Contents

ARTICLES

Investment State Aid for Ocean Energy Projects in the EU:

A Lack of Integration with the Renewable Energy Directive?

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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 to the European Commission, ocean energy techniques can play an important role with respect to energy security and they can make an important contribution to the European Union's decarbonisation goals.[4] Tidal energy, for instance, has a predictable and of-

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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 an inshore or onshore configuration. See Figure 1 for a further explanation of the different ocean energy techniques.

4 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, 2-3.

ten constant energy output, as opposed to wind and solar energy, which generate 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.[5] At the same time, there are fields of EU law that can come into conflict with the 'producing more renewable energy' objective. These fields of EU law include nature protection law[6], State aid law, free movement law[7], and water law[8]. This article analyses whether there is a lack of integration between the Renewable Energy Directive and the EU State aid framework. It focuses on investment State aid for pre-commercial[9] ocean energy projects. Several reports show that the need for public investment funding is highest in these phases of development, particularly with regard to the so-called 'commercialisation valley of death'. This is further discussed in Section II.

The direct reason for researching the integration between these two legal frameworks is the Ocean Energy Forum's[10] claim that the EU's State aid guidelines remain 'burdensome and restrictive' for ocean energy projects. In November 2016, the Ocean Energy Forum presented the 'Ocean Energy Strategic Roadmap – Building Ocean Energy for Europe'. This document reflects the common vision of the ocean energy sector –ie builders and developers– on the future of ocean energy in the EU.[11] One of its conclusions was that for investment and project-specific (individual) financial support for ocean energy projects, EU State aid guidelines remain 'burdensome and restrictive.'[12] In essence, this is a very correct conclusion, as pursuant to Article 107(1) of the Treaty on the Functioning of the European Union (TFEU) State aid is prohibited in the EU. The State aid rules are therefore always restrictive to some extent, but an exemption is possible if one of the exemption clauses of Article 107(3) applies. The right question to ask is therefore whether the State aid rules are *too* burdensome and restrictive. The present article argues that the State aid framework would 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. If that is the case, then it could be said that there is a lack of integration between the EU State aid framework, on the one hand, and the Renewable Energy Directive, on the other.

In this article '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

5 For instance, with respect to tidal energy in the UK: Marine Scotland, 'MeyGen Decision, Decision Letter and Conditions' (2013) 14 and 22 <http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/DecisionLetter> accessed 12 July 2018: '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.'

6 S van Hees, 'Large-scale Water-related Innovative Renewable Energy Projects and the Habitats and Birds Directives: Legal Issues and Solutions' (2018) 27 European Energy and Environmental Law Review, 15.

7 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] (2014) 5/6 Nederlands Tijdschrift voor Energierecht [Dutch Journal for Energy Law] 212.

8 See S van Hees, 'Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions' (2017) 14 Journal for European Environmental & Planning Law 315.

9 For the purposes of this article, *pre-commercial* is defined as all phases of development past the R&D and prototype phases and up to industrial roll-out. See s II for further elaboration.

10 The Ocean Energy Forum was set up as part of an action plan that the European Commission has developed to support the ocean energy sector. See <https://ec.europa.eu/maritimeaffairs/policy/ocean_energy_en> accessed 9 July 2018.

11 The roadmap was produced 'through a series of meetings, workshops and open-session conferences of the Ocean Energy Forum'. Ocean Energy Forum, 'Ocean Energy Strategic Roadmap – Building Ocean Energy for Europe' (2016) 13.

12 While the Ocean Energy Forum's 'strategic roadmap' is not very specific on what are the exact elements in State aid law and policy that are 'burdensome and restrictive' for arranging appropriate investment aid for ocean energy technologies, it does give some suggestions on how to solve the issue. First, the roadmap states that the notification thresholds for individual and investment aid under the General Block Exemption Regulation are too low. It suggests that these could be raised to €30 million. Second, the roadmap argues that the maximum aid intensities for individual and investment aid should be raised. See: Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 32.

coherent and mutually reinforce each other [...].' (the Renewed EU Sustainable Development Strategy).[13] It is suggested here that integration in the EU context essentially means that the documents (in the case of State aid: the Treaty, the General Block Exemption Regulation (GBER) and the Guidelines, and in the case of renewable energy: the RED) 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 always full recognition can be given to the goals of both policy areas. Often, trade-offs 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 is argued here that there is a lack of integration if the State aid framework were to prevent from the outset that *those* renewable (ocean) energy projects which are *important* for achieving a Member State's renewable energy targets can obtain sufficient funding. This article investigates whether such a lack of integration exists and what paths can be chosen to resolve it.

Before discussing the issues identified above, some attention needs to be drawn to the question why a possible lack of public funding for ocean energy projects should be solved through *State aid* in the first place. Arguably, it would be more logical to solve this issue by managing renewable energy investment aid programmes fully on the EU level. Investment aid provided on the EU level is not prohibited by the State aid framework.[14] Moreover, aid given on the EU level may help to minimise distortion of competition on the internal market – especially when implemented through a competitive bidding process that all European undertakings and projects are allowed to participate in. The main reason why State aid is currently still a logical approach to support ocean energy projects is the design of the current RED. The RED obliges Member States to reach a certain percentage of *domestically produced renewable energy*. For Member States a national State aid programme is therefore a potentially powerful instrument to directly influence the volume of domestically produced renewable energy. This has been recognised both by the RED and by the European Court of Justice.[15]

In Section III, the conditions for the application of the GBER and the Commission Guidelines on State aid for environmental protection and energy 2014 are discussed. These are the two main law and policy instruments for the application of the State aid rules to renewable energy projects. It is suggested in this article that the GBER does not pose a barrier to ocean energy projects, and that most conditions of the Guidelines do not erect barriers to investment State aid for pre-commercial ocean energy projects either. Nonetheless, Section III.3 discusses two elements that are part of the proportionality criterion under the Guidelines that may form a barrier to investment State aid to ocean energy projects. This is, *first*, the fact that the method for calculating the costs that are eligible for State aid substantially limits the amount of aid that may be given by Member States. And, *second*, the maximum aid intensities in the Guidelines which limit the aid that can be given to a project to a pre-set percentage of the calculated eligible costs. Section IV discusses whether it can be said that –because of these limitations– the State aid framework offers insufficient room for aid to important ocean energy projects, and if therefore there is a lack of integration with the Renewable Energy Directive. Section V discusses different approaches with regard to how to deal with a possible lack of integration between the RED and the State aid framework in the field of investment aid to ocean energy projects. Finally, section VI formulates a conclusion and some final observations. Before all this, first, the next section discusses why pre-commercial ocean energy projects need State aid in the first place.

II. The Need for Investment Aid for Pre-commercial Ocean Energy Projects

This section explains the main concepts used in the present article. First, the concept of investment aid

13 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) s 5.3, and S van Hees, *Sustainable Development in the EU: Redefining and Operationalizing the Concept* (2014) 10(2) Utrecht Law Review ss 2.1 and 2.3.1.

14 Financial support given directly by EU institutions is not sourced from the budget of Member States and is therefore not State aid in the sense of art 107 TFEU. See s V.3.b.

15 Renewable Energy Directive (n 1) para 25 of the preamble; Case C-573/12 *Ålands Vindkraft* [2014] ECLI:EU:C:2014:2037, paras 95-103.

it explained. Secondly, it defines what is understood by pre-commercial ocean energy projects. Thirdly, it is explained why this type of project may need investment State aid.

1. Investment State Aid

This article focuses on investment aid. There are two main types of public financial support to renewable energy technologies: investment aid and operating aid. While operating aid is directly related to the quantity of electricity produced, investment aid is usually not.[16] *Operating aid* is aid to projects when they are operational and produce energy for the market. Operating aid can be given in several forms, including as 'premiums', which is a top-up on the market price that compensates renewable energy producers for the difference in the costs of producing renewable energy compared to non-renewable energy.[17] *Investment aid* generally covers the upfront capital costs of a renewable energy project. Investment aid may take various forms, including direct grants, repayable loans, and tax exemptions or reductions.[18] Most existing academic publications on State aid and renewable energy deal with *operating aid*.[19] This article only deals with *investment aid*, on which few publications have so far been written. Moreover, as most ocean energy technologies are still at an early phase of development, sourcing sufficient *investment* funding is a primary concern for projects based on these technologies.

2. Pre-commercial Ocean Energy Projects

Furthermore, this article focuses on investment aid to *pre-commercial* ocean energy projects. For the purposes of this article, *pre-commercial* is defined as all phases of development past the R&D and prototype phases and up to industrial roll-out.[20] These include the Technology Readiness Levels (TRLs) 5 to 7 (demonstration), and 6 to 8 (pre-commercial phase).[21] These are the phases of development that the most mature ocean energy projects are currently in, while others may also enter these phases in the near future.[22] These are also the phases of development that correspond to the so-called 'commercialisation valley of death' for ocean energy developments.[23] See Figure 3 below for a typical 'technological readiness level' scale.

The main ocean energy techniques in the EU are: tidal energy, wave energy, and salinity gradient energy (blue energy). They are briefly described in Figure 1.

Box 1 (see Appendix) gives two examples of current ocean energy projects in the EU. These merely serve as illustrations of the type of projects that this article deals with. There is no evidence that the specific projects mentioned in Box 1 (see Appendix) experienced difficulties in securing sufficient private

16 K Struckmann and G Sapi, 'Energy and Environmental Aid' in P Werner and V Verouden (eds), *EU State Aid Control – Law and Economics* (Wolters Kluwer 2017) 676.

17 ibid 675.

18 European Commission, 'Commission Staff Working Document – European Commission guidance for the design of renewables support schemes Brussels' SWD(2013) 439 final, 11; Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 30; Struckmann and Sapi, 'Energy and Environmental Aid' (n 16) 676.

19 For instance: R Callaerts, 'State Aid for the Production of Electricity from Renewable Energy Resources' (2015) 24 European Energy and Environmental Law Review 17; S-L Penttinen, 'The first examples of designing the national renewable energy support schemes under the revised EU State aid guidelines' (2016) 37(2) European Competition Law Review 77.

20 Often, 'pre-commercial' is meant to refer only to TRL's 6-8. For practical reasons the scope of the concept has been widened for the purposes of this article. See for instance: European Commission DG Research and Innovation (study by Ecorys and Fraunhofer), 'Study on lessons for ocean energy development – final report' (2017) xiv.

21 See for instance: European Commission, 'Study on lessons for ocean energy development – final report' (n 20) xiv; Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 22.

22 Wave energy and salinity gradient energy are in the 'prototype' phase (TRLs 3-6), and tidal stream energy is in the demonstration phase (TRLs 5-7) or in the pre-commercial phase (TRLs 6-8), depending on the particular technique. Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 23, and European Commission Joint Research Centre, 'Ocean Energy Status Report – Technology, market and economic aspects of ocean energy in Europe : 2016 edition – Study' (2017) DOI: <http://dx.doi.org/10.2760/509876>.

23 'The Commercialisation Valley of Death is the point at which investment needs are greatest but so are risks associated with potential failure creating very high disincentives to participation in funding projects' '[The Commercialisation Valley of Death entails] far higher capital sums than earlier technology innovation levels, but […] risks levels are much increased.' European Commission DG Research and Innovation (study by ICF in association with London Economics), 'Innovative Financial Instruments for First-of-a-Kind, commercial-scale demonstration projects in the field of Energy' (2016) 40 (Figure 4.1), 41 and 58.

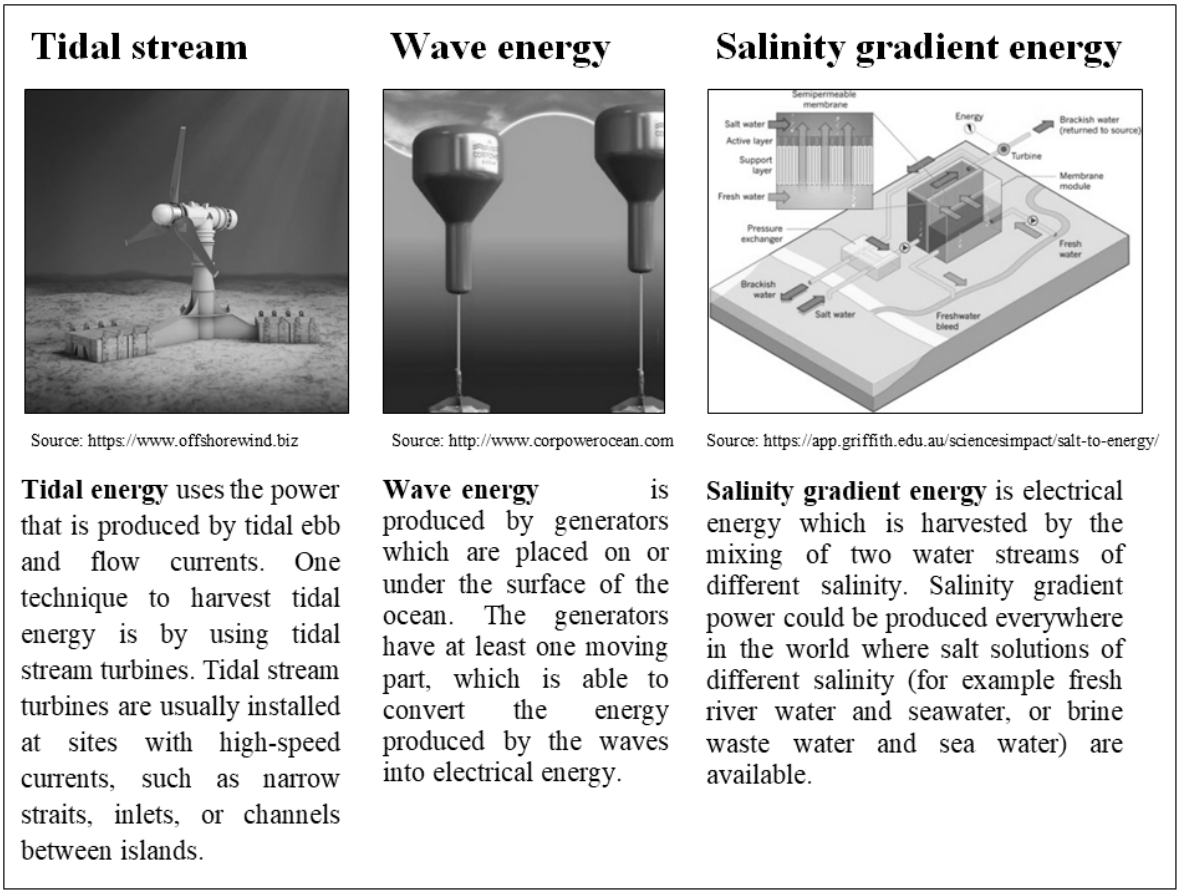


Figure 1. *Main current ocean energy techniques in the European Union.*

or public funding. It is difficult to give examples here of projects that have actually experienced such difficulties. There are two main reasons for this. First, it is often unclear why certain projects proceed and others do not. Project failure *could* be related to a lack of investment State aid, but also to technical problems or to environmental uncertainties which result in companies halting a project or which prevent competent authorities from granting a licence for a project.[24] Second, companies are usually not willing to share sensitive financial information. Nevertheless, there are indications from practice that the State aid framework is insufficiently flexible for facilitating certain pre-commercial ocean energy projects. These are further discussed in Section IV.1.

3. The Need for Investment Aid for Pre-commercial Ocean Energy Projects

In its Guidelines on State aid for environmental protection and energy the European Commission acknowledges that the implementation of the Renewable Energy Directive may not always result in the most efficient market outcome.[25] It also states that 'under certain conditions State aid can be an appro-

24 A recent study carried out by *Ecorys* showed that opinions differ about the reasons for ocean energy project failures. The study found that '[…] developers and industry representatives point rather to non-technological reasons, including framework and regulatory conditions, research and finance support as the main hurdles. Public sector representatives see technological factors as a more important barrier.' Moreover, the study indicated that the failure of two wave energy projects – Pelamis and Aquamarine – was related to a mix of technological barriers and non-technological barriers. European Commission, 'Study on lessons for ocean energy development – final report' (n 20) 22.

25 European Commission, 'Guidelines on State aid for environmental protection and energy 2014-2020' [2014] OJ C200/1, para 107 ('Environmental and Energy State Aid Guidelines').

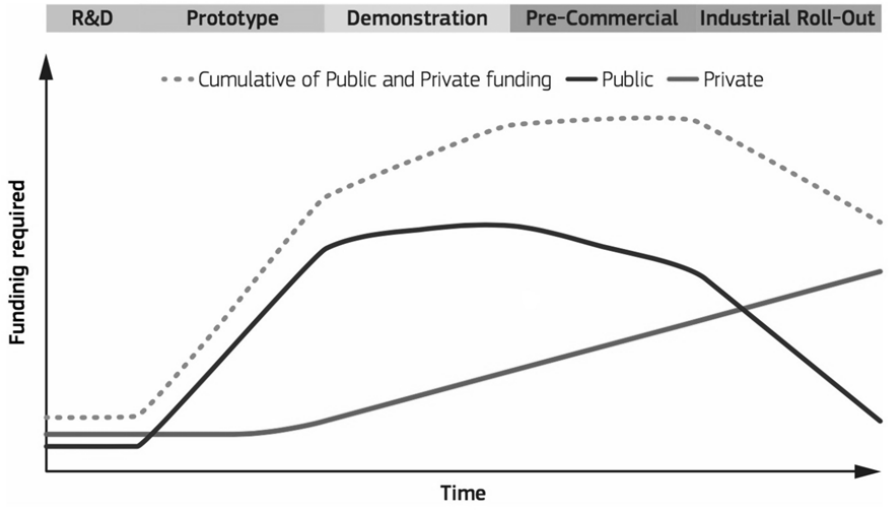


Figure 2. *Indicative share of private and public funding for an ocean energy concept per development phase.*
Source: Ocean Energy Forum, 'Ocean Energy Strategic Roadmap – Building Ocean Energy for Europe' (2016) 31.

priate instrument to contribute to the achievement of the Union objectives and related national targets.'[26] Several reports, articles and research reports show that public financial support for ocean energy technologies is indeed needed. In its Ocean Energy Status Report of 2016, the European Commission's Joint Research Centre (JRC) indicates that market uptake for tidal energy and wave energy is slow.[27] It stresses that public support for demonstration projects is fundamental to ensure the development of a tidal energy market and to increase the number of future projects. It also mentions the importance of public support for wave energy.[28] See Figure 2 for the indicative share of private and public funding for an ocean energy concept per development phase. It must be noted that the limited market uptake of ocean energy technologies is not only caused by difficulties in securing sufficient financing. The main short-term barriers – especially in the case of wave energy – are still technology issues.[29] Nonetheless, public investments in pre-commercial ocean energy projects are often needed. There are three main reasons for that, which are discussed below.

First, there is the existence of a market failure[30] which hampers the development of renewable energy in a general sense. The market failure that particularly affects the development of renewable energy projects is 'negative externalities'. These negative externalities take the form of negative environmental effects that are not taken into account in the price of non-renewable forms of energy production. As a result, the market provides too few incentives for en-

26 ibid para 107.

27 European Commission, 'Ocean Energy Status Report - 2016 Edition' (n 22) 19.

28 ibid 21.

29 ibid 22, 26.

30 In principle, competitive markets are expected to create efficient outcomes in terms of prices, output and the use of resources. In economics, an efficient outcome corresponds – in its strictest meaning – to a situation 'where the allocation of resources is optimal in the sense that no one can be made better off without making someone else worse off.' This is called 'Pareto efficiency'. Under certain conditions markets will however not create efficient outcomes. These situations are referred to as 'market failures'. State aid is one of various methods to improve the level of efficiency of the economy. Other methods are: using market regulation, creating incentives or discouragement through tax policy, or – in the case of air pollution – creating an emissions trading scheme. State aid could help to 'make the cake bigger', ie stimulating the market to become more efficient which will lead to increased welfare, without making any market player worse off. 'A market failure arises if, from a welfare creation point of view, the market outcome results in either too much or too little production of a certain product. This may, for instance, be the case if certain costs of production (eg the costs of pollution) are not taken into account by the company producing the product.' Based on V Verouden and O Stehman, 'Economics of State aid control' in N Pesaresi et al (eds), *EU Competition Law, v. 4, State aid* (2nd edn, Claeys & Casteels Publishing 2016) 40-42.

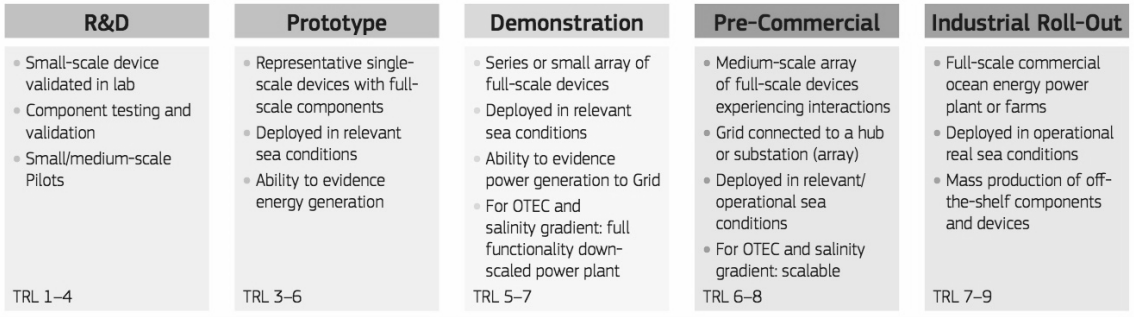


Figure 3. *Technology readiness level (TRL) scale. Source: Ocean Energy Forum, 'Ocean Energy Strategic Roadmap – Building Ocean Energy for Europe' (2016) 22.*

ergy companies to invest in renewable energy.[31] The polluter-pays principle is a fundamental principle of EU environmental law[32], and it ensures –if properly implemented– that the price of electricity produced from fossil sources reflects the degree of pollution it causes. Due to, *inter alia*, the low effectiveness of the European Union's Emissions Trading System (EU ETS), this is currently not the case.[33] Therefore, market parties may find investments in conventional energy still more financially interesting, which results in the necessity for public support to ensure the advancement of renewable energy projects.[34] The market failure of 'negative externalities' is one of the main reasons for the existence of a State aid regime to support energy from renewable sources.[35] It applies to many renewable energy projects, not just to ocean energy projects. Nevertheless, practice shows that the more established renewable energy forms –mainly onshore and offshore wind energy– are increasingly less dependent on State aid.[36] This shows that the scope of the market failure is changing.

Apart from the existence of a market failure that affects renewable energy in general, there are some additional barriers to obtaining private funding that specifically apply to *innovative* renewable energy –including ocean energy. These barriers include the fact that the developers of pre-commercial ocean energy projects are usually small or medium-sized enterprises (SMEs) which generally do not have sufficient equity to finance the pre-commercial phase of their techniques.[37]

Moreover, it is difficult to secure private investments for pre-commercial ocean energy projects. There are two main reasons for this. First, first-of-a-

31 Based on *Verouden and Stehman*, who describe the market failure type called 'negative externalities' as follows: 'Externalities arise when actions by one actor have consequences for other actors which are not taken into account by the former in its decision making. Those effects may be negative ('negative externalities') or positive ('positive externalities'). […] To illustrate, when producers do not take into account the deterioration of the environment induced by their activities, negative externalities may arise; it may for instance increase the cost of other companies in the economy that rely on a clean environment to produce goods (farmers, camping sites, water companies). In those circumstances, the market produces too many environmentally harmful goods and provides too few incentives for the polluting companies to invest in environmental improvements, even though it would be beneficial for the economy if they did. In such cases, State intervention can change the incentives of the market players so that they do take the costly side effects into account.' See Verouden and Stehman, 'Economics of State aid control' (n 30) 42-43.

32 art 191(2) TFEU.

33 For further reasons as to why it may be difficult to apply the polluter pays principle in full at the present time, see M Könings, 'Environmental Aid' in L Hancher, T Ottervanger and PJ Slot (eds), *EU State Aids* (5th edn, Sweet & Maxwell 2016) 937-938.

34 For a further analysis of the role that State aid can play to mitigate the incomplete application of the polluter pays principle, see Könings, 'Environmental Aid' (n 33) 938, and Verouden and Stehman, 'Economics of State aid control' (n 30) 44.

35 See Environmental and Energy State Aid Guidelines (n 25) paras 34 and 115, and Commission Regulation (EU) No 651/2014 declaring certain categories of aid compatible with the internal market in the application of Articles 107 and 108 of the Treaty (General Block Exemption Regulation) (2014) OJ L187/1, para 55 of the preamble. Also see Verouden and Stehman, 'Economics of State aid control' (n 30) 43.

36 For instance: the Swedish energy company Vattenfall wants to build a large wind energy farm in the Dutch North Sea without government subsidies. 'NUON: windpark in zee zonder subsidie' ['NUON: wind energy farm at sea without subsidies'] *NRC* (16 December 2017) <https://www.nrc.nl/nieuws/2017/12/16/nuon-windpark-in-zee-zonder-subsidie-a1585204> accessed 26 March 2018.

37 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, 6; Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 9.

kind projects have a high Capital Expenditure (CAPEX).[38] Capital expenditure can be defined as the money that a company spends on the equipment that it uses to produce its product or to deliver its services. Ocean energy's high CAPEX requires considerable amounts of 'upfront capital': high investments right from the start of a project. Second, there are often still uncertainties concerning the production levels, the reliability of the technology and the maintenance requirements for larger ocean energy projects.[39] Also, the exact environmental effects of ocean energy technologies are often uncertain and can differ according to the location of the project. Therefore, governments often link consent for ocean energy projects to extensive environmental monitoring obligations, the results of which may influence the consenting process for future phases of the project.[40] This may also cause uncertainties for the advancement of the project. The high CAPEX in combination with the uncertainties can create a higher financial risk, which may discourage private parties from investing in pre-commercial ocean energy projects.[41] Therefore, private investors often demand a substantive track record to show that an energy technology can deliver stable revenue during the whole life span of the project, otherwise projects are deemed to be 'not bankable'.[42] It takes time, however, to build such a track record.

Figure 3 shows a typical 'technological readiness level' scale. The area between prototype and industrial roll-out is often described as the commercialisation 'valley of death', where producers of renewable energy technologies have difficulties in finding private investments for the final route to the commercialisation of their technique.[43]

The market failure and additional barriers discussed above show that there is a need for public investment aid during the pre-commercial phases of ocean energy projects (see Section II.2 on how 'pre-commercial' is defined in this article). Present State aid rules and policy allows such investment aid to a certain extent. The following section explores whether these rules and policies are nevertheless burdensome and restrictive, as argued in the Ocean Energy Forum's 'strategic roadmap'.

III. The State Aid Framework

With regard to the compatibility of State aid measures with the EU State aid rules roughly three situations can be distinguished. First, there is the situation that the State aid measure is not considered to be State aid at all. This can be the case if one of the basic conditions for the existence of State aid is not fulfilled.[44] With respect to investment State aid to

38 D Magagna and A Uihlein, 'Ocean energy development in Europe: Current status and future perspectives' (2015) 11 International Journal of Marine Energy 84, 89; Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 9.

39 Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 9.

40 For instance, while the project proposal of a Scottish tidal energy project referred to a deployment of up to 61 tidal turbines, 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 protected Natura 2000 site and species. See: Marine Scotland, 'MeyGen Decision - Appropriate Assessment' (n 29) 77. This consenting method is called a 'phased deployment approach'. For further analysis see: Van Hees, 'Large-scale Water-related Innovative Renewable Energy Projects and the Habitats and Birds Directives: Legal Issues and Solutions' (n 6) 18-20 and 32-33.

41 Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 9; Magagna and Uihlein, 'Ocean energy development in Europe: Current status and future perspectives' (n 38) 87; European Commission, 'Study on lessons for ocean energy development – final report' (n 20) 34-35.

42 Based on presentations given at the Ocean Energy Europe conference on 8 November 2016 in Brussels.

43 'The Commercialisation Valley of Death is the point at which investment needs are greatest but so are risks associated with potential failure creating very high disincentives to participation in funding projects' '[The Commercialisation Valley of Death entails] far higher capital sums than earlier technology innovation levels, but […] risks levels are much increased.' European Commission, 'Innovative Financial Instruments for First-of-a-Kind, commercial-scale demonstration projects in the field of Energy' (n 23) 40 (Figure 4.1), 41 and 58. The JRC report indicates that the current availability of public support mechanisms does not fully cover the development trajectory of ocean energy technologies. While public funding schemes are available for R&D and demonstration projects, they are lacking in the pre-commercial phase. European Commission, 'Ocean Energy Status Report - 2016 Edition' (n 22) 26-27.

44 Pursuant to art 107(1) TFEU, these are: the transfer of state resources, an advantage for the undertaking, selectivity, and distortion of competition and the effect on trade between Member States. For instance, in the seminal *Preussen Elektra* case, the European Court of Justice decided that the obligation placed on electricity distributors by the German authorities to purchase electricity from renewable energy sources at a fixed minimum price did not involve a direct or indirect transfer of State resources to undertakings. It was therefore not considered to be State aid in the sense of art 107(1) TFEU. Case C-379/98 *Preussen Elektra* [2001] ECLI:EU:C:2001:160, 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. For a further discussion of the basic conditions for the existence of State aid in the area of energy and the environment, see: Könings, 'Environmental Aid' (n 33) 940-947.

pre-commercial ocean energy projects the basic conditions are however usually expected to be fulfilled.[45] Second, there are State aid measures which are State aid, but which do not have to be notified to the European Commission because they fall within the scope of the General Block Exemption Regulation.[46] Third, there are State aid measures that must be notified to the Commission, which will then assess the measure on a case-by-case basis in accordance with the assessment criteria as described in the Guidelines on State aid for environmental protection and energy 2014-2020 (EEAG).[47] These Guidelines acknowledge that the implementation of the Renewable Energy Directive may not always result in the most efficient market outcome. It states that 'under certain conditions State aid can be an appropriate instrument to contribute to the achievement of the Union objectives and related national targets.'[48] Proportionality is a guiding principle in EU law[49], and also in the EU State aid framework[50]. It plays an important role in the application of both the GBER and the EEAG, in which it is translated into separate and very detailed conditions for the application of these instruments. The present article argues that the proportionality criterion –especially when applied under the Guidelines– may form the main barrier to investment aid for ocean energy projects. Special attention will be paid to this criterion in the sections below.

The sections below discuss the GBER and the EEAG and their relevance for investment aid to ocean energy projects.

1. The General Block Exemption Regulation

The General Block Exemption Regulation declares five categories of aid to be compatible with the internal market within the meaning of Article 107(3) TFEU. These categories are exempted from the notification requirement of Article 108(3) TFEU, but only if all relevant conditions are fulfilled. The exempted categories of aid include 'aid in favour of environmental protection', which includes the sub-category 'investment aid for the promotion of energy from renewable sources'. There are several criteria that have to be fulfilled for the GBER to be applicable. Three of them are particularly relevant to ocean energy projects: the threshold, the existence of an incentive effect, and the proportionality criterion. First, the application of the GBER to investment aid for environmental protection is bound to a *threshold* of €15 million per undertaking per investment project.[51] If an aid measure exceeds that threshold, then the GBER is not applicable.[52] Second, the existence of an *incentive effect* must be proven. This condition can probably be fulfilled relatively easily, as an incentive effect is considered to be present if the aid recipient has done the aid application before the project started.[53] Third, investment aid can only be exempted under the GBER if it does not exceed certain pre-set *maximum percentages* of the *eligible costs*.[54] This could be seen as a *proportionality test*. Due to pre-commercial ocean energy projects' dependency on public

45 It is also expected that the development of pre-commercial ocean energy projects cannot be seen as a Service of General Economic Interest (SGEI) in the sense of the ECJ's *Altmark* case. Investment State aid to such projects cannot therefore be considered to be compensation to indemnify undertakings for a public service obligation, and taking away the 'advantage' element of State aid. Cf Könings: '[…] usually a compensation for a service of general economic interest should be aimed at large groups in society. Examples include citizens taking the bus in rural areas or receiving postal mail in remote areas. Of course, it is good for society when companies receive a subsidy or compensation to improve their own environmental performance. However, such aid cannot be characterized as a public service obligation. If that was to be the case, it would basically lead to the end of State aid control on environmental measures.' Könings, 'Environmental Aid' (n 33) 945. For a discussion of SGEIs in the field of energy policy see also: Callaerts, 'State Aid for the Production of Electricity from Renewable Energy Resources' (n 19) 19-20.

46 General Block Exemption Regulation (n 35).

47 In principle, ocean energy projects may also be assessed under the R&D Guidelines. As this article focuses on investment aid to *pre-commercial* ocean energy projects, the R&D Guidelines are not discussed in this article. For the R&D Guidelines, see European Commission, 'Framework for State aid for research and development and innovation' (R&D Guidelines) [2014] OJ C198/1.

48 Environmental and Energy State Aid Guidelines (n 25) para 107.

49 TEU, art 5.

50 General Block Exemption Regulation (n 35) paras 3 and 22 of the preamble; Environmental and Energy State Aid Guidelines (n 25) para 27(e).

51 General Block Exemption Regulation (n 35) art 4.

52 This is irrespective of whether the aid is awarded through an aid scheme, or as 'ad-hoc' aid. If the GBER is not applicable, the whole amount of aid must be notified to the Commission pursuant to art 108(3) TFEU, and not only the amount by which the thresholds are exceeded. See: R Ianus, 'Aid Exempted from Notification to the Commission: The General Block Exemption Regulation (GBER)' in H Hofmann and C Micheau, *State aid law of the European Union* (2016 Oxford University Press) 330.

53 For 'Ad hoc aid granted to large enterprises' it must additionally be proven that the aid will result in an additional increase either in the scope of the project, in the total amount spent by the beneficiary on the project, or in the speed of completion of the project. General Block Exemption Regulation (n 35) art 6(3).

54 General Block Exemption Regulation (n 35) para 22 of the preamble.

funding, this condition may pose a barrier to ocean energy developments. The reasons for this dependency were assessed in section II of this article.

Nevertheless, even if not all conditions of the GBER can be fulfilled, a State aid measure may still be found to be permissible after obligatory notification pursuant to Article 108(3) TFEU and a subsequent case-by-case State aid assessment carried out by the European Commission under the Guidelines on State aid for environmental protection and energy. Hence, the possible restrictiveness of the GBER's threshold of €15 million, the eligible costs calculation, and of its maximum aid percentages do not as such have a prohibitive effect on ocean energy developments. The GBER is therefore not further discussed in the remaining sections of this article.

2. The Guidelines on State Aid for Environmental Protection and Energy

In cases where the GBER does not apply, the Commission decides if the aid measure is compatible with the internal market on the basis of Article 107(3)(c) TFEU.[55] In its Guidelines on State aid for environmental protection and energy 2014-2020, the Commission explains how it intends to exercise its decision-making power under that article with respect to State aid in the field of energy and the environment. Although these guidelines are a soft-law instrument, they are binding on the European Commission.[56] The guidelines mention 'investment and operating aid for energy from renewable sources' as one of the State aid measures that may, under certain conditions, be compatible with the internal market.[57] Below, the six main conditions[58] are discussed which the Commission applies in its assessment of whether or not an investment State aid measure for an ocean energy project is compatible with the internal market. These conditions are: the contribution to a well-defined objective of common interest, targeting a residual market failure, the appropriateness of the aid, avoiding undue negative effects on competition and trade, incentive effect of the aid, and the proportionality of the aid.

First, the Guidelines require that the aid contributes to a well-defined objective of common interest.[59] This criterion is not expected to give rise to any problems for ocean energy as the Commission has emphasised in several of its State aid decisions that State aid to renewable energy contributes to the achievement of the Member States' long-term climate change and energy sustainability targets set by the EU as part of its EU 2020 and 2030 strategies.[60] *Second*, State aid is only compatible with the internal market if it targets a *residual market failure*[61] that is not already addressed by other policies and measures. The guidelines acknowledge that the EU ETS and CO_2

55 art 108(3) TFEU requires the Member States to notify the Commission of any plans to grant State aid. Subsequently, it should wait with implementing the aid until the Commission has reached its final decision on the aid's compatibility with the internal market.

56 The European Court of Justice ruled that 'the Commission is bound […] by the guidelines and notices that it issues in the area of supervision of State aid where they do not depart from the rules in the Treaty and are accepted by the Member States.' Case C-409/00 *Spain v Commission* [2003] ECLI:EU:C:2003:92, para 95. Moreover, the Commission is bound by its own guidelines through the 'legitimate expectations' doctrine, which is a reflection of the principle of legal certainty. This doctrine provides that parties (competitors of the beneficiary company, for instance) affected by the guidelines may rely on them if the guidelines evoke legitimate expectations as to how the Commission will deal with a specific State aid case. This does not however prevent the European Court of Justice from deviating from the guidelines if a case is challenged before it. A Johnston, 'The Impact of the new EU Commission guidelines on State Aid for environmental protection and energy on the promotion of renewable energies' in FJ Säcker et al (eds), *Renewable Energy Law in Europe* (Peter Lang 2015) 22-23, 41.

57 Environmental and Energy State Aid Guidelines (n 25) para 18(c).

58 All the guidelines that entered into force after the 2012 State Aid Modernisation (SAM) initiative include a compatibility assessment that is based on the 'seven common principles of compatibility'. The present section discusses all those principles in the light of investment aid to ocean energy, except for the transparency principle, as this is merely a procedural requirement. See further: P Nicolaides, 'The economics of State aid' in L Hancher, T Ottervanger and PJ Slot (eds), *EU State Aids* (5th edn, Sweet & Maxwell 2016) 31-32 and 44.

59 The Guidelines specify that the primary objective of State aid in the energy sector is 'to ensure a competitive, sustainable and secure energy system in a well-functioning Union energy market.' For every environmental or energy State aid measure the Member State in question will have to define precisely the objective pursued and explain what is the expected contribution of the measure towards the aforementioned objective. Environmental and Energy State Aid Guidelines (n 25) paras 30-31.

60 These cases include an investment and operating aid case on a tidal energy plant in France, and an investment and operating aid case on a Finnish offshore wind farm in Arctic conditions. In these cases the Commission decided in relation to the 'objective of common interest' test that these projects help the Member State to 'diversify its energy mix, expanding the portfolio of available renewable energy technologies.' This suggests that for innovative renewable energy projects the 'objective of common interest' criterion will not be a problem in practice. See: *Support to French NEPTHYD tidal energy demo plant* (Case SA.42838), Commission Decision [2017] OJ C 307, paras 44-45; *Individual aid to off-shore wind farm demonstration project* (Case SA.38428), Commission Decision [2014] OJ C 460, paras 25-26.

61 A market failure exists if there is, from a welfare creation point of view, either too much or too little production of a certain product. See s II.3 for further elaboration.

taxes may not yet fully internalise the costs of greenhouse gas emissions. State aid can therefore be 'a driver for the achievement of the related, but distinct Union objectives for renewable energy.' The Commission therefore *presumes*[62] the existence of a residual market failure.[63] This condition will therefore not usually cause any problems for ocean energy projects. *Third*, the aid must be *appropriate.* This condition requires the Member States to investigate if there are other, better placed instruments to achieve their environmental and energy objectives.[64] The Guidelines indicate that 'in order to allow Member States to achieve their targets in line with the EU 2020 objectives', it *presumes* the appropriateness of aid to energy from renewable sources and the limited distortive effects of that aid provided that all other conditions are met.[65] This condition will therefore not cause problems for aid to renewable energy projects. A similar conclusion can be drawn with respect to the *fourth* condition, which requires that *'undue negative effects on competition and trade'* are avoided.[66] The Guidelines indicate that they will *presume* the limited distortive effects of aid to energy from renewable sources provided that *all other conditions* are met.[67] These 'other' conditions include the *proportionality criterion* (discussed below), which in itself is a tool for limiting the distortion caused by State aid. The presumed limited distortive effects of aid to renewable energy projects is also reflected in recent Commission decisions on State aid for ocean energy projects.[68] *Fifth*, aid to renewable energy projects can only be compatible with the internal market if the project would not be implemented without the aid. In other words, the aid must have an *incentive effect.*[69] With respect to a recent tidal energy project in France, the French authorities were able to demonstrate that the production costs of tidal energy would be higher than the expected market price. Without the aid the return on the investment for the project would be negative. The Commission concluded that 'without the aid the project would not be financially viable. The aid therefore causes the beneficiary to change its behaviour and invest in the renewable project.'[70] An incentive effect needs to be determined on a case-by-case basis. As long as it remains difficult for pre-commercial ocean energy projects to reach financial clo-

62 Unless it has evidence to the contrary.

63 Environmental and Energy State Aid Guidelines (n 25) para 115. This approach is also reflected in recent renewable energy State aid decisions where the Commission has readily accepted that there is a need for state intervention, without even materially discussing the existence of a residual market failure. See for instance: Commission Decision on State aid to a French tidal energy demo plant (n 60) para 46; Commission Decision on State aid to a Finnish offshore wind farm demonstration project (n 60) paras 25-26.

64 Also, they must ensure that the type of aid chosen is the type that is likely to achieve the objectives while generating the least distortions of trade and competition. For instance: repayable advances and state guarantees are potentially less distortive than direct grants. Environmental and Energy State Aid Guidelines (n 25) para 39-47.

65 Environmental and Energy State Aid Guidelines (n 25) para 116.

66 This condition requires that, for the aid to be compatible with the internal market, its negative effects in terms of distortions of competition and its impact on trade between Member States must be limited. Also, these effects must be outweighed by the positive effects that the aid measure has on the environmental or the energy objective pursued. The Guidelines indicate that the fact that 'Aid for environmental purposes will by its very nature, tend to favour environmentally friendly products and technologies at the expense of other, more polluting ones and that effect of the aid will, in principle, not be viewed as an undue distortion of competition […]' Instead, the Commission will look in particular at the possible distortive effects on competitors that likewise operate on an environmentally friendly basis, even without aid. The Guidelines mention as an example of a negative effect the situation that there are more efficient or innovative competitors that do not receive State aid but who have a better technology, which may now be unable to enter the market due to a lack of a level playing field. According to the Commission, 'In the long run, interfering with the competitive entry and exit process may stifle innovation and slow down industry-wide productivity improvements.' Environmental and Energy State Aid Guidelines (n 25) paras 88, 90-91.

67 Environmental and Energy State Aid Guidelines (n 25) para 116.

68 In these cases the *'undue negative effects on competition and trade'* test was passed relatively easily. The Commission did, however, pay attention to the fact that the amount of electricity generated and the market share of the projects in question were very small. This suggests that the mere fact that the project is a renewable energy project is not sufficient to pass the test. For bigger projects, and for individual aid in particular, in-depth analyses of market power and expected negative effects on market dynamics might still be required. As pre-commercial projects will often be relatively small, the *'undue negative effects on competition and trade'* test will probably not cause problems for the type of projects that this article focuses on. See Commission Decision on State aid to a French tidal energy demo plant (n 60) para 46; Commission Decision on State aid to a Finnish offshore wind farm demonstration project (n 60) paras 44-45. For the general conditions that are applicable to the 'undue negative effects on competition and trade' test, see: Environmental and Energy State Aid Guidelines (n 25) paras 97-103.

69 In that respect the Commission considers that aid to projects that have already started prior to the aid application is not allowed. Moreover, Member States must present an application form in which beneficiaries describe the situation without the aid, by referring to a counterfactual scenario or alternative project. This is not required if the aid is conferred through a competitive bidding process. See Environmental and Energy State Aid Guidelines (n 25) paras 48-51. For aid measures that are individually notifiable the Commission requires that clear evidence is provided that the aid effectively impacts on the investment decision, in a way that it changes the behaviour of the beneficiary. Individually notifiable investment aid is *ad hoc* investment aid, and investment aid that is provided on the basis of an aid scheme, but which exceeds €15 million per undertaking and is not granted on the basis of a competitive bidding process. See Environmental and Energy State Aid Guidelines (n 25) paras 19, 20, 24 and 57.

70 Commission Decision on State aid to a French tidal energy demo plant (n 60) paras 48-49.

sure, the condition is not expected to give rise to substantial problems for such projects. *Sixth,* the aid must be *proportionate*. Aid schemes are deemed to be proportional if they do not exceed the pre-set maximum aid intensities, which are calculated as a percentage of the eligible costs. Individually notifiable investment aid[71] is deemed proportional if the aid amount corresponds to the *net extra costs* of the aided investment, compared to the counterfactual scenario in the absence of aid. The aforementioned maximum aid percentages are used as a cap for individual aid.[72] Due to a pre-commercial ocean energy project's relatively large dependency on public funding, the proportionality criterion is expected to pose a barrier to ocean energy developments.[73] The degree of restrictiveness of this condition is discussed in the following section.

3. The Proportionality Criterion in the EEAG: A Restriction on Investment Aid for Ocean Energy Projects

As mentioned in the introduction, the direct reason for researching the integration between the State aid framework and the Renewable Energy Directive in this article is the Ocean Energy Forum's claim that the EU's State aid guidelines remain 'burdensome and restrictive' for public investment support for ocean energy projects. The roadmap is not very specific on what are the exact elements in State aid law and policy that cause problems for ocean energy. It argues, however, that 'the maximum aid intensities for individual and investment aid should be raised.'[74] This suggests that the main issue lies with the proportionality criterion. While most conditions discussed in the section above are not expected to pose major problems for public investments in ocean energy, the roadmap's suggestion that the proportionality criterion is restrictive for ocean energy investment aid is true. This restrictiveness does not automatically mean that the way the proportionality criterion is translated into the Guidelines causes a lack of integration between the Renewable Energy Directive and the State aid framework. Whether such a lack of integration exists is a separate issue, which is dealt with in Section IV.

There are two reasons why the proportionality criterion is restrictive. *First*, the method for calculating the costs that are eligible for State aid substantially limits the amount of aid that may be given by Member States. *Second*, the maximum aid intensities in the Guidelines limit the aid that can be given to a project to a pre-set percentage of the calculated eligible costs. Moreover, the maximum aid amount given to individually notifiable aid is limited to the *net extra investment costs*.

The Commission Guidelines consider environmental and energy aid to be proportionate if the aid amount per beneficiary is limited to the minimum needed to achieve the environmental protection or energy objective aimed at.[75] This is the general rule. For investment aid that is awarded under *aid schemes* the Guidelines have chosen a pragmatic approach. This type of aid is deemed proportional if it does not exceed the *maximum aid intensities* set by the Guidelines.[76] The situation is somewhat different for *individually notifiable* investment aid, which is discussed later. Maximum aid intensities are calculated as a given percentage of the eligible costs. It is therefore important to understand how eligible costs are calculated. According to the Guidelines, eligible costs are calculated by determining the *gross*[77] *extra investment costs* of the renewable energy project compared to a situation without aid.[78] The

71 Individually notifiable investment aid is *ad hoc* investment aid, and investment aid that is provided on the basis of an aid scheme, but which exceeds €15 million per undertaking and is not granted on the basis of a competitive bidding process. See Environmental and Energy State Aid Guidelines (n 25) paras 20, 24 and 57.

72 Environmental and Energy State Aid Guidelines (n 25) paras 83-84.

73 See s II.3 for a further analysis of ocean energy's dependency on public funding.

74 Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 32.

75 Environmental and Energy State Aid Guidelines (n 25) paras 68.

76 ibid para 70.

77 Operating costs and benefits do not have to be taken into account in this calculation. Compare this to individually notifiable investment aid for which operating costs and benefits do have to be taken into account in the calculation of the 'net' extra investment costs. See Environmental and Energy State Aid Guidelines (n 25) paras 70 and 84. Further, on the influence of concurring operational State aid on the eligible costs calculation for investment aid, see: Könings, 'Environmental Aid' (n 33) 962-970.

78 See Environmental and Energy State Aid Guidelines (n 25) para 70. The Guidelines also mention another method for the calculation of the eligible costs: 'where the costs of achieving the common interest objective can be identified in the total investment costs as a separate investment, for instance, because the green element is a readily identifiable 'add-on component' to a pre-existing facility, the costs of the separate investment constitute the eligible costs'. Ocean energy projects are new projects, and not an add-on component to a pre-existing facility. This method does not therefore seem to apply to ocean energy projects. Moreover, the 'counterfactual' scenario approach seems to suit ocean energy developments better and it has also been used in the Commission's State aid decisions. See Commission Decision on State aid to a French tidal energy demo plant (n 60) paras 30-31.

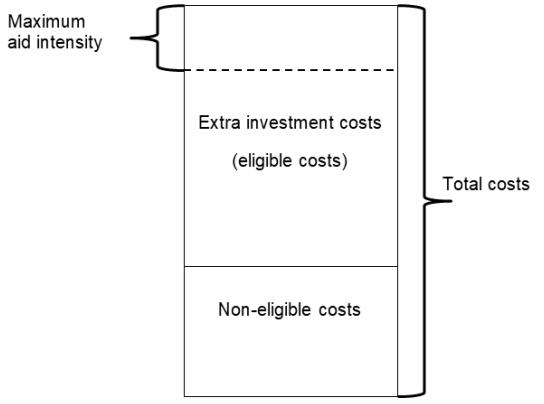


Figure 4. *Calculation of maximum aid intensity for aid granted under an aid scheme.*

situation without aid is called the 'counterfactual' scenario.[79] According to the Guidelines, such a counterfactual scenario can be established by taking into account the *extra investment cost* of the renewable energy project 'compared to the cost of a conventional power plant with the same capacity in terms of the effective production of energy.'[80] Only these *extra investment costs* are considered to be *eligible costs* under the Guidelines. An example of a counterfactual scenario is provided by a State aid decision concerning a new tidal energy project in France. In this case a Combined Cycle Gas Turbine (CCGT) plant with the same electricity production capacity as the tidal energy project was chosen as the counterfactual scenario. The eligible costs were calculated as the estimated investment costs of the tidal energy project minus the investment costs of the gas turbine.[81] See Figure 4 for a diagram of the calculation of maximum aid intensities for aid granted under an aid scheme.

The situation is somewhat different for *individually notifiable* investment aid under the Guidelines. This is investment aid which is not awarded under *aid schemes* –on an *ad hoc* basis– or investment aid which *is* awarded under an aid scheme, but which exceeds €15 million per undertaking and is not granted on the basis of a competitive bidding process.[82] While investment aid that is awarded under *aid schemes* is deemed proportional if it does not exceed the maximum aid intensities calculated as a given percentage of the eligible costs, *individually notifiable* investment aid is only deemed proportional if the aid amount corresponds to the *net*[83] *extra investment costs* of the investment compared to the relevant counterfactual scenario.[84] The maximum aid intensities set by the Guidelines are used as an upper limit that may not be exceeded when calculating these net extra costs.[85]

Hence, both for investment aid under aid schemes and for individually notifiable aid it is not possible to grant State aid up to 100% of the total investment costs of an ocean energy project. In all situations the imaginary investment costs of the counterfactual scenario need to be deducted from the total investment costs of the renewable energy project for which the aid is intended. In the case of individually notifiable investment aid the eligible costs must furthermore be offset against all relevant costs and benefits that the project incurs over its lifetime. Subsequently, for aid schemes the residual aid amount is further lowered by the application of maximum aid intensities. For investment aid for renewable energy projects under the EEAG these are set at 65% for small enterprises, 55% for medium-sized enterprises, and 45% for large enterprises.[86] The maximum aid intensities may only be raised to 100% *of the eligible costs* where

79 Environmental and Energy State Aid Guidelines (n 25) paras 68-75.

80 ibid Annex 2. The Guidelines indicate that the Commission is willing to consider the total costs of a project instead of the eligible costs in situations where a counterfactual scenario cannot credibly be established. This may however imply that maximum aid intensities will have to be decreased to reflect the different eligible cost calculation. Environmental and Energy State Aid Guidelines (n 25) para 74.

81 Commission Decision on State aid to a French tidal energy demo plant (n 60) paras 30-31.

82 See Environmental and Energy State Aid Guidelines (n 25) paras 19, 20, 24 and 57.

83 The addition 'net' means that all relevant costs and benefits that the project incurs over its lifetime should be taken into account, ie all economic benefits which the company gains by investing in the renewable energy project must in principle be subtracted from the additional investment costs. Environmental and Energy State Aid Guidelines (n 25) para 84, and Könings, 'Environmental Aid' (n 33) 940 and 951. Compare this to investment aid that is awarded under aid schemes for which operating costs and benefits do not have to be taken into account in the calculation of the eligible costs. See Environmental and Energy State Aid Guidelines (n 25) para 70.

84 The Guidelines emphasise that if no specific alternative project can be identified as a counterfactual scenario, the Commission will verify whether the aid amount exceeds the minimum necessary to make the aided project sufficiently profitable […]. Environmental and Energy State Aid Guidelines (n 25) para 85.

85 ibid para 83.

86 ibid paras 76, 78-79, and Annex I. Higher aid percentages may be allowed for aid to research and development activities for renewable energy. These are dealt with in the Commission's R&D Guidelines (n 47). As this article deals with aid to *pre-commercial* projects, State aid to R&D projects is not dealt with here.

aid is granted under a competitive bidding process.[87] Competitive bidding processes are the Commission's preferred method for allocating State aid.[88] In Box 2 (see Appendix) competitive bidding processes are explained and assessed in the light of investment aid to ocean energy projects.

The present method for calculating the eligible costs, together with the maximum aid intensities and net extra costs calculation (for individually notifiable aid) have as their result that the maximum amount of investment aid allowed is always lower than the total investment costs of the renewable energy project in question.[89] This is not a surprising fact, given the important position of the proportionality principle in State aid law. Through these restrictions the Guidelines try to find a balance between supporting renewable energy techniques, on the one hand, and creating minimum distortion on the market, on the other.[90] Nevertheless, the fact that under all circumstances a considerable sum of private investments need to be found may be a problem for ocean energy developments in particular. As discussed in Section II.3, securing private investments for pre-commercial ocean energy projects is difficult due to the high CAPEX intensity and the technical and environmental uncertainties in this phase of development. Therefore, the limited amount of State aid allowed could theoretically prevent pre-commercial ocean energy projects from securing sufficient funding, which may cause some of these projects to fall into the so-called 'valley of death' of renewable energy project financing. If that happens, then it could be questioned whether there is indeed sufficient integration between EU renewable energy policy and the EU State aid framework. Whether a lack of integration could be said to exist is discussed in the next section.

IV. Is There a Lack of Integration?

As mentioned before, the restrictions in the EEAG on investment State aid to renewable energy projects are mainly a translation of the proportionality principle. This restrictiveness does not automatically imply that there is insufficient integration between the RED and the EU's State aid framework. The mere existence of possibilities for weighing State aid's positive and negative effects in the view of renewable energy shows that the concept of 'policy integration' (see Box 3 in Appendix) is embedded in State aid law and policy at least to some extent.[91] Moreover, some renewable energy projects can even do without public funding these days.[92] It would be incompatible with the market-oriented competition rules if such projects would be eligible for more than the minimum public funding needed to leverage enough private investments. It is argued in this article 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.

Whether the current State aid framework, and the eligible cost calculation and maximum aid intensities specifically, do indeed have this effect is a very difficult question to answer for at least three reasons. *First*, it is often unclear why certain projects proceed and others do not. Project failure *could* be related to a lack of investment State aid, but also to technical problems or to environmental uncertainties which result in companies halting a project or which prevent competent authorities from granting a licence for a project.[93] *Second*, it is often unclear which projects are important and which are not. Most EU Member States do not have a comprehensive renewable energy strategy in place which details what type of renewable energy projects are needed to meet the Member State's desired renewable energy mix and

87 Environmental and Energy State Aid Guidelines (n 25) para 79 and Annex I.

88 Cf Struckmann and Sapi, 'Energy and Environmental Aid' (n 16) 700-701.

89 This is also the case when the application of a competitive bidding process raises the maximum aid intensity to 100%, as this is still only a percentage of the eligible costs.

90 More in general on the balancing of these interests as a main objective of the Guidelines: Könings, 'Environmental Aid' (n 33) 937 and 939.

91 This is also in line with the so-called 'State Aid Modernisation' (SAM) (2012) which had as one of its main objectives 'to foster sustainable, smart and inclusive growth in a competitive internal market'. See European Commission, *European Commission Communication 'EU State Aid Modernisation (SAM)'* COM(2012) 209 final.

92 For instance (n 36).

93 A recent study carried out by Ecorys showed that opinions differ about the reasons for ocean energy project failures. The study found that '[…] developers and industry representatives point rather to non-technological reasons, including framework and regulatory conditions, research and finance support as the main hurdles. Public sector representatives see technological factors as a more important barrier.' Moreover, the study indicated that the failure of two wave energy projects – Pelamis and Aquamarine – was related to a mix of technological barriers and non-technological barriers. European Commission, 'Study on lessons for ocean energy development – final report' (n 20) 22.

its renewable energy target under the RED.[94] *Third*, investment State aid is never the only possible way to support a project. Other options include granting financial support through schemes managed by the EU, or helping companies to get access to finance.[95] It is therefore difficult to attribute financial problems in ocean energy projects specifically to a lack of investment State aid.

Nonetheless, there are some indications that suggest that the current State aid framework is not sufficiently catered towards the renewable energy challenges as set out under the Renewable Energy Directive. These indications can be derived, *first* from practice, and *second* from the State aid framework itself. Both are discussed below.

1. A Possible Lack of Integration: Indications from Practice

There are several reports that suggest that the State aid framework is insufficiently flexible for facilitating certain pre-commercial ocean energy projects. The Ocean Energy Strategic Roadmap –which reflects the common vision of the ocean energy sector– states that the State aid guidelines remain 'burdensome and restrictive' and that the maximum aid intensities for individual and investment aid should be increased.[96] A recent study conducted by *Ecorys* for the European Commission also pointed at the State aid rules as a barrier to the development of ocean energy projects.[97] It does not, however, clearly identify which elements of the State aid rules must be considered to be a barrier. Another report –written by ICF for the European Commission– gives a more practical example of situations in which State aid guidelines may be inadequate for getting ocean energy projects off the ground. The example concerns a subsidy scheme managed by the UK's *Energies Technology Institute* (ETI). Even though ETI's subsidy scheme was based on the Guidelines for Research and Development[98] – not the EEAG – this example is still interesting for the present article as the ETI scheme supports pre-commercial renewable energy projects, which is the type of projects that are discussed in this article. According to the ICF report, the ETI has reported that some of their first-of-a-kind, commercial-scale demonstration projects in the field of energy need 90% to 100% funding of the total investment costs as they are not yet commercially viable.[99] This is not possible under the current R&D Guidelines[100] –on which the ETI's funding support was based– nor would this be possible under the EEAG. ETI criticizes the fact that the State aid framework for R&D presumes that all different energy technologies are in a similar market position. It argues that for instance, for floating wind turbines, there is currently no market and the associated risks are very high. ETI is only allowed to support projects that are additional, ie do not have a full commercial case. Such techniques need much higher aid intensities than those currently allowed.[101] The argument

94 The Dutch government does have a strategy aimed at the development of offshore windfarms. In its national water plan the Dutch government designated a few areas for the development of offshore wind energy. However, this approach only covers offshore wind energy developments. It is not an all-encompassing strategy or a list that leads to achieving the Netherlands' 14% renewable energy quota as it does not cover all renewable energy projects needed to reach that percentage. See 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) 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) 83-86.

95 These options are further discussed in s V.3.

96 Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 32.

97 European Commission, 'Study on lessons for ocean energy development – final report' (n 20) 57.

98 R&D Guidelines (n 47).

99 ETI does emphasise, however, that the amount of public funding needed is largely dependent on the size of the enterprise involved. Firms with larger balance sheets will be better able to afford to self-fund (or co-finance) projects alongside the ETI's contribution. European Commission, 'Innovative Financial Instruments for First-of-a-Kind, commercial-scale demonstration projects in the field of Energy' (n 23) 33 and 39, and 38-39 of the Annex.

100 Maximum aid intensities under the R&D Guidelines in the category 'experimental development' are 45% (small enterprises), 35% (medium-sized enterprises) and 25% (large enterprises) of the eligible costs. These may all be raised by 15% if the experimental development is subject to effective collaboration between undertakings or between an undertaking and a research organisation, or if the experimental development is subject to a wide dissemination of results. In contrast to the EEAG, under the R&D Guidelines the eligible costs are the total costs of certain pre-set categories, including personnel costs, costs of instruments and equipment, and costs of buildings and land. There are stricter rules for individually notifiable aid. This type of aid has to be kept to the minimum by considering all relevant expected costs and benefits over the lifetime of the project, including the costs and revenues stemming from the results of R&D&I activities. In the case of the existence of a counterfactual project the aid should be limited to the net extra investment costs. See R&D Guidelines (n 47) paras 73-77, 86-93, and annexes I and II.

101 European Commission, 'Innovative Financial Instruments for First-of-a-Kind, commercial-scale demonstration projects in the field of Energy' (n 23) 38-39 of the Annex.

that the maximum State aid amounts under the guidelines are insufficient especially for certain types of early-development ocean energy projects is also supported by some of the interviewees and other sources that have been consulted as part of the research for the present article. All ocean energy techniques are in a different stage of development. As tidal stream is a more advanced technology –ie some devices have been built and small-scale pilot projects have been run– it is easier to source a substantial share of private funding for those projects.[102] Nevertheless, even pre-commercial tidal stream projects are still relatively risky projects of which a large share of the investment was still publicly funded in some recent projects.[103] Wave energy, on the other hand, is still not a fully proven technology, which entails much more risky investments. Such technologies may require public investments of up to 100% of the total investment costs.[104] The lack of public funding from State aid measures may be solved by combining State aid with public funding at the EU level[105], which does not constitute State aid.[106] An ocean energy developer who has been interviewed as part of the research for the present article pointed out that his company managed to reach financial closure for a small-scale wave energy pilot (low TRL) project by combining State aid with EU grants managed by the EIB. He suggested that similar funding arrangements would also be useful for larger-scale pre-commercial ocean developments, provided that the total share of public investments would still meet a minimum of 70% of the total investment costs of the project.[107] Under the present Guidelines these percentages are not permissible. Moreover, according to the ICF report, even when very large EU-level funding instruments like NER 300 are combined with private funding, the combined funding provision in the EU momentarily still falls well short of the total investment needs[108] for first-of-a-kind sustainable energy projects.[109]

The foregoing shows that there are indications from practice that the current limitations on State aid in the area of energy and the environment may hamper the development of certain ocean energy projects. There is not always sufficient private funding or EU funding available to make up for a lack of State aid. As mentioned at the beginning of this section, it is however not possible to give a conclusive answer in this regard as there are several ways to organise energy project funding, and as project failure can be caused by many reasons – not just by a lack of State aid. It must also be noted that while the investment State aid options may be too limited at this point in time, this may change in the future when ocean energy technologies become more mature and interest from private financiers will increase.

2. A Possible Lack of Integration: Indications from the State Aid Framework

Some aspects of the State aid framework itself suggest that it insufficiently caters for the renewable energy challenges as set out under the Renewable Energy Directive. These elements include the method for calculating the eligible costs and the use of a net extra investment calculation for individually notifiable aid under the EEAG, and the limited maximum aid intensities under these guidelines. The reasons why these elements may reflect a lack of integration are discussed below.

102 Examples of tidal stream projects that have obtained substantial amounts of private funding are the *Meygen* project in Scotland, and the *Normandy Hydro* project in France.

103 For the French *Normandy Hydro* project at least €52 million of the total project costs of €112 million was publicly funded. For the Scottish *Meygen* project at least €30.8 million of the total project costs of €51.3 million was publicly funded. See: Atlantis Resources, '£51 million MeyGen Financial Close Completed' (18 September 2014) <https://www.atlantisresourcesltd.com/2014/09/18/51-million-meygen-financial-close-completed-2/>, and Ademe, 'Normandie Hydro' <http://www.ademe.fr/sites/default/files/assets/documents/normandie_hydro_veng.pdf> accessed 12 July 2018.

104 Based on an interview with a scientific officer at the European Commission, Joint Research Centre. The interview transcript is available from the author.

105 NER 300 and InnovFin are examples of such EU funding schemes. See s V.3.b for a further discussion of these schemes.

106 Financial support given directly by EU institutions is not sourced from the budget of Member States and is therefore not State aid in the sense of art 107 TFEU. See sV.3.b.

107 Based on an interview with a CEO of a Swedish wave energy company. Interview transcript available from the author upon request.

108 ICF has made an estimation of the likely number of first-of-a-kind sustainable energy projects that the market would require to have a credible demonstration effect for certain innovations – including ocean energy – to become established in the market. This in turn would help to unlock further funding or capital flows from the private sector, thereby enabling market replication to occur. For example, according to the ICF report, the deployment of 4 to 5 tidal stream *arrays* could help to greatly lower risk perceptions for the ocean energy sector. See European Commission, 'Innovative Financial Instruments for First-of-a-Kind, commercial-scale demonstration projects in the field of Energy' (n 23) 9.

109 ibid 22 and 68.

a. The Calculation of Eligible Costs / The Use of a Net Extra Investment Calculation

As seen before, eligible costs for renewable energy investment aid schemes are determined by calculating the difference between the total investment costs of the renewable energy project and the investment costs of the relevant counterfactual scenario. This counterfactual scenario is 'a conventional power plant with the same capacity in terms of the effective production of energy.' This approach aims to prevent overcompensation by trying to determine the amount of funding that the market can provide for by itself. There are, however, two reasons why this may not be a good method for calculating the eligible costs for renewable energy projects, and for ocean energy projects in particular.

First, this calculation method is based on the presumption that it is credible that in a situation without aid a conventional power plant would be built. This is, however, questionable. Member States are currently focusing their policies on promoting renewable energy projects and on shutting down conventional power plants[110], instead of building new ones. Permits for the construction of new coal and gas-fired power plants are increasingly less likely to be granted. Moreover, investors may also be less likely to invest in conventional power plants as these may face closures in the future. Arguably, there will not therefore be a realistic counterfactual scenario at all, which means that renewable energy projects are the only viable scenario. In that case, the eligible costs would have to be equal to the total costs of the renewable energy investment, instead of just to the extra investment costs. Some commentators have argued that the environmental integration principle, enshrined in Article 11 TFEU, could be said to require the State aid rules to cover the total investment costs of a renewable energy project.[111]

Second, even if investors would want to invest in a conventional power plant, the present way of calculating eligible costs is questionable. The GBER and the Guidelines presume that private funds that are available for a conventional power plant would equally be invested in a renewable energy project, if topped up with public funds to –partially– cover the extra investment costs. This assumption neglects the fact that the risks of investing in pre-commercial renewable energy projects are much higher than investing in a conventional technique. Innovative energy projects, such as pre-commercial ocean energy, are subject to many uncertainties. They may risk shutdowns due to technical failures, monitoring or research activities, or they may even sustain marine mammal collisions.[112] Also, their revenue in terms of energy production may be unsure and unstable during the initial phases of development. While private investors may be interested in investing in a conventional technique, they may be less tempted to do so for some high-risk pre-commercial renewable energy projects.[113] In that case, public financing of just the extra investment costs may be insufficient to bring some pre-commercial renewable energy projects to the market. Instead, the eligible costs should be calculated as the total investment costs of the innovative renewable energy project.

b. Maximum Aid Intensities

The maximum aid intensities as set in the GBER and the Guidelines reflect the results of a balancing act between the need for aid to renewable energy projects, on the one hand, and the expected level of distortion of competition and trade, on the other.[114] They are a reflection of the presumption that a certain percentage of the financing of the extra invest-

110 For instance, in the Dutch 'Energieakkoord voor duurzame groei' [Energy agreement for sustainable growth] – a national umbrella agreement with several participants, including the Dutch government, employers, trade unions, and environmental protection organisations – it has been agreed to close five coal-fired plants from the 1980s. See: Sociaal Economische Raad (SER), 'Energieakkoord voor duurzame groei' (2013) <https://www.rijksoverheid.nl/documenten/convenanten/2013/09/06/energieakkoord-voor-duurzame-groei> accessed 12 July 2018.

111 According to Wiesbrock: 'In the light of the environmental integration principle , it is problematic that aid is calculated as a percentage not of the whole investment costs but only of the extra costs.' Wiesbrock (n 13) 90.

112 See for instance: Van Hees, 'Large-scale Water-related Innovative Renewable Energy Projects and the Habitats and Birds Directives: Legal Issues and Solutions' (n 6) 17-20.

113 See s II.3, and see in a more general sense ICF's analysis on barriers to commercial-scale, first-of-a-kind (FOAK) energy demonstration projects focused on Sustainable Energy Technology (SET) sectors: 'Barriers also include sub-optimal investment situations, in which the market is not interested in supporting SET FOAK projects (despite there being a positive economic rate of return) or where projects that are in principle 'investable' or 'bankable' (ie can generate a positive IRR) but the finance or investment is inadequate because of a project's uncertain outcome and underlying risk structure. Many of these barriers are identified as specific risks to SET FOAK project development and must be mitigated either internally or through public sector interventions.' European Commission, 'Innovative Financial Instruments for First-of-a-Kind, commercial-scale demonstration projects in the field of Energy' (n 23) 65.

114 Environmental and Energy State Aid Guidelines (n 25) para 76.

ment costs of renewable energy projects can be covered by private investments. The maximum aid intensities are also a manifestation of the Commission's policy to promote State aid that 'targets a market failure and thereby complements, not replaces, private spending'.[115] The application of the maximum aid intensities should allow renewable energy projects to be implemented while using the minimum amount of State aid that is necessary. The problem is that it is *presumed* that the maximum aid intensities in the GBER and the Guidelines sufficiently mitigate the market failure[116] at hand. There is, however, no proof that it actually sufficiently does do so. Instead, given the risks connected to investments in pre-commercial renewable energy projects, it is expected that it will sometimes be difficult for projects to attract up to 70% in private investments.[117]

3. Conclusion

The foregoing indications from practice and from the State aid framework itself do not give a conclusive answer to the question of whether the State aid framework prevents important renewable (ocean) energy projects from sourcing sufficient funding. Nevertheless, they do cast sufficient doubt in that respect in order to justify the following assessment of how a possible lack of integration may be solved.

V. Towards Better Integration

As argued above, there may be a lack of integration between the State aid framework, on the one hand, and the EU's renewable energy law and policy, on the other. This section discusses the solutions to this possible lack of integration and assesses their advantages and disadvantages in the light of investment State aid to pre-commercial ocean energy projects. This article's main suggestion is to make the *Guidelines on State aid for environmental protection and energy* more flexible 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 under certain conditions by introducing a more flexible balancing test for the most important projects. This option is discussed first. Subsequently, Section V.2 discusses how it may be decided which projects are *important* –and must therefore benefit from additional flexibility under the Guidelines– and which are not. Finally, Section V.3 discusses two alternative solutions to the possible lack of integration: improving small and medium-sized enterprises' (SMEs) access to finance, and providing for sufficient investment aid on the EU level. Box 4 (see Appendix) gives an overview of all solutions proposed.

1. A More Flexible Balancing Test

Considering the importance of the transition to an increased renewable energy supply in 2020, the introduction of a more flexible balancing test could be used as an additional method for the calculation of the maximum investment aid amounts. The more flexible test would serve as a last resort in cases where the application of the existing limited eligible cost calculation and maximum aid amounts do not bring about a result that is in line with a Member State's renewable energy strategy and its responsibilities under the Renewable Energy Directive. The main goal that is served by having maximum aid intensities and limited eligible costs is the minimisation of distortions of competition in the aided sector while ap-

115 The Commission stated this in its State Aid Modernisation document. The whole relevant section reads as follows: 'Modernised State aid control should facilitate the treatment of aid which is well-designed, targeted at identified market failures and objectives of common interest, and least distortive ('good aid'). This shall ensure that public support stimulates innovation, green technologies, human capital development, avoids environmental harm and ultimately promotes growth, employment and EU competitiveness. Such aid will best contribute to growth when it targets a market failure and thereby *complements, not replaces, private spending*. State aid will be effective in achieving the desired public policy objective only when it has an incentive effect, ie it induces the aid beneficiary to undertake activities it would not have done without the aid. And State aid will have the greatest impact on growth only when it is designed in a way which limits competition distortions and keeps the internal market competitive and open. Therefore State aid control is crucial in order to improve the efficiency and effectiveness of public spending taking the form of State aid, with the overarching objective of spurring more growth in internal market, for which a necessary condition is developing competition. State aid which does not target market failures and has no incentive effect is not only a waste of public resources but it acts as a brake to growth by worsening competitive conditions in the internal market.' European Commission, *European Commission Communication 'EU State Aid Modernisation (SAM)*(n 105) para 12.

116 See s II.3 for the concept of 'market failure' in relation to ocean energy.

117 See ss II.3 and IV.1.

propriately addressing the market failure at hand.[118] Hence, limited eligible costs and maximum aid intensities are the outcome of a pre-set balancing act between preventing distortion of competition caused by State aid, on the one hand, and providing enabling State aid to renewable energy projects, on the other. Limited eligible costs and maximum aid intensities are instruments to ensure that no more State aid is given than absolutely necessary to leverage sufficient private investments. As they are generic –instead of case-specific– instruments, there is a risk that their application will in some cases lead to undesired outcomes. As argued before, these undesired outcomes may include a failure to secure sufficient funding in ocean energy projects that are particularly important for the achievement of a Member State's renewable energy targets. In order to overcome this issue, this article suggests replacing the pre-set balancing test –that is reflected in the limited eligible costs and maximum aid intensities– by a more flexible balancing test, but only in cases where this is most necessary.

Under a more flexible balancing test the Commission would –in some cases– disregard the pre-defined eligible cost calculation, maximum aid intensities and net extra investment cost calculation. Instead, it would weigh the interest of the development of *the specific* (ocean) energy project –for which the Member State in question requested permission to grant investment aid– against the interest of preventing a distortion of competition. State aid as such – irrespective of its intensity – is usually considered to be distortive.[119] It is therefore not possible to completely prevent a distortion of competition and to grant State aid at the same time. The balancing test would therefore focus on limiting the level of distortion –ie the amount of State aid given– while providing sufficient State aid to get the most important (ocean) energy projects off the ground. 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. While some commentators[120] seem to be of the opinion that maximum aid intensities should be scrapped altogether, this is not what is argued in this article. The limitation of eligible costs and the existence of maximum aid intensities also have positive aspects as they may possibly stimulate developers and banks to find market-based solutions for financial gaps in ocean energy project funding. A more flexible balancing test would only give rise to the authorisation of investment aid of up to 100% of the total investment costs if the projects in question fulfil 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, and *second*, that the project in question is sufficiently important for reaching the Member State's national targets under the Renewable Energy Directive. These two conditions guarantee that the main goal which is served by the establishment of maximum aid intensities and limited eligible costs will indeed still be served, being the minimisation of distortions of competition in the aided sector while appropriately addressing the market failure.[121] In order to fulfil the second condition it is necessary to ensure that very high amounts of State aid –ie those 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

118 General Block Exemption Regulation (n 35) para 22; Environmental and Energy State Aid Guidelines (n 25) para 76.

119 The concept of distortion of competition is given a broad interpretation in case law. In the case of *Philip Morris*, the ECJ stated that 'when State financial aid strengthens the position of an undertaking compared with other undertakings competing in intra-Community trade the latter must be regarded as affected by that aid'. See Case 730/79 *Phillip Morris v Commission* [1980] ECLI:EU:C:1980:209, para 11. Medghoul adds to this that 'The wide interpretation of the concept of distortion of competition reflects the fact that State aid, unlike mergers and contractual agreements concluded by undertakings, is *presumed distortive because it is an external intervention in the normal operation of the markets*. In the Spaak report itself, State aid control was conceived as a fundamental safeguard for undertakings against artificial advantages to their competitors, *and hence a guarantee for a level playing field. The distortion of competition through aid is therefore in principle a necessary consequence of its granting.* […] There is consequently no requirement that the distortion be particularly significant. Even a small amount of State support can be considered liable to distort competition […]' See S Medghoul, 'Chapter 12 – Distortion of trade and competition' in N Pesaresi et al, *EU Competition Law, v. 4, State aid* (2nd edn, Claeys & Casteels Publishing 2016) 356.

120 Wiesbrock (n 13) 90.

121 An additional reason for the existence of limited aid intensities is to compensate for the fact that both operational benefits (only in relation to aid schemes), and the possible commercial value to the undertaking of an environmentally friendlier image are not taken into account in the calculation of the eligible costs. This compensatory effect will however disappear in the case that investment aid of up to 100% of the total investment costs is allowed under a more flexible case-to-case balancing test. This could be seen as a necessary evil with respect to the necessity to provide sufficient funding for renewable energy developments that are essential for achieving a Member State's renewable energy targets. Nonetheless, this issue may be solved by granting aid in the form of repayable advances instead of a pure grant.

used as a tool in this regard. These are discussed in the next section.

The introduction of a more flexible case-to-case balancing test would offer Member States and the Commission a tool to increase integration between the State aid rules and renewable energy policy in instances where it is most needed. The more flexible balancing test could be implemented in the current legal and policy framework either by including the test in the current Guidelines, or by allowing investment aid for important renewable energy projects to be balanced directly under Article 107(3)(c) TFEU.[122]

2. Detailed Renewable Energy Plans per Member State

Detailed renewable energy plans that give an overview of a Member State's desired energy mix would be able to translate the Member States' renewable energy targets under the RED into specific energy projects and/or techniques that are required to meet those targets. These plans could then be used by the European Commission for the appraisal of the second condition[123] of a flexible balancing test for State aid measures with higher aid amounts than are currently allowed under the EEAG. 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 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 for investment aid funds for renewable energy on the EU level, as further discussed in Section V.3.b. 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.[124] It 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. In some Member States ocean 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.[125] Detailed national renewable energy plans could help Member States and the European Commission to take funding decisions under the State aid rules and policy and under EU funding schemes that fit within the broader renewable energy strategy of the Member States.[126]

3. Other Solutions

There are also disadvantages to the solutions proposed above. Changing the Commission's policy may take time or might not happen at all. The current core focus of the Guidelines and the GBER is economic

122 While the Commission is in principle bound by its own Guidelines it is still allowed to assess a State aid case directly under art 107(3)(c) where that specific case is not covered by those Guidelines.

123 The two conditions proposed in s V.1 for the application of a flexible balancing test are: *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, and *second*, that the project in question is sufficiently important for reaching the Member State's national targets under the Renewable Energy Directive.

124 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 of 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 Renewable Energy Directive (n 1) art 4 and annex VI.

125 On the negative environmental impacts of ocean energy technologies, see: Van Hees, 'Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions' (n 8) 318-321, and Van Hees, 'Large-scale Water-related Innovative Renewable Energy Projects and the Habitats and Birds Directives: Legal Issues and Solutions' (n 6) 16-20.

126 The introduction of detailed renewable energy plans per Member State was also suggested by the author of this article as a tool for increasing integration between the Renewable Energy Directive and the Water Framework Directive, and between the Renewable Energy Directive and the Birds and Habitats Directives. See in that regard: Van Hees, 'Large-scale water-related innovative renewable energy projects and the Water Framework Directive – Legal issues and solutions' (n 8) 334-336, and Van Hees, 'Large-scale Water-related Innovative Renewable Energy Projects and the Habitats and Birds Directives: Legal Issues and Solutions' (n 6) 33-34.

and market oriented[127], and the European Commission might be of the opinion that a too flexible approach to balancing does not fit into that orientation. As the Commission is the main decision-making authority in the area of State aid, it may be difficult to force a breakthrough on this point in the near future. Therefore, other solutions may currently be more relevant in practice. These include *improving ocean energy developers' access to finance,* and providing for sufficient *investment aid at the EU level.* Both are discussed below.

a. Improving Ocean Energy Developers' Access to Finance

Instead of acting as a direct investor 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[128] (for non-notifiable schemes) and in the Commission's Risk Finance Guidelines[129] (for notifiable schemes). Obviously, this State aid framework is only applicable when the risk finance provided by a Member State fails to meet the *market economy test.*[130] The GBER and the Risk Finance Guidelines are applicable to small and medium-sized enterprises (SMEs)[131], as they recognise that it is often difficult for young SMEs to gain access to finance as they are often unable to demonstrate their creditworthiness or the soundness of their business plans to investors. Also, it is recognised that early-stage (unproven and proven) technologies are often associated with risks and that middle-stage (pre-commercial) technologies are often viewed by private investors as being too risky and are therefore often not funded.[132] Developers of pre-commercial ocean energy projects are usually small or medium-sized enterprises which generally do not have sufficient equity to finance the pre-commercial phase of their techniques.[133]

Risk finance aid is not granted by the Member States to SMEs (the 'eligible undertakings') directly, but is provided through financial intermediaries, which can be any financial institution, such as private or public investment funds, or banks.[134] These intermediaries receive repayable equity, quasi-equity investments, loans, or guarantees from the Member States, which they may then use to provide eligible SMEs with repayable financial instruments of the same type.[135] The public investments must create a return for the Member States which they can then use for new investments. In that sense risk capital aid differs substantially from 'regular' investment aid, which often –but not always– is in the form of non-repayable subsidies.[136]

Risk finance aid is not –like investment aid under the Guidelines on State aid for environmental protection and energy– tied to maximum aid intensities. As the goal of risk finance aid is to attract ('leverage') additional finance from independent[137] private investors[138], the GBER requires certain minimum private participation rates to be met. These are: a minimum of 10% in private investments if the risk finance is provided to the eligible undertakings prior to their first commercial sale on any market (90% of

127 See Johnston, 'The Impact of the new EU Commission guidelines on State Aid for environmental protection and energy on the promotion of renewable energies' (n 56) 41-42.

128 General Block Exemption Regulation (n 35) art 21.

129 European Commission, 'Guidelines on State aid to promote risk finance investments' [2014] OJ C 19 ('Risk Finance Guidelines').

130 If this is not the case, then there is no 'advantage' in the sense of art 107(1) and the State aid rules will not apply. See for a further elaboration: L Silva Morais and L Tomé Feteira, 'Risk Finance Investment' in L Hancher, T Ottervanger and PJ Slot (eds), *EU State Aids* (5th edn, Sweet & Maxwell 2016) 382.

131 For more information on SMEs, see: European Commission, 'What is an SME?' <http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en> accessed 12 July 2018.

132 Risk Finance Guidelines (n 129) 9-10.

133 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, 6; Ocean Energy Forum, 'Ocean Energy Strategic Roadmap' (n 11) 9.

134 General Block Exemption Regulation (n 35) art 21(13); Risk Finance Guidelines (n 129) paras 20 and 52(x).

135 General Block Exemption Regulation (n 35) art 21(2) and (4).

136 P Cesarini and B Cattrysse, ´Chapter 19 – Access to finance´ in: N Pesaresi et al, *EU Competition Law, v. 4, State aid* (2nd edn, Claeys & Casteels Publishing 2016) 657-658.

137 The risk finance measure shall leverage additional finance from private investors which are not shareholders of the eligible undertakings in which they invest. See General Block Exemption Regulation (n 35) para 72 and art 21(10).

138 According to the Risk Finance Guidelines, 'private investors' will typically include the European Investment Fund (EIF) and the European Investment Bank (EIB) investing at their own risk and from their own resources, banks investing at their own risk and from their own resources, private endowments and foundations, family offices and business angel investors, corporate investors, insurance companies, pension funds, private individuals, and academic institutions. Risk Finance Guidelines (n 129) para 31 (fn 25).

the aid may be public investments), 40% in private investments if the eligible SME has been operating in any market for less than 7 years following its first commercial sale (60% may consist of public investments), and 60%[139] of required private investments in some other circumstances. Under the GBER the total amount of risk finance aid shall not exceed €15 million per eligible undertaking under any risk finance measure.

The Guidelines on State aid to promote risk finance investments do, however, under certain circumstances, allow for a higher amount of overall investment aid to certain eligible undertakings. Undertakings dealing with green energy are explicitly mentioned.[140] The GBER also allows the Commission to approve, under certain circumstances, risk finance measures with private investor participation below the ratios set out in the GBER, in particular if they specifically target SMEs affected by a more pronounced market failure, and when the aid is received before the SME's first commercial sale or at the proof-of-concept stage.[141] The ´seven common principles of compatibility´ also apply to risk finance aid.[142]

Finally, the Guidelines allow, under certain circumstances, for risk finance aid to be granted to undertakings which exceed the headcount and/or financial thresholds defining the concept of SME. This may apply *inter alia* to 'innovative mid-caps' carrying out R&D and innovation activities alongside initial investment in production facilities, whose track record is as yet insufficient for private investors to base their investment decision upon.[143] This category could be relevant for undertakings in the field of ocean energy. Obviously, before aid can be granted under the Risk Finance Guidelines, Member States will have to show that all the elements of the compatibility assessment are complied with. This is the same assessment as under the Guidelines on State aid for environmental protection and energy, including an appropriateness and a proportionality assessment.[144]

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 for certain types of undertakings and under certain circumstances be higher than under the Guidelines on State aid for environmental protection and energy. However, there are disadvantages too. First, risk finance measures that provide 100% public support will probably not be permissible, as they would defeat the purpose of risk finance aid as a tool to leverage private capital.[145] Second, risk finance aid's main goal is to encourage the development and expansion of new businesses and to create jobs (and not in the first place supporting environment-friendly projects).[146] Therefore, 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. It is ultimately the company that is the beneficiary of the aid that decides how to use the aid.[147] Moreover, the intermediaries are responsible for selecting the eligible companies, which also limits Member State influence. Risk investment aid may therefore not always be the ideal solution for Member States that need to promote investments in specific energy technologies in order to reach specific goals in their national renewable energy strategy.

b. Investment Aid on the EU Level

Another option, that may be even more effective, is to provide aid to ocean energy projects on the EU level. In its report, ICF even concluded that it is advisable to organise funding for first-of-a-kind (FOAK) commercial-scale demonstration projects in the field of energy on the EU level.[148] Union funding that is

139 See General Block Exemption Regulation (n 35) art 21(10)(c).

140 Risk Finance Guidelines (n 129) paras 75-76.

141 Risk Finance Guidelines (n 129) paras 80-81.

142 For a discussion of the ´seven common principles of compatibility´ in general see section III.2. For a discussion of these principles specifically in relation to risk finance aid, see: Silva Morais and Tomé Feteira, 'Risk Finance Investment' (n 130) 382-390.

143 Risk Finance Guidelines (n 129) para 72.

144 ibid s 3 ('Compatibility assessment of risk finance aid').

145 Also see P Cesarini and B Cattrysse, ´Chapter 19 – Access to finance´ in N Pesaresi et al, *EU Competition Law, v. 4, State aid* (2nd edn, Claeys & Casteels Publishing 2016) 658.

146 Risk Finance Guidelines (n 129) ss 1(2) and (7), and 3.2(57).

147 Cesarini and Cattrysse (n 145) 668.

148 According to ICF: 'The scale of operation for such an equity fund is best delivered at the EU level in order to maximise the number of available FOAK projects, ensure the application and connectivity of all relevant sector experience and knowledge, achieve diverse investor coverage, target the widest choice of renewable resources across geographies, as well as potential Member State engagement. There is a clear strategic need for an EU-wide instrument that can deliver substantial equity investment into SET FOAK projects. The scale of investment flows focused on any one Member State through the Instrument is likely to be greater than for a single Member State developing its own scheme.' European Commission, 'Innovative Financial Instruments for First-of-a-Kind, commercial-scale demonstration projects in the field of Energy' (n 23) 68.

centrally managed by the European Commission and that is not directly or indirectly under the control of the Member State does not, in principle, constitute State aid.[149] Aid that is provided on the EU level is therefore in principle not bound to maximum aid intensities, nor to the restrictive calculation of eligible costs as required by the GBER and the Guidelines. Currently, several such EU funding schemes exist.[150] It must be noted that the *present* EU schemes include financing restrictions of their own.[151] In order to completely replace national funding schemes by EU schemes it may however be necessary to set up clear and detailed renewable energy plans per Member State, as described in section V.2. Such plans could help the EU to decide on its funding priorities. Without such plans there is a risk that the Member States' freedom – as laid down in the Renewable Energy Directive[152] – to design their own renewable energy strategies will not be matched by sufficient funding from the EU. It must be noted that the *present* EU renewable energy funding schemes –such as NER 300 and InnovFin– do not usually take national renewable energy strategies into account when deciding upon the projects that will receive funding.[153] With regard to the proposal for a new Renewable Energy Directive for the period after the year 2020 it can however be questioned if this would still be a problem in the future. The new Directive will probably require Member States to collectively ensure that a binding renewable target of at least 32% of EU final consumption coming from RES is achieved. Probably no additional national targets will be imposed, but Member States must ensure they do not fall below their 2020 targets.[154]

VI. Conclusion and Final Observations

It can be concluded that the Ocean Energy Forum Strategic Roadmap's suggestion that for investment and project-specific (individual) support of ocean energy projects, EU State aid guidelines remain 'burdensome and restrictive, is true. While most conditions of the GBER and the Guidelines hardly seem burdensome for ocean energy projects, the proportionality criteria may form a restriction for pre-commercial projects. The reason for this is the restrictive calculation of eligible costs and net extra investment costs, and restrictive maximum aid intensities, in combination with the existing difficulties to secure

149 Aid on the EU level does not fulfil one of the main criteria for the existence of State aid as listed in art 107(1) TFEU, being that State aid is granted by a Member State or through State resources. Also see Environmental and Energy State Aid Guidelines (n 25) para 81. Nevertheless, resources coming from the Union budget *are* considered as 'State resources' (and imputable to the State) if national authorities have discretion as to the use of these resources. See European Commission, 'Commission Staff Working Document - Guidance on State aid in European Structural and Investment (ESI) Funds Financial instruments in the 2014-2020 programming period' (2017), SWD(2017) 156 final, 6.

150 NER 300 and InnovFin are examples of such EU funding schemes. NER 300 is managed by the European Commission and intends to support a wide range of carbon capture and storage (CCS) technologies (pre-combustion, post-combustion, oxyfuel, and industrial applications) and renewable energy technologies (bioenergy, concentrated solar power, photovoltaics, geothermal, wind, ocean, hydropower, and smart grids). Interestingly, the NER 300 funding comes from the EU Emissions Trading System (ETS) and not from the EU budget. InnovFin Energy Demo Projects (EDP) is managed by the European Investment Bank (EIB) and can finance projects in innovative renewable energy, CCS, smart energy systems and storage. For more information, see: European Commission, 'NER 300 programme' <https://ec.europa.eu/clima/policies/lowcarbon/ner300> accessed 12 July 2018, and European Investment Bank, 'InnovFin Energy Demo Projects' <http://www.eib.org/products/blending/innovfin/products/energy-demo-projects.htm> accessed 12 July 2018.

151 The NER 300 scheme, for instance, only provides funding to renewable energy demonstration projects of up to 50% of the 'relevant costs'. The relevant costs are defined as 'those extra investment costs which are borne by the project as a result of the application of an innovative renewable energy technology [reduced by] the net present value of the best estimate of operating costs and benefits arising during the first 5 years compared to a conventional production with the same capacity in terms of effective production of energy.' See Commission Decision 2010/670/EU laying down criteria and measures for the financing of commercial demonstration projects that aim at the environmentally safe capture and geological storage of CO_2 as well as demonstration projects of innovative renewable energy technologies under the scheme for greenhouse gas emission allowance trading within the Community [2010] OJ L 290, arts 2(3) and 3(3).

152 See Wiesbrock (n 13) s 5.3 (the penultimate para), and Renewable Energy Directive (n 1) preamble paras 6 and 14.

153 Under NER 300, Member States are allowed to decide in an initial assessment –before a funding application is sent to the Commission– whether the Member State in question supports the project. There is however no obligation for the European Commission to take account of a Member State's renewable energy strategy or priorities. InnovFin EDP is a financial instrument and it is therefore entirely market driven. Support is thus provided to eligible projects on a first-come, first-served basis. See: Commission Decision 2010/670/EU (n 151) art 5(3), and European Commission, 'NER 300 programme' (n 150).

154 See for instance: European Parliament, 'Legislative train schedule: Resilient Energy Union with a climate change policy' <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> accessed 8 July 2018; European Parliament, 'Energy: new target of 32% from renewables by 2030 agreed by MEPs and ministers' (Press release, 14 June 2018) <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.

private financing for innovative ocean 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 this article 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 which 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. This article's main suggestion is to solve this possible lack of integration by making the balancing test under the EEAG more flexible for those situations where the State aid framework prevents *important* renewable (ocean) energy projects from sourcing sufficient funding. A more flexible balancing test would require the European Commission to depart from a strict calculation of the eligible costs and maximum aid intensities in some circumstances, and under certain strict conditions. Detailed renewable energy plans per Member State may help in creating clarity on which projects are important for the national energy mix, and which are not. The guidance given by these plans can be used by the European Commission to justify and explain the choice to authorise State aid to specific (ocean) energy projects under a flexible balancing test. As this solution may have disadvantages as well, this article also discusses two alternative solutions to the possible lack of integration: improving access to finance for SMEs in the field of ocean energy, and providing for sufficient investment aid on the EU level.

It must be noted that this article has been written with ocean energy technology *in its present phase of development* in mind. As soon as ocean energy technologies start reaching maturity and enter the industrial roll-out phase, investment State aid-related issues are likely to disappear (compare this to the decreasing costs of wind energy developments over the years).[155] However, at that point new energy technologies that are important for the EU's energy mix may start to appear on the horizon, which are then in a pre-commercial phase, and which will also involve many uncertainties, and which may in their turn also need substantial investment State aid to grow to maturity.

Finally, some ideas for further research flow from the findings of this article. First, there still is a great deal of uncertainty with respect to which type of ocean energy project may suffer from insufficient financing due to restrictive State aid rules. In this respect it would be helpful to conduct economic and case study research into the type of project, the relevant Technology Readiness Level (TRL) and the techniques that are most likely to need additional State aid. Such research may be able to support Member States and the European Commission when deciding which projects need to be eligible for assessment under a more flexible balancing test. Second, it would be useful to conduct policy research into the feasibility and effectiveness of replacing the management of renewable energy investment aid programmes to the EU level –either fully or to a large extent. The management of public funding at the EU level may help to minimise distortion of competition on the internal market – especially when implemented through a competitive bidding process that all European undertakings and projects are allowed to participate in. While the provision of State aid is a logical approach with respect to the design of the present Renewable Energy Directive, this will probably be different for the new Directive. The Renewable Energy Directive for the period up to 2030 will most likely only set an EU target for renewable energy consumption. It will probably not set national targets.[156] Theoretically this change would –at least partly– take away the need for State aid as a powerful instrument to directly influence the volume of domestically produced renewable energy. Financial support instruments on the EU level that support renewable energy irrespective of where it is produced might be more suitable with respect to the new Directive.

155 For instance (n 36).

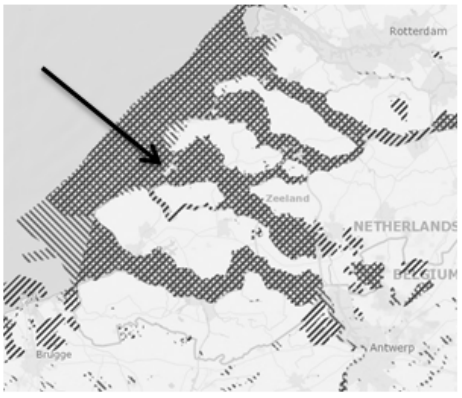
156 See (n 154).

Appendix: Boxes 1-4

All references to the boxes at the end of Appendix.

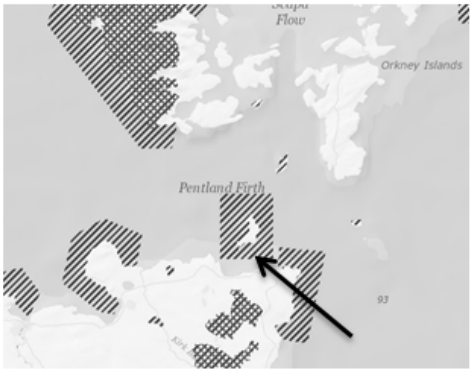
Box 1. *Examples of current ocean energy projects*

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 windmills. The turbines are bi-directional, which means that they will harvest energy both from ebb and flow streams.[a] 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 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 environmental effects of the tidal turbines, such as effects on sea mammals and effects on tidal streams.[b]



Oosterschelde storm surge barrier (in the middle)
Source: EEA, Natura 2000 European protected areas — interactive map

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.[c] The proposal would see an initial deployment of up to 61 fully submerged tidal turbines which are fixed to the seabed.[d] 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 environmental assessments will be required before further deployments are authorised to ensure that full consideration is given to any potential increase in environmental impacts.[e]



Pentland Firth inner sound
Source: EEA, Natura 2000 European protected areas — interactive map

Box 2. *Competitive bidding processes*

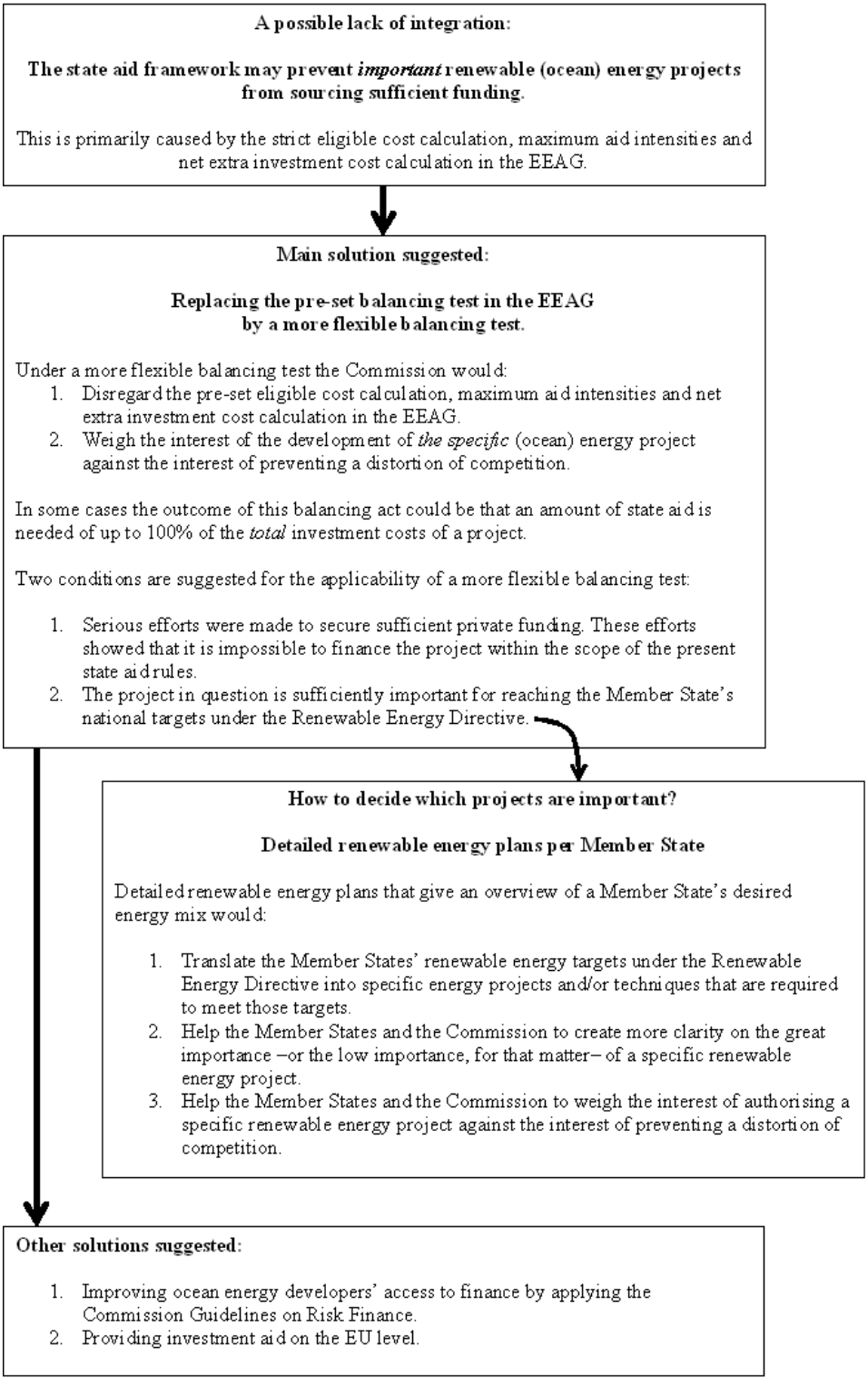
The EEAG[a] allow an aid intensity of up to 100% of the eligible costs if a competitive bidding process is used. According to the Commission, it can be assumed that bids made under a competitive bidding process reflect all possible benefits that might flow from the additional investment.[b] The design of a competitive bidding process should meet six cumulative conditions in order to be in conformity with the Guidelines (and the GBER).[c] The Guidelines assume that the introduction of a competitive bidding process that meets these conditions removes possible distortions of competition and, therefore, the aid may reach up to 100% of the eligible costs. Using a competitive bidding process could therefore be a partial solution to the restrictiveness of the State aid framework.

There are, however, three aspects of the competitive bidding processes that could be disadvantageous for investment aid to ocean energy projects. *First*, while under a competitive bidding process the maximum aid intensity of ocean energy may rise up to 100%, this is still only a percentage of the eligible costs. Hence, project developers will still need to secure a considerable sum of private investments. *Second*, the Guidelines suggest that reaching *cost-effectiveness* is an important goal of competitive bidding processes.[d] A *cost-effectiveness analysis* may be defined as an analysis which compares the different bids in the bidding process in terms of both costs and the achievement of the intended result. As the Guidelines do not provide guidance for the implementation of the cost-effectiveness analysis, there is a possibility that it would all come down to a simple weighing of total investment costs and energy output. Such a cost-energy output analysis would not be suitable for pre-commercial projects, which often have as their goal to gain more knowledge on technological and environmental aspects, rather than to generate revenue.[e] *Third,* the Guidelines seem to suggest that competitive bidding processes for investment aid should in principle be *technology neutral*. This means that the process should be open to all generators producing electricity from renewable energy sources, not specifying a specific source (such as ocean energy).[f] An exception only seems to exist for operational aid.[g] Requiring in principle a technology-neutral bidding process runs counter to the Renewable Energy Directive, which asks the Member States to promote the development of projects which use energy from 'all types of renewable sources'[h], but which essentially leaves the Member States free to choose their own energy mix.[i]

Box 3. *The concept of (policy) integration*

In this article '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).[a]

It is suggested here that integration in the EU context essentially means that the documents (in the case of State aid: the treaty, the GBER and the guidelines, and in the case of renewable energy: the RED) 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 always full recognition can be given to the goals of both policy areas. Often, trade-offs are inevitable. It does mean, however, that it shouldn't be impossible from the outset to meet the goals of one or more of the policy areas involved. In that regard it is argued here that there is a lack of integration if the State aid framework were to prevent from the outset that *those* renewable (ocean) energy projects which are *important* for achieving a Member State's renewable energy targets can obtain sufficient funding. This article investigates whether such a lack of integration exists and what paths can be chosen to resolve it.



Box 4. *Overview of solutions proposed.*

References

Box 1:

[a]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) 6.
[b] ibid 6.
[c] This water body is called the 'inner sound' of the Pentland Firth.
[d] Marine Scotland, 'MeyGen Decision' (n 5) 25.
[e] Marine Scotland, 'MeyGen Decision - Appropriate Assessment' 77 <http://www.gov.scot/Topics/marine/Licensing/marine/scoping/MeyGen/AppropriateAssessment>.

Box 2:

[a] This also applies to the GBER.
[b] Environmental and Energy State Aid Guidelines (n 25) para 79 (fn 53).
[c] These requirements are: 1. Clear, transparent and non-discriminatory criteria shall be used; 2. Providing for the participation of a sufficient number of undertakings; 3. All interested undertakings must be able to participate; 4. The aid is granted on the basis of either the initial bid submitted by the bidder or a clearing price; 5. The budget or volume related to the bidding process is a binding constraint leading to a situation where not all bidders can receive aid; 6. The aid shall be granted on the basis of the initial bid submitted by the bidder, therefore excluding subsequent negotiations. See Environmental and Energy State Aid Guidelines (n 25) paras 19(43) and 79; General Block Exemption Regulation (n 35) arts 2(38) and 41(10).
[d] Environmental and Energy State Aid Guidelines (n 25) paras 108-109.
[e] A State aid decision taken by the Commission in 2014 does however suggest that the cost-effectiveness analysis will be implemented by the Commission in a manner that is compatible with the nature of pre-commercial ocean energy projects. In that case the Commission observed that 'the objectives of the measure – in particular the objective of gaining experience on construction, use and maintenance of offshore wind power in arctic conditions – cannot be quantified purely in terms of electricity generation costs. Therefore, the tendering process [...] includes other selection criteria apart from lowest cost per MWh generated.' Apart from cost-effectiveness in a 'narrow sense', the list of selection criteria included criteria such as the 'significance of the new technology contained in the project for promoting offshore wind power in Finland', 'possibilities of commercialising a new technology contained in the project', and 'possibilities of sharing the experiences and expertise gained through the project'. The Commission concluded that the competitive bidding process as designed by the Finish authorities was in line with the Guidelines. See Commission Decision on State aid to a Finnish offshore wind farm demonstration project (n 60) paras 8, 37-41.
[f] Environmental and Energy State Aid Guidelines (n 25) para 109.
[g] In relation to competitive bidding processes for operational aid, the GBER and the Guidelines do allow Member States to limit the bidding process to specific technologies where a process open to all generators would lead to a suboptimal result. Examples thereof include the situation that a given new and innovative technology has a longer-term potential, and the situation that there is a need to achieve diversification of energy sources. See Environmental and Energy State Aid Guidelines (n 25) para 127; General Block Exemption Regulation (n 35) art 42(3). It is, however, unclear from the Guidelines if this exception clause also applies to competitive bidding processes for investment aid. Moreover, it is not clear what criteria the Commission will use in assessing the applicability of the exception clause. The GBER only indicates that the Member State should carry out a detailed assessment if a suboptimal result will indeed be present, and should report the results to the Commission. See General Block Exemption Regulation (n 35) art 42(3). In the Finish State aid case which was mentioned before, a competitive bidding process for operational and investment aid was approved which is limited to applications for offshore wind technologies that can survive in Arctic conditions. This decision raises the expectation that the Commission is willing to apply an exception to the technology-neutral condition in the case of investment aid for ocean energy projects. See Commission Decision on State aid to a Finnish offshore wind farm demonstration project (n 60) paras 2-9.[h] Renewable Energy Directive (n 1) arts 6 and 14.
[i] In this regard see Wiesbrock: 'Moreover, the Guidelines run counter to the Renewable Energy Directive which gives Member States the flexibility of choosing any support scheme tailored to their potential and energy policy priorities that they deem necessary to achieve their binding national targets.' Wiesbrock (n 13) s 5.3 (the penultimate para), and Renewable Energy Directive (n 1), preamble paras 6 and 14. Moreover, a technology-neutral bidding process would neglect the Commission's recognition of ocean energy as a valuable asset in the EU's energy portfolio due to its predictable energy output. See s I.

Box 3:

[a] For a further elaboration on policy integration see: Wiesbrock (n 13) s 5.3, and Van Hees, 'Sustainable Development in the EU: Redefining and Operationalizing the Concept' (2014) 10(2) Utrecht Law Review ss 2.1 and 2.3.1.

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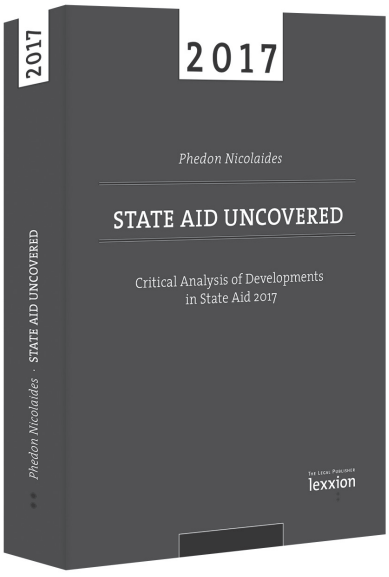

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