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PERSPECTIVE

Developments and Opportunities – A review of national responses to CCS under the London Protocol

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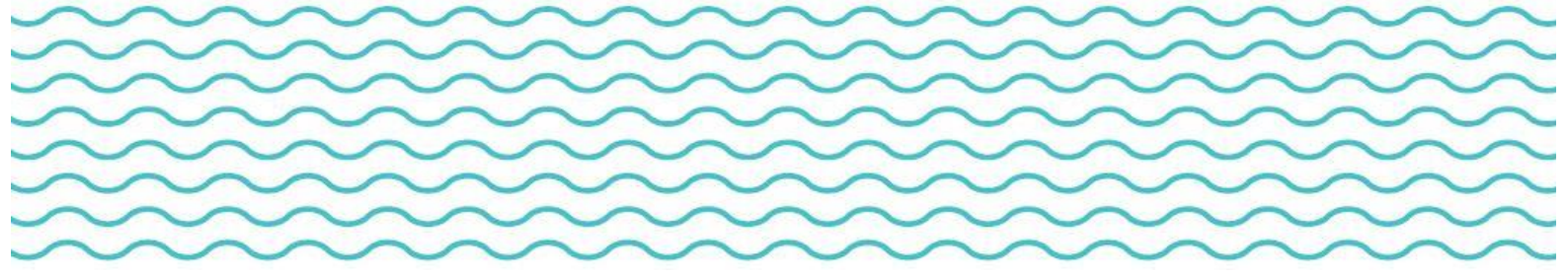
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KEY MESSAGES

- The CCS-specific amendments to the 1996 London Protocol have proven an important aspect of the development of wider legal and regulatory support for the technology. The original amendment to the Protocol, agreed by the Parties in 2006, removed a significant international barrier to deployment and provided one of the first examples of a regulatory regime for CO₂ storage.
- A further amendment to Article 6 and the export provisions of the Protocol, agreed in 2009, sought to address the prohibition on the transboundary movement of CO₂ for the purposes of geological storage. The amendment remained both contentious and a barrier to project deployment until the 14th Meeting of Contracting Parties in October 2019, where agreement was finally reached by the Parties to allow for the provisional application of the amendment to Article 6.
- The 2019 agreement effectively enables projects that require the transport of CO₂ across international boundaries, as part of a network or CCS project, to proceed. In accordance with the terms of the provisional application agreement, Contracting Parties will be required to provide the International Maritime Organisation (IMO) with a declaration of provisional application, as well provide further notification of any arrangements or agreements where projects are to proceed. Parties will also be required to meet the standards prescribed by the Protocol.
- For those projects that include a transboundary element and that are seeking to avail themselves of the new provisional application requirements, the focus will inevitably now shift back to national implementation. National regulators and policymakers will be required to support projects and ensure that all necessary agreements are in-place, including the notification of the IMO of these arrangements.
- Expediting these processes, particularly in jurisdictions which host projects in the advanced stages of planning and development, is now a near-term priority for several national governments. To-date, the governments of Norway, Denmark and the Netherlands have deposited a declaration on provisional application of the amendment with the IMO. Several other jurisdictions have indicated that they too will deposit the necessary declarations in the near future.
- Notwithstanding the importance of these recent developments, the IMO's long term ambition remains the full ratification of the Article 6 amendment by the Protocol's Contracting Parties.
- The Institute's analysis reveals several opportunities for the transboundary export of CO₂, for sub-seabed geological storage. In the two case studies in this briefing paper, three of the nations adjacent to the North Sea (Norway, Netherlands, and the United Kingdom) could theoretically import CO₂ from other nations for CO₂ storage within their territorial waters. Similarly, northern Australia in the Asia-Pacific region has suitable offshore CO₂ storage which may also enable the storage of third-party CO₂.

1. INTRODUCTION

Contracting Parties' amendments to the London Protocol in 2006, signaled an important international development for the technology and provided a formal basis for the regulation of CO₂ sequestration in sub-seabed geological formations under the Protocol's mechanisms. These amendments entered into force for all Parties to the Protocol in February 2007.

In 2009 Contracting Parties adopted a further formal amendment to the Protocol. The new amendment was made to Article 6, which previously had the effect of prohibiting the transboundary transportation of CO₂ for the purposes of geological storage. Notwithstanding the amendment's adoption, an insufficient number of parties have ratified it to-date, with two-thirds of the Protocol's Parties required to ratify for the amendment to enter into force for all Parties. At the time of writing, the following 8 Contracting Parties had submitted acceptances of the amendment: Denmark, Estonia, Finland, Islamic Republic of Iran, Netherlands, Norway, Sweden and the United Kingdom.

At the 14th Meeting of Contracting Parties, in October 2019, the impasse was finally addressed when agreement was reached by the Parties to allow for the provisional application of the amendment to Article 6. The provisional application of Article 6 will now allow proponents, wishing to transport CO₂ across international boundaries as part of a network or CCS project, to proceed with their plans. Parties seeking to host projects and support transboundary activities of this nature will be required to provide a declaration of provisional application and notification of any arrangements or agreements to the International Maritime Organisation (IMO). Furthermore, Parties will still be required to meet the standards prescribed by the Protocol. The governments of Norway, Denmark and the Netherlands have deposited declarations stating their intent to allow the provisional application of the 2009 amendment pending its entry into force.

2. ASSESSING PROGRESS

The Institute has undertaken a high-level assessment of Contracting Parties' progress to-date in implementing the CCS-specific provisions of the Protocol. The Institute's review considered each of the Contracting Parties':

- Ratification of the Article 6 amendment
- Deposition of a declaration of provisional application
- Participation in recent IMO meetings
- Development of storage resources (using the Institute's CCS Storage Indicator)
- Potential for offshore storage within national boundaries
- Transboundary potential (Likely requirement for storage beyond its own territorial boundaries)
- National development of plans or programmes to support the development of CCS infrastructure (e.g., the development of CCS Networks)
- Policy environment for CCS (using the Institute's CCS Policy Indicator)
- Legal and regulatory environment for CCS (using the Institute's Legal and Regulatory Indicator)
- Potential interest in implementing policies that locally contribute to CCS deployment and in reducing emissions from fossil fuels (using the Institute's Inherent CCS Interest Indicator)
- Membership of domestic/intergovernmental CCS-focused organisations
- Hosting of commercial, demonstration and/or pilot CCS facilities.

The results of the Institute's assessment confirm that while several Contracting Parties continue to express an interest in CCS and its wider deployment, only a small number have taken steps to ratify the amendment to Article 6. Fewer Parties still, only the Netherlands, Denmark and Norway, have taken steps to deposit a declaration of provisional application with the IMO. (Figure 1).

While for some Parties the ratification of the Protocol's transboundary amendment is perhaps a lesser priority, the Institute's analysis suggests there are several Parties that would benefit from the ability to export their CO₂ for storage beyond national borders. In a similar manner, several Parties to the Protocol may be well-positioned to accept CO₂ for storage within their territorial waters.

The Institute has also identified the significant opportunity amongst a number of the Protocol Parties to support more widespread regional development of CCS, including through the emergence CCS networks. The Northern Lights project in Norway is one example, however, there are similar

opportunities under development in the Netherlands and the United Kingdom.

2.1 Regional perspectives

The results of the Institute's assessment may be explained in greater detail through two regional cases studies, which are set out in the following sections. The Institute has chosen to focus upon Parties in Europe and the Asia Pacific region, to illustrate the challenges and opportunities facing CCS deployment under the Protocol.

In completing these case studies, the Institute has focused upon the status of ratification amongst nations within the region, their policy, legal and regulatory environment, storage potential and the location of any proposed CCS networks. In particular, the studies have sought to identify "Anchor Nations" and "Opportunity Nations", which may prove significant in terms of facilitating the regional deployment of the technology. In some instances, further diplomatic engagement with these Parties may serve to encourage more widespread ratification of the Protocol and its CCS-specific provisions.

The designation of "Anchor Nation" has been afforded to those Parties that present all or many of the following criteria:

- Demonstrate commitment to the ratification of Article 6
- Actively engaged in international dialogue on transboundary matters
- Possess geographical opportunity by virtue of proximity
- Offer geological storage potential
- Support investment in infrastructure to support industry
- Host facilities (Either planned/in-development)
- Offer a supportive policy, legal and regulatory environment for CCS

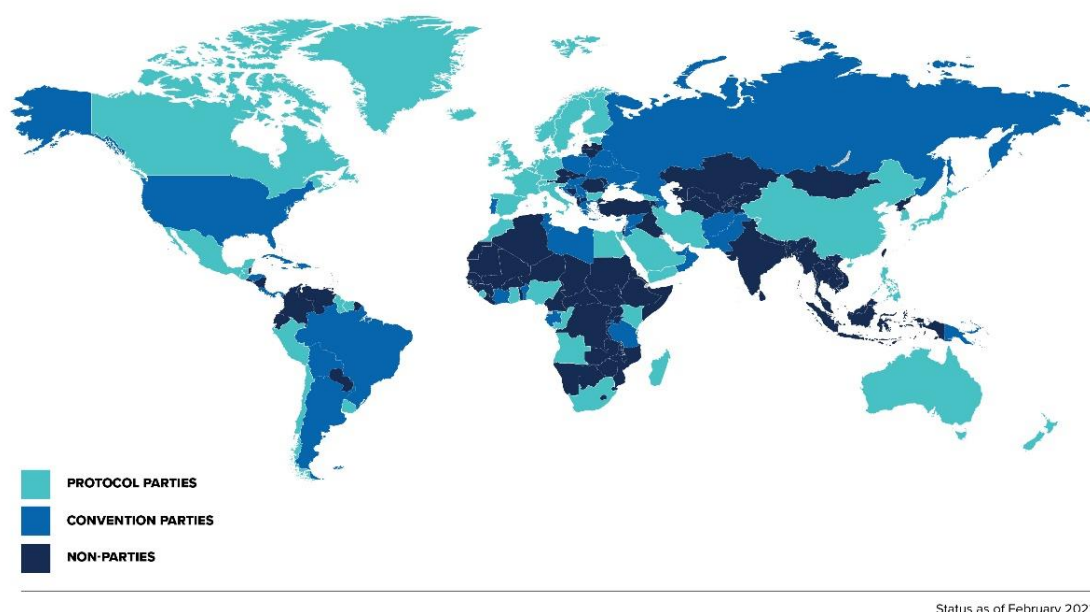


Figure 1. Map of Parties to the London Convention/Protocol (IMO, 2019).

In all instances these Parties have led CCS-specific action under the Protocol to-date. It is suggested that these nations may continue to drive further regional and international engagement on CCS within the auspices of the Protocol. Anchor Nations may also prove to be useful models, within a wider region, for other Parties seeking to adopt the Protocol, or that are advancing their approach to CCS deployment. In many instances, Anchor Nations are likely to host CCS networks and have the potential to receive CO₂ for storage, from other nations within the region.

The assessment has also identified several "Opportunity Nations" within the case studies, which exhibit some or all the following criteria:

- Party to the Protocol
- Have recently participated in intergovernmental meetings
- Potential for transboundary operations – either as an exporter or importer of CO₂
- Offer a supportive policy, legal and regulatory environment for CCS
- Host facilities – planned/in development

While these Parties are perhaps less advanced than the Anchor Nations in terms of their CCS-specific activities under the Protocol, they may prove important nations in developing CCS networks within a region and for supporting the more widespread deployment of the technology.

3. EUROPE

Europe presents perhaps the most encouraging region for CCS-specific developments under the Protocol, as the region has a combination of:

- Highly suitable storage potential in the North Sea
- the development of CCS networks
- geographical proximity
- supportive policy, legal and regulatory regimes amongst many of the Parties within the region.

These advantages suggest a significant opportunity for engagement and support. The recent deposition of declarations, on the provisional application of the amendment to Article 6, by Norway and the Netherlands are also demonstrative of some Parties' commitment to deployment and the elimination of barriers to the technology.

Norway, the Netherlands and the United Kingdom may be considered Anchor Nations within the region, with all three Parties meeting many of the criteria proposed for this designation (Figure 2). All three Parties have established strong drivers for deployment domestically, and their proposed CCS networks offer substantial opportunities for the expansion of CCS activities within the region. Equally significant is the role these Parties continue to play in advocating for CCS within the Protocol, both within the region and more widely.

Several Parties within Europe are to be considered Opportunity Nations, with potential for further engagement within the auspices of the Protocol. Nations such as Denmark, Sweden and Finland are perhaps illustrative of this potential. The latter two nations have already ratified the Article 6 amendment, and their geographical proximity to substantial storage potential in the North Sea, coupled with limited domestic storage resources, suggests these Parties could be engaged further.

Germany may perhaps also be considered an Opportunity Nation. Compared to the Anchor Nations considered above, Germany has not actively developed their CO₂ storage resources within their territorial waters. In addition to a lack of development, Germany has not actively supported CCS deployment within the past decade and heavily limited – within its national legislation – the deployment of onshore CCS facilities. Once again, this has slowed the development of CCS facilities. The nation's proximity to excellent offshore storage facilities and recent government statements regarding the technology, however, may offer the potential for the export and storage of emissions beyond national boundaries.

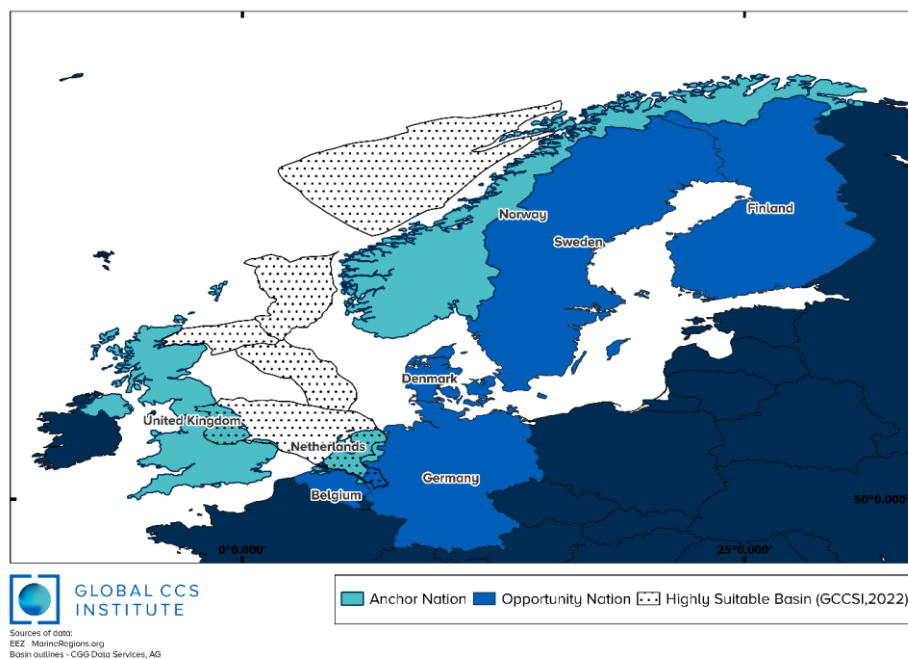


Figure 2. Anchor and opportunity nations in Europe.

4. ASIA PACIFIC

The Asia Pacific region offers significant potential for the deployment of CCS, and several governments and regionally based operators are considering the potential for more widespread deployment of the technology as part of their net-zero commitments. One example is the recently announced 'Bayu-Undan' project that will see CO₂ potentially shipped from Australia to Timor Leste for storage.

Several countries and operators within this region have already identified individual nations limited domestic storage potential and are now actively considering the potential for transporting and storing their CO₂ in the territorial waters of other countries within the region. As a result, there has been renewed interest in considering and addressing the legal barriers to the transboundary movement and storage of CO₂, which include the implications under the Protocol and relevant domestic law and regulation on storing CO₂ from another jurisdiction.

Within the region, Australia may be highlighted as an important Anchor Nation (Figure 3). Renewed domestic commitments to the technology's deployment and excellent storage resources, together with strong historical support for the technology's inclusion within the Protocol, suggest it is well-placed to engage regionally and offer support to those new entrants seeking to deploy CCS. Australia is also increasingly identified by countries throughout the region, as a potential destination for exported CO₂, a factor that may also further strengthen its position as a leader in the region.

Japan, South Korea and the Philippines are all Parties to the Protocol and may be described as Opportunity Nations. Successive studies have found that those nations likely have limited storage potential. These nations have limited accessible storage resources within their territorial boundaries, when compared to their total emissions. However, these nations also have limited knowledge of their offshore geology due to a lack of oil and gas development. With further CO₂ storage-specific exploration, significant resources could be identified in the medium to long term. Recent engagement with industry in Japan and South Korea, also suggests that the export of CO₂ for storage may be a solution for addressing these nations' significant emissions in the near term.

It should be noted that several other countries within the region, that are currently Non-Parties to the London Protocol, have also expressed interest in the export of CO₂ for storage. Although not precluded by the Protocol, the challenges of undertaking transboundary projects with Non-Parties should be considered further, as well as the potential to encourage these nations to ratify the Protocol.

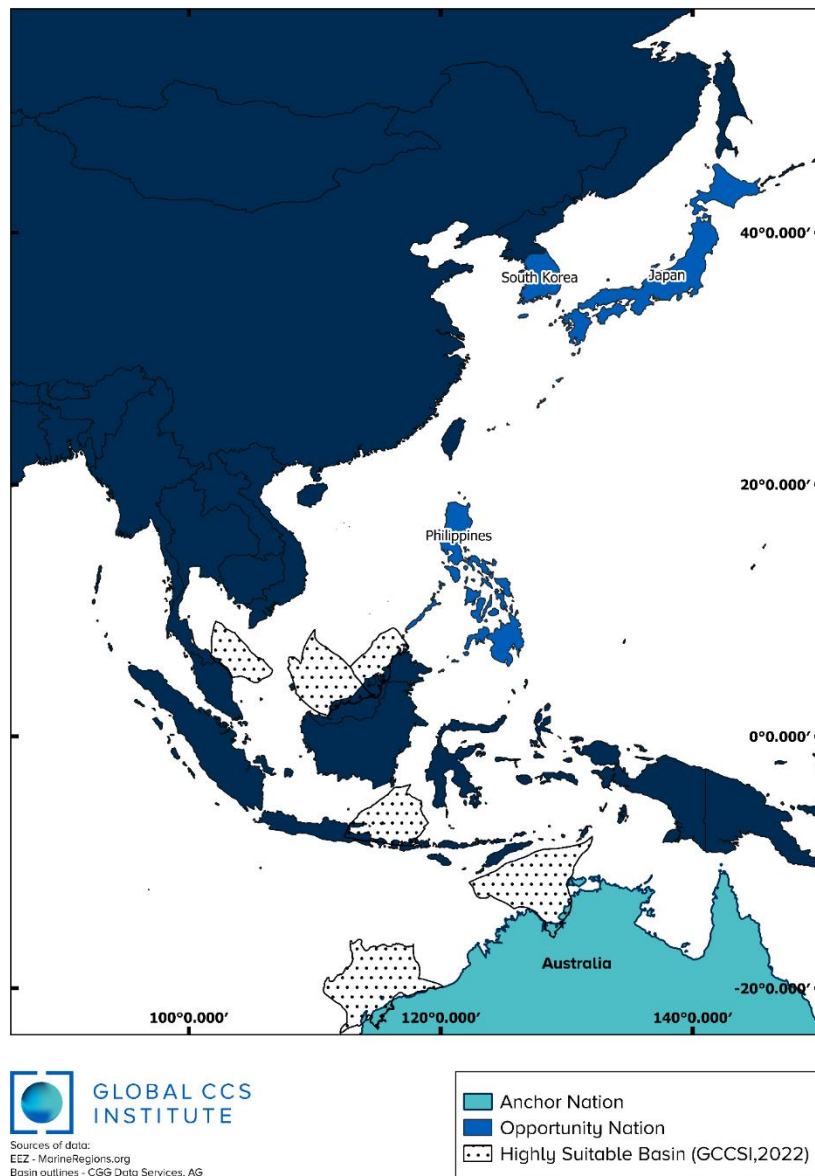


Figure 3. Anchor and opportunity nations in the East and South East Asia region.

5. CONCLUSIONS

The Institute's analysis demonstrates the significant potential for further activity within the auspices of the London Protocol. A strong focus upon the development of regional networks or individual projects, which in many instances will require the transportation of CO₂ across international maritime boundaries, emphasises the need for a renewed focus upon the role of the treaty in supporting deployment.

A coordinated approach between the Anchor and Opportunity nations, identified in this analysis, must be a near-term priority in addressing any remaining barriers to ratification. For more widespread deployment, a greater focus upon the original ambitions of the amendments made to the Protocol, must be realised.

6. References

IMO (2019) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. Available at: <https://www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx> (Accessed: 3 February 2022).