

The Norwegian CCS demonstration project

- request for legal clarifications related to the ETS-directive and the MR-regulation

1. Introduction

The Norwegian Government continues with the planning of a demonstration project for CO₂ capture, transport and storage (CCS). The project – if realized – will be based on capture of CO₂ from one or two capture sites; Fortum Oslo Varme's waste incineration plant in Oslo and Norcem/Heidelberg Cement's cement factory in Brevik. Both projects co-fire fossil and biogenic fuels. The captured CO₂ will be liquified and transported by ship to a CO₂ receiving terminal outside Bergen. The CO₂ will then be injected into a suitable offshore geological storage complex via subsea injection wells and an offshore pipeline from the receiving terminal.

As competent authority responsible both for granting the many of the relevant CCS-permits and at the same time managing the emission requirements under all greenhouse gas emissions (GHG) permits, the Norwegian Environment Agency has identified a few issues regarding how a CCS-network might be integrated into the current EU-ETS scheme. In a short term perspective, there are some issues that we seek to get the EU Commission's feedback on in order to ensure predictability with regard to the applicable legal framework. These issues are addressed in this memo, and we kindly request the EU Commission's view and guidance in this respect, as soon as possible and preferably at the latest by September this year.

Before presenting these issues, we will give a brief description of the Norwegian CCS demonstration project.

2. The Norwegian CCS demonstration project

The Norwegian government has an ambition to realise a full-scale value chain for capture, transport and storage of CO₂. Equinor, Shell, Total, Fortum Oslo Varme and Norcem/HeidelbergCement participate in the project and are currently working on Front End Engineering and Design (FEED) studies.

The project is on track for an investment decision in 2020 or 2021. The current project plan aims at presenting the investment proposal to the Norwegian Parliament by autumn 2020. The aim is that a successful realization of the Norwegian demonstration project will induce new projects that may benefit from technology development and cost reductions through use of shared infrastructure.

The storage site will have extra capacity for additional CO₂ volumes, allowing for shared use of the infrastructure for following CCS projects in Europe. For CCS to meet its full mitigation potential, we must have cross-border cooperation.

The project – if realized – will consist of one or two capture facilities in the south-eastern part of Norway; a cement factory (included in the EU ETS) and a waste incineration plant (not currently in the EU ETS). Both plants will capture both fossil and biogenic CO₂. The captured CO₂ will be transported by pipeline or on trucks to an intermediate storage tank at a harbour close to each of the two capture locations.

The CO₂ would then be transported by ship to the west coast of Norway and delivered to another intermediate storage tank onshore at Øygarden, outside Bergen (hereafter called "receiving terminal"). From the receiving terminal, the CO₂ will be transported by pipeline to an offshore underground geological formation, 2 000–3 000 metres under the seabed. This CCS chain is illustrated in figure 1 below. The map in figure 2, illustrates the relevant locations in the CCS chain in Norway.



Figure 1: Planned CCS chain for the CCS demonstration project in Norway.

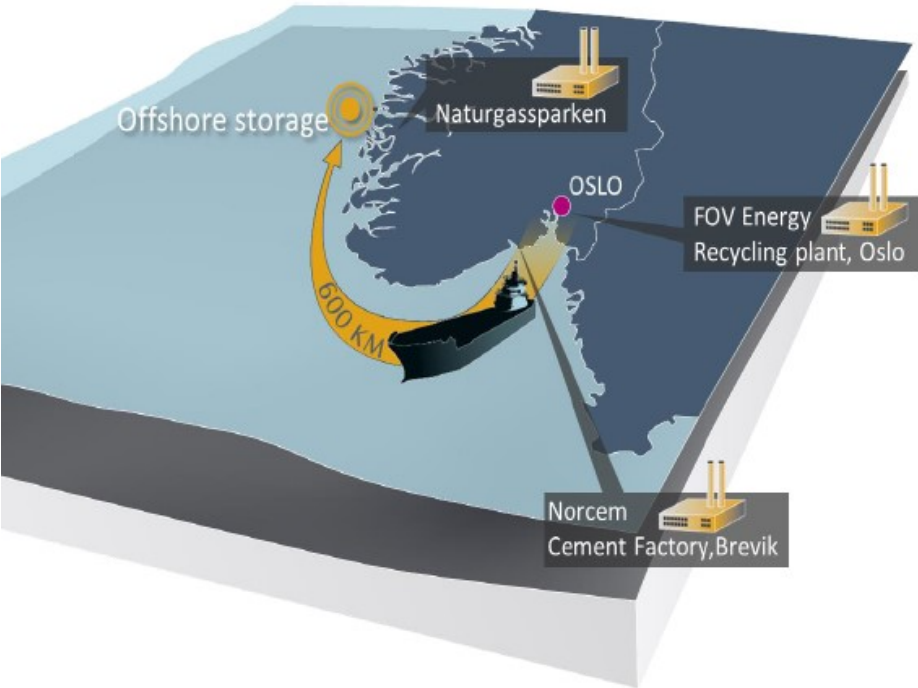


Figure 2: Map of South Norway showing the CCS-locations. Source: Northern Lights project.

It is estimated that about 400 000 tonnes of CO₂ per year could be captured, transported and stored from each of the two capture facilities. According to current plans, there will be one ship allocated for each capture facility. The two ships will hence function as a continuous shuttle service between the two intermediate storage locations respectively and the receiving terminal.

It should be noted that the allocation of one ship per capture facility simplifies the distribution of responsibility, as this project will not be facing mixed CO₂-streams (from different capture facilities) before it is unloaded at the receiving terminal. Thus, in case of any leakage from the ships, one will not be questioning *whose* CO₂ that has been emitted. However, in a medium to long-term perspective, extended implementation of CCS might require utilization of the same ship for more than one capture facility, and the issue related to mixed CO₂-streams might become relevant.

3. Transport of CO₂ by other means than pipeline

3.1. The right to subtract CO₂ that is captured and stored

ETS-installations must each year surrender a number of allowances, that is equal to the total emissions from that installation during the preceding calendar year, cf. Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC (ETS-directive) article 12 item 3. According to Article 12 item 3a, an 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 in accordance with Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide (CCS-directive) is in force.

The principle in the ETS-directive article 12 item 3a is operationalized through more detailed rules in the Commission Implementing Regulation (EU) 2018/2066 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 and amending Commission Regulation (EU) No 601/2012 of 21 June 2012 (MRR). MRR article 49 states:

"The operator shall subtract from the emissions of the installation any amount of CO₂ originating from fossil carbon in activities covered by Annex I of the Directive 2003/87/EC, which is not emitted from the installation, but

(a) transferred out of the installation to any of the following:

- i. a capture installation for the purpose of transport and long-term geological storage in a storage site permitted under Directive 2009/31/EC;*
- ii. a transport network with the purpose of long-term geological storage in a storage site permitted under Directive 2009/31/EC;*
- iii. a storage site permitted under Directive 2009/31/EC for the purpose of long-term geological storage;*

(b) transferred out of the installation and used to produce precipitated calcium carbonate, in which the used CO₂ is chemically bound."

It is only transport by pipeline that falls within the term "transport network" in alternative (a) ii, due to, *inter alia*, the definition of "CO₂ transport" in MRR article 3 (52): "*CO₂ transport means the transport of CO₂ by pipelines for geological storage in a storage site permitted under Directive 2009/31/EC*". We also refer to the definition in the CCS-directive Article 3

item 22: "*transport network*' means the network of pipelines, including associated booster stations, for the transport of CO₂ to the storage site."

According to MRR Article 49 (a) ii, it is not necessary that the captured CO₂ has been transferred to the storage site in order to allow the capturing installation to subtract the CO₂ from its emissions. It is sufficient that the CO₂ has been transferred to the pipeline transport network. The underlying reason for this is that the pipeline transport network is in itself an ETS-activity, cf. the ETS-directive annex I, and that the operator of the transport network thus is obliged to surrender allowances for emissions of CO₂ from the network.

Other forms of transport than *by pipeline* is not included in article 49 (a) ii, based on the definition of "transport network". Thus, transfer of CO₂ from a capturing installation *to a ship or a truck*, with the purpose of transporting the CO₂ to a transport network or directly to a storage site, is not sufficient in order to allow the capturing installation to subtract the CO₂ from its emissions. This corresponds to the fact that transport of CO₂ by ship or truck are not independent activities under the ETS, cf. the ETS-directive annex I. Leakages of CO₂ from the ship or the truck are, in other words, not covered by an obligation by the ship or truck operator to surrender allowances under the ETS.

On the other hand, we find it equally clear that transfer of captured CO₂ to a ship or a truck does not prevent the right to subtract the CO₂ when it later on is transferred from the ship or truck *to a pipeline transport network or directly to a storage site*. When that later transfer from the ship or truck to the transport network or storage site is completed (measured and verified), the capturing installation can subtract the CO₂ according to MRR article 49 (a) ii or iii. There is, in our view, nothing in the wording of article 49 that implies the opposite. This interpretation also fits well with the wording of Annex IV section 21 A, regarding the scope of the greenhouse gas emissions permit and the associated monitoring plan (see more on this in item 3.2 below.)

Furthermore, a different interpretation of MRR Article 49, whereby the right to subtract captured and stored CO₂ is denied because the CO₂ is transported by ship or truck, would in our view be in conflict with the ETS-directive. Firstly, it would be in conflict with the obligation to surrender allowances equal to the emissions (Article 12 item 3) and the definition of "emission" in the ETS directive article 3 (b). That definition refers to "*the release of greenhouse gases into the atmosphere*". Transfer of CO₂ to a ship or a truck does not fall within the definition, provided that the CO₂ later on is in fact transferred to a pipeline transport network or a storage site. Secondly, the said interpretation of MRR Article 49 would also be in conflict with the basic rule in ETS-article 12 item 3a, as cited above, which states that there is no obligation to surrender allowances in respect of emissions verified as captured and transported for permanent storage to a facility with a valid permit. That rule is not limited to specific forms of transport to the storage site. It should also be noted that exclusion of other forms of transport than by pipeline could severely hamper the development of CCS in the EU, contrary to the objectives of the ETS.

The judgment of the Court in case C-460/15 supports, in our view, the conclusion above, and illustrates how the rules in the MRR must be drafted and interpreted in line with the basic

rules of the ETS-directive. The case concerned the German company Schaefer Kalk and its installation for the calcination of lime. At the time of the judgement, Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions, stated the following in the second sentence of Article 49 (1) (following the three alternatives regarding transfer to a capture installation, a transport network and a storage site): *"For any other transfer of CO₂ out of the installation, no subtraction of CO₂ from the installation's emissions shall be allowed."* The Court found that this sentence was invalid in so far as it systematically included the CO₂ transferred to another installation for the production of precipitated calcium carbonate in the emissions of the lime combustion installation, regardless of whether or not that CO₂ was released into the atmosphere. By adopting the second sentence in Article 49(1), the Commission had altered an essential element of the ETS-directive, namely the definition of "emission", and had thus overstepped the limits of its competence laid down in Article 14(1) of that directive. In our view, transfer of CO₂ to a ship or truck must be assessed in the same way: An interpretation of MRR Article 49 whereby the right to subtract captured CO₂ is denied because the CO₂ is transferred to a ship or truck, regardless of whether or not the CO₂ is released into the atmosphere, would – as described above – neither be in line with the definition of "emission", nor with the basic rule in the ETS-directive 12 item 3a.

Accordingly, we conclude that transfer of captured CO₂ to a ship or a truck does not prevent the right to subtract the CO₂ when it later on is transferred from the ship or the truck to a pipeline transport network or directly to a storage site. When that later transfer from the ship or truck to the network or storage site is completed, the capturing installation can subtract the CO₂ according to MRR article 49 (a) ii or iii.

It would be of great value if the Commission could clarify whether it agrees with this conclusion.

3.2. Scope for the permits and monitoring plans in the Norwegian CCS demonstration project - distribution of responsibility between operators

Annex IV of the MRR, section 21 A (scope) states:

*"CO₂ capture shall be performed either by a dedicated installation receiving CO₂ by transfer from one or more other installations, or by the same installation carrying out the activities producing the captured CO₂ under the same greenhouse gas emissions permit. All parts of the installation related to CO₂ capture, intermediate storage, **transfer to a CO₂ transport network or to a site for geological storage of CO₂ greenhouse gas emissions shall be included in the greenhouse gas emissions permit and accounted for in the associated monitoring plan. (...)"** (our emphasis in bold)*

In the Norwegian CCS demonstration project, the captured CO₂ would – as described earlier in this memo – be transported on trucks or by pipeline to an intermediate storage tank at a harbour close to each of the two capture locations. The CO₂ would then be transported by ship to the west coast of Norway to intermediate storage tanks onshore at Øygarden

Municipality ("the receiving terminal"), close to Bergen. From there it would be transported by pipeline to an offshore underground geological storage under the seabed.

According to the conclusions in item 3.1 above, it is our understanding that the capture operator in the CCS demonstration project will be liable for any leakages of captured CO₂, until the CO₂ is transferred to the storage operator at the receiving terminal. Furthermore, according to Annex IV of the MRR, section 21 A, it is our understanding that the capture operator's permit and monitoring plan must cover the capture installation, transport by pipeline and/or trucks to the intermediate storage at the harbour, and the transport by ship to the receiving terminal at Øygarden. This is illustrated in figure 3 below.

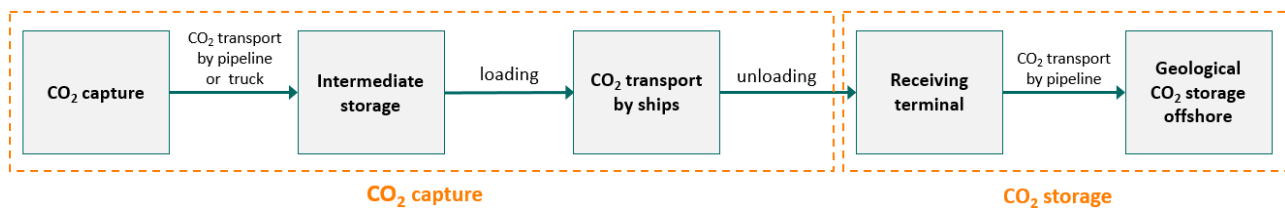


Figure 3: Transfer of responsibility regarding emitted CO₂.

The receiving terminal will be part of the storage operator's permit. The storage operator must have a permit and monitoring plan covering both the receiving terminal, the transport by pipeline and the storage activity.

In order to provide predictability, we ask the Commission to come forward with any comments on the scope of the permits and monitoring plans for the capture operator and the storage operator as described above.

If the transport to the receiving terminal is operated by a different entity than the capture operator, the capture operator will, nevertheless, be liable for any leakages during the transport. CO₂ that is leaked (emitted) during the transport can not be subtracted from the capture operator's emissions. Thus, the capture operator will be liable for emissions that it does not have direct control over. This problem for the capture operator could, however, be solved by contractual arrangements. Such contractual arrangements could for instance include an obligation for the transport operator to compensate the capture operator for economic losses due to leakages during the transport.

3.3. Opt-in of CO₂ transport by other means than pipeline

If the Commission does not agree with our interpretation of MRR article 49 and Annex IV section 21 A as set out in 3.1 and 3.2 above, Norway must consider other possibilities. One option is to unilaterally include ("opt in") the activity 'transport of CO₂ by other means than in pipelines' or 'transport of CO₂ by ship' through article 24 of the ETS-directive (subject to the Commission's approval). We have considered this solution, which would allow the capturing operator to subtract the captured CO₂ when it is transferred to the transport operator. However, there are some challenges with the opt-in solution. Provided that our interpretation of MRR article 49 and Annex IV section 21 A as set out in 3.1 and 3.2 above is correct, we

see no need for an opt-in at this stage. With regard to the Norwegian CCS demonstration project, we consider that the current legal framework offers a robust and flexible solution, whereby the capture operator remains liable for leakages during the transport by truck and ship, combined with the possibility of contractual arrangements between the various operators in order to distribute the economic risks related to leakages.

4. Subtraction of captured CO₂ from biomass

When CO₂-capture is applied to a facility that co-fires fossil and biogenic fuels, the captured CO₂ will consist of a mix of fossil and biogenic CO₂. MRR article 49 (cited above) states that "*The operator shall subtract from the emissions of the installation any amount of CO₂ originating from fossil carbon (...)*". Hence, a literal interpretation of Article 49 indicates that only the *fossil* part of the captured CO₂ (from an installation included in the EU ETS), that is transferred out of the installation for permanent storage¹, can be subtracted from the capture operator's emissions, whereas captured CO₂ originating from biomass (biogenic CO₂) can not be subtracted. The reason behind this distinction is that biogenic CO₂ is "zero-counted", cf. Article 38 (2)² and 43 (4)³ of the MRR.

A strict, literal interpretation of MRR Article 49 as described above would constitute a serious disincentive to capture biogenic CO₂. The costs related to capture, transport and storage of biogenic CO₂ are the same as for fossil CO₂, yet the capture operator would not receive any credit or compensation for investments made in CCS relating to CO₂ from biomass (so-called "BECCS").

In order to enable the capture operator to subtract at least *parts* of captured bio CO₂ for CCS purposes, we propose to interpret the MRR article 49 (1) as follows: The captured CO₂ may – regardless of its origin (fossil or bio) – be subtracted as long as it does not exceed the operator's total amount of produced fossil CO₂ from the relevant installation.⁴ If the operator captures more CO₂ than the total production of fossil CO₂, the captured CO₂ exceeding this number cannot be subtracted. This interpretation, which to a certain extent allows for subtraction of bio CO₂, compared with an interpretation in strict conformity with the current wording of article 49 (1), is illustrated in figure 5 and 6 below. In both examples we have assumed that the captured CO₂ consists of the same proportion of fossil and bio CO₂ as the produced CO₂ (total CO₂ emissions without CCS).

¹ or to produce precipitated calcium carbonate

² Article 38 (2) concerns determination of emissions using a "calculation-based methodology", and states that: "*The emission factor of biomass shall be zero. The emission factor of a mixed fuel or material shall be calculated and reported as the preliminary emission factor determined in accordance with Article 30 multiplied by the fossil fraction of the fuel or material.*"

³ Article 43 (4) concerns determination of emissions using a "measurement-based methodology", and states that: "*Where relevant, the operator shall determine separately any CO₂ amount stemming from biomass using calculation-based monitoring methodologies and subtract it from the total measured CO₂ emissions.*"

⁴ By "produced CO₂" we mean the amount of CO₂ that would have been emitted if it were not captured, including the CO₂ resulting from the capture activity as such.

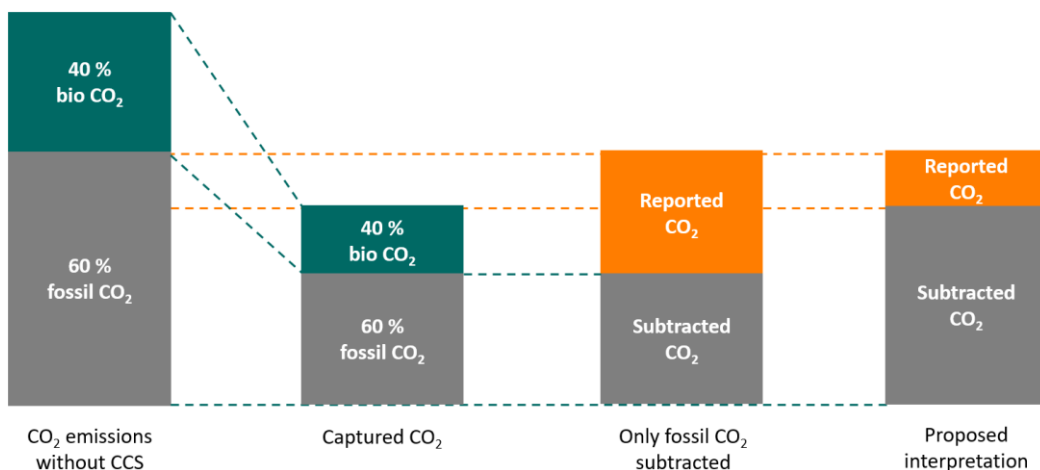


Figure 5: In this case it is captured less CO₂ than the produced amount of fossil CO₂.

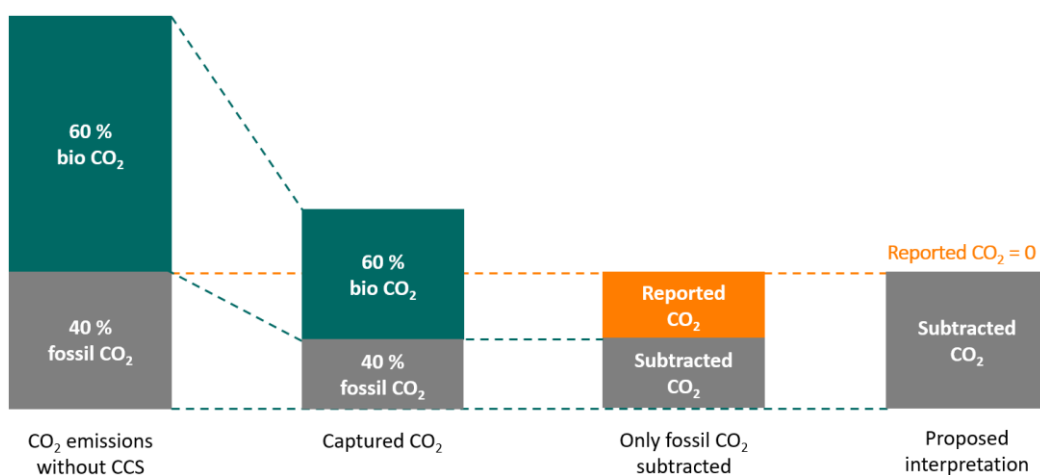


Figure 6: In this case it is captured more CO₂ than the produced amount of fossil CO₂.

We kindly request the Commission's view on this interpretation.

The Norwegian Environment Agency has prepared a proposal for an amendment of MRR article 49 (1), which was presented at the meeting of the TWG MRAV⁵ on 20 June 2019 in Brussels. Based on the interpretation described above, the Agency proposes to amend the wording of article 49 in order to eliminate any ambiguities that may exist in the current wording.

We would like to point out that to make stronger incentives for CCS, we think it is important to look at the EU system in a broader perspective – and consider amendments in order to allow the operators that capture CO₂ for the purpose of permanent storage, to subtract *all* the captured CO₂ despite of its origin. This will, however, require the EU ETS to allow net negative emissions, which is beyond the scope for this memo to address.

5. Closing remarks

The Norwegian Government has an ambition of realizing a cost-efficient solution for full-scale CCS in Norway, provided that such a project contributes to technology development in an

⁵ Meeting of the Informal Technical Working Group on EU ETS Monitoring Reporting Verification & Accreditation.

international perspective. A successful Norwegian CCS demonstration project will be significant for the further development of CCS in Europe and globally. As a front-runner, Norway is eager to share its experiences related to the demonstration project. This project could also uncover other issues that require adjustments to the current EU legislation. In order to keep the project on track for an investment decision in autumn 2020, it is necessary to clarify the issues raised in this memo as soon as possible. We are required to provide feedback to the operators in the Norwegian CCS demonstration project regarding the calculation of GHG emissions covered by the EU ETS. Therefore, we would welcome the Commission's opinion as soon as possible and ideally by the end of September this year.

If it is challenging to comment on the questions in both item 3 and item 4 of this memo within that timeline, we ask that the Commission gives priority to the questions in item 3.