COMMISSION OPINION

of 25.5.2022

on the draft permit to permanently store carbon dioxide in block section P18-2 of the Dutch continental shelf and on the amendment to the permit to permanently store carbon dioxide in block section P18-4

(Only the Dutch text is authentic)
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1. LEGAL CONTEXT


Article 10 of the CCS Directive establishes an additional safeguard to ensure that national storage permits are in line with the CCS Directive through the dialogue between the Member State concerned and the Commission. In this respect, Article 10 of the CCS Directive requires the Member States to inform the Commission of all draft storage permits and to provide all material taken into consideration for the adoption of the draft decision to award the storage permit. The Commission is tasked with the review of the national draft storage permits and is given a possibility to issue, within four months after receipt of the draft storage permit and relevant documents, a non-binding opinion on it. Where the Commission issues a non-binding opinion, the competent authority is expected to take the utmost account of it when adopting the final storage permit. Where the competent authority decides to depart from the Commission’s opinion, Article 10(2) of the CCS Directive requires the competent authority to state the reasons.

The CCS Directive was correctly transposed into Dutch law. The competent authority for issuing the storage permit is the Minister of Economic Affairs and Climate Policy. The Dutch State Supervision of Mines (‘SSM’) is responsible for inspections.

2. PROJECT AND NATIONAL PERMITTING PROCESS

2.1. APPLICATION FOR A STORAGE PERMIT

On 12 February 2021, TAQA Offshore B.V. and Energie Beheer Nederland CCS B.V. (‘the Applicant’) jointly submitted an application for a permit to permanently store CO₂ in block

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2 TAQA Offshore B.V. (TAQA) is a wholly owned subsidiary of TAQA Energy B.V., which is involved in the exploration, production and transportation of oil and natural gas in the Netherlands. TAQA Energy B.V. is a wholly owned subsidiary of TAQA International B.V. (formerly known as TAQA
The Porthos project is intended to capture CO$_2$ from various industrial sources in the Port of Rotterdam, to transport it and permanently store in block sections P18-2 and P18-4 (and possibly P18-6) of the depleted gas fields on the Dutch continental shelf. In particular, the project aims at developing the infrastructure in the Rotterdam port area for the collection and compression of CO$_2$. The CO$_2$ that will be transported and stored by Porthos will be captured by various companies who will supply their CO$_2$ to a collective pipeline running through the Rotterdam port area. The CO$_2$ will then be pressurised in a compressor station and transported through an offshore pipeline to the existing P18-A platform, some 18 km offshore. From this platform, the CO$_2$ will be pumped into the existing depleted gas fields.

Porthos expects to permanently store in total around 32 Million tonnes of CO$_2$, approximately 1.8 Million tonnes CO$_2$ per year, for 18 years at the P18-2 storage site. The CO$_2$ shall be injected at a maximum injection rate of 40 kg of CO$_2$ per second per well with a maximum well and reservoir pressure never to exceed gauge pressure of 351 bar both during the injection period and after injection has ceased. Injection shall start no earlier than 1 January 2024 and shall continue until 31 December 2041 at the latest.

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3. Energie Beheer Nederland CCS B.V. (EBN) is a wholly owned subsidiary of Energie Beheer Nederland B.V. which is a natural gas exploration, production, transportation and sales company owned directly or indirectly by the Dutch State.

4. Port of Rotterdam CO$_2$ Transport Hub and Offshore Storage.

5. The draft permit concerns the following wells: P18-2A1, P18-2A3, P18-2A5 and P18 2A6.

3. REVIEW BY THE COMMISSION


On 22 December 2021, the Dutch Government submitted to the Commission the draft permit, and other supporting documents, such as technical reports and opinions of the Netherlands Organisation for applied scientific research (‘TNO’), SSM and of other bodies. The Dutch Government provided additional information on the draft permit on 14 January 2022.

The draft permit, Application and supporting documents provided by the Dutch Government constitute the basis for the Commission's review and for this non-binding opinion.

In addition, on 10 January 2022, the Dutch Government provided the Commission with the information about the amendment to the storage permit P18-4. Given the linkages between the two permits, the Commission decided to include it in the scope of the review and of this non-binding opinion.

On 22 March 2022, the Commission services met with the Dutch authorities discussed the draft permit. The Dutch authorities sent further clarifications and documents to the Commission services on 29 March 2022.

In particular, the Dutch authorities clarified that, in line with the provisions on permitting of Dutch administrative law, the permits only state special requirements for the permit holder or the project (storage site in the present case) concerned. On the other hand, general requirements established by law are considered to be legal obligations and are never included in the permits. As far as the draft permit is concerned, the Dutch authorities reassured Commission services that the general requirements stemming from the CCS Directive, as transposed into Dutch law, that are not included in the draft permit, must at all times be fulfilled by the permit holder. Those requirements for the permit holder include, but are not limited to:

- keeping a register of the quantities and characteristics of the CO₂ streams, including their composition delivered, stored, and, where applicable, leaked (Article 12(3)(b) of the CCS Directive);
- ensuring regular reporting to the competent authority of the results of the monitoring and the quantities and properties of the CO₂ streams delivered and injected (Articles 14(1) and (2) of the CCS Directive);
- immediately reporting leakages and significant irregularities to the competent authority (Article 16 of the CCS Directive).

In addition, the Dutch authorities clarified that other requirements, such as conditions for the transfer of responsibility under Article 18 of the CCS Directive, are equally covered by the applicable Dutch legislation and do not need to be included in the permit.

The Commission took note of the explanations provided by the Dutch authorities and therefore abstains from recommendations on the draft permit in this regard based on the understanding that the consequences for the permit holder as regards non-respect of such obligations will be similar to those put in place for the non-respect of the obligations explicitly spelled out in the draft permit.

Given that the CCS Directive obliges the Member States in terms of achieving its objectives while leaving the discretion as to the choice of means, the Commission is of the view that the Dutch legal set-up for issuing the storage permits does not hamper the effectiveness of the CCS Directive subject to the provisions of Dutch law being correctly implemented.

4. OPINION

Based on the review of the Application, draft permit and other supporting documents, the Commission decided to provide its views on technical, environmental, and financial aspects of the draft permit as outlined in the following points.

4.1. Technical requirements (in particular Articles 8(1)(c), 4(3), 4(4), 9(2) to 9(7); 12 to 14, 16, 17, 18 of the CCS Directive)

The Commission considers that, from the technical point of view, the P18-2 storage site is suitable for permanent geological storage of CO₂ and the draft permit includes the necessary requirements for the safe operation of the storage site in line with the CCS Directive.

In this respect, the Commission notes that the suitability of the storage site is demonstrated by the detailed characterisation and assessment of the storage site and storage complex contained in the Application and confirmed by the technical reports. The technical assessment provided in the Application contains static, dynamic, fracture, geochemical and well performance modelling proving that the P18-2 CO₂ storage site is hydraulically isolated and suitable for long-term storage of CO₂.

In addition, the maximum permissible volumes to be injected (total quantity of CO₂ authorised to be geologically stored), the maximum 18-year period of injection, the proposed maximum injection rates and pressures in the wells and in the reservoir both during and after cessation of injection established in the draft permit are reasonable. These limits have been based on detailed static, dynamic and well performance modelling using a significant database of information and standard industry techniques and technologies.

Likewise, the requirement of the draft permit for the CO₂ stream to consist overwhelmingly of CO₂ is in line with Articles 12(1), 12(2) and point (a) of Article 12(3) of the CCS Directive.

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8 The maximum permissible volume of CO₂ to be stored is 32 Million tonnes (Article 9 of draft permit).
9 The period of injection of CO₂ is set for a maximum of 18 years, commencing no later than 1 January 2024 and ending by 31 December 2041 (Article 5 of the draft permit).
10 The maximum permissible injection rate is 40 kg CO₂ per second per well, except during the first 6 hours of well start-up operations where 47kg/second can be injected (Article 8 of the draft permit).
11 The maximum pressure in the wells and reservoir during and after cessation of injection must never exceed a gauge pressure of 351 bar which is 20 bar below the hydrostatic pressure (Article 10 of the draft permit).
The injection stream will consist of a minimum content of 95% CO$_2$. The draft permit\textsuperscript{12} only allows a clearly specified and limited range of impurities, which, according to independent scientific views, shall not affect the integrity of the storage system or process. The draft permit\textsuperscript{13} also includes a safeguard clause to address significant irregularities to the CO$_2$ injection stream.

The Commission notes that the monitoring plan presented by the Applicant as well as the requirements related to its updating contained in the draft permit, are compliant with the CCS Directive. The Commission however welcomes the choice of the competent authority to investigate the possibility to enhance the monitoring plan as advised by the TNO, SSM, and the Mining Council. Should the independent review that the Dutch authorities have committed for this purpose indicate that additional monitoring techniques could provide a clear benefit in terms of risk reduction and the cost of such techniques would be proportionate, the Commission would welcome the monitoring plan to include additional technologies and techniques suited to the novel process of CO$_2$ injection into a depleted gas reservoir. In particular, in the Commission’s view, the monitoring plan could benefit from the evaluation of the use of fibre optic sensors to measure possible leaks in micro-annuli, if present, along with the use of microseismic sensors to measure any possible fracturing of the overburden. The Commission considers that the monitoring plan could be enhanced as a part of the update of the monitoring plan in the final permit.

As far as the potential leakage during the operation is concerned, the Commission acknowledges the independent scientific opinions of TNO, SSM, SINTEF and NORCE that the risks of leakage during operation and after closure of the storage are very limited. The site has stored natural gas for millions of years; the well technologies and injection practices are considered to be industry standard and fit for purpose; and appropriate risk assessment, monitoring and corrective measures are planned.

The Commission also acknowledges the conclusion of the same independent bodies that the construction, operation and closure of the storage site and necessary facilities will not pose a significant danger to the environment and human health.

The Commission is of the view that the draft permit provisions on the closure of the storage site satisfy the requirements of the CCS Directive. The closure conditions contained in the draft permit specify that closure shall take place when 32 Million tonnes CO$_2$ are injected and in any case no later than on 31 December 2041. In addition, upon cessation of injection, the draft permit\textsuperscript{14} includes a ‘Period of Alert’ of at least one year during which monitoring, corrective measures, reporting to the competent authority on the site conditions will be maintained until the competent authority is satisfied there are no irregularities, at which time the injection wells and facilities can be decommissioned. The alert period can be extended for as long as required by the competent authority until the competent authority is satisfied the site is safe and the CO$_2$ securely contained.

The Commission however notes that after a storage site has been closed, the operator should remain responsible for maintenance, monitoring and control, reporting, and corrective measures pursuant to the requirements of the CCS Directive on the basis of a provisional post-closure plan submitted to, approved by the competent authority, and forming part of the

\textsuperscript{12} Article 19(1) of the draft permit.

\textsuperscript{13} Article 19(2) of the draft permit requires the permit holder to report the changes to the competent authority in case of significant changes to the CO$_2$ stream composition and to prove that the change has no effect on the safety and integrity of the site, system and storage process.

\textsuperscript{14} Article 7 of the draft permit.
storage permit (Articles 7(8), 9(7), and 17(3)). The provisional post-closure plan is addressed in Article 15(1) of the draft permit in respect of the conditions for closure. However, the draft permit should not only contain the conditions for closure, but it should also include an approved post-closure plan. The approved post-closure plan should include the elements listed in Article 17 of the CCS Directive.

4.2. Environmental requirements (in particular Articles 8(1)(a), 7(9) of the CCS Directive)

As stated under point 4.1 of this Opinion, the Commission acknowledges the views of independent scientific bodies that the construction, operation and closure of the storage site and necessary facilities will not pose a significant danger to the environment and human health.

The Commission notes that the Environmental Impact Assessment study included in the Application largely confirms this conclusion. The study concludes that against the background of other activities and natural processes in the area, the adverse environmental impacts overall are insignificant.

The Commission notes however that the study does not include a clear project description and the scope of the analysis does not explicitly cover the permanent storage of CO₂ after the wells are closed. The Commission considers that the environmental impact assessment should at least state the basis for assuming there will be no leakage and no impacts during the post-closure period.

In addition, the Commission notes that the study does not address the post decommissioning impacts on the environment of potential leakage of CO₂ to the near surface and seabed or the surface. While the Commission understands that the risks of a leakage to surface post decommissioning are minimal as the injection stops when the pressure reaches 20 bar below the hydrostatic pressure, the Environmental Impact Assessment study should address this point. The study should indicate that the potential environmental impacts at the near surface and seabed or the surface are highly unlikely to occur and, in any event, would be negligible.

In light of the competent authority’s obligation to ensure that the permit is only issued if the relevant requirements of the Union legislation are met¹⁵ and bearing in mind that the environmental concerns are at the heart of the debate on public acceptance of the CCS technologies, the Commission regrets that the draft permit does not include any reference to the environmental impact assessment or environmental issues in general, despite such information being included in the Application.

The Commission takes note that the Dutch law does not require explicitly to include the information on the environmental impact into the storage permit, as it is a prerequisite to start the entire project. Bearing in mind the obligations of the Dutch authorities under Articles 8a and 9 of Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment¹⁶, with the view to enhancing the robustness of the national procedure leading up to the permit, the Commission recommends that, at a minimum, the final permit includes a reference to the environmental impact assessment carried out, states the competent authority’s views on the environmental safety and impacts of the storage site, and information on how the public can access the full environmental impact assessment should they so wish.

¹⁵ Article 8(1)(a) of the CCS Directive.
4.3. Financial requirements (in particular Articles 7(10), 8(1)(b), 9(9), 11(4), 18 to 20 of the CCS Directive)

The Commission considers that the draft permit and related documents provide sufficient assurance that the operator is financially sound and technically competent and reliable to operate and control the site. Likewise, it appears that professional and technical development and training of the future operator\(^\text{17}\) and all staff is planned. In addition, the draft permit includes a set of provisions to ensure that the necessary organisational competences are in place prior to the start of injection.

The draft permit\(^\text{18}\) also provides a general framework for the financial security scheme while making the start of injection subject to the approval of the final scheme by the competent authority.

The Commission understands that in these circumstances, the draft permit therefore cannot be expected to provide the same level of detail as the final financial security scheme that will be later approved by the competent authority. The Commission however recommends the competent authority to include, in the final permit, at least the minimum requirements for the financial security scheme to be adequate and effective as per CCS Directive. In the Commission’s view, the final permit should at least require to ensure that:

- the amounts are sufficient and adequate at all times, the underlying assumptions and calculations are justified, verified and confirmed by the qualified independent third party experts;
- all the obligations stemming from the CCS Directive are covered by the financial security scheme;
- not only the insurance, but also the parental guarantee, which aims at filling in the gaps are effective and adequate.

The Commission therefore recommends the competent authority to include, in the final permit, at least the requirements as further detailed in this point of the Opinion.

The Commission welcomes that the draft permit includes the requirement for the insurance to be verified by the independent third party experts. However, in the Commission’s view, the final permit should also contain the requirement, first, to ensure that the verifying bodies will have the necessary expertise. Second, the verification and confirmation requirement should be extended to all underlying cost estimates, including key assumptions, contingency factors and calculation methods, provided by the Applicant. Third, the verification requirement should be extended to the entire scheme of parent guarantee as it is done for the insurance.

As far as the adequacy and sufficiency of the amounts is concerned, the Commission notes, that, first, the draft permit allows the application of several amounts (post-closure monitoring, financial contribution to competent authority, corrective measures, purchase of allowances in the event of leakage) to more than one storage site. However, in the Commission’s view, the amounts of financial security, indicated in the P18-2 draft permit, may be sufficient for at most a single storage site. Second, the draft permit does not require the amounts to be adjusted to account for changes to the assessed risk of leakage and estimated cost changes after injection has commenced, per Article 19(2) of the CCS Directive.

\(^{17}\) A Porthos entity (or a technically competent contractor appointed by Porthos)

\(^{18}\) Article 20 of the draft permit
The application of the same amount to several storage sites and the lack of the needed adjustments raise concerns as to the effectiveness of the financial security in terms of sufficiency of the amounts of financial security compared to the estimated costs. The Commission recalls that for the financial security to be effective, it must provide an adequate amount of financial security based on estimated costs of the obligations. The Commission therefore recommends to make the amounts match the estimated costs for each storage site and to ensure they are sufficient at all times.

As far as the effectiveness of the parental guarantee is concerned, the Commission considers that the final permit should not only require that parent guarantees receive prior consent based on independent third party expert review, just as is required for the insurance, but also require that the parent guarantees oblige the guarantors to accept cost estimate updates and adjustments from their subsidiaries and for the parent guarantors to adjust the amounts of their guarantees accordingly.

As far as the completeness of the financial security scheme’s coverage is concerned, the Commission notes that, for the financial costs that relate to two storage obligations that are not certain to occur, the draft permit agrees with the Applicant’s proposed use of an insurance scheme. The permit also requires supplementing the insurance with parent guarantees from both Applicant companies as a backstop for any gaps in insurance coverage. The permit should however make explicit that the insurance and the backstop parental guarantees also cover obligations that could arise under Article 11(4) of the CCS Directive linked to the temporary continuity of operation by the competent authority following a permit withdrawal.

Subject to the completeness of the coverage of the financial security scheme, the Commission views the use of insurance combined with parent guarantees as a prudent decision by the competent authority, given the novelty of covering CO\textsubscript{2} storage obligations under the CCS Directive using offshore oil and gas insurance policies not originally designed for that purpose.

The aforementioned changes would significantly improve the transparency and effectiveness of the entire financial security scheme to the benefit of the competent authority in view of the distribution of the inherent, yet manageable, risks of the operation covered by the draft permit between the Applicant and the Dutch Government.

Moreover, those changes would also benefit the Applicant by increasing the chance of the final financial scheme being approved and, consequently, avoid unnecessary delays in the implementation of the project.

Finally, the inclusion of the aforementioned requirements into the draft permit would provide assurance that the final financial security scheme, as approved by the Dutch authorities, will fully comply with the CCS Directive.

5. RELATED PERMITS

As mentioned in points 2.1 and 2.2 of the Opinion, the Applicant aims to develop an integrated CO\textsubscript{2} storage complex based on the depleted gas fields accessed from the P18-A platform. These fields include block sections P18-2, P18-4 and P18-6. A storage permit is required for each storage site.
The permit to permanently store CO₂ in block section P18-4 of the Dutch continental shelf was granted to TAQA, though no injection of CO₂ has yet taken place. In order to ensure the integrated system with the P18-2 storage site, on 28 July 2021, TAQA submitted a request to amend the existing permit to permanently store CO₂ in block section P18-4. The amendment to the permit was issued for public consultation from 17 December 2021 until 27 January 2022.

The key amendments requested to the P18-4 CO₂ storage permit include the following:

- harmonisation and integration of the statutory CO₂ monitoring plans with those of the P18-2 CO₂ storage draft permit. These plans include risk management, monitoring, corrective actions and closure;
- change of the composition to the injectate (CO₂ composition) to align it with the one in the draft permit for the P18-2 storage site; and,
- changes to the financial security provisions.

The Commission was informed about the draft amendment by the Dutch Government on 10 January 2022.

Having regard to the linkages between the draft P18-2 storage permit and the draft amendment to the P18-4 storage permit, the Commission reviewed the latter and related documentation. In particular, with a view to ensuring the desired harmonisation of the two permits, the Commission review consisted in comparing the provisions of the draft P18-2 storage permit and of the draft amendment to the P18-4 storage permit.

Comparison of the draft amendment of the P18-4 storage permit with the draft P18-2 storage permit and related documentation indicates that their technical requirements are in harmony. In particular, the requested change to the P18-4 injectate (CO₂ composition) is appropriate and results in an identical CO₂ composition to the one contained in the P18-2 draft permit.

Moreover, it appears that the harmonisation of the P18-4 statutory CO₂ storage permit monitoring plans (i.e., covering risk management, monitoring, corrective actions, and closure) with those of the draft permit for the P18-2 CO₂ storage site is appropriate.

While the Commission has not reviewed the complete extant P18-4 storage permit, the Commission invites the competent authority to review and further amend it, where necessary, to ensure full harmonisation with draft P18-2 storage permit. In particular, the Commission recommends to the competent authority to pay special attention to those P18-4 storage permit provisions which are identical or similar to those of the draft P18-2 permit that the Commission found not compliant with the CCS Directive and (or) issued recommendations on in this Opinion.

For example, as far as the financial security is concerned, Article 16 (financial collateral) of the draft amendment to the P18-4 storage permit largely mirrors Article 20 (financial guarantees) of the draft P18-2 permit insofar as it uses the same amounts of required financial security and the same forms, with similar conditions, as Article 20 of the draft P 18-2 permit, except that only the P18-4 permit holder, TAQA, must provide a parent guarantee backstopping the insurance. Thus, the opinions expressed by the Commission about financial security provisions are still relevant.

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19 The Commission reviewed the draft permit and issued Opinion C(2012) 1236 final on 28 February 2012.
20 https://www.rvo.nl/onderwerpen/bureau-energieprojecten/lopende-projecten/overige-projecten/porthos#
21 Article 19 of the P18-2 draft permit.
22 Articles 12, 13, and 16 of the draft permit.
security for draft permit P18-2 apply equally for the financial security provisions contained in the draft amendment to the P18-4 storage permit.

This Opinion is addressed to the Dutch authorities.

Done at Brussels, 25.5.2022

For the Commission
Frans Timmermans
Executive Vice-President