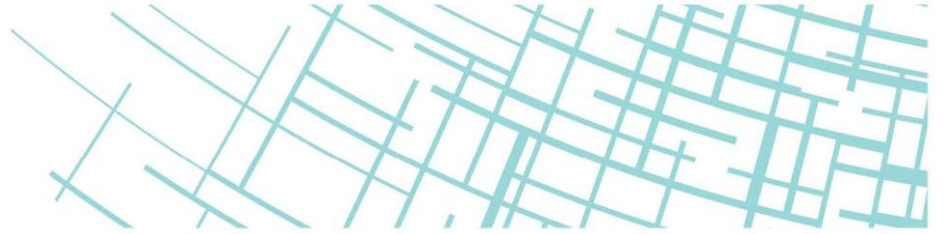




GLOBAL  
**CCS**  
INSTITUTE



# **GLOBAL CCS INSTITUTE PROGRESS REPORT ON ACTIVITIES**

**For the period 1 July – 30 November 2011**



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# 1 POSITIONING AND IMPLICATIONS ON FUTURE DIRECTION OF THE INSTITUTE

The Global CCS Institute is committed to the acceleration of carbon capture and storage (CCS) technologies as they have a vital role in the mitigation of greenhouse gas emissions, specifically carbon dioxide (CO<sub>2</sub>). This global work is generously supported by the Australian Government through the Department of Resources, Energy and Tourism. A key development for the future of the Institute was the term of this funding being extended until 30 June 2017. This will give the Institute time to plan and source new revenue as the Australian Government's funding progressively declines over the next few years.

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.

The Institute's focus areas demonstrate how the Institute will execute its role and work towards its aim of becoming a centre of excellence. The activities, deliverables and budgets in this document are built around the three focus areas, which are:

- **Sharing knowledge**
  - Collecting information to create a central repository for CCS knowledge.
  - Creating and sharing information to fill knowledge gaps and build capacity.
- **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.
- **Assisting projects**
  - Bridging knowledge gaps between demonstration efforts.
  - Developing project specific solutions, particularly amongst early movers.

The Institute's people work within a set of core values to realise its objectives and deliver efficient and effective service to Members.

**Globally Collaborative** – Committed to enabling, providing and communicating ongoing opportunities to



the CCS community.

**Value Diversity** – Committed to harnessing the diversity of ideas, expertise and experience of stakeholders and employees to drive innovative outcomes.

**Create and Share New Ideas** – Committed to engaging with Members and other stakeholders to identify, create and share solutions.

**Outcomes Focused** – Committed to maintaining a clear sense of purpose and focus on outcomes and to measure success through the delivery of results.

Extending the term of the Australian Government's funding for the Institute has given greater certainty for the future, and enabled the continuation of long-term business planning. At the same time, the reduction in total funding has forced reprioritisation of activities, and in particular a reduced focus on project funding as a means of gaining knowledge. The Institute is currently considering its Future Project Approach, but this is likely to mean a shift away from the initial large Project Support Program funding agreements towards a number of avenues to address strategic gaps in the Institute's project portfolio, to access information to fill knowledge gaps, and to maintain good relationships with CCS projects around the world. The Institute will be looking to ensure flexibility to use more information gathering avenues and an ability to target and access a wider pool of knowledge sources than at present.

During the current reporting period, the Institute has taken several important steps towards future funding diversification. An extension of funding from the US State Department was successfully negotiated, doubling funding from that source to US\$1 million in total. The Institute was also the successful bidder to provide the secretariat for the EU Project Network, a contract worth €3 million over four years from January 2012. Several other significant funding opportunities have also been considered, but have either been put on hold by the proponent or have been judged by the Institute to not be appropriate at present. The Institute will continue to seek out funding opportunities that match its strategic goals, to supplement Australian Government core funding. Development of a detailed funding diversification strategy has also commenced, with Board consideration of a preliminary scoping paper in October 2011. Further work will be undertaken on this strategy in the lead-up to the Institute's next Board and Senior Executive Strategic Workshop in February 2012.

Future funding opportunities will have to build on the Institute's strengths. The Institute is becoming recognised as a key source of information on global CCS trends and developments. For example, the website now has in excess of 1200 unique visitors each day, and in the first five weeks of its launch, the 2011 Status Report was downloaded by more than 2800 people. Institute staff are increasingly being sought out for their skills and knowledge. All these factors point to future opportunities, but there are significant obstacles to be overcome. The global economic environment is highly uncertain, with concern over European sovereign debt weighing on global markets, affecting regional growth prospects and severely limiting affected government spending programs. This is likely to mean a lessening of momentum in addressing climate change issues, adding to the lack of progress in the United States over national climate change policies. Against this background, the Institute intends to strengthen its advocacy efforts, to emphasise the role that CCS can play in combating climate change and also greatly increase its Member engagement efforts, to better communicate the role the Institute can play in advancing the cause of CCS.

## 2 REPORTING PERIOD

This Progress Report is related to the period from 1 May 2011 to 30 November 2011.



## 3 REPORT ON WORK PROGRAM AND OUTCOMES

### 3.1 Progress against the Work Program

The Institute has made considerable progress in implementing its Work Program. The table below outlines activities completed against the 'Progress Report Requirements' as set out in the Work Program.

	Business deliverable	Progress against deliverables	Timing
<b>SHARING KNOWLEDGE</b>			
3.1.1	<b>Deliver OpenCCS – a collaboratively developed methodology for CCS Deployment: an online reference source of how to deliver a CCS project</b>		
3.1.1.1	Pilot complete, providing: <ul style="list-style-type: none"> <li>an overall methodology for CCS project delivery</li> <li>priority concept and reference articles</li> <li>ongoing delivery strategy for future enhancements</li> </ul>	<p>The OpenCCS pilot phase is now complete. It focused on establishing the OpenCCS 'frame' which is the design activities across a CCS project. The population of the end-to-end methodology finished in November 2011, with over 350 activity pages making up the approach. OpenCCS is further described on its <a href="#">main landing page</a>.</p> <p>In addition, a number of concept and reference articles have been developed to explain basic concepts of CCS, particularly around technology. The ongoing strategy for building OpenCCS is also complete, with a number of revisions made to the approach during the pilot in relation to quality control, peer review and information accessibility.</p>	Qtr 1 Completed
3.1.1.2	Future enhancements to OpenCCS, focusing on developing methodologies and best practice content related to: <ul style="list-style-type: none"> <li>Technology</li> <li>Policy and Regulation</li> <li>Commercial and Financial</li> <li>additional integration with Project Knowledge Products</li> </ul>	Broadening and enhancing OpenCCS methodologies is an ongoing task and is progressing as planned. The initial focus has been on creating definitional and best-practice content in relation to technology. The next phase will commence in early 2012 and will have a greater focus on policy, legal and regulatory, and commercial and financial issues and methodologies. There has also been significant progress made in linking knowledge products from a number of projects into each activity page of the methodology. All of this work will continue through this financial year.	Qtr 3 In progress
3.1.2	<b>Provide up to date CCS knowledge and information through the Institute's digital platforms to inform CCS community stakeholders and the general public</b>		
3.1.2.1	Public website updates: <ul style="list-style-type: none"> <li>➤ Key knowledge products (e.g. project report)</li> </ul>	The approach of delivering content through an advanced set of digital platforms is working well. Over <a href="#">100 publications</a> have been delivered over the past year and blogs on the topics of policy, legal	On going In progress



	<ul style="list-style-type: none"> <li>➤ Corporate content updates</li> <li>➤ Blogs</li> <li>➤ Newsletter</li> <li>➤ Rich media releases (e.g. videos, podcasts)</li> <li>➤ Community edits or discussions</li> <li>➤ Project map update</li> <li>➤ Data visualisations (e.g. interactive charts)</li> </ul> <p>This will be complemented by knowledge shared in the Institute’s private extranet platform with a more focused group of stakeholders</p>	<p>and regulation, technology, commercial and finance, public engagement and capacity development are <a href="#">published daily</a>. <a href="#">Project map updates</a> are made on a regular basis to ensure the Institute provides the most up-to-date reference of large-scale, integrated projects. This content originates from within the Institute and from its members and significant progress has been made in building a ‘community’ of authors and in putting quality control processes in place for delivering content. Newsletters, social media and rich media, including <a href="#">webinars</a>, are further used to explain and disseminate content to a wider audience.</p> <p>The popularity of the online knowledge platform has grown significantly over the past year. Some key figures:</p> <ul style="list-style-type: none"> <li>• The platform has in excess of 1200 unique visitors each day and around 2000 visitors on the day of the launch of the <i>Global Status of CCS: 2011</i> report. As a point of comparison, the previous public site (decommissioned September 2010 when the new site was launched) had around 100-200 visitors / day.</li> <li>• In the first five weeks of its launch, the 2011 Status Report was downloaded by more than 2800 people and this number continues to increase.</li> <li>• Over the past three months, there have been approximately 80,000 visitors to the public knowledge sharing platform who have come to gain knowledge from the Institute about CCS projects and developments around the world.</li> </ul> <p>Network collaboration is driven primarily through the extranet (see section 3.1.3.2 and 3.1.3.3 for more details). Online collaboration on the public site is primarily driven through OpenCCS and blog commenting and will be significantly improved with the launch of Q&amp;A functionality in late 2011. Data visualisation is an area for improvement that is being re-designed with expected improvements to be released in early 2012.</p>	
3.1.2.2	Disseminate knowledge gained from all PSP projects through reports and publication of evidence from project activity (including webinars, road shows, and workshops)	Following the recent execution of funding agreements with the ROAD project (Netherlands), CarbonNet (Australia) and Maersk Oil (Denmark), and the completion of the funding agreement with the Tenaska/Entergy Nelson 6 Project, there are currently ten active projects in the Institute’s Project	Quarterly In progress



Support Program, being:

- [Rotterdam CCS Network Project](#), Rotterdam, Netherlands;
- [Tenaska Trailblazer Energy Center](#), Texas, USA;
- [TransAlta Project Pioneer](#), Alberta, Canada;
- [AEP Mountaineer](#), West Virginia, USA;
- [Getica CCS Demonstration Project](#), Oltenia, Romania;
- [Rotterdam Opslag en Afvang Demo \(ROAD\)](#), Rotterdam, Netherlands;
- [The Collie South West Geosequestration Hub Project](#), Collie, Western Australia, Australia;
- [Victorian CarbonNet Project](#), Victoria, Australia;
- [CO<sub>2</sub> Shuttle Shipping Study](#), Chiyoda Corporation, Tokyo, Japan; and
- Maersk Project, Norway (recently signed in October 2011).

There have been 19 reports published from these projects on the Institute's web-site since the last progress report, bringing the total to 28.

In addition, knowledge gained from projects has been disseminated via webinars, road shows, and workshops. Since the last Progress Report the Institute has conducted the following webinars:

- Jeff James and Helen Manroe, Directors at Tenaska, US: [Public engagement community approach at the Tenaska Trailblazer Energy Center Project](#);
- Ernie Perkins, a geologist based in Alberta, Canada: [CO<sub>2</sub> EOR and the transition to carbon storage](#);
- Don Wharton, Vice-President of Sustainable Development at TransAlta: [Public perceptions of CCS – Polling results from the Project Pioneer in Alberta, Canada](#);
- Allan Baker, Managing Director and Global Head of Power at Société Générale: [Barriers to project finance for CCS](#); and
- Elvira Huizeling, Special Projects, Capture, ROAD Project: [ROAD Project - CO<sub>2</sub> capture plant FEED study](#).

Webinar attendance is increasing with 80-100 registrants for the first four webinars and the most recent having over 250. They are also made available



		<p>online after the event and have received on average 200 views.</p> <p>Further activities since the road shows and workshops in February and April 2011 in Australia, Korea and Japan, include presentations given by project representatives at the Institute’s Members meetings in Rotterdam and Melbourne; presentations on shipping studies coinciding with the opening of the Institute’s Japan Office; and the preparation of a road show to be held in Washington DC in January 2012 that is in addition to the two held in November 2011 in Canada and the US (see section 3.1.13.8 for more details).</p>	
3.1.3	<b>Establish and engage with existing knowledge sharing networks</b>		
3.1.3.1	<p>Complete Intergovernmental knowledge sharing approach with the Major Economies Forum (MEF) CCUS Action Group</p>	<p>An intergovernmental knowledge sharing network has been convened amongst seven of the key governments delivering large-scale CCS demonstration programs. Participants include; Australia, Canada, Alberta, the European Commission, Norway, the United Kingdom and the US. The network complements the knowledge sharing activities underway internationally. Key outcomes from the network include:</p> <ul style="list-style-type: none"> <li>• A set of knowledge sharing framework principles to help Governments maximise the benefits of CCS demonstration programs through implementation of effective knowledge sharing arrangements.</li> <li>• A framework for knowledge collection to ensure that regional knowledge sharing efforts can effectively exchange equivalent knowledge on a reciprocal basis with a view to supporting the rollout of next-mover projects.</li> </ul> <p>The formal work paper, being the <a href="#">Global Knowledge Sharing Framework</a>, was completed and published in June 2011. These outcomes were fed into the Major Economies Forum (MEF) through the CCUS Action Group in order to achieve greater awareness and uptake.</p> <p>In the context of projects supported under the Australian CCS Flagship program. Discussions have been held with the Australian Government as to how best the Institute can assist in building a CCS capability in Australia through the provision of an appropriate and internationally consistent</p>	<p>Qtr 1 Completed</p>





		knowledge sharing framework.	
3.1.3.2	Deliver Japanese Knowledge Sharing network	<p>A Japanese Knowledge Sharing Network has been established. There is now a face-to-face and an online knowledge network on the Institute's extranet for 17 major CCS-related organisations in Japan from industry and Japanese public and private research organisations.</p> <p>Through this network a common communications framework for CCS in Japan was established, a summary of which is <a href="#">published on the Institute's public website</a> and has been presented to members in Japan in September 2011.</p> <p>Planning is now underway for the next phase of the program which will involve rolling out these communications materials through direct engagement with various stakeholders. The network will also broaden its knowledge sharing scope in areas such as technology and policy issues for CCS in Japan.</p>	Qtr 1 Completed
3.1.3.3	Provide significant support for 3 – 5 additional knowledge networks, such as providing dissemination of knowledge, governance models and processes, linking of knowledge assets and hosting IT platform	<p>This work is progressing as planned. In addition to the Japanese knowledge sharing network, a major knowledge network has been setup and is operating for the Australian National CCS Council to focus on establishing common communications messages for CCS in Australia. The Institute is also proposed to lead knowledge sharing for the European Commission CCS Project Network for the next 4 years. This work is in the final stages of negotiation and the project is set to begin in January 2012.</p> <p>Other online networks that have been established include:</p> <ul style="list-style-type: none"> <li>• CCS Program Managers Network (Australia);</li> <li>• CCS Costs Network (Global)</li> <li>• ICO2N – CO<sub>2</sub> Purity Study (Canada); and</li> <li>• CCS Regions Network (EC).</li> </ul> <p>Most of these online networks are still in the early stages of development and should mature over the next year.</p>	Qtr 3 In progress
3.1.5	<b>Strategically engage in CCS capacity development initiatives in developing countries, including China, India, Malaysia, Indonesia, South Africa and Mexico</b>		



3.1.5.1	Finalise the Regional Profile for Indonesia to enhance understanding of the market environment that will have an effect on the deployment of CCS and publish fact sheets based on this profile	A Regional Profile for Indonesia is near completion. A fact sheet is being developed for public release.	Qtr 1 In progress
3.1.5.2	Finalise Scoping Studies to assess the potential for the deployment of CCS technologies in selected developing countries and publish these studies, subject to host government agreement.	Scoping studies are being developed for India, Malaysia and Mexico. <b>India:</b> In October 2011 the Institute signed a contract with The Energy Research Institute (TERI) of India, to undertake a CCS Scoping Study and Capacity Assessment for CCS in India. The aim of the study is to identify key CCS considerations from a policy-making perspective to enable the Institute to initiate and facilitate discussions on CCS within government and industry. From this study the Institute will develop a capacity development work program and the activities within this program will be made publicly available. The duration of the study should be approximately six months. <b>Malaysia:</b> As previously reported, a CCS scoping study for Malaysia Scoping Study was completed in partnership with the Clinton Climate Initiative and the Malaysian Ministry for Energy, Green Technology and Water (KeTTHA). This was formally delivered to the Malaysian Minister for Energy on 24 January 2011. <b>Mexico:</b> A draft Mexico Profile has been developed by Environment Research Management (ERM) and is being finalised. This profile has been developed to inform the Institute on key aspects of the Mexican environment relating to CCS.	Qtr 3 In progress
3.1.5.3	Finalise Capacity Assessments of the strengths and gaps that will affect the deployment of CCS in selected developing countries and disseminate the results of these assessments through presentations and the Institute's website	<b>India:</b> As noted in 3.1.5.2, a Capacity Assessment will be undertaken as part of the Scoping Study and Capacity Assessment project. <b>Malaysia:</b> As previously reported, a Capacity Assessment has been undertaken and a Capacity Development Program developed in consultation with Malaysian stakeholders. The program currently identifies nine activities of focus in the next 6-8 month period. This has been shared through presentations given at a Malaysian Roundtable, with key stakeholders from	Qtr 3 In progress



government and industry.

Recent activities include a jointly hosted Institute/KeTTHA half day CCS Session at KeTTHA's large Green Technology Conference on 9 September 2011. This attracted approximately 50 participants who engaged with the six person panel whose members were:

- Dr Amir Hisham Hashim, TNB, Strategic Planning;
- Dr Mohd Hariffin Boosroh, TNB, Research;
- Mr Saji Raghavan, Country President, Malaysia – Alstom Power),
- Mr Michael Putra, CO<sub>2</sub> Policy Advisor, Shell;
- Chris Short, Chief Economist, Global CCS Institute; and
- Jessica Morton, Capacity Development Officer, Global CCs Institute.

**Mexico:** Institute representatives met with Mexican stakeholders in a week of intensive meetings from 29 August to 2 September 2011. During this time, two workshops were held with the Mexican CCS Working Group, as well as individual meetings with most of the organisations represented on the Working Group. During this week a Capacity Assessment was undertaken, and the initial results were then presented back to the Working Group later in the week. Further feedback has been requested in order to finalise the Capacity Assessment. A number of near term actions were identified and will be progressed in a partnership between the Institute, the Mexican Secretariat of Energy and other relevant Mexican stakeholders that form part of the Mexican CCS Working Group, including:

- Development of a national CCS Strategy;
- CCS workshop targeted at climate change and environment policy makers, focused on consideration of CCS in mid-term Special Program on Climate Change;
- Registration to attend International Geological Congress hosted by Geoscience Australia, in Brisbane 2012, and apply for Institute supported scholarships to attend the CCS-stream;
- Attendance at Carbon Sequestration Leadership Forum supported training (funded by the Institute, UK, Canada and Norway), managed by the Mexican Electrical Research



		Institute.	
3.1.5.4	Establish organisational relationships to support CCS dialogue in Korea, India, Indonesia, Malaysia, Mexico and South Africa	<p><b>Korea:</b> The Institute's key relationships in Korea are with the Korea CCS Association (KCCSA) and the Korean Electric Power Company (KEPCO). The Institute negotiated a Memorandum of Understanding with the KCCSA in May 2011 to strengthen the cooperation between the Institute and Korea in knowledge sharing and collaboration in support of the demonstration and commercialization 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. KEPCO is the leading private investor and developer on the two commercial-scale CCS projects under development in Korea.</p> <p>A workshop held in collaboration with the Rotterdam Climate Initiative was held in Seoul in April 2011 and attended by over 40 people, representing Korean Members and the organisations (energy, heavy industry, shipping) represented by the KCCSA. The Rotterdam hub concept and lessons learnt from this project was highly applicable to Korea's ambitions to develop domestic CCS. There was a high level of interaction and participation and the key themes were the current status and future development of regulatory and incentive (financial) systems that enabled the development of projects. Also, refer section 3.1.13.3 below.</p> <p><b>India:</b> It is anticipated that through consultation meetings that will be held as part of the Scoping Study (refer section 3.1.5.3 above) the network of Indian stakeholders will be expanded.</p> <p><b>Indonesia:</b> The Institute is fully engaged with a number of Indonesian stakeholders from government and industry. Parties have expressed an interest in working with the Institute and the ADB on CCS in Indonesia. Given the near completion of the Indonesia Regional Profile, the Institute is now developing a strategy for further engagement in Indonesia to better target and coordinate CCS efforts in the region. The Institute aims to have the strategy implemented by the Quarter 3 of 2011-2012. Also, refer to section</p>	Qtr 3 In progress



		<p>3.1.5.1 above.</p> <p><b>Malaysia:</b> The Institute has a strong relationship with the Ministry of Energy, Green Technology and Water. The Institute also has contacts in other key CCS-related organisations.</p> <p><b>Mexico:</b> The Institute has made contact with all the key CCS-related organisations in Mexico and will continue to develop these relationships through the implementation of a capacity development program. Also refer to section 3.1.5.3 above.</p> <p><b>South Africa:</b> The Institute engages with all the key CCS-related organisations in South Africa. Recent activities with South Africa include:</p> <ul style="list-style-type: none"> <li>• supporting a South African study group comprising of government, industry and NGO stakeholders to visit the CO2CRC’s Otway Project and Canberra that took place from 11-14 July 2011 to inform South Africa’s research into a test injection experiment;</li> <li>• developing a South African CCS case study video that will be available on the Institute’s website;</li> <li>• managing the CSLF’s support of South African capacity development projects;</li> <li>• representation and presentations at the South African CCS Week in October 2011; and</li> <li>• discussions regarding the implementation of the Institute’s CCS Regulatory Toolkit are progressing. Also refer to section 3.1.11.1 below.</li> </ul>	
3.1.6	<b>Provide Australian government representatives with an overview of the reporting outcomes against the Key Activities during the Progress reporting period</b>		
3.1.6.1	Undertake six monthly workshops with RET representatives and provide an overview of Business Deliverables (including reports and studies) finalised by the Institute during the prior period	The Institute has and will meet all reporting deliverables with the Department of Resources, Energy and Tourism.	Qtr 2 and Qtr 4 In progress
<b>FACT-BASED ADVOCACY</b>			
3.1.7	<b>Publish the 2011 Global Status of CCS Report on the level and nature of global CCS activities and the major opportunities and challenges experienced by large-scale integrated projects (LSIPs)</b>		
3.1.7.1	Publish the <i>Global Status of CCS</i> :	On 4 October 2011, the Institute published its <a href="#">Global Status of CCS: 2011</a> report. This launch	Qtr 2



	2011 report	<p>was supported by a two week blogging campaign on the Institute's website.</p> <p>This report is the Institute's flagship publication and consolidates the current understanding of the level and nature of global CCS activities, as well as the major opportunities and challenges experienced by large-scale integrated CCS projects.</p> <p>There has been a strong response to the report and in the first five weeks after release it was downloaded over 2800 times.</p>	Completed
3.1.8	<b>Building on the CCS Ready report of 2010 and related papers, publish an updated CCS Ready report to assist Governments considering implementing a CCS ready policy</b>		
3.1.8.1	Publish 2011 CCS Ready Report	<p>The Institute has developed a comprehensive CCS Ready (CCSR) work program that will consist of a series of analytical over the next 18 months. The reports will focus on the development, implementation and observance of CCSR policies from a variety of different key actor perspectives.</p> <p>Report 1 will analyse, evaluate and give voice to the potential impacts of a CCSR policy from the perspective of government actors (policy development and execution, national interest, adoption of world best practices etc). The aim is to identify how and/or whether CCSR policies can help deliver on a broad suite of government objectives (such as economic, environment and energy) while positively assisting private sector interests (e.g. minimising their asset risk of carbon lock in) and CCS development more generally.</p>	Qtr 2 In progress
3.1.9	<b>In conjunction with strategic partners, review current material available on storage guidelines, identify gaps and develop a consolidated compendium of storage guidance</b>		
3.1.9.1	Along with other industry participants, and by way of membership, contribute to and participate on the Steering Committee of two DNV Joint Industry Partnerships (JIP). DNV CO2WELLS JIP and DNV CO2RISKMAN JIP are developing	<p>The CO2WELLS Joint Industry Project (JIP) resulted in a <a href="#">Guideline for selection and qualification of sites and projects for geological storage of CO<sub>2</sub></a>. It was published in June 2011 and is available on the Institute's website. This Guideline provides a common industry framework for risk evaluation of existing wells at CO<sub>2</sub> storage sites and a risk-based procedure for re-qualification</p>	Qtr 2 In progress



	industry best practice guidelines/standards in relation to aspects of CO <sub>2</sub> storage and safety and will publish industry ‘well integrity’ and ‘storage risk assessment’ guidelines.	<p>of existing wells for CO<sub>2</sub> injection. It complements the CO<sub>2</sub>QUALSTORE JIP guideline published in 2010.</p> <p>The CO<sub>2</sub>RISKMAN JIP cuts across all previously published guidelines: CO<sub>2</sub>CAPTURE, CO<sub>2</sub>PIPETRANS, CO<sub>2</sub>WELLS, CO<sub>2</sub>QUALSTORE, with the aim to develop a guidance document that efficiently helps the CCS industry deliver effective risk management of the safety and environmental major accident hazards associated with the CO<sub>2</sub> handling system of a CCS operation. This Guideline is expected to be published in June 2012.</p>	
3.1.9.2	Release Storage Guidance Compendium	<p><a href="#"><i>Review of existing best practice manuals for carbon dioxide storage and regulation</i></a>, which is a desktop study prepared for the Institute by CO<sub>2</sub>CRC, has been published and forms a basis for the Storage Guidance Compendium.</p> <p>Feedback from Members was sought in May and June 2011 as to areas and topics still outstanding through the Institute’s Newsletter and direct approaches to experts.</p> <p>One area that is now being addressed by the Institute is a management guideline for geomechanical issues and risks associated with storage. This work will be finalised by the end of 2011.</p> <p>A second area identified is related to portfolio risk management methodologies for storage exploration and development. This topic reaches beyond the storage compendium’s scope and is proposed to be undertaken by the Thematic Working Group on Project Integration Challenges.</p> <p>The compendium project is largely on target for completion by the end of 2011, but some contracting requirements may delay this delivery to Quarter 3 of 2011-12.</p>	Qtr 2 In progress
3.1.10	<b>Review CCS Liability issues, including valuing of risk, risk/insurance provisions, comparisons to other industries and federal/state requirements</b>		
3.1.10.1	Published report on status of liability issues	<p>This work will provide an overview of jurisdictional approaches to long term-liability, as well as summarising issues concerning the analytic evaluation of the range of potential impacts and calculation of the financial consequences arising from CCS.</p> <p>A key input to the review is the completion of work</p>	Qtr 2 In progress



		<p>being overseen by the CCS Valuation Study Group. The Valuation Group is overseeing a study on valuing the human health, ecological and climate risks from CCS (both the risks and the monetary value of an event). The Valuation Group is jointly funding the study and contains representatives from Chevron, Duke Energy, Southern Company, State of Wyoming, EPRI, World Resources Institute, Natural Resources Defence Council, Environmental Defence Fund and the Institute.</p> <p>The valuation study is undertaking two tasks:</p> <ul style="list-style-type: none"> <li>• the development of a statistical methodology to derive damage estimates across all stages of an operating CCS facility; and</li> <li>• the application of that methodology to a former CCS project (a CCS project that did not proceed through to construction) using real project information and data drawn from various risk assessments undertaken.</li> </ul> <p>A draft of this study is due to be delivered to the group in December 2011.</p>	
3.1.11	<b>Roll-out CCS Regulatory Test Toolkit – a guide to assist Governments to test understanding of, and improve, their regulatory frameworks</b>		
3.1.11.1	Working with Governments which express an interest, roll-out the toolkit in up to four countries to specifically test consent and permitting processes	<p>The Institute has continued to work collaboratively in the deployment of its CCS Regulatory Test Toolkit.</p> <p>The Institute’s first full deployment of the Toolkit was undertaken in <a href="#">July 2011 with the Romanian Government</a>, which used the process to assess the regulatory regimes surrounding the Getica large-scale CCS demonstration project. A report detailing the processes involved, as well as some preliminary findings, is anticipated to be published in the next few months.</p> <p>Presentations and preliminary discussions around further deployment of the Toolkit have been delivered in a number of jurisdictions, including the Netherlands, Malaysia, Mexico, South Africa and Australia. Institute representatives also presented a detailed overview of the process at the South African CCS Week in October 2011.</p>	Qtr 4 In progress





3.1.12	<b>Produce reports and information to enhance understanding of the economic, financial and commercial issues related to the development and deployment of CCS projects</b>		
3.1.12.1	Produce a report comparing CCS technology costs with other low-carbon energy technology options.	<p><a href="#">The costs of CCS and other low-carbon technologies</a> paper was published on 2 November 2011.</p> <p>An active press and web campaign has been undertaken to support and promulgate this report.</p> <p>This paper focuses on the electric power generation industry, and examines the costs of different technologies that are expected to play a part in reducing carbon dioxide emissions to the atmosphere.</p> <p>The Institute has been tracking and reporting on the latest cost studies of various CCS technologies for the past two years. Together with recent studies into other low-carbon technologies, current cost estimates for a range of low-carbon technologies are compared including CCS, wind, nuclear, and solar thermal and solar photovoltaic technology.</p>	Qtr 1 Completed
3.1.12.2	Develop an economic model for sensitivity analysis at screening level on private public partnership (PPP) projects	<p>The Japan Bank for International Cooperation (JBIC) and the Institute will co-develop and co-fund the development of a financial model for the purposes of evaluating CCS projects at the screening level, with sensitivity analysis on the financial impacts of variables such as carbon price, government funding, revenues from enhanced oil and tax credits.</p> <p>This model will provide the Institute (and other stakeholders with whom the model may be shared) with the ability to financially evaluate CCS projects at the screening level, including the impact of aspects related to some types of PPP arrangements. It will have the necessary flexibility to enable users to adapt the model, including its inputs, in the future. The results will also provide future input to the Institute’s annual Global Status of CCS report.</p> <p>An initial workshop with the successful service provider, KPMG, was undertaken on 31 October 2011. Development of the model and completion of the analysis, with accompanying report and user manual, is scheduled to be completed and provided by mid-December 2011.</p>	Qtr 2 In progress
3.1.12.3	Produce a report on possible	This report is currently in the planning stages and a	Qtr 2



	commercial pathways for CCS	<p>steering group, drawn from Members, is being created to guide its development.</p> <p>This work will involve undertaking an assessment of long-term deployment pathways for CCS and other low-carbon technologies. It will also build on recent work linking RD&amp;D expenditure to both the rate of development and deployment of clean technologies and the extent to which the costs of mitigation are reduced when combined with a price on carbon.</p> <p>This project is scheduled for completion in Quarter 4 of 2011-12.</p>	In progress
3.1.12.4	Publish a Benchmarking Summary report on ‘theoretical’ cost studies against actual projects	<p>This work is expected to be delivered in Quarter 4 of 2011-2012. There are key challenges that have been identified and currently consist of:</p> <ul style="list-style-type: none"> <li>• only few CCS projects, notably none in the power generation sector, have progressed through the stages of development, from planning to construction and into operation, and thus, have full cost accounts;</li> <li>• actual project cost analysis will require sophisticated normalisation due to their strong dependence on the specific project proposition, including the host country economy, site conditions, project proponents, owner contributions and competition among technology suppliers; and</li> <li>• limited access to actual cost data due to the confidentiality applied by projects and technology suppliers.</li> </ul> <p>How to manage these challenges is currently being carefully considered.</p> <p>The Institute does have a set of comprehensive CCS cost models. These models will be used for the benchmarking study and the Institute will continue to validate and update the models using available information from FEED studies provided through the Institute’s Project Support Program, from selected contacts in projects or where publicly available.</p> <p>In addition, the <a href="#">proceedings of the first meeting of the Institute supported CCS Costs Network</a> were released in November 2011. Planning is underway for the second meeting to be held in the first half of 2012.</p>	Qtr 3 Under review
3.1.12.5	Assess the financial / commercial	take forward work on the overview/best practices	Qtr 3



	<p>risks and 'gaps' facing projects, including mitigation strategies.</p> <p>Produce:</p> <ul style="list-style-type: none"><li>➤ Overview / Best Practices Report</li><li>➤ 'Toolkit' for assessing and mitigating risk</li></ul>	<p>report.</p> <p>For the first time, the Institute's 2011 annual <i>Global Status of CCS</i> report included a chapter that analysed CCS projects in terms of '<a href="#">Making the Business Case for CCS</a>'. This included an assessment and status update on the complexities faced by projects in putting together a viable business case based on adequate commercial incentives and mitigating risk. It also highlighted the critical role of both the government and the private sector in resolving business case issues and the difficulties for CCS projects to attract financing.</p> <p>The Institute has continued to work closely with its partners under the current Project Support Program on specific knowledge sharing related to their project's economic, financial, and commercial issues. This included working with the Tenaska Trailblazer Energy Center Project in the US, the TransAlta Pioneer Project in Canada, the Getica Project in Romania, and the RCI and ROAD Project in the Netherlands, to review and provide input on draft reports submitted by the project proponents. In the past six months the following three reports have been finalised and posted on the Institute's public website:</p> <ul style="list-style-type: none"><li>• <a href="#">Building a consortium to develop a new pulverised coal plant with post-combustion carbon capture</a>;</li><li>• <a href="#">Bridging the commercial gap for carbon capture and storage</a>; and</li><li>• <a href="#">Rotterdam CCS Network Project: Case study methodology report</a>.</li></ul> <p>Further reports are expected to be finalised and published in December 2011 and the first half of 2012.</p> <p>The Clinton Climate Initiative (CCI), under its funding agreement with the Institute, advanced work related to assessing the financial risks facing CCS projects, including public sector financial support mechanisms. Initial consultations were held with the finance sector, a financial model was developed, and preliminary results were presented in October 2011 to the Institute's Financial and Commercial Steering Committee.</p> <p>Under commitments to support the Major Economies Forum and CCUS Action Group and to contribute to forum activity (3.1.14.1), the Institute</p>	Under review
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		established and supported a Working Group on Funding Mechanisms for Developing Countries. This Working Group's interim recommendations were presented to the CCUS Action Group in September 2011 in Beijing, with final recommendations being prepared for the Clean Energy Ministerial in April 2012.	
3.1.13	<b>Better inform the Member base, build membership value and enhance Member engagement and contributions to Institute activity</b>		
3.1.13.1	Implement a fully functional Member Relationship Management Framework	<p>To implement a fully functional Member Relationship Management Framework, the Institute scoped out priority activities to initiate Phase 1 of this project. These are:</p> <ul style="list-style-type: none"> <li>• gathering and prioritising the requirements of all business functions for a client relationship management (CRM) tool;</li> <li>• upgrading the current version of the Institute's CRM tool to enable more advanced audit and reporting functionalities of the software;</li> <li>• purchase and issuing of CRM tool user licenses to all Institute staff;</li> <li>• developing a basic training package to roll out the CRM tool to Institute staff.</li> </ul> <p>Phase 1 has been initiated and is expected to be completed by end of Quarter 4 of 2011-12.</p>	Qtr 2 In progress
3.1.13.2	Establish Institute representation to enhance CCS engagement in China and Japan	<p><b>Japan:</b> The Japan Office, being the Institute's first office in Asia, was established in Tokyo in September 2011. It is being led by the new General Manager – Japan, Mr Morikuni Makino.</p> <p>At its launch ceremony, the regional Members and the Office received a congratulatory address from Minister Ferguson for the Institute's enhanced engagement with Asia.</p> <p>The Institute also intends to recruit two to three more staff to support the General Manager.</p> <p><b>China:</b> Preparations are underway to appoint a representative in China. The intention is to engage an individual by early 2012, on a contractual basis that will help implement the Institute's China work program which is currently being finalised in consultation with the Chinese Government.</p>	Qtr 2 In progress
3.1.13.3	Finalise the Regional Profiles for Japan and Korea to enhance understanding of the market environments that will have an	<p><b>Japan:</b> The Japan regional profile was completed in March 2011. However, this profile will be revised over the next year in light of the 11 March 2011 Earthquake, and the Japanese Government's</p>	Qtr 1 In progress



	effect on the deployment of CCS	<p>review of their nation’s Basic Energy Policy.</p> <p><b>Korea:</b> The Institute is exploring the possibilities of undertaking the Korean profile in partnership with the KCCSA and other organisations. The Institute would co-ordinate the development of the profile with multiple inputs from different organisations and making use of in house data and information sources. It is expected the profile will now be completed by June 2012.</p>	
3.1.13.4	Conduct Annual Members Meeting / Annual General Meeting (Melbourne)	<p>The sixth Institute Members’ Meeting was held on 4-5 October 2011, hosting approximately 150 delegates (inclusive of Institute staff). The meeting also featured a complementary online program delivered through the Institute’s website which showed good interest from the broader CCS community.</p> <p>At this meeting it was also announced that future Member Meetings would take place only once per year and that they would be aligned with the Institute’s AGM. To support the now annual Members Meetings, the Institute will provide member engagement activities (workshops, road shows, roundtables, web-based activities, and one-to-one meetings) in all key regions.</p> <p>The Institute’s second AGM was held on Tuesday 4 October 2011 with 45 Members sending representatives to the meeting and 50 Members submitting proxy forms prior to the meeting. There was a diverse range of Members at the meeting with representatives from Government, Major Industry and General Membership.</p>	Qtr 2 Completed
3.1.13.5	Produce monthly Institute newsletter to Members	<p>The Institute newsletter was produced and disseminated to Members on the final day of the month, from April to November 2011. In several instances, readership statistics set for prior issues were exceeded in this period. Readership statistics are currently at a good level of about 30 per cent of the approximately 1800 recipients.</p>	Monthly In progress
3.1.13.6	Undertake rolling Workshops for Australian Members focused on priority Member needs, including in NSW, WA, Queensland and Victoria	<p>In April 2011, the Institute hosted a series of workshops in Melbourne, Canberra and Perth to share lessons from the Rotterdam Climate Initiative CCS project with Australian Members. The workshops were attended by representatives of government, industry and the research community.</p> <p>In May-June 2011, the Institute – in partnership</p>	Qtr 4 In progress



		<p>with Parsons Brinkerhoff and AECOM – held a series of seminars to discuss the findings of the 2010 Global Status of CCS report in Brisbane, Sydney and Melbourne.</p> <p>Seminars to discuss legal and regulatory developments were held in Sydney, Brisbane and Melbourne in November 2011. These seminars were held in partnership with Blake Dawson and were aimed at promoting the Institute’s expertise in the legal and regulatory field amongst a range of Australian Members. The Institute’s presentations focused upon highlights from the 2011 Global Status of CCS report, as well as legal and regulatory developments in a selection of Asian jurisdictions.</p> <p>It is also anticipated that another series of Australian workshops will be held in Quarter 3 or 4 of 2011-12.</p>	
3.1.13.7	Organise and deliver a range of issue-driven regional meetings, workshops and action plan activities in Europe, Middle East and North Africa	<p>A series of workshops and meetings have been held to date, including:</p> <ul style="list-style-type: none"> <li>• Workshop on North Sea Storage – 18 August 2011, London (see section 3.1.18.1 for more detail); and</li> <li>• Groundwater Meeting – 30 September 2011, Poland (see section 3.1.18.1 for more detail)</li> <li>• Project Integration Meeting – 3 November, 2011, London (see section 3.1.18.3 for more detail);</li> </ul> <p>The following workshops are currently being planned:</p> <ul style="list-style-type: none"> <li>• Transport mechanisms – Quarter 2, 2011-12;</li> <li>• Middle East and North Africa EOR Workshop – Quarter 3-4, 2011-12; and</li> <li>• Regional Meeting at Technology Centre Mongstad (TCM) – Quarter 4, 2011-12, Norway.</li> </ul>	Qtr 2 In progress
3.1.13.8	Organise and deliver up to four North America Roadshow events in the US and Canada	<p>Three North America road shows were planned for the period. This number was deemed as most cost effective for meeting the objectives of sharing project experiences and knowledge on CCS in North America, and globally. The first two road shows focused on sharing project experiences and knowledge from the projects in North America but also brought in projects from Europe (Don Valley) and Australia (Callide) so that the experience can be shared on a broader</p>	Qtr 2 In progress



		<p>global platform. They were held in:</p> <ul style="list-style-type: none"> <li>• Austin, Texas on 8 November 2011; and</li> <li>• Calgary, Canada on 10 November 2011.</li> </ul> <p>Both events were well received. There was detailed information presented on projects sharing lessons learned which led to more in-depth discussions during question and answer periods as well as during the panel session that followed. Attendance was around 30 to 35 for each which was conducive to open and frank discussions of technical, management, and regulatory issues and challenges that affect project progress and decisions.</p> <p>The third road show will focus on the policy aspects of CCS and will also bring project experience into a policy context. This road show is planned to be held in Washington, D.C. on 19 January, 2012 at the Canadian Embassy. Other governments through their respective embassy representatives, the US Department of Energy, Institute Members and stakeholders will participate in round table discussions. It is anticipated that keynote presentations will be made by the Institute along with the US Department of Energy senior officials and industry leaders. Opening remarks will be invited from the Canadian and Australian Ambassadors. A focus of the discussion will also be on large-scale integrated capture projects tied to CO<sub>2</sub>-EOR in North America as early movers that can inform global community, especially developing economies on the early economic opportunities via a carbon capture utilisation and storage (CCUS) route to expanded CCS deployment.</p>	
<p><b>Support Major Economies Forum Carbon Capture Use and Storage (CCUS) Group</b></p>			
<p>3.1.14.1</p>	<p>Contribute to Forum activity related to CCS</p>	<p>The Institute along with the IEA has been tasked with providing secretariat support to the CCUS Action Group and the CCUS Steering Committee to report on the progress of governments against the CCUS Action Group's recommendations to the Clean Energy Ministerial in April 2011.</p> <p>In September 2011, the Secretariat presented the CCUS Action Group with an update of current progress by governments against each recommendation.</p>	<p>Qtr 4 In progress</p>



		<p>The Secretariat is currently in the process of developing a questionnaire to be sent to all governments that seeks comprehensive information on the identification of any forward actions that articulate the government's commitment to progressing the recommendations. The Secretariat will present its draft report to the CCUS Steering Committee in February/March 2012.</p>	
<b>ASSISTING PROJECTS</b>			
3.1.15	<b>Implement the next phase of project support activities and manage deliverables, including by defining a range of mechanisms to support projects and gain access to knowledge of value to the global CCS community</b>		
3.1.15.1	<p>Define the financial support mechanisms and deliverables for the next phase of project support activities and the rationale for their use.</p> <p>The mechanisms will include a range of different options for assisting projects and/or knowledge acquisition and not just the Project Support Program funding agreement structure presently in place.</p> <p>Define the assurance frameworks for the mechanisms and implement once approved by Executive Committee, Technical Advisory Committee and Board.</p>	<p>Development of the strategy for the next phase of the Project Support Program (PSP) activities is being built around a multi-faceted knowledge gathering approach, involving a suite of avenues for accessing information and a wider pool of sources than at present. Key elements include a focus on filling strategic gaps, more 'targeted' methods of accessing information and greater efforts to engage directly with projects that are in execution or already in operation. The gathered information will be shared with CCS projects under development and the broader CCS community through the established knowledge sharing channels.</p> <p>Proposed avenues include:</p> <ul style="list-style-type: none"> <li>• <b>Filling of strategic gaps in the projects knowledge portfolio</b> – the current portfolio of supported projects is mostly focused towards the (coal-based) power sector in North America and continental Europe. The supported projects also currently have a strong focus on post-combustion capture feasibility and FEED studies. Future activities aim to fill gaps in the current portfolio by targeting: <ul style="list-style-type: none"> <li>○ Regions and countries: An overarching aim of future activities is new market entry into countries that are likely to be especially important in future global CO<sub>2</sub> mitigation plans and where the Institute presently has little or no project support presence (e.g. China, the Middle East and North Africa and the UK).</li> <li>○ Technologies and sectors: Greater</li> </ul> </li> </ul>	<p>Qtr 4 In progress</p>





		<p>emphasis on storage related activities, power projects applying gasification and/or oxyfuel combustion technology and non-power industries (e.g. iron &amp; steel and hydrogen production).</p> <ul style="list-style-type: none"> <li>• <b>Targeted reports to complement the above</b> – focus would be on key issues for CCS deployment that can be delivered in a single report within a period of 6-12 months and which can be undertaken in close collaboration with Institute staff. The Institute has put in place a process specifically dedicated to identifying key information needs that involves internal discipline experts, regional staff and external review.</li> <li>• <b>Structured workshops</b> – with project proponents involved in advanced CCS projects. There is an enormous amount of project information available from projects that have moved into execution or are operating; in particular with regard to their business cases (and associated risk profiles). An increased understanding of how these projects reached FID would assist other (less advanced) projects.</li> <li>• <b>Other avenues to project knowledge</b> – addresses options that may arise for example from embedded personnel in projects and secondment possibilities with the Institute.</li> </ul> <p>The assurance frameworks for the next phase of the Project Support Program activities will remain as presently in place.</p>	
3.1.16	<b>Collect, maintain and utilise up to date information for LSIPs, including through maintaining the online Projects Database</b>		
3.1.16.1	Updated data for large-scale integrated projects	<p>Early in 2011, the Institute developed and implemented a project database update procedure. This procedure continues to be followed and weekly updates are entered into the project database and <a href="#">displayed on the website</a>.</p> <p>On 6 October 2011, a major update was made to the website to reflect the new data received as part of the annual survey of CCS projects and to be consistent with the release of the 2011 Global Status of CCS report.</p>	Weekly In progress
3.1.16.2	Building on existing documented database procedures, develop supporting systems including	In addition to the project database update procedure, new procedures detailing the content, process and technology used in the annual survey	Qtr 1 Completed



	<p>communications (website, newsletter etc)</p>	<p>of CCS projects have been drafted. These procedures provide a basis to ensure that a repeatable and high quality annual survey can be carried out each year. In the 2012 annual survey these procedures will be reviewed and finalised.</p> <p>In May 2011, the Institute rolled out to projects its revised survey instrument and survey process. The data collected through this process underpins the analysis and content development of the 2011 Global Status of CCS report. The revised survey achieved a response rate of 89 per cent.</p> <p>To support communication, the Institute released in June 2011 its first quarterly update of project developments. This article mapped project developments since the release of the 2010 Global Status of CCS report and was well received by the Institute’s membership. Quarterly updates are planned for December 2011, March 2012 and June 2012.</p> <p>In addition to the quarterly update, planning has commenced on releasing time-series data on large-scale integrated projects on the website. This will make available the 2009, 2010 and 2011 core survey data, allowing others to either replicate analysis as presented in the Status Reports or undertake new analysis. This time-series data is scheduled for release in early 2012.</p>	
<p>3.1.17</p>	<p><b>Develop project survey design, methodologies and procedures, and implement an information development process to address maturity of data holdings</b></p>		
<p>3.1.17.1</p>	<p>Refine the nature and content requirements for the 2012 project survey (based on the conduct of the 2011 project survey in support of the Global CCS Status Report 2011)</p>	<p>The annual survey for 2011 and input into the 2011 Global Status of CCS report was finalised in July 2011. Preparation for the 2011 report involved redrafting the question set and rationalising the number of topics to align with writing directions for the 2011 Status Report. The redrafted survey form reduced the number of questions from 247 to 40, and achieved a response rate of 89 per cent.</p> <p>In October 2011, a review of the survey process was completed. This review highlighted the strong success of the new process as well as improvements in the areas of content, process and technology. Some of the key changes now to be made include a review of the survey form (which is a smart form) including addressing any formatting issues, building stronger direct engagement with project proponents and reviewing the database</p>	<p>Qtr 3 In progress</p>



		technology currently used. Over the next few months, these progressive changes will be made to the survey process. The 2012 annual survey is expected to be undertaken in March/April 2012.	
3.1.17.2	Develop project survey framework methodologies and procedures, including survey scheduling, and data confidentiality, access, use and dissemination	As part of preparations for the 2011 survey, draft procedures detailing the content, process and technology used in the annual survey of CCS projects were developed. These procedures provide a basis to ensure that a repeatable and high quality annual survey can be carried out each year. In the 2012 annual survey these procedures will be reviewed and finalised while giving consideration to handling survey data within the context of the Institute's maturing Information Security Management framework, and other steps to maintain data integrity.	Qtr 3 In progress
3.1.17.3	Conduct annual survey of CCS projects in support of the Global CCS Status Report	The 2012 annual survey is expected to commence in March/April 2012 and be completed by June 2012. Preparations for this are underway through the current development planning of the 2012 survey form and review of draft survey procedures.	Qtr 4 In progress
3.1.17.4	Convert the current database into an internet-based platform with integrated survey functions	Preparations for 2011 involved developing a redrafted survey form that would increase the user-friendliness of the survey for project proponents. In 2012, the survey form will be further improved to not only address any formatting issues but to also allow more efficient transfer of data between the survey form and the Institute's project database. In addition to this, planning for the 2012 annual survey will involve analysing the Institute's functional and non-functional project database requirements. The recommendations from this analysis involve the development of an internet-based platform with integrated survey functions as well as other technical options to improve the outcomes of the annual survey.	Qtr 4 In progress
3.1.18	<b>Coordinate Thematic Groups of project proponents and CCS experts around specific themes, to address issues better dealt with through a dedicated and specialist forum</b>		
3.1.18.1	CO <sub>2</sub> Storage and Groundwater Resource Management Thematic Working Group <ul style="list-style-type: none"> <li>• Workshops</li> <li>• Reports/knowledge</li> </ul>	On 18 August 2011 the Institute organised a workshop in London on 'Carbon dioxide storage in the North Sea Basin' which was attended by key players from national geological surveys and institutes, regulatory bodies and industry.	Qtr 4 In progress



	products	<p>The workshop goal was to obtain a better understanding of current knowledge gaps and barriers to the development and deployment of CO<sub>2</sub> storage in the North Sea basin, with the aim of developing project proposals focused on the current priorities of the major stakeholders to fully address the needs of CCS projects under development. The projects proposals include:</p> <ul style="list-style-type: none"><li>• long-term liability of storage post closure;</li><li>• CO<sub>2</sub> storage capacity assessments/atlasses; and</li><li>• further developing CO<sub>2</sub> Storage in Offshore Deep Saline Aquifers from concept to reality, a report on Infrastructure reuse and oil and gas concessions/licenses, and investigating whether it is worth looking further into CO<sub>2</sub> use for EOR/EGR in the North Sea Basin.</li></ul> <p>On 30 September 2011 the Institute organised a workshop in Poland on ‘Current knowledge on carbon dioxide properties and behaviour in deep brine-filled aquifers’. The motivation for holding the workshop in Łódź, back-to-back to the European CCS Demonstration Project Network meeting, was to have direct contact with the CCS projects currently under development to inform, grasp the challenges encountered by the projects in using deep saline aquifers for CO<sub>2</sub> storage and identify how the Institute, in partnership with other organisations, can best contribute to addressing these challenges.</p> <p>Four technical topics emerged from the panel session were geomechanics, modelling and models integration (reservoirs and overlaying groundwater bodies), seismic and carbonates and one non-technical topic emerged that linked technical materials to support public engagement activities.</p> <p>The workshop follow-up includes the facilitation of information exchange between some of the European projects and projects elsewhere with similar issues.</p> <p>In addition, a workshop was held in Canberra in May 2011 that brought together key Australian groundwater stakeholders. The presentations from this workshop can be <a href="#">accessed on the Institute's website</a>.</p>	
3.1.18.2	Hub Development Challenges Thematic Working Group	An extranet group has been created on the Institute's digital knowledge sharing platform for the	Qtr 4



	<ul style="list-style-type: none"> <li>• Workshops</li> <li>• Reports/knowledge products</li> </ul>	<p>‘EU CCS Regions Network’. This network is a collaboration of (local) governments, regulators, and stakeholders around the North Sea who aim to develop a CCS network/hub. The Institute helps to coordinate activities for these ‘hub proponents’ in relation to their joint advocacy program and facilitates the exchange knowledge on permitting, CCS legislation, CO<sub>2</sub> storage, public acceptance, and other hub related challenges. The Institute is currently reviewing how it could best take forward its ‘Thematic Working Group on Hub Development Challenges’ taking into account the work undertaken by the CCS regions network.</p>	In progress
3.1.18.3	<p>Project Integration Challenges Thematic Working Group</p> <ul style="list-style-type: none"> <li>• Workshops</li> <li>• Reports/knowledge products</li> </ul>	<p>A workshop on ‘CCS Project Integration’ was held in London on 3 November 2011 and there were around 50 participants. This workshop is co-organised with the CSLF Technical Group and supported by the IEAGHG. At the workshop:</p> <ul style="list-style-type: none"> <li>• a priority list of key integration issues that need further detailed assessment was identified and these will inform further work undertaken by the Institute; and</li> <li>• the scope of a ‘CCS Project Management Handbook’ was determined, which will outline the various decision gates across the whole chain, and identify key integration issues within and between the various components of the CCS chain.</li> </ul>	<p>Qtr 4 In progress</p>
3.1.18.4	<p>Storage Learning from EOR Operations Thematic Working Group</p> <ul style="list-style-type: none"> <li>• Workshops</li> <li>• Reports/knowledge products</li> </ul>	<p>On 11 August 2011 a webinar entitled <a href="#">CO<sub>2</sub> EOR and the transition to carbon storage</a> and presented by Dr Ernie Perkins was held. This webinar was well attended and attracted several questions with a follow-up video being published to answer the remaining questions that could not be answered during the live webinar.</p> <p>In June 2012 a report will be issued in with a goal of providing the Institute and its members with a better understanding of where EOR can be applied.</p>	<p>Qtr 4 In progress</p>
3.1.19	<p><b>Disseminate and further develop the CSIRO/Institute communications and public engagement toolkit</b></p>		
3.1.19.1	<p>Disseminate current toolkit</p>	<p>The Institute collaborated with CSIRO to produce a Communications and Engagement Toolkit for CCS Projects. As mentioned in the previous Progress Report this toolkit was launched in March 2011 as a practical guide designed to assist project</p>	<p>Qtr 1 In progress</p>



		<p>proponents in developing a public engagement approach. In April 2011, the Institute also released a series of practical ‘Social Site Characterisation’ activities and workbooks to assist project proponents with the application and implementation of in-depth understanding of the local community.</p> <p>Since publication on the Institute website, the following dissemination activities have been undertaken in relation to the toolkit:</p> <ul style="list-style-type: none"> <li>• referenced in the <i>Global Status of CCS: 2011</i> report;</li> <li>• blogs and video clips on the <a href="#">Institute’s website</a>;</li> <li>• a presentation at the Melbourne Members Meeting (4 October 2011) as part of the Institute’s broader public engagement work; and</li> <li>• dissemination of hardcopies of the toolkit at various Institute supported/organised events.</li> </ul>	
3.1.19.2	<p>Further develop toolkit by incorporating learning’s from additional case studies</p> <p>Dissemination of case studies and updates to the toolkit will be via the Institute’s web site and various communication vehicles (e.g. Institute Newsletter).</p>	<p>The scope for further developing the toolkit will be reviewed in the first quarter of 2012.</p>	<p>Qtr 4 In progress</p>

### 3.2 Progress on achieving Outcomes

The Institute has made considerable progress in achieving its outcomes.

#### 1 Accelerate the global adoption of safe, commercially and environmentally sustainable CCS

The Institute has undertaken many activities since the last Progress Report that support the acceleration of CCS globally. Through the Institute’s strong membership base it continues to actively engage with key CCS stakeholders to assist them in the adoption of CCS. As at 25 November 2011, the Institute’s Legal membership comprises 315 Members. The table below shows the breakup of Legal Members. Please refer to Section 6.2, annexure B for a full list of the Institute’s current membership.

Government Members		Major Industry Members	General Members
31			
National 22	Sub-National 9	137	147

A key method of communication with Members is through the [Institute’s knowledge sharing platform](#). The platform has in excess of 1200 unique visitors each day. As a point of comparison, the previous public site



(decommissioned September 2010 when the new site was launched) had around 100–200 visitors per day. Over the past three months, there have been approximately 80,000 visitors to the public knowledge sharing platform who have come to gain knowledge from the Institute about CCS projects and developments around the world. Overall there have been visitors from 188 countries, with Australia, the United States, the United Kingdom, India, China and Japan being the highest.

To help further accelerate large-scale CCS demonstration, the ability to capture knowledge generated from early-mover CCS projects and to transfer it is key, so that it can be utilised by other projects and CCS stakeholders. The Institute shares knowledge across areas such as policy, legal and regulation, financial and commercial, capacity building, technology and public awareness. There is also significant project specific knowledge being shared from the 11 projects that have been engaged as part of the Institute's Project Support Program and from the Institute's Strategic Partners.

For the future deployment of CCS, it is vital that developing countries are engaged. The Institute focuses on developing countries through its capacity development program that aims to build an 'enabling environment', to address the many different barriers to CCS deployment, and to develop appropriate in-country expertise. A Member-based Capacity Development Steering Group was established to help guide these activities. Based on analysis of relevant criteria and advice from the Steering Group, the Institute identified six 'countries of focus' for the capacity development program being China, India, Indonesia, Malaysia, Mexico and South Africa. Active engagement with these countries is now underway.

Engagement with China is increasing and a work plan, which has been developed in consultation with the National Development and Reform Commission, is currently being finalised. This work plan will be rolled out in 2012 and is designed to address CCS issues specific to China, in particular, the need for improved coordination, cooperation and knowledge sharing both domestically and internationally. It will involve workshops, project/proponent engagement and online engagement.

## **2 Drive cooperation to deliver a diverse portfolio of at least 20 fully integrated, large scale demonstration projects operating by 2020.**

The Institute is working with many different organisations and CCS project proponents to help deliver at least 20 large-scale demonstration projects by 2020. CCS has a complex process chain and uses technologies that can go across sectors, which may have not traditionally worked together. So while individual technologies may be proven the integration of these different elements remains a challenge. On 3 November 2011 the Institute held a workshop on 'CCS Project Integration' in London that was co-organised with the CSLF Technical Group and supported by the IEAGHG. Through this workshop a priority list of key integration issues that needed further detailed assessment and that could inform further work undertaken by the Institute were developed and the scope of a 'CCS Project Management Handbook' was defined, which would outline the various decision gates across the whole chain, and identify key integration issues within and between the various components of the CCS chain.

The Institute is monitoring the development of large-scale integrated projects through its annual Global Status of CCS reports. In the *Global Status of CCS: 2011* report, the Institute identified 74 large-scale integrated projects (LSIPs), 14 of which are either in operation or construction and have a total CO<sub>2</sub> storage capacity of over 33 million tonnes a year. Three of these projects have recently commenced construction. Importantly, these include a second power project, Boundary Dam in Canada, and the first project in the United States that will store CO<sub>2</sub> in a deep saline formation. In the Institute's annual project survey for 2011, eleven projects reported 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 projects moving forward to FID is positive, this is contrasted with a paucity of projects being planned in other high emitting sectors such as iron and steel and cement. Along with the



Norwegian Ministry of Petroleum and Energy, the Institute supported the development of the [Technology Roadmap: Carbon Capture and Storage in Industrial Applications](#) undertaken by the International Energy Agency (IEA) and the United Nations Industrial Development Organization (UNIDO). This report paves the way for low-carbon industrial growth in developed and developing countries by providing a vision of industrial CCS up to 2050. This report also offers insights that will help policymakers evaluate the benefits of CCS technology and help them make informed decisions. It also offers investors a much-needed assessment of the potential for CCS in industry. The report focuses on five main industrial applications, including iron and steel and cement.

The Institute is also currently focused on filling strategic gaps in its own projects knowledge portfolio. The current portfolio of supported projects is heavily biased towards the coal-based power sector in North America and continental Europe. The supported projects also have a strong focus on post-combustion capture feasibility and FEED studies. Future activities aim to fill gaps in the current portfolio by targeting specific regions or countries, such as China, the Middle East and North Africa and the United Kingdom, and specific technologies and sectors with a greater emphasis on storage related activities, power projects applying gasification and/or oxyfuel combustion technology and non-power industries such as iron and steel and hydrogen production.

In terms of storage, the IEAGHG *Global storage resources gap analysis for policy makers*, commissioned by the Institute showed that the current CCS project portfolio could allow the G8 target of at least 20 projects by 2020 to be reached provided that adequate resources are made available for a large proportion of the proposed projects and that storage associated with CO<sub>2</sub>-EOR can be included.

To further aid in development and monitoring of LSIPs, the Institute rolled out to projects its revised survey instrument and survey process in May 2011. The data collected through this process underpins the analysis and content development of the 2011 Global Status of CCS report. The revised survey achieved a response rate of 89 per cent. In addition, data on LSIPs is now updated weekly and uploaded onto the Institute's website.

While from its beginning the Institute has been focused on large-scale projects, it does see increasing relevance for pilot to sub-commercial scale projects that are key for addressing scaling uncertainties, performance improvements and reducing the costs of CCS. The Institute is currently investigating the potential to monitor pilot to sub-commercial scale projects that are under construction and in operation in addition to the monitoring of LSIPs.

### **3 Work in concert with the network of existing bodies, establishing new programs where necessary, to overcome the barriers to broad industrial-scale deployment.**

Through the Institute's Members and engagement with its Strategic Partners (see section 3.3) the Institute has focused on overcoming obstacles to CCS deployment. One Strategic Partner that the Institute continues to engage closely with is the Carbon Sequestration Leadership Forum (CSLF), as a participant in its Groups and Task Forces and a contributor to its work program and forums. At the Fourth CSLF Ministerial Conference in September 2011 the Institute contributed a background paper on *Status, Gaps and Measures to Close Gaps*, and the Institute's CEO presented on the Status of CCS. Institute staff also presented on its work program and made contributions in several Group and Task Force meetings held in the margins of the Ministerial Conference.

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 United Kingdom, the Netherlands, Poland and Romania.





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 also worked with the IEAGHG, the IEA, ZEP and two of the leading academic experts in CCS, Howard Herzog of Massachusetts Institute of Technology 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.

This year the Institute also 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.

#### **4 Maintain a project focus and actively support large scale demonstration projects through facilitation of issues, discussion with key stakeholders (including Governments) and provision of technical knowhow.**

There are now ten active projects in the Institute portfolio, since the execution of funding agreements with the ROAD project (Netherlands), CarbonNet (Australia) and Maersk Oil (Denmark), and the completion of the funding agreement with the Tenaska/Entergy Nelson 6 Project. There have been 19 reports published from these projects on the Institute's web-site since the last progress report, bringing the total to 28 reports.

In addition, knowledge gained from projects has been disseminated via webinars, road shows, and workshops. Since that last Progress Report the Institute has conducted the following webinars:

- Jeff James and Helen Manroe, Directors at Tenaska, United States: Public engagement community approach at the Tenaska Trailblazer Energy Center Project;
- Ernie Perkins, a geologist based in Alberta, Canada: CO<sub>2</sub> EOR and the transition to carbon storage;
- Don Wharton, Vice-President of Sustainable Development at TransAlta: Public perceptions of CCS – Polling results from the Project Pioneer in Alberta, Canada;
- Allan Baker, Managing Director and Global Head of Power at Société Générale: Barriers to project finance for CCS; and
- Elvira Huizeling, Special Projects, Capture, ROAD Project: ROAD Project - CO<sub>2</sub> capture plant FEED study.

Webinars planned for the remainder of 2011 include those that are based on reports received from projects in Japan, North America and Europe.

Further activities since the road shows and workshops in February and April 2011 in Australia, Korea and Japan, include presentations given by project representatives at the Institute's Members meetings in Rotterdam and Melbourne; presentations on shipping studies coinciding with the opening of the Institute's Japan Office; and the preparation of the third North American road show to be held in Washington DC in January 2012. The road show in Washington DC on 19 January 2012 will focus on the policy aspects of CCS that will also bring in project experience in a policy context. Other countries through their respective embassy representatives, the US Department of Energy, members and stakeholders will participate in round table discussions. The first two North American road shows were held in November 2011 in Calgary, Canada, and in Austin, United States, and focused on sharing project experiences and knowledge from the projects in North America but also brought in projects from Europe and Australia so that the experience can be shared on a broader global platform. Both road shows were well received.



In September 2011, the Institute's storage team had a workshop with Chevron's Gorgon technical injection team for an exchange of information. Gorgon provided a detailed outline of their project with the view to the Institute developing a public document on their project from concept to present and corresponding lessons learnt. This report is expected to be released in early 2012. The Institute in turn provided insights into approaches taken by other projects. This workshop was conducted under the existing 'Basis of Cooperation' with Chevron and the Institute expects to undertake other activities with Gorgon in 2012. In addition, under the Institute's two year agreement with Collie Hub, the first report being the [Collie-South West CO<sub>2</sub> Geosequestration Hub – Project overview report](#) was released in November 2011 and covers the formulation and the structure of the Collie Hub project as well as outlining the key project issues for the next 6-12 months. Institute personnel have also visited the Callide A Power Station Oxyfuel Project in September 2011, [a site visit report](#) is available on the Institute's website.

Development of the strategy for the next phase of the Project Support Program activities is being built around a multi-faceted knowledge gathering approach, involving a suite of avenues for accessing information and a wider pool of sources than at present. Key elements include a focus on filling strategic gaps, more 'targeted' methods of accessing information and greater efforts to engage directly with projects that are in execution or already in operation.

## **5 Be an active clearinghouse and standard setter for CCS information, especially in relation to the deployment of technology and processes.**

Significant progress has been made on the Institute becoming the active clearinghouse for CCS information. This includes:

- the knowledge sharing architecture being able to accommodate the storing of public, restricted and confidential information across multiple platforms;
- that approximately 100 major reports have been delivered over the past year and blogs on the topics of policy, legal and regulation, technology, commercial and finance, public engagement and capacity development are published on the website daily; and
- the public platform having in excess of 1200 unique visitors each day and around 2000 visitors on the day of the launch of the *Global Status of CCS: 2011* report. As a point of comparison, the public site (decommissioned September 2010 when the new website was launched) had around 100–200 visitors per day. The Institute understands based on information received from other major CCS platforms that the Institute's is the most visited CCS-specific knowledge platform by a significant margin.

The information shared from other international knowledge sharing activities (through projects and 'networks') continues to increase. As opposed to competing with these other initiatives, the Institute is positioning itself as both a 'platform provider' and the 'global glue' to link these initiatives together in a coordinated fashion. This is being achieved through:

- capabilities that have been developed on the public site to optimise dissemination for high-value assets, such as publications to encourage other organisations to host their reports through the Institute;
- OpenCCS that provides an approach for linking together information from the Institute's public platform and other sites into an overall methodology for delivering CCS projects. Some of the most recent high profile publications include:
  - [FEED study reports](#) from the UK Department of Energy and Climate Change. These reports provide extensive information covering all aspects along the full-chain of post-combustion coal-fired power plant projects.
  - [Policy making resources](#) from the IEAGHG. This report included detailed modelling of the timescales and resources required for storage sites to achieve bankable status, whereby final investment decisions can be made in advance of site construction, commissioning and operations.



- [Technology roadmaps](#) from the IEA and UNIDO. This work paves the way for low-carbon industrial growth in developed and developing countries by providing a vision of industrial CCS up to 2050.
- [Perspective on barriers](#) to CCS deployment from the World Bank. The insights from this report use a case study methodology to assess some of the most important barriers facing CCS deployment within the context of developing and transition economies.
- [Cost analyses and modelling](#) undertaken by ZEP. This work uses newly-developed in-house data provided by ZEP member organisations and establishes a reference point for the costs of CCS.
- [Legal and regulatory review](#) of CCS undertaken by the IEA. This bi-annual publication collates contributions by national and regional governments, as well as leading organisations engaged in CCS regulatory activities and serves as a resource for those developing CCS legal and regulatory frameworks worldwide.
- the Institute's expertise database is currently being piloted, this database will allow the Institute to target specific individuals based on their interests. This will result in the targeted dissemination of knowledge being generated through Institute's and other organisation's initiatives; and
- the Institute's offers to host extranet capabilities for other initiatives. The public platform has also been discussed as a potential alternative to building a public website for some smaller knowledge sharing efforts. For example, the European Regions network will soon begin using the Institute's extranet for hosting its private collaboration and will have a page on its public site.

The Institute's initial Project Support Program provided significant benefits in supporting key projects. The initial Project Support Program provided significant knowledge products for 2011, with reports from 11 projects worldwide; some recent publications include the following:

- [CO<sub>2</sub> capture technology selection methodology](#) by ROAD. This report aims to help other CCS projects using post-combustion capture technology to design their own capture plant supplier selection methodology. In a broader sense, it is envisioned that other CCS projects or projects involving novel technologies can learn from the analysis provided in this report.
- [CO<sub>2</sub> Liquid Logistics Shipping Concept \(LLSC\) - Overall supply chain optimization](#) by RCI (Anthony Veder, Vopak). The Global CCS Institute supported Vopak and Anthony Veder to conduct a feasibility study on their CO<sub>2</sub> LLSC that will provide emitters with a complete logistical transportation solution for captured CO<sub>2</sub> from their site to an offshore storage location. This report provides an optimisation study for RCI's CO<sub>2</sub> Hub concept.
- [Building a consortium to develop a new pulverized coal plant with post-combustion carbon capture](#) by Tenaska. This report discusses the factors considered in Tenaska's approach to building and managing the consortium required to develop, construct and operate the project.
- [Bridging the commercial gap for carbon capture and storage](#) by Tenaska. In this report Tenaska shares their analysis of the commercial market factors which drive their project. This report discusses the economic realities facing the Trailblazer Project to incorporate a commercial-scale carbon dioxide capture plant into its initial design. It also reviews the markets for both electricity and carbon dioxide, and discusses the governmental support that may be needed to bridge the gap between the project's likely costs and revenues.
- [Preliminary feasibility study on CO<sub>2</sub> carrier for ship-based CCS](#) by Chiyoda Corp, The University of Tokyo and other partners. This report covers a technical pre-feasibility study of shuttle type CO<sub>2</sub> ship transport, the engineering design of ship equipment and injection method suitable for offshore operations, and goes further on to discuss the regulatory considerations for ship-based CO<sub>2</sub> transport and injection.
- [ROAD CCS Project - Non-confidential FEED study report](#) by ROAD. This report summarises the recently completed FEED study for the capture plant as performed by Fluor. This report includes topics such as technology selection, process flow diagrams, heat and mass balances, layout designs, cooling studies, capital and O&M cost estimates and project schedules. The report aims to help other CCS



projects, particularly those using post-combustion capture technology, to design and cost their own capture plant. sue

The Institute is redesigning this support program to acquire information in a much more targeted fashion, against a prioritised set of 'key questions' that the Institute believes must be answered to accelerate CCS. The Institute will also focus more actively on 'knowledge collection' which is the sharing of publicly available information from other initiatives (as well as information that may have been previously restricted) using key questions to guide literature reviews and facilitated working groups with Members and advisory committees.

### 3.3 Strategic partnerships

#### Background

RET entered into project funding agreements with a number of strategic partner organisations on behalf of the Institute during the 2008-09 Financial Year. These agreements were novated to the Institute.

Novated Contract	Comments
Asian Development Bank	There has been progress on the ADB's Regional Technical Assistance project for the Philippines, Thailand and Vietnam. The Institute has been asked to comment on the Regulatory Report in Southeast Asia, which will form part of the larger Regional Assistance project.
CSIRO	<p>CSIRO has produced many deliverables, most of which are available on the Institute's website. They include:</p> <ul style="list-style-type: none"> <li>• <a href="#">Database on public communication materials on CCS</a> – Cambridge University has completed the <i>CCS communication report</i> and database. The report was released in August 2011.</li> <li>• Social site characterisation - The <a href="#">Social site characterisation: From concept to application</a> report was released in June 2011.</li> <li>• <a href="#">Communicating the risks of CCS report</a> – This report was released in August 2011.</li> <li>• <a href="#">Large group process in Australia, Europe and Canada</a> – Both the Canadian and Dutch final reports have released on the Institute website. CSIRO is currently finalising the contract for the University of Edinburgh to conduct third and final large group process.</li> <li>• <a href="#">Japanese stakeholder day report</a> – This report is from a CCS Stakeholder Day held in Tokyo, Japan on Friday 19 November, 2010. It was released in June 2011.</li> </ul> <p>Below is an update on CSIRO's continuing work:</p> <ul style="list-style-type: none"> <li>• <b>Risk factsheets</b> – The second scientific review and amendment process for the risk factsheets (12 in total) has now been completed. The final drafts are currently under review by the Institute.</li> <li>• <b>Understanding how people perceive CO<sub>2</sub></b> – Development of the final report is almost complete and is now subject to review before being submitted the Institute.</li> <li>• <b>CCS education materials</b> – The first stage report, focusing on availability and quality of existing CCS education materials has been delivered to the Institute, including the CCS Education Database. The second stage of the project is underway with the development of the CCS Educational Units and Teaching Support Notes completed and scientifically reviewed. The Units and Support Notes have been sent to 4 international (1 x Canada, 1 x China</li> </ul>



Novated Contract	Comments
	<p>and 2 x US) and 13 Australian schools for review and trialling within classrooms. Once feedback has been received from all participating reviewers, CSIRO will amend the educational materials and provide a summary report (this is due to the Institute in Quarter 3, 2011-12).</p> <ul style="list-style-type: none"><li>• <b>Identify public perceptions to CCS using the ICQ methodology</b> – The first round of expert review and feedback of the draft options packages has been finalised and have been re-designed to address the specific policy problem identified for the Australian context. This includes realignment of the packages to reflect the recent announcement by the Australian Federal Government of the ‘Clean Energy Future Policy’ for Australia. The first full draft report is due to the Institute in April 2012.</li><li>• <b>CCS Flagships Australia, CarbonNet</b> – CSIRO is in discussions with the Institute and the Victorian Department of Primary Industries who are involved in the CarbonNet project from an engagement and communication perspective to identify research activities CSIRO could conduct, or assist to coordinating, for the CarbonNet project.</li></ul>
Carbon Sequestration Leadership Forum	<p>. Australia’s contribution through the Institute of AU\$1.2 million to the CSLF Capacity Building Program was combined with contributions from the UK, Norway, and Canada with total contributions being approximately US\$3 million.</p> <p>The Governing Council has now allocated funding (worth approximately US\$1.4 million) to 9 projects in CSLF emerging economies.</p> <p>The Institute is contract managing funds provided two countries.</p> <p>At the CSLF Ministerial meeting held in Beijing in September 2011, there was a further call for capacity building proposals for the remaining funds.</p>
IEA Greenhouse Gas R&D Programme (IEAGHG)	<p>The Institute has continued its support of the IEAGHG, including some of its network meetings such as the Risk Assessment Network in June 2011.</p> <p>The Institute has supported the following studies that are publicly available on the website:</p> <ul style="list-style-type: none"><li>• <a href="#"><i>Effects of impurities on geological storage of CO<sub>2</sub></i></a> – This study was undertaken by Natural Resources Canada and provides a review of existing information and published research on the potential impact of CO<sub>2</sub> waste stream purity on storage engineering and associated costs. A range of storage scenarios are considered, including deep saline aquifer formations, depleted gas fields and CO<sub>2</sub>-EOR schemes, although the study focuses primarily on deep saline formations since this scenario has the largest theoretical storage capacity and the most significant potential for complex geological reactions.</li><li>• <a href="#"><i>Global storage resources gap analysis for policy makers</i></a> – This study was undertaken by Geogreen and includes detailed modelling of the timescales and resources required for storage sites to achieve bankable status, whereby final investment decisions can be made in advance of site construction, commissioning and operations. Building on this analysis, the study showed that the current CCS project portfolio could allow the G8 target to be reached provided that adequate resources are made available for a</li></ul>



Novated Contract	Comments
	<p>large proportion of the proposed projects and that storage associated with CO<sub>2</sub>-EOR can be included.</p> <ul style="list-style-type: none"> <li>• <i>What have we learnt from operational CCS demonstrations, Phase 1b</i> – This study was undertaken by the IEAGHG as an addendum to the original report and gains further information from projects on more specific topics within the subjects of well injectivity, regulation and public communication.</li> </ul> <p>The Institute continues to be a series sponsor for the IEAGHG’s Summer School. In July 2011 the IEAGHG held its fifth International Interdisciplinary CCS Summer School, hosted by the Sequestration Training and Education Program (STEP) and the Midwest Geological Sequestration Consortium (MGSC) at the University of Illinois, in Champaign, Illinois, US. Fifty three students, from over twenty five different countries and from a wide variety of different backgrounds were selected to participate in this international Summer School. The students were supported by 29 experts throughout the week.</p>
Clinton Climate Initiative	<p>The Institute continues to work with the Clinton Climate Initiative (CCI), and a proposed future work plan is currently being developed.</p> <p>The most significant progress between the Institute and CCI has been a formal agreement to provide AU\$2.3 million to fund the CarbonNet Project over the course of two years (until 30 June 2013) upon CarbonNet meeting specified milestones. Under the agreement, the Institute is seeking:</p> <ul style="list-style-type: none"> <li>• Full understanding of the financial and commercial issues, risks, and challenges facing CCS projects, in particular for the current stage of early movers, including:             <ul style="list-style-type: none"> <li>○ along the entire value chain of an integrated CCS project, including for potential networks;</li> <li>○ understanding the risks from the investor, project developer, technology provider, and government perspective; and</li> <li>○ the scale of financial ‘gap’.</li> </ul> </li> <li>• Learning from current demonstration projects, including:             <ul style="list-style-type: none"> <li>○ an overview of possible financial structures and mechanisms for addressing these risks/gaps, given the current policy environment;</li> <li>○ what is needed to bring investors to table and how to best unlock capital from the private sector, given certain policy scenarios;</li> <li>○ best practices/lessons learned from demonstration projects so far;</li> <li>○ a summary of possible ‘building blocks’ and commercial/financial structures for advancing projects; and</li> <li>○ precedents from other clean energy technologies.</li> </ul> </li> </ul>
IEA	<p>The IEA continues to advance work on key CCS issues in accordance with its work program. Since the last Progress Report this has included:</p> <ul style="list-style-type: none"> <li>• Contribution to Energy Technology Perspectives (ETP) 2012 publication, with a comprehensive CCS chapter. The first stage of drafting will be undertaken during 2011 and the ETP is scheduled for publication in June 2012;</li> </ul>



Novated Contract	Comments
	<ul style="list-style-type: none"> <li>• The launch of the IEA-UNIDO <a href="#">Technology Roadmap: Carbon Capture and Storage in Industrial Applications</a>, jointly with project sponsors Institute and the Norwegian government, on 20 September 2011 in Beijing. This report has also been <a href="#">translated into Chinese</a>;</li> <li>• Preparations are now underway to revisit/revise the 2009 CCS roadmap. IEA's intention is to publish a new CCS roadmap during the second half of 2012;</li> <li>• Contribution to the CEM CCUS Action Group;</li> <li>• Development of the incentive policy study (scheduled to be published December 2011);</li> <li>• Development of a paper on CCS in China (scheduled to be published December 2011);</li> <li>• Publication of analysis on CO<sub>2</sub>-EOR; also a collaborative work with OPEC and the Institute on this subject;</li> <li>• Publication of the second edition of the <a href="#">IEA CCS Legal and Regulatory Review</a> with the third edition in production;</li> <li>• Webinars on topical issues including from the Regulatory Network;</li> <li>• Publication of an analysis of options in international law for cross-border CO<sub>2</sub> transport report called <a href="#">Carbon Capture and Storage and the London Protocol</a>;</li> <li>• Regional/industry focussed meetings of the IEA International CCS Regulatory Network;</li> <li>• Preparation for the 4th IEA International CCS Regulatory Network meeting;</li> <li>• Participation in Alberta Regulatory Framework Assessment Working Group;</li> <li>• Analysis on the global potential of CCS retrofitting and of aspects of flexibility of CCS-equipped power plants in evolving electricity markets. This paper is now being prepared with publication expected in December 2011;</li> <li>• Analysis of bioenergy-CCS options and policy requirements. This paper will be published for COP 17 in Durban; and</li> <li>• Input to UNFCCC SBSTA workshop on CCS in CDM and input to wider IEA activity at COP 17 in Durban.</li> </ul>
The Climate Group	<p>A variation to the original Climate Group Funding Agreement was signed on 6 June 2011. The Work Program agreed under this variation focuses on:</p> <ul style="list-style-type: none"> <li>• <b>Climate Week 2011:</b> the Institute was a platinum sponsor of Climate Week 2011 held in New York during September. In addition to various promotion opportunities, Victor Der (General Manager, North America) participated in the opening session of Climate Week, and the Institute held a CCS Session following the opening session. This was a successful outcome.</li> <li>• <b>CCS Blogging:</b> the Institute has received regular blogs from Rupert Posner of the Climate Group on issues agreed in liaison with the Institute's Media Manager.</li> <li>• <b>China Projects Update:</b> The Institute received an English version of a Climate Group report on CCUS in China: 18 key questions.</li> <li>• <b>CCS in India:</b> the Climate Group were requested to help arrange meetings with relevant organisations if and when the Institute visited India. The</li> </ul>



Novated Contract	Comments
	Institute did not visit India during this period and therefore did not utilise this service.

### 3.4 Key issues and developments

#### Progress is being made

In its most recent Global Status of CCS report, the Institute identified eight large-scale integrated projects (LSIPs) in operation around the world and a further six under construction. Three of these projects have recently commenced construction. Importantly, these include a second power project, Boundary Dam in Canada, and the 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 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. In the Institute's annual project survey for 2011, eleven projects reported 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.

In total there are 74 LSIPs recorded in this report, which continue to be concentrated in North America, Europe, Australia and China with few large-scale projects planned in developing countries.

#### Factors influencing a project's success

All the 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. 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, such as EOR or other opportunities, or where CO<sub>2</sub> capture is not already part of an established industrial process.

There are 11 LSIPs that are considered on-hold or cancelled since the Institute's 2010 report, 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.

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 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. A major cost for CCS is the energy penalty or 'parasitic load' involved in applying the technologies. Going forward a major emphasis in pre-, post- and oxyfuel combustion capture applied to power stations (and other industrial applications) is on research into reducing this cost.

Despite these challenges, construction of a post-combustion capture project (Boundary Dam in Canada) and an integrated gasification combined cycle (IGCC) project (Kemper County) is 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. Both these projects received government support and will be selling CO<sub>2</sub> for EOR, thus tapping into another revenue stream.

## 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. As noted above, 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. There have been limited recent developments in iron and steel sector demonstrations of capture technologies. In the cement sector, capture technology is still at an early stage. Both these industries are major emitters and further developments are expected and necessary.

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 all aspects of the project, including its possible and potential impacts and 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, legislation 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.

In the past year the development of CCS laws and regulations has continued, with a number of jurisdictions completing framework legislation and commencing implementation of secondary regulations and guidance. 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. In the past year, several European Union Member States, Australia, the United States and Canada have all sustained their regulatory momentum and delivered a number of new proposals, laws, regulations and initiatives. The importance of effective regulation has also been recognised by the many countries that are to become the second generation of CCS lawmakers. Korea is one such example. 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 in 2011. Competitive funding programs designed to measure and fund the 'gap' required to make projects financially viable have been widely adopted by governments internationally. This approach will be taken by the European Union's NER300 program where 13 CCS projects, together with 65 innovative renewable projects, were identified as meeting the criteria to go forward to the next stage with decisions on funding allocation expected in the second half of 2012.

In the near-term, government policy and funding levels will impact strongly on the rate at which demonstration projects progress and their overall viability. For this to be done effectively, ongoing cooperation between government and industry is required to address the complex challenges in establishing early-mover CCS projects. In the long-term, the value of CCS demonstration can only be realised and supported through sustained forward looking climate change policies and carbon-price signals that will underpin the future deployment of CCS.

These developments illustrate the continuing challenges faced by the CCS industry. Clearly, early expectations of the pace of development of CCS projects have proven overly optimistic. While the G8 goal of 20 operational projects by 2020 may be reached, this is by no means certain and will require continuing concerted action by governments and project proponents in many jurisdictions. Against this background, the aims and objectives of the Institute remain relevant.

### 3.6 Knowledge sharing rights

In establishing service contracts under which tangible knowledge products may be created, the Institute requests that contractors grant the Institute a world-wide, royalty-free, non-exclusive licence to use, reproduce, adopt, modify and communicate Agreement Material. However, particularly when joining consortia, confidentiality provisions typically prevent contract materials from being disclosed to third parties without the prior consent of all the parties involved in the consortium.

In negotiating the terms of agreements entered into under the Institute's Project Support Program, applicants have been required to:

- acknowledge that a key aspect of the Institute's mandate is to support the effective sharing of relevant CCS knowledge between diverse stakeholder groups and all interested parties; and
- use best endeavours to assist the Institute achieve its goals by participating in, or supporting, knowledge sharing activities developed or coordinated by the Institute, and by providing information, knowledge and access to resources, as reasonably required.

The full terms, and the extent of knowledge being requested by the Institute for sharing, have been negotiated with individual project proponents in establishing project agreements. In this regard, a position of extensive knowledge sharing has been assumed as default and contractually captured as the preparation of key reports and knowledge products to benefit other projects and the development of a sustainable CCS industry.

Complementing licensing of the knowledge sharing assets, a well-defined set of principles, policies and procedures have been put in place to govern the sharing of knowledge assets. This framework applies



across a three level knowledge sharing architecture of a public platform, private intranet and extranet and confidential information layer.

For building its knowledge base the Institute has three basic models:

- creating information, such as the Global Status of CCS Report;
- acquiring information from other projects / organisations (e.g. the funding of the Tenaska Trailblazer project in exchange for reports); and
- collecting information from other projects / organisations (e.g. a report from the ZEP) where the Institute does not make a direct financial contribution.

The following access models then apply in relation to sharing of information:

- public information is shared with anyone;
- restricted information is shared with a controlled group of stakeholders within and external to the Institute. Specific knowledge sharing 'groups' are setup for sharing restricted information.
- confidential information is highly controlled and is only accessible to a narrow audience.

This model applies to the creation of reports as well as collaboratively-developed content on extranet platforms. All content goes through a quality control process before being publicly published. In all cases the goal has been to encourage public sharing of information. The most commonly used license has been the [creative commons license \(attribution version\)](#) which provides significant flexibility in the use of content to optimise its dissemination.

The key challenges that have arisen have been the following:

- negotiations and review processes with projects on which information should be included in public vs. confidential reports and in working groups; and

### 3.7 Risk management

The Audit and Risk Committee of the Board has responsibility for establishing a sound and comprehensive risk management framework, and reporting against this framework to the Board of the Institute. The Audit and Risk Committee facilitates and overviews a risk management framework that enables early identification of potential areas of risk to the Institute. As an outcome of the risk review the Institute is able to put into action appropriate control frameworks to alleviate and/or remove the identified risks. The risk management framework is reviewed at each Audit and Risk Committee meeting with a formal review and update undertaken on a six monthly basis, the latest of which was undertaken during November 2011.

Prior to the previous formal risk assessment review, a number of internal and external events have occurred that continue to shape the nature and ranking of risks. These events include the:

- appointment of Mr Brad Page as new CEO effective 15 August 2011;
- signing of a Funding Agreement Variation reducing Australian Government funds to \$315 million with rephasing to 30 June 2017; and
- termination of Phase 2 of an Institute funded project under the Project Support Program.

The above events, in combination with the continued evolution of the Institute's control frameworks and associated policies and procedures, have realigned the key risks.



## 4 GOVERNANCE

### 4.1 CEO

The Institute's first CEO, Mr Nicholas Otter, OBE, completed his term at the end of 2010 and has now joined the Technical Advisory Committee which allows the Institute to access his vast technical experience as well as his stature and reputation in the CCS community.

Mr John Hartwell was appointed as the Interim CEO on 1 January 2011; formerly with the Department of Resources, Energy and Tourism, Mr Hartwell was a key part of the team that worked to get the idea of the Global CCS Institute accepted in many parts of the world. Mr Hartwell remained as CEO while the Board completed its search for a permanent replacement.

The Board appointed Mr Brad Page to the position of CEO from 15 August 2011. Mr Page has had a career of over 30 years during which he has held senior positions in Government and in the private sector. In his most recent position of CEO of Energy Supply Association of Australia (ESAA), which he had held for 7 years, he became an authoritative spokesperson for the electricity and downstream natural gas industries. Before joining the ESAA, Mr Page had a successful career in the public service, with his first senior appointment in 1997 as the Manager of Electricity Reform in the Department of Industry, Science and Resources. He has also held the positions of Director, Industry Policy and Regulation at the ACT Government, Department of Urban Services, Head of Secretariat at COAG, Energy Market Review, and General Manager, Innovation Programs, AusIndustry at the Department of Industry, Tourism and Resources. During his career Mr Page has travelled extensively and has engaged with governments around the world in the United States, Japan, the UK and Europe in relation to energy and climate change.

In 2009 Mr Page was awarded the British Council Chevening Fellowship to study the economics of climate change at Cambridge.

At the time of his appointment, Mr Page was a 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.

### 4.2 Board

The Institute's Board has met five times since the beginning of May 2011. Two of these meetings were held in Canberra with overseas Directors joining by video conference or telephone. One was held in Rotterdam in conjunction with the May Members' Meeting, another was held in Melbourne in conjunction with the AGM and Members Meeting and the fifth was in Canberra with all Directors in attendance.

As required by the Company's Constitution (clause 11.2), Ms Tina McMeckan retired as Director at the second AGM. Ms McMeckan was eligible for re-appointment to the Board and consented to act for a second term. Ms McMeckan's re-appointment was supported by both the Board and the BSP and Members approved the appointment at the AGM.

### 4.3 Board Selection Panel (BSP)

Each year, two members of the BSP retire. This year, Dr Don Elder representing the Institute's General Members, and Graham White representing Government Members are due to retire on 31 December. Unfortunately, both Dr Elder from Solid Energy in New Zealand, and Mr White from the Government of the United Kingdom are not available for reappointment to the BSP.

The Institute issued a Call for Nominations to fill these vacancies and received four nominations from the General Members. An election was held electronically to determine which of the candidates would fill the upcoming vacancy to represent the General Membership. The election closed on 28 September 2011 and 43



votes were submitted. CEO of the World Coal Association, Milton Catelin, received the majority of votes and was therefore elected to serve a three-year term on the BSP, commencing on 1 January 2012.

As no valid nominations from Government Members were received to fill the upcoming vacancy on the BSP in their category, the Constitution required the Board Chair, to appoint a person to fill the vacancy. After consultation with Members and Board colleagues, Mr Higgins appointed Ms Tone Skogen from the Government of Norway to serve a three-year term, commencing 1 January 2012. This was announced at the Institute's Annual General Meeting on 4 October 2011.

Mr Ralph Hillman, formerly of the Australian Coal Association and representing the Institute's General Members, has announced his resignation from the Panel. A meeting of the BSP was convened to appoint a person to fill this vacancy as required by the Company's Constitution. The BSP appointed Dr Carmen Dybwad, CEO of International Performance Assessment Centre for Geologic Storage of Carbon Dioxide (IPAC-CO2) in Canada to complete Mr Hillman's term on the Panel.

#### 4.4 Annual General Meeting (AGM)

The Institute's AGM was held in Melbourne on 4 October 2011, in conjunction with the Member's Meeting. The AGM gave Members the opportunity to ask questions or make comments on the 2011 Financial Statements. There were also three resolutions before the Members regarding appointments to the Board. The first two resolutions were to give Members the opportunity to approve the Board appointments of 10 October 2010 of Rachel English and Dr Mario Ruscev. The third resolution gave Members the opportunity to approve the re-appointment of Ms Tina McMeckan to serve a second term on the Board. All resolutions were passed.

#### 4.5 Technical Advisory Committee (TAC)

Meeting No.7 of the TAC was held on 8 May 2011 in Rotterdam, just prior to the Institute Members Meeting on 9-10 May 2011. The meeting discussed the status of the project support program, the Institute's knowledge sharing activities and future directions for project support activities. This meeting fulfilled the requirements of the TAC Charter to hold at least one face to face meeting of the TAC each year.

Meeting No.8 of the TAC was held by email between 22-29 June 2011. The meeting discussed a project funding proposal for submission to the Board of the Institute.

Meeting No. 9 of the TAC was held by teleconference on 4 November 2011 to update the TAC on future project approach activities.

#### 4.6 International Advisory Panel (IAP)

The Institute has considered a number of potential candidates to fill the position of Chair of the IAP following Mr James Wolfensohn's resignation in February this year. Mr Claude Mandil, who is already a member of the IAP, has agreed to chair the IAP.

Below is a summary of the Institute's engagement with the IAP:

**Lord Nicholas Stern:** In 2011 Lord Stern has agreed to again co-host a private VIP dinner with Minister for Climate Change, Greg Combet, at COP 17 in Durban, which is sponsored by the Institute.

In 2010 at COP 16 in Cancun this reception attracted an eminent mix of guests including the UK Minister for Climate Change, the Hon. Greg Barker MP and a number of other senior executives from industry and academia. The Institute will replicate the same calibre of guests this year with Ministers, high-level public servants, chief negotiators and high-level industry executives having confirmed attendance.



The dinner provides an opportunity for a select number of influential guests to engage in discussions on climate change policy, matters relating to the two negotiating tracks, as well as progress in delivering the UNFCCC mechanisms considered fundamental to the future global success of CCS deployment, including the Clean Development Mechanism and the financial and technology mechanisms. Lord Stern may also speak on CCS at relevant media opportunities during COP 17.

**Dr Leena Srivastava:** The Institute has been working closely with Dr Srivastava on negotiating the arrangements for development the CCS Scoping Study and Capacity Assessment for India. The contract for this project was signed with The Energy Research Institute (TERI) of India in October 2011. Dr Srivastava played an important role in negotiating the Terms of Reference for this project. While Dr Srivastava is not the lead project officer in this study, she continues to take a strong interest in the project developments and is kept informed and engaged.

This study forms part of the Institute's capacity development program and represents the Institute's first major engagement with India. The study will examine the key CCS considerations from a policy perspective and provide the information base for the Institute discussions with India's government and industry.

**Professor Zeng Rongshu:** The Institute continues to engage with Professor Zeng on a regular basis to develop its business in China. Professor Zeng also attended the Institute's Members' Meeting in Melbourne 2011.

The Institute has made considerable progress in building its relationships with the key stakeholders in China, particularly with the National Development and Reform Commission (NDRC). Professor Zeng continues to play an important role in facilitating this relationship, and has helped to overcome potential challenges relating to differences in language and culture as well as changes of key personnel within the NDRC.

Professor Zeng has accompanied the Institute to all its meetings with the NDRC, including the most recent meeting on 7 November 2011 where the parties discussed the Institute's proposed future activities in China.

**Mr Claude Mandil:** Mr Mandil continues to be actively engaged in Institute activities, particularly those in Europe. Mr Mandil also participated in a panel session at the Institute's Members' Meeting in Melbourne 2011.

Claude Mandil (and General Manager – Europe, Bob Pegler) wrote a letter to all of the EU Directors-General for Energy in July 2011 when they were meeting in Belchatow, Poland, seeking to share some important insights for their consideration as they met to deliberate on the key objectives of the Energy Roadmap 2050; to achieve the necessary greenhouse gas (GHG) emission reductions to meet agreed targets and to seek to strike an appropriate and proper balance between environmental requirements, energy and economic security and competitiveness. The letter reiterated the importance of CCS in helping to achieve the correct balance in the EU energy mix, and called for strong and clear political support, not only at a regional/EU level, but also at national and local level.



## 5 ANNEXURE

### 6.1 Annexure A – List of acronyms

Acronym	Title
ADB	Asian Development Bank
AEP	American Electric Power
AGM	Annual General Meeting
BSP	Board Selection Panel
CCI	Clinton Climate Initiative
CCS	Carbon capture and storage
CCSR	CCS Ready
CCUS	Carbon capture use and storage
CDM	Clean Development Mechanism
CEM	Clean Energy Ministerial
CEO	Chief Executive Officer
CO <sub>2</sub>	Carbon dioxide
CO2CRC	Cooperative Research Centre for Greenhouse Gas Technologies
COAG	Council of Australian Governments
COP	Conference of Parties
CRM	Client Relationship Management
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSLF	Carbon Sequestration Leadership Forum
EC	European Commission
EOR	Enhanced Oil Recovery
EPRI	Electric Power Research Institute
ERM	Environment Research Management
ETP	Energy Technology Perspectives
FEED	Front-end engineering and design
FID	Final investment decision
G8	Group of Eight
GHGT	Greenhouse gas technologies
IAP	International Advisory Panel
ICQ	Information Choice Questionnaire
IEA	International Energy Agency
IEAGHG	International Energy Agency Greenhouse Gas R&D Programme
ICO2N	Integrated CO2 Network
IGCC	Integrated gasification combined cycle
JBIC	Japan Bank for International Cooperation
JIP	Joint Industry Partnership
KCCSA	Korea CCS Association



KEPCO	Korean Electric Power Cooperation
KeTTHA	Malaysian Ministry for Energy, Green Technology and Water
LSIP	Large-scale integrated projects
MEF	Major Economies Forum
NER300	'NER300 ' name given to participants of the New Entrants' Reserve of the European Emissions Trading Scheme for subsidising installations of innovative renewable energy technology and carbon capture and storage (CCS).
PPP	Public private partnerships
PSP	Project Support Program
Q&A	Question and Answer
R&D	Research and development
RD&D	Research, development and deployment
RCI	Rotterdam Climate Initiative
RET	Department of Resources, Energy and Tourism
ROAD	Rotterdam Opslag en Afvang Demonstratieproject
SBSTA	Subsidiary Body for Scientific and Technological Advise
TAC	Technical Advisory Committee
TCM	Technology Centre Mongstad
TERI	The Energy Research Institute (India)
UK	United Kingdom
UNFCCC	United Nations Framework for Climate Change Convention
UNIDO	United Nations Industrial Development Organisation
US	United States
WPFF	Working Parties on Fossil Fuels
ZEP	Zero Emissions Platform





## 6.2 Annexure B – The Global CCS Institute Members

*As at 25 November 2011.*

KEY - All Members 330  
Legal Members 315  
**Foundation Members 10**  
Collaborating Participants 5

### GOVERNMENT MEMBERS

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  
Chugai Technos Corporation (CTC)  
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  
Elcogas S.A  
Électricité de France (EDF) DPIT  
Electricity Supply Board  
ENAGAS SA  
Enbridge Inc.  
ENEL S.p.A.  
Entergy Services Incorporated  
ERM Ltd  
Ernst & Young  
Exergen Pty Ltd  
ExxonMobil  
Fluor Ltd



Fortum Oyj  
Freshfields Bruckhaus Deringer LLP  
GDF SUEZ S.A.  
General Electric International Inc  
Golder Associates Pty Ltd  
Halliburton Australia Pty Ltd  
Hatch Associates Pty Ltd  
Hess Corporation  
Hitachi Limited  
Honeywell Ltd  
Howden Group Limited  
IBM Australia Ltd  
IFP Energies nouvelles  
IHI Corporation  
INPEX Corporation  
Jacobs Consultancy  
Japan Bank for International Cooperation (JBIC)  
Japan Oil, Gas and Metals National Corporation  
JGC Corporation  
JPMorgan Chase & Co.  
Kawasaki Heavy Industries Ltd  
Korea Electric Power Corporation (KEPCO)  
Korea Institute of Energy Research  
KPMG  
L.E.K Consulting Pty Ltd  
Lloyd's Register  
Macquarie Capital Group  
Maersk Olie og Gas AS  
Marubeni Corporation  
**Mitsubishi Corporation**  
Mitsui & Co. Ltd.  
National Grid  
Nippon Steel Engineering Co. Ltd  
Norwest Corporation  
Parsons Brinckerhoff Australia Pty Ltd  
Peabody Energy Australia Pty Limited  
Peel Energy Limited  
Perdaman Chemicals and Fertilisers Pty Ltd  
POSCO Engineering & Construction Co. Ltd  
Poyry Energy Consulting  
**Praxair Inc**  
PricewaterhouseCoopers  
Repower Energia Italy S.p.A  
Reykjaviku Orkuveita (Reykjavik Energy)  
Rio Tinto Limited  
Rolls-Royce PLC  
Samsung Techwin Co. Ltd  
Santos Limited  
Sasebo Heavy Industries Co., Ltd  
Scottish Power  
Services Petroliers Schlumberger  
Shell International Petroleum Company Limited  
Siemens Australia Ltd  
Societe Generale  
Sojitz Corporation  
Solid Energy New Zealand Limited  
Solvay S.A.  
Standard Chartered Bank

Stanwell Corporation Ltd  
Statoil, ASA  
Strike Energy Limited  
Sumitomo Corporation  
Taisei Corporation  
Taiwan Power Company  
Technip  
Tenaska Inc  
The Rhead Group  
Toshiba Corporation  
Total S.A.  
Toyo Engineering Corporation  
Toyota Motor Corporation  
TransAlta Corporation  
TRUenergy Development Pty Ltd  
Tuev Sued industrie  
Uhde Shedden Australia Pty Ltd  
Vattenfall AB  
Vattenfall Europe  
WDS Limited  
Woodside Energy Ltd  
Worley Parsons Services Pty Ltd  
Xstrata Coal Pty Ltd

#### **GENERAL MEMBERS**

3D-GEO Pty Ltd  
Alberta Innovates - Technology Futures  
Altona Energy PLC  
Asian Development Bank  
ASME Australia  
Australian Coal Association  
Australian National Low Emissions Coal  
Research and Development Ltd  
Aviva Corporation Limited  
B9 Coal  
Bellona  
Blake Dawson  
Bloomberg New Energy Finance  
Blue Strategies LLC  
Bluewave Resources, LLC  
Brazilian Coal Association  
British Geological Survey  
Brown Coal Innovation Australia  
Calera Corporation  
Calix Limited  
Canadian Clean Power Coalition  
CanSyd Australia Pty Ltd  
Carbon Capture and Storage Association  
Carbon Capture and Storage Research  
Consortium Nova Scotia  
Carbon Counts  
Carbon Dioxide Reduction & Sequestration R&D  
Center  
Carbon Management Canada Inc  
Cardiff University  
CCS TLM  
CE.Si.S.P (Interuniversity Centre for the  
Development of Product Sustainability)



Central Petroleum Ltd  
Centre for Research and Technology Hellas - Solid Fuels Technology & Applications  
CH2M Hill Australia Pty Ltd  
Clean Air Taskforce  
Clean Energy Systems, Inc.  
CO2 Capture Project Phase 3 (CCP3)  
CO2 Solution Inc.  
CO2 Technology Centre Mongstad (TCM)  
CO2Sense Ltd  
Coal Resources and Mining Engineering Co., Ltd  
Coal Utilization Research Council  
Commonwealth Scientific and Industrial Research Organisation (CSIRO)  
Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC)  
CPC Corporation - Exploration and Development Research Institute  
Deltalinqs  
demos EUROPA  
Electric Power Research Institute (EPRI)  
Emerson Process Management Flow B.V.  
ENEA Consulting  
Energy Research Centre of the Netherlands (ECN)  
Energy Valley Foundation  
Enhance Energy Inc.  
ENINVEST S.A  
EnTech Strategies LLC  
Enviro-Energy International Holdings Ltd  
Frommer Lawrence & Haug LLP  
Fundación Ciudad de la Energía (Ciuden)  
Gassnova SF  
Geogreen  
Geological Storage Consultants LLC  
Geological Survey of Ireland (GRI)  
Główny Instytut Górnictwa  
HTC Pureenergy Inc  
IEA Greenhouse Gas R & D Programme  
Industrial Technology Research Institute (ITRI)  
Infrastructure Partnerships Australia  
InnoSeptra  
Institute for Studies and Power Engineering for Romania  
Integrated Carbon Sequestration Pty Ltd  
Integrated CO2 Network  
Interkonsult Limited  
International Aluminium Institute (IAI)  
ION Engineering  
IPAC-CO2 Research Inc.  
IPIECA - International Petroleum Industry Environmental Conservation Association  
Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)  
Japan CCS Company Limited  
Japan Coal Energy Center (JCOAL)  
Japan NUS Co. Ltd (JANUS)  
Jupiter Oxygen  
Korea Advanced Institute of Science & Technology (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 Geocology  
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  
Quintessa K.K (Japan)  
Quintessa Limited (United Kingdom)  
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

**COLLABORATING PARTICIPANTS**

European Commission  
International Energy Agency  
International Energy Forum  
OPEC  
The World Bank

All information correct at 1 December 2011.