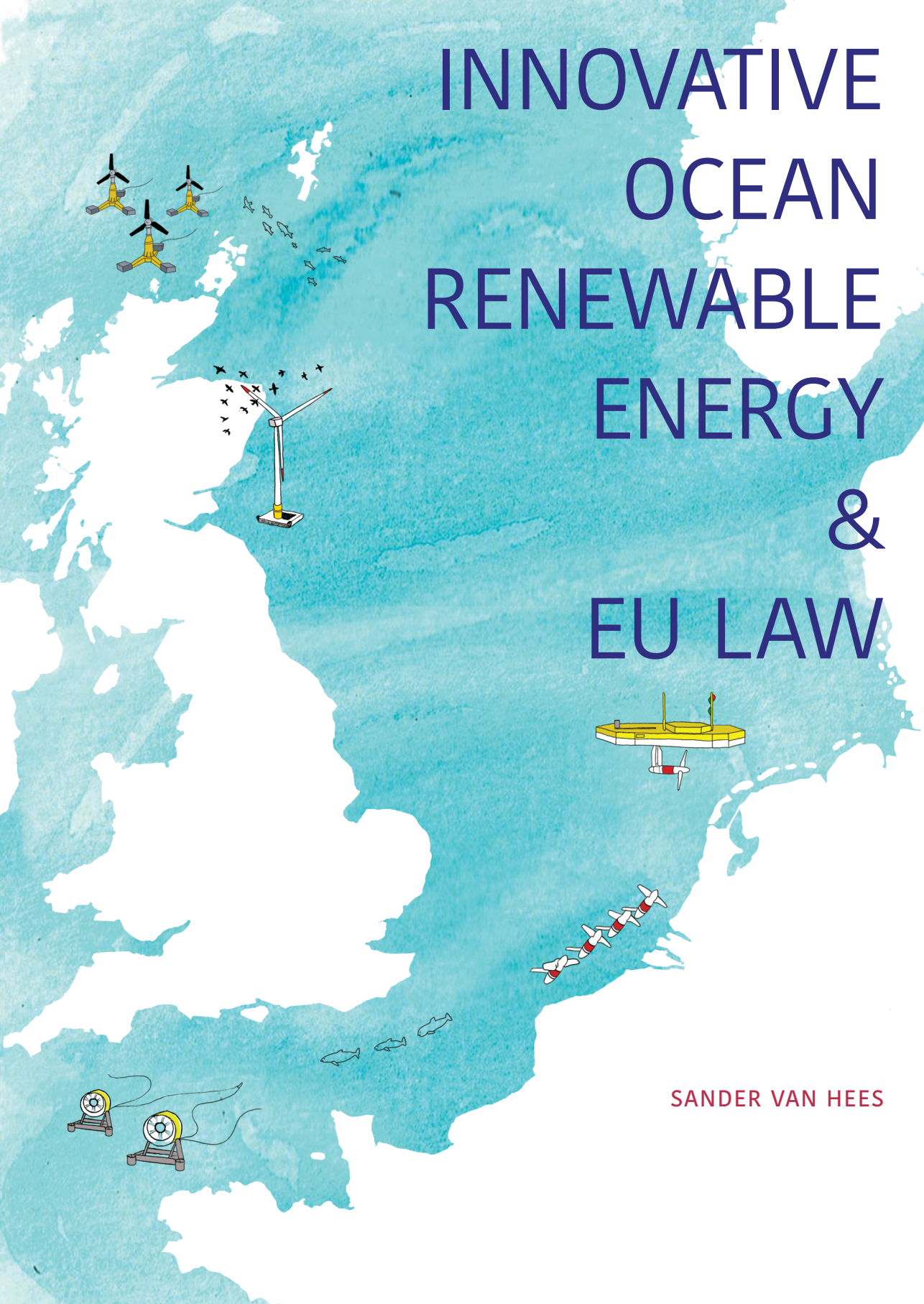
INNOVATIVE OCEAN RENEWABLE ENERGY & EU LAW



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INNOVATIVE OCEAN RENEWABLE ENERGY & EU LAW

Towards the Integration of the EU's Environmental, Economic and Renewable Energy Policy Areas

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INNOVATIVE OCEAN RENEWABLE ENERGY
&
EU LAW

Towards the Integration of the EU's Environmental, Economic and Renewable Energy Policy Areas

Innovatieve duurzame energie uit de zee & Europees recht
Op weg naar de integratie van het milieubeleid, het economische beleid
en het duurzame-energiebeleid van de Europese Unie
(met een samenvatting in het Nederlands)

Proefschrift

ter verkrijging van de graad van doctor aan de Universiteit Utrecht op gezag van de rector magnificus, prof.dr. H.R.B.M. Kummeling, ingevolge het besluit van het college voor promoties in het openbaar te verdedigen op
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PREFACE

The French ocean explorer Jacques-Yves Cousteau spoke the following true words:

"For most of history, man has had to fight nature to survive; in this century he is beginning to realise that, in order to survive, he must protect it."

Today, the understanding that nature needs to be protected seems to be more present than ever in the European Union. We have European rules that oblige us to protect amongst others birds, seals, harbour porpoises, the habitats of these animals, and the quality of sea and river water. Moreover, the EU's Member States have made binding agreements in order to fight global warming, including the commitment to produce twenty per cent of their energy from renewable sources in the year 2020. In the year 2030 this percentage should have even risen to over thirty per cent.

We thus see a European Union that appears to be a rather successful platform for concluding binding agreements on the protection of the environment. Yet the roots of the EU as an organisation do not lie in the protection of the environment. Indeed, the economic values at the foundation of the EU can sometimes form a barrier to the implementation of measures aimed at protecting the environment. One can think, for example, of the state aid rules, which set limits on the height of government subsidies for renewable energy projects, to maintain a level playing field on the market. A further challenge lies in the fact that different policy instruments that aim at environmental protection may be mutually opposing. One can think here of turbines that harvest energy from the tides. On the one hand these contribute to achieving the European renewable energy goals. On the other hand the moving parts of these turbines could pose a threat to protected harbour porpoises and salmon.

It is precisely these policy tensions to which this dissertation aims to respond by mapping mutually opposing rules and finding corresponding solutions. These solutions aim to contribute to a smooth but balanced transition to an increased European renewable energy supply. In that quest, this dissertation focuses on the most interesting forms of renewable energy production: innovative methods to convert waves, tidal streams and even differences in salt concentration into electricity. Potentially, these types of energy-from-the-sea projects can be applied in the EU on a large scale in the future. They could then make an important contribution to an increased European renewable energy supply, and as such to the protection of the European environment. In order to get to this point, however, the right balance should be found between opposing rules in the areas of the environment, the economy and renewable energy. This dissertation investigates how these policy areas relate according to EU law. Moreover, it offers instruments that can help to find a

better balance between these policy areas. Finding this balance is necessary for the protection of the environment, and therewith –in the words of Cousteau– necessary for our own protection.

VOORWOORD

De Franse oceaan-ontdekkingsreiziger Jacques-Yves Cousteau sprak de volgende ware woorden:

"For most of history, man has had to fight nature to survive; in this century he is beginning to realise that, in order to survive, he must protect it."

Het besef dat de natuur moet worden beschermd lijkt in de Europese Unie op dit moment sterker aanwezig dan ooit: we hebben Europese regelgeving die ons dwingt om o.a. vogels, zeehonden, bruinvissen, de leefgebieden van deze dieren, en de kwaliteit van het zee- en rivierwater te beschermen. Daarnaast hebben de EU-lidstaten bindende afspraken gemaakt om opwarming van de aarde tegen te gaan; onder andere door in het jaar 2020 twintig procent van hun energie uit duurzame bronnen te produceren. Voor het jaar 2030 zou het percentage duurzame energie zelfs op meer dan dertig procent moeten liggen.

We zien een Europese Unie die een betrekkelijk succesvol platform blijkt te zijn voor het maken van bindende milieubeschermingsafspraken. Toch is de EU van oorsprong geen milieubeschermingsorganisatie. De economische waarden die aan de EU ten grondslag liggen kunnen soms een belemmering vormen voor het uitvoeren van maatregelen ter bescherming van het milieu. Denk aan de staatssteunregels, die grenzen stellen aan de hoogte van overheidssubsidies voor duurzame-energieprojecten, ter bescherming van een gelijk speelveld op de markt. Daarnaast kunnen ook verschillende beleidsinstrumenten ter bescherming van het milieu elkaar onderling tegenwerken. Denk aan turbines voor de opwekking van getijdenenergie. Aan de ene kant leveren die een bijdrage aan het behalen van de Europese duurzame-energiedoelstellingen. Aan de andere kant zouden de draaiende delen van deze turbines een gevaar kunnen vormen voor beschermde bruinvissen en zalmen.

Het zijn precies deze spanningsvelden waar dit proefschrift een bijdrage aan wil leveren: het in kaart brengen van elkaar tegenwerkende regels en daar oplossingen voor aandragen. Deze oplossingen pogen een bijdrage te leveren aan een soepele doch gebalanceerde transitie naar een grotere Europese duurzame-energievoorziening. Dit proefschrift focust in die zoektocht op de meest interessante vormen van duurzame energieproductie: innovatieve methodes om golven, getijdenstromingen en zelfs verschillen in zoutconcentratie om te zetten in elektriciteit. In potentie kunnen dit soort energie-uit-de-zee-projecten in de toekomst op grote schaal worden toegepast om een belangrijke bijdrage te leveren aan een duurzamere Europese energievoorziening, en daarmee aan de bescherming van het Europese

milieu. Daarvoor moet er echter wel een goede balans worden gevonden tussen tegenstrijdige regels op het gebied van milieu, economie en duurzame energie. Dit proefschrift gaat over hoe deze beleidsgebieden zich –middels het Europese recht– tot elkaar verhouden en biedt instrumenten voor het vinden van een betere onderlinge balans tussen deze beleidsgebieden. Het vinden van een goede balans is noodzakelijk voor de bescherming van het milieu, de natuur en het klimaat, en daarmee –in de woorden van Cousteau– voor de bescherming van onszelf.

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4 State aid

5 Water Framework Directive

7 Maritime Spatial Planning

8

ABBREVIATIONS

AA	Appropriate Assessment (Habitats Directive)
ACM	Autoriteit Consument en Markt (Dutch National Competition Authority)
AG	Advocate General at the European Court of Justice
CAPEX	Capital Expenditure
CCGT	Combined Cycle Gas Turbine
CHP	Combined heat and power installation
DOI	United States Department of the Interior
EC	European Community (until 30 November 2009)
ECJ	European Court of Justice
ECLI	European Case-Law Identifier
ECR	European Court Report
EEA	European Environment Agency
EEAG	The European Commission's Guidelines on State aid for environmental protection and energy 2014-2020
EELF	European Environmental Law Forum
EIA	Environmental Impact Assessment (Directive 2011/92/EU)
EIP	European Innovation Partnership
EMEC	European Marine Energy Centre (Scotland)
EQR	Ecological quality ratio (Water Framework Directive)
ETI	The UK's Energies Technology Institute
EU	European Union
EU ETS	The European Union's Emissions Trading System
EU SDS	Renewed EU Sustainable Development Strategy (2006)
EuGH	Gerichtshof der Europäischen Union
FOAK	First-of-a-kind
GBER	General Block Exemption Regulation (Commission Regulation (EU) No 651/2014)
GES	Good environmental status (Marine Strategy Framework Directive)
HBD	The Habitats and Birds Directives

HRA	Habitats Regulations Appraisal (Scotland)
ICF	ICF Inc. (a global consulting services company)
IEA	International Energy Agency
IMARES	Wageningen IMARES (applied marine ecological research institute, part of Wageningen University & Research Centre)
IRENA	International Renewable Energy Agency
IROPI	Imperative reason of overriding public interest (Habitats Directive)
IRR	Internal Rate of Return
JRC	The European Commission's Joint Research Centre
MSFD	Marine Strategy Framework Directive
MSP	Maritime Spatial Planning
MW	Megawatt
MWh	Megawatt hour
NER 300	The European Commission's NER 300 subsidy programme (Commission Decision 2010/670/EU)
NGO	Non-governmental organization
OES	The Ocean Energy Systems Technology Collaboration Programme
OJ	Official Journal of the European Union
OTEC	Ocean Thermal Energy Conversion
PFOW	The Pentland Firth and Orkney Waters (Scotland)
PhD	Doctor of Philosophy
R&D	Research and Development
RBMP	River Basin Management Plan (Water Framework Directive)
RED	The Renewable Energy Directive (2009/28/EC)
SAM	The State aid modernisation initiative
SEA	Strategic Environmental Assessment (Directive 2001/42/EC)
SET	Sustainable Energy Technology
SMEs	Small and medium-sized enterprises
SNH	Scottish Natural Heritage (a Scottish public body)
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union
TRL	Technology Readiness Level
UK	The United Kingdom
WFD	Water Framework Directive (2000/60/EC)

INTRODUCTION

1

1. PAINTING THE CONTEXT

The promotion of the increased use of renewable energy in the European Union (EU) is an important element of the EU's approach to reducing greenhouse gas emissions. It contributes to the EU's efforts to comply with the Kyoto Protocol to the United Nations Framework Convention on Climate Change,[1] and with subsequent conventions including the Paris Agreement to limit global warming to well below 2°C, as adopted at the Paris climate conference (COP21) in December 2015.[2] EU renewable energy policy started in the 1970s and 1980s as a mainly *economic policy area* as a way to curb oil dependence, to enhance European energy security, and to develop economic activity in less wealthy regions. Since the 1990s it has also become –triggered, partly, by the 1992 Rio Earth Summit and the 1997 Kyoto Protocol– an indispensable part of the EU's environmental and climate policies.[3] Despite its clear economic aspects –with regard to revenues, R&D, employment and export opportunities stemming from the sector[4]– renewable energy policy became a policy area which serves both economic and non-economic policy goals.[5] This distinction is important when balancing conflicting policy interests in the light of the concept of sustainable development – see section 5.3.2 of this introduction for a further elaboration of this distinction. In that sense, the EU's (renewable) energy policy could be seen as an integral part of the EU's 2020 strategy, which aims to turn the EU into a smart, sustainable and inclusive economy.[6]

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1 See Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16.

2 Commission Communication, 'The Road from Paris: assessing the implications of the Paris Agreement and accompanying the proposal for a Council decision on the signing, on behalf of the European Union, of the Paris agreement adopted under the United Nations Framework Convention on Climate Change' (COM/2016/0110 final).

3 I Solorio and P Bocquillon, 'EU renewable energy policy: a brief overview of its history and evolution' in: I Solorio and H Jörgens (eds), *A Guide to EU Renewable Energy Policy – Comparing Europeanization and Domestic Policy Change in EU Member States* (Edward Elgar 2017) pp 24-26.

4 The Renewable Energy Directive states, for instance, that: "The opportunities for establishing economic growth through innovation and a sustainable competitive energy policy have been recognised. Production of energy from renewable sources often depends on local or regional small and medium-sized enterprises (SMEs). The opportunities for growth and employment that investment in regional and local production of energy from renewable sources bring about in the Member States and their regions are important." Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, paragraph 3 of the preamble.

5 See section 5.3.2. of this introduction for a further elaboration on the difference between economic policy areas and non-economic policy areas.

6 Europe 2020 – A European strategy for smart, sustainable and inclusive growth (2010) Commission Communication, COM(2010) 2020.

The Renewable Energy Directive (RED) is one of the tools that the EU uses to comply with the aforementioned international obligations.[7] The directive requires the Member States to comply with mandatory and individual renewable energy targets. For instance, in 2020 the share of energy use from renewable sources should be 14% in the Netherlands, 23% in France, and 15% in the UK.[8] In order to meet these targets the directive requires the Member States to encourage the production of energy from "all types of renewable sources".[9] Apart from wind and solar energy, which are established forms of renewable energy production, these sources also include sources that require *innovative* water-related techniques. Tidal energy, wave energy, and salinity gradient energy (the latter is sometimes also called 'blue energy') are examples of such techniques. Together, these techniques are often referred to as 'marine energy' or 'ocean energy'. According to the European Commission, ocean renewable energy sources can play an important role with respect to energy security and reaching Europe's decarbonisation goals.[10] The move from a largely fossil-based energy supply towards an energy supply that is mainly based on renewable sources is often referred to as the 'energy transition'.[11]

Before innovative ocean renewable energy projects can be implemented on a large scale in the European Union, it will be necessary to deal with several technological,[12] financial, economic, environmental, social[13] and legal[14] issues. Experiences in the field of wind energy provide an indication of what may be the main legal issues which play a role in the development of ocean energy towards large-scale deployment. Wind energy projects on land and at sea, and related research and reports, have shown that while renewable energy projects are partly beneficial to the environment, they

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7 The Renewable Energy Directive is part of the EU's 2020 package, which is a set of binding legislation to ensure that the EU meets its climate and energy targets by the year 2020. The package sets three key targets: 20% cut in greenhouse gas emissions (from 1990 levels), 20% of EU energy from renewables, 20% improvement in energy efficiency. See: https://ec.europa.eu/clima/policies/strategies/2020_en.

8 See Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, annex I.

9 Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, articles 6 and 14.

10 European Commission, Communication, Blue Energy – Action needed to deliver on the potential of ocean energy in European seas and oceans by 2020 and beyond, COM(2014) 8 final (20 January 2014), pp 2-3. The Commission uses the term 'ocean energy', which is somewhat confusing as some of the techniques that are covered by this term (tidal energy and salinity gradient energy in particular) can also be used in an inshore or onshore configuration. Nevertheless, this dissertation adopts the Commission's use of terminology by using the term 'ocean energy', instead of 'marine energy'.

11 The EU needs to reach 20% renewable energy consumption in 2020, and to reach 32% in 2030. See https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2020-energy-strategy, and http://www.europarl.europa.eu/news/en/press-room/20180614IPR05810/energy-new-target-of-32-from-renewables-by-2030-agreed-by-meps-and-ministers. Accessed 8 July 2018.

12 The main short-term barriers to ocean energy developments –especially in the case of wave energy– are still technology issues. European Commission Joint Research Centre, 'Ocean Energy Status Report – Technology, market and economic aspects of ocean energy in Europe: 2016 edition – Study' (2017) 22, 26, DOI: http://dx.doi.org/10.2760/509876.

13 Cf. S Akerboom, 'Between public participation and energy transition: the case of wind farms' (2018) PhD Thesis, forthcoming.

14 G Wright, et al., *Establishing a legal research agenda for ocean energy*, 63 Marine Policy (2016).

may still have negative environmental effects.[15] These environmental effects have led, and still lead, to EU environmental law barriers to wind energy projects in the EU.[16] Bird-turbine collisions is the most well-known negative environmental effect of wind energy. As innovative water-related renewable energy projects are usually located in pristine natural environments, it may be expected that also these techniques will face EU environmental law barriers. *Johnson, Kerr and Side* have referred to future issues raised by the advancement of ocean renewables in the following manner:

> "There are a number of choices and trade-offs to be made at temporal and spatial scales. Exchanging […] for example a relatively pristine scenic marine environment for a marine energy industrialised seascape and a reduction in global carbon emissions, substituting non-market environmental goods for energy security and economic growth."[17]

Apart from the environmental law aspects, experience from the different development phases of wind energy in the EU also shows that substantial amounts of public financial incentives are required to assist the development of new renewable energy technology. These are required, first, to reach technological maturity, and second, to find its way to the market.[18] These public financial incentives include incentives during the investment phase and during the operational phase. The scope of any public financial incentive programme is subject to the EU's rules and policy on state aid. In comparison to the era of wind energy technology development (roughly from the 1980s until the 2000s), the EU state aid framework has been substantially reformed pursuant to the State aid modernisation initiative (SAM), which was practically completed in 2014.[19] Therefore, it is particularly interesting to look at the current interplay between public financial incentives aimed at innovative ocean renewable energy and the modernised EU state aid rules.

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15 For instance: JK Kaldellis and D Zafirakis, 'The wind energy (r)evolution: A short review of a long history' Renewable Energy 36 (2011) 1895.

16 See for instance R Frins and H Schoukens, *Balancing Wind Energy And Nature Protection: From Policy Conflicts Towards Genuine Sustainable Development?* in L Squintani and HHB Vedder (eds.), *Sustainable Energy United in* Diversity (EELF 2014).

17 KR Johnson, SA Kerr and JC Side, 'The Pentland Firth and Orkney Waters and Scotland – Planning Europe's Atlantic gateway' (2016) 71 Marine Policy 290. The quote continues as follows: "The dilemma is evident in the ecosystem aims of the Marine Strategy Framework Directive and the Integrated Maritime Policy of the EU. It has a deeper history and recalls the 19th century forestry arguments, between two giants of the US conservation movement. On one side John Muir's preservationist perspective argued for national parks to preserve wilderness areas as "fountains of life" for the "common good of people for all time", including for their existence values [J. Muir, Our National Parks, Diadem Books, London, 1992 (1st pub.1909)]. Gifford Pinchot's opposing utilitarian perspective advocated "the use of natural resources now... for the benefit of people who live here now", focusing more on their utility value [F. Turner, John Muir: from Scotland to the Sierra, Edinburgh, Cannongate, 1997.]"

18 A Bergek and S Jacobsson, 'The Emergence of a Growth Industry: A Comparative Analysis of the German, Dutch and Swedish Wind Turbine Industries' in J Metcalfe and U Cantner (eds), *Change, Transformation and Development* (Physica-Verlag Heidelberg 2003), sections 4.1.1-4.1.2, 4.2.1, and 5; JK Kaldellis and D Zafirakis, 'The wind energy (r)evolution: A short review of a long history' Renewable Energy 36 (2011) pp 1887 and 1895; P Harborne and C Hendry, 'Pathways to commercial wind power in the US, Europe and Japan: The role of demonstration projects and field trials in the innovation process' Energy Policy 37 (2009), pp 3583-3586.

19 N Pesaresi and T Beranger, 'State aid modernisation' in: N Pesaresi et al (eds), *EU Competition Law* (Claeys & Casteels 2016), pp 4-6.

Moreover, several recent and older EU court cases on wind energy developments –*Preussen Elektra*[20] and *Ålands Vindkraft*[21] in particular– have shown that the EU rules on free movement may also affect renewable energy projects. It is expected that free movement issues will also play a role with regard to ocean energy projects.

This dissertation assesses the main legal barriers that are expected to arise from EU law with respect to the following innovative ocean energy techniques: tidal energy, wave energy, and salinity gradient energy (see Figure 1).

Tidal stream

Source: https://www.offshorewind.biz

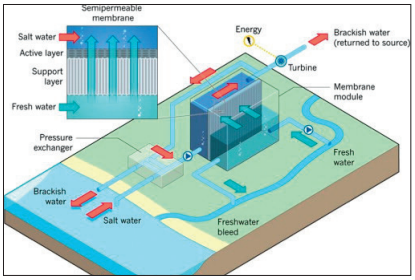
Tidal energy uses the power that is produced by tidal ebb and flow currents. One technique to harvest tidal energy is by using tidal stream turbines. Tidal stream turbines are usually installed at sites with high-speed currents, such as narrow straits, inlets, or channels between islands.

Wave energy

Source: http://www.corpowerocean.com

Wave energy is produced by generators which are placed on or under the surface of the ocean. The generators have at least one moving part, and a part which is able to convert the energy produced by the waves into electrical energy.

Salinity gradient energy



Source: https://app.griffith.edu.au/sciencesimpact/salt-to-energy

Salinity gradient energy is electrical energy which is harvested by the mixing of two water streams of different salinity. Salinity gradient power could be produced everywhere in the world where salt solutions of different salinity (for example fresh river water and seawater, or brine waste water and sea water) are available.

Figure 1. Main current ocean energy techniques in the European Union.

Based on: IRENA, 'Tidal Energy – Technology Brief' (2014), IRENA, 'Wave energy – Technology Brief' (2014), and IRENA, 'Salinity gradient energy – Technology Brief' (2014). Available at: www.irena.org/publications.

The reasons why this dissertation focuses on these techniques are threefold:

20 European Court of Justice, Case C-379/98 *Preussen Elektra,* paras 59-61. For a further analysis of this case, see S de Vries, 'European Court of Justice: Case Report – Case C-379/98: PreussenElektra' (2001) 10 European Environmental Law Review 193, 201-202. Also see the article on state aid in this dissertation.

21 See the article on the free movement of goods in this dissertation.

- First, most research that has already been carried out on legal barriers to renewable energy focuses on more established forms of renewable energy, including wind and solar energy; ocean energy has not been sufficiently covered so far.[22]
- Second, ocean renewable energy techniques are new and innovative techniques which bring about many technological,[23] environmental and financial uncertainties; these uncertainties involve legal issues that are different from those encountered by established techniques. Hence, ocean energy also provides an interesting case study for studying the concepts of implementation, integration and innovation. Moreover, the link with water raises additional interesting and new legal and governance challenges.
- Third, innovative techniques are necessary for meeting the EU's renewable energy targets for many reasons. These include the unpredictable energy revenue of wind and solar energy, which requires more predictable sources –like tidal and salinity gradient– to be added to the energy mix to serve as baseload sources, in order to help guarantee a balance on the electricity network. Increasingly limited available space on land in some Member States is another pressure creating a necessity for producing energy at sea.

Admittedly, there are more ocean renewable energy techniques under developments than the ones that are dealt with in the present dissertation. These include Ocean Thermal Energy Conversion (OTEC), energy harvested with kites that fly a predefined pattern at or near to the sea, and floating wind energy. The main reasons for not including these techniques in the research are: the technique is largely unsuitable for application in the EU (OTEC), or the technique is still in the early R&D phase resulting in a lack of information on the technique, its applicability, its feasibility and its (environmental) effects (energy produced by kites, and floating wind).

This dissertation explores the specific sources of ocean energy's main barriers in EU law, and it discusses a range of possible solutions. This is done with a view to finding solutions that guarantee the achievement of the EU's renewable energy, environmental, and economic policy goals – to the maximum level possible and in an balanced manner. In this way, this research aims to contribute to a possible revaluation of the EU's approach to the energy transition that is in line with the concept of sustainable development. The concept of sustainable development is used as the normative framework for this dissertation. A further elaboration of this concept is provided in section 5.3.

22 See for instance: G Wright, et al., *Establishing a legal research agenda for ocean energy*, 63 Marine Policy (2016).

23 The main short-term barriers to ocean energy developments –especially in the case of wave energy– are still technology issues. European Commission Joint Research Centre, 'Ocean Energy Status Report – Technology, market and economic aspects of ocean energy in Europe: 2016 edition – Study' (2017) 22, 26, DOI: http://dx.doi.org/10.2760/509876.

2. HYPOTHESIS

Based on past and current experiences with the development and implementation of wind energy techniques, the analysis of EU environmental and economic law, and interviews with stakeholders, the hypothesis of the present dissertation is that innovative ocean renewable energy techniques will face EU law and policy barriers on their path to reaching technological maturity, market access and large-scale deployment. These barriers are the result of both inconsistencies within the EU law and policy framework, and the mix of positive and negative effects that is an inherent aspect of all present-day renewable energy techniques. Subsequently, this research hypothesises that it is both possible *and* necessary –considering the rapidly approaching deadline for reaching the EU's renewable energy targets, and the large amount of time that a renegotiation of EU environmental and economic law would take– to solve these issues in the *short term* and *within* the current EU legal framework.

3. RESEARCH QUESTIONS

In order to structure the exploration of the aforementioned issues, the following general research question has been developed:

What barriers exist within EU law to large-scale innovative ocean renewable energy projects, and how can these be solved in line with the concept of sustainable development?

This question is explored by addressing the following sub-questions:

1. What areas of EU law are expected to raise the main barriers to large-scale innovative ocean renewable energy projects?
2. What elements in these areas of EU law raise those barriers?
3. Does EU law provide sufficient procedures for dealing with barriers to the development of large-scale innovative ocean renewable energy projects?
4. What are the possible solutions to guarantee an outcome of these procedures that is in line with the concept of sustainable development?

In the following sections of this introduction the concepts and terminology that are used in these research questions are explained. Subsequently, the research questions are linked to the normative framework used in this dissertation and to the academic articles that lie at the heart of this dissertation.

4. CENTRAL CONCEPTS AND TERMINOLOGY

This section explains the main concepts as used in: the research questions (section 3), in the articles, and in the normative framework (section 5.3).

a. EU law (and policy)

EU law in a 'narrow' sense encompasses EU sources of law that are binding upon the EU and the Member States. These include: primary sources (the Treaties –TEU and TFEU– and the Charter of Fundamental Rights), general principles of EU law, external sources (including international agreements), secondary sources (regulations, directives and decisions) and the case law of the European Court of Justice.

In this dissertation, the term 'EU law' refers to both EU law in a 'narrow' sense and the (binding and non-binding) EU policy measures used to draft, implement and enforce EU law. These include: strategy documents (such as the renewed EU Sustainable Development Strategy), guidelines (such as the Commission's state aid guidelines), and guidance documents (such as the Commission Guidance document on Article 6(4) of the Habitats Directive). It would probably be more accurate to refer to these sources separately as 'EU policy', but this has not been done everywhere in this thesis for the sake of efficiency and to prevent overly long and complicated sentences in particular. If parts of this dissertation mean to refer to EU law in a narrow sense (excluding policy) in particular, then this is indicated explicitly or the text will refer to the relevant source of EU law directly (e.g. a directive).

b. EU policy area

EU policy area', or 'policy area' or 'policy area of the European Union' is used in this dissertation as an umbrella term for all sources of law (e.g. directives and regulations) and policy documents (e.g. guidelines and strategies) that govern a specific sector or domain. EU policy areas include: environmental policy, energy policy and state aid policy.

c. Barriers

Barriers to renewable energy projects are those elements in EU law and policy that prevent the direct or smooth implementation of those projects that are –or may become– important[24] for achieving a Member State's renewable energy

24 It is suggested in the articles of this dissertation that 'important' renewable energy projects should be defined as projects that are important for reaching a Member State's national renewable energy targets under the Renewable Energy Directive. The introduction of detailed renewable energy plans per Member State could be used as a tool in this regard. Detailed national renewable energy plans would indicate *which types of projects at which sites* are essential in the light of achieving the Member State's renewable energy targets under the Renewable Energy Directive, and which are not. It should be flexible plans, that allow for additions and alterations, as policy and technological developments progress over time. For a further elaboration, see the article on the Habitats and Birds Directives (section 5.2), the article on the Water Framework Directive (section 5.2), the article on state aid (section 5.2), the article on Maritime Spatial Planning (section 6.2), and the conclusion of this dissertation.

targets pursuant to the Renewable Energy Directive. The present dissertation distinguishes between barriers in the following phases and at the following levels of governance:

Table 1. Phases and levels of governance of EU law

Phase	Level	Example
Strategy	EU	– EU Renewed Sustainable Development Strategy – EU Blue Growth Strategy
EU law	EU	– Habitats, Birds, Water Framework, Marine Strategy Framework and Marine Spatial Planning Directives – Renewable Energy Directive – Article 107 TFEU on state aid and Article 34 TFEU on the free movement of goods
Implementation and interpretation	EU	– Guidelines on State aid for environmental protection and energy – Commission Guidance document on Article 6(4) of the Habitats Directive – State aid decisions of the European Commission – Judgments of the European Court of Justice
Implementation of EU law	Member States	– Implementation of EU law in the national law of the Member States
Planning	Member States	– Programmes of measures pursuant to environmental directives – National renewable energy strategies – Maritime spatial plans
Implementation (lower level)	Member States (often a decentralised authority)	– Decisions in licensing procedures under environmental directives – Management measures pursuant to environmental directives – Applications of derogation clauses – Decisions to grant state aid – Judgments of Member State courts

The articles of this dissertation describe for every barrier discussed in which phase(s) and at what level(s) of governance this barrier comes to light.

d. Large-scale innovative ocean renewable energy projects

Projects based on techniques in early phases of development and relying on marine waters for the production of electricity (e.g. tidal, wave, salinity gradient energy). The addition 'large-scale' refers to a future in which these type of projects may be implemented on a large scale. Large-scale projects are the topic of this dissertation, which aims to map what barriers such future projects may face and how these may be solved.

e. Solutions

Measures that remove barriers raised by EU law or policy and that help to facilitate the implementation of those renewable energy projects that are –or may

become– important[25] for achieving a Member State's renewable energy targets pursuant to the Renewable Energy Directive. Various different measures may serve as solutions to the types of barriers discussed in the present dissertation. These include: changing legislation, changing policy, changing the application of law and policy at the EU level, and changing the application of law and policy at the national or sub-national level. Which mix of tools, instruments and policies is most suitable is part of the process to answer the aforementioned research questions. One barrier may have different possible solutions in different phases and at different levels of governance (see Table 1). The articles of this dissertation describe for every solution discussed in which phase(s) and at what level(s) of governance it may be implemented. The articles also discuss the advantages and disadvantages of implementing solutions in a specific phase and/or at a specific level of governance.

This research focuses on short-term solutions that can be implemented within the current EU legal framework. This dissertation hypothesises that it is necessary –considering the rapidly approaching deadline for reaching the EU's renewable energy targets, and the large amount of time that a renegotiation of EU environmental and economic law would take– to solve these issues in this way. This does not detract from the fact that changing EU legislation may be a possibility in the long term.

f. The concept of sustainable development

See section 5.

g. Fragmentation

In this dissertation the 'fragmentation of law' is understood as a situation in which areas of law that are interrelated are in practice partially or fully dealt with in isolation. In relation to environmental and renewable energy policy, for instance, both horizontal and vertical fragmentation can be distinguished. There is horizontal fragmentation, as the protection of habitats and species, on the one hand, and renewable energy, on the other, are dealt with in separate sectoral directives (multi-sector governance), and vertical fragmentation, as both policy areas are often dealt with by separate governmental bodies that are responsible for just one of the two policy areas (multi-level governance).[26]

h. (Policy) integration

See section 5.

25 See footnote 24 for an explanation of the concept of 'important' renewable energy projects.

26 For a further analysis of fragmentation in EU law in relation to renewable energy, see: K Van Hende, *Offshore Wind in the European Union – Towards Integrated Management of Our Marine Waters*, 68-69 and 77-78 (Wolters Kluwer 2015). For an overview of the history of the concept of fragmentation in the legal literature, see: H K Gilissen, et al., *Bridges over Troubled Waters: An Interdisciplinary Framework for Evaluating the Interconnectedness within Fragmented Flood Risk Management Systems*, 25(1) Journal of Water Law 12, 13-14 (2016).

i. The precautionary principle[27]

The precautionary principle is recognised in Article 191(2) TFEU (under the environmental title of the treaty) as a fundamental principle of EU environmental law,[28] and is reflected in the substantive rules of the Habitats, Birds, Water Framework and Marine Strategy Framework Directives.

Sadeleer describes the precautionary principle as follows:

"Whereas, under a preventive approach, the decision-maker intervenes provided that the threats to the environment are tangible, pursuant to the precautionary principle authorities are prepared to tackle risks for which there is no definitive proof that there is a link of causation between the suspected activity and the harm or whether the suspected damage will materialize. […] In other words, precaution means that the absence of scientific certainty–or, conversely, the scientific uncertainty–as to the existence or the extent of a risk should henceforth no longer delay the adoption of preventative measures to protect the environment."[29]

Hence, the precautionary principle requires that weight should be attached to uncertain negative environmental effects, in a similar way as to certain effects.

A clear expression of the precautionary principle can be found in Article 6(3) Habitats Directive and in the case law of the European Court of Justice, which state that competent authorities may only agree to new projects when they are certain that those projects will not have 'lasting adverse effects on the integrity' of the Natura 2000 sites in question, and 'where no reasonable scientific doubt remains as to the absence of such effects'.[30]

j. The proportionality principle

The proportionality principle as referred to in this dissertation is what in the EU is usually referred to as 'proportionality stricto sensu'. It concerns the balancing of two different –and often contradicting– interests.[31] It could be said that the proportionality stricto sensu test in fact seeks to guarantee a proper relation between the benefit gained by the policy measure chosen and the harm caused by it.[32]

This type of proportionality requires a balancing of:

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27 On the role, substance and authority of principles in EU (environmental) law, see: G Van Calster and L Reins, *EU Environmental Law* (Edward Elgar 2018) pp 17-19.

28 Article 191(2) TFEU provides: "Union policy on the environment shall aim at high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay".

29 N de Sadeleer, *EU Environmental Law and the Internal Market* (Oxford University Press 2014), p 69; Also see in this regard: AA Cançado Trindade, 'Principle 15 – Precaution' in: JE Viñuales (ed), *The Rio Declaration on Environment and Development – A Commentary* (Oxford University Press 2015), pp 404-405.

30 European Court of Justice, Case C-258/11, *Sweetman,* para 40.

31 See for instance: WT Eijsbouts, JH Jans, A Prechal and LAJ Senden (eds), *Europees Recht Algemeen Deel* (Europa Law Publishing 2015) 118.

32 Based on A Barak, *Proportionality – Constitutional Rights and their Limitations* (Cambridge University Press 2012) 343.

- the benefits gained by the public interest that is served by the implementation of the policy measure chosen, and
- the harm caused to other public interests caused by the implementation of that policy measure.[33]

In EU case law proportionality is usually considered to consist of two additional elements: 1) the suitability test: the policy measure in question must be suitable to achieve a legitimate aim under the treaty, and 2) the necessity test: the measure is the least restrictive (of the conflicting EU goal) measure possible.[34]

5. NORMATIVE FRAMEWORK: SUSTAINABLE DEVELOPMENT

The concept of sustainable development is used as a normative framework to evaluate the main elements of the research questions. It is used to evaluate, *first,* the EU law (and policy) barriers to innovative renewable energy projects and, *second,* to evaluate the possible solutions to these barriers. In order to give a solid basis for these evaluations, sections 5.1 and 5.2 discuss the substance of the concept of sustainable development, and how it is interpreted in EU law and policy. Section 5.3 explores how the concept of sustainable development can be applied and how it serves as a normative framework in the context of this dissertation.

5.1 The concept of sustainable development

The origins of the concept of sustainable development can be traced back to the report 'The Limits to Growth' published by the Club of Rome in 1972.[35] This report observed that the Earth is finite, and that there are limitations to its exploitation.[36] It stated

33 Based on Barak's explanation of proportionality strictu sensu in the context of the balancing of public interests and constitutional rights: "The last test of proportionality is the "proportional result," or "proportionality stricto sensu" (Verhältnismässigkeit im engeren Sinne). This is the most important of proportionality's tests. What does the test require? According to proportionality stricto sensu, in order to justify a limitation on a constitutional right, a proper relation ("proportional" in the narrow sense of the term) should exist between the benefits gained by fulfilling the purpose and the harm caused to the constitutional right from obtaining that purpose. This test requires a balancing of the benefits gained by the public and the harm caused to the constitutional right through the use of the means selected by law to obtain the proper purpose. Accordingly, this is a test balancing benefits and harm. It requires an adequate congruence between the benefits gained by the law's policy and the harm it may cause to the constitutional right." A Barak, *Proportionality – Constitutional Rights and their Limitations* (Cambridge University Press 2012) 340.

34 Cf. S Kingston, 'Integrating environmental protection and EU competition law: why competition isn't special', *European Law Journal*, Vol 16, No 6, 2010, p 789; and G Van Calster and L Reins, *EU Environmental Law* (Edward Elgar 2018) p 21.

35 In fact, the essence of the concept of sustainable development featured in writings from a much earlier date, including those of the English cleric and scholar Thomas Malthus who already observed back in the year 1798 *inter alia* that 'the increase of population is necessarily limited by the means of subsistence'. See T Malthus, 'An essay on the principle of population' (London, 1798), available from: http://www.esp.org/books/malthus/population/malthus.pdf.

36 On planetary boundaries, also see S Suykens, 'The Law of the River – The Institutional Challenge for Transboundary River Basin Management and Multi-Level Approaches to Water Quantity Management' (2017) PhD Thesis.

that an increase in human activity will inevitably lead to trade-offs in terms of the production of food, the consumption of resources, and in the generation and clean-up of pollution.[37] The concept of sustainable development was popularised by a report entitled 'Our Common Future' in 1987,[38] which is also referred to as the 'Brundtland Report'. The core message of this report is that while striving for economic growth and better lives we should at the same time protect the environment and stop asking more from the Earth than it can give us over the longer term (no overexploitation).[39] The Brundtland Commission gave the name *sustainable development* to this *parallel* (or *integrated*) approach to economic development and environmental protection and used the following definition for this concept:

> 'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'[40]

The idea of sustainable development demands that we (ourselves, our governments and our businesses) make sure that while producing products and services, *renewable resources* (such as forests and fish stocks) will not be degraded beyond reasonable recovery. As far as *non-renewable resources* (such as oil, gas and minerals) are concerned, we can use them but they should not run out before acceptable substitutes are available. Also, their adverse effects on the environment should be minimised.[41] Ultimately, the concept of sustainable development requires us to take social, environmental and economic elements into account in all decisions.[42]

5.2 Sustainable development in EU law and policy

Through its *Renewed EU Sustainable Development Strategy* (EU SDS) and in subsequent policy documents, the European Council embraced the Brundtland Commission's definition of sustainable development. The EU SDS emphasises that the Treaty on European Union (TEU) and the Treaty on the Functioning of the European Union (TFEU) designate sustainable development as an overarching objective of the

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37 The report continues by observing that "In general, modern society has not learned to recognize and deal with these trade-offs. The apparent goal of the present world system is to produce more people with more (food, material goods, clean air and water) for each person. In this chapter we have noted that if society continues to strive for that goal, it will eventually reach one of many earthly limitations." See DH Meadows et al., *The Limits to Growth* (Universe Books 1972) 86-87.

38 Misiedjan, Daphina (2017), *Towards A Sustainable Human Right to Water*, 95.

39 S van Hees, 'Sustainable development in the EU – Redefining and operationalizing the concept' (2014) 10 Utrecht Law Review, 64-65; Also see: F Bierman, 'The Anthropocene: A governance perspective' (2014) 1 The Anthropocene Review.

40 World Commission on Environment and Development (WCED), *Our Common Future,* 1987, Chapter 2, paragraph 1.

41 S van Hees, 'Sustainable development in the EU – Redefining and operationalizing the concept' (2014) 10 Utrecht Law Review 65; World Commission on Environment and Development (WCED), *Our Common Future,* 1987, chapter 2, Paras. 11-14.

42 These three elements are also reflected in Article 3(3) TEU on the aims of the European Union and must be seen as being of equal importance and not imposing a hierarchy. Also see in this regard: N De Sadeleer, *EU Environmental law and the internal market* (Oxford University Press 2014) p 17.

European Union, governing all of the Union's policies and activities.[43] While the Treaties do not give a definition of the concept of sustainable development, they show that *policy integration* is one of the most important tools to achieve sustainable development.

The importance of policy integration is first of all expressed by Article 3(3) TEU, which states that it is one of the goals of the EU to achieve:

> 'the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment.'

Furthermore, the importance of policy integration is emphasised by the so-called general 'integration clause' in Article 7 TFEU:

> 'The Union shall ensure consistency between its policies and activities, taking all of its objectives into account and in accordance with the principle of conferral of powers.'

Finally, Article 11 TFEU provides for a similar integration obligation, but focuses on environmental protection:

> 'Environmental protection requirements must be integrated into the definition and implementation of the Union policies and activities, in particular with a view to promoting sustainable development.'

Moreover, a strong reference to policy integration and sustainable development is laid down in Article 37 of the Charter of Fundamental Rights of the European Union, which reads:

> 'A high level of environmental protection and the improvement of the quality of the environment must be integrated in to the policies of the Union and ensured in accordance with the principle of sustainable development.'

While these Treaty (and Charter) provisions are only binding upon the EU,[44] Member States are also obliged to comply with sustainable development when they take action in policy areas which have been partly or fully harmonised by EU law. This may be derived from the principle of sincere cooperation as laid down in Article 4(3) TEU.[45] Moreover, Member States will automatically be required to apply aspects

43 Council of the European Union, 'Renewed EU Sustainable Development Strategy' (annex to Council Note 10917/06) (2006) 2.

44 For a further elaboration on the binding nature of policy integration, see: N De Sadeleer, *EU Environmental law and the internal market* (Oxford University Press 2014) pp 25-27.

45 S van Hees, 'Sustainable development in the EU – Redefining and operationalizing the concept' (2014) 10 Utrecht Law Review 64; Cf N Dhondt, *Integration of environmental protection into other EC policies – Legal theory and practice* (Europa Law Publishing 2003) pp 34-37 and 48-49.

of sustainable development –such as policy integration– when they implement secondary EU law that reflects these aspects.[46]

5.3 Applying sustainable development: A normative framework

In the EU the concept of sustainable development has been given further shape through eight so-called 'policy guiding principles', which are listed in the Renewed EU Sustainable Development Strategy (EU SDS). These could be seen as the *tools* that can help sustainable development to be achieved.[47] The most prominent of these principles is the principle of *policy integration* – which can be traced back to the 1992 Rio Declaration on Environment and Development.[48] This principle requires the EU to *take into account* all policy objectives that relate to sustainable development in the decisions they take.[49] These include economic, social and environmental policy objectives, often referred to as *people, planet and profit*.[50] But what does 'to take into account' mean in this context? According to the EU SDS it means that policies should be 'coherent and mutually reinforce each other'. Section 5.3.1 gives a further elaboration of the principle of policy integration.

Another policy guiding principle that is especially relevant for renewable energy policy is *solidarity within and between generations*.[51] In section 5.3.2. this principle is further discussed.

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46 Cf. N Dhondt, *Integration of environmental protection into other EC policies – Legal theory and practice* (Europa Law Publishing 2003) p 34.

47 S van Hees, 'Sustainable development in the EU – Redefining and operationalizing the concept' (2014) 10 Utrecht Law Review 66; Misiedjan, Daphina (2017), *Towards A Sustainable Human Right to Water*.

48 The parallel provision is Principle 4 of the Rio Declaration, which reads: "In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it." United Nations, General Assembly, 'Report of the United Nations Conference on Environment and Development (Rio de Janeiro, 3-14 June 1992) – Annex I – Rio Declaration on Environment and Development'. Available at: http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm.

49 Council of the European Union, *Renewed EU Sustainable Development Strategy* (annex to Council Note 10917/06), 2006, pp 5-6.

50 John Elkington introduced the linked concepts of the 'triple bottom line' and 'People, Planet & Profit' in his book *Cannibals With Forks.* J Elkington, *Cannibals with Forks* (John Wiley & Sons 1999). Also see Elkington on this topic in a more recent book: "Our focus can no longer be on a single, financial bottom line. Future success— lasting success— will mean much more than posting positive quarterly earnings or boosting stock prices by a penny a share. In a world that is increasingly intertwined and interdependent, we must consider people and the planet as well as profits. We must build the foundations of tomorrow's prosperity by expanding the focus of accounting and reporting from financial and manufactured forms of capital (for example, infrastructures, buildings, and equipment) to embrace other forms, including intellectual (intellectual property, patents, tacit knowledge, and intangible assets like brands), human (people's competencies, capabilities, and experience), social (shared norms, common values, key stakeholder relationships, and an organization's social license to operate), and natural (air, water, land, minerals, forests, biodiversity, and wider ecosystem health) forms." J Elkington and J Zeitz, *The Breakthrough Challenge: 10 Ways to Connect Today's Profits with Tomorrow's Bottom Line* (John Wiley & Sons 2014) 2-3.

51 The parallel provision is Principle 3 of the Rio Declaration, which reads: "The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations."

The following sections assess the content of the above-mentioned policy guiding principles, how these principles relate to each other and how they can be applied in practice.

5.3.1 The principle of policy integration: The requirement of a balancing of interests

While both the Treaties and the EU SDS position policy integration as an important concept, neither of these sources provide for a clear definition, nor for guidelines for its application. A clear definition and guidelines for its application are however necessary in order to use the concept of sustainable development, both in general, and as a normative framework in the present dissertation. In order to fill this gap, a suggestion is made below for a clearer definition of the integration principle which includes elements that help to operationalise the concept.

> In this dissertation '**policy integration**' (or simply 'integration') is defined in conformity with its definition within European Union law and policy, notably Articles 7 and 11 TFEU and the Renewed EU Sustainable Development Strategy. According to these sources the European Union "*shall* ensure consistency between its policies and activities" (Article 7 TFEU) and shall "Promote integration of economic, social and environmental considerations so that they are coherent and mutually reinforce each other […]" (the Renewed EU Sustainable Development Strategy).[52]
>
> It is suggested here that integration in the EU context –with consistency and the mutual reinforcement of policy areas as its main elements– essentially means that the documents (e.g. in the case of a water-energy conflict: the Water Framework Directive and the Renewable Energy Directive) that govern two potentially conflicting policy areas must offer sufficient tools to guarantee that the goals of either of the policy areas involved can, in theory, be achieved. This does not mean, obviously, that in a specific case full recognition can always be given to the goals of both policy areas. Often, trade-offs –which should be made through a balancing act– are inevitable. It does mean, however, that it should not be impossible from the outset to meet the goals of one or more of the policy areas involved. It also means that the goals of both policy areas involved are treated equally under a balancing act.[53]

The constitutive elements of this proposed definition and its operationalisation are explained below.

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52 For a further elaboration on policy integration see: A Wiesbrock, 'Sustainable State Aid: A Full Environmental Integration into the EU's State Aid Rules?' in B Sjåfjell and A Wiesbrock (eds), *The Greening of European Business under EU Law: Taking Article 11 TFEU Seriously* (Routledge 2015) section 5.3, and S van Hees, 'Sustainable development in the EU – Redefining and operationalizing the concept' (2014) 10 Utrecht Law Review, sections 2.1 and 2.3.1.

53 The TEU and TFEU do not establish a hierarchy of the EU's policy areas. Equal treatment of the goals of the EU's renewable energy and environmental policy areas is therefore required. Moreover, it could be argued that renewable energy policy must nowadays be seen as being –at least partly– an essential element of the EU's environmental policy. See in this regard: N De Sadeleer, *EU Environmental law and the internal market* (Oxford University Press 2014) p 17. Also see section 1 of this introduction.

First, while the proposed definition speaks of 'conflicting policy areas', the existence of a conflict is not a prerequisite for the integration principle to apply. Two policy areas can of course be made more coherent and mutually reinforcing without them being in conflict. This formulation has nevertheless been chosen as this dissertation deals with potentially conflicting policy areas.

Second, the core of policy integration –as argued here– is that that the goals of either of the conflicting policy areas involved can, in theory, be achieved. This means that EU law should give Member States the necessary tools to reach their renewable energy targets under the Renewable Energy Directive, *while* also enabling them to meet their environmental protection obligations under the Habitats Directive, for instance. If the documents that govern the policy areas involved offer tools that *actually* –meaning: not only theoretically, but also in practice– make this possible, then it can be said that the policy areas concerned are 'coherent and mutually reinforce each other'. In that case these policy areas are compliant with the integration principle. The EU competition rules are an example of a policy area that may not in all circumstances be compliant with the integration principle. Its main objective is the optimalisation of consumer welfare, and it is mostly regarded as offering little room for the integration of other policy objectives.[54] The competition rules are therefore not likely to allow, for instance, environmental or renewable energy policy goals to prevail. Article 9 of the Birds Directive offers another example of a lack of integration. The article contains an exhaustive list of reasons[55] that may qualify for a derogation from the obligation to protect wild bird species. These do not however include a reason that can easily be linked to renewable energy.[56] Similar observations can be made in the area of state aid control. The article on state aid argues that there would be a lack of integration if the state aid framework were to prevent, from the outset, *those* renewable (ocean) energy projects which are *important*[57] for achieving a Member State's renewable energy targets from obtaining sufficient funding. Interestingly, in the case of state aid the source of the possible lack of integration is not primary or secondary EU law, but rather the Commission's policy guidelines that have been developed to apply EU state aid law. Hence, it is argued here that a lack of integration can also stem from a too strict application or interpretation of EU law through policy measures, or from the very

54 Article 101(3) TFEU only allows derogations from the cartel rules for an agreement 'which contributes to improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefit […]'. See further on this issue: S Kingston, 'Integrating environmental protection and EU competition law: why competition isn't special', *European Law Journal*, Vol 16, No 6, 2010, p 781-782; G Monti and J Mulder, 'Escaping the Clutches of EU Competition Law – Pathways to Assess Private Sustainability Initiatives' (2017) 42 European Law Review; A Gerbrandy, *Futureproof Competition Law* (Eleven 2018) 15-16; S van Hees, *A sustainable competition policy for Europe: a research on how the European cartel rules can make a stronger contribution to Europe's sustainable development goals* (Science Shop of Law, Economics and Governance, Utrecht University 2013).

55 Article 9 Birds Directive allows a derogation from the protection rules for birds where there is no other satisfactory solution, for the following reasons: in the interests of public health and safety, in the interests of air safety, to prevent serious damage to crops, livestock, forests, fisheries and water, or for the protection of flora and fauna.

56 The article on the protection of habitats and species in this dissertation nevertheless argues that this omission will not give rise to substantial barriers in practice for the implementation of renewable energy projects. See section 4.1.2 of that article.

57 See footnote 24 for an explanation of the concept of 'important' renewable energy projects..

absence of such policy measures. In the articles on the protection on habitats, species and water, the latter situation was found to cause a lack of integration. The absence of a clear policy tool that details exactly what types of renewable energy standards should be met, could lead to the undervaluation of renewable energy interests when weighed against environmental interests. This could lead to an unequal balancing of the policy goals involved.

Third, the integration principle requires that a balancing act is carried out when trade-offs are needed between different policy interests. While in the ideal situation the concept of policy integration would mean that the goals of all policy areas involved can be fully achieved, this is often not possible. Some policy areas have inherently opposing goals and it is therefore not possible to design these policies in such a way that they can coexist in complete harmony. In conflict situations, the integration principle requires a balancing of interests. *Dhondt* refers to this obligation in the following manner:

> 'The balancing requirement lies in the context and goal of the integration principle: the Treaty system (Gleichrang between the EC objectives) (context) and the need to promote sustainable development (goal).'[58]

Fourth, the integration principle requires that this balancing act is carried out in an equal manner. The TEU and TFEU as such do not establish a hierarchy of the EU's policy areas.[59] An equal treatment of the goals of the EU's renewable energy and environmental policy areas is therefore required. Moreover, as mentioned in section 1, it could be argued that renewable energy policy must nowadays be seen as being –at least partly– an essential element of the EU's environmental policy. The integration principle requires that EU law and policy do not favour one policy area over another from the outset. In the articles on the protection of habitats, species and water it is argued that the relevant EU environmental directives could have the effect of *de facto* favouring the protection of the environment over the achievement of the EU's renewable energy targets. In that regard it needs to be emphasised that the mere existence of tools, provisions or procedures in a (legal or policy) document for integrating different policy objectives is not sufficient to guarantee compliance with the integration principle. A correct application of the integration principle requires not only a procedure for integration, but also a subsequent equal balancing act between the policy areas concerned. That balance should be made based on the respective goals of the policy areas concerned. The balance itself should be made by politicians or national authorities. If the application of integration tools, provisions or procedures in a legal or policy document are merely optional –i.e. the national authorities are not required to apply them, or the tools are not suitable to guarantee

58 See N Dhondt, *Integration of environmental protection into other EC policies – Legal theory and practice* (Europa Law Publishing 2003) p 107. Also see in this regard: N De Sadeleer, *EU Environmental law and the internal market* (Oxford University Press 2014) pp 14 and 17; S van Hees, 'Sustainable development in the EU – Redefining and operationalizing the concept' (2014) 10 Utrecht Law Review.

59 Nevertheless, it is argued in this dissertation that the concept of sustainable development implies that a hierarchy should exist between the EU's economic and non-economic policy areas. This idea is discussed in section 5.3.2 of this introduction.

an equal balancing act– then the policy area that is governed by that document may not be compliant with the integration principle after all.

A lack of integration between different areas of public policy has been labelled by *Mortelmans and Hellingman* as a 'coordination problem'. They state that several conditions must be fulfilled in order to achieve a consistent government policy. One of those conditions is 'the mutual harmonisation of different forms of governmental actions and interventions.' If this is not properly done, then there is a 'coordination problem'.[60] One of the clearest examples of a coordination problem that is discussed in this dissertation is the outright permission given in the Renewable Energy Directive to infringe upon the EU's free movement rules. This example is elaborated upon in the article on the free movement of goods.

5.3.2 The principle of solidarity within and between generations: The requirement to give more weight to environmental policy areas

Furthermore, it is argued in this dissertation that the concept of sustainable development not only requires an actual balancing of interests, but that it moreover influences *the weight* that should be given to the *environmental policy interests* involved in this balancing act. The promotion of environmental policy interests should be given priority over the promotion of merely economic policy interests. In fact this would come down to an adaptation of the previously discussed equality between the EU's policy areas. The argument that a hierarchy should exist between the EU's environmental and economic policy areas is inspired by a policy guiding principle that was mentioned before: *solidarity within and between generations*. In order to explain this argument, first a distinction should be made between two types of conflicts between policy areas.

First, there is the 'classic' conflict in EU law between 'economic' policy areas and 'non-economic' policy areas. Non-economic policy areas have been described by *De Vries* (who calls them 'horizontal and flanking policies') as follows:

> "Horizontal and flanking policies are a generic term including policies on *inter alia* the environment, consumer protection, public health, culture, sport and education. […] [They] are the caring, idealistic and spending policy areas, affecting everybody and characterised by the Court of Justice as non-economic, but with economic consequences […]."[61]

Despite its clear economic aspects –with regard to revenues, R&D, employment and export opportunities stemming from the sector[62]– renewable energy policy can also

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60 K Hellingman and KJM Mortelmans, *Economisch Publiekrecht* – rechtswaarborgen en rechtsinstrumenten (Kluwer 1989) 32.

61 S de Vries, *Tensions within the Internal Market – The Functioning of the Internal Market and the Development of Horizontal and Flanking Policies* (Europa Law Publishing 2006) 8.

62 The Renewable Energy Directive states, for instance, that: "The opportunities for establishing economic growth through innovation and a sustainable competitive energy policy have been recognised. Production

increasingly be regarded as a non-economic policy area. The EU's policy towards the promotion of the increased use of renewable energy, and R&D activities in that field, play an indispensable part in the EU's efforts to comply with the international climate obligations as laid down *inter alia* in the Kyoto Protocol and in the Paris Agreement.[63]

This double economic and non-economic objective of renewable energy policy is also clearly expressed in the TFEU's title on energy policy through Article 194(1), which reads:

> 'In the context of the establishment and functioning of the internal market and with regard for the need to preserve and improve the environment, Union policy on energy shall aim, in a spirit of solidarity between Member States, to: a. ensure the functioning of the energy market; b. ensure security of energy supply in the Union; c. promote energy efficiency and energy saving and the development of new and renewable forms of energy; and d. promote the interconnection of energy networks.'

This dissertation therefore considers renewable energy policy to be a non-economic policy area with regard to its components that contribute to the EU's environmental and climate policies.

Examples of conflicts between the economic and non-economic policy areas of the EU are provided in Table 1.

Table 1. Conflicts between economic and non-economic policy areas

–	the conflict between competition law and climate mitigation,[64]
–	the conflict between competition law and the conservation of species,[65]

of energy from renewable sources often depends on local or regional small and medium-sized enterprises (SMEs). The opportunities for growth and employment that investment in regional and local production of energy from renewable sources bring about in the Member States and their regions are important." Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, paragraph 3 of the preamble.

63 See section 1 of this introduction.

64 An example of this type of conflict is given by the preliminary assessment of the Dutch national competition authority (ACM) on the closure of five old coal-fired energy plants from the 1980s. The decision to close these plants was taken under the umbrella of the Dutch Energy Agreement for Sustainable Growth (het Energieakkoord). This agreement involved many stakeholders and organisations that play a role in the transition to more sustainable development in the Netherlands. One of those stakeholders was the trade association for the Dutch energy industry, Energie Nederland (EN). In its preliminary assessment, the Dutch competition authority concluded –despite the fact that the agreement was part of the wider overarching sustainable development objectives of the Energieakkoord– that the agreement to close the power plants was an agreement between undertakings within the meaning of the competition rules. For a further elaboration see: G Monti and J Mulder, 'Escaping the Clutches of EU Competition Law – Pathways to Assess Private Sustainability Initiatives' (2017) 42 European Law Review 638-639. The Dutch Energy Agreement for Sustainable Growth can be found at https://www.energieakkoordser.nl/doen/engels.aspx. See for the preliminary assessment by the Dutch competition authority: https://www.acm.nl/nl/publicaties/publicatie/12033/Notitie-ACM-over-sluiting-5-kolencentrales-in-SER-Energieakkoord.

65 An example of this type of conflict is given by an informal opinion of the Dutch national competition authority (at that time called NMa) on competition law issues in the MSC Management Plan of the Dutch shrimp fisheries sector, which was drafted by several organisations representing shrimp producers. This plan limited the amounts of shrimps caught in order to improve and maintain the population of North Sea shrimps (as required by MSC). For a further elaboration see: S van Hees, *A sustainable competition*

– the conflict between the state aid rules and investment aid to innovative renewable energy projects,[66] and
– the conflict between the free movement of goods and revenue support state aid to renewable energy.[67]

Second, there may be a conflict between two 'non-economic' policy areas. Examples are given in Table 2. These examples are especially interesting as they concern two conflicting policy areas that have very similar objectives: the protection of specific elements of the environment vs. the protection of the global environment as such (i.e. combating climate change).

Table 2. Conflicts between two non-economic policy areas

– the conflict between the protection of endangered habitats and the construction of tidal energy turbines in storm surge barriers,[68]
– the protection of bird species and the production of wind energy (bird-turbine collisions),[69] and
– the protection of water quality and the production of salinity-gradient energy.[70]

It is argued here that the principle of *solidarity within and between generations* must be seen as influencing the weight that should be given to 'environmental' policy areas –being non-economic policy areas– when these come into conflict with economic policy areas.[71] This principle requires that apart from the interests of the present generation, also the interests of future generations are taken into account. It can be said that economic policy is essentially benefiting the present generation while it causes resources and nature to be consumed and harmed, and which future generations will no longer be able to benefit from. Therefore, it is argued here that even in situations where an economic and an environmental policy area are considered to carry equal weight, the environmental policy area must in some situations prevail after all.[72] Situations in which an environmental policy area must

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policy for Europe: a research on how the European cartel rules can make a stronger contribution to Europe's sustainable development goals (Science Shop of Law, Economics and Governance, Utrecht University 2013) 66-68.

66 See the article on state aid in this dissertation.

67 See the article on the free movement of goods in this dissertation.

68 See the article on the Birds and Habitats Directives in this dissertation.

69 See for instance R Frins and H Schoukens, *Balancing Wind Energy And Nature Protection: From Policy Conflicts Towards Genuine Sustainable Development?* in L Squintani and HHB Vedder (eds.), *Sustainable Energy United in* Diversity (EELF 2014).

70 See the article on the Water Framework Directive in this dissertation.

71 As a counter-argument is could be said that –although it is listed in the Renewed EU Sustainable Development Strategy– the principle of *solidarity within and between generations* is not mentioned in the TEU or the TFEU, while the principle of policy integration is mentioned in these treaties. See in that regard N De Sadeleer, *EU Environmental law and the internal market* (Oxford University Press 2014) p 18.

72 It has been argued by some authors that a requirement to prioritise environmental protection over economic policies can even be read into the Article 11 TFEU integration clause (see for instance S Kingston, 'Integrating environmental protection and EU competition law: why competition isn't special', *European Law Journal*, Vol 16, No 6, 2010, p 789). Others –including the author of the present dissertation– are of the opinion that this cannot be derived from that clause as it stands (see for instance N Dhondt, *Integration of*

prevail over an economic policy area include, *at the very least,* those situations where the attainment of the goals of the environmental policy area in question is essential to preserve key environmental elements for future generations. Examples of such situations may be: allowing prohibited (cartel) agreements between undertakings when these agreements help to prevent substantial damage to the environment, allowing infringements on the free movement of energy when this would help to mobilise substantial local governmental funds for 'important'[73] renewable energy projects, and allowing high amounts of state aid if this is necessary to help 'important' renewable energy technologies to reach maturity.

It must be observed, however, that the prioritisation of environmental policy is not easily reconcilable with the current formulation and interpretation of the EU's economic policy areas. Competition policy has consumer welfare as its primary objective and is mostly regarded as offering little room for the integration of other policy objectives.[74] Some commentators[75] are even of the opinion that it is better not to use a single policy instrument (e.g. competition policy) to pursue different goals.[76] Arguably, this position is not compatible with the principle of policy integration. Other commentators do not agree, however, and are of the opinion that competition policy is designed to also take into account other EU policy areas, certainly to some extent.[77] The rules on the free movement of goods *do* offer room for the prioritisation of environmental policy, but only by way of an exception and on a case-by-case basis. State aid law and policy, in its turn, prioritises environmental policies *by default*. Nevertheless, it only does so to a limited extent, making it very difficult for member states to grant state aid beyond these pre-set limitations.[78]

Finally, it must be emphasised that it is not argued here that non-economic or environmental policy areas (including renewable energy policy) must take precedence over economic policy in all circumstances. This is where the principle of proportionality comes in. See section 4 for an explanation of this principle. Pursuant to the proportionality principle (described in section 4 as essentially being 'a test balancing benefits and harm') it would not be required, for instance, to issue

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environmental protection into other EC policies – Legal theory and practice (Europa Law Publishing 2003) 182.

73 See footnote 24 for an explanation of the concept of 'important' renewable energy projects.

74 S Kingston, 'Integrating environmental protection and EU competition law: why competition isn't special', *European Law Journal*, Vol 16, No 6, 2010, p 781-782; G Monti and J Mulder, 'Escaping the Clutches of EU Competition Law – Pathways to Assess Private Sustainability Initiatives' (2017) 42 European Law Review; A Gerbrandy, *Futureproof Competition Law* (Eleven 2018) 15-16; S van Hees, *A sustainable competition policy for Europe: a research on how the European cartel rules can make a stronger contribution to Europe's sustainable development goals* (Science Shop of Law, Economics and Governance, Utrecht University 2013).

75 See for instance: M Kneepkens, *Competition Law and Public Interests – Principles for resolving conflicts and an application to the banking sector'* (2017) 76.

76 This argument is based on the so-called *Tinbergen principle.* This principle implies that 'two goals cannot be fully achieved by one policy instrument, unless these goals are fully complementary (i.e. the goals never conflict with each other).' M Kneepkens, *Competition Law and Public Interests – Principles for resolving conflicts and an application to the banking sector'* (2017) 76.

77 See for instance: G Monti, 'Article 81 EC and Public Policy' (2002) 39 Common Market Law Review 1069-1078.

78 See the article on state aid in this dissertation.

derogations from competition policy, free movement law or the state aid framework in order to facilitate a renewable energy project that is not 'important'[79] for reaching a Member State's renewable energy targets pursuant to the Renewable Energy Directive.

5.3.3 Conflict between two environmental policy areas: Balancing is a political choice, but is conditioned by the integration principle and the proportionality principle

Nevertheless, when a conflict arises between two 'non-economic' policy areas with similar objectives –e.g. the protection of specific elements of the environment vs. the protection of the global environment as a whole– then the principle of *solidarity within and between generations* is of no further assistance. In that case the policy areas on both sides of the weighing scales contribute to preserving key environmental values for future generations, albeit on a different scale. In that situation it is up to the relevant authorities to find a balance between the conflicting policy areas. In some cases these authorities need to prioritise the one non-economic policy goal, and in other cases they will need to prioritise the other. The choice of when to prioritise which policy objective is subject to the integration principle, which requires that the goals of both policy objectives in the balance should be balanced in an equal manner. The integration principle also demands that prioritising one policy objective does not render the achievement of another policy objective impossible (see section 5.3.1 of this introduction).[80]

Outside of these requirements, it falls within the scope of the Member States' discretionary power to decide which non-economic policy area is given priority. This margin of appreciation is however subject to the proportionality principle. As explained in section 4, it could be said that proportionality in fact requires balance to be struck between:

- the benefits gained by the public interest that is served by the implementation of the policy measure chosen, and
- the harm caused to other public interests caused by the implementation of that policy measure.[81]

The application of the proportionality principle to a balancing act between two non-economic policy areas could mean, for instance, that the construction of a renewable energy project that may have substantial negative effects on protected habitats is allowed if that project is 'important'[82] for reaching the Member State's renewable energy targets pursuant to the Renewable Energy Directive. On the contrary, the result of a proportionality test could also be that environmental protection is given precedence over an 'important' renewable energy project, in particular when such

79 See footnote 24 for an explanation of the concept of 'important' renewable energy projects.
80 Cf. N De Sadeleer, *EU Environmental law and the internal market* (Oxford University Press 2014) p 24.
81 Based on A Barak, *Proportionality – Constitutional Rights and their Limitations* (Cambridge University Press 2012) 340.
82 See footnote 24 for an explanation of the concept of 'important' renewable energy projects.

a project may cause irreparable harm to habitats, species or water which is difficult to compensate. Both EU (environmental) law *and* the concept of sustainable development require a balancing of interests in *all* cases. Consequently, EU law does not facilitate a policy that requires certain energy projects to be given priority over environmental interests from the outset.[83]

5.4 Conclusion

The foregoing explanations and the interpretation and operationalisation of the concept of sustainable development are used in the articles of this dissertation, and in its conclusion, to evaluate the barriers and solutions discussed.

6. SOCIETAL RELEVANCE

This dissertation aims to contribute to the achievement of the EU's renewable energy targets by the year 2020 and beyond by:

1) Mapping the main EU legal and policy barriers to the large-scale implementation of (now) innovative techniques that may be necessary to achieve those targets,
2) suggesting practical solutions to those barriers that can be implemented within a short period of time.

The findings of this research may be helpful to EU Member States in creating a legal and policy framework that is beneficial for meeting EU renewable energy targets. Moreover, the findings may be of assistance to project developers and other stakeholders that work on the actual implementation of the said innovative renewable energy projects and which are trying to deal with legal and policy barriers to such projects. These stakeholders may also benefit from this research when looking for arguments to influence the political debate on the energy transition and related legal and policy barriers. The findings from this research may also serve as guidelines for creating a more consistent EU regulatory system. They may in particular prove to be a helpful input for the European Parliament and the Council in the legislative process of the new Renewable Energy Directive covering the period up to the year 2030.[84]

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83 Cf. *Jones, Lieberknecht and Qiu*, who describe how certain Member States seem to undermine the 'integration' aspect of Maritime Spatial Planning by prioritising blue growth over environmental protection. PJS Jones, LM Lieberknecht, and W Qiu, 'Marine spatial planning in reality: Introduction to case studies and discussion of findings', Marine Policy 71 (2016), section 3.4 (blue growth priorities).

84 See for instance: http://www.europarl.europa.eu/legislative-train/theme-resilient-energy-union-with-a-climate-change-policy/file-jd-renewable-energy-directive-for-2030-with-sustainable-biomass-and-biofuels; http://www.europarl.europa.eu/news/en/press-room/20180614IPR05810/energy-new-target-of-32-from-renewables-by-2030-agreed-by-meps-and-ministers.

7. ACADEMIC RELEVANCE

While many scholars have attempted to define the concept of sustainable development, few have also come up with an actual operationalisation of the concept. This dissertation aims to offer tools for applying the concept of sustainable development in practical situations in the field of renewable energy policy. It therefore also builds on the findings of an earlier article on sustainable development by the author of the present dissertation.[85] This earlier article's main conclusion was that the concept of sustainable development risks being seen as merely requiring that a certain procedure is followed which takes into account different economic, social and environmental policy objectives. It argued that the concept of sustainable development does not guarantee that decision-making processes also have a 'sustainable *outcome*.'[86] The present dissertation builds on these findings by exploring approaches to the concept of sustainable development that guarantee well-balanced outcomes of decision-making processes in the field of renewable energy policy. In this regard the dissertation identifies two policy-guiding principles that lie at the heart of the concept of sustainable development and can be seen as tools that can help to achieve sustainable development. These are the integration principle and the principle of solidarity within and between generations. This dissertation (the introduction and the conclusion in particular) provides a detailed explanation of these principles, and it investigates how these principles can be applied to improve EU and Member State law and policy in the light of the concept of sustainable development.

Moreover, while there are several publications on the interaction between EU environmental and economic law and policy, on the one hand, and more established renewable energy techniques (e.g. wind energy), on the other, few scholars have, to date, published on the current and predicted interaction between EU law and policy, and very new, innovative and water-related forms of renewable energy production. These forms pose different and new challenges to existing EU law and policy. The present dissertation aims to contribute to the existing academic discussions by analysing EU law and policy from the perspective of these very new, innovative and water-related forms of renewable energy production.

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85 S van Hees, 'Sustainable development in the EU – Redefining and operationalizing the concept' (2014) 10 Utrecht Law Review.

86 The article concluded that decision-making processes can still have seemingly 'unsustainable' results (for instance: authorisation for building a new coal-fired plant in the Dutch Eemshaven in 2013), even when all policy-guiding principles for the achievement of sustainable development (as described in the EU Renewed Sustainable Development Strategy) have been taken into account in the process: "When carrying out this sustainability impact assessment it stands out that a decision-maker could answer the questions in a way which is beneficial to the outcome he or she wants to achieve. Moreover, seemingly unsatisfactory answers can be given and the project being continued after all (which is the case for the Eemshaven project). This is a consequence of the fact that EU law and policy on sustainable development only provides guidelines for the *process* of decision-making, while it does not give any indications of the desired results. The lack of guidance as to the *outcome* of a sustainable decision-making process can frustrate the achievement of the goals of sustainable development. Moreover, it makes it difficult to hold decision-makers accountable for not achieving sustainable results." S van Hees, 'Sustainable development in the EU – Redefining and operationalizing the concept' (2014) 10 Utrecht Law Review 73-76.

Finally, this dissertation combines the findings from both Dutch and Scottish ocean renewable energy practice, giving both a practical and a comparative perspective on the interaction between EU law and policy and the development of innovative ocean renewable energy projects at the Member State level.

8. METHODOLOGY

1. Scoping exercise

The research for the present dissertation took place from 2014 to 2018 and started by a scoping exercise. First, a list was made of the areas of EU law that were expected to form the main barriers to the development of innovative water-related renewable energy projects. This inventory was based on interviews with renewable energy developers, government officials, researchers and consultants. Additional desk-based research of legal and non-legal sources (books, articles, reports, EU and national legal sources, policy documents and case law, webinars, the websites of relevant stakeholders, etc.) has been carried out to complement the inventory. Large parts of the conclusion of this scoping exercise have been reflected in the first article of this dissertation, as published in the Journal of Water Law in 2015.

2. Further exploratory research and the drafting of the research questions

The list of barriers reflected in the article in the Journal of Water Law has been further improved under the influence of subsequent research into *inter alia* literature and reports. Subsequent research into state aid and the specifications of renewable energy techniques, for instance, helped to better define the legal issues at the interface of renewable energy and state aid law and policy, for instance. A report published by the Ocean Energy Forum in 2016, for instance, also helped in this respect. Other issues that were identified as barriers for ocean energy during the scoping exercise were omitted from the subsequent parts of the research for this dissertation. The main reason for this is that these barriers are policy issues or technical issues, rather than legal issues. Examples of such issues are the lack of an effective one-stop-shop system for licence applications in some Member States, and the time-consuming and costly nature of environmental assessments. Conversely, subsequent law, literature and case study research, and academic discussions at conferences and universities demonstrated the relevance of including the Water Framework Directive, the Marine Strategy Framework Directive, and the Marine Spatial Planning Directive in the research. Subsequently, based on the scoping exercise and subsequent research, a set of research questions has been developed.

Further exploratory research also led to the choice for the renewable energy techniques researched. The reasons why this dissertation focuses on tidal (stream), wave and salinity gradient energy have been explained in section 1 of this introduction.

3. Desk-based research

Desk-based legal research into legal and non-legal sources has been carried out to answer these research questions of this dissertation. These sources include books, articles, reports, EU and national legal sources, policy documents and case law, webinars, the websites of the relevant stakeholders, etc. The findings of the desk-based research have been cross-checked through further interviews with relevant stakeholders.

4. Case study research

Two case studies were carried out in this dissertation. The findings from the case studies of the Scottish and the Dutch situations were used to supplement and crosscheck the findings of the desk-based research. They offered the opportunity to test hypotheses and to discuss different views and developments. Moreover, the case studies function as illustrations of the relevance of the research questions at hand. Scotland and the Netherlands were chosen as case studies as in both countries small-scale tidal energy projects are currently in operation, and both countries have implemented the Maritime Spatial Planning Directive in a rather different way. Moreover, in the Netherlands a pilot salinity gradient plant is currently operational. Moreover, the fact that the present author has a command of the languages of the relevant sources (English and Dutch) allowed for a detailed study of the cases.

The case study research was based on research into relevant reports, environmental assessments, court cases, the decisions of licensing authorities, Member State law, etc. The findings of the research into these sources was supplemented by interviews with relevant stakeholders. A research visit to Marine Scotland, the licensing and planning authority for renewable energy developments in the Scottish part of the North Sea, and the interviews conducted at Marine Scotland, were also part of the case study research.

5. Interviews

In the course of this dissertation 25 semi-structured interviews were conducted. An anonymised list of the interviewees, their position and organisation is included in the Annex. While some of the interviews have been explicitly referred to in the articles of the dissertation, most interview results were merely used for inspiration, guidance and verification during the research process. Moreover, many informal discussions and phone calls took place with the relevant stakeholders, which served the same goals.

6. Dissemination of the research results and the peer-review process

The results of the research for this dissertation have been published primarily in peer-reviewed academic journals.

Article	Journal	Type of review	Article revised pursuant to reviewers' comments?	Status
Scoping article	The Journal of Water Law	Single blind peer review	Yes, average revisions	Published (2015)
Free movement of goods	Nederlands Tijdschrift voor Energierecht [Dutch Journal for Energy Law]	Reviewed by the editorial team	Yes, minor revisions	Published (2014)
State aid	European State Aid Quarterly (EStAL)	Double blind peer review	Yes, average revisions	Published (2018)
Water Framework Directive	Journal for European Environmental & Planning Law (JEEPL)	Double blind peer review	Yes, minor revisions	Published (2017)
Habitats and Birds Directives	European Energy and Environmental Law Review (EEELR)	Reviewed by the editorial team	Yes, average revisions	Published (2018)
Maritime Spatial Planning	Marine Policy	Double blind peer review	Yes, substantial revisions	Accepted (2018)

The submission of the articles was in all circumstances followed by an (anonymised) academic discussion between the reviewer(s) and the present author. This discussion started by written comments on the article's manuscript sent by the reviewers. The comments showed that the reviewers were experts in the field of the topic of the articles submitted. Subsequently, the comments were processed by the present author and the actions to implement the comments were explained in a separate document as an answer to the reviewer. If the present author did not agree with the reviewers' comments, this was also explained and supported by arguments in this document. Finally, in most situations, the reviewers were offered a final opportunity by the editor to check whether their comments had been sufficiently processed.

9. FUNCTION AND COHESION OF THE ARTICLES

The article on **EU legal barriers to innovative forms of energy production** (2015) is a general article containing an inventory of the possible barriers to innovative forms of water-related renewable energy production. The article entitled Ålands Vindkraft (C-573/12): Conflict tussen het vrij verkeer van goederen en de bevordering van duurzame energie (2014) provides a case study of a specific area of EU law (free movement law) that shows elements of a lack of integration with EU renewable energy law and policy. It also discusses several approaches for solving the lack of integration that has been observed. In a way, this article is the odd one out as it focuses on wind energy instead of on innovative ocean renewables. The article is nevertheless of importance in the discussion underlying the present dissertation as it shows that issues of the fragmentation and integration of EU law and policy are still

of influence during all development phases of an energy technology, right up until –and including– the phase of technology maturity and market access. Moreover, free movement of goods issues may also play a role with regard to future large-scale ocean energy projects. The article on the **Water Framework Directive** (2017), the article on the **Habitats and Birds Directives** (2018), and the article on **investment state aid** (2018) provide for case studies into specific areas of EU law and policy that demonstrate a lack of integration with renewable energy policy and may give rise to barriers to the implementation of large-scale innovative ocean renewable energy projects. These articles also discuss several approaches to solving this lack of integration and in order to deal with possible barriers. Finally, the article on **Maritime Spatial Planning** (2018) explores to what extent maritime spatial planning is a suitable instrument for creating increased integration between renewable energy policy, on the one hand, and habitats, species and water protection, on the other.

ANNEX

Anonymised list of interviewees

The list below includes the positions that the interviewees had at the time the interview was conducted.

Position	Organisation	Category
CEO	Dutch marine energy consultancy firm	Industry
CEO	Dutch developer of salinity gradient energy	Industry
CEO	Dutch developer of tidal stream energy	Industry
Manager	Dutch developer of tidal stream energy	Industry
Project Director	Dutch consultancy and engineering firm, working on marine renewables	Industry
Director	Dutch developer of marine renewable energy techniques, including wave energy	Industry
Director	Scottish developer of tidal stream energy	Industry
Managing Director	Scottish environmental consultancy firm, working on marine energy	Industry
CEO	Swedish developer of wave energy	Industry
Director	Brussels-based environment and innovation NGO, working *inter alia* on marine renewables	Non-governmental organisation
Policy advisor	Waterschap (Dutch public water authority) Vallei & Veluwe, working on energy from wastewater projects	Government
Policy advisor	Dutch Province of South Holland, working on tidal stream energy in a storm surge barrier	Government
Senior legal advisor	Directorate-General of Public Works and Water Management ('Rijkswaterstaat') of the Dutch Ministry of Infrastructure and Water Management, working on tidal stream energy in a storm surge barrier	Government
Scientific officer	European Commission – Joint Research Centre, conducting research into marine renewable energy	Government
Science advisor	Scottish Government – Marine Scotland Science	Government
Planning and strategy officer	Scottish Government – Marine Scotland	Government
Marine renewable energy scientist	Scottish Government – Marine Scotland Science	Government
Marine renewables casework manager	Scottish Government – Marine Scotland's Licensing Operations Team (MS-LOT)	Government
Marine renewable energy officer	Scottish Government – Marine Scotland	Government
EIA/HRA compliance officer	Scottish Government – Marine Scotland	Government

Position	Organisation	Category
Senior Policy Planner	Orkney Islands Council, Scotland, working with a pilot regional Marine Spatial Plan	Government
Professor of Sustainable Energy in Delta Areas	HZ University of Applied Sciences in Vlissingen, the Netherlands	Academia
Senior lecturer in environmental and planning law	University of Aberdeen – School of Law, Scotland	Academia
Lecturer in energy economics, energy policy, development appraisal and planning	Heriot Watt University – School of Energy, Geoscience, Infrastructure and Society – International Centre for Island Technology, Orkney Islands, Scotland	Academia
Lecturer in planning, management and conservation of marine resources	Heriot Watt University – School of Energy, Geoscience, Infrastructure and Society – International Centre for Island Technology, Orkney Islands, Scotland	Academia

EU LEGAL BARRIERS TO INNOVATIVE FORMS OF ENERGY PRODUCTION: ANALYSIS BASED ON WATER-RELATED CASE STUDIES

Reference to the published article:
van Hees, S.R.W. (2015). EU legal barriers to innovative forms of energy production – analysis based on water-related case studies. *Water Law*, 24 (5-6), (pp. 281-288) (8 p.).

1. INTRODUCTION

This article gives an overview of the first research results the PhD research project of the author, which aims to find solutions to EU law barriers to the development and implementation of innovative forms of water-related energy production. This paper is not a full-bodied article, but rather an introduction to the more extensive research on this topic that is coming up in the coming two years (or 'future research').

The central research question is: Which innovative solutions can be found to EU law barriers that delay or impede the development and implementation of new and innovative forms of water-related energy production?

Because it is not possible to study all new forms of energy production, the research will focus on four case studies only, which cover the main developments in the renewable energy sector, and which are all related to water. These are tidal energy, wave energy, blue energy and energy from waste water. Further explanation will be given later in the article about the methodology used for the case studies and about the details of these renewable energy techniques.

This article will continue by explaining the set-up of the PhD research and by sharing the first results, which will form the basis for all future research. The first results are based on a set of initial interviews with (mainly) Dutch project developers, complemented with some case law, reports and literature research. More EU-wide research (including case studies and more examples from the UK) will follow in future research. First, an introduction to the background and the relevance of the research topic will be given, followed by a description of the methodology of the research undertaken to date to be undertaken in the future. Thirdly, the case studies used in the research will be explained, followed by an overview of the most important legal barriers which were found during the initial case study research, the legal background of those barriers and ideas for future research into these barriers. Finally, an analysis of these barriers and an agenda for future research will be given.

1.1 Background and relevance of the topic

Since the introduction of the Renewable Energy Directive (RED) in 2009, the Member States of the European Union are bound to mandatory renewable energy targets. For instance, in 2020 the share of energy use from renewable sources should be 14 per cent in the Netherlands, 23 per cent in France, and 15 per cent in the UK.[1] The directive encourages the Member States not only to promote renewable energy projects which use 'conventional' sources (such as wind and solar energy) but the Directive asks the Member States to also promote the development of new and innovative renewable energy projects. The Directive calls for the development of projects which use energy from 'all types of renewable sources'.[2]

However, existing renewable energy techniques have shown in the past that legal issues can obstruct their development or their access to the market. Some examples are given hereafter: windmills can, for instance, interfere with the protection of birds under the Habitats Directive.[3] Windmills often lead to opposition by local businesses, citizens and politicians.[4] Solar energy projects are often confronted with barriers related to complicated grid connection rules and lengthy permitting procedures.[5] Furthermore, the national schemes and programmes designed to encourage renewable energy production can encounter legal challenges.[6]

The PhD project aims to find out if very new forms of renewable energy encounter similar problems and, if they do, what solutions can be found to these problems. Finding solutions is important because barriers that cause delay or even cancellation of new and innovative energy projects could hamper the objectives of the Renewable

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1 Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, annex I.

2 Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, preamble paras 6 and 14.

3 European Commission, Guidance document 'Wind energy developments and Natura 2000' (2011), chs 3 and 5.

4 An example comes from the province of Noord-Holland where (because of on-going protests from citizens) the construction of new windmills on land for electricity production is now forbidden. See: Province of Noord-Holland, "Beleidswijziging Wind op Land", http://www.noord-holland.nl/web/Actueel/Nieuws/Artikel/Beleidswijziging-Wind-op-Land.htm.

5 PV Legal, Final report 'Reduction of bureaucratic barriers for successful PV deployment in Europe' (2012), http://www.pvlegal.eu.

6 See for instance Case C–573/12 *Ålands Vindkraft AB v Energimyn- digheten* judgment of 1 July 2014 (alleged infringement of the EU free movement of goods by a Swedish support scheme for renewable energy; in its judgment the Court found that the scheme did not infringe the free movement of goods after all) and Case C–379/98 *PreussenElektra Aktiengesellschaft v Schleswag Aktiengesellschaft* [2001] ECR I–02099 (alleged infringement of the EU rules on state aid by a German feed-in promotion scheme for renewable energy; in its judgment the Court found that the scheme did not infringe the rules on state aid after all). See also Analyse van de Autoriteit Consument en Markt met betrekking tot de voorgenomen afspraak tot sluiting van 80er jaren kolencentrales in het kader van het SER Energieakkoord, ACM 26 September 2013 (Note of the Dutch national competition authority (ACM) which expresses the expectation that an agreement (which is a component of the national strategy towards a sustainable energy supply) between inter alia the Dutch government and some energy producers to close five coal fired energy plants is infringing national and European competition law).

Energy Directive and the sustainable development goals of the EU in general.[7] They would best be known about beforehand so that mitigation is still possible.

1.2 Methodology and future research deliverables

So far, initial case study research has resulted in an overview of the main EU-law related barriers that are encountered by developers of the four energy techniques/case studies researched (see further below). This overview is presented in the following sections. The following research activities have been carried out in order to acquire the initial research results presented hereafter:

- Interviews with Dutch project developers and consultants working in the field of tidal energy, wave energy and blue energy.
- Interviews with project managers of Dutch Water Boards who are responsible for projects related to energy production at waste water purification facilities.
- Analysis of reports and articles on tidal energy, wave energy, blue energy and energy from wastewater. These reports do not only cover the Dutch situation, but also include examples from other Member States such as the UK and Sweden.
- Analysis of nature protection licences and of appropriate assessments of new tidal energy pilot plants in the Netherlands.

The future research within this PhD project will build upon the initial research results presented in this article. It will add the following elements:

1. A more extensive description of the sources of the legal problems found in the initial research and of their embedding in EU law. This will include research into case law (of the EU and Member States' courts) and legal literature.
2. Additional research to find out if the legal problems which are identified in the initial research results are present on a broad scale throughout the EU Member States, including the UK. This will be done by conducting more in-depth case study research on renewable energy projects throughout Europe which are similar to the ones researched so far.
3. Identification of possible innovative solutions to problems encountered by the renewable energy forms researched. Depending on the type of problem, solutions could be found in changing the specifications of the form of energy production, or in reinterpretation, contextualisation[8] or adaptation of the legislation that creates the barrier. In some situations it may be necessary to create

7 For a detailed account of the EU's approach to sustainable development see S R W van Hees 'Sustainable development in the EU: redefining and operationalizing the concept' (2014) 10(2) Utrecht Law Review 60 http://www.utrechtlawreview.org/index.php/ulr/article/view/269.

8 English summary of Project Context, http://context.verdus.nl/1377; Willem Salet & Jochem de Vries (2013) 'The Innovative Potential of Contextualising Legal Norms in Processes of Urban Governance: The Case of Sustainable Area Development', CONTEXT Report 1. AISSR programme group Urban Planning, Amsterdam, http://context.verdus.nl/upload/documents/CONTEXT-Report-1.pdf.

better coordination between legislation,[9] or to improve the implementation of sustainable development. Theoretically, also *new* legislation could be necessary to enable certain innovative energy projects.
4. Assessment of whether the findings of the PhD research are expandable to innovative forms of energy production which are not included in one of the four water-related case studies which will be discussed hereunder in section 2.

The results of the future research will be published in academic journals in four separate articles, each of them discussing a different legal barrier, whilst using examples from the four case studies.

2. CASE STUDIES

2.1 Water-related case studies

The PhD research that lies at the basis of this article deals with legal barriers that were found in four case studies, which are all related to water: tidal energy, wave energy, blue energy and energy from waste water. These case studies were chosen, first of all, because they are currently all in the pilot phase or early commercial phase. This means that sufficient information was available about the techniques and that project developers had already encountered some legal issues whilst setting up their first projects.

Secondly, these case studies were chosen because this PhD research will be carried out at the Utrecht Institute for Water Oceans and Sustainability law, which has much experience and prior knowledge on water-related legal issues. Thirdly, as only a limited amount of time is available it would not be possible to assess all new and innovative forms of energy production, which necessitated a choice for one category of new and innovative forms of energy production (those which are related to water). The choices that have been made to delimit the research do not, however, exclude the possibility that research results will be valuable for other forms of energy production which have not been studied.

9 See for a discussion on the 'coordination problem' in the EU: S.R.W. van Hees, 'Conflict tussen het duurzame energiebeleid en het vrij verkeer van goederen in de EU – Besproken aan de hand van Ålands Vindkraft (C-573/12)' ('Conflict between sustainable energy policy and the free movement of goods in the EU – Discussion on the basis of the Ålands Vindkraft case (C-573/12)'), in: Anna Gerbrandy & Reshmi Rampersad (red.), *De sociale markteconomie van de EU en de kansen voor Nederland. Gedachten over de toekomst vanuit de niet-positivistische driesporenbenadering van Bart Hessel*, Boom juridisch, Den Haag 2016.

2.2 Overview of the case studies

2.2.1 Tidal energy

Tidal energy can be harvested by using free-flow driven turbines which are placed in tidal currents. This type of turbine will normally be placed in barriers, under bridges or in tidal flow channels where flow directions are more or less constant. A two directional flow turbine can generate electricity both during ebb and flood tides. The turbines used for tidal energy can also be used to harvest energy from the water flows in rivers.

Currently, a tidal energy facility is operated in the Afsluitdijk where the outflow of fresh water into the Wadden Sea creates powerful tidal flows. The Afsluitdijk is a 32 km long primary sea defence in the north of the Netherlands. Currently, four tidal turbines are installed in the water outlets of the Afsluitdijk. Future projects in the Netherlands will be situated in the Marsdiep strait and in the Oosterschelde storm barrier.

2.2.2 Wave energy

Wave energy is produced by large electricity generators which are placed on the surface of the ocean. Currently there are many different types of generators being tested. The generators have at least one moving part which is able to convert the energy produced by waves into electrical energy. The energy output is determined by wave height, wave speed, wave length, and water density.[10] To date there are just a few wave energy pilot projects running. A well known test sites is the European Marine Energy Centre (EMEC) in Scotland.

2.2.3 Blue energy

Salinity gradient energy is electrical energy which is harvested by the mixing of two water streams of different salinity. Salinity gradient power could be produced everywhere in the world where salt solutions of different salinity (for example fresh river water and seawater, or brine waste water and sea water) are available. In order to increase the energy output, residual heat (eg from a coal-fired power plant, or a data centre) can be added to the fresh water before it enters the Blue Energy installation.

2.2.4 Energy from waste water

In the Netherlands energy is being produced at waste water purification plants, which are owned by public water boards. During the water purification process organic matter is fertilised and, during this process methane gases are created. Electrical energy can be produced by inserting these gasses into a combined heat and power

10 http://www.alternative-energy-news.info/technology/hydro/wave-power/.

(CHP) installation. Apart from electrical energy, water boards can also become producers of gas for household use and of heat which can be fed into neighbourhood heating networks.

3. LEGAL BARRIERS

The initial interviews that have been done, and the reports and licences which have been studied in the course of this research reveal that projects related to new and innovative forms of energy production encounter many different types of legal barriers. Discussed below are only those barriers which are present in at least two out of the four case studies. These are: (i) potential significant effects on protected Natura 2000 sites; (ii) over-detailed appropriate assessments; (iii) over-detailed environmental impact assessments; and (iv) state aid issues. Such 'parallel' barriers could indicate that something is wrong with the underlying EU legislation. Finding solutions to parallel barriers may therefore also be relevant for forms of energy production that are not included in this research.

Apart from those discussed below, some project developers have indicated that they are also encountering other legal issues, including issues related to grid connection, to fragmented consenting procedures on the national level and to licensing procedures which do not offer sufficient flexibility to optimise and change the design of pilot installation during the testing phase. These issues will not be discussed below.

The references to interviews with project developers have been anonymised. The interview transcripts and the list of interviewees are available from the author on request.

3.1 Potential significant effects on protected Natura 2000 sites

3.1.1 Introduction to Natura 2000 protection measures

The Habitats directive requires the Member States to contribute to the creation of the Natura 2000 network 'a coherent European ecological network' which has as its goal to make it possible for certain natural habitat types and the habitats of certain species 'to be maintained or, where appropriate, restored at a favourable conservation status in their natural range'.

The Natura 2000 network consists of two types of protected areas: so-called *special protection areas* (Birds Directive) and *special areas of conservation* (Habitats Directive). *Special protection areas* (Birds Directive) contain the habitats of certain endangered wild bird species, which need special conservation measures. These measures have to ensure the survival and reproduction of the protected birds. *Special areas of conservation* (Habitats Directive) contain natural habitat types (including sandbanks and estuaries) and the habitats of certain species other than birds (certain

mammals, reptiles, fish and invertebrates), which have to be maintained or, where appropriate, restored to a favourable conservation status.

Both types of protected areas are subject to the same protection measures. The Member States must take action to avoid that existing projects in those protected areas contribute to deterioration of habitats, or to the disturbance of species. This obligation is also applicable to unforeseen effects of new plans or projects. National authorities must only agree to new plans or projects after having ascertained through an appropriate assessment that the integrity of the protected area will not be adversely affected (see section 3.2 below for an analysis of the appropriate assessment). All these protection measures are also applicable to activities that take place outside the protected areas, but which have a significant effect on species within that area.

If the appropriate assessment shows that a plan or project will adversely affect the integrity of a protected area, a plan or project can nevertheless be carried out if the exceptions grounds of Article 6(4) of the Habitats Directive are complied with. According to Article 6(4), a plan or project that has negative effects on a protected site can be carried out if the following conditions are met: there are no alternative solutions; there are *imperative reasons of overriding public interest* making it necessary to carry out the plan or project; and the Member State will take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. Article 6(4) contains a non-limitative list of imperative reasons, which includes reasons related to 'beneficial consequences of primary importance for the environment'. This imperative reason of overriding public interest could possibly be of relevance for projects related to new forms of energy production.

3.1.2 Why can Natura 2000 protection measures be a barrier?

Project developers have indicated that most tidal and blue energy installations are situated at sensitive sites, such as deltas and estuaries.[11] At these places salt and fresh water meet and therefore they are ideal sites for blue energy installations. Deltas and estuaries are perfect locations for tidal energy installations as well because of the presence of tidal streams and of dams and barrages in which tidal turbines can be installed.

Often, these locations are protected Natura 2000 sites. Indeed, in the Netherlands all current tidal and blue energy installations are located in or close to Natura 2000 sites: the Wadden Sea, the Marsdiep strait and the Oosterschelde delta area. As yet, the tidal energy industry is not ready to take the technology offshore, where turbines will be less likely to have an influence on Natura 2000 sites. An appropriate assessment

11 Minutes of EIP Meeting in Brussels on 15th June 2015 with Pavel Misiga (European Innovation Partnerships (EIP), Action Group Energy and Water Works – energizing sustainable deltas), available at http://www.eip-water.eu/EWW.

report of a Dutch tidal energy pilot project[12] and interviews with project developers[13] show that tidal energy could negatively influence Natura 2000 sites in several ways, including through preventing migration of fish, seals and sea hogs by creating a barrier between salt and fresh water areas, through increasing the mortality rate of these animals when they are hit by tidal turbine blades, and through decreasing the tidal streams which could harm the habitat of seals and wading birds.

Blue energy installations could also negatively influence Natura 2000 sites in some ways, including through discharging high concentrations of brackish water in the habitats of salt water organisms, and through causing thermal pollution if warm water is fed-in to optimise the blue energy production process.[14] Most of the aforementioned effects of tidal and blue energy techniques will be very minor when caused by pilot installations. They could, however, adversely affect the integrity of protected Natura 2000 sites if applied on a large scale.[15]

An additional issue, which is caused by the newness of the tidal and blue energy techniques, is the uncertainty about the actual environmental risks of these techniques to protected Natura 2000 sites. As very little environmental data is available, national authorities are inclined to require project developers to carry out extensive monitoring programmes. Some project developers have argued that they had to carry out monitoring programmes for projects for which it was clear from the outset that they could not have a significant effect on Natura 2000 sites owing to their size.[16] For large-scale projects this could, however, be quite different and extensive monitoring might then be a necessary measure.

3.1.3 Focus of future research into this issue

Future research will conduct a more thorough assessment of which of the new forms of energy production included in the case studies are likely to be harmful to Natura 2000 sites and which will therefore be required to have recourse to the exemptions of Article 6(4) of the Habitats Directive. It will also assess which *imperative reasons of overriding public interest* can be used in relation to the new forms of energy production, and how a balance can be struck between the wish to develop innovative

12 'Passende Beoordeling van een getijdencentrale in de Oosterscheldekering' (appropriate assessment of a tidal energy plant in the Oosterscheldekering), IMARES Wageningen UR, 27April 2010.

13 Interview with a Dutch professional who is active in the field of tidal energy projects (interview transcript available from the author on request); Interview with a Dutch entrepreneur who is active in the field of marine energy projects (interview transcript available from the author on request).

14 Article 'Osmotic Power with Pressure Retarded Osmosis: Theory, Performance and Trends – a Review' (Helfer, Lemckert, Anissimov, Griffith University, Australia); Interview with a Dutch entrepreneur who is active in the field of blue energy projects (interview transcript available from the author on request).

15 'Passende Beoordeling van een getijdencentrale in de Oosterscheldekering' (appropriate assessment of a tidal energy plant in the Oosterscheldekering), IMARES Wageningen UR, 27 April 2010.

16 Interview with a Dutch entrepreneur who is active in the field of marine energy projects (interview transcript available from the author on request); Minutes of EIP Meeting in Brussels on 15 June 2015 with Pavel Misiga (n 11).

energy technologies and the wish to protect the environment and biodiversity in specific.

This will be done by conducting interviews with project developers, governments and nature protection organisations throughout the EU, by studying project descriptions and licences of energy projects throughout the EU, and by conducting case law (of the EU and Member States' courts) and literature study.

3.2 Over-detailed appropriate assessments (Habitats and Birds Directives)

3.2.1 Introduction to appropriate assessments under the Habitats Directive

As mentioned above, the Natura 2000 network consists of so-called *special areas of conservation* (Habitats Directive). The *special protection areas* which are designated pursuant to the Birds Directive are also part of this network.[17]

Article 6(3) of the Habitats Directive requires an *appropriate assessment* to be carried out for 'any new *plan or project* not directly connected with or necessary to the management of the site but likely to have *a significant effect* thereon …'. Such an appropriate assessment must assess the project's implications for the conservation objectives of the site. The competent national authorities shall agree to the plan or project only after having ascertained that it will *not adversely affect* the integrity of the site concerned. If an appropriate assessment shows that a plan or project will adversely affect the integrity of a special area of conservation, Member States can use the grounds for exception contained in Article 6(4) of the Habitats Directive (which require the presence of imperative reasons of overriding public interest).

The protection measures of Article 6 are also applicable to activities that take place outside a *special area of conservation*, but which have a significant effect on species within that area.[18]

3.2.2 Relevant EU case law

The case law of the European Court of Justice confirms –in accordance with the precautionary principle– that Article 6(3) of the Habitats Directive requires an appropriate assessment even in situations where it is unclear if the new plan or project will have a negative effect on the protected site. In Case C-127/02 *Waddenvereniging and Vogelbeschermingsvereniging*,[19] and again in Case C-6/04 *Commission v United Kingdom of Great Britain and Northern Ireland,*[20] the Court ruled that an appropriate assessment is necessary if there is a 'probability, or a risk, that the plan or project will

17 Habitats directive Article 3.
18 B A Beijen *De kwaliteit van milieurichtlijnen* (Dissertation, Utrecht University 2010) 183.
19 Case C-127/02, *Waddenvereniging and Vogelbeschermingsvereniging*, paras 43-44, 57 and 61.
20 Case C–6/04 *Commission v United Kingdom of Great Britain and Northern Ireland* [2005] ECR I–9017 para 54.

have a significant effect on the site concerned'. According to the Court such a risk is considered –in the light of the precautionary principle– to exist if 'it cannot be excluded, on the basis of objective information, that the plan or project will have a significant effect on the site concerned'.

The Court of Justice also explains that the term 'significant effect' is linked to the 'conservation objectives' of the site (an example of a conservation objective could be: 'preventing the decrease of the population of seals at the site'). Accordingly, the Court says: 'where such a plan or project has an effect on that site but is not likely to undermine its conservation objectives, it cannot be considered likely to have a significant effect on the site concerned. Conversely, where such a plan or project is likely to undermine the conservation objectives of the site concerned, it must necessarily be considered likely to have a significant effect on the site'.[21] In the first situation no appropriate assessment will be necessary, whilst in the second situation an appropriate assessment will be required.

Although the Habitats Directive does not define how an appropriate assessment has to be carried out, the Court of Justice explains that a thorough assessment is usually needed: 'all the aspects of the plan or project which can, either individually or in combination with other plans or projects, affect those objectives [the conservation objectives of the site] must be identified in the light of the best scientific knowledge in the field'.[22] In Case C-304/05 *Commission v Italy*, the Court continues its explanation by suggesting that reports and studies which 'have gaps and lack complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the SPA [Special Protection Area] concerned' cannot be considered to be an appropriate assessment.[23] In other words, an extensive and complete appropriate assessment is the norm.

3.2.3 Why can appropriate assessments be a barrier?

Initial interviews have been conducted with developers of tidal energy[24] and blue energy[25] projects in the Netherlands, who have indicated that they are required by the competent authorities to carry out appropriate assessments for all of their pilot projects, a procedure which is burdensome in terms of both time and cost. These assessments need to include a determination of the baseline situation at the protected site, of changes to that situation caused by the pilot project, and of its cumulative effects in relation to other projects in the same area. These assessments have to cover all protected habitats and species which are present at the site (fish, sea mammals, birds and plants). Owing to the extensive research required, appropriate assessments

21 Case C–127/02 Waddenvereniging and Vogelbeschermingsvereniging (n 20) paras 46–49.
22 ibid paras 52–54.
23 Case C–304/05 *Commission v Italy* [2007] ECR I-7495 paras 68–70.
24 Interview with a Dutch entrepreneur who is active in the field of marine energy projects (interview transcript available from the author on request).
25 Interview with a Dutch entrepreneur who is active in the field of blue energy (n 14) (interview transcript available from the author on request).

can cover more than 100 pages and cost €50,000 (which does not yet include extra costs, such as those for involving stakeholders). The whole process can also take a minimum of a year to finish, owing to the amount of research that has to be done, the changes to be made during the research process pursuant to observations of the competent authorities, and the time required for public consultation (six to eight weeks in the Netherlands).

The project developers who have been interviewed have indicated that the time and cost burdens that are imposed by appropriate assessments weigh heavily on small and medium-sized enterprises (SMEs) that are usually the initiators of pilot projects for tidal and blue energy. Moreover, they contend that their pilot projects have very minimal environmental impacts, making overly-detailed environmental assessments a disproportional requirement.

An additional issue linked to the above is that researches carried out for one project may usually not be reused in the permitting procedure of another project, which makes projects even more time-consuming and costly. Similarly it is not possible to use a environmental research which has been done for a technique in one Member State in the permitting procedure in another Member State.[26]

3.2.4 Focus of future research into this issue

The Habitats Directive and related case law suggest that the precautionary principle is the main reason why the appropriate assessment requirement has been applicable to all Dutch blue energy and tidal energy pilot projects so far. These projects are new developments of which the exact environmental impacts are unknown, and therefore the Habitats Directive seems to require an appropriate assessment to rule out negative effects on the conservation objectives of the Natura 2000 site in question. It could, however, be questioned if pilot projects can be considered to be likely to have a significant effect on the conservation objectives of the protected site.

According to the Court this is the case if 'it cannot be excluded, on the basis of objective information, that the plan or project will have a significant effect on the site concerned'. Pilot projects are often, however, relatively small objects, which are mainly built for testing purposes and which produce only small amounts of energy. Usually they will have a minimal impact on the living environment and are very unlikely to undermine a site's conservation objectives. In two appropriate assessments of Dutch tidal energy pilot projects it has indeed been concluded that the projects had a very minimal effect on the site, and no effect on its conservation objectives.[27]

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26 Minutes of EIP Meeting in Brussels on 15 June 2015 with Pavel Misiga (n 11); Interview with a Dutch entrepreneur who is active in the field of marine energy projects (interview transcript available from the author on request).

27 'Passende Beoordeling van een getijdencentrale in de Oosterscheldekering' (n 12); 'Passende Beoordeling van een drijvende proefopstelling voor getijdenenergie in het Marsdiep bij Texel' (appropriate assessment of a floating testing installation for tidal energy in the Marsdiep close to Texel), IMARES Wageningen UR (8 August 2014).

Future research will focus on assessing if the present EU rules offer possibilities to exempt small scale pilot projects from the appropriate assessment requirement. Or, if that is not possible, it will be assessed if EU law offers possibilities to make the requirements for an appropriate assessment less stringent for small-scale projects. The aim of the future research is to help to speed up the development of new forms of energy production within the EU, whilst finding a balance between renewable energy development and environmental protection. The future research will be done by conducting interviews with project developers, governments and nature protection organisations throughout the EU, by studying project descriptions and licences of energy projects throughout the EU, and by reviewing case law (of the EU and Member States' courts) and literature study.

3.3 Over-detailed environmental impact assessments (EIA Directive)

3.3.1 Environmental impact assessment

The EIA Directive requires the Member States to ensure that, before development consent is given, projects likely to have significant effects on the environment are made subject to an assessment with regard to their effects on the environment (an Environmental Impact Assessment or EIA). Article 3 of the EIA Directive states that the environmental impact assessment

> … shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11, the direct and indirect effects of a project on the following factors:
>
> a) human beings, fauna and flora;
> b) soil, water, air, climate and the landscape;
> c) material assets and the cultural heritage;
> d) the interaction between the factors referred to in points (a), (b), and (c).

According to the EIA Directive there are two types of projects: projects which shall be made subject to an EIA (Annex I), and projects of which the Member State must decide whether an EIA must be carried out (Annex II). Wave, tidal and blue energy belong to the latter category. The Member State can make the decision whether an EIA must be carried out either on a case-by-case basis, or by setting thresholds or criteria. If an environmental impact assessment is required, the developer shall prepare and submit an environmental impact assessment report, which includes: (a) a description of the project, (b) a description of the likely significant effects of the project on the environment, (c) a description of measures to avoid, prevent or reduce and, if possible, compensate these effects and (d) a description of the reasonable alternatives studied by the developer. If requested by the developer, the competent authority shall issue an opinion on the scope and the level of detail of the information to be included in the environmental impact assessment report by the developer.

3.3.2 Relevant case law

As early as 1996, the European Court of Justice had confirmed that the EIA Directive has an 'extended scope and very broad objective'.[28] This has been confirmed and further specified in many subsequent cases. In Case C-50/09 *Commission v. Ireland*[29] the Court of Justice explained that: 'That competent environmental authority must thus undertake both an investigation and an analysis to reach as complete an assessment as possible of the direct and indirect effects of the project concerned on the factors set out in the first three indents of Article 3 and the interaction between those factors'.[30]

Another case shows that an EIA assessment 'must also include an analysis of the cumulative effects on the environment which that project may produce if considered jointly with other projects, in so far as such an analysis is necessary in order to ensure that the assessment covers examination of all the notable impacts on the environment of the project in question'.[31] Also, the Court has stated in Case C-392/96 Commission v Ireland that: 'Even a small-scale project can have significant effects on the environment if it is in a location where the environmental factors set out in Article 3 of the directive, such as fauna and flora, soil, water, climate or cultural heritage, are sensitive to the slightest alteration'.[32]

3.3.3 Why can EIAs be a barrier?

Both wave and tidal energy can be made subject to an EIA. Whether an EIA has to be carried out, and what the exact scope should be for an EIA for a specific project, is dependent on the EIA implementation legislation of the relevant Member State.[33] In principle, blue energy and energy from waste water could be made subject to an EIA-requirement as well, although no proof is found that this has happened up until now. Reports show that developers of wave and tidal energy projects have experienced EIA procedures and have described them as 'burdensome'.

One report states that 'EIAs require the compilation of at least two years' data on marine wildlife habitats and migration at a particular site', which can be too burdensome for many marine energy projects. Furthermore, it can be disproportionate to the level of environmental risk actually present at the site.[34] At least two reports advise to simplifying the EIA procedures for projects at test centres, and for small-size projects.[35] One report argues that: 'The level of required environmental data needs to

28 Case C–72/95 *Kraaijeveld and Others* [1996] ECR I-5403 paras 30 and 31.
29 Case C–50/09 *Commission v Ireland* [2011] ECR I-873.
30 ibid para 40.
31 Case C–404/09 *Commission v Spain*, Judgment of 24 November, paras 78–80
32 Case C–392/96 *Commission v Ireland* [1999] ECR 1-5901 para 66.
33 For an overview of the scope of EIAs in different countries see Ocean Energy Systems (OES) 'Consenting processes for ocean energy on OES member countries' (OES February 2015).
34 Wave and Tidal Energy Market Deployment Strategy for Europe (SI OCEAN 2014) 38.
35 The Streamlining of Ocean Wave Farms Impact Assessment (SOWFIA) Project 'Interim report on barriers, accelerators and lessons learned from all wave energy site experiences' (March 2012) 7; Wave and Tidal

be proportionate to the size of the project and the potential risks associated with the device at a particular location.'[36]

A related issue is that governments tend to find it difficult to decide on the scope of the EIA and on the requirements for environmental monitoring activities. This was experienced by project developers that are active Scotland, Portugal and Spain. The reports suggest that this is caused by a lack of knowledge about the new techniques and about its environmental impacts, on the part of the government.[37] According to one of the reports, the uncertainties of the EIA process have a negative influence on investors in marine renewable energy projects.[38] On the contrary, there has also been an account of a small-sized wave energy project in Sweden which did not require a full EIA.[39]

3.3.4 Focus of future research into this issue

Similarly to the issue of over-detailed appropriate assessments, future research into EIAs will focus on assessing if EU law offers room for excluding pilot projects of new forms of energy production from being subject to an EIA. Alternatively, if that is not possible, it will be assessed if EU law offers possibilities to make the requirements for an EIA less stringent for small-scale projects. The aim of the future research is to help to speed up the development of new forms of energy production within the EU, whilst finding a balance between renewable energy development and environmental protection.

3.4 State aid

3.4.1 State aid rules

Article 107 of the TFEU requires public authorities not to give financial advantages to undertakings when those advantages distort or threaten to distort competition, and when they affect trade between Member States. Such advantages include direct subsidies, interest-free loans, state guarantees, favourable conditions, and price discounts (and more).

However, state aid is not always forbidden. Small amounts of aid are allowed, to a maximum of €200,000 over any period of three fiscal years. There are also exemptions for state aid related to renewable energy, such as 'Investment aid for the promotion of energy from renewable sources', where the aid may be 30-100 per cent of the eligible costs, depending on the awarding procedure; 'Operating aid for the promotion of electricity from renewable sources', where the aid may be a maximum of 5 per cent

Energy Market Deployment Strategy for Europe (n 34) 40.

36 Wave and Tidal Energy Market Deployment Strategy for Europe (n 34) 40.

37 SOWFIA Project (n 35) 10–11, 27.

38 SOWFIA Project (n 35) 31.

39 ibid 21.

of the planned new electricity capacity per year in total, but can be higher for small-scale installations; and 'Aid for research and development projects', where the aid intensity shall not exceed 50-70 per cent of the eligible costs for industrial research, depending on the size of the enterprise.

3.4.2 Why can state aid rules be a barrier?

3.4.2.1 Complicated financing packages vs. complicated state aid rules

Studies and interviews[40] have shown that it is difficult for developers of tidal and wave projects to find sufficient funding for their pilot projects, which involve risky investments with high upfront costs. In order to meet the costs for the investment and those for the permitting procedure project developers therefore tend to pile-up different sources of financing, both of private and public origin. This reduces transparency, making it difficult for project developers and public authorities to understand when they exceed the state aid thresholds. There are accounts of several providers of state aid having a differences of opinion concerning the state aid position of the same project. This can lead to financial uncertainty on the part of the project developer.

The uncertainty about the state aid position of renewable energy projects is also linked to the evolving nature of renewable enterprises and their projects. The thresholds of many state aid exemptions are dependent on these factors: the undertaking that is the beneficiary, the size of the project, and/or the type of project (pilot installation or commercial plant). As these characteristics changes over time (enterprises grow, projects expand), this also influences the state aid position of a project. This can lead to uncertainty about the project's financial position. Potentially, changes in the state aid position of a project could even mean that state aid has to be paid back.

Finally, some project developers and public authorities seem to be unsure about whether state guarantees qualify as state aid and what the conditions are for legal state guarantees.

Focus of future research into this issue

Taking into account the evolving nature of renewable energy enterprises and their projects there may be a need for an innovative approach to the application of the state aid rules in order to ensure effective and reliable funding programmes. Future research will assess if sufficient room is offered by the current state aid rules for such an innovative approach, and if not, if and how the rules can be changed.

40 Wave and Tidal Energy Market Deployment Strategy for Europe (n 34) 23; Conversation with a Dutch consultant who is active in the field of tidal energy projects (conversation transcript available from the author on request).

3.4.2.2 Public waste water treatment body entering the market

An interview[41] with a representative of a Dutch Water Board (a public body responsible for *inter alia* the purification of sewage water) revealed that Dutch waste water treatment facilities have the potential to become an active player on at least five markets for goods and services, including the following markets:

- processing of industrial waste
- processing of animal faeces
- electricity production for the electricity grid
- heat production for neighbourhood heating networks
- green gas production for the gas network

On all of these markets the public waste water treatment body will face competition from private enterprises. Public waste water bodies enjoy benefits not enjoyed by those private enterprises, such as: an existing and publicly financed energy production infrastructure, public protection against bankruptcy, and the possibility of obtaining cheap loans. In order to prevent state aid issues arising, they must make sure not to use these benefits to give financial advantages to the enterprises to which they deliver their services. Examples of such advantages are: selling electricity or heat at a price lower than the market price, or failing to pass on all the costs of a service to the consumer of that service.

Apart from the Netherlands, some other EU Member States also have publicly owned waste water treatment facilities. Scottish Water is a good example as they are also exploring the possibilities of producing energy from waste water.[42]

Focus of future research into this issue

Future research could help to provide clarity about how publicly provided energy services should be organised so that they do not infringe the state aid rules. Such clarity could prevent public authorities from deciding not to enter the renewable energy market out of fear for competition law-related issues.

4. CONCLUSION AND FUTURE RESEARCH

The overview in section 3 of this article focuses on two main policy areas which could create barriers for innovative forms of water-related energy production: environmental protection and the protection of competition. Both of them are analysed below in order to see how future research could help to solve these barriers.

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41 Interview with a professional working in the energy from waste water sector in the Netherlands (interview transcript available from the author on request).

42 http://www.scottishwater.co.uk/investment-and-communities/investment-programme/energy.

In the case of environmental protection, the first challenge is how to deal with uncertain environmental risks posed by innovative renewable energy installations. As yet, uncertainty seems to result in over-specific EIAs and appropriate assessments. These may –both from the perspective of the project developer as from an environmental perspective– not always be the most effective way to deal with uncertain environmental risks. Future research will assess if sometimes more room can and should be given for experimenting with new renewable energy techniques on a small scale, without having to complete full-bodied EIAs and appropriate assessments beforehand. However, such arrangements could be at the expense of the protection of nature and biodiversity. Therefore future research will have to analyse how a balance can be struck between these conflicting interests.

A second challenge is how to deal with actual environmental harm caused by innovative renewable energy installations. The Birds and Habitats Directives contain grounds for exceptions and a great deal of discretionary power for the Member States. Article 6(4) of the Habitats Directive might be able to play an important role here, as it offers an exception to projects having 'beneficial consequences of primary importance for the environment'. However, here again there is a danger of compromising the protection of nature and biodiversity. Future research will assess how national authorities can best use Article 6(4) and other legal instruments in a way to protect the environment, whilst also offering room for the development of innovative technologies – which are of vital importance for that very same environment.

In the case of the protection of competition it is –when we talk about innovative forms of energy production– mainly about maintaining a level playing-field on the market. The EU's wish to support the development of innovative forms of energy production can clash with the wish to protect the market from governmental inference, either in the form of direct state aid or in the form of financially advantaged public bodies which act as market players.

Relating to the first issue, it is clear that it is very difficult for wave and tidal energy pilot projects to find private funding. Therefore, they will often be fully or partly dependent on public funding in order to succeed. Taking into account the evolving nature of renewable energy enterprises and their projects there may be a need for an innovative approach to the application of the state aid rules in order to ensure effective and reliable funding programmes.

Relating to the second issue, the future research could help to provide clarity about how publicly provided energy services should be organised so that they do not infringe the state aid rules.

The future research within this PhD project will build upon the initial research results that have been presented in this article. It will add the following elements: a more extensive description of the sources of the legal problems found in the initial research and of their embedding in EU law, additional research to find out if the legal problems which are identified in the initial research results are present on a

broad scale throughout the EU, identification of possible innovative solutions to problems encountered by the renewable energy forms researched, and an assessment of whether the findings of the PhD research are expandable to innovative forms of energy production which are not included in one of the four water-related case studies discussed in this article.

ÅLANDS VINDKRAFT (C-573/12): THE CONFLICT BETWEEN THE FREE MOVEMENT OF GOODS AND THE PROMOTION OF RENEWABLE ENERGY

Reference to the published article in Dutch:
van Hees, Sander (2014). Ålands Vindkraft (C-573/12): Conflict tussen het vrij verkeer van goederen en de bevordering van duurzame energie. *Nederlands Tijdschrift voor Energierecht* [Dutch Journal for Energy Law], 2014 (5/6), (pp. 212-216) (5 p.).

Case note on the judgement of the European Court of Justice of the European Union of 1 July 2014 (C-573/12, ECLI:EU:C:2014:2037)

1. INTRODUCTION

The year 2014 was a year with two interesting European court cases on Member State-designed support schemes for the promotion of renewable energy. Member States use these schemes to promote the production of renewable energy, in order to reach their binding national targets for the domestic use of energy from renewable sources by the year 2020 (as laid down in Directive 2009/28/EC on the promotion of the use of energy from renewable sources).[1] In September 2014 the Court delivered its judgement in the case of *Essent/VREG* on the compatibility of a Flemish support scheme, which was only applicable to energy produced in Flanders, with Article 34 TFEU (the free movement of goods). Interestingly, the Directive that was applicable at the time (Directive 2001/77/EC, which was the predecessor of Directive 2009/28/EC) did not mean to oblige Member States to open their support schemes to renewable energy that was produced in a different Member State.[2] In this case the Court decided that the Flemish support scheme infringed upon Article 34 TFEU. Nevertheless, this infringement could be justified due to environmental protection reasons.[3] Two months before this, in July 2014, a judgement was delivered in the case of *Ålands Vindkraft* (discussed in this case note) which dealt with almost exactly the same issues. The difference is that Directive 2009/28/EC was in force at the time of the conflict discussed in the *Ålands Vindkraft* case. That directive explicitly allows for the establishment of a *territorial limitation* (limiting the promotion scheme's scope of application to energy produced within the relevant Member State). Both cases are strongly reminiscent of the *PreussenElektra* case from 2001. In that case the Court also delivered a judgment on the relationship between a national system for

1 For the Netherlands, for instance, the binding national target for the share of energy from renewable sources in the gross final consumption of energy by 2020 is 14%; see Annex 1 of Directive 2009/28/EC.
2 Joined cases C-204/12 to C-208/12, *Essent/VREG*, para 66.
3 Joined cases C-204/12 to C-208/12, *Essent/VREG*, paras 83-115 in particular.

the promotion of renewable energy and the free movement of goods.[4] An interesting element of both the *Essent/VREG* and the *Ålands Vindkraft* cases is that they bring to light the existence of a lack of mutual coordination between two important European policy areas: renewable energy policy and the rules on the free movement of goods. The analysis in section 3 of this case note focuses on this issue.

2. SUMMARY OF THE CASE

2.1 The Swedish support scheme for renewable energy

Directive 2009/28 on the promotion of the use of energy from renewable sources[5] obliges the Member States to reach a national target for the *use* of energy from renewable sources in their territory. In reality, 'use' is calculated as the quantity of electricity that is *produced* from renewable sources in a specific Member State.[6] In order to reach this production target the directive suggests that the Member States can *inter alia* establish national support schemes that are based on a green certificate system (Articles 3(3) and 2(k)-(l) of the directive).

With regard to the *Ålands Vindkraft* case, green certificates are transferable bonds that are issued by the Swedish government. On the one hand, energy producers that are officially recognised by the Swedish government receive an electricity certificate for every megawatt hour (MWh)[7] of green electricity produced. On the other hand, electricity suppliers and some consumers are obliged to annually acquire a certain amount of certificates and to hand these over to the Swedish government. That amount of certificates needs to correspond to a share of the total amount of electricity that they have supplied or consumed during the past year.[8] The electricity suppliers and (certain) consumers can buy the certificates required from the producers of

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4 In *PreussenElektra* (Case C-379/98, *PreussenElektra*) the promotion system was however shaped in a different way. That case concerned a German system that obliged distributors of electricity to purchase all energy from renewable sources produced in their area at a fixed price. The Court concluded that such a rule was not –under the then applicable EU law on the electricity market– incompatible with Article 34 (then Article 28) of the Treaty. See for a further analysis of this case: HHB Vedder, 'Het Europese recht en de stimulering van duurzame energie – Duitse windhandel' [European law and the promotion of renewable energy – German wind trading], Nederlands Tijdschrift voor Europees Recht (NVER) [Dutch Journal for European Law], nr. 6, juni 2001 [June 2001], p 147-155.

5 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, OJ L 140.

6 The directive (Article 3 and Annex 1) shows that the national targets refer to the share of energy from renewable sources in the gross final consumption of energy of every Member State in a specific year. Nevertheless, Article 5(3) of the directive shows that this gross final consumption of electricity from renewable energy sources shall be calculated as the quantity of electricity produced in a Member State from renewable energy sources.

7 'A megawatt is a unit for measuring power that is equivalent to one million watts. One megawatt is equivalent to the energy produced by 10 automobile engines. A megawatt hour (Mwh) is equal to 1,000 Kilowatt hours (Kwh). It is equal to 1,000 kilowatts of electricity used continuously for one hour. It is about equivalent to the amount of electricity used by about 330 homes during one hour.' Source: http://www.cleanenergyauthority.com.

8 Case C-573/12, *Ålands Vindkraft*, para 15.

green electricity since the electricity certificates are tradable 'on an open competitive market where price is determined by the interplay of supply and demand.'[9]

2.2 The territorial limitation clause

Under Swedish law green certificates can only be awarded to electricity that is produced in Sweden.[10] This seems to be in line with Directive 2009/28 which mentions that Member States shall have the right to decide 'to which extent they support energy from renewable sources which is produced in a different Member State.'[11] Advocate General Bot observed in this regard that 'The fact that national targets are set for promoting green energy use and the emphasis on production arguably make it quite legitimate for Member States to reserve their support exclusively to national production, which is what will enable them to meet their targets.'[12]

Nonetheless, 'Ålands Vindkraft' (an energy producer) asked the Swedish government to be awarded green certificates with regard to electricity produced by a wind farm in the Finnish Åland archipelago. The Swedish energy agency refused to issue these certificates. In the subsequent court case the Swedish judge –who made the reference for the preliminary judgement– asked the European Court of Justice ('the Court'), *first of all*, whether the territorial limitation in the Swedish green certificate scheme was allowed with regard to Directive 2009/28. The Court indicated in its judgement that it is essential, according to the Directive, 'that Member States be able to determine whether and, if so, to what extent their national support schemes are to apply to green energy produced in other Member States […].'[13] As this discretionary power of the Member States is explicitly referred to in the directive, the Court was of the opinion that the Swedish support scheme was compliant with the directive.[14]

2.3 Infringement of the free movement of goods

Subsequently, the Swedish court asked itself whether the territorial limitation of the Swedish green certificate scheme was an infringement of the free movement of goods (Article 34 TFEU). First, the Court emphasised that national support schemes have not been exhaustively harmonised by Directive 2009/28. In the directive there was (in the opinion of the Court) nothing 'to suggest that the directive is intended to bring about harmonisation of characteristics specific to the various national support schemes.'[15] Therefore, the Swedish green certificate scheme needed to be examined for its compatibility with Article 34 TFEU.[16]

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9 Case C-573/12, *Ålands Vindkraft*, paras 12-15 and 113 ff.
10 Case C-573/12, *Ålands Vindkraft*, para 12.
11 Directive 2009/28/EC, Article 3(3).
12 Opinion of Advocate General Bot, Case C-573/12, *Ålands Vindkraft*, para 50.
13 Case C-573/12, *Ålands Vindkraft*, para 50. Directive 2009/28/EC, para 25 and Article 3(3).
14 Case C-573/12, *Ålands Vindkraft*, para 54.
15 Case C-573/12, *Ålands Vindkraft*, paras 58-64.
16 The court reiterated the basic rule: 'In that regard, it should be noted that the Court has consistently held that, where a matter has been the subject of exhaustive harmonisation at EU level, any national measure

First, the Swedish system obliged the suppliers of imported energy to buy Swedish green certificates (as the handing over of foreign certificates to the Swedish government was not allowed). Those suppliers had to pay a fee if they did not succeed in handing over those certificates. According to the Court such measures are capable of impeding electricity imports from other Member States.[17]

Secondly, the Court observed that *Swedish* producers of green energy had the opportunity to sell their (green and/or grey) electricity *in combination* with green certificates (as a 'package deal'). Non-Swedish energy producers did not have this opportunity. Therefore, this could have led to a decrease in electricity imports to Sweden from other Member States. According to the Court the Swedish failure to *prevent* this type of barrier to import could be seen as an infringement (by Sweden) of Article 34 TFEU (c.f. the cases of *Spanish Strawberries* and *Schmidberger*).[18] In the light of the foregoing the Court concluded that the Swedish support scheme infringed the free movement of goods in the EU.

2.4 Justification for the infringement

The Court subsequently observed that the infringement that was caused by the Swedish scheme could nevertheless be justified because the goal of the scheme ('the promotion of the use of renewable sources for the production of electricity') contributed to the protection of the environment and, moreover, to the protection of the health and life of humans, animals or plants (this is one of the reasons for the justification as mentioned in Article 36 TFEU).[19]

2.5 The proportionality test

Finally, the Court discussed the proportionality test in great detail (in order for the national legislation to be able to be justified it must be appropriate for securing the attainment of the legitimate objective pursued and it must be necessary for those purposes). First, the Court appreciated the fact that a national support scheme promotes the *production* of green electricity (instead of its *use*) as 'the green nature of the electricity relates only to its method of production'.[20] Furthermore, the directive clearly indicates that the degree of compliance of the Member States with the targets will be calculated as the quantity of electricity that is *produced* from renewable sources

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relating thereto must be assessed in the light of the provisions of that harmonising measure and not in the light of primary law', see Case C-573/12, *Ålands Vindkraft*, para 57.

17 Case C-573/12, *Ålands Vindkraft*, paras 68-70.

18 Case C-573/12, *Ålands Vindkraft*, paras 71-74.

19 Case C-573/12, *Ålands Vindkraft*, paras 77-82.

20 Case C-573/12, *Ålands Vindkraft*, para 95. This observation of the Court was probably meant as a further clarification of the relationship between the Swedish support scheme (which promoted the *production* of green electricity) and the directive (which was made for the benefit of the promotion of the *use* of green electricity). It was also an answer to an argument raised by Ålands Vindkraft (the applicant) in the national court procedure. See para 25 of the case.

in a specific Member State.[21] Subsequently, the Court observed that the Swedish support scheme was a proportional measure as it is essential "that Member States be able to 'control the effect and costs of their national support schemes according to their different potentials', while maintaining investor confidence."[22]

Moreover, the Court observed that "while preserving the national and, in principle, territorial nature of the existing support schemes, the EU legislature has none the less also established various mechanisms to enable Member States to cooperate, in so far as is possible, in order to achieve their mandatory targets under Directive 2009/28."[23]

The Court also discussed Ålands Vindkraft's argument that Sweden would also reach the targets as set by Directive 2009/28 with its current domestic production capacity of green energy. A support programme with a territorial limitation was therefore, according to Ålands Vindkraft, unnecessary. The Court rejected this argument and stated that the effectiveness of national support schemes requires "a measure of continuity sufficient, in particular, to ensure the fulfilment of the legitimate expectations of investors" who have committed themselves to investments in new energy installations.[24] The Court concluded its judgement with four additional observations on proportionality.[25] Also these final considerations led, according to the Court, to the conclusion that the Swedish green certificate scheme withstood the proportionality test.

2.6 Conclusion

Finally, the Court concluded that Article 34 TFEU did not in fact prohibit the Swedish support scheme. The support scheme included a territorial limitation that can form a barrier to the trading of renewable energy between Member States, but this barrier can be justified and it withstands the proportionality test.[26]

3. ANALYSIS

The Ålands Vindkraft case reveals a frequently occurring problem in EU law: the coordination problem.[27] In the present case it appears that there has been insufficient

21 Case C-573/12, *Ålands Vindkraft*, paras 95-97; Directive 2009/28/EC, Article 3(5).
22 Case C-573/12, *Ålands Vindkraft*, paras 98-99.
23 Case C-573/12, *Ålands Vindkraft*, paras 100-101.
24 Case C-573/12, *Ålands Vindkraft*, paras 102-103. See the critical comments on these paragraphs by Professor Dr. Markus Ludwigs (Universität Würzburg) in the 'Europäische Zeitschrift für Wirtschaftsrecht': *EuGH: Energierecht: Keine Pflicht zur Erstreckung der Ökostromförderung auf in anderen Mitgliedstaaten erzeugten Strom*, EuZW 2014, 620, see the last paragraph of the Analysis (II) on page 627.
25 Case C-573/12, *Ålands Vindkraft*, paras 105-119.
26 This summary does not include the fourth preliminary question in which the Court was asked whether the Swedish measure was compatible with the principle of legal certainty. See paras 120-132 of the case.
27 *Mortelmans and Hellingman* state that several conditions must be fulfilled in order to achieve a consistent government policy ('in an economy like ours'). One of those conditions is 'the mutual harmonisation of different forms of governmental actions and interventions.' If this is not properly done, then there

coordination between the EU's renewable energy policy and the rules on the free movement of goods. In the *Ålands Vindkraft* case this lack of coordination led to a conflict between Article 34 TFEU (the free movement of goods) and Directive 2009/28, which aims to promote the use of energy from renewable sources. Ultimately, the Court of Justice had to resolve this problem by deciding –under Article 36 TFEU or through the application of 'the rule of reason'– which of the two conflicting policy areas should prevail over the other. The Court decided that the infringement of Article 34 could be justified because the goal of the Swedish support scheme ('the promotion of the use of renewable sources for the production of electricity')[28] contributed to the protection of the environment. It seems that the court made –from the perspective of an effective implementation of the *current* EU renewable energy policy– a sensible decision in this regard. After all, Directive 2009/28 obliges the Member States to guarantee that a certain percentage of *domestically* produced energy stems from renewable sources (wind, sun, water, etc.). If Member States would be required to open their support schemes to renewable energy which is produced *outside of their borders*, then they would potentially lose a powerful instrument to directly influence the amount of domestically produced energy. Obviously, the effectiveness of the promotion of renewable energy *per Member State* could be questioned. After all, the production of energy is not bound by Member State borders. Apart from the fact that this is not factually the case (one could take the Dutch intake of German surplus wind energy on windy days as an example),[29] this thought would also be contrary to the idea of a European internal market in electricity.[30] It would perhaps be more logical to establish EU-wide support schemes for renewable energy. However, the existence of individual targets for the production of renewable energy is the *status quo* and it seems that the Court took a decision that fits this reality. The Court seemed to argue that as long as there is no harmonisation of support schemes for green energy on the EU level, it remains necessary to allow the establishment of national support schemes that are limited to domestically produced green energy.[31] An obvious question would be why is there a need for intervention by a European court in the case of a seemingly simple subsidy application for the production of renewable energy. Another obvious question is the following: is this a desirable situation? The answer to the first question can be found in Directive 2009/28. This directive explicitly includes the possibility for the Member States to establish support schemes for which electricity produced in other Member States is not eligible. Hence, the directive contains a clause that represents an inherent lack of coordination with the free movement of goods. There are two ways in which the legislator could rectify this mistake. On the one hand, the directive could be adapted to the extent that it would exhaustively harmonise support schemes for renewable energy. As a result, Article 34 TFEU will not any longer be

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is a 'coordination problem'. See K Hellingman and KJM Mortelmans, *Economisch Publiekrecht* – rechtswaarborgen en rechtsinstrumenten (Kluwer 1989) p 32.

28 Case C-573/12, *Ålands Vindkraft*, paras 77-82.

29 See for instance: 'Duitse stroom is mazzel voor ons', [German electricity is a piece of luck for us'] AD/ Algemeen Dagblad, Algemeen – Economie, p. 23, vrijdag 23 mei 2014 [Friday 23 May 2014].

30 Directive 2009/72/EC concerning common rules for the internal market in electricity. See for instance paras 1-6 of the preamble on the goals of the internal market in electricity.

31 Case C-573/12, *Ålands Vindkraft*, para 94.

applicable.[32] It would be possible, in that regard, to lay down (in a binding way) that support schemes containing territorial limitations are allowed. On the other hand, it would be possible to amend the directive to the extent that it would no longer allow support schemes that infringe the free movement of goods. In that way, the directive would be compatible with Article 34 TFEU, which means that further harmonisation is not necessary.[33] Which one of the two solutions must be chosen, is a political choice. It is up to the legislator, on the one hand, to decide on which of the conflicting interests (the promotion of renewable energy and the protection of the free movement of goods) should be given more weight, and, on the other hand, to lay down this choice in the law. In the light of an effective renewable energy policy it is undesirable to leave this choice to the European court on an *ad hoc* basis. The details of the future decisions taken by the European court in this regard are dependent on the specific characteristics of new national support schemes that will be brought before the court. The court will decide on a case-by-case basis whether a support scheme is allowed under Article 34, or whether it must be prohibited. In this way the beneficial effect of legislation (the fact that stakeholders, including Member States and investors, are given *ex ante* legal certainty) is taken away: one will have to wait for the decision of the court in the specific case. Judges only have very limited tools and can (in the case of Ålands Vindkraft) only decide that a national rule is *either* in conformity *or* not in conformity with EU law. In the case of an infringement of EU law, the national rule will have to be set aside. In that case we can speak of *deregulation*.[34] By means of the implementation of secondary legislation, the EU legislator has much more advanced tools (see the two suggestions above) to coordinate the two policy areas in question. Therefore, the task to come up with a solution to conflicting policy areas should lie with the EU legislator, instead of with the court. Another reason why it is undesirable to stick to the *status quo* is that not all cases (by far) in which a conflict arises between a national support scheme and Article 34 will be brought before the European Court of Justice.[35] In cases in which this does not occur, it is up to the national court to take a decision. Courts in different Member States can take different decisions. This can

32 See footnote 16.

33 The General Block Exemption Regulation (GBER) in the area of state aid control can be taken as an example here. Article 1(5) GBER states that the GBER is not applicable to certain aid measures which infringe the EU's rules on the free movement of goods. For instance, the GBER does not apply to state aid measures which entail 'aid measures where the grant of aid is subject to the obligation for the beneficiary to use nationally produced goods or national services'. See Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty, Article 1(5)(b). Also see B Hessel and M Vidal, 'De nieuwe Algemene groepsvrijstellingsverordening voor staatssteun (deel I)' [The new General block exemption regulation for state aid (part I)], *De Gemeentestem*, 2014/99, para 2.5.

34 L Woods and P Watson, *Steiner & Woods EU Law*, Oxford University Press 2014, 12th edition, chapter 16 (Harmonisation), p 342.

35 *Van Harten* even suggests that a reference for a preliminary judgement as such is in fact exceptional in the Dutch European law case law. Moreover, he points at the fact that even if a preliminary decision *is* taken by the Court, then this decision will in all cases be followed by a final decision of the national court. Van Harten states that, in practice, the decision of the national court is not always a pure application of the decision of the Court of Justice. In practice the national judge often also has to 'translate' the decision of the Court into the actual decision on the dispute in the national case. See HJ Van Harten 'Wat doet de Nederlandse rechter met het Europees recht?' [What does the Dutch court do with EU law?] (2013) *Trema*, 36(4), pp 121-127.

result in the situation that one type of support scheme is allowed in one Member State, while it is prohibited in another.

Finally, it is also for another reason undesirable to maintain the *status quo* and to leave it to the Court to solve this type of conflict. Altogether, the parties involved had to wait five years for the decision of the Court (the time that lapsed between the refusal of the Swedish energy agency to issue the certificates to Ålands Vindkraft, and the decision of the Court of Justice). In the case of *Essent/VREG* this was four years (the time that lapsed between bringing the issue before the Belgian judge, and the final judgement by the Court of Justice). This period of uncertainty surrounding the future of a national support scheme for green energy can be disadvantageous for investors, Member States and the EU (although further research should be carried out in order to confirm this assumption). This uncertainty could harm the effectiveness of the EU's renewable energy policy, while creating certainty for investors is actually one of the goals of this policy.[36] From the perspective of an effective renewable energy policy it is therefore very important that the EU legislator assumes its responsibility in coordinating between different policy areas. This should be done by mitigating potential conflicts *beforehand*, i.e., during the legislative process.

36 Directive 2009/28/EC, para 14 of the preamble.

INVESTMENT STATE AID FOR OCEAN ENERGY PROJECTS IN THE EU: A LACK OF INTEGRATION WITH THE RENEWABLE ENERGY DIRECTIVE?

Reference to the published article:
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Abstract

Ocean energy techniques (including tidal energy, wave energy, and salinity gradient energy) can play an important role with respect to the achievement of the Member States' specific renewable energy targets set by the Renewable Energy Directive. In 2016, the EU´s *Ocean Energy Forum* reported that EU State aid guidelines remain 'burdensome and restrictive.' This article argues that the State aid framework would indeed be *too* restrictive if it were to prevent *those* renewable (ocean) energy projects which are *important* for achieving a Member State's renewable energy targets from sourcing sufficient funding. This would imply a lack of integration between State aid and renewable energy policy. It is concluded that while most conditions of the *General Block Exemption Regulation* and the *Commission Guidelines on State aid for environmental protection and energy* hardly seem to be burdensome, the State aid framework's proportionality criteria may form a restriction to pre-commercial ocean energy projects. This article's main suggestion is to solve this possible lack of integration by making the balancing test under the Guidelines more flexible for those situations where the State aid framework prevents *important* renewable (ocean) energy projects from sourcing sufficient funding. Also, two alternative solutions are discussed: improving access to finance for SMEs in the field of ocean energy, and providing for sufficient investment aid on the EU level.

I. INTRODUCTION

Since the introduction of the Renewable Energy Directive (RED) in 2009, the Member States of the European Union (EU) are bound by mandatory renewable energy targets.[1] Under this Directive Member States must encourage the production of energy from 'all types of renewable sources'[2] in order to meet the renewable energy production targets for the year 2020 as set out in the Directive. Apart from wind and solar energy, these also include sources that require innovative water-related techniques, such as tidal energy, wave energy, and salinity gradient energy (blue energy). These techniques are usually labelled as 'ocean energy'.[3] According

1 For instance, in 2020 the share of energy use from renewable sources should be 14% in the Netherlands, 23% in France, and 15% in the UK. See Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (Renewable Energy Directive) [2009] OJ L140/16, annex I.

2 Renewable Energy Directive (n 1) arts 6 and 14.

3 The Commission uses the term 'ocean energy', which is somewhat confusing as some of the techniques that are covered by this term (tidal energy and salinity gradient energy in particular) can also be used in

LARGE-SCALE WATER-RELATED INNOVATIVE RENEWABLE ENERGY PROJECTS AND THE WATER FRAMEWORK DIRECTIVE: LEGAL ISSUES AND SOLUTIONS

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Abstract

This article discusses two legal issues that relate to the conflict between the interest of protecting water quality under the Water Framework Directive (WFD), versus the interest of promoting the use of innovative water-related renewable energy, with regard to the quota in the Renewable Energy Directive. These legal issues are: *first,* the conflict between the provisions of the WFD and the Renewable Energy Directive as expressed by the no-deterioration obligation, and *second,* the lack of integration between the Renewable Energy Directive and the derogation clause of the Water Framework Directive. Tidal energy and salinity gradient energy (blue energy) are used as a case study to show the practical relevance of the legal issues for innovative water-related renewable energy techniques. The final section discusses solutions to the legal issues. These are *first,* the application of adaptive management in combination with phased deployment in order to deal with uncertainty, and *second,* the introduction of detailed renewable energy plans per Member State in order to increase integration between the WFD and the Renewable Energy Directive.

1. INTRODUCTION

Since the introduction of the renewable energy directive (RED) in 2009, the Member States of the European Union are bound to mandatory renewable energy targets.[1] Under this directive Member States must encourage the production of energy from 'all types of renewable sources'[2] in order to meet the renewable energy production targets for the year 2020 as set out in the directive. Apart from wind and solar energy, these also include sources that require innovative water-related techniques, such as tidal energy, wave energy, and salinity gradient energy (blue energy). According to the European Commission, such renewable energy techniques can play an important role with respect to energy security and contribution to the Europe's decarbonisation goals.[3] At the same time, there are fields of EU law that can get into conflict with the

1 For instance, in 2020 the share of energy use from renewable sources should be 14 % in the Netherlands, 23 % in France, and 15 % in the UK. See Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, annex I.

2 Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, articles 6 and 14.

3 European Commission, Communication, 'Blue Energy – Action needed to deliver on the potential of ocean energy in European seas and oceans by 2020 and beyond', COM(2014) 8 final (20 January 2014), pp 2-3.

'producing more renewable energy'-objective. These fields of EU law include nature protection law, state aid law, free movement law, and water law. This article discusses two legal issues related to the conflict between the interest of protecting water quality under the Water Framework Directive (WFD), versus the interest of promoting the use of innovative renewable energy, which follows from the Renewable Energy Directive. Tidal energy and salinity gradient energy are two innovative water-related renewable energy sources that may in particular face legal issues related to the WFD,[4] especially when implemented on a large scale in the future. These renewable energy techniques fall within the scope of application of the WFD as they can be implemented in inland surface waters, transitional waters, and coastal waters.[5]

The first legal issue concerns a potential conflict between the goals of the two directives. The purpose of the Water Framework Directive is to establish a framework for the protection of waters that prevents further deterioration and protects and enhances the status of aquatic ecosystems. The WFD's ultimate goal is to achieve a 'good status' for all of the European Union's surface waters and groundwater.[6] It is likely that this goal of no-deterioration of water quality will sometimes come into conflict with Member State's efforts to promote an increased production of renewable energy, as required by the Renewable Energy Directive. This may especially be the case when it concerns water-related energy forms –such as tidal energy and salinity gradient energy– that may have a negative effect on fish and other elements of water quality. An additional issue in this regard is the scientific uncertainty that often exists with regard to the existence and scope of such negative effects.

The second legal issue discussed in this article concerns the lack of integration between the two directives, which is demonstrated most clearly by the WFD's derogation clause: article 4(7) WFD. This clause offers a possibility to exempt certain projects that are of overriding public interest from the no-deterioration obligation after a balancing act is carried out. There is however no actual integration between the derogation clause and the Renewable Energy Directive (RED). Nor is there an obligation to apply the clause in cases where a renewable energy project risks to cause a prohibited deterioration of water quality. Therefore, there is no guarantee that applications for the authorisation of renewable energy projects that are important for achieving the RED's goals will actually be weighed under the WFD. Nor is there a guarantee that a serious balancing of interests will take place.

The Commission uses the term 'ocean energy', which is somewhat confusing as some of the techniques that are covered by this term (tidal energy and salinity gradient energy in particular) can also be used in an in or on-shore configuration. This is further discussed in the next section.

4 They may, however, also face legal issues related to the Habitats and Birds Directive. See section 6, second paragraph, for further elaboration on this.

5 The scope of application of the WFD is indicated in article 1: "The purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater […]".

6 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, article 1; Opinion of Advocate General Jääskinen in Case C-461/13, *Bund für Umwelt und Naturschutz Deutschland* (Weservertiefung) [2014], paras 38-39.

These two legal issues are discussed in the following sections, followed by a section that discusses possible solutions to the issues. First, however, this article features a brief case study of the two innovative water-related renewable energy forms 'tidal energy' and 'salinity gradient energy', which serve to illustrate the practical relevance of the two legal issues for future innovative renewable energy projects.

2. CASE STUDY: TIDAL ENERGY AND SALINITY GRADIENT ENERGY

Tidal energy uses the power that is produced by tidal ebb and flow currents. Tidal energy turbines are usually installed at sites with high-speed currents, such as narrow straits, inlets,[7] or channels between islands.[8] One technique to harvest tidal energy is by using tidal stream turbines.[9] Tidal stream technology harvests the energy from water streams that are moving due to the tides. The design of tidal stream turbines is similar to the design of wind turbines, but 'due to the higher density of water the blades are smaller and turn more slowly than wind turbines'.[10] This type of turbine will normally be placed in barriers, under bridges or they can be fixed to the sea-bed.

Salinity gradient energy is electrical energy which is harvested by the mixing of two water streams of different salinity. Salinity gradient power could be produced everywhere in the world where salt solutions of different salinity (for example fresh river water and seawater, or brine waste water and sea water) are available.

Both are relatively new techniques. Currently there are only a few smallscale tidal stream developments in operation, including in the *Oosterschelde* and the *Afsluitdijk* storm surge barriers in the Netherlands, and in the *Pentland Firth* straight in the north of Scotland. Momentarily a small-scale salinity gradient energy testing installation is installed at the Afsluitdijk storm surge barrier. Both techniques have in common that they have a predictable and often constant energy output, as opposed to wind and solar energy, which have a variable revenue. Therefore, they can help to achieve security of supply on the EU's renewable energy market. Moreover, they have the potential to produce a considerable percentage of the EU's renewable energy needs.[11]

7 For instance: the *Oosterschelde tidal energy project* in the Netherlands, see: http://www.tocardo.com/Project/oosterschelde/.

8 For instance: the *Pentland Firth tidal energy project* in Scotland, see: https://www.atlantisresourcesltd.com/projects/meygen/.

9 Another –and slightly more established– tidal energy technique is 'tidal range energy'. 'Tidal range devices make use of the vertical difference in the water level between a high tide and a low tide. They usually do this by 'trapping or impounding the sea water within a flooded basin behind a large tidal barrage before releasing it back to the sea via turbines.' See http://www.alternative-energy-tutorials.com/tidal-energy/tidal-power.html.

10 International Renewable Energy Agency, Tidal Energy – Technology Brief, 2014, p 11.

11 For instance, with respect to tidal energy in the UK: Marine Scotland, MeyGen Decision, Decision Letter and Conditions, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/DecisionLetter, pp 14 and 22: "Wave and tidal stream energy technology have the potential to play an important role in decarbonising our energy supply, increasing energy security and reducing our dependence on fossil fuels. The Carbon Trust has estimated that wave and tidal resources could provide 20 per cent of the UK's electricity if fully developed." […] "Due to the intermittent nature of renewables generation, a balanced electricity mix is required to support security of supply requirements." And for instance, with respect to

Both techniques do, however, have the potential to negatively impact water quality elements that are protected by the Water Framework Directive. These include the composition and abundance of fish fauna, the tidal regime, thermal conditions and salinity. These are all quality elements that are linked to the ecological status of a water body.[12]

Environmental assessments[13] that have been carried out for the authorisation procedure of current small-scale tidal energy developments indicate that tidal turbines may have negative effects on fish. With respect to the tidal energy project in the *Oosterschelde,* it was indicated that the underwater turbulence caused by the turbines could cause fish to become disorientated and therefore they could be easier to catch by birds. Fish are also at risk of being hit by a rotor blade and they may be sensitive to underwater noise.[14] Moreover, fish might be prevented from migrating to the fresh water side of the dam in which the tidal turbines are placed because of their passage being blocked by the turbines.[15] With respect to the tidal energy project in the *Pentland Firth* an assessment indicated similar potential impacts from the tidal array on fish species, including: collision risks, noise (during installation, operation, maintenance and decommissioning) and effects on fish passage.[16] The assessment of the *Oosterschelde* project also indicate that tidal energy turbines may reduce the tidal flow in the water body where they are installed.[17] In both small-scale projects these possible effects have not led to a prohibition based on the non-deterioration rule of the Water Framework Directive. The assessments do show, however, that tidal energy may cause risks for fish and the tidal flow. As 'the composition and abundance of fish fauna' and 'the tidal regime' are quality elements[18] under the WFD, negative effects on fish and the tides may play an important role in the authorisation procedure of future large-scale tidal energy projects.

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salinity gradient energy: J W Post, Blue Energy: electricity production from salinity gradients by reverse electrodialysis, 2009, p 187: "The technical potential for [the Rhine and Meuse (with their river mouth located in The Netherlands)] – as derived from the global datasets – is 2.4 GW. The economic potential is estimated to be 1.5 GW, when looking into more detail to the Dutch Delta."

12 For an overview of the quality elements for the qualification of ecological status of a water body, see: Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, annex V.

13 The environmental assessments referred to in this section are 'appropriate assessments' that were carried out pursuant to the Natura 2000 rules. These assessments do, however, also mention possible negative effects on water quality that are covered by the Water Framework Directive.

14 IMARES, Institute for Marine Resources & Ecosystem Studies, 'Passende Beoordeling van een getijdencentrale in de Oosterscheldekering' [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, p 34.

15 IMARES, Institute for Marine Resources & Ecosystem Studies, 'Passende Beoordeling van een getijdencentrale in de Oosterscheldekering' [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, pp 45-47.

16 Marine Scotland, MeyGen Decision – Appropriate Assessment, September 2013, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment, pp 84-85 and 90-92.

17 IMARES, Institute for Marine Resources & Ecosystem Studies, 'Passende Beoordeling van een getijdencentrale in de Oosterscheldekering' [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, p 17.

18 Effects on tidal flow relates to water quantity rather than water quality. Under the WFD it is qualified, however, under 'Hydromorphological elements supporting the biological elements' and it is used in the assessment process of the water quality of transitional waters.

As salinity gradient energy is in its very early stages of development, there are no project-related environmental assessments that indicate possible negative effects on water quality. There are, however, some academic publications that give some suggestions in this regard. First, as salinity gradient energy mixes two streams of different salinity to produce energy, it will always discharge a brackish residue. When this brackish water is discharged in superficial layers of the ocean, it would release nutrients at the surface layer that originate from the fresh water side, 'and subsequently lead to local eutrophication'.[19] Eutrophication is the addition of nutrients (mainly phosphor) to water, which allows organisms to grow which would otherwise not be able to grow there.[20] This may be seen as pollution under the physico-chemical quality elements as protected by the WFD. Moreover, the discharge of brackish water may also alter the local aquatic environment due to salinity changes.[21] 'Salinity' also is a quality element under the WFD.[22] These two environmental effect would, however, only be an issue for the authorisation of a salinity gradient energy project if the brackish water is discharged at a site where it would not end up without the presence of the salinity gradient plant.[23] Second, the energy output of salinity gradient installations can be increased by adding industrial waste heat in the form of warm water to the energy production process.[24] As a result, thermal pollution could occur in the water body that receives the brackish water stream. As 'thermal conditions' are a quality element under the WFD, this aspect may play a role in the authorisation procedure of large-scale salinity gradient energy installations. Third, large-scale salinity gradient energy plants will abstract large quantities of water, creating a risk that fish are sucked into the installation and will suffer physical damage and disorientation, which can lead to increased fish mortality.[25] As seen before, 'the composition and abundance of fish fauna' is a quality element under the WFD, and negative effects on fish may therefore play a role in the authorisation procedure of future large-scale salinity gradient energy projects. Moreover, the abstraction of large quantities of water from rivers or other water bodies influences the water body's 'hydrological regime', or more specific 'the quantity and dynamics of water flow'. This also is a quality element under the WFD.[26]

19 F Helfer, C Lemckert and YG Anssimov, Osmotic power with Pressure Retarded Osmosis: Theory, performance and trends – A review, Journal of Membrane Science 2014 (1) p 33.

20 Based on http://dictionary.cambridge.org/dictionary/english/eutrophication, and on an interview with a developer of salinity gradient energy in the Netherlands (transcript available from the author upon request).

21 F Helfer, C Lemckert and YG Anssimov, Osmotic power with Pressure Retarded Osmosis: Theory, performance and trends – A review, Journal of Membrane Science 2014 (1) p 33; A Cipollina, G Micale (eds), Sustainable Energy from Salinity Gradients, 2016, pp 317-318.

22 For an overview of the quality elements for the qualification of ecological status of a water body, see: Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, annex V.

23 In the situation of the test-installation on the *Afsluitdijk* there is, for instance, probably no issue as the installation is built at a site where fresh water discharges into the sea also without the presence of a salinity gradient plant.

24 M Janssen, A Härtel, R van Roij, Boosting capacitive blue-energy and desalination devices with waste heat, Phys. Rev. Lett. 2014 (113) p 1.

25 A Cipollina, G Micale (eds), Sustainable Energy from Salinity Gradients, 2016, p 316.

26 This element actually concerns water quantity rather than water quality. Under the WFD it is qualified, however, under 'Hydromorphological elements supporting the biological elements' and it is used in the assessment process of the water quality of rivers.

3. LEGAL ISSUE I: CONFLICT BETWEEN THE PROVISIONS OF THE WFD AND THE RENEWABLE ENERGY DIRECTIVE

With respect to surface waters, the Water Framework Directive requires the Member States to achieve two separate, though linked,[27] objectives. First, Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water (the no-deterioration obligation). And second, Member States shall protect, enhance and restore all bodies of surface water, with the aim of achieving 'good surface water status' or 'good ecological potential'.[28] Both a water body's ecological status and its chemical status must at least be 'good' in order to reach this goal.[29] In order to achieve these objectives Member States shall establish 'programmes of measures' and 'river basin management plans'.[30] As shown by the case study in the former section, innovative water-related renewable energy projects could cause a deterioration of some of the quality elements that are used for the qualification of the ecological status of a water body. Therefore, the no-deterioration obligation could form a barrier to the development of this type of projects. At the same time, those projects may actually be necessary to achieve an increased production of renewable energy, as required by the Renewable Energy Directive. In this sense there is a potential conflict between the provisions of the WFD and those of the Renewable Energy Directive. This section explains the functioning of the no-deterioration obligation and assesses the extent to which projects such as large-scale tidal and salinity gradient energy may be caught by it.

3.1 The no-deterioration obligation

In its seminal *Weser*-judgement the European Court of Justice decided that Member States are required 'to refuse authorisation for an individual project where it may cause a deterioration of the status of a body of surface water or where it jeopardises the attainment of good surface water status or of good ecological potential and good surface water chemical status […]'. Authorisation does, however, not have to be refused if 'the view is taken that the project is covered by a derogation under

27 "Both the obligation to enhance and the obligation to prevent deterioration of the status of bodies of water are designed to attain the qualitative objectives pursued by the EU legislature, namely the preservation or restoration of good status, good ecological potential and good chemical status of surface waters.", see Case C-461/13, *Bund für Umwelt und Naturschutz Deutschland* (Weservertiefung) [2014], para 41.

28 'good ecological potential' applies when the water body in questions is designated as an 'artificial and heavily modified body of water'. See Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, article 4(1)(a).

29 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, article 2(18).

30 "The management plan is both *a descriptive document* of the status of the river basin district and *an action plan* in so far as it refers to new measures designed to achieve the objectives of the WFD. On the basis of the estimation of all existing impacts and the outlook for change, a Member State determines the *necessary measures for achieving the environmental objectives* laid down under Article 4 of the WFD.", see Opinion of Advocate General Jääskinen in Case C-461/13, *Bund für Umwelt und Naturschutz Deutschland* (Weservertiefung) [2014], para 52; Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, articles 11 and 13, and annexes VI and VII.

Article 4(7)' of the WFD.[31] This is a strict interpretation of the WFD, which differs from the initial interpretation used by the Dutch and German governments. They were of the opinion that the water quality standards of the WFD were only relevant for the river basin management plans and the Member States' programmes of measures for water, and that they do not play a role in the approval of individual projects.[32] In the Weser-judgement the ECJ clarified that an individual project's influence on the water quality standards is a decisive factor in the authorisation procedure on the Member State level. As the types of water-related renewable energy projects described in the case study may cause a deterioration of water quality, they risk to be denied authorisation pursuant to this new interpretation of the WFD.

The Weser-case also clarified what must be understood by 'a deterioration' in the sense of the WFD. In order to understand this, first some remarks have to be made on how the water quality of a water body is established in the first place. Following from the WFD, the ecological quality of a surface water body is expressed by designating it to one of the following classes: high, good, moderate, poor or bad. The status of the water body is further specified by breaking it down into 'quality elements', which may include elements related to 'fish' or 'salinity', depending on the characteristics of the water body in question.[33] Quality elements for the classification of ecological status are split up into 'biological', 'hydromorphological' and 'physico-chemical' elements. As mentioned in the case study, quality elements that are relevant to tidal and salinity gradient energy include the composition and abundance of fish fauna (a biological quality element), the tidal regime (a hydromorphological quality element), and thermal conditions and salinity (physic-chemical quality elements). The status of the water body as a whole is established according to the 'one out all out' principle, meaning that a water body's status is equal to the status of the quality element with the lowest classification.[34] For example, even as a body of water has excellent thermal and salinity conditions, but the quality element relating to fish is designated as 'poor', then the water quality of the water body as a whole is also qualified as 'poor'.[35]

Having established this, we can now assess the meaning of 'deterioration' in the sense of the WFD. According to the ECJ in Weser, one can speak of 'deterioration of the status' of a body of surface water as soon as the status of at least one of the quality

31 Case C-461/13, *Bund für Umwelt und Naturschutz Deutschland* (Weservertiefung) [2014], paras 50-51.

32 HFMW van Rijswick, CW Backes, Ground Breaking Landmark Case on Environmental Quality Standards? The Consequences of the CJEU 'Weser-judgment' (C-461/13) for Water Policy and Law and Quality Standards in EU Environmental Law, Journal for European Environmental & Planning law 2015 (12) pp 368-369.

33 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, annex V.

34 Case C-461/13, *Bund für Umwelt und Naturschutz Deutschland* (Weservertiefung) [2014], para 59; and Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, annex V, section 1.4.2(i).

35 See also JJH van Kempen, Kroniek jurisprudentie waterrecht, M&R 2016 (89) p 523, and HFMW van Rijswick, CW Backes, Ground Breaking Landmark Case on Environmental Quality Standards? The Consequences of the CJEU 'Weser-judgment' (C-461/13) for Water Policy and Law and Quality Standards in EU Environmental Law, Journal for European Environmental & Planning law 2015 (12) p 373.

elements of the water body falls by one class.[36] This is even the case 'if that fall does not result in a fall in classification of the body of surface water as a whole.'[37] However, if the quality element concerned is already in the lowest class, then 'any deterioration of that element constitutes a "deterioration of the status" of a body of surface water'.[38] This explanation is different from what some Member States and academic literature have suggested in the past.[39] When applying these rules to tidal energy this could for instance mean that a turbine's negative effects on the quality element 'composition and abundance of fish fauna' may cause a prohibited deterioration of the water quality, even when the rest of the water body's quality elements are in a good conditions and the status of the water body as a whole would remain unchanged.

It must be noted, however, that not *every* deterioration of a quality element will immediately lead to a deterioration in the sense of the WFD.[40] As long as quality elements stay within their present class, deterioration is allowed. With respect to 'biological quality elements' this aspect is explained quite well by Annex V of the WFD. According to the WFD the Member States have to establish so-called 'limit values'[41] for the biological quality elements[42] in order to indicate the boundaries between the different classes.[43] There is some room for deterioration as long as a new renewable energy project does not cause the quality element in question to fall below the limit value. In that case, it will remain in the same class and there will be no deterioration in the sense of the WFD. This is also what a Dutch court concluded in the *Borgharen*-case (2017), which is a case on the authorisation of a hydro-energy[44] plant in the Meuse river in the south of the Netherlands. In that case the lower limit

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36 Case C-461/13, *Bund für Umwelt und Naturschutz Deutschland* (Weservertiefung) [2014], para 69.

37 With reference to the example given earlier, this could for instance be the case if the quality element 'salinity' drops from a 'high' to 'good' class, while the water body as a whole was qualified as 'poor' due to the bad situation of its fish stock. In that situation the fall of the quality element 'salinity' by one class does not result in a fall in classification of the body of surface water as a whole. Nevertheless, it will result in a 'deterioration' in the sense of the WFD.

38 Case C-461/13, *Bund für Umwelt und Naturschutz Deutschland* (Weservertiefung) [2014], para 69.

39 France, for instance, codified a 'lenient interpretation', 'according to which a water body only deteriorates if it passes to a lower water class', see for further elaboration on this discussion H.F.M.W. van Rijswick, C.W. Backes, Ground Breaking Landmark Case on Environmental Quality Standards? The Consequences of the CJEU 'Weser-judgment' (C-461/13) for Water Policy and Law and Quality Standards in EU Environmental Law, Journal for European Environmental & Planning law 2015 (12) pp 372.

40 See in this regard: H.F.M.W. van Rijswick, C.W. Backes, Ground Breaking Landmark Case on Environmental Quality Standards? The Consequences of the CJEU 'Weser-judgment' (C-461/13) for Water Policy and Law and Quality Standards in EU Environmental Law, Journal for European Environmental & Planning law 2015 (12) p 374, and K Faßbender, Wasserrechtliche Ausnahmeprüfung nach dem EuGH-Urteil zur Schwarzen Sulm, Natur und Recht 2017 (39) p 435.

41 These values are so-called 'ecological quality ratios' ('EQR's), which are numerical values that represent the relationship between the current water conditions and the situation that the water body would be in a normal, undisturbed condition. The ratio is expressed 'as a numerical value between zero and one, with high ecological status represented by values close to one and bad ecological status by values close to zero.' See Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, annex V, section 1.4.1(ii).

42 The WFD does not explain in detail how this works for 'hydromorphological' and 'physico-chemical' quality elements.

43 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, annex V, section 1.4.1(ii).

44 See footnote 64 below for a technical explanation of hydro-energy.

value for the class 'poor' for the quality element 'fish' in the Meuse river was an EQR[45] of 0.40, while the present EQR value of that quality element was 0.47. This means that there was room for a deterioration of the fish stock of 0.07 before it would be a prohibited deterioration in the sense of the WFD. In the *Borgharen*-case the Dutch court concluded that the competent authority in question had presented sufficient proof that deterioration caused by the hydro-energy plant would stay above the lower limit mentioned above.[46] Hence, the quality element 'fish' would not fall to the class 'bad' and the Dutch court decided that the project was therefore permissible on the basis of the WFD.[47]

The Weser case shows that the ECJ takes a strict approach to the no-deterioration obligation, which leaves no room for substantial deteriorations of water quality unless the derogation clause applies. With respect to innovative renewable energy technologies it is, however, often uncertain whether or not deterioration of water quality will occur at all. The next section elaborates on this kind of situations.

3.2 Uncertainty

There is still a considerable lack of scientific knowledge on the nature and the extent of the environmental effects of innovative water-related renewable energy technologies. This is mainly caused by the fact that these are relatively new technologies and that few projects have been realised so far. Therefore there is limited environmental monitoring data available. These knowledge gaps get more problematic as the size of projects grow.[48] Moreover, as different project locations and different project scales have different characteristics, findings on the environmental effects of one project, may not automatically be transferable to another project.[49] These issues are reflected in the prior-authorisation assessments for the small-scale tidal energy projects referred to in the case study above.[50] These assessments only talk about 'potential' and 'expected' environmental effects, and they indicate the need for post-construction monitoring in order to gain more knowledge on these environmental effects.[51]

45 See footnote 41 above for an explanation of 'ecological quality ratios' ('EQR's).

46 Rechtbank Midden-Nederland, Case ECLI:NL:RBMNE:2017:2109, *Waterkrachtcentrale Borgharen* ['Borgharen hydro-energy plant'] paras 29 and 34.

47 However, unfortunately for the project developer there also was a national Dutch policy rule that applied to the project in this case. As that rule was stricter than the WFD requirements it caused the court to annul the project authorisation after all. See: Rechtbank Midden-Nederland, Case ECLI:NL:RBMNE:2017:2109, *Waterkrachtcentrale Borgharen* ['Borgharen hydro-energy plant'] paras 51 and 56.

48 G Wright, et al., Establishing a legal research agenda for ocean energy, Marine Policy 2016 (63) p 128.

49 G Wright, Environmental Impact Assessment to Support Marine Innovation: The 'Rochdale Envelope' and 'Deploy & Monitor' in the UK's Ocean Energy Industry, in B Vanheusden and L Squintani (eds.) EU Environmental and Planning Law Aspects of Large-Scale Projects, 2016, p 191.

50 See section 2.

51 Marine Scotland, MeyGen Decision – Appropriate Assessment, September 2013, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment, for instance p 90, and IMARES, Institute for Marine Resources & Ecosystem Studies, 'Passende Beoordeling van een getijdencentrale in de Oosterscheldekering' [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, for instance p 48.

The Court in Weser decided that project authorisation should be denied if a project causes deterioration of water quality. It did not, however, explain what happens if there is scientific uncertainty on whether deterioration of water quality will occur or not. In its judgements on the application of the Natura 2000 rules, the ECJ was more specific on the issue of scientific uncertainty. In its *Sweetman* judgement it stated that projects under the Habitats Directive may be given authorisation *only* when the competent authorities 'are certain' that the project will not have lasting adverse effects on the integrity of a protected nature site. According to the ECJ this certainty exists 'where no reasonable scientific doubt remains as to the absence of such effects'.[52] Arguably, the 'no reasonable scientific doubt' interpretation should also be applied to the WFD. By deciding that a deterioration of a water quality element by one class leads to refusal of project authorisation, the ECJ in Weser seems to have given the WFD's no-deterioration obligation an equally strict interpretation as the Natura 2000's authorisation rules for projects that may harm the integrity of protected nature sites. The practical implication of the ECJ's ruling in *Sweetman* is that authorities must refuse to authorise a project where uncertainty remains.[53] If the same approach is indeed applied to the WFD in relation to tidal and salinity gradient energy, then it could well mean that authorisation of many projects will have to be rejected because of the existence of unresolved uncertainties about their effect on water quality.

Another interesting case in this regard is the abovementioned Dutch *Borgharen* hydro-energy case (2017). This case featured a discussion on the type of risk assessment to be used in the face of uncertainty about the hydro-energy plant's effects on fish mortality. In the Borgharen case, the prevailing norm[54] describing the maximum fish-mortality was a very precise and strict one. Therefore, the Dutch court considered it appropriate to use a 'worst case scenario', leaving no doubt that the maximum fish-mortality norm would be respected. The court decided to annul the project authorisation as the competent authority was not able to prove beforehand that the worst case scenario would not occur. The competent authority's argument, that a more flexible test should be used because a certain amount of uncertainty is inherent to the application of a new technique, was rejected by the court.[55]

Both the *Sweetman* and *Borgharen* cases show how strict environmental norms may have to be applied in the face of uncertain environmental effects. In both cases the courts decided that uncertainty should be taken away, and that, in the case this is not possible, project authorisation should be refused. The ECJ's Weser judgement advocates a strict interpretation of the no-deterioration obligation, and seems to leave few room for uncertainty and experimenting with new technologies.[56] It would therefore be a logical consequence of the *Weser*-judgement to also apply the

52 Case C-258/11, *Sweetman*, para 40.
53 Case C-258/11, *Sweetman*, para 41.
54 In this case this was not the WFD's no-deterioration obligation but an even stricter Dutch policy rule on hydro-energy plants.
55 Rechtbank Midden-Nederland, Case ECLI:NL:RBMNE:2017:2109, *Waterkrachtcentrale Borgharen* ['Borgharen hydro-energy plant'] paras 40-42 and 49-51.
56 T Paloniitty, The Weser Case: Case C-461/13 Bund v Germany, Journal of Environmental Law 2016 (28), pp 157-158.

interpretations used in *Sweetman* and *Borgharen* to the no-deterioration obligation under the WFD. A strict interpretation, which entails project refusal in cases that uncertainty cannot be taken away, would also be in line with the precautionary principle, which is one of the principles that are at the basis of the Water Framework Directive.[57]

In conclusion, it is argued in this article that in the face of lasting uncertainty about an innovative water-related renewable energy project's effects on water quality, a competent authority will have to decide to refuse project authorisation. Possible paths that could lead to evading such refusal are *mitigation* and a *derogation under Article 4(7) WFD*. These options are discussed in the following sections.

3.3 Mitigation

Mitigation measures can be described as 'measures aimed at minimising or even cancelling the negative impact' of a project.[58] Mitigation measures usually are an integral part of the project and are aimed at preventing deterioration of water quality from occurring in the first place. Unfortunately, neither in academic literature, nor in reports from practice, descriptions are given of effective methods for mitigating negative effects on water quality caused by tidal and salinity gradient energy plants. Fish barriers are sometimes mentioned as a possible mitigation measure for preventing fish-turbine collisions. These are, however, problematic as they cause a loss of hydraulic power which is needed for energy production, and it is difficult to keep them clean.[59]

Nonetheless, even if suitable mitigation measures will be found in the future, these can only be successful at preventing a refusal to grant project authorisation if they succeed at taking away the negative effects on water quality or any remaining uncertainty with regard to the occurrence of such effects. This will often be difficult to proof beforehand as innovative water-related renewable energy projects often concern first-of-a-kind projects. Moreover, the results of mitigation measures applied in small-scale projects are not automatically transferable to large-scale projects. Hence, the burden of proof for mitigation measures is high and therefore mitigation measures will not normally be an easy project-saver in the case of possible negative effects caused by new and innovative renewable energy techniques. This is also shown by the Dutch *Borgharen* hydro-energy plant case (2017), which –although not technically comparable to tidal or salinity gradient energy– also used new techniques that were not previously tested elsewhere. In that case the project developer was not able to prove beforehand

57 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, para 11 of the preamble.

58 See for instance: European Commission, 'Managing Natura 2000 sites – Provisions of Article 6 of the 'Habitats' Directive 92/43/CEE (2000)', http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf, pp 36-37.

59 Based on an interview with Dr. ir. J van Berkel, Professor of Sustainable Energy in Delta Areas at the HZ University of Applied Sciences in Vlissingen, the Netherlands. The interview transcript is available from the author.

that the planned fish passages would indeed succeed in sufficiently mitigating the negative effects of the turbines.

3.4 Conclusion

It is argued in this article that in the face of lasting uncertainty about an innovative water-related renewable energy project's effects on water quality, a competent authority will have to decide to refuse project authorisation. It is expected that mitigation measures will not always be effective at preventing deteriorations or at taking away uncertainties. In that situation only the derogation clause of Article 4(7) WFD can be used to prevent project authorisation from being refused.

4. LEGAL ISSUE II: LACK OF INTEGRATION BETWEEN THE RENEWABLE ENERGY DIRECTIVE AND THE DEROGATION CLAUSE OF THE WATER FRAMEWORK DIRECTIVE

Article 4(7) WFD contains a derogation clause that allows for the weighing of water quality interests against other interests.[60] Its application could, if all conditions are fulfilled, lead to a renewable energy project's derogation from the WFD's obligation to prevent deterioration of water quality. There is however no actual integration between the derogation clause and the Renewable Energy Directive (RED). Nor is there an obligation to apply the clause in cases where a renewable energy project risks to cause a prohibited deterioration of water quality. Therefore, there is no guarantee that applications for the authorisation of renewable energy projects that are important for achieving the RED's goals will actually be weighed under the WFD. Nor is there a guarantee that a serious balancing of interests will take place.

The following sections first discuss the scope of the derogation clause, and secondly its lack of integration with the Renewable Energy Directive.

4.1 Article 4(7) WFD: The derogation clause

According to Article 4(7) WFD, Member States are not in breach of the WFD if failure to achieve good water status, or failure to prevent deterioration of water status, is the result of 'new modifications to the physical characteristics of a surface water body'.[61] Moreover, the article mentions four conditions that should be met in order for the derogation clause to be applicable. Before discussing these conditions it is

60 Case C-461/13, *Bund für Umwelt und Naturschutz Deutschland* (Weservertiefung) [2014], para 68.

61 According to Article 4(7) WFD also 'failure to prevent deterioration from high status to good status of a body of surface water' is not in breach with the WFD if such failure is the result of 'new sustainable human development activities'. Up until now it is, however, unclear what this latter phrase entails and to what kind of situations it applies. See in this regard: K Faßbender, Wasserrechtliche Ausnahmeprüfung nach dem EuGH-Urteil zur Schwarzen Sulm, Natur und Recht 2017 (39) p 434, footnote 20, and also: Common Implementation Strategy for the Water Framework Directive, Guidance Document no. 20 'Guidance

important, for the purposes of this article, to determine if renewable energy projects such as tidal and salinity gradient energy are covered by 'new modifications to the physical characteristics of a surface water body'. The WFD does not specify the scope of this concept.

4.1.1 New modifications to the physical characteristics of a surface water body

Arguably, renewable energy project such as tidal and salinity gradient energy can be qualified as 'new modifications to the physical characteristics of a surface water body'. A first argument in that regard can be derived from the seminal *Schwarze Sulm* case of the European Court of Justice. This judgement shows that at least some renewable energy projects may be regarded as 'new modifications' in the sense of Article 4(7) WFD. In *Schwarze Sulm* the European Commission issued an infringement procedure to contest the authorisation –given by the local Austrian authorities– of the construction of a hydropower plant on the Schwarze Sulm river. The project would affect the course of the river over a stretch of 8 kilometers and would cause a deterioration of the status of the body of surface water of the Schwarze Sulm river. The Austrian authorities successfully relied on the derogation provided by Article 4(7) WFD.[62] The ECJ seems to accept without any reluctance that the hydroenergy plant is a 'new modification to the physical characteristics of a surface water body', as it moves on to the discussion of the four conditions set out in Article 4(7) without bothering to discuss the pre-condition of the existence of 'new modifications' at all.[63] This finding does, however, not automatically mean that also tidal and salinity gradient energy projects can be qualified as 'new modifications' in the sense of the WFD. Tidal and salinity gradient energy use significantly different techniques than hydro-energy plants.[64] There is, however, sufficient technological overlap in order to reasonably argue that the techniques researched in this article are also eligible for a derogation under Article 4(7). This is most clear for salinity gradient energy, which extracts water from a surface water body in a way similar hydro-energy plants, albeit for a different purpose and possibly in different amounts. Tidal stream energy does not require abstraction of water,[65] but it does influence the water flow as turbines form a barrier in the surface water body. Arguably, this must also be qualified as a 'modification' in the sense of the WFD. Like hydro-energy devices, tidal stream turbines modify the normal water flow, albeit through a different method. Moreover, in academic literature it is argued that even changes in *water quality* could be regarded

document on exemptions to the environmental objectives', 2009, p 24. Due to the lack of clarity on the practical relevance of this phrase it is not further dealt with in this article.

62 Case C-346/14, *European Commission v Republic of Austria* (Schwarze Sulm) [2016], paras 60-61.

63 Case C-346/14, *European Commission v Republic of Austria* (Schwarze Sulm) [2016], paras 64-66.

64 Hydro-energy usually implies the diversion of a substantial amount of water from the river through a pressurised pipe into a turbine, after which the used water is redirected back into the river downstream. This is also the technique envisaged for the hydro-energy plant in the Schwarze Sulm, see: http://www.sulmkraft.at/Sulmkraft/FUNKTIONSPRINZIP.html.

65 This is different for *tidal range energy* which does not only require the abstraction of water, but usually also requires a barrage to be built in order to create two separate water basins. Therefore, tidal range energy projects will probably easily qualify as 'new modifications to the physical characteristics of a surface water body'.

as 'modifications to the physical characteristics of a surface water body'.[66] Such a broad interpretation of Article 4(7) would make it even more likely that all kinds of water-related renewable energy projects can be fitted under the 'new modifications' concept. A final contribution to support the argument that tidal energy projects can be qualified as 'new modifications' in the sense of Article 4(7) is given by the 'Common implementation strategy for the Water Framework Directive' (CIS). One of the Guidance documents of this strategy states that 'Modifications to the physical characteristics of water bodies mean modifications to their hydro-morphological characteristics.'[67] According to this interpretation, tidal energy would fall under the 'new modifications' concept as tidal energy can bring about 'changes in the tidal regime', which is a modification of hydro-morphological nature. The CIS is, however, not of a legally binding nature, but rather a consensus document on 'best practices' agreed on by the Member States, the Commission and other WFD stakeholders. It is therefore unsure if this interpretation would also be accepted by the ECJ.

While the above shows that it is likely that tidal and salinity gradient energy projects can be regarded as 'new modifications', these projects can only benefit from the derogation clause if the four conditions discussed in the following section are fulfilled.

4.1.2 Conditions 1 and 2: Mitigation and reference in the RBMP

The first two of Article 4(7)'s conditions are merely procedural and relatively easy to be met. The *first condition* requires that all practicable steps are taken to mitigate the adverse impact on the status of the body of water. See Section 3.3 above for further elaboration on mitigation measures for tidal and salinity gradient energy. The *second condition* requires that the reasons for the 'new modifications to the physical characteristics of a surface water body' are specifically set out and explained in the river basin management plan and the objectives are reviewed every six years.[68]

The third and the fourth conditions, however, offer the Member State's competent authorities a considerable amount of discretionary power and require them to weigh water quality interests against non-water quality interests.

4.1.3 Condition 3: Reasons of overriding public interest and weighing of interests

The *third condition* requires that 'the reasons for [the modifications] are of overriding public interest and/or the benefits to the environment and to society of achieving the [no-deterioration objective] is outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable

66 K Faßbender, Wasserrechtliche Ausnahmeprüfung nach dem EuGH-Urteil zur Schwarzen Sulm, Natur und Recht 2017 (39) p 437.

67 Common Implementation Strategy for the Water Framework Directive, Guidance Document no. 20 'Guidance document on exemptions to the environmental objectives', 2009, p 24.

68 Section 5.2, fourth paragraph, of this article discusses a possible approach to increase integration between River Basin Management Plans and renewable energy policy and law.

development.' The first question that has to be answered in this respect is if renewable energy projects may be considered to be 'of overriding public interest'. In its aforementioned *Schwarze Sulm* judgement the ECJ answers this question in the affirmative. It states that Member States have 'a certain margin of discretion for determining whether a specific project is of such interest'. Austria was therefore entitled to consider that the hydro-energy project in question was an overriding public interest. Moreover, the Court refers to the EU's environmental and renewable energy policy to support its findings.[69] Subsequently, the third condition requires a balancing of interests to be made between the benefits of the renewable energy project in question and the deterioration of the water body caused by that project. In *Schwarze Sulm* the competent authority concluded that the public interest of constructing the hydro-energy project was clearly higher than the harm done to the environmental objectives mentioned in the WFD. It reached this conclusion due to the project's 'major importance for the region's sustainable development', the project's positive energy result, its 'positive contribution towards the reduction in global warming', and the 'economic aspects of the project for the local economy'. The competent authority also took account of the very high ecological quality of the Schwarze Sulm river, but found that the project's advantages for the public interest outweighed its negative effect on the WFD's non-deterioration objective.[70] According to the ECJ, the Austrian competent authority 'based himself on a detailed and specific scientific analysis of the contested project, before going on to conclude that the conditions for a derogation from the prohibition of deterioration were met'. Moreover, the ECJ emphasises that the competent authority 'reached a decision on the basis of a study from the Institute which was such as to provide him with relevant information on the impact of the contested project'. The Court therefore considered that the competent authority could rightly consider the conditions of Article 4(7) to be met.[71] It follows from the foregoing that Member States have a high level of discretionary power as it comes to balancing water quality interests against renewable energy interests. As long as they present a well-founded analysis, the result of the balancing act is likely to be accepted by the ECJ.[72]

4.1.4 Condition 4: There are no suitable alternatives

The fourth and final condition mentioned by Article 4(7) requires that 'the beneficial objectives served by [the modifications] of the water body cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option.' Neither the WFD, nor the ECJ in *Schwarze Sulm* give any further clarification on what type of alternative options should be investigated in this regard, nor do they specify what 'a significantly better

69 Case C-346/14, *European Commission v Republic of Austria* (Schwarze Sulm) [2016], paras 70-73.
70 Case C-346/14, *European Commission v Republic of Austria* (Schwarze Sulm) [2016], paras 77-80.
71 Case C-346/14, *European Commission v Republic of Austria* (Schwarze Sulm) [2016], paras 80-81.
72 It must be observed, however, that the Schwarze Sulm had a very high water quality. Arguably, the evidence that a renewable energy project outweighs water quality interests should be stronger in situations where the deterioration concerns a water body that is in a much lower quality class, or where it concerns an artificial and heavily modified body of water.

environmental option' entails. Instead –similarly to its reasoning in relation to the third condition– the ECJ leaves the appraisal of whether there are suitable alternatives completely to the Member States.[73]

By reaching this conclusion, the Court leaves open an important issue that has been raised by the Commission in *Schwarze Sulm*. According to the Commission, the fourth condition of Article 4(7) requires Member States to conduct investigations into 'potential substitute sites' and 'other renewable energy sources'.[74] Interpreting article 4(7) WFD in such a way that it requires stakeholders to research the possibility to use different energy sources, such as wind or solar power, may cause problems for a Member State's renewable energy policy. Article 4(7) requires a choice for the significantly better environmental option, if available. It is likely to be easier to prove the absence of negative environmental effects for established renewable energy techniques, such as wind and solar energy. The aforementioned interpretation could therefore require competent authorities to give precedence to these techniques over innovative ones. Such an interpretation of the fourth condition of Article 4(7) could therefore frustrate a government's policy to create a healthy energy mix including renewable energy sources which provide a continuous (base load) supply of energy, such as tidal and salinity gradient energy. It does not follow from the *Schwarze Sulm* case if the Austrian authorities have conducted investigations into other renewable energy sources. The Court dismissed the Commission's allegations that the authorities had not lived up to their obligations under the fourth condition of Article 4(7) on the basis that the Commission presented insufficient arguments to that end.[75] The exact scope of the fourth condition therefore remains unclear. Based on the foregoing the author of this article takes the position that it is better if Article 4(7) does not require Member States to consider alternatives that entail a completely different type of project. This position is also taken elsewhere in legal literature.[76]

4.2 Lack of integration

Having discussed the various aspects of the derogation clause of article 4(7), this section further elaborates on the lack of integration between article 4(7) and the goals of the Renewable Energy Directive.

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73 The Court simply observes in this regard: "[…] the national authorities weighed up the expected benefits of the contested project with the resulting deterioration of the status of the body of surface water of the Schwarze Sulm. On the basis of that weighing-up, they were entitled to find […] that the objectives pursued by the project could not, for reasons of technical feasibility or disproportionate cost, be achieved by other means which would have been a significantly better environmental option." See Case C-346/14, *European Commission v Republic of Austria* (Schwarze Sulm) [2016], para 74.

74 Case C-346/14, *European Commission v Republic of Austria* (Schwarze Sulm) [2016], para 33.

75 Case C-346/14, *European Commission v Republic of Austria* (Schwarze Sulm) [2016], paras 82-83.

76 K Faßbender, Wasserrechtliche Ausnahmeprüfung nach dem EuGH-Urteil zur Schwarzen Sulm, Natur und Recht 2017 (39) p 436. A similar discussion is taking place with respect to the 'no-alternatives' condition of the derogation clauses in the Habitats and Birds directives, see for instance: R Frins and H Schoukens, Balancing Wind Energy And Nature Protection: From Policy Conflicts Towards Genuine Sustainable Development?, in L Squintani and HHB. Vedder (eds.) Sustainable Energy United in Diversity – Challenges and approaches in energy transition in the EU, 2014, p 93.

While the WFD's no-deterioration obligation can form a barrier for innovative water-related renewable energy projects, the WFD also offers the possibility for a derogation for such projects. The mere fact that there is a possibility to derogate from the WFD's objectives for the benefit of renewable energy shows that the concept of 'policy integration'[77] is embedded in the WFD at least to some extent. Policy integration –which is one of the main aspects of sustainable development– requires the EU and its Member States to take all sustainability-related policy objectives into account in all the decisions that they take.[78] These policy objectives include the protection of water quality, but also the promotion of renewable energy production. Nevertheless, the mere existence of a procedure that allows for weighing various policy objectives does not as such guarantee that that procedure is also used in practice, nor does it guarantee that the weighing exercise is carried out in a manner that fits both in the water *and* in the renewable energy policy of the Member State in question. In other words, the existence of a procedure that embodies aspects of sustainable development, does not automatically lead to a sustainable outcome.[79]

While it is possible to take renewable energy into account under Article 4(7) WFD, that article does not specify *to what extent* renewable energy *can and should* be taken into account. It is also unclear what the importance of renewable energy is compared to the protection of water quality. By not specifying this, there remains a considerable amount of fragmentation[80] between the Water Framework Directive and the Renewable Energy Directive. Whether or not integration will occur under Article 4(7) is completely dependent on the –often decentralised– national authorities that are responsible for the implementation of the WFD. As discussed before, these authorities have a considerable amount of policy discretion, especially when it comes

77 In this article 'policy integration' is defined in conformity with its definition within European Union law and policy, notably Articles 7 and 11 TFEU and the Renewed EU Sustainable Development Strategy. According to these sources the European Union "*shall* ensure consistency between its policies and activities" (Article 7 TFEU) and shall "Promote integration of economic, social and environmental considerations so that they are coherent and mutually reinforce each other by making full use of instruments for better regulation, such as balanced impact assessment and stakeholder consultations." (the Renewed EU Sustainable Development Strategy). For further elaboration on policy integration see: S van Hees, Sustainable Development in the EU: Redefining and Operationalizing the Concept, Utrecht Law Review 2014 (2), sections 2.1 and 2.3.1.

78 S van Hees, Sustainable Development in the EU: Redefining and Operationalizing the Concept, Utrecht Law Review 2014 (2) pp 66-68.

79 S van Hees, Sustainable Development in the EU: Redefining and Operationalizing the Concept, Utrecht Law Review 2014 (2) p 76.

80 In this article 'fragmentation of law' is understood as a situation in which areas of law that are interrelated are in practice partially or fully dealt with in isolation. In relation to water quality and renewable energy policy both horizontal and vertical fragmentation can be distinguished. There is horizontal fragmentation, as the policy areas water quality and renewable energy are dealt with in separate sectoral directives (multi-sector governance), and vertical fragmentation, as both policy areas are often dealt with by separate governmental bodies that are responsible for just one of the two policy areas (multi-level governance). For further analysis on fragmentation in EU law in relation to renewable energy, see: K Van Hende, Offshore Wind in the European Union – Towards Integrated Management of Our Marine Waters, 2015, pp 68-69 and 77-78. For an overview of the history of the concept of fragmentation in legal literature, see: H K Gilissen, et al., Bridges over Troubled Waters: An Interdisciplinary Framework for Evaluating the Interconnectedness within Fragmented Flood Risk Management Systems, Journal of Water Law 2016 (1) pp 13-14.

to the appraisal of the third and fourth conditions of Article 4(7) WFD.[81] These authorities can decide to take renewable energy into account under the derogation clause, which happened in the *Schwarze Sulm* case. However, they can also decide not to do so, as there is no obligation to actually apply the derogation clause in a specific case. It may be difficult for authorities that have enforcement of the water quality rules as their primary task, to take renewable energy into account at all times. These authorities could be tempted to focus on the protection of water quality. If a competent authority decides to refuse the authorisation of a future innovative water-related renewable energy project, this could be a very good decision from a case level perspective. The project's impact on water quality might in that specific case indeed seem to be higher than its contribution to renewable energy production. However, in order to achieve a fair balancing act, the role that a specific renewable energy project plays within the broader renewable energy strategy of the Member State in question should also be taken into account in that decision. The WFD does currently not guarantee that this will happen in practice.

The following sections deal with the question how the two legal issues mentioned in this article can be dealt with.

5. SOLUTIONS TO THE LEGAL ISSUES: DEALING WITH UNCERTAINTY AND TOWARDS BETTER INTEGRATION IN THE ENERGY-WATER NEXUS

The former sections of this article discussed two legal issues that relate to the conflict between the interest of protecting water quality under the Water Framework Directive (WFD), versus the interest of promoting the use of innovative water-related renewable energy, with regard to the quota in the Renewable Energy Directive. These issues are: *first,* the conflict between the provisions of the WFD and the Renewable Energy Directive as expressed by the no-deterioration obligation, and *second,* the lack of integration between the Renewable Energy Directive and the derogation clause of the Water Framework Directive. Tidal energy and salinity gradient energy have been used as a case study to show the practical relevance of the legal issues at hand. This final section discusses possible solutions to the abovementioned legal issues.

5.1 Dealing with uncertainty

In section 3.2 it has been argued that the no-deterioration obligation leaves no room for uncertainty concerning the effects of a renewable energy project on water quality. Uncertainty needs to be taken away, and if that is not possible then project authorisation should be refused. In cases in which it is not possible to take away scientific uncertainty about a project's negative effects on water quality, the most

81 In this regard, also see: S van Holten and M van Rijswick, The consequences of a governance approach in European Environmental directives for flexibility, effectiveness and legitimacy, in M Peeters and R Uylenburg (eds.) EU environmental legislation – Legal perspectives on regulatory strategies, Cheltenham, 2014, pp 35-36.

straightforward solution is to invoke the derogation clause of Article 4(7) WFD. There might, however, be situations in which it is undesirable to do so. This could be the case, for instance, if the water body in question is in a very bad status and that further deterioration is undesirable, even if it would be for the benefit of renewable energy production. Moreover, from the perspective of the precautionary principle Article 4(7) should arguably only be used as a last resort, when all other policy options are exhausted.

In this regard 'adaptive management in combination with phased deployment' could be an interesting alternative policy option. Adaptive management is a flexible way of taking a licensing decision, which can be relevant for situations where there is an important enough problem to necessitate taking action in the face of uncertainty. It requires a strong monitoring and evaluation process. The lessons learnt from this process will lead to better scientific understanding over time. These lessons are subsequently used to take a better informed decision at the next decision point.[82] A disadvantage of this definition of adaptive management is that it allows for possible negative effects to occur initially, so that they can be taken into account in the decision for a second project. This may not be compatible with the WFD's non-deterioration obligation, which –as argued before– does not allow for uncertainty with regard to a project's negative effects. This issue can be solved by applying adaptive management in combination with 'phased deployment'.

Phased deployment means that the development will start at a small scale, for instance with a few tidal stream turbines only. This first phase will –although the exact scope of its negative effects on water quality may be unknown– because of its small size never cause a deterioration that is prohibited under the WFD.[83] There will however be a clear intention to considerably scale up the array in the future. In order to inform future phases of development the initial small-scale project will be bound to intensive monitoring requirements. The approval of subsequent phases of development will only be granted if the competent authority is certain that water quality-related risks of the largerscale development are well understood (based on the information gathered from the monitoring of the small-scale project).[84] An example of how the phased deployment approach can be applied is provided by the *Pentland Firth* tidal energy project in Scotland. In this project the competent authorities main concerns were related to the Natura 2000 rules on biodiversity. While the project proposal refers to a deployment of up to 61 tidal turbines,[85] the turbines will be installed in

82 This explanation of adaptive management is derived from the technical guide on adaptive management of the U.S. Department of the Interior, see: B K Williams, R C Szaro and C D Shapiro, Adaptive Management: The U.S. Department of the Interior Technical Guide, 2009, Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.

83 As mentioned before, the WFD allows for some degree of deterioration. See section 3.1 of this article.

84 This explanation is derived from Marine Scotland's 'survey deploy and monitor' policy, which combines adaptive management with phased deployment. Marine Scotland is the competent authority for most offshore energy projects in Scotland. See: Marine Scotland, Survey, deploy and monitor licensing policy guidance (version 2), http://www.gov.scot/Topics/marine/Licensing/marine/Applications/SDM, pp 6-7.

85 Marine Scotland, MeyGen Decision, Decision Letter and Conditions, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/DecisionLetter, p 25.

stages and the first phase has been restricted to 6 turbines. Monitoring is required to inform decisions on future deployments and further environmental assessments will be required before further deployments are authorised in order to ensure that full consideration is given to any potential increase in impacts on the relevant Natura 2000 site an species.[86]

Adaptive management combined with phased deployment is an interesting policy option for renewable energy developments that are coping with uncertainty, as it allows these developments to proceed anyway –although on a small scale– while gaining more scientific knowledge over time.[87] A clear disadvantage of phased deployment is, however, that it risks to slow down the transition to an increased innovative renewable energy supply in 2020, which actually requires a rapid development of large-scale –rather than small-scale– energy projects. Moreover, initial phases of the project may point out that not all negative effects of innovative water-related energy projects can be prevented. Therefore, subsequent phases may be denied authorisation after all. In that case the only solution left might be to use the derogation clause of Article 4(7) WFD. Yet, even when the derogation clause is applied it may still be useful to apply an adaptive management approach combined with phased deployment. When Article 4(7) is used, no absolute certainty as to the absence of negative effects of the first phase on water quality is required. The first phase may therefore consist of a larger and more risky project than in a situation without application of the derogation clause. However, monitoring results collected during the first phase of the project could still be used to feed into the decision making process of future phases. If these results show that negative effects do not occur, then it would not longer be necessary to invoke Article 4(7) for future phases of the project.

5.2 Towards better integration

In Section 4.2 it has been argued that there is fragmentation between the WFD's derogation clause on the one hand, and the goals of the Renewable Energy Directive on the other hand. This fragmentation is caused by the lack of specification in Article 4(7) WFD of *to what extent* renewable energy *can and should* be taken into account in that article. It is also remains unclear what the importance of renewable energy is compared to the protection of water quality. These unclarities may hamper the carrying out of a fair balancing act between water quality and renewable energy interests under Article 4(7) WFD.

The introduction of detailed national renewable energy plans per Member State could be a practical solution to the issue of fragmentation. Such plans would indicate

86 Marine Scotland, MeyGen Decision – Appropriate Assessment, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment, p 77.

87 Or as Marine Scotland puts it: '[the Survey, deploy and monitor licensing policy guidance] is designed to enable novel technologies whose potential effects are poorly understood to be deployed in a manner that will simultaneously reduce scientific uncertainty over time whilst enabling a level of activity that is proportionate to the risks.' Marine Scotland, Survey, deploy and monitor licensing policy guidance (version 2), http://www.gov.scot/Topics/marine/Licensing/marine/Applications/SDM, p 1.

which types of projects at which sites are essential in the light of achieving the Member State's renewable energy quota under the Renewable Energy Directive, and which are not.[88] It should be flexible plans, that allow for additions and alterations, as policy and technological developments progress over time. The guidance given by a national renewable energy plan can be used by competent authorities to justify and explain the use of their discretionary powers under the derogation clause of the Water Framework Directive. If a competent authority is aware at an early stage of the great importance –or the low importance, for that matter– of a specific renewable energy project, then it will be better positioned to weigh the interest of that specific renewable energy project against the interest of preventing deterioration of water quality. In some Member States innovative water-related forms of energy production –such as tidal and salinity gradient energy– would feature in the national renewable energy plan, while other Member States may choose to focus on other forms of energy. This may for instance be the case if the Member State in question does not have water bodies that are suitable for tidal and salinity gradient energy developments, or if a Member State can reach its renewable energy targets by using other sources of energy that have less negative environmental impacts. In that sense, the national renewable energy plan would also, in an early stage, contribute to fulfilling Article 4(7)'s fourth condition on research into suitable alternatives. The main advantage of introducing national renewable energy plans is that such plans could help competent authorities to take decisions under Article 4(7) that fit within the broader renewable energy strategy of the Member State in question. Without such a plan there is a chance that these decisions are taken in isolation, resulting in arbitrary decisions that are founded in the individual enforcement priorities of the competent authority in question rather than in broader policy objectives.

Moreover, the importance of having a well thought out and detailed renewable energy plan of the type described above, is emphasised by the European Commission's arguments in the *Schwarze Sulm* case. In that case the Commission questioned the relevance of the hydro-energy plant for Austria's energy supply by arguing that 'hydroelectricity is only one source of renewable energy among others and that the energy produced by the hydropower plant […] will have only a minor impact on the regional and national energy supply'.[89] In other words, the Commission suggested that the hydro-energy plant was not sufficiently important in the light of Austria's renewable energy strategy, and is therefore not suitable to justify a deterioration of water quality. In this specific instance, the ECJ dismissed the Commission's arguments because they were insufficiently substantiated. The arguments do show, however, that Member States need to present strong arguments under the third condition of

88 In that sense the plans proposed here differ from the 'National renewable energy action plans' that Member States are required to make under the Renewable Energy Directive. These plans set out the measures that the Member States plan to take to promote and support the use renewable energy. They do not, however, contain a list of specific renewable energy projects that are essential in the light of achieving the Member State's renewable energy quota under the Renewable Energy Directive. See Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, article 4 and annex VI.

89 Case C-346/14, *European Commission v Republic of Austria* (Schwarze Sulm) [2016], para 82.

Article 4(7) WFD to show why a specific renewable energy project is necessary in the context of the Member State's renewable energy strategy. If Member States fail to do so, subsequent and better substantiated infringement procedures initiated by the Commission may at some point result in annulment of project authorisations of renewable energy projects. Detailed national renewable energy plans could contribute to a Member State's argumentation in this regard.

Ideally, the national renewable energy plans would be linked to the River Basin Management Plans[90] (RBMPs) that the Member States are required to produce for each river basin district within their territory.[91] According to Article 4(7) WFD one of the conditions that need to be fulfilled for a derogation to be valid, is that the reasons for '*New modifications to the physical characteristics of a surface water body*' are specifically set out and explained in the River Basin Management Plan. Hence, the reasons for the construction of new renewable energy projects that cause deterioration of water quality should be explained in the RBMP. The importance of the River Basin Management Plans in this regard is also emphasised by the ECJ, which states in *Weser* that 'it is impossible to consider a project and the implementation of management plans separately'.[92] In that regard it would be practical if the national renewable energy plans directly feed into the RBMPs. The insertion of an explanation of the importance of certain renewable energy projects in the relevant RBMPs in an early stage improves integration between the WFD and renewable energy policy. Moreover, it contributes to compliance with the second condition of Article 4(7). Pursuant to the WFD, the RBMPs are reviewed and updated once every six years.[93] According to the Common Implementation Strategy for the Water Framework Directive this does, however, not mean that the implementation of new renewable energy projects that cause deterioration of water quality will have to wait until the publication of a new RBMP. Arguably, new renewable energy projects may simply be implemented and the derogation clause may be invoked to this end, as long as the reasons for that renewable energy project are set out in the subsequent update of the relevant RBMP.[94] The CIS is, however, not of a legally binding nature, but rather a consensus document on 'best practices' agreed on by the Member States, the Commission and other WFD stakeholders. It is therefore unsure if this interpretation would also be accepted by the ECJ.[95]

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90 The RBMP is 'both *a descriptive document* of the status of the river basin district and *an action plan* in so far as it refers to new measures designed to achieve the objectives of the WFD.' See Opinion of Advocate General Jääskinen in Case C-461/13, Bund für Umwelt und Naturschutz Deutschland (Weservertiefung) [2014], para 52; and Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, articles 11 and 13, and annexes VI and VII.

91 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, article 13.

92 Case C-461/13, *Bund für Umwelt und Naturschutz Deutschland* (Weservertiefung) [2014], para 47.

93 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy, OJ 2000 L327/1, article 13(7).

94 Common Implementation Strategy for the Water Framework Directive, Guidance Document no. 20 'Guidance document on exemptions to the environmental objectives', 2009, p 29.

95 For further elaboration on possible interpretations of the relationship between the derogation clause and RBMPs, see: K Faßbender, Wasserrechtliche Ausnahmeprüfung nach dem EuGH-Urteil zur Schwarzen

In conclusion, this article recommends the development of a practical framework to bring about an increased integration between the Water Framework Directive and the Renewable Energy Directive. This framework could take the form of Member State-specific detailed renewable energy plans which are linked to the WFD's River Basin Management Plans. The proposed renewable energy plans would list the renewable energy projects that are important for reaching the Member States renewable energy quota under the Renewable Energy Directive (RED). These plans must be drafted on a Member State level rather than on an EU level, as the RED sets Member State-specific renewable energy quotas and leaves the Member States a considerable amount of policy discretion as to how to reach those quotas.

6. CONCLUSION

The development of innovative water-related renewable energy techniques –such as tidal energy and salinity gradient energy– risks to be hampered by the no-deterioration obligation of the Water Framework Directive. This may especially be the case if those techniques are applied on a large scale, and when there is ongoing scientific uncertainty concerning the negative effects on water quality of these techniques. While mitigation measures and adaptive management are expected to be insufficiently effective to solve this issue, the use of the WFD's derogation clause is expected to play an important role in authorisation procedures of future large-scale tidal and salinity gradient energy projects. Nevertheless, due to a lack of integration between the WFD's derogation clause and the goals of the Renewable Energy Directive, there is currently no guarantee that a fair balance will be struck between water quality and renewable energy interests under the WFD. This article recommends to solve this lack of integration by introducing detailed national renewable energy plans per Member State, which would give a detailed overview of important renewable energy projects. These plans could help competent authorities in weighing the interest of a renewable energy project against the interest of preventing deterioration of water quality. Further integration can be achieved if these renewable energy plans subsequently feed into the drafting and reviewing process of the River Basin Management Plans which Member States have to set up pursuant to the Water Framework Directive.

The solutions that are discussed in this article help to address legal issues that arise at the interface between renewable energy policy and the Water Framework Directive. Water-related innovative renewable energy projects may, however, also have negative effects on Natura 2000 sites and species that are protected under the Habitats and Birds Directives.[96] Solving issues that are related to the WFD does therefore not automatically mean that a specific project will be permissible under EU law. It will often also need to undergo the authorisation procedure prescribed by

Sulm, Natur und Recht 2017 (39) pp 437-439.

96 S van Hees, EU legal barriers to innovative forms of energy production: analysis based on water-related case studies, Journal of Water Law 2015 (24) pp 283-284.

the Habitats and Birds Directives.[97] The interaction between innovative water-related renewable energy projects and the Habitats and Birds Directives raises legal issues of its own. These are, however, similar to the ones discussed in relation to the WFD. Legal issues on the interface between large-scale water-related innovative renewable energy projects and the Habitats and Birds Directives, and possible solutions, will be discussed in a future article of this author.

97 Specific mitigation and adaptive management strategies that are targeted at dealing with the WFD's no-deterioration obligation may not automatically also solve a project's negative effects on habitats and species that are protected by the Habitats and Birds Directives. Moreover, it has been argued in academic legal literature that 'the invocation of the derogation regime of the WFD cannot be used to derogate from the objectives and obligations laid down in other directives'. See in that regard P De Smedt and M van Rijswick, Nature conservation and water management – One battle?, in C-H Born, A Cliquet et al (eds.) The Habitats Directive in its EU Environmental Law Context – European Nature's Best Hope?, Routledge, 2015, 425.

LARGE-SCALE WATER-RELATED INNOVATIVE RENEWABLE ENERGY PROJECTS AND THE HABITATS AND BIRDS DIRECTIVES: LEGAL ISSUES AND SOLUTIONS

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Abstract

This article discusses two legal issues that relate to the conflict between the interest of protecting habitats and species under the Habitats and Birds Directives, versus the interest of promoting the use of innovative water-related renewable energy, with regard to the quota in the Renewable Energy Directive. These legal issues are: *first,* the possible conflict between the protection rules of the Habitats and Birds Directive on the one hand and the Renewable Energy Directive on the other hand, and *second,* the lack of integration between the Renewable Energy Directive and the derogation clauses of the Habitats and Birds Directives. Tidal stream energy is used as a case study to show the practical relevance of the legal issues for the large-scale deployment of innovative water-related renewable energy techniques. The final sections discuss solutions to the legal issues. These are *first,* the application of adaptive management in combination with mitigation or phased deployment, in order to deal with uncertainty, and *second,* the introduction of detailed renewable energy plans per Member State in order to increase integration between the Habitats and Birds Directives and the Renewable Energy Directive. The final sections also discuss the applicability of the findings of this article to other innovative water-related renewable energy sources such as wave energy and salinity gradient energy (blue energy).

1. INTRODUCTION

Since the introduction of the renewable energy directive (RED) in 2009, the Member States of the European Union are bound to mandatory renewable energy targets.[1] Under this directive Member States must encourage the production of energy from "all types of renewable sources"[2] in order to meet the renewable energy production targets for the year 2020 as set out in the directive. Apart from wind and solar energy, these also include sources that require innovative water-related techniques, such as tidal energy, wave energy, and salinity gradient energy (blue energy). According to the European Commission, such renewable energy techniques can play an important

1 For instance, in 2020 the share of energy use from renewable sources should be 14 % in the Netherlands, 23 % in France, and 15 % in the UK. See Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, annex I.

2 Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, articles 6 and 14.

role with respect to energy security and reaching Europe's decarbonisation goals.[3] At the same time, there are fields of EU law that can get into conflict with the "producing more renewable energy"-objective. These fields of EU law include nature protection law, state aid law,[4] free movement law,[5] and water law.[6] This article discusses two legal issues related to the conflict between the interest of protecting habitats and species under the Habitats and Birds Directives, versus the interest of promoting the use of innovative renewable energy, which follows from the Renewable Energy Directive. Tidal stream energy is used as a case study as it is an innovative water-related renewable energy source that may in particular face legal issues related to the Habitats and Birds Directives,[7] especially when implemented on a large scale in the future. Moreover, tidal stream energy is the most mature innovative water-related renewable energy technique that currently exists.[8] This article will not focus on tidal range energy.[9] The final sections of this article also discuss the applicability of the findings to other innovative water-related renewable energy sources such as wave energy and salinity gradient energy (blue energy).

The first legal issue discussed in this article is the existence of a possible conflict between the goal to protect habitats and species, and the goal to produce more water-related innovative renewable energy. This is a very interesting conflict as it concerns

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3 European Commission, Communication, *Blue Energy – Action needed to deliver on the potential of ocean energy in European seas and oceans by 2020 and beyond*, COM(2014) 8 final (20 January 2014), pp 2-3. The Commission uses the term 'ocean energy', which is somewhat confusing as some of the techniques that are covered by this term (tidal energy and salinity gradient energy in particular) can also be used in an in or on-shore configuration. This is further discussed in the next section.

4 The relation between investment aid and innovative renewable energy projects in EU law will be discussed in a future article of the author.

5 S van Hees, *Ålands Vindkraft (C-573/12): Conflict tussen het vrij verkeer van goederen en de bevordering van duurzame energie* [Ålands Vindkraft (C-573/12): Conflict between the free movement of goods and the promotion of renewable energy], 5/6 Nederlands Tijdschrift voor Energierecht, 212 (2014).

6 See S van Hees, *Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions*, 14 Journal for European Environmental & Planning Law 313 (2017).

7 They may, however, also face legal issues related to the Water Framework Directive. See section 6, third paragraph, for further elaboration on this.

8 Tidal stream energy is positioned between Technology Readiness Level (TRL) 7 and 8, while wave energy and salinity gradient energy are positioned at TRLs 6 and 4 respectively. Therefore, there is more data available on tidal energy than on the other energy forms. See in that regard: International Renewable Energy Agency (IRENA), *Ocean Energy – Technology Readiness, patents, deployment status and outlook* (2014), p xi.

9 There are two main types of tidal energy: tidal stream and tidal range energy. While this article will refer to tidal range energy at several occasions, it will focus on tidal stream energy. There are three main reasons for this choice. First, tidal range energy is based on conventional hydropower technology that may be dangerous to marine animals, and it requires a barrage or a dam to be built that may disturb the local ecosystem. Hence, its ecological impacts are deemed to be more severe than those of tidal stream energy. See International Renewable Energy Agency (IRENA), *Tidal Energy – technology brief* (2014), p 27. Therefore, the author of this article estimates that tidal range energy will be less desirable from a sustainable development point of view. Second, wave and tidal stream energy 'are largely viewed to have the highest potential for significant commercial applications globally in the near to medium terms." See International Renewable Energy Agency (IRENA), *Ocean Energy – Technology Readiness, patents, deployment status and outlook* (2014), p 9; and Ocean Energy Forum (2016), *Ocean Energy Strategic Roadmap 2016, building ocean energy for Europe*, p 23. Third, in the EU there are many recent tidal stream projects, but few recent tidal range projects. There is one recent tidal range project in the UK, which is fully permitted. See Ocean Energy Forum (2016), *Ocean Energy Strategic Roadmap 2016, building ocean energy for Europe*, p 20. Focusing on tidal stream allowed to compare a recent project in the Netherlands to a recent project in Scotland.

two opposing policy areas which are both contributing to the EU's sustainable development goals. It is likely that the goal to protect habitats and species will sometimes come into conflict with Member State's efforts to promote an increased production of renewable energy, as required by the Renewable Energy Directive. This may especially be the case when it concerns water-related energy forms –such as tidal energy– that may have a negative effect on fish, marine mammals, sand banks and birds. An additional issue in this regard is the scientific uncertainty that often exists with regard to the existence and scope of such negative environmental effects.

The second legal issue discussed in this article concerns the lack of integration between the Habitats and Birds Directives on the one hand and the Renewable Energy Directive on the other hand. This lack of integration is demonstrated most clearly by the Habitats and Birds Directives' derogation clause. These clauses offer the possibility to exempt certain projects that are of overriding public interest from the protection rules after a balancing act is carried out. There is however no actual integration between the derogation clauses and the Renewable Energy Directive (RED). Nor is there an obligation to apply these clauses in cases where a renewable energy project risks to cause a prohibited negative effect on protected habitats and species. Therefore, there is no guarantee that applications for the authorisation of renewable energy projects that are important for achieving the RED's goals will actually be weighed under the Habitats and Birds Directives. Nor is there a guarantee that a serious balancing of interests will take place.

These two legal issues are discussed in the following sections, followed by a section that discusses possible solutions to the issues. First, however, this article features a brief case study of the innovative water-related renewable energy form "tidal stream energy", which serves to illustrate the practical relevance of the two legal issues for future innovative renewable energy projects. Both a Dutch and a Scottish project are assessed.

2. CASE STUDY: TIDAL STREAM ENERGY IN THE NETHERLANDS AND SCOTLAND

Tidal energy uses the power that is produced by tidal ebb and flow currents. One technique to harvest tidal energy is by using tidal stream turbines.[10] Tidal stream technology harvests the energy from water streams that are moving due to the tides. Tidal stream turbines are usually installed at sites with high-speed currents, such

10 Another –and slightly more established– tidal energy technique is 'tidal range energy'. 'Tidal range devices make use of the vertical difference in the water level between a high tide and a low tide. They usually do this by 'trapping or impounding the sea water within a flooded basin behind a large tidal barrage before releasing it back to the sea via turbines.' See http://www.alternative-energy-tutorials.com/tidal-energy/tidal-power.html.

as narrow straits, inlets,[11] or channels between islands.[12] The design of tidal stream turbines is similar to the design of wind turbines, but "due to the higher density of water the blades are smaller and turn more slowly than wind turbines".[13] This type of turbine will normally be placed in barriers, under bridges or they can be fixed to the sea-bed.

Tidal stream energy is a relatively new technique. Currently there are only a few small-scale tidal stream developments in operation, including in the *Oosterschelde* and the *Afsluitdijk* storm surge barriers in the Netherlands, and in the *Pentland Firth* straight in the north of Scotland. Tidal energy has a predictable and often constant energy output, as opposed to wind and solar energy, which have a variable revenue. Therefore, tidal energy can help to achieve security of supply on the EU's renewable energy market. Moreover, it has the potential to produce a considerable percentage of the EU's renewable energy needs.[14]

Below two tidal energy pilot projects[15] are discussed to illustrate the possible conflict between tidal energy and the Birds and Habitats Directives. The Appropriate Assessments of both projects show that the negative environmental effects of these pilot projects were –in the present small-scale set-up– not found to be significant. Therefore the competent authorities authorised their construction. Nonetheless, the information gained from these small-scale pilot projects is relevant for this article as it suggests that tidal stream technology will possibly have significant negative effects on protected habitats and species if it is applied on a large scale in the future.

2.1 Tidal energy in the Oosterschelde (the Netherlands)

In 2015 the Dutch company Tocardo Tidal Turbines has installed a testing installation for tidal energy in one of the 62 openings of the Oosterschelde dam in the delta area of the province of Zeeland, in the south of the Netherlands. The installation consists of five two-bladed turbines which look like small upside-down wind turbines. The turbines are bi-directional, which means that they will harvest energy both from ebb

11 For instance: the *Oosterschelde tidal energy project* in the Netherlands, see: http://www.tocardo.com/Project/oosterschelde/.

12 For instance: the *Pentland Firth tidal energy project* in Scotland, see: https://www.atlantisresourcesltd.com/projects/meygen/.

13 International Renewable Energy Agency, *Tidal Energy – Technology Brief*, 2014, p 11.

14 For instance, with respect to tidal energy in the UK: Marine Scotland, *MeyGen Decision, Decision Letter and Conditions*, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/DecisionLetter, pp 14 and 22: "Wave and tidal stream energy technology have the potential to play an important role in decarbonising our energy supply, increasing energy security and reducing our dependence on fossil fuels. The Carbon Trust has estimated that wave and tidal resources could provide 20 per cent of the UK's electricity if fully developed." […] "Due to the intermittent nature of renewables generation, a balanced electricity mix is required to support security of supply requirements."

15 The tidal energy projects in the *Oosterschelde* and the *Pentland Firth* have been selected to serve as examples as they are in a relatively developed phase, which means that there is some information available on their expected effects on protected Natura 2000 sites and species.

and flow streams.[16] The Oosterschelde dam is a storm surge barrier which has been built in order to protect the southern Netherlands from flooding by the North Sea. The doors of the dam are opened during normal weather conditions and will only be closed in the case of a storm. The dam separates the North Sea from an inland water body called "the Oosterschelde", which belongs to the estuaries of the Scheldt river. Both the Oosterschelde and the area just in front of the dam at the North Sea side are designated as Natura 2000 sites. The project is a commercial demo installation with a capacity of 1,2 MW. It will supply energy to an estimate of 2000 households. During the testing period, which lasts till 2030, measurements will be carried out to gather knowledge about the possible effects of the tidal turbines, such as effects on sea mammals and effects on tidal streams.[17]

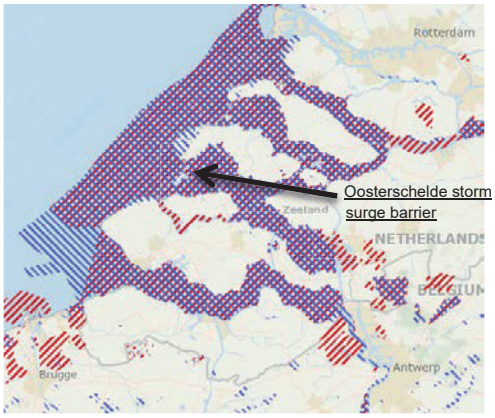

Figure 1. Oosterschelde (in the middle)
Source: EEA, Natura 2000 European protected areas - interactive map

The Appropriate Assessment of the project shows that the tidal energy turbines could have negative environmental effects on the Natura 2000 sites in and around the Oosterschelde water basin. The two main effects will be mentioned here.

First, the project could cause an increase of so-called "sediment starvation".[18] The installation of tidal turbines in two openings of the Oosterschelde dam is expected to cause a 14 per cent reduction of the tidal water flow per opening.[19] This decrease of water flow in the Oosterschelde water basin could result in a decrease of the difference between high and low water levels (amplitude), which will possibly cause increased erosion of

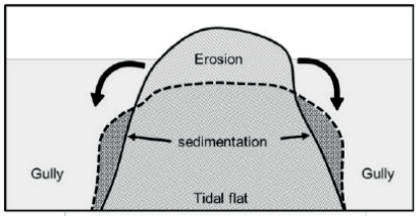

Figure 2. Sediment starvation: sediments that are eroding from the tidal flat end up being deposited in the gullies.
Source: Walles, B. (2015). The role of ecosystem engineers in the ecomorphological development of intertidal habitats. PhD thesis, Wageningen University, Wageningen.

16 IMARES, Institute for Marine Resources & Ecosystem Studies, *Passende Beoordeling van een getijdencentrale in de Oosterscheldekering* [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, p 6.

17 IMARES, Institute for Marine Resources & Ecosystem Studies, *Passende Beoordeling van een getijdencentrale in de Oosterscheldekering* [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, p 6.

18 For further explanation of the 'sediment starvation'-effect see: B Walles, *The role of ecosystem engineers in the ecomorphological development of intertidal habitats*, PhD Thesis (2015), p 15, box 1.2, available at: www.researchgate.net.

19 IMARES, Institute for Marine Resources & Ecosystem Studies, *Passende Beoordeling van een getijdencentrale in de Oosterscheldekering* [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, p 17.

sandbanks. These sandbanks are protected under the Habitats Directive, and are used by certain birds and by seals.[20]

Second, the project has a potential negative effect on seals,[21] harbour porpoises[22] and certain fish species. The harbour seal uses resting areas in the Oosterschelde and forages (searches for food) in the North Sea, which means that they need to pass the Oosterschelde dam.[23] Scientists assume that the harbour seal passes through the Oosterschelde dam on a regular basis. Also the harbour porpoise passes the dam. The Appropriate Assessment indicates that harbour seals, harbour porpoises and certain fish species are at risk of being hit by a rotor of a turbine. They could also decide to avoid the area of the tidal energy installation as they could be sensitive to underwater noise.[24]

2.2 Tidal energy in the Pentland Firth (Scotland)

MeyGen is a company that develops an offshore tidal turbine array in the body of water that separates the north of the Scottish mainland from Stroma Island.[25] The marked areas on the map represent the designated Natura 2000 sites in that area. The proposal would see an initial deployment of up to 61 fully submerged tidal turbines which are fixed to the seabed.[26] The turbines will be installed in stages with a final generating capacity of 86 MW. The first phase of the Meygen Phase 1 development shall be restricted to 6 turbines. Monitoring will be required to inform decisions on future deployments and a further Appropriate Assessment will be required before further deployments are authorised to ensure that full

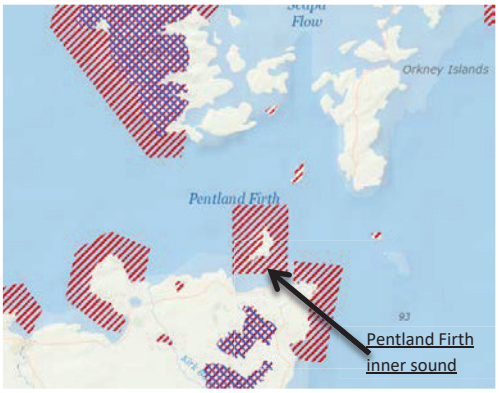

Figure 3. Pentland Firth inner sound
Source: EEA, Natura 2000 European protected areas - interactive map

20 B Walles, *The role of ecosystem engineers in the ecomorphological development of intertidal habitats*, PhD Thesis (2015), p 14, available at: www.researchgate.net.

21 The conservation objective for the harbour seal in the Oosterschelde is: "Conservation of the size and improvement of the quality of the habitat for the benefit of an increase of the population in order to contribute to reaching a regional population of 200 animals at minimum in the delta area."

22 These animals are given specific protection under rules on species protection of the Habitats Directive.

23 IMARES, Institute for Marine Resources & Ecosystem Studies, *Passende Beoordeling van een getijdencentrale in de Oosterscheldekering* [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, p 10.

24 According to the Appropriate Assessment the project also has a potential *positive* effect on seals as seals could benefit from changed water flow patterns caused by the turbines, because of which fish could become disorientated and could then be easier to catch. This could, however, have a potential negative effect for some fish species which are protected under the Habitats Directive.

25 This water body is called the 'inner sound' of the Pentland Firth.

26 Marine Scotland, *MeyGen Decision, Decision Letter and Conditions*, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/DecisionLetter, p 25.

consideration is given to any potential increase in environmental impacts.[27] This type of consenting is called "phased deployment" and is discussed as one of the solutions to the conflict between innovative renewable energy and the Habitats and Birds Directives in section 5.1.2 of this article.

The two main environmental effects of the Pentland Firth project are mentioned hereafter. First, the Appropriate Assessment shows that there may be displacement and a loss of foraging habitat for certain bird species due to the physical presence of the turbines, and also a potential for collision between birds and turbines. Furthermore, according to the initial assessment the Pentland Firth is considered to be one of the routes used by Atlantic salmon and sea lamprey migrating between freshwater and the open water. Potential impacts from the proposed tidal array on these species include: collision risks, noise (during installation, operation, maintenance and decommissioning) and effects on fish passage.[28] Second, according to the initial assessment there was no likely significant effect on nearby Natura 2000 sites designated for grey or harbour seals. The assessment does however state that as understanding of seal behaviour and movements improves, this conclusion might need reconsideration for future phases/turbine deployments. Moreover, in the Appropriate Assessment it is stated that "Due to potentially significant adverse impacts to other natural heritage features, namely the predicted collisions for harbour seals, an initial first phase deployment of 6 turbines is recommended, with a comprehensive post-construction monitoring programme to inform future phases."[29] In the final authorisation decision the Scottish Ministers noted that "Scottish Natural Heritage [SNH] and Whale and Dolphin Conservation considered the Company's Environmental Statement and concluded that there was the potential for significant adverse impacts to cetaceans such as the harbour porpoise and the minke whale due to increased vessel activity and collision risk with the turbines." However, with regard to the predicted avoidance rates by cetacean species SNH concluded that the 6-turbine development would not have an adverse impact on the favourable conservation status of the population.[30]

2.3 Conclusion

As regards the above mentioned negative effects the Appropriate Assessments of both projects concluded that they will be very limited or not occur at all in relation to the present small scale projects. Scientific uncertainty about the exact scope of these effects does however remain and monitoring will be necessary to inform future

27 Marine Scotland, *MeyGen Decision – Appropriate Assessment*, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment, p 77.

28 The conservation objectives for all the aforementioned species include the objectives to avoid deterioration of habitats, to avoid significant disturbance, and to maintain the viability of the population within the site. See Marine Scotland, *MeyGen Decision – Appropriate Assessment*, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment, pp 97-80.

29 Marine Scotland, *MeyGen Decision – Appropriate Assessment*, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment, pp 90-91.

30 Marine Scotland, *MeyGen Decision, Decision Letter and Conditions*, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/DecisionLetter, p 19.

projects or phases.[31] The habitats and species that feature in the case study are all covered by the protection rules of the Habitats and Birds Directive. The protection rules of these directives may cause problems for tidal energy projects if negative effects to those habitats and species occur on a sufficiently large scale. These effects are therefore expected to play an important role in the authorisation procedure of future large-scale tidal energy projects.

3. LEGAL ISSUE I: CONFLICT BETWEEN THE PROVISIONS OF THE HABITATS AND BIRDS DIRECTIVES AND THE RENEWABLE ENERGY DIRECTIVE

The first legal issue is the existence of a potential conflict between the Habitats and Birds Directives' goal to protect habitats and species, and the goal to produce more water-related innovative renewable energy, with regard to the quota in the Renewable Energy Directive. The Habitats and Birds Directives may require rejection of certain projects due to their possible negative effects on protected habitats and species. At the same time, those projects may actually be necessary to achieve an increased production of renewable energy, as required by the Renewable Energy Directive. In this sense there is a potential conflict between the provisions of the Renewable Energy Directive and those of the Habitats and Birds Directives. This section discusses the protection rules of these environmental directives and assesses the extent to which projects such as large-scale tidal energy may be caught by them.

3.1 The rules for the protection of Natura 2000 sites

The nature sites which are designated as Natura 2000 sites[32] are subject to a strict protection regime, which gives effect to the important position of the precautionary principle in EU nature protection law.[33] According to Article 6(3) Habitats Directive and case law of the European Court of Justice, competent authorities may only

31 IMARES, Institute for Marine Resources & Ecosystem Studies, *Passende Beoordeling van een getijdencentrale in de Oosterscheldekering* [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, p 45; Marine Scotland, *MeyGen Decision – Appropriate Assessment*, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment, pp 90-92.

32 The Natura 2000 network consists of two types of protected areas: so-called *special protection areas* (Birds Directive) and *special areas of conservation* (Habitats Directive). *Special protection areas* contain the habitats of certain endangered wild bird species, which are in need of special conservation measures. These measures have to ensure the survival and reproduction of the protected birds. *Special areas of conservation* contain natural habitat types (including tidal flats and estuaries) and the habitats of certain species other than birds (certain mammals, reptiles, fish and invertebrates), which have to be maintained or, where appropriate, restored to a favourable conservation status.

33 According to the ECJ: "In this respect, it is clear that the authorisation criterion laid down in the second sentence of Article 6(3) of the Habitats Directive integrates the precautionary principle […] and makes it possible effectively to prevent adverse effects on the integrity of protected sites as the result of the plans or projects being considered. A less stringent authorisation criterion than that in question could not as effectively ensure the fulfilment of the objective of site protection intended under that provision." See European Court of Justice, Case C–127/02 *Waddenvereniging and Vogelbeschermingsvereniging* [2004] ECR I–7405, para 58.

agree to new projects when they are certain that those projects will not have "lasting adverse effects on the integrity" of the Natura 2000 sites in question, and "where no reasonable scientific doubt remains as to the absence of such effects".[34]

Whether such a lasting adverse effect on a site's integrity actually exists must be decided through an appropriate assessment,[35] which assesses the project's effects on the site "in view of the site's conservation objectives". These conservation objectives set targets for the habitats for which the site is designated as a Natura 2000 site.[36] The site's integrity will be adversely affected if the appropriate assessment shows that a project leads –or may lead– to a situation in which 'the lasting preservation' of these habitats can no longer be guaranteed.[37] The conservation objectives provide information on the degree to which these habitats must be protected and must be consulted in order to know when a site's integrity will be adversely affected.[38]

The above explanation of Article 6(3) may have consequences for tidal energy projects as many of these projects will due to their nature be situated in, or close to, Natura 2000 sites. If one of the reasons for designating a site as a Natura 2000 site was –for instance– the presence of the habitat type "tidal flats"[39] then "the lasting preservation" of these flats must be guaranteed. If a tidal energy project will cause

34 European Court of Justice, Case C-258/11, *Sweetman,* para 40.

35 An appropriate assessment is a detailed environmental assessment that has to be carried out for every project for which there is a 'probability, or a risk' that it will have a 'significant effect' on a protected Natura 2000 site. It needs to identify all aspects of the project which can, 'by themselves or in combination with other plans or projects', affect the conservation objectives of the site concerned. These assessments should be carried out in the light of the best scientific knowledge in the field. See Article 6(3) of the Habitats Directive and European Court of Justice, Case C–127/02 *Waddenvereniging and Vogelbeschermingsvereniging* [2004] ECR I–7405, paras 43–44, 57 and 61, and European Court of Justice, Case C-258/11, *Sweetman,* para 40.

36 A conservation objective can be described as 'the specification of the overall target for the species and/or habitat types for which a site is designated in order for it to contribute to maintaining or reaching favourable conservation status of the habitats and species concerned, at the national, the biogeographical or the European level.' See European Commission, *Commission note on setting conservation objectives for Natura 2000 sites*, final version 23 November 2012, section 2. Note that the term 'favourable conservation status' is used here in a 'broad sense' (it concerns the achievement of a favourable conservation status of the habitats and species at 'the national, the biogeographical or the European level', which is the ultimate goal of the directive), while the term is used in a 'narrow sense' (only referring to the favourable conservation status of the Natura 2000 site in question) in relation to the question whether a site's integrity is affected (see footnote 38).

37 According to the ECJ, in order for a site's integrity not to be adversely affected, the site must be preserved at *a favourable conservation status*. One can speak of a favourable conservation status of a Natura 2000 site when 'the lasting preservation' is guaranteed of the '*constitutive characteristics of the site* concerned that are connected to the presence of a natural habitat type whose preservation was the objective justifying the designation of that site in the list of SCIs, in accordance with the directive.' See European Court of Justice, Case C-258/11, *Sweetman,* paras 39 and 46.

38 The importance of conservation objectives is emphases by AG Sharpston, whose conclusion has been agreed to by the ECJ. According to the AG: "It follows that the constitutive characteristics of the site that will be relevant are those in respect of which the site was designated and their associated conservation objectives. Thus, in determining whether the integrity of the site is affected, the essential question the decision-maker must ask is 'why was *this particular site* designated and what are its conservation objectives?'." Conclusion of AG Sharpston, Case C-258/11, *Sweetman,* para 56.

39 According to Article 3 Habitats Directive, the Natura 2000 network is 'composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II' of that directive. Tidal flats are mentioned by Annex I of the Habitats Directive as 'natural habitat types of community interest whose conservation requires the designation of special areas of conservation'.

permanent damage to the tidal flats in that site, then the site is not kept at *a favourable conservation status* and there will be lasting adverse effects on the "integrity of the site".[40] The project will then in principle be forbidden. Apart from habitats, the Habitats Directive may also have implications for renewable energy projects that have negative effects on animals. For instance, the conservation objective for the harbour seal in the *Oosterschelde* Natura 2000 site is the "Conservation of the size and improvement of the quality of the habitat for the benefit of an increase of the population in order to contribute to reaching a regional population of 200 animals at minimum in the delta area."[41] Taking into account the preceding explanations of Article 6(3), this conservation objective implies that authorisation of a project is not allowed if it affects the seal's habitat that is present in the Natura 2000 site to such extent that the site is not suitable anymore for reaching and sustaining a population of 200 seals. This may occur when tidal turbines prevent –or risk to prevent– seals from reaching their protected habitats.[42] Hence, even though these animals are not granted specific protection under Article 12 of the Habitats Directive, they may still require protection in relation to their habitat due to the formulation of the relevant conservation objectives.[43]

The above shows that the Habitats Directive focuses on the long-term sustainability of protected habitats in Natura 2000 sites, rather than on preventing short-term and reversible negative effects.[44] If, however, this long-term sustainability is at risk, then project authorisation needs to be refused. The case law is strict in this regard and leaves no room for deviation, except when the derogation clause of Article 6(4) is applied. The prohibition to authorise projects that cause lasting negative effects to Natura 2000 sites also applies to situations where there is scientific uncertainty as to those effects. With respect to innovative renewable energy technologies it is often uncertain whether or not an effect on a nature site will occur at all or to what extent it will occur. Section 3.3 elaborates further on uncertainty with regard to the environmental effects of innovative renewable energy projects.

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40 Compare to the situation in Sweetman where the site's constitutive characteristics was the natural habitat type 'limestone pavement', which would be permanently damaged by the project. See European Court of Justice, Case C-258/11, *Sweetman,* para 45.

41 IMARES, Institute for Marine Resources & Ecosystem Studies, *Passende Beoordeling van een getijdencentrale in de Oosterscheldekering* [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, p 19.

42 This could even be the case if the turbines are placed outside of the Natura 2000 site in question as Article 6(3)'s protection measures are also applicable to activities that take place outside the Natura 2000 sites, but which have a significant effect on those sites. See European Commission, *Managing Natura 2000 sites – The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (2000), p 30.

43 This is also shown by a recent ECJ case about the cooling water inlet of a coal-fired energy plant that would prevent migratory fish from reaching their breeding areas in a protected Natura 2000 site upstream. The conservation objectives of that site covered these species and therefore they were awarded protection from negative effects of the coal-fired plant. European Court of Justice, Case C 142/16, *European Commission v Germany* (Moorburg coal-fired plant), paras 6 and 34-38.

44 Such effects could occur for instance during the construction phase of a renewable energy project. Nevertheless, if such activities (such as piling or drilling) would cause disturbance of species in the sense of the articles on species protection (see the following sections), then these activities could still be forbidden pursuant to those articles. C.f. Conclusion of Advocate General Sharpston in Case C-258/11, *Sweetman, para* 59.

3.2 The rules for the protection of species

Article 12 of the Habitats Directive covers the protection rules for animals that are in need of strict protection, which includes the harbour porpoise (categorised under "Cetacea"), which is a species that is present in both the *Oosterschelde* and the *Pentland Firth* Natura 2000 sites. There is a generic obligation to protect these animals, irrespective of where their habitat is. The relevance of this article for tidal energy projects is that it prohibits the *deliberate* disturbance of species, particularly during the period of breeding, rearing, hibernation and migration[45] and that it prohibits the deterioration or destruction of breeding sites or resting places.[46] Article 16 of the Habitats Directive offers a possibility for derogating from Article 12 if all the conditions in that article are fulfilled.

The Birds Directive protects *all* species of naturally occurring birds in the wild state which are present in the European territory of the Member States. The relevance of the Birds Directive for tidal energy projects is that Article 5 prohibits the *deliberate* disturbance of birds, particularly during the period of breeding and rearing and the deliberate destruction of, or damage to, nests and eggs or removal of nests. Article 9 of the Birds Directive offers a possibility for derogating from Article 5 if all the conditions in that article are fulfilled.

Although the directives do not specify the meaning of the term *disturbance*, some guidance is given in a (non-binding) Commission Guidance where the Commission suggests that "any disturbing activity that affects the survival chances, the breeding success or the reproductive ability of a protected species or leads to a reduction in the occupied area should be regarded as a 'disturbance' in the sense of Article 12."[47] Probably this interpretation also applies to "deliberate disturbances" in the sense of Article 5 Birds Directive. A large-scale tidal energy project in the *Oosterschelde* may be regarded as "disturbance" as it could make it more difficult for harbour porpoises to cross the Oosterschelde dam. Moreover, animals may start avoiding the dam or may be hit by the turbines. As it is known that the animals also breed in the Oosterschelde, this may be a severe form of disturbance. Similar issues may apply to the Pentland Firth.

The Directive does not specify the meaning of *deliberate* disturbance, but the ECJ suggested in relation to the prohibition of "deliberate capture or killing" of species[48] that a "deliberate" action requires that the author of the act *intended* the capture or killing, or, at the very least, *accepted the possibility* of such capture or killing.[49] Most probably this interpretation of the term "deliberate" also applies to the prohibition of "deliberate disturbances" of both wild birds and species that are protected under Article 12 Habitats Directive. This has –in relation to Article 12 species– also been

45 Article 12(1)(b) Habitats Directive.
46 Article 12(1)(d) Habitats Directive.
47 European Commission, *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC* (2007), para 39.
48 Article 12(1)(a) Habitats Directive.
49 European Court of Justice, Case C-221/04, *Commission v Spain,* paras 72-74.

argued by an English Court of Appeal.[50] The prohibition of accepting the mere *possibility* that species will be disturbed, may require competent authorities to refuse projects of which the exact environmental effects are still uncertain. This is likely to apply to many innovative renewable energy projects. The next section elaborates further on uncertainty with regard to the environmental effects of innovative renewable energy projects.

3.3 Uncertainty

Innovative water-related renewable energy technologies such as tidal stream energy are relatively new technologies and relatively few projects have been realised so far. Therefore there is limited environmental monitoring data available. Moreover, as different project locations and different project scales have different characteristics, monitoring data on the environmental effects of one project may not automatically be transferable to another project.[51] For these reasons there still is a considerable lack of scientific knowledge on the nature and the extent of the environmental effects of innovative water-related renewable energy technologies. This is exemplified by the appropriate assessments of the *Oosterschelde* and *Pentland Firth* tidal energy projects.[52] These assessments refer to "potential" and "expected" environmental effects, and they indicate the need for postconstruction monitoring in order to gain more knowledge on these environmental effects.[53] Such knowledge gaps get more problematic as the size of projects increases.[54]

As concluded in the former sections, both the Natura 2000 and the species protection regimes require that authorisation of renewable energy projects is refused if there is uncertainty as to their effects on protected habitats or species. As the existence of knowledge gaps in this regard is inherently linked to innovative renewable energy techniques, future largescale water-related innovative renewable projects are likely to face refusal of project authorisation under Articles 6(3) and 12 Habitats Directive and Article 5 Birds Directive. Possible paths that could lead to evading such refusal are *mitigation* and using the *derogation clauses* of the Habitats and Birds Directives. These options are discussed in the following sections.

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50 J Lowther, *Determining the Meaning of 'Disturbance' for European Protected Species – R (Morge) v Hampshire County Council [2011] UKSC 2, 23:2* Journal of Environmental Law 319, 323 (2011).

51 G Wright, *Environmental Impact Assessment to Support Marine Innovation: The 'Rochdale Envelope' and 'Deploy & Monitor' in the UK's Ocean Energy Industry*, in B Vanheusden and L Squintani (eds.) *EU Environmental and Planning Law Aspects of Large-Scale Projects*, 191 (Intersentia 2016).

52 See section 2.

53 Marine Scotland, *MeyGen Decision – Appropriate Assessment*, September 2013, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment, for instance p 90, and IMARES, Institute for Marine Resources & Ecosystem Studies, *Passende Beoordeling van een getijdencentrale in de Oosterscheldekering* [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, for instance p 48.

54 G Wright, et al., *Establishing a legal research agenda for ocean energy*, 63 Marine Policy 126, 128 (2016).

3.4 Mitigation

Mitigation measures can be described as "measures aimed at minimising or even cancelling the negative impact of a plan or project".[55] They are an integral part of the specifications of the project.[56] Mitigation measures prevent the occurrence of negative environmental effects that are prohibited under Articles 6(3) and 12 Habitats Directive and Article 5 Birds Directive. The idea is that it will not be necessary for a competent authority to refuse authorisation of a project if by means of mitigation measures and prior to implementation of a project all prohibited negative environmental effects –or uncertainty as to those effects– are taken away. Mitigation measures must be strictly distinguished from *compensation* measures.[57]

There are several examples of mitigation measures that are potentially effective at reducing the environmental risks of tidal stream energy projects. *"Smart turbine-positioning"* –locating the project away from the corridors which marine mammals are most likely to use for passage to their preferred resting areas– could be an effective mitigation measure if the monitoring data of pilot projects offer clear data on migration patterns and if turbine locations can be adapted accordingly.[58] However, in the case of largescale projects there might be insufficient room for "smart turbine-positioning".[59] Moreover, monitoring data from small-scale projects may not give sufficient certainty to judge the effectiveness of the mitigation measure in largescale projects. *Additional sand suppletion* on affected tidal flats could be a way to counter sediment starvation. However, taking the ECJ's judgement in *Briels* into account, "habitat improvement measures" –which include the creation of new foraging and resting areas, or improving existing ones, of which sand suppletion is an example– may be seen by the Court as a compensation measure, which cannot be taken into consideration under Article 6(3).[60] Nevertheless, there are also strong arguments in

55 European Commission, *Managing Natura 2000 sites – Provisions of Article 6 of the 'Habitats' Directive 92/43/CEE (2000)*, http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf, pp 36-37.

56 The European Commission has mentioned some examples of mitigation measures, which include: adapting the dates and the timetable of implementation of a project (e.g., not to operate during the breeding season of a particular species), or specification of the type of tools and operation to be carried out (e.g., to use a specific dredge at a distance agreed upon from the shore in order not to affect a fragile habitat). See: European Commission, *Managing Natura 2000 sites – Provisions of Article 6 of the 'Habitats' Directive 92/43/CEE (2000)*, http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf, pp 36-37.

57 Mitigation measures guarantee that the project will not adversely affect the integrity of the site, while compensation measures compensate after the fact for any significant adverse effects on the protected habitats or species concerned. See European Court of Justice, Case C-521/12, *Briels*, para 31. Compensation measures can only be introduced under the derogation procedures of the Birds and Habitats Directives. See section 4.1.3. for further elaboration.

58 'Smart turbine-positioning' has been done in the *Oosterschelde* pilot project and has been coupled with a programme to monitor if seals are suffering from rotor blade injuries. IMARES, Institute for Marine Resources & Ecosystem Studies, *Passende Beoordeling van een getijdencentrale in de Oosterscheldekering* [Appropriate Assessment of a tidal energy plant in the Oosterschelde storm surge barrier], 27 April 2010, p 49.

59 For instance in the case of a future large-scale project in the Oosterschelde –which would use a considerable percentage of the dam's openings– it might be difficult to keep all the turbines far away from resting areas.

60 European Court of Justice, Case C-521/12, *Briels*, para 31. Moreover, the Orleans case shows that nature creation measures which are taken before the harm has been done, but which do not prevent the occurrence

favour of qualifying sand suppletion as a mitigation measure.[61] Other techniques for countering sediment starvation are *smoothening* the edges and the bottom of the storm surge barrier dam,[62] and the *introducing oyster reefs* on tidal flats.[63] These techniques are however very new and their effectiveness is not yet proven. Finally, *fish barriers* are sometimes mentioned as an option for mitigating fish-turbine collisions. Such barriers are however problematic as they cause a loss of hydraulic power which is needed for energy production, and it is difficult to keep them clean.[64]

The above shows that there is uncertainty about the effectiveness, feasibility and –in the case of sand suppletion– the legality of mitigation measures for tidal energy projects. Moreover, mitigation measures can only be successful at preventing a refusal to grant project authorisation if they succeed at taking away the prohibited negative effects on habitats or species or any remaining uncertainty with regard to the occurrence of such effects. Even in the case that some of these –or other– mitigation measures turn out to be effective in small-scale projects it will be difficult to proof beforehand that they will also work in largescale projects. The burden of proof for mitigation measures is high as the Birds and Habitats Directives require that uncertainty is taken away before projects are authorised. The ECJ's strict reasoning in the recent *Moorburg coal-fired plant* case is an example in this regard.[65] Mitigation measures will therefore normally not be an easy project-saver in the case of possible negative effects caused by new and innovative renewable energy techniques.

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of such harm, must be qualified as compensation measures, see: European Court of Justice, Joined cases C-387/15 and C-388/15, *Orleans*, paras 55-58 and 64.

61 It is conceivable that sand suppletion in the Oosterschelde *can* be qualified as a mitigation measure as it differs considerably from the measures taken in *Briels*. According to the Court, the creation of new meadows in the *Briels*-case was not aimed at avoiding or reducing the significant adverse effects on the protected and affected meadows, but they tended to compensate after the fact for those effects. However, sand suppletion in the Oosterschelde would prevent the negative effect –i.e. the erosion of tidal flats– from occurring at all. In that sense it is more logical to qualify it as a mitigation measure. Compare this to a recent Dutch case which shows that mitigation measures can sometimes even consist of the construction of new foraging and resting areas for birds outside of the affected Natura 2000 site. According to the Court (the Council of State) the measure prevented the decrease of the population of protected birds and can therefore be seen as a mitigation measure. See Raad van State, ECLI:NL:RVS:2014:3884, Primaire waterkering Zwakke Schakels Noord-Holland (29-10-2014), paras 24.4.3.1. For further discussion of this issue see R Frins and H Schoukens, *Balancing Wind Energy And Nature Protection: From Policy Conflicts Towards Genuine Sustainable Development?* in L Squintani and HHB Vedder (eds.), *Sustainable Energy United in* Diversity, 105-107 (EELF 2014).

62 This approach has not yet been tested. See Provinciale Zeeuwse Courant, 'Pas bodemkering aan voor getijdenenergie' ['Adapt the bottom of the storm surge barrier for the benefit of tidal energy'], 1-3-2016.

63 This will slow down erosion and preserve biodiversity. This technique was tested in the Oosterschelde but quantitative studies are still needed to prove their effectiveness. B Walles, *The role of ecosystem engineers in the ecomorphological development of intertidal habitats*, PhD Thesis (2015), pp 19 and 34-35, available at: www.researchgate.net.

64 Based on an interview with Dr. ir. J van Berkel, Professor of Sustainable Energy in Delta Areas at the HZ University of Applied Sciences in Vlissingen, the Netherlands. The interview transcript is available from the author.

65 In this case a fish ladder was proposed as a mitigation measure for the cooling water inlet of a coal-fired energy plant that would prevent migratory fish from reaching their breeding areas in a protected Natura 2000 site upstream. It was concluded that the effectiveness of the measure could only be confirmed following several years of monitoring. The ECJ therefore concluded that the parties could not guarantee *beyond all reasonable doubt* that that plant would not adversely affect the integrity of the site. European Court of Justice, Case C 142/16, *European Commission v Germany* (Moorburg coal-fired plant), paras 34-38.

3.5 Conclusion

It is argued in this article that due to expected –certain or uncertain– negative environmental effects of future large-scale tidal energy projects, competent authority will often have to decide to refuse project authorisation under the Habitats and Birds Directives. It is expected that mitigation measures will not always be effective at preventing deteriorations or at taking away uncertainties. Moreover, some mitigation measures may not be feasible or not allowed. In that case only the derogation clauses of the Habitats and Birds Directives can be used to prevent project authorisation from being refused.

4. LEGAL ISSUE II: LACK OF INTEGRATION BETWEEN THE RENEWABLE ENERGY DIRECTIVE AND THE DEROGATION CLAUSES OF THE HABITATS AND BIRDS DIRECTIVES

Articles 6(4) and 16 Habitats Directive and article 9 Birds Directive contain derogation clauses that allow for the weighing of habitats and species protection against other interests. Their application could, if all conditions are fulfilled, lead to a renewable energy project's derogation from the protection rules of the Habitats and Birds Directives. There is however no actual integration between these derogation clauses and the Renewable Energy Directive (RED). Nor is there an obligation to apply the clauses in cases where a renewable energy project risks to cause prohibited negative effect on habitats or species. Therefore, there is no guarantee that applications for the authorisation of renewable energy projects that are important for achieving the RED's goals will actually be weighed under the Habitats and Birds Directives. Nor is there a guarantee that a serious balancing of interests will take place.

The following sections first discuss the scope of the derogation clauses, and secondly their lack of integration with the Renewable Energy Directive.

4.1 The derogation clauses

According to Article 6(4) Habitats Directive, Member States are not in breach of Article 6(3) if a project that has a prohibited negative effect on a Natura 2000 site must be carried out for "imperative reasons of overriding public interest". Similarly, Article 16 Habitats Directive says that Member States may derogate from the Article 12 rules on species protection if justified by imperative reasons of overriding public interest. And Article 9 Birds Directive offers a possibility to derogate from the obligations to protect wild birds –as laid down in Article 5– in the interest of *inter alia* public health, safety or the protection of flora and fauna. All three derogation clauses mention several conditions that have to be fulfilled in order for the clauses to be applicable. These conditions are listed in Table 1.

Conditions for the application of the derogation clauses

Article 6(4) Habitats Directive	Article 16 Habitats Directive	Article 9 Birds Directive
1) There are no **alternative solutions** 2) There are so-called '**imperative reasons of overriding public interest**', making it necessary to carry out the plan or project 3) The Member State takes all **compensatory measures** necessary to ensure that the overall coherence of Natura 2000 is protected	1) there is no **satisfactory alternative** 2) a **favourable conservation status** of the species can be guaranteed 3) and furthermore, the derogation must have one of the reasons listed in Article 16, of which '**imperative reasons of overriding public interest**' (IROPI) is most relevant to tidal energy projects There is no explicit compensation requirement.	1) there is **no satisfactory alternative** 2) the derogation is for one of the reasons listed in the exhaustive list in Article 9, which includes **reasons for derogation like** 'it is in the interest of public health and safety', and 'for the protection of flora and fauna' There is no explicit compensation requirement.

The following sections discuss the conditions which are most relevant for tidal energy projects.

4.1.1 Alternative solutions

All three derogation articles require the competent authority to establish that there is no available alternative to the proposed project.[66] This is a decisive criterion for the applicability of the derogation articles. The competent authority must assess *all* alternatives,[67] and if it is of the opinion that a less harmful alternative exists which is suitable to achieve the aim of the project, then that alternative should be used. The competent authority has a considerable amount of discretionary power in this regard. The problem here is that one can differ of opinion about what in a certain situation must be considered as a suitable alternative for a specific tidal energy project.

It can be said that there are two possible interpretations. First, a suitable alternative could only consist of choosing a different location for the project that causes less harm to habitats or species. Second, a suitable alternative could also consist of choosing a different source of energy that causes less harm to habitats or species. The first interpretation is most preferable and would probably raise few problems for

66 According to the ECJ this requirement must be interpreted strictly (in relation to Article 6(4), but this probably also applies to the other derogation articles). In the case *Commission v Portugal*, about the construction project of a motorway which would cross and negatively impact a Natura 2000 site, the Court ruled that it could not 'be ruled out immediately' that the routes which fell outside of the protected site (although they would present certain difficulties) could qualify as alternative solutions. Accordingly, by failing to examine that type of solution, the Portuguese authorities did not comply with the requirement that the absence of alternative solutions should be demonstrated. See European Court of Justice, Case C-239/04 *Commission* v *Portugal* (Castro Verde), paras 25-40.

67 According to the Advocate General an examination is required of *all* alternatives which would achieve the aim of the project but would affect the protected site less adversely or not at all. The decisive factor is – according to the AG– 'whether imperative reasons of overriding public interest require the implementation of specifically *that* alternative or whether they can also be satisfied by another alternative with less of an adverse effect on the protected site.' See Opinion of Advocate General Kokott in Case C-239/04 *Commission* v *Portugal,* paras 42-46.

tidal energy projects. Tidal energy projects require very specific sites with high-speed currents, such as narrow straits, inlets (e.g. the *Oosterschelde*), or channels between islands (e.g. the *Pentland Firth*). These are scarce sites and in general it will be difficult to find suitable alternative locations, which would mean that the "no-alternatives" condition can be fulfilled relatively easily.[68] Opinions differ about the second interpretation. It can be argued that the derogation articles do not require research into other energy sources than the one proposed.[69] But it can also be argued that they require competent authorities to look into other energy sources.[70] Interpreting the "no alternatives" condition such that it is required to look into the possibility to use different energy sources –such as wind or solar power– could potentially frustrate a Member State's renewable energy policy. In order to create a healthy energy mix Member States may actually need renewable energy sources which provide a continuous –base load– supply of energy, such as tidal energy. The author of this article therefore takes the position that it is better to interpret the derogation articles such that it is not required to consider alternatives that entail a completely different source of energy. While the sources referred to in this section mostly refer to the "no alternatives" condition in relation to Article 6(4) Habitats Directive, it is expected that these sources are equally applicable to articles 16 Habitats Directive and 9 Birds Directive.

4.1.2 Imperative reasons of overriding public interest

Articles 6(4) and 16 Habitats Directive require the existence of an imperative reason of overriding public interest (IROPI) that outweighs the site's conservation objectives which are at risk of being compromised by a project. Article 9 Birds Directive

68 Nonetheless, even if there is a suitable alternative site which has less impact on the environment, it may still be sensible not to use that alternative. The reason for that is that that there is need for many renewable energy installations in order to reach the EU's 2020 quotas for renewable energy. This implies that a site which may seem a suitable alternative at first sight, may actually be needed for future renewable energy projects instead. This line of thought could make it a less suitable alternative after all. Moreover, a Dutch case on species protection suggests that even *if* there is an available alternative location, economic arguments could justify a choice for the originally proposed site. In this case the Dutch Council of State decided that an alternative location for a wind park was not a *satisfactory* alternative because the costs for wind energy would be higher at that site (Raad van State, JM 2015/56 RvS, 18-02-2015, *201402971/1/A3*, ECLI:NL:RVS:2015:438, para 9.5). This economic argument played a role in the Court's decision alongside ecological arguments. The Court also found that from an ecological point of view none of the alternatives was better than the original site. According to the European Commission economic criteria cannot, however, be seen as *overruling* ecological criteria under the 'no-alternatives'-test (European Commission, *Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC*, no 2007/2012, para 1.3.1). In view of the ECJ's ruling in *Commission v Portugal* this is indeed the correct approach.

69 The UK's Department for Environment, Food & Rural Affairs (DEFRA) takes this view and states in its (not legally binding) Article 6(4) Guidance that 'alternative solutions are limited to those which would deliver the overall objective as the original proposal.' It uses wind energy as an example and says that in the case of an offshore wind energy project, 'the competent authority would normally only need consider alternative offshore wind renewable energy developments. Alternative forms of energy generation (e.g. building a nuclear power station instead) are not alternative solutions to this project as they are beyond the scope of its objective'. See DEFRA, *Habitats and Wild Birds Directives: guidance on the application of article 6(4)* (2012), p 3.

70 R Frins and H Schoukens, *Balancing Wind Energy And Nature Protection: From Policy Conflicts Towards Genuine Sustainable Development?* in L Squintani and HHB. Vedder (eds.), *Sustainable Energy United in Diversity – Challenges and approaches in energy transition in the EU*, 93 (EELF 2014).

requires that the project in question relates to one of the reasons as mentioned in the exhaustive list in that article. Renewable energy projects will probably be eligible to qualify as an imperative reason of overriding public interest. The Habitats Directive does not specifically mention that "renewable energy production" can be an imperative reason of public interest. It does indicate that reasons related to "beneficial consequences of primary importance for the environment" may be raised. Water-related innovative forms of energy production can probably qualify as being beneficial for the environment as they are emission-free forms of energy production that can contribute to the EU-wide aim of reducing CO2-emissions by 20 per cent in 2020. The highest Dutch administrative court also confirms the view that renewable energy can be an IROPI.[71] The ECJ has not yet ruled on a case that explicitly recognises renewable energy as an IROPI within the meaning of the Habitats and Birds Directives. However, it *has* confirmed that renewable energy can be an overriding public interest within the meaning of the Water Framework Directive in the *Schwarze Sulm* case.[72] In that case the Court referred *inter alia* to the high priority status that the promotion of renewable energy sources has within the European Union. A similar reasoning is likely to be successful in cases that concern the protection of habitats and species.

Article 9 of the Birds Directive contains an exhaustive list of reasons for derogation which does not include a reason that can automatically be linked to renewable energy production. Nevertheless, it is argued in the present article that the aforementioned arguments can also justify a derogation for renewable energy projects based on the Article 9 reasons "public health" and "the protection of flora and fauna". This argument is supported by the highest Dutch administrative court and by the European Commission.[73] This is a desirable approach, as otherwise the presence of wild birds at a development site could frustrate a project, even if the derogation clauses of the Habitats Directive are applicable.

Apart from establishing the existence of a valid reason for derogation, the derogation articles also require that a balancing act is carried out. According to the ECJ a project

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71 The highest Dutch administrative court confirms this view by stating that it cannot be said that the generation of renewable energy cannot be an imperative reason of overriding public interest (in the sense of the former Article 19g, second paragraph, of the Nature Conservancy Act 1998 (now Article 2.8, fourth paragraph, Nature Conservation Act), which is the Dutch implementation of article 6(4) of the Habitats Directive). The Dutch court underpins its statement by referring to the increasing need for sustainable energy and to the existence of national and international goals which aim to reduce the emission of greenhouse gasses. For the case, see: Raad van State, ECLI:NL:RVS:2009:BH4011 (Windturbines Emmapolder), para 2.16. A similar argument has been given by the Dutch court in relation to species protection in a case about protected bats that would be harmed by the construction of a small wind energy farm. See Raad van State, ECLI:NL:RVS:2015:438 (Windturbines Sabina Henricapolder), para 9.4.

72 European Court of Justice, Case C-346/14, *Schwarze Sulm*, paras 71-74.

73 The Dutch Council of State accepted the argument that climate change has effects on public safety, public health and flora and fauna, and that a windfarm could therefore be exempted under these reasons. See Raad van State, ECLI:NL:RVS:2016:1227, *Windcollectief Wieringermeer*, para 7.2. Moreover, in a guidance document the European Commission argued that public health and public safety might apply as reasons for a derogation for wind farms in the context of Article 9 of the Birds Directive and Article 16 of the Habitats Directive. See 'EU Guidance on wind energy development in accordance with the EU nature legislation' (2011), p 18.

must be of such an importance "that it can be weighed up against that directive's objective of the conservation of natural habitats and wild fauna and flora."[74] Hence, not every individual renewable energy project will be of such importance that it outweighs the need to protect certain habitats and species. This is illustrated by a Dutch case about a permit for the construction of 17 wind turbines next to a Natura 2000 site. In that case the highest Dutch administrative court argued that while renewable energy *can* be qualified as an imperative reason of overriding public interest, this does not mean that *every* contribution to the generation of sustainable energy can be qualified as such. The Dutch Court ultimately concluded that the competent authority had failed to substantiate sufficiently why more weight must be given to the installation of 17 wind turbines at that specific site than to the relevant conservation objective.[75] By way of contrast, in another Dutch case the same court approved a 3-turbine wind energy project because the project contributed to the Dutch renewable energy objectives while having a relatively small impact on protected bat species.[76] These cases show that competent authorities must sufficiently substantiate the outcome of the balancing act. When competent authorities do sufficiently substantiate the outcome of the balancing act, they have a considerable amount of discretionary power. The reason for that is that the directives do not specify how the balancing act under the IROPI condition should be carried out. This aspect of policy discretion may cause problems for renewable energy projects, which are further discussed in section 4.2.

4.1.3 Compensation

Compensation is a compulsory condition of the derogation clause in Article 6(4) Habitats Directive. It is not an explicit requirement under Article 16 Habitats Directive and Article 9 Birds Directive. Compensation measures are meant to offset the negative effects of a project in order to guarantee that the ecological coherence of the Natura 2000 network is preserved.[77] Hence, the compensation requirement requires a very precise determination of the negative impacts of the project.[78] Compensatory measures differ from mitigation measures as they do not guarantee that the project will not adversely affect the integrity of the site within the meaning

74 The European Court of Justice draws this conclusion from the term *imperative reasons of overriding public interest,* which must be both 'public' and *'overriding'*. See Case European Court of Justice, C-182/10 *Marie-Noëlle Solvay and others v Région Wallonne* (16 February 2012), para 75.

75 It must be noted that in this case the Court decided to include in its balancing exercise its conclusion that insufficient research has been done into suitable alternative sites. By doing that, the court in fact mixed the *alternative solutions* and the *reasons of overriding public interest* conditions. See Raad van State, ECLI:NL:RVS:2009:BH4011 (Windturbines Emmapolder), para 2.16.

76 Moreover, the court was convinced that the chosen project is better than the available alternatives in terms of wind, cost-effectiveness and ecological impact. See Raad van State, ECLI:NL:RVS:2015:438 (Windturbines Sabina Henricapolder), paras 9.3-9.5.

77 Geert Van Hoorick, *Compensatory Measures in European Nature Conservation Law*, 10(2) Utrecht Law Review 161, 162 (2014).

78 H Schoukens and A Cliquet, *Mitigation and Compensation under EU Nature Conservation Law in the Flemish Region: Beyond the Deadlock for Development Projects?*, 10(2) Utrecht Law Review 194, 199 (2014).

of Article 6(3) of the Habitats Directive. Instead, they tend to compensate after the harm has been done.[79]

In its guidance document on Article 6(4) the European Commission gives a couple of examples of specific measures that would qualify as compensation in the sense of Article 6(4). These include: the recreation of a comparable habitat, the biological improvement of a substandard habitat within an existing designated site, and the addition to the Natura 2000 Network of a new site of comparable quality to the original site. According to the Commission compensation ratios should be well above 1:1. Ratios of 1:1 or below should only be considered when it is proved that the compensation measures will be 100 per cent effective in replacing the structure and function of the harmed habitat type within a short period of time.[80] Furthermore, compensatory measures must go beyond the normal measures which are required for the protection and management of Natura 2000 sites.[81]

For large-scale tidal energy projects it will probably be difficult to comply with the compensation requirement. As literature points out, the lack of available and suitable sites which can be purchased within a short time is often a constraint for the implementation of compensation measures.[82] Moreover, tidal energy projects are typically located at sites which house a unique combination of tidal streams, and animals and habitats which are dependent thereon. It may be difficult to find a suitable location for compensation measures as such sites are often unique. Furthermore, "no net loss of biodiversity" is one of the principles of European nature protection policy,[83] and therefore the characteristics of compensation areas must probably also be very similar to the characteristics of the harmed nature site. This will make the task of finding a location even more difficult. This problem seems to be confirmed by the Commission's (non-binding) Guidance document which states that "Compensation should refer to the site's conservation objectives […] and to the habitats and species negatively affected in comparable proportions in terms of their numbers and status. At the same time the role played by the site concerned in relation to biogeographical distribution has to be adequately replaced."[84]

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79 European Court of Justice, Case C-521/12, *Briels*, paras 30-31; The Orleans case shows that also nature creation measures which are taken before the harm has been done, but which do not prevent the occurrence of such harm, must be qualified as compensation measures, see: European Court of Justice, Joined cases C-387/15 and C-388/15, *Orleans*, paras 55-58 and 64.

80 European Commission, *Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC* (2007), pp 17-18.

81 If, for instance, a new Natura 2000 area is designated which was already inventoried as 'of Community importance', then this designation is a 'normal' measure. Consequently, this area cannot simultaneously be used as compensation site under Article 6(4). See European Commission, *Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC* (2007), p 10.

82 R Frins & H Schoukens, *Balancing Wind Energy And Nature Protection: From Policy Conflicts Towards Genuine Sustainable Development?* in L Squintani and HHB Vedder (eds.), *Sustainable Energy United in Diversity – Challenges and approaches in energy transition in the EU*, 100 (EELF 2014).

83 Geert Van Hoorick, *Compensatory Measures in European Nature Conservation Law*, 10(2) Utrecht Law Review 161, 165 (2014).

84 European Commission, *Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC* (2007), p 12.

According to the ECJ's *Briels* case, compensation measures cover any measure liable to protect the overall coherence of Natura 2000, whether it is implemented within the affected site or in another part of the Natura 2000 network.[85] In the case of future large-scale projects in the *Oosterschelde* and *Pentland Firth* one of the few possible solutions might therefore be to design the project in such a way that it affects only a part of the Natura 2000 site. Nature elements that will be lost in that part of the area might then be re-created in the part that has not been affected.

4.2 Lack of integration

Having discussed the most relevant conditions of the derogation clauses of the Habitats and Birds Directives, this section further elaborates on the lack of integration between those derogation clauses and the goals of the Renewable Energy Directive. This issue arises in relation to the *alternative solutions* condition and the *imperative reasons of overriding public interest* condition. The *compensation* condition will therefore be left aside for the moment.[86]

While the protection rules for habitats and species can form a barrier for innovative water-related renewable energy projects such as tidal energy, the Habitats and Birds Directives also offer the possibility for a derogation for such projects. The mere fact that there is a possibility to derogate from the objectives of these directives for the benefit of renewable energy shows that the concept of "policy integration"[87] is embedded in both directives at least to some extent. Policy integration –which is one of the main aspects of sustainable development– requires the EU and its Member States to take all sustainability-related policy objectives into account in all the decisions that they take.[88] These policy objectives include the protection of habitats and species, but also the promotion of renewable energy production. Nevertheless, the mere existence of a procedure that allows for weighing various policy objectives does not as such guarantee that that procedure is also used in practice, nor does it guarantee that the weighing exercise is carried out in a manner that fits both in the environmental *and* in the renewable energy policy of the EU and the Member State in question. In other words, the existence of a procedure that embodies aspects of sustainable development, does not automatically lead to a sustainable outcome.[89]

85 European Court of Justice, Case C-521/12, *Briels*, para 38.

86 In section 6 the position of the compensation condition is further elaborated on.

87 In this article 'policy integration' is defined in conformity with its definition within European Union law and policy, notably Articles 7 and 11 TFEU and the Renewed EU Sustainable Development Strategy. According to these sources the European Union "*shall* ensure consistency between its policies and activities" (Article 7 TFEU) and shall "Promote integration of economic, social and environmental considerations so that they are coherent and mutually reinforce each other by making full use of instruments for better regulation, such as balanced impact assessment and stakeholder consultations." (the Renewed EU Sustainable Development Strategy). For further elaboration on policy integration see: S van Hees, *Sustainable Development in the EU: Redefining and Operationalizing the Concept*, 10(2) Utrecht Law Review, sections 2.1 and 2.3.1 (2014).

88 S van Hees, *Sustainable Development in the EU: Redefining and Operationalizing the Concept*, 10(2) Utrecht Law Review, 60, 66-68 (2014)

89 S van Hees, *Sustainable Development in the EU: Redefining and Operationalizing the Concept*, 10(2) Utrecht Law Review, 60, 76 (2014). A similar conclusion was drawn by the author of this article in relation to the

While it is possible to take renewable energy into account under the derogation clauses, these clauses do not specify *to what extent* renewable energy *can and should* be taken into account. It is also unclear what the importance of renewable energy is compared to the protection of habitats and species. By not specifying this, there remains a considerable amount of fragmentation[90] between the Habitats and Birds Directives and the Renewable Energy Directive. Whether or not integration will occur under the derogation clauses is completely dependent on the –sometimes decentralised– national authorities that are responsible for the enforcement of the Habitats and Birds Directives. As discussed before, these authorities have a considerable amount of policy discretion, especially when it comes to the appraisal of the availability of alternative solutions and the application of the balancing exercise under the *imperative reasons of overriding public interest* condition.[91] These authorities can decide to take renewable energy into account under the derogation clause, which happened in the Dutch cases discussed in the third paragraph of section 4.1.2. above. However, they can also decide not to do so, as there is no obligation to actually apply the derogation clauses in a specific case. This is illustrated by the ECJ case *Azienda AgroZootecnica Franchini* which concerned the refusal by the Italian competent authority to authorise the construction of a wind energy project in a Natura 2000 site. This decision was taken pursuant to a regional law providing for a total ban on wind turbines in Natura 2000 sites. In line with Article 193 TFEU[92] the ECJ concluded that the Habitats and Birds Directives do not forbid an absolute prohibition on the construction of wind turbines in Natura 2000 sites. The directives do not even require a competent authority to carry out a prior environmental assessment of the effects of the project on the site in question.[93] This specific case apart, in general it may be difficult for national authorities that have the enforcement of the Habitats and Birds

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derogation clause of the Water Framework Directive. See in that regard: S van Hees, *Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions*, 14 Journal for European Environmental & Planning Law 313, 334-336 (2017).

90 In this article 'fragmentation of law' is understood as a situation in which areas of law that are interrelated are in practice partially or fully dealt with in isolation. In relation to environmental and renewable energy policy both horizontal and vertical fragmentation can be distinguished. There is horizontal fragmentation, as the protection of habitats and species on the one hand and renewable energy on the other hand are dealt with in separate sectoral directives (multi-sector governance), and vertical fragmentation, as both policy areas are often dealt with by separate governmental bodies that are responsible for just one of the two policy areas (multi-level governance). For further analysis of fragmentation in EU law in relation to renewable energy, see: K Van Hende, *Offshore Wind in the European Union – Towards Integrated Management of Our Marine Waters*, 68-69 and 77-78 (Wolters Kluwer 2015). For an overview of the history of the concept of fragmentation in legal literature, see: HK Gilissen, et al., *Bridges over Troubled Waters: An Interdisciplinary Framework for Evaluating the Interconnectedness within Fragmented Flood Risk Management Systems*, 25(1) Journal of Water Law 12, 13-14 (2016).

91 In this regard, also see: S van Holten and M van Rijswick, *The consequences of a governance approach in European Environmental directives for flexibility, effectiveness and legitimacy*, in M Peeters and R Uylenburg (eds.) *EU environmental legislation – Legal perspectives on regulatory strategies*, 25-26 (Edward Elgar 2014).

92 The Habitats Directive was adopted on the basis of Article 192 TFEU (the environmental legal basis), and Article 193 TFEU provides that Member States may adopt more stringent protective measures. With respect to the Birds Directive Article 14 of the Birds Directive provides that Member States may introduce stricter protective measures than those provided for under that directive. See European Court of Justice, Case C-2/10, *Azienda Agro-Zootecnica Franchini Sarl and Eolica di Altamura Srl v Regione Puglia*, paras 49-50.

93 European Court of Justice, Case C-2/10, *Azienda Agro-Zootecnica Franchini Sarl and Eolica di Altamura Srl v Regione Puglia*, para 58.

Directives as their primary task, to take renewable energy into account at all times. These authorities could be tempted to focus on the protection of habitats and species. If a competent authority decides to refuse the authorisation of a future innovative water-related renewable energy project, this could be a very good decision from a case level perspective. The project's impact on protected habitats and species might in that specific case indeed seem to outweigh its contribution to renewable energy production. However, in order to achieve a fair balancing act, the role that a specific renewable energy project plays within the broader renewable energy strategy of the Member State in question should also be taken into account in that decision. The Habitats and Birds Directives do currently not guarantee that this will happen in practice.[94]

The following sections deal with the question how the two legal issues mentioned in this article can be dealt with.

5. SOLUTIONS TO THE LEGAL ISSUES: DEALING WITH UNCERTAINTY AND TOWARDS BETTER INTEGRATION

The former sections of this article discussed two legal issues that relate to the conflict between the interest of protecting habitats and species under the Habitats and Birds Directives, versus the interest of promoting the use of innovative water-related renewable energy, with regard to the quota in the Renewable Energy Directive. These issues are: *first,* a potential conflict between the Habitats and Birds Directives' goal to protect habitats and species, and the goal to produce more water-related innovative renewable energy with regard to the quota in the Renewable Energy Directive, and *second,* the lack of integration between the Renewable Energy Directive and the derogation clauses of the Habitats and Birds Directives. Tidal stream energy has been used as a case study to show the practical relevance of the legal issues at hand. This section discusses possible solutions to the aforementioned legal issues.

5.1 Dealing with uncertainty

In section 3.1 is was pointed out that the rules for the protection of Natura 2000 sites leave no room for uncertainty with regard to the environmental effects of a renewable energy project. In section 3.2 it was argued that the same applies to the rules for the protection of species. Both regimes require uncertainty about whether the project will cause a prohibited effect to be taken away, and if that is not possible then project authorisation should be refused. In cases in which it is not possible to take away scientific uncertainty, the most straightforward solution is to invoke the derogation clauses. There might, however, be situations in which it is undesirable to do so. This

94 A similar conclusion was drawn by the author of this article in relation to the derogation clause of the Water Framework Directive. See in that regard: S van Hees, *Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions*, 14 Journal for European Environmental & Planning Law 313, 334-336 (2017).

could be the case, for instance, if the habitats or species in question are in a relatively bad state already and that further deterioration is undesirable, even if it would be for the benefit of renewable energy production. Moreover, from the perspective of the precautionary principle the derogation articles should arguably only be used as a last resort, when all other policy options are exhausted.

In this regard "adaptive management" could be an interesting alternative policy option. Adaptive management is a flexible way of taking a licensing decision, which can be relevant for situations where there is a sufficiently important problem to necessitate taking action in the face of uncertainty. It requires a strong monitoring and evaluation process. The lessons learnt from this process will lead to better scientific understanding over time. These lessons are subsequently used to take a better informed decision at the next decision point. Adaptive management entails a circular process involving the repeated acquisition of new knowledge and adaptation of strategy on the basis of what has been learned. In this sense, adaptive management "allows decision makers at each juncture to make the best decisions they can with the information available at that time". Although an adaptive management process involves many steps,[95] the "learning by doing" aspect is seen as its most important characteristic. This definition of adaptive management is derived from the technical guide on adaptive management of the U.S. Department of the Interior (DOI).[96] A disadvantage of this definition of adaptive management is that it allows for possible negative effects to occur initially, so that they can be taken into account in the decision for a future project. This may not be compatible with the Habitats and Birds Directives, which –as discussed before– do not allow for negative effects to occur, nor allow the existence of uncertainty with regard to a project's negative effects. This issue can be solved by applying adaptive management in combination with mitigation measures, or by applying adaptive management in combination with "phased deployment". Both options are discussed hereafter.

5.1.1 Adaptive management in combination with mitigation

The European Commission recognises that adaptive management can be a useful decision making tool to allow projects to proceed in the face of uncertainty. It does, however, interpret adaptive management in its own way, with a strong focus on mitigation. According to the European Commission, the application of adaptive management to a project requires: a) a rigorous monitoring scheme, and b) a pre-defined validated package of appropriated corrective measures.

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95 "An adaptive approach involves exploring alternative ways to meet management objectives, predicting the outcomes of alternatives based on the current state of knowledge, implementing one or more of these alternatives, monitoring to learn about the impacts of management actions, and then using the results to update knowledge and adjust management actions.", BK Williams, RC Szaro, and CD Shapiro, *Adaptive Management: The U.S. Department of the Interior Technical Guide* (2009), Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC, p 1.

96 BK Williams, RC Szaro, and CD Shapiro, *Adaptive Management: The U.S. Department of the Interior Technical Guide* (2009), Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.

Such corrective measures must guarantee that the –initially unforeseen– negative effects of the project will be neutralised.[97] As discussed before, the DOI's interpretation of adaptive management aims at learning from monitoring results in order to improve decision making for *future* projects. The Commission views adaptive management as a way to adapt the *current* project while it is in operation in the case that negative environmental effects would occur. This resembles an approach that the highest Dutch administrative court has approved in 2007 in a case about a license for a large-scale gas extraction project. The Dutch Court argued that the mere existence of remaining uncertainty over the nature and the intensity of the expected negative effects on the Waddenzee Natura 2000 site was an insufficient reason to refuse the license. The court pointed out that it was important in that respect that the –binding– adaptive management approach allowed for adaptation of the project when unforeseen effects of the gas extraction activities would occur. The approach aimed at preventing that the project would adversely affect the integrity of the protected site. It aimed to do so by establishing –prior to implementation of the project– maximum thresholds for possible negative effects. The adaptive management strategy would then allow to limit or stop the gas extraction activities if monitoring results showed that these thresholds would be exceeded, or threatened to be exceeded.[98]

This approach to adaptive management allows projects to go ahead even when on the basis of current scientific knowledge it cannot be excluded that the integrity of the protected site will be harmed, or that protected species will be disturbed by the project.

An example of how the adaptive management approach in combination with mitigation can be used with respect to tidal energy is given in the UK by the SeaGen tidal energy project in the *Strangford Lough*, a coastal inlet in Northern Ireland. This was a 1.2 MW project, consisting of two tidal turbines that were fixed to the seabed. The nature and extent of effect on marine mammals from the device, and possible negative impacts, were unknown. The license for the project was subject to mitigation measures to reduce the potential for collisions between marine mammals and tidal turbines. In fact, the objective of the monitoring programme for this particular area was to ensure *no mortality* of marine mammals as a consequence of physical interactions with the turbine rotors. *Active sonar systems* were installed which could detect if an animal entered an area where there was a risk for it to be harmed by a turbine. Subsequently the sonar system was able to shut down the turbines for a short period of time, until the animal had moved away. As monitoring results were constantly analysed and fed back into the project management, it was found safe to reduce the action radius of the sonar system over some years, in order to reduce the number of shutdowns.[99]

97 European Commission, *EC Guidance on the implementation of the EU nature legislation in estuaries and coastal zones* (January 2011), pp 33-34.

98 Raad van State, ECLI:NL:RVS:2007:BB2499, paras 2.13, 2.17.3 and 2.21, https://www.raadvanstate.nl/uitspraken/zoeken-in-uitspraken/tekst-uitspraak.html?id=18065.

99 G Savidge, D Ainsworth et al., *Strangford Lough and the SeaGen Tidal Turbine*, in MA Shields, AIL Payne (eds.), *Marine Renewable Energy Technology and Environmental Interactions*, 157-159 (Springer 2014).

While adaptive management combined with mitigation measures can be –and have been– used in a gas drilling, wind turbine[100] and small-scale tidal energy project in the EU, it is not likely to become a widely-used solution for solving conflict between the protection rules of the Habitats and Birds Directives' and large-scale tidal energy projects. There are two main reasons for that. First, as some legal scholars have convincingly argued, there is a danger that adaptive management leads to a "fait-accompli" situation.[101] This means that when projects with uncertain negative effects are awarded a license, it may be difficult, due to political, physical and economic considerations, to reverse the already built project if it turns out to be harmful to protected habitats and species in a later stage. This may especially be true for large-scale projects. Therefore, it is advisable not to use the adaptive management approach in the most sensitive Natura 2000 sites, or close to the most vulnerable species.[102] Second, adaptive management in large-scale tidal energy projects can be problematic as not all negative effects can be solved merely by "corrective measures" like shutting down a turbine. Site avoidance by fish or marine mammals, barrier effects in relation to migrating fish and marine mammals, loss of foraging habitat of birds, avoidance effects related to noise during the construction phase, and sediment starvation are examples of effects that could occur in the *Oosterschelde* and *Pentland Firth* projects and that will not necessarily be solved by simply shutting down turbines. At the same time, other types of "corrective measures" –such as adapting the construction, lifting turbines out of the water or even decommissioning them– could be too costly and will therefore not always be a realistic option. Third, an ongoing precautionary shutdown of turbines if mammals are approaching, might substantially decrease a large-scale projects' profitability, making its construction less financially viable. Moreover, ongoing precautionary shutdowns could prevent projects from gathering essential information on mammals' ability to avoid or evade the moving blades, which could mean that uncertainty stays intact instead of being removed through monitoring.[103]

The applicability of adaptive management in combination with mitigation measures to tidal energy projects will therefore most probably be limited to the construction phase –e.g. through the pausing of piling activities when a marine mammal is

100 The Dutch Council of State has accepted the use of adaptive management in the domain of species protection under the Habitats Directive (in this case: shutting down wind turbines during certain hours of the day) in a case on bat-wind turbine collisions. In this case, however, the measure was not sufficiently effective because it did not prevent the killing of certain bat species completely. See ECLI:NL:RVS:2015:438, para 4.2. Also see R Frins and H Schoukens, *Balancing Wind Energy And Nature Protection: From Policy Conflicts Towards Genuine Sustainable Development?* in L Squintani and HHB Vedder (eds.), *Sustainable Energy United in* Diversity, 104 (EELF 2014) about the adaptive management approach in relation to the construction of 3 wind turbines in the Port of Antwerp, which were localized close to a SPA.

101 R Frins and H Schoukens, *Balancing Wind Energy And Nature Protection: From Policy Conflicts Towards Genuine Sustainable Development?* in L Squintani and HHB Vedder (eds.), *Sustainable Energy United in* Diversity, 105 (EELF 2014); and H Schoukens and A Cliquet, *Mitigation and Compensation under EU Nature Conservation Law in the Flemish Region: Beyond the Deadlock for Development Projects?*, 10(2) Utrecht Law Review 194, 207 (2014).

102 R Frins and H Schoukens, *Balancing Wind Energy And Nature Protection: From Policy Conflicts Towards Genuine Sustainable Development?* in L Squintani and HHB Vedder (eds.), *Sustainable Energy United in* Diversity, 104-105 (EELF 2014) for further analysis of the risks of the adaptive management approach.

103 G Savidge, D Ainsworth et al., *Strangford Lough and the SeaGen Tidal Turbine*, in MA Shields, AIL Payne (eds), *Marine Renewable Energy Technology and Environmental Interactions*, 161 (Springer 2014).

observed nearby the construction site– or to small-scale projects such as the project in the *Strangford Lough*. Large-scale tidal energy projects are more likely to benefit from adaptive management combined with a so-called "phased deployment" approach.

5.1.2 Adaptive management in combination with phased deployment

Marine Scotland is the competent authority for most tidal energy projects in Scotland and it has developed a so-called "survey deploy and monitor" policy that is very much similar to adaptive management as described by the DOI.[104] For larger scale projects, however, "consent is likely to be conditional upon the company deploying the devices in a phased approach."[105]

Phased deployment means that the development will start at a small scale, for instance with a few turbines only. This first phase will –although the exact scope of its negative environmental effects may be unknown– because of its small size never cause a prohibited negative effect on protected habitats or species. There will however be a clear intention to considerably scale up the project in the future. In order to inform future phases of development the initial small-scale project will be bound to intensive monitoring requirements. The approval of subsequent phases of development will only be granted if the competent authority is certain that the nature protection-related risks of the large-scale development are well understood (based on the information gathered from the monitoring at the small-scale project).[106] Phased deployment is not a mitigation measure, but rather a policy to postpone the implementation of large-scale developments until sufficient environmental data has been gathered. An example of how the phased deployment approach can be applied is provided by the *Pentland Firth* tidal energy project in Scotland – which is one of the case studies discussed in section 2. While the project proposal refers to a deployment of up to 61 tidal turbines,[107] the turbines will be installed in stages and the first phase has been restricted to 6 turbines. Monitoring is required to inform decisions on future deployments and further environmental assessments will be required before further deployments are authorised in order to ensure that full consideration is given to any potential increase in impacts on the relevant Natura 2000 site an species.[108]

Adaptive management combined with phased deployment is an interesting policy option for renewable energy developments that are coping with uncertainty. It allows

104 Marine Scotland's 'Survey, deploy and monitor licensing policy guidance' (version 2) states on page one that that guidance "[…] is designed to enable novel technologies whose potential effects are poorly understood to be deployed in a manner that will simultaneously reduce scientific uncertainty over time whilst enabling a level of activity that is proportionate to the risks."

105 Marine Scotland, *Survey, deploy and monitor licensing policy guidance* (version 2), http://www.gov.scot/Topics/marine/Licensing/marine/Applications/SDM, p 6.

106 Marine Scotland, *Survey, deploy and monitor licensing policy guidance* (version 2), http://www.gov.scot/Topics/marine/Licensing/marine/Applications/SDM, pp 6-7.

107 Marine Scotland, *MeyGen Decision, Decision Letter and Conditions*, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/DecisionLetter, p 25.

108 Marine Scotland, *MeyGen Decision – Appropriate Assessment*, http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment, p 77.

these developments to proceed anyway –although on a small scale– while gaining more scientific knowledge over time.[109] This may be important as there can be doubts about the effectiveness, feasibility and –in the case of sand suppletion– the legality of mitigation measures in relation to tidal energy projects.[110] A clear disadvantage of phased deployment is, however, that it risks to slow down the transition to an increased innovative renewable energy supply in 2020, which actually requires a rapid development of large-scale –rather than small-scale– energy projects. Moreover, initial phases of projects may point out that not all prohibited negative effects of innovative water-related energy projects can be prevented. Therefore, subsequent phases may be denied authorisation after all. In that case the only solution left may be to use the derogation clauses of the Habitats and Birds Directives. Yet, even when the derogation clauses are applied it may still be useful to apply an adaptive management approach combined with phased deployment. When the derogation clauses are used, it is no longer required to obtain absolute certainty as to the absence of prohibited negative effects of the first phase on habitats and species.[111] The first phase may therefore consist of a larger and more risky project than in a situation without application of the derogation clauses. However, monitoring results collected during the first phase of the project could still be used to feed into the decision making process of future phases. If these results show that negative effects do not occur, then it would not longer be necessary to invoke the derogation clauses for future phases of the project.[112]

5.2 Towards better integration

In section 4.2 it has been argued that there is fragmentation between the derogation clauses of the Habitats and Birds Directives on the one hand, and the goals of the Renewable Energy Directive on the other hand. This fragmentation is caused by the lack of specification in the derogation clauses of *to what extent* renewable energy *can and should* be taken into account in those articles. It also remains unclear what the importance of renewable energy is compared to the protection of habitats and species. These unclarities may hamper the carrying out of a fair balancing act between habitats and species protection and renewable energy interests under Articles 6(4) and 16 of the Habitats Directive and Article 9 of the Birds Directive.

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109 Or as Marine Scotland puts it: '[the Survey, deploy and monitor licensing policy guidance] is designed to enable novel technologies whose potential effects are poorly understood to be deployed in a manner that will simultaneously reduce scientific uncertainty over time whilst enabling a level of activity that is proportionate to the risks.' Marine Scotland, *Survey, deploy and monitor licensing policy guidance* (version 2), http://www.gov.scot/Topics/marine/Licensing/marine/Applications/SDM, p 1.

110 See section 3.4.

111 Under the derogation clause of Article 16 Habitats Directive it is still required that the favourable conservation status of the protected species is guaranteed. For further elaboration on that condition see the relevant footnote in section 6.

112 A similar conclusion was drawn by the author of this article in relation to the derogation clause of the Water Framework Directive. See in that regard: S van Hees, *Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions*, 14 Journal for European Environmental & Planning Law 313, 334-336 (2017).

The introduction of detailed national renewable energy plans per Member State could be a practical solution to the issue of fragmentation. Such plans would indicate *which types of projects at which sites* are essential in the light of achieving the Member State's renewable energy quota under the Renewable Energy Directive, and which are not.[113] It should be flexible plans, that allow for additions and alterations, as policy and technological developments progress over time. The guidance given by a detailed national renewable energy plan can be used by competent authorities to justify and explain the use of their discretionary powers under the derogation clauses of the Habitats and Birds Directives. If a competent authority is aware at an early stage of the great importance –or the low importance, for that matter– of a specific renewable energy project at a specific site, then it will be better positioned to weigh the interest of that specific renewable energy project against the interest of protecting habitats and species. In some Member States innovative water-related forms of energy production –such as tidal energy– would feature in the national renewable energy plan, while other Member States may choose to focus on other forms of energy. This may for instance be the case if the Member State in question does not have water bodies that are suitable for tidal energy developments, or if a Member State can reach its renewable energy targets by using other sources of energy that have less negative environmental impacts. In that sense, the national renewable energy plan would also, in an early stage, contribute to fulfilling the derogation articles' condition on research into suitable alternatives. The main advantage of introducing detailed national renewable energy plans is that such plans could help competent authorities to take decisions under the derogation articles that fit within the broader renewable energy strategy of the Member State in question. Without such a plan there is a chance that these decisions are taken in isolation, resulting in arbitrary decisions that are founded in the individual enforcement priorities of the competent authority in question rather than in broader policy objectives.[114]

Moreover, the importance of having a renewable energy plan of the type described above, is emphasised by the European Commission's arguments in the *Schwarze Sulm* case. While this case is about the protection of water quality under the Water Framework Directive (WFD), it provides insights in the importance of having a well thought out and detailed renewable energy plan per Member State. In the Schwarze Sulm case the Commission questioned the relevance of a specific hydro-energy plant for Austria's energy supply by arguing that "hydroelectricity is only one source of renewable energy among others and that the energy produced by the hydropower

113 In that sense the plans proposed here differ from the 'National renewable energy action plans' that Member States are required to make under the Renewable Energy Directive. These plans set out the measures that the Member States plan to take to promote and support the use renewable energy. They do not, however, contain a list of specific renewable energy projects that are essential in the light of achieving the Member State's renewable energy quota under the Renewable Energy Directive. See Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, OJ 2009 L140/16, article 4 and annex VI.

114 A similar solution was proposed by the author of this article in relation to the derogation clause of the Water Framework Directive. See in that regard: S van Hees, 'Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions', Journal for European Environmental & Planning Law 14 (2017), pp 334-336.

plant […] will have only a minor impact on the regional and national energy supply".[115] In other words, the Commission suggested that the hydro-energy plant was not sufficiently important in the light of Austria's renewable energy strategy, and is therefore not suitable to justify a deterioration of water quality via the WFD's derogation clause. In this specific instance, the ECJ dismissed the Commission's arguments because they were insufficiently substantiated. The arguments do suggest, however, that Member States need to present strong arguments under the derogation articles to show why a specific renewable energy project is necessary in the context of the Member State's renewable energy strategy. If Member States fail to do so, subsequent and better substantiated infringement procedures initiated by the Commission may at some point result in annulment of project authorisations of renewable energy projects. This could also happen in relation to the derogation clauses of the Habitats and Birds Directive. Similar to the WFD, these include –under the *important reasons of overriding public interest* condition– a balancing requirement that grant much policy discretion to competent authorities. The outcome of this balancing test can easily be contested –as has been done in the Schwarze Sulm case– by the European Commission, especially if it is not sufficiently substantiated. Detailed national renewable energy plans could contribute to a Member State's argumentation in this regard.

Inspiration for the implementation of detailed national renewable energy plans as meant in the present article can be drawn from the government approach currently used in the domain of large offshore wind parks in the Netherlands. In its national water plan the Dutch government designated a few areas for the development of offshore wind energy. It indicated that the development of wind parks outside of these areas would not be allowed. It has been decided that designated wind energy sites would not overlap with Natura 2000 sites in order to preclude the occurrence of significant effects. Additionally, the government carried out an Environmental Impact Assessment (EIA Directive) and an Appropriate Assessment (Habitats Directive) in order to assess the suitability –in terms of environmental protection– of the areas proposed for the development of wind energy. These assessments also advise on the application of mitigation measures.[116] This approach differs from the one proposed in this paper as it only concerns offshore wind energy developments. Moreover, it is not an all-encompassing strategy or list that lead to achieving the Netherlands' 14 per cent renewable energy quota as it does not cover all renewable energy projects needed to reach that percentage. Nevertheless, the Dutch water plan seems to provide guidance with regard to the use of the discretionary powers under the derogation clauses of the Habitats and Birds Directives. This can be illustrated by the following example. In an official decision to designate an area as a site for wind energy development, it was concluded that the designation of that site would

115 European Court of Justice, Case C-346/14, *Schwarze Sulm*, para 82.

116 Ministerie van Infrastructuur en Milieu / Ministerie van Economische Zaken, *Rijksstructuurvisie Windenergie op Zee – Partiële herziening van het Nationaal Waterplan Hollandse Kust en Ten Noorden van de Waddeneilanden* (September 2014), pp 16-17 and 20; Ministerie van Infrastructuur en Milieu / Ministerie van Economische Zaken, *Beleidsnota Noordzee 2016-2021 – Bijlage 2 bij het Nationaal Waterplan 2016-2021*, December 2015, pp 83-86.

result in a certain degree of habitat loss for 11 species of wild birds. This would be an infringement of the Dutch law that implements the Birds Directive. In the decision the competent authority reasoned that the designated wind energy sites that are included in the water plan have been selected carefully. Moreover, it emphasised that during the selection of those sites all interests have been weighed, including the nature protection aspects. It was also emphasised that pursuant to the Dutch law on wind energy at sea, the authorisation for wind energy farms can only be given within designated sites. Therefore it was concluded that there are sufficient guarantees that the wind energy project is built on the most suitable location and that there are no suitable alternatives. It appears from the foregoing that the competent authority in question used the water plan for its reasoning under the *alternatives* condition of the Birds Directive's derogation clause.[117] By doing that, the competent authority placed its decision in the wider context of the national renewable energy policy – instead of deciding upon the plans on a pure case-by-case basis. In that sense the Dutch approach can be used as inspiration for the detailed national renewable energy plans as meant in this article.

In conclusion, this article recommends the development of a practical framework to bring about an increased integration between the Habitats and Birds Directives and the Renewable Energy Directive. This framework could take the form of Member State-specific detailed renewable energy plans. The proposed renewable energy plans would list the renewable energy projects that are important for reaching the Member States' renewable energy quota under the Renewable Energy Directive (RED). These plans must be drafted on a Member State level rather than on an EU level, as the RED sets Member State-specific renewable energy quotas and leaves the Member States a considerable amount of policy discretion as to how to reach those quotas.

6. CONCLUSION AND FINAL OBSERVATIONS

The development of innovative water-related renewable energy techniques –such as tidal energy– risk to be hampered by the rules for the protection of habitats and species as laid down in the Habitats and Birds Directives. This may especially be the case if those techniques are applied on a large scale, and when there is ongoing scientific uncertainty concerning the negative effects of these techniques on protected habitats and birds. While mitigation measures and adaptive management are expected to be sometimes insufficiently effective to solve this issue, the Habitats and Birds Directives' derogation clauses are expected to play an important role in authorisation procedures of future large-scale tidal energy projects. Nevertheless, due to a lack of integration between those derogation clauses and the goals of the Renewable Energy Directive, there is currently no guarantee that a fair balance will be struck between the protection of habitats and species and renewable energy interests under the Habitats and Birds Directives. This article recommends to solve this lack of integration by

117 Staatscourant 2016 nr. 14523 – 8 april 2016, *Kavelbesluit III windenergiegebied Borssele*, paras 7.5.2, 7.5.5, 7.5.7 and 7.5.8.

introducing detailed national renewable energy plans per Member State, which would give a detailed overview of important renewable energy projects. These plans could help competent authorities in weighing the interest of a renewable energy project against the interest of protecting certain habitats and species. Inspiration for the implementation of these plans can be drawn from the approach for the designation of large offshore wind parks in the Netherlands. Nevertheless, it must be observed that increased integration stemming from detailed national renewable energy plans will not smoothen the application of all conditions of the derogation clauses. Problems may still arise from the strict requirements on compensation for Natura 2000 sites. As mentioned before, it is expected to be difficult to find suitable compensation sites for tidal energy projects.[118] Also the condition of the derogation clause in Article 16 that the favourable conservation status of protected species is guaranteed at all times may raise additional problems.[119] It could even lead to the refusal of projects in cases in which a successful appeal to the Natura 2000 derogation clause can be done. A final problem could be caused by the derogation clause of the Birds Directive, which does not include a derogation reason that can automatically be linked to renewable energy.[120] While it is argued in this article that this will probably not cause problems in practice, the ECJ has to date not given a decisive answer in this regard.

Apart from tidal stream energy projects, other forms of innovative renewable energy production –most notably wave energy, salinity gradient energy (blue energy) and tidal range energy– may also benefit from the findings of this article. Tidal range projects are expected to have considerable environmental impacts, and they may also be built in or in the vicinity of Natura 2000 areas.[121] The findings of this article may therefore also apply to tidal range projects. The considerations on mitigation and phased deployment might however not apply, due to the specific characteristics of tidal range, which uses artificial barrages and hydro energy turbines. Although not much research has been done into the environmental effects of wave energy, most existing studies estimate that wave energy installations will have limited environmental effects.[122] However, uncertainty remains as to the environmental implications of

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118 See section 4.1.3 for further elaboration on the compensation condition.

119 'maintenance of the populations of the species concerned at a favourable conservation status in their natural range' is a condition under Article 12's derogation clause (Article 16 Habitats Directive). Nevertheless, this condition is interpreted somewhat less strictly by the Court of Justice than the way it is formulated in Article 16 Habitats Directive. According to the ECJ 'the grant of [derogations under Article 16(1)] remains possible by way of exception where it is duly established that they are not such as to worsen the unfavourable conservation status of those populations or to prevent their restoration at a favourable conservation status.' See European Court of Justice, Case C-342/05, *Commission v Finland*, paras 28-29. For further elaboration see B.A. Beijen, *De kwaliteit van milieurichtlijnen – Europese wetgeving als oorzaak van implementatieproblemen* [The quality of environmental directives – European legislation as a cause of issues of implementation] 184-185 (Boom Juridische Uitgevers 2010).

120 See section 4.1.2. for further elaboration on the exhaustive list of derogation reasons of Article 9 Birds Directive.

121 See for instance: UK Department of Energy & Climate Change, *Record of the Habitats Regulations Assessment undertaken under Regulation 61 of the Conservation of Habitats and Species Regulations 2010 (as amended) & Assessment of the project under article 4.7 derogation for the Water Framework Directive – Project Title: Tidal Lagoon Swansea Bay* (8th June 2015).

122 International Renewable Energy Agency (IRENA), *Wave energy – technology brief* (June 2014), pp 20-21; Streamlining of Ocean Wave Farms Impact Assessment (SOWFIA), *Deliverable D.2.4 – Interim report on*

large-scale wave energy production in general and concerning possible collision risk and underwater noise effects on marine mammals in specific.[123] The findings of this article may also apply to wave energy if they have an effect on one or more protected habitats or species. Also large-scale blue energy installations can potentially negatively influence Natura 2000 sites and protected species. This could happen through the discharge of high concentrations of brackish water in the habitats of salt water organisms, and through thermal pollution caused by warm waste water which may be added in order to optimise the blue energy production process.[124] Large-scale salinity gradient energy plants may also cause increased mortality of protected fish as fish may be sucked into the installation and may suffer physical damage and disorientation.[125] Whether the above mentioned effects will actually occur strongly depends on the type of production process that will be chosen for future wave and blue energy projects. If they occur –or if there is a risk that they will occur– then the findings of this article on dealing with uncertainty and better integration will also be applicable to those innovative water-related renewable energy techniques.

The solutions that are discussed in this article help to address legal issues that arise at the interface between renewable energy policy and the Habitats and Birds Directives. Water-related innovative renewable energy projects may, however, also have negative effects on water quality as protected by the Water Framework Directive.[126] Solving issues that are related to the Habitats and Birds Directives does therefore not automatically mean that a specific project will be permissible under EU law. It will sometimes also need to undergo the authorisation procedure prescribed by the Water Framework Directive.[127] The interaction between innovative water-related renewable energy projects and the Water Framework Directive raises legal issues of its own. These are, however, similar to the ones discussed in relation to the Habitats and Birds Directive. Legal issues on the interface between large-scale water-related innovative renewable energy projects and the Water Framework Directive, and possible solutions, have been discussed in an earlier article by this author.[128]

barriers, accelerators and lessons learned from all wave energy site experiences (March 2012), p 30.

123 Streamlining of Ocean Wave Farms Impact Assessment (SOWFIA), *Deliverable D.2.4 – Interim report on barriers, accelerators and lessons learned from all wave energy site experiences* (March 2012), p 30.

124 F Helfer, C Lemckert and YG Anissimov, *Osmotic power with pressure retarded osmosis: theory, performance and trends: a review*, 453 Journal of Membrane Science 337 (2014); M Janssen, A Härtel, R van Roij, *Boosting capacitive blue-energy and desalination devices with waste heat*, 113 Physical Review Letters 268501 (2014).

125 A Cipollina, G Micale (eds), *Sustainable Energy from Salinity Gradients*, 316 (Woodhead Publishing 2016).

126 S van Hees, *Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions*, 14 Journal for European Environmental & Planning Law 313 (2017).

127 Specific mitigation and adaptive management strategies that are targeted at solving a project's negative effects on habitats and species may not automatically also solve the possible deterioration of water quality caused by that project. Moreover, it has been argued in academic legal literature on water law that 'the invocation of the derogation regime of the WFD cannot be used to derogate from the objectives and obligations laid down in other directives'. See in that regard P De Smedt and M van Rijswick, *Nature conservation and water management – One battle?*, in C-H Born, A Cliquet et al (eds.), *The Habitats Directive in its EU Environmental Law Context – European Nature's Best Hope?*, 425 (Routledge 2015).

128 S van Hees, *Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions*, 14 Journal for European Environmental & Planning Law 313 (2017).

INCREASED INTEGRATION BETWEEN INNOVATIVE OCEAN ENERGY AND THE EU HABITATS, SPECIES AND WATER PROTECTION RULES THROUGH MARITIME SPATIAL PLANNING

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Abstract

This article investigates whether Maritime Spatial Planning (MSP) –which promotes the *integrated* planning and management of seas and oceans– can play a role in creating increased integration between the EU's renewable energy policy and the potentially conflicting rules on the protection of habitats, species and water. The article focuses on innovative ocean energy (tidal stream, wave and salinity gradient energy). It can be said that there is a possible lack of integration between the Renewable Energy Directive and the EU rules on the protection of habitats, species and water: the Habitats Directive, the Birds Directive, the Water Framework Directive and the Marine Strategy Framework Directive. The role that MSP could play in solving this is assessed with regard to the following two legal issues that reflect the said lack of integration: 1) while there are derogation clauses, there is no obligation for Member States to apply these clauses and to undertake a balancing act between ocean energy, on the one hand, and the protection of habitats, species and water, on the other; 2) even *if* these clauses are applied, it remains unclear how much weight Member States should attach to ocean energy under a subsequent balancing act. The concept of Maritime Spatial Planning *in theory* is very suitable for guaranteeing that the interests of both renewable energy policy and environmental policy are duly taken into account in licensing procedures and management measures. The contribution that MSP can make towards increased integration is, however, strongly dependent on the way MSP is interpreted on the Member State level. This is illustrated by a discussion of the differences in the current MSP approaches in Scotland and the Netherlands. This article concludes that Maritime Spatial Planning may –if certain conditions are fulfilled– be a suitable way to create a necessity to balance the EU's habitats, species and water protection rules with (ocean) renewable energy projects, on different levels of governance. Nevertheless, it also concludes that MSP alone cannot guarantee a balancing act that represents the goals of the Renewable Energy Directive *and* those of the aforementioned environmental directives in an equal manner. This article proposes to link MSP to detailed renewable energy plans per Member State in order to solve this issue.

1. INTRODUCTION

According to the European Commission, innovative ocean energy techniques –including tidal, wave and salinity gradient energy– can play an important role with respect to energy security and it contributes to the European Union's (EU) decarbonisation goals.[1] Ocean energy may form a substantial contribution to

1 European Commission, 'Blue Energy – Action needed to deliver on the potential of ocean energy in European seas and oceans by 2020 and beyond' COM(2014) 8 final, pp 2-3. The Commission uses the term

CONCLUSION

This dissertation aims to contribute to the achievement of the EU's renewable energy targets for the year 2020 and beyond, *first* by mapping the main EU legal and policy barriers to the large-scale implementation of innovative ocean energy techniques (the relevance of which was discussed in the introduction), and *second*, by suggesting practical solutions to those barriers that can be implemented on a short time-scale and within the current EU legal framework. It was hypothesised in the introduction that it is both possible *and* necessary –given the rapidly approaching deadline for reaching the EU's renewable energy targets, and the large amount of time that a renegotiation of EU environmental and economic law would take– to solve these issues in the *short term* and *within* the current EU legal framework.

The research questions as set out in the introduction are largely answered in the academic articles that together form the core of this dissertation. This conclusion summarises the findings from the articles and connects these findings where necessary. Also, emphasis is put on the evaluations of the barriers and solutions in the light of the concept of sustainable development. This concept is used as the overarching normative framework of this dissertation.

First, the barriers to the development of large-scale innovative ocean energy projects are summarised, followed by a discussion of these barriers. Second, the proposed solutions to these barriers are summarised, followed by a discussion of these solutions. Third, the barriers and solutions are discussed and evaluated in the light of the concept of sustainable development. Finally, a general synthesis is provided, which gives a broad perspective on dealing with new and innovative renewable energy techniques under EU environmental and economic law and policy.

1. BARRIERS TO THE DEVELOPMENT OF LARGE-SCALE INNOVATIVE OCEAN ENERGY PROJECTS

1.1 Summary of the barriers in EU law and policy

1.1.1 The free movement of goods

The article on the *free movement of goods* deals with the possible conflict between an economic policy area and an environmental/non-economic policy area. The article shows that the Renewable Energy Directive (RED) contains a clause allowing Member States to design financial support schemes that are solely applicable to

renewable energy which is generated in that specific Member State (a territorial limitation clause). This is a logical policy choice when it is taken into consideration that the RED obliges Member States to reach a certain percentage of *domestically produced renewable energy*. If Member States would be required to open their national renewable energy support schemes to *renewable energy produced in other Member States*, then they would lose a potentially powerful instrument to directly influence the volume of domestically produced renewable energy. At the same time, the territorial limitation clause is an infringement of the rules on the free movement of goods as laid down in Article 34 TFEU. The policy areas of renewable energy and free movement do not therefore –in principle– guarantee the achievement of each other's goals. Even when the derogation clause of Article 36 TFEU is applied, this lack of integration is not solved. When this clause is applied, it is ultimately left to the national or European courts –if the applicability of the derogation clause is challenged– to decide on an ad-hoc basis whether a specific national state aid measure is admissible. A court may sometimes decide in favour of the renewable energy side of the balance. This happened in the Ålands Vindkraft case, which was discussed in the article in question. A possible annulment of a national support scheme by a court, however, may frustrate a Member State's policy to promote renewable energy projects as required by the RED. Moreover, the long period of uncertainty surrounding the legality of a national support programme –caused by usually lengthy court proceedings– undermines one of the goals of the Renewable Energy Directive: creating certainty for investors.

1.1.2 The state aid framework

The article on *state aid* also deals with the possible conflict between an economic policy area and an environmental/non-economic policy area. The article shows that EU state aid law and policy may prevent investment aid programmes from providing sufficient amounts of funding to help ocean renewable energy technologies to reach maturity. These technologies may –at least in some Member States– be an important aspect of the strategy to reach the targets of the Renewable Energy Directive. In that case the EU state aid framework would not sufficiently support the achievement of the goals of the Renewable Energy Directive, meaning that there is a lack of integration between both policy areas. The barrier that raises this lack of integration is rooted in the restrictive calculation of the eligible costs and the net extra investment costs, and restrictive maximum aid intensities. In combination with the existing difficulties in securing private financing for this type of project, these restrictions may result in substantial barriers to the development of innovative ocean renewable energy projects. This restrictiveness does not automatically imply that there is insufficient integration between the Renewable Energy Directive (RED) and the EU's state aid framework. It is argued in the article on state aid that one can *only* speak of a lack of integration between the RED and the state aid framework if the state aid framework prevents *important*[1] renewable (ocean) energy projects from sourcing sufficient

1 The meaning of which is explained in the article on state aid in this dissertation.

public funding in order to succeed. There are some indications from practice and in the state aid framework itself that suggest that the current state aid framework is indeed not sufficiently catered towards the renewable energy challenges as set out in the Renewable Energy Directive.

1.1.3 The protection of habitats, species and water quality

The article on the *protection of habitats and species* and the article on the *protection of water quality* deal with the possible conflict between two environmental/non-economic policy areas. There is a possible conflict between the goals of the Habitats and Birds Directives (HBD) and the Water Framework Directive (WFD), on the one hand, and those of the Renewable Energy Directive (RED), on the other. The RED promotes renewable energy techniques that may negatively affect aspects of the environment (species, habitats, water quality) which are protected by the HBD and the WFD. The HBD's articles on the protection of habitats and species are strongly influenced by the precautionary principle. They leave no room for uncertainty concerning the effects of renewable energy projects on protected habitats and species. Similarly, the no-deterioration obligation in the WFD leaves no room for uncertainty concerning a project's effects on water quality. At the same time, uncertain *and* certain negative environmental effects are inherent in all ocean renewable energy projects. The competent authorities will have to refuse to authorise a project if prohibited negative effects or uncertainty about those effects cannot be removed before a project is implemented. Such a refusal can especially be expected if ocean renewable energy techniques are applied on a large scale. Mitigation measures and adaptive management approaches are expected to be sometimes insufficiently effective to solve prohibited environmental effects caused by ocean renewable energy projects. Therefore, the Habitats, Birds and Water Framework Directives' derogation clauses are expected to play an important role in the authorisation procedures of future large-scale ocean energy projects. However, while these derogation clauses are meant to balance (opposing) goals of different EU policy areas, they are not designed to guarantee that an equal balance will be struck. The derogation clauses offer room for the competent authorities to negate renewable energy interests in a balancing act. And even *if* both sides are taken into account, then it is still unclear how much weight should be attached to the renewable energy side of the balance.

1.2 Discussion

The barriers discussed in this dissertation relate to different phases and levels of governance. As discussed in the introduction, the present dissertation distinguishes between barriers in the following phases and at the following levels of governance:

Table 1. Phases and levels of governance of EU law

Phase	Level	Examples
Strategy	EU	– EU Renewed Sustainable Development Strategy – EU Blue Growth Strategy
EU law	EU	– Habitats, Birds, Water Framework, Marine Strategy Framework and Marine Spatial Planning Directives – Renewable Energy Directive – Article 107 TFEU on state aid and Article 34 TFEU on the free movement of goods
Implementation and interpretation	EU	– Guidelines on State aid for environmental protection and energy – Commission Guidance document on Article 6(4) of the Habitats Directive – State aid decisions of the European Commission – Judgments of the European Court of Justice
Implementation of EU law	Member States	– Implementation of EU law in the national law of the Member States
Planning	Member States	– Programmes of measures pursuant to environmental directives – National renewable energy strategies – Maritime spatial plans
Implementation (lower level)	Member States (often a decentralised authority)	– Decisions in licensing procedures under environmental directives – Management measures pursuant to environmental directives – Application of derogation clauses – Decisions to grant state aid – Judgments of Member State courts

The barriers in the different policy areas described in section 1.1 have one main common characteristic. They all originate in primary or secondary EU law (treaties, directives), but their actual effects on innovative ocean renewable energy projects come to light through an incoherent application of derogation clauses at a lower level of governance. This does not necessarily mean that the derogation clauses are the cause of the lack of integration. It does mean, however, that their application in specific cases does not generally solve the lack of integration. The barrier in the area of the free movement of goods (see section 1.1.1.), for instance, originates in Article 34 TFEU, which does not allow Member State measures that discriminate between Member States. The actual effect of this rule came to light at the court level, where it appeared that the derogation clause (which was created to avoid Article 34's applicability), as laid down in the Renewable Energy Directive, does not itself have binding force. The barrier in the area of state aid (see section 1.1.2.) originates in Article 107(1) TFEU

which *in principle* prohibits distortive state aid that favours certain undertakings over others. The actual effect of this rule comes to light at the EU level during the Commission's implementation of the state aid rules in a state aid procedure, based on its state aid guidelines. It could also occur that the lack of integration already comes to light in the Member State's decision to grant state aid, which is often based on the Commission's guidelines. The guidelines which the Commission applies in state aid procedures (arguably) offer a derogation whose scope is too limited to meet the requirements of ocean renewable energy developments. The barriers in the areas of the protection of habitats, species and water quality (see section 1.1.3.) originate in the Habitats, Birds and Water Framework Directives, which prohibit certain negative effects on the local aquatic environment and its animal inhabitants. The actual effects of these prohibitions come to light at the project authorisation level, where it is up to the discretion of the Member States' competent authorities to apply the derogation clauses without EU law and policy giving clear guarantees that renewable energy interests will be taken into account.

The synthesis above shows that there is a lack of integration between primary and secondary economic and environmental EU law and policy, on the one hand, and renewable energy law and policy, on the other. This in itself is not very surprising, however. Renewable energy policy is a relatively young policy area, which explains why it is not fully integrated in the EU's more established economic and environmental policy areas. It *is* surprising, however, that the possibilities offered by EU economic and environmental policy (i.e. the derogation clauses) are not adequately applied as a means to solve the said lack of integration. The application of these derogation clauses[2] is either carried out in a largely uncoordinated way (the environmental derogation clauses),[3] applied in a too limited fashion (the derogation clause on state aid), or applied in an ineffective way (the derogation from the free movement rules in the RED).

2 Which include: the derogation clauses of the Habitats and Birds Directives (Articles 6(4) and 16 Habitats Directive and Article 9 Birds Directive), the derogation clause of the Water Framework Directive (Article 4(7) WFD), the article in the Renewable Energy Directive that explicitly allows the design of national support schemes that include a territorial limitation (Article 3(3) RED), and the derogation clause for the development of certain economic activities in Article 107(3)(c) on state aid.

3 In the sense that it is often left to the discretion of authorities on lower decisions making levels to decide whether or not, and in which fashion, to take into account renewable energy interests in a balancing act under the derogation clauses.

2. BARRIERS AND SOLUTIONS (VISUALISATION)

This table gives an overview of the barriers and solutions discussed in sections 1 (barriers) and 3 (solutions).

	Barriers to RE policy (+ levels and phases of governance)	**Solutions** (+ levels and phases of governance)	**Preferred solution** (and why)
Free movement of goods	EU law Art. 34 TFEU forbids (a possibly useful, and one which is mentioned in the RED) territorial limitation clause in Member State support schemes for renewable energy	1) Member State/EU Implementation Apply the derogation clause: Art. 36 TFEU 2) EU Law Harmonise the rules on support schemes in the RED and allow territorial limitations (or prohibit them).	Change EU secondary law (RED). If Article 36 TFEU is applied on an ad-hoc basis, it is left to the Courts, which means a lack of policy integration and a lack of legal certainty.
State aid	EU implementation Commission Guidelines prescribe restrictive methods for calculating maximum state aid amounts for renewable energy projects.	1) EU Law Change state aid law 2) EU Implementation Change Commission Guidelines so as to allow increased state aid amounts for important projects 3) Member State Planning Require Member State to establish what are the essential projects through RE plans.	Change EU implementation and require renewable energy planning by Member States (to indicate which projects are important), as these solutions may be implemented in a relatively short time frame
The protection of habitats, species and water	EU law EU environmental directives contain highly protective rules	1) Change EU law Make directives less restrictive for renewable energy and/or implement balancing requirements 2) Member State Implementation Mitigation and adaptive management approaches 3) Member State Implementation Use the derogation clauses	Mitigation and adaptive management approaches are not always effective and in that case use may be made of the derogation clauses, as this may provide for solutions in a relatively short time frame

The protection of habitats, species and water	Member State Implementation Member State discretion in the application of derogation clauses risks insufficient room being given to the development of renewable energy projects	1) EU Law or Implementation Require Member States to base the use of their discretionary powers on their renewable energy plans 2) MS planning – Use maritime spatial planning to guarantee policy integration through balancing requirements – Require Member States to establish what are important projects, through detailed national renewable energy plans 3) MS implementation – Base the use of discretionary powers on renewable energy plans and maritime spatial plans to ensure an equal and balanced outcome of licensing procedures and management measures

3. SOLUTIONS TO THE BARRIERS

3.1 Summary of the suggested solutions to the barriers

3.1.1 The free movement of goods

The source of the lack of integration discussed between the free movement of goods and renewable energy policy can be found in the Renewable Energy Directive (RED). This directive explicitly allows Member States to establish support schemes that exclude renewable energy produced in other Member States. In that sense a lack of integration with the rules on the free movement of goods is inherent in the directive. The article indicates two different ways in which the EU legislator could solve this 'mistake'. First, the Renewable Energy Directive could be adapted to the extent that it exhaustively harmonises support schemes for renewable energy. In that case Article 34 TFEU will no longer be applicable. The possibility of a territorial limitation –if explicitly mentioned in the adapted version of the directive– would then become a legitimate policy tool. Second, the legislator could choose to adapt the RED to the extent that it explicitly *prohibits* territorial limitation clauses. The RED will then incorporate the free movement rules and conflict will be prevented in this context. This approach would remove the need for further harmonisation. Nevertheless, this approach would not fit in the present design of EU renewable energy policy, which is based on individual Member State renewable energy targets. On the other hand, from the perspective of the transition to a European integrated internal energy market, it would perhaps be more logical to start to move from national support schemes to European support schemes for renewable energy.

3.1.2 The state aid framework

The main suggestion of the *article on state aid* is to implement in the *Guidelines on State aid for environmental protection and energy* (EEAG) a more flexible balancing test for those situations where the state aid framework prevents *important* renewable (ocean) energy projects from sourcing sufficient funding. This can be done by departing from a strict calculation of the eligible costs and maximum aid intensities for the most important projects. Moreover, as changing the Commission's policy may not be feasible in the short term, this article also discusses two alternative solutions: improving small and medium-sized enterprises' (SMEs) access to finance, and providing for sufficient investment aid on the EU level. All three solutions are discussed below.

The first solution discussed by the article is the introduction of a *more flexible balancing test* in the EEAG. Under a more flexible balancing test the Commission would –in some cases– disregard the predefined eligible cost calculation, maximum aid intensities and net extra investment cost calculation. Instead, it would weigh the interest of the development of *the specific* important renewable energy project –for which the Member State in question requested permission to grant investment aid– against the interest of preventing distortion of competition. In some cases the outcome of this balancing act could be that an amount of state aid is needed that equals 100% of the *total* investment costs. However, the more flexible balancing test proposed in the article would only give rise to the authorisation of investment aid of up to 100% of the total investment costs if the project in question fulfils two conditions. *First*, serious efforts should have been made to secure sufficient private funding, and these efforts have shown that it is impossible to finance the project within the scope of the present state aid rules. *Second*, the project in question is sufficiently important for reaching the Member State's national targets under the Renewable Energy Directive. In order to fulfil the second condition it is necessary to ensure that state aid amounts exceeding the maximum aid intensities in the Guidelines are only granted to projects that are very important for a Member State's renewable energy strategy. Detailed renewable energy plans per Member State could be used as a tool in this regard. Detailed national renewable energy plans would indicate *which types of projects at which sites* are essential in the light of achieving the Member State's renewable energy quota under the Renewable Energy Directive, and which are not. They should be flexible plans that allow for additions and alterations, as policy and technological developments progress over time. If the Member States and the Commission use such plans to create more clarity on the great importance –or the low importance, for that matter– of a specific renewable energy project, then they will be better positioned to weigh the interest of that specific renewable energy project against the interest of preventing a distortion of competition. These plans could be used by the European Commission for appraising the second condition of a flexible balancing test described above. At the same time, the Member State that is granting the state aid can use the renewable energy plan to support its claim to the Commission that an important (ocean) project needs more state aid than is allowed under the present Guidelines. Moreover, such detailed renewable energy plans per Member State could

also be useful for EU institutions that take investment decisions under investment aid funds for renewable energy on the EU level, as further discussed below.

The second solution discussed by the article is *improving the ocean energy developer's access to finance*. Instead of acting as direct investors in renewable energy projects, Member States could also choose to focus on improving renewable energy companies' access to finance. State aid policy provides a framework for this approach through *inter alia* the provisions on *risk finance aid schemes* in the GBER and in the Commission's *Risk Finance Guidelines*. These rules and policies are mainly targeted at SMEs, the category to which most ocean renewable energy companies belong. Risk finance aid could be an interesting approach in order to increase investments in new and innovative ocean energy projects, as the amount of public investment may be higher for certain types of undertakings and under certain circumstances than under the EEAG. However, there are also disadvantages. These include the fact that risk finance aid is aimed at financing *companies* instead of *projects*. It may therefore be more difficult for Member States to influence the exact destination of the aid, and to make sure that it is used for renewable energy projects.

The third solution discussed by the article is promoting *investment aid on the EU level*. Union funding that is centrally managed by, e.g., the European Commission and that is not directly or indirectly under the control of a Member State does not, in principle, constitute state aid. Aid that is provided on the EU level is therefore in principle not bound by maximum aid intensities, nor by the restrictive calculation of eligible costs as required by the GBER and the Guidelines. The article notes, however, that *present* EU schemes include financing restrictions of their own. In order to completely replace national funding schemes by EU schemes it may be necessary to set up clear and detailed renewable energy plans per Member State, as discussed above. Such plans could help the EU to decide on their funding priorities. Without such plans there is a risk that the Member States' freedom to design their own renewable energy strategies under the RED will not be matched by sufficient funding from the EU.

3.1.3 The protection of habitats, species and water quality

The article on the *protection of habitats and species* and the article on the *protection of water quality* distinguish two types of barriers. The first barrier is the result of the strict rules in the HBD and the WFD. These rules may require competent authorities to refuse the authorisation of large-scale[4] ocean renewable energy projects. This is

4 The negative environmental effects described in the articles on the Birds, Habitats and Water Framework Directives, and in the article on Maritime Spatial Planning, are expected to be very limited or may not occur at all in relation to the small-scale ocean energy projects that are currently in operation in the EU. This was also concluded in the appropriate assessments of the Scottish and the Dutch small-scale tidal energy projects discussed in the articles. This may be different when projects are implemented on a large scale in the future. Large-scale projects may result in larger environmental impacts and increased uncertainty. The negative environmental effects are therefore expected to play an important role in authorisation procedures for future large-scale ocean energy projects in the marine waters of the EU. They are also expected to

caused by the uncertain *and* certain negative environmental effects that are inherent in all projects of this kind. The second barrier is formed by the large amount of policy discretion enjoyed by the competent authorities under the derogation clauses. This policy discretion may result in licensing decisions on the project level that do not take proper account of renewable energy in a balancing act. Both types of barriers require different solutions, which are discussed below.

The first barrier consists of two elements: there are *certain* environmental effects and also *uncertain* environmental effects of ocean renewable energy projects. For those environmental effects that are certain *and* prohibited, the application of the derogation clauses of the Habitats and Birds Directives and the Water Framework Directive is the only possible way to avert a refusal of project authorisation.[5] For those environmental effects that are uncertain, the application of an adaptive management approach may also be a possible way to prevent the refusal of a project. The articles explore two types of adaptive management[6] approaches: adaptive management in combination with mitigation (e.g. active sonar systems that are able to shut down a tidal turbine when a seal is in the vicinity)[7] and adaptive management in combination with phased deployment (a project starts on a very small scale and the approval of the installation of subsequent devices is made dependent on the monitoring results of

play a role in the design of management measures pursuant to the MSFD. The reason for this is that the EU environmental legislation discussed in the articles –the Birds and Habitats Directives, the Water Framework Directive and Marine Strategy Framework Directive– is designed to avoid the types of negative environmental effects that may be caused by ocean energy.

5 It must be noted, however, that the interpretation of the EU rules on the protection of habitats, species and water differs between the Member States. Some Member States may apply these rules in a stricter manner than others. The threshold for the application of the derogation clauses may therefore differ between the Member States. See in this regard CW Backes and S Akerboom, 'Renewable energy projects and species protection – A comparison into the application of the EU species protection regulation with respect to renewable energy projects in the Netherlands, United Kingdom, Belgium, Denmark and Germany' (Report commissioned by the Ministries of Economic Affairs and Climate and Agriculture, Nature and Food Quality) (2018) pp 26-27, available at: https://www.rijksoverheid.nl/documenten/rapporten/2018/05/28/projecten-voor-hernieuwbare-energie-en-soortenwetgeving---een-juridisch-vergelijkend-onderzoek.

6 It could well be questioned whether the approaches referred to here may be labelled as adaptive management. Adaptive management in its purest form is a very detailed and well-planned iterative process on which many academic publications have been written. Arguably, the approaches referred to in the present dissertation should rather be referred to as approaches 'containing adaptive elements'. The possible contribution of a truly adaptive management approach to the development of ocean renewable energy in the EU would be an interesting topic for further research. For a further elaboration on the concept of adaptive management, see for instance: CR Allen, JJ Fontaine, KL Pope and AS Garmestani, 'Adaptive management for a turbulent future' Journal of Environmental Management (2011).

7 Adaptive management in combination with mitigation is only included in the article on the protection of habitats and species. It is not included in the article on the protection of water quality as adaptive management in combination with mitigation is expected to be largely unsuitable for solving the negative effects on water quality (including fish mortality and local eutrophication) caused by ocean renewable energy projects. While it may be possible to shut down tidal turbines (or to stop piling activities) when there are seals in the vicinity (seals are protected under the Habitats Directive), this may be much more difficult –e.g. given their size and abundance– in relation to fish (which are protected under the WFD). Shutting down turbines when local eutrophication (a water quality element under the WFD) exceeds certain limits is also expected to be problematic (e.g. because of monitoring issues and because turbines may need to be shut down for a long period of time). These are, however, the assumptions that are made by the present author and which have been made on the basis of information derived from interviews, informal talks and reports. Further non-legal (ecological and biological) research would be needed to verify these assumptions.

the former phase). Nonetheless, both adaptive management approaches have various disadvantages. These vary from the approaches not always being sufficiently effective, to them taking too much time if seen from the perspective of the rapidly approaching deadlines for meeting the EU's renewable energy targets. It is therefore argued that also in the case of uncertain negative environmental effects, it will sometimes be necessary to invoke the directives' derogation clauses.

The second barrier is related to these derogation clauses. These clauses offer a great deal of discretion to the competent authorities, without imposing any minimum standards to guarantee that an authorisation decision on the project level is taken in a way that takes proper account of both environmental *and* renewable energy policy goals. This can be problematic because EU environmental protection standards are better defined than the standards for increasing the EU's renewable energy supply. The applicable standards for most of the environmental interests discussed are relatively clear: no deterioration of water quality (WFD), no lasting adverse effects on the integrity of Natura 2000 sites (HBD), and no deliberate disturbance of species (HBD). The standards of renewable energy policy are much less clearly defined. According to the RED, in 2020 the share of energy use from renewable sources should be 14 % in the Netherlands, for instance. Such a broad goal, expressed through a percentage, does not reveal what weight should be attached to an individual renewable energy project. The articles propose to solve this issue by introducing so-called 'detailed national renewable energy plans' for every Member State. These plans would require Member States to specify which types of projects at which sites are essential in the light of achieving the Member State's renewable energy quota under the RED, and which are not. They should be flexible plans, that allow for additions and alterations, as policy and technological developments progress over time. The introduction of such plans could make the competent authorities aware, at an early stage, of the great importance –or the low importance, for that matter– of a specific renewable energy project in a specific area. It could help them to balance the protection of the environment (for which clear and high standards are set by the Habitats and Birds Directives and WFD) with the implementation of specific ocean renewable energy projects in an equal manner.

3.2 Discussion

As previously observed, the barriers discussed above all originate in primary or secondary EU law (treaties, directives), but their actual effects on innovative ocean renewable energy projects come to light through an incoherent application of derogation clauses at lower levels of governance. The exact level of governance that these effects stem from differs amongst the barriers discussed. As a consequence, also the level of governance of the suggested solutions differs amongst the barriers discussed. The effect of the barrier in the area of the free movement of goods, for instance, came to light at the level of the courts, where it appears that the derogation clause, as laid down in the Renewable Energy Directive, does not itself have binding force. It is suggested in this dissertation to solve this barrier on the level of governance

in which its effects originate: the Renewable Energy Directive. Finding solutions at other levels of governance might be possible, but seem less attractive. It would be possible, for instance, to leave it to the courts to decide on a case-by-case basis whether a national support scheme may benefit from a derogation under Article 36 TFEU. However, the long period of uncertainty concerning the legality of a national support scheme –caused by usually lengthy court proceedings– would possibly undermine one of the goals of the Renewable Energy Directive: creating certainty for investors.

The effect of the barrier in the area of state aid comes to light at the level of Commission implementation, which arguably offers a derogation whose scope is too limited to meet the requirements of ocean renewable energy developments. It is suggested in this dissertation to solve this barrier on the level of governance where its effects come to light: the Commission's Guidelines on State aid for environmental protection and energy (EEAG). However, in order to aid decision-making at the Member States' implementation level it is necessary to provide guidance on a higher level of governance: the planning phase. The introduction of detailed national renewable energy plans would help to steer the decision-making process in the implementation phase. Finding solutions at levels of governance other than those discussed here might be possible, but seem less attractive. It would be possible, for instance, for the EU regulator to design rules that specify how the Commission should act in state aid cases on renewable energy. This option is not very attractive as the EU legislative process is very time consuming and as the deadlines for the achievement of the EU's renewable energy targets are rapidly approaching. Changing the Commission's guidelines could theoretically be done within a much shorter timeframe.

The effect of the barrier in the area of the protection of habitats, species and water quality come to light in the authorisation procedure at the project level, where it is up to the discretion of the Member States' competent authorities to apply the derogation clauses without there being sufficient guarantees that renewable energy interests will be taken into account. It is suggested in this dissertation to solve this barrier on the level of governance where its effects come to light: the authorisation procedure at the project level. However, here again, in order to aid decision-making at the project level it is necessary to provide guidance on a higher level of governance: during the planning phase. The introduction of detailed national renewable energy plans would help to steer the decision-making process at the project level. Finding solutions at levels of governance other than those discussed here might be possible, but are either not effective in all situations, or seem less attractive. Inserting a requirement for physical mitigation measures (e.g. placing fish barriers or smart-turbine positioning) in authorisation decisions, for instance, is for various reasons not generally expected to be effective for solving the environmental problems faced by ocean renewable energy projects. Similarly, even though the competent authorities could make project authorisation dependent on one of the adaptive management approaches discussed above, this may only be partly effective in solving the environmental problems in question. Another solution, that has been advocated by some scholars, is to change the environmental directives in order to make them more compatible with renewable

energy policy.[8] While this may be a suitable option in the longer term, it does not –in the opinion of the present author– fit within the EU's current approach towards renewable energy. This approach aims at the production of very much increased amounts of renewable energy in the short term (by 2020, and then by 2030). Changing the environmental guidelines would simply take too much time due to the EU's time-consuming legislative process. Therefore, this cannot be the main approach to solve the issues identified above.

3.3 Maritime spatial planning in combination with detailed renewable energy plans

The article on Maritime Spatial Planning argues that the solutions discussed above do not solve all of the main issues that could arise when applying EU environmental law to ocean renewable energy projects. The article identifies three issues which may emerge when the EU rules on habitats, species and water protection are applied to ocean renewable energy projects. These issues are:

1) There is a potential conflict between ocean renewable energy projects and the protection rules, meaning that some projects may need to be prohibited;
2) while there are derogation clauses, there is no obligation for the competent authorities to apply these clauses and to undertake a balancing act between ocean renewable energy, on the one hand, and the protection of habitats, species and water, on the other;
3) even *if* these clauses are applied, it remains unclear how much weight the competent authorities should attach to ocean renewable energy under a subsequent balancing act.

Sections 3.1.1 to 3.1.3 above only discuss solutions to the first issue (solutions: mitigation, adaptive management or derogation clauses) and the third issue (solution: detailed national renewable energy plans). They do not discuss a solution to the second issue. The article concludes that Maritime Spatial Planning (MSP) could serve as a solution to the second issue. The introduction of MSP may be a way to create a necessity to strike a balance between the EU's rules on the protection of habitats, species and water, and (ocean) renewable energy projects. MSP may require national authorities to look beyond a single-sector assessment and to take all relevant policy issues into consideration in their decisions based on the Habitats and Birds Directives, the Water Framework Directive and the Marine Strategy Framework Directive. MSP can create balancing responsibilities both on the planning level and on lower decision-making levels, including the project authorisation level.

Importantly, the article also concludes that while MSP could –if certain conditions are fulfilled– help to guarantee that a balancing act takes place is struck, it cannot

8 See for instance: K Van Hende, *Offshore Wind in the European Union – Towards Integrated Management of Our Marine Waters* (Wolters Kluwer 2015).

guarantee that different policy goals are treated in an equal manner under such a balancing act. In order to solve this issue, Member States must be aware how much weight should be attached to an individual ocean energy project in this balancing. It is proposed to link maritime spatial plans to detailed renewable energy plans per Member State in order to reach this goal.

4. USING THE CONCEPT OF SUSTAINABLE DEVELOPMENT TO EVALUATE THE BARRIERS AND SOLUTIONS FOUND

The concept of sustainable development is used as the overarching normative framework of this dissertation. This section evaluates the barriers and solutions found in this dissertation in the light of this concept.

In the introduction to this dissertation it was concluded that two policy guiding principles can be seen as the main tools for the application of the concept of sustainable development. These are, *first,* the integration principle, and *second,* the principle of solidarity within and between generations.

It was argued that the integration principle essentially means that:

- The documents that govern two potentially conflicting policy areas must offer sufficient tools to guarantee that the goals of either of the policy areas involved can, in theory, be achieved. It should not be impossible from the outset to meet the goals of one or more of the policy areas involved.
- If trade-offs are necessary, these should be made through a balancing act.
- The goals of both policy areas involved are treated equally under a balancing act.

It was argued that the principle of solidarity within and between generations requires that two elements are added to this list:

- When a conflict between economic and environmental policy goals exists, even when these are considered to carry equal weight, the environmental policy goal (including renewable energy) must prevail in some situations.
- These include *at the very least* those situations where the achievement of the goals of the environmental policy area in question is essential to preserve key environmental elements for future generations.

Finally, it was argued that the outcome of every balancing act in a specific case is also subject to the proportionality principle.[9]

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9 This principle in fact requires a balance to be struck between the following: the benefits gained by the public interest that is served by the implementation of the policy measure chosen, and the harm caused to other public interests caused by the implementation of that policy measure. Based on A Barak, *Proportionality – Constitutional Rights and their Limitations* (Cambridge University Press 2012) 340.

The sections below evaluate the barriers and solutions found in this dissertation in the light of the above-mentioned policy guiding principles.

4.1 Barriers

When assessing the barriers listed above in the light of these principles, it first of all shows that on the level of primary and secondary EU law there is little actual integration of renewable energy policy in the areas of EU law researched. There are only possibilities, but no guarantees, that renewable energy goals are taken into account. When zooming in on the use of derogation clauses it shows that these are either applied in a largely uncoordinated way (the environmental derogation clauses), they are applied in a too limited fashion (the derogation clause on state aid), or they are applied in a rather ineffective way (the derogation from the free movement rules in the RED) with respect to renewable energy. These derogation clauses do not guarantee that the goals of renewable energy policy can be achieved. Moreover, they do not guarantee an equal balancing of the interests involved. The EU environmental directives could have the effect of *de facto* favouring the protection of the environment over the achievement of the EU's renewable energy targets. The state aid framework, in its turn, may not be sufficiently able to take into account some important renewable energy projects. The articles of this dissertation conclude that the relatively vague standards for the achievement of the EU's renewable energy goals may be a reason for these possibly unequal balancing acts.

When looking at the principle of solidarity within and between generations it shows that there is currently no guarantee in EU law and policy that important renewable energy projects are given priority over economic policy areas (state aid, the free movement of goods). With the current state of the law and policy, it is either left to the courts to decide on a case-by-case basis whether economic or renewable energy policy is given precedence (the free movement of goods), or there is a situation where economic policy is automatically given precedence over renewable energy policy once certain thresholds have been exceeded (state aid).

The combined lack of integration and the lack of the implementation of the principle of solidarity within and between generations brings to light that there is an insufficient implementation of the concept of sustainable development on the interface of EU environmental, economic and renewable energy policy.

4.2 Solutions

When assessing the solutions in the light of the integration principle, it shows that they all help the goals of renewable energy policy to be better respected throughout the policy areas researched. However, they do this in different ways. Both the legitimisation of the territorial limitation clause (the free movement of goods) and a more flexible application of the state aid rules, for instance, may be seen as solutions that offer tools that Member States need in order to meet the goals of the Renewable

Energy Directive. The complementary introduction of detailed renewable energy plans contributes to an equal balancing process, as these could help Member States to direct the application of these tools (i.e. derogations from economic policy) to the most important renewable energy projects. The application of maritime spatial planning –in the way described in the article on MSP– helps to guarantee that –where necessary– a balancing of interests is carried out under the derogation clauses of the environmental directives. It does not guarantee, however, that this balancing act takes environmental and renewable energy policy goals into account in an equal manner. Linking maritime spatial plans to detailed renewable energy plans could however contribute to achieving an equal balancing act.

By helping renewable energy policy to achieve its goals *and* by contributing to a more equal balancing process, these solutions may therefore be said to contribute to an enhanced implementation of the integration principle.

The solutions proposed in the areas of free movement and state aid do not, however, help to increase the implementation of the principle of solidarity within and between generations. While they open up the possibility to prioritise important renewable energy projects over economic policy, they do not guarantee that this will occur in practice. This issue could be solved by making the detailed renewable energy plans binding upon the Member States, to the extent that they must derogate from state aid or free movement law for the benefit of important renewable energy projects.

5. SYNTHESIS: DEALING WITH NEW AND INNOVATIVE RENEWABLE ENERGY TECHNIQUES UNDER EU ENVIRONMENTAL AND ECONOMIC LAW AND POLICY

EU renewable energy policy started in the 1970s and 1980s as a mainly *economic policy area* as a way to curb oil dependence, to enhance European energy security, and to develop economic activity in less wealthy regions. Since the 1990s it has become –triggered, partly, by the 1992 Rio Earth Summit and the 1997 Kyoto Protocol– also an indispensable part of the EU's environmental and climate policies. The importance of renewable energy policy requires other EU policy areas to be receptive to the needs of renewable energy goals. Innovation in the renewable energy sector is an ongoing process, existing techniques are being continuously improved and new techniques are being developed. EU legal and policy issues that are hampering the advancement of ocean energy techniques that are currently under development may disappear over the course of time when techniques reach maturity. Simultaneously, however, again newer and more innovative energy techniques will start facing similar –but slightly different– legal and policy issues of their own. This means that EU law –and its implementation on different levels of governance– must be able to deal with the uncertain effects (but also the certain effects) of innovative renewable energy techniques. This may require adaptations to both economic and environmental EU law and policy

areas. Economic policy areas –such as state aid and the free movement of goods– need to offer tools and procedures that are able to guarantee that the renewable energy innovations that are most important for achieving Member States' and the EU's renewable energy targets are provided with the necessary (financial) means to be developed and to reach the phase of market access. Environmental policy, in its turn, must continue fulfilling its role as the guardian of Europe's unique and sensitive ecosystems for the benefits of present and future generations. At the same time, individual environmental directives should not solely focus on the protection of *specific elements* of the environment (species, habitats, water). The derogation clauses that are enshrined in these environmental directives should be used in a wise, careful and primarily *planned* manner in order to also offer sufficient leeway for *those* renewable energy innovations that are deemed most important for climate mitigation, and therefore for the protection of the environment in a *more comprehensive* sense. Of course, it would be even better –where this is effective and does not slow down the transition to renewable energy too much– to use mitigation and adaptive approaches to advance renewable energy innovations within the boundaries set by the rules on the protection of habitats, species and water. In the short term substantial policy –and to a lesser extent, legislative– measures should be implemented by both the EU and the Member States to guarantee that renewable energy policy is treated in an equal manner compared to traditional economic and environmental policy areas. EU law as it stands offers sufficient policy discretion –particularly for the European Commission and the Member States– to develop tools and policies that help innovative renewable energy interests to be better represented within the implementation practice of EU law. Comprehensive planning –in the areas of economic, environmental *and* renewable energy policy– is required to guarantee that trade-offs concerning the goals of these policy areas are only made in cases when this is indeed important and proportional.

SUMMARY

THE RESEARCH

A. Aim of the research

This dissertation aims to contribute to the achievement of the EU's renewable energy targets for the year 2020 and beyond,

- *first* by mapping the main EU law and policy barriers to the large-scale implementation of innovative ocean energy techniques, and
- *second*, by suggesting practical solutions to those barriers that can be implemented on a short time-scale and within the current EU legal framework.

This dissertation hypothesises that it is both possible *and* necessary –given the rapidly approaching deadlines (2020 and 2030) for reaching the EU's renewable energy targets, and the large amount of time that a renegotiation of EU environmental and economic law would take– to solve these issues in the *short term* and *within* the current EU legal framework.

See pages: 1-5

B. The need for Ocean renewable energy

The Renewable Energy Directive (RED) is one of the tools that the EU uses to comply with its international obligations on CO2 reduction and climate change. The directive requires the Member States to comply with mandatory and individual renewable energy targets. For instance, in 2020 the share of energy use from renewable sources should be 14% in the Netherlands, 23% in France, and 15% in the UK. In order to meet these targets the directive requires the Member States to encourage the production of energy from *all types of renewable sources*. Apart from wind and solar energy, which are established forms of renewable energy production, these sources also include sources that require *innovative* water-related techniques. Tidal energy, wave energy, and salinity gradient energy (the latter is sometimes also called 'blue energy') are examples of such techniques. Together, these techniques are often referred to as 'marine energy' or 'ocean energy'. According to the European Commission, ocean renewable energy sources can play an important role with respect to energy security and reaching Europe's decarbonisation goals.

See pages: 1-2, 57-58

C. Research questions

In order to structure the exploration of the aforementioned issues, the following general research question has been developed:

> What barriers exist within EU law to large-scale innovative ocean renewable energy projects, and how can these be solved in line with the concept of sustainable development?

This question is explored by addressing the following sub-questions:

1. What areas of EU law are expected to raise the main barriers to large-scale innovative ocean renewable energy projects?
2. What elements in these areas of EU law raise those barriers?
3. Does EU law provide sufficient procedures for dealing with barriers to the development of large-scale innovative ocean renewable energy projects?
4. What are the possible solutions to guarantee an outcome of these procedures that is in line with the concept of sustainable development?

See pages: 6-11

D. Methodology and set-up

The research process for this dissertation consisted of the following elements:

1. A scoping exercise into the areas of EU law that were expected to form the main barriers to the development of innovative water-related renewable energy projects, based on interviews and additional desk-based research.

2. Further exploratory research and the drafting of the research questions.

3. Desk-based legal research into legal and non-legal sources.

4. Case study research

5. Interviews

6. Dissemination of the research results and the peer-review process.

The research questions are answered in the six articles that lie at the heart of this research. These are: a scoping article, an article on the free movement of goods, an article on the state aid framework, an article on the rules on the protection of habitats, species and water, and an article on maritime spatial planning. The conclusion contains a further elaboration of the answers to the research questions.

See pages: 25-27

SUSTAINABLE DEVELOPMENT AS A NORMATIVE FRAMEWORK

E. The concept of sustainable development

See pages: 11-23

The concept of sustainable development is used as the overarching normative framework for this dissertation. It is used to evaluate, *first,* the EU law (and policy) barriers to innovative renewable energy projects and, *second,* to evaluate the possible solutions to these barriers.

Two policy guiding principles can be seen as the main tools for the application of the concept of sustainable development. These are, *first,* the integration principle, and *second,* the principle of solidarity within and between generations.

It is argued that the integration principle essentially means that:

- The law and policy documents that govern two potentially conflicting policy areas must offer sufficient tools to guarantee that the goals of either of the EU policy areas involved can, in theory, be achieved. It should not be impossible from the outset to meet the goals of one or more of the policy areas involved.
- If trade-offs are necessary, these should be made through a balancing act.
- The goals of both EU policy areas involved are treated equally in a balancing act.

It was argued that the principle of solidarity within and between generations requires that two elements are added to this list:

- When a conflict between economic and environmental policy goals exists, even when these are considered to carry equal weight, the environmental policy goal (including renewable energy) must prevail in some situations.
- These situations include *at the very least* those situations where the achievement of the goals of the environmental policy area in question is essential to preserve key environmental elements for future generations.

Finally, it is argued that the outcome of every balancing act in a specific case is also subject to the proportionality principle.

The final sections of this summary (sections N and O) evaluate the barriers and solutions found in this dissertation in the light of the above-mentioned policy guiding principles.

F.
The free movement of goods

The article on the *free movement of goods* deals with the possible conflict between an economic policy area and an environmental/non-economic policy area. In a way, this article is the odd one out as it focuses on wind energy instead of on innovative ocean renewables. The article is nevertheless of importance in the discussion underlying the present dissertation as it shows that issues of the fragmentation and integration of EU law and policy are still of influence during all development phases of an energy technology, right up until –and including– the phase of technology maturity and market access. Moreover, free movement of goods issues may also play a role with regard to future large-scale ocean energy projects. The article shows that the Renewable Energy Directive (RED) contains a clause allowing Member States to design financial support schemes that are solely applicable to renewable energy which is generated in that specific Member State (a territorial limitation clause). This is a logical policy choice when it is taken into consideration that the RED obliges Member States to reach a certain percentage of *domestically produced renewable energy.* If Member States would be required to open their national renewable energy support schemes to *renewable energy produced in other Member States*, then they would lose a potentially powerful instrument to directly influence the volume of domestically produced renewable energy. At the same time, the territorial limitation clause is an infringement of the rules on the free movement of goods as laid down in Article 34 TFEU. The policy areas of renewable energy and free movement do not therefore – in principle – guarantee the achievement of each other's goals. Even when the derogation clause of Article 36 TFEU is applied, this lack of integration is not solved. When this clause is applied, it is ultimately left to the national or European courts –if the applicability of the derogation clause is challenged– to decide on an ad-hoc basis whether a specific national state aid measure is admissible. A court may sometimes decide in favour of the renewable energy side of the balance. This happened in the Ålands Vindkraft case, which was discussed in the article on the free movement of goods in this dissertation. A possible annulment of a national support scheme by a court, however, may frustrate a Member State's policy to promote renewable energy projects as required by the RED. Moreover, the long period of uncertainty surrounding the legality of a national support programme –caused by usually lengthy court proceedings– undermines one of the goals of the Renewable Energy Directive: creating certainty for investors.

See pages: 49-56

G.
The state aid framework

The article on *state aid* also deals with the possible conflict between an economic policy area and an environmental/non-economic policy area. The article shows that EU state aid law and policy may prevent investment aid programmes from providing sufficient amounts of funding to help ocean renewable energy technologies to reach maturity. These technologies may –at least in some Member States– be an important aspect of the strategy to reach the targets of the Renewable Energy Directive. In that case the EU state aid framework would not sufficiently support the achievement of the goals of the Renewable Energy Directive, meaning that there is a lack of integration between both policy areas. The barrier that raises this lack of integration is rooted in the restrictive calculation of the eligible costs and the net extra investment costs, and restrictive maximum aid intensities. In combination with the existing difficulties in securing private financing for this type of project, these restrictions may result in substantial barriers to the development of innovative ocean renewable energy projects. This restrictiveness does not automatically imply that there is insufficient integration between the Renewable Energy Directive (RED) and the EU's state aid framework. It is argued in the article on state aid that one can *only* speak of a lack of integration between the RED and the state aid framework if the state aid framework prevents *important** renewable (ocean) energy projects from sourcing sufficient public funding in order to succeed. There are some indications from practice and in the state aid framework itself that suggest that the current state aid framework is indeed not sufficiently catered to the renewable energy challenges as set out in the Renewable Energy Directive.

See pages: 57-96

*** The concept of 'important' renewable energy projects**

It is suggested in this dissertation that 'important' renewable energy projects should be defined as projects that are important for reaching a Member State's national renewable energy targets under the Renewable Energy Directive. The introduction of detailed renewable energy plans per Member State could be used as a tool in this regard. Detailed national renewable energy plans would indicate *which types of projects at which sites* are essential in the light of achieving the Member State's renewable energy targets under the Renewable Energy Directive, and which are not. It should be flexible plans, that allow for additions and alterations, as policy and technological developments progress over time.

See pages: 116-119, 148-151

H.
The protection of habitats, species and water quality

The article on the *protection of habitats and species* and the article on the *protection of water quality* deal with the possible conflict between two environmental/non-economic policy areas. There is a possible conflict between the goals of the Habitats and Birds Directives (HBD) and the Water Framework Directive (WFD), on the one hand, and those of the Renewable Energy Directive (RED), on the other. The RED promotes renewable energy techniques that may negatively affect aspects of the environment (species, habitats, water quality) which are protected by the HBD and the WFD. The HBD's articles on the protection of habitats and species are strongly influenced by the precautionary principle. They leave no room for uncertainty concerning the effects of renewable energy projects on protected habitats and species. Similarly, the no-deterioration obligation in the WFD leaves no room for uncertainty concerning a project's effects on water quality. At the same time, uncertain *and* certain negative environmental effects are inherent in all ocean renewable energy projects. The competent authorities will have to refuse to authorise a project if prohibited negative effects or uncertainty about those effects cannot be removed before a project is implemented. Such a refusal can especially be expected if ocean renewable energy techniques are applied on a large scale. Mitigation measures and adaptive management approaches are expected to be sometimes not sufficiently effective to solve prohibited environmental effects caused by ocean renewable energy projects. Therefore, the Habitats, Birds and Water Framework Directives' derogation clauses are expected to play an important role in the authorisation procedures of future large-scale ocean energy projects. However, while these derogation clauses are meant to balance (opposing) goals of different EU policy areas, they are not designed to guarantee that an equal balance will be struck. The derogation clauses offer room for the competent authorities to negate renewable energy interests in a balancing act. And even *if* both sides are taken into account, then it is still unclear how much weight should be attached to the renewable energy side of the balance

See pages: 97-120 (WFD), 121-154 (HBD)

I.
Synthesis

There is a lack of integration between primary and secondary economic and environmental EU law and policy, on the one hand, and renewable energy law and policy, on the other. This in itself is not very surprising, however. Renewable energy policy is a relatively young policy area, which explains why it is not fully integrated into the EU's more established economic and environmental policy areas. It *is* surprising, however, that the possibilities offered by EU economic and environmental policy (i.e. the derogation clauses) are not adequately applied as a means to solve the said lack of integration. The application of these derogation clauses is either carried out in a largely uncoordinated

way (the environmental derogation clauses), applied in a too limited fashion (the derogation clause on state aid), or applied in an ineffective way (the derogation from the free movement rules in the RED).

SOLUTIONS
to the barriers to innovative ocean energy

J.
The free movement of goods

The source of the lack of integration discussed between the free movement of goods and renewable energy policy can be found in the Renewable Energy Directive (RED). This directive explicitly allows Member States to establish support schemes that exclude renewable energy produced in other Member States. In that sense a lack of integration with the rules on the free movement of goods is inherent in the directive. The article indicates two different ways in which the EU legislator could solve this 'mistake'. First, the Renewable Energy Directive could be adapted to the extent that it exhaustively harmonises support schemes for renewable energy. In that case Article 34 TFEU will no longer be applicable. The possibility of a territorial limitation –if explicitly mentioned in the adapted version of the directive– would then become a legitimate policy tool. Second, the legislator could choose to adapt the RED to the extent that it explicitly *prohibits* territorial limitation clauses. The RED will then incorporate the free movement rules and conflict will be prevented in this context. This approach would remove the need for further harmonisation. Nevertheless, this approach would not fit in the present design of EU renewable energy policy, which is based on individual Member State renewable energy targets. On the other hand, from the perspective of the transition to a European integrated internal energy market, it would perhaps be more logical to start to move from national support schemes to more European support schemes for renewable energy.

See pages: 53-56

K.
The state aid framework

The main suggestion of the article on state aid is to implement in the *Guidelines on State aid for environmental protection and energy* (EEAG) a more flexible balancing test for those situations where the state aid framework prevents *important* renewable (ocean) energy projects from sourcing sufficient funding (see * above for an explanation of the concept of *important* renewable energy projects). This can be done by departing from a strict calculation of the eligible costs and maximum aid intensities for the most important projects. Moreover, as changing the Commission's policy may not be feasible in the short term, this article also discusses two alternative solutions: improving small and medium-

See pages: 85-95

sized enterprises' (SMEs) access to finance, and providing for sufficient investment aid on the EU level. All three solutions are discussed below.

The first solution discussed by the article is the introduction of a *more flexible balancing test* in the EEAG. Under a more flexible balancing test the Commission would –in some cases– disregard the predefined eligible cost calculation, maximum aid intensities and the net extra investment cost calculation. Instead, it would weigh the interest of the development of *the specific* important renewable energy project –for which the Member State in question requested permission to grant investment aid– against the interest of preventing a distortion of competition. In some cases the outcome of this balancing act could be that an amount of state aid is needed that equals 100% of the *total* investment costs. However, the more flexible balancing test proposed in the article would only give rise to the authorisation of investment aid of up to 100% of the total investment costs if the project in question fulfils two conditions. *First*, serious efforts should have been made to secure sufficient private funding, and these efforts have shown that it is impossible to finance the project within the scope of the present state aid rules. *Second*, the project in question is sufficiently *important* for reaching the Member State's national targets under the Renewable Energy Directive. Detailed renewable energy plans per Member State could be used as a tool to ensure that state aid amounts exceeding the maximum aid intensities in the Guidelines are only granted to projects that are very important for a Member State's renewable energy strategy indeed. See * above for a further elaboration on detailed renewable energy plans. If the Member States and the Commission use such plans to create more clarity on the great importance –or the low importance, for that matter– of a specific renewable energy project, then they will be better positioned to weigh the interest of that specific renewable energy project against the interest of preventing a distortion of competition. These plans could be used by the European Commission for appraising the second condition of a flexible balancing test described above. At the same time, the Member State that is granting the state aid can use the renewable energy plan to support its claim to the Commission that an important (ocean) project needs more state aid than is allowed under the present Guidelines. Moreover, such detailed renewable energy plans per Member State could also be useful for EU institutions that take investment decisions under investment aid funds for renewable energy on the EU level, as further discussed below.

The second solution discussed by the article is *improving the ocean energy developer's access to finance*. Instead of acting as direct investors in renewable energy projects, Member States could also

choose to focus on improving renewable energy companies' access to finance. State aid policy provides a framework for this approach through *inter alia* the provisions on *risk finance aid schemes* in the GBER and in the Commission's *Risk Finance Guidelines*. These rules and policies are mainly targeted at SMEs, the category to which most ocean renewable energy companies belong. Risk finance aid could be an interesting approach in order to increase investments in new and innovative ocean energy projects, as the amount of public investment may be higher for certain types of undertakings and under certain circumstances than under the EEAG. However, there are also disadvantages. These include the fact that risk finance aid is aimed at financing *companies* instead of *projects*. It may therefore be more difficult for Member States to influence the exact destination of the aid, and to make sure that it is used for renewable energy projects.

The third solution discussed by the article is promoting *investment aid on the EU level*. Union funding that is centrally managed by, e.g., the European Commission and that is not directly or indirectly under the control of a Member State does not, in principle, constitute state aid. Aid that is provided on the EU level is therefore in principle not bound by maximum aid intensities, nor by the restrictive calculation of eligible costs as required by the GBER and the Guidelines. The article notes, however, that *present* EU schemes include financing restrictions of their own. In order to completely replace national funding schemes by EU schemes it may be necessary to set up clear and detailed renewable energy plans per Member State, as discussed above. Such plans could help the EU to decide on their funding priorities. Without such plans there is a risk that the Member States' freedom to design their own renewable energy strategies under the RED will not be matched by sufficient funding from the EU.

L. The protection of habitats, species and water quality

The article on the *protection of habitats and species* and the article on the *protection of water quality* distinguish two types of barriers. The first barrier is the result of the strict rules in the Habitats and Birds Directives and the Water Framework Directive. These rules may require competent authorities to refuse the authorisation of large-scale ocean renewable energy projects. This is caused by the uncertain *and* certain negative environmental effects that are inherent in all projects of this kind. The second barrier is formed by the large amount of policy discretion enjoyed by the competent authorities under the derogation clauses. This policy discretion may result in licensing decisions on the project level that do not take proper account of renewable energy in a balancing act. Both types of barriers require different solutions, which are discussed below.

See pages: 114-120 (WFD), 143-154 (HBD)

The first barrier consists of two elements: there are *certain* environmental effects and also *uncertain* environmental effects of ocean renewable energy projects. For those environmental effects that are certain *and* prohibited, the application of the derogation clauses of the Habitats and Birds Directives and the Water Framework Directive is the only possible way to avert a project authorisation being refused. For those environmental effects that are uncertain, the application of an adaptive management approach may also be a possible way to prevent the refusal of a project. The articles explore two types of adaptive management approaches (although it could well be questioned whether the approaches referred to here may be labelled as adaptive management in its purest form): adaptive management in combination with mitigation (e.g. active sonar systems that are able to shut down a tidal turbine when a seal is in the vicinity) and adaptive management in combination with phased deployment (a project starts on a very small scale and the approval of the installation of subsequent devices is made dependent on the monitoring results of the former phase). Nonetheless, both adaptive management approaches have various disadvantages. These vary from the approaches not always being sufficiently effective, to them taking too much time if seen from the perspective of the rapidly approaching deadlines for meeting the EU's renewable energy targets. It is therefore argued that also in the case of uncertain negative environmental effects, it will sometimes be necessary to invoke the directives' derogation clauses.

The second barrier is related to these derogation clauses. These clauses offer a great deal of discretion to the competent authorities, without imposing any minimum standards to guarantee that an authorisation decision on the project level is taken in a way that takes proper account of both environmental *and* renewable energy policy goals. This can be problematic because EU environmental protection standards are better defined than the standards for increasing the EU's renewable energy supply. The applicable standards for most of the environmental interests discussed are relatively clear: no deterioration of water quality (WFD), no lasting adverse effects on the integrity of Natura 2000 sites (HBD), and no deliberate disturbance of species (HBD). The standards of renewable energy policy are much less clearly defined. According to the RED, in 2020 the share of energy use from renewable sources should be 14 % in the Netherlands, for instance. Such a broad goal, expressed through a percentage, does not reveal what weight should be attached to an individual renewable energy project. This dissertation proposes to solve this issue by introducing so-called 'detailed national renewable energy plans' for every Member State. See * above for a further

elaboration on detailed renewable energy plans. These plans could help competent authorities to balance the protection of the environment (for which clear and high standards are set by the Habitats and Birds Directives and WFD) with the implementation of specific ocean renewable energy projects in an equal manner.

M. Complementary solution:

Maritime spatial planning

The article on Maritime Spatial Planning argues that the solutions discussed above do not solve all of the three main issues that could arise when applying EU environmental law to ocean renewable energy projects. These main issues are:

1) There is a potential conflict between ocean renewable energy projects and the environmental protection rules, meaning that some projects may need to be prohibited;

2) while there are derogation clauses, there is no obligation for the competent authorities to apply these clauses and to undertake a balancing act between ocean renewable energy, on the one hand, and the protection of habitats, species and water, on the other;

3) even *if* these clauses are applied, it remains unclear how much weight the competent authorities should attach to ocean renewable energy under a subsequent balancing act.

The solutions discussed above only provide solutions to the first issue (solutions: mitigation, adaptive management or derogation clauses) and the third issue (solution: detailed national renewable energy plans). They do not provide a solution to the second issue. Maritime Spatial Planning (MSP) could serve as a solution to the second issue. The introduction of MSP may be a way to create a necessity to strike a balance between the EU's rules on the protection of habitats, species and water, and (ocean) renewable energy projects. MSP may require national authorities to look beyond a single-sector assessment and to take all relevant policy issues into consideration in their decisions based on the Habitats and Birds Directives, the Water Framework Directive and the Marine Strategy Framework Directive. MSP can create balancing responsibilities both on the planning level and on lower decision-making levels, including the project authorisation level.

Importantly, while MSP could –if certain conditions are fulfilled– help to guarantee that a balancing act takes place, it cannot guarantee that different policy goals are treated in an equal manner under such a balancing act. In order to solve this issue, Member States must be aware of how much weight should be attached to an individual ocean energy project in this balancing act. It is proposed to link maritime spatial plans to detailed renewable energy plans per Member State in order to reach this goal.

See pages: 155-192

ANALYSIS BASED ON THE NORMATIVE FRAMEWORK:
The concept of sustainable development

(see **Section E** of this summary for an explanation of the concept of sustainable development)

N.
Using the concept of sustainable development to evaluate the barriers found

When assessing the barriers listed above in the light of the integration principle, and the principle of solidarity within and between generations, it first of all shows that on the level of primary and secondary EU law there is little actual integration of renewable energy policy in the areas of EU law researched. There are only possibilities, but no guarantees, that renewable energy goals are taken into account. When zooming in on the use of derogation clauses it shows that these are either applied in a largely uncoordinated way (the environmental derogation clauses), they are applied in a too limited fashion (the derogation clause on state aid), or they are applied in a rather ineffective way (the derogation from the free movement rules in the RED) with respect to renewable energy. The existence of these derogation clauses does not guarantee that the goals of renewable energy policy can be achieved. Moreover, they do not guarantee an equal balancing of the interests involved. The EU environmental directives could have the effect of *de facto* favouring the protection of the environment over the achievement of the EU's renewable energy targets. The state aid framework, in its turn, may not be sufficiently able to take into account some important* renewable energy projects. The articles of this dissertation conclude that the relatively vague standards for the achievement of the EU's renewable energy goals may be a reason for these possibly unequal balancing acts.

When looking at the principle of solidarity within and between generations it shows that there is currently no guarantee in EU law and policy that important renewable energy projects are given priority over economic policy areas (state aid, the free movement of goods). With the current state of the law and policy, it is either left to the courts to decide on a case-by-case basis whether economic or renewable energy policy is given precedence (the free movement of goods), or there is a situation where economic policy is automatically given precedence over renewable energy policy once certain thresholds have been exceeded (state aid).

The combined lack of integration and the lack of the implementation of the principle of solidarity within and between generations brings to light that there is an insufficient implementation of the concept of sustainable development on the interface of EU environmental, economic and renewable energy policy.

See pages: 206-208

O. Using the concept of sustainable development to evaluate the solutions found

When assessing the solutions in the light of the integration principle, it shows that they all help the goals of renewable energy policy to be better respected throughout the policy areas researched. However, they do this in different ways. Both the legitimisation of the territorial limitation clause (the free movement of goods) and a more flexible application of the state aid rules, for instance, may be seen as solutions that offer tools that Member States need in order to meet the goals of the Renewable Energy Directive. The complementary introduction of detailed renewable energy plans contributes to an equal balancing process, as these could help Member States to direct the application of these tools (i.e. derogations from economic policy) to the most important* renewable energy projects. The application of maritime spatial planning –in the way described in the article on MSP– helps to guarantee that –where necessary– a balancing of interests is carried out under the derogation clauses of the environmental directives. It does not guarantee, however, that this balancing act takes environmental and renewable energy policy goals into account in an equal manner. Linking maritime spatial plans to detailed renewable energy plans could however contribute to achieving an equal balancing act.

By helping renewable energy policy to achieve its goals *and* by contributing to a more equal balancing process, these solutions may therefore be said to contribute to an enhanced implementation of the integration principle.

The solutions proposed in the areas of free movement and state aid do not, however, help to increase the implementation of the principle of solidarity within and between generations. While they open up the possibility to prioritise important* renewable energy projects over economic policy, they do not guarantee that this will occur in practice. This issue could be solved by making the detailed renewable energy plans binding upon the Member States, to the extent that they *must* derogate from state aid or free movement law for the benefit of the most important renewable energy projects.

See pages: 206-208

* See the Box after section G of this summary

SAMENVATTING

HET ONDERZOEK

A.
Doel van het onderzoek

Dit proefschrift heeft als doel om een bijdrage te leveren aan het bereiken van de duurzame-energiedoelstellingen van de Europese Unie voor het jaar 2020 en verder,

- *ten eerste* door het in kaart brengen van de belangrijkste Europeesrechtelijke en beleidsmatige belemmeringen voor de grootschalige toepassing van innovatieve technieken voor duurzame-energieopwekking uit de zee, en
- *ten tweede* door het aandragen van praktische oplossingen voor deze belemmeringen, die op korte termijn binnen het huidige, bestaande Europeesrechtelijke kader kunnen worden toegepast.

De hypothese van dit proefschrift is dat het zowel mogelijk *als* noodzakelijk is (gezien de snel naderende deadlines (2020 en 2030) voor het behalen van de Europese duurzame-energiedoelstellingen, en de grote hoeveelheid tijd die een heronderhandeling van het Europese economische en milieurecht zou kosten) om deze belemmeringen *op korte termijn* en *binnen* het huidige Europeesrechtelijke kader op te lossen.

Zie pagina: 1-5

B.
Het belang van het opwekken van duurzame energie uit de zee

De Richtlijn hernieuwbare energie (RED) is één van de instrumenten die de Europese Unie gebruikt ter uitvoering van haar internationale verplichtingen op het gebied van CO2-reductie en klimaatverandering. De richtlijn verplicht de lidstaten tot het behalen van individuele duurzame-energiedoelstellingen. In het jaar 2020 moet het aandeel energie uit hernieuwbare bronnen bijvoorbeeld 14% zijn in Nederland, 23% in Frankrijk, en 15% in het Verenigd Koninkrijk. De richtlijn vereist dat lidstaten de productie van energie bevorderen uit *alle soorten hernieuwbare bronnen* om de doelstellingen te behalen. Naast gevestigde duurzame-energievormen zoals wind en zonne-energie, vallen hier ook energiebronnen onder die *innovatieve* watergerelateerde opwekkingstechnieken gebruiken. Getijdenenergie, golfenergie, en 'salinity gradient energy' (de laatste wordt ook wel 'blauwe energie' genoemd) zijn voorbeelden van dit soort technieken. Als groep worden zij meestal aangeduid als 'mariene energie' of 'energie uit de zee' (in het Engels

Zie pagina: 1-2, 57-58

respectievelijk: 'marine energy' en 'ocean energy'). Volgens de Europese Commissie kan duurzame energie uit de zee een belangrijke rol spelen met betrekking tot de leveringszekerheid van elektriciteit in de EU en met betrekking tot het bereiken van de Europese doelstellingen voor het verminderen van de uitstoot van broeikasgassen.

C. Onderzoeksvragen

Met als doel het onderzoek naar de voorgenoemde onderwerpen te structureren, is de volgende hoofdvraag opgesteld:

> Welke belemmeringen bestaan er, binnen het recht van de Europese Unie, voor grootschalige innovatieve projecten voor de opwekking van duurzame energie uit de zee; en hoe kunnen deze belemmeringen worden opgelost op een manier die past binnen het concept duurzame ontwikkeling?

Deze hoofdvraag wordt beantwoord door middel van het beantwoorden van de volgende deelvragen:

1. Welke deelgebieden binnen het Europese recht zullen naar verwachting de voornaamste belemmeringen opwerpen voor grootschalige innovatieve projecten voor de opwekking van duurzame energie uit de zee?
2. Welke elementen van deze deelgebieden vormen de bron van deze belemmeringen?
3. Biedt het recht van de Europese Unie toereikende procedures om om te gaan met belemmeringen voor de ontwikkeling van grootschalige innovatieve projecten voor de opwekking van duurzame energie uit de zee?
4. Welke mogelijke oplossingen zijn er om te garanderen dat deze procedures een uitkomst hebben die past binnen het concept duurzame ontwikkeling?

Zie pagina: 6-11

D. Methodologie en opzet van het onderzoek

Het onderzoek voor dit proefschrift bestond uit de volgende onderdelen:

1. Een verkennend onderzoek naar de deelgebieden van het Europese recht die naar verwachting de voornaamste belemmeringen op zouden werpen voor de ontwikkeling van innovatieve watergerelateerde duurzame-energieprojecten. Dit verkennend onderzoek is gebaseerd op interviews en aanvullend deskresearch.
2. Verder verkennend onderzoek en het opstellen van de onderzoeksvragen.
3. Deskresearch naar juridische en niet-juridische bronnen.
4. Case study onderzoek.

Zie pagina: 25-27

5. Interviews
6. Verspreiding van de onderzoeksresultaten en het peer-review proces.

De onderzoeksvragen worden beantwoord in de zes artikelen die de kern vormen van dit proefschrift. Dit zijn de volgende artikelen: een verkennend artikel (scoping article), een artikel over het vrije verkeer van goederen, een artikel over staatssteun, een artikel over de regels voor de bescherming van habitats, soorten en water, en een artikel over ruimtelijke ordening op zee. Het concluderende hoofdstuk van dit proefschrift bevat een verdere uitwerking van de antwoorden op de onderzoeksvragen.

DUURZAME ONTWIKKELING ALS NORMATIEF KADER

E. Het concept duurzame ontwikkeling

Het concept duurzame ontwikkeling wordt in dit proefschrift gebruikt als overkoepelend normatief kader. Het concept wordt gebruikt, ten eerste, voor de beoordeling van de Europeesrechtelijke en beleidsmatige belemmeringen voor innovatieve duurzame-energieprojecten en, ten tweede, voor de beoordeling van de mogelijke oplossingen voor deze belemmeringen.

Er zijn twee zogenaamde 'beleidsondersteunende beginselen' (in het Engels: 'policy guiding principles') die kunnen worden gezien als de belangrijkste instrumenten voor de toepassing van het concept duurzame ontwikkeling. Dit zijn het integratiebeginsel, en het beginsel van solidariteit binnen en tussen generaties.

Dit proefschrift beargumenteert dat het integratiebeginsel in feite het volgende inhoudt:

- De juridische en beleidsdocumenten die twee potentieel conflicterende beleidsterreinen beheersen, moeten toereikende instrumenten bieden om te garanderen dat de doelen van beide beleidsterreinen (in theorie) behaald kunnen worden.
- In het geval dat er tot een compromis moet worden gekomen, dan dient dat te gebeuren middels een belangenafwegingsprocedure.
- De doelen van beide Europese beleidsterreinen moeten een gelijkwaardige behandeling krijgen binnen die belangenafwegingsprocedure.

Dit proefschrift beargumenteert dat het beginsel van solidariteit binnen en tussen generaties vereist dat er twee elementen aan de bovenstaande lijst worden toegevoegd:

Zie pagina: 11-23

- In het geval van een conflict tussen een economisch en een milieugerelateerd beleidsdoel, moet het milieugerelateerde beleidsdoel (waaronder ook duurzame energie kan vallen) in sommige gevallen voorrang krijgen. Dit is ook het geval indien beide beleidsdoelen in eerste instantie worden geacht van even groot belang te zijn.
- Het gaat hier *op zijn minst* om die gevallen waarin het bereiken van de doelen van het betreffende milieu-gerelateerde beleidsgebied essentieel is om de belangrijkste en kwetsbaarste elementen van het milieu te bewaren voor toekomstige generaties.

Tenslotte beargumenteert dit proefschrift dat de uitkomst van elke belangenafwegingsprocedure in het specifieke geval ook nog dient te worden onderworpen aan een beoordeling op basis van het evenredigheidsbeginsel.

In de laatste delen van deze samenvatting (delen N en O) worden de belemmeringen en oplossingen die dit proefschrift aandraagt beoordeelt in het licht van de bovengenoemde beleidsondersteunende beginselen.

BELEMMERINGEN VOOR INNOVATIEVE ENERGIE UIT DE ZEE
voortkomend uit Europees recht en beleid

F.
Het vrije verkeer van goederen

Het artikel over het *vrije verkeer van goederen* gaat over een potentieel conflict tussen een economisch beleidsgebied en een milieugerelateerd/niet-economisch beleidsgebied. In zekere zin is dit artikel de vreemde eend in de bijt, aangezien het gaat over windenergie in plaats van over innovatieve energie uit de zee. Het artikel is desalniettemin van belang voor de discussie binnen dit proefschrift aangezien het laat zien dat problemen gerelateerd aan de fragmentatie en integratie van Europees recht en beleid van invloed blijven tijdens alle ontwikkelingsfasen van een energietechnologie (tot en met het moment dat een techniek volwassen is en de markt betreedt). Problemen gerelateerd aan het vrije verkeer van goederen zullen waarschijnlijk ook een rol spelen in toekomstige grootschalige projecten voor de opwekking van duurzame energie uit de zee. Het artikel laat zien dat de Richtlijn hernieuwbare energie (RED) een bepaling bevat die het aan de lidstaten toestaat om steunprogramma's ter bevordering van duurzame-energieproductie op te zetten die uitsluitend van toepassing zijn op duurzame energie die in die specifieke lidstaat is opgewekt (een territoriale beperking). Vanuit het perspectief van de Hernieuwbare energierichtlijn is dit een logische beleidskeuze. Deze richtlijn verplicht de lidstaten immers er zorg voor te dragen dat een bepaald percentage van

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de *binnen de lidstaat* geproduceerde energie, uit hernieuwbare bronnen voortkomt. Indien lidstaten verplicht zouden zijn hun steunregelingen ook open te stellen voor duurzame energie die is geproduceerd *buiten de eigen lidstaat*, verliezen zij een potentieel krachtig instrument om direct invloed uit te oefenen op de omvang van de binnenlandse energieproductie. Tegelijkertijd vormt de territoriale beperking een inbreuk op het vrije verkeer van goederen, zoals vastgelegd in artikel 34 VWEU. De beleidsterreinen van duurzame energie en van het vrije verkeer van goederen bieden dus (in principe) geen garantie dat elkaars doelen kunnen worden behaald. Zelfs met toepassing van de uitzonderingsbepaling van artikel 36 VWEU wordt dit probleem nog niet opgelost. Wanneer deze bepaling wordt toegepast wordt het in het uiterste geval (wanneer de toepasselijkheid van de uitzonderingsbepaling wordt aangevochten) aan de nationale of de Europese rechter overgelaten om op een ad hoc basis te beslissen of het nationale steunprogramma toelaatbaar is. In sommige gevallen kan een rechter in het voordeel van het duurzame-energiebelang beslissen. Dit gebeurde in de Ålands Vindkraftzaak, die wordt behandeld in het artikel over het vrije verkeer van goederen in dit proefschrift. In andere gevallen, zou een rechter kunnen beslissen om een nationaal steunprogramma te laten ontbinden. Dit zou het conform de RED gevoerde duurzame-energiebeleid van de betreffende lidstaat kunnen frustreren. Daarnaast zou de lange periode van onzekerheid over de rechtmatigheid van een steunprogramma (die wordt veroorzaakt door de veelal langdurende gerechtelijke procedures) één van de doelen van de Richtlijn hernieuwbare energie kunnen ondermijnen: het creëren van zekerheid voor investeerders.

G. Staatssteun

Het artikel over staatssteun gaat eveneens over een mogelijk conflict tussen een economisch beleidsterrein en een milieugerelateerd/niet-economisch beleidsterrein. Het artikel laat zien dat het Europese staatssteunrecht en beleid mogelijkerwijs te weinig ruimte biedt aan steunprogramma's om voldoende financiële investeringssteun te geven om technieken voor de productie van duurzame energie uit de zee tot volwassenheid te laten komen. Deze technieken zouden (in ieder geval in sommige lidstaten) een belangrijk onderdeel van de strategie kunnen worden om de doelstellingen van de Richtlijn hernieuwbare energie (RED) te bereiken. In het voorgenoemde geval zou het Europese staatssteunrecht en beleid onvoldoende ondersteuning bieden aan het bereiken van de doelen van de RED, wat betekent dat er een gebrek aan integratie is tussen beide beleidsgebieden. De belemmering waardoor dit gebrek aan integratie wordt gevormd stamt uit de restrictieve berekening van de 'in aanmerking komende kosten' (eligible costs) en de 'netto extra investeringskosten', en de

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restrictieve maximale steunintensiteiten. In combinatie met de bestaande moeilijkheden om private financiering te krijgen voor dit type projecten, zouden deze beperkingen kunnen leiden tot substantiële belemmeringen voor de ontwikkeling van projecten voor innovatieve duurzame-energieproductie uit de zee. Het bestaan van deze beperkingen betekent niet automatisch dat er ook onvoldoende integratie is tussen de Richtlijn hernieuwbare energie (RED) en het Europese staatssteunrecht en beleid. Het artikel over staatssteun beargumenteert dat er *alleen* gesproken kan worden over een gebrek aan integratie wanneer het staatssteunrecht en beleid de succesvolle financiering van *belangrijke** duurzame-energieprojecten (op zee) belemmert. Er zijn een aantal aanwijzingen uit zowel de praktijk, als uit het staatssteunrecht en beleid zelf, dat het huidige staatssteunrecht en beleid inderdaad onvoldoende toegerust is op de door de Richtlijn hernieuwbare energie voorgeschreven uitdagingen.

*** Het concept 'belangrijke' duurzame-energieprojecten**

Dit proefschrift beargumenteert dat 'belangrijke' duurzame-energieprojecten moeten worden gedefinieerd als projecten die belangrijk zijn om de nationale duurzame-energiedoelstellingen van een specifieke lidstaat (zoals vastgelegd in de Richtlijn hernieuwbare energie) te behalen. De invoering van gedetailleerde duurzame-energieplannen per lidstaat zou gebruikt kunnen worden als een instrument in dit verband. Gedetailleerde duurzame-energieplannen per lidstaat zouden moeten aangeven *welk type projecten op welke locaties* essentieel zijn in het licht van het bereiken van de duurzame-energiedoelstellingen van de betreffende lidstaat onder de Richtlijn hernieuwbare energie, en welke dat niet zijn. Gezien de continue ontwikkeling van duurzame-energietechnieken en bijbehorend beleid, zouden dit flexibele plannen moeten zijn die ruimte laten voor toevoegingen en veranderingen.

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H. De bescherming van habitats, soorten en waterkwaliteit

Het artikel over de *bescherming van habitats en soorten* en het artikel over de *bescherming van waterkwaliteit* gaan beiden over een mogelijk conflict tussen twee milieugerelateerde/niet-economische beleidsgebieden. Er is een mogelijk conflict tussen de doelen van de Vogel- en Habitatsrichtlijnen (VHR) en de Kaderrichtlijn Water (KRW), aan de ene kant, en de doelen van de Richtlijn hernieuwbare energie (RED), aan de andere kant. De RED heeft als doel duurzame-energietechnieken te bevorderen die tegelijkertijd een negatief effect kunnen hebben op milieuaspecten (soorten, habitats, waterkwaliteit) die beschermd worden door de VHR en de KRW. De bepalingen in de VHR die strekken ter bescherming van soorten en habitats zijn sterk beïnvloed door het voorzorgsbeginsel. Deze bepalingen laten geen

Zie pagina: 97-120 (KRW), 121-154 (VHR)

ruimte voor onzekerheid met betrekking tot de effecten van een duurzame-energieproject op beschermde soorten en habitats. In vergelijkbare mate laat het verbod op achteruitgang van de waterkwaliteit geen ruimte voor onzekerheid met betrekking tot de effecten van een project op de waterkwaliteit.

Tegelijkertijd moet worden vastgesteld dat onzekere *en* zekere negatieve milieueffecten inherent zijn aan alle projecten voor duurzame-energieproductie uit de zee. Het betreffende bevoegd gezag zal een projectvergunning moeten weigeren indien verboden negatieve effecten of onzekerheid omtrent deze effecten niet weggenomen kunnen worden voordat een project van start gaat. Een dergelijke weigering kan met name worden verwacht wanneer projecten voor duurzame-energieopwekking uit de zee op grote schaal toegepast zullen gaan worden. Mitigatiemaatregelen en verschillende vormen van 'adaptive management' zullen naar verwachting in sommige gevallen onvoldoende effectief zijn om een oplossing te bieden voor verboden negatieve milieueffecten van duurzame-energieopwekking uit de zee.

Het ligt daarom in de lijn der verwachting dat de uitzonderingsbepalingen van de Vogel- en Habitatsrichtlijnen en de Kaderrichtlijn Water een belangrijke rol gaan spelen in de vergunningsprocedures van toekomstige grootschalige projecten voor duurzame-energieopwekking uit de zee. Hoewel de uitzonderingsbepalingen zijn bedoeld voor het afwegen van (tegenstrijdige) Europese beleidsdoelstellingen, zijn ze niet ontworpen om te garanderen dat een gelijkwaardig evenwicht wordt gevonden tussen deze doelstellingen. De uitzonderingsbepalingen bieden ruimte aan het bevoegd gezag om duurzame-energiedoelstellingen te negeren in een belangenafwegingsprocedure. En zelfs *als* beide kanten in de belangenafweging worden betrokken, dan nog is onduidelijk hoeveel gewicht er moet worden toegekend aan de duurzame-energiezijde van de belangenafweging.

I. Synthese

Er is een gebrek aan integratie tussen het primaire en secondaire economische en milieugerelateerde EU recht en beleid, aan de ene kant, en het duurzame-energierecht en beleid aan de andere kant. Dit is op zich niet heel verbazingwekkend. Het duurzame-energiebeleid van de Europese Unie is een relatief nieuw beleidsgebied. Dit verklaart waarom het niet volledig is geïntegreerd in de meer gevestigde economische en milieugerelateerde beleidsgebieden van de EU. Het is daarentegen *wel* verbazingwekkend dat de mogelijkheden die door het Europese economische en milieurecht en beleid worden geboden (d.w.z. de uitzonderingsbepalingen) niet op adequate wijze worden toegepast om het voorgenoemde gebrek aan integratie op te lossen. De uitzonderingsbepalingen worden ofwel toegepast op een voornamelijk ongecoördineerde wijze (bij de milieugerelateerde uitzonderingsbepalingen), op een

te beperkte wijze (bij de uitzonderingsbepalingen van de staatssteunregels), of op een ineffectieve wijze (de uitzondering op de vrij verkeerregels in de Richtlijn hernieuwbare energie).

OPLOSSINGEN
voor de belemmeringen voor innovatieve energie uit de zee

J.
Het vrije verkeer van goederen

De bron van het gebrek aan integratie tussen het vrije verkeer van goederen en het duurzame-energiebeleid ligt in de Richtlijn hernieuwbare energie (RED). De richtlijn staat het aan de lidstaten expliciet toe om steunprogramma's op te zetten die niet toegankelijk zijn voor duurzame energie die in andere lidstaten wordt geproduceerd. In die zin is een gebrek aan integratie met de regels omtrent het vrije verkeer van goederen inherent aan deze richtlijn. Het artikel over het vrije verkeer van goederen bespreekt twee verschillende manieren waarop de Europese wetgever deze 'fout' op zou kunnen lossen. Ten eerste zou de Richtlijn hernieuwbare energie zodanig kunnen worden aangepast dat er een uitputtende harmonisatie ontstaat van steunprogramma's voor duurzame energie. In dat geval zal artikel 34 VWEU niet langer van toepassing zijn. Het gebruik van een territoriale beperking zal dan (indien expliciet genoemd in de aangepaste richtlijn) een legitiem beleidsmiddel zijn. Ten tweede zou de wetgever ervoor kunnen kiezen om de RED zodanig aan te passen dat het een territoriale beperking expliciet *verbiedt*. In dat geval zou de RED zich verenigen met de regels omtrent het vrije verkeer van goederen waardoor conflict voorkomen wordt. Met deze benadering zou de noodzaak voor verdere harmonisatie komen te vervallen. Desalniettemin zou deze aanpak niet goed passen binnen de huidige vormgeving van het Europese duurzame-energiebeleid, dat is gebaseerd op individuele duurzame-energiedoelstellingen per lidstaat. Aan de andere kant zou het bezien vanuit het perspectief van de transitie naar een geïntegreerde Europese interne energiemarkt wellicht logischer zijn om langzamerhand van nationale steunprogramma's te bewegen richting meer Europese steunprogramma's voor duurzame energie.

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K.
Staatssteun

De belangrijkste suggestie in het artikel over staatssteun is om een meer flexibele belangenafwegingsprocedure te implementeren in de *Richtsnoeren staatssteun ten behoeve van milieubescherming en energie 2014-2020* (EEAG). Deze flexibelere procedure zou van toepassing moeten zijn op situaties waarin staatssteunregels en beleid een belemmering vormen om de financiering rond te krijgen van *belangrijke* projecten voor de productie van duurzame energie (uit de zee). Zie * hierboven voor een uitleg van het concept 'belangrijke' duurzame-energieprojecten. Het artikel stelt

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voor om met betrekking tot de belangrijkste projecten af te wijken van de restrictieve berekening van de 'in aanmerking komende kosten' (eligible costs) en de restrictieve maximale steunintensiteiten. Aangezien het aanpassen van het beleid van de Europese Commissie wellicht niet haalbaar is op de korte termijn bespreekt dit artikel ook nog twee alternatieve oplossingen: het verbeteren van de toegang tot financiering voor het MKB (midden- en kleinbedrijf; in het Engels: SMEs), en het zorgdragen voor voldoende investeringssteun op EU-niveau. Alle voorgenoemde drie oplossingen worden hieronder verder besproken.

De eerste oplossing die in dit artikel wordt besproken is het implementeren van een meer flexibele belangenafwegingsprocedure in de EEAG. Onder een meer flexibele belangenafwegingsprocedure zou de Europese Commissie de vastgestelde berekeningsmethode van de 'in aanmerking komende kosten' (eligible costs), de 'netto extra investeringskosten' en de maximale steunintensiteiten in sommige gevallen buiten toepassing moeten laten. In plaats daarvan zou de Commissie het belang van de ontwikkeling van *het specifieke* belangrijke duurzame-energieproject (waarvoor de betreffende lidstaat toestemming om investeringssteun te geven heeft aangevraagd) af moeten wegen tegen het belang van het voorkomen van de vervalsing van de mededinging. In sommige gevallen kan de uitkomst van deze belangenafwegingsprocedure zijn dat het benodigde staatssteunbedrag 100% van de *totale* investeringskosten bedraagt. Desalniettemin zal de meer flexibele procedure die in het artikel wordt besproken enkel toestaan dat de totale investeringssteun stijgt tot maximaal 100% van de totale investeringskosten wanneer het betreffende energieproject aan twee voorwaarden voldoet. *Ten eerste* zullen er serieuze pogingen moeten zijn gedaan om voldoende private financiering te regelen. Uit deze pogingen moet blijken dat het onmogelijk is om het project te financieren binnen de kaders van de huidige staatssteunregels en beleid. *Ten tweede* moet het betreffende project voldoende *belangrijk* zijn voor het bereiken van de nationale doelstellingen van de betreffende lidstaat zoals gesteld in de Richtlijn hernieuwbare energie. Gedetailleerde duurzame-energieplannen per lidstaat zouden kunnen worden opgesteld om te verzekeren dat staatssteunbedragen die de maximale steunintensiteiten van de richtsnoeren overschrijden enkel worden toegekend aan projecten die zeer belangrijk zijn voor de duurzame-energiestrategie van de betreffende lidstaat. Zie * hierboven voor een verdere uitweiding over gedetailleerde energieplannen. Als de lidstaten en de Commissie zulke plannen gebruiken om meer duidelijkheid te creëren over het grote belang (of juist het beperkte belang) van een specifiek duurzame-energieproject, dan zullen zij beter in staat zijn om het belang van dat specifieke

project af te wegen tegen het belang van het voorkomen van de vervalsing van de mededinging. Deze plannen kunnen door de Europese Commissie worden gebruikt om te boordelen of is voldaan aan de tweede voorwaarde van de meer flexibele belangenafwegingsprocedure (zie hierboven). Tegelijkertijd stellen gedetailleerde duurzame-energieplannen de lidstaten in staat om tegenover de Commissie te onderbouwen dat een bepaald project voor de productie van duurzame energie (uit de zee) meer staatssteun moet krijgen dan is toegestaan onder de huidige richtsnoeren. Bovendien kunnen dergelijke plannen ook nuttig zijn voor Europese instellingen die investeringsbeslissingen moeten nemen onder Europese investeringsfondsen voor duurzame energie. Zie hierover verder hieronder.

De tweede oplossing die wordt besproken in het artikel over staatssteun is het *verbeteren van de toegang tot financiering* voor projectontwikkelaars van projecten voor de productie van duurzame energie uit de zee. In plaats van zich op te werpen als directe investeerders in duurzame-energieprojecten kunnen lidstaten er ook voor kiezen om zich te richten op het verbeteren van de toegang tot financiering voor bedrijven in de duurzame energiesector. Het staatssteunbeleid biedt hiervoor een kader via onder andere de bepalingen over *risicofinancieringsinvesteringen* in de Algemene Groepsvrijstellingsverordening (AGV) en in de *Richtsnoeren inzake staatssteun ter bevordering van risicofinancieringsinvesteringen* van de Europese Commissie. Deze regels en dit beleid focussen met name op het MKB, de categorie waar de meeste bedrijven die zich richten op duurzame energie uit de zee toe behoren. De maximumbedragen voor risicofinancieringssteun kunnen voor bepaalde type bedrijven en onder bepaalde voorwaarden hoger zijn dan de maximumbedragen onder de EEAG. Risicofinancieringssteun zou daarom in theorie een interessante manier kunnen zijn om te pogen de investeringen in nieuwe en innovatieve projecten voor de opwekking van duurzame energie uit de zee te vergroten. Desalniettemin zijn er ook een aantal nadelen aan deze vorm van staatssteun. Eén daarvan is dat risicofinancieringssteun bedoeld is voor het financieringen van *bedrijven* in plaats van *projecten.* Dit zou het voor lidstaten lastiger kunnen maken om invloed uit te oefenen op de exacte bestemming van het steunbedrag, en zo om te waarborgen dat het gebruikt wordt voor duurzame-energieprojecten.

De derde oplossing die wordt besproken in het artikel over staatssteun is het bevorderen van *investeringssteun op EU-niveau*. In het geval dat Europese steun daadwerkelijk op EU-niveau wordt gecoördineerd (en dus niet direct of indirect wordt gecontroleerd door een lidstaat) dan kwalificeert die steun in principe niet als staatssteun. Steun die op EU-niveau wordt gegeven is daarom in principe niet gebonden aan maximale

steunintensiteiten of aan de restrictieve berekening van de 'in aanmerking komende kosten' (eligible costs) zoals vereist door de AGV en de richtsnoeren. Het artikel over staatssteun merkt desalniettemin op dat de *huidige* Europese steunprogramma's op hun beurt ook financieringsrestricties bevatten. Ter facilitering van een eventuele toekomstige volledige vervanging van nationale steunprogramma's door Europese steunprogramma's, is het wellicht noodzakelijk om duidelijke en gedetailleerde duurzame-energieplannen per lidstaat te introduceren (zie hierboven voor een verdere discussie). Zulke plannen zouden de EU kunnen helpen om prioriteiten te stellen met betrekking tot investeringsbeslissingen. Zonder dit soort plannen bestaat het gevaar dat de vrijheid die de lidstaten ingevolge de RED hebben om hun eigen duurzame-energiestrategie vorm te geven niet wordt beantwoord met passende financiering vanaf het EU-niveau.

L.
De bescherming van habitats, soorten en waterkwaliteit

Het artikel over de bescherming van habitats en soorten, en het artikel over de bescherming van waterkwaliteit onderscheiden twee soorten belemmeringen. De eerste belemmering is het gevolg van de strenge regels in de Vogel- en Habitatsrichtlijnen (VHR) en in de Kaderrichtlijn Water (KRW). Deze regels kunnen het aan een nationaal bevoegd gezag verplichten om een vergunning te weigeren aan grootschalige projecten voor de opwekking van duurzame energie uit de zee. Dit wordt veroorzaakt door de onzekere en zekere negatieve milieueffecten die inherent zijn aan al dit soort projecten. De tweede belemmering wordt veroorzaakt door de grote mate van beoordelingsvrijheid die bevoegde gezagen hebben onder de uitzonderingsbepalingen van de milieurichtlijnen. Deze beoordelingsvrijheid kan resulteren in vergunningsprocedures op projectniveau die in hun belangenafwegingsprocedure onvoldoende rekening houden met duurzame energie. Beide belemmeringen vereisen verschillende oplossingen, welke hieronder worden besproken.

De eerstgenoemde belemmering bestaat uit twee elementen: projecten voor de opwekking van duurzame energie uit de zee hebben *zekere* milieueffecten en ook *onzekere* milieueffecten. Voor de effecten die zeker *en* verboden zijn, is de toepassing van de uitzonderingsbepalingen van de VHR en de KRW de enige mogelijkheid om een vergunningsweigering te voorkomen. Voor onzekere effecten zijn er meer mogelijkheden. De artikelen van dit proefschrift bespreken twee soorten 'adaptive management'-benaderingen (al is het de vraag of de hier besproken benaderingen wel als adaptive management in zijn puurste vorm mogen worden aangemerkt): 'adaptive management' in combinatie met mitigatie (bijv. actieve sonarsystemen die een turbine kunnen stilzetten wanneer er een zeehond bij in de buurt komt) en 'adaptive management' in combinatie met gefaseerde

Zie pagina: 114-120 (KRW), 143-154 (VHR)

implementatie (in dat geval begint een project op heel kleine schaal en wordt de vergunningsverlening voor een uitbreiding van het project afhankelijk gemaakt van de resultaten van de monitoring van tijdens het vorige schaalniveau). Desalniettemin hebben deze 'adaptive management'-benaderingen verschillende nadelen. Die nadelen variëren van het niet altijd voldoende effectief zijn van deze benaderingen, tot dat ze vanuit het perspectief van de aanstormende deadlines voor het behalen van de Europese duurzame-energiedoelstellingen teveel tijd in beslag zouden kunnen nemen. De artikelen betogen daarom dat het ook in het geval van onzekere negatieve milieu-effecten soms noodzakelijk zal zijn om de uitzonderingsbepalingen van de VHR en de KRW toe te passen.

De tweede belemmering houdt verband met de voorgenoemde uitzonderingsbepalingen. Deze bepalingen bieden aan het bevoegd gezag een grote mate van beoordelingsvrijheid, zonder dat de bepalingen enige minimumstandaarden opleggen om te garanderen dat er in vergunningsprocedures op projectniveau voldoende rekening wordt gehouden van zowel de doelen van het milieubeleid als de doelen van het duurzame-energiebeleid. Dit kan problematisch zijn aangezien de Europese milieubeschermingsstandaarden duidelijker geformuleerd zijn dan de standaarden voor het bevorderen van de Europese duurzame-energieproductie. De toepasselijke standaarden voor de meesten van de besproken milieubelangen zijn redelijk duidelijk: geen verslechtering van de waterkwaliteit (KRW), geen blijvende negatieve effecten op de integriteit van Natura 2000 gebieden (VHR), en geen opzettelijke verstoring van diersoorten (VHR). De standaarden van het duurzame-energiebeleid zijn een stuk minder duidelijk gedefinieerd. Volgens de RED moet het aandeel energie uit hernieuwbare bronnen in 2020 in Nederland bijvoorbeeld 14 % zijn. Zo een algemene doelstelling, uitgedrukt in een percentage, zegt niets over het gewicht dat toegekend moet worden aan een individueel duurzame-energieproject. Dit proefschrift stelt voor om dit probleem op te lossen door het invoeren van zogenaamde gedetailleerde nationale energieplannen per lidstaat. Zie * hierboven voor een verdere uitweiding over gedetailleerde energieplannen. Deze plannen zouden een bevoegd gezag kunnen helpen om een gelijkwaardige belangenafweging te maken tussen de bescherming van het milieu (waarvoor door de VHR en de KRW duidelijke en hoge standaarden worden gesteld) en het vergunnen van specifieke projecten voor de opwekking van duurzame energie uit de zee.

M. Aanvullende oplossing:

Ruimtelijke ordening op zee

Het artikel over ruimtelijke ordening op zee beargumenteert dat de bovengenoemde oplossingen slechts voor twee van de drie bovengenoemde problemen daadwerkelijk een oplossing bieden. Deze problemen zijn:

1) Er is een potentieel conflict tussen projecten voor de productie van duurzame energie uit de zee en de milieubeschermingsregels, wat betekent dat voor sommige projecten de vergunning wellicht moet worden geweigerd;

2) ondanks het bestaan van uitzonderingsbepalingen is er geen verplichting voor het bevoegd gezag om deze bepalingen daadwerkelijk toe te passen, noch om een belangenafwegingsprocedure te volgen die rekening houdt met zowel het belang van de opwekking van duurzame energie uit de zee, als de bescherming van habitats, soorten en waterkwaliteit;

3) zelfs *als* deze bepalingen worden toegepast blijft het onduidelijk hoeveel gewicht er door het bevoegd gezag in een belangenafwegingsprocedure moet worden toegekend aan de productie van duurzame energie uit de zee.

De hierboven besproken oplossingen bieden enkel oplossingen voor het eerste probleem (oplossingen: mitigatie, adaptive management, of uitzonderingsbepalingen) en het derde probleem (oplossing: gedetailleerde duurzame-energieplannen per lidstaat). Ze bieden geen oplossing voor het tweede probleem. Ruimtelijke ordening op zee (MSP; Maritime Spatial Planning) zou een oplossing kunnen bieden voor het tweede probleem. De invoering van MSP kan een manier zijn om een noodzaak te creëren voor het uitvoeren van een belangenafweging tussen de Europese regels voor de bescherming van habitats, soorten en waterkwaliteit, en duurzame-energieprojecten. MSP kan de lidstaten en hun instituties verplichten om verder te kijken dan een sectorale beoordeling en om alle relevant beleidselementen mee te nemen in hun beslissingen ingevolge de VHR, KRW en de Kaderrichtlijn mariene strategie (KMS). MSP zou belangenafwegingsverplichtingen kunnen creëren op zowel het planniveau als op lagere besluitvormingsniveaus, waaronder de vergunningverlening op projectniveau.

Het is desalniettemin belangrijk om hier te vermelden dat ondanks dat MSP wellicht kan helpen (indien aan enkele voorwaarden is voldaan) om te garanderen dat er een belangenafwegingsprocedure plaatsvindt, het niet kan garanderen dat verschillende beleidsdoelen op een gelijkwaardige manier worden behandeld binnen zo een procedure. Om dit probleem op te lossen dienen lidstaten er zich van bewust te zijn hoeveel gewicht er binnen een belangenafwegingsprocedure moet worden toegekend aan een individueel project voor de opwekking van duurzame energie uit

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de zee. Om dit doel te bereiken stelt het artikel over MSP voor om maritieme ruimtelijke plannen te koppelen aan gedetailleerde duurzame-energieplannen per lidstaat.

ANALYSE OP BASIS VAN HET NORMATIEVE KADER:
het concept duurzame ontwikkeling

(zie **deel E** van deze samenvatting voor een uitleg van het concept duurzame ontwikkeling)

N.
Het concept duurzame ontwikkeling gebruikt ter beoordeling van de gevonden belemmeringen

Wanneer we de bovengenoemde belemmeringen analyseren in het licht van het integratiebeginsel en het beginsel van solidariteit binnen en tussen generaties, dan blijkt ten eerste dat er op het niveau van het primaire en het secondaire Europese recht weinig daadwerkelijke integratie bestaat tussen het duurzame-energiebeleid en de andere onderzochte Europese beleidsgebieden. Er bestaan enkel mogelijkheden, maar geen garanties, dat er rekening wordt gehouden met beleidsdoelen op het gebied van duurzame energie. Wanneer we inzoomen op het gebruik van de uitzonderingsbepalingen dan blijkt dat die bepalingen vanuit het perspectief van de bevordering van duurzame energie ofwel worden toegepast op een voornamelijk ongecoördineerde wijze (bij de milieugerelateerde uitzonderingsbepalingen), op een te beperkte wijze (bij de uitzonderingsbepalingen van de staatssteunregels), of op een ineffectieve wijze (de uitzondering op de vrij verkeerregels in de Richtlijn hernieuwbare energie). Het bestaan van de uitzonderingsbepalingen biedt geen garantie dat de doelen van het duurzame-energiebeleid kunnen worden bereikt. Bovendien bieden ze geen garantie dat er een gelijkwaardige belangenafweging plaatsvindt van de betrokken belangen. De toepassing van de Europese milieurichtlijnen kan het *de facto* gevolg hebben dat de bescherming van het milieu wordt bevoordeeld boven het bereiken van de Europese duurzame-energiedoelstellingen. De staatsteunregels en beleid houden op hun beurt wellicht onvoldoende rekening met belangrijke* duurzame-energieprojecten. De artikelen van dit proefschrift concluderen dat de relatief vage standaarden voor het bereiken van de Europese duurzame-energiedoelstellingen wellicht aan de wieg liggen van deze potentiële ongelijkwaardige belangenafwegingsprocedures.

Wanneer we het beginsel van solidariteit binnen en tussen generaties in ogenschouw nemen dan blijkt dat het huidige Europese recht niet kan garanderen dat belangrijke duurzame-energieprojecten voorrang krijgen boven economische beleidsgebieden (staatssteun, het vrije verkeer van goederen). Binnen het huidige recht en beleid wordt het ofwel aan de

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rechter overgelaten om per geval te beoordelen of voorrang moet worden gegeven aan het economische of aan het duurzame-energiebeleid, ofwel bestaat er de situatie dat aan het economische beleid automatisch voorrang wordt verleend zodra bepaalde grenswaarden worden overschreden (staatssteun).

De combinatie van een gebrek aan integratie en een gebrek aan toepassing van het beginsel van solidariteit binnen en tussen generaties brengt aan het licht dat het begrip duurzame ontwikkeling in onvoldoende mate wordt toegepast op het snijvlak tussen het milieubeleid, het economische beleid en het duurzame-energiebeleid van de Europese Unie.

O. Het concept duurzame ontwikkeling gebruikt ter beoordeling van de gevonden oplossingen

Wanneer we de oplossingen analyseren in het licht van het integratiebeginsel, dan blijkt dat alle besproken oplossingen eraan bijdragen dat de doelen van het Europese duurzame-energiebeleid beter worden behartigd binnen de andere onderzochte Europese beleidsgebieden. Ze doen dit echter op verschillende manieren. Zo kunnen zowel het legitimeren van een territoriale beperking (het vrije verkeer van goederen) of een meer flexibele toepassing van de staatssteunregels, worden gezien als oplossingen die de lidstaten instrumenten aanreiken die nodig zijn om de doelstellingen van de Richtlijn hernieuwbare energie te bereiken. De aanvullende invoering van gedetailleerde duurzame-energieplannen draagt bij aan een gelijkwaardige belangenafwegingsprocedure, aangezien zulke plannen de lidstaten kunnen helpen om de toepassing van de genoemde instrumenten (bijv. het inroepen van uitzonderingen op het economische beleid) te richten op de meest belangrijke* duurzame-energieprojecten. De toepassing van ruimtelijke ordening op zee (op de wijze als beschreven in het artikel over MSP) draagt eraan bij dat er (waar nodig) een belangenafwegingsprocedure uitgevoerd wordt bij de toepassing van de uitzonderingsbepalingen van de milieurichtlijnen. De toepassing van ruimtelijke ordening op zee kan echter niet garanderen dat die procedure een gelijkwaardige afweging maakt tussen duurzame energie en milieugerelateerde belangen. Dit proefschrift stelt derhalve voor om maritieme ruimtelijke plannen te koppelen aan gedetailleerde duurzame-energieplannen om tot een gelijkwaardige belangenafweging te komen.

Aangezien bovenstaande oplossingen bijdragen aan het bereiken van de doelen van het duurzame-energiebeleid *en* omdat ze een bijdrage leveren aan meer gelijkwaardige belangenafwegings-procedures, kunnen ze worden gezien als een stimulans voor de verdere implementatie van het integratiebeginsel binnen het Europese recht.

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De voorgestelde oplossingen op het gebied van het vrije verkeer van goederen en staatssteun dragen echter *niet* bij aan een verdere implementatie in het Europese recht van het beginsel van solidariteit binnen en tussen generaties. Ondanks dat de besproken oplossingen een opening creëren voor het prioriteren van belangrijke duurzame-energieprojecten boven het economische beleid, kunnen ze niet garanderen dat dit in de praktijk ook daadwerkelijk gebeurt. Dit probleem zou kunnen worden opgelost door de gedetailleerde duurzame-energieplannen bindend te maken voor de lidstaten, in zoverre dat de lidstaten de uitzonderingsbepalingen voor staatssteun of het vrije verkeer van goederen *moeten* inroepen wanneer de meest belangrijke* duurzame-energieprojecten op het spel staan.

* Zie de tabel aan het einde van deel G van deze samenvatting.

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DANKWOORD

In een periode van iets meer dan 24 uur wordt het in Nederland twee keer eb en twee keer vloed. Het ritme van de Nederlandse getijdenstromingen komt overeen, weet ik nu, met het ritme van het schrijven van dit proefschrift. Ook dat proces kende een regelmatig ritme van pieken en dalen. Beiden waren overigens zeer leerzaam. Het belangrijkste verschil is misschien wel dat getijdenstroming een onuitputtelijke energiebron is waar, denken we, geen einde aan komt. Aan het schrijven van dit proefschrift is, weten we, wel degelijk een einde gekomen.

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