

# ANNUAL REVIEW 2011





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# ABOUT THE GLOBAL CCS INSTITUTE

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## ABOUT THE GLOBAL CCS INSTITUTE

The Global CCS Institute’s mission is to be a centre of excellence for carbon capture and storage (CCS) knowledge, to accelerate the development and deployment of CCS globally, and to help ensure that CCS has a significant role in reducing the world’s greenhouse gas emissions.

The Institute works collaboratively to build and share the expertise necessary to achieve this goal. It is an independent, not-for-profit entity owned by its Members. The Institute is registered under the Australian Corporations Act 2001 as a public company, limited by guarantee.

The Institute’s Members comprise more than 300 government, industry, academic and research organisations from around the world who are interested in the advancement of CCS.

### Strategic Goals

The long-term (three to five year) direction of the Institute is expressed through four strategic goals:

- 1 Prove the value of the Institute, through:
  - (a) effective and recognised advocacy of CCS, practically demonstrating its value and reporting on its status;
  - (b) facilitating CCS projects to fill learning gaps, and sharing gained knowledge;
  - (c) developing and advancing the financial and commercial value proposition of CCS;

- (d) advancing positive and proactive policy and regulation towards permitting CCS, accelerating government and public acceptance, and managing liability issues;
  - (e) advancing collection, development and dissemination of technical CCS knowledge, particularly of storage; and
  - (f) undertaking capacity development to facilitate the deployment of CCS, with a focus on assisting developing countries.
- 2 Develop a global focus and presence to engage effectively on CCS development and deployment.
- 3 Secure access to specialist skills and expertise to support CCS development and deployment, through internal and external networks.
- 4 Implement a diversified funding model to underpin a sustainable organisation.

Achieving these strategic goals will ensure that the Institute becomes a centre of excellence in its core roles and remains a viable organisation that can continue pursuing the global development and deployment of CCS in the long term.

# KEY FOCUS AREAS

The Institute’s focus areas demonstrate how it will operate, and work towards becoming a centre of excellence. The three focus areas are:

## ASSISTING PROJECTS

- Bridging knowledge gaps between demonstration efforts.
- Developing project specific solutions, particularly amongst early movers.

## FACT-BASED ADVOCACY

- Using facts to inform and influence domestic and international low-carbon policies.
- Supporting the commercialisation of CCS by advancing the understanding of appropriate funding and financing solutions, and risk regimes.
- Increasing the awareness of the benefits of CCS and the role it plays within a portfolio of low-carbon technologies.

## SHARING KNOWLEDGE

- Collecting information to create a central repository for CCS knowledge.
- Creating and sharing information to fill knowledge gaps and build capacity.

# MESSAGE FROM THE CHAIRMAN



The Global CCS Institute's second year of operation has seen significant contributions to the worldwide effort to successfully demonstrate CCS technology. These contributions have taken many different forms, including a comprehensive overview of CCS projects around the world through the *Global Status of CCS: 2010* report, direct project support, shared knowledge and lessons from this portfolio of CCS projects, a wide range of published reports, and continued efforts towards building a collaborative international Membership. This has been accomplished in pursuit of our goal of accelerating the development and deployment of CCS, globally.

The past year has seen significant milestones and developments in the progress of CCS across the world. Acceptance that CCS could be an eligible activity under the Clean Development Mechanism (CDM), provided that some remaining issues can be addressed, marked significant recognition of the critical role the technology can play in reducing the world's greenhouse gas emissions. Furthermore, we have seen an increase in the number of large-scale projects entering the construction phase, and significant progress in government support for CCS in some jurisdictions.

However, there is no doubt that CCS has faced challenging times over the past year. The ongoing effect of the Global Financial Crisis, among other factors, has meant that significant barriers remain to CCS demonstration, especially financial ones. The lack of a coordinated global approach to carbon abatement places more weight on direct assistance from governments to support the next stage of CCS project development. In some countries, there is a lack of financial support and uncertainty regarding carbon abatement policies. This has led several project proponents to reprioritise their investments, leading to the discontinuation or re-evaluation of some projects. These situations however, also present opportunities for knowledge sharing – recognising the difficulties these projects have faced, and investigating how the lessons learnt can be applied to assist other projects to overcome similar challenges presented in the future.

The Institute has solidified its commitment to engagement and knowledge sharing with its Members and the broader CCS community as a critical area to pursue for the successful development of CCS. Through the sharing of know-how, experiences and lessons learnt from CCS projects, we strive to provide information to enhance understanding of the economic, financial, commercial, and engagement issues faced by projects. This knowledge can then be used by project proponents to facilitate the rollout of CCS to new or existing projects. The year ahead promises to be an exciting one.

This year saw the addition of two new members to the Board of the Global CCS Institute: Rachel English and Dr Mario Ruscev. This has strengthened the Board through diversity, adding new skill sets, geographies and experiences. I welcome Mario and Rachel to the Board.

I would also like to take this opportunity to recognise the combined efforts of outgoing CEO Nick Otter and Interim CEO John Hartwell, and welcome the Institute's new CEO Brad Page. I am confident that Brad has the right skills and breadth of experience to help the Institute further develop its leadership role in the global CCS industry. I would like to thank my fellow Board members and the staff of the Global CCS Institute for their hard work and commitment in pursuing our goals in this second year of operation.

A handwritten signature in dark ink, appearing to read 'Russell Higgins'.

**Russell Higgins AO, Board Chair**  
Global CCS Institute

# MESSAGE FROM THE CEO



The global challenge of reducing greenhouse gas emissions while also facilitating the growth of economies and improving standards of living, especially in developing countries, remains before us. One of the critical enablers to meeting this challenge is the development and deployment of new, low-emission technologies. Along the way, many low and zero-emission technologies will be required. All will have their strengths and weaknesses. It is clear that fossil fuels will continue to be used in large volume and across the globe for many decades to come.

The reasons are simple. Globally we continue to have very large, easily accessed and low-cost reserves of a range of fossil fuels, especially coal. The technology to extract, process and use these fuels is mature, widely available and delivers relatively low-cost energy.

Energy security also remains a critical policy concern for most countries and drawing on a range of sources for energy, including fossil fuels, is a real and legitimate choice.

Addressing the emissions from the use of fossil fuels and delivering cost-competitive technology to achieve this is vital if the challenge of emission reduction and economic growth is to be met.

CCS is one of the required technologies. Making it a commercial, cost-competitive technology as fast as possible is critical, and is the fundamental reason that the Institute has been established.

In only its second year of operation, the Institute has made a significant contribution to global efforts to develop and deploy CCS technology.

As detailed in this report, we have:

- rolled out, and shared lessons from an international program of projects for which the Institute has provided financial assistance;
- created, and performed early implementation work on a Regulatory Test Toolkit;
- unveiled a state-of-the-art knowledge platform, allowing regular and simplified collaboration within the CCS community;

- delivered updates and an annual report on the status of the world's CCS projects; and
- maintained and updated a database of projects across the world.

The ongoing support of our Members around the world is highly valued and is an endorsement of the work of the Institute. From 263 Members at this time last year, we have seen a steady increase in the number of organisations pledging their support to our mandate. Today, our Membership stands at 326.

The Institute would not exist without the generous financial support of the Australian Government. Establishing the Institute in support of global efforts to rapidly develop and deploy CCS technology is visionary and exemplary.

Having recently joined the Institute, I'd like to recognise foundation CEO Nick Otter for his work in establishing the organisation. My thanks go to Interim CEO John Hartwell for his many months' service and the delivery of a solid set of strategic goals that will stand us in good stead.

Finally, I thank the Institute's Members, advisory panels and collaborators. Their active involvement and support is central to the achievements the Institute has recorded in the short time it has existed.

**Brad Page, CEO**  
Global CCS Institute



## THE GLOBAL STATUS OF CCS

The Global CCS Institute released the *Global Status of CCS: 2010* in March 2011, to be followed by the *Global Status of CCS: 2011* in October 2011. The following is a summary of observations from the reports.

Carbon capture and storage (CCS) has an essential role in reducing global greenhouse gas emissions. As part of a portfolio of low-carbon technologies, CCS is needed to stabilise atmospheric greenhouse gas concentrations at levels consistent with limiting projected temperature rises to 2°C by 2050, as recommended by the United Nations Intergovernmental Panel on Climate Change.

The specific challenge for the CCS industry is to demonstrate the entire chain at commercial scale – incorporating CO<sub>2</sub> capture from large point sources, CO<sub>2</sub> compression and then transportation and injection into suitable storage sites or for a use that results in permanent emissions abatement.

### Progress is being made

The CCS industry continues to exhibit measured progress, with an increase in the number of large-scale integrated projects (LSIPs) in operation or under construction, and a clustering of projects around the advanced stages of development planning.

There is a total of 74 LSIPs, which continue to be concentrated in North America, Europe, Australia and China.

Around the world, there are eight large-scale projects in operation and six under construction. Three projects recently commenced construction. Importantly, this includes a second power project, Boundary Dam in Canada, and a first project in the United States that will store CO<sub>2</sub> in a deep saline formation, the Illinois Industrial Carbon Capture and Sequestration (ICCS) project.

The total CO<sub>2</sub> storage capacity of all 14 projects in operation or under construction is over 33 million tonnes a year. This is broadly equivalent to preventing the emissions from more than six million cars from entering the atmosphere each year.

In the Institute's annual projects survey for 2011, ten projects in the most advanced

planning stage have also indicated that they could be in a position in the next 12 months to decide on whether to take a final investment decision (FID) and move into construction.

While the prospect of a number of power projects moving to a FID in the next year is a positive development, this is contrasted with other high-emitting industries such as iron and steel and cement, where there is a paucity of projects being planned at large-scale.

### Factors influencing successful projects

As with most industrial projects, building a viable business case for a CCS demonstration project is a complex and time consuming process that requires both the project economics and the risks to be understood prior to a FID.

All projects in operation use CO<sub>2</sub> separation technology as part of an already established industry process and either use CO<sub>2</sub> to generate revenue through enhanced oil recovery (EOR) and/or have access to lower-cost storage sites based on previous resource exploration and existing geologic information sets. This can be seen where six of the eight operating projects are in natural gas processing, while the other two are in synthetic fuel production and fertiliser production, and five of these projects use EOR.

A number of projects in operation or under construction are undertaking CCS in response to, or anticipation of, longer-term climate policies and/or potential carbon offset markets. While this is promising, developing a business case is challenging especially when projects do not have access to either revenue streams, or where CO<sub>2</sub> capture is not already part of an established industrial process.

Since the 2010 Status Report, there are 11 LSIPs that are considered on-hold or cancelled, with eight in the United States and three in Europe. The most frequently cited reason for a project being put on-hold or cancelled is that it was deemed uneconomic in its current form and policy environment. The lack of financial support to continue to the next stage of project development and uncertainty regarding carbon abatement policies and regulations were critical factors that led several project proponents to reprioritise their investments, either within their CCS portfolio or to alternative technologies.

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This clearly indicates that substantial, timely and stable policy support, including a carbon price signal, is needed for CCS to be demonstrated and then deployed. This support will give industry confidence to continue moving forward and invest in CCS. In turn, such investment would ensure continuing innovation which will ultimately help to drive down technology capital and operating costs.

### CCS in the power sector

Power generation projects have significant additional costs and risks from scale-up and the first-of-a-kind nature of incorporating capture technology. Electricity markets do not currently support these costs and risks even where climate policies and carbon pricing are already enacted.

Despite these challenges, projects are proceeding. This indicates that the technology risk for these applications is considered manageable and the technical barriers are not insurmountable, if other conditions are right, such as allowance for the added cost into the rate base and other incentives.

### Capture, transport and storage issues

The eight operating CCS projects in the natural gas processing, synthetic fuels and fertiliser production industries attest to the proven nature of the capture technology in these applications. While there are projects proceeding to construction in the power sector, there is a need for more projects to demonstrate the range of possible capture technologies that could be applied.

Pipeline transport of CO<sub>2</sub> is a proven and well developed technology, but it is the scale of the future CO<sub>2</sub> transport requirements that will require strong investment support. While pipelines are expected to be a cost-effective transport solution, with increasing distance and in certain circumstances, shipping can be cost competitive and offers greater flexibility to serve multiple CO<sub>2</sub> sources and sinks.

Information from project proponents indicates that storage assessment and characterisation requires considerable investment and can have long lead times of five to 10 years or more for a greenfield storage site, depending on the existing available geologic information about the site.

As with storage, public engagement is situation and site specific and on a local level must address project impacts, including benefits.

Project proponents need to continuously review their public engagement approach to identify and mitigate potential challenges.

### Policy and legal developments

CCS applied in new and large-scale applications is at the demonstration phase and requires substantial policy and financial support. Governments should continue to send strong, consistent and sustained policy signals (including incentives, legislative and regulatory frameworks) to support this early stage of transitioning towards commercial deployment. Some project proponents perceive policy uncertainty as a major risk to project development and it is of particular concern when governments articulate policy intent without implementation.

Throughout 2010-11, the development of CCS laws and regulations has continued at a considered pace. Effective regulatory regimes on a national level play a significant role in the development of CCS projects globally. Notwithstanding these efforts, project proponents have identified a number of issues that in some cases have yet to be adequately addressed, including regulation that is incomplete in nature or delayed. A number of proposals, amendments and review exercises have already been put in motion by regulators and policymakers across several jurisdictions to address such issues.

Many of the countries and regions that have been acknowledged as leaders in the deployment of laws and regulation for CCS have continued in these roles. The importance of effective regulation has also been recognised by the many countries that are to become the second generation of CCS lawmakers. While many of these countries have yet to pass legislation, or complete the design of their regulatory frameworks, it is clear that significant actions are being taken to facilitate their development.

Government funding to support large-scale CCS demonstration projects has remained largely unchanged throughout 2010-11. Competitive funding programs that consider the additional amount required to make an individual project viable when allocating funding can increase the likelihood of seeing projects progress through to operation.

For more information on the global status of CCS, visit [www.globalccsinstitute.com](http://www.globalccsinstitute.com)

# INSTITUTE ACHIEVEMENTS

## PROJECTS, FINANCIAL AND COMMERCIAL

### PROJECT EVALUATION AND ASSESSMENT

The Institute maintains a comprehensive database of information on large-scale integrated CCS projects (LSIPs). These data are compiled from the Institute's annual survey sent to lead project proponents, as well as a range of other information sources. A public data set based on this information is published on the Institute's website and is updated on a frequent basis, reflecting changes to the status and details of individual projects, which the Institute continually tracks.

The projects database forms a major input to the Institute's annual *Global Status of CCS* report. In addition, the Institute delivered a concise report on updates in project status for the G8 meeting in July 2010 in Canada, and published a short update of the global overview of CCS projects in June 2011.

This year, the Institute undertook a major redesign of the project survey to make it more user-friendly and targeted towards Status Report analysis. The response rate for the 2011 survey of CCS projects, conducted in May-June 2011, was in excess of 80 per cent. In support of this survey work, the Institute also carried out significant engagement with a large number of LSIPs around the world covering Europe, North America, Australia and China.

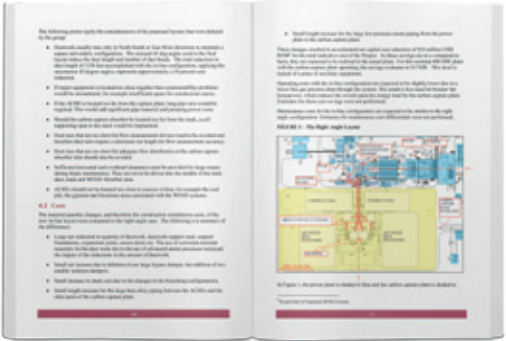
### PROJECT OPERATIONS

The Institute has signed agreements with 10 CCS projects in Australia, Europe, the United States, Canada and Japan. Under these agreements, support is provided to address the barriers to deployment and leverage key knowledge sharing products for wider dissemination among Institute Members and the broader CCS community. Discussions are continuing with a further three projects.

The agreements will result in delivery to the Institute of over 50 Special Reports plus front-end engineering and design (FEED) and feasibility studies, as well as extensive access to project staff. The Special Reports cover the full range of issues of importance to CCS deployment, covering stakeholder engagement, technology selection methodology, storage, CO<sub>2</sub> shipping, specific capture technology and integration, permitting, health, safety and environment, and financial and commercial issues.

Reports from these projects are published and shared via the Institute's website. The detailed results of the studies are also shared with the broader industry through communication mechanisms such as workshops, Thematic Group discussions on particular topics and one-on-one meetings.

In June 2011, the Institute commenced a series of webinars in which project developers share their lessons learnt to an audience of Institute Members around the world. The first presentation was by the Tenaska Trailblazer Project on community engagement. This was later followed by a webinar on the role of CO<sub>2</sub> use in enhanced oil recovery (CO<sub>2</sub>-EOR) in CCS deployment. A further seven webinars are planned in the remainder of 2011.



Tenaska's *Carbon Capture Plant Layout Optimization with a New Coal Fired Power Generating Facility* report, one of several published to the Institute's website during 2010-11.

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## FINANCIAL AND COMMERCIAL

A Financial and Commercial Steering Group was established and held its inaugural meeting in February 2011 in London. It comprises a cross-section of Institute Members from government, industry, research and the international financial community. The Steering Group established a set of principles to guide the Institute's work plan related to financial and commercial issues, and in the future will also serve to provide insight on key related initiatives.

The Institute established a partnership with the Japan Bank for International Cooperation (JBIC) to develop a financial model at the screening level for integrating CCS with coal and natural gas-fired electricity generation. Work on this model has commenced.

The Institute is coordinating work on the identification and advancement of funding mechanisms for CCS projects in developing countries. This work was agreed by Energy Ministers at the second Clean Energy Ministerial in Abu Dhabi in April 2011 in response to recommendations by the Carbon Capture, Use and Storage (CCUS) Action Group. Results from the work will be presented to the 2012 Clean Energy Ministerial in London. The Institute's partners in undertaking this work are the Asian Development Bank (ADB), Carbon Sequestration Leadership Forum (CSLF), Clinton Climate Initiative, the International Energy Agency (IEA), World Bank and World Resources Institute.

Through its strategic partnership with the Clinton Climate Initiative, the Institute initiated work on optimising coverage by governments of the 'economic gap' for early-mover demonstration projects, both in developed and developing countries.

## PUBLIC ENGAGEMENT

The Institute has contributed greatly to the development of research, reporting and knowledge sharing materials on CCS public engagement. Working with partners such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the global social research network, the Institute published multiple project case studies evaluating the relevant public engagement approaches globally, as well as various reports covering CCS communications and best practice public engagement implementation. This has been complemented by engaging experts to contribute blogs and analysis to the Institute's website, to disseminate the learnings with the global audience.

The Institute developed and launched the *Communications and Engagement Toolkit for CCS Projects*, which was cited as a valuable resource by communication practitioners and social science experts at various CCS conferences including the Tenth Annual CCS Conference in Pittsburgh in May 2011. In addition, the Institute has developed and launched a *Public Engagement Self Assessment Tool* for project proponents to quantitatively self-assess their approach.

In order to provide practical public engagement support to projects, the Institute delivered a pilot program to peer review and advance the public engagement strategies of CarbonNet and the Rotterdam ROAD project, through closed sessions with public engagement experts.



The *Communication and Engagement Toolkit for CCS Projects*, developed in collaboration with the CSIRO.

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# INSTITUTE ACHIEVEMENTS

## PROJECTS, FINANCIAL AND COMMERCIAL (CONT.)

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### CAPTURE, TRANSPORT AND STORAGE

The Institute has been involved in several reports addressing storage, including Special Reports received from projects, an impurities report with the IEA Greenhouse Gas R&D Programme (IEAGHG), and a Storage Guideline desktop review prepared for the Institute by the Cooperative Research Centre on Greenhouse Gas Technologies (CO2CRC). This latter work is in support of a broader work program within the Institute to develop a compendium of available Storage Guidelines and identify possible deficiencies.

The Institute presented papers on storage issues at events hosted by the CSLF (Al Khobar, Saudi Arabia and Edmonton, Canada), IEAGHG Network Meeting (Pau, France), Chinese Australian Geological Storage Workshop (Wuhan, China), and Society of Petroleum Engineers (Queensland, Australia), as well as holding a Groundwater Thematic workshop in May 2011.

In April 2011, the Institute participated in, and presented a key summary of the status of CCS at the IEA World Energy Outlook – Workshop on Future of Coal, held in Beijing, China.

The Institute has completed the development of a generic project delivery framework for power capture, transport and storage for LSIPs. This framework will be used in OpenCCS, a section on the Institute's website that is being developed as a 'project encyclopedia'. Further details of OpenCCS are provided in the Knowledge, Media and ICT section of this review.



The Institute's Head of Project Analysis and Development Andrew Roden provides an address on the 'Status of CCS' at the October 2010 Kyoto Members' Meeting.



# POLICY AND MEMBERSHIP

## THE STATUS OF CCS

In support of its mission to be a centre of excellence for CCS knowledge, each year the Institute releases an annual review of global project developments and the drivers behind them. This annual report then serves as a reference point for Members and the broader CCS community.

The *Global Status of CCS: 2010* was developed over several months, and then published in March 2011. This report serves as the only comprehensive source of information on CCS, integrating developments from ground-level project establishment through the policy and regulatory frameworks that support projects – including storage and transport issues – to community engagement activities.

The release of the *Global Status of CCS: 2010* report was supported by widespread media engagement, specific speaking engagements across four continents, and an internet campaign that engaged 23 respected members of the CCS community to actively contribute to the Institute's website through blogs on specific issues identified in the report.

More than 3,500 copies of the Institute's *Global Status of CCS: 2010* report were downloaded within five months of its release.



## COSTS OF CCS

To support and develop transparency regarding CCS cost estimation, the Institute published an economic assessment of carbon capture and storage technologies in March 2011. This report provides information on the costs of incorporating CCS into electric power plants with a variety of capture technologies, using a range of transport and storage systems across 11 different regions in the world. Estimates of costs for industrial applications to steel, cement and fertiliser production were also provided.

The Institute also worked with the IEAGHG, the IEA, Zero Emissions Platform (ZEP) and two of the leading academic experts in CCS, Howard Herzog of MIT and Ed Rubin of Carnegie Mellon University to form the 'CCS Costs Network'. This Network brings together around 50 of the world's leading experts on costing CCS technologies from capture through transport. As part of this group, the Institute is now working to develop a common terminology and framework for cost estimates, including how to characterise variability and uncertainty, as well as how to improve communication of cost estimates and their characteristics to all stakeholders.

## CAPACITY DEVELOPMENT

The Institute's capacity development activities continue to focus on developing countries, helping to build an 'enabling environment', addressing the many different barriers to CCS deployment, and developing appropriate in-country expertise.

A Member-based Capacity Development Steering Group was established to help guide these activities. The Steering Group is chaired by Dr Leena Srivastava, a member of the Institute's International Advisory Panel (IAP). Based on analysis of relevant criteria and advice from the Steering Group, the Institute identified six 'countries of focus' for the capacity development program: China, India, Indonesia, Malaysia, Mexico and South Africa. Active engagement with these countries is now underway.

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## POLICY AND MEMBERSHIP (CONT.)

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Substantial progress has been made in developing and implementing an integrated and tailored capacity development program for Malaysia. The Institute, in partnership with the Malaysian Ministry of Energy, Green Technology and Water (KeTTHA) and the Clinton Climate Initiative, produced a *Malaysia CCS Scoping Study* which was formally handed over on 24 January 2011. In addition, a CCS Capacity Assessment has been completed and the first stage of a tailored work program has been developed.

In support of South Africa's work towards a test injection project, the Institute sponsored and facilitated a South African delegation of policy, legal and non-government representatives to visit Australia in mid-2011. The focus of the trip was to learn about the CO2CRC's experience in running a test injection demonstration project in Australia.

There was also significant progress in the capacity development programs of the Institute's Strategic Partners. As part of the Institute's financial contribution towards the ADB CCS Trust Fund, it is supporting CCS scoping studies in Indonesia, Philippines, Thailand and Vietnam. Representatives from these countries gave an update on this work at the CCS Ready Workshop in Manila in June 2011. The Institute is working closely with the ADB on the development of this work in Indonesia, and working closely with relevant ministries to identify areas where the Institute can support the deployment of CCS in Indonesia.

As part of its ongoing support of the IEAGHG, the Institute sponsored their CCS Summer School, held in Norway in August 2010. The Institute also provided ten scholarships to early career professionals and post graduate students from the Asia-Pacific region to attend the CO2CRC's CCS School held in Brisbane in July 2010.

### MEMBER ENGAGEMENT: AUSTRALIA

The Institute is supporting the CarbonNet initiative being coordinated by the Department of Primary Industries in Victoria. A key focus of the CarbonNet work is around building the business case for a network approach. The Institute is also working closely with the Collie Hub project, which has been established to examine the options for CCS in the South West of Western Australia. These involvements are particularly relevant from a global perspective, as hub-type concepts are influencing the development of several proposed CCS projects. The Institute is in discussions with a number of other projects and organisations in Australia on supporting capture and storage-related work scopes.

In February 2011, the Institute held a series of events to share North American project lessons with Australian Members. Over 100 representatives from government, industry and the research and diplomatic community attended workshops in Melbourne, Brisbane and Canberra.

In April 2011, lessons from the Rotterdam Climate Initiative (RCI) were shared with Australian Members at workshops in Australia (Melbourne, Canberra and Perth) which was followed by workshops in Korea and Japan.

The Institute supported a Community Consultation Workshop at the Collie Hub project in February 2011, which was implemented by the CSIRO. This workshop resulted in a number of significant improvements in participants' self-rated knowledge of climate change and related issues, as well as discussion around the benefits of the project to the local community.

The Institute supported the National CCS Council in the coordination and facilitation of a Communications Network, by establishing and hosting a digital communications platform and assisting with its operation. This network can help stimulate collaboration and exchange of information between member and project proponent communication managers, as well as create a capacity to proactively and creatively deal with issues likely to be raised by the public or to prepare and participate in public events.

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## MEMBER ENGAGEMENT: NORTH ASIA

The Institute is continuing to build its Membership base in North Asia, and to strengthen ties and share knowledge among this group.

### Japan

The Institute is supporting studies being undertaken by a consortium between the private sector and academia, headed by the Chiyoda Corporation, towards a study of shuttle-type CO<sub>2</sub> ship transport, including engineering and design studies of the required equipment, and regulatory considerations on the transportation of CO<sub>2</sub> in nearby sea waters.

The Institute is also supporting a University of Tokyo study to undertake a comprehensive review on all of the CO<sub>2</sub> shipping activities that are currently underway around the world.

The Institute hosted several events and visits for Japanese stakeholders, including J-Power, JCoal, JBIC, Mitsubishi Heavy Industries, Nippon Steel, Chiyoda Corp, and the University of Tokyo. This engagement provided an important opportunity to gain insight into Japan's priorities in developing clean coal technology. The Institute also held several workshops and meetings in Japan, well attended by Japanese Members across government, industry and industry associations. This included a workshop on Stakeholder Engagement which was held in Tokyo in November 2010.

In April 2011, the Institute held a meeting in Tokyo for Japanese Members which attracted 75 representatives from all of Japan's Member organisations. Presentations were made on the Rotterdam Hub Project Overview, Summary of Japan Regional Profile, CO<sub>2</sub> Shipping update, Shuttle Shipping Feasibility Study and the Japanese Knowledge Platform. Members were provided the opportunity to comment on the presentations and have their feedback incorporated into Institute work plans.

### Korea

The Institute hosted two large Korean delegations in 2010. The Institute held a workshop in Seoul in April 2011 in conjunction with the RCI, which was attended by over 40 people representing Korean Members and the organisations represented by the Korea CCS Association (KCCSA). Key themes were the current status and future development of regulatory and incentive (financial) systems that enabled the development of projects. On 23 May 2011, the Institute negotiated a Memorandum of Understanding with the KCCSA, to strengthen the cooperation between the Institute and Korea in knowledge sharing and collaboration in support of the demonstration and commercialisation of CCS technologies and the regulatory/policy infrastructure for the industry and government. The KCCSA was established by Korea's top 20 energy, steel and engineering companies and will be a conduit for Institute stakeholder engagement in Korea.

### China

The Institute continued its active engagement in the China market, with a number of important reports being produced.

*The Feasibility of CCS Readiness in Guangdong Province* is the first annual report for a three-year project which will ultimately produce a roadmap for CCS Ready in Guangdong Province and provide policy recommendations for CCS implementation. This project is an initiative of the UK Government and is co-funded by the Institute.

*CCS in Developing Countries: Analysis of Key Policy Issues and Barriers* was completed by the ADB under the CCS Trust Fund. This report examined CCS barriers in developing countries, focusing on China and the financing issue in particular. The report also examines related Intellectual Property issues and trade barriers.



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# POLICY AND MEMBERSHIP (CONT.)

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## POLICY, LEGAL AND REGULATORY

In late 2010, the Institute actively participated in the United Nations Framework Convention on Climate Change (UNFCCC) 16th Conference of Parties (COP16), hosted in Cancun, Mexico. This was the first time the Institute attended such proceedings, joining many of its Members who also take an active interest in the progress and outcomes of international climate change negotiations. The Institute's effort in Cancun resulted in not only lifting its profile as a credible international advocate for CCS in the Clean Development Mechanism (CDM), but also enhanced its understanding of how CCS could be positioned in a post-2012 architecture. In February 2011, the Institute formally expressed its views on CCS under CDM to the UNFCCC through its submission process.

The Institute hosted several side events at COP16 (attracting ministers and internationally-renowned expert presenters), and collaborated with many organisations including the IEA, the United Nations Industrial Development Organization (UNIDO), IEAGHG and World Resources Institute. Topics ranged from the need for CCS, to profiling what countries are doing, and exploring the use of CO<sub>2</sub> with biomass.

The Institute also engaged high-level international media around CCS, including Reuters, The Economist and major Norwegian broadcast agency NRK. IAP Member Lord Stern of Brentford, Kt, FBA hosted a dinner for a number of ministers and lead negotiators at the climate talks.

The Institute has been active in both analysing liability issues around CCS, and in supporting jurisdictions that are developing appropriate legislation and regulations. The Institute worked as a member of a consortium developing an approach to estimating information on risks and liability based around real world projects. The consortium includes industry representatives, such as Chevron and Southern Company, governments, including Alberta (Canada) and Wyoming (US), as well as civil society organisations such as the World Resources Institute and the Natural Resources Defense Council. This work is anticipated to be released in the second half of 2011.

The Institute also provided advice to the State Government of New South Wales (Australia) in developing their Regulatory Framework for Greenhouse Gas Injection and Storage, particularly around liability issues.

The Institute supplemented its development of a definition on 'CCS Ready' from early 2010 with an issues paper published in November 2010 setting out the key elements necessary to support implementing the definition.

The Institute is also actively engaged with a number of governments considering implementing a CCS Ready policy and ran a CCS Ready Workshop in association with the ADB's Clean Energy Forum in Manila in June 2011.

A *Regulatory Test Toolkit* was published in February 2011 to provide assistance to regulators in developing early-stage regulatory regimes. The toolkit was developed in conjunction with Edinburgh University and builds upon a test exercise to assess the existing regulatory and consenting framework for CCS in Scotland.

The toolkit can be applied by governments anywhere, enabling them to determine present regulatory ability and what is further required to enable the deployment of CCS technology in a regulatory-efficient manner. The toolkit exercise embodies a regulatory simulation or 'dry-run' of a real or simulated CCS scheme, thereby tracking the approvals processes for a project from the initial planning stages, through the operational phase, and into the decommissioning period.

The Institute continues to roll out the toolkit process, targeting a number of jurisdictions worldwide throughout 2011 and 2012.

A key factor in accelerating the global uptake and widespread demonstration of large-scale CCS is the ability to capture the knowledge created from delivery of early-mover CCS projects and allow it to be utilised by other projects and CCS stakeholders.

The Institute has established the Knowledge Sharing Steering Group to ensure appropriate governance of its knowledge sharing program. The Steering Group consists of representatives that bring experience in communications, sharing CCS knowledge and advanced digital platforms to help guide the Institute's overall approach.

## KNOWLEDGE DELIVERY CHANNELS

Over the past year, the Institute has developed a knowledge sharing framework to delivering information in a proactive, engaged and real-time fashion. This people-centric approach has been pursued through the launch of a digital platform, which has been built up with various knowledge and information delivery tools targeting different audiences.

## KNOWLEDGE SHARING PLATFORM

The Institute's Knowledge Sharing Platform was launched in October 2010 and features three layers: a public site, an extranet and an intranet.

The public tier of the platform (the Institute's website) provides advanced capabilities for dissemination, collaboration and data sharing. It also provides opportunities for the Institute's Members and broader CCS community to contribute and gain information through blogs, webinars and discussions.

The intranet and extranet are spaces for Institute staff and/or external users to interact in a private fashion, allowing users in the various regions access to shared data, and significantly, the ability to edit documents from one place rather than reconciling emails.

This facility was set up specifically for groups to discuss given topics in-depth. For example, the extranet houses a space set up specifically for CCS demonstration project program managers, where participants access information directly relevant to their needs. Online and face-to-face channels for knowledge sharing have been put in place to complement each other and optimise the efficiencies of time and resources.

### Intranet



### Extranet



### Public website



# KNOWLEDGE, MEDIA AND ICT (CONT.)

The Institute launched two targeted knowledge sharing networks, accessible to a particular set of users.

1. The Japanese Knowledge Sharing Network involves participants from over 15 organisations and is currently focused on a national communications approach for CCS in Japan. At a high level, it is also looking at how events related to the March 2011 earthquake and tsunami in Japan may impact the national energy portfolio, CCS, and views on seismicity.
2. An Australian network of CCS communication practitioners (under the National CCS Council) is sharing information and lessons learnt from the development and implementation of public communication activities and enhancing the capacity to anticipate and respond effectively to local and national events in a coordinated way.

## PUBLICATIONS, BLOGS AND NEWS ITEMS

The Institute has shared nearly 100 publications through its website over the past year. In addition to content written by the Institute, publications have been sourced from dozens of organisations that play major roles in the CCS community. Knowledge sourced from projects as part of the Institute's Project Support Program resulted in some of the Institute's most viewed publications. These publications included very detailed lessons from early-mover projects that can be used to help other projects around the world.

An important functionality of the knowledge platforms is encouragement of 'online conversations'. Daily blogs focused on key topics to the CCS community have been published since January 2011, linking to relevant papers, reports or news items.

The Institute produces a library of news items, delivered to audiences daily, with key items also distributed through the website, and other communication and social media channels. Key voices from news articles are also pursued for participation in the Institute's 'online conversations' through blogs and other content.

## THE GLOBAL CCS INSTITUTE IN THE MEDIA

During 2010-11, the Institute:

- garnered coverage of the *Global Status of CCS: 2010* report in major international media including the Wall Street Journal;
- saw media attention to CCS and Institute issues at the Cancun climate talks, with participation from The Economist, PointCarbon, major wires, and other broadcast media; and
- published a number of opinion pieces by senior staff and members of the IAP in major press in Australia, Europe and the United States.

Since the beginning of 2011, the Institute's website has been accessed by an average of 12,172 users per month. Users are most frequently looking for publications, especially the *Global Status of CCS: 2010* report.

Australia, the United States, and the United Kingdom are home to about half of the Institute's knowledge platform users. The rest are from major CCS countries, but also others that are exploring their options for climate change mitigation beyond current portfolios (India, the Philippines and Germany).

Based on current trends, it is expected that the United States and United Kingdom will pass Australia in terms of visitor traffic in the next few months. The number of visitors from Asia has also been trending upwards.

## OPENCCS

OpenCCS is the Institute's most recently-launched knowledge sharing tool. It is being developed as an open and collaborative area on the Institute's website for building and sharing methodologies, best practices and lessons learnt. It is essentially a 'project encyclopaedia, containing assets such as recommended project activities for delivering a CCS project, information on CCS projects and technologies, links to useful pages on other sites, and definitional pages to explain core CCS concepts. It will also be used to integrate other publicly-available CCS content.

Growing the OpenCCS repository is a priority for the Institute in coming months.

## GOVERNANCE

Creating an effective governance model is essential to defining, driving, controlling and overseeing the successful implementation of knowledge sharing. The Institute established a set of policies and procedures to uphold effective management of its knowledge sharing program.

These policies and procedures establish guidelines, rules, roles, responsibilities and processes for knowledge sharing. For much of the core content it has sourced, the Institute reserves a worldwide, royalty-free, non-exclusive licence to use, reproduce, adapt, modify and further communicate any knowledge created, allowing it to be shared with the widest possible audience.

## MEMBER ENGAGEMENT IN EUROPE

The Institute is firmly engaged within the European CCS community, working with many stakeholders, including the European Commission (EC), Zero Emissions Platform (ZEP), Bellona, the IEA, the Carbon Capture & Storage Association and many national Governments and key industry players. While the Institute spent time working with all European government Members, the most active involvement was with Norway, the UK, the Netherlands, Poland and Romania.

### Norway

Norway is home to two of the oldest operating large-scale CCS projects: Sleipner (1996) and Snøhvit (2007). Given the experience and knowledge that Norway has in CCS, the Institute set up bi-annual meetings with the Norwegian Government as well as Member companies, which included a site visit to the TCM Capture test facility in April 2011.

### United Kingdom

The Institute played an active role in the UK, mainly through the newly-formed CCS Development Forum which was launched by Minister of Energy Charles Hendry, in July 2010. The Forum aims to bring government together with key industry stakeholders to work together to overcome barriers and maximise business opportunities in order to commercially deploy CCS in the UK. The Forum met three times, with the Institute presenting at the meeting in April 2011.

The Institute contributed to two formal consultations by the UK Government: a Market Sounding exercise in November 2010 (looking at overall CCS market dynamics); and on infrastructure issues. The Market Sounding exercise was intended to help the Department of Energy and Climate Change (DECC) to explore workable options for UK CCS demonstration project selection and funding processes. The Infrastructure response investigated the treatment of third-party access provisions that will need to be made following the EU CCS Directive, and a response to the call for evidence regarding the

long term development of CCS Infrastructure. The Institute developed an accompanying position paper regarding CO<sub>2</sub> transport infrastructure. This included an analysis of the different potential methods for encouraging the development of CCS infrastructure, and the most efficient use of investment in CO<sub>2</sub> transport infrastructure that anticipates future demand. It also considered such frameworks in light of the need for third party access to CO<sub>2</sub> pipelines and storage sites.

### The Netherlands

The Institute held its Members' Meeting in May 2011 in the City of Rotterdam in collaboration with the European CCS Demonstration Project Network. The Institute has supported the Rotterdam CCS Network on a feasibility study into transport options for CO<sub>2</sub>, including shipping, storage studies and a case study outlining the benefits to projects in creating joint partnerships between multiple industries and organisations. The Institute is also involved with the ROAD Project, (Maasvlakte CCS) for knowledge products around FEED studies and execution planning.

### Poland

The Institute supported a study by DemosEuropa on 'How to efficiently implement CCS in Poland?' and a 'Roadmap for CCS in Poland' by the Bellona Environmental CCS Team (BEST). Both these reports were launched at an international event on CCS in Warsaw in March 2011.

### Romania

In 2010, the Romanian Government announced a CCS Demonstration Project (GETICA Project), aiming to implement a full chain operational CCS system capturing 1.5 million tonnes a year of CO<sub>2</sub> emissions from an existing unit of the Turceni Power Plant in Oltenia, Romania. The Institute is supporting the feasibility study of the GETICA Project, with expectation of knowledge products which will include reports on permitting, storage and other issues. Largely due to the financial investment of the Institute, Romania was able to submit the project to vie for NER300 funding in February 2011.



## CCS REGULATORY TEST TOOLKIT ROLL-OUT IN ROMANIA

With the full support of the Romanian Government, the Institute implemented its *Regulatory Test Toolkit* process in Romania, which became the first country to roll-out the exercise. Romania is seeking to test and improve its emerging legal and institutional framework and the rules governing the GETICA Project in time for the transposition of the EU CCS Directive.

This exercise was undertaken in April 2011 with a meeting of the steering committee determining the action plan for identifying gaps and overlaps in the CCS regulatory framework. As part of the action plan, a regulatory matrix identifying all permits and approvals was

drafted, with a view to serving as the basis for discussions during the CCS workshop.

The final workshop was held in July 2011, with the aim to simulate a ‘dry-run’ for the GETICA Project permitting process by the Romanian key players, tracking the approvals processes from the initial planning stages of the project, through the operational phase and into the decommissioning period. This was the first time the toolkit process has been applied to a real CCS project.

A major immediate benefit of the exercise is that it ‘flushed out’ many of the outstanding questions and started to force regulators to look at the GETICA project in a collective regulatory sense, as well as look at linkages between agencies. A final report on the process and conclusions will be produced.

## COUNTRY ENGAGEMENT THROUGH BELLONA'S BEST PROGRAM

In October 2009, Bellona launched a partnership bringing together a number of leading energy and technology companies and institutes in support of the Bellona Environmental CCS Team (BEST). The objective of the partnership is to ‘accelerate the demonstration and eventual deployment of environmentally sound CCS’ and to contribute significantly to making CCS a commercially-attractive technology by 2020. BEST seeks to support decision-making by establishing roadmaps for CCS demonstration and deployment as well as raising public

awareness in key European countries. The Institute is the major funder of BEST, contributing AU\$900,000 over three years.

The CCS roadmaps are being prepared for countries where energy production is largely based on fossil fuels and where CCS can play an important role to ensure CO<sub>2</sub> emission reduction and energy supply security. The roadmaps present CCS value chains, including mapping of sources and sinks for CO<sub>2</sub>, and recommending further regulations and policy actions to deploy CCS in the selected country. They form the basis for targeted advocacy in those countries, aimed at enhancing public understanding and acceptance of CCS and the development of policy implementation to facilitate CCS deployment.

## STORAGE IN THE NORTH SEA BASIN

Countries bordering the North Sea Basin are making good progress in storage capacity assessments, including risk assessments and economics, complying with the European Directive 2009/31/EC on the geological storage of CO<sub>2</sub>. The Institute held a storage workshop in August 2011 with the North Sea basin key players. The outcomes of this workshop will be central to identifying a storage project proposal to support the commercial deployment of CCS.

## CO2WELLS GUIDELINES

DNV's CO2WELLS, a new guideline for managing the risks and opportunities associated with existing wells at CO<sub>2</sub> storage sites, was published in July 2011. The Institute provided both financial and expertise-based contributions to the publication, which was the outcome of a DNV Joint Industry Project. The guideline was developed in response to industry and regulatory concerns about the potential for CO<sub>2</sub> leakage along abandoned

wells, with the scope expanded to include all types of existing wells and to provide guidance on the qualification of well conversions or abandonment. It is intended to assist regulators and CO<sub>2</sub> storage projects to manage the potentially large uncertainties related to existing well stock.

## INTERNATIONAL ENERGY AGENCY

The Institute provides funding to the IEA to establish and operate a dedicated CCS unit aimed at utilising expertise on energy issues and markets to deconstruct the barriers to project deployment. During 2010-11 planned supporting activities and workshops have been delivered, in particular capacity building activities in the regulatory space, round-table meetings with Russia and the Ukraine, and a significant activity with China. Inputs have been provided to the UNFCCC SBSTA, CEM CCUS Action Group, and to the Industrial CCS roadmap.



Dr Graeme Sweeney, Executive Vice President CO<sub>2</sub> for Shell addresses delegates at CCS Rotterdam 2011.

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# NORTH AMERICA

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The Institute strengthened its presence in the North American region by appointing a General Manager in May 2011, to increase its representation in this market and to better represent the needs of its Members. The Institute is now moving to register and formalise its presence in North America by opening a representative office.

## PROJECT ACTIVITIES

The Institute established a robust platform for provision of knowledge products from a number of projects in the United States and Canada. Key projects include the Tenaska Trailblazer project and the AEP Mountaineer project in the United States and the Pioneer project in Canada. Numerous technical, commercial and other wide ranging Special Reports have been generated from these projects, with a significant number under development.

## SPECIALIST INPUT

The Institute participated in the Alberta CO<sub>2</sub> Purity Project managed by ICO2N. This project will evaluate CO<sub>2</sub> purity requirements across the capture, compression, transportation and storage elements of the CCS chain. It will produce CO<sub>2</sub> purity specifications and models that optimise the cost, reliability and performance of integrated CCS systems across the potential spectrum of pipeline configurations for EOR and saline storage applications. CO<sub>2</sub> purity is a critical design parameter in all CCS projects and this work will produce a set of specifications and models that can be used worldwide to optimise CCS system costs and performance. Beyond participation in the project, the Institute made a proposal to ICO2N to host and facilitate the Alberta CO<sub>2</sub> Purity Project, which is awaiting approval.

In early 2011, the Institute was invited by the Alberta Minister for Energy to sit as a member of a steering committee to oversee a Regulatory Framework Assessment (RFA) of the prevailing CCS governance arrangements in the province. The Institute is also participating in several related working groups, looking at specific technical and regulatory issues. This evaluation will enable the development of a suite of recommendations to efficiently support the implementation of CCS in Alberta, which will

be subsequently forwarded to the Government of Alberta for its consideration.

While work in this area has been performed by the IEA and others, the Province of Alberta is the first government to perform such a comprehensive regulatory framework assessment. When developed and implemented, it will provide a model for other governments to utilise around the world.

## REPRESENTATION ACTIVITIES

In conjunction with The Climate Group, the Institute presented at the opening ceremony of Climate Week NYC 2010. Representatives attended two days of events, providing information on the Institute and recruiting new Members.

Presentations were made at an Austrade event and the Canadian Business Forum on CCS. The Austrade involvement showcased the Institute to an oil and gas industry audience. For the Canadian Business Forum, the Institute chaired a session on the scale-up of CCS technologies. Both events enhanced the Institute's visibility as a leading advocate for CCS internationally.

The Institute had a prominent role in the Tenth Annual CCS Conference in Pittsburgh in May 2011. Institute staff presented on the Global Status of CCS in the conference's plenary session, and in the Cost of CCS breakout session. Connections were made and further developed with many North American Members such as utilities, technology developers, regulators and environmental groups, as well as with project proponents.

In December 2010, the Institute held a one-day workshop on public engagement with a number of leading CCS projects and practitioners in Dallas, Texas. The workshop discussed some of the key issues facing project developers as they seek public acceptance and educate the broader community on the importance of CCS.

Also in December 2010, the Institute participated in the 8th Annual EOR Carbon Management Workshop held in Houston, Texas. A presentation on the topic of 'Building CCS Project Capability through Knowledge Sharing' was delivered.



Throughout 2010-11, the Institute continued to build upon solid foundations for human resources, finance, contract management, facilities and information technology. This allows effective operation of head and regional offices and internal control systems.

## INFRASTRUCTURE AND BUSINESS SERVICES

Remediation work is continuing to further stabilise the Institute's information and communications technology (ICT) environment.

ICT Strategy work is complete and the Institute has started to initiate a number of projects to move its ICT environment from its remediated state to its new future state which will effectively support its Membership, project, knowledge management, global events and operational activities.

## INTERNATIONAL OFFICES

The Institute adopted a phased, market-entry approach, based on the level of CCS opportunity in respective countries and regions to the establishment of international offices. A report on the operational needs to establish the Institute's presence in China was completed in December 2010. An in-country, locally-engaged representative is planned to be appointed in the second half of 2011 to help implement a local work program and help drive the Institute's work plan.

Support was delivered to regional and satellite offices in Europe and North America. North American operations are being consolidated and preliminary steps to register and formalise arrangements for an office in Washington DC have commenced.

In addition, work was carried out in anticipation of the Institute's Japan Office launch. In this vein, the Institute held formal discussions with the Japanese Government and Members on the form, focus and location of an office in Tokyo.

## HUMAN RESOURCES

Employee training and induction programs have been conducted to ensure relevant personnel are aware of individual and corporate responsibilities, and continue to expand their skill sets.

The Institute defined and filled required roles, in line with the organisation's changing needs, varied skill sets, and global scope.

Throughout the year, the Institute has employed or contracted experts across Australian and regional offices, providing technical and regional expertise. In particular, during the year the Institute significantly strengthened its expertise in CO<sub>2</sub> capture, storage, legal and regulatory issues, and knowledge sharing.

The Institute developed a Core Competency Framework that is reinforced as part of the recruitment process, and also through goals set in its performance management module.

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## FUNDING DIVERSIFICATION

Initial funding support received from the Australian Government has allowed the Institute to grow a Membership base across all major continents, in developed and developing economies, and to interact with the most influential CCS proponents in government and industry. Funding from a range of sources will be required to underpin the Institute's future operations and create a sustainable revenue stream allied to the Institute's mission. The Institute commenced a detailed examination of its future funding support and income options.

In 2010, the Institute was awarded US\$500,000 by the US Department of State for initiatives carried out under the Major Economies Forum CCUS Global Partnership to allow the Institute to undertake work in assisting the CCUS Action Group with implementing its activities.

# MEMBERSHIP AND OPERATIONS

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A significant milestone was achieved during the year when Institute Membership reached the 300 level. Membership (as at 13 September 2011) sits at 326 and consists of governments, corporations, industry bodies and research organisations from key markets across the globe. This diversified Membership profile represents a healthy cross-section of these international stakeholders.

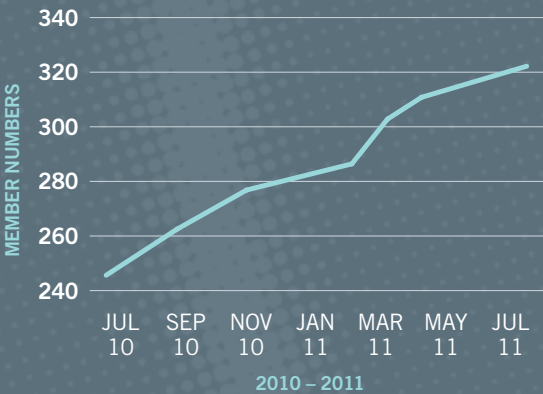
The Institute’s Membership has grown by over 50 Members in 2010-11.

In the past year, the Institute has held two Members’ Meetings: Kyoto in October 2010 and Rotterdam in May 2011. Attendance at these meetings represented 31 and 36 per cent (respectively) of the Institute’s Membership.

The Institute employs 71 permanent staff across offices located in Canberra, Australia; Paris, France and Washington, DC, with representation also in London, Brussels, the Netherlands, Ottawa and California. The Institute plans to establish an office in Tokyo, Japan, launching in September 2011.

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Membership Growth



Membership Breakdown



Industry	158
Government	38
Association/NGO	37
Consultancy	41
Research/Academia	42
Financial	10
Total	326

The Institute's Constitution defines its function and provides a set of principles and procedures to govern its conduct. Among other things, the Constitution outlines the rights of Members, sets out procedures for considering Membership applications and for holding Members' Meetings, details the procedures for selecting the Institute's Board of Directors, and sets out the rules around meetings of the Board and its Committees.

## BOARD AND COMMITTEES

As a global, not-for-profit organisation, the Institute and its Board are committed to appropriate corporate governance. The Board acts in accordance with the Australian Corporations Act and the corporate governance principles contained within.

### Role and structure of Board

The role of the Board is established by the Institute's Board Charter. This role includes:

- overseeing the Company, including its control and accountability systems;
- monitoring and ensuring compliance with legal and regulatory requirements and ethical standards and policies;
- monitoring and ensuring compliance with best practice corporate governance requirements; and
- approving and ensuring compliance with the Institute's aim, objectives and values, and providing strategic direction for the development, execution and modification of the Institute's strategy.

Board members including the Chair are independent, non-executive Directors. As at 30 June 2011, there are five Directors:

- Russell Higgins AO, Chair;
- Dr Makoto Akai, Director;
- Rachel English, Director;
- Tina McMeckan, Director; and
- Dr Mario Ruscev, Director.

Biographies for each Board member are provided from page 30.

The Board formally delegates responsibility for the Institute's day-to-day operations and administration to the CEO and the executive team. Biographies of the Institute's executive team are provided from page 32.

### Board committees

The Institute's Constitution provides for the establishment of an International Advisory Panel (IAP) and a Technical Advisory Committee (TAC) as committees reporting to the Board. In addition, an Audit and Risk Committee (ARC) reporting to the Board has been established.

The IAP provides strategic guidance and advice to the Board, and acts as ambassadors for the organisation. The IAP collectively brings forward experience in corporate building, strategic engagement, international liaison and government policy. Members of the IAP are:

- Russell Higgins AO;
- Claude Mandil;
- Dr Leena Srivastava;
- Lord Nicholas Stern of Brentford, Kt, FBA; and
- Prof Zeng Rongshu.

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The TAC provides specialist technical advice on CCS-related issues, technologies, proposals and projects, extending across the full range of CCS project development activities and disciplines. Members of the TAC bring a high degree of technical expertise to the role. As at 30 June 2011, members are:

- Dr Makoto Akai (Chair);
- Dr Mario Ruscev;
- Mr Carl Bauer;
- Mr John Gale;
- Mr Sandeep Sharma;
- Mr Jamie Carstairs;
- Mr Kai Tullius; and
- Mr Nick Otter.

The ARC assists the Board in its oversight of material business risk. In carrying out this task, the ARC has implemented a comprehensive risk management framework for the Institute, and it assists the Board in maintaining and improving the effectiveness of compliance strategies, internal and external audit functions, and the quality and credibility of financial accounting processes. As at 30 June 2011, members of the ARC are:

- Ms Tina McMeckan (Chair);
- Mr Russell Higgins, AO (Member); and
- Mr Roger Amos (Member).

## STEERING GROUPS

The Institute's work program is guided by a number of specialist Steering Groups in key areas of its operations. These Groups comprise representatives from member organisations who have particular expertise in these areas, and who donate their time to advising on particular issues. Steering Groups operate in the areas of:

- Policy, Legal and Regulatory;
- Financial and Commercial;
- Community and Public Awareness;
- Capacity Development; and
- Knowledge Sharing.

### Board Selection Panel (BSP)

At the Annual General Meeting (AGM) in October 2010, the Institute's Constitution was amended to change the requirements around the election of BSP members. The Board may now determine the process by which members are elected to the BSP. The two members of the BSP due to retire at the end of 2011 are:

- Dr Don Elder representing the General Members; and
- Mr Graham White, representing the Government Members.

The Board is currently looking at electronic voting as the preferred method for conducting elections to fill the upcoming vacancies from the Government and General Members. Both retiring BSP Members are eligible to stand for a second term.

# GOVERNANCE

## BOARD

## BIOGRAPHIES

**Russell Higgins AO**  
Board Chair



Russell Higgins has extensive corporate and government experience both in Australia, and internationally. He is a non-executive director of APA Group, Argo Investments, Telstra Corporation Limited and SunRice Limited.

Russell was Chairman of the Federal Government's Energy Task Force from 2003-04, Secretary of the Department of Industry, Science and Resources from 1997 to 2002 and Executive Director, Resources and Energy from 1992-96. Prior to that appointment he worked on economic and fiscal policy in the Departments of Treasury and Finance and at the OECD in Paris.

He is a former Chairman of the Snowy Mountains Council and the Australian Government's Management Improvement Advisory Committee and a former director of Australian Biodiesel Group Limited, EFIC, CSIRO, Austrade, the Australian Industry and Development Corporation, as well as a former member of the Australian Government's Joint Economic Forecasting Group.

In 2006-07 Russell was a member of the Prime Ministerial Task Group on Emissions Trading. He also led the APEC work in the energy sphere for many years.

**Dr Makoto Akai**  
Board Director



Dr Makoto Akai is a Fellow Research Scientist of Japan's National Institute of Advanced Industrial Science and Technology (AIST) under the Ministry of Economy Trade and Industry (METI) and a Professor of the Tokyo Institute of Technology.

Makoto has over 20 years' experience in research on various aspects of CCS which include not only technical but also socio-economic and policy studies such as public awareness, scenario study with energy models and accounting protocol development that leads to the world's first submission of new methodologies of CCS under the Clean Development Mechanism (CDM).

Makoto has led a number of research groups in AIST and has played key roles in international activities which have included managing the International Collaboration Project on CO<sub>2</sub> Ocean Sequestration under IEA/CTI, a Coordinating Lead Author of the IPCC's Special Report on Carbon Dioxide Capture and Storage, a Lead Author to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 2, Chapter 5 'Carbon Dioxide Transport, Injection and Geological Storage'), a Lead Author to IPCC Special Report on Renewable Energy Sources, and brings a great deal of technical knowledge and expertise associated with the energy sector and specifically carbon capture and storage.

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**Rachel English**  
Board Director



Rachel English holds a number of Non-Executive positions in the United Kingdom. She is a Director of NHS London, a Director of Helios Social Enterprise, a member of the Audit Committee for the Department for International Development (DFID), and an Advisory Board Member for the Institute for Energy Research and Policy at the University of Birmingham.

An economist and financial expert, Rachel has over 25 years experience across the energy sector. She was the Chief Financial Officer of a UK-listed energy company, has held a number of senior management positions for leading international energy companies (including BG Group, Shell, and Entergy) and also spent a period at the World Bank.

Rachel has an MA from Oxford University, is a Fellow of the Institute of Chartered Accountants in England and Wales and is located in London, England.

**Tina McMeckan**  
Board Director



Tina McMeckan is a Director of SP Ausnet Ltd and has served on the Boards of a number of energy-related corporations, including Alinta Ltd, United Energy Ltd and Snowy Hydro Trading Pty Ltd. Other energy related directorships have included the Westar and Kinetik Energy Group, Victorian Power Exchange, and Solaris Power.

Tina was previously an Executive Manager with GPU PowerNet and the SECV Energy Traders, and a project manager with the Victorian Department of Treasury and Finance on gas industry reform. She offers specific expertise in commercialisation of science and technology.

Outside the energy sector, she is the Chair of the Centre for Eye Research Australia, a Director of Circadian Technologies Ltd, a Director of the Cooperative Research Centre for Spatial Information, a Director of Metlink Victoria Pty Ltd and a Director of the National Board of Norton Rose law firm.



# GOVERNANCE

## BOARD BIOGRAPHIES

Dr Mario Ruscev  
Board Director



Dr Mario Ruscev has been the CEO of an American nanotechnology company, FormFactor, for the past two years. Previous to this position, he had worked for 23 years with Schlumberger in a number of senior roles in France, the United Kingdom and Norway.

Mario's project management experience is extensive and he has worked in the areas of water, CO<sub>2</sub>, sequestration as well as CCS. He has worked in Australia on several projects and with a number of Australian institutions as well as with the US based FutureGen initiative.

Mario has a PhD in Nuclear Physics from Yale University and a Doctorate in Nuclear Physics from the Université Pierre et Marie Curie in Paris. He is located in Paris, France.

## SENIOR MANAGEMENT PROFILES

Brad Page,  
Chief Executive Officer



Prior to joining the Institute in August 2011, Brad served as CEO of the Energy Supply Association of Australia (esaa), the peak representative organisation of the electricity and downstream gas industry in Australia, for over seven years. During this time he acted as national spokesperson for these industries, and was also an active member of the Australian Government Business Roundtable on Climate Change, the CSIRO Energy Transformed Flagship Advisory Committee, and the Australian Government Energy White Paper High-Level Consultative Committee.

During 2001 and 2002, Brad headed the secretariat for the Council of Australian Governments (COAG) Energy Market Review, recommending significant changes to the governance, regulation and policy development arrangements for electricity and gas markets. Brad also served as Chair of the Commonwealth Scientific and Industrial Research Organisation's (CSIRO) Energy and Transport Sector Advisory Council between November 2004 and January 2009.

Before joining esaa, Brad enjoyed a long career in the Australian Public Service, departing at senior executive level. He was heavily involved with government-led microeconomic reform initiatives, including the implementation of Australia's National Electricity Market and enabling third party access to natural gas transmission pipelines. He also spent two years in the Australian Capital Territory Government implementing choice of gas and electricity retailer for smaller customers.

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**Holger Bietz, General Manager – Projects,  
Financial and Commercial**



Holger joined the Global CCS Institute in April 2011 as General Manager – Projects, Financial and Commercial. In this role, Holger is responsible for the Institute's Project Support Program, and the Institute's work on addressing financial and commercial issues faced by CCS projects globally.

Prior to joining the Institute, Holger held the role of Head of Regional Business Development at RWE Group, overseeing business development opportunities in mid Central and South Eastern Europe. In this position Holger was accountable for the origination, development, monitoring and completion of a portfolio of large-scale infrastructure projects in the energy sector. Holger has more than 16 years of worldwide Business Development experience and an extensive knowledge of the energy value chain.

Holger has previously worked in various senior project management roles within RWE Group. Holger has a legal and business management educational background.

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**Victor Der PhD,  
General Manager – North America**



Victor joined the Institute in May 2011, following over 37 years at the US Department of Energy (USD OE), retiring recently as the Assistant Secretary (acting) for Fossil Energy. He has led the Office of Fossil Energy in the areas of Clean Coal, Carbon Capture and Storage (CCS), Oil and Gas R&D, and the Strategic Petroleum Reserve. He had served in various prior capacities at USD OE including the Principal Deputy for Fossil Energy and Deputy Assistant Secretary for Clean Coal and CCS. He is also the former Chair of the Carbon Sequestration Leadership Forum (CSLF) Policy Group, and had also served as the Chair of the CSLF Technical Group. As the Assistant Secretary (acting), he managed a multi-billion dollar portfolio of Clean Coal Technology and CCS Demonstration projects in addition to a multi-million dollar research portfolio on carbon capture and storage, power generation, and enhanced oil and gas recovery research. His prior experience includes research and management in advanced nuclear energy, geologic storage of high-level nuclear waste, and superconductivity for magnetic fusion energy.

His prior work includes NASA's Apollo 15 moon mission project and the National Oceanic and Atmospheric Administration program on modelling the upper atmospheric density.

He holds a Bachelor of Science, Master of Science and PhD in Mechanical Engineering from the University of Maryland.

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# GOVERNANCE

## SENIOR MANAGEMENT PROFILES (CONT.)

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**Barry Jones, General Manager –  
Policy and Membership**



Barry has overall responsibility for the Institute's work on CCS economic, policy, legal and regulatory issues, capacity development, and membership relations.

Barry has extensive senior executive experience in policy, research and delivering business services gained over many years in a number of Australian Government departments and agencies. He has worked in the fields of energy and resources, climate change, tourism, industry policy, and small and medium enterprise issues.

Barry's past roles include head of Enterprise Connect, Chief Executive Officer of Invest Australia, and head of the Bureau of Tourism Research. He has Bachelor of Science and Master of Public Policy degrees from the Australian National University.

**Sean McClowry, General Manager –  
Knowledge Management**



Sean joined the Global CCS Institute in April 2010 as General Manager for Knowledge Management. In this role Sean is focused on building a global exchange of CCS knowledge.

Sean has worked with dozens of organisations to solve complex issues related to knowledge sharing, information management and business strategy in a number of locations, including Australia, Europe and the US. He has done significant work with open source and collaborative technologies and is the founder of the [www.openmethodology.org](http://www.openmethodology.org) and [www.open-sustainability.org](http://www.open-sustainability.org) initiatives.

Prior to joining the Institute, he was a Director at PricewaterhouseCoopers and has held national and global lead roles for information and knowledge sharing. He is also an Executive Director and Board Member for the MIKE 2.0 Governance Association.

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**Bob Pegler,**  
**General Manager – Europe**



Bob Pegler is the General Manager – Europe for the Global CCS Institute, and is based in Paris. This role follows an illustrious career in the Australian Public Service spanning more than 30 years, and including work in resources and energy, industry, finance and environment.

Bob brings a strong suite of management skills and achievements to his role, in particular a broad knowledge and expertise in relation to industry and energy issues, including international experience. He has represented Australia in a wide range of fora, including leading delegations and heading up formal negotiation teams at both national and international levels.

**Susan Steele, General Manager – Corporate/  
Chief Financial Officer**



Susan has a strong financial background incorporating extensive experience in international business, establishment and company set up, project implementation and management, organisation structure and ownership, governance, legal, risk and contract management.

Susan previously held the position of CFO with a privately owned Project Management Consulting firm which grew to one of the top three international aid consulting firms with the Australian Government. Susan is a member of the National Institute of Accountants and the Australian Institute of Company Directors.

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# APPENDIX A

## ABBREVIATIONS

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ADB	Asian Development Bank
AEP	American Electric Power
AGM	Annual General Meeting
BEST	Bellona Environmental CCS Team
BSP	Board Selection Panel
CCS	Carbon capture and storage
CCSA	Carbon Capture and Storage Association (UK)
CCUS	Carbon capture, use and storage
CDM	Clean Development Mechanism
CO2CRC	Cooperative Research Centre for Greenhouse Gas Technologies
COP	Conference of Parties
CSLF	Carbon Sequestration Leadership Forum
DECC	Department of Energy and Climate Change (Government of United Kingdom)
DNV	Det Norske Veritas
EC	European Commission
EOR	Enhanced Oil Recovery
FEED	Front End Engineering and Design
IAP	International Advisory Panel
ICT	Information Communication Technology
IEA	International Energy Agency
IEAGHG	International Energy Agency Greenhouse Gas R&D Programme
JBIC	Japan Bank for International Cooperation
KCCSA	Korea CCS Association
KeTTHA	Ministry of Energy, Green Technology and Water Malaysia
LSIP	Large-scale integrated project
MEF	Major Economies Forum
MIT	Massachusetts Institute of Technology
NER300	New Entrants Reserve
NRCan	Natural Resources Canada
RCI	Rotterdam Climate Initiative
RET	The Department of Resources, Energy and Tourism (Australia)
RFA	Regulatory Framework Assessment
TAC	Technical Advisory Committee
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
ZEP	Zero Emissions Platform

# APPENDIX B

## LIST OF MEMBERS

### Government Members

European Commission

Latrobe City Council

The Commonwealth of Australia

The Emirate of Abu Dhabi - Masdar

The Federal Republic of Germany

The Government of Alberta

The Government of Canada

The Government of Egypt

The Government of India

The Government of Indonesia

The Government of Italy

The Government of Japan (METI)

The Government of Malaysia

The Government of Mexico

The Government of Netherlands

The Government of New Zealand

The Government of Norway

The Government of Papua New Guinea

The Government of Romania

The Government of Saskatchewan

The Government of Scotland

The Government of South Africa

The Government of Sweden

The Government of the French Republic

The Government of the Peoples Republic of China

The Government of the Republic of Bulgaria

The Government of the Republic of Korea

The Government of the Republic of Trinidad & Tobago

The Government of the United Kingdom

The Government of the United States of America

The Kingdom of Saudi Arabia

The Russian Federation

The State Government of New South Wales

The State Government of Queensland

The State Government of South Australia

The State Government of Victoria

The State Government of Western Australia

### Major Industry Members

2Co Energy Ltd

A.P. Moller – Maersk A/S

Accenture LLP

AECOM Australia Pty Ltd

AGR Field Operations

Air Products and Chemicals Inc

Aker Clean Carbon AS

Aker Solutions

Alcoa of Australia Ltd

Alstom Power Ltd

Ambre CTL Limited (Ambre Energy)

AMEC PLC

American Electric Power Company

Anglo American Metallurgical Coal Pty Ltd

Anglo American Thermal Coal

Anthony Veder Group NV

ARC Resources

ArcelorMittal Research Maizieres S.A.I.

Arch Coal Inc.

ARUP Pty Ltd

Aurecon Australia Pty Ltd

Babcock & Wilcox Company

Baker & McKenzie

Bechtel Power Corporation

BG Energy Holdings Ltd

BHP Billiton Ltd

Biorecro AB

Booz & Co.

Boston Consulting Group

BP Australia Ltd

CCS Alliance

CGGVeritas

Chartis International

Chevron Australia Pty Ltd

China Huaneng Group

China Steel Corporation

Chiyoda Corporation

ConocoPhillips

Daewoo Shipbuilding & Marine Engineering Co. Ltd

Det Norske Veritas AS

Deutsche Bank Asset Management

Doosan Babcock Energy Limited

Dow Chemical Company

Drax Power Limited

Duke Energy

E.ON.AG

Ecofys Netherlands B.V.

EcoSecurities International Ltd

Électricité de France (EDF) DPIT

# APPENDIX B

## LIST OF MEMBERS (CONT.)

Electricity Supply Board	Peel Energy Limited
ENAGAS SA	Perdaman Chemicals and Fertilisers Pty Ltd
Enbridge Inc.	POSCO Engineering & Construction Co. Ltd
ENEL S.p.A.	Poyry Energy Consulting
Entergy Services Incorporated	Praxair Inc
ERM Ltd	PricewaterhouseCoopers
Ernst & Young	Repower Energia Italy S.p.A
Exergen Pty Ltd	Reykjaviku Orkuveita (Reykjavik Energy)
ExxonMobil	Rio Tinto Limited
Fluor Ltd	Rolls-Royce PLC
Fortum Oyj	Samsung Techwin Co. Ltd
Freshfields Bruckhaus Deringer LLP	Santos Limited
GDF SUEZ S.A.	Sasebo Heavy Industries Co., Ltd
General Electric International Inc	Scottish Power
Golder Associates Pty Ltd	Services Petroliers Schlumberger
Halliburton Australia Pty Ltd	Shell International Petroleum Company Limited
Hatch Associates Pty Ltd	Siemens Australia Ltd
Hess Corporation	Societe Generale
Hitachi Limited	Sojitz Corporation
Honeywell Ltd	Solid Energy New Zealand Limited
Howden Group Limited	Solvay S.A.
IBM Australia Ltd	Standard Chartered Bank
IFP Energies nouvelles	Stanwell Corporation Ltd
IHI Corporation	Statoil, ASA
INPEX Corporation	Strike Energy Limited
Jacobs Consultancy	Sumitomo Corporation
Japan Bank for International Cooperation (JBIC)	Taisei Corporation
Japan Oil, Gas and Metals National Corporation	Taiwan Power Company
JGC Corporation	Technip
JPMorgan Chase & Co.	Tenaska Inc
Kawasaki Heavy Industries Ltd	The Rhead Group
Korea Electric Power Corporation (KEPCO)	Toshiba Corporation
Korea Institute of Energy Research	Total S.A.
KPMG	Toyo Engineering Corporation
L.E.K Consulting Pty Ltd	TransAlta Corporation
Lloyd's Register	TRUenergy Development Pty Ltd
Macquarie Capital Group	Tuev Sued industrie
Maersk Olie og Gas AS	Uhde Shedden Australia Pty Ltd
Marubeni Corporation	Vattenfall AB
Mitsubishi Corporation	Vattenfall Europe
Mitsui & Co. Ltd.	WDS Limited
Nippon Steel Engineering Co. Ltd	Woodside Energy Ltd
Norwest Corporation	Worley Parsons Services Pty Ltd
Parsons Brinckerhoff Australia Pty Ltd	Xstrata Coal Pty Ltd
Peabody Energy Australia Pty Limited	

## General Members

3D-GEO Pty Ltd	Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Alberta Innovates - Technology Futures	Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC)
Altona Energy PLC	CPC Corporation - Exploration and Development Research Institute
Asian Development Bank	Deltalinqs
ASME Australia	demos EUROPA
Australian Coal Association	Electric Power Research Institute (EPRI)
Australian National Low Emissions Coal Research and Development Ltd	Emerson Process Management Flow B.V.
Aviva Corporation Limited	ENEA Consulting
B9 Coal	Energy Research Centre of the Netherlands (ECN)
Bellona	Energy Valley Foundation
Blake Dawson	Enhance Energy Inc.
Bloomberg New Energy Finance	ENINVEST S.A
Blue Strategies LLC	EnTech Strategies LLC
Bluewave Resources, LLC	Enviro-Energy International Holdings Ltd
Brazilian Coal Association	Frommer Lawrence & Haug LLP
British Geological Survey	Fundación Ciudad de la Energía (Ciuden)
Brown Coal Innovation Australia	Gassnova SF
Calera Corporation	Geogreen
Calix Limited	Geological Storage Consultants LLC
Canadian Clean Power Coalition	Geological Survey of Ireland (GRI)
CanSyd Australia Pty Ltd	Główny Instytut Górnictwa
Carbon Capture and Storage Association	HTC Pureenergy Inc
Carbon Capture and Storage Research Consortium Nova Scotia	Hydrogen Energy California LLC
Carbon Counts	IEA Greenhouse Gas R & D Programme
Carbon Dioxide Reduction & Sequestration R&D Center	Industrial Technology Research Institute (ITRI)
Carbon Management Canada Inc	Infrastructure Partnerships Australia
Cardiff University	InnoSeptra
CCS TLM	Institute for Studies and Power Engineering for Romania
CE.Si.S.P (Interuniversity Centre for the Development of Product Sustainability)	Integrated Carbon Sequestration Pty Ltd
Central Petroleum Ltd	Integrated CO2 Network
Centre for Research and Technology Hellas - Solid Fuels Technology & Applications	Interkonsult Limited
CH2M Hill Australia Pty Ltd	International Aluminium Institute (IAI)
Clean Air Taskforce	ION Engineering
Clean Energy Systems, Inc.	IPAC-CO2 Research Inc.
CO2 Capture Project Phase 3 (CCP3)	IPIECA - International Petroleum Industry Environmental Conservation Association
CO2 Solution Inc.	Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)
CO2 Technology Centre Mongstad (TCM)	Japan CCS Company Limited
CO2Sense Ltd	Japan Coal Energy Center (JCOAL)
Coal Resources and Mining Engineering Co., Ltd	Japan NUS Co. Ltd (JANUS)
Coal Utilization Research Council	Jupiter Oxygen
	Korea Advanced Institute of Science & Technology



# APPENDIX B

## LIST OF MEMBERS (CONT.)

(KAIST)  
Korea CCS Association (KCCSA)  
Korean Institute for Advanced Engineering  
Latin American Thematic Network for the CO2 Capture and Storage  
Lawrence Livermore National Laboratory  
Liberty Resources Limited  
Long O Donnell Associates Ltd  
Low Carbon Society Japan  
M.E.T.T.S. Pty Ltd  
National Institute of Marine Geology and Geoecology  
Nature Research Centre of Lithuania  
New Energy and Industrial Technology Development Organisation (NEDO)  
Norton Rose  
NTT Data Institute of Management Consulting Inc  
Oxand S.A  
Oxyfuel Technologies Pty Ltd  
Petroleum Technology Research Centre Inc.  
Petrophysical Institute Foundation (IPf)  
Polish Geological Institute - NRI  
Powerspan Corp.  
Process Group Pty Ltd  
Quality Energetics JSC  
Ramgen Power Systems  
Reed Smith LLP  
Register Larkin Ltd  
Research Institute of Industrial Science and Technology (RIST)  
Research Institute of Innovative Technology for the Earth (RITE)  
ResourcesLaw International Associates Pty Ltd  
ROAD Project (Maasvlakte CCS Project C.V)  
Rotterdam Climate Initiative  
RPS Group plc  
RWE Power AG  
Sargas AS  
Scottish Carbon Capture and Storage  
Scottish Enterprise  
Scottish European Green Energy Centre  
Senergy Alternate Energy Ltd  
Seoul National University  
South African National Energy Research Institute (SANERI)  
Southern States Energy Board  
Summit Power Group

Technovation Partners Co. Ltd  
Tele-Rilevamento Europa - T.R.E srl  
Texas Carbon Capture and Storage Association  
The Carbon Sequestration Council  
The Climate Group  
The Clinton Foundation  
The Institute of Applied Energy  
The National Centre for Carbon Capture and Storage (NCCCS)  
TNO Consulting  
Tokyo Institute of Technology  
UCG Association  
United States Energy Association  
University College of London  
University of Ballarat  
University of Leeds (Low Carbon Combustion Centre)  
University of Mining and Geology of Bulgaria  
University of Tokyo  
US Carbon Sequestration Council (USCSC)  
World Coal Association  
World Petroleum Council  
World Steel Association  
Yonsei University  
ZEEP  
Zero - Zero Emission Resource Organisation  
Zero Emission Development Institute  
ZeroGen Pty Ltd

### Collaborating Participants

International Energy Agency  
International Energy Forum  
OPEC  
The World Bank

### Key

Members 326  
(inclusive of 11 Foundation Members)

List current at 13 September 2011.

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All information correct at 13 September 2011.



ABOUT THIS PAPER STOCK: MANUFACTURED CARBON NEUTRAL PRODUCTS FOR WHICH THE CARBON EMISSIONS CREATED DURING THE MANUFACTURING PROCESS ARE CALCULATED, REDUCED AND THEN OFFSET, HOWEVER EMISSIONS 'FROM CRADLE TO GRAVE' ARE NOT ASSESSED. THE CALCULATED FOOTPRINT IS THEREFORE RESTRICTED TO THE MANUFACTURING PROCESS WITHIN THE MILL GATES ONLY AND DOES NOT INCLUDE DELIVERY TO THE CONSUMER. RENEWABLE ENERGY ENERGY OBTAINED FROM SOURCES THAT CAN BE NATURALLY REPLENISHED. CURRENT FORMS USED BY PAPER MILLS INCLUDE SOLAR, HYDROELECTRICITY (COMMERCIAL AND SMALL-SCALE), BIOMASS, WAVE AND WIND POWER. FOREST MANAGEMENT THESE PAPERS ARE TOTALLY DERIVED FROM RESOURCES WHICH ARE MANAGED TO ENSURE THEIR RENEWABILITY FOR GENERATIONS TO COME. ELEMENTAL CHLORINE FREE (ECF) PULP IS BLEACHED USING PROCESSES THAT DO NOT USE ELEMENTAL CHLORINE GAS, REDUCING SIGNIFICANTLY THE AMOUNT OF TOXINS RELEASED.

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