REPORT OF THE CLIMATE CHANGE & EMISSIONS COMMITTEE

This report summarizes key developments in environmental policy, regulation and legislation relating to climate change and emissions. The timeframe covered by this report includes activities from roughly late 2007 to mid-2009.*

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I. FEDERAL GOVERNMENT ACTIVITY

A. American Recovery and Reinvestment Act of 2009

On February 17, 2009, President Obama signed into law the American Recovery and Reinvestment Act (ARRA) of 2009,[1] a comprehensive economic stimulus bill containing a wide variety of programs and expenditures. The ARRA was designed to, among other goals, create and preserve jobs, invest in various infrastructure projects, and incentivize the development of renewable energy industries. The Congressional Budget Office estimated the ARRA will cost $787 billion over the 2009-2019 period.[2]

B. Innovative Technology Loan Guarantee Program

Section 1705 of the ARRA expanded the Department of Energy's (DOE) Innovative Technology Loan Guarantee Program,[3] a program originally authorized by the Energy Policy Act of 2005,[4] by appropriating nearly $6 billion to the program.[5] According to the DOE, the Loan Guarantee Program plans to award an estimated $48.6 billion in loan guarantees based on nearly $6 billion in credit subsidy authority for Section 1705 activities.[6] The loan guarantees are intended for projects that can commence construction no later than September 30, 2011.[7]

The expanded Loan Guarantee Program focuses on projects that promote the rapid deployment of renewable energy systems, electric power transmission systems, and biofuel projects. While the DOE guidelines make clear that the program will fund the manufacture of related components,[8] it is still uncertain whether loan guarantees will be awarded to projects for the production of raw materials used for renewable energy systems. Recipients of the loan guarantees will be commercial entities ranging from small businesses to large corporations. The DOE's Loan Guarantee Program Office is charged with overseeing all of the typical activities in the life cycle of a loan, including initial project screening,

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1. American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009) [hereinafter, *ARRA*].

2. Letter from Douglas Elmendorf, Director, Congressional Budget Office, to Nancy Pelosi, U.S. House of Representatives Speaker (Feb. 13, 2009), *available at* https://www.cbo.gov/ftpdocs/99xx/doc9989/hr1conference.pdf.

3. *See* DOE, *Loan Guarantee Program*, http://www.lgprogram.energy.gov/index.html (last visited Oct. 6, 2009).

4. Energy Policy Act of 2005, 42 U.S.C. §§ 16511-14 (2005). Title XVII of the Energy Policy Act of 2005 authorized the DOE to make loan guarantees to certain types of projects under the auspices of a program titled, "Loan Guarantees for Projects that Employ Innovative Technologies." Prior to 2009, however, the DOE did not issue a single loan guarantee.

5. *ARRA*, *supra* note 1, at tit. 17.

6. *Innovative Technology Loan Guarantee Program*, http://www.energy.gov/recovery/documents/Innovative_Technology_Loan_Guarantee_Program.pdf (last visited July 24, 2009).

7. *ARRA*, *supra* note 1, at § 1705(3).

8. Innovative Technology Loan Guarantee Program, *supra* note 6.

due diligence, structuring, approval, documentation, funding and monitoring until full repayment.

The DOE has announced only three conditional loan guarantees for the construction of two manufacturing plants of renewable energy components and one energy storage plant. The first conditional loan guarantee of $535 million was awarded in March 2009 to Solyndra Inc. to expand its manufacturing of advanced photovoltaic panels in Fremont, California.[9] The DOE's agreement with Solyndra requires the company to obtain twenty percent of the project's loan financing from other sources.[10] The second and third conditional loan guarantees totaling $59 million were both announced in July 2009. Nordic Windpower USA is to receive a $16 million loan guarantee to build an assembly plant in Pocatello, Idaho for the manufacture of two-blade 1 MW wind turbines.[11] Beacon Power is to receive a $43 million loan guarantee to build an energy storage plant in Stephentown, New York.[12]

C. Vehicles and Transportation Fuels

ARRA also provided support for a variety of programs directed towards reducing emissions in the transportation sector. Of the nearly $3 billion appropriated to transportation initiatives, the majority of funds were allocated to promote the advancement of electric transportation technologies. Two billion was set aside to support the construction and upgrade of U.S. based manufacturing facilities for the production of batteries and other electric drive components,[13] while $400 million was provided to support the testing and deployment of advanced electric vehicles and vehicle components, along with other related infrastructure projects, such as charging stations and electrification of cargo handling equipment in ports and airports.[14]

The Alternative Fueled Vehicle Pilot Program and Diesel Emission Reduction programs, both of which were initially established under the Energy Policy Act of 2005,[15] were each allocated an additional $300 million.[16] The Alternative Fueled Vehicle Pilot Program provides funding to state and local governments and transit authorities for the incremental cost of acquiring or retrofitting vehicles using biofuel, natural gas, electric, or other non-petroleum propulsion technologies (including various hybrid technologies).[17] The Diesel Emissions Reduction program, administered by the Environmental Protection Agency, provides funding largely to regional, state, local, and tribal transportation agencies, as well as certain non-profit organizations, to support

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9. Press Release, DOE, Obama Administration Offers $535 Million Loan Guarantee to Solyndra, Inc. (March 20, 2009), *available at* http://www.lgprogram.energy.gov/press/032009.pdf.

10. Ben German, *DOE: Solar Company Near Final Sign-Off for Loan Guarantee - Chu*, E&E NEWS, July 7, 2009.

11. Press Release, DOE, Obama Administration Offers $59 Million in Conditional Loan Guarantees to Beacon Power and Nordic Wind Power, Inc. (July 2, 2009), *available at* http://www.lgprogram.energy.gov/press/070209.pdf (last visited July 24, 2009).

12. *Id*.

13. *ARRA*, *supra* note 1, at tit. IV.

14. DOE, Funding Opportunity No. DE-FOA-0000028 (March 19, 2009).

15. Energy Policy Act of 2005, 42 U.S.C. §§ 16071, 16131 *et seq* (2005).

16. DOE, Funding Opportunity No. DE-PS26-09NT01236-00 (March 31, 2009); *ARRA*, *supra* note 1, at tit. VII.

17. DOE, Funding Opportunity No. DE-PS26-09NT01236-00 (March 31, 2009).

the demonstration and commercialization of technologies that reduce diesel emissions. A small portion of the funds available under this program are made available directly to the states to support similar diesel reduction programs administered by state governments.[18]

Funding solicitations for each program listed above have been announced by the DOE and the Environmental Protection Agency, but to date no grants have been awarded.[19]

D. American Clean Energy and Security Act of 2009

On June 26, 2009, the American Clean Energy and Security Act of 2009 (ACES)[20] became the first comprehensive climate change bill to pass one of the chambers of Congress. This section provides a brief review of the greenhouse gas (GHG) mitigation provisions of the bill.[21]

1. Cap-and-Trade: Basic Mechanics

Title III of ACES would establish an economy-wide "cap-and-trade" program for the reduction of GHG emissions, under a new Title VII of the Clean Air Act (CAA) administered by the Environmental Protection Agency (EPA). Cap-and-trade programs – such as those now in place for sulfur dioxide under Title IV of the CAA, and for carbon dioxide under the Regional Greenhouse Gas Initiative – function by establishing an annual limit, or "cap," on the aggregate quantity of pollutants that may be emitted by a designated set of regulated facilities, called "covered entities." This cap is enforced by issuing tradable pollution permits called "allowances," which the government either distributes for free to various entities or sells in public auctions. Each year, covered entities are obligated to acquire a quantity of allowances corresponding to their regulated emissions, and surrender those allowances to the government. By decreasing the quantity of allowances issued each year, cap-and-trade programs encourage gradual reductions in regulated emissions over time.

2. Stringency and Coverage

The ACES cap-and-trade program would commence in 2012 with a cap equal to three percent below the 2005 level of U.S. GHG emissions from covered entities. The quantity of allowances issued would decline gradually each year thereafter, reaching seventeen percent below 2005 levels in 2020, and eighty-three percent below 2005 levels by 2050 (when the program would end).[22] EPA would be permitted a single opportunity to adjust the size of the cap

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18. Nat'l Clean Diesel Campaign, *Grants & Funding*, http://www.epa.gov/otaq/diesel/grantfund.htm (last visited Oct. 6, 2009).

19. For data on the Recovery Act, visit http://www.recovery.gov/?q=content/investments (last visited Oct. 6, 2009).

20. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009) [hereinafter, *ACES*].

21. *Id*. Titles I and II of ACES contain a number of provisions to encourage deployment of renewable energy, energy efficiency, and carbon capture and sequestration technologies. As those provisions do not directly concern GHG mitigation, they will not be reviewed here but see below for a summary of the provisions dealing with carbon capture and sequestration.

22. *Id.* at § 311 (adding CAA §§ 702-703).

in order to ensure that the cap accurately reflects 2005 emissions by covered entities.[23]

Only GHG sources designated as covered entities – which together account for approximately eighty-five percent of U.S. GHG emissions – would be obligated to surrender allowances to EPA under the cap-and-trade program. The categories of covered entities are listed in proposed CAA Section 700(13), and include: electricity sources; producers and importers of liquid fossil fuels; producers and importers of fossil fuel-based CO2 and certain fluorinated GHGs; carbon sequestration sites; facilities emitting nitrogen trifluoride; most large industrial sources (defined to include facilities in the manufacturing, natural gas transportation, or natural gas processing sectors); and natural gas local distribution companies (LDCs).

As this list suggests, ACES regulates different GHGs in distinct ways. For example, GHGs attributable to the combustion of coal are regulated at the *point of emission* – that is, coal-burning power plants and industrial facilities would bear the responsibility of submitting allowances for the resulting emissions (this is referred to as a "downstream point of regulation"). By contrast, allowances for emissions resulting from petroleum use must be surrendered "upstream," by producers and importers of petroleum-based fuels. The precise types of emissions for which covered entities must submit allowances are listed in Proposed CAA Section 722(b). With the exceptions of electricity sources, carbon sequestration sites, and industrial facilities in specific sectors, ACES would *not* require smaller GHG sources to submit allowances. The GHG emissions threshold that would trigger an allowance requirement is generally 25,000 CO_2-equivalent tons per year, but EPA would have authority to lower that threshold to 10,000 tons beginning in 2020.[24]

Most covered entities would have to submit allowances for the first time on April 1, 2013 (corresponding to emissions in 2012). However, emissions from industrial sources would not carry an allowance obligation until 2014, and natural gas LDCs would not be required to comply until 2016.[25] A covered entity that fails to surrender the required quantity of allowances would be subject to a financial penalty for each allowance in default, and required to make up the shortfall by submitting extra allowances in the following year.[26]

3. Compliance Flexibility and Cost Containment

ACES provides four mechanisms to restrain increases in the price of allowances.

a. Offsets

Entities that achieve permanent and additional GHG emission reductions from sources that are *not* covered by the cap – such as agricultural and forestry operations – could apply to receive "offset credits" over a fixed "crediting period" for every ton of emissions avoided, reduced, or sequestered. Offset credits could be traded in the same manner as allowances and submitted by

23. *Id.* at § 721(e)(2).
24. *Id.* at § 722(g).
25. *Id.* at § 722(c).
26. *Id.* at § 723.

covered entities for compliance, thereby augmenting the supply of allowances.[27] ACES would limit the percentage of a covered entity's compliance obligation that could be satisfied using offset credits; this percentage would increase over the course of the cap-and-trade program, and would allow the submission of a maximum of approximately 2 billion offset credits each year.[28]

Title V of ACES gives EPA and the U.S. Department of Agriculture (USDA) overlapping authority to regulate offset credits for agriculture and forestry projects, and provides EPA exclusive authority over all other offset projects. The agencies would be empowered to issue offset credits for projects both within the United States and in developing countries; international offset credits could only be awarded for projects in countries pursuant to an agreement with the United States. Special conditions would apply to international forestry offset projects, offset credits for sector-wide emission reductions, and offset credits issued under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC, discussed *infra*).[29]

b. Banking and Borrowing[30]

In general, ACES would permit covered entities to satisfy their compliance obligation in one year by submitting allowances or offset credits issued in a different year. For example, covered entities could "bank" allowances issued in a given year for use in any later compliance year, without penalty or limit. In addition, covered entities could "borrow" by submitting allowances from future years;[31] however, "borrowing" could only account for up to fifteen percent of an entity's allowance requirement, and would carry an interest penalty of eight percent for every year an allowance is carried forward.

c. Strategic Reserve[32]

ACES would require that between one and three percent of the allowances in each year of the cap-and-trade program be deposited in a "strategic reserve" in 2012. EPA would make a limited quantity of "strategic reserve" allowances available only to covered entities at special quarterly auctions. These auctions would be subject to a high minimum price.

d. International Emission Allowances

ACES would allow EPA to recognize allowances issued by international emissions trading programs (such as the European Trading System).

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27. *Id.* at § 722(d). With two exceptions, ACES would regard offset credits as equivalent in value to emission allowances. First, certain agriculture and forestry projects would generate a special form of offset credit known as a "term offset credit," which would expire after a fixed period. Covered entities submitting term offset credits for compliance would be required to replace those credits upon expiration. Second, beginning in 2018 international offset credits would have a "discounted" value of 5 credits for every 4 emission allowances. *Id.*

28. *Id.* Covered entities could meet up to one-half of this limit using offset credits for projects within the U.S., and the other half using credits for projects in developing countries ("international offset credits").

29. *Id.* at § 743.

30. *Id.* at § 725.

31. EPA would sell some allowances from future years in each auction. *Id.* at § 791.

32. *Id.* at § 726.

International programs would only qualify if they impose mandatory emission limits and are at least as stringent as the U.S. program.[33]

4. Allocations

ACES provides two ways for allowances to be introduced into trading. First, EPA would sell a specified quantity of allowances at quarterly public auctions each year, and use the revenue for deficit reduction assistance to consumers, or designated public programs. Second, EPA would provide or "allocate" allowances for free to various public and private entities specified in the bill. In general, ACES would allocate declining shares of allowances free of charge to certain industrial sectors, distribute allowances to state and federal programs promoting clean energy development, climate change adaptation, consumer assistance, and auction a gradually increasing share of allowances over time. The table below summarizes the allocation of allowances in 2020, 2030, and 2050.[34]

SUMMARY OF ACES ALLOWANCE ALLOCATIONS IN SELECTED YEARS			
Purpose	**Allocation**		
	2020	**2030**	**2050**
Electricity Sector & Natural Gas LDCs*	44.5%	0%	0%
Consumer Assistance (Low-Income & Heating Fuel)	16.5%	15%	15%
Industrial Sources (Trade-Sensitive & Refineries)*	15.55%	4.7%	0%
Carbon Capture / Sequestration Subsidies*	5%	5%	5%
Energy Efficiency / Building Programs	6.03%	5.03%	5.03%
Clean Vehicle Commercialization*	1%	0%	0%
Clean Energy Research	1.5%	1.5%	1.5%
International Deforestation Program	5%	3%	2%
Adaptation (International & Domestic)	4%	16%	16%
Worker Assistance / Job Training	0.5%	1%	1%
Auction for Deficit Reduction / Consumer Refunds	0.42%	32.27%	54.47%
Auctioned in Prior Years	0%	16.5%	0%
TOTAL	**100%**	**100%**	**100%**
Proportion Auctioned for Revenue or Refunds	0.42%	48.77%	54.47%
Proportion Earmarked for Public Programs	33.53%	41.53%	40.53%
*Proportion Distributed to Industry Sectors (marked *)*	66.05%	9.7	5

33. *Id.* at § 728.

34. *Id.* at § 782.

5. Addressing International Competitiveness Impacts of ACES

ACES would establish a two-phase program to assist domestic firms competing against firms located in countries that do not have comparable GHG regulations.

a. Trade-Vulnerable Industry Rebates

A system of annual "rebates," financed by allowance allocations, would directly compensate industries (including both covered and non-covered entities) affected by international discrepancies in greenhouse gas programs. Rebates would only flow to industry sectors that EPA determines meet minimum thresholds of sensitivity to trade, energy intensity, and GHG intensity.[35] The amount of the rebate for any given firm would depend on the firm's output and the average direct and indirect GHG emissions for the relevant industry sector.[36] Rebates to individual firms would phase out between 2025 and 2035 absent special action by the President.

b. International Reserve Allowances

If a multilateral agreement meeting certain conditions has not entered into force by January 1, 2018, ACES would require importers of certain goods to obtain "international reserve allowances" beginning in 2020.[37] The requirement could apply to almost any product for which EPA determines that less than eighty-five percent of U.S. imports derive from countries that have taken certain actions to mitigate GHG emissions. The price of import allowances would be equal to recent auction prices of emission allowances, and the quantity required to be submitted for each good would be fixed by regulation.

6. Relationship to Other Clean Air Act Programs

ACES would direct EPA to reduce emissions from sources outside the cap through two separate CAA programs. First, EPA would be required to establish GHG emission rate targets for new or modified *uncapped* stationary sources under the existing New Source Performance Standards (NSPS) program.[38] These standards would be issued within ten years of the enactment of ACES, and would be designed to reach a minimum percentage of overall industrial source GHG emissions and major uncapped sources of methane (such as landfill gases).[39] Second, ACES would amend Title VI of the CAA to establish a new cap-and-trade system exclusively for the production, importation and consumption of hydrofluorocarbons (HFCs). This system would aim to achieve an eighty-five percent reduction in the production and importation of HFCs by 2032.[40]

At the same time, ACES would expressly prohibit EPA from regulating GHGs (except for impacts not related to climate change) under other CAA

35. *Id.* at § 764.
36. *Id.* at § 765.
37. *Id.* at §§ 766-767.
38. 42 U.S.C. § 7411 (2005).
39. *ACES*, *supra* note 20, at § 811.
40. *Id.* at § 619.

programs, including National Ambient Air Quality Standards for criteria pollutants (CAA Section 108), the Hazardous Air Pollutants program (CAA Section 112), New Source Review permitting for new or modified sources (CAA Title I, Part C), and the operating permit program (CAA Title V).[41]

7. Relationship to State Programs

ACES would preempt state and local cap-and-trade programs from 2012 through 2017.[42] States would remain free to implement their own motor vehicle emission requirements and low-carbon fuel standards. In addition, ACES would amend Section 116 of the CAA to permit states to implement their own GHG performance standards for stationary sources, so long as those standards are at least as stringent as federal standards.[43]

8. Market Oversight

Section 401 of ACES would give the Federal Energy Regulatory Commission (FERC) authority to regulate the "cash" market for GHG allowances and offset credits, and establish guidelines for market regulations concerning exchange trading; transaction clearing; market transparency; and fraud and manipulation. Responsibility for oversight of GHG derivative markets would rest with the Commodity Futures Trading Commission (CFTC). ACES would amend the Commodity Exchange Act[44] to classify GHG allowances as "non-exempt" commodities and prohibit CFTC from issuing waivers of commodity regulations for GHG derivatives.[45]

9. Transitional Measures

ACES would also establish a number of programs, most of them financed through allowance allocations, directed at assisting consumers, workers, and governments in transitioning and adapting to a carbon-constrained economy. These programs include an "energy refund" program for low-income consumers;[46] funding for worker training in the fields of energy efficiency and renewable energy;[47] benefits for workers adversely affected by climate change policies;[48] bilateral and multilateral assistance for clean energy projects in developing countries;[49] and domestic and international programs to help society adapt to the impacts of climate change.[50]

41. *Id.* at §§ 831-835.
42. *Id.* at § 335.
43. 42 U.S.C. § 116 (2005); *ACES*, *supra* note 20, at § 334.
44. 7 U.S.C. § 1 (1936).
45. *ACES*, *supra* note 20, at § 342.
46. *Id.* at § 431.
47. *Id.* at § 422.
48. *Id.* at §§ 425-427.
49. *Id.* at §§ 441-446.
50. *Id.* at §§ 451-495.

II. SELECTED FEDERAL AGENCY ACTIVITY AND OTHER FEDERAL DEVELOPMENTS

A. California's Waiver to Implement State-Level Vehicle GHG Standards

Developments over the last year have brought a tentative resolution to the long-standing legal dispute surrounding California's attempt to implement standards for GHG emissions from passenger cars and light-duty trucks.

Section 209 of the CAA generally preempts the states from adopting their own vehicle emission standards. However, Section 209(b) allows California alone to petition EPA for a "waiver" of preemption on a case-by-case basis. EPA may deny such a waiver only on limited grounds provided in the statute.[51] Once EPA grants a waiver of preemption, Section 177 of the CAA permits other states to adopt California standards in lieu of federal vehicle emission standards.[52]

In December 2005, California sought to apply this provision to GHGs by petitioning for a waiver for average GHG emission standards for passenger cars and light-duty trucks for model years 2009 through 2016 (also known as the Pavley standards, after the sponsor of the Assembly Bill mandating their establishment).[53] Following the filing of the petition, fourteen states (the "Section 177 states") – mostly in the Northeast and the West Coast[54] – moved to adopt the Pavley standards pursuant to Section 177 of the CAA.

As the Pavley standards proliferated, automobile manufacturers, trade associations, and dealerships filed several legal challenges against California, Vermont, Rhode Island, and New Mexico, premised on theories of federal preemption.[55] The central claim unifying these lawsuits was that the Pavley standards amounted to de facto fuel economy standards. As such, the plaintiffs argued, the Pavley standards were broadly preempted by the federal statute governing fuel economy standards –the Energy Policy and Conservation Act (EPCA) of 1975[56] – regardless of EPA's ultimate decision on the waiver.[57] Several months after the Supreme Court decided *Massachusetts v. EPA*, the

51. 42 U.S.C. § 7543(b) (2005).

52. 42 U.S.C. § 7507 (2005).

53. CAL. CODE REGS. tit. 13, § 1961.1 (2009).

54. AZ, CT, FL, MA, MD, ME, NJ, NM, NY, OR, PA, RI, WA, VT; *See* Pew Center on Global Climate Change, *Vehicle Greenhouse Gas Emissions Standards*, http://www.pewclimate.org/what_s_being_done/in_the_states/vehicle_ghg_standard.cfm (last visited Oct. 7, 2009).

55. Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie, 508 F. Supp. 2d 295 (D. Vt. 2007); *appeal pending* No. 07-4342 (2d Cir. March 19, 2009);

Central Valley Chrysler-Jeep, Inc. v. Goldstene, 529 F. Supp. 2d 1151 (E.D. Cal. 2007); *appeal pending* No. 08-17378 & 08-17380 (9th Cir. Oct. 30, 2008); Lincoln-Dodge, Inc. v. Sullivan, 588 F. Supp. 2d 224 (D.R.I. 2008); *appeal pending* No. 09-1023 (1st Cir. Jan. 7, 2009). *See also* Zangara Dodge, Inc. v. Curry, No. 07-01305 (D. NM Dec. 27, 2007) (a separate lawsuit filed by two New Mexico dealerships alleging preemption under EPCA and CAA).

56. 49 U.S.C. §§ 32901-19 (2005).

57. The other principal claim pursued in *Green Mountain* and *Central Valley* was that the Pavley standards infringed on the President's power to conduct U.S. foreign policy. For a thorough discussion of plaintiffs' theories, *see* Kevin O. Leske, *A Closer Look at Green Mountain Chrysler v. Crombie*, 32 VT. L. REV. 439, 449-454 (2007-2008).

Eastern District of California and the District of Vermont both issued detailed opinions concluding, albeit for slightly different reasons, that the Pavley standards were not preempted by EPCA.[58]

In March 2008, just months after these decisions, EPA opened a second front in the Pavley litigation by denying California's petition for a waiver – the first time the agency had ever wholly denied such a petition.[59] EPA concluded that California did not require the Pavley standards to meet "compelling and extraordinary conditions," one of the three limited statutory grounds for a waiver denial under Section 209(b) of the CAA.[60] On February 12, 2009, the Obama Administration announced that EPA would reconsider the denial.[61]

In May 2009, the Administration announced that the federal government, the major automakers, and the state of California had reached a landmark agreement that would, in principle, temporarily resolve all pending litigation brought by the automakers over the Pavley standards.[62] Under the agreement, EPA and NHTSA would promulgate coordinated fuel economy and GHG emission standards for vehicles in model years 2012 through 2016, designed to improve the fuel economy of new cars and trucks by five percent each year. In exchange, California committed to defer to the joint EPA/NHTSA standards for model years 2012 through 2016. California also agreed to amend the Pavley standards for model years 2009 through 2011 to allow automakers to comply by averaging the performance of vehicles sold in California and the Section 177 states. Finally, the automakers agreed to dismiss, and refrain from initiating, all suits against California and EPA concerning the Pavley standards. Similarly, California agreed not to challenge EPA's waiver decision or the joint EPA/NHTSA standards. The agreement did not address frameworks for emission standards and fuel economy regulations after model year 2016.

On June 30, 2009, the EPA granted California's waiver petition.[63] EPA explained its change of course as a return to the agency's traditional interpretation of Section 209(b) of the CAA, although EPA indicated it would have reached the same result even under the previous Administration's interpretation.

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58. Green Mountain, *supra* note 55, at 350; Central Valley, *supra* note 55, at 1176.

59. Anne E. Carlson, *Federalism, Preemption, and Greenhouse Gas Emissions*, 37 U.C. DAVIS L. REV. 281, 293 note 63 (2003) (explaining that EPA has partially denied, or delayed, waiver petitions in the past).

60. Notice of Decision Denying a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 73 Fed. Reg. 12,159 (Mar. 6, 2008).

61. Reconsideration of Previous Denial of a Waiver of Preemption, 74 Fed. Reg. 7,040, 7,041 (Feb. 12, 2009).

62. Press Release, Office of the Press Secretary, Remarks by the President on National Fuel Efficiency Standards (May 19, 2009), *available at* http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-national-fuel-efficiency-standards.

63. Notice of Decision Granting a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 74 Fed. Reg. 32,744 (July 8, 2009).

B. EPA Proposed Rule Requiring GHG Reporting

In response to the FY2008 Consolidated Appropriations Act,[64] EPA proposed a rule for mandatory reporting of GHGs which would require large GHG sources located in the United States to report annual emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), perfluorochemicals (PFCs), and other fluorinated gases. The proposed rule[65] would apply to certain facilities that emit GHGs, upstream suppliers of fossil fuels and industrial GHGs, and manufacturers of vehicles and engines; with some exceptions, the proposd rule would apply principally to facilities with GHG emissions of at least 25,000 tons CO_2-equivalent per year. In general, the proposed rule would require reports to be prepared on the basis of facility-wide emissions; however, some entities (such as importers of fossil fuels) would be required to report on a corporate basis.[66] According to EPA, the purpose of the proposed Rule is to collect accurate and comprehensive emissions data to inform future policy decisions.

Although EPA grounded the reporting rule on its information-gathering authority under Section 114 of the CAA, the impetus for the reporting rule was the FY2008 Consolidated Appropriations Act. That Act authorized funding for EPA to

> develop and publish a draft rule not later than 9 months after the date of enactment of this Act, and a final rule not later than 18 months after the date of enactment of this Act, to require mandatory reporting of Greenhouse Gas Emissions above appropriate thresholds in all sectors of the economy of the United States.[67]

An accompanying joint explanatory statement directed EPA to use its existing authority under the CAA[68] to develop the rule, and to require reporting from upstream producers and downstream emitters "to the extent that the Administrator deems it appropriate."

As proposed, the reporting rule would require affected facilities and suppliers to begin collecting data on January 1, 2010, and submit their first reports to EPA on March 31, 2011 (for calendar year 2010 emissions).[69] The proposed rule would require reporting entities to continue to submit annual reports indefinitely, even if GHG emissions reported by those facilities eventually fall below the thresholds that trigger the application of the reporting rule.

As for the content of the reports, the proposed rule would require facilities to calculate total annual GHG emissions in metric tons of carbon dioxide equivalents for all 41 categories of GHG sources for which the rule provides a

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64. Consolidated Appropriations Act, Pub. L. No. 110-161, 121 Stat. 1844 (2008); *see also* Environmental Protection Agency, Final Mandatory Reporting of Greenhouse Gases Rule (Oct. 4, 2009), *available at* http://epa.gov/climatechange/emissions/ghgrulemaking.html (for proposed preamble and rule).

65. Mandatory Greenhouse Gas Reporting, 74 Fed. Reg. 16,609 (Apr. 10, 2009) (to be codified at 40 C.F.R. pt. 98).

66. Facilities and suppliers that are subject to the proposed rule would have to comply with the general provisions of mandatory reporting of greenhouse gases. *Id.* at 16,612.

67. Consolidated Appropriations Act, *supra* note 64, at 2128.

68. *Id*.

69. Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 16,448, 16,462 (Apr. 10, 2009).

methodology.[70] Each facility would also separately report emissions from each source category and each type of GHG for which the rule provides an applicable requirement. The proposed rule does not include a de minimis provision to avoid imposing reporting costs on minor emission points since only those facilities over established thresholds would be required to report, only emissions from those source categories for which methods are provided would be reported, and the proposal includes simplified emissions estimation methods for smaller sources.

Under the proposal, each facility and supplier would retain the records used in the reporting of the GHG emissions for five years. Rather than require a third party to verify emission reports, EPA proposed that facilities subject to the reporting rule "self-certify" that the information submitted is accurate and complete. EPA also proposed to require that reporting facilities submit sufficient supporting data to allow the agency to verify that GHG emissions are properly calculated and reported.

EPA proposed that affected sources submit the emissions data and supplemental data directly to the agency, and not to state authorities. Although EPA has statutory authority to delegate implementation of the reporting rule to the states, the agency declined to propose to do so in order to reduce the administrative burdens of the rule, allow rapid dissemination of emission reports, and ensure consistent data quality.[71] However, EPA noted that it expects state and local agencies to aid in implementation of the rule by educating and assisting facilities that are subject to its requirements.[72]

The public comment period for the proposed rule ended June 9, 2009, sixty days after the proposed rule was published in the Federal Register. On September 22, 2009, EPA released the final text of the reporting rule.[73]

C. Environmental Appeals Board - Deseret Decision

In the decision of *In re Deseret Power Electric Cooperative*,[74] the EPA's Environmental Appeals Board (EAB) remanded to EPA to decide whether carbon dioxide (CO_2) is currently "subject to regulation" under the CAA for purposes of the Prevention of Significant Deterioration (PSD) permitting program. The *Deseret* decision followed in the wake of the U.S. Supreme Court case *Massachusetts v. EPA*,[75] the latter of which established that greenhouse gases are "air pollutants" within the meaning of the CAA and required the EPA to respond to a petition requesting that the agency find that GHG emissions from motor vehicles cause or contribute to air pollution that endangers public health and welfare.

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70. *Id*.

71. 42 U.S.C. § 7414 (1990). *See also* Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 16,547, 16,595 (Apr. 10, 2009).

72. *Id*.

73. As of this writing, the final reporting rule has not yet been published in the Federal Register. The text is available at http://www.epa.gov/climatechange/emissions/ghgrulemaking.html (last visited Oct. 19, 2009).

74. In re Deseret Power Electric Cooperative, EAB App. No. PSD 07-03 (Nov. 13, 2008).

75. Massachusetts v. EPA, 549 U.S. 497, 534 (2007).

The PSD preconstruction permitting program[76] applies to new major sources[77] or modified existing sources of regulated air pollutants located in an area that is either attaining the National Ambient Air Quality Standards[78] or unclassifiable. If the newly constructed source emits one or more of the regulated pollutants, it is subject to the requirements of the PSD program, including the requirement to install the best available control technology (BACT) for any pollutant that is "subject to regulation" under the CAA.[79]

In *Deseret*, the Sierra Club sought review by the EAB of a PSD permit issued by EPA, Region 8 to Deseret Power Electric Cooperative on August 30, 2007. The permit authorized Deseret to construct a waste-coal-fired electric generating unit at Deseret's existing Bonanza Power Plant near Bonanza, Utah. The Sierra Club argued that long-standing EPA regulations requiring coal-fired power plants to monitor CO_2 emissions were sufficient to make CO_2 a pollutant "subject to regulation" under the CAA. Thus, Sierra Club argued that Region 8's permitting decision violated the CAA by failing to require a BACT emissions limit for CO_2 emissions from the facility.[80] On November 21, 2007, the EAB granted review of the CO_2 BACT issue raised by the Sierra Club.[81] Almost a year later, on November 13, 2008, the EAB issued an order remanding the permit back to EPA, Region 8, to reconsider whether it should impose a CO_2 BACT limit on Deseret's PSD permit.

Soon after the *Deseret* decision, on December 18, 2008, then EPA Administrator Stephen L. Johnson issued a memorandum titled "EPA's Interpretation of Regulations that Determine Pollutants Covered by Federal Prevention of Significant Deterioration (PSD) Permit Program."[82] The memorandum sought to clarify that CO_2 is not a regulated pollutant subject to the CAA. According to Johnson, the CAA does not apply to those pollutants "for which EPA regulations only require *monitoring or reporting* . . . ."[83] However, it does apply to "each pollutant subject to either a provision . . . or regulation adopted by EPA under the [CAA] that requires *actual control* of emissions of that pollutant."[84] Johnson argued that this interpretation is

76. 42 U.S.C. §§ 7470-7479 (1970).

77. Environmental Protection Agency, *Terms of Environment: Glossary, Abbreviations and Acronyms*, http://www.epa.gov/OCEPAterms/mterms.html (last visited Oct. 7, 2009).

78. Environmental Protection Agency, *Technology Transfer Network: National Ambient Air Quality Standards (NAAQS)*, http://www.epa.gov/ttn/naaqs (last visited Oct. 7, 2009).

79. Environmental Protection Agency, *Prevention of Significant Deterioration (PSD)*, http://www.epa.gov/nsr/psd.html (Oct. 7, 2009) (According to EPA website, "BACT is an emissions limitation which is based on the maximum degree of control that can be achieve[d]. It is a case-by-case decision that considers energy, environmental, and economic impact. BACT can be add-on control equipment or a modification of the production processes or methods.").

80. In re Deseret, *supra* note 75.

81. The EAB also held under advisement a second argument raised by the Sierra Club regarding EPA's failure to consider "alternatives" to the proposed facility. *Id.* at 2. It later denied review of this argument.

82. Memorandum, Stephen L. Johnson, Administrator, Environmental Protection Agency, EPA's Interpretation of Regulations that Determine Pollutants Covered by Federal Prevention of Significant Deterioration (PSD) Permit Program (Dec. 18, 2008), *available at* http://www.epa.gov/nsr/documents/psd_interpretive_memo_ 12.18.08.pdf.

83. *Id.* at 1 (emphasis added).

84. *Id.* (emphasis added).

supported by the language and history of the regulation, as well as policy considerations.[85]

On January 6, 2009, prior to the change in the presidential administration, the Sierra Club filed an amended petition for reconsideration of former Administrator Johnson's memo. The Sierra Club also requested that EPA stay the effectiveness of Johnson's memorandum pending a decision regarding its petition for reconsideration and any future legal challenges to the memorandum.

In response, current EPA Administrator Lisa P. Jackson wrote in a letter dated February 17, 2009 that "the EPA grants the petition for reconsideration in order to allow for public comment on the issues raised in the memorandum."[86] That is, EPA would reconsider whether greenhouses gases should be a regulated pollutant subject to PSD permitting requirements. EPA agreed to accept public comment on any issues raised by the *Deseret* decision and "publish a notice of proposed rulemaking in the Federal Register in the near future."[87] However, it declined to take any action to stay the effectiveness of the memorandum pending the petition for reconsideration.[88] Thus, the Johnson memo currently remains in effect as official EPA policy, despite Administrator Jackson's statement that the memo is not "the final word on the appropriate interpretation of Clean Air Act requirements."[89]

On September 30, 2009, EPA issued a proposed rule that would largely affirm the reasoning and conclusions of the Johnson memorandum.[90] If this rule is finalized in its current form, the PSD program would apply to GHG emissions upon the effective date of EPA's first regulation establishing "actual control" of GHG emissions under any provision of the CAA. EPA has acknowledged that its forthcoming GHG emission standards for motor vehicles – which are expected to be finalized in March 2010 – would satisfy this "actual control" standard, and thus trigger the applicability of PSD (and operating permit requirements under Title V of the CAA) to GHG emissions.[91]

D. EPA Endangerment Finding

On April 17, 2009, EPA issued two proposed findings regarding greenhouse gases under section 202(a) of the CAA. In the first proposed finding, referred to as "Proposed Endangerment," EPA proposed to find that the

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85. *Id.* at 6, 10.

86. Letter from EPA Administrator Lisa P. Jackson to David Bookbinder, Sierra Club Chief Climate Counsel (Feb. 17, 2009), *available at* http://epa.gov/nsr/documents/20090217LPJlettertosierraclub.pdf.

87. *Id.*

88. *Id.*

89. *Id.*

90. Environmental Protection Agency, Prevention of Significant Deterioration (PSD): Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by the Federal PSD Permit Program, 74 Fed. Reg. 51,535 (Oct. 7, 2009).

91. *Id*. at 51,547. EPA's proposed reconsideration of the Johnson Memorandum was accompanied by a proposed rule, known popularly as the "Tailoring Rule," that, among other things, would restrict PSD requirements to new facilities with a potential to emit of at least 25,000 tons CO_2-equivalent per year, or to modifications that would increase a facility's potential to emit by between 10,000 and 25,000 tons CO_2-equivalent per year. Section 169 of the Clean Air Act currently provides that PSD applies to facilities with a potential to emit of 100 to 250 tons per year. See Environmental Protection Agency, Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (September 30, 2009), available at http://www.eenews.net/public/25/12762/features/documents/2009/10/13/document_pm_04.pdf.

current and projected concentrations of the mix of six key greenhouse gases, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydroflurocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6), endanger the public health and welfare of current and future generations.[92] In the second proposed finding, referred to as a "cause or contribute finding," EPA proposed to find that the combined emissions of CO_2, CH_4, N_2O, and HFCs from new motor vehicles and vehicle engines contribute to global concentrations of GHGs and hence to climate change.[93] On April 24, 2009, EPA published the proposed rule titled "Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act" in the Federal Register.[94]

EPA's proposed rule responded to the U.S. Supreme Court's April 2007 decision in *Massachusetts v. EPA*.[95] In that case, the Court found that greenhouse gases are "air pollutants" within the meaning of the CAA and rejected EPA's policy-based rationales for denying a petition to regulate GHG emissions from motor vehicles. The Court remanded the petition to EPA, and instructed EPA to decide whether to make an endangerment finding with respect to greenhouse gases. It held that the "EPA can avoid taking further action only if it determines that greenhouse gases 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."[96] While the Court did not dictate EPA's actions on remand, it did find that EPA must ground any decisions regarding endangerment in the requirements of section 202(a) of the CAA.

After *Massachusetts v. EPA*, EPA reviewed the question of whether climate change does in fact endanger the public health and welfare. By the end of 2007, EPA was prepared to present an endangerment finding to the White House.[97] This finding, however, was withheld from the public and further efforts by EPA were reportedly halted by the White House.[98] The following year, on July 30, 2008, EPA published an Advance Notice of Proposed Rulemaking on "Regulating Greenhouse Gas Emissions under the Clean Air Act" (ANPR).[99] With the ANPR, EPA did not actually make an endangerment finding with regard to greenhouse gas emissions. Rather, EPA solicited public comment on a wide variety of issues relating to how EPA should respond to *Massachusetts v. EPA*, including the potential regulation of greenhouse gases under the CAA. The ANPR also contained summaries of work EPA had completed in 2007

92. 74 Fed. Reg. 18,886 (Apr. 24, 2009).

93. *Id.*

94. *Id.*

95. Massachusetts v. EPA, 549 U.S. 497 (2007).

96. *Id.* at 533.

97. Letter from Henry A. Waxman, House Representative, to Stephen L. Johnson, former EPA Administrator (Mar. 12, 2008), *available at* http://oversight.house.gov/documents/20080312110250.pdf.

98. *Id*. *See also* Henry A. Waxman, House Representative, Statement on EPA's Greenhouse Gas Decision (Mar. 27, 2008), *available at* http://oversight.house.gov/story.asp?ID=1831. On October 13, 2009, EPA released the draft endangerment finding in response to a Freedom of Information Act request. *See* Letter from Brian J. McLean, Director, Office of Atmospheric Programs, EPA to Darren Samuelsohn (Oct. 13, 2009), *available at:* http://www.eenews.net/public/25/12762/features/documents/2009/10/13/document_pm_04.pdf

99. 73 Fed. Reg. 44,354 (July 30, 2008).

regarding an endangerment finding and draft greenhouse gas emission standards.[100]

In the proposed rule, EPA initiated a sixty-day comment period on two proposed findings. The proposed rule interprets Section 202(a) of the CAA as providing a two-part test to determine whether EPA must regulate air pollution from motor vehicles: (1) determine whether air pollution may reasonably be anticipated to endanger the public health and welfare; and (2) decide whether emissions of any air pollutant from new motor vehicles or engines cause or contribute to air pollution.[101] Under EPA's interpretation, if both prongs of the endangerment analysis are satisfied for a given air pollutant, the agency must proceed to regulate emissions of that air pollutant under the CAA.

The proposed endangerment finding would conclude that greenhouse gases pose a danger to both public health and welfare by causing climate change. It discusses EPA's interpretation of the legal standard and analytical approach for determining endangerment under the CAA. It considers six greenhouse gases and current and anticipated future impacts of climate change. Based primarily on reports by the Intergovernmental Panel on Climate Change and the U.S. Climate Change Science Program, the endangerment finding examines the severity and likelihood of future impacts of climate change, as well as any mitigating factors. Although EPA's analysis briefly discusses international climate change impacts, the agency stated that its endangerment finding rested solely on consideration of the effects of climate change within the United States.[102]

In addition, the proposed cause or contribute finding would determine that motor vehicles and engines contribute to the emissions of four greenhouse gases, including CO_2, CH_4, N_2O, and HFCs. The proposed finding discusses the interplay between the definition of "air pollutant" and the endangerment finding,[103] and explores data regarding global and national emissions from motor vehicles and engines, as compared to GHG emissions from other sources.[104] Finally, it analyzes whether these levels of motor vehicle emissions contribute to climate change-inducing pollution.[105]

Despite requests from industry groups and Republicans, EPA declined on June 17, 2009 to extend the comment period for the proposed endangerment finding.[106] If and when EPA finalizes an endangerment finding, it will then issue greenhouse gas emission standards for new motor vehicles, as mandated by Section 202(a) of the CAA. These motor vehicle standards, in turn, are expected to trigger regulation of GHG emissions from stationary sources under the CAA's PSD program (see II.D, above). Because other key CAA programs – such as National Ambient Air Quality Standards and New Source Performance Standards – also require endangerment findings, EPA's decision on the Section

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100. Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 18,890 (Apr. 24, 2009) (to be codified at 40 C.F.R. ch. 1).

101. *Id.* at 18,888.

102. *Id.* at 18,894-18,904.

103. *Id.* at 18,904-18,905.

104. *Id.* at 18,906-18,907.

105. *Id.* at 18,907-18,909.

106. Robin Bravender, *EPA Comment Period on 'Endangerment' Proposal Closes Tomorrow*, E&E NEWS (June 22, 2009).

202 endangerment finding could influence whether and how the agency acts under these other programs with respect to GHG emissions from stationary sources.

III. CARBON CAPTURE AND SEQUESTRATION

A. Summary of CCS Provisions of the Waxman-Markey Bill

Subtitle B of the Waxman-Markey climate change bill, known as the American Clean Energy and Security Act of 2009 (ACES), deals with carbon capture and sequestration (CCS). CCS takes four basic forms: (1) terrestrial sequestration, involving trees, grasses, soils or algae; (2) deep-sea sequestration, involving containment and dissolution in ocean depths; (3) technological, involving the transformation of carbon dioxide into a component of a solid material; and (4) geologic (GCCS). The focus of Subtitle B of the Waxman-Markey bill is GCCS which utilizes underground reservoirs, such as depleted oil and gas fields, saline aquifers, and un-mineable coal seams as the medium to store carbon dioxide permanently. The process of GCCS begins with capturing carbon dioxide from fossil-fuel power plants, cement plants, petroleum refineries, or other emission sources. The gas stream is then treated, resulting in virtually pure carbon dioxide which is then compressed, cooled, and injected into "pore space" several thousand feet below the surface and below one or more impervious rock formations.

This portion of ACES seeks to develop a comprehensive strategy to implement CCS, particularly geologic CCS. It requires the Secretary of Energy and heads of various Federal agencies to submit reports to Congress identifying barriers to commercial-scale CCS operations, including strategies to overcome legal and regulatory barriers at the Federal and State levels. It requires a coordinated permitting process for geologic sequestration to be developed by the Administrator of the EPA under amended authority of the CAA, while reducing redundancy requirements under the Safe Drinking Water Act and recent EPA proposed rulemaking. Furthermore, it requires the EPA Administrator to promulgate regulations to protect the environment and human health by "minimizing the risk of escape" of carbon dioxide after sequestration. These regulations must also include requirements for monitoring sequestered carbon dioxide and related record keeping. Two years after the promulgation of these regulations, and every three years thereafter, the EPA Administrator must provide a report to Congress on the performance of federal CCS and CCS-related programs. The EPA Administrator is also required to establish financial responsibility regulations. Further, ACES requires the formation of a task force to study federal and state environmental laws that apply to geologic sequestration, including health, safety, and property rights issues.

ACES also mandates a CCS demonstration and early-deployment program. It authorizes various electric industry organizations, and distribution utilities to conduct a referendum among owners and operators of fossil fuel-based utilities to determine whether to establish a Carbon Storage Research Corporation. If approved by the referendum and by at least sixty percent of state regulatory authorities, the Corporation would be established. The Corporation, while neither an agency nor instrumentality of the government, would be empowered to establish and administer a CCS program providing grants and other financial

support to commercial CCS technologies. The Corporation would be required to provide financial support to at least five commercial-scale CCS demonstration projects. The Corporation would raise capital through assessments on distribution utilities tied to their direct delivery of fossil fuel-based electricity to retail customers. Each annual assessment would total approximately $1 billion. ACES also requires that distribution utilities not be denied the opportunity to recover in their rates the full amount of their assessment by the Corporation.

The EPA Administrator is also required to develop regulations for the distribution of emission allowances to support commercial deployment of CCS. For the first six gigawatts of electric-generating units deploying CCS, the EPA Administrator must distribute emission allowances based on a formula incorporating tonnage of sequestered carbon dioxide, the value of an emission allowance, and bonus allowances. Allowances begin at $90 per ton for units with an eighty-five percent rate of capture and moves down to $50 per ton for units with a fifty percent rate of capture. A bonus allowance of $10 per ton is allowed for units that achieve at least a fifty percent capture rate no later than January 1, 2017. No later than two years after the six gigawatts threshold is reached, a system of reverse action allocation would be established for the distribution of bonus allowance values. Furthermore, electric-generating units permitted between 2009 and 2014 would be subject to a system of reduced emission allowances based on the number of years of operation after certain taxes, and the level of emission reduction achieved by those units. Units permitted between 2015 and 2019 would not be eligible for emission allowances if they do not achieve at least a fifty percent reduction in carbon dioxide emissions. ACES provides additional limits on allowances and for other CCS-related regulations and reports.

B. Clean Coal – Carbon Capture & Sequestration Technology Development

It is generally recognized that achieving necessary climate change mitigation objectives will require the development of cost-effective technology to capture and sequester permanently CO2 emissions produced from the burning of coal for the generation of electricity.[107] Coal-fired generation produces the greatest volume of CO2 emissions per MW of major generation fuels, nearly double that of its major fossil fuel rival – natural gas. In the U.S., almost fifty percent of present electric generation is produced through the burning of coal, and coal provides perhaps the largest demonstrated generation fuel supply for the future. Also, major developing country economies, such as India and China, are substantially dependent upon the burning of coal for their electric supply.[108] For this reason, major strategies advanced to achieve desired climate change mitigation typically obtain close to twenty percent of their greenhouse gas

107. DOE, Office of Fossil Energy, *Carbon Sequestration Research & Development* (2008), *available at* http://www.fossil.energy.gov/programs/sequestration/overview.html; DOE, Office of Fossil Energy & Nat'l Energy Tech. Lab., *Carbon Sequestration Technology Roadmap and Program Plan* (2007), *available at* http://www.netl.doe.gov/technologies/carbon_seq/refshelf/ project%20portfolio/2007/2007Roadmap.pdf [hereinafter, *CCS Roadmap*]; DOE, Office of Fossil Energy, *Clean Coal Technology – From Research to Reality* (2006), *available at* http://fossil.energy.gov/aboutus/fe_cleancoal_brochure_web2.pdf [hereinafter, *Research to Reality*].

108. *See CCS Roadmap*, *supra* note 107, at 4 (U.S. CO2 emissions are only approximately 20% of world CO2 emissions).

emission mitigation from the projected development and deployment of carbon capture and sequestration technologies.[109]

Carbon capture and sequestration involves five separate functions: (i) carbon capture either from the exhaust stream after coal combustion or removal pre-combustion; (ii) identification of sequestration sites meeting criteria stated below which maximize assurance that the CO2 will not escape to the atmosphere; (iii) transportation of the captured CO2 to that sequestration site; (iv) injection of the CO2 into storage – i.e. into an underground reservoir, either a depleted oil or natural gas formation, saline formation, unmined coal seam or other formation; and (v) monitoring, mitigation and verification that the sequestered carbon remains in the underground formation and is not being released back into the atmosphere.[110] All of these functions have been demonstrated to be technically feasible and are in use today, some having had more than thirty years of use. The issue is not technical feasibility, but rather cost and demonstrating that the large quantities of CO2 needed to be sequestered to meet climate improvement objectives can successfully be stored.[111] Both the DOE and industry are pursuing research and are designing demonstration projects to address these issues.

DOE has established the following objective for its carbon capture and sequestration program: "To develop, by 2012, fossil fuel conversion systems that offer 90 percent CO2 capture with 99 percent storage permanence at less than a 10 percent increase in the cost of energy services."[112] Perhaps the greatest impediment to achieving that objective is the carbon capture function. As noted, a number of pre- and post-combustion technology options have already been identified and have established technical feasibility. These options increase the cost of existing coal fired generation from thirty to sixty-five percent because of the additional equipment and operations required, and because of the energy required for those operations—which can consume almost thirty percent of the electricity produced from the plant.[113] As noted, a principal objective of the DOE research program is to reduce these costs penalties in order that CCS achieve market acceptance.

Sequestration sites are typically underground geologic formations. These formations must have a porous layer able to absorb and hold (perhaps through chemical reaction) the injected CO2, covered with an impermeable layer of rock

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109. *Id*. *See also* Victor Der, Principal Deputy Assistant Secretary, U.S. DOE Office of Fossil Energy, The Role of Carbon Capture and Storage in Carbon Management and Energy Security, Presentation at Energy Bar Association Mid-Year Meeting, at 8-9 (Nov. 2008).

110. *See CCS Roadmap*, *supra* note 107, at 6-7.

111. *Id*.

112. *CCS Roadmap*, *supra* note 107, at 9. The Roadmap further states that: "As a technology and a research discipline, carbon sequestration is in its infancy." *Id.* For a description of DOE's broader Clean Coal Technology development program, *see Research to Reality*, *supra* note 107; *see also* Clean Coal Technology & The Clean Coal Power Initiative, http://www.fossil.energy.gov/programs/powersystems/cleancoal/ (last visited Oct. 7, 2009).

113. *CCS Roadmap*, *supra* note 107, at 6, 16-20. CO2 capture accounts for over 75% of CCS cost, adding 36% to the cost of a new IGCC plant (i.e. pre-combustion cleaning) or over 80% to the cost of a new sub or super critical pulverized coal plant. *See* Der, *supra* note 109. *See CCS Roadmap*, *supra* note 107, at 6. The DOE Roadmap notes that "potential cost reductions of 30-45% have been identified for the capture of CO2." Technologies being examined include solvent, sorbent, membrane and oxy-combustion systems.

which prevents the CO2 from escaping to the surface and the atmosphere. As one element of its Carbon Sequestration Program, which began in 1997, DOE and industry have completed a Carbon Sequestration Atlas which identifies geologic formations with sequestration potential. This analysis indicates that North America has between 1121 and 3403 gigatons of CO2 storage potential as compared to the U.S. production of CO2 at 6 gigatons per year, an apparently more than sufficient potential though the studies to confirm this potential are ongoing.[114] Injection and transportation of CO2 is a major cause of the energy penalty noted above, particularly where the CO2 must be concentrated and placed under pressure to permit its transportation.[115] The available science strongly supports that CO2 can be injected into proper underground formations and that it will stay there for substantial periods. Indeed, CO2 has been used for enhanced oil and natural gas recovery for over thirty years, providing the opportunity to study this likelihood. Research in this area is focusing upon better understanding and identifying the mechanisms that could be used to immobilize CO2 in the pore spaces of a formation. Also, past field tests have demonstrated the ability to "map" CO2 in underground formations, including any movement, and research to enhance this ability is ongoing.[116]

As noted, DOE seeks to meet its technology development and demonstration objective for CCS by 2012. DOE-Fossil Energy Clean Coal and CCS projects in late 2008 were valued at $5.6 billion and the Department was finalizing loan guarantees to incentivize future project development in the amount of an additional $6 billion.[117] Thereafter, DOE proposes to pursue, in conjunction with industry, large demonstration projects to establish the ability of these technologies to operate on the scale needed while meeting climate change mitigation objectives.[118] To assist in program advancement, DOE has established seven Regional Carbon Sequestration Partnerships with industry to assist in the design and implementation of these demonstration projects and in future deployment of CCS. The deployment phase for these projects began in 2008 and is expected to continue through 2017, with the objective of widespread deployment of CCS after 2020. Also, the Department has facilitated the establishment of the Carbon Sequestration Leadership Forum, a voluntary initiative of developed and developing countries through which CCS technology

114. *CCS Roadmap*, *supra* note 107, at 6; Der, *supra* note 109, at 16.

115. *CCS Roadmap*, *supra* note 107, at 10, 17.

116. *Id.* at 6, 13-14, 20-28.

117. Der, *supra* note 109, at 11.

118. *CCS Roadmap*, *supra* note 107, at 7, 8, 11. The Electric Power Research Institute (EPRI), in partnership with industry members having coal generation as a significant part of their electric supply, have designed and are managing a number of carbon capture projects to further this research program. *See* Presentation of Jim Turner, Pres. & Chief Operating Officer, Franchised Electric and Gas, Duke Energy at Energy Bar Association Mid-Year Meeting at 7-9 (Nov. 14, 2008); Press Release, EPRI, EPRI Joins Launch of National Carbon Capture Center (May 21, 2009); EPRI, *Coalfleet for Tomorrow – Future Coal Generation Options – Program 66* (2009), *available at* http://my.epri.com. The new center has a stated purpose as follows: "The center, which will be fully operational in 2010, will support the work of scientists and technology developers from government, industry and universities in creating the next generation of enhanced carbon capture technologies." The Center will be operated by Southern Company. Major CCS related projects are also being conducted by Duke Energy, and American Electric Power.

can be transferred from one country to another and particularly from the developed to the developing countries.[119]

Progress has also been made on legal and regulatory issues whose clarification is needed before private investment in CCS technologies can be expected. For example, a number of states have passed legislation to address such issues including : defining ownership of pore space and injected CO2, liability issues and designing concepts for an efficient regulatory structure.[120] Also, the CCS Regulatory Project, a collaboration of several entities has issued an Interim Report setting forth recommendations as to a number of these matters.[121] Finally, the EPA has issued a major rule establishing permitting requirements and other standards for CCS injection wells to protect ground water sources from contamination.[122]

C. Summary First Draft of Report to Congress Concerning CCS

Section 714 of the Energy Independence and Security Act of 2007 requires, within one year of its enactment, the Secretary of the Interior to submit a report to both the Committee of Natural Resources of the House of Representatives and to the Committee on Energy and Natural Resources of the Senate. Pursuant to Section 714, a joint report by the Department of Interior, in consultation with the Department of Energy, the Environmental Protection Agency and the U.S. Geological Survey was submitted prior to the House's passage of the Waxman-Markey bill. The report notes that geological carbon sequestration is one of the potential approaches to reduce the concentration of greenhouse gases in the atmosphere. It also recognizes that the implementation of geologic carbon sequestration on public lands poses substantial legal and regulatory challenges. The report reviews general criteria for selection of sites for geologic sequestration as well as criteria more specific to the several types of available sequestration formations. In addition, the report raises several significant matters and presents various recommendations including the following:

1. Whether CO2 is classified as a waste, pollutant, contaminant, resource or commodity will affect how it is treated from both a legal and regulatory standpoint. The type and level of impurities that may accompany CO2 at the stage of injection can also impact such legal issues.

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119. *CCS Roadmap*, *supra* note 107, at 12, 30-41; Der, *supra* note 109, at 12, 19-20. Large scale CO2 commercial demonstration, injection programs are already underway internationally, including at Weyburn, Canada and at Sleipner in the North Sea (i.e. Norway). Clean coal technology development and related assistance is also a part of the Asia Pacific Partnership on Clean Development and Climate managed by State department.

120. *See* F. Eames, Partner, Hunton & Williams L.L.P., Presentation, CCS Legal Issues at Energy Bar Association Mid-Year Meeting (Nov. 14, 2008).

121. *See* CCS Reg Project, *Carbon Capture and Sequestration: Framing the Issues for Regulation* (Jan. 2009), *available at* http://www.ccsreg.org/pdf/CCSReg_12_28.pdf. *See also* CCS Reg Project, *Policy Brief Summaries & Recommendations* (July 21, 2009), *available at* http://www.CCSReg.org. The Project is a collaboration of Carnegie Mellon University, Vermont Law School, University of Minnesota, and Van Ness Feldman.

122. Environmental Protection Agency, Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO2) Geologic Sequestration (GS) Wells, 73 Fed. Reg. 43,492 (July 25, 2008).

2. Geologic carbon sequestration may impact other land uses and could potentially adversely impact other uses of both surface and subsurface land.

3. Long-term, if not permanent, storage of CO2 is a fundamental element of geologic carbon sequestration as a mechanism to reduce adverse consequences of CO2 emission. This raises unique issues of stewardship and long term liability that require solution.

4. There are no specific Federal statutory provisions for leasing public land for long-term carbon sequestration. However, various statues and regulations, as well as proposed regulations, can impact the regulation and management of geologic sequestration. In some areas, existing state and Federal regulations may differ or conflict. Nevertheless the totality of such statues and regulations leave significant gaps that must be filled.

5. There is significant scientific research concerning a large scale geologic sequestration project that has been operative for twelve years and has shown no sign of leakage. However, existing information on the technology and consequences of long term carbon geologic sequestration is limited. As a consequence, the basis for regulatory policy is limited by the limitations of our current information. Therefore, additional investment in research is essential.

6. Much of our Federal land is subject to split estates where the surface is managed by one department of the government under one set of regulations while the subsurface is regulated by another department of the government under a different set of regulations.

7. Additional complications result from the ambiguity in the law over the ownership of pore space, etc. These need resolution.

In conclusion, the report raises a series of question that it proposes require future regulatory or legislative resolution and recommends the federal agencies use what existing authority may exist to resolve or address many of these issues.

IV. REGIONAL OR STATE GOVERNMENT ACTIVITY

A. California AB 32

California's Global Warming Solutions Act of 2006 established a comprehensive program of regulatory and market mechanisms to reduce GHG emissions. In 2006, the California State Legislature passed and Governor Schwarzenegger signed Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006,[123] which seeks to reduce GHG to 1990 levels by 2020. It directed the California Air Resources Board (ARB) to develop discrete early actions to reduce GHG while also preparing a scoping plan to identify how to reach the 2020 limit.[124] The reduction measures to meet the 2020 target are to be adopted by the start of 2011.

The AB 32 scoping plan contains the main strategies California will use to reduce the GHG that cause climate change.[125] The adopted scoping plan has a range of GHG reduction actions which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary

123. CAL. HEALTH & SAFETY CODE §§ 38500-38599 (2006).

124. CAL. HEALTH & SAFETY CODE § 38561 (2006).

125. Cal. Air Resources Board, *Climate Change Scoping Plan* (Dec. 11, 2008), *available at* http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.

actions, market-based mechanisms such as a cap-and-trade system, and a cost of implementation fee regulation to fund the program.

The AB 32 scoping plan identifies a cap-and-trade program as one of the main strategies California will employ to reduce GHG emissions that cause climate change. The program is broad-based to provide a limit on emissions covering over eighty-five percent of California's emissions from electricity generation, large industrial sources, transportation fuels, and residential and commercial use of natural gas.[126] Under cap-and-trade, an overall limit on GHG emissions from capped sectors will be established. Facilities subject to the cap will be able to trade permits (allowances) to emit GHG. ARB is working with stakeholders to design an enforceable cap-and-trade program which meets the requirements of AB 32, including consideration any potential impacts on disproportionately impacted communities. Members of the Market Advisory Committee advised ARB on the design of the cap-and trade program.[127] Consistent with AB 32, ARB must adopt the cap-and-trade regulation by January 1, 2011, and the program itself must begin in 2012.[128] California is also working closely with six other western states and four Canadian provinces through the Western Climate Initiative (WCI) to design a regional cap-and-trade program that can deliver GHG emission reductions at costs lower than could be achieved through a California-only program.

Other requirements of AB 32 include indentifying the statewide level of GHG emissions in 1990 to serve as the emissions limit to be achieved by 2020.[129] In December 2007, ARB, based on its 1990-2004 inventory work, approved the 2020 emission limit of 427 million metric tons of carbon dioxide equivalent of greenhouse gases.[130] AB 32 provides for an adoption of a regulation requiring the mandatory reporting of greenhouse gas emissions.[131] In December 2007, the Board adopted a regulation requiring the largest industrial sources to report and verify their greenhouse gas emissions.[132]

AB 32 requires identification and adoption of regulations for discrete early actions that could be enforceable on or before January 1, 2010.[133] ARB identified nine discrete early action measures including regulations affecting landfills, motor vehicle fuels, refrigerants in cars, tire pressure, port operations and other sources that included ship electrification at ports and reduction of high GWP gases in consumer products. Development of regulations for the remaining measures is proceeding. In addition, ARB must ensure that early voluntary

126. *Id*. at ES-7.

127. Recommendations of the Market Advisory Committee to the California Air Resources Board for Designing a Greenhouse Gas Cap-and-Trade System for California, at 19 (June 30, 2007), *available at* http://www.climatechange.ca.gov/publications/market_advisory_committee/2007-06-29_MAC_FINAL_REPORT.PDF; *See also* Cal. Executive Order S-20-06 (Oct. 18, 2006)

128. CAL. HEALTH & SAFETY CODE §38562 (a) (2006).

129. CAL. HEALTH & SAFETY CODE §38550 (2006).

130. Cal. Air Resources Board, Resolution No. 07-55 (Dec. 6, 2007).

131. CAL. HEALTH & SAFETY CODE §38530 (2006).

132. CAL. CODE REGS. tit. 17, §§ 95100 to 95133 (2007).

133. CAL. HEALTH & SAFETY CODE §38560.5 (2006); *see* Cal. Air Resources Board, Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommend for Board Consideration (Oct. 25, 2007), *available at* http://www.arb.ca.gov/cc/ccea/ccea.htm.

reductions receive appropriate credit in the implementation of AB 32.[134] In February 2008, the Board approved a policy statement encouraging voluntary early actions and establishing a procedure for project proponents to submit quantification methods to be evaluated by ARB.[135] ARB, along with California's local air districts and the California Climate Action Registry, is working to implement these programs.

B. Midwestern Greenhouse Gas Accord

On November 15, 2007, six Midwestern Governors and the Premier of a Canadian Province signed the Midwestern Greenhouse Gas Accord (MGGA). Noting the serious effects anticipated from climate change if not arrested, the Accord proposes the establishment of a program to reduce greenhouse gas emissions in their respective jurisdictions through developing a market-based and multi-sector cap and trade mechanism.[136] On June 8, 2009, MGGA released a draft final design and recommendations for implementation of its program, proposing that the planned market become operational in 2012. In releasing the draft final design, MGGA expressed a "strong preference" that a federal cap and trade program be implemented even though federal cap and trade legislation could preempt regional initiatives.[137]

C. Western Climate Initiative

Formed in February, 2007 by the governors of Arizona, California, New Mexico, Oregon, and Washington, the Western Climate Initiative (WCI) provides a framework for a regional cap-and-trade program intended to reduce greenhouse gas emissions from its participating jurisdictions in 2020 by fifteen percent against 2005 levels.[138] At present, the jurisdictions that have agreed to participate in the WCI cap-and-trade program are Arizona, California, Montana, New Mexico, Oregon, Utah, and Washington, as well as the Canadian provinces of British Columbia, Manitoba, Ontario, and Montreal.[139]

On September 23, 2008, the WCI released its design recommendations for the cap-and-trade program,[140] which outlines the basic legal architecture of the program. Under the current proposal, each jurisdiction will be provided an annual emissions allowance beginning in 2012 (or in 2015 for certain types of emissions, including those related to transportation fuels).[141] The allowance of each jurisdiction will initially be set at the level of expected actual emissions for

134. CAL. HEALTH & SAFETY CODE §38562(b)(3) (2006).

135. Cal. Air Resources Board, Policy Statement on Voluntary Early Actions (Feb. 28, 2008).

136. A copy of the accord is available at http://www.midwesternaccord.org/news.html (last visited Oct. 12, 2009).

137. MidWest Greenhouse Gas Accord – Advisory Group Draft Final Recommendations (June 2009), available at http://www.midwesternaccord.org/ GHG%20Draft %20Advisory%20Group% 20Recommendations.pdf.

138. *See* Western Climate Initiative, *WCI Cap-and-Trade Program, Frequently Asked Questions*, http://www.westernclimateinitiative.org/the-wci-cap-and-trade-program/faq (last visited Oct. 12, 2009).

139. *See* Western Climate Initiative, *WCI Provincial and State Partner Contacts*, http://www.westernclimateinitiative.org/wci-partners (last visited Oct. 12, 2009).

140. Western Climate Initiative, *Design Recommendations for the WCI Regional Cap-and-Trade Program*, http://www.westernclimateinitiative.org/the-wci-cap-and-trade-program/design-recommendations (last visited Oct. 12, 2009).

141. *Id.* at § 7.

the relevant year, and will decline in a straight-line fashion in order to reach the ultimate emissions goal by 2020.[142]

Each jurisdiction within the WCI has broad discretion as to the manner in which it allocates its allowance of emissions credits, subject to certain safeguards to ensure the effectiveness and fairness of the system across jurisdictions. For example, all partner jurisdictions are required to auction a minimum of 10% of their allowable emissions credits in the first three years through a coordinated regional process, and provision is made for uniform treatment of certain industries to avoid placing entities in certain jurisdictions at a competitive disadvantage relative to those in other WCI partner jurisdictions.[143]

Given recent developments at the federal level in the United States, one issue that the framers of the WCI (as well as other regional programs) may soon need to address is how the regional system created by the WCI would be integrated into a larger federal or international cap-and-trade regime. The WCI partners have clearly stated their intent to structure the program in order to make it compatible with other cap-and-trade programs operating at the federal level, both by promoting federal legislation that is compatible with the WCI and by ensuring that any WCI credits issued prior to implementation of a federal cap-and-trade regime receive credit under the federal regime as well.[144]

D. Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) is the United States' first mandatory, market-based effort to reduce greenhouse gas emissions.[145] Ten Northeastern and Mid-Atlantic states have begun efforts to cap and then reduce CO2 emissions from the power sector by ten percent by 2018.[146] Participating states include: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.[147] Guided by RGGI's model rule that the participating states committed to follow, each participating state developed their own legislation or regulations that: capped CO2 emissions from power plants, created and allocated CO2 allowances between the public and market actors, and mandated participation in a single, region-wide auction regime.[148] The first formal auction of emission allowances occurred on September 25, 2008 and involved six states; subsequent auctions involved all participating states and occurred in December 2008 and March and June of 2009 with additional auctions scheduled for September and December 2009.[149] The auctions have successfully created a regional market for carbon emissions.

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142. *Id.* at § 6.

143. *Id.* at § 8.

144. *Id.* at § 14.

145. *See* Regional Greenhouse Gas Initiative, http://www.rggi.org/home (last visited Oct. 12, 2009).

146. *Id*.

147. *Id*.

148. *See* Regional Greenhouse Gas Initiative, *State Regulations*, http://www.rggi.org/states/state_regulations (last visited Oct. 12, 2009).

149. *See* Regional Greenhouse Gas Initiative, *Upcoming Auctions*, http://www.rggi.org/CO2-auctions/upcoming (last visited Oct. 12, 2009).

RGGI's market-based, cap-and-trade approach to reducing carbon emissions has five key components.[150] First, the RGGI states have created a regional CO2 emissions cap that will gradually decrease until 2018 when it will be ten percent lower than it was when RGGI started. Second, RGGI requires all but the smallest electric power generators to own allowances to enable them to emit CO2 . Next, RGGI has established an emissions auction and trading system to allow electric power generators to buy, sell, and trade CO2 emissions allowances. Other market actors can buy, sell, and trade these allowances. Fourth, RGGI states use their share of the auction proceeds to finance state initiatives to reduce GHG, generate reduced-carbon power, or use energy more efficiently. Finally, RGGI allows the use of offsets, *i.e.* GHG emission reduction or sequestration projects outside the electricity sector, to help meet the goal of a ten percent reduction in emissions. Offsets must be located within the participating states, must reduce emissions of methane, carbon dioxide, or sulfur hexafluoride, and are generally limited to just over three percent of a company's allowed emissions.

RGGI's auctions have yielded a clearing price for 2009 allowances ranging from $3.07 to $3.51 and for 2012 allowances from $2.06 to $3.05.[151] Such prices likely reflect, on the one hand, successful implementation of a regional cap and trade regime premised on a gradual approach to reducing GHG emissions in the power sector, and on the other, considerable uncertainty about RGGI's future as Congress considers nation-wide regimes to cap on carbon emissions.

V. INTERNATIONAL

The current legal framework for addressing Global Climate Change was established in 1992 when the United Nations Framework Convention on Climate Change (UNFCCC) was opened for signature.[152] The Convention's stated objective is "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic [human caused] interference with the climate system" requiring both developed and developing nations to establish national programs that together will achieve that objective.[153] However, the content of those programs is not specified, but may include quantified greenhouse gas (GHG) emissions reductions, policies and measures, technology development and other approaches. In its preamble, the Convention recognizes that developed countries have contributed "the largest share of historical and current global emissions of greenhouse gases", and have higher per capita emissions levels than developing countries.[154] For this reason, the Convention anticipates more expansive national programs from developed countries.[155] The Kyoto Protocol, under which a cap and trade program has been

150. *See* Regional Greenhouse Gas Initiative, *About RGGI*, http://www.rggi.org/about (last visited Oct. 12, 2009).

151. Regional Greenhouse Gas Initiative, *Results By Auction*, http://www.rggi.org/CO2-auctions/results (last visited Oct. 12, 2009).

152. United Nations Framework Convention on Climate Change - 1992, 1771 U.N.T.S. 107 (Mar. 21, 1994).

153. *Id*. at Art. 3, 4.1 & 4.2.

154. *Id*. at Preamble.

155. *Id*.

developed and which the United States did not sign as it imposed no limitations on developing countries, was agreed to in 1997, requiring a five percent reduction from 1990 greenhouse gas emission levels by 2012.[156] The Kyoto Protocol effectively expires in 2012 and must be either extended or replaced.[157]

In December 2007, in Bali, Indonesia, the parties to the Framework Convention (including the United States) met and agreed to a negotiating process (termed the Bali Action Plan) by which a replacement to or extension of the Kyoto Protocol would be developed by December 2009.[158] A multi-lateral conference is to be held in Copenhagen, Denmark in December 2009 at which the new, post-Kyoto program is to be finalized. The Action Plan's Preamble notes that it is responding to the Intergovernmental Panel on Climate Change's findings that "warming of the climate system is unequivocal", and that delay in addressing the matter "increases the risk of more severe climate change impacts."[159] Developing nations agree to consider "nationally appropriate mitigation actions" (i.e. no specific mention of emission limitations or reductions), while developed countries agree to pursue "measurable, reportable and verifiable nationally appropriate . . . commitments or actions, including quantified emission limitation and reduction objectives."[160]

The Bali Action Plan was to be implemented through bilateral discussions and at a series of multi-lateral conferences sponsored by the UN, which have occurred every other month during 2009, and through national submissions as to what the Copenhagen Agreed Outcome should be, with final discussions and agreement to occur at Copenhagen in December 2009.[161] The United States made its submission in late May.[162] In its introductory comments, it stated that:

> The United States is committed to reaching a strong international agreement in Copenhagen based on both the robust targets and ambitious actions that will be embodied in U.S. domestic law and on the premise that the agreement will reflect the important national actions of all countries with significant emissions profiles to contain their respective emissions.[163]

The U.S submission then continued to make specific proposals about the major actions required to address climate change as identified in the Convention, including "mitigation" (i.e. quantitative emissions reductions for developed countries by 2020 & 2050), "adaptation" (proposals to address climate change effects which have already or will in the future occur), "technology" (development of technology to assist in mitigation and adaptation), and

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156. Kyoto Protocol to the United Nations Framework Convention on Climate Change - 1997, U.N. Doc. FCCC/CP/1997/L.7/Add.1 (Feb. 16, 2005), *available at* http://unfccc.intlresource/docs/convkp/kpeng.pdf.

157. *Id*.

158. U.N. Framework Convention on Climate Change, Conference of the Parties, Thirteenth Session, Bali Action Plan, Decision 1/CR.13, U.N. Doc. FCCC/CP2007/6Add.1 (Mar. 14, 2008), *available at* http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf.

159. *Id*. at 1.

160. *Id*. at 1(b)-1(e).

161. *Id.* at 9(d), 14(b).

162. *See* Department of State, U.S. Submission on Copenhagen Agreed Outcome (May 29, 2009), *available at* http://www.state.gov/g/oes/rls/other/2009/124101.htm. The U.S. proposed that Copenhagen's Agreed Outcome take the form of an "Implementing Agreement" under the Framework Convention. *See also* Toward an Agreement in Copenhagen, http://www.un.org/climatechange/ (last visited Oct. 12, 2009).

163. *Id.*

"financing" (providing funds to developing nations to assist them in mitigation and adaptation).

On July 8 & 9, 2009, at L'Aquila, Italy, both the G-8 and the Major Economies Forum on Energy and Climate[164] met and issued declarations as to matters necessary for decision if Copenhagen objectives are to be met. In its Declaration, the Major Economies Forum states the problem as follows:

> Climate change is one of the greatest challenges of our time. As leaders of the world's major economies, both developed and developing, we intend to respond vigorously to this challenge, being convinced that climate change poses a clear danger requiring an extraordinary global response, that the response should respect the priority of economic and social development of developing countries, that moving to a low-carbon economy is an opportunity to promote continued economic growth and sustainable development, that the need for and deployment of transformational clean energy technologies at lowest possible cost are urgent and that the response must involve balanced attention to mitigation and adaptation.[165]

The Leaders then state their "resolve to spare no effort to reach agreement in Copenhagen," and that "peaking of global and national emissions should take place as soon as possible."[166] In other words, global emissions reductions (not merely stabilization) should be sought in the near or mid-term (i.e. by 2020). The Declaration then expresses the commitments made toward emission reduction as follows:

> Developed countries among us will take the lead by promptly undertaking robust aggregate and individual reductions in the midterm consistent with our respective ambitious long-term objectives and will work together before Copenhagen to achieve a strong result in this regard. Developing countries among us will promptly undertake actions whose projected effects on emissions represent a meaningful deviation from business as usual in the midterm, in the context of sustainable development, supported by financing, technology and capacity-building . . . . We recognize the scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2 degrees C.[167]

Separately, the G-8 countries announced a goal to reduce their CO2 emissions by eighty percent from 1990 levels by 2050, and world emission levels by fifty percent by that time. However, the Major Economies Declaration explicitly recognized that the larger group had not reached an agreement on such a goal (i.e. the major developing economies did not join the G-8), and neither the G-8 nor developing countries announced any goal for "mid-term" (i.e. 2020) emission reductions needed if the two degree limit and early "peaking" of emissions was to be achieved.[168] As respects Developed Country support for

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164. The Forum is an initiative of the Obama Administration. It met three times before L'Aquila and provides a forum at which 17 countries (i.e. effectively the G-8 and the largest developing country economies – China, India, Brazil, Mexico, South Africa & Indonesia) meet and exchange views on Copenhagen related issues. *See* Press Release, Dep't of State, President Obama Announces Launch of the Major Economics Forum on Energy and Climate (Mar. 28, 2009), *available at* http://www.state.gov/g/oes/rls/other/2009/120980.htm.

165. Press Release, The White House, Declaration of the Leaders – The Major Economies Forum on Energy and Climate (July 9, 2009), *available at* http://www.whitehouse.gov/the_press_office/Declaration -of-the-Leaders-the-Major-Economy-Forum-on-Energy-and-Climate/.

166. *Id.* The Declaration notes that "peaking" of emissions will occur later in developing than developed countries as "social and economic development and poverty eradication are the first and overriding priorities in developing countries."

167. *Id.*

168. *Id.;* Press Release, White House Office of the Press Secretary, Meeting the International Clean Energy and Climate Change Challenges (July 9, 2009), *available at*

Developing Country mitigation and adaptation efforts, no quantifiable nor firm commitment was announced, though the importance of the issue and a plan for further discussions was stated in the Declaration as follows:

> Adaptation to the adverse effects of climate change is essential. Such effects are already taking place . . . in developing countries which will be disproportionately affected. There is a particular and immediate need to assist the poorest and most vulnerable to adapt to such effects. Not only are they the most affected but they have contributed the least to the build up of greenhouse gases in the atmosphere. Further support will need to be mobilized, should be based on need, and will include resources additional to existing financial assistance. . . . Financial resources for mitigation and adaptation will need to be scaled up urgently and substantially and should involve mobilizing resources to support developing countries. . . . Greater predictability of international support should be promoted.[169]

A Global Partnership to drive technology development was established with each developed country undertaking responsibility to advance development of a particular technology area (the U.S. is to pursue energy efficiency) and to report on its future program proposal by November 15.[170] A doubling of public investments in technology development was promised by 2015.[171]

Reaction to the Declaration and G-8 commitment was positive but emphasized that much work remains to be done. For example, U.N Secretary General Ban Ki-moon termed the G8 GHG emission reduction proposals as "welcome . . . [but] not sufficient", further noting that the long-term goal was not credible without "ambitious mid-term targets and base-lines."172 He further stated:

> In order to achieve such a global goal [80% GHG reduction by 2050], developed countries must lead by example in making firm commitments to reduce their emissions by 2020 on the order of the 25 to 40 per cent below 1990 levels that the Intergovernmental Panel on Climate Change tells us [is] required. It is disappointing to note thus far, the mid-term emissions targets announced by developed countries in the MEF are not in this range.[173]

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http://www.whitehouse.gov/the_press_office/FACT-SHEET-Meeting-the-International-Clean-Energy-and-Climate-Change-Challenges/; Press Release, White House Office of the Press Secretary, Remarks by the President on Major Economies Forum Declaration (July 9, 2009), *available at* http://www.whitehouse.gov/the_press_office/REMARKS-BY-PRESIDENT-OBAMA-ON-MAJOR-ECONOMIES-FORUM-DECLARATION/.

169. *Id*. A discussion of the major matters for negotiation between developed and developing countries (i.e. relative level of emission reduction over business as usual; terms of technology transfer; extent of developed country contribution to developing country adaptation and mitigation costs) can be found in: Stuart Eisenstat, *The U.S. Role in Solving Climate Change: Green Growth Policies Can Enable Leadership Despite the Economic Downturn*, 30 ENERGY L. J. 1 (2009).

170. *Id.*

171. *Id.*

172. Press Release, United Nations, Time for Delays and Half-Measures is Over, Says Secretary-General Calling G-8 Climate Change Commitments "Not Sufficient" (July 9, 2009), *available at* http://www.un.org/News/Press/docs/2009/sg2153.doc.htm; Press Release, United Nations, Press Conference on Climate Talks at G-8 Summit (July 15, 2009), *available at* http://www.un.org/News/briefings/docs/2009/090715_Climate_Change.doc.htm; Press Release, United Nations, Financing for Poorer Countries Key to Securing New Climate Deal – Top UN Official (July 24, 2009), *available at* http://www.un.org/apps/news/story.asp? NewsID=31582&Cr=climate&Crl=Copenhagen; Press Release, United Nations, Press Conference by Chairman of Intergovernmental Panel on Climate Change (July 20, 2009), *available at* http://www.un.org/News/briefings/docs/2009/090720_IPCC.doc.htm.

173. *Id.*

Indeed, others noted that the two degree temperature increase limit adopted in the Declaration is achievable, based on UN science reports, only if developed countries adopt a goal of twenty-five to forty percent GHG emission reductions by 2020.[174] The Waxman-Markey Bill, for example, proposes only a seven percent reduction (measuring its twenty percent as against higher 2005 GHG emission levels), and even the European Union's proposed commitment is but a twenty percent reduction against 1990 levels.[175]

The UN held a high level conference on Climate Change at its New York City Headquarters on September 22 to focus on interactive discussion of issues and approaches among Heads of State and Senior Government Officials. This Conference followed a meeting of the G-20 Finance Ministers in Pittsburgh at which financing issues for developing country adaptation and mitigation was to be addressed.[176] In early October and again in early November, further multi-lateral meetings will occur between principal developed and developing countries to clarify and reach agreement on matters necessary to completion of the expected new international agreement. Through these meetings, and continued bilateral discussions, it is expected that necessary agreements will be reached to permit a successful conclusion of the Bali Action Plan at Copenhagen. The primary issues to be decided by such agreements may be broadly characterized as falling within three categories: 1) the quantity and allocation of developed country commitments; 2) the nature and extent of developing country commitments; and 3) the forms of assistance, both with respect to reduction of emissions and adaptation to changing climactic conditions, to be provided to developing countries by developed countries.

Under the Bali Action Plan, the contributions of developed countries are intended to reflect "comparability of efforts."[177] The European Community has identified four criteria relevant to a determination of comparability: 1) the capability of a country to pay; 2) the country's emissions reduction potential; 3) previous efforts to reduce emissions; and 4) a country's demographic profile and total emissions.[178] Agreement between the developed countries regarding

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174. *Id.*; Press Conference on Climate Talks at G-8 Summit, STATES NEWS SERVICE (July 15, 2009); G-8 Fails to Find Consensus on Climate Change, INTERPRESS SERVICE (July 14, 2009). *See also* John C. Dernbach, Achieving Early and Substantial Greenhouse Gas Reductions Under Post-Kyoto Agreement, 20 GEO. INT'L ENV. L. REV. 573 (2008).

175. *Id*.

176. *Id*. Also see Press Release, United Nations, UN Climate Change Negotiations Result in More Clarity on "Bricks and Mortar" of Copenhagen Agreed Outcome, but Decisions on Finance and Mid-Term Targets Remain Outstanding (October 9, 2009), *available at* http://www.un.org/wcm/webdav/site/climatechange/shared/Documents/Bangkok%20closing%20press%20release%20Oct%202009.pdf; U.S. Department of State, Chair's Summary: Fourth Meeting of Leaders' Representatives of the Major Economies Forum on Energy and Climate (September 21, 2009), *available at* heep://www.state.gov/g/oes/rls/other/2009/129491.htm; Todd Stern, Special Envoy for Climate Change, The Current State of Our Negotiations on a New International Climate Agreement, Statement to the House Select Committee for Energy Independence and Global Warming (September 10, 2009), *available at* http://www.state.gov/g/oes/rls/remarks/2009/129204.htm.

177. U.N. Framework Convention on Climate Change, Conference of the Parties, Thirteenth Session, Bali Action Plan, Section 1(b)(i), Decision 1/ CP.13, U.N. Doc. FCCC/CP2007/6Add.1 (Mar. 14, 2008), *available at* http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf.

178. Submission of Czech Republic on Behalf of the European Community and its Member States to the Ad Hoc Working Group on Long-Term Cooperative Action, FCCC/AWGLCA/2009/MISC.4 (Part I) (Apr. 28, 2009) [hereinafter, *EC Submission*].

whether the proposed reductions of each are "comparable" given the circumstances of each country is likely to be a topic of significant discussion during the Copenhagen conference. Some developing countries have also taken a position regarding the appropriate level of reductions to be assumed by developed countries. Perhaps most notable is China's demand that developed countries commit to an aggregate reduction of forty percent from 1990 levels.[179]

Developed countries, and particularly the U.S. and the E.U., have expressed expectations that those developing countries with large economies and significant emissions will assume quantifiable and firm commitments to reduce emissions from their anticipated levels under a business as usual case. The E.U. appears to have taken the strongest position in this regard, by calling on developing countries "that are at levels of development and GDP/capita comparable to those of the group of developed countries, notably OECD member countries and candidates for membership thereof, to consider making similar commitments [to those assumed by developed countries] in line with their responsibilities, capabilities and national circumstances."[180] The U.S. has taken a similar position by requesting that developing countries "whose national circumstances reflect greater responsibility or capability" take "nationally appropriate mitigation actions in the 2020. . .time-frame that are quantified (e.g., reduction from business-as-usual) and are consistent with levels of ambition needed to contribute to meeting the objectives of the [UNFCCC]."[181] China, on the other hand, appears unwilling to take any measures that would impede economic growth, asserting unequivocally that "[e]conomic and social development and poverty eradication are the first and overriding priorities of the developing countries."[182]

Another key issue that must be resolved with respect to the involvement of developing countries is the nature and degree of financial, technical and other assistance that will be provided to them by the developed countries. Developed countries have acknowledged the importance of a mechanism for channeling resources (including technological and managerial capabilities) to developing countries to help them mitigate emissions and adapt to the effects of climate change.[183]A key demand of developing countries is that any such assistance be predictable in nature and that it represents a genuinely additional contribution of resources from developed countries, as well as an additional source of reductions above and beyond the developed countries mandatory commitments.[184] Various schemes have been proposed at the conceptual level as a means of channeling

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179. Submission of China to the Ad Hoc Working Group on Long-Term Cooperative Action, FCCC/AWGLCA/2009/MISC.4 (Part I) (Apr. 24, 2009) [hereinafter, *China Submission*].

180. *EC Submission*, *supra* note 176, at 10.

181. Submission of the United States to the Ad Hoc Working Group on Long-Term Cooperative Action, FCCC/AWGLCA/2009/MISC.4 (Part II) (May 4, 2009) [hereinafter, *U.S. Submission*].

182. *China Submission*, *supra* note 179, 1(f).

183. *See, e.g.*, *U.S. Submission*, *supra* note 181, § 4 ("[T]he U.S. is keenly aware of the need for a dramatic increase in the flow of resources available to developing countries to catalyze both mitigation and adaptation activities"); *See also EC Submission*, *supra* note 176, at ¶ 49 ("Significant domestic and external sources of finance, both private and public, will be required for financing mitigation and adaptation actions . . . the EU is prepared to take on its fair share . . .").

184. *See* Submission of Brazil to the Ad Hoc Working Group on Long-Term Cooperative Action, FCCC/AWGLCA/2009/MISC.4 (Part I) (Apr. 24, 2009); *See also China Submission*, *supra* note 179, at ¶ 3(a).

mitigation assistance to developing countries, including a registry matching major mitigation programs with funding sources[185] and a "sectoral crediting" program granting developing countries tradable credits for reductions in particular industries that exceed an agreed threshold.[186]

As more fully described in the references provided in note 176 above, much effort is yet to be expended to reach agreement and design a new international agreement covering these several matters.

185. *Id.* at non-Annex I countries.

186. *EC Submission*, *supra* note 176, at ¶¶ 26-29.

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Woodrow D. Smith
Mary Anne Sullivan
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Elizabeth Thomas
Jonathan P. Trotta
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Elaine M. Walsh
O. Julia Weller
Kristine R. Wilson
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John M. Wingate
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