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

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## 1 INTRODUCTION

This article gives an overview of the first research results of 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 article is not a full-bodied article; rather, it is an introduction to the more extensive research on this topic that will be undertaken in the next 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.[2] 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 also to 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'.[3]

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.[4] Windmills often lead to opposition by local businesses, citizens and politicians.[5] Solar energy projects are often confronted with barriers related to complicated grid connection rules and lengthy permitting procedures.[6] Furthermore, the national schemes and programmes designed to encourage renewable energy production can encounter legal challenges.[7]

The PhD project aims to find out if very new forms of renewable energy encounter similar problems and, if they

1 Sander van Hees is a PhD researcher at the Utrecht Centre. This is a position paper in advance of his thesis.

2 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.

3 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.

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

5 An example comes from the province of Noord-Holland where (because of ongoing 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.

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

7 See for instance Case C–573/12 *Ålands Vindkraft AB v Energimyndigheten* 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).

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 Energy Directive and the sustainable development goals of the EU in general.[8] 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[9] or adaptation of the legislation that creates the barrier. In some situations it may be necessary to create better coordination between legislation[10] or to improve the implementation of sustainable development. Theoretically, *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 all currently 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.

### 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

8 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.

9 English summary of Project Context http://context.verdus.nl/1377; Willem Salet, Jochem de Vries 'The innovative potential of contextualising legal norms in processes of urban governance: the case of sustainable area development' (2013) CONTEXT Report 1. AISSR programme group Urban Planning, Amsterdam.

10 For a discussion on the 'coordination problem' in the EU see 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)') *Liber Amicorum Bart Hessel*, not yet published.

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.[11] To date there are just a few wave energy pilot projects running. A well known test site 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 gases into a combined heat and 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.

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

#### *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.[12] 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 report of a Dutch tidal energy pilot project[13] and interviews with project developers[14] 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.[15] 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.[16]

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.[17] 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 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.[18]

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.[19]

#### *3.2.2 Relevant EU case law*

The case law of the European Court of Justice confirms – in accordance with the precautionary principle – that

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

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

14 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).

15 F Helfer, C Lemckert and Y G Anissimov 'Osmotic power with pressure retarded osmosis: theory, performance and trends: a review' (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).

16 'Passende Beoordeling van een getijdencentrale in de Oosterscheldekering' (n 13).

17 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 12).

18 Habitats Directive Article 3.

19 B A Beijen *De kwaliteit van milieurichtlijnen* (Dissertation, Utrecht University 2010) 183.

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*,[20] and again in Case C–6/04 *Commission v United Kingdom of Great Britain and Northern Ireland*,[21] the Court ruled that an appropriate assessment is necessary if there is a 'probability, or a risk, that the plan or project will 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'.[22] 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'.[23] 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.[24] 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[25] and blue energy[26] 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 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 environmental research which has been done for a technique in one Member State in the permitting procedure in another Member State.[27]

### *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

20 Case C–127/02 *Waddenvereniging and Vogelbeschermingsvereniging* [2004] ECR I–7405 paras 43–44, 57 and 61.

21 Case C–6/04 *Commission v United Kingdom of Great Britain and Northern Ireland* [2005] ECR I–9017 para 54.

22 Case C–127/02 *Waddenvereniging and Vogelbeschermingsvereniging* (n 20) paras 46–49.

23 ibid paras 52–54.

24 Case C–304/05 *Commission v Italy* [2007] ECR I-7495 paras 68–70.

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

26 Interview with a Dutch entrepreneur who is active in the field of blue energy projects (n 15) (interview transcript available from the author on request).

27 Minutes of EIP Meeting in Brussels on 15 June 2015 with Pavel Misiga (n 12); Interview with a Dutch entrepreneur who is active in the field of marine energy projects (interview transcript available from the author on request).

the projects had a very minimal effect on the site, and no effect on its conservation objectives.[28]

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'.[29] This has been confirmed and further specified in many subsequent cases. In Case C–50/09 *Commission v Ireland*[30] 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'.[31]

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'.[32] 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'.[33]

### *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.[34] 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.[35] At least two reports advise simplifying the EIA procedures for projects at test centres, and for small-size projects.[36] One report argues that: 'The level of required environmental data needs to be proportionate to the size of the project and the potential risks associated with the device at a particular location'.[37]

28 'Passende Beoordeling van een getijdencentrale in de Oosterscheldekering' (n 13); '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).

29 Case C–72/95 *Kraaijeveld and Others* [1996] ECR I-5403 paras 30 and 31.

30 Case C–50/09 *Commission v Ireland* [2011] ECR I-873.

31 ibid para 40.

32 Case C–404/09 *Commission v Spain*, Judgment of 24 November, paras 78–80.

33 Case C–392/96 *Commission v Ireland* [1999] ECR 1-5901 para 66.

34 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).

35 Wave and Tidal Energy Market Deployment Strategy for Europe (SI OCEAN 2014) 38.

36 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 Energy Market Deployment Strategy for Europe (n 35) 40.

37 Wave and Tidal Energy Market Deployment Strategy for Europe (n 35) 40.

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.[38] According to one of the reports, the uncertainties of the EIA process have a negative influence on investors in marine renewable energy projects.[39] 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.[40]

#### *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 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[41] 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 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.

##### *3.4.2.2 Public waste water treatment body entering the market*

An interview[42] 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,

38 SOWFIA Project (n 36) 10–11, 27.
39 SOWFIA Project (n 36) 31.
40 ibid 21.
41 Wave and Tidal Energy Market Deployment Strategy for Europe (n 35) 23; Conversation with a Dutch consultant who is active in the field of tidal energy projects (conversation transcript available from the author on request).
42 Interview with a professional working in the energy from waste water sector in the Netherlands (interview transcript available from the author on request).

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 it is also exploring the possibilities of producing energy from waste water.[43]

*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.

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.

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