CHAPTER 21

Navigating Legal Barriers to Mortgaging Energy Installations at Sea – the Case of the North Sea and the Netherlands

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1 Introduction

Annual investments in the global energy sector exceed $1.5 trillion.[1] Tens of billions per year thereof are invested in oil, gas and electricity infrastructure situated above, on or under the seabed of the North Sea. In the second half of the 20th century, the investments in the North Sea energy sector predominantly concerned the exploration and exploitation of oil and gas fields. Since the turn of the century, the number of wind farms constructed on the North Sea seabed has increased drastically. The energy sector can be characterized as highly capital intensive. This is particularly true for the offshore energy sector. Hundreds of millions or billions of euros are invested in individual offshore oil and gas and offshore wind projects.[2] It is common business practice that debt is attracted to finance such operations.[3] The companies active in the oil and gas sector in the last century had no issues attracting the required capital, in particular when oil and gas prices were high, as they could use their extensive assets and oil and gas reserves as collateral.[4] This is different in the current sector as oil and gas prices are relatively low, the discovered fields are smaller and many fields are nearing depletion. New companies with fewer assets have

1 'World Energy Investment 2018' (OECD/International Energy Agency 2018). In 2017, total investments in the energy sector, including electricity generation and supply, oil and gas supply, energy efficiency and coal supply, amounted to 1.8 trillion USD. In 2015 and 2016 global investments in the energy sector were higher.

2 Construction and operation of individual wind farms often exceeds €1 billion, 'Offshore Wind in Europe – Key Trends and Statistics 2018' (*WindEurope*, 2019) 21 <windeurope.org/about-wind/statistics/offshore>.

3 The following explanation receives more attention in C.G. Verburg & J.J.A. Waverijn, 'Liberalizing the Global Supply Chain of Renewable Energy Technology: The Role of International Investment Law in Facilitating Flows of Foreign Direct Investment and Trade' (2019) Brill Open Law and my forthcoming PhD thesis.

4 'Economic Report 2016' (*Oil and Gas UK*, 2017) 34 <http://oilandgasuk.co.uk/wp-content/uploads/2016/09/Economic-Report-2016-Oil-Gas-UK.pdf>.

entered the market, for example specializing in the offshore wind sector, ocean energy, the production of mature oil and gas fields or the re-use of oil and gas infrastructure. These companies require different types of collateral since reserves are not present.

In order to hedge their risks, lenders require the establishment of a comprehensive security package to cover the hundreds of millions of euros provided.[5] The current possibilities to offer financial security could be improved in many jurisdictions such as the Netherlands, where mortgaging installations on the seabed beyond the territorial sea (22.2km) is impossible.[6] Strengthening the security package with such a mortgage could decrease the cost of capital in certain jurisdictions. Moreover, if the result is that a less complex security package can be established and legal opinions have to be provided, transaction costs would decrease.

In the civil law jurisdictions bordering the North Sea, the regulations governing security rights are arranged for by law. This chapter discusses a rule of private international law which legislators could adopt and which other laws they should take into account to allow for the establishment of mortgage against installations at sea. Relevant rules of the law of the sea, private international law and national property law will be discussed. At the level of national law, the Netherlands will be used as the example as it is currently impossible to establish such a mortgage under Dutch law and the legal questions and discussions concerning current and possible future Dutch legislation may be exemplary for other states.

This chapter starts by setting out the extent to which coastal states can regulate the construction and operation of oil, gas, electricity and other energy infrastructure above, on or below the seabed according to the Law of the Sea (Section 2). This discussion includes the question whether coastal states enjoy the right to adopt property laws concerning installations constructed on the seabed. Subsequently, the practical potential for mortgage to be established against offshore installations will be illustrated by discussing investments in the production of oil, gas and electricity in the North Sea area and in how far costs are carried by private actors and states (Section 3). The North Sea area will be used as an example in this part, as some countries bordering the North Sea have a long history regulating oil and gas production and increasing experience with the regulation of electricity production at sea. Subsequently, the

5 See, for example, Philip Benger and Patrick Holmes, 'Ancillary Finance Documentation' in John Dewar (ed), *International Project Finance Law and Practice* (2nd ed, OUP 2015) 463.

6 There is a range of legal questions and uncertainties connected to different security rights established concerning main assets of projects, such as the license and subsidies. Questions pertaining in particular to the Netherlands are discussed in my PhD on this topic and further publications thereon are forthcoming.

focus lies on the legal questions which the legislator in the Netherlands faces to introduce the possibility to mortgage installations on the seabed beyond the territorial sea (Section 4).

2 Legal Basis in International Law

The limits of coastal state jurisdiction over oil, gas and electricity production at sea are determined by the law of the sea. In light of the focus on the mortgaging of installations at sea, particular attention will be given to whether the right to adopt property laws falls within coastal state jurisdiction.

The UN Convention on the Law of the Sea (UNCLOS) sets out coastal states' rights and duties in the different maritime zones.[7] To begin with, a distinction has to be made between the territorial sea on the one hand and the continental shelf and Exclusive Economic Zone (EEZ) on the other.[8] The reason therefore is that the territorial sovereignty of the coastal state extends to its territorial sea.[9] As a result, legislation applicable to the territory of a coastal state applies to its territorial sea as well, unless it contains a provision explicitly providing otherwise.[10] The property laws of the coastal state thus govern, *inter alia*, installations in its territorial sea, unless the laws explicitly exclude application within the territorial sea.

Beyond their territorial sea, coastal states enjoy sovereign rights for the purpose of exploring and exploiting the natural resources on their continental shelf[11] and can claim sovereign rights for these purposes and for the production of energy from the water, currents and winds in the EEZ.[12] This includes

7 The parties to UNCLOS 1982 currently include 167 states and the European Union. Important provisions of the treaty became customary international law, especially those granting states rights rather than obligations, as they were applied by both parties and non-parties, Robin Churchill and Vaughan Lowe, *The Law of the Sea* (3rd edition, Manchester University Press 1998) 19.

8 Following UNCLOS 1982, arts 3, 57 and 76; the maximum breath of the territorial sea is 12nm, of the EEZ is 200nm and the breath of the continental shelf can exceed 200nm under certain circumstances.

9 UNCLOS 1982, arts 2, 56 and 77. See, for example, Peter Malanczuk, *Akehurst's modern introduction to international law*, (Routledge 1997) 76; Bernard H. Oxman, 'Jurisdiction of States' (2007) MPEPIL, para 13 <opil.ouplaw.com/home/EPIL>; Ian Brownlie, *Principles of International Law* (7th ed, OUP 2008) 105.

10 See, for example, Malcolm Evans, 'Law of the Sea' in Malcolm Evans, *International Law* (4th ed, OUP 2014) 657; Brownlie (n 9) 105.

11 1958 Continental Shelf Convention, art 3; UNCLOS 1982, art 77. The ICJ ruled that customary law provides that coastal states have a continental shelf *ab inito* and *ipso jure*, North Sea Continental Shelf Cases [1969] ICJ Rep 3.

12 UNCLOS 1982, art 56(1)(a).

sovereign rights concerning the cables and pipelines used for the aforementioned purposes. The entire seabed and subsoil of the North Sea falls under the continental shelf regime of UNCLOS. In the 1960s, the United Kingdom, Belgium, the Netherlands, Germany, Denmark and Norway have entered into agreements dividing the vast majority of the seabed and subsoil of the North Sea between them.[13] The states bordering the North Sea have all claimed an EEZ and the associated sovereign rights, which allows them to regulate the production of oil and gas as well as electricity from the wind, waves and tides at sea.[14]

In the areas where a coastal state enjoys sovereign rights, its jurisdiction is not full but limited to the rights and area defined in UNCLOS. UNCLOS does not explicitly mention that these sovereign rights allow the coastal states to adopt property laws in this area. Instead, Article 60(1) UNCLOS provides that on their continental shelf and in their EEZ, coastal states have the exclusive right to regulate the construction, operation and use of installations and structures for the purposes of exploring and exploiting the natural resources and the production of electricity from the water, currents and winds. Article 60(2) UNCLOS provides that coastal states have exclusive jurisdiction over such artificial islands, installations and structures, including jurisdiction with regard to customs, fiscal, health, safety and immigration laws and regulations.[15] There are convincing arguments supporting that Article 60 UNCLOS also grants coastal states the right to adopt property laws governing these installations.[16] These include that with the adoption of Article 60 UNCLOS a clear choice was made for coastal state jurisdiction, rejecting the suggestion made during the UNCLOS negotiations to grant jurisdiction to the state constructing or operating the installation.[17] Also as a result of this choice, the interpretation that coastal

13 Most of these bilateral treaties were signed between 1964 and 1966. However, in some cases reaching agreement on the exact delimitation of the continental shelf proved to be more difficult. Most famously, the International Court of Justice delivered judgment on continental shelf delimitation in the *North Sea Continental Shelf* cases concerning the borders of the German, Dutch and Danish continental shelves; North Sea Continental Shelf Cases [1969] ICJ Rep 3.

14 Act of 22 April 1999 relating to Belgian's exclusive economic zone in the North Sea, Belgian Official Journal of 10 July 1999; The UK Exclusive Economic Zone Order 2013, SI 2013/3161; Exclusive Economic Zone (Establishment) Act (1999) Netherlands Official Journal 281; Act No. 91 of 17 December 1976 relating to the Economic Zone of Norway; Danish Act No. 411 of 22 May 1996 on Exclusive Economic Zones.

15 Pursuant to UNCLOS 1982, art 80, art 60 also applies *mutatis mutandis* to artificial islands, installations and constructions on the continental shelf.

16 In agreement: Maria Gavouneli, *Functional Jurisdiction in the Law of the Sea* (Martinus Nijhoff Publishers 2009) 11; Christopher Staker, 'Jurisdiction' in Malcolm Evans (ed), *International Law* (OUP 2014) 316.

17 Barbara Kwiatkowska, *The 200 Mile Exclusive Economic Zone in the New Law of the Sea* (Martinus Nijhoff 1989) 112.

states can adopt property laws for these installations does not conflict with the rights of other states and is in line with the rest of the treaty: the treaty grants coastal states exclusive jurisdiction concerning these installations.[18]

3 Energy Activities in the North Sea and Their Financing

The states bordering the North Sea have adopted laws and regulations to govern the construction, use and removal of installations, cables and pipelines on the seabed of their territorial sea and EEZ. In some respects distinctly different approaches were used, while in others the approaches are similar, at times because of EU regulation. In the following, I will firstly provide some background on the development and regulation of the production of oil and gas, wind and ocean energy and transmission infrastructure present on and above the seabed of different countries bordering the North Sea. This includes discussion of investments in these sectors and by whom these investments are carried, the private sector or the state, be it through state-owned companies or direct state participation. Finally, paragraph 3.3 will reflect on different forms of finance.

3.1 *Production*

3.1.1 Offshore Oil and Gas

In the continental shelves of Denmark and the Netherlands and in particular Norway and the United Kingdom, significant oil and gas deposits were found. The total oil and gas expenditures on the Norwegian[19] and UK[20] continental shelves are, since 2011, annually between €15 and €23 billion. In addition, expenses must be made for the removal of infrastructure at the end of the lifetime of oil and gas fields, or alternatively for the re-use of production platforms and pipelines, as there, for example, is ample potential for CO_2 storage in reservoirs beneath the North Sea seabed.[21]

Companies investing in the offshore oil and gas sector are confronted with high costs for the exploration of the seabed and its subsoil in search of

18 The argumentation supporting coastal state jurisdiction to adopt property laws regarding these installations and structures is discussed in more detail in the fourth chapter of my PhD.

19 'Investments in oil and gas, manufacturing, mining and electricity supply', (*Statistics Norway*, 21 February 2019) <ssb.no/en/energi-og-industri/statistikker/kis>.

20 Oil and Gas UK (n 4), 33–34.

21 See chapter 19 of this book, M. Roggenkamp,' Re-using (nearly) depleted Oil and Gas Fields in the North Sea for CO_2 Storage: Seizing or Missing a Window of Opportunity?', discussing the re-use of depleted oil and gas fields in the North Sea for CO_2 storage.

hydrocarbon deposits. The cost of drilling a single exploration well ranges from millions of euros in shallow waters to more than 100 million euros for a single deep-water well. Over the life-time from exploration until decommissioning, capital expenditures form more than half of the costs for installations on the seabed of the continental shelf in Norway and the United Kingdom.[22] Operating costs form almost forty percent of the total costs made in the United Kingdom, but a significantly smaller part in Norway.[23]

The governments of the countries bordering the North Sea provide licenses to private companies who wish to undertake exploration or exploitation activities. In accordance with the Hydrocarbons Licensing Directive, these licenses are provided on a competitive basis.[24] As regards state participation, the United Kingdom does not, while the Netherlands, Denmark and Norway do know a system in which the state, through a state-owned company, participates in all or certain oil and gas exploration and exploitation licenses.[25] The Danish state-owned company Nordsøfonden becomes a licensee, while the Dutch EBN does not. In Norway, the State's Direct Financial Interest is managed by Petoro, which is a licensee in the vast majority of licenses, but in a few instances its participation is limited to a right to a share of possible profit.

The state-owned companies in these countries have not always been, and in other countries still are not always, responsible for their share of the investments and costs. For example, until 1988 the Norwegian state participant did not financially contribute to costs incurred for exploration, but contributed only to production.[26] Following developments such as low oil and gas prices and the discovery of fewer large fields, the Norwegian, Dutch and Danish state participants currently do financially contribute to exploration activities in order to stimulate investments. The share the state-owned company obtains is in the Netherlands by law set at forty percent, is in Denmark usually twenty

22 See, for example, figures provided by the Norwegian Petroleum Directorate, www.norskpetroleum.no/en/economy/investments-operating-costs and graphics.wsj.com/oil-barrel-breakdown.

23 Ibid.

24 Directive 94/22/EC of the European Parliament and of the Council of 30 May 1994 on the conditions for granting and using authorizations for the prospection, exploration and production of hydrocarbons [1994] OJ L164/3.

25 See, *inter alia*, section 3–6 and Chapter 11 Norwegian Petroleum Act 1996; articles 81 to 97 Dutch Mining Act; section 8 Act on the Danish Subsoil and the Act on the Danish North Sea Fund; the United Kingdom used to know a system of state participation, but this was abolished in the 1980s.

26 Ernst Nordtveit, 'Regulation of the Norwegian upstream petroleum sector', in Tina Hunter (ed), *Regulation of the Upstream Petroleum Sector: A Comparative Study of Licensing and Concession Systems* (Edward Elgar 2015) 145.

percent and is for current projects in Norway between five and 63 percent.[27] Finally, state-participants are expected to provide their part of the required investments in decommissioning.[28] The private companies holding the oil and gas exploration and exploitation licenses are thus not responsible to carry all investments and costs in a number of jurisdictions. In case the state does not participate, the private companies are fully responsible for capital costs, but they can still rely on existing laws decreasing their tax burden.

3.1.2 Offshore Wind

Whereas wind farms in the North Sea were scarce in number in the early 2000s, during the past decade the installed capacity has increased exponentially.[29] The driving forces behind this increase are the commitments states have made regarding the consumption of electricity from renewable energy sources.[30] For several states, reaching these targets by constructing onshore capacity proved to be difficult, *inter alia*, because of public opposition against onshore wind and spatial constraints.[31] Therefore, within the boundaries of the Electricity Directive and the Renewable Energy Directive,[32] states bordering the North Sea have decided to introduce varying legislation on licensing and support schemes which allow for the realization of offshore wind projects,

27 Articles 88 and 94 Dutch Mining Act. EBN has a fifty percent share in production activities for which the exploration license was granted under a previous regime. In two licenses, the Danish state-owned company Nordsøfonden has a 36.36 percent rather than a twenty percent share, see <nordsoefonden.dk>.

28 See, for example, J.J.A. Waverijn & L. Baljon, 'Verslag van European Energy Law Seminar 2018' (2018) 4 *Nederlands Tijdschrift voor Energierecht* 133–147.

29 Offshore Wind in Europe (n 2) 12. The Norwegian offshore wind sector is currently limited to one, floating, wind mill both because the already installed hydroelectric capacity in Norway limits the need for offshore wind farms and because the water depths off the Norwegian coast provide technical and thereby financial challenges which other North Sea states do not face.

30 The states bordering the North Sea have committed themselves to national renewable electricity production targets and to targets at EU level through Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources [2009] OJ L 140/16 and Directive 2018/2001/EU of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources [2018] OJ L 328/82 (the RES Directive).

31 See, for example, Anita Rønne, 'Opposition to Wind Farms and the Possible Responses of the Legal System', in Lila Barrera-Hernández and others (eds), *Sharing the Costs and Benefits of Energy and Resource Activity: Legal Change and Impact on Communities* (OUP 2016) 176.

32 Currently, Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity [2009] OJ L 211/55 and the RES Directive (n 30).

giving the sector an opportunity to mature and try to reduce costs.[33] Furthermore, the states bordering the North Sea have signed various agreements and understandings to further the development of offshore wind in the North Sea and identified the North Sea as a 'power house' which may deliver as much as 8 percent of the energy supply of Europe by 2030.[34] As will be elaborated on in the following paragraph, these agreements also concern increased electricity transport through cables laid on the seabed of the North Sea.

The developers of offshore wind farms in the North Sea are private companies. These include (partially) state owned power companies such as Ørsted, Equinor and Vattenfall, which jointly represent around thirty percent of the current market.[35] As the subsidy schemes currently in place for offshore wind can only be relied upon once production starts, developers have to fully provide the capital required to construct the wind farms.[36] For large scale offshore wind farms in the North Sea, this usually concerns €1–2 billion, while operational expenditures are relatively low.[37] As regards the European offshore wind sector, yearly investments grew from €8 billion in 2010 to €18 billion in 2016.[38] Between 2017 and 2021, the annual capacity of permitted and planned projects is comparable to or greater than the capacity installed during the year 2015.[39] On the longer term, both national governments and the EU are aiming for ambitious targets regarding the consumption of electricity produced from renewable energy sources by 2030 and 2050 and offshore wind is expected to play an important role in reaching these targets.[40]

33 For an overview in the development of and support schemes used for offshore wind in the UK, Germany, the Netherlands and Denmark see Hannah Katharina Müller, *A Legal Framework for a Transnational Offshore Grid in the North Sea* (Intersentia 2015) 145, 163, 174, 190.

34 See, in particular, Council of the EU, 'Political declaration on energy cooperation between the North Seas Countries' 8673/16 of 13 May 2016, which echoes the 2016 Manifesto Northern Seas as the Power House of North Western Europe which was signed by twenty Members of the European Parliament from countries neighbouring the North Seas.

35 Offshore Wind in Europe (n 2) 27–28.

36 Previously and currently used support schemes include renewable obligation certificates, contracts for difference, feed-in premiums and feed-in tariffs. See also, n 33.

37 Offshore Wind in Europe (n 2) 21.

38 'The European Offshore Wind Industry – Key Trends and Statistics 2016' (*WindEurope*, 2017) 33 <windeurope.org/about-wind/statistics/offshore>.

39 Ibid, 24–25.

40 See, for example, Commission, 'Energy Roadmap 2050' (Communication) COM (2011) 885 final.

3.1.3 Ocean Energy

Electricity can be produced from an array of ocean sources, of which the tides and waves are currently regarded to be most promising.[41] The majority of the installed capacity is situated within territorial seas. The expectation is that production will extend to the EEZ where facilities, such as network connections, may be shared with offshore wind farms.[42]

The main arguments in favour of developing ocean energy technologies are that the sources are renewable, add diversity to national generation, and – unlike electricity production from wind and sun – the output is predictable. Thus, electricity production from these sources is favourable in terms of balancing and the achievement of renewable electricity goals. For these reasons, the European Commission is active in stimulating the development of ocean energy technologies within the EU and have provided around €150 million in support in the last ten years.[43] The potential worldwide market for electricity production from ocean energy sources has been estimated at €535 billion between 2010 and 2050.[44] A significant part thereof may develop in the North Sea, as the EU hosts around half of the world's tidal energy developers, sixty percent of all wave energy developers and seventy percent of the ocean energy research and testing infrastructure.[45] Between 2007 and 2015, €2.6 billion was invested in ocean energy in the EU of which 75 percent by the private sector.[46] Until 2030, a further €2.8 to €9.4 billion will be invested in the sector.

3.2 *Transport Infrastructure*

To transport electricity, oil and gas from either the production site to shore or from one country to another, a large number of electricity cables and oil and gas pipelines have been laid down on or under the seabed of the North Sea. Producers constructed oil and mainly gas pipelines connecting the production platforms to shore and were responsible for these investments. As a

41 Commission, 'Renewable Energy: a Major Player in the European Energy Market' (Staff Working Document) SWD (2012) 0164 final.

42 See, for example, Eric D. Stoutenburg, 'Integrating Wind and Wave Power in California' (PhD thesis, University of Stanford 2012); Sharay Astariz and Gregorio Iglesias, 'Enhancing Wave Energy Competitiveness through Co-Located Wind and Wave Energy Farms. A Review on the Shadow Effect' (2015) 8 Energies 7344.

43 See, for example, Davide Magagna and Andreas Uihlein, '2014 JRC Ocean Energy Status Report' (Scientific and Technical Research Reports) EUR (2015) 26983; The 2018 Annual Economic Report on EU Blue Economy (European Union, Joint Research Centre 2018) 73.

44 Commission, 'Blue Energy – Action needed to deliver on the potential of ocean energy in European seas and oceans by 2020 and beyond' (Communication) COM (2014) 08 final.

45 The 2018 Annual Economic Report on EU Blue Economy (n 43) 70.

46 Ibid, 73.

result of efficiency considerations, offshore pipeline systems have been constructed which connect multiple production platforms to each other and to shore, of which the most elaborate network lies on the Norwegian continental shelf. Initially, the companies in control of these upstream pipelines were owned by the producers and the state participated. For example, almost all of the Norwegian upstream gas pipeline network is owned by Gassled. Gassled is a joint venture of which the state indirectly holds 51 percent of the shares.[47] In the Netherlands, the Dutch state participant EBN has a share in five offshore upstream gas pipelines, among which a 45 percent stake in NOGAT.

The majority of electricity cables on the seabed in the North Sea are radial connections.[48] The national regimes concerning offshore wind farm connection to shore differ. For example, in the United Kingdom, the wind farm operators are responsible for financing the construction but choose whether they or an offshore transmission system operator (OFTO) construct the connection.[49] Until 2016, developers in the Netherlands were obliged to fund and construct and owned the connection. However, the Dutch national TSO TenneT has been appointed to construct joint connections from multiple wind farms, funded through government support, with the aim to reduce costs.[50] This brings the Netherlands in line with Denmark and Germany where, respectively, Energinet and TenneT are responsible for both construction and funding.

The other main category of offshore pipelines and electricity cables are those which cross borders, i.e. interconnectors. These pipelines and electricity cables cross the North Sea, connecting for example the Netherlands to Norway or the United Kingdom to Germany. The construction costs of a number of interconnectors exceeded €500 million.[51] The vast majority of interconnectors are owned, operated and funded by state-owned TSOs.[52]

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47 The 51 percent of the state involvement consists of 46,6 percent of Gassled shares held by Petero and 5 percent by Equinor. The state has a controlling interest in Equinor as it holds 67 percent of the shares.

48 A radial connection directly connects electricity production facilities to shore.

49 Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2013, SI 2013/175.

50 The Minister of Economic Affairs has appointed TenneT as offshore TSO in September 2016 by means of a decision taken on the basis of the Act of 23 March 2016 Amending Electricity Act 1998 (tijdig realiseren doelstellingen Energieakkoord), article III.

51 The NorNed electricity cable between the Netherlands and Norway cost at least €600 million, Commission, 'The European Investment Bank finances NorNed (Press Release) BEI (2007)118. The BBL Pipeline – natural gas – between the Netherlands and the UK cost €500 million, see <bblcompany.com>.

52 See, for example, Electricity Interconnectors (Ofgem) <ofgem.gov.uk/electricity/transmission-networks/electricity-interconnectors> and Commission, 'Exemption Decisions and Pending Notifications of National Exemption Decisions for Gas and Electricity' <ec.europa.eu/energy/sites/ener/files/documents/exemption_decisions2017.pdf>. In

The aforementioned cooperation agreements also concern the potential construction of a cross-border offshore grid, connecting offshore wind farms and the electricity networks of coastal states bordering the North Sea.[53] The envisaged benefits of an offshore grid would include further interconnection of European energy markets, which should reduce electricity prices, construction costs and should contribute to decarbonisation and the share of consumed renewable energy. Realization of such infrastructures is estimated to cost between €59 and €107 billion.[54] Before such a grid can be built, technical, legal and financial hurdles will have to be overcome.[55]

3.3 *Finance*

The developers of these energy exploration, production and transmission activities at sea use different methods to raise the required debt or equity to finance their activities. This section touches upon corporate finance and project finance and a few significant differences between the two. Regardless of the method used, it is common that the assets and liabilities connected to a single activity are housed in a separate legal entity. This is always the case when project finance is used.[56] The assets and liabilities held by this special purpose vehicle (SPV) include the permits, the off-take agreement and construction contracts.[57] In case of project finance, equity and debt are used to fund the SPV. The defining feature of project finance is that lenders of the debt only have recourse against the assets of the SPV and not against any other assets of the shareholders of the SPV.[58] Conversely, financial constructions wherein the recourse of the lenders is broader, for example when the parent company

Norway, until recently, only the fully state owned national TSO could own and operate interconnectors. This has been changed, but the authorities are now considering reversing the decision.

53 See, for example, Commission, 'Second Strategic Energy Review: an EU energy security and solidarity action plan' (Communication) SEC (2008) 2870, 2871, 2872; Memorandum of Understanding on the North Seas Countries' Offshore Grid Initiative (NSCOGI) of 3 December 2010; Council of the EU (n 34).

54 Commission, 'Study of the benefits of a meshed offshore grid in northern seas region' (2014).

55 See, for example, Müller (n 33); Ceciel Nieuwenhout, 'Offshore Hybrid Grid Infrastructures: The Kriegers Flak Combined Grid Solution', in Martha M. Roggenkamp & Catherine Banet (eds), *European Energy Law Report* XII (Intersentia 2019) 95–112.

56 In the upstream petroleum sector, unincorporated joint ventures are most commonly used. When attracting debt, lenders often require incorporating the company, Aled Davies and James Orme, 'International Projects – Sector Focus Section A – Oil and Gas' in John Dewar (ed), *International Project Finance* (2nd ed, OUP 2015) 152.

57 Stefano Gatti, *Project Finance in Theory and Practice* (Elsevier Academic Press 2013) 271.

58 Robert Clews, *Project Finance for the International Petroleum Industry* (Elsevier Academic Press 2016) 7.

provides a guarantee to lenders, fall outside the scope of project finance and are referred to as corporate finance.[59]

Around ten percent of oil and gas funding is provided through project finance.[60] In the European offshore wind sector, the share of project finance in total investments is significantly higher with 40 percent in 2015 and 2016, out of total investments of €31.5bn.[61] In 2018, €8 out of €10.3 billion invested in new projects was raised using project finance.[62] On top of that, another €8.5 billion of debt was refinanced in 2018.[63]

The average debt raised for individual North Sea project finance deals is around one billion euro. This debt is provided by commercial banks, insurance companies, pension funds and public and semi-public financial institutions.[64] The public and semi-public financial institutions are instrumental to the success of these deals and include development banks and export credit agencies, such as the European Investment Bank, the German development bank KfW and the Denmark's export credit agency EKF, which *inter alia* can provide debt, guarantees and insurance.[65] As commercial banks rarely offer risk commitments exceeding €200mln to individual projects, a consortium of commercial banks is involved in these deals.[66] In addition, a growing number of institutional investors, such as pension funds and insurance companies, are involved in financing offshore wind. This can be by providing debt, but also equity as, for example, some utilities sell off minority stakes in their wind farm to free up capital to invest in other projects. In this model, the utility remains in control over the wind farm while an institutional investor such as a pension fund, seeking equity returns, becomes a shareholder.[67]

Debt is attracted for almost all energy activities carried out by private parties, regardless of whether this is done through corporate finance or project finance. Further distinctions include that the cost of capital for debt attracted through corporate finance is often higher: The lenders only have recourse against the assets of the SPV and therefore may face higher risks which translate

59 Definitions along these lines are broadly, but not exclusively, used. Referring to sources used in this contribution in particular: 'Funding challenges in the oil and gas sector' (EY 2014) 2 <ey.com/oilandgas>; The European Offshore Wind Industry (n 38) 20.

60 Funding challenges in the oil and gas sector (n 59) 2.

61 The European Offshore Wind Industry (n 38) 33–34.

62 Offshore Wind in Europe (n 2) 35.

63 Offshore Wind in Europe (n 2) 36.

64 Cathy Marsh and Andrew Pendleton, 'Project Participants and Structures' in John Dewar (ed), *International Project Finance* (OUP 2011) 35–36.

65 Davies and Orme (n 56) 155; The European Offshore Wind Industry (n 38) 32.

66 Mark Plenderleith, 'Sources of Funding' in John Dewar (ed), *International Project Finance* (OUP 2011) 61.

67 Marsh and Pendleton (n 64) 34–35.

to higher interest rates. In case of project finance, it is thus of greater importance that the security which can be provided in light of the individual project is as extensive as it can be, as this decreases risks and thus may lead to lower interest rates and thus a lower cost of capital.[68] The cost of capital can be a major part of the life-time expenses of a project, as they can for example total a billion euros over the lifetime of a two-billion-euro loan. The cost of capital can thus be prohibitive and result in projects not being developed. This is currently an issue in the ocean energy sector. Developers of ocean energy have particular trouble attracting sufficient funds to scale up to commercial levels as the projects are too capital intensive to attract venture capitalists, too risky to attract private equity and borrowing from banks is too expensive because of the risks and subsequent cost of capital.[69] Governments will thus have to provide financial support and legislative support. One manner in which governments can provide legislative support is by ensuring that the law does not contain unnecessary barriers, for example by allowing for mortgage of installations on the seabed as will be discussed in the following paragraph.

4 Mortgaging Property on the Seabed

4.1 *Introduction*

We have established that the investments required for the construction and operation of offshore installations, cables and pipelines are significant and that a large part of the costs involved are carried by private companies. In order to hedge their risks, lenders ensure to be granted a security rights. In case of project finance this concerns a comprehensive security package usually concerning all assets of the SPV including the shares of the SPV itself, even if a certain security or a security regarding certain assets is doubtful or limited in efficacy.[70] This includes the license, the income streams from the power purchase agreement, a possible subsidy agreement, the bank accounts of the SPV or the physical installations. Developers not using project finance also mortgage and pledge their assets. Practice in the Norwegian offshore oil and gas sector is an excellent example thereof. The Norwegian Petroleum Act contains a chapter dedicated to the mortgage of licenses.[71] The Ministry regularly allows licensees

68 Shannon Pratt & Roger Grabowski, 'Relationship between Risk and the Cost of Capital', in Shannon Pratt & Roger J. Grabowski (eds.), *Cost of Capital* (5th ed, Wiley 2014) 70–87.

69 Commission, 'Market Study on Ocean Energy' (Publications Office of the European Union, 2018) 45.

70 Joanne Robertson and Patrick Holmes, 'Ancillary Finance Documentation' in John Dewar (ed), *International Project Finance* (OUP 2011) 319.

71 Norwegian Petroleum Act 1996, ch 6.

to mortgage an offshore license to finance activities carried out under another licence than the one which has been mortgaged, which means this mortgage does not concern project finance as that would be limited to the licensed activity.[72] In the context of specific laws addressing security rights of offshore energy activities, Denmark knows laws specifically allowing for mortgaging physical wind farms at sea.[73]

In the Netherlands, such specific legislation has not been adopted. The possibility to mortgage energy installations on the seabed beyond the territorial sea would provide lenders with additional security, however, which could result in a reduction in the cost of capital. The benefits of mortgaging offshore energy installations were recognized by the Netherlands State Commission for Private International Law (the State Commission), but the Dutch government did not follow their initial recommendations.[74] The following paragraphs discuss the advice issued by the State Commission and a subsequent publication by the chairman of the State Commission. Through this discussion, a number of legal issues are identified which have to be resolved in order to allow for mortgaging of offshore installations in conformity with Dutch law. The discussion of the Dutch regime illustrates the questions of property law which other governments could also be confronted with.

4.2 *Property Law and Installations on the Seabed of the Continental Shelf*

Upon request of the Dutch government, in 1990 the State Commission issued an advice concerning national legislative jurisdiction on the Dutch continental shelf beyond the territorial sea.[75] The main area of attention identified by the State Commission related to property laws and installations. Private international law dictates which national laws apply to installations on the continental shelf beyond the territorial sea.[76] Problems arise as the *lex rei sitae* – the place where the property is situated – determines which property laws apply.[77] As the continental shelf has no internal civil law, the State

72 Pursuant to Section 6–2 Norwegian Petroleum Act 1996; Olav Nordli, 'Pantsettelse av utvinningstillatelser' (2011) 3 Tidsskrift for Forretningsjus 131.

73 Danish Promotion of Renewable Energy Act, s 25(4).

74 The State Commission, whose members include judges, academics and practicing lawyers, provides the Dutch government with requested and unrequested advice concerning international private law.

75 Staatscommissie voor het Internationaal Privaatrecht, 'Advies van 12 december 1990' in E.N. Frohn, E. Hennis (eds), *Geselecteerde adviezen – naar een afgewogen IPR* (T.M.C. Asser Instituut 1995). Even though it is not included in the main text, the Dutch EEZ overlaps with the Dutch continental shelf beyond the territorial sea.

76 Staatscommissie voor het Internationaal Privaatrecht (n 75) 247.

77 Ibid; DCC, art 10:127(1).

Commission concluded that the *lex rei sitae* refers to a *locus sine lege* – a place without law – and that a legal vacuum concerning property laws exists.[78]

In order to increase legal certainty for both investors and developers, the State Commission advised the Dutch government to propose a new rule of private international law, along the following lines:

> Installations on the continental shelf of the coastal state are treated as installations within that coastal state.[79]

The Minister of Internal Affairs decided against pursuing the introduction of this rule. The reasons provided were that financial practice in the offshore oil and gas sector would not require such a rule and that according to the State Commission there may already be an unwritten rule of referral to Dutch property law concerning the Dutch continental shelf, which would allegedly resolve the issue when encountered in practice.[80] In an advice issued in 1996, the State Commission itself advised against the adoption of a comparable rule.[81] The State Commission argued that the rule would lead to confusion as regards which laws should and which should not be applied. It also used the argument put forward by the Minister, that the legal structures used in the practice of financing petroleum installations on the continental shelf did not require a change in law.[82]

Even though the State Commission may have been correct in asserting that the financial structures used in the past half century in the petroleum industry do not seem to have hampered investments in the Netherlands, the landscape has changed radically after the advice was issued and the need for legal certainty and financial security has increased, as previously mentioned. Allowing for the mortgaging of installations at sea would in fact strengthen the security package and thereby increase legal certainty for investors in offshore energy activities.[83]

While the appetite for investments in offshore wind in the North Sea area is currently high, this increase in legal certainty could prove vital for investors

78 Ibid.

79 Ibid 247–248. This is a translation and interpretation of the much more elaborate rule drafted by the State Commission in Dutch.

80 Netherlands Parliamentary Papers II (1990–91) 22 390, nr 1.

81 Staatscommissie voor het Internationaal Privaatrecht, *Rapport aan de Minister van Justitie – Internationaal Goederenrecht* (1 November 1998) 8.

82 Ibid.

83 In agreement: Frank M.J. Verstijlen, 'Eigendom van Delfstoffen en in de ondergrond opgeslagen stoffen' in: *Preadvies Nederlandse Vereniging voor Energierecht: Energie en Eigendom* (Intersentia 2011) 19; X.E. Kramer & H.L.E. Verhagen, *Asser 10-II Internationaal Vermogensrecht* (Wolters Kluwer 2015) 413.

in the development of ocean energy, storage potential or other activities in the North Sea in the future, which may involve new technologies and thus greater risks and therefore costs. Moreover, considering that the *lex rei sitae* is used to identify which property laws apply in the vast majority of countries,[84] comparable issues as those concerning the Dutch continental shelf are expected to exist in a significant number of other coastal states, many of which have a comparatively high cost of capital. In the coastal states with potential for offshore production of electricity from renewable energy sources and storage, cost reductions will be determinant in realizing projects.

4.3 *National Law*

The adoption of a rule prescribing that installations on the continental shelf are regarded to be situated within the territory of the coastal state would resolve certain but not all barriers to mortgaging installations on the seabed of the Netherlands continental shelf. To illustrate this, it is necessary to briefly discuss mortgage (*hypotheekrecht*) under Dutch law.

> A mortgage is established by a notarial instrument drawn up between the parties in which the grantor grants a mortgage to the mortgagee over registered property, followed by the entry of the instrument, in the appropriate public registers provided for that purpose.[85]

The following questions must be answered to ascertain whether installations at sea can be mortgaged or pledged: What is the definition of registered property? Can installations at sea, inside and outside the territorial sea, be defined as such? The definition of registered property is enshrined in Article 3:10 of the Dutch Civil Code (DCC):

> Registered property is property the transfer or creation of which requires entry in the appropriate public registers.[86]

The most common category of property the transfer of which requires registration in the public register is immovable property.[87] Immovable are the land, not yet mined minerals, plants connected to the land, and buildings and

84 Malanczuk (n 9) 73.

85 DCC, art 3:260. Hans Warendorf, Richard Thomas and Ian Curry-Summer, *The Civil Code of the Netherlands* (1st ed, Wolters Kluwer 2009) 498.

86 Hans Warendorf (n 85) 434.

87 DCC, art 3:89. Warendorf (n 85) has been used for this and the following references to the DCC.

constructions permanently attached to the land, either directly or through connection with other buildings or constructions.[88] All tangible property which is not immovable is movable property.[89] Immovable property is not the only category of property requiring registration to transfer or establish. The most prominent other example is ships. While a ship is movable property, Dutch law provides that ships are registered property.[90]

The result is that both movable property for which law provides that transfer or creation requires registration and immovable property can be mortgaged. The mortgage has to be established by notarial mortgage deed which must be entered into the public registers. Against movable property outside this category, *inter alia*, a non-possessory security right comparable to pledge can be established (*pandrecht*).[91] The qualification of property as immovable or movable therefore has an important influence on which type of security right can be established.

4.4 *Installations at Sea, Immovable or Movable Property?*

As Dutch law does not contain a rule that transfer of installations in the EEZ requires registration in a public register, the question is whether installations at sea are movable or immovable property. This is discussed assuming that Dutch property law applies pursuant to a comparable rule as proposed by the State Commission.

The response of the Dutch Minister of Economic Affairs to questions from members of the Lower House provides an example of how unclear the legal qualification of offshore installations currently is. The minister stated that windmills in the EEZ are immovable property because they qualify as such pursuant to the Valuation of Immovable Property Act (VIPA).[92] This act concerns municipal taxes, while the limits of jurisdiction of Dutch municipalities is one kilometer offshore.[93] Without providing further supporting arguments, the minister added that the fact that this law does not apply within the EEZ did not affect his conclusion.[94] Solely supporting this argumentation with a law which

88 DCC, art 3:3(1).

89 DCC, art 3:3 (2).

90 DCC, art 8:199(1).

91 DCC, art 3:237(1).

92 Letter of the Minister of Economic Affairs to the Lower House as regards questions and amendments for the bill 'Electricity- and Gas law (32 199), 2 October 2015, DGETM-EI / 15138937.

93 Act of 2 November 1990, concerning provincial and municipality borders along the North Sea coast 1984 (1990) Netherlands Official Journal 553.

94 Letter of the Minister of Economic Affairs (n 92).

does not apply is clearly insufficient. Considering the aforementioned conclusion that Dutch property laws do not apply in the Dutch EEZ in particular, there is no reason to assume that the VIPA would influence the property law status of installations in the Dutch EEZ.

The then chair of the State Commission and Advocate-General to the Netherlands Supreme Court Roelvink, addressed the question whether installations beyond territorial waters are movable or immovable in a publication following the advice discussed above.[95] In this publication, Roelvink argued for the adoption of a rule of private international law. Coastal state property law should apply to installations within the continental shelf and EEZ in so far the installations are used for the purpose of the exploration and exploitation of natural resources.[96] This rule would create an unfortunate situation where the material property laws of the coastal state provide both that these installations are immovable and that for the transfer and mortgaging of immovable property registration in the public registers is required, but where the public registers do not extend to the relevant part of the sea.[97] Roelvink added that Dutch public registers do not extend beyond territorial borders. He further observed that other commentators have argued that matters would become worse if the seabed beyond the territorial sea is to be considered a *res nullius* and if national law is considered to provide that through accession the windmills legally accede to, and thus are part of, the seabed and therefore also are *res nullius*.[98] Roelvink concluded as follows:

> I have a different point of view, at least as regards Dutch property law. I defend the position that an installation, connected to the ownerless continental shelf, can qualify as and can be treated as movable property. I do not see good grounds to assume that ownership of property is lost because of connection to a *res nullius,* nor to assume that the absence of public registers makes transfer impossible.[99]

Roelvink takes a very pragmatic approach. His conclusion that these installations qualify as movable property is not based on the legal requirements

95 H.L.J. Roelvink, 'Het Continentaal plat als IPR-aanknopingspunt', in S.C.J.J. Kortmann and others (eds), *Op recht* (*lib. am. Struycken*) (W.E.J. Tjeenk Willink 1996).

96 National property law should not apply to anchored beacons for shipping, telephone cables, transmission islands or tunnels, according to Roelvink (n 95) 280.

97 Roelvink made note of that the Dutch public registers do not extend beyond the territorial sea, Roelvink (n 95) 820.

98 Roelvink (n 95) 280.

99 Translated from Roelvink (n 95) 280. Moving on to another part of his publication, Roelvink does not provide further insight on the legal reasoning supporting his views.

included in Dutch property law, specified in extensive case law. Instead, he attaches decisive significance to avoiding the legal issues created by the treatment of these installations as immovable property. While the issues caused by qualification as immovable property are undesirable, the present author is of the opinion that this cannot be considered a valid justification for deviation from Dutch property law, which is the law Roelvink explicitly refers to.

The applicability of Dutch property law to installations in the territorial sea is without doubt. The adoption of a rule in line with the proposal by the State Commission would ensure the same for installations on the continental shelf and EEZ. In the following, it will be assessed whether these installations qualify as movable or immovable property pursuant to contemporary Dutch law, and whether problems such as those mentioned by Roelvink arise.

Pursuant to Dutch law, immovable property includes constructions and buildings which are permanently attached to the land.[100] The *travaux préparatoires* reveal that the land should be interpreted as the outer layer of the earth's crust and the solid layers beneath the crust.[101] Considering that the seabed is the outer layer of the earth's crust, albeit covered by water, it qualifies as the land in the sense of this provision. Permanently attached is interpreted as requiring that a construction is designed and inherently intended to stay in place for a prolonged period of time.[102] This relies on the intention of the constructing party; insofar this intention is clear to third parties through the nature and design of the construction.[103] The question whether constructions at sea, such as wind farms and oil or gas production platforms are immovable thus requires a case-by-case assessment. Arguments supporting classification of installations such as wind mills and oil and gas production platforms as immovable property are their size,[104] and – where applicable – their concrete foundations, which are designed and constructed with the sole purpose of supporting the

100 DCC, art 3:3(1).

101 C.J. van Zeben, M.M. Olthof in cooperation with J.W. Du Pon (eds), *Parlementaire Geschiedenis van het Nieuwe Burgerlijk Wetboek. Boek 3. Vermogensrecht in het algemeen* (Kluwer 1981) 69. No different opinions have been supported since, according to *Groene Serie Vermogensrecht*, DCC, art 3:3, comment 16 (1–1-2017).

102 Netherlands Supreme Court, 13 June 1975, ECLI:NL:HR:1975:AC3080 (*Amercentrale*); Van Zeben, Olthof and Du Pon (n 101) 69.

103 Netherlands Supreme Court, 23 February 1994, ECLI:NL:HR:1994:ZC5591 (*Inzake Onroerende Windmolens*); Netherlands Supreme Court 13 May 2005, ECLI:NL:HR:2005:AT5469; Netherlands Supreme Court, 31 October 1997, ECLI:NL:HR:1997:ZC2478 (*Portacabin*) para 3.3.

104 Netherlands Supreme Court, 8 July 1997, ECLI:NL:HR:1997:AA2223 (*Rijdende Havenkranen I*); Netherlands Supreme Court 24 December 2010, ECLI:NL:HR:2010:BO3644 (*Rijdende Havenkranen II*); H.D. Ploeger, 'Een mobiele onroerende zaak?' (1998) 6321 WPNR 472.

installations.[105] Further arguments include that these installations have the sole purpose to produce electricity, oil or gas and that they are not constructed for temporary use. Indeed, many of these installations have been in place for a long period time which has been brought forward as evidence of the intention by Advocate-General to the Dutch Supreme Court Mok.[106] This sufficiently supports that offshore production platforms and wind farms are permanently attached to the land, as was also concluded in a case regarding onshore wind mills by Advocate-General Moltmaker.[107] As a result, both requirements are satisfied, and installations in the territorial sea, on the continental shelf and in the EEZ would qualify as immovable property and thereby also as registered property.

4.5 *Ownership and Registration*

As a consequence of the conclusion that production platforms and wind farms in the EEZ and continental shelf would be immovable property if Dutch law applied, questions of ownership and registration should be taken into consideration when discussing mortgage.

Firstly, ownership of the seabed should be considered. Pursuant to UNCLOS 1982, the seabed beneath the territorial sea is subject to national sovereignty, while the seabed beyond the territorial sea is not owned by the coastal state. Dutch law provides that the state is the owner of the seabed beneath the territorial sea.[108] It further provides that the state owns immovable property which has no other owner.[109] This would include the seabed beyond the territorial sea after adoption of a rule as proposed by the State Commission. The DCC also provides that the ownership of the land comprises buildings and constructions permanently attached to the soil.[110] The Dutch state thus is the owner of

105 Conclusion Advocate-General A.J. Moltmaker in *Inzake Onroerende Windmolens* (n 103).

106 Conclusion Advocate-General Mok, ECLI:NL:PHR:1980:AC1719, who interprets permanent as at least several years. Also referred to by Advocate-General Moltmaker in his conclusion in *Inzake Onroerende Windmolens* (n 103).

107 Conclusion Advocate-General A.J. Moltmaker in *Inzake Onroerende Windmolens* (n 103).

108 DCC, art 5:25.

109 DCC, art 5:24.

110 DCC, art 5:20. Many scholars support the view that pursuant to DCC, art 3:4 buildings and installations such as wind mills, in line with Roman law, accede to the land, Th.F. de Jong, *De structuur van het goederenrecht* (PhD thesis, University of Groningen 2006) 115 fn 196. The owner would thus also be the owner of the seabed. This rule of law also formed the basis of the argument mentioned by Roelvink that installations on the continental shelf beyond the territorial sea become *res nullius* through accession to the seabed. However, as the alternative is that no law applies (*locus sine lege*), this conclusion implies that Dutch property law applies which also contains the aforementioned DCC, art 5:24, which provides that the state would be the owner of the seabed rather than it being a *res nullius*.

the wind turbines, transformer stations and transmission cables in the territorial sea and would also be the owner of those on the Dutch continental shelf beyond the territorial sea were the suggested rule adopted. To avoid this, the state has to grant developers a right of 'long leasehold' (*erfpacht* bears some similarities to leasehold) for the relevant seabed area and rights of superficies (*opstalrecht*) regarding the installations and cables. This is already done for wind farms constructed on the seabed of the Dutch territorial sea.[111]

Secondly, the requirements of Dutch law regarding the registration of notarial deeds cause practical problems. Comparable to other jurisdictions, Dutch law requires the entry of deeds for the establishment and transfer of immovable property and property rights therein into the appropriate public registers. This includes the aforementioned rights of long leasehold and right of superficies. To allow for registration, the public registers should extend to the Dutch continental shelf beyond the territorial sea, which is currently not the case.

5 Conclusions

Capital expenditures in the offshore energy sector are high. The investments in offshore wind and electricity and gas transport infrastructure in particular are increasing. The investments in ocean energy and the re-use of installations, for example for storage purposes or power-to-gas, may also greatly increase in the coming decades motivated by targets for carbon emissions reduction and electricity consumption from renewable energy sources.

It is common practice that debt is raised to finance large energy and infrastructure projects. The greater the risks, the higher the cost of capital. The debt providers require a comprehensive security package to hedge their risks. Mortgage is commonly used and the strongest onshore security right in the Netherlands, but currently cannot be used in the EEZ. The first question is which laws regulate such a transaction. Analysis of public international law results in the conclusion that the coastal state can exercise full civil jurisdiction over artificial islands, installations and structures within its jurisdiction in the EEZ and on its continental shelf. Subsequently, the legal situation depends on whether the coastal state has exercised its jurisdiction. In jurisdictions where such laws are not in place and the *lex rei sitae* is used to determine which property laws apply, a *locus sine lege* or legal vacuum exist as regards property

111 Johan Dekkers, 'Rapportage Proces Vergunningverlening Offshore Windpark Egmond aan Zee' (Noordzeewind, August 2007) <www.noordzeewind.nl/wp-content/uploads/2012/02/OWEZ_R_192_20070820_vergunningen.pdf>.

laws. This vacuum may be resolved by the judiciary, but this does not provide investors with certainty.

Considering that most states worldwide use the *lex rei sitae* to determine which property laws apply and that practice in the countries bordering the North Sea shows that the adoption of property laws governing installations on the continental shelf and in the EEZ is not commonplace, it is expected that a property law vacuum exists in a significant number of coastal states. The impossibility to mortgage installations on the seabed could be resolved with the adoption of a rule of private international law stating that installations connected to the continental shelf should be treated as if they were situated within the territory of the coastal state. The public registers would have to be extended to the continental shelf and EEZ. Further rights may have to be granted by the state, depending on the applicable laws on accession and ownership. In line with Dutch law, the state may have to grant rights of long leasehold and superficies to transfer ownership of the installations.

The adoption of legislation allowing for the mortgaging of offshore installations can increase legal certainty and strengthen the security package offered by parties using debt to finance their business. In coastal states where the cost of capital is comparatively high, consequences can include a reduction in the cost of capital, increased investor appetite and the realization of additional projects at sea.