



## **TECHNICAL GROUP**

### **Draft Concept Paper for the Fifth CSLF Ministerial Conference**

#### **Decision Document**

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## CSLF IS GOING GREEN\*

### DRAFT CONCEPT PAPER FOR THE FIFTH CSLF MINISTERIAL CONFERENCE

*Note by the Secretariat*

#### Background

The first four CSLF Ministerial Meetings were held in Tysons Corner, Virginia, USA in June 2003, in Melbourne, Australia in September 2004, in London, United Kingdom in October 2009, and in Beijing, China in September 2011. A fifth Ministerial Meeting is now proposed, as required every two years under Section 3.2(b) of the Terms of Reference and Procedures.

In their September 22, 2011 Communiqué, following deliberations at the Beijing CSLF Ministerial Meeting, CSLF member country Ministers and Heads of Delegation affirmed that CO<sub>2</sub> Capture, Utilization and Storage (CCUS) is an indispensable element of any effective response to climate change and urged the world to increase the number of large demonstrations to enable the deployment of CCUS commercially by the end of this decade. The Ministers also applauded the decision at last year's United Nations Framework Convention on Climate Change (COP 16) to recognize CCUS as a measure in the Clean Development Mechanism (CDM). The Ministerial Communiqué further observed that the Ministers:

*“...Met today to discuss and address the key challenges facing CCUS and identify activities necessary to support further research, development, demonstration and deployment. While it is clear that significant progress is being made on CCUS, challenges remain, but these are challenges that can—and will—be overcome... We support strategies for the CSLF to resolve barriers for successful implementation of CCUS projects at a time of significant global economic challenge. We will work with the private sector to develop and implement methods to finance projects, including those in developing countries. We will work to develop legal and regulatory mechanisms to assure safety and appropriately allocate liabilities between the public and private sectors appropriate to our national circumstances. We will strengthen cooperation on both technology and policy in order to reduce the financial costs, to lower the energy penalty and to allay public concerns associated with the deployment of CCUS technologies... We task the CSLF to undertake CCUS development initiatives...”*

The Ministers also indicated that they welcomed additional international collaborations on CCUS through the International Energy Agency (IEA) the Global CCS Institute, and the Clean Energy Ministerial (CEM).

Since the last Ministerial Meeting, the CSLF has undertaken many activities in response to Ministerial guidance. A Ministerial Meeting at this time would formally take note of what the CSLF has achieved and recommit to its objectives at the ministerial level, would provide

further guidance, and would greatly strengthen global momentum in moving forward with CCS and CCUS.

After reviewing the deliberations and conclusions of the last Ministerial meeting and considering the current global situation with regard to climate related actions and CCS/CCUS, the CSLF Secretariat has prepared a draft concept paper for the fifth CSLF Ministerial Meeting. This draft concept paper is intended as a starting point for discussions.

### Action Requested

The Policy and Technical Groups are requested to consider the Draft Concept Paper for the fifth Ministerial Conference prepared by the Secretariat and to consider the proposed CSLF Ministerial Meeting.

As stated in the Draft Concept Paper, the strongly suggested theme for this Conference is “The Business Case for CCUS: Carbon Utilization to Meet Energy Sustainability, for Economic Development and to Fight Poverty.” CCUS enables the deployment of CO<sub>2</sub> capture technology even in the absence of forcing carbon legislation or regulation by creating a market driver for the CO<sub>2</sub> as a commodity, especially in CO<sub>2</sub>-EOR applications. EOR is the business driver for catalyzing CCUS, while providing economic drivers for commercial projects. It can improve a country’s balance of trade, increase domestic economic activity, create jobs and promote energy security. International collaboration can assist developing countries in pooling their resources, forming project alliances and pursuing commercial scale CCUS projects.

\* **Note:** This document is available only electronically. Please print it prior to the CSLF meeting if you need a hardcopy.

Draft as of 14 September

## Concept Paper

### FIFTH CSLF MINISTERIAL CONFERENCE - 2013

#### 0. Background

This Concept Paper outlines issues, which might be debated, and presents options for the fifth CSLF Ministerial Conference, which is proposed to be held during 2013. The options aim at ensuring visibility to the event, the main issues and practical outcomes while promoting wide and qualified attendance. The last Ministerial Conference identified new opportunities for CCS through CCUS. The fifth Ministerial Conference can build on the conclusions of the fourth Ministerial Conference and the CSLF activities to date; which can continue to grow momentum for CCUS. It can also introduce new momentum and impulse into the CSLF process and the emerging international partnerships.

#### 1. Scope of the Ministerial Conference and Expected Outcome

**a) General Theme:** A general theme is recommended to provide the Conference with mission, focus and guidance. The suggested theme is *“The Business Case for CCUS: Carbon Utilization and Storage to Meet Energy Sustainability, for Economic Development and to Fight Poverty.”* CCUS enables the deployment of CO<sub>2</sub> capture technologies even in the absence of enabling carbon legislation or regulation by creating a market driver for the CO<sub>2</sub> as a commodity, especially in CO<sub>2</sub>-enhanced oil recovery (CO<sub>2</sub>-EOR) applications. CO<sub>2</sub>-EOR is a business driver for catalyzing CCUS, while providing economic drivers for commercial projects. It can improve a country’s balance of trade, increase domestic economic activity, create jobs and promote energy security and environmental sustainability. In addition, CO<sub>2</sub>-enhanced coalbed methane (ECBM) recovery and CO<sub>2</sub>-enhanced gas recovery (EGR) are positioned to further expand market opportunities for CCUS. International collaboration can assist developing countries in pooling their resources, forming project alliances and pursuing commercial scale CCUS projects.

**b) Framework:** According to the CSLF Charter, the purpose of the CSLF is *“to accelerate the research, development and commercial deployment of improved, cost-effective technologies for the separation and capture of CO<sub>2</sub> for its transport and long term safe storage or utilization; to make these technologies broadly available internationally; and to identify and address wider issues relating to CCUS. This could include promoting the appropriate technical, political, economic, and regulatory environments for the research, demonstration and commercial deployment of such technology.”*

The fifth Ministerial Conference will be held in a highly dynamic policy framework. Global policy, strategy, legislation and legal frameworks on climate change remain unresolved in many

countries. While the decision at last year's United Nations Framework Convention on Climate Change (COP 16) to recognize CCUS as a measure in the Clean Development Mechanism (CDM) showed progress, it can be assumed that differences will remain among the parties on how to respond to the global climate challenge. Carbon Capture, Utilization and Storage (CCUS) remain a win-win option in this circumstance.

**c) Energy and Environment Context:** Since the time of the 1997 Kyoto Protocol, there has been only limited global progress in curbing CO<sub>2</sub> emissions. The current global mechanisms have not yet been successful in achieving the broad commercial deployment of CCS. The global recession has partly contributed to the limited progress, as has the high cost of low carbon emission technologies. CCUS offers the potential for being able to make major reductions in carbon emissions, but the current cost of CO<sub>2</sub> capture is high and there is major uncertainty in some countries as to how CCS will be regulated. The purpose of this Ministerial is to identify the best path forward for CCUS in the current political, legislative, regulatory and economic climate. The ideal pathway would be one that is economically viable and makes business sense, even in the absence of legislative and regulatory drivers for CCS.

Ranges of experts and analyses have generally concluded that CCS may be essential to meeting global climate goals. Some global leaders have drawn the same conclusion. Former UK Prime Minister Tony Blair stated that *“developing carbon capture and storage technology is not optional, it is literally of the essence.”*<sup>1</sup> Norway's Prime Minister Stoltenberg remarked, *“With nine billion people expected on the planet in 2050, there is no way we can choose between increased energy production and reduced CO<sub>2</sub> – we have to achieve both. Without CCS, we cannot do it.”*<sup>2</sup> Steven Chu, U.S. Secretary of Energy, in a recent article in Nature magazine wrote, *“If the world is to continue to produce electricity from fossil fuels, the carbon emissions from major point sources will have to be significantly reduced in the coming decades. Carbon capture and storage from coal and natural gas power plants and other major emitters, such as cement and steel plants, will be necessary. Also, the International Energy Agency concluded that a climate strategy with CCS would have approximately half the marginal cost in 2050 of a program lacking CCS technology, and (under IEA's assumptions) global cost savings attributable to CCS would total \$1.3 trillion per year in 2050.”*<sup>3</sup>

The world will be dependent on fossil fuels for the foreseeable future and policy makers throughout the world are increasingly aware of this fact. Developing economies will be the major source of energy demand growth, but all countries need energy for economic and social progress and all countries aspire for supply security and a sustainable fuel mix. CCUS will enable the world to use fossil fuels in a more sustainable way, thus easing shared concerns about development, energy security and social progress. However, CCUS must be commercially viable.

CCS market deployment is confronted with the barriers of high cost, project risks, lack of

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<sup>1</sup> [Breaking the Climate Deadlock, A Global Deal for Our Low-Carbon Future \(speech\)](#), T. Blair, The Climate Group, 2008.

<sup>2</sup> [Whatever happened to carbon capture in the fight against climate change?](http://www.guardian.co.uk/environment/2012/may/09/carbon-capture-storage-climate-change), D. Carrington, *The Guardian*, May 9, 2012, <http://www.guardian.co.uk/environment/2012/may/09/carbon-capture-storage-climate-change>.

<sup>3</sup> [Energy Technology Perspectives - 2008](#), Table 2.5, International Energy Agency, 2008

economic incentives and uncertain legal and regulatory frameworks for carbon dioxide transport, storage and the associated liabilities. CCUS can bridge these barriers, but barriers differ among countries and each country must choose the set of measures that best meets its national objectives and circumstances while at the same time supporting the development of regional and international cooperation and cross-border movement of CO<sub>2</sub>.

**d) Policy Imperative:** The key policy imperative is to reach agreement on a strategy for the broad commercial deployment of CCUS in the current global climate and to accelerate its deployment. Even though the precise nature of the agreement that will emerge is not known, it is expected that substantial cuts in carbon dioxide emissions are likely to be required. It is therefore necessary to ensure that CCUS is market deployable when the global outcomes have been agreed upon.

There is also a need to reaffirm agreement on and a willingness to promote CO<sub>2</sub>-EOR as the key component of CO<sub>2</sub> utilization in an effective CCUS strategy. Using CO<sub>2</sub> for EOR is a promising strategy for the commercial deployment of CCS in the current climate. CO<sub>2</sub>-EOR provides for the use of captured CO<sub>2</sub> from power and other industrial plants to facilitate additional production of crude oil via CO<sub>2</sub>-EOR, and the accompanying revenue from its sale. Governments would also benefit from the increased oil production through increased tax revenues and the availability of such oil from either domestic resources or from other secure sources – all of which would strengthen national and global economies. However, such projects also convey significant technical, economic and environmental risks to their sponsors. An incentives program and legal/regulatory clarity is likely to be required to encourage project sponsors to take on the associated risks, as well as a commitment to invest in R, D, &D projects to bring down the cost of CO<sub>2</sub> capture technology. It is also worth noting that CO<sub>2</sub> storage in depleted oil and gas fields and deep saline formations will be required over time to realize the full CCS mitigation potential and demonstration projects must start now.

**e) Government Action:** Governments need to know when CCUS is commercially available and market deployable. Accordingly, Governments will consider what measures they need to take to ensure or accelerate that availability and deploy ability, including pursuing the actions identified as outcomes from the proposed Ministerial Meeting (see subsection h “**Expected Outcomes**” below).

**f) Key Issues:** Key issues for CCUS market deployment are:

- ❖ **Issue A:** Willingness of countries to invest in the development and demonstration of additional large-scale CCUS projects and to assure the success of ongoing projects. Such investment must be made to bring down the costs of CCS, as well as to improve its maturity. CCS technology immaturity is not frequently highlighted but it is a key impediment. Energy producers continue to be concerned that adding CCS at current technology costs would raise the cost of energy, whether it is electricity or liquid fuel, to the point that they could not pass costs through to the consumer and therefore could not pursue CCS.
- ❖ **Issue B:** Willingness of countries to commit to and invest in a winning CCUS deployment strategy. The issues impeding the commercial deployment of CCS have not changed over the last 15 years, which include high CO<sub>2</sub> capture cost, large scale application of technology, technology immaturity, risk allocation, liability, financing, public acceptance, absence of

binding legislation, regulatory uncertainty and more recently the global economic recession. There is a critical need to adopt a CCUS strategy that can overcome these issues by making a business case for the broad commercial deployment of CCUS. Given the current global situation, the most promising strategy for some countries would be to “kick start” a global CO<sub>2</sub>-EOR business using captured anthropogenic CO<sub>2</sub>.

- ❖ **Issue C:** Willingness of countries to make sufficient and especially timely investment in advancing CO<sub>2</sub> capture and related technology performance and cost. Timely investment is needed in component research and development to reduce parasitic energy consumption (including solvent regeneration, compression, gas separation, and solids management), which leads to components at scale that can be retrofitted on existing installations and integrated with existing demonstrations for the purpose of commercialization.
- ❖ **Issue D:** Willingness of countries to pursue environmental, legislative and regulatory strategies that would eliminate any obstacles and would incentivise the use of captured anthropogenic CO<sub>2</sub> for EOR applications.
- ❖ **Issue E:** Willingness of countries to pursue environmental, legislative and regulatory strategies that would eliminate any obstacles and would incentivise the deployment of CCS systems.
- ❖ **Issue F:** Willingness of countries to aggressively incentivize CO<sub>2</sub> capture to overcome the absence of legislative/regulatory requirements to curb CO<sub>2</sub> emissions from gas power plants. Climate strategies cannot be achieved without deploying CO<sub>2</sub> capture on gas plants as well as all other fossil energy sources.
- ❖ **Issue G:** Willingness of developing countries to invest in and enable the deployment of CCUS in their respective countries.
- ❖ **Generic Issues:** The key generic issues, previously identified by the CSLF, specific to CCS and relevant to CCUS as well include:
  - Need to ensure a level playing field for CCUS technologies with other low carbon or zero carbon technologies.
  - Lowering the cost of capture to commercially and economically practicable levels particularly in electricity generation.
  - Developing public confidence in the integrity of the entire CCUS process.
  - Need to ensure a major consultation and outreach process on CCUS to communicate the need for and the benefits of CCUS.
  - Need to develop, where they do not already exist, appropriate legal/regulatory/fiscal frameworks to address intergenerational management of CCUS systems – the liability issue and who carries liability.
  - Need to make sure that the ongoing work on legal/regulatory/fiscal measures does not constrain pilot, demonstration and commercial projects from being implemented.
  - Because of differing national circumstances, need to develop legal/regulatory/fiscal measures that are largely locally based for managing the use of CCUS technology.
  - Need to maintain a global research effort and public/private partnership.

- The IPCC work could be a policy driver – especially in terms of the technical issues and the creation of community confidence in CCUS.

**g) Priority of Issues:** The issue priorities are in the same sequence as listed in the Issues Section (A to G). This prioritization is consistent with accelerating CCUS through CO<sub>2</sub>-EOR. Countries that can and would wish to utilize tax and other incentives to accelerate CO<sub>2</sub> storage by making captured anthropogenic CO<sub>2</sub> economically attractive for CO<sub>2</sub>-EOR applications are likely to agree with this prioritization.

Countries or constituencies that are unable or unwilling to pursue a CCUS/CO<sub>2</sub>-EOR strategy, but desire to assure early CCS deployment would have to assign an even higher priority to making a large direct investment in multiple large-scale integrated CCS projects to bring down the cost of CCS, increase technology maturity, gain public acceptance and would also have to create a favorable economic, legislative and regulatory environment for their deployment. In this context, the prioritization by such countries would lower the issues which focus on CCS/CO<sub>2</sub>-EOR strategies toward the bottom of the issues list, but the prioritization of the remaining issues would remain as listed in the Issues Section.

**h) Expected Outcomes:** Important desired outcomes from the fifth Ministerial Conference include the following:

- ❖ Reaffirmation that governments will work to create the business case for CCUS.
- ❖ Reaffirmation of the importance of CCUS to a global climate strategy, energy security economic development and fighting poverty. Endorse international collaboration to pursue at least one commercial scale CCUS project in developing countries.
- ❖ Reaffirmation of the need for countries to make the necessary and especially timely investment in research and development on carbon capture technology to bring down its cost.
- ❖ Reaffirmation that all fossil fuels will continue to be used and that CCUS is needed to make them sustainable.
- ❖ Reaching agreement that both oil consumers and producers benefit from EOR.
- ❖ Reaching agreement and issuing statement that CCUS and central power plants are needed to reduce poverty.
- ❖ Reaching agreement on and endorsement of a CCUS strategy that will accelerate the early deployment of CCUS in the current global political, legislative, regulatory and economic environment. This would necessarily have to be a strategy that can succeed even in the absence of binding climate legislation and regulation. For some countries, the winning strategy would be utilizing captured anthropogenic CO<sub>2</sub> and using it for CO<sub>2</sub>-EOR and, potentially, for enhanced gas or coalbed methane production.
- ❖ Reaching agreement on and endorsement of a set of incentives that must be implemented by Governments to achieve the agreed upon strategy, including direct investment and tax credits to reduce the cost of the captured CO<sub>2</sub> into the range required to make CO<sub>2</sub>-EOR

commercially feasible. The additional oil thereby produced should yield revenue streams (such as additional tax revenues) that should offset the cost of the tax credits.

- ❖ Reaching Ministerial commitment to pursue the necessary financial incentives in their respective countries to enable the agreed upon strategy.
- ❖ Reaching Ministerial agreement to promote CO<sub>2</sub>-EOR as the key component of CO<sub>2</sub> utilization for an effective CCUS strategy.
- ❖ Reaching Ministerial agreement to endorse environmental legislative and regulatory strategies that would encourage the use of captured, anthropogenic CO<sub>2</sub> for CO<sub>2</sub>-EOR.
- ❖ Identifying follow-on action for the next Ministerial Meeting to assure a continuity of effort and maximizing the pursuit of opportunities and growing the momentum for CCUS deployment.

## 2. Draft Agenda for the Ministerial Meeting

- a) **Calendar:** The Ministerial Meeting and the related events would develop over three days:
  - i) First Day: Policy and Technical Group Meetings
  - ii) Second Day: Parallel Events: Stakeholder's Dialogue and Outreach Forum. Ministers may wish to be present and possibly participate as speakers at selected sessions.
  - iii) Third Day: Ministerial Forum organized along three main Sessions and a Ministerial Statement.
  - iv) A CCS/CCUS projects exhibition will be organized and maintained for the full duration of the Ministerial Meeting and related events.
- b) **Policy and Technical Group:** Meetings will have their standard agenda and should provide the opportunity to fine tune the Ministerial Statement.
- c) **Stakeholders:** Dialogue would focus on the different but complementary roles of governments and various Stakeholders, social consensus and transparency of information. A joint CCS data collection and information exchange initiative might be advocated to facilitate public understanding, acceptance and support. The Stakeholders' Register might also receive a boost.
- d) **Outreach Forum:** The Forum should gather interest and involvement from non-CSLF participant entities (countries, international organizations and non-industry stakeholders).

## 3. Choice of Chairs, Discussants, and Background Papers

- a) The entire Ministerial Forum will have a Chair and two Co-chairs. Co-chairs will be selected from countries chairing or co-chairing the CSLF Policy and Technical Groups. The Ministerial Forum will have three sessions. Background papers will be prepared addressing the key issues.

b) Tentative titles for the Ministerial Sessions:

Session 1: The Strategic Role of Fossil Fuels and Carbon Capture, Utilization and Storage to Secure a Sustainable Energy Future

Session 2: The Business Case for CCUS and for Advancing Carbon Sequestration

- Presentation by the Global CCS Institute on the opportunities for 4-5 additional large-scale CCUS projects in developed countries, to include both EOR and CCS.
- Presentation by the Asian Development Bank on the opportunities for at least one large-scale CCUS project in developing countries.

Session 3: The CSLF Role for Accelerating CCUS Deployment and to Respond to the Global Challenges, including enabling, facilitating financing and incentivizing large-scale CCUS Projects

- c) The Minister from the hosting country will chair Session 1 and Present the Closing Statement. Ministers from the co-hosting countries will chair Sessions 2 and 3, respectively. A panel would be included in each session and would help to stimulate the discussion. The Panel would include the Chair, a Discussant (or Moderator), and two Ministers or Heads of International Organizations. General discussions will follow. The Chair will make a short summary at the end.
- d) Two to three background papers or discussion documents will be prepared. The papers will set the framework and suggest points for discussion. The papers could be prepared by international organizations such as the International Energy Agency, United Nations Environment Program, World Bank, and World Energy Council. Aspects covered must be central to the topics of the three conference sessions and could include the business case for CCUS (which could include both EOR and CCS), the global energy scene, the long-term energy policy views, the obstacles to investment and opportunities -- including identifying tools and actions to implement and enhance international cooperation.
- e) The specific subjects of the papers could include the following:

- A report on what makes some projects succeed and others fail.
- A paper suggesting creative new ways to finance demonstration projects, perhaps by countries collaborating.
- A paper discussing a possible initiative that could be pursued by developing countries to do a CCUS project in a CSLF developing country that would be of adequate scale technically and of interest to technology vendors, but small enough to be affordable.
- A paper on using CSLF project recognition as a vehicle for further collaboration/information sharing.
- A paper providing information, such as the CURC Roadmap, to convey what needs to be done. The latter paper must:

- Clearly describe the sustained effort, phases, and time needed to make CCUS commercial.
- Discuss environmental policies that would be support or impede the development of critically needed technology.
- Support the need to do projects at scale.
- Discuss the elements of an effective deployment strategy.

#### **4. Stakeholders' Dialogue and Outreach Forum**

- a) The Stakeholders' Dialogue will examine how to promote public/private partnerships (i.e. cooperation between governments and industry) and social acceptance. The Dialogue could be a full day event and could be organized into Sessions. Non-government organizations will have a key role. Ministers may wish to attend and intervene. Each Session will be introduced by a keynote speech. Stakeholders' will be invited by the host country and by the countries participating in the CSLF.
- b) The Outreach Forum will involve countries and international organizations, which are not formal participants in the CSLF.
- c) Stakeholders' discussion as well as Outreach Forum debate will be reported at the Ministerial Forum.

#### **5. Participation in the Ministerial Meeting**

- a) Who should participate: Ministers and their staff, Heads of international organizations, observers, and technical staff.
- b) Issues papers should be circulated in advance. Ministers should know they have a mission.
- c) Identification of global personalities as speakers. Some possibilities include Jeffrey Sachs, IEA Director, Bill Clinton, Head of WEC, Bill Gates, Microsoft and, from India, the heads of Reliance and TATA

#### **6. Organizing Stakeholders while Providing Them with a Role**

The choice of themes is important e.g. opportunities for socially responsible investors, challenges and opportunities for sectors and firms, etc.

#### **7. How to Communicate the Results of the Ministerial Meeting**

A communications strategy is necessary for interacting with the press and the media. Each day should make the news by planning a special news release.

- a) Should take advantage of the EOR industry in Houston and Texas to highlight what can be done for CCUS.
- b) Should emphasize utilization, which should include more than just EOR—chemicals, for example.

- c) Should focus attention on all aspects of CCUS including capture, storage, EOR, and economic and energy security benefits.
- d) Should emphasize the importance of CCS.
- e) All messages need to be carefully crafted and negotiated for broad acceptance.
  - Work with IEA to help support the right messages.
  - Messages need to be consistent with energy ministers, not environmental ministers.

#### **8. Proposals and Guidance Emerging from Recent International Events.**

Relevant international conferences and other events must be reviewed in terms of what role they may play in shaping the outlook for CCS and their results should be assessed for what impact they may have on the Ministerial.

#### **9. Organizing a Technology Expo**

Include a Technology Expo as part of the Ministerial

- a) Special tour and site visits for ministers and media
- b) Have in an area where people congregate (e.g., receptions area)
- c) Highlight US industry, but open to companies from all CSLF members
- d) Highlight both utilization/EOR and CCS (especially benefits and successes)