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CHAPTER XX

CARBON CAPTURE AND STORAGE IN THE NETHERLANDS

A Long and Winding Process

Martha M. ROGGENKAMP

1. INTRODUCTION

Carbon capture and storage (CCS) has been a policy of the Dutch government for almost two decades, although the interest in developing CCS has faced many ups and downs. The interest in CCS started as an important instrument in the process of energy transition, i.e. a policy aiming to transition away from a fossil fuel economy and to limit the level of CO₂ emissions.

The policy of energy transition was developed by several ministries¹ in early 2000 and led to the establishment of the Energy Transition Task Force (ETTF) in January 2005, which consisted of representatives from industry, government, research organizations, financial institutions and non-governmental organizations (NGOs). In the Transition Action Plan 'More with Energy' that was presented in May 2006, the task force set some ambitious goals for 2050, i.e. energy savings of 1.5 to 2 per cent each year, a substantial use of renewable energy sources and a reduction of CO₂ emissions by half (compared to 1990) and at the same time strengthening the position of Dutch industry. In order to make the gas industry more sustainable, the task force considered the need for projects involving CO₂ capture and (underground) storage. As part of a Working Programme 'Clean and Efficient'² of 2007 the Dutch government aimed at examining the possibility of CCS and to develop and subsidise three

¹ These ministries were at that time: the Ministry of Economic Affairs, the Ministry of Housing, Spatial Planning and the Environment, the Ministry of Transport, Public Works and Water Management, the Ministry of Agriculture, Nature Management and Food Quality, the Ministry of Foreign Affairs, and the Ministry of Finance.

² TK 1998–1999, 26 219, No 7, p. 20 and TK 2009–2010, 32 343, No 3, p. 4.

demonstration projects in the Netherlands.³ The task force even presented the ambitious idea that the Netherlands could be turned into an EU CO₂ hub due to the expected large number of (soon to be) depleted oil and gas fields.⁴ It thus focused on developing CO₂ storage locations *onshore* as suitable reservoirs would (soon) become available and it was the least costly option. Despite a serious attempt to set up a pilot phase in Barendrecht where Shell was involved both as the capturer at a refinery near Rotterdam and as the holder of a gas production licence (and potential storage licence), the project failed due to major public opposition. As a result, no storage licence was awarded for this project.⁵ Consequently, the focus shifted to storage in depleted gas reservoirs *offshore*. In its 2017 Coalition Agreement, the Dutch government again highlighted carbon capture and storage as one of the central pillars of its climate policy and an important interim tool to reduce carbon dioxide emissions.⁶ According to the 2019 Climate Agreement, the Netherlands need to reduce by 2030 its greenhouse emissions by 49 per cent compared to 1990 levels, and 95 per cent by 2050.⁷ CCS, although on a limited scale, is included as one of the proposed instruments to reach this goal.⁸ Given the *de facto* ban on onshore storage of carbon dioxide, the focus is on the storage of CO₂ offshore.

Some of the first pilot projects primarily considered means to capture CO₂ but others also looked primarily at the final part of the CCS chain, i.e. subsoil storage. The new Mining Act, which entered into force in 2003,⁹ already facilitated such storage as it introduced a separate licence for subsoil storage. Article 25 of the Mining Act required a person to obtain a licence in order to store 'substances'. The term 'substances' was not defined but was generally understood to include CO₂.¹⁰ However, this regime has in practice never been applied to storage of CO₂ as a more stringent regime was introduced in 2009

³ TK 1998–1999, 26 219, No 7, p. 20. These projects included: (1) the Zero Emission Power Plant (ZEPP) project in Drachten, involving the capture of CO₂ from a gas-fired power plant and injecting the CO₂ into the nearby Akkrum gas field for enhanced recovery; (2) developing a 840 MW gas-fired power plant in the Rotterdam area and capturing CO₂, by using the cryogenic principle (freezing CO₂); and (3) testing CO₂ capture at the Buggenum (coal-fired and biomass) plant.

⁴ See Advice of working group CO₂ storage of Platform New Gas (Nieuw Gas) to the Task Force on Energy Transition, March 2006, pp. 11 and 25.

⁵ See TK 2010–11, 28982 No. 113.

⁶ Coalition Agreement 2017–2021 Confidence in the Future (*Regeerakkoord 2017–2021 Vertrouwen in de toekomst*), 2017, p. 38. The Dutch government aims at a reduction of carbon dioxide emissions by 18 megatons in 2030 through carbon dioxide storage.

⁷ See, for the Dutch Climate Agreement, also Chapter XIII of this volume by L. Braaksma and R. Fleming, as well as Chapter XXIII of this volume by G. van der Veen and K. de Graaf.

⁸ See letter from the Minister of Economic Affairs and Climate to Parliament of 28 June 2019 at: www.klimaataakkoord.nl.

⁹ Staatsblad 2002, 542. The Mining Decree and the Mining Regulations entered into force at the same time (Staatsblad 2002, 604 and 245).

¹⁰ See preparatory works to the Act, TK 1998–1999, 26219, no. 7, p. 20.

following the need to transpose Directive 2009/31/EC on geological storage of CO₂ into national law.

2. LEGAL FRAMEWORK

2.1. INTRODUCTION

Directive 2009/31/EC on geological storage of CO₂ was implemented in Dutch law on 6 June 2010.¹¹ The Dutch legislature transposed the Directive (almost to the letter) as a separate chapter in the Mining Act governing storage (of substances and carbon dioxide) as it wanted to avoid any major delays in the implementation process.¹² The Mining Act was also considered as the proper legal basis, as it already provided for a regime on the storage of substances (including the storage of CO₂).¹³ The Mining Act, nevertheless, needed some particular amendments because the Directive included additional requirements regarding exploration, monitoring and closure. Similarly to the Directive, the Mining Act primarily governs the final part of the CCS chain; the capture of CO₂ and to some extent also the transport of CO₂ is regulated by other laws.

2.2. LICENSING REGIME

As provided by the Directive, geological storage of CO₂ may involve two licences: one licence for exploring suitable sites and another licence for subsoil storage. Both types of licence are exclusive in the sense that only one licence can be awarded per area/reservoir.¹⁴ These licences are basically available to all entities possessing the necessary technical and financial capacities and are issued on the basis of objective, published criteria. With regard to carbon dioxide storage licences some additional assessment criteria exist, such as the risks of carbon dioxide leakage and the risk of significant health and environmental effects.¹⁵

Following the CCS Directive and general practice in the hydrocarbons sector, licences need to be awarded in competition. This entails that the Minister will be calling for alternative bids once a licence application has been made.¹⁶ If no use is made of an exploration licence, competitive bidding will take place when awarding a storage licence. If use is to be made of a (almost) depleted

¹¹ Act of 6 June 2010, Staatsblad 2010, 381.

¹² Articles 25–32 Mining Act.

¹³ Article 25 Mining Act.

¹⁴ Article 26(6) Mining Act.

¹⁵ Article 27(3) Mining Act.

¹⁶ Article 26b Mining Act.

oil or gas reservoir, account needs to be taken of the fact that a hydrocarbons production licence may already apply. In that case, the Mining Act allows for the additional award of an exploration licence or a carbon dioxide storage licence.¹⁷ Given the requirement of competitive bidding, the person holding the hydrocarbons exploration or production licence does not hold a privileged position in the award procedure for a carbon dioxide storage licence and will not automatically be rewarded the licence. The holder of the hydrocarbons licence thus needs to compete with all other applicants and does not have a priority right. This situation may result in a situation where holders of a hydrocarbons licence will be less interested in applying for a licence to (re)use the reservoir for CO₂ storage. On the other hand, the holder of a hydrocarbons licence will have an advantage when applying for such storage licences as it is familiar with the reservoir and has all relevant technical and geological knowledge of the field.

The provisions in the Mining Act regarding carbon dioxide exploration permits are less detailed than the Directive,¹⁸ probably because the Netherlands anticipated making use of depleted oil and gas fields and, consequently, sufficient knowledge of the subsoil should be available for granting storage licences.¹⁹ A storage licence is required, with or without an exploration permit, if a site has found to be suitable for the storage of CO₂. The CO₂ storage provisions in the Mining Act are identical to those in the Directive.²⁰ By contrast to other licences, however, a CO₂ storage permit also needs to be assessed by the Commission.²¹ If awarded, a storage licence should provide information about the total quantity of CO₂ to be stored, the maximum injection rates, an approved monitoring plan, an approved provisional post-closure plan, and the type of financial security that ensures that all obligations arising under the permit can be met.²²

2.3. TRANSPORT AND STORAGE

2.3.1. *The Mining Act*

The provisions in the Mining Act applying to carbon dioxide storage are more or less similar to the Directive. Although not explicitly stated, it may be assumed that in parallel to the Directive any injection of carbon dioxide for the purpose of enhanced hydrocarbon recovery (EHR) is not to be considered as storage unless such injection is combined with, or will result in, geological storage of CO₂.²³

¹⁷ Article 26(7) Mining Act.

¹⁸ In case of exploration, the general licensing principles of the Mining Act will apply.

¹⁹ TK 2009–2010, 32 343, No. 3, p. 5.

²⁰ Articles 25–31d Mining Act and Arts 6–9 CCS Directive.

²¹ Cf Art 10, CCS Directive.

²² Article 31b Mining Act.

²³ Recital (20) Directive 2009/31/EC.

The holder of a carbon dioxide storage licence is bound by a large number of requirements dealing with the need to provide information on the quantity and quality of the carbon dioxide and the execution of risk management, to monitor the site on the basis of a monitoring plan and to report any irregularities or leakages, as well as the need to make any necessary corrective measures and to provide financial securities.²⁴ The holder of the carbon dioxide storage licence is, moreover, obliged to keep a register of the delivered, stored and leaked quantities of carbon dioxide and to inform the Minister on a yearly basis about the monitoring outcomes. The State Supervisor of Mines is required to regularly inspect the storage sites.²⁵ Moreover, the licensee is required to hold an emission permit in order to compensate for potential leakages by way of purchasing and submitting an equal number of emissions allowances.²⁶

As regards the transport of CO₂, the Mining Act provides little guidance. If a dedicated pipeline needs to be constructed to transport carbon dioxide to a subsoil storage facility, the developer will need a pipeline permit as provided for by the Mining Decree. This permit only governs the construction but not the operation of the pipeline. Moreover, this construction permit does not in any way specify the substance for which the pipeline will be used or has to be used. In principle, this seems to imply that once a pipeline is constructed, it can be used to transport any substance under the condition that the pipeline is operated in accordance with the operational rules found in the Mining Decree. These rules in turn primarily pertain to regular inspections of the strength and integrity of the pipelines and the need to prevent and limit any damage stemming from leakages.²⁷ This entails that in accordance with the Directive, the development of a CO₂ pipeline will need to be based on an environmental impact assessment and that the pipeline operator also needs a CO₂ emissions permit in case of any leakage.²⁸ Consequently rules applying to pipelines transporting CO₂ as part of the CCS chain differ from those that apply to pipelines transporting CO₂ to carbon users like greenhouse growers. The latter pipelines do not require an environmental impact assessment or a CO₂ emissions permit.

CO₂ storage reservoirs and pipelines may be considered as a natural monopoly and/or an essential facility and therefore the Directive provides for a regime of non-discriminatory third-party access.²⁹ When granting access the operator of the facility may take into account the following: (i) the available capacity, (ii) the incompatibility of technical specifications, (iii) any duly

²⁴ Articles 31b–31h Mining Act and Art 4, Mining Decree implementing Art 13, CCS Directive.

²⁵ Articles 126–130, Mining Act and Arts 14–15, CCS Directive.

²⁶ See also Martha M. Roggenkamp, ‘Transportation of CO₂ in the EU’ in I. Havercroft, R. Macrory, R. Stewart, *Carbon Capture and Storage – Emerging Legal and Regulatory Issues*, 2nd edn., Hart Publishing, Oxford 2018, p. 251.

²⁷ Articles 99 and 100 Mining Decree.

²⁸ These requirements have been transposed into the Environmental Management Act.

²⁹ Article 21 of the CCS Directive.

substantiated reasonable needs of the owner, and (iv) CO₂ reduction obligations to be met through CCS.³⁰ An almost similar provision can be found in the Mining Act.³¹ Such approach is also in line with the regime governing third-party access to upstream pipelines as provided for in the Gas Act.

2.3.2. *Offshore Transport and Storage: Some Specific Provisions under International Law*

When assessing the geological storage of carbon dioxide offshore, it also needs to be assessed whether such activity can be considered as dumping of waste under international law. Although the London Protocol originally listed carbon dioxide as a substance that could be considered dumping at sea,³² the Protocol was amended in 2006 as a result of which the injection of carbon dioxide streams in subsea reservoirs is possible if the following three conditions are met: (i) the disposal is into a sub-seabed geological formation, (ii) the carbon dioxide streams consist *overwhelmingly* of carbon dioxide, and (iii) no wastes or other matter are added for the purpose of disposing of those wastes or other matter.³³ The same situation more or less applies under the 1992 OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. This Convention also allows for the sub-sea storage of carbon dioxide. This storage is allowed under the same conditions as under the London Protocol, but adds a fourth criterion in that the carbon dioxide is intended to be retained in the sub-sea formations permanently and will not lead to significant adverse consequences for the marine environment, human health and other legitimate uses of the maritime area.³⁴ On the issue of dumping, it can thus be concluded that both the London Protocol and the OSPAR Convention do not hamper the permanent geological storage of carbon dioxide offshore.

As regards transport, the situation is slightly different, as article 6 of the London Protocol prohibits the export of waste to other countries for dumping at sea. This prohibition prevents any transboundary transport of CO₂ for geological storage. In 2009 a proposal was made to amend the Protocol by adding a provision making such transboundary disposal possible, dependent on prior agreement or arrangement concluded between the countries concerned.³⁵ This

³⁰ See also Martha M. Roggenkamp, 'Transportation of CO₂ in the EU' in I. Havercroft, R. Macrory, R. Stewart (eds), *Carbon Capture and Storage – Emerging Legal and Regulatory Issues*, 2nd edn., Hart Publishing, Oxford 2018, p. 253.

³¹ Article 32 Mining Act.

³² London Protocol, Annex I.

³³ Ibid.

³⁴ OSPAR Convention, Annex II, article 3.

³⁵ Resolution LP.3(4) on the amendment to article 6 of the London Protocol adopted on 30 October 2009. See: [http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/London-Convention-London-Protocol-\(LDC-LC-LP\)/Documents/LP.3\(4\).pdf](http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/London-Convention-London-Protocol-(LDC-LC-LP)/Documents/LP.3(4).pdf).

amendment to the London Protocol is essential for developing transboundary CCS and is of specific relevance for the North Sea area where several states border one another. However, the amendment needs to be ratified by 33 contracting parties and in 2018 only five parties (Norway, the UK, the Netherlands, Finland and Iran) have done so. In order to allow for a provisional application of this amendment, the parties to the London Convention adopted a resolution at their annual meeting on 14 October 2019. This resolution provides for an interim solution pending sufficient ratifications. Parties who wish to make use of this possibility need to deposit a declaration of provisional application and provide notification of any agreements or arrangements with the Secretary-General of the IMO.³⁶

2.3.3. *Re-Use of Offshore Reservoirs and Installations*

As the Netherlands in particular is considering carbon dioxide storage in (almost) depleted oil and gas fields, it is necessary to consider how such re-use relates to the re-use of existing wells and installations. This may also depend on the fact whether a production licence already has lapsed before a CO₂ storage licence is awarded.

In general disused offshore installations need to be removed entirely. However, as both the production of hydrocarbons and the storage of carbon dioxide are governed by the Mining Act, they are considered as a mining activity. Since the removal clause from the Mining Act is not limited to a particular type of mining activity, the Minister of Economic Affairs and Climate has taken the position that a platform will only have to be removed after all mining activities have been ceased. As a consequence of this, the removal obligation does not apply to mining installations that will be re-used for storage once hydrocarbons production has ceased.³⁷ The last holder of a licence pursuant to the Mining Act or the last operator of the platform will be responsible for the decommissioning of the asset.³⁸ In the case of a re-used platform for carbon dioxide injection, this will be the licence-holder or operator of the carbon dioxide activities. However, the question remains how to deal with the costs of removal. Does it mean that the holder of the production licence will be exempted from the payment of all removal costs? This will become of special relevance if different parties hold the CO₂ storage licence.

A slightly different situation may appear if the hydrocarbons production has ceased and the carbon dioxide storage is contemplated as an option for the longer term. In that case, the assessment as to the disuse of the installation

³⁶ <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/22-CCS-LP-resolution-.aspx>.

³⁷ *Kamerstukken II* 6 May 2011, 32343, nr. C, p. 3.

³⁸ *Ibid.*

might be different. Can the Minister request the operators to leave their assets in place for longer periods of time in order to keep them ‘mothballed’ for potential re-use? Or should another party be appointed to maintain the installation in the period in between the end of the production (and possibly the licence has lapsed) and the award of a carbon dioxide storage licence? Who will then be responsible for the maintenance costs and liability for damage caused by or from the installation? Further governmental guidance will be necessary to identify which reservoirs and installations may play a role in large-scale offshore storage of carbon dioxide in the future and to provide for a transitional regime on the basis of which wells and installations are kept in place whilst future use and decommissioning is considered. Currently, the Mining Act does not provide any guidance to facilitate such re-use.

2.4. CLOSURE AND POST-CLOSURE

A crucial phase in the process of creating permanent geological storage of CO₂ is the closure of the storage site after completion of the injection. The Mining Act applies the same conditions for closure and the post-closure plan as the CCS Directive.³⁹ Consequently, the licensee or operator needs to close the well in accordance with a closure plan that has been approved by the competent authority and, as a general rule, the licensee or operator remains responsible for monitoring the well after it has been closed and has to take all necessary corrective measure when leakages occur.⁴⁰ This liability only ends when the licence is cancelled and the competent authority (Ministry of Economic Affairs and Climate) takes over responsibility for the licence area. The responsibility can be transferred to the authorities after a period of at least 20 years if and when (i) all available evidence indicates that the carbon dioxide is permanently stored, (ii) the storage site is permanently closed and the injection facilities have been removed, and (iii) the licence-holder provides a financial contribution sufficient to cover the anticipated monitoring costs for at least 30 years.⁴¹ After the transfer of responsibility to the Dutch state, in principle, the (former) operator will be absolved from liability from any costs incurred after the transfer of responsibility, unless there has been fault on the part of the operator.⁴²

Given the absence of any carbon dioxide storage licences, it is too early to assess how this regime will work in practice. However, industry has already identified a number of obstacles. One of the obstacles is the absence of any criteria for assessing when carbon dioxide is permanently stored, especially in combination

³⁹ Article 31j Mining Act and Art 17, CCS Directive.

⁴⁰ Articles 29d–29f Mining Decree.

⁴¹ Article 31j Mining Act.

⁴² Article 31k, para 5, Mining Act and Art 18, para 7, CCS Directive.

with the 20-year period before a licensee can transfer its responsibility to the authorities. Secondly, there is considerable financial uncertainty. What are the anticipated costs of monitoring and any potential corrective measures? In case of any leakage the licensee/operator needs to purchase as many ETS allowances as are necessary to cover the volume of leaked carbon dioxide. However, currently it is impossible to assess the costs for such allowances in the longer term. This creates considerable uncertainty that may need to be addressed in order to stimulate carbon storage.

3. DEVELOPING CO₂ STORAGE PROJECTS OFFSHORE

Following the public opposition to carbon storage onshore and the switch to offshore storage, several attempts have been made to develop such projects. However, this first attempt to develop carbon storage offshore has not been very successful, partly due to financial constraints but also due to changes in the energy market. More recently, another offshore CCS project is being developed. Below, these projects will be discussed.

3.1. FIRST DEMONSTRATION PROJECTS

3.1.1. *The 'Green Hydrogen' Project*

The 'Green Hydrogen' was meant to be a cross-border CCS project in which capture would take place at Air Liquide near Rotterdam (and possibly later from the Antwerp facility) and the captured CO₂ would be shipped during a period of 10 years by ship to the Danish Continental Shelf where it would be injected into an almost depleted oil field operated by Maersk.⁴³ The injection of carbon dioxide was intended for enhanced oil recovery. The project was planned to start in 2016 but this did not happen due to funding problems as the NER 300 funds were withdrawn late 2012. The problem lies not only in the absence of EU and national funding but also in the low allowance price on the EU Emissions Trading System (ETS), which does not cover operational costs.

By contrast to other CCS projects, this project did not aim to transport CO₂ from the emitter to the storage reservoir by pipeline but by ship. Moreover, it involved a cross-border shipment and this is basically not permitted by Article 6 of the London Protocol (see above). However, in the case of the Green Hydrogen project the cross-border shipment did not aim at the disposal of CO₂ but at the

⁴³ The ROAD project is undertaken by EON Benelux, Electrabel and GdF Suez. See further: <http://www.globalccsinstitute.com/projects/12706> ('Green Hydrogen') and <http://www.road2020.nl/en/> ('ROAD').

injection of CO₂ for the purpose of enhanced oil recovery. If so, the export of CO₂ would be in line with international law but, on the other hand, could also imply that this project, basically, cannot not be considered as a CCS project.

3.1.2. *The ROAD Project*

In the same period, the ROAD⁴⁴ project was developed. ROAD involved a joint venture (Maasvlakte CCS Project C.V.) consisting of Uniper (previously E.ON Benelux), GDF SUEZ Energie Nederland and TAQA Energy. Uniper and GDF Suez Energie aimed at CO₂ capture at Uniper's MPP3 power plant near Rotterdam (Maasvlakte) and subsequent transport through a 25 kilometres (20 kilometres offshore) pipeline to reservoirs operated by TAQA Energy in P15 and P18 some 20–40 kilometres from Rotterdam. The original aim was to start injecting in 2015.

By contrast to 'Green Hydrogen', this project managed to organise all necessary permits. Whereas in 2012 all emissions and capture permits had been awarded and became irrevocable,⁴⁵ the licence for the permanent storage of carbon dioxide in block P18 was awarded to TAQA in 2013⁴⁶ and all necessary transport permits were issued early 2015. However, this project also was faced with an issue regarding financing as the price of ETS allowances at that time was very low and caused a financing gap compared to plan of more than €100 million. However, the main reason for the lack of success was the fact that parties withdrew from the project in September 2017⁴⁷ due to the possible early closure of coal-fired power plants (see Chapter XIII of this volume by Braaksma and Fleming). This illustrates that future CCS projects no longer will benefit the electricity sector as the number of generators using fossil fuels as their primary resources will decline but will rather be relevant for other CO₂ emitting industries.

3.2. THE PORTHOS PROJECT

In 2019 the Porthos project was launched. Porthos is an acronym for Port of Rotterdam CO₂ Transport Hub & Offshore Storage, and is a joint initiative of the Port of Rotterdam, the gas infrastructure company 'Gasunie', and the company EBN, which is representing the Dutch state in oil and gas exploration and production. This project differs from the two projects discussed above as it

⁴⁴ ROAD is an acronym for 'Rotterdam Opslag en Afvang Demonstratieproject'.

⁴⁵ See for an overview of all permits, the 'Guidance on CCS permitting, including description of Permitting Guidance Tool' prepared under the CATO-2 programme at: www.co2-cato.org.

⁴⁶ Stc No 21233 of 29 July 2013. The European Commission issued its Opinion on the draft permit on 28 February 2012, C(2012)1236 final.

⁴⁷ See Letter to Parliament of 20 October 2017 at: www.overheid.nl.

involves the transport and storage of carbon dioxide only and does not engage any capturers. Moreover, it also aims at transporting carbon dioxide for other purposes than geological storage. In other words, the project involves Carbon Capture Use and Storage (CCUS). The 'usage' part is primarily focussing on the use by greenhouse growers in the province of South Holland. Although such use does not result in permanent storage of captured CO₂, it may be an important element in the process of energy transition, i.e. energy savings, as it allows greenhouse growers to make use of captured CO₂ for growing their products instead of purchasing and burning natural gas.⁴⁸

It follows from the above that the project is designed as an open access pipeline starting in the Rotterdam port area and terminating at a geological offshore storage facility or being connected to the existing OCAP pipeline that transports CO₂ to greenhouse growers. The pipeline will have a length of approximately 30–33 kilometres and run through the Rotterdam port area where it can serve several industries emitting CO₂. Most of the CO₂ will be transported to an empty gas field (P18 operated by TAQA⁴⁹) situated about 20–25 kilometres off the coast and where it can store approximately between 2 and 5 million tonnes of CO₂ per year until the reservoir has been filled. Other reservoirs can be connected to the pipeline at a later stage and, if successful, the pipeline could, in the longer term, also accommodate CO₂ suppliers from Belgium and Germany.⁵⁰

The pipeline and storage facility are intended to operate as open access facilities, which means that third parties can request non-discriminatory access to the transport and storage facilities, probably on the basis of a negotiated tariff (see above). In order to assess the interest of industrial parties in such access, Porthos investigated such interest ('open season') during the spring of 2019. As a result, Porthos is now focussing on concluding a Joint Development Agreement (JDA) with the companies that have shown interest. Companies that have signed such a JDA before 14 October 2019 will be granted priority access in case of scarce capacity. Moreover, by concluding a JDA the companies also agree to jointly conclude a transport and storage agreement and to commit themselves to prepare the capture process and to organise all necessary capture permits.

Currently the route of the pipeline is being investigated. This means that an environmental impact assessment was initiated in May 2019, which involves

⁴⁸ See also Martha M. Roggenkamp, 'Carbon Capture Storage and Reuse of CO₂ – Law and Policy in the Netherlands' in *European Energy Law Report V*, Intersentia, Cambridge 2008, pp. 109–208 and 'Transportation of Carbon Dioxide in the European Union' – Some Legal Issues' in I. Havercroft, R. Macrory and R. Stewart (eds), *Carbon Capture and Storage – Emerging Legal and Regulatory Issues*, Hart Publishing, Oxford 2018, Chapter 13.

⁴⁹ Use is made of the platform situated at P18-A, and from there the carbon dioxide will be injected in the P18-2 and P18-4 fields.

⁵⁰ See: www.rotterdamccus.nl.

an assessment of two possible routes. As regards the storage permit, it can be noted that this project aims at injection in P18-4 just like the ROAD project. In order to be able to use this storage for the Porthos project, the Minister of Economic Affairs and Climate has agreed to an extension of the permit as a result of which the permanent storage of carbon dioxide needs to start no later than 1 January 2021.⁵¹ It is therefore most likely that use can be made of the existing storage permit. As before, financing will be one of the key issues for the project's success. In this regard it is relevant that the price of ETS allowances has increased since 2015 and the project may rely on some EU funding, as it was selected as a Project of Common Interest in 2018.⁵² In July 2018 also the Dutch government awarded Porthos some funding.⁵³ Finally, the parties involved may also benefit from the national support scheme 'SDE++'. Although this support scheme initially was intended to provide support to renewable energy projects, the support scheme has been changed so that, as of 2020, support may also be granted to other climate-friendly techniques such as CCS and CCUS. However, the funds will be limited and will not be awarded to CCS projects starting after 2035.⁵⁴ Together this may result in a situation that Porthos may be successful and the first CCS project in the Netherlands may get started in 2020.

4. CONCLUSION

The Netherlands is facing severe challenges in order to meet its climate goals. This was clearly illustrated by the *Urgenda* case, and a large number of policy instruments have been included in the 2019 Climate Agreement. CCS and CCUS are listed as possible means to assist in reaching these climate goals. It is interesting to note that CCUS was already included in the Working Programme of 2007, which amongst other things promoted the use of carbon dioxide in the Dutch greenhouse agriculture sector. One of the major disadvantages of using CO₂ for other uses is the possibility that the CO₂ will still be emitted, which may be problematic if the user (like a greenhouse grower) is not required to hold an emissions permit. So it remains to be seen how effective CCUS will be in reaching the climate goals.

As regards CCS, the Netherlands is now focussing on the possibilities offshore. Some earlier demonstration projects have not been successful, as they have not materialised. Lack of finances and/or public support has played an important role. This may change in the future as the price of emissions allowances

⁵¹ Amendment to the storage permit awarded on 29 July 2019, Stc. 2016, no. 4809.

⁵² <https://ec.europa.eu/energy/en/topics/infrastructure/projects-common-interest>.

⁵³ See: www.rotterdamccus.nl and <https://projecten.topsectorenergie.nl> › projecten › porthos.

⁵⁴ See Letter to Parliament of 28 June 2019 on the Climate Agreement, p. 15.

is gradually increasing. Apart from this, it is interesting to note that it is no longer the electricity sector that needs to apply CCS, given the increased use of renewable energy sources, but rather other industrial sectors like refineries and the cement industry. This may also explain why the Porthos project has a different approach. Instead of developing a point-to-point CCS chain (from capturer to storage), this project is being developed as an open access infrastructure project. It offers pipeline and storage capacity to all interested parties who wish to permanently store CO₂. This obviously brings with it some other risks such as a lack of interest. However, applying an open season and subsequently concluding with all interested parties a joint development agreement, may limit that risk. Although other risks remain, it may be that this project possibly could be successful.