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United States

Robert Wyman, Marc Campopiano, Joshua Bledsoe, Buck Endemann and Aron Potash*

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Main climate regulations, policies and authorities

1 International agreements

Do any international agreements or regulations on climate matters apply in your country?

The United States ratified the United Nations Framework Convention on Climate Change on 15 October 1992 and it entered into force on 21 March 1994. The US signed the Kyoto Protocol on 11 December 1998 but has never ratified, accepted or approved it. As such, the US is not required to comply with the Kyoto Protocol.

2 International regulations and national regulatory policies

How are the regulatory policies of your country affected by international regulations on climate matters?

US regulatory policies are affected more by the absence of a comprehensive international regime to control greenhouse gas (GHG) emissions than by current international regulations. In particular, the absence of binding international controls on developing countries experiencing rapid economic growth and associated GHG emissions (eg, China, Brazil and India) has made the US reluctant to join an international climate regime or commit to nationwide GHG emission reductions for fear of impairing its relative economic competitiveness.

US climate change policies nonetheless have been affected by developments in policy and science at the international level, particularly by the United Nations. For example, scientific research by the United Nations Intergovernmental Panel on Climate Change (IPCC) concerning the causes and implications of global climate change informed the US Environmental Protection Agency's (EPA's) Endangerment Finding, discussed in question 3 below.

3 Main national regulatory policies

Outline recent government policy on climate matters.

Federal developments

Legislative efforts to enact climate legislation narrowly failed in 2010. The 2010 midterm US congressional elections – which removed cap-and-trade supporters from office – suspended any serious consideration of cap-and-trade legislation. Indeed, immediately after the 2010 election results, President Obama announced that he was abandoning cap-and-trade as a legislative policy option. However, President Obama has indicated that he may pursue climate legislation if re-elected to serve a second term.

In the absence of federal legislation on climate change, EPA has been regulating GHG emissions through its pre-existing authority under the federal Clean Air Act (CAA). In the seminal decision of *Massachusetts v EPA*, 549 US 497 (2007), the US Supreme Court held that GHGs met the CAA's definition of an 'air pollutant' and

thus can be regulated. Pursuant to the *Massachusetts v EPA decision*, EPA published its Endangerment Finding on 15 December 2009. In the Endangerment Finding, EPA concluded that six GHGs – carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride – reasonably may be anticipated to endanger public health and welfare. On the same day, EPA issued findings defining the applicable air pollutant as the same six GHGs, in aggregate, and found that this new air pollutant, when emitted from new motor vehicles and new motor vehicle engines, contributes to GHG air pollution that endangers public health and welfare.

On 2 April 2010, EPA published a final rule commonly referred to as the Johnson Memorandum Reconsideration. Therein, EPA interpreted the CAA term 'subject to regulation', which is one of the regulatory triggers for permitting stationary sources under the CAA's Prevention of Significant Deterioration (PSD) programme. The Johnson Memorandum Reconsideration concluded that EPA's imposition of GHG tailpipe (ie, exhaust) emission standards for certain mobile sources would trigger PSD applicability for GHG-emitting stationary sources on or after 2 January 2011, the expected effective date for the then-forthcoming 'Tailpipe Rule'. The Tailpipe Rule was published on 7 May 2010. On 3 June 2010, the EPA published the 'Tailoring Rule', which limits the applicability of PSD permitting for GHGs to only the highest-emitting GHG sources. In the absence of the Tailoring Rule, the PSD programme's existing thresholds would have applied. See question 10 for a discussion of the permitting programme.

As required by the CAA, most states have taken steps to modify their applicable air regulations and CAA state implementation plans (SIPs) to conform to EPA's Tailoring Rule and guidance. However, Texas notably has chosen not to issue GHG permits. Accordingly, on 3 May 2011, EPA promulgated a federal implementation plan (FIP) for the state. Both Texas and Wyoming currently are challenging EPA's authority to issue a GHG FIP in federal courts.

On 20 July 2011, EPA published its final rule deferring GHG permitting requirements for CO₂ emissions from biomass-fired and other biogenic sources until 21 July 2014. Environmental groups have challenged the deferral. In September 2011, EPA released an 'Accounting Framework for Biogenic CO₂ Emissions from Stationary Sources', which analyses accounting methodologies and suggests an implementation framework for biogenic CO₂ emitted from stationary sources.

On 4 April 2012, EPA published a proposed rule to establish, for the first time, a new source performance standard (NSPS) for GHG emissions. The proposed rule would apply to new fossil fuel-fired electric generating units (EGUs). Under the proposed rule, new fossil fuel-fired EGUs larger than 25MW would be required to limit emissions to 1,000 pounds CO₂/MWh on an average annual basis, subject to certain exceptions.

On 17 April 2012, EPA issued emission rules for oil production and natural gas production and processing operations. The rules include a new NSPS that address sulphur dioxide and volatile

organic compounds (VOC) emissions and a new national emission standard for hazardous air pollutants (NESHAP) that address emissions of hazardous air pollutants. Among other things, the rules require a 95 per cent reduction in VOC emissions by using reduced emission completions, or 'green completions', at gas wells that are hydraulically fractured or refractured after 1 January 2015. While these new rules do not directly regulate methane, a potent GHG, EPA values the expected reduction in methane emissions at \$440 million annually.

The US also regulates mobile source GHG emissions. EPA's GHG emission standards for model year 2012–2016 light-duty vehicles took effect on 2 January 2011. On 28 August 2012, EPA extended these standards to model year 2017–2025 passenger vehicles. Corporate average fuel economy (CAFE) standards and EPA-based tailpipe GHG emission standards generally require carmakers to produce cars with greater fuel economy, with compliance measured on a fleet-wide basis.

EPA's regulation of GHGs has faced, and continues to face, judicial challenges. On 26 June 2012, in *Coalition for Responsible Regulation, Inc v EPA*, 684 F3d 102 (DC Cir 2012), the Tailoring Rule, the endangerment finding, the Johnson Memorandum Reconsideration, and the Tailpipe Rule were upheld. This case represents a significant victory for both EPA and the Obama administration.

On 30 August 2012, President Obama signed an executive order (EO) titled 'Accelerating Investment in Industrial Energy Efficiency', which set a goal of creating 40GW of new industrial combined heat and power (CHP) by the end of 2020. According to a joint report from the US Department of Energy (DOE) and EPA in August 2012, meeting the goal would increase national CHP capacity by 50 per cent and save 1 quadrillion Btu of energy, or 1 per cent of the total energy used in the US. CHP takes thermal energy produced during industrial processes that would otherwise go to waste and uses it in applications like making steam or providing hot water or heating, reducing the need to purchase electricity for those uses. In order to achieve the new goal, President Obama instructed several federal agencies and councils to coordinate with the states, industry, utilities, and other relevant stakeholders to expand CHP usage and reduce industrial energy consumption and emissions.

Regional developments

Several states have adopted or are pursuing regional cap-and-trade programmes, but other states have withdrawn from these programmes. The Regional Greenhouse Gas Initiative (RGGI), discussed in question 12, currently includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont. In June 2012 via legislation, New Hampshire changed how it would utilise RGGI revenue and can now withdraw from RGGI if two other New England states, or one state with 10 per cent or more of RGGI electricity load, exit first. The Western Climate Initiative (WCI) is a regional cap-and-trade programme designed to link with California's programme (discussed below). The WCI currently includes California and the Canadian provinces British Columbia, Manitoba, Ontario and Quebec. The Midwest GHG Reduction Accord is now dormant.

State developments

In general, efforts by the states to regulate GHG emissions persist but have been slowed due to poor economic conditions. The most noteworthy GHG regulation at the state level is California's Global Warming Solutions Act of 2006, commonly known as Assembly Bill (AB) 32, which mandates a reduction in GHG emissions to 1990 levels by 2020. The California Air Resources Board (ARB) is

charged with implementing AB 32 and approved a Climate Change Scoping Plan (Scoping Plan) in December 2008. The Scoping Plan is a detailed roadmap of emission-reduction measures that ARB will promulgate per AB 32.

Due to judicial challenges, ARB reapproved a modified Scoping Plan on 24 August 2011. On 20 October 2011, ARB finalised a core Scoping Plan measure, the California cap-and-trade programme. ARB is relying on this programme to provide approximately 20 per cent of the reductions necessary under AB 32. See question 12 for more information.

There has been comparatively less activity in other states. New York regulates CO₂ emissions from new electric generating facilities with a generating capacity of at least 25MW and existing facilities that increase capacity by at least 25MW. Oregon has established CO₂ emissions performance standards for new electric generating facilities that vary by fuel type and load service; facilities also can comply by obtaining CO₂ emission offsets. Washington requires: all new electric generating resources to meet a GHG emission performance standard; and new fossil-fuel thermal generating facilities and existing facilities proposing to increase their capacity by 15 per cent to mitigate 20 per cent of total CO₂ emissions. Montana, via House Bill 25 passed in 2007, prohibits the approval of new coal plants that do not sequester at least 50 per cent of CO₂ emissions. New Mexico was taking steps to implement a cap-and-trade programme, but its Environmental Improvement Board repealed the programme on 6 February 2012.

4 Main national legislation

Identify the main national laws and regulations on climate matters.

Currently, there is no main national climate legislation in the US. Ongoing regulatory activity is being conducted under the CAA. See question 19 for a discussion of renewable energy policies and incentive programmes.

5 National regulatory authorities

Identify the national regulatory authorities responsible for climate regulation and its implementation and administration. Outline their areas of competence.

EPA is the primary national regulatory authority responsible for climate regulation and its implementation and administration. EPA's authority includes promulgation and enforcement of CAA standards for GHG emissions reporting and emissions limits for both mobile and stationary sources, adaptation to a changing climate, and protection of drinking water aquifers under the federal Safe Drinking Water Act (42 USC sections 300f, et seq) regarding carbon capture and sequestration (CCS) underground injection technologies.

The National Environmental Policy Act (NEPA) requires federal agencies to consider major federal actions that may significantly affect the environment. The Council on Environmental Quality (CEQ) is charged with ensuring federal agencies comply with NEPA. On 18 February 2010, CEQ issued Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions to help federal agencies address climate-change effects under NEPA. Although the comment period closed in May 2010, CEQ has not finalised the guidance. Nonetheless, certain federal agencies have developed internal guidance to facilitate the agency's analysis of climate change under NEPA (eg, Department of the Interior, Fish & Wildlife Service, Federal Aviation Administration, and the Army Corps of Engineers).

General national climate matters

6 National emissions and limits

What are the main sources of emissions of greenhouse gases (or other regulated emissions) in your country and the quantities of emissions from those sources? Describe any limitation or reduction obligations. Do they apply to private parties in your country?

According to EPA's 2012 US GHG Inventory Report, which covers the period from 1990 to 2010, total US GHG emissions were 6,821.8 million metric tons of CO₂ equivalent in 2010. The two largest sources of emissions were electricity generation and transportation.

Due to recent mandatory GHG reporting rules, which went into effect for many industries in 2011 and additional industries in 2012, future inventory reports should include more robust data. The GHG reporting programme (GHGRP) imposed GHG monitoring and reporting requirements for any 'facility' with operations that fall within one or more 'source categories', which EPA estimates covered about 80 per cent of GHG emissions in the US. In 2012, EPA estimates that this coverage will increase to 85–90 per cent of the total US GHG emissions. For certain source categories, the reporting rule was triggered regardless of the facility's GHG emissions levels. For other source categories, mandatory reporting was triggered only when the facility's GHG emissions for those operations exceeded 25,000 tons per year (tpy) carbon dioxide equivalent (CO₂e). The GHGRP identified for the first time individual sources operating in the US that fall within these categories and provide a regulatory system for year-to-year tracking of their GHG emissions. Much of the information reported under the GHGRP is available to the public.

See questions 3 and 10 for a discussion of GHG-related regulations and permitting requirements.

7 National emission projects

Describe any major emission reduction projects implemented or to be implemented in your country. Describe any similar projects in other countries involving the participation of government authorities or private parties from your country.

EO 13514, 'Federal Leadership in Environmental, Energy, and Economic Performance', signed on 5 October 2009, set forth new GHG emissions management and reduction requirements for the federal government. Under EO 13514, federal agencies are required to develop annual inventories of their GHG emissions and to set applicable reduction targets.

Private companies are also proposing projects that would result in CO₂ reductions through carbon sequestration. For example, the Texas Clean Energy Project and the Hydrogen Energy California Project, each funded in part by DOE Clean Coal Power Initiative grants, plan for 90 per cent carbon capture and sequestration.

See questions 3 and 10 for a discussion of GHG-related regulations and permitting requirements and question 19 for a discussion of renewable energy policies and incentive programmes.

Domestic climate sector

8 Domestic climate sector

Describe the main commercial aspects of the climate sector in your country, including any related government policies.

The commercial climate business environment in the US persists but continues to be sluggish due to general economic conditions and the failure of Congress to adopt cap-and-trade legislation. Nonetheless, federal, state, and, to a lesser extent, local subsidies continue to provide significant drivers of commercial climate investment. Federal and state environmental review statutes also drive GHG mitigation

investments in the context of individual projects that trigger such review.

The DOE's Loan Guaranty Programme (LGP) has backed private investment in climate technologies, on a commercial scale, as well as new and improving technologies. In 2010 and 2011, 41 new US solar manufacturing facilities began operations across America, motivated in part to support solar projects with LGP backing. These facilities have fostered new steel manufacturing facilities, glass producers, and tool dye manufacturing facilities for solar electronics and tracking equipment, helping the US solar market grow by nearly 110 per cent in 2011. The LGP programme, however, is under increased congressional scrutiny and subject to volatility.

Additionally, since 2009, several technologies have received American Recovery and Reinvestment Act of 2009 (ARRA) funding. For example, under ARRA \$855 million was distributed to develop the carbon capture and sequestration (CCS) industry, and grid and efficiency technologies also received significant grants of ARRA funding, at \$706 million and \$903 million, respectively. ARRA also extended the wind production tax credit (PTC), an important federal subsidy first enacted in 1992, to the end of 2012. While the PTC has been a major incentive for wind power and has helped to spur independent wind energy power producers, members of the wind industry fear that the expiration of the PTC could limit growth and investment in this sector.

The US is the world's leading producer of ethanol, a biofuel usually mixed with gasoline to power motor vehicles. The main drivers of the commercial production of biofuels remain federal and state subsidies. Such subsidies include grants, tax credits and exemptions (eg, exemption from the 51 cent/gallon federal gasoline tax), and government procurement contracts that require purchase of biofuel vehicles. Additionally, under the authority of CAA section 211(o), EPA has required that 36 billion gallons of biofuel be blended into gasoline by 2022.

Many individual states have renewable energy standards that require utilities to purchase a percentage of their electricity from renewable energy sources, which has spurred significant development in US-based wind and solar companies that manufacture power generating equipment for wind, solar, geothermal and biomass projects. See question 19 for a discussion of renewable energy policies and incentive programmes.

General emissions regulation

9 Regulation of emissions

Do any obligations for emission limitation, reduction or removal apply to your country and private parties in your country? If so, describe the main obligations.

See question 3 for more discussion of applicable federal, state and regional GHG regulations. See question 10 for a discussion of related GHG permitting requirements.

10 Emission permits or approvals

Are there any requirements for obtaining emission permits or approvals? If so, describe the main requirements.

At the present time, federal regulatory controls on stationary source emissions of GHGs are implemented primarily through the CAA PSD permit programme. Under the CAA, new or modified sources that have the potential to exceed statutory limits on certain pollutants must first obtain New Source Review (NSR) approval from EPA or, where applicable, the delegated local permitting authority. If a project is located in an area that is 'in attainment' for ambient air quality standards, the project must obtain a PSD permit to satisfy NSR requirements. GHG emissions are regulated by a PSD permit because they are considered 'regulated pollutants' (ie, pollutants that

EPA has regulated elsewhere under the CAA but for which it has not set national ambient air quality standards (NAAQS)). A PSD permit requires major sources to install Best Available Control Technology (BACT), among other requirements. BACT determinations are made on a case-by-case basis by the EPA or delegated permitting authority. EPA has interpreted the CAA PSD provisions as requiring BACT to be established for regulated pollutant emissions.

Under step 1 of the Tailoring Rule, as of 2 January 2011, facilities required to obtain a PSD permit for reasons other than their GHG emissions also were required to address GHG emissions increases of 75,000 tpy or more of CO₂e emissions under the PSD programme. Under step 2 of the Tailoring Rule, as of 1 July 2011, all new stationary sources with the potential to emit GHG emissions of 100,000tpy CO₂e or more, and all existing facilities with GHG emissions of at least 100,000tpy CO₂e undertaking modifications that would increase GHG emissions by at least 75,000tpy CO₂e, became subject to PSD permitting requirements. On 29 June 2012, EPA issued the step 3 Tailoring Rule that retained the step 1 and 2 PSD applicability thresholds for GHG sources. In that rulemaking, EPA also finalised new plantwide applicability limitations (PALs) for GHG sources, allowing a source that emits or has the potential to emit 100,000tpy of GHGs, but that has minor source emissions of all other regulated pollutants, to apply for a GHG PAL while still maintaining its minor source status.

What constitutes BACT for GHG emissions is subject to some uncertainty. On 10 November 2010, EPA issued a guidance document about applying PSD and Title V requirements to stationary sources after 2 January 2011. Although EPA BACT guidance heavily promotes energy efficiency measures, industry groups remain concerned that the cost and requirements to satisfy BACT are uncertain, potentially hindering economic development. Nonetheless, as of September 2012, EPA and several states had issued approximately 50 PSD permits with GHG BACT determinations, providing some comfort that the GHG rules have not entirely stalled the PSD permitting process.

For sources that are already operating, Title V of the CAA requires facilities that have the potential to exceed statutory limits on certain emissions to apply for and receive a Title V operating permit. For Title V operating permits, new or existing major sources that are otherwise subject to Title V also are subject to Title V requirements for GHGs. Beginning on 1 July 2011, facilities with the potential to emit over 100,000tpy of GHGs are independently subject to Title V requirements. In the spring of 2012, EPA established a work group to evaluate potential GHG permit streamlining options to reduce the burdens on GHG sources. The group's report was delivered to EPA on 20 September 2012.

11 Oversight of emissions

How are emissions monitored, reported and verified?

See question 6 for a discussion of the EPA's GHG monitoring and reporting rule.

Emission allowances (or similar emission instruments)

12 Regime

Is there an emission allowance regime (or similar regime) in your country? How does it operate?

No GHG emission allowance regime exists at the federal level, but regimes exist, or are in the process of implementation, at the state and regional levels in some areas.

RGGI is a regional, emission allowance-based regime covering power sector GHG emissions. RGGI came into effect in 2009 in 10 north-eastern and mid-Atlantic states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey,

New York, Rhode Island and Vermont), but New Jersey withdrew in 2011. RGGI caps total power sector CO₂ emissions and reduces them over time by requiring fossil fuel-fired electric power generators with a capacity of 25MW or greater to obtain allowances in amounts equal to their respective CO₂ emissions. Individual participating states create allowances, which are authorisations to emit one short ton of CO₂, in an aggregate amount equal to the regional emissions cap and sell these allowances at auctions or for a fixed price. Power plants in the RGGI states reduced their emissions by an average of 23 per cent during the first three years of the programme, a decrease that can be attributed to switching from coal to natural gas, energy efficiency measures, and lowered levels of economic activity.

In October 2011, California approved final cap-and-trade regulations for an emission allowance regime that will cap aggregate annual emissions of GHGs from certain sectors of the economy starting in 2013. The cap will be reduced over time and enforced through the requirement that emitters of GHGs in capped sectors obtain compliance instruments – either allowances or offsets – in amounts equal to their respective emissions of GHGs. ARB will create allowances in amounts equalling the aggregate annual GHG emission caps, reflecting declining emissions towards the AB 32 reduction targets. An allowance is defined as an authorisation to emit one metric ton of CO₂ equivalent. ARB will then allocate the allowances, auctioning some and distributing others at no cost to covered entities. The use of offsets is limited to 8 per cent of each covered entity's respective compliance obligation.

The WCI intends to link the cap-and-trade scheme in California with similar regimes in Canadian provinces and, ultimately, other states. As of September 2012, California did not anticipate linking its cap-and-trade scheme with any other programme until sometime in or after 2013. Quebec has been working on its own cap-and-trade programme in anticipation of a 2013 linkage to California's, but it is unclear if any other provinces will have cap-and-trade programmes ready to link to California's in 2013.

13 Registration

Are there any emission allowance registries in your country? How are they administered?

Currently, no emission allowance regime exists at the federal level.

Under RGGI, the majority of CO₂ allowances issued by each participating state are distributed through quarterly auctions. Quarterly allowance auctions began in September 2008 and 88 per cent of allowances in RGGI's auction on 17 August 2012 were purchased by electricity generators.

Under AB 32, ARB will allocate some or all of the allowances needed at no cost to covered entities in industrial sectors based on the risk of 'leakage' associated with individual industrial activities. Electricity generating facilities and importers of electricity are also to receive free allowances from ARB but must use them exclusively for the benefit of retail ratepayers. Quarterly auctions will be held, with the first auction to take place in November 2012.

14 Obtaining, possessing and using emission allowances

What are the requirements for obtaining emission allowances? How are allowances held, cancelled, surrendered and transferred?

No emission allowance regime exists at the federal level.

The RGGI CO₂ Allowance Tracking System (RGGI COATS) is an electronic registry that records and tracks data on the issuance, initial ownership, transfer and retirement of CO₂ allowances. In California and other WCI jurisdictions, the Compliance Instrument Tracking System Service (CITSS) tracks the issuance, initial ownership, transfer and retirement of allowances and offsets.

Trading of emission allowances (or similar emission instruments)

15 Emission allowances trading

What emission trading systems or schemes are applied in your country?

No emission allowance regime exists at the federal level.

RGGI allows the trading of allowances such that a utility holding more allowances than it needs to cover its own compliance obligation is allowed to sell the excess allowances to another utility. Similarly, under California's cap-and-trade regulations, trading of allowances is generally permissible.

16 Trading agreements

Are any standard agreements on emissions trading used in your country? If so, describe their main features and provisions.

As of September 2012, there are no standard agreements on emissions trading in the US.

Sectoral regulation

17 Energy production, use and efficiency

Give details of (non-renewable) energy production and consumption in your country. Describe any regulations on emissions. Describe any obligations on the state and private persons for minimising energy use and improving efficiency. Describe the main features of any scheme for registration of energy savings and for trade of related accounting units or credits.

The following information provides a snapshot of US energy production. The US energy market is highly regulated at the federal and state level. Energy-related emissions can be regulated and controlled by a number of federal and state laws, most notably the CAA. See questions 3 and 10 for a discussion of GHG-related regulations and permitting requirements. See question 19 for a discussion of renewable energy and efficiency measures.

Crude oil

- In 2011, the US produced 2,065,172 thousand barrels and imported 3,261,422 thousand barrels of crude oil.
- In 2011, total US petroleum consumption was 35.283 quadrillion Btu, or approximately 36 per cent of all US energy use. The US consumes more energy from petroleum than from any other energy source.

Natural gas

- In 2011, there were 28,576,117 million cubic feet of gross withdrawals of natural gas in the US.
- In 2011, the US consumed 24,309,599 million cubic feet of natural gas, with consumption divided among the following sectors:
 - Lease and plant fuel (1,383,379 million cubic feet);
 - Pipeline and distribution use (683,875 million cubic feet); and
 - Volumes delivered to consumers (22,242,344 million cubic feet).

Coal

- In 2011, the US produced 1,094,336 thousand short tons of coal. As of 2010, there were 1,285 coal mines in the US.
- In 2011, the electric power sector consumed 928,558 thousand short tons of coal. Total coal consumption in the US was 999,103 thousand short tons, divided among the following sectors:

- coke plants (21,434 thousand short tons);
- other industrial (46,334 thousand short tons);
- residential (305 thousand short tons); and
- commercial (2,471 thousand short tons).

Nuclear

According to preliminary estimates from the US Energy Information Administration (EIA) for 2011, nuclear power plants generated 790,225,042MWh of electricity.

Emissions

According to the EPA's estimates, total US anthropogenic GHG emissions in 2010 were 6,821.8 MMTCO₂e. This 3.2 per cent increase over 2009 was mostly due to increased electricity consumption because of greater economic activity and hotter summer weather, requiring greater use of air conditioning.

18 Other sectors

Describe, in general terms, any regulation on emissions in connection with other sectors.

See questions 3, 10 and 19 regarding regulations and policies pertaining to GHG emissions and renewable energy. Certain other pollutant emissions are regulated under the CAA and other federal and state programmes, where applicable.

Renewable energy and carbon capture

19 Renewable energy consumption, policy and general regulation

Give details of the production and consumption of renewable energy in your country. What is the policy on renewable energy? Describe any obligations on the state and private parties for renewable energy production or use. Describe the main provisions of any scheme for registration of renewable energy production and use and for trade of related accounting units or credits.

The US renewable energy market is rapidly expanding. In 2011, the US produced 9.236 quadrillion Btu of net electricity generation from renewable energy. The US Energy Information Administration projects that electricity generation from renewable sources will grow 77 per cent by 2035, raising its share of total generation from 11 per cent in 2009 to 15 per cent in 2035. Most of this growth in renewable electricity generation in the power sector comes from growth in wind generation, although solar and biomass facilities also are expected to grow at a rapid pace.

Wind energy production has increased by an average of 35 per cent over each of the past five years, totalling 1.168 quadrillion Btu in 2011. Solar energy production has also experienced steady growth of approximately 19 per cent per year over the past five years, surpassing the 100 trillion Btu mark for the first time in 2010. The largest single source of renewable energy in the US continues to be hydropower, which generated more than 3.1 quadrillion Btu in 2011, though hydropower production depends on water availability and can vary significantly from year to year.

The US does not have a comprehensive policy on renewable energy production or use. Instead, there is a patchwork of federal and state regulations and incentive programmes. Key examples include, but are not limited to:

- Federal renewable energy production tax credit (PTC) – An inflation-adjusted tax credit for electricity produced from qualifying renewable energy sources or technologies. It recently was renewed by the ARRA. Unless extended by Congress, the PTC for wind expires at the end of 2012, while the PTC for incremental hydro, wave and tidal energy, geothermal, municipal solid waste (MSW) and bioenergy expires at the end of 2013.

- Federal renewable energy investment tax credit (ITC) – A tax credit available as an alternative to the PTC described above. It may be taken for equipment (property) eligible to receive the PTC and for facilities that produce renewable electricity. The ITC is available for eligible systems placed in service on or before 31 December 2016.
- Federal renewable energy investment grant – A grant programme for investors that cannot use the PTC or ITC. Most grant dollars in 2010 went to wind and solar power.
- Federal energy loan guarantee and funding programmes – DOE has three main loan guarantee programmes. The Advanced Technology Vehicles Manufacturing Loan Programme authorises DOE to provide funding to certain eligible automotive manufacturers and component suppliers to finance the cost of re-equipping, expanding or establishing manufacturing facilities in the US to produce advanced technology vehicles or components. Section 1703 of Title XVII of the Energy Policy Act of 2005 authorises DOE to make certain loan guarantees to eligible innovative clean energy technologies that are typically unable to obtain conventional private financing due to high technology risks. Section 1705 of Title XVII of the Energy Policy Act of 2005 authorises DOE to make certain loan guarantees to eligible renewable energy, transmission and biofuel projects that commenced construction no later than 30 September 2011. Funding under the programme includes investment in two of the world's largest solar power plants and one of the world's largest wind power facilities. The section 1705 programme expired on 30 September 2011. Aspects of DOE's energy loan programmes have become politically controversial because several companies that received support have declared bankruptcy. Recently, the House of Representatives voted in favour of a bill to curtail DOE's loan guarantee programme, but currently the bill appears to stand little chance of becoming law.
- State financial incentives – In 2011, every state had some type of financial incentive to subsidise the installation of renewable energy equipment through grants, rebates, tax credits, or other measures.
- Net metering programmes – These programmes allow grid-connected customers to offset their electrical load or sell back electricity to their utility through renewable energy systems installed on their property. Forty-three states and the District of Columbia have statewide net metering programmes in place, and individual utilities in three other states offer net metering.
- Feed-in tariffs (FITs) – Several states and individual utilities purchase electricity from certain types of renewable energy systems at higher rates than retail electricity rates.
- Green power programmes – Consumers in many states can purchase 'green power', which represents electricity generated from specific types of renewable resources.
- Ethanol and other renewable motor fuels – There are a variety of federal and state requirements and incentives for the production, sale, and use of ethanol, biodiesel, and other fuels made from biomass. See question 24.
- Renewables research and development (R&D) – DOE and other federal agencies fund research and development of renewable energy technologies.
- The DOI and the Bureau of Land Management (BLM) implemented a Solar Energy Programme (SEP) to facilitate approval and development of solar energy generation and transmission facilities on BLM-administered lands in six Western states (California, Nevada, Utah, Colorado, Arizona and New Mexico). A final programmatic environmental impact statement for the SEP was released on 24 July 2012. BLM has given priority status to 17 projects (nine solar, six wind and two geothermal) representing about 7,000MW.
- The DOI created renewable energy coordination offices in four Western states (California, Nevada, Wyoming and Arizona) and smaller renewable energy teams in five other states (New Mexico, Idaho, Utah, Colorado and Oregon) to expedite processing of applications for new renewable energy projects on public lands.
- The BLM adopted policies to assist renewable energy projects in complying with the National Environmental Policy Act (NEPA) for utility-scale renewable energy right-of-way applications on public lands.
- The DOI and California entered into multiple memoranda of understanding to facilitate the development of renewable energy resources.

State renewable energy mandates are driving demand for renewable energy. Currently 37 states have a renewable energy mandate or goal requiring that a percentage of electric power sales come from renewable energy. In 2011, a seminal state programme, California's RPS, was increased to require regulated sellers of electricity to procure 33 per cent of their total energy supplies from certified renewable resources by 2020, which represents a significant increase from the previous 20 per cent by 2010 RPS. Key changes of California's RPS legislation include:

- public utilities must comply with the new RPS requirements;
- the law sets mandatory minimum allocations of in-state and limited out-of-state renewable resources that may be used to satisfy the RPS requirements and these mandatory minimums increase over time;
- the law permits the use of Tradable Renewable Energy Credits (TREC) for RPS compliance but lowers the maximum limits for using TREC over time; and
- the law permits the use of out-of-state firmed and shaped renewable resources to satisfy a portion of a regulated entity's RPS compliance obligations.

20 Wind energy

Describe, in general terms, any regulation of wind energy.

Wind energy is supported by a mix of federal incentives that are in place through the end of 2012, including the PTC now worth 2.1 cents per kWh for the first 10 years a project operates, a 30 per cent investment tax credit, the section 1603 30 per cent cash grant for one year, and various levels of bonus depreciation. Although there is bipartisan support in Congress to extend the PTC, it is uncertain whether that will occur given the closely divided Congress and the US presidential election in November 2012. If the PTC incentive expires at the end of 2012, new wind energy capacity additions for 2012 are anticipated to exceed 2011 levels, but growth may be severely constricted in 2013 and beyond.

New wind power installations increased in 2011 in the US, with roughly 6.8GW of new capacity added and \$14 billion invested. This represents a 31 per cent increase from 2010 in the rate of new installations, and wind power comprised 32 per cent of US electricity generating capacity additions in 2010, down from 25 per cent in 2010 but below its historic peak of 42–43 per cent in 2008 and 2009. Cumulative wind power capacity grew by 16 per cent in 2011, bringing total American wind power capacity to nearly 47GW.

Federal agencies have also implemented various programmes to expedite development of renewable energy resources on public lands. These measures are in part intended to fulfill the goal set by the Energy Policy Act of 2005 for the US Department of the Interior (DOI) to approve 10,000MW of electricity from non-hydro power renewable energy projects located on public lands. President Obama's 'New Energy for America' plan also established national goals of producing 10 per cent of the nation's electricity from renewable sources by 2012 and 25 per cent by 2025. Measures include but are not limited to:

In 2011, 78 per cent of new US wind power capacity was built in states with mandatory renewable energy standards. Renewable energy programmes are projected to drive annual average renewable energy additions of 4–5 GW/year between 2012 and 2020. See question 19 for a discussion of the many programmes and policies in place that incentivise the development of renewable energy projects.

As a general rule, wind project siting and land use approvals are matters of state and local concern unless the project is located on federal lands. Nonetheless, federal, state and local environmental, land use, or natural resources laws or regulations may trigger the need for myriad federal, state and local approvals. The Federal Energy Regulatory Commission (FERC) also plays a role in matters such as interconnection. Access to transmission remains a significant constraint for wind projects located in remote locations.

For illustrative purposes, a utility-scale wind facility could require approvals under the following laws, depending on the location of the project and resources affected:

- Federal Lands Policy and Management Act;
- Clean Water Act;
- Clean Air Act;
- National Environmental Policy Act;
- Coastal Zone Management Act;
- National Historic Preservation Act;
- Endangered Species Act;
- Marine Mammals Protection Act; and
- various state and local siting, land use and environmental laws or regulations.

21 Solar energy

Describe, in general terms, any regulation of solar energy.

Solar energy is supported by a mix of federal and state incentives, and programmes. See question 19 for a discussion of the many programmes and policies in place that incentivise the development of renewable energy projects.

For large, utility-scale solar power facilities, regulatory approvals would likely be conceptually similar to the approvals needed for a large wind facility, discussed in question 20, depending on the location of the solar project and the resources affected. States may require certification of a solar facility before energy can be counted towards the state's renewable energy mandate, such as California's RPS.

Smaller, rooftop solar installations on commercial or residential structures typically do not require major regulatory approvals, although local building or development permits may apply. Some states have programmes in place to allow some small-scale solar installations to count towards a state's renewable energy standard. For example, in California, small solar facilities, also known as distributed generation facilities, can be certified for the RPS. To obtain certification, smaller solar facilities must meet the broader eligibility requirements for the solar resource used (ie, photovoltaic), participate in the Western Renewable Energy Generation Information System, and report generation using a meter with 2 per cent or higher accuracy. Facilities that receive state funding under certain programmes or participate in net metering tariffs are also eligible. Several other states allow small solar facilities to qualify for some credit in their renewable energy standards, including Arizona, Colorado, Michigan, Nevada, New Jersey and Texas.

22 Hydropower, geothermal, wave and tidal energy

Describe, in general terms, any regulation of hydropower, geothermal, wave or tidal energy.

FERC issues licences for construction of new hydropower projects, re-licenses hydropower projects and provides oversight of all

ongoing hydropower project operations, including dam safety inspections and environmental monitoring. FERC regulates over 1,700 non-federal dams in the US and currently oversees licences for more than 1,000 hydropower facilities. Other hydropower facilities in the US are operated by BLM, US Army Corps of Engineers, and Tennessee Valley Authority. Hydropower resources also qualify for some states' renewables portfolio standards and net metering programmes.

Geothermal projects are regulated by a mix of federal and state agencies, with requirements varying by state and whether the project is located on state, federal or private land. The Geothermal Steam Act of 1970 requires DOI to establish rules and regulations for the leasing of geothermal resources on lands managed by federal agencies. These regulations are issued by the Bureau of Land Management. For injection wells, the existing EPA Underground Injection Control Regulations under the federal Safe Drinking Water Act define class V wells to include injection wells associated with the recovery of geothermal energy.

The first commercial, grid-connected tidal energy project in the US was deployed off the coast of Eastport, Maine in July 2012. Several other wave and tidal energy projects are in developmental stages. The federal government provides support for wave and tidal power development through the DOE's Water Power Programme.

23 Waste-to-energy

Describe, in general terms, any regulation of production of energy based on waste.

Electricity and fuels can be produced by collecting, processing and converting different waste products into energy. Some jurisdictions include generating electricity from landfill gas as a renewable resource while excluding incineration of municipal solid waste (MSW). See question 20 for an illustration of the type of siting, land use and environmental permits that could be required depending on the location of the project and resources impacted.

24 Biofuels

Describe, in general terms, any regulation of biofuels.

In 2007, EPA established a national renewable fuel standard (RFS) programme. This RFS programme establishes the annual renewable fuel standards, responsibilities of refiners and other fuel producers, a trading system and other compliance mechanisms, and recordkeeping and reporting requirements. It requires that 15.2 billion gallons of renewable fuel be used in 2012, increasing to 36 billion gallons per year by 2020. A certain percentage of the renewable fuel blended into transportation fuels must be cellulosic biofuel, biomass-based diesel and advanced biofuel.

Some individual states have implemented their own regulations, such as acquisition or fuel use standards, taxes, fuel production or quality regulations and air quality or emissions regulations. For example, California has implemented its low carbon fuel standard (LCFS) that requires a reduction in the carbon intensity of transportation fuels sold, supplied or offered for sale in the state by a minimum of 10 per cent by 2020. Beginning 1 January 2011, transportation fuel producers and importers had to meet specified average carbon intensity requirements for fuel in each calendar year. Carbon intensity reductions are based on reformulated gasoline mixed with 10 per cent corn-derived ethanol and low-sulphur diesel fuel. The LCFS programme allows producers and importers to generate, acquire, transfer, bank, borrow and trade credits. A federal court ruled in December 2011 that the LCFS programme violates the interstate commerce clause of the US Constitution. Although the programme continues while the ARB appeals the ruling, the future of the programme is uncertain.

Update and trends

The 2010 midterm US congressional elections – which saw some cap-and-trade supporters voted out of office – signalled the end to serious consideration of comprehensive federal legislation to regulate GHG emissions until at least after the 2012 election cycle. In the absence of comprehensive federal legislation on climate change, EPA has been regulating GHG emissions through its pre-existing authority under the federal Clean Air Act. The outcome of the 2012 presidential election and various congressional races will greatly influence whether federal climate change and renewable and clean energy development programmes are advanced further or tempered. If President Obama is re-elected, EPA and other federal agencies will likely continue to use existing authority to regulate GHG emissions and to support renewable energy technologies through a combination of legislative and regulatory tools. Given the Supreme Court’s decision in *Massachusetts v EPA*, it is difficult to predict whether a victory by Governor Romney would, as a practical matter, reverse this trend or whether EPA regulation of GHG sources would continue, either authorised by a new administration or compelled through the courts, in the absence of congressional action.

25 Carbon capture and storage

Describe, in general terms, any policy on and regulation of carbon capture and storage.

Several large-scale, commercially viable, integrated CCS demonstration projects supported by the DOE are anticipated to begin operation in the US by approximately 2016. These projects are supported by resources allocated by the ARRA, as well as a variety of federal and state incentives, including tax credits and loan guarantees.

In 2010, President Obama established an Interagency Task Force on Carbon Capture and Storage, co-chaired by DOE and EPA. The Task Force’s final report contained several recommendations on overcoming barriers to broad and economical deployment of CCS in the next 10 years. DOE is also focusing research and development funding toward the economic utilisation of captured carbon dioxide. It has funded seven projects that aim to find ways

of converting captured carbon dioxide emissions from industrial sources into useful products.

For the PSD permitting programme discussed in questions 3 and 10, EPA, or an authorised state permitting agency, must determine whether CCS technologies constitute BACT for GHG emissions. Such consideration is necessarily very case-specific and will require consideration of a number of factors. EPA’s Clean Air Act Advisory Committee Task Force on GHG BACT declined to take a position on whether CCS might be BACT in specific situations. In its PSD permitting guidance, EPA also declined to designate CCS as BACT but did not preclude consideration of CCS options in the future. On 1 December 2010, EPA published its final rule concerning an expansion of the GHG reporting rule discussed in question 6 to include facilities that inject and store CO₂ for the purposes of geologic sequestration or enhanced oil and gas recovery. A key feature of this rule is the use of ‘monitoring, reporting and verification’ plans to track the sequestration of CO₂ in geologic storage sites.

On 8 August 2011, EPA proposed a regulation clarifying how the Resource Conservation and Recovery Act (RCRA) applies to CO₂ streams in the CCS context. The proposed regulation, which has not yet been finalised, includes a conditional exemption from the RCRA requirements for hazardous CO₂ streams in order to facilitate implementation of geologic sequestration.

Climate matters in transactions

26 Climate matters in M&A transactions

What are the main climate matters and regulations to consider in M&A transactions and other transactions?

Matters to consider include:

- the impact of future carbon costs favouring industries with low GHG emissions (ie, incentives to invest in clean tech) and dis-favouring industries emitting high levels of GHG (ie, chilling effect on M&A due to uncertainty, new liability associated with increased costs and public relations concerns);
- continuing EPA regulation of GHGs under the CAA and potential future piecemeal or wholesale congressional action;

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- continuing and expanding state and regional GHG regulatory programmes;
 - continuing and expanding environmental mitigation potentially required by federal and state environmental review programmes for applicable projects;
 - direct and indirect effects of higher energy costs;
 - insurance considerations, including the effect of changing weather patterns on particular industries and geographies;
 - enhanced Securities and Exchange Commission requirements regarding disclosure of climate-related liabilities;
 - litigation exposure to claims based upon alleged climate impact of corporate operations or of climate changes on corporate operations; and
- financial institution adherence to Equator Principles, which include requirements for climate impacts.
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