

# Are we ready for the ship transport of CO<sub>2</sub> for CCS? Crude solutions from international and European law

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## Abstract

Carbon capture and storage (CCS) is a crucial element of the energy transition that must take place over the next decades to tackle climate change. In recent years, the political momentum for CCS has increased and Norway is ready to deploy its first full-chain industrial CCS project. The Norwegian government hopes that, in time, this project will expand into a European CCS network. The carbon dioxide (CO<sub>2</sub>) will be carried by ships for much of the distance. While there are in principle no legal barriers to the ship transport of CO<sub>2</sub>, this article argues that international and European law are not ready yet to accommodate the ship carriage of CO<sub>2</sub>. First, the method for overcoming the Article 6 obstacle of the London Protocol reflects what has been politically achievable and not what would be legally desirable. Second, regarding the future Hazardous and Noxious Substances Convention's Fund, the article argues that CCS is a special case and certain concessions would be warranted. Third, the article highlights that the method for including CO<sub>2</sub> shipping into the European Union emissions trading system is not satisfactory.

## 1 | INTRODUCTION

Carbon capture and storage (CCS) is a well-known climate change mitigation technology. In a nutshell, carbon dioxide (CO<sub>2</sub>) is captured at power plants or industrial plants (cement, paper, chemicals, etc.), transported, and injected into suitable geological formations. Such formations may be onshore or offshore. Offshore, the transport can take place through pipelines or by ships.

CCS has two roles. In its first role, CCS is a bridging technology to reduce the CO<sub>2</sub> emissions of the power sector during the transition to renewable energy. In its second role, CCS is used to reduce emissions from CO<sub>2</sub>-generating industrial processes.<sup>1</sup> Both of these roles are to be part of the portfolio of measures required to meet the

1.5°C or 2°C goals of the Paris Agreement.<sup>2</sup> CCS is a recognized emission reduction technology in the UNFCCC's framework: CCS came under the Clean Development Mechanism (CDM) of the Kyoto Protocol,<sup>3</sup> and it is expected that it will also be an eligible activity under the Sustainable Development Mechanism (SDM) of the Paris Agreement.<sup>4</sup> Further, CCS is also eligible for support from the Green

<sup>2</sup>See in particular V Masson-Delmotte et al (eds), *Global Warming of 1.5°C* (Intergovernmental Panel on Climate Change 2018) 14. This source shows four model pathways to reach the 1.5°C goal with no or limited overshoot. Only one of these models does not include CCS technology. Overshoot pathways are defined as 'pathways that exceed the stabilization level (concentration, forcing, or temperature) before the end of a time horizon of interest (e.g., before 2100) and then decline towards that level by that time. Once the target level is exceeded, removal by sinks of greenhouse gases is required'. JBR Matthews et al, 'Glossary' in Masson-Delmotte et al, *ibid* 541, 555.

<sup>3</sup>UNFCCC 'Decision 7/CMP.6, Carbon Dioxide Capture and Storage in Geological Formations as Clean Development Mechanism Project Activities' UN Doc FCCC/KP/CMP/2010/12/Add.2 (15 March 2011); and UNFCCC 'Decision 10/CMP.7, Modalities and Procedures for Carbon Dioxide Capture and Storage in Geological Formations as Clean Development Mechanism Project Activities' UN Doc FCCC/KP/CMP/2011/10/Add.2 (15 March 2012).

<sup>4</sup>E Tamme and J Scowcroft, 'The Role of CCS in the Paris Agreement and its Article 6' (Global CCS Institute 2020) 5-7.

<sup>1</sup>For example, the production of cement – an ingredient of concrete – is estimated to be responsible for 5–8 percent of the world's CO<sub>2</sub> emissions.

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Climate Fund.<sup>5</sup> Likewise, CCS plays a key role in the European Union's (EU) climate change policy.

The timeliness of this article stems from the current Norwegian efforts to deploy a full-chain CCS demonstration project in the North Sea.<sup>6</sup> Once running, the project is hoped to expand with CO<sub>2</sub> sources from other European countries.<sup>7</sup> In its first phase, the project is planned to have two capture sites: a cement production plant in Brevik, South-East Norway and a waste incineration plant in Oslo respectively.<sup>8</sup> The combined amount of the captured CO<sub>2</sub> will be approximately 0.8 megaton/year.<sup>9</sup> The full project is called 'Longship' after the famous Viking boats. The transport and storage of the CO<sub>2</sub> is addressed by a sub-project named 'Northern Lights', run by Equinor in partnership with Shell and Total.<sup>10</sup> The captured gas is to be taken by ships to a receiving terminal on the western coast of Norway.<sup>11</sup> From the terminal, the CO<sub>2</sub> will be delivered by pipelines to a seabed facility, which will inject it into the geological formations beneath.<sup>12</sup> The infrastructure is designed in a way so that other projects can join in the future.<sup>13</sup> Indeed, a key aim of the demonstration project is to lay the foundation of a European CCS network.<sup>14</sup>

While both the international and the European legal framework are supportive of CCS,<sup>15</sup> it is submitted in this article that three elements of the legal framework for carrying CO<sub>2</sub> by ship still need attention. These are: (i) the recent amendment of Article 6 of the London Protocol and its provisional application; (ii) the status of CO<sub>2</sub> carriage under the anticipated Hazardous and Noxious Substances (HNS) Convention; and (iii) the integration of ship transport of CO<sub>2</sub> into the EU's emissions trading system (ETS). Only once these three questions are addressed will the legal framework be truly ready to accommodate the ship transport of CO<sub>2</sub>. The article proceeds in three parts. First, the amendment of Article 6 of the London Protocol and its provisional application are examined through five sections (background, the question of Article 6, the latest steps, analysis, and the broader status of CCS under the London Protocol). Second, a shorter section introduces the HNS

Convention and discusses the status of CO<sub>2</sub> carriage under it. Third, the article analyses the shipping of CO<sub>2</sub> under the EU ETS.

## 2 | THE OVERCOMPLICATED AMENDMENT OF ARTICLE 6 OF THE LONDON PROTOCOL

### 2.1 | The background

Marine pollution can take several forms. The most prominent form of intentional pollution is dumping, whereby waste is disposed of at sea. Today, there is a broad set of rules which seek to limit and prohibit dumping. At the highest level, the United Nations Convention on the Law of the Sea (UNCLOS) requests its State parties in its Article 210 to 'prevent, reduce and control pollution of the marine environment by dumping'.<sup>16</sup> There are two international treaties in force that are specifically dedicated to the limitation and banning of dumping: the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)<sup>17</sup> and its 1996 Protocol (London Protocol).<sup>18</sup> The latter is a standalone treaty, which supercedes the London Convention for the States which are party to it. Apart from these, certain regional conventions also have regulations on dumping, like the 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention).<sup>19</sup>

Since offshore CCS means disposing CO<sub>2</sub> under the seabed, the question arose among the parties to the London Convention-Protocol framework and the OSPAR Convention whether offshore CCS is dumping and whether it should be allowed.<sup>20</sup> The London Protocol and the OSPAR Convention have been amended to expressly allow CCS.<sup>21</sup> Since these amendments came into force, the status of offshore CCS in itself was not questioned under international law. However, the amendment of the London Protocol did not concern its Article 6. This article prohibits the international movement of waste

<sup>5</sup>UNFCCC 'Decision 3/CP.17, Launching the Green Climate Fund' UN Doc FCCC/CP/2011/9/Add.1 (15 March 2012) para 35.

<sup>6</sup>See Government of Norway, 'CCS in Norway' <<https://www.regjeringen.no/en/topics/energy/carbon-capture-and-storage/ccs-in-norway/id2601471/>>; and Northern Lights Project, 'About' <<https://northernlightsccs.eu/en/about>>.

<sup>7</sup>ibid; and Northern Lights Project, 'Business Opportunities' <<https://northernlightscs.eu/en/business-opportunities>>.

<sup>8</sup>Government of Norway (n 6); At the time of writing only the Brevik cement plant is confirmed to have sufficient funding, see Government of Norway, 'The Government launches 'Longship' for Carbon Capture and Storage in Norway' <<https://www.regjeringen.no/en/aktuelt/the-government-launches-longship-for-carbon-capture-and-storage-in-norway/id2765288/>>.

<sup>9</sup>ibid.

<sup>10</sup>ibid.

<sup>11</sup>The Kollsnes processing plant to the west of Bergen.

<sup>12</sup>The Johansen and Cook formations at the Aurora site near the Troll Vest field. The author is grateful to Peter Zweigel (Equinor, Trondheim) for the clarification of this point.

<sup>13</sup>See Government of Norway (n 6).

<sup>14</sup>Northern Lights Project (n 7).

<sup>15</sup>See the CCS Directive in general and its recital (12) (Parliament and Council Directive (EC) 31/2009 of 23 April 2009 on the geological storage of carbon dioxide [2009] OJ L140/114).

<sup>16</sup>United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3 (UNCLOS) art 210.

<sup>17</sup>1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (adopted 29 December 1972, entered into force 30 August 1975) 1046 UNTS 120 (LC).

<sup>18</sup>1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (adopted 7 November 1996, entered into force 24 March 2006) 36 ILM 7 (LP).

<sup>19</sup>1992 Convention for the Protection of the Marine Environment of the North-East Atlantic (adopted 22 September 1992, entered into force 25 March 1998) 2354 UNTS 67 (OSPAR Convention).

<sup>20</sup>Most notably, it was asked whether CO<sub>2</sub> is 'industrial waste' for the purposes of the London Convention (see the reports from the consultative meetings of the parties: LC 21/13, LC 26/15, LC 27/16, LC 28/15, LC 29/17, LC/SG 29/15, all available at <<https://docs.imo.org/>>). However, this question has never been expressly answered. Under the OSPAR Convention, see OSPAR Commission, 'Report from the Group of Jurists and Linguists on Placement of Carbon Dioxide in the OSPAR Maritime Area' OSPAR 04/23/1-E (28 June - 1 July 2004) Annex 12.

<sup>21</sup>IMO, 'Resolution LP.1(1) on the Amendment to Include CO<sub>2</sub> Sequestration in Sub-Seabed Geological Formations in Annex 1 to the London Protocol' LC-LP.1/Circ.5 (27 November 2006); OSPAR Commission, 'Amendments of Annex II and Annex III to the Convention in Relation to the Storage of Carbon Dioxide Streams in Geological Formations' OSPAR 07/24/1-E (25-29 June 2007) Annex 4.

for the purposes of dumping or incineration. On the understanding that offshore CO<sub>2</sub> storage is dumping, and that CO<sub>2</sub> is waste, the Contracting Parties had considered Article 6 to prohibit the transport phase of any international CCS project. Today, the question is considered to be resolved through a later amendment to Article 6 and a resolution on the provisional application of that amendment, which was necessary due to the lack of sufficient ratifications of the amendment. The following sub-sections argue that the solution reached is effective (i.e. cross-border CO<sub>2</sub> transport for CCS is now seen as allowed) but not appropriate. The appropriate solution would have been an interpretative resolution on the non-applicability of Article 6 to the transport of CO<sub>2</sub> in CCS operations.

## 2.2 | The Article 6 question

A dumping regime is not worth much if the parties can circumvent it by exporting the material to be dumped to a non-contracting State.<sup>22</sup> This is the rationale behind Article 6 of the London Protocol, which states that 'Contracting Parties shall not allow the export of wastes or other matter to other countries for dumping or incineration at sea'.<sup>23</sup> Also, this provision brings the London Protocol in line with the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.<sup>24</sup>

To understand the difficulty that the Contracting Parties had in relation to Article 6 in the context of CCS and why the solution that they reached is not the most appropriate one, it is appropriate to examine the negotiations in detail.

On the understanding that CCS falls under the London Protocol and that it is allowed, the Legal and Technical Working Group on Transboundary CO<sub>2</sub> Sequestration Issues (set up by the second Meeting of the Parties)<sup>25</sup> was tasked to examine the legality of CO<sub>2</sub> transport in the light of Article 6. The specific question before the Group was

whether the prohibition to export under Article 6 was to non-Contracting Parties only, or to Contracting Parties and non-Contracting Parties and whether potential ambiguities in this respect should be clarified by a resolution to interpret Article 6 or by an amendment of the Article itself.<sup>26</sup>

<sup>22</sup>See A Nollkaemper, 'Transboundary Movement of Hazardous Waste for the Purpose of Dumping at Sea' (1991) 22 *Marine Pollution Bulletin* 377.

<sup>23</sup>LP (n 18) art 6.

<sup>24</sup>Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal 1989 (adopted 22 March 1989, entered into force 5 May 1992) 1673 UNTS 57 (Basel Convention); IMO, 'Resolution LDC.42(13) Matters related to the Basel Convention on the Transboundary Movements of Hazardous Wastes and their Disposal' LDC 13/15 (18 December 1990) Annex 8; IMO, 'Report of the 1st Meeting of the Legal and Technical Working Group on Transboundary CO<sub>2</sub> Sequestration Issues' LP/CO<sub>2</sub> 1/8 (3 March 2008) para 3.13.4.

<sup>25</sup>IMO, 'Report of the Twenty-Ninth Consultative Meeting and the Second Meeting of Contracting Parties' LC 29/17 (14 December 2007) para 4.7.

<sup>26</sup>IMO, 'Report of the 1st Meeting of the Legal and Technical Working Group on Transboundary CO<sub>2</sub> Sequestration Issues' LP/CO<sub>2</sub> 1/8 (3 March 2008) para 3.6.

At the 17th Consultative Meeting of the Parties to the London Convention it had been agreed that the export provision to be included in the draft London Protocol should prohibit exports generally and not only to particular countries.<sup>27</sup> Consequently, 'the meeting rejected the option of a resolution to interpret Article 6 for the purpose of transboundary movement of CO<sub>2</sub> streams'.<sup>28</sup> The Group opined that 'Article 6 [had prohibited] the export of CO<sub>2</sub> streams from the jurisdiction of one Contracting Party to any other country .... Consequently, it was felt that an amendment to Article 6 was required in order to permit such movements',<sup>29</sup> and a possible amendment was drafted.<sup>30</sup>

The third meeting of the Contracting Parties approved the Group's report.<sup>31</sup> However, there was still no consensus as to whether Article 6 should be amended or an interpretative resolution is passed.<sup>32</sup> Another working group was established for the further review of the Legal and Technical Working Group's report.<sup>33</sup> The main outcome of the new group was to recommend the establishment of the Intersessional Correspondence Group to consider, among others, whether Article 6 should be amended or an interpretative resolution should be issued.<sup>34</sup>

The respondents in the Intersessional Correspondence Group mostly preferred an amendment because they saw no or little room for interpretation in the wording of Article 6.<sup>35</sup> Having said that, the United Kingdom was open to both options, noting that the London Protocol was not designed with CCS in mind.<sup>36</sup> The United States advocated an interpretative resolution due to the procedure being simpler than the one for an amendment and because such resolution could cover future technologies as well.<sup>37</sup>

On the fourth meeting of the Contracting Parties, the Intersessional Correspondence Group's recommendations were taken into account. Revisions were made to the proposed amendment and further debate followed. Since no consensus could be reached, the amendment was put to a vote and was adopted as Resolution LP.3(4).<sup>38</sup>

Since this is an amendment to an article of the Protocol, two-thirds of the Contracting Parties have to accept it for it to come into

<sup>27</sup>ibid para 3.7.

<sup>28</sup>ibid para 3.8.

<sup>29</sup>ibid para 3.9.

<sup>30</sup>ibid para 3.11 and Annex 3.

<sup>31</sup>IMO, 'Report of the Thirtieth Consultative Meeting and the Third Meeting of Contracting Parties' LC 30/16 (9 December 2008) para 5.14.

<sup>32</sup>ibid paras 5.17–5.18, 5.20.

<sup>33</sup>ibid para 5.21.

<sup>34</sup>ibid para 5.23.

<sup>35</sup>IMO, 'CO<sub>2</sub> Sequestration in Sub-seabed Geological Formations: CO<sub>2</sub> Sequestration in Transboundary Sub-seabed Geological Formations – Report of the Intersessional Correspondence Group on Transboundary CO<sub>2</sub> Sequestration Issues' LC 31/5 (3 April 2009) para 12.

<sup>36</sup>ibid; and IMO, 'CO<sub>2</sub> sequestration in Sub-seabed Geological Formations: CO<sub>2</sub> Sequestration in Transboundary Sub-seabed Geological Formations – Individual Responses Received by the Intersessional Correspondence Group on Transboundary CO<sub>2</sub> Sequestration Issues' LC 31/INF.2 (6 April 2009) 19.

<sup>37</sup>IMO (n 35) and IMO (n 36).

<sup>38</sup>IMO, 'Report of the Thirty-first Consultative Meeting and the Fourth Meeting of Contracting Parties' LC 31/15 (30 November 2009) paras 5.1–5.18.

force.<sup>39</sup> Out of the 53 Contracting Parties, 35 would have to ratify the amendment. However, as of December 2020 (11 years after the adoption), only six parties have done so.<sup>40</sup> It appears that the slow progress on the ratification of the amendment is a reflection of a lack of interest in CCS in the international community. At the moment, CCS has a high investment cost, it is reliant on State funding, and for most Contracting Parties the upfront payment is not outweighed by the long-term benefits.<sup>41</sup>

### 2.3 | The final steps(?)

For CCS to be successful, it must be deployed as a network of storage sites and transport infrastructure. While there has been considerable investment in Northern Europe into scaling up CCS and turning it into a significant climate change mitigation method, the slow ratification of the amendment jeopardized the utility of these efforts.

In 2019, at the 14th Meeting of the Parties, Norway and the Netherlands submitted a resolution proposal for the provisional application of the amendment.<sup>42</sup> The proposed resolution was adopted.<sup>43</sup> Accordingly, the international transport of CO<sub>2</sub> for the purposes of CCS is now understood to be allowed. However, from a purely legal point of view, this solution is not appropriate, and an interpretative resolution should have been used as the next sub-section will show.

### 2.4 | Analysis of the Contracting Parties' options

Provisional application was already part of the various options presented by the International Energy Agency (IEA) in a 2011 working paper.<sup>44</sup> On the basis of the 1969 Vienna Convention on the Law of Treaties (VCLT),<sup>45</sup> precedent, and the commentaries of the International Law Commission, the IEA drew up six options for overcoming the Article 6 obstacle. Option 1 was to pass an interpretative resolution, and option 2 was an agreement on the temporary application of the amendment. Since option 2 has already been adopted

and the argument made here is that option 1 should have been used, only these two options will be discussed.<sup>46</sup>

In the meaning of Article 25 of the VCLT, a treaty can be applied provisionally pending its entry into force if the negotiating States have in some manner so agreed (option 2). In the present case, the treaty is the amending resolution to Article 6 and the agreement on the provisional application is the subsequent resolution to this effect. Langlet pointed out that the London Protocol is a so-called interdependent treaty, meaning that 'the rights and obligations of the treaty cannot be reduced to reciprocal rights between any two parties'.<sup>47</sup> Consequently, he argued that the provisional application of the amendment would compromise the 'integral' nature of the Protocol. An argument based on the interdependence of obligations may be mitigated by asking how much importance should be attributed to it. According to Article 21(3) of the Protocol, '[a]n amendment shall enter into force for the Contracting Parties which have accepted it on the sixtieth day after two-thirds of the Contracting Parties shall have deposited an instrument of acceptance'.<sup>48</sup> Thus, the Protocol itself has a built-in mechanism that may lead to parallel standards. Nevertheless, even if a double standard is considered to be acceptable, it is undesirable. In addition to compromising the integrity of the Protocol, option 2 has two further disadvantages. First, although option 2 is meant to be temporary, it carries the risk of remaining in place as it is. In turn, this would convey the poor political message that CCS is not important. Second, option 2 is complicated by reflecting three layers of agreements: the Protocol with its Article 6, the amendment, and the resolution on the provisional application.

Option 1 proposed by the IEA was an interpretative resolution in line with Article 31 (general rule of treaty interpretation) of the VCLT. As it was shown above, the idea of an interpretative resolution did arise during the Meetings of the Parties; however, it was abandoned later, and the focus of the negotiations on this point was the receiving country's party status to the Protocol.<sup>49</sup> The IEA opined that 'a resolution made at a meeting of London Protocol contracting parties could potentially be an effective manner of clarifying the application of Article 6 of the London Protocol'.<sup>50</sup> However, this does not tell how such a resolution could clarify the matter.

It is submitted here that the answer should unfold from the response of the United Kingdom sent to the Intersessional Correspondence Group: 'The London Protocol was not designed with CCS in mind'.<sup>51</sup> In the language of Article 31 of the VCLT, CO<sub>2</sub> export for CCS was not part of the 'context' of Article 6; it is not the

<sup>39</sup>LP (n 18) art 21.

<sup>40</sup>Norway, the United Kingdom, the Netherlands, Iran, Finland and Estonia; See IMO, 'Report of the Forty-first Consultative Meeting and the Fourteenth Meeting of Contracting Parties' LC 41/17 (17 October 2019) para 6.2.

<sup>41</sup>See also D Langlet, 'Exporting CO<sub>2</sub> for Sub-Seabed Storage: The Non-Effective Amendment to the London Dumping Protocol and Its Implications' (2015) 30 International Journal of Marine and Coastal Law 395, 397–398.

<sup>42</sup>IMO, 'CO<sub>2</sub> Sequestration in Sub-Seabed Geological Formations – Proposed Resolution on the Provisional Application of the 2009 Amendment to Article 6 of the London Protocol' LC 41/6 (2 August 2019).

<sup>43</sup>IMO, 'Resolution LP.5(14)' LC 41/17/Add.1 (29 October 2019) Annex 2; IMO (n 40) para 6.21.

<sup>44</sup>International Energy Agency (IEA), 'Carbon Capture and Storage and the London Protocol – Options for Enabling Transboundary CO<sub>2</sub> Transfer' Working Paper (IEA 2011). See also H S Skjetne, 'Om dynamikk i traktatretten - med artikkel 6-hindringen i Londonprotokollen som illustrasjon' master thesis (University of Bergen 2019) <<https://bora.uib.no/bora-xmlui/handle/1956/21783>>.

<sup>45</sup>Vienna Convention on the Law of Treaties (adopted 23 May 1969, entered into force 27 January 1980) 1155 UNTS 331 (VCLT).

<sup>46</sup>The other options proposed by the IEA were: (3) a subsequent bi- or multilateral agreement between the Contracting Parties; (4) modification of the operation of relevant aspects of the London Protocol as between two or more Contracting Parties; (5) suspension of the operation of relevant aspects of the London Protocol as between two or more Contracting Parties; and (6) conducting CCS through non-Contracting Parties.

<sup>47</sup>Langlet (n 41) 414.

<sup>48</sup>LP (n 18) art 21(3) (emphasis added).

<sup>49</sup>See Section 2.2.

<sup>50</sup>IEA (n 44) 15.

<sup>51</sup>IMO (n 36) 19.

'object and purpose' of Article 6 to regulate CO<sub>2</sub> export for CCS. Further, CCS is different from ordinary dumping (see Section 2.5), and it is carried out with the intention to protect the environment. Therefore, it can be stated in 'good faith' that Article 6 was not meant to apply to this activity. Had the drafting parties thought about CCS at the time, most probably a clarification would have been inserted into the Protocol about the non-applicability of Article 6. This assumption is supported by the facts that Annex I has been amended to expressly allow CO<sub>2</sub> storage under the Protocol and the third Meeting of the Contracting Parties agreed to give the political signal that the London Protocol should not constitute a barrier to the transboundary movement of CO<sub>2</sub> streams.<sup>52</sup> Thus, the interpretative resolution should affirm that Article 6 is not applicable to the export of CO<sub>2</sub> streams for the purposes of CCS.

There are two important reasons why an interpretative resolution should have been chosen. First, this solution is not a method to overcome the Article 6 obstacle; rather it is a clarification that there is, in fact, no obstacle. Article 6 is not incompatible with CO<sub>2</sub> export but simply not applicable to it. It follows that any other option designed for removing 'the obstacle' is inappropriate, even if it achieves the desired practical result. Second, an interpretative resolution states how a treaty has to be understood in the form in which it is. That is, it is not a change to the Protocol itself. This precludes arguments based on the interdependency of obligations.

It should be noted that the argument made here is for an interpretative resolution which should have been agreed upon in the first place. The IEA's assessment and Langlet's commentary came after the amendment to Article 6 had been drafted and adopted. Accordingly, the IEA and Langlet have found that the key problem with an interpretative resolution was that the amending resolution for Article 6 had been already in place.<sup>53</sup> Thus, the formal amendment process had already been started, which indicated that Article 6 is not compatible with CO<sub>2</sub> export. Further, several parties rejected the option of an interpretative resolution.<sup>54</sup> Further still, for an interpretative resolution consensus would be necessary, which is unlikely to arise in light of the negotiation history.<sup>55</sup>

For the interpretative resolution advocated here, the already existing amendment would not be a problem. Resolutions can be repealed while the perceived incompatibility is merely a reflection of an earlier understanding. The same would hold true for the agreement on the provisional application of the amendment. The obvious difficulty with option 1 as presented here is not legal but political. The slow progress on the ratification of the amendment to Article 6, despite the fact that CCS itself is expressly allowed under Annex I, indicates that consensus is not likely to arise.<sup>56</sup>

In summary, the best approach to the Article 6 dilemma would be to follow option 1 with a focus on the purpose of the London

Protocol and not on the party status of the destination country. If this is not achievable, the second-best option is an amendment and an agreement on the provisional application of the amendment if the amendment does not come into force soon enough. This is what is happening at the moment. However, it should be remembered that this is just an accepted method to achieve the desired result and not the legally appropriate solution.

## 2.5 | The status of CCS under the London Protocol

The previous section has argued that Article 6 of the London Protocol is not applicable to CO<sub>2</sub> transport for the purposes of CCS. To bolster this point, the discussion in this section shows that the applicability of the London Protocol as a whole is qualified in the first place.

As it was considered above, CCS is similar to dumping.<sup>57</sup> However, the validity of this comparison must be examined carefully. CCS is not the throwing of waste into the water, the placing of waste on the seabed, or the burying of waste in the seabed. While similar, CCS does not fall under the classic notion of dumping. Of course, along the common perception, it must be examined whether CCS is dumping under the law. The London Protocol defines 'dumping' as 'any deliberate disposal into the sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea'.<sup>58</sup> 'Sea' is defined as 'all marine waters other than the internal waters of States, as well as the seabed and the subsoil thereof'.<sup>59</sup> 'Subsoil' is not defined in the Protocol. The Oxford English Dictionary defines 'subsoil' as the 'stratum of soil lying immediately under the surface soil, or beneath the normal depth of disturbance by cultivation'.<sup>60</sup>

The storage of CO<sub>2</sub> does not take place in this way. The CO<sub>2</sub> is injected into geological formations at great depth<sup>61</sup> under several strata (overburden) and at least one so-called cap rock (a specific layer of rock that is impermeable for the stored CO<sub>2</sub>). Furthermore, unlike shallowly buried waste, the chance of the injected CO<sub>2</sub> returning to the sea is extremely small. Even if this happened, the amount would be so little that it would not pose a threat of damage to the environment. Further still, if a small amount of CO<sub>2</sub> leaked into the sea is compared with the vast amount of avoided emissions (some of which would be dissolved in the sea), the disadvantage is less than negligible in comparison to the benefit. Thus, in fact, CCS is a very different activity from what is commonly understood as dumping. It can be considered as a form of protecting the environment rather than polluting it.

<sup>57</sup>See Section 2.1.

<sup>58</sup>LP (n 18) art 1.4.1.1.

<sup>59</sup>ibid art 1.7.

<sup>60</sup>Oxford English Dictionary Online, 'subsoil, *n.* and *adj.*' (31 March 2021) <<https://oed.com/view/Entry/193030>>.

<sup>61</sup>In the storage site of the Longship project the injected CO<sub>2</sub> will accumulate at approximately 2,100 metres below the seabed. See Equinor, 'Northern Lights Project Concept report' (Equinor 2019) <<https://northernlightsccs.com/wp-content/uploads/2021/03/Northern-Lights-Project-Concept-report.pdf>> 37.

<sup>52</sup>IMO (n 31) paras 5.22, 5.24; IMO (n 38) para 5.2. See also IEA (n 44) 15–16

<sup>53</sup>IEA (n 44) 16 and Langlet (n 41) 413.

<sup>54</sup>Langlet (n 41) 413.

<sup>55</sup>ibid.

<sup>56</sup>See also ibid.



This invites the question to what extent should CCS fall under the scope of the Protocol. While the question of whether CCS comes under the London Convention-Protocol regime was examined by the State Parties, no express statement or agreement was made at any point that CCS falls within the scope of the Protocol. The conclusion that it does is only derived from the fact that Annex I was amended to accommodate CCS.

Having said that, the inclusion of CCS into the London Protocol is strongly justifiable: the conditions to which CCS is subjected in the amendment are important,<sup>62</sup> and the Protocol is the closest treaty in topic for the introduction of these conditions at the global level. However, caution must be exercised in the application of the provisions of the Protocol. The special nature of CCS means that it does not fit the terms of the Protocol easily, and some provisions – Article 6 in particular – are not as relevant as for ordinary dumping. Consequently, an interpretative resolution on the inapplicability of Article 6 would most likely not offend the spirit of the treaty.

Even though the answer of the international community to Article 6 is not considered here to be the most fitting, it is a solution that allowed agreement as to the legality of exporting CO<sub>2</sub> for CCS. While finding a practicable solution has been crucial, the discussion above is more important for legal theory than practice. In contrast to the London Protocol, the future HNS Convention will not affect the legality of CO<sub>2</sub> carriage. However, contributing to the Convention's fund has financial consequences for CCS projects, and it is arguable that CCS should be subject to special conditions as discussed in the next section.

### 3 | CO<sub>2</sub> CARRIAGE UNDER THE HNS CONVENTION<sup>63</sup>

The HNS Convention<sup>64</sup> was designed with the intention to create an international liability framework for hazardous and noxious substances which is similar to the one applying to the carriage of oil. Although this Convention is not in force at the time of writing, it is expected to come into force in the near future.<sup>65</sup> Once in

force, the HNS Convention will also apply to CO<sub>2</sub> carriers,<sup>66</sup> and for such ships it will replace the Convention on Limitation of Liability for Maritime Claims (LLMC Convention) where this latter treaty is applicable.<sup>67</sup> The key features of the Convention are that liability is channelled to the shipowner<sup>68</sup> and it is strict<sup>69</sup> (subject to certain exceptions<sup>70</sup>); in turn, liability is limited and beyond the limit the HNS Fund provides compensation. The limit on the shipowner's liability depends on the size of the ship and the form of the cargo (bulk or packaged).<sup>71</sup> The currently planned ships are estimated here to have a size of about 12,600 gross tonnage (gt),<sup>72</sup> which corresponds to a total liability limit of about US\$ 25.9 million. Above this limit, the Fund is to provide compensation up to US\$ 360 million.<sup>73</sup> It should be noted that the Convention only applies when the cargo is on board.<sup>74</sup> Thus, it would not cover an accident while the CO<sub>2</sub> is waiting in storage tanks or after it has been discharged. The Fund is financed by 'receivers' of 'contributing HNS cargo'.<sup>75</sup> A 'receiver' is a person who physically receives or on whose behalf the cargo was physically received.<sup>76</sup> 'Contributing cargo' is defined by the Convention as 'any bulk HNS which is carried by sea as cargo to a port or terminal in the territory of a State Party and discharged in that State'.<sup>77</sup> In the context of the Longship project, the receiver would be an entity at the Kollsnes receiving terminal, and CO<sub>2</sub> would be contributing cargo.<sup>78</sup>

<sup>62</sup>The CO<sub>2</sub> stream must be disposed into a sub-seabed geological formation, it must consist overwhelmingly of CO<sub>2</sub> and no wastes or other matter must be added. See added para 4 in the amendment (n 21).

<sup>63</sup>This section is based on the author's revision of the corresponding section in V Weber and M Tsimplis, 'The UK Liability Framework for the Transport of CO<sub>2</sub> for Offshore Carbon Capture and Storage Operations' (2017) 32 *International Journal of Marine and Coastal Law* 138, 157–165.

<sup>64</sup>International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea 1996 and its Protocol of 2010 (adopted 3 May 1996, 29 April 2010, not yet in force) 35 *ILM* 1415 (HNS Convention).

<sup>65</sup>Council Decision (EU) 769/2017 of 25 April 2017 on the ratification and accession by Member States, in the interest of the European Union, to the Protocol of 2010 to the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea [2017] OJ L115/15; Council Decision (EU) 770/2017 of 25 April 2017 on the ratification and accession by Member States, in the interest of the European Union, to the Protocol of 2010 to the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea [2017] OJ L115/18. See also <<https://www.hnsconvention.org/implementation/>>.

<sup>66</sup>Liquefied bulk CO<sub>2</sub> comes under the Convention through the reference to Chapter 19 of the International Gas Carrier Code in the HNS Convention (n 64) art 1(5)(a)(v).

<sup>67</sup>Convention on Limitation of Liability for Maritime Claims 1976 (adopted 19 November 1976, entered into force 1 December 1986), Protocol of 1996 (adopted 2 May 1996, entered into force 13 May 2004) 1456 *UNTS* 221 (LLMC). See HNS Convention (n 64) art 42; LLMC, *ibid* art 18(1)(b).

<sup>68</sup>This means that in case of an accident, the shipowner bears liability for the damage even if the fault rests with certain third parties; HNS Convention (n 64) arts 7(1), 7(5) and 7(6).

<sup>69</sup>This means that the liability arises regardless of the shipowner's fault; *ibid* art 7(1).

<sup>70</sup>*ibid* arts 7(2)–(3).

<sup>71</sup>By the general formula, the limit is 10 million Special Drawing Rights (SDR) for the first 2,000 units of tonnage plus 1,500 SDR per ton between 2,001 to 50,000 units and 360 SDR per ton above 50,000 units. The complete calculation method can be found in Article 9 of the Convention. A Special Drawing Right is defined by the International Monetary Fund. It is based on the value of the US Dollar, the Euro, the Chinese Renminbi, the Japanese Yen and the British Pound Sterling. One SDR equals US\$ 1.44 at the time of writing.

<sup>72</sup>No data on gross tonnage is available at the time of writing. This figure is merely an estimate of magnitude. The author is grateful to Gisle Nysæter (Brevik Engineering, Brevik) for his advice. A gross ton (gt) is a unit for the measurement of a ship's volume. See the International Convention on Tonnage Measurement of Ships 1969 (adopted 23 June 1969, entered into force 18 July 1982) 1291 *UNTS* 3.

<sup>73</sup>HNS Convention (n 64) art 14.

<sup>74</sup>*ibid* arts 1(9) and 4(1).

<sup>75</sup>*ibid* arts 16–20 and Annex II.

<sup>76</sup>*ibid* art 1(4).

<sup>77</sup>*ibid* art 1(10).

<sup>78</sup>At the time of writing, the HNS Finder database only lists CO<sub>2</sub> as packaged, non-contributing cargo <<https://www.hnsconvention.org/hns-finder/>>.

The exact financing duties to the Fund stem from a highly political debate. The HNS Fund is supported by contributions from traders or importers of various hazardous and noxious substances. The 2010 HNS Convention provides for the creation of a general account divided into sectors<sup>79</sup> (bulk solids and other HNS) and, in addition, an oil account,<sup>80</sup> a liquified natural gas (LNG) account,<sup>81</sup> and a liquified petroleum gas (LPG) account.<sup>82</sup> The reason for the various separate accounts is the unwillingness of the safer industries to cross-subsidize damages from other industries. Thus, they lobbied and achieved the creation of separate accounts.<sup>83</sup> Once the Convention will be in force, it is understood here that bulk CO<sub>2</sub> will be a contributing cargo to the general account.

Two points must be highlighted in relation to this. First, commercial CCS is in its early days. The Longship project is a demonstration of feasibility and a preparation of a broader network. It is a not-for-profit undertaking, and it is heavily dependent on public funding. The partners involved are not importers or traders of CO<sub>2</sub> in the classic sense. The CO<sub>2</sub> will not be sold on the market, and no product will be made from or with it. Furthermore, even when CCS matures into a commercially viable activity, the business case will still be relatively fragile at the beginning. The question naturally arises whether, at least initially, CO<sub>2</sub> should qualify as contributing cargo. It is strongly arguable that an exception or a reduced contribution would be justified in the interest of promoting this climate change mitigation method. Second, CO<sub>2</sub> is non-flammable and it is not expected to cause significant environmental pollution.<sup>84</sup> Being a gas, its carriage is likely to have an excellent safety record.<sup>85</sup> If CO<sub>2</sub> is to contribute, it is strongly arguable that CO<sub>2</sub> should be eligible for its own account.

The carriage of CO<sub>2</sub> for CCS is a unique scenario that was not thought of during the elaboration of the HNS Convention. As a result, the carriage of CO<sub>2</sub> would fall under the generic HNS regime which is ill-suited for the nascent CCS industry. To be prepared for CCS, the HNS regime must recognize the value of CCS for climate change mitigation and its low environmental risk profile through adjusting its contribution requirements. At the European level, the EU ETS creates a similar issue to that of the HNS Convention. Although the ship transport of CO<sub>2</sub> is not prohibited by the EU ETS, it is not well aligned with it. However, as it will be seen in the section below,

the mismatch under the EU ETS is not originating from a blanket policy but from the poor integration of CO<sub>2</sub> shipping into the system's legal instruments.

## 4 | THE SHIP TRANSPORT OF CO<sub>2</sub> AND THE EU ETS

The EU ETS was established by the ETS Directive.<sup>86</sup> Since the ETS is implemented in the European Economic Area, the provisions of the system are applicable in Norway as well. Under the EU ETS, operators of certain activities must purchase emission allowances corresponding to the amount of CO<sub>2</sub> they produce, unless they capture the CO<sub>2</sub> as part of CCS.<sup>87</sup> The ETS Directive phrases this in Article 12(3a) as follows:

[a]n obligation to surrender allowances shall not arise in respect of emissions verified as captured and transported for permanent storage to a facility for which a permit is in force in accordance with [the CCS Directive].<sup>88</sup>

The activities which fall under the EU ETS are listed in Annex I of the ETS Directive. Notably, power generation and cement production are on the list. The various phases of CCS are also on this list in their own right. That is, CO<sub>2</sub> capture,<sup>89</sup> CO<sub>2</sub> transport by pipelines, and CO<sub>2</sub> storage. The Monitoring Regulation complements the ETS Directive by specifying the rules on how to measure and report the emissions from each of the activities coming under the Directive.<sup>90</sup> Regarding CCS, the calculations include both fugitive emissions and the CO<sub>2</sub> production of the activity itself. For example, a pipeline may have fugitive emissions in the form of leakages, and it has operational emissions from its related equipment, such as compressor stations.

Annex I of the ETS Directive includes CO<sub>2</sub> transport specifically as 'transport of greenhouse gases by pipelines'. Article 49(1b) of the Monitoring Regulation refers to 'transport networks', which are defined by the CCS Directive in Article 3(22) as a 'network of pipelines ... for the transport of CO<sub>2</sub> to the storage site'.<sup>91</sup> The Monitoring Regulation itself defines 'CO<sub>2</sub> transport' in its Article 3(52) as 'the

<sup>79</sup>HNS Convention (n 64) art 16(1).

<sup>80</sup>ibid art 16(2)(a), with oil as defined in art 1(5)(a)(1).

<sup>81</sup>ibid art 16(2)(b), liquefied natural gases of light hydrocarbons with methane as the main constituent.

<sup>82</sup>ibid art 16(2)(c), liquefied petroleum gases of light hydrocarbons with propane and butane as the main components.

<sup>83</sup>See M Göransson, 'The HNS Convention' (1997) 2 Uniform Law Review 249, 265–266; P Wetterstein, 'Carriage of Hazardous Cargoes by Sea – The 2010 HNS Convention' (1997) 26 Georgia Journal of International and Comparative Law 595, 608–609.

<sup>84</sup>The carriage of LNG is often compared to the carriage of CO<sub>2</sub>, and the carriage of LNG is understood to be a safe sector. See B Metz et al (eds), *Carbon Dioxide Capture and Storage* (Cambridge University Press 2005) Sections 4.3 and 4.4.4. See also E Vanem et al, 'Formal Safety Assessment of LNG Tankers' (10th International Symposium on Practical Design of Ships and Other Floating Structures 2007) <[https://www.researchgate.net/publication/281273707\\_Formal\\_Safety\\_Assessment\\_of\\_LNG\\_tankers](https://www.researchgate.net/publication/281273707_Formal_Safety_Assessment_of_LNG_tankers)>.

<sup>85</sup>ibid.

<sup>86</sup>Parliament and Council Directive (EC) 87/2003 of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community [2003] OJ L275/32 (ETS Directive).

<sup>87</sup>CCS can exist when the capture, transport, injection, and the profit on these together cost less than the price of emission allowances for simply emitting the CO<sub>2</sub>. Thus, the ETS and emissions allowances are the financial engine of CCS.

<sup>88</sup>ETS Directive (n 86) art 12(3a).

<sup>89</sup>A capturing installation operator may be the same entity as the CO<sub>2</sub> producer, for instance when CO<sub>2</sub> is captured in a power plant. For conciseness, reference will only be made to the CO<sub>2</sub> producer.

<sup>90</sup>Commission Regulation (EU) 2066/2018 of 19 December 2018 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council [2018] OJ L334/1 (Monitoring Regulation).

<sup>91</sup>CCS Directive (n 15) art 3(22); The preamble of the Monitoring Regulation (n 89) in para (3) provides that the definitions laid down in the CCS Directive also apply to the Regulation.

transport of CO<sub>2</sub> by pipelines.<sup>92</sup> The drafters of the legislative framework focused on pipelines and did not plan for the ship transport of CO<sub>2</sub>. To understand the effect of this omission, Article 12(3a) of the ETS Directive and Article 49 of the Monitoring Regulation must be considered.

Article 12(3a) of the ETS Directive simply refers to 'transport'. Reading this provision without allowing it to include shipping, the unreasonable situation arises whereby CO<sub>2</sub> shipped and deposited in a storage site still attracts emission liability because it was not transported by pipelines. Therefore, it would be sensible to argue that the term in this provision must include shipping as well. Indeed, if a CO<sub>2</sub> source is above a storage site, no transport may be needed at all. In this light, the phrase 'captured and transported for permanent storage' is merely a write-out of the term 'CCS' and the only thing that matters is the fact the CO<sub>2</sub> is being stored as opposed to emitted.

Article 49 of the Monitoring Regulation states:

the operator shall subtract from the emissions of the installation any amount of CO<sub>2</sub> ... which is not emitted from the installation, but *transferred* out of the installation to *any of the following*:

- (a) a capture installation ...
- (b) a transport network ...
- (c) a storage site permitted under [the CCS Directive] for the purpose of long-term geological storage.

For any other transfer of CO<sub>2</sub> out of the installation, no subtraction of CO<sub>2</sub> from the installation's emissions shall be allowed.<sup>93</sup>

This provision raises the same problem as Article 12(3a) above. However, it is more precise, and it offers less room for interpretation. Arguably, the expressions 'transfer' and 'to any of the following' allow the construction whereby the producer transfers the CO<sub>2</sub> directly to the storage site. In other words, the whole transport element is part of the transfer, and therefore the CO<sub>2</sub> producer can make the corresponding subtraction from their emissions once the CO<sub>2</sub> reaches the storage operator. Having said that, this construction is technical and artificial. It seems that point (c) was originally drafted for the transfer from the pipeline network to the storage site operator or where the CO<sub>2</sub> producer is already at the storage site and hands over the CO<sub>2</sub> to the storage site operator, and for the case where the storage site operator actually stores the received CO<sub>2</sub>. Equally well, the CO<sub>2</sub> producer was not meant to be liable for the CO<sub>2</sub> after it is no longer under their control. Furthermore, corresponding with the limitation of Article 49, unlike for pipelines, there are no instructions on how to calculate emissions arising during shipping (fugitive and operational) in Annex IV of the Monitoring Regulation. This compromises the accounting of CO<sub>2</sub> in the CCS chain, which, in turn, could raise the

question whether the ship transport of CO<sub>2</sub> is allowed. Yet, it would be counterproductive to say that since the CO<sub>2</sub> is not handed over to a transport network of pipelines but to a ship, no subtraction from the producer's emissions should be allowed.

The Norwegian Environment Agency also identified the problem described here.<sup>94</sup> Based on a similar line of reasoning as the one here presented, in the Agency's view, subtraction from the producer's emissions should be allowed once the CO<sub>2</sub> reaches the storage operator. The Agency has sent its observations to the European Commission for confirmation. The Commission confirmed that the Agency is indeed correct.<sup>95</sup> Thus, the use of ships for CO<sub>2</sub> transport is not hindered by their non-inclusion into the ETS. This is a rational outcome, which could be expected. However, from a legal point of view, various issues can be flagged which indicate that the system for accounting emissions is not yet ready for CO<sub>2</sub> shipping.

First, the accommodation of CO<sub>2</sub> shipping into the ETS relies on a technical argument rather than the natural interpretation of the ETS legislation. Second, the Commission's response is only a form of quasi-law rather than binding legislation.

Second, the ETS and the Monitoring Regulation are supposed to create a tight system. If the use of ships is simply confirmed to be allowed without the introduction of the corresponding details in the ETS Directive and the Monitoring Regulations, the integrity of system becomes compromised. Who and how will account for operational, fugitive, and accidental emissions during the shipping phase? The question is only partly answered.

In the Norwegian suggestion, the CO<sub>2</sub> producer remains liable until arrival for storage. The calculation of the lost amount would be established at the point of delivery according to tailor-made monitoring solutions. The Commission confirmed these suggestions. However, neither the Norwegian suggestion nor the Commission's reply mention the CO<sub>2</sub> emissions from the ships' engines and machinery (a form of operational emissions). The CO<sub>2</sub> producer is not in a position to assess or control these. Should they be liable for it? If not, and shipping is not understood as transport, who should be liable for it? How should the calculations be made? If we ignore this point, then again, the integrity of the system becomes compromised.

Third, while the reached solution may seem workable, it disturbs the original balance of risk and liability between the parties. If the transport takes place through pipelines, the CO<sub>2</sub> producer is free from risk the moment it hands over the CO<sub>2</sub>. Where the CO<sub>2</sub> is carried by ships, the risk remains with the producer until arrival to

<sup>94</sup>Letter from the Norwegian Ministry of Climate and Environment to the European Commission, DG CLIMA, 'The Norwegian CCS Demonstration Project – Request for Legal Clarifications Related to the ETS Directive and the MR-Regulation' (7 July 2019). See also Carbon Neutral Cities Alliance (CNCA), 'Note 7: Barriers to Transport and Storage of CO<sub>2</sub> within the European Union' (CNCA 2020) <<http://carbonneutralcities.org/wp-content/uploads/2020/01/Barriers-to-Transport-and-Storage-of-CO%E2%82%82-Within-the-EU.pdf>>. See also H S Egeland, 'Carbon Capture, Transport and Storage Under the EU Emissions Trading System – Accommodating Mobile CO<sub>2</sub> Transport' (2021) 537 Marlus 1, Section 3.2.3; A O'Brien, 'The liability framework for the shipping phase of carbon capture and storage: A critical study of the liability regime for CO<sub>2</sub> leakage during cross-border CO<sub>2</sub>-shipping activities in the North Sea' (2019) 512 Marlus 1, Section 3.3.3.

<sup>95</sup>Letter from the European Commission, Directorate-General, Climate Action to the Ambassador of Norway to the European Union' (Ref. Ares(2020)3943156 – 27/07/2020). At the time of writing, this letter is not available online.

<sup>92</sup>Monitoring Regulation (n 90) art 3(52).

<sup>93</sup>ibid art 49 (emphasis added).



the storage operator. This can be bridged through contracts between the CO<sub>2</sub> producer and the shipper, which is an extra layer of unnecessary complication. Fourth, soon shipping is expected to come under the EU ETS in its own right,<sup>96</sup> and the current solution will fit poorly. It would make sense to design legislation that can be seamlessly integrated into the EU ETS.

In case the Commission would not have agreed with the Norwegian query, the Agency also considered unilaterally introducing the 'transport of CO<sub>2</sub> by other means than in pipelines' or 'transport of CO<sub>2</sub> by ship' through Article 24 of the ETS Directive (subject to the Commission's approval). This inclusion would have been a much more elegant solution than the present one. It would resemble the amendments needed (assuming the drafting of rules on monitoring and accounting as well), but it would only apply to Norway. The Agency noted that 'there are some challenges with the opt-in solution'<sup>97</sup> without specifying what those challenges are.

All in all, the Commission's response is welcome in that it expressly supports the ship transport of CO<sub>2</sub>. However, the solution reached raises more questions than it answers. The Monitoring Regulation must be amended to expressly include ship transport. If not sooner, then at the inclusion of shipping into the ETS. Surprisingly, the opportunity at the recent amendment of the Monitoring Regulation was missed.<sup>98</sup>

In the meantime, knowing that CO<sub>2</sub> shipping is supported, opting in the shipping of CO<sub>2</sub> for the purposes of CCS into the ETS would be a much more appropriate solution. The rules and formulas for the ship-side calculations could be based on the provisions of Regulation 2015/757<sup>99</sup> on the monitoring, reporting and verification of CO<sub>2</sub> emissions from maritime transport. This approach would safeguard the integrity of emissions accounting until shipping, in general, is included in the EU ETS. Likewise, this approach would minimize the legal risk of costly adjustments to future legislative changes.

## 5 | CONCLUSIONS

Offshore CCS is ready to enter a new phase. The first full-scale and full-chain project is to be realized in the coming years. Once running at its full potential, the storage site will accept CO<sub>2</sub> from several sources, not only from Norway but internationally. Regardless of the location of the source, shipping will take an important part in delivering the CO<sub>2</sub>. It goes without saying that the legal framework should be prepared for this. Having said that, the present article identified two

areas at the international level and one at the European level where the law is not ready yet to embrace the carriage of CO<sub>2</sub> for CCS.

The amendment of Article 6 of the London Protocol is an essential part of the legal framework. While the provisional application of the amendment offers a workable solution, as a matter of treaty law it is a less satisfactory solution than an interpretative resolution of the kind suggested above. Equally well, there is a risk that the present solution remains in place permanently. It was noted subsequently that attention should be given to the modalities of contributing to the future HNS Fund. At least at the beginning, the special nature of CCS would justify a more favourable treatment than for general HNS cargo.

Finally, it was shown that, despite best efforts, the ETS is not compatible with the carriage of CO<sub>2</sub> for the purposes of CCS. It is understood that the ETS was not intended to bar the use of ships for CO<sub>2</sub> transport. However, the applied interpretation is a makeshift solution. The law as it stands does not provide a coherent and satisfactory framework. CCS projects should strongly consider opting in the shipping of CO<sub>2</sub> for CCS into the ETS framework, both to avoid inconsistencies and to be already prepared for the time when appropriate amendments take place at the European level. This would minimize the related legal risks for the entities concerned.

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<sup>96</sup>The European Parliament voted in September 2020 in favour of including shipping into the ETS from 2022. See Parliament (EU), 'Global data collection system for ship fuel oil consumption data' (Texts adopted) Amendment 60, P9\_TA(2020)0219, 16 September 2020.

<sup>97</sup>Norwegian Ministry of Climate and Environment (n 94) Section 3.3.

<sup>98</sup>The current Monitoring Regulations came into force on 1 January 2021, replacing Commission Regulation (EU) 2012/601 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC [2012] OJ L181/30. For the present purposes, the current instrument has the same content as its predecessor.

<sup>99</sup>Parliament and Council Regulation (EU) 2015/757 of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport [2015] OJ L123/55.

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