXIDE EMISSIONS FROM THE CONSUMPTION OF ENERGY (MILLION METRIC TONS) (2010), available at <http://tonto.eia.doe.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=90&pid=44&aid=8> (click "Download Excel") (noting that China surpassed the United States in total CO₂ emissions from the consumption of fossil fuels in 2006); U.S. ENERGY INFO. ADMIN., WORLD PRIMARY ENERGY CONSUMPTION (BTU), 1980-2006 (2010), available at <http://www.eia.doe.gov/pub/international/iealf/tablee1.xls> (noting U.S. percentage of total energy consumption in 2006); Cent. Intelligence Agency, Country Comparison: Population, The World Fact Book, <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2119rank.html> (Nov. 20, 2010) (indicating that the United States is the third largest country in the world by population and providing population break down by country).

⁹² PARKER & BLODGETT, *supra* note 89, at 4.

⁹³ ENERGY INFO. ADMIN., *supra* note 70, at tbl.H.1cco2, (click on "H.1cco2" link).

⁹⁴ *Id.* (calculating from data); U.S. Dep't of State, Countries and Other Areas, <http://www.state.gov/p/af/ci/index.htm> (last visited Nov. 21, 2010) (noting what countries constitute "Sub-Saharan").

⁹⁵ ENERGY INFO. ADMIN., *supra* note 70, at tbl.H.1cco2, (click on "H.1cco2" link).

⁹⁶ PARKER & BLODGETT, *supra* note 90, at 5.

⁹⁷ See *id.* at 4 n.14, 8.

Brazil, which are major contributors of GHGs and are economic competitors of the United States. The Kyoto Protocol encourages business migration, known as “leakage,” to non-Annex I countries because they have no CO₂ reduction requirements. China is the world’s most energy-consuming nation and was responsible for 20.61% of the world’s CO₂ emissions from fossil fuels in 2006.⁹⁸ World CO₂ emissions from the use of fossil fuels increased by 5.185 billion mt from 2000 to 2006; China was responsible for 58.85% of this increase.⁹⁹ China’s energy use grew by 71.5% in five years (2001–2006), which is a per annum increase of 11.4%.¹⁰⁰ In the same five years, China’s electric power generating capacity and its coal consumption nearly doubled.¹⁰¹ There were 650 new coal-fired power plants being built in China and India in 2005, and their projected emissions will exceed all the reductions required by Kyoto, if the Protocol was actually implemented, which is not the case.¹⁰² China’s petroleum consumption increased from 4.80 million barrels per day (mb/d) in 2000 to 7.57 mb/d in 2007.¹⁰³ China’s increase represents nearly one-third of the world’s increase in petroleum consumption from 2003 through 2007, although its consumption is only 42.5% of U.S. consumption.¹⁰⁴ In 1990 China had 1.622 million registered vehicles, in 2007 there were 13.758 million registered vehicles, which constitutes an annual 10.3% increase since 1997.¹⁰⁵ China has become the second largest manufacturer of motor vehicles, after Japan, and in 2008 it produced 9,345,101 vehicles, while the United States produced 8,705,239 vehicles.¹⁰⁶ Thus, any international agreement that does not impose limits on China’s emissions is unlikely to find support from the United States Senate.

⁹⁸ AUSTRALIAN CHAMBER OF COMMERCE & INDUSTRY, A MULTILATERAL SOLUTION TO CLIMATE CHANGE IS VITAL 2 (2008), available at http://www.acci.asn.au/text_files/ACCI_PolicyReview/2008/APRIssue6_June08.pdf (discussing the migration of economic activity to developing countries); ENERGY INFO. ADMIN., *supra* note 70, at tbl.H.1co2, (click on “H.1co2” link) (calculating from data); Press Release, The White House, President Bush Discusses Global Climate Change (June 11, 2001), <http://georgewbushwhitehouse.archives.gov/news/releases/2001/06/print/20010611-2.html> (citing the general and economic unfairness of the Kyoto Protocol in exempting developing nations like China and India from emission standards).

⁹⁹ ENERGY INFO. ADMIN., *supra* note 70, at tbl.H.1co2, (click on “H.1co2” link) (calculating from data).

¹⁰⁰ Peter Sheehan & Fiona Sun, *Energy Use in China: Interpreting Changing Trends and Future Directions* 1 (Ctr. for Strategic Econ. Studies, Climate Change Working Paper No. 13, 2007), available at http://www.cfses.com/documents/climate/13_Sheehan_Sun_Energy_Use_China.pdf.

¹⁰¹ *Id.* at 4.

¹⁰² Margaret J. Kim & Robert E. Jones, *China’s Energy Security and the Climate Change Conundrum*, 19 NAT. RESOURCES & ENV’T, Winter 2005 at 3, 7; Fareed Zakaria, Editorial, *In Search of a Better Kyoto*, WASH. POST, April 9, 2007, at A13.

¹⁰³ Energy Info. Admin., Table 11.10 World Petroleum Consumption, 1960–2008, <http://www.eia.doe.gov/emeu/aer/txt/ptb1110.html> (last visited Nov. 21, 2010).

¹⁰⁴ *Id.* (calculated from the data).

¹⁰⁵ STACY C. DAVIS, SUSAN W. DIEGEL & ROBERT G. BOUNDY, U.S. DEP’T OF ENERGY, TRANSPORTATION ENERGY DATA BOOK 3-2 tbl.3.1 (2009), available at <http://www.kerstech.com/PDFs/Transportation%20Energy%20Data%20Book%202009.pdf>.

¹⁰⁶ INT’L ORG. OF MOTOR VEHICLE MFRS., WORLD MOTOR VEHICLE PRODUCTION BY COUNTRY AND TYPE 2007–2008, available at <http://oica.net/wp-content/uploads/all-vehicles.pdf>.

The Kyoto Protocol is far more onerous for the United States than for Europe. The Protocol calls for emission reductions from a 1990 base year. Because of the declining economy of the former Soviet Union countries and East Germany, Europe can comply with its obligations by reducing emissions by a few percent.¹⁰⁷ Since 1990 the U.S. population has increased by more than 60 million people.¹⁰⁸ The combined population increase of the other Group of Eight (G-8) developed nations is only about one-third of the U.S. increase.¹⁰⁹ Because there are no effective penalties for a nation's failure to meet the emissions reductions found in the Kyoto Protocol, nations are relatively free to ignore the agreement. Moreover, a nation has considerable freedom to consider how it will monitor and report emissions. The difficulty in obtaining accurate monitoring data and in assuring compliance may lead to programs that do not produce actual reductions. If the United States joins the Protocol, or its successor, it will have to enact domestic legislation to implement its obligations. The laws and the associated regulations will be subject to citizen challenge and perhaps to subsequent citizen suits to ensure compliance. The U.S. government will be under considerable legal and political pressure to meet the Protocol's target even if it is the only nation complying. The adverse impact on the U.S. economy could be substantial without an offsetting significant environmental benefit.

Global GHG emissions from anthropogenic sources increased 26% from 1990 to 2005, and CO₂ emissions, which comprise almost three-fourths of the total, increased 31%.¹¹⁰ U.S. GHG emissions increased 14% from 1990 to 2008, and CO₂ emissions increased 16%.¹¹¹ Between 1995 and 2000 global GHG emissions increased by over 6% annually; from 2000 to 2005 the annual increase was 15%, according to the European Commission.¹¹² The United States Department of Energy (DOE), however, reports a much lower increase in world CO₂ emissions from the use of fossil fuel of 21.59% from 2000 through 2006.¹¹³ The more significant change is the impact of the industrializing nations. From 2005 to 2006 the developed nations that comprise the OECD had their energy-related CO₂ emissions decrease by

¹⁰⁷ Robert O. Mendelsohn, *An Economist's View of the Kyoto Climate Treaty*, NAT'L PUB. RADIO ONLINE, Feb. 18, 2005, <http://www.npr.org/templates/story/story.php?storyId=4504298> (last visited Nov. 21, 2010).

¹⁰⁸ This figure is based on a U.S. population in 1990 of 249 million and a September 2010 estimated population of 310 million. *Compare* Nationmaster, People Statistics: Population (1990) by Country, http://www.nationmaster.com/graph/peo_pop-people-population&date=1990 (last visited Nov. 21, 2010), *with* U.S. Census Bureau, U.S. & World Population Clock, <http://www.census.gov/population/www/popclockus.html> (last visited Nov. 21, 2010).

¹⁰⁹ *Compare* Nationmaster, *supra* note 108, *and* U.S. Census Bureau, *supra* note 108, *with* HistoryCentral.com, Nation By Nation Almanac, <http://www.nationbynation.com> (last visited Nov. 21, 2010) (providing data for the other G-8 nations, Canada, France, Germany, Italy, Japan, Russia, and the United Kingdom).

¹¹⁰ U.S. ENVTL. PROT. AGENCY, *supra* note 13, at 4.

¹¹¹ *Id.* at 11.

¹¹² Stephen Gardner, *Global Greenhouse Gas Emissions Increased 15 Percent from 2000–2005*, *EU Data Show*, 40 Env't Rep. (BNA) 1242, at 1242 (May 29, 2009).

¹¹³ Calculated using statistics published by the United States Department of Energy (DOE). ENERGY INFO. ADMIN., *supra* note 70, at tbl.H.1co₂, (click on "H.1co₂" link).

0.3%, but the non-OECD nations grew by 5.2%.¹¹⁴ From 2006 to 2030 it is projected that emissions from OECD nations will average an annual increase of 0.3%, which is one-seventh the projected non-OECD annual emissions increase of 2.2%.¹¹⁵ China is projected to have an average annual growth in energy-related CO₂ emissions of 2.8% from 2006 to 2030, and the rest of Asia is projected to increase its emissions at 2.7%, while Brazil is projected at 2.5% and India at 2.1% annually.¹¹⁶ In 2030 China is expected to account for 29% of the world's carbon emissions.¹¹⁷

Trying to reform the Kyoto Protocol is unlikely to work. It is time to adopt a new approach. It makes little sense to negotiate with 170 countries in an effort to reach a consensus when twenty countries are responsible for nearly eighty percent of the CO₂ emissions,¹¹⁸ and only eight countries plus the European Union contribute two percent or more of the world's CO₂ emissions.¹¹⁹ We need to seriously engage the nations that are responsible for most of the emissions, now and in the future. At the same time, the United States should be making a serious effort to reduce the importance of fossil fuel to the U.S. economy in a manner that protects and enhances our nation's environment and economy.

III. U.S. DOMESTIC LEGISLATIVE PROPOSALS

International efforts to address climate have not been effective and even if such an approach leads to a meaningful agreement, domestic legislation will be needed to implement such an agreement. For almost twenty years, advocates for a government program to deal with climate change have pursued both the international approaches, discussed above, and worked to enact new domestic legislation that is the subject of this section. In the past decade a consensus slowly developed that the use of cap-and-trade programs to control carbon emissions is the approach to pursue.¹²⁰ However, there is strong disagreement, particularly by Republicans, over whether legislation is needed, and if needed whether it should include economic penalties on the use of fossil fuel. Opposition also

¹¹⁴ U.S. DEP'T OF ENERGY, INTERNATIONAL ENERGY OUTLOOK 2009, at 109 (2009), *available at* <http://www.eia.doe.gov/oiaf/archive/ieo09/index.html> (click on "Chapter 8. Energy-Related Carbon Dioxide Emissions").

¹¹⁵ *Id.* at 111 tbl.15.

¹¹⁶ *Id.* at 112 fig.84.

¹¹⁷ *Id.* at 110.

¹¹⁸ The top 20 emitters of CO₂ in 2006, in the order of their emissions, were China, United States, Russian Federation, India, Japan, Germany, United Kingdom, Canada, South Korea, Italy, Islamic Republic of Iran, Mexico, South Africa, France, Saudi Arabia, Australia, Brazil, Spain, Indonesia, and Ukraine. *See* ENERGY INFO. ADMIN., *supra* note 70, at tbl.H.1co2 (click on "H.1co2" link).

¹¹⁹ *See id.* Some efforts in this direction occurred when on July 8, 2009, the G-8 agreed to reduce their GHG emissions by 80% by 2050, although they did not specify the baseline or promise any specific reductions. Eric J. Lyman, *Major Economies Vow to Limit Increase in Temperature, but Omit Emissions Target*, 40 Env't Rep., (BNA) 1631, at 1631-32 (July 10, 2009).

¹²⁰ Pew Ctr. for Global Climate Change, *Climate Action in Congress*, http://www.pewclimate.org/what_s_being_done/in_the_congress (last visited Nov. 21, 2010).

is based on concerns over how such a program will be administered and how the revenue generated by a cap-and-trade program will be utilized. These concerns prevent bipartisan agreement.

Since 2007 numerous bills before Congress addressed climate change, but nothing of importance survived the legislative process.¹²¹ The only bill to have been passed by either the House of Representatives or the Senate is H.R. 2454, but a similar Senate bill (S. 1733) seemed unlikely to receive the necessary votes to become law as of July 2010.¹²² If any legislation is enacted in 2010 it will probably be limited to electric power and will not include economic penalties. These bills, which are discussed briefly below, most likely will be the basis for future legislative efforts.¹²³

A. H.R. 2454 & S. 1733

Representative Henry Waxman (D-Cal.), the chairman of the House Energy and Commerce Committee, and the chairman of its subcommittee, Representative Edward Markey (D-Mass.), introduced H.R. 2454, the American Clean Energy and Security Act of 2009 (ACES) (a.k.a. the Waxman-Markey bill) on May 15, 2009.¹²⁴ After numerous amendments, the House, on June 26, 2009, approved the 1200 page H.R. 2454 by a vote of 219 to 212.¹²⁵ Since then, climate change legislation has been in limbo because the proponents of climate change legislation have been unable to secure the votes necessary to pass a bill in the Senate.

In the Senate, the Environment and Public Works Committee Chairman, Senator Barbara Boxer (D-Cal.), and Senator John Kerry (D-Mass.) on September 30, 2009, introduced the Clean Energy Jobs and American Power Act (S.1733),¹²⁶ which is similar to H.R. 2454. A modified S. 1733 was reported out of the Environment and Public Works Committee by a vote of 11-1, with no Republican support.¹²⁷ On February 2, 2010, it was placed on

¹²¹ See Reitze, *supra* note 86, at 26 (describing climate change legislative proposals before 2008).

¹²² Bryan Walsh, *Cap and Trade Is Dead (Really, Truly, I'm Not Kidding). Who's to Blame?*, TIME ECOCENTRIC BLOG (July 22, 2010, 7:15 PM), <http://ecocentric.blogs.time.com>.

¹²³ See Arnold W. Reitze, Jr., *Electric Power in a Carbon Constrained World*, 34 WM. & MARY ENVTL. L. & POL'Y REV. 821, 910-14 (2010) (discussing the efforts in the House to enact H.R. 2454 and S. 1733).

¹²⁴ H.R. REP. NO. 111-137, pt. 1, at 277 (2009).

¹²⁵ Richard C. Stoll, *House Global Climate Bill Mandates Many EPA Rulemakings with Tight Deadlines*, 40 Env't Rep. (BNA) 1672, at 1672 (July 10, 2009).

¹²⁶ Press Release, Majority Page, U.S. S. Comm. on Env't & Pub. Works, Kerry, Boxer Introduce Clean Energy Jobs and American Power Act, Sept. 30, 2009, http://epw.senate.gov/public/index.cfm?FuseAction=Majority.PressReleases&ContentRecord_id=0c00344c-802a-23ad-4f4d-edb0c9408d2e (last visited Nov. 21, 2010).

¹²⁷ Press Release, Majority Page, U.S. S. Comm. on Env't & Pub. Works, Boxer Statement on Committee Passage of S. 1733—The Clean Energy Jobs and American Power Act, Nov. 5, 2009, http://www.epw.senate.gov/public/index.cfm?FuseAction=Majority.PressReleases&ContentRecord_id=c512ac4d-802a-23ad-4884-2b95a8405efe (last visited Nov. 21, 2010) (noting that this bill was passed without any support or participation from Republican members of the committee).

the Senate Legislative Calendar.¹²⁸ The Boxer/Kerry bill is opposed by most Republican Senators because of its cost, its cap-and-trade program, and its failure to provide a major role for nuclear power.¹²⁹ The bill differs from H.R. 2454 by calling for a GHG reduction of 20% from 2005 levels by 2020, while the House bill calls for a 17% reduction.¹³⁰ The Senate bill gives the Federal Energy Regulatory Commission (FERC) carbon market oversight; the House bill gives FERC primary responsibility, but the Commodity Commission is given regulatory authority over derivatives.¹³¹ Oversight in the Senate bill would be the responsibility of the Department of Justice; in the House bill United States Environmental Protection Agency (EPA) is responsible for oversight.¹³² Both bills provide relief when the cost of an allowance reaches a trigger point, but there are differences in the details.¹³³ S. 1733 is silent on the continuing role of the Clean Air Act (CAA), but H.R. 2454 exempts new sources of GHG emissions from new source review (NSR).¹³⁴

The heart of both H.R. 2454 and S. 1733 is the cap-and-trade program. H.R. 2454, Title III, amends the CAA¹³⁵ to create a new Title VII that provides a cap-and-trade program that uses allowances to cap GHG emissions.¹³⁶ An allowance is an intangible asset issued by EPA that allows the emission of one metric ton of CO₂ or its equivalent in other GHGs.¹³⁷ By specifying the number of allowances and reducing the number over time, the number of tons of GHG emissions that are allowed can be limited.¹³⁸ H.R. 2454 and S. 1733 allocate most allowances without charge, but vary in who receives these valuable assets. Both bills, however, provide most of the allowances to political interests needed to pass the legislation with only small amounts going to clean technology development. S. 1733 provides about 12.7% of the value of the allowance to clean energy programs and H.R. 2454 provides about 13.8%.¹³⁹

H.R. 2454 provides a tax credit funded by 15% of the allowances that is to be provided to approximately 20% of the people with the lowest incomes.¹⁴⁰

¹²⁸ Bill Summary & Status, 111th Cong. (2009–2010), S. 1733, All Congressional Actions, <http://thomas.loc.gov/home/LegislativeData.php?n=BSS> (search by Bill Number for S. 1733 and then select “All Congressional Actions”).

¹²⁹ Dean Scott, *Bill Maintains Emissions Cuts, EPA Authority, Leaves Negotiating Room for Senate Debate*, 40 Env’t Rep. (BNA) 2282, at 2283–84 (Oct. 2, 2009).

¹³⁰ Leora Falk, *Senate, House Bills Differ on Key Provisions; Details on Senate Legislation Still to Come*, 40 Env’t Rep. (BNA) 2284, at 2285 (Oct. 2, 2009).

¹³¹ *Id.*

¹³² *Id.*

¹³³ *Id.*

¹³⁴ *Id.*

¹³⁵ 42 U.S.C. §§ 7401–7671q (2006).

¹³⁶ American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong., sec. 335, § 861 (2009) (defining cap-and-trade).

¹³⁷ *Id.* sec. 312, § 700(5); *see also id.* sec. 311 §§ 711–12 (2009) (defining CO₂ equivalency).

¹³⁸ Reitze, *supra* note 123, at 914 (covering the nuances of cap-and-trade in more detail).

¹³⁹ Jesse Jenkins, *Kerry-Boxer Climate Bill Allowance Allocation Breakdown*, BREAKTHROUGH BLOG, (Oct. 26, 2009, 11:08 PM), http://thebreakthrough.org/blog/2009/10/kerryboxer_climate_bill_allowa.shtml.

¹⁴⁰ H.R. 2454, sec. 431–432.

Federal payments are to be made to a single person with an income of \$23,000 or less; for a family with two or more children benefits are available if their income is \$42,000 or less.¹⁴¹ The Joint Committee on Taxation estimates the credit will cost \$83 billion over the 2009–2019 period.¹⁴²

H.R. 2454 specifies the percentage of free allowances to be distributed to various classes of recipients. It requires the federal government to give away 70.4% of the allowances from 2012 to 2013, and the percentage of free allowances increases to 82.5% in 2016.¹⁴³ About 75% of the allowances are to be distributed in a manner that will have no direct effect in reducing GHG emissions.¹⁴⁴ Electric utilities are to receive 43.7% of the allowances in 2012 and 2013, which declines to 35% in 2016 to 2025.¹⁴⁵ The natural gas industry is to receive 9% of the allowances in 2016 to 2025.¹⁴⁶ Some or most of the value of these allowances is to be returned to consumers as specified in regulations that are to be promulgated by the states.¹⁴⁷ These rebates will not necessarily go to those that pay higher energy costs.¹⁴⁸ H.R. 2454 and S. 1733 do not impose obligations on the recipients of the free allowances. Other than identifying categories for allowances the legislation provides little information concerning the details of the programs to be subsidized. H.R. 2454 allocates allowances for electric utilities using a formula based 50% on historic emissions and 50% on retail sales of electricity, which requires customers of coal-burning power plants to subsidize nuclear or renewable power users.¹⁴⁹

The projected expenditures to accomplish the goals of H.R. 2454 are estimated by the Congressional Budget Office to be \$821 billion over 2010–2019.¹⁵⁰ The House Committee on Energy and Commerce estimated the total value of allowances created by H.R. 2454 during the period 2010 through 2019 at approximately \$825 billion and would range from \$75 billion in 2015 to \$105 billion in 2030.¹⁵¹ The Congressional Budget Office estimates that the secondary market for allowance distributed free will exceed \$60 billion in

¹⁴¹ CONG. BUDGET OFFICE, CONGRESSIONAL BUDGET OFFICE COST ESTIMATE: H.R. 2454: AMERICAN CLEAN ENERGY AND SECURITY ACT OF 2009, at 21 (2009), *available at* <http://www.cbo.gov/ftpdocs/102xx/doc10262/hr2454.pdf>.

¹⁴² *Id.*

¹⁴³ *Id.* at 6.

¹⁴⁴ *See generally* H.R. 2454, sec. 321 § 782 (stating the allocation of emission allowances); *see also* H. COMM. ON ENERGY & COMMERCE, AMERICAN ENERGY AND SECURITY ACT (H.R. 2454) 4 (2009), *available at* http://energycommerce.house.gov/Press_111/20090602/hr2454_reported_summary.pdf (stating that the allocation of 55% of allowances will be used to protect “consumers from energy price increases” and 19% will assist “trade-vulnerable” industries transition).

¹⁴⁵ *See id.* (providing for allocation of allowances).

¹⁴⁶ H.R. 2454, sec. 321, § 782(b) (providing for the allocation of allowances).

¹⁴⁷ *Id.*

¹⁴⁸ *Id.* § 784.

¹⁴⁹ Dean Scott, *Senators Call for Shifting Free Allowances to Safeguard Coal-Reliant Electric Utilities*, 40 *Env’t Rep.* (BNA) 2659, at 2659 (Nov. 20, 2009).

¹⁵⁰ CONG. BUDGET OFFICE, *supra* note 141, at 2.

¹⁵¹ *See* HOUSE COMM. ON ENERGY & COMMERCE, THE AMERICAN ENERGY AND SECURITY ACT (H.R. 2454), at 4 (2009), *available at* http://energycommerce.house.gov/Press_111/20090724/hr2454_housesummary.pdf.

2012 and the value should increase over time.¹⁵² The ultimate costs can be expected to be much more because the program runs until the year 2050.¹⁵³ In addition, the cost to state and local governments and the private sector to meet unfunded mandates is estimated at \$69 million and \$139 million a year, respectively, and is expected to increase over time due to inflation.¹⁵⁴

The cap-and-trade program being advocated by the Democratic majority will involve the financial services industry playing an important role in the trading of allowances, which creates the possibility of an expensive manipulation of the energy market such as what occurred in the mortgage-backed derivatives market.¹⁵⁵ Because the cap is likely to be relaxed if an electric utility claims a blackout is forthcoming, it is likely to work only until it actually has an effect. The major effect of cap-and-trade as found in H.R. 2454 and S. 1733 is to create large semi-permanent subsidies for some segments of the energy industry and will involve major transfers of wealth. The allowances provided by H.R. 2454 or S. 1733 could have a value exceeding a trillion dollars over ten years;¹⁵⁶ this amount of money will create a continuous effort by potential beneficiaries to have it diverted to them, and it will lead to an expansion of the federal government to deal with this complex program. H.R. 2454, for example, requires EPA to promulgate thirty-one new regulations in twelve to thirty-six months, and make the EPA a major regulator of energy.¹⁵⁷ Moreover, the allowance approach, despite subsidies for some industries, will make it more difficult for U.S. made goods to compete in world markets, and the attempt to impose charges on some imported goods such as those provided in the Waxman-Markey Bill, may be a violation of international free trade agreements.¹⁵⁸

B. S. 1462

An alternative to the cap-and-trade approach is the American Clean Energy Leadership Act of 2009 (S. 1462), sponsored by Senator Jeff Bingman (D-N.M.).¹⁵⁹ It indirectly reduces GHG emissions by encouraging efficient, alternative, and low carbon energy production and use. S. 1462 would create a Clean Energy Deployment Administration (CEDA) to facilitate

¹⁵² CONG. BUDGET OFFICE, *supra* note 141, at 11.

¹⁵³ *Id.* at 1.

¹⁵⁴ *Id.* at 2.

¹⁵⁵ See Shelley Smith, *Reforming the Law of Adhesion Contracts: A Judicial Response to the Subprime Mortgage Crisis*, 14 LEWIS & CLARK L. REV 1035, 1067 (2010) (describing the roots of the subprime mortgage crisis and its economic effect).

¹⁵⁶ See *supra* text accompanying note 150–54.

¹⁵⁷ Stoll, *supra* note 125, at 1673.

¹⁵⁸ Tom Mounteer, *Did Copenhagen Give Climate Change Legislation Any “Bounce” in the Senate?*, 40 ENVTL. L. REP. (ENVTL. LAW INST.) 10,248, at 10,248 (Mar. 2010).

¹⁵⁹ SENATE COMM. ON ENERGY & NATURAL RES., LEGISLATIVE CALENDAR, http://energy.senate.gov/public/index.cfm?FuseAction=Legislation.ViewByBillType&Type_ID=07f15fd7-6014-478c-ab8b-fa78441de9d0&Congress_ID=111 (last visited Nov. 21, 2010) (click on “S. 1462”).

breakthroughs in the deployment of clean energy technologies.¹⁶⁰ It would provide \$130 billion in loan guarantees to nuclear and fossil fuel energy projects with almost no limit on overall loan guarantees because the CEDA is exempted from the Federal Credit Reform Act of 1990¹⁶¹ (H.R. 2454 does not exempt loan guarantees from the Federal Credit Reform Act).¹⁶²

S. 1462 also requires electric utilities to meet fifteen percent of their electricity sales by 2021 using renewable energy.¹⁶³ It requires the establishment of a national electrical energy transmission grid.¹⁶⁴ FERC is required to establish national interconnection standards for power production facilities of fifteen kilowatts or less to encourage residential-sized distributed generation.¹⁶⁵ It calls for improving protection for the grid including protection from cyber attacks.¹⁶⁶ It also calls for the federal government to improve the efficiency of homes, equipment, and appliances to reduce energy use.¹⁶⁷ It calls for opening the Eastern Gulf of Mexico to expanded oil and gas production.¹⁶⁸ It seeks to reform the energy planning process by requiring a comprehensive federal energy plan to be produced every four years.¹⁶⁹ S. 1462 was reported out of the Energy and Natural Resources Committee in June 2009 and enjoys more broad-based support than the bills discussed above.¹⁷⁰

C. 2010 Developments

After Scott Brown (R-Mass.) replaced Senator Edward Kennedy (D-Mass.), the Republicans achieved the ability to sustain a filibuster. To respond to the potential legislative gridlock, several senators drafted the American Power Act.¹⁷¹ The bill is primarily the work of Senator John Kerry (D-Mass.), Chairman of the Foreign Relations Committee, and Senator Joe Lieberman (I-Conn.), Chairman of the Homeland Security and Governmental

¹⁶⁰ SENATE COMM. ON ENERGY & NATURAL RES., AMERICAN CLEAN ENERGY LEADERSHIP ACT OF 2009, SENATE REP. NO. 111-48, at 111 (2009), *available at* http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_reports&docid=f:sr048.111.pdf.

¹⁶¹ 5 U.S.C. §§ 661-661f (2006).

¹⁶² Ari Natter, *Senate Plan for 'Green Bank' Draws Fire for Including Nuclear, Fossil Fuel Projects*, 41 Env't Rep. (BNA) 1449, at 1461 (July 2, 2010).

¹⁶³ American Clean Energy Leadership Act of 2009, S. 1462, 111th Cong., sec. 132, § 610(b) (2009), *available at* http://energy.senate.gov/public/index.cfm?FuseAction=IssueItems.Detail&IssueItem_ID=1fbce5ed-7447-42ff-9dc2-5b785a98ad80.

¹⁶⁴ *Id.* sec. 121, § 216.

¹⁶⁵ *Id.* sec. 296, § 118(a).

¹⁶⁶ *Id.* sec. 301, § 224.

¹⁶⁷ *Id.* sec. 193, §§ 255-256.

¹⁶⁸ *Id.* sec. 343, § 104.

¹⁶⁹ *Id.* sec. 506, § 603.

¹⁷⁰ Lynn Garner, *Dorgan Plans to Push for Energy Bill, Says Senate Unlikely to Take Up Climate in 2010*, 41 Env't Rep. (BNA) 155, at 155 (Jan. 22, 2010).

¹⁷¹ American Power Act, S., 111th Cong. (2010) (Discussion Draft introduced to the Senate by Sen. John Kerry), *available at* <http://kerry.senate.gov/imo/media/doc/APAbill3.pdf>; Jason Schaefer, *A Market-Based Approach: The Best Way to Transition to a New Energy Economy While Meeting the Responsibility to Address Global Climate Change—A North Dakota Perspective*, 85 N.D. L. Rev. 849, 891 (2009).

Affairs Committee.¹⁷² Senator Lindsey Graham (R-S.C.) played a major role until he ended his participation because Senate Majority Leader Harry Reid (D-Nev.) indicated he planned to take up immigration reform before dealing with the climate change legislation.¹⁷³ This compromise bill deals with energy policy and climate change through a comprehensive program that involves the federal government playing a more important role in nearly every aspect of the nation's economy. The bill aims to reduce CO₂e emissions by 17% in 2020 and by over 80% by 2050.¹⁷⁴

The nearly one thousand pages of the bill are divided into six titles. Title I subsidizes nuclear power, encourages domestic oil and gas production (including offshore production), subsidizes carbon capture and sequestration deployment, and supports energy efficiency improvement programs.¹⁷⁵ Title II mandates GHG reduction through a cap-and-trade program, with both floor and ceiling prices, which adds a new Title VII to the CAA.¹⁷⁶ This title also adds new requirements for hydrofluorocarbons and black carbon.¹⁷⁷ Title III is titled "Consumer Protection."¹⁷⁸ It specifies how the allowances that are distributed will be used to benefit energy consumers including relief for households with incomes of up to 250% of the poverty line.¹⁷⁹ Title IV is titled "Job Protection and Growth."¹⁸⁰ It is primarily a subsidy program for industry that will offset the costs of compliance with the bill's GHG emissions reduction requirements, and it provides for charges to be imposed on imports from countries that have not taken action to limit GHG emissions.¹⁸¹ Title IV also has a program to subsidize natural gas-powered vehicle production and use, and it contains a carbon biological sequestration program that is a subsidy for the agriculture industry.¹⁸² Title V is a program to fund international efforts to reduce GHG emissions and to fund mitigation and adaptation efforts.¹⁸³ Title VI has various provisions aimed at protecting communities from climate change impacts through adaptation strategies.¹⁸⁴

Title I, Subtitle A subsidies to encourage the expansion of nuclear power include provisions for an expedited combined construction and

¹⁷² Press Release, Office of Senator John Kerry, Kerry, Lieberman: American Power Act Bill Will Secure America's Energy, Climate Future, (May 12, 2010), <http://kerry.senate.gov/press/release/?id=5e1dc216-ce17-4cc2-92e1-8321efc8240c>.

¹⁷³ Dean Scott, *Climate Bill Suffers Setback as Sen. Graham Withdraws Support Over Scheduling Dispute*, 41 Env't Rep. (BNA) 928, at 928 (Apr. 30, 2010).

¹⁷⁴ Office of Senator John Kerry, American Power Act, <http://kerry.senate.gov/work/issues/issue/?id=7f6b4d4a-da4a-409e-a5e7-15567cc9e95c> (last visited Nov. 21, 2010).

¹⁷⁵ American Power Act, S., secs. 1122, 1201, 1401, 1412, 1601, 1602.

¹⁷⁶ *Id.* sec. 2001, § 703.

¹⁷⁷ *Id.* sec. 2201, § 619; *id.* sec. 2212, § 805.

¹⁷⁸ *Id.* tit. III.

¹⁷⁹ *Id.* sec. 3201; *id.* sec. 3202, §36D(b)(2).

¹⁸⁰ *Id.* tit. IV.

¹⁸¹ *Id.* sec. 4001, §§ 771, 775.

¹⁸² *Id.* secs. 4121(a), 4152.

¹⁸³ *Id.* secs. 5001–5007.

¹⁸⁴ *Id.* secs. 6001–6011.

operating license,¹⁸⁵ a loan guarantee program,¹⁸⁶ expedited environmental review,¹⁸⁷ and numerous tax benefits.¹⁸⁸ Funding for nuclear loan guarantees would be increased from about \$18.4 billion to \$54 billion, which is consistent with the latest budget request.¹⁸⁹ Subtitle B increases revenue sharing with states that allow offshore oil and gas drilling but strengthens the right of states to prohibit leasing within seventy-five miles of its coastline.¹⁹⁰ But, it would place a moratorium on new offshore drilling until the cause of the Deepwater Horizon offshore oilrig explosion is determined and require “liability mechanisms that ensure adequate funds are available to mitigate the economic and environmental impacts of offshore drilling accidents.”¹⁹¹ The offshore drilling provisions were placed in the legislation to attract support from Republicans and pro-drilling Democrats, but following the British Petroleum oil spill, this provision generated substantial opposition.¹⁹² Subtitle C provides for a program to encourage the commercialization of carbon capture and sequestration technology to enable coal to be used with reduced adverse environmental impact.¹⁹³ Subtitle C would impose new performance standards on coal-fired power plants through a new CAA “Title VIII—Greenhouse Gas Standards.”¹⁹⁴ The aim of this part is to require coal-burning power plants to utilize geological sequestration as soon as it is commercially demonstrated.¹⁹⁵

Title I, Subtitle D encourages renewable energy and energy efficiency program development through loans, subsidies, and support for state operated renewable energy markets.¹⁹⁶ Subtitle E provides for the development of electric-drive vehicle refueling infrastructure.¹⁹⁷ It requires states and metropolitan planning organizations to plan and implement a program to reduce GHG emissions through transportation-related efforts as specified in a new CAA section 803.¹⁹⁸ This is to be financed using distributed allowances as specified in a new CAA section 781(f)(3)¹⁹⁹ and by using money from the Highway Trust Fund.²⁰⁰ Subtitle F establishes a Clean Energy Technology Fund to support the development of advanced energy

¹⁸⁵ *Id.* sec. 1101(a).

¹⁸⁶ *Id.* sec. 1102.

¹⁸⁷ *Id.* sec. 1109.

¹⁸⁸ *Id.* secs. 1121–1126.

¹⁸⁹ Dean Scott, *Kerry, Liebermann Unveil Climate Bill, Increase Utility, Manufacturing Allowances*, 41 Env’t Rep. (BNA) 1050, at 1051 (May 14, 2010).

¹⁹⁰ American Power Act, S., secs. 1202–1205.

¹⁹¹ *Id.* sec. 1201(b)(2).

¹⁹² Dean Scott, *Nelson Calls Offshore Plan ‘Dead on Arrival’; Spill Shows Need for Climate Bill, Reid Says*, 41 Env’t Rep. (BNA) 984, at 984 (May 7, 2010).

¹⁹³ American Power Act, S., secs. 1401–1432.

¹⁹⁴ *Id.* sec. 1441, § 801(b).

¹⁹⁵ *Id.* sec. 1441, § 801(b)(2)(B).

¹⁹⁶ *Id.* secs. 1601–1604.

¹⁹⁷ *Id.* sec. 1701.

¹⁹⁸ *Id.* sec. 1711, § 803.

¹⁹⁹ *Id.* sec. 1712(a).

²⁰⁰ *Id.* sec. 1721.

technologies.²⁰¹ The renewable energy and energy efficiency programs would receive 2.5% of the allowances, which is estimated to amount to \$8.8 billion in the first year.²⁰² This is substantially less than the estimated \$67.8 billion provided in H.R. 2454 and the estimated \$51.3 billion provided in S. 1733 for the first year.²⁰³

Title II contains the program to reduce GHG emissions through the new CAA Title VII program. New CAA section 702 would call for GHG emissions to be 95.25% of the 2005 emissions in 2013; 83% in 2020; 58% in 2030; and 17% in 2050.²⁰⁴ New CAA section 703 would require sources subject to caps to emit 95.25% of their 2005 emissions in 2013; 83% in 2020; 58% in 2030; and 17% in 2050.²⁰⁵ Thus, most of the serious reductions are required twenty years from enactment. Part B designates seven GHGs: CO₂, methane, NO_x, sulfur hexafluoride, hydrofluorocarbons from chemical manufacturing process at a stationary source, any perfluorocarbon that is an anthropogenic gas with a 100-year global warming impact equal to or greater than CO₂, and nitrogen trifluoride.²⁰⁶ GHGs do not include gases that are captured and sequestered, but the sequestration site is a “covered entity.”²⁰⁷ The CO₂e values of the GHGs are listed in new CAA section 712.²⁰⁸ New CAA section 713 requires EPA to revise its GHG reporting regulations to comply with the requirements of the American Power Act including reporting on the capture and sequestration of GHGs.²⁰⁹ Part C would add new CAA section 721, which sets out annual emission allowances required for specified activities with each allowance representing one ton of CO₂e.²¹⁰ But, new CAA section 722(b)(5) would provide an offset for each ton of CO₂e sequestered in a geologic site,²¹¹ and new CAA section 722(d) would provide for offsets for approved international GHG reductions found in new CAA section 728.²¹² New CAA section 734(b)(2)(G) would identify geologic sequestration as a project eligible to generate offset credits.²¹³ A project that receives offset credits would have to report any release of GHGs²¹⁴ and the project would be subject to requirements for addressing reversals that EPA must promulgate.²¹⁵ Such projects would be subject to audits and reviews by new CAA section 739 and the verification requirements found in new CAA section 758.²¹⁶

²⁰¹ *Id.* sec. 1801.

²⁰² Ari Natter, *Climate Bill Proposal Would Provide Billions for Clean Energy, but Less Than Other Bills*, 41 Env't Rep. (BNA) 1053, at 1053 (May 14, 2010).

²⁰³ *Id.*

²⁰⁴ American Power Act, S., sec. 2001, § 702.

²⁰⁵ *Id.* sec. 2001, § 703(a).

²⁰⁶ *Id.* sec. 2001, § 711(a).

²⁰⁷ *Id.* sec. 2002.

²⁰⁸ *Id.* sec. 2001, § 712(b).

²⁰⁹ *Id.* sec. 2001, § 713(b).

²¹⁰ *Id.* sec. 2001, § 721(e)(1).

²¹¹ *Id.* sec. 2001, § 722(b)(5).

²¹² *Id.* sec. 2001, § 722(d).

²¹³ *Id.* sec. 2001, § 734(b)(2)(G).

²¹⁴ *Id.* sec. 2001, § 735(b)(1)(C).

²¹⁵ *Id.* sec. 2001, § 755(b).

²¹⁶ *Id.* sec. 2001, §§ 739, 758.

Emissions in excess of CO₂e allowances would be prohibited by new CAA section 722 and are enforced using excess emission penalties found in new CAA section 723.²¹⁷ Allowance trading, banking, and borrowing would be allowed by new CAA sections 724 and 725.²¹⁸ Petroleum fuels and products are to be regulated by requiring allowances to be held by the refiners.²¹⁹ New CAA sections 733 and 753 would provide for offsets for domestic and international emissions reductions.²²⁰ Stationary sources that are subject to CAA operating permit requirements will have the applicable American Power Act requirements placed in their permit, which will be enforced in accordance with Title V.²²¹

Title II, Subtitle B, section 2101, deals with the disposition of allowances by creating a Part G in the CAA's Title VII.²²² New CAA section 781 would allocate allowances for consumer protection, job protection, clean energy development and deployment (including commercial deployment of carbon capture and sequestration), national and international adaptation efforts, and swapping state allowances for the new federal allowances to reward early action to reduce GHG emissions.²²³ New CAA sections 790–792 would provide an auction procedure for allowances not given away.²²⁴ Electricity consumers would be the beneficiaries of 51% of the allowances until 2016 when the percentage becomes 35% and the percentage declines until 2029.²²⁵ Natural gas consumers would receive 9% of the allowances in 2016–2025 and a declining percentage thereafter.²²⁶ Home heating oil consumers would receive 1.9% of the allowances in 2013 through 2015 and a declining percentage thereafter.²²⁷

Low-income households will be provided monthly federal benefits through programs found in Title III.²²⁸ Energy-intensive, trade-exposed entities are allocated 2% of the allowances in 2013 through 2015, which jumps to 15% from 2016 through 2025 and then slowly decreases.²²⁹ A program to improve the energy efficiency of manufacturing plants is also included.²³⁰ To facilitate domestic fuel production, allowances are given to refiners.²³¹ For 2013 through 2015, the percentage is 4.3%, and in 2016 through 2025 it is 3.75%.²³² Carbon capture is allocated a percentage of

²¹⁷ *Id.* sec. 2001, §§ 722, 723(b)(1).

²¹⁸ *Id.* sec. 2001, §§ 724–725.

²¹⁹ *Id.* sec. 2001, § 729.

²²⁰ *Id.* sec. 2001, §§ 733(a)(1)(A), 753(a)(1).

²²¹ *Id.* sec. 2001, § 727.

²²² *Id.* sec. 2101.

²²³ *Id.* sec. 2101, §§ 781(a)–781(d), 786(b)(1).

²²⁴ *Id.* sec. 2101, §§ 790–792.

²²⁵ *Id.* sec. 2101, § 781(a)(1).

²²⁶ *Id.* sec. 2101, § 781(a)(2).

²²⁷ *Id.* sec. 2101, § 781(a)(3).

²²⁸ *Id.* sec. 2101, § 782–783.

²²⁹ *Id.* sec. 2101, § 781(b)(1)(A).

²³⁰ *Id.* sec. 2101, § 781(b)(2).

²³¹ *Id.* sec. 2101, § 781(b)(3).

²³² *Id.*

allowances that begins at 0.8% and increases until it reaches 10% in 2030.²³³ Low Emissions vehicle technology, low-carbon industrial technologies, energy efficiency, and renewable energy are allocated allowances, as are adaptation programs and transportation infrastructure and efficiency programs.²³⁴ The transportation provisions generally are opposed by highway and transportation officials because they consider the amount of money going to infrastructure development to be inadequate.²³⁵

Title II, Subtitle C has programs to control hydrofluorocarbons through modification of CAA Title VI,²³⁶ black carbon through modification of the new CAA Title VII,²³⁷ and international methane emissions.²³⁸ Title II, Subtitle D, aims to prevent the CAA from being used to control GHG except as provided in the American Power Act legislation. It prohibits making GHGs criteria pollutants based on the effects on climate change or ocean acidification.²³⁹ It prohibits using standards of performance under CAA section 111 to control climate change effects.²⁴⁰ No GHG may be added to the list of hazardous pollutants or controlled as an international air pollutant under CAA section 115 because of climate change or ocean acidification effects.²⁴¹ It terminates state run allowance programs²⁴² and limits the use of NSR and operating permits based on emissions of GHGs.²⁴³

Title II, Subtitle E regulates GHG markets. Section 2402 gives trading supervision jurisdiction to the Commodities Futures Trading Commission and prohibits exchange trading of GHG futures.²⁴⁴ Subtitle E regulates swap transactions and excessive speculation, and prohibits fraud, certain transactions, and market manipulation.²⁴⁵ It establishes a process for trading GHG instruments.²⁴⁶

Title III deals with consumer protection. Subtitles A and B deal with distributed allowances to electricity, gas, and home heating oil suppliers. Section 3001 creates a CAA Title VII, Part G, which in CAA section 782 specifies how the allowances that are to be distributed to electricity local distribution companies from 2013 through 2029 are to be used to benefit the ratepayers of the companies.²⁴⁷ Section 3101 has similar requirements in a new CAA section 783 for allowances to be distributed to natural gas local distribution companies from 2015 through 2028 for the benefit of retail

²³³ *Id.* sec. 2101, § 781(c)(1)(A).

²³⁴ *Id.* sec. 2101, §§ 781(c)(2), (3), (5), 781(d), (f).

²³⁵ Adam Snider, *Climate Bill's Transportation Money Spurs Rebuke From Highway Groups*, 41 Env't Rep. (BNA) 1054, at 1054–55 (May 14, 2010).

²³⁶ American Power Act, S., sec. 2201.

²³⁷ *Id.* secs. 2212–14.

²³⁸ *Id.* sec. 2221.

²³⁹ *Id.* sec. 2301.

²⁴⁰ *Id.* sec. 2302.

²⁴¹ *Id.* secs. 2303–2304.

²⁴² *Id.* sec. 2305, 2501, § 806(c)(2).

²⁴³ *Id.* secs. 2306–2307.

²⁴⁴ *Id.* sec. 2402.

²⁴⁵ *Id.* secs. 2403–2407.

²⁴⁶ *Id.* secs. 2408–2415.

²⁴⁷ *Id.* sec. 3001, § 782.

ratepayers,²⁴⁸ and section 3102 does the same thing for home heating oil and propane customers in a new CAA section 784 that applies from 2013 through 2029.²⁴⁹

Subtitle C is the working families refundable relief program. Section 3201 establishes a program under the Internal Revenue Code, chapter 1, subchapter A, part IV, subpart C, section 36D.²⁵⁰ The program is to be funded using 2.5% of the annual allowances.²⁵¹ Eligible households with an income of 150% of the poverty level as specified in section 2110(c)(5) of the Social Security Act²⁵²—up to about \$38,400 for a family of four—would receive full benefits and households up to 250% of the poverty level—up to about \$64,000 for a family of four—would receive partial benefits.²⁵³ For the first ten years of the program, 2013 through 2022, annual allowances specified in section 2001 (CAA section 721) average a little over 5 billion, so 125 million allowances will be auctioned and the proceeds delivered to recipients that meet the programs qualification requirements.²⁵⁴ Section 2001, CAA section 726, has a cost containment program to limit the cost of each allowance to \$25 in 2009 dollars, which increases each year after 2013 by 5% plus the rate of inflation.²⁵⁵ This would cap the payments to households with incomes of up to 250% of the poverty level to about \$3.125 billion a year.²⁵⁶ For households that meet the poverty criteria for the working families relief program, sections 3203–3207 create an Energy Refund Program that amends the Social Security Act to provide monthly cash payments to eligible recipients.²⁵⁷ This would be funded with the proceeds from 12.5% of the emission allowances.²⁵⁸ Using the same calculations as above, this would provide welfare payments capped at about \$15.625 billion a year. This program would be administered by the states.²⁵⁹ Section 3206 establishes a Universal Trust Fund to hold the auction proceeds after calendar year 2026, with 25% of the fund to be used for deficit reduction and 75% to be used for the universal refund as specified in section 3207.²⁶⁰

Title IV provides for a few billion dollars a year to be given to specified energy intensive U.S. manufacturing and mining businesses to compensate for increased energy costs created by enactment of CAA Title VII. It does this in section 4001 which creates a new CAA section 771.²⁶¹ Free allowances begin in 2013 before the sector has any obligations under the bill and

²⁴⁸ *Id.* sec. 3101, § 783.

²⁴⁹ *Id.* sec. 3102, § 784.

²⁵⁰ *Id.* sec. 3201.

²⁵¹ *Id.*

²⁵² 42 U.S.C. §§ 301–1305mm (2006 & Supp. II 2009).

²⁵³ American Power Act, S., sec. 3202, § 36D; *see* Delayed Update of the HHS Poverty Guidelines for the Remainder of 2010, 75 Fed. Reg. 45,628, 45629 (Aug. 3, 2010).

²⁵⁴ American Power Act, S., sec. 2001, § 721.

²⁵⁵ *Id.* sec. 2001, § 726.

²⁵⁶ *Id.* sec. 3204, § 2201.

²⁵⁷ *Id.* secs. 3203–3207.

²⁵⁸ *Id.* sec. 3203.

²⁵⁹ *Id.* sec. 3204, § 2201(f).

²⁶⁰ *Id.* secs. 3206–3207.

²⁶¹ *See id.* sec. 4001, § 771(b).

increase from 2016 to 2025 by receiving 15% of the allowances.²⁶² Title IV also seeks to prevent the transfer of GHG producing activities to foreign countries. This bill addresses the concern that H.R. 2454 could violate the World Trade Organization rules and trigger retaliatory sanctions. The Senate bill gives the President the power to decide whether to impose tariffs.²⁶³ The process is set out in CAA sections 773 and 774.²⁶⁴ CAA section 775 seeks to promote international agreements to create binding commitments from all major GHG emitting countries to reduce emissions.²⁶⁵ Subtitle B deals with creating clean energy technology-related jobs. Section 4101 provides authority to the Secretary of Education to award grants to develop programs to prepare people for jobs in the fields of clean energy, renewable energy, energy efficiency, climate change mitigation, and climate change adaptation.²⁶⁶ Section 4103 seeks to establish apprentice-training programs for careers in clean energy.²⁶⁷ Part II provides for the development of clean vehicles,²⁶⁸ natural gas-powered vehicles,²⁶⁹ and new emissions standards for heavy duty vehicles (HDVs) and non-road vehicles.²⁷⁰ Sections 4151–4153 provide a program to encourage biological carbon sequestration by the agriculture sector.²⁷¹

Title V deals with international climate change activities. Section 5001 sets out a policy in support of international efforts to address the impacts of global climate change.²⁷² This includes a call for the establishment of programs to reduce emissions caused by deforestation.²⁷³ Title VI seeks to protect fish, wildlife and plants from the effects of climate change. It provides an outline for the development of federal agency natural resources adaptation plans²⁷⁴ as well as state level natural resources adaptation plans that are to be funded up to 90% by the federal allowance program.²⁷⁵

The cap-and-trade bills appear to have died in the summer of 2010, including the compromise American Power Act. In an attempt to pass some kind of climate change legislation, the previously discussed S.1462, which was approved by the Senate Committee on Energy and Natural Resources in June 2009, was being revived. The Committee was considering adding the contents of a number of relatively non-controversial bills introduced in 2010

²⁶² Dean Scott, *Kerry, Lieberman Unveil Climate Bill, Increase Utility, Manufacturing Allowances*, 41 Env't Rep. (BNA) 1050, at 1051. (May 14, 2010).

²⁶³ Dean Scott, *Senate Bill Would Give President Discretion over Tariffs Related to Climate Agreements*, 41 Env't Rep. (BNA) 1125, at 1125. (May 21, 2010).

²⁶⁴ American Power Act, S., sec. 4001, §§ 773–774.

²⁶⁵ *Id.* sec. 4001, § 775.

²⁶⁶ *Id.* sec. 4101.

²⁶⁷ *Id.* sec. 4103.

²⁶⁸ *Id.* sec. 4111.

²⁶⁹ *Id.* sec. 4121.

²⁷⁰ *Id.* sec. 4141, § 804.

²⁷¹ *Id.* secs. 4152–4153.

²⁷² *Id.* sec. 5001.

²⁷³ *Id.* sec. 5004.

²⁷⁴ *Id.* sec. 6006.

²⁷⁵ *Id.* secs. 6007–6008.

to create a bill that would subsidize various energy programs without creating financial disincentives to the use of fossil fuel.²⁷⁶

IV. GHG CONTROL USING THE CAA

The failure to develop a meaningful program to address climate change either through treaties or new federal legislation has led to a reevaluation of existing law in order to use U.S. environmental laws to force sources of GHGs to reduce their emissions. While existing laws are not the ideal way to control CO₂ emissions, EPA is committed to moving forward using the legal tools that are available.

A. GHG Emissions Reporting

Accurate information concerning GHG emissions is a prerequisite to the development of an effective control program.²⁷⁷ The first step to control CO₂ emissions should be to create an accurate emissions inventory that is publicly disclosed in a useful form, such as facility specific, company wide, and source category aggregation of data. Section 1605(b) of the 1992 Energy Policy Act²⁷⁸ has a program to track GHG emissions, but it has weak reporting standards, no verification requirements, and provides no penalties for companies that do not report their data.²⁷⁹ Section 1605(b) requires the DOE to establish guidelines for the voluntary reporting of GHG releases and their annual reduction.²⁸⁰ DOE issued guidelines entitled *Guidelines for Voluntary Greenhouse Gas Reporting*.²⁸¹ This voluntary program evolved into DOE's Climate Vision program.²⁸²

²⁷⁶ Ari Natter, *Senate Energy Committee Considers Adding Clean Energy Measures to Passed Legislation*, 41 Env't Rep. (BNA) 1355, at 1355 (June 18, 2010). The bills are: S.3460, the Million Solar Roofs Act of 2010; S.3396, the Supply Star Act of 2010; S.3251, the Improving Energy Efficiency and Renewable Energy Use By Federal Agencies Act of 2010; S.679, the Heavy Duty Hybrid Vehicle Research, Development, and Demonstration Act of 2009; and S.2900, the Gas Turbine Efficiency Act of 2009. *Id.*; see also Dean Scott, *As Momentum from 2008 Election Fades, Senators Struggle to Salvage Climate Bill*, 41 Env't Rep. (BNA) 1616, 1616 (July 16, 2010); Dean Scott, *Reid Abandons Carbon Limits in Energy Bill, Will Focus on Oil Spills, Efficiency Measures*, 41 Env't. Rep. (BNA) 1633, 1633 (July 23, 2010).

²⁷⁷ This material on GHG reporting is a modified and updated version of material appearing in Reitze, *supra* note 123, at 833.

²⁷⁸ Energy Policy Act of 1992, Pub. L. No. 102-486, 106 Stat. 2776.

²⁷⁹ *Id.* § 1605(b), 106 Stat. at 3002-03 (codified at 42 U.S.C. § 13385(b) (2006)).

²⁸⁰ *Id.* ("[T]he Secretary shall, after opportunity for public comment, issue guidelines for the voluntary collection and reporting of information on sources of greenhouse gases.").

²⁸¹ 10 C.F.R. §§ 300.1, 300.13 (2006); see ENERGY INFO. ADMIN., GUIDELINES FOR VOLUNTARY GREENHOUSE GAS REPORTING (2006), available at <http://www.eia.doe.gov/oiaf/1605/FinalGenGuidelines041306.pdf>.

²⁸² Energy Info. Admin., Climate VISION: 1605(B) Reporting Guidelines, <http://www.climatevision.gov/1605b.html> (last visited Nov. 21, 2010) (discussing the revision of the voluntary GHG guidelines under § 1605(b) to what they are today under Climate Vision).

EPA administers a similar voluntary program, called “Climate Leaders,” that collects data on GHG emissions.²⁸³ Most of the reporting involved electric power generators and covered nearly six hundred projects to reduce emissions or prevent the release of GHGs.²⁸⁴ The federal voluntary reporting system subsequently began to be supplanted by the Climate Registry, a state-developed program that includes thirty-nine states, five Canadian provinces, two Mexican states, the District of Columbia, and three Native American Tribes.²⁸⁵ EPA also administers a mandatory reporting program found in CAA section 412 that is applicable primarily to twenty-five megawatt or larger electric power plants.²⁸⁶ EPA has developed a comprehensive inventory of environmental data on electric power systems based on information supplied to EPA, the Energy Information Administration, and FERC that is known as the “Emissions & Generation Resource Integrated Database.”²⁸⁷

The Consolidated Appropriations Act of 2008 (H.R. 2764)²⁸⁸ authorized funding for EPA to finalize a rule for an economy-wide GHG registry by June 26, 2009.²⁸⁹ EPA promulgated a final regulation to implement a mandatory GHG emissions reporting program on October 30, 2009.²⁹⁰ The rule has monitoring, recordkeeping, verification, and reporting requirements for emissions of the GHGs covered by the United Nations FCCC.²⁹¹

The GHG reporting rule is based on EPA’s authority under CAA sections 114 and 208, allowing the Administrator to require information to be supplied for the purposes of carrying out any provision of the CAA.²⁹² The reporting rule became effective on January 1, 2010, with the first reports due on March 31, 2011.²⁹³ The rule applies to fossil fuel suppliers, industrial gas suppliers, and direct GHG emitters if they emit 25,000 mt of GHGs or more a year, expressed as CO₂e.²⁹⁴ Some facilities in identified categories must

²⁸³ U.S. Env’tl. Prot. Agency, Climate Leaders, <http://www.epa.gov/climateleaders/> (last visited Nov. 21, 2010).

²⁸⁴ Pamela Wexler & David Hodas, *Special Committee on Climate Change and Sustainable Development 1995 Annual Report*, in NATURAL RESOURCE, ENERGY, AND ENVIRONMENTAL LAW 1995, THE YEAR IN REVIEW, 164, 168 (1996).

²⁸⁵ See The Climate Registry, List of Members, <http://www.theclimateregistry.org/members> (last visited Nov. 20, 2010).

²⁸⁶ Clean Air Act, 42 U.S.C. § 7651k (2006).

²⁸⁷ U.S. Env’tl. Prot. Agency, Clean Energy: eGRID FAQ, <http://www.epa.gov/cleanenergy/energy-resources/egrid/faq.html> (last visited Nov. 21, 2010).

²⁸⁸ Consolidated Appropriations Act, 2008, Pub. L. No. 110-161, 121 Stat. 1844.

²⁸⁹ See *id.* tit. II, 121 Stat. at 2128.

²⁹⁰ Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,260 (Oct. 30, 2009) (codified in scattered sections of 40 C.F.R.).

²⁹¹ *Id.* at 56,264–65 (noting that annual reporting is required for emissions of CO₂, methane, NO_x, sulfur hexafluoride, hydrofluorocarbons, perfluorocarbons, and other fluorinated gases).

²⁹² Clean Air Act, 42 U.S.C. §§ 7414(a), 7542(b) (2006).

²⁹³ 74 Fed. Reg. at 56,267.

²⁹⁴ *Id.* at 56,264. “CO₂ equivalent” means “[t]he 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.” Energy Info. Admin., Glossary, http://www.eia.doe.gov/glossary/glossary_c.htm (last visited Nov. 21, 2010). CO₂ “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).” *Id.* “Carbon equivalent units’ are defined

report even if emissions are below 25,000 tons of CO₂e.²⁹⁵ Facilities within listed categories include electric power plants subject to the Acid Rain Program,²⁹⁶ including those owned by the Federal and municipal governments and those located in Indian Country.²⁹⁷ Other facilities within listed categories include aluminum production, cement production, lime manufacturing, soda ash production, petroleum refineries, and pulp and paper manufacturers.²⁹⁸

Reporting for manufacturers of heavy trucks, motorcycles, and non-road engines and vehicles begins with model year 2011 (MY2011).²⁹⁹ Light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles are not included in this rule, but are included in a proposed light-duty GHG emission control program that will begin with MY2012 vehicles.³⁰⁰ About 10,000 facilities that are responsible for about eighty-five percent of the United States' GHG emissions are subject to the reporting requirements, including about 3000 stationary combustion sources, 1108 electric generation facilities, 150 petroleum refineries, and 317 vehicle manufacturers.³⁰¹ The rule does not apply to a number of sources still being reviewed by EPA.³⁰² On March 23, 2010, EPA proposed three rules requiring GHG reporting by oil and natural gas well operations, carbon sequestration facilities, and facilities that produce or use fluorinated gases, such as hydrofluorocarbons.³⁰³ The sequestration reporting requirements apply to CO₂ sequestered underground and require reporting of the amount received, the amount injected, and the source of the CO₂, if known.³⁰⁴ It requires the development and implementation of a site-specific monitoring, reporting, and verification plan approved by EPA, including a strategy for detecting and quantifying CO₂ leakage.³⁰⁵ The cost of monitoring and reporting is estimated by EPA at about \$300,000 a year for each site.³⁰⁶

as carbon dioxide equivalents multiplied by the carbon content of carbon dioxide (i.e., 12/44)."
Id.

²⁹⁵ 74 Fed. Reg. at 56,266–67.

²⁹⁶ *Id.* at 56,266.

²⁹⁷ *Id.* at 56,260 tbl.1.

²⁹⁸ *See id.* at 56,266–67 (listing facilities subject to reporting).

²⁹⁹ *Id.* at 56,352.

³⁰⁰ *See* Regulatory Announcement, U.S. Env'tl. Prot. Agency, EPA and NHTSA Finalize Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks 1 (2010), *available at* <http://www.epa.gov/oms/climate/regulations/420f10901.pdf>.

³⁰¹ U.S. ENVTL. PROT. AGENCY, FINAL MANDATORY GREENHOUSE GASES REPORTING RULE 5 (2009), *available at* [http://www.epa.gov/climatechange/emissions/downloads09/FinalMRR Overview.pdf](http://www.epa.gov/climatechange/emissions/downloads09/FinalMRR%20Overview.pdf); *see also* 74 Fed. Reg. at 56,264 (referring to facilities responsible for 85% of the U.S. GHG emissions); Draft Guidance "Federal Greenhouse Gas Accounting and Reporting," 75 Fed. Reg. 41,452 (July 16, 2010) (announcing that the Council on Environmental Quality released draft guidance for GHG emissions reporting from federal agency operations on July 16, 2010).

³⁰² 74 Fed. Reg. at 56,270; U.S. ENVTL. PROT. AGENCY, *supra* note 301, at 14.

³⁰³ Steven D. Cook, *EPA Proposes Greenhouse Gas Reporting for Oil and Gas Wells, Carbon Storage, HFCs*, 41 Env't Rep. Online (BNA) 659, at 659 (Mar. 26, 2010).

³⁰⁴ *Id.*

³⁰⁵ *Id.*

³⁰⁶ *Id.*

Facilities may cease to report after five consecutive years of emissions below 25,000 mt of CO₂e, or after three consecutive years of emissions below 15,000 mt of CO₂e, or after the GHG producing operations are shut down.³⁰⁷ EPA will collect the data from facilities in the fifty states, the District of Columbia, the U.S. possessions and territories.³⁰⁸ The federal “reports must be submitted electronically, in a format to be specified by the Administrator.”³⁰⁹ The 25,000 ton emission threshold for reporting CO₂e is equivalent to the emissions from the energy used by 2200 homes in a year, or from the combustion of 58,000 barrels of oil, or from the combustion of 131 railroad cars of coal.³¹⁰ Most commercial buildings will be below the threshold.³¹¹ Agricultural sources are exempt except for livestock facilities with manure management systems with emissions that are 25,000 tons of CO₂e or more per year.³¹² In addition, on October 27, 2009, the House and Senate agreed on an EPA fiscal year 2010 appropriations bill that includes a provision exempting livestock operations from the need to report their GHGs.³¹³

On April 12, 2010, EPA proposed reporting requirements for cogeneration units.³¹⁴ On June 29, 2010, EPA announced a final rule imposing GHG emissions reporting requirements on industrial landfills, industrial wastewater treatment facilities, underground coalmines, and magnesium production facilities emitting more than 25,000 mt of CO₂e per year.³¹⁵ On August 11, 2010, EPA promulgated a proposed rule that would make extensive technical changes and corrections to the GHG reporting rule.³¹⁶

Because federal efforts were considered inadequate, in 2001 California created its Climate Action Registry, a nonprofit 501(c)(3) organization, as a voluntary GHG reporting mechanism that became a model for other states.³¹⁷ Thirty-nine states, ten Canadian provinces and two Canadian territories, six Mexican states, the District of Columbia and three American Indian tribes

³⁰⁷ 74 Fed. Reg. at 56,267.

³⁰⁸ *Id.* at 56,264, 56,392.

³⁰⁹ *Id.* at 56,268.

³¹⁰ ALSTON & BIRD LLP, THE A+BCS OF EPA’S PROPOSED GHG REPORTING RULE 2, *available at* http://www.metroatlantachamber.com/files/file/pub_pol/water_environment/EPA_%20Greenhouse_Gas_Reporting_Rule.pdf.

³¹¹ U.S. ENVTL. PROT. AGENCY, *supra* note 301, at 7.

³¹² *Id.* at 17.

³¹³ *House-Senate Deal on EPA FY10 Budget Includes Key Policy Exemptions*, 26 ENVTL. POL’Y ALERT (Inside EPA) Nov. 5, 2009, at 34.

³¹⁴ Mandatory Reporting of Greenhouse Gases, 75 Fed. Reg. 18,455 (proposed Apr. 12, 2010) (to be codified at 40 C.F.R. pt. 98).

³¹⁵ Steven D. Cook, *EPA Requires Four Industrial Sectors to Report Greenhouse Gas Emissions*, 41 Env’t Rep. (BNA) 1456, at 1456 (July 2, 2010).

³¹⁶ See Mandatory Reporting of Greenhouse Gases, 75 Fed. Reg. 48,744 (proposed Aug. 11, 2010) (to be codified at 40 C.F.R. pt. 98).

³¹⁷ Carbon Offset Research & Educ., Climate Action Reserve, <http://www.CO2offsetresearch.org/policy/CAR.html> (last visited Nov. 21, 2010); *see also* The Climate Registry, About, *supra* note 285, *available at* <http://www.theclimateregistry.org/about> (last visited Nov. 21, 2010) (providing general information on the California Climate Action Registry).

are participating.³¹⁸ There are fifty-two companies and local governments that have agreed to participate by voluntarily measuring and reporting their GHG emissions.³¹⁹

The federal GHG reporting rules do not replace reporting requirements that are required by states, but EPA is working with the Climate Registry and Exchange Network to harmonize the reporting requirements of the various data generating programs.³²⁰ The Western Climate Initiative (WCI) called for more stringent requirements,³²¹ but on June 2, 2010, WCI proposed a reporting rule for its members that would be consistent with EPA's mandatory reporting rule while requiring additional recordkeeping and monitoring that will be needed to operate a cap-and-trade program.³²² Ultimately, each state will have to decide whether it wishes to impose more stringent reporting requirements than are imposed by EPA. The state of Washington, for example, has a 10,000 tones per year (tpy) trigger applicable to indirect emissions, as well as sources not covered by the federal rule.³²³ The GHG reporting rule is the subject of a lawsuit filed in the United States Court of Appeals for the District of Columbia Circuit by industry trade associations whose primary concern is that the rule does not adequately protect confidential business information.³²⁴

B. GHGs and the CAA

Since the late 1980s, the United States made minor efforts to control emissions of GHGs, but no federal program imposed binding requirements or enforceable mandates to reduce GHGs until 2010. Congress considered and rejected regulating CO₂ emissions, as well as other GHGs, in the process of enacting the 1990 CAA Amendments.³²⁵ But, the legislative history became irrelevant after the United States Supreme Court ruled in *Massachusetts v. U.S. Environmental Protection Agency* (*Massachusetts v. EPA*)³²⁶ that GHGs are pollutants under the CAA.³²⁷ That case began on October 20, 1999, when the International Center for Technology Assessment (ICTA) and about

³¹⁸ Dean Scott, *Shell Oil, Duke Energy to Report Emissions Under Voluntary Climate Registry Initiative*, 39 Env't Rep. (BNA) 117, at 117 (Jan. 18, 2008).

³¹⁹ *Id.*

³²⁰ Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,260, 56,284, 56,359–60 (Oct. 30, 2009).

³²¹ *California Regulators Move Closer to Tighten GHG Reporting Threshold*, 27 Env'tl. Pol'y Alert (Inside EPA) Mar. 24, 2010, at 36 (noting that WCI had set a 10,000 tpy threshold).

³²² Carolyn Whetzel, *Western Climate Initiative Aims to Harmonize Emissions Reporting with EPA Requirements*, 41 Env't Rep. (BNA) 1230, at 1230 (June 4, 2010).

³²³ *States Struggle to Harmonize GHG Reporting Rules with EPA Approach*, 27 Env'tl. Pol'y Alert (Inside EPA) Nov. 5, 2009, at 42.

³²⁴ Molly Davis, *Industry Pushes for Key Confidentiality Provisions in GHG Registry*, 21 Clean Air Rep. (Inside EPA) Mar. 18, 2010, at 17; Anthony Lacey, *Court Suspension Allows EPA to Seek Deal on GHG Reporting Rule*, 21 Clean Air Rep. (Inside EPA) Mar. 18, 2010, at 18.

³²⁵ Clean Air Act Amendments of 1990, S. 1630, 101st Cong. § 206 (1990). This legislative history is discussed in Reitze, *supra* note 14, at 10,257.

³²⁶ 549 U.S. 497 (2007).

³²⁷ *Id.* at 532.

twenty other environmental and renewable energy industry organizations filed a petition to compel EPA to regulate emissions of GHGs from motor vehicles pursuant to section 202(a)(1) of the CAA, which was denied by EPA.³²⁸

EPA's administrative denial of the ICTA petition was challenged in a lawsuit filed in the D.C. Circuit on July 15, 2005, that resulted in EPA's position being upheld by a divided court.³²⁹ The case was appealed to the United States Supreme Court where the Court addressed two questions concerning the meaning of CAA section 202(a)(1): whether EPA has the statutory authority to regulate GHG emissions from new motor vehicles; and if so, whether its stated reasons for refusing to do so are consistent with the statute.³³⁰ In a 5 to 4 decision, written by Justice Stevens, in which Justices Kennedy, Souter, Ginsburg, and Breyer joined, the Court ruled that the petitioners had standing.³³¹ The Court then held that GHGs are physical and chemical substances that are emitted into the air and qualify as air pollutants based on the definition provided in CAA section 302(g).³³² It addressed the issue of whether EPA properly refused to exercise its authority to regulate GHGs under section 202(a)(1) by ruling that "EPA can avoid taking further action only if it determines that GHGs do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do."³³³ The Supreme Court reversed the Court of Appeals decision and remanded the case to EPA for additional proceedings, however it did not say whether EPA must make an endangerment finding, and it did not articulate what policy concerns may be considered by EPA in making its finding.³³⁴

³²⁸ Petition for Rule Making and Collateral Relief Seeking the Regulation of Greenhouse Gas Emissions from New Motor Vehicles Under § 202 of the Clean Air Act, from Int'l Ctr. for Tech. Assessment, to U.S. Env'tl. Prot. Agency 1-5 (2009), *available at* <http://www.icta.org/doc/ghgpet2.pdf>. On August 8, 2003, EPA issued a notice of denial of the petition for rulemaking that concluded the Agency did not have authority to regulate GHGs, including CO₂, under the CAA, and that even if the Agency had the authority to set GHG emission standards, it would be unwise to do so at this time. 68 Fed. Reg. 52,922, 52,922-23, 52,925 (Sept. 8, 2003).

³²⁹ *Massachusetts v. U.S. Env'tl. Prot. Agency*, 415 F.3d 50, 53, 58 (D.C. Cir. 2005), *rev'd* 549 U.S. 497 (2007). The court addressed the merits despite standing issues. Judge Randolph did not rule on standing but on the merits held that it was reasonable for EPA to base its decision on policy considerations such as scientific uncertainty and the concern that unilateral action could weaken efforts to reduce GHGs from other countries. *Id.* at 58. Judge Sentelle dissented in part because he concluded the petitioners had not demonstrated an injury necessary to have Article III standing, but he joined Judge Randolph in his judgment on the merits. *Id.* at 59 (Sentelle, J., dissenting). Judge Tatel dissented based on the CAA's statutory language which he viewed as mandating the control of CO₂ in § 202(a)(1) even though the provision overlaps responsibilities given to other agencies under other acts. *Id.* at 67-68 (Tatel, J., dissenting).

³³⁰ *Massachusetts v. EPA*, 549 U.S. at 528, 532.

³³¹ *Id.* at 501, 526.

³³² *Id.* at 528-29.

³³³ *Id.* at 533.

³³⁴ *Id.* at 534-35. The history of *Massachusetts v. EPA* is covered in more detail in Arnold W. Reitze, Jr., *Controlling Greenhouse Gas Emissions from Mobile Sources—Massachusetts v. EPA*, 37 Env'tl. L. Rep. (Env'tl. Law Inst.) 10,535, at 10,535-36 (July 2007).

EPA subsequently promulgated an “Advance Notice of Proposed Rulemaking” on July 30, 2008, in which EPA effectively decided not to regulate GHGs at that time, and commenced a lengthy regulatory process that precluded a decision being made before President Obama’s Administration occupied the White House.³³⁵

On April 17, 2009, the Administrator made a proposed endangerment finding that six GHGs are air pollutants that may be reasonably anticipated to endanger public health and welfare, and four of them—CO₂, methane, NO_x and hydrofluorocarbons—are emitted from new automobiles, which would allow their regulation under CAA section 202.³³⁶ On September 28, 2009, the National Highway Traffic Safety Administration (NHTSA) and EPA each proposed rules to control GHG emissions from passenger cars, light-duty trucks, and medium-duty passenger vehicles.³³⁷ EPA would limit CO₂ emissions, and the United States Department of Transportation (DOT) would adopt Corporate Average Fuel Economy (CAFE) standards for model years beginning in 2012.³³⁸ EPA’s GHG controls for light-duty vehicles could not be finalized until the Agency made an endangerment finding. On December 15, 2009, EPA promulgated a final rule saying GHG emissions contribute to GHG pollution, which threatens public health and welfare.³³⁹ This allowed EPA’s light-duty vehicle CO₂ standard to be finalized, which would make CO₂ a regulated pollutant. By mid-January 2010 sixteen lawsuits had been filed in the D.C. Circuit challenging the endangerment finding.³⁴⁰ Petitioners included three states, twelve Republican members of Congress, and many industry trade organizations.³⁴¹ The court postponed the case to allow EPA to respond to ten administrative petitions that were filed with EPA.³⁴² The Agency denied the petitions for review, and on August 13, 2010, the United States Chamber of Commerce filed a suit with the D.C. Circuit challenging the legality of EPA’s rejection of the administrative petition.³⁴³ On January 21, 2010, Senator Lisa Murkowski (R-Alaska)

³³⁵ 73 Fed. Reg. 44,354, 44,355 (proposed July 30, 2008). *See generally* Roger Martella, James Cahan & Chris Bell, *EPA’s Greenhouse Gas Proposal: A Blueprint for Federal Regulation*, 39 Env’t Rep. (BNA) 2145, at 2145–46, 2152 (Oct. 24, 2008) (discussing the background of federal GHG regulation and five key themes of EPA’s Advance Notice of Proposed Rulemaking).

³³⁶ 74 Fed. Reg. 18,886, 18,886 (proposed Apr. 24, 2009).

³³⁷ 74 Fed. Reg. 49,454, 49,454 (proposed Sept. 28, 2009).

³³⁸ *Id.* at 49,468, 49,631.

³³⁹ 74 Fed. Reg. 66,496, 66,496 (Dec. 15, 2009) (to be codified at 40 C.F.R. ch. 1).

³⁴⁰ Steven D. Cook, *Sixteen Lawsuits Filed Challenging EPA Rule That Greenhouse Gas Emissions Pose Danger*, 41 Env’t Rep. (BNA) 363, at 363 (Feb. 19, 2010). In May 2010, the National Electrical Manufacturers Association (NEMA) was added to the industry groups challenging the endangerment finding. *Electrical Manufacturers Challenge Greenhouse Gas Endangerment Finding*, 21 Clean Air Rep. (Inside EPA) May 27, 2010, at 22. In addition, ten petitions were filed with EPA to reconsider its endangerment finding. *See EPA Rejects 10 Petitions to Reconsider Climate Risk Finding*, 21 Clean Air Rep. (Inside EPA) Aug. 5, 2010, at 19. They were rejected on July 29, 2010. *Id.*

³⁴¹ Cook, *supra* note 340, at 363.

³⁴² Lacey, *supra* note 324, at 18.

³⁴³ *U.S. Chamber Sues EPA over Rejection of GHG Endangerment Petition*, 21 Clean Air Rep. (Inside EPA) Aug. 19, 2010, at 31.

introduced a resolution seeking to nullify EPA's endangerment finding.³⁴⁴ She had substantial Republican support, but needed to obtain support from Democrats if she was to achieve the necessary 51 votes.³⁴⁵ On February 2, 2010, Representative Ike Skelton (D-Mo.) introduced H.R. 4572 to repeal EPA's authority to regulate GHG emissions under the CAA.³⁴⁶ In June 2010, Senator Murkowski's resolution was rejected by the Senate in a 53 to 47 vote, although six Democrats supported the resolution.³⁴⁷ Subsequently, Senator Jay Rockefeller (D-W. Va.) introduced S. 3072 to delay regulation of CO₂ from power plants and other stationary sources, and it attracted Democratic support.³⁴⁸

On May 7, 2010, EPA and DOT's NHTSA promulgated their joint final rule to regulate GHG emissions from light-duty vehicles, as well as new fuel economy requirements.³⁴⁹ This rule makes CO₂ a regulated pollutant, which triggers the applicability of many other sections of the CAA. This means that carbon sources, such as fossil-fueled electric power plants, are now subject to regulation to control CO₂ emissions, which is discussed below.

C. CO₂ as a Criteria Pollutant

Conventional pollutants have been regulated by "command and control" measures since the CAA was created. For common pollutants released in large quantities—primarily from the combustion of fossil fuels³⁵⁰—EPA regulates ambient air concentrations of six pollutants through its national ambient air quality standards (NAAQS) as part of its criteria pollutant control program.³⁵¹ Each state creates a state implementation plan (SIP) to control emission sources in order to reach the ambient levels of pollution set

³⁴⁴ *Critics Say Murkowski Resolution Sets Dangerous Science Precedent*, 21 Clean Air Rep. (Inside EPA) Feb. 4, 2010, at 25.

³⁴⁵ See Doug Obey, *Murkowski Seen Eyeing Jobs Debate for Push to Block EPA Climate Rules*, 27 Env'tl. Pol'y Alert (Inside EPA) Jan. 27, 2010, at 26 (noting that only three Democrats have supported Murkowski); *NHTSA Joins EPA in Opposing Murkowski Push to Block Vehicle GHG Rules*, Clean Air Rep. (Inside EPA) Mar. 4, 2010, at 31 (discussing the battle between Republican and Democratic Senators over EPA's endangerment finding).

³⁴⁶ Steven D. Cook, *Skelton, Peterson, Emerson Introduce Bill to Eliminate EPA Greenhouse Gas Authority*, 41 Env't Rep. (BNA) 261, at 261 (Feb. 5, 2010); see U.S. Senate Roll Call Votes 111th Congress—2nd Session, http://www.senate.gov/legislative/LIS/roll_call_lists/roll_call_vote_cfm.cfm?congress=111&session=2&vote=00184 (last visited Nov. 21, 2010).

³⁴⁷ Doug Obey, *Senate Climate Agenda Remains Murky as Democrats Acknowledge Split*, 27 Env'tl. Pol'y Alert (Inside EPA) June 16, 2010, at 23.

³⁴⁸ Steven D. Cook & Dean Scott, *Senators Seek Vote on Rockefeller Bill to Delay EPA Regulation of Carbon Emissions*, 41 Env't Rep. (BNA) 1354, at 1354 (June 18, 2010).

³⁴⁹ 75 Fed. Reg. 25,324 (May 7, 2010) (to be codified in scattered sections of 40 C.F.R. and 49 C.F.R.).

³⁵⁰ See OFFICE OF AIR QUALITY PLANNING & STANDARDS, U.S. ENVTL. PROT. AGENCY, OUR NATION'S AIR: STATUS AND TRENDS THROUGH 2008, at 5–6 (2010), available at <http://www.epa.gov/airtrends/2010/report/airpollution.pdf>.

³⁵¹ See Clean Air Act, 42 U.S.C. §§ 7408–7410 (2006). The criteria pollutants are particulate matter, SO₂, nitrogen dioxide, carbon monoxide, ozone, and lead. See 40 C.F.R. §§ 50.4–.13 (2009) (establishing national primary and secondary ambient air quality standards for each criteria pollutant).

out in the applicable NAAQS.³⁵² This is supplemented by technology-based requirements that are imposed on various sources.³⁵³

Under CAA section 108(a) the Administrator must list air pollutants “which may reasonably be anticipated to endanger public health or welfare.”³⁵⁴ After listing a pollutant, CAA section 109(a)(2) requires the Administrator to issue an air criteria document within twelve months, and simultaneously publish a proposed primary and secondary air quality standard.³⁵⁵ Primary standards are to protect public health, whereas secondary standards are to protect public welfare.³⁵⁶ No existing criteria pollutant has been designated solely because of its impact on public welfare. It is not clear from the wording of section 109 that the Administrator could promulgate a criteria pollutant standard for a pollutant that adversely affected human welfare but did not adversely affect public health. CO₂ does not adversely affect human health directly at the concentrations found in the atmosphere,³⁵⁷ but that does not prevent EPA from making a determination that it does.

If EPA is to regulate CO₂, it will be difficult to develop a viable program using the SIP process,³⁵⁸ because ambient troposphere levels of CO₂ essentially are the same everywhere in the world.³⁵⁹ Moreover, the United States is responsible for only about twenty percent of the world’s anthropogenic GHG emissions and the percentage is declining as developing nations increase their utilization of fossil energy.³⁶⁰ If EPA adopted a criteria pollutant approach to control CO₂, it would have to set atmospheric numerical values that are either above or below present values. If CO₂ NAAQS values were below present CO₂ atmospheric concentration, the entire country would have a nonattainment status with no realistic expectation that any measure taken as part of a SIP would lead to attainment of the standard.

If a NAAQS value above the present CO₂ atmospheric concentration was selected, the entire nation would be in attainment, and significant effort to reduce CO₂ would not be needed. Major new or modified sources would be required to participate in an expensive and time-consuming

³⁵² 42 U.S.C. § 7410(a) (2006).

³⁵³ Robert J. Martineau, Jr., *Hazardous Air Pollutants*, in *THE CLEAN AIR ACT HANDBOOK* 227, 243 (2d ed. 2004).

³⁵⁴ 42 U.S.C. § 7408(a) (2006).

³⁵⁵ *Id.* § 7409(a)(2).

³⁵⁶ *Id.* § 7409(b)(1)–(2).

³⁵⁷ U.S. ENVTL. PROT. AGENCY, TECHNICAL SUPPORT DOCUMENT FOR ENDANGERMENT AND CAUSE AND CONTRIBUTE FINDINGS FOR GREENHOUSE GASES UNDER SECTION 202(A) OF THE CLEAN AIR ACT 17 (2009).

³⁵⁸ Delaware in 2008 became the first state to include CO₂ as a pollutant in its SIP, which triggers the need to address the pollutant in the state’s PSD program. Steven D. Cook, *Revisions to Delaware Plan Raise Possibility of Carbon Dioxide Regulation Under Air Act*, 39 Env’t Rep. (BNA) 1818, at 1818 (Sept. 12, 2008).

³⁵⁹ There are small variations between the northern and southern hemisphere of about 2 ppm because more fossil fuel is burned in the northern hemisphere. JOHN HOUGHTON, *GLOBAL WARMING: THE COMPLETE BRIEFING* 27 (4th ed. 2009).

³⁶⁰ INT’L ENERGY AGENCY, CO₂ EMISSIONS FROM FUEL COMBUSTION: HIGHLIGHTS 10, 11 (2009).

prevention of significant deterioration (PSD) program³⁶¹ with no realistic expectation of improving the atmospheric concentration of CO₂. Nevertheless, some environmental organizations have moved to have CO₂ declared a criteria pollutant.³⁶²

Even if EPA does not make CO₂ a criteria pollutant, sources of CO₂ can expect to have new emission restrictions in order to meet the requirements of a SIP revision because of more stringent criteria pollutant standards for ozone and nitrogen dioxide. Moreover, as of 2009, thirty-seven states had failed to submit SIP revisions to comply with EPA's haze reduction requirements, and EPA plans to issue a federal implementation plan for states that fail to comply by January 15, 2011.³⁶³ On June 2, 2010, EPA announced it was setting a one-hour SO₂ standard of 75 parts per billion using a three-year average of the 99th percentile of annual distribution of the daily maximum concentrations.³⁶⁴ This change represents a significant tightening of the standard and will add to the costs imposed on coal-fired power plants.³⁶⁵

D. Construction and Operating Permits

Proposed new or modified major sources must obtain permits prior to construction.³⁶⁶ In areas that meet the NAAQS for all of the pollutants that the source will emit, the legal requirement is known as a PSD review.³⁶⁷ If the area does not meet the NAAQS for a pollutant that will be emitted, a project is subject to NSR.³⁶⁸ EPA frequently uses NSR to mean both the PSD and NSR programs. Projects must have their environmental impacts assessed as part of a construction permit program.³⁶⁹ The PSD process includes determining the appropriate technology to require an applicant to use in order to comply with the CAA section 165(a)(4) requirement to use the best available control technology (BACT), which as defined in CAA section

³⁶¹ See Nathaniel Lord Martin, *The Reform of New Source Review: Toward a More Balanced Approach*, 23 STAN. ENVTL. L.J. 351, 354 (2004) (discussing characterizations of the NSR program prior to 2002 reforms); see also 42 U.S.C. § 7475 (2006) (PSD program).

³⁶² Dawn Reeves, *Activists Petition EPA for CO₂ NAAQS Citing Insufficient Climate Action*, 20 Clean Air Rep. (Inside EPA) Dec. 10, 2009, at 4.

³⁶³ *Colorado Gas Bill Touted as Model for States to Meet EPA Air Rules*, 27 Env'tl. Pol'y Alert (Inside EPA) Apr. 7, 2010, at 38, 39.

³⁶⁴ U.S. ENVTL. PROT. AGENCY, FACT SHEET: REVISIONS TO THE PRIMARY NATIONAL AMBIENT AIR QUALITY STANDARD, MONITORING NETWORK, AND DATA REPORTING REQUIREMENTS FOR SULFUR DIOXIDE 1 (2010), available at <http://www.epa.gov/air/sulfurdioxide/pdfs/20100602fs.pdf>.

³⁶⁵ See Andrew Childers, *EPA Establishes First Hourly Air Standard for Sulfur Dioxide, Revokes Other Standards*, 41 Env't Rep. (BNA) 1221, at 1221 (June 4, 2010).

³⁶⁶ Arnold W. Reitze, Jr., *New Source Review: Should It Survive?*, 34 Env't'l L. Rep. (Env'tl. Law Inst.) 10,673, at 10,673 (July 2004).

³⁶⁷ *Id.*; 61 Fed. Reg. 38,250, 38,309–10 (proposed July 23, 1996) (to be codified at 40 C.F.R. pts. 51, 52) (explaining the purpose and objectives of PSD review).

³⁶⁸ Reitze, *supra* note 366, at 10,673.

³⁶⁹ See, e.g., Clean Air Act, 42 U.S.C. § 7475(a)(2) (2006). See generally Reitze, *supra* note 366, at 10,673 (overview of the NSR program).

169(3) requires consideration of economic impacts and costs.³⁷⁰ In nonattainment areas, CAA section 173(a)(2) requires the lowest achievable emission rate (LAER) to be achieved.³⁷¹ EPA usually uses a “top-down” analysis for determining what BACT/LAER is.³⁷² The primary guidance is EPA’s 1990 New Source Review Workshop Manual.³⁷³ Determining the appropriate technology requires considering process changes, fuel substitution, add-on controls and any other available methods to obtain the maximum degree of emission reduction.³⁷⁴ The process begins with requiring the application of the new source performance standards (NSPS), but it is site specific, which allows the permitting authority to impose more stringent standards.³⁷⁵ New and modified major stationary sources would have to meet the BACT/LAER requirements required by CAA sections 165(a)(4) and 173(a)(2). However, there is no technology that meets the BACT/LAER definitions found in CAA sections 169(3) and 171(3).³⁷⁶

The PSD process, if applicable, applies to “each pollutant subject to regulation under [the CAA] emitted from, or which results from, such facility.”³⁷⁷ In nonattainment areas a new or modified major source must control any pollutant that is subject to a NSPS.³⁷⁸ The NSPS for an industrial category applies to any air pollutant.³⁷⁹ “Air pollutant” is defined broadly in CAA section 302(g).³⁸⁰ PSD/NSR requirements are site specific and allow the permitting authority to impose more stringent requirements on a permit applicant than otherwise would be imposed by the CAA.³⁸¹ States may impose additional standards pursuant to CAA section 116.³⁸² All states have

³⁷⁰ 42 U.S.C. §§ 7475(a)(3), 7479(3) (2006); *see also* Entergy Corp. v. Riverkeeper, Inc., 129 S. Ct. 1498, 1510 (2009) (upholding EPA’s use of a cost-benefit analysis to determine the best technology under the Clean Water Act’s effluent discharge standard); Alaska Dep’t Env’tl. Conservation v. U.S. Env’tl. Prot. Agency, 540 U.S. 461, 471–73 (2004).

³⁷¹ 42 U.S.C. § 7503(a)(2) (2006).

³⁷² U.S. ENVTL. PROT. AGENCY, NEW SOURCE REVIEW WORKSHOP MANUAL: PREVENTION OF DETERIORATION AND NONATTAINMENT AREA PERMITTING, at B.5 (1990), *available at* <http://www.epa.gov/region07/air/nsr/nsrmemos/1990wman.pdf>.

³⁷³ *Id.*

³⁷⁴ 40 C.F.R. § 51.166(b)(12) (2010).

³⁷⁵ 42 U.S.C. § 7416 (2006); ENVTL. PROT. AGENCY, *supra* note 372, at B.5–7.

³⁷⁶ *See, e.g.,* Svend Brandt-Erichsen & Dustin Till, *EPA Issues Final Rule Regulating Greenhouse Gases from New and Modified Sources*, MARTEN LAW (May 14, 2010), *available at* <http://www.martenlaw.com/newsletter/20100514-epa-issues-final-ghg-rule> (last visited Nov. 21, 2010).

³⁷⁷ 42 U.S.C. § 7475(a)(4) (2006).

³⁷⁸ *See id.* §§ 7410(a)(2)(D), 7411(a), 7411(f), 7501; 40 C.F.R. § 423.15 (2009).

³⁷⁹ 42 U.S.C. § 7411(a)(1), (b), (f).

³⁸⁰ *Id.* § 7602(g) (“The term ‘air pollutant’ means any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive . . . substance or matter which is emitted into or otherwise enters the ambient air.”).

³⁸¹ Memorandum from Stephen L. Johnson, Adm’r, to Reg’l Adm’rs (Dec. 18, 2008), *available at* http://www.epa.gov/NSR/documents/psd_interpretive_memo_12.18.08.pdf.

³⁸² 42 U.S.C. § 7416 (2006).

been delegated the authority to run their nonattainment NSR program; most states have been delegated the authority to run their PSD programs.³⁸³

An issue of concern was whether GHGs that were not regulated, but could be regulated, were subject to Federal PSD/NSR requirements, which is an issue the Supreme Court's April 2, 2007 decision in *Massachusetts v. EPA* did not answer.³⁸⁴ EPA's position prior to 2009 was that CO₂ impacts did not have to be considered as part of the NSR permit process because it was not yet a regulated pollutant.³⁸⁵ But, EPA's Environmental Appeals Board (EAB) did not always concur. On August 30, 2007, EPA's Region 8 issued a PSD permit to the Deseret Power Electric Cooperative's proposed new facility near Bonanza, Utah, despite its potential for increasing CO₂ emissions.³⁸⁶ The permit did not include BACT limits for CO₂.³⁸⁷ The decision was challenged by the Sierra Club in *In re Deseret Power Electric Cooperative*.³⁸⁸ On November 13, 2008, EAB remanded the permit to the Region to reconsider whether or not to impose a CO₂ BACT limit based on the "subject to regulation" definition in the CAA and for the Region to develop an adequate record for its decision.³⁸⁹ In another case, *In re Northern Michigan University Ripley Heating Plant*,³⁹⁰ EAB directed the Michigan Department of Environmental Quality to review a permit for a new power plant at Northern Michigan University to determine whether GHGs should be regulated on

³⁸³ See 40 C.F.R. §§ 52.50–.2635 (2009) (approving SIP). For instance, Maine has been delegated authority to implement both its nonattainment NSR and PSD program. *Id.* §§ 52.1026, 52.1029.

³⁸⁴ Memorandum from Stephen L. Johnson, *supra* note 381.

³⁸⁵ *Id.* But see *Genesee Power Station*, 4 E.A.D. 832, 848 (EAB 1993) (holding that the environmental impact of unregulated pollutant is a proper consideration in selecting the appropriate control technology for regulated pollutants); *N. Country Res. Recovery Assocs.*, 2 E.A.D. 229, 230 (Adm'r 1986) (holding that it is clearly within EPA's authority to evaluate the environmental impact of unregulated pollutants in making a BACT determination).

³⁸⁶ *Deseret Power Electric Coop.*, PSD Appeal No. 07-03, slip op. at 1 (EAB Nov. 13, 2008), available at [http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%20By%20Appeal-Number/C8C5985967D8096E85257500006811A7/\\$File/Remand...39.pdf](http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%20By%20Appeal-Number/C8C5985967D8096E85257500006811A7/$File/Remand...39.pdf).

³⁸⁷ *Id.*

³⁸⁸ *Id.*

³⁸⁹ *Id.* at 1, 63–64. The Board held that prior EPA actions were insufficient to establish a historic, binding interpretation that "subject to regulation" for PSD purposes included only those pollutants subject to regulations that require actual control of emissions. *Id.* at 8–9. However, EAB rejected arguments that the CAA compelled only one interpretation of the phrase "subject to regulation" and found no evidence of a congressional intent to apply BACT to pollutants that are subject only to monitoring and reporting requirements. *Id.* at 31, 33–34, 63. EAB encouraged EPA to consider addressing this issue as an action of nationwide scope, rather than through this specific permitting proceeding. *Id.* at 64. Because the grant of reconsideration directed EPA to conduct this reconsideration using a notice and comment process, the proposal did not address the procedural challenge presented in the Petition for Reconsideration. *Id.* at 64–65. EAB did not rule on a Sierra Club argument that section 821 of the Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399, 2699, which is not codified in the CAA, but which require monitoring and reporting of CO₂ emissions, is a regulation under the CAA. *Id.* at 31.

³⁹⁰ PSD Appeal No. 08-02 (EAB Feb. 18, 2009), available at [http://yosemite.epa.gov/oa/EAB_WEB_Docket.nsf/Filings%20By%20Appeal%20Number/06DBEC31EBFD8C3E852575620052318B/\\$File/Denying%20and%20Remanding...79.pdf](http://yosemite.epa.gov/oa/EAB_WEB_Docket.nsf/Filings%20By%20Appeal%20Number/06DBEC31EBFD8C3E852575620052318B/$File/Denying%20and%20Remanding...79.pdf).

February 18, 2010.³⁹¹ However, on April 28, 2010, the Texas Commission on Environmental Quality approved an expansion of the Coletto Creek Power Station without sufficiently considering GHG issues.³⁹²

On December 18, 2008, EPA Administrator Stephen Johnson issued a memorandum setting forth EPA's interpretation regarding which pollutants were subject to regulation for the purposes of the Federal PSD permitting program.³⁹³ The memorandum defines "regulated NSR pollutant" as including pollutants "subject to a provision in the Act or regulation adopted by EPA under the Act that requires actual control of emissions of that pollutant," while excluding pollutants "for which EPA regulations only require monitoring or reporting."³⁹⁴ The memorandum provides EPA's interpretation of CAA sections 165(a)(4) and 169(3), which use language similar to the EPA regulations. On December 31, 2008, EPA issued an interpretive memorandum clarifying the December 18th memorandum explaining that pollutants for which only monitoring or reporting are required are not regulated pollutants.³⁹⁵

On February 17, 2009, EPA granted a Petition for Reconsideration and announced its intent to conduct a rulemaking to allow for public comment on the issues raised in the Interpretive Memorandum and on any issues raised by EAB's *Deseret* opinion.³⁹⁶ On May 25, 2010, the Court of Appeals of Virginia upheld a PSD permit issued to Virginia Electric and Power Company for a coal-fired electric generating plant that did not impose CO₂ requirements based on the position of EPA concerning what is a regulated pollutant.³⁹⁷

On September 28, 2009, the NHTSA and EPA each proposed rules to control GHG emissions from passenger cars, light-duty trucks, and medium-duty passenger vehicles that would reduce GHGs and improve fuel economy from motor vehicles.³⁹⁸ EPA's rule to control GHGs from light-duty vehicles could not be finalized until the Agency made its proposed endangerment finding final.³⁹⁹ On December 15, 2009, EPA promulgated an endangerment finding that CO₂, methane, NO_x, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride in the atmosphere threaten public health and welfare.⁴⁰⁰

³⁹¹ *Id.* at 2, 31–32, 66.

³⁹² Nancy J. Moore, *Texas Agency Approves Air Permits for Expansion of Coal-Fired Power Plant*, 41 Env't Rep. (BNA) 1025, at 1025 (May 7, 2010).

³⁹³ 73 Fed. Reg. 80,300, 80,300–01 (proposed Dec. 31, 2008) (to be codified at 40 C.F.R. pt. 52) (providing public notice of EPA's interpretation regarding what pollutants are subject to regulation).

³⁹⁴ *Id.* at 80,301.

³⁹⁵ *Id.*

³⁹⁶ 74 Fed. Reg. 51,535, 51,535, 51,546 (proposed Oct. 7, 2009) (to be codified at 40 C.F.R. pt. 52).

³⁹⁷ *Appalachian Voices v. State Air Pollution Control Bd.*, 693 S.E.2d 295, 295–301 (Va. Ct. App. 2010).

³⁹⁸ 74 Fed. Reg. 49,454 (proposed Sept. 28, 2009) (to be codified at 40 C.F.R. pts. 85–86, 600 and 49 C.F.R. pts. 531, 533 & 536–38).

³⁹⁹ See Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 18,886, 18,888 (proposed Apr. 24, 2009) (to be codified at 40 C.F.R. § 1).

⁴⁰⁰ 74 Fed. Reg. 66,496 (Dec. 15, 2009) (codified at 40 C.F.R. ch. 1).

On May 7, 2010, EPA and NHTSA published a joint final rule to control GHG emissions from light-duty vehicles.⁴⁰¹ Now that GHGs are regulated pollutants under the CAA, they will be subject to regulation under many provisions of the CAA, including the CAA's PSD/NSR requirements.⁴⁰² This led to at least seventeen petitions for review in the D.C. Circuit challenging the light-duty GHG vehicle rule.⁴⁰³

On April 2, 2010, EPA promulgated its regulatory interpretation concerning the pollutants covered by the CAA.⁴⁰⁴ EPA decided to continue applying the Agency's existing interpretation of 40 C.F.R. § 52.21(b)(50) found in the PSD Interpretive Memo.⁴⁰⁵ However, EPA refined its interpretation of 40 C.F.R. § 52.21(b)(50) and the parallel provision in 40 C.F.R. section 51.166(b)(49) to establish that PSD permitting requirements apply to a newly regulated pollutant at the time a regulatory requirement to control emissions of that pollutant "takes effect," rather than upon promulgation or the legal effective date of the regulation.⁴⁰⁶ EPA also addressed several outstanding questions regarding the applicability of the PSD and Title V permitting programs to GHGs.⁴⁰⁷ The emissions control requirements in the rule for mobile sources require compliance through vehicular certification before introducing any MY2012 vehicles into commerce.⁴⁰⁸ EPA concluded PSD program requirements and other stationary source requirements apply to GHGs upon the date that the tailpipe standards for the MY2012 light-duty vehicles take effect, which EPA ruled is January 2, 2011.⁴⁰⁹ By June 2010 there were at least fourteen lawsuits challenging EPA's scheduling rule.⁴¹⁰

The onset of the BACT requirement is not to be delayed in order for technology or control strategies to be developed. EPA will continue to interpret the definition of "regulated NSR pollutant" in 40 C.F.R. section 52.21(b)(50) to exclude pollutants, which only require monitoring or reporting, but to include each pollutant subject to either a CAA provision or promulgated regulation that requires actual control of emissions of that pollutant. EPA—in its April 2, 2010, interpretation—made it clear that provisions in a SIP regulating a pollutant do not make it a nationally regulated pollutant under the CAA,⁴¹¹ which could trigger the need for compliance with other provisions of the CAA. On April 2, 2010, mining and

⁴⁰¹ 75 Fed. Reg. 25,324 (May 7, 2010) (codified at 40 C.F.R. pts. 85–86, 600 and 49 C.F.R. pts. 531, 533 & 536–38); *see infra* Part IV.G.

⁴⁰² See discussion, *supra* Part IV.B.

⁴⁰³ *EPA GHG Vehicle Rule Faces Slew of Last-Minute State, Industry Lawsuits*, 21 Clean Air Rep. (Inside EPA) July 22, 2010, at 34; *Stationary Source Groups Sue EPA over Final Vehicle Tailpipe GHG Rules*, 27 Env'tl. Pol'y Alert (Inside EPA) May 19, 2010, at 32.

⁴⁰⁴ 75 Fed. Reg. 17,004 (April 2, 2010) (codified at 40 C.F.R. pts. 50–51, 70–71).

⁴⁰⁵ *Id.* at 17,005–06.

⁴⁰⁶ *Id.* at 17,006.

⁴⁰⁷ *Id.*

⁴⁰⁸ *Id.* at 17,007.

⁴⁰⁹ *Id.*

⁴¹⁰ Steven D. Cook, *Chamber of Commerce, Manufacturers Sue EPA over Greenhouse Gas Regulation*, 41 Env't Rep. (BNA) 1227, at 1227 (June 4, 2010).

⁴¹¹ 75 Fed. Reg. at 17011.

agricultural groups challenged the mobile source regulation claiming that regulating mobile sources should not automatically lead to regulation of stationary sources under other sections of the CAA.⁴¹²

Because of the large quantities of CO₂ emitted by stationary sources, industry is concerned that if GHGs are regulated the threshold amounts of CO₂ necessary to trigger the applicability of the PSD or nonattainment program will be reached by 1,000,000 commercial buildings, 200,000 manufacturing operations, and 20,000 large farms, rather than the 150,000 stationary sources presently subject to regulation.⁴¹³ The threshold for the PSD program under section 169(1) of the CAA is 100 or 250 tpy of a pollutant, depending on the industry classification.⁴¹⁴ In nonattainment areas, the statutory threshold under CAA sections 302(j) and 181–187 is at least 100 tpy and sometimes is less.⁴¹⁵ A farm with 25 dairy cows or 200 hogs can release 100 tpy of CO₂e,⁴¹⁶ and even if it was not new or modified so as to trigger NSR, it would be a major source subject to CAA Subchapter V's operating permit requirements.⁴¹⁷ The operating permit requires a minimum fee of \$25 per ton, so a small farm that emits 100 tpy would have to pay \$2500 per year.⁴¹⁸ It is expected that industries will challenge the rule because EPA failed to consider the impact on small businesses as required under the Regulatory Flexibility Act.⁴¹⁹ The PSD program also could apply to new gas-fired peaking facilities, which will adversely impact the development of renewable energy because wind and solar facilities need backup electric power.⁴²⁰

When combusted, a gallon of gasoline combines with the oxygen in the air to produce about twenty pounds of CO₂.⁴²¹ Therefore, the PSD threshold may be triggered by using about 5000 gallons of fuel a year, equivalent to 100 tpy of CO₂; in a nonattainment area less combusted fuel is needed to trigger the program's applicability. To cope with the potentially large number of

⁴¹² Dean Scott, *Industries Target EPA Regulatory Authority over Power Plant Emissions, Other Sources*, 41 Env't Rep. (BNA) 779, at 779 (Apr. 9, 2010).

⁴¹³ Steven D. Cook, *Air Regulators to Endorse Strong Role for Clean Air Act in Climate Program*, 39 Env't Rep. (BNA) 2168, at 2168–2169 (Oct. 31, 2008); Steven D. Cook, *Carbon Dioxide Regulation Under Air Act Would Affect 1.2 Million Sources, Group Says*, 39 Env't Rep. (BNA) 1871, at 1871 (Sept. 19, 2008).

⁴¹⁴ 42 U.S.C. § 7479(1) (2006).

⁴¹⁵ See 40 C.F.R. § 51.165(a) (2006).

⁴¹⁶ Steven D. Cook, *Business Commentators Oppose Regulation of Greenhouse Gases Under Clean Air Act*, 39 Env't Rep. (BNA) 2356, at 2356 (Nov. 28, 2008).

⁴¹⁷ *Id.*

⁴¹⁸ Cook, *supra* note 416, at 2357; Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 74 Fed. Reg. 55,292, 55,292 (proposed Oct. 27, 2009) (to be codified at 40 C.F.R. pts. 51–52, 70–71) (discussing these issues and establishing 25,000 tons of GHGs as the threshold for PSD).

⁴¹⁹ Regulatory Flexibility Act of 1980, 5 U.S.C. §§ 601–612 (2006); Jonathan Strong, *EPA Faces Legal Hurdle over Small Business Impacts of Climate Rules*, 27 Envtl. Pol'y Alert (Inside EPA) Jan. 13, 2010, at 26.

⁴²⁰ *California Says EPA Climate Rules May Hurt Renewable Energy Expansion*, 21 Clean Air Rep. (Inside EPA) Jan. 21, 2010, at 25.

⁴²¹ U.S. Dep't of Energy, *How Can a Gallon of Gasoline Produce 20 Pounds of Carbon Dioxide?*, <http://www.fueleconomy.gov/feg/CO2.shtml> (last visited Nov. 21, 2010).

new permits that would be needed to regulate GHG emissions, EPA promulgated a proposed rule on October 27, 2009, called the Tailoring Rule, to modify the regulations applicable to the PSD program and the Subchapter V operating permit program.⁴²² The Agency proposed to limit the applicability of PSD requirements to new sources emitting 25,000 tons or more of CO₂e for the first six years of the program.⁴²³ The rule would impose PSD permit requirements on existing sources making modifications between 10,000 and 25,000 tpy of CO₂e, with the exact significance level to be determined after public comment.⁴²⁴ It is not expected that the NSR program will apply to GHG emissions because there is no NAAQS for any GHG, therefore there can be no GHG nonattainment areas.⁴²⁵

The existing PSD program issues 280 permits a year,⁴²⁶ whereas unless EPA limits its permit obligations for sources of GHG emissions, EPA and the states could be required to handle permit applications from 41,000 new and modified facilities in 2010,⁴²⁷ and one year after GHG regulations for mobile sources are promulgated, *six million* sources would be required to submit CAA Subchapter V operating permit applications.⁴²⁸ These permits would need to be issued within eighteen months after receipt of a complete application.⁴²⁹ In addition, GHG limitations would need to be added to the existing 14,700 Subchapter V permits.⁴³⁰ For this reason, states urged EPA to delay implementation of its proposed Tailoring Rule.⁴³¹

EPA's effort to limit the number of potential permits using the proposed Tailoring Rule would not affect states that have PSD programs that are part of an approved SIP. They must continue to use the 100/250 tpy threshold trigger until a SIP revision is approved. Under the CAA's 100/250 tpy trigger, existing sources would be subject to permit requirements for any increase in emissions because there is no regulatory "significance level," thus any increase is considered significant.⁴³²

⁴²² 74 Fed. Reg. at 55,294–95, 55,301.

⁴²³ *Id.* at 55,291, 55,338.

⁴²⁴ *Id.* at 55,338.

⁴²⁵ See *supra* notes 358–62 and accompanying text. However, environmentalists already are seeking to have CO₂ declared a criteria pollutant. Reeves, *supra* note 362, at 4.

⁴²⁶ 74 Fed. Reg. at 55,316.

⁴²⁷ *Id.* at 55,301.

⁴²⁸ *Id.* at 55,295, 55,306.

⁴²⁹ *Id.* at 55,306.

⁴³⁰ *Id.* at 55,302; see also Alec Zacaroli, Ben Snowden & Julie R. Domike, *EPA Begins Regulation of Greenhouse Gas Emissions Under the Clean Air Act*, 40 Env't Rep. (BNA) 2859, at 2859, 2861 (Dec. 11, 2009) (noting the implications for Title V permits of applying the existing threshold to GHG sources).

⁴³¹ Stuart Parker & Molly Davis, *States Cite Legal Concerns in Urging Delay for EPA GHG Permitting Rule*, 20 Clean Air Rep. (Inside EPA) Dec. 10, 2009, at 31–32. Florida has asked EPA to take over stationary source permitting for GHGs because it cannot make the required changes before the tailoring rule trigger date of January 2, 2011. Doug Obey, *State Says EPA Must Take over Permits to Implement GHG 'Tailoring' Rule*, 21 Clean Air Rep. (Inside EPA) Aug. 5, 2010, at 20.

⁴³² See 40 C.F.R. § 52.21(b)(23) (2009).

On June 3, 2010, EPA promulgated its final tailoring rule.⁴³³ EPA has decided to subject GHG sources to the PSD permitting program in three steps. Beginning January 2, 2011, sources currently subject to the PSD permitting process will require compliance with the program if they are new or are modified to increase emissions above existing significance levels and have total GHG emissions of 75,000 tpy CO₂e.⁴³⁴ No sources will be subject to CAA permitting requirements solely due to GHG emissions until July 1, 2011.⁴³⁵ The second step begins July 1, 2011, and runs until July 1, 2013.⁴³⁶ PSD permitting requirements will apply to new construction with GHG emissions of at least 100,000 tpy, even if they do not exceed the permit threshold for other pollutants.⁴³⁷ 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.⁴³⁸ For facilities that are subject to operating permit requirements, CO₂e requirements will be added.⁴³⁹ Facilities that do not have an operating permit will be required to obtain one if emissions exceed 100,000 tpy of CO₂e.⁴⁴⁰ The third step involves another rulemaking to conclude by July 1, 2012.⁴⁴¹ EPA must now develop guidance concerning what is BACT for sources of GHG emissions. EPA's efforts may not survive judicial review because they conflict with CAA's section 502, which imposes a 100 tpy trigger for Title V permitting and the PSD program's section 169(a) that defines "major emitting facility" as a 100 or 250 tpy source.⁴⁴²

While EPA has acted to regulate GHGs as pollutants under the CAA, the House of Representatives acted to prevent this from occurring. The ACES Act (H.R. 2454), approved by the House on June 26, 2009, would modify the use of the CAA to regulate GHGs.⁴⁴³ It creates a new Title VIII to the CAA. ACES section 331 creates CAA section 831 that would prohibit GHGs from

⁴³³ Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,513 (June 3, 2010) (codified at 40 C.F.R. pts. 51, 52, 70 & 71).

⁴³⁴ *Id.* at 31,523.

⁴³⁵ *Id.*

⁴³⁶ *Id.* at 31,523–24.

⁴³⁷ *See id.* at 31,524.

⁴³⁸ *Id.*

⁴³⁹ *Id.* at 31,524.

⁴⁴⁰ *Id.*

⁴⁴¹ *Id.* at 31,525.

⁴⁴² Clean Air Act, 42 U.S.C. § 7661–7661b (2006); *id.* § 7479(1). Industry is also asking EPA to amend its rules to remove pollutants from PSD review if they are not subject to ambient air quality standards. Doug Obey, *Industry Cites GHG Limits as Basis to Revise EPA's Years-Old PSD Rules*, 31 Wkly. Rep. (Inside EPA) July 16, 2010, at 7. EPA also sent two proposed rules to the White House Office of Management and Budget (OMB) for review. *EPA Sends GHG Permit Backstop Proposals to White House for Review*, 27 Env'tl. Pol'y Alert (Inside EPA) July 14, 2010, at 21. The first proposed rule would ensure state and local permit programs have the authority to regulate GHGs. *Id.* The second proposed rule outlines EPA's authority to impose a federal implementation plan (FIP) to take over GHG permitting until states obtain the authority to run a GHG permit program. *Id.*

⁴⁴³ Stoll, *supra* note 125, at 1672.

being added to the list of criteria pollutants.⁴⁴⁴ CAA section 832 would prohibit the use of CAA section 115, which can require states to revise their SIPs when a pollutant is found to endanger public health or welfare in a foreign country, to control pollutants based on their contribution to global warming.⁴⁴⁵ CAA section 833 would prohibit regulating GHGs as hazardous air pollutants (HAPs) unless the substance meets the criteria for listing independent of its effects on global climate change.⁴⁴⁶ CAA section 834 would say that Part C's NSR is not triggered by the release of a GHG.⁴⁴⁷ CAA section 835 would say that there is no need for a Title V operating permit for a source of GHGs that is based solely on the emissions of a GHG.⁴⁴⁸

To control GHG emissions, H.R. 2454 proposed CAA section 811 would allow regulation under the CAA section 111 NSPS, as well as the regulation of existing sources based on CAA section 111(d) to control GHG emissions.⁴⁴⁹ However, sources subject to cap-and-trade will continue to be subject to NSPS for their non-GHG emissions, but will not be subject to NSPS for capped GHG emissions.⁴⁵⁰ H.R. 2454 generally focuses its cap-and-trade program on GHG sources with emissions greater than 25,000 tpy of CO₂e, but its NSPS provision targets sources with 10,000 tpy to 25,000 tpy of CO₂e, which could expose millions of businesses to the need to comply with NSPS.⁴⁵¹ This could lead to GHG emission standards for small sources that are more stringent than the standards applicable to large sources.

To obtain a preconstruction PSD/NSR permit, CAA sections 165(a)(2) and 173(a)(5) require an analysis of alternative sites, sizes, production processes, and environmental control techniques for the proposed source that demonstrates the benefits significantly outweigh the environmental and social costs that are imposed by construction or modification.⁴⁵² The extent to which alternative analysis can be used to require an alternative be adopted is not clear,⁴⁵³ and this ambiguity is likely to be the subject of challenges to permit applications. If an alternative analysis is to be used to stop a project, who will have the power to determine the social values that are to be considered and how these values are to be balanced? These requirements have not been controversial and the scope of this authority has not been the subject of litigation, but if the CAA becomes the basis for a national energy policy and carbon-based energy is to be rationed this requirement is likely to become very controversial.

⁴⁴⁴ American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong., sec. 331, § 831 (2009).

⁴⁴⁵ *Id.* sec. 331, § 832; 42 U.S.C. § 7415(a)–(b) (2006).

⁴⁴⁶ H.R. 2454, sec. 331, § 833.

⁴⁴⁷ *Id.* sec. 331, § 834.

⁴⁴⁸ *Id.* sec. 331, § 835.

⁴⁴⁹ *Id.* sec. 331, § 811.

⁴⁵⁰ *Id.* sec. 331, § 811(b).

⁴⁵¹ *Id.* sec. 311 § 713(a)(2)(B)(ii).

⁴⁵² Clean Air Act, 42 U.S.C. §§ 7475(a)(2), 7503(a)(5) (2006).

⁴⁵³ See Gregory B. Foote, *Considering Alternatives: The Case for Limiting CO₂ Emissions from New Power Plants Through New Source Review*, 34 *Envtl. L. Rep.* (Envtl. Law Inst.) 10,642, at 10,650–51 (July 2004).

Court decisions have held that BACT/LAER requirements cannot be used to force an applicant to redesign a proposed facility.⁴⁵⁴ Thus, BACT/LAER cannot be defined to force a proposed coal-burning plant to use alternative energy, gas, or nuclear power. On August 24, 2006, EAB ruled the Agency could not require the use of low sulfur coal at Peabody Energy's Prairie State proposed facility in Illinois because it would redefine the basic design of the facility, which was planned as a mine-mouth facility that would burn high-sulfur Illinois coal.⁴⁵⁵ Subsequently, in *Sierra Club v. U.S. Environmental Protection Agency*,⁴⁵⁶ the United States Court of Appeals for the Seventh Circuit ruled that EPA does not have to consider whether the applicant should use low-sulfur coal as a pollution control technology because such a requirement would require significant modifications of the plant.⁴⁵⁷ This case is considered an important precedent for the principle that BACT review cannot be used to require a redesign of a proposed facility.

With about 153 new coal-fired plants being proposed in forty-two states,⁴⁵⁸ an important issue is whether integrated gasification combined cycle (IGCC) can be mandated by the government as the BACT. IGCC is required for a PSD construction permit by CAA section 165(a)(4) or the LAER that is required in nonattainment areas by CAA section 173(a)(2). Is IGCC a pollution control technology that may be required as BACT/LAER or is IGCC a different electric power generating technology that cannot be imposed by a permitting authority?

In the IGCC process, coal of any quality is fed to a gasifier where it is partly oxidized by steam under pressure.⁴⁵⁹ By reducing the oxygen in the gasifier, the carbon in the fuel is converted to a gas that is eighty-five percent carbon monoxide and hydrogen.⁴⁶⁰ Hydrogen sulfide is separated from CO₂ prior to combustion.⁴⁶¹ Sulfur can be removed as elemental sulfur or sulfuric acid and sold.⁴⁶² Inorganic ash and metals drop out as slag, which is stable and may be used in construction materials.⁴⁶³ The process

⁴⁵⁴ See, e.g., *Sierra Club v. U.S. Env'tl. Prot. Agency*, 499 F.3d 653, 657 (7th Cir. 2007).

⁴⁵⁵ *Prairie State Generating Co.*, 13 E.A.D. 1, 28 (EAB Aug. 24, 2006), http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/dac76d2b073d9f75852573da006e9fc9/7414685644289ceb852571d4006785e2!OpenDocument (last visited Nov. 21, 2010).

⁴⁵⁶ 499 F.3d at 657.

⁴⁵⁷ *Id.*

⁴⁵⁸ Press Release, Nat'l Energy Tech. Lab., U.S. Dep't of Energy, Department of Energy Tracks Resurgence of Coal-Fired Power Plants (Aug. 2, 2006), http://www.netl.doe.gov/publications/press/2006/06046-Coal-Fired_Power_Plants_Database.html (last visited Nov. 21, 2010).

⁴⁵⁹ OLA MAURSTAD, LAB. FOR ENERGY & THE ENV'T., MASS. INST. OF TECH., AN OVERVIEW OF COAL BASED INTEGRATED GASIFICATION COMBINED CYCLE (IGCC) TECHNOLOGY 2-3 (2005), available at http://sequestration.mit.edu/pdf/LFEE_2005-002_WP.pdf.

⁴⁶⁰ Reitze, *supra* note 86, at 35.

⁴⁶¹ Air Prods. & Chemicals, Inc., CO₂ Capture and Purification Technologies, <http://www.airproducts.com/Responsibility/EHS/EnvironmentalProtection/Gasification.html> (last visited Nov. 21, 2010).

⁴⁶² MAURSTAD, *supra* note 459, at 29.

⁴⁶³ MAURSTAD, *supra* note 459, at 6.

also can be used to provide process or heating steam, which further increases overall efficiency.⁴⁶⁴

It has been argued that IGCC is BACT even though it is a different production process and is not an “end of stack” control.⁴⁶⁵ This position is supported by the language of CAA section 169(3), which includes different production processes, fuel cleaning, and innovative fuel combustion processes as BACT options.⁴⁶⁶ EPA’s 1990 draft guidance indicated that it was not the Agency’s general policy to redefine an applicant’s design for a facility for the purpose of considering what is available technology.⁴⁶⁷ In the Energy Policy Act of 2005,⁴⁶⁸ Congress stated that it was taking no position as to whether IGCC was adequately demonstrated for purposes of CAA section 111 or whether it is achievable for the purposes of CAA sections 169 or 171.⁴⁶⁹ EPA’s Stephen D. Page, however, in a letter dated December 23, 2005, stated that IGCC is not BACT because it involves the basic design of a proposed source.⁴⁷⁰ EPA’s position was that CAA section 165(a)(2) requires alternative sources to be considered at an early stage in the permitting process, but once a technology is selected, CAA section 165(a)(4) requires air pollution control requirements to be based on controls that are appropriate for that technology as IGCC is considered by EPA to be a technology for generating electricity, not an air pollution control technology.⁴⁷¹

The Desert Rock coal-fired power plant is located on Navajo tribal land in northwest New Mexico, and it needs an EPA construction permit.⁴⁷² On January 22, 2009, EAB agreed to hear the permit application that was challenged by states and environmentalists, but on April 27, 2009, EPA asked EAB to remand *In Re Desert Rock Energy Company*,⁴⁷³ in order for the Agency to review the policy of whether IGCC technology is BACT.⁴⁷⁴ In Georgia, a state court in *Friends of the Chattahoochee, Inc. v. Couch*⁴⁷⁵ decided an appeal from a state administrative law judge that awarded a

⁴⁶⁴ Air Prods. & Chemicals, Inc., *supra* note 461.

⁴⁶⁵ Prairie State Generating Co., 13 E.A.D. 1, 24 (EAB Aug. 24, 2006).

⁴⁶⁶ Clean Air Act, 42 U.S.C. § 7479(3) (2006).

⁴⁶⁷ U.S. ENVTL. PROT. AGENCY, *supra* note 372, at B.13.

⁴⁶⁸ Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005) (codified primarily in scattered sections of 42 U.S.C.).

⁴⁶⁹ *Id.* § 402, 119 Stat. at 753.

⁴⁷⁰ Stephen D. Page, *EPA Letter on Use of Integrated Gasification Combined Cycle Technology as BACT*, 36 Env’t Rep. (BNA) 2666, at 2666–67 (Dec. 23, 2005).

⁴⁷¹ *See id.* at 2666–67; *see also* Steven D. Cook, *EPA Official Rejects Gasification as Standard for New Coal-Fired Electric Power Plants*, 36 Env’t Rep. (BNA) 2625, at 2625 (Dec. 23, 2005) (providing additional information on the letter from Stephen D. Page).

⁴⁷² *See* Tripp Baltz, *Colorado Officials Ask EPA to Reconsider Permit Decision for New Mexico Power Plant*, 40 Env’t Rep. (BNA) 674, at 674 (Mar. 27, 2009).

⁴⁷³ EPA Region 9’s Motion for Voluntary Remand, at 1, 7, Desert Rock Energy Co., PSD Appeal Nos. 08-03, 08-04, 08-05 & 08-06 (EAB Apr. 27, 2009), *available at* [http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%20By%20Appeal%20Number/DF867D52B4F33D4C852575A50070881A/\\$File/EPA%20Motion%20for%20Voluntary%20Remand...158.pdf](http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%20By%20Appeal%20Number/DF867D52B4F33D4C852575A50070881A/$File/EPA%20Motion%20for%20Voluntary%20Remand...158.pdf).

⁴⁷⁴ *EPA Air Permit May Present First Stationary Source CO2 Test for Obama*, 26 Env’tl. Pol’y Alert (Inside EPA) Jan. 28, 2009, at 27; Baltz, *supra* note 472, at 674.

⁴⁷⁵ No. 2008CV146398, 2008 WL 7531591 (Sup. Ct. Ga. June 30, 2008), *rev’d sub nom.* Longleaf Energy Assocs., Inc. v. Friends of the Chattahoochee, 681 S.E.2d 203 (Ga. Ct. App. 2009).

construction permit to a coal-fired power plant. The court remanded the case to the agency, finding that CO₂ emissions are subject to BACT requirements.⁴⁷⁶ The case, now designated *Longleaf Energy Associates, Inc. v. Friends of the Chattahoochee, Inc.*,⁴⁷⁷ was appealed to the Georgia Court of Appeals. On July 7, 2009, the court reversed the lower court, holding that CO₂ does not have to be regulated and IGCC technology does not have to be considered as part of a BACT analysis.⁴⁷⁸ The case was appealed to the Georgia Supreme Court, but it denied certiorari on September 28, 2009.⁴⁷⁹ The plant received its final permits from Georgia's Environmental Protection Division on April 9, 2010.⁴⁸⁰

In Texas a proposed 800-megawatt pulverized coal power plant was the subject of a challenge by environmentalists because it did not plan to use IGCC technology. On January 29, 2009, a Texas state appeals court ruled in *Blue Skies Alliance v. Texas Environmental Quality Commission*⁴⁸¹ that IGCC is not a viable control technology for a conventional pulverized coal plant.⁴⁸² On December 15, 2009, EPA sent the operating permit for the proposed John Turk power plant in Arkansas back to the state regulators because they improperly rejected IGCC technology when the agency established BACT requirements.⁴⁸³ Also, on December 15, 2009, EPA held the operating permit for the Cash Creek Generating Station in Kentucky was flawed because the state regulators failed to consider natural gas as an alternative to IGCC.⁴⁸⁴

The uncertainties surrounding the construction permit process and the time required to obtain a permit allows intervenors to extract significant concessions from permit applicants in return for dropping a challenge. For example, as part of a TXU buyout, on February 26, 2007, environmentalists announced a nonbinding agreement that eight of eleven proposed coal-fired power plants in Texas would not be built.⁴⁸⁵ The company also agreed to expand wind generation and invest \$400 million in energy efficiency measures.⁴⁸⁶ A number of other permit applications show that the

⁴⁷⁶ *Id.* at 7, 19.

⁴⁷⁷ 681 S.E.2d 203 (Ga. Ct. App. 2009).

⁴⁷⁸ *Id.* at 207, 209; see Barney Tumey, *State Appeals Court Overturns Ruling Vacating Building Permit for Coal-Fired Plant*, 40 Env't Rep. (BNA) 1665, at 1665 (July 10, 2009).

⁴⁷⁹ *Longleaf Energy Assocs., Inc.*, 681 S.E.2d at 203.

⁴⁸⁰ Barney Tumey, *State Regulators Issue Final Permits for Construction of Coal-Fired Power Plants*, 41 Env't Rep. (BNA) 858, at 858 (Apr. 16, 2010).

⁴⁸¹ No. 07-07-00306-CV, 2009 WL 214340 (Tex. App. Jan. 29, 2009), *withdrawn on overruling of reh'g*, 283 S.W.3d 525 (Tex. App. 2009).

⁴⁸² *Desert Rock Suit Tees Up Long-Running Dispute over IGCC as BACT*, 20 Clean Air Rep. (Inside EPA) Mar. 5, 2009, at 30–31.

⁴⁸³ *EPA Permit Responses Signal Major Shifts on BACT to Address GHGs*, 26 Env'tl. Pol'y Alert (Inside EPA) Dec. 30, 2009, at 20.

⁴⁸⁴ *Id.* at 20. The Cash Creek plant was also the focus of environmentalists challenging their water discharge permit, which was the first such permit proposed for a commercial-scale coal gasification plant. *Environmentalists Challenge First Water Permit for Coal Gasification Plant*, 27 Env'tl. Pol'y Alert (Inside EPA) Mar. 10, 2010, at 13.

⁴⁸⁵ *Kansas Pact May Set New Floor for Resolving Coal Plant Disputes*, 18 Clean Air Rep. (Inside EPA) Apr. 5, 2007, at 16–17.

⁴⁸⁶ *Id.* at 17.

requirements to obtain a construction permit is uncertain in this fast changing regulatory environment and permit applicants may be required to make costly concessions to obtain a permit.⁴⁸⁷

The electric power industry may be giving up their efforts to permit new coal-fired power plants. On July 9, 2009, Intermountain Power announced it would allow its permit to build a new plant in Utah to expire.⁴⁸⁸ On December 17, 2009, Seminole Electric announced it was withdrawing its application for a construction permit to build a coal-fired power plant in Florida after three administrative challenges.⁴⁸⁹ Environmentalists claim plans for 100 new coal-fired plants have been shelved in the United States since 2001.⁴⁹⁰ However, environmentalists and states have had only mixed success using NSR to force electric utilities to upgrade their facilities.⁴⁹¹

Environmental organizations have had considerable success at preventing new facilities from being constructed. By 2007 at least fifty-nine proposed coal-burning power plants had been cancelled, abandoned, or put on hold, and in 2008 an additional nineteen proposals were cancelled, abandoned, or put on hold.⁴⁹² In 2009 at least twenty-one plants were added to the list of proposed plants that are unlikely to be constructed.⁴⁹³ But, in an effort to control existing sources, environmental organizations are now using the operating permit requirements in Subchapter V of the CAA as the basis for challenging the renewal of operating permits granted by the states and seek to enforce the provisions of existing operating permits.⁴⁹⁴ This includes efforts to require compliance schedules in operating permits. In 2005, the United States Court of Appeals for the Second Circuit held that a facility's CAA Subchapter V operating permit must include a compliance schedule to address a formal enforcement complaint and enforcement action brought by the state.⁴⁹⁵ In 2008, the United States Court of Appeals for the Eleventh Circuit, and in 2009, the United States Court of Appeals for the Sixth Circuit, ruled against the Sierra Club on this issue, creating a split

⁴⁸⁷ See Reitze, *supra* note 86, at 11.

⁴⁸⁸ Steve Cook, *With Coal-Fired Plant in Utah Canceled, Sierra Club Says 100 Facilities Shelved*, 40 Env't Rep. (BNA) 1711, at 1711 (July 17, 2009).

⁴⁸⁹ Drew Douglas, *Seminole Electric to Withdraw Application for Coal-Fired Electric Generating Unit*, 41 Env't Rep. (BNA) 33, at 33 (Jan. 1, 2010).

⁴⁹⁰ Steve Cook, *supra* note 488, at 1711.

⁴⁹¹ *Compare* Nat'l Parks & Conservation Ass'n v. Tenn. Valley Auth., 502 F.3d 1316, 1324 (11th Cir. 2007) (holding that failure to apply BACT did not constitute a series of discrete violations under the Alabama SIP and therefore the statute of limitations had run), *with* Nat'l Parks & Conservation Ass'n v. Tenn. Valley Auth., 480 F.3d 410, 419 (6th Cir. 2007) (holding that the statute of limitations had not run because "failing to apply BACT is actionable, and this cause of action manifests itself anew each day").

⁴⁹² SourceWatch, *Coal Plants Cancelled in 2009*, available at http://www.sourcewatch.org/index.php?title=Coal_plants_cancelled_in_2009 (last visited Nov. 21, 2010).

⁴⁹³ *Id.*

⁴⁹⁴ See, e.g., *Sierra Club v. U.S. Envtl. Prot. Agency*, 557 F.3d 401, 405 (6th Cir. 2009); *N.Y. Pub. Interest Research Grp. v. Johnson*, 427 F.3d 172, 177-78, 180 (2d Cir. 2005).

⁴⁹⁵ *N.Y. Pub. Interest Research Grp.*, 427 F.3d at 173, 181.

among the circuits.⁴⁹⁶ EPA is also beginning to use enforcement to limit GHGs. 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.⁴⁹⁷

Now that EPA's GHG rule for mobile sources is finalized, operating permits will be required to consider CO₂ emissions during the permitting process. This will require states to process a massive increase in first-time permit applications and renewal applications.⁴⁹⁸ In EPA's Tailoring Rule, issued June 3, 2010, the agency plans to limit operating permit requirements to new sources of 75,000 tpy or more of CO₂e and existing sources not yet holding a Subchapter V permit that emit 100,000 tpy and plan to increase emissions of CO₂e by 75,000 tpy.⁴⁹⁹ Pursuant to CAA section 503(c), 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.⁵⁰⁰ Because the GHG requirements do not become applicable until January 2011, the applications would not be required until January 2012.⁵⁰¹ Environmentalists are also beginning to look at the best available retrofit technology permit requirements for protecting visibility in pristine areas as a potential litigation tool.⁵⁰²

E. NSPS and HAPs

The CAA has two federal programs that provide for emission standards to be established through regulations promulgated for industrial categories. EPA imposes NSPS based on CAA section 111⁵⁰³ and regulates HAPs based on CAA section 112.⁵⁰⁴ There is no emissions threshold in CAA section 111,⁵⁰⁵ therefore, almost all changes to existing facilities potentially could trigger NSPS applicability, although the absence of cost effective control

⁴⁹⁶ *Sierra Club v. U.S. Env'tl. Prot. Agency*, 557 F.3d at 403, 405, 407; *Sierra Club v. Johnson*, 541 F.3d 1257, 1259 (11th Cir. 2008).

⁴⁹⁷ Dawn Reeves, *EPA Region VIII Using Enforcement to Drive GHG Limits at Natural Gas Sites*, 21 Clean Air Rep. (Inside EPA) Mar. 4, 2010, at 20; *see also* Andrew Childers, *EPA Agrees to Review Operating Permit for Coal-Fired Power Plant, Settling Lawsuit*, 41 Env't Rep. (BNA) 720, at 721 (Apr. 2, 2010).

⁴⁹⁸ *See supra* text accompanying notes 426–29. On August 12, 2010, EPA proposed a rule to require 13 states to change their regulations to enforce the GHG permitting requirements. Steven D. Cook, *EPA Proposes Rule to Require 13 States to Enforce Greenhouse Gas Requirements*, 41 Env't Rep. (BNA) 1817, at 1817 (Aug. 13, 2010). EPA also proposed a federal implementation plan applicable in states that cannot enforce the GHG permit requirements. *Id.*

⁴⁹⁹ Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514, 31,541 (June 3, 2010) (codified at 40 C.F.R. pts. 51–52, 70–71).

⁵⁰⁰ *Id.* at 31,551.

⁵⁰¹ *See* Clean Air Act, 42 U.S.C. § 7661b(c) (2006) (giving a year deadline for submitting a permit application after a source becomes subject to a permit program).

⁵⁰² *See id.* § 7491(b)(2)(A) (detailing when major stationary sources are subject to best available retrofit technology); Dawn Reeves, *Environmentalists Petition Other Agencies in Bid for Strict EPA Haze Limit*, 21 Clean Air Rep. (Inside EPA) Mar. 18, 2010, at 34.

⁵⁰³ 42 U.S.C. § 7411 (2006).

⁵⁰⁴ *Id.* § 7412.

⁵⁰⁵ *New York v. U.S. Env'tl. Prot. Agency*, 443 F.3d 880, 890 (D.C. Cir. 2006).

technology would hamper the use of this section. In addition, unlike other sections of the CAA, section 111(b)(1) requires an air pollutant to “significantly” contribute to endangerment of public health or welfare.⁵⁰⁶ It is not clear how much discretion the term significantly provides EPA. EPA could also try to regulate CO₂ emitted by existing sources using section 111(d), but this would not appear to provide any relief from the problems already discussed. If EPA designates CO₂ as either a criteria pollutant or a HAP then section 111(d) may not be utilized.⁵⁰⁷

The Agency is scheduled to propose numerous NSPS-based regulations because section 111(b)(1)(B) requires EPA to review NSPS every eight years.⁵⁰⁸ These regulatory actions are subject to pressure from environmental groups to include controls on GHG emissions. If EPA decides not to regulate them, litigation is likely.⁵⁰⁹ EPA was under a court order to promulgate a final NSPS for refineries, and a final rule was published June 24, 2008,⁵¹⁰ but the rule does not establish standards for CO₂ emissions.⁵¹¹ EPA rejected consideration of GHG limits in proposed NSPS for Portland cement facilities on May 30, 2008.⁵¹² Now that CO₂ is a regulated pollutant, it will be difficult for the Agency to avoid adding CO₂ requirements to NSPS.

The CAA regulates HAPs by limiting emissions using technology-based requirements pursuant to section 112. Section 112(b)(1) lists 189 hazardous pollutants for potential regulation; CO₂ is not on the list.⁵¹³ 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.⁵¹⁴ These health effects are all the result of direct exposure. Any health effects from climate change, whether or not caused by increases in atmospheric CO₂ concentrations, are indirect effects, such as diseases spread by insect populations that increase due to higher temperatures.⁵¹⁵ This differs from the direct harm caused by the listed substances regulated pursuant to section 112. Furthermore, when section 112 discusses adverse environmental effects as a basis for regulating a substance, the language “whether through ambient concentrations, bioaccumulation, deposition, or otherwise” indicates a concern with the direct harmful effects of a substance.⁵¹⁶ HAPs are those substances that pose serious health risks.⁵¹⁷ While EPA is given some

⁵⁰⁶ 42 U.S.C. § 7411(b)(1)(A) (2006).

⁵⁰⁷ *Id.* § 7411(d)(1)(A).

⁵⁰⁸ *Id.* § 7411(b)(1)(B).

⁵⁰⁹ Steven D. Cook, *Agency to Confront Greenhouse Gas Controls as Litigation, Probes, Rulemakings Loom*, 39 Env’t Rep. (BNA) (2008 Outlook) S-13, at S-13 (Jan. 18, 2008).

⁵¹⁰ 73 Fed. Reg. 35,838 (June 24, 2008) (codified at 40 C.F.R. § 60.100).

⁵¹¹ Andrew Childers, *EPA Issues Revised Standards for Refineries With Some Limits Not as Strict as Proposed*, 39 Env’t Rep. (BNA) 845, at 845 (May 2, 2008).

⁵¹² *EPA Defers to ANPR in Opting Against Climate Controls for Cement NSPS*, 19 Clean Air Rep. (Inside EPA) June 12, 2008, at 19.

⁵¹³ 42 U.S.C. § 7412(b)(1) (2006).

⁵¹⁴ *Id.* § 7412(b)(2).

⁵¹⁵ Reitze, *supra* note 86, at 6–7.

⁵¹⁶ 42 U.S.C. § 7412(b)(2) (2006).

⁵¹⁷ H.R. Rep. No. 101-490, pt. 1, at 315 (1990). However, the 1989 Senate report is more ambiguous and would allow environmental effects to include “a significant adverse effect on the

flexibility in making decisions on the “frontiers of scientific knowledge,” case law requires a rational basis for a decision to designate a pollutant as hazardous.⁵¹⁸ There is not a rational basis for EPA to designate CO₂ as hazardous. None of the section 112 HAPs are as ubiquitous in the environment as is CO₂. Nevertheless, on December 15, 2009, EPA found that GHGs threaten the public health and welfare and contribute to GHG pollution, which threatens public health and welfare.⁵¹⁹ Whether this finding could be used to regulate CO₂ under section 112 and whether such an action could survive judicial review is unknown at this time.

The HAP control program primarily regulates major stationary sources, which are defined as sources of emissions of 10 tpy of any HAP or 25 tpy of a combination of HAPs.⁵²⁰ If CO₂ is designated a HAP, section 112’s requirements would be triggered by the emission of 10 tons of CO₂ per year. This threshold would be reached by burning about 1000 gallons of petroleum-based fuel⁵²¹ and would make almost every home in America a hazardous emissions stationary source. This in turn, would require an operating permit to be obtained for nearly every furnace in the country. The administrative headaches associated with such a program would seem to be overwhelming, but some people in industry consider the need for an operating permit to be less onerous than having to comply with NSR requirements.⁵²² If section 112 is used to control CO₂ emissions, presumably a technology standard of maximum available control technology (MACT) would need to be established for all industry categories that emit CO₂. Whether EPA can change the statutory threshold to a higher number by regulation and whether such a regulation will be upheld by a reviewing court is not known.

Even if CO₂ is not regulated under section 112, EPA is required to issue a MACT standard for coal- and oil-fired power plants by November 16, 2011,⁵²³ to replace the rule vacated by the D.C. Circuit in 2007.⁵²⁴ The regulation is expected to significantly add to the costs being incurred by this industry in order to reduce emissions of mercury and other metals, organics,

environment.” S. Rep. No. 101-228, at 160–162 (1990), *reprinted in* 1990 U.S.C.C.A.N. 3385, 3545–47.

⁵¹⁸ *Ethyl Corp. v. U.S. Env’tl. Prot. Agency*, 541 F.2d 1, 23 (D.C. Cir. 1976) (quoting *Amoco Oil Co. v. U.S. Env’tl. Prot. Agency*, 501 F.2d 722, 740–741 (D.C. Cir. 1974)).

⁵¹⁹ 74 Fed. Reg. 66,496 (Dec. 15, 2009) (to be codified at 40 C.F.R. ch. 1).

⁵²⁰ 42 U.S.C. § 7412(a)(1) (2006). EPA also has a “Great Water Program” pursuant to CAA section 112(m) to deal with atmospheric deposition of HAPs, and other pollutants, in order to protect major water bodies. *Id.* § 7412(m).

⁵²¹ See U.S. Dep’t of Energy, *supra* note 421.

⁵²² See Elizabeth M. Morss, *Clean Air Act Implementation: An Industry Perspective*, 14 PACE ENVTL. L. REV. 63, 64–65 (1996) (detailing industry criticisms of regulatory burdens imposed on facilities undergoing new construction or modifications subject to NSR requirements).

⁵²³ See *Am. Nurses Ass’n v. Jackson*, No. 08-2198, 2010 WL 1506913, at *1 (D.D.C. Apr. 15, 2010) (consent decree); Molly Davis, *District Court Order Could Bolster EPA in Pursuit of Power Plant MACT*, 21 Clean Air Rep. (Inside EPA) Apr. 29, 2010, at 20.

⁵²⁴ *Natural Res. Def. Council v. U.S. Env’tl. Prot. Agency*, 489 F.3d 1250, 1254 (D.C. Cir. 2007).

dioxin, and hydrogen chloride.⁵²⁵ For example, on August 10, 2009, a Virginia state court invalidated a permit for a coal-fired power plant that had been under construction for more than a year because the facility's mercury emissions were not adequately controlled.⁵²⁶

In addition to costly new regulations under the CAA, EPA is in the process of developing rules to control the over 130 million tons of coal ash generated by the electric power industry each year.⁵²⁷ EPA is attempting to regulate the ash as hazardous waste under the Resource Conservation and Recovery Act;⁵²⁸ the proposed rule was released in May 2010.⁵²⁹ If finalized, this rule would add considerable cost to coal-fired power plants and could limit the use of ash by other industries.⁵³⁰

F. Interstate Transport

EPA could claim CO₂ is primarily an interstate transport problem and regulate it at the federal level. This would be similar to the approach used to regulate SO₂ found in Subchapter IV of the CAA.⁵³¹ Such an approach would result in EPA rationing the use of fossil fuel through caps on CO₂ emissions. Whether the CAA gives EPA this power would almost certainly have to be determined by the courts. CAA section 126 provides EPA authority to control major sources to prevent releasing air pollution that may significantly contribute to levels of air pollution in excess of NAAQS in another state.⁵³² Air pollutants that are carried beyond a state's boundary may be regulated using CAA section 110(k)(5).⁵³³ While the SIP process is primarily locally focused and is predicated on the SIP being able to achieve significant reductions of targeted pollutants,⁵³⁴ a revision may be required if the SIP does not adequately deal with air pollutants being transported to a downwind state. EPA promulgated the Clean Air Interstate Rule (CAIR) on

⁵²⁵ Kate Winston, *Industry Revives Bid for Controversial Compliance Option in Boiler MACT*, 21 Clean Air Rep. (Inside EPA) Apr. 15, 2010, at 38.

⁵²⁶ Alan Kovski, *State Judge Rules Air Permit Invalid for Coal-Fired Plant Under Construction*, 40 Env't Rep. (BNA) 1977, at 1977 (Aug. 14, 2009).

⁵²⁷ ENVTL. INTEGRITY PROJECT & EARTHJUSTICE, OUT OF CONTROL: MOUNTING DAMAGES FROM COAL ASH WASTE SITES iv (2010), available at www.earthjustice.org/sites/default/files/library/reports/ej-eipreportout-of-control-final.pdf.

⁵²⁸ See *Activists Cite Coal Ash Water Pollution Data in Push for EPA Rule Release*, 27 Env'tl. Pol'y Alert (Inside EPA) Mar. 10, 2010, at 4; *Jackson Rebuts Fears over EPA 'Hazardous' Ash Rule Impact on Reuse*, 27 Env'tl. Pol'y Alert (Inside EPA) Mar. 10, 2010, at 3.

⁵²⁹ Dawn Reeves, *Despite Neutral Proposal, EPA Seen Preferring Hazardous Coal Ash Rules*, 31 Wkly. Rep. (Inside EPA) May 7, 2010, at 3–4.

⁵³⁰ *Id.* at 4; Charlotte E. Tucker, *Meetings at OMB on Coal Ash Proposal Reflect Complexity, Potential Impact of Rule*, 41 Env't Rep. (BNA) 163, at 163 (Jan. 22, 2010).

⁵³¹ See Clean Air Act, 42 U.S.C. § 7651 (2006).

⁵³² See *New York v. U.S. Env'tl. Prot. Agency*, 852 F.2d 574, 576 (D.C. Cir. 1988); see also 40 C.F.R. pt. 97 (2009) (SIP Call regulations).

⁵³³ 42 U.S.C. § 7410(k)(5) (2006).

⁵³⁴ *Union Electric Co. v. U.S. Env'tl. Prot. Agency*, 427 U.S. 246, 249–50 (1976); *Natural Res. Def. Council, Inc. v. Train*, 545 F.2d 320, 322 (2d Cir. 1976).

May 12, 2005.⁵³⁵ CAIR was to replace Subchapter IV's SO₂ cap-and-trade program and the SIP Call's NO_x trading program.⁵³⁶ It was aimed at twenty-eight eastern states and the District of Columbia.⁵³⁷ This program was to be implemented by states that are assigned tradable emission allowances by EPA, which are allocated to specific power plants by the state.⁵³⁸

An alternative approach would be to regulate GHGs using CAA section 115, which deals with international air pollution.⁵³⁹ This provision has not received much attention from EPA although it has been part of the CAA since the 1960s. A CO₂ control program based on this provision would not have many of the problems discussed concerning trying to use the CAA to control GHGs because section 115 gives extraordinary discretion to the Administrator. Section 115 was originally included in the 1963 CAA to control interstate air pollution.⁵⁴⁰ In 1977 the interstate portion of section 115 was removed and the section became an international air pollution provision.⁵⁴¹ This rarely utilized section could be an effective tool to use to regulate GHG emissions.⁵⁴²

CAIR was challenged in the D.C. Circuit by North Carolina and by industry plaintiffs.⁵⁴³ North Carolina objected to the regional caps because they did not adequately protect the state from upwind emissions.⁵⁴⁴ The court considered CAIR to be so flawed that it vacated it and its associated trading program for NO_x on July 11, 2008.⁵⁴⁵ EPA and other parties asked for an *en banc* hearing, and on November 4, 2008, EPA asked for a stay of the decision until a replacement rule could be drafted.⁵⁴⁶ On December 23, 2008, the D.C. Circuit granted EPA's petition and remanded the case without vacatur to the Agency to cure the fundamental flaws that were identified by the court in its July 11, 2008 opinion.⁵⁴⁷ CAIR's emissions trading program remains in effect and power plants continue to need to hold allowances for their NO_x and SO₂ emissions.⁵⁴⁸ An industry concern is that a replacement for CAIR could have a more serious impact on coal-generated electricity than CO₂ control.⁵⁴⁹

⁵³⁵ 70 Fed. Reg. 25,162 (May 12, 2005) (codified at 40 C.F.R. pts. 51, 72–74, 77–78 & 96).

⁵³⁶ *Id.* at 25,162.

⁵³⁷ *Id.*

⁵³⁸ *Id.* at 25,165.

⁵³⁹ Clean Air Act, 42 U.S.C. § 7415 (2006).

⁵⁴⁰ Clean Air Act, Pub. L. No. 88-206, § 5, 77 Stat. 392, 396 (1963).

⁵⁴¹ Clean Air Act Amendments of 1977, Pub. L. No. 95-95, § 114, 91 Stat. 710 (1977).

⁵⁴² Roger Martella & Matthew Paulson, *Regulation of Greenhouse Gases Under Section 115 of the Clean Air Act*, 40 Env't Rep. (BNA) 585, at 585 (Mar. 13, 2009).

⁵⁴³ *North Carolina v. U.S. Env'tl. Prot. Agency*, 531 F.3d 896 (D.C. Cir. 2008).

⁵⁴⁴ *Id.* at 906–07.

⁵⁴⁵ *Id.* at 929–30.

⁵⁴⁶ *North Carolina Seeks 12-Month Deadline for CAIR Vacatur Response*, 29 Wkly. Rep. (Inside EPA) Nov. 13, 2008, at 5; Andrew Childers, *EPA Asks Federal Court to Stay Decision on Clean Air Interstate Rule Pending Rewrite*, 39 Env't Rep. (BNA) 2293, at 2293 (Nov. 21, 2008).

⁵⁴⁷ *North Carolina v. U.S. Env'tl. Prot. Agency*, 550 F.3d at 1178.

⁵⁴⁸ Andrew Childers, *EPA Contests Lawsuit Seeking to Change Method for Granting Allowances Under CAIR*, 41 Env't Rep. (BNA) 359, at 359 (Feb. 19, 2010).

⁵⁴⁹ Nick Juliano, *Multipollutant Limits Could Shutter Coal Plants Faster Than CO₂ Controls*, 27 Env'tl. Pol'y Alert (Inside EPA) May 5, 2010, at 7.

On July 6, 2010, EPA proposed the Transport Rule that will replace CAIR when it is finalized.⁵⁵⁰ The rule will apply to Kansas, Nebraska, Oklahoma, Texas, and twenty-seven states plus the District of Columbia that are to the east.⁵⁵¹ It will not apply to Maine, Vermont, New Hampshire, or Rhode Island. It requires twenty-eight states to reduce SO₂ and NO_x in order to help downwind states meet the 24-hour PM_{2.5} standard.⁵⁵² It requires twenty-six states to reduce NO_x in the summer to help downwind states meet the ozone standard.⁵⁵³ By 2014 power plant emissions of SO₂ are to be reduced by 71% from 2005 levels and NO_x emissions are to be reduced 52% at an annual cost of \$2.8 billion.⁵⁵⁴ EPA expects to propose more stringent standards in 2011 and finalize them in 2012.⁵⁵⁵ EPA is proposing several approaches to implement this proposed rule, but its preferred approach is to set pollution limits for each of the thirty-two states and the District of Columbia and allow limited interstate trading among power plants as long as each state stays within its emissions budget.⁵⁵⁶ EPA is proposing a federal implementation plan to reduce interstate pollution transport, but will allow states to develop state plans to replace the federal plan.⁵⁵⁷

G. Mobile Source Control

CO₂, the GHG of primary concern, is the product of even perfect combustion of any fossil fuel.⁵⁵⁸ There is no cost-effective technology to prevent CO₂ emissions from motor vehicles, and there is no reasonable expectation that it will be developed in the foreseeable future.⁵⁵⁹ The only way to reduce CO₂ emissions from mobile sources is to have the nation's vehicle fleet use less fossil fuel.⁵⁶⁰ Even improved vehicle fuel efficiency, while helpful, will not reduce CO₂ emissions if vehicles are driven more miles.⁵⁶¹

The transportation sector is the U.S. end-use sector with the second most CO₂ releases, accounting for 33.1% of total CO₂ emissions from fossil fuel combustion in 2008.⁵⁶² Petroleum use is responsible for 98.0% of the sector's CO₂ emissions and 58.6% percent of the emissions were from the

⁵⁵⁰ U.S. ENVTL. PROT. AGENCY, PROPOSED TRANSPORT RULE WOULD REDUCE INTERSTATE TRANSPORT OF OZONE AND FINE PARTICLE POLLUTION 1-2 (2010), *available at* <http://www.epa.gov/airquality/transport/pdfs/FactsheetTR7-6-10.pdf>.

⁵⁵¹ 75 Fed. Reg. 45,210, 45,215-16 (proposed Aug. 2, 2010) (to be codified at 40 C.F.R. pts. 51-52, 72, 78 & 97).

⁵⁵² *Id.*

⁵⁵³ *Id.*

⁵⁵⁴ *Id.* at 45,217, 45,333.

⁵⁵⁵ U.S. ENVTL. PROT. AGENCY, *supra* note 550, at 2.

⁵⁵⁶ 75 Fed. Reg. at 45,215.

⁵⁵⁷ U.S. ENVTL. PROT. AGENCY, *supra* note 550, at 4.

⁵⁵⁸ *See* Reitze, *supra* note 86, at 2-3.

⁵⁵⁹ Reitze, *supra* note 334, at 10,538.

⁵⁶⁰ *Id.*

⁵⁶¹ *Id.*

⁵⁶² ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, EMISSIONS OF GREENHOUSE GASES IN THE U.S. 2008, at 2 (2009), *available at* [http://www.eia.doe.gov/oiaf/1605/ggrpt/pdf/0573\(2008\).pdf](http://www.eia.doe.gov/oiaf/1605/ggrpt/pdf/0573(2008).pdf).

use of motor vehicle gasoline.⁵⁶³ From 1990 to 2007, CO₂ emissions from the transport sector increased 27.3% for an average annual growth of 1.6%.⁵⁶⁴ From 1990 to 2010, population in the United States grew from 250.13 million to 309.16 million, which is a 23.6% increase, or an annual average increase of about 1.18%.⁵⁶⁵ Thus, a substantial portion of the growth in CO₂ emissions from the transportation sector may be attributable to the effects of population growth.

In 2007 the United States used 24% of the world's oil supply but it has only 2% of the world's petroleum reserves.⁵⁶⁶ The United States imported 56.9% of its oil in 2008, and transportation was responsible for 69.8% of U.S. petroleum consumption.⁵⁶⁷ The United States is importing about 3.4 billion barrels of oil a year in 2010.⁵⁶⁸ With a price of about \$79 a barrel at the beginning of August 2010 and about \$75 a barrel in September 2010,⁵⁶⁹ imported petroleum costs United States consumers around \$260 billion a year. Reducing carbon emissions from the transportation sector would benefit the economy as well as the environment and would reduce the need to shape foreign policy to support our dependency on imported oil.

The U.S. mobile source emissions control program framework was created by the 1970 CAA Amendments.⁵⁷⁰ From 1970 to 1990, emission standards became more stringent, and the scope of the program expanded, but there was little change in the program to control highway vehicles based on mandated reductions in emissions of hydrofluorocarbons, carbon monoxide, and NO_x.⁵⁷¹ Section 202(a)(1) of the CAA grants the Administrator of EPA the power to regulate "any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare," but this authority is restricted by section 202(a)(3)'s provision for heavy-duty trucks.⁵⁷² Air pollution is defined in CAA section 302(g).⁵⁷³

⁵⁶³ DAVIS, DIEGEL & BOUNDY, *supra* note 105, at 11-7 tbl.11.6. Electric power production, while not considered an end-use, is the industry that produces the most CO₂ emissions. Electricity use is allocated to the various economic sectors, but electricity used by the transportation sector is a nominal 0.2 percent of the sector's total energy demand. *Id.*

⁵⁶⁴ *See id.* (calculated from data).

⁵⁶⁵ U.S. CENSUS BUREAU, POPULATION BY REGION AND COUNTRY: 1950-2050 (2004), *available at* www.census.gov/ipc/prod/wp02/tabA-04.xl.

⁵⁶⁶ DAVIS, DIEGEL & BOUNDY, *supra* note 105, at 1-6 tbl.1.5.

⁵⁶⁷ *Id.* at 1-15 tbl.1.12, 1-18 tbl.1.13.

⁵⁶⁸ ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, YEAR TO DATE IMPORTS OF CRUDE OIL AND PETROLEUM PRODUCTS BY PAD DISTRICT, JANUARY-JUNE 2010 (2010), *available at* http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_supply_monthly/current/pdf/table38.pdf.

⁵⁶⁹ ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, WORLD CRUDE OIL PRICES, at tbl.Data1 (2010), *available at* http://tonto.eia.doe.gov/dnav/pet/xls/PET_PRI_WCO_K_W.xls.

⁵⁷⁰ Clean Air Act Amendments of 1970, Pub. L. No. 91-604, 84 Stat. 1676, 1690, 1703-04 (1970).

⁵⁷¹ *Compare* Clean Air Act, 42 U.S.C. § 7521(b) (2006), *with id.* § 1857f-1 (Supp. V 1970).

⁵⁷² *Id.* § 7521(a)(1) & (3) (2006). In the 1970 CAA Amendments, the clause stated, "which in his judgment causes or contributes to, or is likely to cause or contribute to, air pollution which endangers the public health or welfare," but was changed in 1977 to, "which in his judgment cause, or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare." *Compare id.* § 7521(a)(1), *with* Clean Air Act Amendments of 1970, Pub. L.

HDFVs manufactured after 1983 are subject to section 202(a)(3)(A), which regulates emissions of hydrocarbons, carbon monoxide, NOx, and particulate matter.⁵⁷⁴ The Administrator may revise heavy-duty truck standards, but revisions are limited to changes promulgated under the CAA prior to the CAA Amendments of 1990, except for NOx from model year 1998 heavy-duty trucks.⁵⁷⁵ GHGs, including CO₂, were not regulated prior to 1990 and therefore section 202 appears to preclude their regulation from HDFVs. However, the Energy Independence and Security Act of 2007⁵⁷⁶ requires new fuel economy standards to be promulgated for medium- and heavy-duty trucks.⁵⁷⁷ The power to impose fuel economy standards is effectively the power to regulate CO₂ emissions. On May 21, 2010, President Obama directed EPA to begin rulemaking for medium- and heavy-duty trucks to control fuel economy and GHG emissions for MY2014 and beyond.⁵⁷⁸

For a GHG from most mobile sources to be regulated by the CAA there must be findings that (1) it is a pollutant, (2) it endangers public health or welfare, (3) there is an appropriate control technology, (4) the technology is cost effective, and (5) appropriate time is provided to apply the technology.⁵⁷⁹ Because the “endangerment” language also appears in section 211(c),⁵⁸⁰ in section 213,⁵⁸¹ and in section 231,⁵⁸² the Supreme Court’s decision in *Massachusetts v. EPA*, which declared GHGs to be air pollutants within the meaning of CAA section 302(g) has the potential to affect most of the CAA’s Subchapter II, mobile source program.⁵⁸³ EPA’s endangerment finding of December 15, 2009, stated that GHG emissions contribute to GHG pollution, which threatens public health and welfare and so meets the second requirement.⁵⁸⁴ EPA expects to meet the third and fourth requirement using fuel economy standards.⁵⁸⁵

Federal fuel economy requirements began with the 1975 Energy and Policy Conservation Act (EPCA).⁵⁸⁶ Among its provisions were CAFE

No. 91-604, 84 Stat. at 1690 (1970). The remainder of section 202(a)(1) and (2) remains as enacted in 1970.

⁵⁷³ 42 U.S.C. § 7602(g) (2006).

⁵⁷⁴ *Id.* § 7521(a)(3)(A).

⁵⁷⁵ *Id.* § 7521(a)(3)(B).

⁵⁷⁶ Energy Independence and Security Act of 2007, Pub. L. No. 110-140, 121 Stat. 1492 (2007).

⁵⁷⁷ *Id.* at 1499–1500; Ari Natter, *Study Recommends Methods to Curb Growth in Emissions from Large Trucks*, 40 Env’t Rept. (BNA) 2712, at 2712 (Nov. 27, 2009).

⁵⁷⁸ Steven D. Cook, *Obama Orders EPA, Transportation Agency to Set Fuel, Emissions Rules for Trucks, Cars*, 41 Env’t Rep. (BNA) 1176, at 1176–77 (May 28, 2010).

⁵⁷⁹ 42 U.S.C. § 7521(a)(1)–(3)(A) (2006).

⁵⁸⁰ *Id.* § 7545(c) (regulating fuels and fuel additives).

⁵⁸¹ *Id.* § 7547 (regulating non-road engines).

⁵⁸² *Id.* § 7571 (regulating aircraft).

⁵⁸³ 549 U.S. 497, 532 (2007); *see also supra* Part IV.B (providing a discussion of the decision in *Massachusetts v. EPA*).

⁵⁸⁴ 74 Fed. Reg. 66,496 (Dec. 15, 2009) (to be codified at 40 C.F.R. ch.1).

⁵⁸⁵ *See* Reitze, *supra* note 86, at 52, 53–60 (describing the history, purpose, and effects of CAFE standards).

⁵⁸⁶ Energy Policy and Conservation Act, Pub. L. No. 94-163, § 502, 89 Stat. 871, 902 (1975).

standards for light-duty vehicles.⁵⁸⁷ CAFE requirements were 27.5 miles per gallon (mpg) for passenger cars from MY1985 until MY2011 and were 20.7 mpg for light-duty trucks from MY1996 through MY2004.⁵⁸⁸ CAFE standards for light trucks increased in stringency to 21.0 mpg in MY2005 and further increased to 23.1 mpg in MY2009.⁵⁸⁹ CAFE requirements for MY2011 light trucks and medium-duty passenger became more stringent with mpg requirements based on vehicle weight.⁵⁹⁰ The actual fuel economy of U.S. cars and light trucks was 22.1 mpg in 1987–1988, and it remained relatively constant for a decade because the increasing percentage of light trucks, vans, and sport utility vehicles (SUVs) in the nation's vehicle fleet nullified the improved technology used on vehicles.⁵⁹¹

CAFE standards for automobiles are more stringent than the standards for light-duty trucks, SUVs, and crossover vehicles, which often have been able to take advantage of the more lenient truck standards. On April 6, 2006, DOT mandated new fuel economy standards for SUVs, pickup trucks, vans, and minivans beginning with MY2008.⁵⁹² The 2006 rule divides light-duty trucks into six classes according to vehicle size, with each class required to meet a different fuel economy standard.⁵⁹³

Four national environmental organizations, eleven states, the District of Columbia, and New York City challenged NHTSA's "Average Fuel Economy Standards for Light Trucks, Model Years 2008–2011,"⁵⁹⁴ in *Center for*

⁵⁸⁷ See 49 U.S.C. §§ 32901(a)(3), 32902 (2006). The CAFE program distinguishes between domestic and imported passenger cars. *Id.* § 32904(b). An imported car is one with less than 75% domestic content. *Id.* The domestic fleet and the import fleet must each meet the CAFE standard. *Id.* This requirement makes little sense today because vehicle components and vehicle assembly are carried out in a global market. See NAT'L RESEARCH COUNCIL, EFFECTIVENESS AND IMPACT OF CORPORATE AVERAGE FUEL ECONOMY (CAFE) STANDARDS 21 (2002). Moreover, under the North American Free Trade Agreement (NAFTA), Mexican and Canadian manufactured vehicles are considered to be domestic production. See *id.* § 32904 (2006).

⁵⁸⁸ See DAVIS, DIEGEL & BOUNDY, *supra* note 105, at 4-21, tbl. 4.21 (listing CAFE standards up to 2009); Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011, 74 Fed. Reg. 14,196, 14,205 (Mar. 30, 2009) (to be codified at 49 C.F.R. pts. 523, 531, 533, 534, 536 & 537) (noting required fuel efficiency of 27.5 mpg for passenger cars in Energy Independence and Security Act of 2007).

⁵⁸⁹ DAVIS, DIEGEL & BOUNDY, *supra* note 105, at 4-22 tbl.4.21.

⁵⁹⁰ 71 Fed. Reg. 17566, 17566 (Apr. 6, 2006) (codified at 49 C.F.R. pts. 523, 533 & 537).

⁵⁹¹ Pamela Najor, *EPA Reports Average Fuel Economy of Model Year 2005 Vehicles Rose Slightly*, 36 Env't Rep. (BNA) 1556, at 1556 (July 29, 2005). In 1970 light trucks made up 17.4% of the nation's vehicle fleet, but in 2007, 44.8% of the vehicle fleet was light-duty trucks (including SUVs). DAVIS, DIEGEL & BOUNDY, *supra* note 105, at 3-5 tbl.3.3 (calculated from FHWA data). SUVs accounted for 29.7% of new light-duty vehicle sales in 2008. *Id.* at 4-10 tbl.4.10. Sales weighted fuel economy for new cars was 30.3 mpg in 2008, and it was 22.5 mpg for light trucks including SUVs. *Id.* at 4-7 tbl.4.7, 4-9 tbl.4.9.

⁵⁹² 71 Fed. Reg. at 17,566.

⁵⁹³ *Id.* at 17,568. A light-duty truck is defined as "any truck or 'truck derivative' with a gross vehicle weight rating (GVWR) of 8,500 pounds or less, and a vehicle curb weight (VCW) of 6,000 pounds or less." BRENT D. YACOBUCCI, CONG. RESEARCH SERV., RS 20298, SPORT UTILITY VEHICLES, MINI-VANS, AND LIGHT TRUCKS: AN OVERVIEW OF FUEL ECONOMY AND EMISSIONS STANDARDS 2 (2004).

⁵⁹⁴ 71 Fed. Reg. at 17,566.

Biological Diversity v. National Highway Traffic Safety Administration.⁵⁹⁵ The regulation sets standards for light trucks, including SUVs and minivans for MY 2008–2010, based on the existing CAFE standards.⁵⁹⁶ For MY2011 and beyond the standards vary depending on the truck's size.⁵⁹⁷ Petitioners challenged the final rule under the National Environmental Policy Act of 1969⁵⁹⁸ and EPCA.⁵⁹⁹ Petitioners claimed the rule could lead to increased GHG emissions because the use of vehicle weight classifications may encourage manufacturers to build larger, less fuel-efficient vehicles.⁶⁰⁰

The United States Court of Appeals for the Ninth Circuit, on November 15, 2007, after a comprehensive review of CAFE regulation under the 1975 EPCA legislation, held the final rule to be “arbitrary and capricious,” contrary to EPCA requirements, and held the Environmental Assessment was inadequate.⁶⁰¹ It remanded the rule to NHTSA to promulgate new standards as expeditiously as possible and to prepare a full Environmental Impact Statement.⁶⁰² On August 18, 2008, the Ninth Circuit amended its order so that NHTSA would have to consider the benefits of reducing CO2 emissions, but it only needed to revise its environmental analysis, and so might not have to do a full environmental impact statement.⁶⁰³

More stringent CAFE standards for passenger vehicles were provided in the Energy Independence and Security Act of 2007.⁶⁰⁴ Section 102 provides for modest increases in motor vehicle fuel economy to be prescribed by the Secretary of Transportation after consultation with the Secretary of Energy and the Administrator of EPA.⁶⁰⁵ The Act requires a 40% increase in fuel economy from cars and light-duty trucks by 2020.⁶⁰⁶ On April 22, 2008, DOT proposed new fuel economy standards that are more stringent than those imposed by the 2007 legislation.⁶⁰⁷ However, before the proposed rule was finalized, President Obama directed NHTSA to issue new MY2011 fuel economy standards.⁶⁰⁸ On March 30, 2009, NHTSA required MY2011

⁵⁹⁵ 508 F.3d 508 (9th Cir. 2007), *vacated*, 538 F.3d 1172 (9th Cir. 2008). The states were California, Connecticut, Maine, Massachusetts, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont, and Minnesota. *Id.*

⁵⁹⁶ 71 Fed. Reg. at 17,568.

⁵⁹⁷ *Id.* at 17,566.

⁵⁹⁸ 42 U.S.C. §§ 4321–4347 (2006).

⁵⁹⁹ *Ctr. for Biological Diversity*, 508 F.3d at 514.

⁶⁰⁰ *Id.* at 513–14.

⁶⁰¹ *Id.* at 514.

⁶⁰² *Id.*

⁶⁰³ *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1177–80 (9th Cir. 2008); Carolyn Whetzel, *Ninth Circuit Declines to Reconsider Order Striking Down Rules for Light-Duty Trucks*, 39 Env't Rep. (BNA) 1682, at 1682 (Aug. 22, 2008).

⁶⁰⁴ Energy Independence and Security Act of 2007, Pub. L. No. 110-140, § 102, 121 Stat. 1492, 1498–99 (2007).

⁶⁰⁵ *Id.*

⁶⁰⁶ Steven D. Cook, *Growth in Vehicle Travel May Wipe Out Emissions Reductions from New CAFE Bill*, 39 Env't Rep. (BNA) 158, at 158 (Jan. 25, 2008).

⁶⁰⁷ Steven D. Cook, *Transportation Department Proposes Increase in Fuel Economy Standards for 2011-2015*, 39 Env't Rep. (BNA) 794, at 794 (Apr. 25, 2008).

⁶⁰⁸ Steven D. Cook, *Ninety-One Congressmen Urge Obama to Go Beyond Bush Fuel Economy Standards*, 40 Env't Rep. (BNA) 677, at 677 (Mar. 27, 2009).

passenger cars and light-duty trucks to achieve a combined average of 27.3 mpg.⁶⁰⁹ Passenger cars must meet a standard of 30.2 mpg, which is the first increase since the 27.5 mpg standard was established in 1975.⁶¹⁰ For light trucks the MY2011 standard is 24.1 mpg.⁶¹¹

On September 28, 2009, EPA and NHTSA promulgated a proposed rule to regulate CO₂ emissions and improve fuel economy for passenger cars, light-duty trucks, and medium-duty passenger vehicles.⁶¹² On May 7, 2010, EPA and NHTSA promulgated a final joint rule.⁶¹³ Vehicles covered by this rule are responsible for almost 60% of the transportation-related GHG emissions.⁶¹⁴ This rule is projected to reduce GHGs from the U.S. light-duty fleet by approximately 21% by 2030 from what would occur without this rule.⁶¹⁵ An additional goal of the rule is to create a single standard that would be accepted by California and other states that have worked to create more stringent motor vehicle fuel efficiency standards.⁶¹⁶ This has been successful and has resulted in the automobile industry dropping lawsuits opposing the California standards and their adoption by thirteen other states.⁶¹⁷ However, industry groups are challenging the May 7, 2010 rule in the D.C. Circuit.⁶¹⁸ Because emissions of CO₂, which are 95% of the GHG emitted from light-duty vehicles, are essentially constant per gallon of a given type of fuel, emission limits for CO₂ are effectively the same as fuel efficiency standards. NHTSA and EPA continue to work to develop more stringent fuel economy standards that will be applicable to MY2017 and thereafter vehicles.⁶¹⁹ EPA appears to be taking the lead on what is expected to be a single standard.⁶²⁰

⁶⁰⁹ 74 Fed. Reg. 14,196, 14,205 (Mar.30, 2009) (codified at 49 C.F.R. pts. 523, 531, 533–34 & 536–37).

⁶¹⁰ *Id.*; Cook, *supra* note 607, at 794.

⁶¹¹ 74 Fed. Reg. 14,196, 14,439.

⁶¹² 74 Fed. Reg. 49,454, 49,454 (proposed Sept. 28, 2009) (to be codified in scattered sections of 40 C.F.R. and 49 C.F.R.).

⁶¹³ 75 Fed. Reg. 25,324, 25,324 (May 7, 2010) (codified in scattered sections of 40 C.F.R. and 49 C.F.R.).

⁶¹⁴ *Id.* at 25,328.

⁶¹⁵ *Id.*

⁶¹⁶ *Id.* at 25,326.

⁶¹⁷ Steven D. Cook, *Automobile Industry Drops Lawsuits Against States Adopting California Standards*, 41 Env't Rep. (BNA) 778, at 778 (Apr. 9, 2010). The cases dismissed include *Central Valley Chrysler-Jeep v. Goldstone* in the Ninth Circuit, *Association of International Automobile Manufacturers v. Sullivan* in the First Circuit, and *Green Mountain Chrysler-Plymouth-Dodge v. Crombie* in the Second Circuit. See *Automakers Drop Challenge to GHG Rules, Reserve Right For Post-2016 Suits*, 21 Clean Air Rep. (Inside EPA) Apr. 15, 2010, at 27; see also *Jackson Vows to Begin Negotiations over Post-2016 Vehicle Rules*, 21 Clean Air Rep. (Inside EPA) May 13, 2010, at 18.

⁶¹⁸ *Coal. for Responsible Regulation v. U.S. Env'tl. Prot. Agency*, No. 10-1165 (D.C.C. 2010). States and the automobile industry are seeking to intervene on behalf of EPA. Carolyn Whetzel, *States, Automakers Support EPA in Industry Challenge to Vehicle Rules*, 41 Env't Rep. (BNA) 1295, at 1295 (June 11, 2010).

⁶¹⁹ *EPA, DOT to 'Soon' Unveil Plans for Next Round of GHG Vehicle Rules*, 21 Clean Air Rep. (Inside EPA) Mar. 18, 2010, at 32.

⁶²⁰ *EPA Moves Ahead of DOT in Drafting GHG Standards for Trucks*, 27 Env'tl. Pol'y Alert (Inside EPA) May 5, 2010, at 25.

EPA's CO₂ standards are based on its CAA section 202 authority,⁶²¹ NHTSA's standards are based on its authority under EPCA, as amended by the Energy Independence and Security Act of 2007.⁶²² EPA's standards require vehicles to meet an estimated combined average emissions level of 250 grams/mile in MY 2016, which is equivalent to a combined average fuel economy of 35.5 mpg, if the standard is met solely through fuel economy improvements.⁶²³ NHTSA's standards would require a combined fuel economy that becomes increasingly stringent from MY2012 until it reaches 34.1 mpg in MY2016, which is an average annual increase in fuel efficiency of 4.3% relative to MY2011 standards.⁶²⁴ Each manufacturer must meet a standard determined using a sales-weighted average for the various passenger cars and light-duty trucks.⁶²⁵ However, light trucks require a 3.4% annual improvement, while cars must increase fuel efficiency by 4.5% per year.⁶²⁶ While the regulations are designed to impose one set of standards, the fact that they are designed to meet the requirements of different statutes leads to some differences in the requirements imposed by the two agencies.⁶²⁷ Environment Canada subsequently proposed regulations that would limit GHG emissions from new motor vehicles that will harmonize Canada's standards with the new U.S. standards.⁶²⁸

Motor vehicles are not very thermally efficient, but the potential for motor vehicle fuel efficiency improvements by 2015 is only between 10% and 15%; a mid-range 12.5% improvement would result in about an 11% CO₂ emission reduction.⁶²⁹ Using existing technology, the maximum GHG emissions reduction is about 38% for cars and light-duty trucks and 24% for HDVs.⁶³⁰ Between 1976 and 1989, about 70% of the improvement in fuel economy was due to weight reduction, improvements in transmissions, improved aerodynamics, the use of front wheel drive, and the use of fuel injection.⁶³¹ These improvements will be nullified if car buyers selected

⁶²¹ See 75 Fed. Reg. 25,324, 25,326.

⁶²² See Energy Policy and Conservation Act, Pub. L. No. 94-163, 89 Stat. 871 (1975) (codified as amended at 49 U.S.C. § 32902); 75 Fed. Reg. at 25,324–25 (May 7, 2010) (codified in scattered sections of 40 C.F.R. and 49 C.F.R.).

⁶²³ Steven D. Cook, *Standard on Vehicle Carbon Emissions Announced in EPA Greenhouse Gas Limits*, 41 Env't Rep. (BNA) 723, at 723 (Apr. 2, 2010).

⁶²⁴ 75 Fed. Reg. at 25,330.

⁶²⁵ *Id.*

⁶²⁶ Rick Mitchell, *New U.S. Vehicle Rules Likely to Cut Demand for Gas Despite Light Truck Bias, IEA Says*, 41 Env't Rep. (BNA) 827, at 827 (Apr. 16, 2010).

⁶²⁷ 75 Fed. Reg. at 25,330.

⁶²⁸ Peter Menyasz, *Environment Canada Proposes Regulations to Limit Vehicles' Greenhouse Gas Emissions*, 40 Env't Rep. (BNA) 2821, at 2821 (Dec. 11, 2009).

⁶²⁹ DAVID L. GREENE & ANDREAS SCHAFER, PEW CTR. ON GLOBAL CLIMATE CHANGE, REDUCING GREENHOUSE GAS EMISSIONS FROM U.S. TRANSPORTATION 22 (2003), available at <http://www.pewclimate.org/docUploads/ustransp.pdf>.

⁶³⁰ *Id.* A National Academy of Sciences study in 2001 concluded that it is possible to obtain a 40% increase in fuel efficiency in light-duty trucks and SUVs at costs that could be recovered over the lifetime of ownership. See NAT'L ACAD. OF SCI., EFFECTIVENESS AND IMPACT OF CORPORATE AVERAGE FUEL ECONOMY (CAFE) STANDARDS 66, 67 tbl. 4-2 (2002).

⁶³¹ BRENT D. YACOBUCCI & ROBERT BAMBERGER, CONG. RESEARCH SERV., RL 33413, AUTOMOBILE AND LIGHT TRUCK FUEL ECONOMY: THE CAFE STANDARDS 4 (2008).

vehicles with enhanced performance or if vehicle miles traveled (VMTs) increase. Improved fuel efficiency also may be nullified if credits for flexible fuel vehicles, advanced technology vehicles, electric vehicles, or other credits are used to allow manufacturers to sell traditional vehicles with high fuel consumption.⁶³² In addition, the method used to calculate the fuel economy of electric and plug-in hybrid vehicles is an unresolved issue because mpg tests do not properly account for the “upstream” pollution created by the source of the electricity.⁶³³

VMTs also increase as a result of population increase. The number of vehicles per thousand people increased by 72.59 per thousand from 1990 to 2007, so about 21.9 million additional vehicles or almost half the growth in the vehicle fleet is due to increases in consumption, but the total number of vehicles increased by 58.26 million between 1990 and 2007,⁶³⁴ so population growth appears to be responsible for more than half this increase. VMT per capita since 1970 have nearly tripled,⁶³⁵ with an average increase of 1.7% a year from 1997 to 2007.⁶³⁶

To reduce CO₂ emissions from the transportation sector requires both technology improvements and changes in the use of transportation. To reduce VMT requires long-term changes in land use and transportation that will be difficult to achieve because of the lack of political support. Moreover, tax benefits including parking as an employee fringe benefit, the home mortgage interest deduction, preferential treatment of the oil and gas industry, and tax deductions for the purchase of large SUVs encourage a petroleum intensive lifestyle.⁶³⁷ There are at least thirty-six vehicles presently being marketed in the United States that achieve thirty-five mpg, or better, based on EPA’s highway fuel economy test.⁶³⁸ There are more than thirty-two hybrid models available.⁶³⁹ But not enough of these vehicles are purchased to prevent motor vehicle CO₂ emissions from increasing. For the period 1998 to 2008, U.S. petroleum consumption by the transportation sector increased by 0.8% a year.⁶⁴⁰ This resulted in a 5.56 million gallon per day increase in U.S. transportation fuel consumption in the 1970 to 2008 period.⁶⁴¹ However, the cost of gasoline and the poor economy contributed to a 0.63 million

⁶³² Steven D. Cook, *Comments on Auto Fuel Economy Rules Argue Case for ‘Backstop’ on Use of Credits*, 40 Env’t Rep. (BNA) 2754, at 2754 (Dec. 4, 2009).

⁶³³ *EPA Vehicle Rule Seeks to Limit GHG Impacts of Greater Electricity Use*, 21 Clean Air Rep. (Inside EPA) Apr. 15, 2010, at 33.

⁶³⁴ See DAVIS, DIEGEL & BOUNDY, *supra* note 105, at 3-5 tbl.3.3, 3-8 tbls.3.4–5, 8-2 tbl.8.1 (calculated from data).

⁶³⁵ *Id.* at 8-3 tbl.8.2.

⁶³⁶ *Id.* at 8-2 tbl.8.1.

⁶³⁷ Roberta F. Mann, *On the Road Again: How Tax Policy Drives Transportation Choice*, 24 VA. TAX REV. 587, 589 (2005).

⁶³⁸ See U.S. DEP’T OF ENERGY, MODEL YEAR 2010 FUEL ECONOMY GUIDE 5–11, *available at* <http://www.fueleconomy.gov/feg/FEG2010.pdf>.

⁶³⁹ *Id.* at 17.

⁶⁴⁰ DAVIS, DIEGEL & BOUNDY, *supra* note 105, at 1-15 tbl.1.12.

⁶⁴¹ *Id.*

barrel per day decrease in transportation petroleum consumption in 2008.⁶⁴² If we are serious about reducing petroleum demand we need to consider increasing the cost of driving by enacting a carbon tax, increasing gasoline taxes, or using cap-and-trade legislation. Another approach would be to increase the tax benefits for purchasing hybrid vehicles, which is a quick way to lower fossil fuel consumption.

V. CONCLUSION

The CAA is not a tool designed to deal with GHG emissions, or more specifically CO₂. To limit CO₂ requires less fossil fuel to be combusted. EPA has neither the mandate nor the ability to be the “Czar” of energy utilization. To reduce carbon emissions will require expanded use of nuclear power and continued development of alternative renewable energy. Moreover, it will require lifestyle changes involving land use and transportation policy. Such efforts are unlikely to be effective and would carry the EPA well beyond what most people would consider the authority granted by the CAA, and perhaps beyond what many people would consider the appropriate role of the Agency.

To stabilize atmospheric concentrations of CO₂ will be very difficult in the context of a growing world population and a growing demand for useable energy. Under a “business as usual” scenario global CO₂ emissions could more than double and emissions from coal combustion could more than triple by 2050.⁶⁴³ Whether the world’s emissions of GHGs can be cut to the extent necessary to stabilize atmospheric concentrations of GHGs in half a century while population and consumption increases is unknown. Achieving stabilization will require that growth in primary power consumption come from non-CO₂ emitting sources. These include renewable sources (solar, wind, hydroelectric, biofuels), nuclear, and fossil fuel combustion that includes carbon capture and sequestration. No one technology will provide a “silver bullet” solution to global warming. Rather, a long-term strategy needs to evolve using many approaches.

To reduce U.S. CO₂ emissions requires consideration of the four major contributing factors: population, per capita GDP, the energy intensity of the economy, and the carbon intensity of the fuel used.⁶⁴⁴ The population of the United States grew by 0.9 percent in 2009,⁶⁴⁵ so the other three factors need to be reduced to deal with population growth merely to avoid an increase in emissions. To date, the most aggressive effort to control GHG emissions has been California’s Senate Bill No. 375, enacted in 2008.⁶⁴⁶ This law is the first

⁶⁴² *Id.*; see also ENERGY INFO. ADMIN., U.S. DEP’T OF ENERGY, U.S. CARBON DIOXIDE EMISSIONS FROM ENERGY SOURCES 2008 *FLASH* ESTIMATE 2, 4 (2009), available at <http://www.eia.doe.gov/oiaf/1605/flash/pdf/flash.pdf> (outlining causes of reduced CO₂ emissions and reductions in oil use in 2008).

⁶⁴³ MASS. INST. OF TECH., *THE FUTURE OF COAL* xi tbl.1 (2007).

⁶⁴⁴ ENERGY INFO. ADMIN., U.S. DEP’T OF ENERGY, U.S. CARBON DIOXIDE EMISSIONS IN 2009: A RETROSPECTIVE REVIEW 3 (2010), available at http://www.eia.doe.gov/oiaf/environment/emissions/carbon/pdf/2009_CO2_analysis.pdf.

⁶⁴⁵ *Id.*

⁶⁴⁶ S.B. 375, 2007–08 Leg. Reg. Sess. (Cal. 2008).

U.S. law to require comprehensive land use, transportation, housing, and climate change planning.⁶⁴⁷ Regulations to implement the legislation were proposed on August 9, 2010.⁶⁴⁸ The four largest urban areas are to reduce GHG emissions by between 13% and 16% per capita by 2035 and the rest of the state is to reduce GHGs by 1% to 14% by 2035.⁶⁴⁹ However, California's population is projected to increase from 38 million to 46 million by 2030, which is a 21.05% population increase five years before S.B. 375 is to achieve a smaller per capita reduction.⁶⁵⁰ This is an example of how difficult it will be to reduce GHGs in a world of rapidly increasing population.

Because CO₂ emissions from fossil fuel combustion are the dominant source of U.S. GHG emissions,⁶⁵¹ a program to deal with climate change needs to focus on fossil fuel use and be tailored to the various sectors of the economy. In the short term, energy conservation measures may provide the best opportunity for meaningful reductions in CO₂ emissions. At the same time, the United States should be pursuing a policy of aggressive development of nuclear and alternative energy. Mobile sources need to continue to increase fuel efficiency by using hybrid, plug-in hybrid, electric vehicles, and natural gas-powered vehicles. More use should be made of railroads to carry freight and mass transit to transport people. Encouraging energy conservation and the use of new energy sources requires energy costs to remain as high as or higher than they were in the summer of 2008. If energy costs are allowed to drop, those who invest in a low-carbon energy future may lose their investment and attracting capital for a post-carbon economy will be difficult. Even if investing in low-carbon energy is made attractive, the size of the capital investment required will be a challenge for the capital markets.

The best hope for a viable program is that Congress will create an effective new program to reduce our dependence on carbon-based fuels without harming the economy. The pending cap-and-trade legislation, previously discussed, will be unlikely to accomplish this goal. The price of fossil fuel-based energy needs to be increased to represent an approximation of its real cost. But, we do not need a complex trading system run by—and manipulated by—the financial services industry. An energy policy should be simple, such as a carbon tax that redistributes the revenue back to the citizens. It should not significantly expand the federal government. It should not be an income redistribution program and should allow the free market to work by creating a level playing field for all energy related technologies to compete. If we are to develop an effective policy to deal with climate

⁶⁴⁷ Carolyn Whetzel, *State Proposes Targets for Urban Planners to Help Reduce Greenhouse Gas Emissions*, 41 Env't Rep. (BNA) 1846, at 1846 (Aug. 13, 2010).

⁶⁴⁸ *Id.*

⁶⁴⁹ *Id.*

⁶⁵⁰ Office of the Governor, Senate Bill 375: Redesigning Communities to Reduce Greenhouse Gases (Oct. 1, 2008), <http://gov.ca.gov/fact-sheet/10707/> (last visited Nov. 21, 2010).

⁶⁵¹ See U.S. ENVTL. PROT. AGENCY, *supra* note 5, at ES-7 ("Historically, changes in emissions from fossil fuel combustion have been the dominant factor affecting U.S. emission trends.").

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change, it will need to protect the planet while providing jobs and expanding our economy.