



2016-IP35: London Convention meeting LC-38 / LP-11 (2016).

Negligible progress on the export amendment for CCS. Positive response to IEAGHG report on ROAD project permit.

It was the 38th meeting of the London Convention and the 11th meeting of the London Protocol on the 19th -23rd September 2016, the global treaties that protect the marine environment. The detailed work on CCS was completed in 2012 (see IEAGHG 2013-IP26 and 2014-IP19) but outstanding is the ratification of the 2009 CO₂ export amendment which is a barrier to transboundary projects offshore, and there is an ongoing request for information and experiences with offshore CCS.

In terms of ratification of the CO₂ export amendment, UK, Norway and Netherlands have previously ratified, and Canada announced at this meeting that they are making progress in their ratification. There were no reports of progress by other countries, although previously Korea, Australia and Sweden announced they were working on ratification. So it appears overall there is very poor progress given that two thirds of the 47 Parties to the London Protocol need to ratify the export amendment for it to come into force. The Philippines asked for more capacity building for CCS regulation, such as workshops. IEAGHG responded with information on relevant activities, including by IEA, IEAGHG and CSLF and the recent offshore workshop (see Annex 3).

IEAGHG gave the intervention given in Annex 1 to this Information Paper, covering activities by IEAGHG and IEA. IEAGHG submitted a paper on the study on the ROAD project permit assessment (IEAGHG Report 2016-TR4), see Annex 2. The purpose of this was to address ongoing criticisms from Greenpeace on lack of transparency with CCS in the London Convention, by assessing the compliance of the ROAD permit with London Protocol requirements. This compliance assessment indicated overall technical compliance with the CO₂ Specific Guidelines, with some recommendations to enhance clarity. Overall, this exercise demonstrated that the requirements of the CO₂ Specific Guidelines are relevant and achievable by national regulators and CCS projects, and that transparency of compliance assessment is possible in ensuring the protection of the marine environment. This paper was extremely well received, and was even praised by Greenpeace for both the initiative of IEAGHG and the results of the exercise. I should give credit to Tom Mikunda of TNO who undertook this assessment for IEAGHG.

Also in the plenary, Nigeria submitted a paper on the Offshore Workshop in Austin in April (see IEAGHG report 2016-TR2) which was also well received and was complimentary to IEAGHG's work. This report is attached to this IP as Annex 3.

On marine geo-engineering, it was reported that a working group has been set up by GESAMP (the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection – an advisory body to UN) to look further in to the environmental and socio-economics aspects, involving experts from the London Convention Scientific Group.

So overall for CCS, one perceived issue of transparency has been addressed, but the offshore transboundary issue still continues due to the very slow rate of ratification of the export amendment. There is continuing interest in offshore CCS; IEAGHG and IEA continue to be primary information sources on CCS for the London Protocol. And of course, it is always reaffirming to hear appreciation for IEAGHG's activities on CCS.

Tim Dixon

22 September 2016



Annex 1. IEA and IEAGHG Intervention in Plenary to the LC-38/LP-11 agenda item “6.2 Experiences with CO₂ Sequestration Technologies and their application”.

The International Energy Agency (IEA) and IEAGHG’s work on policy and technical issues associated with Carbon dioxide capture and storage (CCS) has been ongoing since the last meeting.

IEA analysis continues to highlight the importance of CCS as a technology that allows us to meet the challenge of reducing emissions while meeting growing energy demand around the world. The 2015 edition of *IEA Energy Technology Perspectives (ETP 2015)* highlights the role for technological innovation in meeting the challenge of climate change and the importance, in particular, of near-term opportunities for continued development of CCS. This analysis supports the goals of the IEA 2013 CCS Roadmap, which also includes ratification of the LP export amendment as key action for CCS.

The IEA continues to support governments in implementing enabling policies and regulatory frameworks for CCS, including those that pertain to sub-seabed storage of CO₂. The main vehicles through which the IEA supports its member and non-member governments in this area are the *IEA International CCS Regulatory Network* and its regular update on CCS regulation, the *IEA Carbon Capture and Storage Legal and Regulatory Review*. The Regulatory Network provides a neutral forum for CCS regulators, policy makers and stakeholders to share updates and views on CCS regulatory developments. The next meeting of the Regulatory Network will be November 23-24 in Paris, France.

IEAGHG runs several Research Networks relevant to CCS and the marine environment. The report has been published of the combined meeting of the **Risk Management Network and the Environmental Research Network** in September 2015, which had an offshore theme and was hosted by the National Oceanography Centre in Southampton, UK (IEAGHG Report 2016-08).

Following on from the **Carbon Sequestration Leadership Forum (CSLF)** Offshore Task Force’s report in 2015, IEAGHG helped organise an **international workshop on offshore CCS**, co-organised and hosted by the University of Texas BEG in April 2016. This has been reported at LC38 by Nigeria in LC38/6 and a report of the meeting is available on IEAGHG, CSLF and BEG websites (IEAGHG Report 2016-TR2). There are discussions on follow-on work, including further workshops.

IEAGHG initiated work to assess a permit issued to a CCS project in the Netherlands’ in the context of London Protocol requirements. The objective of this work was to assess to what extent the proposed storage site complies with the London Protocol’s 2012 Specific Guidelines for Assessment of Carbon Dioxide Streams for Disposal into Sub-seabed Geological Formations (CO₂ Specific Guidelines), and therefore the 1996 London Protocol itself.

To note that the regulations applied to the project have undergone several transpositions from the London Protocol. The CCS project was permitted primarily under the Dutch Mining Act (2011). This Act applies the conditions required by the EU’s CCS Directive (2009). This Directive applies the conditions required by the OSPAR CCS amendment and permit guidelines (2007). These follow closely the conditions required by the London Protocol amendment (2006) and CO₂ Specific Guidelines (2007 version). It would be hoped that, even with these multiple transpositions, the conditions required on the project at the national level should be consistent with those of the London Protocol.

The compliance assessment has been achieved through a simple, but systematic, cross-check of the 56 requirements of the CO₂ Specific Guidelines against the contents of the application material provided by the operator to the National Authority. This involved the appraisal of approximately 1100 pages of submitted material in order to identify evidence of compliance. TNO were contracted by IEAGHG to undertake this assessment and this report represents their findings (IEAGHG Report 2016/TR4, May 2016).



The conclusions were that the material submitted to the National Authority is broadly sufficient to allow an evaluation of the planned CO₂ storage activities in a manner consistent with the provisions of the 1996 London Protocol. This compliance assessment indicates overall technical compliance with the CO₂ Specific Guidelines.

There are eight areas from within the application material which would benefit from further clarification. In addition, there is also one area of partial compliance and one of non-compliance from within the permit conditions which is the responsibility of the national authority.

A number of recommendations are provided to address some areas that have been identified by this assessment. The recommendations are relevant both for this specific case study, but also for future CO₂ storage permits in marine territories of contracting parties. The recommendations are made to national authorities and to the London Protocol, and can be seen on pages 2 and 3 of Inf.4.

Overall, this exercise demonstrates that the requirements of the CO₂ Specific Guidelines are relevant and achievable by national regulators and CCS projects, and that transparency of compliance assessment is possible in ensuring the protection of the marine environment.

For more information on IEA activities contact tristan.stanley@iea.org or visit their website <http://www.iea.org/> , and for more information on IEAGHG activities contact tim.dixon@ieaghg.org or visit the website <http://www.ieaghg.org/> .

Tim Dixon (IEAGHG) and Tristan Stanley (IEA) Sep 2016



Annex 2. IEAGHG paper to London Convention on ROAD permit assessment
(front pages only – see IEAGHG report 2016-TR4 for the rest)

THIRTY-EIGHTH CONSULTATIVE MEETING
OF CONTRACTING PARTIES TO THE
LONDON CONVENTION
&
ELEVENTH MEETING OF CONTRACTING
PARTIES TO THE LONDON PROTOCOL
19 – 23 September, 2016
Agenda item 6

LC 38/INF.4
14 June 2016
ENGLISH ONLY

CO₂ SEQUESTRATION IN SUB-SEABED GEOLOGICAL FORMATIONS (LP)

Review of CO₂ Sequestration Permit under the London Protocol – An assessment of the proposed P18-4 CO₂ storage site in the Netherlands¹

Submitted by OECD

SUMMARY

Executive summary: The annex to this document contains a review of a CO₂ Sequestration Permit under the London Protocol as part of the assessment of the proposed P18-4 CO₂ storage site in the Netherlands

Action to be taken: Paragraph 9

Related documents: None

Background

1 The P18-4 field, originally part of the ROAD² carbon capture and storage (CCS) Project, is a near-depleted gas field at a depth of 3.5 km under the seabed, located approximately 20 km off the Dutch coast in the North Sea. The operator of the gas field applied for a CO₂ storage permit to the Dutch authorities in 2011. The objective of this report is to assess to what extent the proposed P18-4 storage site complies with the London Protocol's *2012 Specific Guidelines for Assessment of Carbon Dioxide Streams for Disposal into Sub-seabed Geological Formations* (CO₂ Specific Guidelines), and therefore the 1996 London Protocol itself.

2 The project was permitted primarily under the Dutch Mining Act (2011). This Act applies the conditions required by the EU's CCS Directive (2009). This Directive applies the

¹ Report published by OECD/IEAGHG.

² The ROAD Project is a planned post-combustion capture unit on a coal-fired power plant in the Rotterdam harbour, capable of capturing 1.1 Mton CO₂ per annum (equivalent of decarbonizing 250MWe coal-fired power production).

conditions required by the OSPAR CCS amendment and permit guidelines (2007). These follow closely the conditions required by the London Protocol amendment (2006) and CO₂ Specific Guidelines (2007 version). Therefore it would be hoped that the conditions required on the project at the national level should be consistent with those of the London Protocol.

3 The assessment has been achieved through a simple, but systematic, cross-check of the requirements of the CO₂ Specific Guidelines against the contents of the application material provided by the operator to the National Authority. This involved the appraisal of approximately 1,100 pages of submitted material in order to identify evidence of compliance. TNO were contracted by IEAGHG to undertake this assessment and this report, found in the annex to this document represents their findings (IEAGHG Report 2016/TR4, May 2016).

Results

4 The material submitted to the National Authority is broadly sufficient to allow an evaluation of the planned CO₂ storage activities in a manner consistent with the provisions of the 1996 London Protocol. This compliance assessment indicates overall technical compliance with the CO₂ Specific Guidelines, no information was sufficiently absent that would indicate clear non-compliance with the CO₂ Specific Guidelines.

5 There are eight areas from within the application material which would benefit from further clarification. In addition, there is also one area of partial compliance and one of non-compliance from within the permit conditions which is the responsibility of the National Authority.

6 A number of recommendations are provided to address some areas that have been identified by this assessment. The recommendations are relevant both for this specific case study and also for future CO₂ storage permits in marine territories of Contracting Parties.

Recommendations to the National Authority

7 The following recommendations are made to the National Authority:

- .1 it should be requested that within any future permit applications, that the applicant makes a statement recognizing the applicability of the 1996 London Protocol and the requirements of the Specific Guidelines for Assessment of Carbon Dioxide for Disposal into Sub-seabed Geological Formations;
- .2 the applicant should be requested to explicitly highlight an "Impact Hypothesis", which could be an additional concise statement as part of the outcome of the standard risk assessment;
- .3 for future permit allocations for CO₂ storage sites provided by the national authorities of Contracting Parties, it is recommended that a brief summary of conformance with the requirements of the 1996 London Protocol is included in the preamble to the permit conditions;
- .4 if it has been decided not to develop an Action List, due to a limited number of CO₂ streams for storage, this should be explicitly mentioned as part of the LP compliance summary recommended above;
- .5 the National Authority should ensure that fixed intervals for permit review are explicitly mentioned in the permit conditions; and

- .6 recognizing the focus of the London Protocol on protecting the marine environment, the applicant should provide a clear statement on the foreseen effects of CO₂ leakage on the marine environment, including seawater, sediments and biota.

Recommendations to the Contracting Parties to the London Protocol

8 The following recommendations are made to the Contracting Parties to the London Protocol:

- .1 clarification could be sought on the extent to which the applicant must comment on the economic and operational feasibility as a consideration in the selection of a sub-seabed geological formation for the disposal of CO₂ streams; and
- .2 clarification could be sought on the extent and nature of public participation recommended in the permitting process of CO₂ storage sites, given a lack of experience and suitable legal provisions for enforcing such participation in some Contracting Parties.

Action requested of the governing bodies

9 The governing bodies are invited to take note of the information provided and to comment as they deem necessary.



Annex 3. Nigerian Report on Offshore Workshop

THIRTY-EIGHTH CONSULTATIVE MEETING
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LONDON CONVENTION
&
ELEVENTH MEETING OF CONTRACTING
PARTIES TO THE LONDON PROTOCOL
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CO₂ SEQUESTRATION IN SUB-SEABED GEOLOGICAL FORMATIONS (LP)

**Report on the International Workshop on Offshore CO₂ Storage
(Austin, Texas, United States, 19 to 21 April 2016)**

Submitted by Nigeria

SUMMARY

Executive summary: This document describes the outcomes of the International Workshop on Offshore CO₂ Storage which was held in Austin, Texas, United States from 19 to 21 April 2016

Action to be taken: Paragraph 12

Related documents: None

Introduction

1 The world of offshore Carbon Capture and Storage (CCS) gathered together from 19 to 21 April, 2016 at the Bureau of Economic Geology (BEG) at the University of Texas, Austin, Texas, United States for a workshop on offshore geological CO₂ Storage.

2 Under the leadership of Mr. Tim Dixon (OECD/IEAGHG), who also initiated and ensured Nigeria's invitation, the workshop was organized by the Gulf Coast Carbon Centre, the IEAGHG, and the South African National Energy Development Institute. The Workshop was supported by the Carbon Sequestration Leadership Forum (CSLF). Over 50 people attended from 13 countries, including from seven developing countries.

3 The workshop was organized in response to a recommendation for international knowledge-sharing outlined in the CSLF Final Report on Technical Barriers and R&D Opportunities for Offshore, Sub-Seabed Storage of CO₂ which was finalized in September 2015. Further information about this report can be found at <http://www.csforum.org/publications/documents/OffshoreStorageTaskForceFinalCombinedReport.pdf>.

4 The aims of the workshop were to undertake a global needs assessment for offshore geological CO₂ storage, to initiate a discussion about the various aspects of offshore transport and storage, and to build an international community of parties interested in offshore storage. This was achieved by bringing together those who are undertaking offshore CCS to share knowledge with those who are interested in this activity, and by facilitating countries to identify their specific issues, challenges, opportunities, and then to identify synergies, common gaps and goals, and define common action items. There was a pre-workshop survey to assess the status and needs assessment survey for each country.

Outcomes

5 Experts shared their knowledge and experiences on the first day, with the current state of knowledge from Brazil, Japan (RITE), the Netherlands (TNO), Norway (Statoil) and the United Kingdom (Shell). These "How To...." talks covered storage assessments, CO₂-EOR, transport options, risk management, monitoring, environmental impacts, infrastructure and regulations. Of particular interest were the subsea engineering solution being developed by Aker Solutions to take gas-processing systems off the platforms and onto the seabed, and the potential for shipping with hubs.

6 Other countries then presented their status and needs, including Australia, China, Ghana, the Republic of Korea, Mexico, Nigeria, South Africa and the United States. Information was also provided on the Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP) initiative and the CGS Baltic programme, both undertaking regional storage assessments. It was notable that although each country is in very different stages of pursuing offshore CCS, these countries also share common interests as outlined in this report.

7 Participants formed breakout groups to discuss issues around themes identified by the workshop, including technology transfers, infrastructure, funding and finance, moving from pilot to larger-scale projects, and regulations. This activity resulted in development of a list of recommendations on areas to be addressed and actions to be taken. Common issues included how to assess storage potential, and the many aspects of reuse of existing offshore infrastructure.

8 In summary, the list of recommendations included:

- .1 international collaboration and funding mechanism for a demonstration project;
- .2 development of a test programme and pilot project for infrastructure developments;
- .3 workshops and training on a range of topics including: storage resource assessment, funding sources for early stages of CCS resource assessment in developing countries, platform infrastructure and transport infrastructure issues and developments, and comparing specific aspects across projects such as environmental monitoring;
- .4 assistance with access to existing key information sources, and a common language on storage; and
- .5 creation of an "Offshore Network" or other means of continuing the momentum from this workshop.

9 The workshop concluded with demonstrations and posters of offshore work featuring several of the United States Department of Energy's recently funded studies, and included a demonstration of the P-cable monitoring system and its results from the Gulf of Mexico. Of note was that the UNFCCC's Climate Technology Centre Network (CTCN) supported attendees from Ghana and Nigeria, and this was possibly the first activity on CCS supported by CTCN. There was great interest from all the developing country attendees in the CTCN (IEAGHG and The University of Texas are members of the Network) and a separate session was devoted to introducing developing countries to the work of the CTCN.

10 Overall, it was clear that each country is at a different stage on the path to offshore CCS, but with common interests. The enthusiasm from attendees suggested they considered the workshop a success. There was common recognition that there is a nexus of interests and needs converging in progressing CCS offshore, and that momentum was being created towards international collaboration, not just in knowledge-sharing, but towards pilot and demonstration projects.

11 Collaboration between the CCS Team and that of the London Convention and Protocol communities and GESAMP was emphasized by Nigeria and it was so recorded in the main report of the meeting. If developing countries access the fund made available through UNFCCC Climate Technology Centre (CTC), it can serve as a way of meeting up with technology experts and build up knowledge of Contracting Parties from developing countries to implement the disposal of CO₂ waste streams under the London Protocol.

Action requested of the governing bodies

- 12 The governing bodies are invited to note the information provided and in particular:
- .1 the support provided by IEAGHG;
 - .2 that Nigeria is available to share the lessons learnt as may be needed;
 - .3 encourage the Secretariat to work more closely with the UNFCCC (CTCN) and the IEAGHG in this regard; and
 - .4 that the workshop identified the London Protocol as the primary global instrument that can be used to regulate CCS.
-