North Sea Energy II
Regulatory Framework: Barriers or Drivers for Offshore System Integration

Deliverable B.1.

As part of Topsector Energy:
TKI Offshore Wind & TKI New Gas

Prepared by: RUG: Dinand Drankier
Martha Roggenkamp
L&L: Roland de Vlam
Max Oosterhuis

Checked by: TNO: Joris Koornneef

Table of Content

1 Introduction

The North Sea Area (NSA) is of profound economic importance to its littoral states.[1] The North Sea is one of the busiest and most intensively used marine environments in the world, with the exploitation of energy resources, shipping, fisheries, sand extraction, defense, recreation and other uses all claiming a part of the available space.[2] The exploitation of offshore energy resources will be central to this report and can *grosso modo* be divided into two segments.

On the one hand, there is the long established industry for the exploitation of the oil and gas (O&G) reserves on the North Sea. The exploration and production of hydrocarbons has been taking place in the NSA since approximately the 1970s. Oil and gas activities on the North Sea are in a mature phase and as such will be confronted with rising extraction costs and diminishing proven reserves within the license area's.. In view of the depletion of the reservoirs, more and more platforms will cease their economic activities in the nearby future and will therefore need to be decommissioned. In the NSA more than 600 platforms and their associated physical infrastructures, such as pipelines, will have to be removed in the upcoming decades. Focusing on the Dutch part of the North Sea, in policy documents usually referred to as the Dutch continental shelf (DCS),[3] approximately 150 platforms will have to be decommissioned in the upcoming decades.[4]

On the other hand, there is the production of energy from renewable energy sources (RES), such as wind and waves. Currently, especially offshore wind is projected to grow into a substantial source of energy. At the moment, 10 gigawatt (GW) of offshore wind capacity has been installed at the North Sea. In the medium to long term, this installed capacity is projected to grow to 60 GW in 2030 and to approximately 180-250 GW in 2050.[5] Within the Dutch part of the NSA, the Dutch government and the wind energy sector aim at roughly 4,5 GW of offshore wind capacity in 2023 and according to the World Energy Council already more than 10 GW of offshore wind projects are planned for 2030.[6]

Moreover, from a broader sustainability and climate change perspective, the NSA is also increasingly looked at as a place to implement carbon capture and storage (CCS) technology.[7] The utilization of depleted oil and gas reservoirs to permanently store carbon dioxide (CO_2) is currently embraced by the Dutch government as one of the central pillars of its energy and climate policy.[8]

---

[1] The North Sea borders the coasts of Belgium, the Netherlands, Germany, Denmark, Norway and the United Kingdom.
[2] Mariene Strategie voor het Nederlandse deel van de Noordzee 2012-2020 (Marine Strategy for the Dutch part of the North Sea), 2012, Part I, p. 53.
[3] In Dutch policy documents, the Dutch part of the North Sea is usually referred to as the NCP (Nederlands Continentaal Plat).
[4] Energiebeheer Nederland, Netherlands masterplan for decommissioning and re-use, 2016, p. 11.
[5] World Energy Council, Bringing North Sea Energy Ashore Efficiently, 2018, p. 6.
[6] Social and Economic Council of the Netherlands (SER), Energieakkoord voor Duurzame Groei (Energy Agreement for Sustainable Growth), 2013, p. 17.; World Energy Council, The North Sea Opportunity, 2017, p. 32.
[7] For a deeper analysis of offshore carbon capture and storage, see section 1.1.3.
[8] Regeerakkoord 2017-2021 Vertrouwen in de toekomst (Coalition Agreement 2017-2021 Confidence in the Future), 2017, p. 38.

1.1 System integration

The parallel occurrence of the trends identified above, opens up the possibility to search for synergies between both processes. Within the North Sea Energy 2 program, these synergies are explored under the header of offshore system integration.
System integration is described by the overarching TKI Energy program as:

> *"a process of integration between various stages and players of the energy value chains, between various energy carriers, between actors in the value chains and with adjacent sectors in the system, as a consequence of which solutions to bottlenecks are being offered and as a consequence of which opportunities arise for new products and services."*[9]

This broad definition highlights some of the central elements of system integration, such as the fact that system integration is about linking previously separated stages, players, energy carriers and adjacent sectors through innovative methods into one large energy system.
Typical forms of integration that are possible offshore are electrification of platforms, the production of hydrogen on platforms and the storage of carbon dioxide in depleted oil and gas reservoirs. Although other integration options exist, such as gas-to-wire (G2W) technology or compressed air energy storage (CAES), the focus of this report will be on the three options identified above. The main reason for this is that the industry partners involved in the North Sea Energy 2 program have identified the former three as the options they consider the most viable for system integration with regard to the platforms they operate.[10] In the upcoming three subsections, the technical and socio-economic specifics of these three system integration options will be introduced. The discussion in these sections does not yet concern the regulatory framework governing these integration options.

1.1.1 Electrification

The first integration option is the electrification of platforms. Currently most platforms make use of diesel- or gas-fired generators and turbines for power supply. Future electrification involves linking the platform to an external source of power. As such, electrification involves the integration of O&G production sites into the electricity system and the replacement of on-site turbines by external power production.
In principle, three tie-in options may be considered for electrification. First, a platform can be connected via a cable to the onshore grid. This option may be viable for near-shore platforms. Secondly, a platform may be connected to an offshore grid. In the Netherlands, the transmission system operator (TSO) TenneT is the designated offshore grid operator with the statutory task to create an offshore grid dedicated to connect offshore wind energy farms to the onshore grids (see further below section 3.3). For many platforms further offshore, it would significantly reduce their costs of obtaining a grid connection if it would be possible to tie in and connect to an offshore grid. A third option could be the direct connection of a platform to an existing or

[9] ''Systeemintegratie is het proces van integratie tussen schakels en spelers in de energiewaardeketens, tussen verschillende energiedragers, tussen actoren in de waardeketen en met aanpalende sectoren in het systeem, waardoor oplossingen voor knelpunten worden geboden en waardoor er kansen ontstaan voor nieuwe producten en diensten.'' See https://topsectorenergie.nl/systeemintegratie.
[10] The industry partners involve Royal Dutch Shell/ NAM, Total, ENGIE and TAQA Energy.

future offshore windfarm.[11] For the North Sea Energy 2 program in particular the potential tie-in with an offshore grid or windfarm are of relevance. Electrification may lead to lower operational costs for platform operators and eliminate emissions from the diesel- or gas-fired generators and turbines.[12] Moreover, lower operational costs may contribute to extend the lifetime of the field and as such may help to prevent a loss of opportunity to utilize the platform for potential other future purposes, such as offshore hydrogen production.[13]

1.1.2 Offshore power-to-gas

The second option for offshore system integration is offshore power-to-gas (P2G). This technology involves the usage of an electrolyzer to separate water molecules into hydrogen and oxygen molecules. Generally speaking, electrolysis is an energy-intensive process, whereby electricity is used as input for the decomposition of the water molecules. The hydrogen that is produced through electrolysis can later be used as industrial feedstock or as energy carrier to convert to heat or electricity.

Hydrogen can be produced onshore, but also offshore. With a sufficient supply of fresh water and electricity, it is possible to produce hydrogen on offshore hydrocarbon platforms. Such value chain would involve electricity production and delivery to the platform,[14] assuring a supply of fresh and desalinized water, the decomposition of water into hydrogen and oxygen on the platform via electrolysis and the transport of the hydrogen to shore. This transport can in principle take place in three ways. First, for as long as the platform is operating and producing natural gas, the hydrogen can be admixed to the outgoing stream of natural gas. Secondly, it is possible to dedicate a disused gas production pipeline to the exclusive transport of hydrogen or to construct a new dedicated pipeline for hydrogen transport. Thirdly, the hydrogen can be transformed into an identical chemical substance as natural gas labelled as Synthetic Natural Gas or Substitute Natural Gas (SNG). Through a process called methanation, hydrogen can be turned into SNG by adding carbon dioxide. SNG could be technically transported through the gas transport infrastructure and does not require dedicated SNG-only infrastructure. The North Sea Energy 2 program in principle only focusses on the first two options.

P2G may thus contribute to an extended economic life time of the platform and a postponement of decommissioning costs. From a holistic energy system perspective, P2G may also contribute to large scale (renewable) energy storage,[15] whereby excess electricity (produced by offshore wind farms) can be stored as hydrogen in times when electricity production exceeds demand and can be applied for industrial use or may be turned into electricity once again when electricity demand exceeds (renewable) electricity production. Besides, where hydrogen can be transported via an already existing offshore (gas production) pipeline system, it may extend the economic life time of such pipelines and may avoid or reduce investments in offshore electricity cables in the situation (for instance far from the coast) where the entire production of a wind park can be turned into hydrogen.

---

[11] Such a connection would usually take the form of a connection between a platform and the substation of a wind farm. As will be highlighted below, depending on the applicable legal framework, such a substation can be either part of the offshore network or part of the wind park.

[12] Due to space and weigh limitations on platforms, the generators and turbines used on platforms are usually using singe cycle technology. As a consequence of this, electricity production on platforms is on average rather inefficient.

[13] Many offshore integration technologies are innovative and not yet fully mature and need to be further refined and experimented with before they can be deployed on a larger scale. In that perspective electrification may contribute to bridge the gap by providing an opportunity to extend field life time and delay decommissioning of O&G assets until future operationalisation of other innovative offshore integration options.

[14] Electricity can be supplied via one of the three options identified under 1.1.1.

[15] It is easier to store energy content in the form of molecules, than in the form of electrons.

1.1.3 Offshore carbon dioxide storage

Option three involves the permanent offshore storage of CO_2 in depleted oil and gas reservoirs. CO_2 can be captured at industrial production facilities and thermal energy plants and can be transported offshore through dedicated CO_2 pipelines. This may involve either the reuse of disused gas production pipelines or the construction of new pipelines specially designated for the transport of CO_2 for the purpose of offshore carbon storage.[16] At the storage site, the CO_2 will be injected into the depleted O&G reservoirs. Once the reservoirs are full, the storage site will be sealed, the injection facilities will be removed and the location will be monitored to detect any leakages occurring.

It should be noted that CCS is an energy-intensive and costly activity. The economic viability of offshore CCS is largely dependent on the price of emission allowances compared to the costs of CCS. When the emission allowance price is low, it will be cheaper for companies to buy addition allowances than to capture and store CO_2. As such, the development of the allowance price has a significant impact on the viability of offshore CCS. From a climate change perspective, the advantage of (offshore) CCS is its potential contribution to the reduction of greenhouse gas emissions. For platform operators, CCS provides the opportunity to extend the economic lifetime of their offshore assets.

1.1.4 Rationale behind system integration

System integration may be beneficial for the energy system in various ways. First, a larger integrated energy systems with increased flexibility, increased storage possibilities and the opportunity to switch between energy transport and storage via molecules or electrons, will contribute to a more robust and resilient energy supply. Second, system integration may contribute to decreasing costs for the energy transition on the North Sea. Currently, the World Energy Council estimates that the decommissioning of O&G assets and the ramp-up of wind energy on the North Sea at large will cost between 390 and 690 billion Euros.[17] Re-usage and optimization of investment strategies in new assets are likely to lower those costs significantly. Thirdly, system integration will also make the energy system itself more efficient as increased storage possibilities will allow for the possibility to store energy when there is an excess of (renewable) production and to utilize this energy in periods when demand exceeds the (renewable) production. Finally, through the re-use of assets, the environmental disruptions resulting from the construction of new infrastructures, such as cables, can be reduced. Besides that, the negative environmental effects of decommissioning platforms can be postponed by extended life time.

1.2 Structure

This report will analyze the legal barriers and drivers for offshore system integration. This report will do so in four chapters. The subsequent chapter, chapter two, will analyze the international legal aspects of offshore system integration through the perspective of international maritime law. Chapter three will analyze the current Dutch legislation in place pertaining to offshore hydrocarbons production, wind energy activities, carbon storage and hydrogen production. The fourth chapter will then provide an overview of possible barriers and drivers in realizing an integrated and hybrid offshore energy system. In addition to the main body of text, this report contains two annexes. One with the outcomes of a series of interviews with the

[16] Liquefaction and shipping of CO_2 is not within the scope of NSE2.
[17] WEC, 2017, p. 8.

operators participating in NSE2 and one with a brief analysis of some potential fiscal implications of the analyzed system integration scenario's.

2 International Law of the Sea

When discussing the regulation of offshore energy activities, it is important to establish the extent to which coastal states have legislative powers offshore. In principle, states enjoy sovereignty over their territory and as such have the jurisdiction to regulate the activities taking place within their territory.[18] This sovereignty covers the entire landmass of a state, including the natural resources that can be found in for example subsoil deposits.[19] Offshore however, the extent to which (coastal) states have sovereign rights and jurisdiction is limited and embedded in international law, and in particular the treaties governing the law of the sea. These treaties relate the coastal states' sovereign rights to a number of maritime zones. This chapter will first present the maritime zones where coastal states have sovereign rights and may exercise jurisdiction with regard to a range of energy activities and subsequently analyse the (international) rules pertaining to the construction and decommissioning of offshore infrastructures. The chapter will moreover provide a brief analysis of the position of carbon dioxide storage in international maritime law.

2.1 Offshore zones

The United Nations Convention on the Law of the Sea of 1982 (UNCLOS) is without much doubt the most important international legal instrument dealing with the law of the sea in general and with offshore jurisdiction in particular.[20] UNCLOS can be seen as the successor to the 1958 Geneva Conventions.[21] Since all North Sea states, including the Netherlands, have ratified UNCLOS, this treaty provides the general legal framework for offshore energy activities on the North Sea. UNCLOS divides the sea into four zones, all with their own characteristics in terms of coastal state sovereignty (or sovereign rights) and jurisdiction. Of those four zones, i.e. the territorial sea, the continental shelf, the Exclusive Economic Zone (EEZ) and the high seas, the first three are of particular relevance for the North Sea region.

2.1.1 Territorial sea

The zone closest to shore is the territorial sea. This zone covers the water column, seabed and subsoil up to 12 nautical miles (22.2 kilometres) from shore.[22] In this zone, coastal states enjoy full sovereignty and consequently all national laws apply.[23] Pertaining to energy activities, this means that the state has the right to regulate the construction and use of the assets necessary for, *inter alia*, oil and gas production, electricity production from wind, the conversion of electricity into hydrogen and the permanent storage of carbon dioxide in the subsoil. The only limitation on the state's ability to regulate in the territorial sea are other

[18] Jurisdiction entails the right of a state to legislate, to apply this legislation and to enforce it within a territory or over particular subjects. Jurisdiction always needs to have an implicit or explicit basis. The most common forms of jurisdiction are territorial jurisdiction, where a state enjoys jurisdiction over its territory, and treaty-based jurisdiction, where a state enjoys jurisdiction by virtue of an international treaty that allocates this jurisdiction to it.
[19] As a rule of customary international law states in principle enjoy permanent sovereignty over their natural resources and can as such regulate the exploration and exploitation of these resources.
[20] United Nations Convention on the Law of the Sea (UNCLOS), Montego Bay, 1982.
[21] The 1958 Geneva Conventions include the Convention on the Territorial Sea and the Contiguous Zone, Geneva, 1958.; the Convention on the High Seas, Geneva, 1958.; the Convention on Fishing and Conservation of the Living Resources of the High Seas, Geneva, 1958.; and the Convention on the Continental Shelf, Geneva, 1958.
[22] UNCLOS, art. 3.
[23] Idem, art. 2.

international legal commitments binding the state and the right of innocent passage, which means that coastal states should assure that foreign ships are still capable of navigating the territorial sea.[24]

2.1.2 Continental shelf

The second maritime zone to be found in UNCLOS is the continental shelf. Geologically, a continental shelf is a relatively shallow submarine terrace of continental crust forming the edge of a continental landmass. Under UNCLOS, the definition of continental shelf is limited to that part of the geological continental shelf that is located beyond the territorial sea and extends up to a maximum of 200 nm.[25] The North Sea largely consists of continental shelf and, given the overlap of the claims to the continental shelf held by various states, the NSA states have delimitated their respective continental shelves in accordance with UNCLOS.
On the seabed and in the subsoil of this maritime zone, states enjoy sovereign rights for the purpose of exploring and exploiting natural resources.[26] Sovereign rights can best be understood as a limited and derived form of sovereignty, where the state only has sovereignty over a particular set of activities. In terms of jurisdiction, this translates in a functional jurisdiction, i.e. jurisdiction for the purpose of regulating these particular activities. On the continental shelf this jurisdiction thus extends to the regulation of activities taking place with the aim of exploring and exploiting natural resources, such as oil and gas. UNCLOS to this end also explicitly provides coastal states with the right to regulate the construction of artificial islands and installations and structures for economic purposes.[27] The coastal state moreover has jurisdiction over all cables or pipelines on its continental shelf constructed or used in connection with the exploration and exploitation of its natural resources on the continental shelf or the operations of artificial islands, installations and structures under its jurisdiction.[28]

2.1.3 Exclusive Economic Zone

One the legal innovations of UNCLOS, in comparison to the Geneva Conventions, is the introduction of a so-called Exclusive Economic Zone. Beyond 12 nautical miles (nm), states may under UNCLOS establish an EEZ. This maritime zone may extend to 200 nm from shore.[29] Unlike the continental shelf, an EEZ needs to be explicitly proclaimed. In the NSA, all states, including the Netherlands, have done so.[30] On the North Sea the continental shelves and the EEZs of the littoral states overlap.
Within the EEZ, coastal states enjoy sovereign rights for the purpose of exploring, exploiting, conserving and managing the natural resources and regarding other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds.[31] The scope of sovereign rights in the EEZ is broader than the sovereign rights enjoyed by states on their continental shelf. Economic activities at a minimum seem to also include wind parks, P2G and CCS operations. As on the continental

[24] Idem, art. 2 (3) and art. 17-26.
[25] Idem, art. 76 (1); hereafter the term 'continental shelf' will be used to refer to the continental shelf as defined by UNCLOS, the geological phenomenon continental shelf will be referred to as 'geological continental shelf'.
[26] Idem, art. 76 (1) and 77.
[27] Idem, art. 60 (1) and 80.
[28] Idem, art. 79 (4).
[29] Idem, art. 57.
[30] The Netherlands established an EEZ through the Kingdom Act Establishing Exclusive Economic Zone (*Rijkswet instelling exclusieve economische zone*), which entered into force on 28 April 2000.
[31] Idem, art. 56 (1)(a).

shelf, coastal states are entitled to regulate the construction of artificial islands and installations and structures for economic purposes in their EEZ.[32]
It follows from the above that coastal states may have sovereign rights beyond the territorial sea and thus may exercise a functional jurisdiction. If so, national laws do not automatically apply to the continental shelf or the EEZ. Only laws that explicitly state so are applicable.

2.2 Offshore infrastructure

On the basis of their sovereign rights coastal states may develop offshore installations and structures (hereafter 'infrastructure'). The construction and use of such infrastructure needs to be balances with other users of the sea such as shipping and navigation. To dovetail the various uses of the seas and the rights of the various users of the sea, UNCLOS provides guidelines on the construction and the decommissioning of offshore infrastructures, such as platforms, wind turbines, pipelines and submarine cables.

2.2.1 Constructing offshore infrastructure

When a state has the jurisdiction to regulate a particular activity, it can adopt national laws with regard to the construction of the infrastructures necessary for that activity, the operation of these infrastructures and, in the end, the removal of these infrastructures. One important limitation in this respect is that such national laws will have to comply with other rules of international law. The degree to which a coastal state has to take into account the rights of other users of the sea when executing its right to regulate offshore activities however differs per maritime area.
Within the territorial sea, states have full jurisdiction to allow for the construction of any infrastructures as long as they exercise their jurisdiction subject to UNCLOS and other rules of international law.[33] In its EEZ, a state has the right to allow for the construction of offshore installations and structures for any economic purposes. This right is, however, limited by the duty to have due regard to the rights and duties of other states.[34] These rights are listed in article 58 of the Convention and include the right of navigation, the right of overflight, the right to lay pipelines and submarine cables.[35] The right to construct offshore installations and structures should just be exercised with due respect for the right of navigation, the right to overflight and the right of other actors to lay pipelines and cables in the EEZ of the coastal state. The same regime applies to the continental shelf, where the coastal state can exercise its jurisdiction as long as this does not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other states as provided for in UNCLOS.[36] Since cables and pipelines have a more limited disturbing effect on the rights of other users of the sea, the coastal state should only take into consideration the right of other actors to lay cables or pipelines when it is authorizing the construction of a pipeline or cable on its continental shelf.[37]

2.2.2 Decommissioning platforms, wind turbines, pipelines and cables

Offshore infrastructures could hamper the rights of other states to fully exercise their rights and freedoms. To balance the rights of coastal states to exploit their offshore resources with the freedoms of other states,

[32] Idem, art. 60 (1).
[33] Idem, art. 2 (3).
[34] Idem, art. 56 (2).
[35] Idem, art. 58 (1).
[36] Idem, art. 78 (2).
[37] Idem, art. 79.

international rules have been established to limit any unjustifiable interference with the freedoms of third states.

2.2.2.1 UNCLOS

As such, UNCLOS provides with regard to installations or structures constructed on the continental shelf (and in the EEZ) that:

> *"Any installations or structures which are abandoned or disused shall be removed to ensure safety of navigation, taking into account any generally accepted international standards established in this regard by the competent international organization".*[38]

One of the weaknesses of the UNCLOS regime (and the earlier Geneva Conventions) is that it does not define terms such an 'installations' and 'structures.' It is however generally accepted that these terms at least cover large physical infrastructures such as offshore platforms and wind turbines. Given the explicit reference to safety of navigation, it is generally understood that cables and pipelines are not covered by this obligation.[39] Moreover, in contrast to the 1958 Geneva Convention on the Continental Shelf the current regime does no longer require a 'complete removal' but only a 'removal' of disused/abandoned installations or structures. Further requirements with regard to this removal obligation are based on "international standards established […] by the competent international organization" (article 60 of UNCLOS). Please note that these standards have been drafted on the basis of experiences in the oil and gas sector and therefore not necessarily apply to offshore wind turbines as well.

2.2.2.2 IMO Guidelines

These internationally recognised standards are the 1989 Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone issued by the International Maritime Organisation (IMO). [40] Although the IMO guidelines are adopted as recommendations to the IMO members,[41] the fact that these guidelines are generally seen as being international standards in the sense of article 60 of UNCLOS provides them with an important role in determining when and how an installation or structure should be removed.[42] The Guidelines distinguish between installations in deep and shallow waters (i.e. less than 70 meters). As a general rule the guidelines provide that abandoned or disused installations or structures should be removed except for those cases in which partial or non-removal is consistent with the guidelines.[43] Non-removal can be consistent with the guideline in the following cases: 1) when the installation or structure will serve a new a use, 2) when the installation or structure can be left in place without causing unjustifiable interference with other uses of the sea, or 3) when entire removal is not technically feasible or would involve extreme cost, or an unacceptable

---

[38] Idem, art. 60 (3).
[39] Generally, under UNCLOS, pipelines and cables not seen as being an integral part of the installations to which they are connected. Rather they are seen as separate activities. See: Müller 2016, p. 18.
[40] International Maritime Organisation Assembly resolution A.672(16) Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone (IMO Guidelines), 1989, London.
[41] IMO Guidelines, art. 2.
[42] Moreover, the Guidelines also provide instructions with regard to the way in which oil and gas platforms should be constructed as the construction may determine the extent to which platforms can be removed.
[43] Idem, art. 1.1.

risk to personnel or the marine environment.[44] The guidelines however explicitly mention that points 2 and 3 do not apply to lightweight platforms standing in shallow waters.[45] Since all platforms in the Dutch part of the North Sea fall in the category of 'lightweight platforms located in shallow waters" as defined by the Guidelines, only re-use can provide a valid reason for leaving in place a platform which has ceased its original activity. Pipelines and cables are not covered by the IMO Guidelines.

2.2.2.3 London Convention

When decommissioning takes the form of leaving in place an offshore asset, it should be assessed whether this could be seen as a form of dumping. The most important international legal instrument dealing with dumping is the London Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matters (London Convention). In 1996 the London Convention was amended by the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Protocol). This protocol entered into force in 2006 and supersedes the Convention for all parties that become parties to it. Since the Netherlands and all other North Sea states are parties to the Protocol, the Protocol supersedes the Convention for these parties. Under the Protocol *dumping* is defined as the *deliberate disposal* at sea of wastes, vessels, aircraft, platforms or other man-made structures. The Protocol prohibits the dumping of all materials, with the exception of a limited list of materials that can be dumped in a maritime environment after a permit has been awarded by the national competent authorities. Vessels, platforms and other man-made structures are named as materials that can be dumped, after consideration has been given to a list of aspects, including the availability of land-based methods of disposure, the environmental effects of dumping and the effects of dumping on other uses of the sea.[46]

2.2.2.4 OSPAR

On the regional level, standards for decommissioning and dumping on the North Sea are provided by the OSPAR Convention and OSPAR Decision 98/3 on Disposal of Disused Offshore Installations.[47] The OSPAR Convention, also known as the Convention for the Protection of the Marine Environment of the North-East Atlantic, is a regional convention of which all North Sea states are signatories and that covers the marine environment in the North-Eastern part of the Atlantic. The OSPAR Convention stipulates that no disused offshore installations or disused offshore pipelines shall be dumped offshore and that no disused offshore installations shall be left in place without a permit issued by the competent authority of the contracting parties.[48] In the OSPAR Convention, offshore installations are fixed structures placed in the marine environment for the purpose of hydrocarbons production.[49] As such, OSPAR does not contain any removal obligation pertaining to offshore structures that are being place in the marine environment for the purpose of producing wind energy. It is important to note that OSPAR Decision 98/3 provides further clarification on this obligation and establishes that platforms serving another legitimate purpose in the maritime area authorised

[44] Idem, art. 3.4. and 3.5.
[45] Idem, art. 3.1. and 3.2.
[46] London Protocol, article 4 and Annex I.
[47] Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), 1992, Paris.; OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations (OSPAR Decision 98/3), 1998, Sintra.
[48] OSPAR Convention, annex III, art. 5.1.
[49] Idem, art. 1 (j) and (l).

or regulated by the competent authority of the relevant contracting party are not considered as being disused and do therefore not need to be removed.[50]
A legally challenging situation can arise when platforms are temporarily shut down in the period between the cessation of oil and gas production and the commencement of a new use. Does such an act go against the decommissioning obligation enshrined in the UNCLOS and the above mentioned standards? Currently, no legal guidance is provided on this issue. Given the explicit opening provided for re-use in both the IMO Guidelines and the OSPAR regime, it is however questionable whether a temporal disuse for a reasonable amount of time would go against the aims and norms of the current decommissioning regime.

2.3 Offshore carbon dioxide storage

As noted in the previous section, dumping wastes and man-made structures at sea is strictly regulated on an international level. When assessing the potential barriers for system integration it is important to highlight the ambivalent situation with regard to the qualification of carbon dioxide as a waste product from electricity production and industrial activities, and, if so, the injection of carbon dioxide into sub-sea reservoirs would qualify as dumping.
The London Protocol lists carbon dioxide as a substance that can be considered for dumping at sea.[51] Carbon dioxide was however only added to the list after the Protocol was amended in 2006 and only refers to carbon dioxide streams from carbon dioxide capture processes for sequestration. These streams can only be dumped under three conditions: 1) disposal is into a sub-seabed geological formation, 2) the carbon dioxide streams consist overwhelmingly of carbon dioxide; they may contain incidental associated substances derived from the source material and the capture and sequestration processes used, and 3) no wastes or other matter are added for the purpose of disposing of those wastes or other matter.[52]
A similar approach applies with regard to the OSPAR Convention. This Convention also allows for the sub-sea storage of carbon dioxide. Such storage is permitted 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.[53]
On the issue of dumping, it can thus be concluded that neither the London Protocol nor the OSPAR Convention provides an impediment to the re-use of offshore reservoirs for the permanent storage of carbon dioxide. This may differ, if the carbon dioxide is stored in sub-sea reservoirs in another jurisdiction. Article 6 of the London Protocol prohibits the export of wastes for dumping. This provision has been amended to facilitate such export of waste if the concerned States have agreed to such export. However, this amendment has not yet reached the required number of ratifications as a result of which States may not yet permanently store carbon dioxide outside their national boundaries.

Conclusion

In short, UNCLOS provides for four different maritime zones. Coastal states have the right to regulate oil and gas exploration in three of them, i.e. the territorial sea, the EEZ and the continental shelf. Pertaining to wind energy production, offshore CCS and offshore P2G, coastal states only have jurisdiction when the activities are located on the territorial sea or in the EEZ. In the exercise of their rights, coastal states should however always have due regard of other obligations under international law, such as those that serve the rights and

[50] OSPAR Decision 98/3, art. 1.
[51] London Protocol, Annex I.
[52] Ibidem.
[53] OSPAR Convention, Annex II, article 3.

freedoms of third states. Pertaining to decommissioning, a reading of UNCLOS, the IMO Guidelines and the OSPAR Convention makes clear that in principle all platforms on the DCS will have to be removed once they become disused. The term disused under these legal instruments, however, seems to leave room for the repurposing of platforms. Wind turbines will also have to be removed in accordance with the UNCLOS. For pipelines and cables no international removal obligation exists, as long as they do not hamper the freedom of navigation.

3 The Offshore Legal Regime on the Dutch North Sea

In the Netherlands, energy activities, both onshore and offshore, are covered by a patchwork of legal instruments. This chapter will analyze the regulatory framework for offshore spatial planning, offshore exploration, production and storage activities in the subsoil, offshore electricity production and transport and offshore hydrogen production.

3.1 Streamlining multifunctional spatial use

As already highlighted in the introduction, the North Sea is one of the busiest and most intensively used maritime areas in the world. Given the limited space of the Dutch part of the North Sea and the multiple uses, such as hydrocarbons production, wind energy production, shipping, national defence and environmental protection, taking place on the North Sea, some guidance by the government on the allowed and desirable development of these uses and their spatial implications is necessary.

3.1.1 Spatial planning

Onshore and offshore, spatial planning is regulated by the Spatial Planning Act (*Wet ruimtelijke ordening*).[54] This Act provides the government with two instruments to steer spatial developments on the North Sea. The first instrument is the so-called national governmental spatial zoning plan (*rijksbestemmingsplan*) that can be adopted for the North Sea.[55] Through such zoning plan, the national government may allocate spatial uses to the different zones of the North Sea and as such provide a detailed plan on the allowed uses of every part of the North Sea. So far however, the national government has not made use of the possibility to draft such a plan.

The second instrument for spatial planning found in the Spatial Planning Act is the structure vision. The Act provides the government with the possibility to draft a structure vision for the North Sea describing the main aspects of the spatial development in this area.[56] This structure vision in practice takes the form of the national water plan, which is developed in accordance with the Water Act (*Waterwet*).

3.1.2 National water plan

The national water plan is a document that outlines the national water policy, including the spatial aspects of the different uses of national water bodies.[57] Given its prominence among all national water bodies, the policies and preferred developments with regard to the North Sea are described in a special North Sea policy annex to the national water plan. The spatial aspects of the National Water Plans drafted pursuant to the Water Act are a structure vision within the meaning of the Spatial Planning Act.[58]

Pertaining to the offshore energy industry, the North Sea policy annex gives clear guidance on the government's vision on the different offshore energy activities, such as hydrocarbons production, wind energy production, carbon storage and the situation of pipelines and cables. The document outlines the visions and challenges of these activities and the policy of the government pertaining to the offshore application of those activities. These policy statements found in the North Sea annex tend to be rather short

[54] Spatial Planning Act, article 1.1 (2)(a).
[55] Idem, art. 10.3.
[56] Idem, art. 2.3 (1).
[57] Water Act, article 4.1 (1).
[58] Ibidem.

and general. In the 2016-2021 National Water Plan, it is for example stated with regard to carbon dioxide storage that this is an activity of national importance and that there should be sufficient space for this activity on the North Sea.[59] For carbon dioxide storage, as for hydrocarbons production, the government has thus decided to take a more passive role in the spatial allocation of these functions by waiting for market parties to make their interest known in the execution of one of these activities in a particular area. Only after market parties have made their interest known, the government will make an assessment of whether it will allow the execution of that activity in a particular area.

With regard to wind energy however, the national government has taken a more active role in directing the spatial use and locations necessary of this specific energy activity. In the 2009-2015 National Water Plan and the 2014 revision of this National Water Plan, the government has assigned four areas for offshore wind energy production: Borselle and IJmuiden Ver (National Water Plan 2009-2015) and Hollandse Kust/ Dutch Coast and North of the Wadden Islands (2014 Review).[60] Only within these assigned areas, the production of electricity from wind is possible.[61]

3.2 Exploration, production and storage activities

As already highlighted in the introduction, the exploration and production of hydrocarbons are two of the most prominent energy activities taking place on the North Sea. In addition, subsoil reservoirs can also play a role in the energy system as storage locations for substances such as natural gas or carbon dioxide. Since 2003, the exploration and production of hydrocarbons and the usage of subsoil reservoirs for storage is regulated by the Mining Act (*Mijnbouwwet*). It implements the European Union's Hydrocarbons Licensing Directive (94/22/EC) that provides rules to assure that the licenses for the exploration and production of hydrocarbons are allocated in a fair and transparent way and the European Union's Directive on the geological storage of carbon dioxide (2009/31/EC), which provides rules on the transport and permanent storage of carbon dioxide.

The Mining Act applies onshore, in the territorial sea and on the continental shelf and governs all minerals, including hydrocarbons located at a depth of at least 100 meters.[62] The Act is supplemented by a Royal Decree (*Mijnbouwbesluit*) and a Ministerial Decree (*Mijnbouwregeling*) that both provide further rules on exploration, production and storage activities in the underground. The Act contains at least five sets of provisions that are of pivotal importance to offshore energy activities and system integration. Those provisions pertain to the licensing of the exploration and production of hydrocarbons, the licensing of subsoil storage, the regulation of carbon dioxide storage sites and the rules pertaining to the construction and decommissioning of offshore infrastructures. Procedurally, the Ministry of Economic Affairs and Climate is responsible for the implementation and enforcement of the provisions of the Act. The State Supervision of the Mines is the central authority when it comes to supervising the environmental and safety aspects of the activities.

[59] National Water Plan 2016-2021 (NWP2), North Sea Annex, p. 48.
[60] See National Water Plan 2009-2015 (NWP1) and the 2014 Review of National Water Plan 2009-2015.
[61] The further operationalization of wind energy takes place under the Wind Energy at Sea Act that is analyzed in section 3.3.
[62] Mining Act, articles 2 (1) and 2 (2).

3.2.1 Exploration and production license

Both the exploration and production of hydrocarbons are only allowed when holding a license for these activities.[63] Although the term hydrocarbons is not defined by the Mining Act, the chemical definition of a hydrocarbon is an organic compound consisting of hydrogen and carbon. Practically, this means crude oil or natural gas, but excludes the production of pure hydrogen from the orbit of the Act.

Exploration and production licenses are exclusive in the sense that only one exploration or one production license can be awarded for a specific area.[64] The award of both licenses is competitive and follows an open-door system. This means that when a natural or legal person or a consortium of multiple natural or legal persons applies for a license in a particular area, the Minister of Economic Affairs and Climate invites other parties to submit a competitive application.[65] When an exploration license has been awarded for a particular area and the holder or holders of that license find an economically exploitable quantity of hydrocarbons, they can however apply for a production license without competition.[66] The Minister will decide on the award of a license within a period of six months after the end of the application period.[67] A limited list of refusal grounds and criteria for the assessment of competitive bids can be found in Article 9 of the Act. The most prominent of these include the technical and financial capacities of the applicant, the proposed extraction techniques by the applicant, the conduct of the applicant under any previous licenses held, the management of resources and negative effects for the environment.

The awarded license will specify the minerals and the area to which it applies, as well as the duration of its validity.[68] Although the Minister can modify the license under any of the conditions specified in Article 18 of the Act, it is impossible to modify the license in such a way that it will cover other activities or minerals.[69] The holder of a license can only transfer the license to another (natural or legal) person after approval of the Minister.[70] The Minister also has the right to revoke entirely or partially the license when the license is, for example, no longer needed for the execution of the activity for which it has been awarded.[71] When the license is held by a consortium of multiple parties, the horizontal legal relations between the various parties holding the license is regulated by a joint operating agreement. This agreement inter alia regulates the distribution of revenue and liability within the exploration and production venture. When multiple parties hold the license, they will appoint an operator for the project and will allocate the responsibility of the execution of the exploration and production to that party. It is moreover important to take into consideration that EBN, as the state participant, holds between a 40 and 50 percent share in every oil and gas production activity.

The production of hydrocarbons takes place in accordance with a production plan.[72] This plan needs to be approved by the Minister,[73] and at a minimum describes the location of the production, the mining works involved, being all works necessary for the production of the minerals, the production techniques, the risks of earth movements and the minerals involved in production.[74] Moreover, the operator is also held to issue a so-called work plan which has to be renewed only a yearly basis.[75] The work plan contains, amongst others,

[63] Idem, art. 6 (1)(a-b).
[64] Idem, art. 7.
[65] Idem, art. 15 (1-3).
[66] Idem, art. 15 (4).
[67] Idem, art. 17.
[68] Idem, art. 11.
[69] Idem, art. 18 (2).
[70] Idem, art. 20 (1).
[71] Idem, art. 21 (1)(b).
[72] Idem, art. 34 (1).
[73] Idem, art. 34 (3)
[74] Mining Decree, article 24.
[75] Idem, art. 4.

an overview of all mining activities foreseen for the next five years, descriptions of any construction activities such as drilling boreholes, changing mining works and constructing pipelines, an overview of the organization and the persons responsible for the various mining activities, maps and a time pad with all activities.[76]

To ensure the health and safety of the staff located on offshore hydrocarbons production sites, the operator or the license holder is required to prepare per platform a safety case report.[77] This report presents the company's policy for preventing heavy accidents, a document describing the safety and environmental control systems available on the platform and a regulation for independent verification of the uses of the platform.[78] The report moreover entails a security and health document in accordance with the Dutch Royal Decree on Working Conditions and an internal emergency plan.[79] In case of essential changes of the installation, the report needs to be updated.[80]

3.2.2 Storage license

Mirroring the exploration and production licensing system, the storage of substances is prohibited without a license.[81] Although the term 'substances' is not defined, it at a minimum includes oil, natural gas and carbon dioxide.[82] A storage license is exclusive in that it cannot be awarded for any area for which already an exploration, production or storage license is being held by another party.[83] Like the exploration and production licensing system, storage licenses are in principle also awarded on a competitive basis, whereby after an initial application has been made by one party, the Minister invites other parties to submit competitive applications for that area.[84] The major exception to this rule is however that, given the exclusive nature of the license, a storage license cannot be awarded for an area for which at the moment that the license would come into force a exploration, production or storage license is held by another actor.[85] This in principle limits, the competitive procedure to situations in which the exploration, production or storage license for a particular area has lapsed or is revoked at the moment that the new storage license would enter into force.

The Minister can refuse to award a license on the limited grounds found in article 27 of the Act, which to a significant extent mirror the grounds found in Article 9 regarding the exploration and production license. When the Minister decides to award a storage license, the license will specify the substances to be stored, area of storage, the time frame of storage and whether storage is temporary or permanent.[86] As with production, storage has to be executed in accordance with a storage plan and a work plan.[87] The operator or license holder is not obliged to have in place a report on the large dangers, but should have in place an emergency plan.[88]

---

[76] Ministerial Mining Decree, article 1.11.1.
[77] Mining Act, article 45b.
[78] Idem, art. 45c.
[79] Mining Decree, article 84b.
[80] Idem, art. 45e.
[81] Mining Act, article 25 (1).
[82] As will be highlighted in section 3.1.3., the permanent storage of carbon dioxide is governed by additional requirements.
[83] Mining Act, art. 26 (1-2).
[84] Idem, art. 26b (1-3).
[85] Idem, art. 26b (4)(b).
[86] Mining Act, article 28.
[87] Idem, art. 39 (1) and 34 (1).
[88] Mining Decree, article 85 (1).

3.2.3 Carbon dioxide storage

One specific category of storage that is covered by additional regulation is the permanent storage of carbon dioxide.[89] In respect of carbon dioxide storage, two licenses exist: a license for the exploration of carbon dioxide storage sites and a license for the permanent storage of carbon dioxide. Per area, only one carbon dioxide storage site exploration license can be awarded.[90] Moreover, such an exploration license cannot be awarded for any areas to which a storage license applies on the date that the exploration license would enter into force, independent on who holds the storage license.[91] It is however possible to be awarded an exploration license for carbon dioxide storage sites for an area in which another actor holds a hydrocarbons exploration or production license.[92] The award of the exploration license is competitive in nature, with the Minister calling for alternative bids once a first bid has been made.[93] An important implication of this is that the holder of an hydrocarbons exploration or production license does not have a privileged position in obtaining the carbon dioxide storage sites exploration license. Even more surprisingly, given the possibility for awarding the exploration license for areas where also a hydrocarbons exploration or production license is in place, two different actors may hold licenses for two different activities at the same time for the same area. The Minister has acknowledged this odd situation, but does not see any risks in it.[94]

In addition to an exploration license, there is also a license for permanent storage of carbon dioxide. This license is also exclusive in that only one storage license can be held for a particular area, independent whether it is a license for storing carbon dioxide or another substance.[95] Like the exploration license, the carbon dioxide storage license can also be combined with an exploration or production license for hydrocarbons. The award procedure for the carbon dioxide storage license is like the other licenses competitive in nature, except when the holder of an exploration license for carbon dioxide storage sites applies for the permanent storage license.[96] Once again, this means that the holder of a hydrocarbons (exploration or production) license does not hold a privileged position and will not automatically rewarded the storage license. In the same vein as above, the holder of the hydrocarbons license may be confronted with another party obtaining a carbon dioxide storage license for the area for which it holds the exploration or production license for hydrocarbons. The carbon dioxide storage licensing procedure has the same refusal grounds as the procedure for a 'normal' storage license, with some addition grounds. The most important of these are the risks of carbon dioxide leakage and the risk of significant health and environmental effects.[97]

In case of permanent storage of carbon dioxide, the license will also contain a more elaborate list of topics, including the need to provide information on the quantity and quality of the carbon dioxide, rules relating to risk management, monitoring, closure and corrective measures and, last but not least, the need to provide financial securities.[98] The holder of the carbon dioxide storage license is obliged to keep a registry with the delivered, stored and leaked quantities of carbon dioxide and to inform the Minister on a yearly basis about the monitoring outcomes.[99]

Although the carbon dioxide can be transported to the storage site by various transport means, the Directive (and thus the Dutch Mining Act) focuses on transport via pipelines. The Mining Act provides some rules,

[89] In the Netherlands, we have a moratorium on carbon dioxide storage on land.
[90] Mining Act, article 26 (6).
[91] Ibidem.
[92] Idem, art. 26 (7).
[93] Idem, art. 26b.
[94] See also: Kamerstukken II, 34 348 nr 20, p.7-8.
[95] Mining Act, article 26 (6).
[96] Idem, art. 26b (4)(d).
[97] Idem, art. 27 (3).
[98] Idem, art. 31d.
[99] Idem, art. 31f and 31g.

which apply equally to the carbon dioxide storage site and the pipeline system. During the operation of the carbon dioxide storage site, the holder of the storage license and the entity exploiting the carbon dioxide transport network are held to provide third parties fair, transparent and non-discriminatory access. Moreover, the holder of the storage license and the operator of the transport network are furthermore in need of an emissions permit in accordance with the Royal Decree on trade in emission rights (*Besluit handel in emissierechten*).[100] This emissions permit is needed in case of a leakage so that the operator of a carbon dioxide storage site or a pipeline for the transport of carbon dioxide for permanent storage will be able to surrender emission allowances when leakages occur.

Once the injection of carbon dioxide is completed in accordance with the license, the license holder is obliged to permanently close the storage site and remove the injection facilities.[101] The license holder can transfer the responsibility to the State (and thus be 'relieved' of his license) if the carbon dioxide is permanently stored, the storage site is permanently closed, the injection facilities have been removed, and a period of approximately 20 years has passed since the permanent closure of the storage site and when the license holder provides a financial contribution sufficient to cover the monitoring costs for at least 30 years.[102] After the cancellation of the license in accordance with the previously mentioned provision, the Minister will become responsible for monitoring and any corrective measures.

3.2.4 Construction of infrastructures

The system of the Mining Act is such that the award of a license gives the license holder the right to use the soil and the subsoil for the purpose of the activity for which the license was awarded. In the case of a production license this, for example, translates into a right to place infrastructures for the production of a particular resource. These infrastructures can however not be placed randomly or at will of the license holder. The construction of infrastructures requires a number of other (environmental and planning) permits, as well as obtaining approvals and coordination with the Ministry of Economic Affairs and Climate and the State Supervision of the Mines.

A first important observation in this respect is that the Mining Act distinguishes between different types of infrastructures. First, it distinguishes between mining works and mining installations. A mining work is a broad term as it refers to a work designed for 1) the exploration and production of resources and geothermal energy, 2) the storage of substances or 3) works connected to works for the previous two purposes.[103] The term 'mining installation' refers to a specific mining work, i.e. a mining work that is permanently fixed or present above the soil of a surface water.[104] Secondly, the Mining Act treats pipelines as a separate piece of infrastructure. A pipeline is defined as a line that connects two or more mining works or a mining work with another work for the purpose of transporting substances.[105] This means that only some pipes (intra field pipelines) are not to be considered as a pipeline and fall within the scope of a mining work.[106] Hence, pipelines are seen as separate objects with a separate legal status. The same applies to cables, although a cable is only defined as in the Mining Decree as a line in the territorial sea or on the continental shelf between two or more mining installations or between a mining installation and another work for the purpose

[100] Royal decree on trade in emission rights, annex 1.
[101] Mining Act, article 31i.
[102] Idem, art. 31j.
[103] Idem, art. 1 (n).
[104] Idem, art. 1 (o).
[105] Idem, art. 1 (ag) and Mining Decree, article 92 (a).
[106] Mining Decree, article 2; see also Staatsblad 604 (2002), p. 81, where it is explicitly stated that the compressors used for transport are mining works.

of transporting electricity or electronic signals.[107] Mining installations and infrastructure like pipelines and cables are thus subject to a separate regime governing their construction and operation.

3.2.4.1 Construction of mining installations

For mining works in general, a licensee is obliged to obtain an environmental permit. Without such a permit, the construction of a mining work is prohibited.[108] The permit can only be refused on grounds pertaining to the protection of the environment and nature and may contain restrictions with the aim of protecting nature or the environment.[109] On the basis of the Environmental Management Act (*Wet milieubeheer*) and the Royal Decree on environmental impact assessments (*Besluit milieueffectrapportage*), an environmental permit can only be awarded for oil and gas production activities and carbon dioxide storage sites after an environmental impact assessment (EIA) has been conducted.[110] For offshore mining installations the situation is slightly different as the Environmental Management Act does not apply offshore and rules governing environmental protection offshore have therefore been included in the Mining Act.[111]
In addition, Ministerial approval is needed before a platform for production or storage purposes can be put in place.[112] This approval will be granted if the platforms adhere to a set of technical standards and norms.[113] Moreover, two days before the start of production or storage operations, the operator or license holder is obliged to provide to the State Supervision of the Mines a statement by an independent expert that the technical integrity of the installation is guaranteed.[114] In the case that both a hydrocarbons production license and the permanent carbon dioxide license have been awarded for the same area as described in the above section, both license holders as an additional step have to come to a joint agreement on the concurrent execution of both exploration and storage activities.[115]

3.2.4.2 Construction of pipelines and cables

Although the Mining Act does not provide for a specific license, a special regime for the construction of pipelines has been included in the Mining Decree. Article 94 of this Decree stipulates that pipelines and cables can only be constructed within the territorial sea or on the continental shelf after a permit for their construction has been issued.[116] The permit conditions can be respectively found in Articles 93 and 105 for pipelines and cables.[117] These conditions primarily pertain to the technical integrity of the infrastructure, the risk of damages stemming from the pipelines and cables, and the maintenance of the pipelines and cables.[118] Depending on the diameter of the pipeline, an EIA may be necessary before a construction permit on the basis of the Mining Decree can be awarded.[119]

---

[107] Idem, art. 92 (b).
[108] Idem, art. 40 (2).
[109] Mining Act, article 40 (3-4).
[110] Royal Decree on environmental impact assessments, annex under C.
[111] Mining Act, article 40
[112] Mining Decree, articles 55 (1) and 55 (8).
[113] Idem, art. 55 (2).
[114] Idem, art. 53a.
[115] Mining Act, article 42 (3).
[116] Mining Decree, article 94 (1).
[117] Idem, art. 93 and 105.
[118] Ibidem.
[119] Royal Decree on environmental impact assessments, annex under C.

Regarding the operation of the pipelines or cables, the Decree stipulates that pipelines and cables can only be taken into use subject to the Minister's approval.[120] The operator of the pipeline or cable or moreover held to periodically check the pipeline or cable with regard to the aspects found in Articles 93 respectively 105 as identified above.[121]

3.2.4.3 Using offshore gas pipelines

Whereas the Mining Act regulates the safety and the environmental aspects of offshore gas pipelines, it is the Gas Act (*Gaswet*) that provides the economic rules on the usage of offshore pipelines. The Gas Act distinguishes between two types gas networks, i.e. production networks and transport networks. The former denotes (i) pipelines that are part of an oil or gas production project or (ii) pipelines that connect a gas production project with a treatment facility, a storage facility or a landing facility whereas the later denotes the pipelines that used for the transport of gas, but that are not part of a gas production network.[122] The pipelines located on the continental shelf are in practice all gas production networks.

The distinction between both types of networks is relevant, since it provides for two different regulatory which differ substantially. Unlike transport networks, production networks are not subject to the provisions in the Gas Act governing unbundling, third party access and tariff regulation. In short, this means that the operator of a production network does not have to be independent from entities engaging in either gas production or supply, rules governing regulated third party access do not apply and the Authority for Consumers and Markets is not involved in setting regulated tariffs. Practically, this means that access to offshore production networks is based on negotiations with the network operator and that it is up to the network operator to set the tariffs for the use of its network. The Gas Act does, however, limits the freedom of gas production network operators to determine their own access conditions and network tariffs as the Competition Act (*Mededingingswet)* also applies to the continental shelf.[123] Consequently, a gas production network operator can be disciplined by the Competition Authority when it abuses its dominant position vis-à-vis entities requesting access to its network.

3.2.5 Removal of infrastructures

3.2.5.1 Removal of mining installations

As noted in the previous chapter, the international law of the sea provides clear guidance on the fact that disused infrastructures should in principle be removed. In Dutch law, an obligation to remove disused mining installations can be found in Article 44 of the Mining Act.[124] Although the term *disused* is not defined in the Act, the explanatory memorandum to the Mining Act clearly states that Article 44 has as its primary aim to assure that platforms which are no longer used for the exploration or production of minerals or the storage of substances will be removed.[125] When a platform is thus no longer used for an activity falling within the working sphere of the Mining Act, it should be removed.

This obligation rests with the license holder or the operator in case of a joint venture. When the license has already expired (or earlier if the activities have terminated), the last license holder or operator is responsible

[120] Mining Decree, articles 97 and 106.
[121] Idem, art. 99 and 106.
[122] Gas Act, article 1 (1).
[123] Idem, art. 17.
[124] Mining Act, article 44 (1).
[125] Kamerstukken II 26219 nr. 3, p. 26.

for the execution of the removal obligation. To ensure that the costs of removal will be borne by the licensee or the operator, the Minister can request a financial guarantee.[126] It is up to the Minister to decide the moment at which the guarantee should be issued, the amount of guarantee, the kind of guarantee and the term for which the guarantee should be provided.[127] To date the Minister has however not yet made use of this provision.

The Minister can determine a time frame within which the installation has to be removed.[128] According to the explanatory memorandum of the Act, this provision has been included to provide the Minister with a measure to oblige parties to fulfill their removal obligations, but also to allow a postponement of the decommissioning. The memorandum does give one example of a condition under which postponement may be an option, i.e. when a platform does not have function anymore in the production of hydrocarbons, but still has a role in the transport system.[129]

The removal of a mining installation occurs in accordance with a removal plan, which needs to be approved by the Minister.[130] Unlike onshore, where the closure plans for disused mining works need to be submitted to the Minister within 12 months after the end of production, there is no explicit deadline for submitting the removal plans for offshore mining installations.[131] The removal plan at a minimum describes the method of removal, the method of proving that the entire installation and its debris have been removed, the method of transport of the installation and the debris, the final destination of the installation and the debris, any waste present on mining installation and its destination and a time pad for the execution of these tasks.[132]

3.2.5.2 Removal of pipelines and cables

With regard to cables and pipelines, the Minister has been awarded the discretion to decide whether these assets need to be removed after disuse.[133] Article 104 of the Royal Mining Decree stipulates that any pipelines will in principle be cleanly and safely left behind, unless the Minister decides otherwise.[134] In accordance with Article 106, the same standard applies to cables permitted under the Mining Act.[135]

3.3 Electricity Production and Transport at Sea

In addition to the exploration, production and storage activities covered by the Mining Act, electricity production and transport are becoming more and more important in the North Sea. Interestingly, the production and transport of electricity are covered by two separate Acts. Whereas electricity production in the North Sea is primarily regulated by the Wind Energy at Sea Act (*Wet windenergie op zee*), the Electricity Act (*Elektriciteitswet*) regulates the offshore transport of electricity.

---

[126] Mining Act, article 47 (1).
[127] Mining Act, art. 47 (2) jo. 46 (3).
[128] Idem, art. 44 (3).
[129] Kamerstukken II, 26 219 nr. 3, p. 27.
[130] Mining Decree, article 60 (1-2).
[131] For onshore mining works the Mining Decree uses the term ‘closure plan’ (*sluitingsplan*) and for offshore installations the Mining Decree uses the term ‘removal plan’ (*verwijderingsplan*).
[132] Idem, art. 61.
[133] Mining Act, article 45 (1).
[134] Mining Decree, article 104.
[135] Idem, art. 106.

3.3.1 Electricity production at sea

The Wind Energy at Sea Act provides the legal framework for the offshore development of wind parks.[136] Wind parks within the meaning of the Act includes the facilities necessary to produce electricity from wind energy, the connections between these facilities, and the connection of these facilities to a connection to the network.[137] The Act provides the Minister of Economic Affairs and Climate with the necessary instruments to transform the designated wind energy areas from the national water plan into areas where also in practice electricity is produced by wind parks. These instruments are the plot decision and the wind energy at sea permit.

3.3.1.1 Plot Decision

Since the wind energy areas identified in the national water plan are of significant size, the government has considered it necessary to subdivide these areas into smaller plots. In determining which parts of the identified locations will be turned into separate plots, the Minister of Economic Affairs and Climate takes into account the other uses of the sea as well as the costs and possibilities of creating a wind energy project in the subparts of the identified areas.[138] When the Minister is of the opinion that a particular area should be turned into a wind energy plot, he takes a plot decision which contains information on the physical characteristics of the plot, the measures taken to limit the environmental impact of the wind park, a time frame for the future wind energy permit and the rights of third parties pertaining to the plot.[139] In addition to delimitating plots, the plot decision also specifies the location of the cables connecting the wind park to the network.[140]

3.3.1.2 Wind energy at sea permit

For each available plot, the Minister may organise a tender in order to award an exclusive permit for the construction and operation of a wind park.[141] Without such a permit both the construction and operation of a wind park are prohibited. The permit cannot be awarded for any area outside a plot or for a plot for which a permit has already been awarded.[142] These tenders are announced through the issuing of a separate Ministerial Decree and are competitive in nature and can follow two procedures: one for project developers who do not require a subsidy for the construction and operation of the wind park and one procedure for project developers that do need subsidy.
Independent of which of the procedures is followed, all applications are pursuant to Article 14 of the Act always assessed on the basis of the applicant's technical and financial capability, i.e. whether the applications provide sufficient ground to assume that the construction and operation of the wind park is technically, financially and economically achievable.[143] Both procedures require that the application describes the design of the wind park, the time scheme for construction and exploitation, presents an estimation of the costs and benefits of the park, an inventory and an analysis of risks, a description of the measures taken to assure cost efficiency and an overview of all parties involved in the construction and

[136] Unlike the Mining Act, the Wind Energy at Sea Act is not explicitly based on any European regulation.
[137] Wind Energy at Sea Act, article 1.
[138] Idem, art. 3 (3).
[139] Idem, art. 4.
[140] Idem, art. 3 (2).
[141] Idem, art. 12, 14.
[142] Idem, art. 13.
[143] Idem, art. 14.

exploitation of the wind park, including a description of the expertise and experience of the different parties involved.[144] When more than one applicant has submitted a plan that provides sufficient ground to assume that it is achievable, the Minister will rank the different applicants on the basis of the expertise and experience of the parties involved, the quality of the design of the wind park, the capacity of the wind park, the societal costs of the park, the quality of the risk inventory and analysis and the quality of the proposed measures to assure cost efficiency.[145] In the most recent standard wind park tender in 2018, this procedure was followed and a permit for two plots was awarded to Chinook C.V., a subsidiary of Vattenfall, without subsidy.

Previously however, also permitting procedures with subsidy have been organised. Under this procedure the subsidy procedure and a permitting procedure are simultaneously executed. The permit is awarded to the applicant that meets the requirements found in Article 14 of the Act and that obtains the subsidy. The subsidy is awarded under the Royal Decree governing renewable energy production (*Besluit stimulering duurzame energieproductie*). Pursuant to Article 2 of this Decree a special Ministerial Decree will be issued with a call for subsidy applications pertaining to the concerned plot. The applicant with the lowest amount of requested subsidy will in practice be awarded the subsidy and consequently, the permit. The subsidy can be awarded for renewable electricity that is fed into an electricity network, such as the offshore electricity network administered by TenneT[146] and for renewable electricity that is fed into an installation and for which a guarantee of origin for non-network delivery has been issued.[147] Under this provision subsidy can also be awarded for electricity fed into an offshore hydrogen production installation.

The awarded wind park permit, independent of the procedure under which it has been awarded, will specify its validity, the plot to which it applies and the time frames within which the licensed activities should start.[148] The license will be valid for a maximum of 30 years.[149] As with the hydrocarbons licenses found above, the licenses can be withdrawn or transferred under specific conditions.[150]

In February 2018, the Minster of Economic Affairs and Climate has opened a consultation for an Act amending the Wind Energy at Sea Act.[151] The proposed amendment Act will involve two major revisions of the current regime for offshore wind. First of all, the amending Act will broaden the scope of the Wind Energy at Sea Act from an exclusive focus in producing electricity to the broader production of wind energy, which can be any energy carrier based on the conversion of wind energy.[152] The explanatory memorandum explicitly refers to ammonia and hydrogen as possible energy carriers.[153] To facilitate the production of alternative carriers, the amendment Act also replaces the concept of a network connection with the concept of a connection point. Whereas at the moment a network connection only refers to the possibility to connect a wind park to a network, the concept will be broadened as a result of which a connection can connect a wind park to a network or to an installation.[154] The explanatory memorandum gives three examples of such connection point:

1. The connection of an electricity cable to a hydrogen factory (on shore or offshore);
2. The connection of a hydrogen pipeline to an installation where the hydrogen is distributed over various means of transport (such as pipelines, ships or trucks);

---

[144] Idem, art. 23 (2).
[145] Idem, art. 24 (1-2).
[146] Royal Decree governing renewable energy production, article 15 (1).
[147] Idem, art. 15 (6).
[148] Idem, art. 15 (1).
[149] Idem, art. 15 (2).
[150] Idem, art. 16 and 17.
[151] Act amending the Wind Energy at Sea Act (supporting the targets for wind energy at sea).
[152] Amending Act, article 1 (A).
[153] Memorandum, page 17-18.
[154] Amending Act, article 1 (A).

3. The connection of a hydrogen pipeline to an installation where electricity is produced from hydrogen.[155]

In addition, the amendment Act will also introduce two new wind permitting procedures. The first new option provides for a procedure with a financial bid. It entails a procedure that all interested actors submit an application, which also includes a financial bid. This financial bid will be one of the criteria of the Minister's assessment. Other criteria include an assessment of the prospect that the wind park will be realised and the contribution of the proposed wind park to the energy supply. A second new option is the possibility of an auctioning of the licence in which the Minister awards the license to the highest bidder.[156]

3.3.2 Electricity transport at sea

The Electricity Act is the Act governing, inter alia, the transport of electricity. The Electricity Act implements the European Electricity Market Directive (Directives 1996/92/EC, 2003/54/EC and 2009/72/EC) that provides rules on, inter alia, the conditions for third-party access to electricity networks and the ownership of electricity networks. In the Netherlands, the Electricity Act also regulates the offshore transport of electricity from wind parks to the onshore grid.

Prior to an amendment of the Electricity Act in 2016, wind energy project developers were themselves responsible for transporting their electricity onshore. In this situation, every project developer constructed its own electricity cable between the wind park and the onshore grid. These cables were permitted on the basis of the Water Act or the Public Works and Water Management Act and were operated by the wind park developers themselves. Given the lack of offshore wind energy projects, the Electricity Act was amended and Article 15a was added to the Act. This article mandated the construction and operation of an offshore network for the transport of offshore produced electricity from wind parks to shore. This article has been introduced by the legislator to promote the cost-efficient deployment of offshore wind and to assure the efficient transport of this energy to shore.

According to the amended Act, the offshore network encompasses the transport network that transports the electricity produced by one or more wind parks to the onshore network.[157] This network also encompasses the substations of the wind parks. The cables for electricity transport between wind parks and the onshore grid that have been permitted before 2016 under the Water Act or the Public Works and Water Management Act fall outside the scope of the offshore network.[158] The offshore network has its own network operator, TenneT, that has been appointed as such by the Minister of Economic Affairs and Climate.

To assure a smooth development of the offshore network, article 16e of the Act stipulates that the Minister of Economic Affairs and Climate will draft a development framework for wind energy at sea stating, inter alia, the location of the foreseen wind parks, the foreseen starting dates of production for these wind parks, the capacity of these wind parks and the foreseen delivery dates of parts of the offshore network.[159] TenneT is obliged to follow this development framework and to assure the timely realisation of the offshore network. In case TenneT does not deliver the offshore network in time or is insufficiently capable of transport all electricity of the wind parks, project developers are entitled to compensation.[160] TenneT operates under the scrutiny of the Authority for Consumers and Markets that also regulates the income of TenneT as the offshore network operator.[161] This income is provided to TenneT in the form of a subsidy by the Minster.[162]

---

[155] Memorandum, page 17-18
[156] Amending Act, article 1 (U).
[157] Electricity Act, articles 1 (1)(ba) and 15a (1).
[158] Idem, art. 15a.
[159] Idem, art. 16e.
[160] Idem, art. 16f.
[161] Idem, art. 42a-42e.

3.4 Hydrogen production and transport at sea

Unlike the exploration and production of oil and gas (and the potential for carbon dioxide storage) and the production and transport of electricity, hydrogen production is a new activity that is not yet taking place on the Dutch North Sea. Although there is no specific legal regime in place governing offshore hydrogen production and transport, other permits may be used as a basis for such developments.

3.4.1 Water permit

The most important Act for the construction of offshore hydrogen production installations is the Water Act. As already highlighted above, the Water Act plays an important role in offshore spatial planning. In principle, the Water Act provides a general framework for the regulation of all activities taking place in water systems to the extent that they are not partially or entirely regulated by specific sectoral legislation, such as the Mining Act.[163] The Water Act has three primary aims, i.e. the prevention of flooding and water scarcity, assuring and improving the chemical and ecological quality of water systems and assuring the execution of societal functions of the water systems.[164] The Ministry of Infrastructure and Environment and its oversight body *Rijkswaterstaat* are the prime bodies responsible for the execution and enforcement of the provisions of the Water Act.

On the basis of Article 6.5 of the Water Act it is prohibited to establish or leave in place installations or structures or to lay or leave in place cables or pipelines within a maritime area, such as the North Sea, without a permit to that end from the Minister of Infrastructure and the Environment.[165] This prohibition does, however, not apply to installations, structures, cables and pipelines covered by the Mining Act and to wind parks permitted under the Wind Energy at Sea Act. Since hydrogen production platforms and pipelines fall under neither Act, a permit will be required on the basis of Article 6.5 of the Water Act.

The permit awarded under Article 6.5 of the Water Act is also known as the water permit. The award is not competitive and involves an actor requesting the permit for a particular usage of an area of the concerned water body. This request is assessed against the general purposes of the Act and only when the proposed usage is incompatible with these purposes the Minister can refuse the request.[166] These purposes are, as highlighted above, preventing floods and water scarcity, protecting the chemical and biological quality of the water systems and assuring the societal functions of the water system.[167] In accordance with the Ministerial Water Decree (*Waterregeling*), a request for a water permit for the construction of an installation or structure should always include information on the removal of that installation or structure.[168] When awarding the permit, the Minister of Infrastructure and the Environment, can include instructions in the water permit with regard to, inter alia, the compensation and removal of negative effects to the environment when the activity is ceased and the financial security of the permit recipient with regard to fulfilling the instructions.[169] This can

[162] Idem, art. 77g.
[163] Another example of an sectoral act is the Wind Energy at Sea Act discussed above.
[164] Water Act, article 2.1 (1).
[165] Idem, art. 6.5 (c).
[166] Idem, art. 6.21.
[167] Idem, art. 2.1.
[168] Ministerial water decree, article 6.26.
[169] Water Act, article 6.20 (1).

include an instruction in the Water permit with regard to the removal of the physical infrastructures when these will become disused.[170]

3.4.2 Environmental aspects

Onshore, hydrogen production is an activity that is covered by the Environmental Licensing (General Provisions) Act (*Wet algemene bepalingen omgevingsrecht*). Depending on the exact size and environmental effects of a hydrogen production installation, it may be necessary to obtain a so-called environmental permit when constructing and operating an hydrogen production installation.[171] Since the Environmental Licensing Act does not apply to the EEZ and the continental shelf, hydrogen production activities taking place in these areas are not regulated by this Act.

In the same vein, the Environmental Management Act (*Wet milieubeheer*) only has limited applicability in the EEZ. Most importantly, the Environmental Management Act contains provisions governing environmental impact assessments and provisions governing greenhouse gas emissions. Depending on the exact composition and size of the hydrogen production facility and the transport pipeline, the award of a water permit for a production facility or pipeline may only be possible after an EIA has been obtained.[172] Moreover, pertaining to greenhouse gas emissions, the Royal Decree on trade in emission rights provides that installations for the production of hydrogen or synthetic gas by reforming or partial oxidation with a production capacity of more than 15 tonnes per day are in need of an emissions trading permit.[173]

3.4.3 Gas legislation

As noted above, the Gas Act regulates the transport of both natural and synthetic gas on the territory of the Netherlands, the territorial sea, the EEZ and the continental shelf. The scope of the Act depends on the definition in the Act of the term 'gas'. Since 2012, the Act explicitly state that the term gas covers both natural gas and substances, such as biogas, to the extent that these meet a set of specifications concerning production method and the chemical state of the substance when held under a particular temperature and under a particular pressure. One important requirement pertaining to the chemical state is that the substance should mainly consist of methane or another other substance that is equivalent to methane in terms of its characteristics and that can safely be transported in accordance with chapter 2 of the Act. Chapter 2 does not provide any further guidance on the meaning of safe transport, but article 11 of Chapter 2 does provide for a list of requirements that gas should meet before it can be fed into the gas transport network. These requirements are set out in the Ministerial Decree on gas quality (*Regeling gaskwaliteit*). This Decree rules out the transport of pure hydrogen and therefore pure hydrogen transport and delivery seems to be outside the working sphere of the Gas Act. As a consequence of this, the Gas Act does not apply to hydrogen production and the transport of pure hydrogen.

This situation is, however, different when hydrogen is admixed into a natural gas stream. As noted above, the regulation of offshore production networks is limited and no regulation on for example gas quality in these networks is provided. Therefore, each upstream gas pipeline may have its own technical specifications and operators of these pipelines are entitled to refuse access where there is an incompatibility of technical

[170] The Minister has for example used this possibility with regard to the offshore network constructed by TenneT, see for example the Water permit for the offshore network in the Borselle Area, permit RWS2016/28137, instruction 14, p. 10.
[171] Environmental Licensing (General Provisions Act), article 2.1 (1).
[172] Royal Decree on environmental impact assessments, annex under C.
[173] Royal decree on trade in emission rights, annex 1.

specifications which cannot reasonably be overcome.[174] However, as these upstream pipelines are connected to the onshore transportation network, account also needs to be taken to the gas quality standards applying to the onshore grid. Pursuant to the Gas Act, all gas fed into the onshore gas transport network needs to adhere to certain quality standards.[175] These standards can be found in the above mentioned Ministerial Decree on gas quality.

As noted above, the gas fed into the network should primarily consist of methane or equivalent substances. Nonetheless, some room for the injection of hydrogen into the onshore gas network exists. In 2016, the Minister updated the gas quality requirements and provided additional room for the development of hydrogen in the gas network, the Minister has set the maximum content level of hydrogen in the low-calorific gas network at 0,5%.[176] Although this requirement does not apply to the gas transported through the offshore production network, any quantity of gas that is transported from an offshore location to the onshore transmission network will have to be treated in such a way that it meets the criteria upon injection into the onshore network. In practice this means it will either have to be fed into the offshore pipelines in such a way that it meets the onshore criteria or that it will have to be treated onshore prior to injection into the network. This consequently limits the possibilities for admixing offshore produced hydrogen into gas that is transported to the onshore network.

3.4.4 Electricity legislation

Currently, hydrogen is not governed by the Dutch Electricity Act. As mentioned earlier, the Electricity Act is primarily transposing into Dutch law the European Electricity Market Directive. Currently, this Directive is being revised and in European Commission's proposal for the so-called Recast Electricity Directive, hydrogen production is to some extent brought under the header of electricity legislation. The Commission's proposal contains a provision on energy storage, which is defined as "in the electricity system, deferring an amount of the electricity that was generated to the moment of use, either as final energy or converted into another energy carrier"[177] In practice, hydrogen production can be seen as such a form of energy storage. The current proposal by the Commission contains regulation on the ownership of energy storage facilities. The Commission seems to take the view that energy storage is a commercial activity and therefore in principle prohibits transmission system operators and distribution system operators from owning, managing or operating an energy storage facility.[178] As the legislative process pertaining to the Recast Electricity Directive is still ongoing, the precise content of the foreseen regulation of energy storage may however still change. It is however possible, that the regulation of hydrogen production will in the future be developed under the Electricity Act.[179]

3.5 Conclusions

All in all, it can be noted that although a limited number of laws are applicable offshore, they nonetheless provide for a fragmented legal framework under which different aspects of a value chain can be regulated by different acts. From a system integration perspective, we see that offshore energy activities can be clustered

[174] Gas Act, article 34.
[175] Gas Act, article 11.
[176] Ministerial Decree on gas quality, annexes 2 and 4.
[177] Recast E-Directive, commission proposal (COM 864 final/2), article 2 (47).
[178] Idem, art. 36 and 54.
[179] In this sense it is also interesting that the proposed amendment of the Wind Energy at Sea Act also contains references to hydrogen and as such promotes a link between the electricity and the hydrogen energy systems.

in three big groups: subsoil activities, electricity production and transport and hydrogen production and transport. Whereas subsoil activities are all regulated in one act, the regulation for electricity production and transport and hydrogen production and transport is more dispersed.

4 Barriers to offshore system integration

The new offshore energy developments taking place under the header of offshore system integration challenge the fundamentally fragmented legal landscape involving offshore energy activities. This chapter builds on the previous chapter and looks at the misfit between the emerging technological energy options for the North Sea and the current legal framework. The legal issues associated with system integration are grouped into three large categories: re-use of platforms, re-use of pipelines and the constructing and operation of electricity cables.

4.1 Re-using platforms

The re-use of platforms is an issue that plays in two of the foreseen system integration scenarios, i.e. the hydrogen and the CCS scenario. In both cases, a platform that is originally used for the purpose of producing hydrocarbons will cease its original use and will be given a new function in the form of either hydrogen production or carbon dioxide injection. Such a change in function is accompanied by a number of legal challenges.

4.1.1 Licensing

As noted in the previous chapter, the construction and operation of installations and objects in or on a national water body is in principle prohibited unless based on a special permit or license. For hydrocarbons exploration and production and carbon dioxide injection and permanent storage such a license will be issued on the basis of the Mining Act and will take the form of respectively the hydrocarbons exploration and/or production license and the carbon dioxide storage license. For hydrogen the situation is different. Since the production of hydrogen is not covered by the Mining Act or any other sectoral legislation, the construction of an offshore hydrogen installation will have to be permitted on the basis of the Water Act.
From a practical perspective, this creates four possible scenarios.

4.1.1.1 Carbon dioxide storage

The first possibility is that the holders of a hydrocarbons production license want to engage in carbon storage activities once hydrocarbons production has ceased. In such a case, the holders of the production license will have to apply for a license for the permanent storage of carbon dioxide for the particular area for which it holds a production license. As noted in the previous chapter, the award of a carbon dioxide storage license is in principle competitive in nature, which means that it is not an exclusive priority right that the holder of the original hydrocarbons license will also be awarded the permanent carbon dioxide storage license. This involves the theoretical risk that a third party may submit a competitive bid and may obtain the carbon dioxide storage license instead of the hydrocarbons production license holder. In practice however, it will be nearly impossible for a third party to submit a competitive bid without prior surveying and exploration activities for carbon dioxide storage sites given the necessity to include detailed information on the storage sites in the license application.
A more realistic legal risk in this scenario involves the decommissioning obligation for the license holder to remove the installations that will be out of use once the production activities will come to an end. Decommissioning obligations will also apply to the (new) carbon dioxide storage license. The fact that the new storage license will impose decommissioning obligations as well, does not automatically rescind existing decommissioning obligations of the previous production license. The Mining Act does not elaborate the re-use, let alone a procedure to streamline the administrative procedures for transfer and re-use of mining

installations for the purpose of carbon dioxide storage, for instance the withdrawal or fulfilment of any decommissioning obligations under a previous license in the situation that the license area (= the reservoir) will be used for carbon dioxide storage instead of hydrocarbons production. In the absence of any formal streamlined procedure for re-use, the hydrocarbons license holder will have to enter into negotiations with the Ministry on the possibilities to coordinate the decommissioning procedures under the original production license and the award of a new license. From an industry perspective, this creates legal uncertainty for license holders who may want to re-use their platform, amongst others, for carbon dioxide storage. On a positive note, the Minister of Economic Affairs has acknowledged this issue and is planning to come with a proposal to amend the Mining Act to facilitate re-use of platforms.[180]

4.1.1.2 Hydrogen production

A second integration option is that the holders of the hydrocarbons license want to start producing hydrogen once oil or gas production has ceased. As noted in the previous chapter, hydrogen production is not a mining activity and falls outside the scope of the Mining Act and consequently the facility producing hydrogen cannot qualify as a mining installation. This means that the mining license necessary for the construction and operation of the mining installation may need to be replaced by a water permit for the construction or leaving in place of an offshore hydrogen production installation. A potential legal problem in such a situation could be the institutional complexity of coordinating all procedures. As with the first option, no codified legal procedure for re-using platforms exists, which creates a need for coordination between the administrative wrap-up of the hydrocarbon activities and permitting of the new hydrogen activities. This coordination will be more complex than in the carbon dioxide storage scenario, because the license holder will have to interact with two separate legal systems for enforcement and supervision: on the one hand it will have to report to and interact with the Ministry of Economic Affairs and Climate and the State Supervision of the Mines on the issue of decommissioning pursuant to the original mining license and on the other hand it will have to interact with the Ministry of Infrastructure and the Environment and its supervisory body *Rijkswaterstaat* to obtain a new water permit to leave in place the existing platform and to re-use it as a hydrogen installation. Moreover, given the different requirements to qualify for a mining license and the refusal grounds for a hydrocarbons production license and the environmental mining work permit on the one hand and the water permit on the other, it is not an automatism that a water permit will be awarded for keeping in place the platform and starting hydrogen production on the platform.

4.1.1.3 Dual usage

A potential third and fourth option relate to the start of the new activity, which instead of being subsequent also could coincide with the original use. In other words, a third option would be the dual usage of a platform for both hydrocarbons production and carbon dioxide storage and a fourth option would be dual usage for hydrocarbons production and hydrogen production. For both options a primary question pertains of course to the technical feasibility of combining multiple uses on one platform given the space and weight limitations of offshore platforms. Independent from this issue, the legal situation is quite straightforward in situation three. As noted in the previous chapter, it is possible to obtain a carbon storage license for the same area as the area for which one holds a hydrocarbons production license. So from a legal perspective, there is no impediment to the simultaneous execution of both activities within one area. When carbon dioxide injection is however incidental and instrumental in increasing the hydrocarbons output of a reservoir, the so-called enhanced hydrocarbons recovery method, the injected carbon dioxide is seen as a facilitating substance for

[180] Kamerstukken I 2017/18, 30 196, G.

hydrocarbons production and consequently no carbon dioxide storage license is required. When carbon dioxide is injected for both enhanced hydrocarbons recovery and permanent storage, a storage license would be required for that part of the carbon dioxide that will be permanently stored.[181]
With regard to hydrogen production, the situation is less transparent. Hydrogen activities are not regulated under the Mining Act. There is legal uncertainty whether the dual usage of a platform for hydrocarbon production and hydrogen production is allowed and which licenses or permits would be necessary for combining hydrocarbons and hydrogen production. The first option would be to license the platform under the Mining Act. The Mining Act does however not provide any guidance on the usage of mining platforms for other purposes than those connected with the mining activities. From the system of the Mining Act it is clear that when a platform does no longer fulfil a function related to a mining activity, it should be removed. The Mining Act and the explanatory memorandum are however silent on dual usage. A second option would be the Water Act. This Act however clearly provides that it cannot be used to permit any activity falling within the scope of the Mining Act.

4.1.2 Timing

Another issue that plays a role in the re-use of offshore platforms is the adjustment of the time horizons of both the old and the new use of the platform. Problems with regard to timing can exist, when the original mining activity comes to an end and the new activity cannot yet start because certain infrastructures are not yet ready or even when investment decisions are still pending. A misalignment between the time horizons of the old and the new use may be a problem for at least two reasons. First of all, there is the decommissioning obligation that rests on the shoulders of the hydrocarbons production license holders. As noted in the previous chapter, the Mining Act does not explicitly state when the platform should be decommissioned, but it is clear that this should happen within a reasonable timeframe after production activities have ceased. As there is not yet any experience in this field, it is unclear how the Minster would approach such issue and for how long the decommissioning obligation can be postponed and how certain the re-use plans have to be before the minister would be willing to postpone the obligation. If the time gap between the old and new activities will be too significant, the decommissioning rules found in the Mining Act may impede the re-use of the platform.
Secondly, in the time period between the end of the original activity and the start of any new activities, the so-called mothballing period, the platform will have to be maintained and the license holders will remain liable for any damage occurring during the mothballing. These costs and liabilities may provide a limit on the willingness of the license holders to keep in place the platform.
An interesting variation to this topic would be the situation in which an operator wants to remove its platform, but the government wants to keep the platform in place because it considers it a vital asset for the future deployment of carbon storage or hydrogen production. Currently, the regulatory framework does not provide guidance on this topic and subsequently potentially valuable assets might be decommissioned while they could have played a role in any future offshore carbon dioxide or hydrogen networks.

4.1.3 Changes in license holders

A third problem with the re-use of platforms could be that not all of the original license holders may be interested in re-using the platform and taking part in the new activities. In the same vein, other parties with specific knowledge and expertise in the field of, for example, hydrogen production or carbon storage may be interested to step in or take over as license holders for the new activity. This might require changes to the

[181] Kamerstukken I 2009/10, 32 343, no. 3, p. 15.

composition of the joint venture holding the licences (farm-in / farm-out agreements).To achieve such a change and alter the composition of the joint venture holding the license may be a challenge or even provide a barrier to the re-use of platforms.

First, the transfer of license interests requires the prior consent of the Minister. To the extent that new parties would enter or exit under an already existing license, this change is only allowed after approval of the Minister. To be eligible to act as license holder, the new parties will have to fulfil the requirements found in article 9 of the Mining Act. Consequently, the new parties will also have to comply with the requirements of article 9 and have to be technically and financially viable.

Second, changes in the composition of the license holder group may increase the complexity of the decommissioning and licensing procedures. As noted above, the re-use of a platform involves the need to finalise and/or fulfil all obligations with regard to the original activities and making all necessary arrangements to allow for the start of the new use. Since both these activities need to be closely aligned, increasing the number of actors involved in any of both processes significantly increases the complexity of such process.

Further, an important issue in this respect will be the costs of decommissioning the platform at the end of its lifetime. Although several scenarios are possible it should be pointed out that from a legal perspective, it is possible that the entire decommissioning obligation will be included in the new license as the installation under the previous license is not being decommissioned. So, when the hydrocarbons production license is replaced by a carbon dioxide storage license, the decommissioning costs would then automatically fall on the new license holders. This is the case because the decommissioning obligation is enshrined in the Mining Act and not in the license. In the case of a water permit for hydrogen production, such an obligation can be included in the provisions of the permit. This may include provisions with regard to financial security. Please note that any legislation governing this issue could provide for a different regime resulting, for example, in shared decommissioning costs.

Thirdly, pertaining to the horizontal relations between the license holders, the participants of the new joint venture (like the situation in a joint operating agreement used in the oil and gas sector) will have to make the necessary arrangements to adequately distribute the costs and benefits among each other. Once again especially the decommissioning costs may be an important issue that needs to be horizontally settled. This is especially the case when some of the original parties leave the joint venture. A special case in this respect would be if EBN would not be interested in maintaining its share in any future carbon dioxide or hydrogen production activities.

4.2 Re-using pipelines

In addition to re-using platforms, some of the identified system integration scenarios also involve the re-use of offshore pipelines. Both the hydrogen production and carbon dioxide injection scenarios require pipeline capacity to respectively transport the offshore produced hydrogen to shore and to transport the carbon dioxide that is captured onshore to offshore subsoil reservoirs. Depending on the local characteristics of a project, the project developer can choose to re-use existing pipelines that were previously used for hydrocarbons transport or can choose to construct new dedicated pipelines for hydrogen or carbon dioxide transport. Issues that play a role in this choice include the availability of existing pipelines and the technical condition of the existing pipelines. This section will exclusively look at the re-use of pipelines. Constructing new pipelines will follow the procedures outlined in the previous chapter, i.e. the procedure under Article 94 of the Royal Mining Decree for carbon dioxide pipelines and the water permit procedure in case of hydrogen pipelines as found in Article 6.5 of the Water Act. This section will not focus on these situations given the fact that the standard situations have already been discussed in the previous chapter.

4.2.1 Licensing

To assess whether a pipeline can be re-used, it is first of all necessary to examine whether a new license or permit is necessary when the use of a pipeline is changed. This situation differs depending on the fact whether the pipeline in place will be re-used for carbon dioxide or hydrogen transport. In case of the former, the pipeline remains within the working sphere of the Mining Act. As noticed in the previous chapter, Article 94 of the Mining Decree only requires the award of a pipeline permit for the construction of the pipeline and not for the operation of the pipeline. Since both hydrocarbons and carbon dioxide pipelines fall under the concept of a pipeline in the sense of this Decree, it seems that a new permit will not be necessary when a pipeline will be re-used for the transport of another substance as long as the pipeline under its new function remains within the working sphere of the Mining Act and the Mining Decrees. This view is reinforced by the fact that pipeline permits usually not contain any specifications on the type of substances transported through the permitted pipeline.[182] Re-using existing hydrocarbons transport pipelines for the purpose of carbon dioxide transport thus does not require a new pipeline permit. Moreover, the operator is still bound by the obligation to act in accordance with the operational requirements found in the Decree regarding maintenance and regular assessment of the technical integrity of the pipeline as described in the previous chapter.[183] Nevertheless, uncertainty remains as this construction permit is not based on the Mining Act but merely on the Mining Decree. It is therefore unclear whether the permit is limited in time (construction only) and/or whether such permit can or should be transferred to another party if the use of the pipeline changes.
The situation is more complicated when a pipeline will be re-used for a purpose outside the working sphere of the Mining Act. As has been noted above, a platform exclusively used for hydrogen production will not qualify as a mining installation and consequently the pipeline connected to that platform will also no longer qualify as a pipeline within the meaning of the Mining Decree. If a pipeline is re-used for hydrogen transport, it is no longer subject to the rules of the Mining Act and the Mining Decrees and therefore, in principle, will be subject to the Water Act. In accordance with this Act every pipeline that is not regulated under the Mining Act, requires a water permit for its construction and operation. In analogy to the re-use of a hydrocarbons platform for hydrogen production, this situation requires a close coordination between the procedures for ending the function of the pipeline governed by the Mining Act and the re-permitting of the pipeline under the Water Act. Regarding the operations of the pipeline, the Minister of Infrastructure and the Environment can include instructions into the water permit regarding the maintenance and technical integrity of the pipeline with the aim of preventing environmental damage to the water systems.

4.2.2 Pipeline regimes

When it comes to the operations of the different types of pipelines, a difference can be made with regard to the rules pertaining to health, safety and the environment on the one hand and the rules pertaining to the market conduct of the operator on the other hand. The former set of rules is already highlighted in the above section and in the case of pipelines primarily pertains to regular inspections and assessments of the technical integrity of the pipelines. The latter set of rules is, however, more elaborate and relates to issues such as asset ownership and unbundling, third party access to the asset and the regulation of the tariffs and access conditions when making use of the asset. These market rules differ greatly depending on how a particular pipeline is qualified. When a pipeline is seen as a gas production network (= upstream pipeline) pursuant to the Gas Act, access conditions and tariffs have to be negotiated with the pipeline operator and the latter has limited grounds for refusal. If access is not granted, the third party may turn to the Competition

[182] See for example Stcrt. 2018, 24349 or Stcrt. 2017, 57993.
[183] It is plausible that the State Supervision of the Mines will take into consideration the substances transported through a pipeline when enforcing the provisions on technical integrity of the pipeline.

Act in case the operator of the network is abusing its dominant position. When the pipeline is used for carbon dioxide transport, Article 32 of the Mining Act provides for a rather similar regime for negotiation access and similar reasons apply for refusing access (Article 32 (2) of the Mining Act). However, whereas the Gas Act explicitly states that the Competition Act applies to the EEZ a similar provision is not included in the Mining Act (and neither does the Competition Act refer to the Mining Act). Therefore it is less clear whether a third party have any legal means to achieve access if the network operator is not willing to cooperate. As regards hydrogen it has already been noted that any transport of hydrogen through (dedicated) pipelines is not regulated at all. Given the fact that offshore hydrogen transport falls outside the scope of the Gas Act, the Mining Act and the Competition Act, a third party will have no means to enforce access to such a pipeline.

Table 1: Market Conduct Regulation for pipeline transport on the EEZ and the Continental Shelf per substance

Substance	Qualification	Act	Unbundling	TPA	Tariff regulation
Gas (including hydrogen admix)	Gas production network	Gas Act	n/a	Negotiated based on fair, transparent and competitive conditions with a limited list of refusal grounds *	Proposed by operator but subject to negotiations*
Carbon dioxide	Carbon dioxide transport network	Mining Act	n/a	Negotiated based on fair, transparent and competitive conditions with a limited list of refusal grounds	Proposed by the operator but subject to negotiations
Hydrogen	n/a	n/a	No specific legal requirements	No legal requirements	No legal requirements

* Within scope of the Competition Act

4.3 Constructing and operating electricity cables

A last set of legal issues revolves around the issue of offshore electricity consumption and supply. All three system integration scenarios, i.e. electrification of the hydrocarbons production, carbon dioxide injection into the subsoil and hydrogen production require an offshore connection to an electricity distribution system for the supply to and consumption of electricity by offshore platforms. *Grosso modo*, the electricity required can technically be supplied from two possible sources. First, when the platform is located in the vicinity of a wind park, it is possible to connect an offshore platform directly to an offshore wind park. Secondly, it is possible to connect the platform to the offshore network operated by TenneT. For both of these options a difference can be made with regard to the rules for construction, connecting and operating such cables.

4.3.1 Constructing offshore electricity cables

Reiterating some of the points made previously, the construction of any offshore structures, installations, pipelines and cables is only allowed with a license or permit to that end. The construction of an offshore electricity cable can be licensed or permitted on the basis of either the Mining Act or the Water Act, depending on whether a particular cable falls inside or outside the working sphere of the Mining Act. The working sphere of the Mining Act with regard to cables is limited to cables connected to at least one mining work. In the above mentioned scenarios, an electrified hydrocarbons production platform and a carbon storage injection platform would qualify as being mining works. Consequently, any electricity cable connected to either of these installations would fall inside the working sphere and can be permitted on the basis of the Mining Decree. The permitting method is equivalent to the permitting of pipelines on the basis of the Mining Decree. All other cables can be permitted on the basis of the Water Act in the same way as the Water Act regulates the construction and leaving in place of pipelines.

4.3.2 Connecting offshore electricity cables

4.3.2.1 Connecting wind parks and platforms

In addition to constructing and physically placing a cable on the sea bed, another issue of importance is the possibility to connect the cable to an electricity production facility or a network. As regards the first option, a cable between an offshore wind park and an offshore platform, no explicit regulations exist. The current system of the Wind Energy at Sea Act does not seem to preclude this possibility. From a practical perspective, however, a distinction should be made between wind parks which have been permitted before or after 2016. For the wind parks that have been permitted before 2016, the operator of the wind park is itself responsible for the construction of the connection to shore. This means that these wind parks have a substation that is operated by the wind park operator and that is not part of the offshore network of TenneT. For the wind parks permitted after 2016, the substation of the wind park is part of the network of TenneT, which may make it unclear whether it is possible to create a direct connection between the wind park and the electricity-demanding platform via that substation or whether a new substation should be constructed to that end.

For future wind parks, the proposed amendments to the Wind Energy at Sea Act seem to promote the possibility to connect wind parks to offshore consumers, given the fact that it introduces the a new type of connection, i.e. the possibility to connect a wind park to an energy conversion installation as an alternative to connection of the wind park to the offshore network of TenneT.

4.3.2.2 Connecting the offshore network and platforms

With regard to the second option, the situation is more difficult. The offshore network that is developed by TenneT is defined in the Electricity Act as those networks intended for the transport of the electricity of one of more wind parks to the onshore grid. This means that the offshore network only has the function of transporting electricity offshore and is not meant for the facilitation of offshore electricity consumption and supply. This makes is highly unlikely that it will be allowed to connect a *platform* to the offshore electricity grid. Furthermore, even to the extent that if would be allowed to connect an offshore platform to the offshore electricity grid, is also doubtful whether it is technically and/or administratively possible to connect such platforms to the offshore network. Such connection is in fact hampered by the legal requirement that the offshore electricity grid has to be developed in accordance with a development plan issued by the Minister. This development plan only takes into account connections between the offshore grid and the offshore wind parks. Since the network and the offshore substation are exclusively designed for connecting the designated

wind parks, it is possible that the network would not have the technical characteristics to accommodate additional connections to offshore platforms.
Even if such connection would have been possible, it would require a complete reregulation of the offshore electricity grid. The current regulatory framework is based on the assumption that only producers are connected to the grid and that, in the absence of grid connection and transport fees, the financing of the grid is completely based on government subsidies. In other words, this regime is not taking into account connections and use by consumers (third parties). Hence, any connections of offshore platforms (consumers) to the grid would require the introduction of a regime governing third party access, regulated tariffs and conditions and, possibly, balancing services.

4.3.3 Operating 'other' offshore electricity cables

Finally it should be pointed out that there may be the need to develop electricity cables, which have not yet been identified. This could involve a cable between an offshore platform and a wind park. Similarly it may be possible to connect a platform on the EEZ or continental shelf with the offshore electricity system. As the Electricity Act does not apply in its entirety to the EEZ, it is unclear whether these cables can be qualified as a direct line or as part of a connection. For these offshore cables no legal topology exists yet and therefore these cables/situations fall outside of the regulatory scope of the Electricity Act.

4.4 Conclusions

As this chapter has shown, the various system integration techniques would introduce situations that are not yet covered by current legislation. Examples of issues where current legislation provides insufficient guidance include the administrative coordination of re-use initiatives as an alternative to decommissioning, the regulation of dedicated hydrogen pipelines and the transport and supply of electricity to offshore consumers.

5 Conclusions

All in all it can be concluded that system integration is a promising development for the offshore energy system. As stated in chapter one, this report primarily looked at three scenarios: electrification of offshore hydrocarbons production, permanent carbon dioxide storage and offshore hydrogen production. Chapter two in this respect showed that states have the sovereign rights to regulate these activities in their EEZs, but that they should strike a balance between the execution of this right and the rights of other users of the sea. Therefore international law also presents detailed rules governing the decommissioning of offshore energy assets. Then chapter three presented the most important legal instruments applicable to offshore energy activities on the Dutch continental shelf and in the Dutch EEZ. These instruments are the Mining Act, the Water Act, the Wind Energy at Sea Act, the Electricity Act and the Gas Act. Chapter four examined the three system integration scenarios and concluded that the process of system integrations is facing various legal barriers and challenges.

Fundamentally, these barriers and challenges can be grouped into three categories. First, there is the issue of re-using platforms and pipelines and the applicable rules and licensing regimes. Currently, the legal framework for constructing, operating and decommissioning offshore structures, installations and pipelines provides insufficient guidance on the possibilities to re-use disused mining installations. Especially the situations where a platform will be re-used for hydrogen production or will be engaged in dual usage are not fully clear. The current legal framework does not seem to have envisioned such developments to happen, so it is not entirely clear whether these developments are allowed and if they are allowed, which licenses would be required. Moreover, the current administrative procedures for decommissioning do not facilitate the re-use of assets, since they provide little guidance or streamlining on the steps that operators or license holders should take if they want to re-use their assets. This problem is however acknowledged by the Minister and in the nearby future legislation is expected to facilitate the re-use of existing infrastructures.

Secondly, there is the issue of the offshore electricity network. For all system integration scenarios, the offshore consumption and supply of electricity plays a pivotal role. The offshore electricity network operated by TenneT would play a key role when organising the supply of electricity to offshore platforms, but unfortunately the current legal framework hampers this possibility. The current Electricity Act only allows for the connection of offshore wind parks to the network in order to bring the electricity to shore. To be able to connect offshore oil and gas platforms, carbon dioxide facilities or hydrogen production installations to the offshore electricity grid requires a fundamental revision of the Electricity Act.

Thirdly, there is the issue of the qualification of new offshore pipelines and cables and thus defining the applicable legal market regimes. Currently, the Electricity Act and Gas Act provide no clear guidance on the extent to which existing market regimes could apply to various new types of offshore pipelines and cables.

To exploit the potential of system integration, legislative reforms on the above mentioned points are of importance. These reforms can be implemented by the Netherlands alone or in cooperation with other North Sea states. Given the commonalities of the current energy challenges and opportunities faced by the NSA states and the ongoing process of European energy market integration, North Sea states should strive for a common approach and solutions for offshore system integration.

Annex I – Feedback from interviews

On Monday 3 September 2018 and Monday 10 September 2018 the representatives of Loyens & Loeff (Max Oosterhuis and Roland de Vlam) have conducted some interviews by phone with representatives of operators participating in the NSE2 program.[184] This Annex summarises the results of these interviews.

The interviews aimed at testing the preliminary findings of the research and to discuss statutory and regulatory issues that could come into play as a potential hurdle or, in the absence of regulation, may provide legal uncertainty that may hamper envisaged initiatives. The interviews have not brought to light any other outcomes than the ones identified in the report. Below the main elements are listed.

Electrification – access to the power source
Electrification of offshore mining installations is something that all initiatives have in common albeit that the activity (gas production, hydrogen production, carbon dioxide storage) or the options for a tie-in to a power source can, in theory, be distinguished:

1) Tie-in of the offshore mining installation to an onshore power plant;
2) Connection of the offshore mining installation to the onshore (national/regional) power grid;
3) Tie-in of the offshore mining installation transport to an offshore wind farm;
4) Connection of the offshore mining installation to the offshore grid.

The Electricity Act only applies within and up to the twelve mile border. The Electricity Act is not applicable offshore, except for the offshore grid designated to offshore wind farms.

Ad 1.
In this alternative, the power is produced onshore and transported directly from the power plant through an electricity cable that runs partly onshore, partly near shore (within the twelve miles border) and then offshore to the mining platform.

The Electricity Act provides for the qualification as a 'direct line', defined as an electricity cable only connected to a grid via one connected person and which links a production installation directly to one or more electricity user(s), with the intervention of a supplier. A direct line is not subject to any regulation of third party access (tariff or conditions). There is only an obligation to notify the regulator ACM, with no preceding test on merits.

The Electricity Act does not include a direct line as a public work for the purpose of obtaining a right of way pursuant to the Act on Private Law Obstacles (*Belemmeringenwet Privaatrecht*).

As the Electricity Act does not apply outside the 12 miles border there is regulatory uncertainty with regard to this qualification as a direct line for the tie in of an offshore platform to an onshore power plant.

Ad 2.
The Electricity Act provides that the network operator has the statutory obligation to provide a connection to the grid within its designated (regional) territory. It would appear that this does not cover an offshore mining installation, which is located outside the designated regional territory.

Besides that, the definition of a connection in the Electricity Act refers to an immovable property within the meaning of the Immovable Property Valuation Act (IPVA) to be connected to the grid. There is regulatory uncertainty if a mining installation may qualify as an immovable property under the IPVA as interpreted by the regulator ACM. The regulator ACM determined that the qualification as immovable property should be based upon an the IPVA valuation decision *(WOZ-beschikking)* to be rendered by the local municipality. For

[184] Names of these energy companies are available at Loyens & Loeff.

offshore mining installations no IPVA valuation decisions can be obtained. This may affect the qualification of the electricity cable between a mining installation and the onshore grid.

A possible solution may be to connect an onshore substation (an immovable property (building) owned and operated by the (mining) operator) to the onshore grid and this onshore substation is connected to the offshore mining installation by an electricity cable owned and operated by the (mining) operator, as part of the mining installation.

However, there is regulatory certainty how this electricity cable running from an onshore substation and within the 12 mile zone, up to the offshore platform may be will qualified. And this may be further complicated if other off-shore platforms will be electrified as well by a tie-in to this electricity cable. Under the Electricity Act, this could lead to the qualification as a 'network' if this would be perceived as a situation where more than one party and more than one immovable property is connected to an electricity cable.

Ad 3.
In the third alternative, the offshore mining installation is connected directly to an offshore electricity production facility, for example a wind farm. In this alternative, a further distinction can be made between wind farms realised prior to 1 January 2016 (in particular: Luchterduinen), and offshore windfarms of later date.

For the new windfarms the designated offshore grid is realised and operated by TenneT. Under current legislation the operator of the offshore grid only has the designated statutory task to connect the applicable offshore windfarms. It would be outside the scope of its statutory tasks to connect an offshore mining installation to the OHVS, which is designated specifically for the applicable offshore windfarms.

For ‘Luchterduinen’ a potential offshore tie-in of an offshore mining installation to its offshore high voltage substation (OHVS) may trigger regulatory uncertainty with regard to the qualification of the offshore tie-in cable (between the mining installation and the offshore windfarm), as well as the export cable (between the OHVS and the onshore connection point). The tie-in to the offshore windfarm could qualify as direct line, as discussed above. Under the Electricity Act the export cable could perhaps be qualified as a 'network' if this would be perceived as a situation where more than one party and more than one immovable property is connected to an electricity cable.

Ad 4.
In the last alternative, the connection is made on the ‘grid-side’ of the OHVS, i.e. *after* the point where the 66kV inter array cables from the turbines are connected to the OHVS. Under current legislation there is no statutory task for the operator of the designated offshore grid to connect anything other than the designated offshore wind farms.

Gas and other pipelines
A returning question regarding offshore system integration is the regulatory qualification of the gas infrastructure. The hydrogen production and carbon dioxide injection scenarios require pipeline capacity to transport the hydrogen produced offshore to shore and, as the case may be, to transport the carbon dioxide that is captured at onshore installations to depleted fields offshore to permanently store it.

Under current legislation of the Gas Act the existing gas pipeline systems are qualified as (non-regulated) gas production pipelines. The access conditions and tariffs can be negotiated between the pipeline operator and the producer requiring transportation (and gas treatment) services. The same will apply for comingled streams, if up to a certain % of hydrogen will be produced offshore and shipped together with natural gas produced offshore and will be treated to comply with downstream gas quality requirements.

When a gas pipeline will be used for carbon dioxide transport, the Mining Act stipulates by general provision that for conditions for access should be fair, transparent and non-discriminatory.

Hydrogen production and hydrogen transport through pipelines is not regulated. This may leave room for legal uncertainty whether gas production pipelines will remain within the regulatory qualification as gas production pipeline, when it is used solely or primarily or partly for transportation of hydrogen.

Other relevant questions may relate to the title and risk to the respective gaseous substances in the pipelines.

Annex II – Initial tax observations

This annex provides a brief overview on some tax issues relating to offshore energy activities. This overview has been prepared by Loyens & Loeff (tax).

VAT
VAT shall be collected on the supply of goods and services rendered in the Netherlands. For the supply of goods "The Netherlands" includes the Dutch territory and the Dutch territorial waters (the twelve-mile zone). This means that, in principle, the supply of goods outside the scope of the Dutch territory are not subjected to Dutch VAT. For example, the supply of infrastructure or platforms outside the scope of the Dutch territory is not subject to Dutch VAT. Services rendered between VAT entrepreneurs (B2B) are, in principle, subject to VAT in the country of the recipient of the services. Dutch VAT is only due when the recipient is established in The Netherlands. Of course there are many exceptions on the above-mentioned rules. Worthy to mention are the following:

The supply of electricity and gas
If electricity and gas are supplied to a reseller via a designated network, this supply is subject to VAT in the country of the recipient. If the recipient of the supply is not a reseller, the supply is subject to VAT in the country of the effective use of the gas and electricity.

Real estate services
These services are subject to VAT in the county where the immovable property is located. In case the immovable property is located outside the scope of the Dutch territory, no Dutch VAT is due.
Taking into account the nature of the parties involved in "the system integration" it would appear that in case a transaction is subject to Dutch VAT (and no exemption or 0%-rate is applicable), that this VAT is deductible at the level of the recipient of the supplied goods or services.

Real Estate Transfer Tax
Real Estate Transfer Tax (RETT) is levied on the acquisition of an immovable property (and all rights that are subject to this immovable property) located in The Netherlands.

Similar to the VAT rules regarding territory, "The Netherlands" in terms of the RETT includes the Dutch territory and the Dutch territorial waters (the twelve-mile zone). Thus the transfer of an immovable property which is situated on the Dutch part of the continental shelf does not fall within the scope of the Dutch RETT. If an acquisition is however subject to RETT, this acquisition can in some situations be exempt from RETT. For instance: the acquisition of a cable network for the transport of solid, liquid or gaseous substances and energy.

Energy Tax
It would appear that Energy Tax *(Energiebelasting)* is only applicable in The Netherlands, the Dutch territory and the Dutch territorial waters (the 12 miles zone), and not on the Dutch part of the continental shelf or EEZ.

As such, the supply of electricity to an offshore mining installation (located on the Dutch part of the continental shelf) would appear not to be subject to energy tax. For the supply of electricity to mining installations located within the 12 miles zone the energy tax will apply.

An exemption applies for the supply of gas used for the production of electricity in a production installation with an efficiency of at least 30%. In view of the envisaged electrification: currently no such exemption exists for electricity used for the production of natural gas.