

7. Climate Change: CCS [72]

Commitment:

“We strongly support the launching of 20 large-scale CCS demonstration projects globally by 2010, taking into account various national circumstances with a view to beginning broad deployment of CCS by 2020.”

G8 Leaders Declaration on the Environment and Climate Change

Assessment:

| Country | Final Compliance Score | | |
|----------------------|------------------------|------------------|-----------------|
| | Lack of Compliance | Work in Progress | Full Compliance |
| | -1 | 0 | +1 |
| Canada | | | +1 |
| France | -1 | | |
| Germany | | | +1 |
| Italy | -1 | | |
| Japan | | | +1 |
| Russia | -1 | | |
| United Kingdom | | | +1 |
| United States | | | +1 |
| European Union | | | +1 |
| Average Score | | | +0.33 |

Background:

Many have suggested that carbon capture and storage (CCS) systems will be essential in the fight against climate change.⁵⁵³ By trapping and storing carbon dioxide (CO₂) from emission points, such as power plants, CCS technology could prevent harmful greenhouse gas from reaching the Earth’s atmosphere. Currently, human activity generates 27 billion tonnes of CO₂ emissions per year.⁵⁵⁴ Some argue that CCS technology could reduce carbon emissions by 9-16 billion tonnes worldwide by 2050 if it is implemented without delay.⁵⁵⁵

⁵⁵³ Report to the G8 Summit, International Energy Agency (Paris) July 2008. Date of Access: 20 November 2008. http://www.iea.org/G8/2008/G8_IEAwork_2008.pdf.

⁵⁵⁴ Pamphlet on CO₂ Storage, European Technology Platform for Zero Emissions Fossil Fuel Power Plants (Brussels) August 2008. Date of Access: 2 December 2008. <http://www.zero-emissionplatform.eu/website/docs/ETP%20ZEP/ZEP%20insert%20on%20CO2%20storage.pdf>.

⁵⁵⁵ EU Demonstration Programme for CO₂ Capture and Storage, European Technology Platform for Zero Emission Fossil Fuel Power Plants (Brussels) 10 November 2008. Date of Access: 16 December 2008. <http://www.zero-emissionplatform.eu/website/docs/ETP%20ZEP/EU%20Demonstration%20Programme%20for%20CCS%20-%20ZEP's%20Proposal.pdf>.

Small-scale CCS demonstration projects are already in place across the globe and have been functioning for over ten years.⁵⁵⁶ Large-scale capture and storage, however, has yet to be proven technologically and financially feasible.

Reducing carbon emissions has been an important issue for the G8. At the 2003 Evian Summit, G8 members articulated their desire for “cleaner, more efficient fossil fuel technologies and carbon sequestration systems,” and agreed to work towards increasing the availability of, and access to, carbon capture technology.⁵⁵⁷

Members agreed to undertake a number of measures for the implementation of carbon capture and low-emissions technologies at the 2005 Gleneagles Summit. In the Gleneagles Plan of Action for Climate Change, Clean Energy and Sustainable Development, members promised to “accelerate the development and commercialization of carbon capture and storage technology” by exploring its potential and addressing barriers to the public acceptability of the technology.⁵⁵⁸ Subsequent summits in St Petersburg and Heiligendamm in 2006 and 2007 both saw reiterations of the Gleneagles Plan of Action.

At the 2008 Hokkaido-Toyako Summit, the International Energy Agency (IEA) reported that fossil fuel power generation, renewable energy technology, nuclear energy, “and especially” CCS technology could lead to a 50 per cent reduction of CO₂ emissions.⁵⁵⁹ With 14 CCS demonstration projects already operating around the world and many more in development, CCS technology is likely to remain on the G8 agenda into the future.⁵⁶⁰

Commitment Features:

The commitment focuses on the next stage of CCS implementation, the creation of large-scale, working CCS systems that can serve as a proof of concept for widespread commercialization. G8 members have agreed to support the launch of 20 large-scale CCS demonstration projects by 2010. Some action must be taken in this compliance cycle. Support for large-scale CCS projects outside the G8 can constitute compliance. Support for basic research or small-scale demonstration projects does not constitute compliance.

⁵⁵⁶ Pamphlet on CO₂ Storage, European Technology Platform for Zero Emissions Fossil Fuel Power Plants (Brussels) August 2008. Date of Access: 2 December 2008. <http://www.zero-emissionplatform.eu/website/docs/ETP%20ZEP/ZEP%20insert%20on%20CO2%20storage.pdf>.

⁵⁵⁷ Science and Technology for Sustainable Development – A G8 Action Plan, 2003 Evian Summit (Evian) 2003. Date of Access: 16 December 2006. http://www.g8.fr/evian/english/navigation/2003_g8_summit/summit_documents/science_and_technology_for_sustainable_development_-_a_g8_action_plan.html.

⁵⁵⁸ 2005 Gleneagles Plan of Action on Climate Change, Clean Energy and Sustainable Development, G8 Information Centre (Toronto) 8 July 2005. Date of Access: 16 December 2008. <http://www.g7.utoronto.ca/summit/2005gleneagles/climatechangeplan.pdf>.

⁵⁵⁹ Report to the G8 Summit, International Energy Agency (Paris) July 2008. Date of Access: 20 November 2008. http://www.iea.org/g8/2008/G8_IEAwork_2008.pdf.

⁵⁶⁰ Rai, Varun, Ngai-Chi Chung, Mark C. Thurber and David G. Victor. PESD Carbon Storage Project Database, Program on Sustainable Energy and Development (Stanford) 12 November 2008. Date of Access: 1 December 2008. http://iis-db.stanford.edu/pubs/22191/wp76_Oct08_pesd_ccs_database.pdf.

Scoring:

| | |
|----|---|
| -1 | Member cuts funding OR provides no funding to large-scale CCS demonstration projects currently in development. |
| 0 | Member continues funding an existing large-scale CCS demonstration project. |
| +1 | Member creates OR allocates resources to create a new large-scale CCS demonstration project. |

Lead Analyst: Denitza Koev

Canada: +1

Canada has fully complied with its commitment to support large-scale CCS demonstration projects.

On 28 July 2008, Sustainable Development Technology Canada announced support and funding for 19 Clean Technology projects. Among the projects to be funded is the Aquistore Project, which aims to demonstrate the viability of CCS in the Western Canadian Sedimentary Basin.⁵⁶¹ When complete, Aquistore plans to sequester underground up to 500 tonnes of CO₂ per day.⁵⁶² The project will receive CAD5 million from the Government of Canada.⁵⁶³

In its 2009 federal budget, the Canadian government announced the creation of a new Clean Energy Fund to support CCS demonstration projects, among other initiatives. Over five years, the government will provide CAD850 million for large-scale CCS projects and other clean energy demonstration projects.⁵⁶⁴

Canada has funded a new large-scale CCS demonstration project. Thus, it has been awarded a score of +1.

Analyst: Jayme Miles Turney

France: -1

⁵⁶¹ Government of Canada boosts 19 Clean Technology Projects Sustainable Development Technology Canada approves \$57 million in new funding, Sustainable Development Technology Canada (Ottawa) 28 July 2008. Date of Access: 13 December 2008.

http://www.sdte.ca/en/news/media_releases/media_28072008.htm.

⁵⁶² Round 12 Funded Projects, Sustainable Development Technology Canada (Ottawa) 28 July 2008. Date of Access: 13 December 2008. http://www.sdte.ca/en/news/media_releases/Projects_Rd12.htm.

⁵⁶³ Johnstone, Bruce, PTRC gets funding for carbon storage research project, Leader Post (Regina) 28 July 2008. Date of Access: 13 December 2008.

<http://www.canada.com/reginaleaderpost/news/story.html?id=b74e347a-eb3c-43c9-8ac4-21febf463072>.

⁵⁶⁴ Action to Support Business and Communities, Budget 2009, 27 January 2009. Date of Access: 29 June 2009. <http://www.budget.gc.ca/2009/plan/bpc3e-eng.asp>.

France has failed to comply with its commitment to support large-scale CCS demonstration projects.

On 21 October 2008, France's National Assembly adopted a bill drafted by the Grenelle Environnement, endorsing the bill's plans to equip new coal power stations with CCS mechanisms.⁵⁶⁵ On 27 January 2009, France's Senate endorsed the bill's plan to provide a “suitable legal framework and the allocation of financing” for CCS technology.⁵⁶⁶ On 7 January 2009, the Grenelle Environnement also proposed a further bill that pushes for the creation of a legal framework for the implementation of CCS technology.⁵⁶⁷ There is no evidence that these funds have gone towards a large-scale demonstration project, however.

On 8 February 2007, in cooperation with the French Petroleum Institute (IFP) and the French Bureau of Geological and Mining Research (BRGM), French multinationals Total and Alstom launched the world's first carbon capture and geological sequestration project in the Lacq basin in southwestern France.⁵⁶⁸ The demonstration project at Lacq began operating in April 2009.⁵⁶⁹ The EUR60 million project is being entirely funded by the private sector, however.⁵⁷⁰

While CCS is being developed in France, there is no evidence that the French government is directly funding any large-scale CCS demonstration projects. Thus, France has been awarded a score of -1.

Analyst: Amelie Meyer-Robinson

Germany: +1

Germany has fully complied with its commitment to support large-scale CCS demonstration projects.

⁵⁶⁵ Mesures phares du projet et principaux points adoptés en séance à l'Assemblée nationale, Ministry of Ecology, Energy, Sustainable Development and Spatial Planning (Paris) 20 October 2008. Date of Access: 9 May 2009. http://www.environnement.gouv.fr/article.php3?id_article=3791&var_recherche=carbone.

⁵⁶⁶ Le projet de loi Grenelle Environnement au Sénat, Ministry of Ecology, Energy, Sustainable Development and Spatial Planning (Paris) 27 March 2009. Date of Access: 9 May 2009.

⁵⁶⁷ Projet de loi “Engagement national pour l'environnement,” Ministry of Ecology, Energy, Sustainable Development and Spatial Planning (Paris) 7 January 2009. Date of Access: 9 May 2009. http://www.developpement-durable.gouv.fr/article.php3?id_article=4106.⁵⁶⁸ International CCS Technology Survey: France, Innovation Norway (Oslo) 14 July 2008. Date of Access: 9 May 2009. <http://www.gassnova.no/frontend/files/CONTENT/CCSWorld/Europa/france.pdf>.

⁵⁶⁸ International CCS Technology Survey: France, Innovation Norway (Oslo) 14 July 2008. Date of Access: 9 May 2009. <http://www.gassnova.no/frontend/files/CONTENT/CCSWorld/Europa/france.pdf>. Total launches the first integrated CO2 capture and geological sequestration project in a depleted natural gas field, Total Press Releases (Paris) 8 February 2007. Date of Access: 9 May 2009. http://www.total.com/en/press/press_releases/pr_2007/070208-co2-capture-sequestration_11400.htm.

⁵⁶⁹ New era for fossil fuels as first carbon capturing power plant begins work, The Guardian (London) 8 April 2009. Date of Access: 9 May 2009. <http://www.guardian.co.uk/environment/2009/apr/08/first-carbon-capture-power-plant-lacq>.

⁵⁷⁰ New era for fossil fuels as first carbon capturing power plant begins work, The Guardian (London) 8 April 2009. Date of Access: 9 May 2009. <http://www.guardian.co.uk/environment/2009/apr/08/first-carbon-capture-power-plant-lacq>.

In October 2008, the Federal Ministry for Economics and Technology (BMWi) announced that it will be allocating an additional EUR396 million for the promotion of CCS technology and innovation between 2009 and 2012.⁵⁷¹ Concurrently, the BMWi allocated EUR18 million to its CO2 reduction technologies (COORETEC) initiative for the years 2007-2009, with a yearly raise of EUR7-14 million.⁵⁷² The funds allocated to COORETEC are being used to study CCS and CO2 reduction technologies.

On 19 February 2009, German energy multinationals Siemens and E.ON announced joint plans to retrofit an E.ON power plant near Hanau, Germany with CCS technology. The German Federal Ministry of Economics is funding the project as part of its COORTEC initiative, and the pilot plant is expected to begin operating in the summer of 2009.⁵⁷³

In August 2008, Germany announced its plan to implement national legislation on CCS to parallel EU CCS legislation.⁵⁷⁴ In line with this plan, the German Federal Cabinet adopted a draft CCS Act on 1 April 2009 to provide incentives and guidelines for demonstration projects in the future.⁵⁷⁵ The Federal Ministry for the Environment's press release emphasized that "the state has the task of establishing clear legal provisions for the environmentally sound use of CCS for companies choosing to pursue this option."⁵⁷⁶

On 3 September 2008, Schwarze Pumpe – a coal-fired power station in North Germany – began operating. The project is coordinated by French engineering services company Alstom and Swedish electricity services company Vattenfall. The latter owns the power plant and has entirely funded the EUR70 million Schwarze Pumpe project.⁵⁷⁷ The pilot plant will run for three years in order to demonstrate the process of carbon capture using Oxyfuel combustion technology.⁵⁷⁸ The German government has not directly supported this project.

⁵⁷¹ Schlaglichter der Wirtschaftspolitik: Monthly Report Oct. 2008, Federal Ministry of Economics and Technology (Berlin) 24 September 2008. Date of Access: 9 May 2009.

<http://www.bmwi.de/BMWi/Navigation/Presse/pressemitteilungen.did=271418.html>.

⁵⁷² Entscheidender Schritt auf dem Weg zum CO2-armen Kraftwerk, Federal Ministry of Economics and Technology (Berlin) 13 June 2007. Date of Access: 9 May 2009.

<http://www.bmwi.de/BMWi/Navigation/Presse/pressemitteilungen.did=207072.html>.

⁵⁷³ Siemens and E.ON Kraftwerke to build pilot CO2 capture plant for coal-fired power plants, Siemens Press Releases (Erlangen) 19 February 2009. Date of Access: 9 May 2009.

http://w1.siemens.com/press/en/pressrelease/2009/fossil_power_generation/efp200902023e.htm.

⁵⁷⁴ Effizienz, Transparenz, Wettbewerb: Sicher und bezahlbare Energie für Deutschland, Federal Ministry of Economics and Technology (Berlin) August 2008. Date of Access: 9 May 2009.

<http://www.bmwi.de/BMWi/Navigation/Service/publikationen.did=268758.html>.

⁵⁷⁵ Federal Cabinet adopts CCS act, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Berlin) 1 April 2009. Date of Access: 9 May 2009.

http://www.bmu.de/english/current_press_releases/pm/43681.php.

⁵⁷⁶ Federal Cabinet adopts CCS act, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Berlin) 1 April 2009. Date of Access: 9 May 2009.

http://www.bmu.de/english/current_press_releases/pm/43681.php.

⁵⁷⁷ Harrabin, Roger, Germany leads 'clean coal' pilot, BBC News Germany (Cologne) 3 September 2008. Date of Access: 9 May 2009. <http://news.bbc.co.uk/2/hi/science/nature/7584151.stm>.

⁵⁷⁸ Vattenfall's project on CCS – Pilot Plant, Vattenfall Europe's Project on CCS (Stockholm) 3 September 2008. Date of Access: 9 May 2009.

http://www.vattenfall.com/www/co2_en/co2_en/879177tbd/879211pilot/index.jsp.

Thus, Germany has been awarded a score of +1 for providing direct funding for a CCS demonstration project as well as providing financial and political support for future CCS initiatives.

Analyst: Amelie Meyer-Robinson

Italy: -1

Italy has failed to comply with its commitment to support large-scale CCS demonstration projects.

The Italian government has not undertaken a CCS demonstration project since the Hokkaido-Toyako Summit. Previously, the government contributed EUR150 million to the Energy R&D Program.⁵⁷⁹ The two main research agencies engaged in carbon capture and storage technology are the National Agency for New Technologies, Energy and the Environment (ENEA) and the National Research Council (CNR).⁵⁸⁰

The Italian Ministry of the Environment has joined the Australian government's initiative to create the Global CCS Institute (GCCSI). This institute aims to accelerate the development of environmentally sound technologies for capturing and storing carbon dioxide generated by large combustion plants. One of the institute's principal objectives is to enable and support the construction of industrial-scale demonstration projects so that CCS technology can be commercially available by 2020. The founding members held their first meeting on 16-17 April 2009 in Canberra.⁵⁸¹

On 21 October 2008, Italian oil and gas company Eni and electric power utility Enel signed an agreement to implement Italy's first large-scale CCS demonstration project at the Brindisi thermal power station.⁵⁸² The project will test the feasibility of the entire CO₂ capture and storage process. The Brindisi pilot plant is expected to be operational by the fall of 2009.⁵⁸³ The Italian government did not announce funding for the project. However, Eni, Enel, and the Italian Environment Ministry signed a Memorandum of Understanding aimed at the verification and diffusion of CCS technology. At the close of the meeting, Environment Minister Stefania Prestigiacomo reaffirmed "the Government's

⁵⁷⁹ International CCS technology Survey Executive Summary July 2008. Date of Access 12 December 2008.

<http://74.125.95.132/search?q=cache:RMy3l9TjefwJ:www.gassnova.no/gassnova/frontend/files/CONTENT/CCSWorld/Europa/summary-f-i.pdf+Italy+150+Euros+to+CCS&hl=en&ct=clnk&cd=1&gl=ca>.

⁵⁸⁰ International CCS Technology Survey, Innovation Norway and Gassnova (Porsgrunn) July 2008. Date of Access: 20 December 2008.

<http://www.innovasjon Norge.no/upload/Surveillance%20of%20CCS%20projects%20and%20initatives%20-%20ver3.0%20dist.pdf>.

⁵⁸¹ G8 environment ministers meeting Syracuse, Italy, 22-24 April 2009. Italy and Australia sign accord on carbon capture and storage (CCS). Date of Access: 10 May 2009.

http://www.g8ambiente.it/public/images/20090422/doceng/09_04_22_Italy-Australia_accord.pdf.

⁵⁸² Press Release: Eni and Enel sign strategic agreement on CO₂ capture, Eni (Rome) 21 October 2008. Date of Access: 21 December 2008. http://www.eni.it/en_IT/media/press-releases/2008/10/2008-10-21-accordo-Eni-Enel.shtml.

⁵⁸³ Press Release: Eni and Enel sign strategic agreement on CO₂ capture, Eni (Rome) 21 October 2008. Date of Access: 21 December 2008. http://www.eni.it/en_IT/media/press-releases/2008/10/2008-10-21-accordo-Eni-Enel.shtml.

commitment is to support and promote [CCS] experimentations, which represent an important contribution towards the need to reduce greenhouse gases in the global energy scenario.”⁵⁸⁴

Thus, Italy has been awarded a score of -1. While Italy has supported general research on CCS, there is no evidence that it is directly supporting any large-scale CCS demonstration projects.

Analysts: Darya Frolova and Krista Gallagher

Japan: +1

Japan has fully complied with its commitment to support large-scale CCS demonstration projects.

Twenty-nine major companies have pooled their resources into Japan CCS Co Ltd, incorporated on 26 May 2008. Its aim is to “achieve early massive reduction of CO₂ emissions by CCS,” burying 50 million tonnes of CO₂ a year by 2020.⁵⁸⁵ In December 2008, Japan CCS said that it was about to begin construction on a large-scale CCS demonstration project in an offshore gas field.⁵⁸⁶ The project has been made possible in part by subsidies from the Government of Japan.⁵⁸⁷ The Japanese government is expected to invest USD30 billion over the next five years to develop clean energy technology, including CCS for coal fired power plants.⁵⁸⁸

Thus, Japan has been awarded a score of +1 for subsidizing the construction of a new large-scale CCS demonstration project.

Analyst: Jayme Miles Turney

Russia: -1

Russia has failed to comply with its commitment to support large-scale CCS demonstration projects.

Russia has not taken any action to support CCS technology. It has not initiated or funded a large-scale pilot project.

⁵⁸⁴ Press Release: Eni and Enel sign strategic agreement on CO₂ capture, Eni (Rome) 21 October 2008. Date of Access: 21 December 2008. http://www.eni.it/en_IT/media/press-releases/2008/10/2008-10-21-accordo-Eni-Enel.shtml.

⁵⁸⁵ Japan CCS has embarked upon a full-scale enterprise, Japan CCS (Tokyo) 26 September 2008. Date of Access: 12 December 2008. <http://www.rite.or.jp/Japanese/labochoryu/ccs/ccs2008tokyo/6.pdf>.

⁵⁸⁶ Japan CCS has embarked upon a full-scale enterprise, Japan CCS (Tokyo) 26 September 2008. Date of Access: 12 December 2008. <http://www.rite.or.jp/Japanese/labochoryu/ccs/ccs2008tokyo/6.pdf>.

⁵⁸⁷ Interview: Japan needs to capture CO₂ to meet emissions goals, Reuters (Tokyo) 8 December 2008.

Date of Access: 22 January 2009.

<http://www.reuters.com/article/companyNews/idUKT36243120081208?symbol=5001.T&pageNumber=2&virtualBrandChannel=0&sp=true>.

⁵⁸⁸ International CCS technology survey, Innovation Norway and Gassnova (Porsgrunn) July 2008. Date of Access: 20 December 2008.

<http://www.innovasjon Norge.no/upload/Surveillance%20of%20CCS%20projects%20and%20initatives%20-%20ver3.0%20dist.pdf>.

Thus, Russia has been awarded a score of -1.

Analyst: Natalya Churkina

United Kingdom: +1

The United Kingdom has fully complied with its commitment to support large-scale CCS demonstration projects.

The United Kingdom's 22 April 2009 budget allotted GBP1.4 billion to support a low carbon economy.⁵⁸⁹ Of this amount, GBP405million will be allocated specifically to the development of low carbon technologies, including CCS.⁵⁹⁰ The budget includes plans for two new CCS demonstration plants and the option of two more in the future.⁵⁹¹

Further, Climate Change Secretary Ed Miliband announced on 23 April 2009 that any new coal-fired power stations built in Britain in the future will be required to employ CCS.⁵⁹² New plants will need to capture 25 per cent of emissions initially, and 100 per cent by 2025. Paired with this plan is a GBP90 million commitment to tax breaks for research and development.⁵⁹³ The legislation also requires a full-scale retrofit of existing coal-fired plants with CCS within five years of a time when CCS technology is proven to be commercially viable.⁵⁹⁴

The United Kingdom has also pursued CCS funding from the European Union. In December 2008, at Prime Minister Gordon Brown's urging, EU leadership agreed to grant 300 million emissions trading scheme permits, worth approximately EUR6 billion, to CCS projects.⁵⁹⁵

Thus, the UK has been awarded a score of +1 for allocating resources and creating legislation to create new large-scale CCS projects.

⁵⁸⁹Budget 2009: £1.4bn package to create low-carbon economy is inadequate, campaigners say, The Guardian (London) 22 April 2009. Date of Access: 6 May 2009.

<http://www.guardian.co.uk/uk/2009/apr/22/budget-low-carbon-economy>.

⁵⁹⁰ Budget 2009: £1.4bn package to create low-carbon economy is inadequate, campaigners say, The Guardian (London) 22 April 2009. Date of Access: 6 May 2009.

<http://www.guardian.co.uk/uk/2009/apr/22/budget-low-carbon-economy>.

⁵⁹¹ United Kingdom's First Low Carbon Budget' – Investment in Offshore, Free Press Release Center, 23 April 2009. Date of Access: 6 May 2009. http://www.free-press-release-center.info/pr000000000000000039732_united-kingdoms-first-low-carbon-budget--investment-in-offshore-wind-energy-efficiency--green-collar-jobs.html.

⁵⁹² Clean coal push marks reversal of UK energy policy, The Guardian (London) 23 April 2009. Date of Access: 15 June 2009. <http://www.guardian.co.uk/environment/2009/apr/23/clean-coal-energy-policy>.

⁵⁹³ UK Coal soars as Whitehall gives thumbs up to Dark Lord, The Evening Standard (London) 27 April 2009. Date of Access: 6 May 2009. <http://www.thisislondon.co.uk/standard-business/article-23681416-details/UK+Coal+soars+as+Whitehall+gives+thumbs+up+to+Dark+Lord/article.do>.

⁵⁹⁴ U.K. cracks down on coal-fired plants, an industrial info news alert, PR-Canada, 3 May 2009. Date of Access: 6 May 2009.

http://prcanada.net/index.php?option=com_content&task=view&id=95204&Itemid=61.

⁵⁹⁵ UK wins battle over carbon capture billions: sources, Reuters (Brussels) 12 December 2008. Date of Access: 15 January 2009. <http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE4BB3OY20081212>.

United States: +1

The United States has fully complied with its commitment to support large-scale CCS demonstration projects.

On 17 November 2008, at the International Conference on Greenhouse Gas Control Technologies, Acting Deputy Secretary of Energy Jeffrey Kupfer announced a USD66.9 million grant to the Big Sky Regional Carbon Sequestration Partnership.⁵⁹⁶ The Big Sky Partnership is the United States' seventh CCS project. This project will conduct a large-scale test of CCS technology at the Riley Ridge Unit on the LaBarge Platform in Southwest Wyoming.⁵⁹⁷ Big Sky is intended to demonstrate the ability of a geologic formation to store over two million tons of CO₂ safely and economically.⁵⁹⁸

The total cost of this project is estimated at USD131 million.⁵⁹⁹ Phase III of the project is expected to begin in late 2009, with baseline work completed by the end of 2010. Drilling operations are scheduled to begin by mid 2010.⁶⁰⁰

Further, FutureGen Industrial Alliance has proposed the world's first coal-fuelled zero-emissions power plant. The estimated cost is USD1.5 billion.⁶⁰¹ Secretary of Energy Steven Chu has stated that he will support the plant with some modifications.⁶⁰² Congress has set aside USD73 million to support the project, if it is revised.

To get FutureGen on track, the Energy Department must approve a previously submitted environmental impact statement, and funding would also need to be restored, said FutureGen Alliance Chief Executive Mike Mudd. The government would cover 74

⁵⁹⁶ Address by Acting Deputy Secretary Kupfer at the 9th International Conference on Greenhouse Gas Control Technologies, US Department of Energy (Los Angeles) 17 November 2008. Date of Access: 11 December 2008. <http://www.energy.gov/news/6746.htm>.

⁵⁹⁷ Address by Acting Deputy Secretary Kupfer at the 9th International Conference on Greenhouse Gas Control Technologies, US Department of Energy (Los Angeles) 17 November 2008. Date of Access: 11 December 2008. <http://www.energy.gov/news/6746.htm>.

⁵⁹⁸ Address by Acting Deputy Secretary Kupfer at the 9th International Conference on Greenhouse Gas Control Technologies, US Department of Energy (Los Angeles) 17 November 2008. Date of Access: 11 December 2008. <http://www.energy.gov/news/6746.htm>.

⁵⁹⁹ Address by Acting Deputy Secretary Kupfer at the 9th International Conference on Greenhouse Gas Control Technologies, US Department of Energy (Los Angeles) 17 November 2008. Date of Access: 11 December 2008. <http://www.energy.gov/news/6746.htm>.

⁶⁰⁰ Geologic Activities Phase III – (2009- 2017), Big Sky CO₂ Project. Date of Access: 3 May 2009. www.bigsky.com.

⁶⁰¹ About FutureGen, Overview. Date of Access: 1 May 2009. About FutureGen, Overview. Date of access May 1, 2009. <http://www.futuregenalliance.org/about.stm>.

⁶⁰² New Life for Clean Coal Project, Illinois Plant was Abandoned by Bush; Now its backers are in power, Washington Post (Washington) 6 March 2009. Date of Access 2 May 2009. <http://www.washingtonpost.com/wp-dyn/content/story/2009/03/06/ST2009030600119.html>.

percent of FutureGen's costs, with the rest coming from a partnership of utilities and energy firms.⁶⁰³

Thus, the United States has been awarded a score of +1 for its promotion and funding of large-scale CCS demonstration projects.

Analyst: Krista Gallagher

European Union: +1

The EU has fully complied with its commitment to support large-scale CCS demonstration projects.

On 28 January 2009, the European Commission proposed a EUR1.25 billion investment in carbon capture and storage facilities, to be spent in 2009 and 2010 as part of its economic stimulus plan.⁶⁰⁴ Germany, Poland, Spain, Portugal, the Netherlands, and the United Kingdom were each set to receive EUR250 million.⁶⁰⁵ On 20 March 2009, the European Council agreed to grant EUR1.05 billion to fund 13 CCS projects across these nations.⁶⁰⁶ The European Parliament passed the EUR5 billion European Union Economic Recovery plan on 6 May 2009.⁶⁰⁷⁶⁰⁸

Previously, on 12 December 2008, the European Council allocated 300 million allowances from the EU Emissions Trading Scheme (ETS) to the development of CCS demonstration plants.⁶⁰⁹ These allowances are equivalent to approximately EUR7 billion

⁶⁰³ FutureGen Coal Plant in Mattoon May be Revived Sen. Dick Durbin pushes to get \$1.87 billion project back on track, Chicago Tribune (Chicago) 8 January 2009. Date of Access 1 May 2009.

<http://archives.chicagotribune.com/2009/jan/08/business/chi-thu-mattoon-coal-power-futurejan08>.

⁶⁰⁴ The Commission proposes € 5 billion new investment in energy and Internet broadband infrastructure in 2009-2010, in support of the EU recovery plan, Europa (Brussels) 28 January 2009. Date of Access: 23 April 2009. <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/142>.

⁶⁰⁵ EU to use unspent cash for clean energy, broadband, Euractiv Network (Brussels) 29 January 2009. Date of Access: 23 April 2009. <http://www.euractiv.com/en/energy/eu-use-unspent-cash-clean-energy-broadband/article-178929>.

⁶⁰⁶ £155m funding for North Sea Grid agreed by EU Member States Date, New Energy Focus. 23 March 2009. Date of Access: 25 April 2009.

http://newenergyfocus.com/do/ecco.py/view_item?listid=1&listcatid=32&listitemid=2403§ion=Europe

European energy projects receive \$5.4 billion boost, Reliable Plant. Publishing Date Unlisted. Date of Access: 25 April 2009.

<http://www.reliableplant.com/article.aspx?articleid=16750&pagetitle=European+energy+projects+receive+%245.4+billion+boost>.

⁶⁰⁷ EU passes €5bn Economic Recovery Plan – includes renewables and energy infrastructure, Renewable Energy Focus. 6 May 2009. Date of Access: 6 May 2009.

<http://www.renewableenergyfocus.com/view/1714/eu-passes-5bn-economic-recovery-plan-includes-renewables-and-energy-infrastructure/>.

⁶⁰⁸ MEPs give green light to EU economic recovery plan, European Parliament (Brussels) 6 May 2009. Date of Access: 6 May 2009. http://www.europarl.europa.eu/news/expert/infopress_page/034-55118-124-05-19-905-200905051PR55117-04-05-2009-2009-false/default_en.htm.

⁶⁰⁹ EU leaders clinch deal on CO2 storage financing, EurActiv Network (Brussels) 12 December 2008. Date of Access: 16 December 2008. <http://www.euractiv.com/en/energy/eu-leaders-clinch-deal-co2-storage-financing/article-178038>.

in funding.⁶¹⁰ While the sum was EUR2 billion short of the European Parliament's initial request, it met the minimum amount set by the EU demonstration program. The price of permits has since fallen during the recession, lowering the value of this contribution and its efficacy as a financial incentive to build CCS power plants.⁶¹¹

The EU demonstration program was proposed on 10 November 2008 by the European Technology Platform for Zero Emissions Fossil Fuel Power Plants (ZEP) – a conglomerate of industry, academic, and NGO stakeholders united in their support to fight climate change with CCS technology.⁶¹² The ZEP argues that ten to twelve large-scale demonstration plants need to be operational by 2015 in order to make CCS technology commercially available by 2020.⁶¹³ The project will cost an estimated EUR7-12 billion.

Prior to the establishment of the demonstration program, UK MEP Chris Davies and Dr Graeme Sweeney, chairman of the ZEP and executive vice president for Future Fuels and CO₂ at Royal Dutch Shell, coordinated their efforts on a legal framework for CCS.⁶¹⁴ On 7 October 2008, ENVI Committee MEPs voted in favour of an amendment to Directive 2001/80/EC, which requires EU member states to limit CO₂ performance of power stations. Under Amendment 27, power plant emissions cannot exceed 500 kg of CO₂ per kilowatt hour after 2015.⁶¹⁵ This change was suggested in a report by MEP Davies and supported by the ZEP.⁶¹⁶ Davies designed the amendment to force companies to install CCS equipment, particularly targeting coal-fired power plants, which produce a large amount of CO₂.

The EU has provided both funding and legislation to support large-scale CCS

⁶¹⁰ EU leaders clinch deal on CO₂ storage financing, EurActiv Network (Brussels) 12 December 2008. Date of Access: 16 December 2008.

<http://www.euractiv.com/en/energy/eu-leaders-clinch-deal-co2-storage-financing/article-178038>.

⁶¹¹ Ed Miliband to back power supply from clean coal, The Times (London) 20 April, 2009. Date of Access: 23 April 2009.

http://business.timesonline.co.uk/tol/business/industry_sectors/natural_resources/article6128615.ece.

⁶¹² EU Demonstration Programme for CO₂ Capture and Storage, European Technology Platform for Zero Emission Fossil Fuel Power Plants (Brussels) 10 November 2008. Date of Access: 16 December 2008.

<http://www.zeroemissionplatform.eu/website/docs/ETP%20ZEP/EU%20Demonstration%20Programme%20for%20CCS%20-%20ZEP's%20Proposal.pdf>.

⁶¹³ EU Demonstration Programme for CO₂ Capture and Storage, European Technology Platform for Zero Emission Fossil Fuel Power Plants (Brussels) 10 November 2008. Date of Access: 16 December 2008.

<http://www.zeroemissionplatform.eu/website/docs/ETP%20ZEP/EU%20Demonstration%20Programme%20for%20CCS%20-%20ZEP's%20Proposal.pdf>.

⁶¹⁴ EU offered plan to commercialise carbon capture, EurActive Network (Brussels) 12 November 2008. Date of Access: 16 December 2008. <http://www.euractiv.com/en/energy/eu-offered-plan-commercialise-carbon-capture/article-177087>.

⁶¹⁵ Davies, Chris. The geological storage of carbon dioxide and amending Council Directives, Committee on the Environment, Public Health and Food Safety, European Union (Brussels) 6 October 2008. Date of Access: 16 December 2008.

http://www.europarl.europa.eu/meetdocs/2004_2009/documents/dv/envi_20081006_ccs_compr+/envi_20081006_ccs_compr_en.pdf.

⁶¹⁶ Mathiason, Nick. Carbon clean-up in Stinky Town, The Guardian (London) 28 September 2008. Date of Access: 16 December 2008.

<http://www.guardian.co.uk/business/2008/sep/28/utilities.carboncapturestorage>.

demonstration projects. Thus, it has been awarded a score of +1.

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