"Governing Offshore Wind: Legal Challenges, Market Opportunities and Policy Perspectives" (GOV-WIND)

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Project Summary

The world's energy future is electric and renewable. Humankind consumes more energy than ever and will continue to do so to support the growing use of technology, the digitalisation of almost all facets of citizens' lives and to satisfy basic societal needs. Offshore wind power could and should play a leading role in providing consumers with clean, affordable and renewable energy in the near future due to its characteristics, and thus, can be a key player in limiting climate change. While the technology is already here, the regulation and policy to foster and deal with the consequences of its exploitation are still nascent creating the need for further legal research.

This project proposal, **"Governing Offshore Wind: Legal Challenges, Market Opportunities and Policy Perspectives" (GOV-WIND),** will contribute to filling this gap. It will do so by providing a critical and rigorous interdisciplinary analysis of the current regulation of offshore wind in the EU/EEA and other selected jurisdictions from a *market-oriented perspective*. I will clarify what is the current state of the law concerning the governance of offshore wind to, then, build up policy recommendations to promote the full potential of eolic electricity.

Six aspects make this project proposal relevant, timely, novel and needed.

- Unlike other studies concerning offshore wind regulation which are of a narrow scope – focusing on its environmental impact,[1] health and safety,[2] land planning and jurisdictional matters,[3] financial viability,[4] or grid development[5] – this project is designed to provide a *holistic and interdisciplinary analysis of offshore wind governance from a regulatory and market-oriented perspective*.
- Further, offshore wind regulation is constructed *following a 'top-down' approach,* studying offshore power as *as part of renewable electricity regulation.* This would contribute to a better understanding of the applicable rules because wind governance is built upon and must comply with the EU/EEA energy rules and policy, while Member States having some room for national diversity.
- The project aspires to have practical impact. Thus, it has been designed to have a *special emphasis on the competitiveness, market integration, and financial development and state support* of offshore wind activity, an area currently lacking legal research.
- The project is *interdisciplinary*. While it has legal method(s) at its core, I will resort to other disciplines (such as industrial economics, wind engineering, economic geography of political science) and methodologies to

[1] Leung DYC and Yang Y, 'Wind energy development and its environmental impact: A review' 16 Renewable and Sustainable Energy Reviews [2012], 1031; European Commission, Wind Energy Developments and Natura 2000 (2011); Lindeboom HJ and Degraer S, 'Offshore Environmental Aspects' in Kuik Gv and Peinke J (eds), Long-term research challenges in wind energy: a research agenda by the European Academy of Wind Energy, vol Volume 6 (Springer 2016); Duff J, 'Offshore Management Considerations: Law and Policy Questions Related to Fish, Oil, and Wind' 31 Boston College Environmental Affairs Law Review [2004], 385;

[2] Wifa, Eddy "U.K Health, Safety and Environmental Risk Governance Regime for Offshore Marine Renewables", PhD thesis [2018], University of Aberdeen.

[3] See, inter alia: Chavarria L, 'Wind Power: Prospective Issues' October 2005 Texas Bar Journal [2005]; Toke D, 'The UK offshore wind power programme: A sea-change in UK energy policy?' 39 Energy Policy [2011], 526; Schütz SE, 'Renewable energy production in marine areas and costal zone: the Norwegian model' in Little GFM and Heffron RJ (eds), Delivering energy law and policy in the EU and the US (Edinburgh University Press, cop. 2016 2016); Schütz SE and Myklebust IE, 'Coastal zone management – between politics and law: new guidelines for differentiated management of the shore zone in Norway' 21 Local Environment [2014], 1.

[4] Dvorak MJ, Archer CL and Jacobson MZ, 'California offshore wind energy potential' 35 Renewable Energy [2010], 1244; Dedecca JG, Hakvoort RA and Ortt JR, 'Market strategies for offshore wind in Europe: A development and diffusion perspective' 66 Renewable and Sustainable Energy Reviews [2016], 286; Shariat Torbaghan S and others, 'The legal and economic impacts of implementing a joint feed-in premium support scheme on the development of an offshore grid' 45 Renewable and Sustainable Energy Reviews [2015], 263.

[5] See, inter alia: the ongoing project PROMOTioN - Progress on Meshed HVDC Offshore Transmission Networks (www.promotion-offshore.net), and, inter alia, its report on Legal framework and legal barriers to an offshore HVDC electricity grid in the North Sea (2017); Müller, H. K. (2016). A Legal framework for a transnational offshore grid in the North Sea. Cambridge, Intersentia; Anaya-Lara O, Offshore wind energy generation: control, protection, and integration to electrical systems (Wiley 2014); Snyder B and Kaiser MJ, 'Offshore wind power in the US: Regulatory issues and models for regulation' 37 Energy Policy [2009], 4442; Müller HK and Roggenkamp MM, 'Regulating Offshore Energy Sources in the North Sea-Reinventing the Wheel or a Need for More Coordination?' 29 The International Journal of Marine and Coastal Law [2014], 716.

design relevant research questions, help answering questions on the law and about the law, and provide technical knowledge to create well-informed policy suggestions.

- Additionally, the focus of this project complements expertise at the UiB as a whole and the legal faculty in particular, as well as the UiB's strategy. My research, teaching and administrative skills will further the expertise of our university in energy matters, thus contributing to its further consolidation as an international point of reference.
- Finally, the project is designed to *strengthen cross-Faculty cooperation* at the UiB and utilize my existing and also create *new international network opportunities* for collaborative work, which I actively endeavour to achieve in realising the project goals, and to participate in external funding applications and promote the further development of energy law research and teaching at the UiB.

GOV-WIND – Detailed Project description

Importance of offshore wind regulation

Offshore wind is the electricity source of the future.[6] It is estimated that about 80% of the world's energy potential can be provided by offshore wind power,[7] and in the years to come, its wide availability is likely to become a reality. These changes are currently happening thanks to offshore wind's features: its renewability, relatively low-costs, expansion possibilities, technological development, and somewhat limited environmental impact.[8]

Since 1991 Europe has been the world leader in offshore wind electricity production,[9]with a first wind farm installed in Denmark.[10] Its growth in the EU/EEA Member States and the world has been meteorical. The existing capacity has grown since 2000 from almost 0 MW to 15,760 MW in 2017, with Europe generating about 84% of the world's production.[11] This represents about 1,5% of Europe's electricity consumption, produced by more than 4,100 wind turbines in constant movement every day.[12] The potential is *still enormous.* For example, in Norway offshore wind potential is estimated to be 100 times larger than hydropower, and the government is actively fostering wind power production as clarified several times by high government officials.[13] Furthermore, offshore wind power is needed if the new European renewable energy targets,[14] and United Nations energy sustainable and affordable development goals, are to be met.[15]

However, while technological development allows for larger, more efficient (even floating)[16] turbines and commercial success, legal expertise and understanding of the regulatory needs and implication for offshore wind still lags behind in Norway, the rest of Europe, and even more in other jurisdictions. This is in part because energy regulation in general is a complex topic, mixing need for competitiveness, reliability and social considerations, and because offshore wind development is a novel issue and energy source. My research project aims at contributing to closing this knowledge gap to understand and improve the offshore wind regulation.

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[6] Esteban MD and others, 'Why offshore wind energy?' 36 Renewable Energy [2011], 444; Kaldellis JK and Zafirakis D, 'The wind energy (r)evolution: A short review of a long history' 36 Renewable Energy [2011], 1887; Timilsina GR, Cornelis van Kooten G and Narbel PA, 'Global wind power development: Economics and policies' (2013) 61 Energy Policy 642.

[7] https://www.regjeringen.no/no/aktuelt/morgendagens_energi/id2629061/.

[8] Esteban M and Leary D, 'Current developments and future prospects of offshore wind and ocean energy' 90 Applied Energy [2012], 128; Rodrigues S and others, 'Trends of offshore wind projects' 49 Renewable and Sustainable Energy Reviews [2015], 1114; Paterson J and others, 'Offshore wind installation vessels – A comparative assessment for UK offshore rounds 1 and 2' 148 Ocean Engineering [2018], 637; Perveen R, Kishor N and Mohanty SR, 'Off-shore wind farm development: Present status and challenges' 29 Renewable and Sustainable Energy Reviews [2014], 780

[9] Wind Europe, *Offshore Wind in Europe - Key Trends and Statistics 2018* (2019), p. 6.

[10] Vindeby Offshore Wind Farm, located in the waters around Lolland, Denmark with an annual net output of 9.61 GWh, decommissioned in 2017.

[11] https://gwec.net/global-figures/global-offshore/.

[12] Wind Europe: https://windeurope.org/policy/topics/offshore-wind-energy/.

[13] See, inter alia, https://www.regjeringen.no/en/aktuelt/equinor-autumn-conference/id2619687/; https://www.regjeringen.no/no/aktuelt/wind-power-in-norway-post-2020/id2588446/; https://www.owjonline.com/news/view,norway-recognises-offshore-winds-huge-potential_50452.htm; https://www.regjeringen.no/no/aktuelt/morgendagens_energi/id2629061/; https://www.regjeringen.no/en/aktuelt/working/id2628180/; Cf with a previous rather negative report by the Norwegian Water Resources and Energy Directorate "Offshore wind power in Norway" (2013).

[14] Article 3 of the Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (OJ [2018] L328/82).

[15] United Nations, General Assembly Resolution, "Transforming our world: the 2030 Agenda for Sustainable Development", 25 September 2015, Goal 7, and para. 7.

[16] Atcheson M and Cruz Jo, *Floating offshore wind energy: the next generation of wind energy* (Springer 2016); Paterson J and others, Op. Cit (n. 8); Rodrigues S and others, Op. Cit (n. 8).

The project is designed to cover three thematic 'Clusters' in 6 years as described below.

Research thematic areas

Cluster 1: Regulating renewable energy in the Clean Energy Package – Particularities of offshore wind?

On November 2016 the European Commission announced its "Clean Energy for all Europeans" ("CEP") strategy to transform the regulation of energy (electricity) markets in Europe due to two main factors. First, technological developments that make renewable energy production much more cost-efficient and available, and second, the active participation of end-consumers ("prosumers") in energy markets. This legislative proposal, including 8 Directives and Regulations (some of them already adopted),[17] aims at bolstering the transition towards a competitive, green and more integrated energy market by ensuring the promotion of security of supply, affordability of electricity and decarbonisation of electricity production. The Commission aims to achieve this is by "putting energy efficiency first, achieving global leadership in renewable energies and providing a fair deal for consumers".[18]

While none of these new instruments are aimed expressly at offshore wind electricity, all of them are relevant for its future regulation. They will constitute its main and minimum regulatory framework covering its production, transportation, market integration and commercialization in the EU and EEA Member States. Therefore, identifying what are the main changes and novelties brought by the CEP and what is their impact and legal significance on renewable electricity and in particularly offshore wind generation is paramount.

1.1. What's new in the EU Energy Renewable Directive regarding support schemes and financing for renewable electricity?

Articles 4, 5, 6 and 13 of the new Renewable Energy Directive establish the framework for Member States to regulate and promote renewable energy production and use.[19] The Directive also sets up financial and administrative support schemes to reach the national renewable targets. These schemes seek to expand generation of renewable power in a "market based and responsible way", and avoiding market distortions. Thus, they are crucial to kick start large infrastructure projects or explore offshore wind power possibilities in new areas.

While the topic of support for renewable energy is well studied and discussed in the literature, for example regarding 'feed in tariffs'[20] or 'prioritized dispatching'[21](and its removal from the Directive),[22] the changes brought about the new Directive and its relation to offshore wind remain underexplored.

In my project I seek to investigate:

1. What is the scope granted by the new Renewable Energy Directive to support schemes for renewable energy (and offshore wind), and their relation to the EU competition and state aid rules, as illustrated by a very recent case in France of state support for floating wind farms.[23]
2. What business opportunities and modalities for renewable energy schemes adapt better to offshore wind? What experiences exist in other jurisdictions, and how can these be adopted to fit Norway's situation?

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[17] Out these 8 proposals 5 have already been politically accepted by the actors in the trialogue process as confirmed by the EU Commissioner Arias Cañete on 22 November 2018, http://europa.eu/rapid/press-release_STATEMENT-18-6533_en.htm. And it is expected that all of them will be adopted in 2019.

[18] https://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition.

[19] Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (OJ [2018] L328/82).

[20] Commission Staff Working Document - for the design of renewables support schemes, https://ec.europa.eu/energy/sites/ener/files/com_2013_public_intervention_swd04_en.pdf; Shariat Torbaghan, Op. Cit. (n. 4); Couture T and Gagnon Y, 'An analysis of feed-in tariff remuneration models: Implications for renewable energy investment' 38 Energy Policy [2010], 955; Nordensvärd J and Urban F, 'The stuttering energy transition in Germany: Wind energy policy and feed-in tariff lock-in' 82 Energy Policy [2015], 156.

[21] Oggioni G, Murphy FH and Smeers Y, 'Evaluating the impacts of priority dispatch in the European electricity market' 42 Energy Economics [2014], 183; Morthorst PE, 'Wind power and the conditions at a liberalized power market' 6 [2003], 297.

[22] Cf the absence of rules for priority dispatching in the previous Recitals (60) and (61) and Article 16 of the 2009 Renewable Energy Directive but also compare with the rules in the proposed Electricity Regulation (2018 version, not yet adopted), Article 11.

[23] Commission approves support for four floating demonstration offshore wind farms in France on 25 February 2019 on the cases SA.49672, SA.49673, SA.49674 and SA.52085. See also the Belgian cases of approved aid of €3,5 billion to floating offshore wind farms in SA.51306.

3. What is the relation of these support schemes with other rules concerning public and/or private financing for sustainable energy, such as the Regulation on trans-European energy infrastructure?[24] And its relation to the state aid rules and guidelines for the development of energy infrastructure,[25] and public procurement of utilities?[26]
4. What are the implications for priority dispatch for renewable power brought by its removal from the Energy Renewable Directive and what is the content of the rules included in the Electricity Regulation?

1.2. New rules for capacity remuneration mechanisms and offshore and renewable energy impact on their assessment

Introducing renewable energy into the grid is a commendable objective but implies costs and market risks, connected to its variability of supply. Predicting wind production is a science of its own and this also applies to solar power.[27] Member States desire to both have large amounts of renewable power and stable and consistent availability of supply to meet peaks in demand. At the same time, producers of energy are not always enticed to invest in new capacity to cope with an increase in demand because it is not always profitable to do so, being this due to tariff caps, rules on priority dispatching or other regulatory matters. This lack of investment, the introduction of (more) variable power and increase in the society's energy demand creates legal, economic and technical challenges concerning security of supply.

This conflict between legal rules, fostering of renewable sources, possible market distortions due to aid, and the need for a stable, secure and consistent supply of energy is most palpable concerning the establishment of Capacity Remuneration Mechanisms (CRM), which are growing in popularity due to the non-predicable nature of renewable energy generation.[28] These schemes are designed to compensate providers of electricity capacity (usally non-renewable energy producers) in order to ensure sufficient availability in peak times to prevent blackouts and may have a distortive competition effect.

While much has been written concerning the CRM's compatibility with state aid and the need to secure supply, less attention has been paid to the strictness of the assessment of these regimes by the Commission and now the EU Courts, with the very recent case of *Tempus v Commission* as a clear example.[29] Not only a stricter review can be identified in the case law, but also in the hard law. For the first time, the CEP has proposed substantive detailed rules on the minimum requirements and evaluation of CRMs in the Electricity Regulation,[30] and the revised proposed Risk-Preparedness Regulation.[31]

In the evaluation of the rules and case law I will study the following issues:

1. In which way does renewable electricity brings about particular changes or need for the instalment of CRM mechanisms? Is the influx of variable supply increasing the need for CRM? Can a pattern be seen?
2. What are the differences brought by the new substantive rules concerning the minimum requirements and assessment of CRM in comparison to the Commission's Guidelines? What is their impact?
3. Are renewable sources and offshore wind power in disadvantage to offer capacity if strategic reserves are the default option as required by the new rules?

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[24] Regulation (EU) No 347/2013 on Guidelines for Trans-European Energy Infrastructure (OJ [2013] L 115/39).
[25] Communication from the Commission — Guidelines on State aid for environmental protection and energy 2014-2020 (OJ [2014] C 200).
[26] Directive 2014/25 on Procurement by Entities Operating in the Water, Energy, Transport and Postal Services Sectors (OJ [2014] 94).
[27] Foley AM and others, 'Current methods and advances in forecasting of wind power generation' 37 Renewable Energy [2012], 1; Jung J and Broadwater RP, 'Current status and future advances for wind speed and power forecasting' 31 Renewable and Sustainable Energy Reviews [2014], 762.
[28] For some literature dealing with this topic see, inter alia, Hancher L, de Hauteclocque A and Sadowska M, Capacity Mechanisms in the EU Energy Market: Law, Policy, and Economics (Oxford: Oxford University Press 2015); Hary N, Rious V and Saguan M, 'The electricity generation adequacy problem: Assessing dynamic effects of capacity remuneration mechanisms' 91 Energy Policy [2016], 113; Keppler JH, 'Rationales for capacity remuneration mechanisms: Security of supply externalities and asymmetric investment incentives' 105 Energy Policy [2017], 562; Höschle H and others, Capacity remuneration mechanisms and the transition to low-carbon power systems (2015); Cervigni G, Generation capacity adequacy in Europe: What economic rationale for Capacity Remuneration Mechanisms? (2013); Henriot A and Glachant J-M, Capacity remuneration mechanisms in the European market: now but how? (2014).
[29] T-793/14 - *Tempus Energy and Tempus Energy Technology v Commission* [15 November 2018].
[30] Articles 18a of the Prpoposed Electricity Regulation (not yet adopted) requiring cross-border participation in capacity mechanisms. See also: Huhta K, 'Capacity mechanisms in EU Law: A comment on the free movement of goods' (2018) 1, p. 7.
[31] Proposal for a Regulation on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC, COM(2016) 862 final.

4. What has been and what would be the treatment given to renewable energy in CRM and what role will the provisions on CO_2 emission requirements will have for offshore wind?

1.3. **Right to wind-based power and cross-border nature of energy activities: Need for ACER's intervention?**

Energy market integration and the shift to renewable generation sources require coordination among the policymakers, regulators, and other stakeholders. EU and EEA law have devised a system based on shared competences between national and EU/EEA regulators, as the outcome of a political compromise.[32] However, despite these shared competences, the degree of integration of energy law governance and enforcement in Europe remains a mostly national matter which has led to sub-optimal coordination and decision-making efforts, particularly in cross-border matters, which are of relevance for offshore wind projects and its grids located near the borders. To fill this vacuum, the Agency for the Cooperation of Energy Regulators (ACER) and the European Network of Transmission System Operators (ENTSO)[33] were created to perform an EU/EEA wide regulatory role alongside the national regulators and as European wide-coordinating agencies, not without controversy in the Third Energy Package in 2009, or as we lived in Norway in 2018 when incorporating these rules to the EEA system.[34]

Originally, these agencies were entrusted with quite limited and mostly advisory functions. However, with the aim of creating an Energy Union,[35] the Commission argues that further coordinated enforcement, technical standartization and regulatory oversight from a centralized body is needed. Consequently, the CEP grants ACER and ENTSO-E with new (and binding) powers in cross-border and technical matters, power to issue individual decisions in cross-border cases of disputes, and the drafting of Network Codes. These competences, according to the Commission, should result in a "fine-tuned balance of powers between the different actors",[36] something which is highly debated by both Member States and industry players.

My research seeks to clarify what is the content of these new powers granted to ACER and ENTSO-E on the CEP, and the existing powers concerning trans-European energy infrastructure in Regulation 347/2013 for projects of common interest and cross allocation of costs and risks. Also, I will discuss what are the consequences of this new architecture of decision-making for offshore wind installations, in which cross border issues are of importance, such as in the North sea where borders are close and every maritime inch counts.

Among the specific research questions that I envisage tackling are:

1. What is the nature of ACER as a quasi-European regulator?
2. What new competences are assigned by the CEP to ACER and ENTSO-E in cross-border issues?
3. In which circumstances can ACER decide upon regulatory issues that fall within the competence of national authorities?[37] Or regarding the exemptions for new interconnectors from ownership unbundling and third-party access, like in offshore wind projects? How are these decisions implemented?[38]
4. Have there been cases related to wind (and offshore in particular) in which ACER has intervened? If so, how can this affect offshore wind farms operation and planning?

□ Cluster 2: Licensing Offshore Wind Farms

Setting up and operationalizing offshore wind farms is the first necessary step in generating and integrating wind-produced electricity on to the grid. Most legal systems require a governmental permit (license) or grant a concession

[32] See, inter alia: Talus K, *Introduction to EU Energy Law* (Oxford University Press 2016); Roggenkamp MM and others (eds), *Energy law in Europe: national, EU and international regulation* (3rd ed. edn, Oxford University Press 2016); Vedder H and others, 'EU Energy Law' in Roggenkamp MM and others (eds), *Energy law in Europe: national, EU and international regulation* (3rd ed. edn, Oxford University Press 2016).

[33] Regulation (EC) No 713/2009 establishing an Agency for the Cooperation of Energy Regulators (OJ [2009] L 211) and, Regulation (EC) No 714/2009 on conditions for access to the network for cross-border exchanges in electricity (OJ [2009] L 211).

[34] Herrera Anchustegui, Ignacio. 2018. Hva er egentlig ACER - Eksperten gir deg svar. Dagsavisen. 1 sider. Publisert 2018-03-20.

[35] The strategy for creating an Energy Union was launched in February 2015. The latest and third report on the State of the Energy Union is available here: https://ec.europa.eu/commission/publications/third-report-state-energy-union_en.

[36] Proposal for a Regulation establishing a European Union Agency for the Cooperation of Energy Regulators COM(2016) 863 final/2 2016/0378(COD), p. 23.

[37] Article 6 of the Proposal for a Regulation establishing a European Union Agency for the Cooperation of Energy Regulators (2018 version).

[38] Article 59 of the Proposal for an Electricity Regulation (2018 version) and Articles 6, 43, 59 and 60 of the Proposal for an Electricity Directive (2018 version).

for the exploitation of a designated site for a windfarm operation and they will impose different requirements for operations to start. Also, they might require different types of licenses for different activities, and their scope and rights and obligations vary.

2.1 International comparative analysis

While there are studies concerning the licensing of offshore wind farms, these are either focused on one or two jurisdictions,[39] some specific geographical area,[40] some narrow aspects of the licensing process,[41] or on decommissioning of installations once the license has elapsed.[42] Because of this, the literature lacks a comparative overview of these issues with a global or even regional perspective. This is why the project will include an edited book centered on the comparative analysis of licensing process for the set-up of offshore wind operations in selected jurisdictions, and I will collaborate as an author and main editor of the book. This project will be of interest not only to academics but (and perhaps more importantly) to policy makers and the industry as it will serve to compare and improve the legal regimes.

This edited collection will group about 10 contributions from different countries chosen due to their importance concerning offshore wind operation, potential and/or geographical and legal diversity. Some of the potential countries to analyze in the study are: Norway, Spain, UK, Denmark, Germany, the Netherlands, Belgium, France, Sweden, Finland, USA, China, Japan, Brazil and South Africa.

Each chapter will be based on a thematic questionnaire to provide a clear statement of the law in the analysed jurisdiction and also answer the legal challenges posed by offshore wind farm operationalization. Among the relevant issues to discuss in each chapter are:

1. Pre-license procedure and site selection: minimum requirements, body(ies) entrusted to carry out operations, pilot projects.
2. Operator selection methods. Is the operation of offshore wind installations reserved to the state? Is it tender based or through administrative regulatory designation?
3. Environmental considerations and its weighing in the licensing procedure and rules concerning cessation and decommissioning of the activities and structures.
4. Legal nature of the licensing instrument: What type of rights it confers? Is it transmissible? Is it a license, a permit or a concession?
5. Length of the license(s).
6. Contractual and extra contractual liability concerning damages. What is the applicable law and what role does the law of the sea applies here, if any?

2.2 The role of the public international law of the sea and offshore wind farm installations

A key aspect to the understanding of rights, duties and limits of States when licensing offshore wind farms is the regulation of the maritime area in which they will be operating within national and international law. This applies to both the wind-turbine and its base, as well as the grid (cables) that are used to connect it to the transmission and distribution lines.

The main source of public international law regulating maritime areas is the United Nations Convention of the Law of the Sea from 1982. Three different jurisdictional areas are distinguished with different level of complexity for offshore wind. Territorial sea, Exclusive Economic Zone, and High Seas. These areas delineate different marine spaces in which the state has full, limited or no sovereignty over the waters and the underground, or sovereign or

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[39] Toke D, Op. Cit (n. 3); Snyder B and Kaiser MJ, Op. Cit (n. 5); Mani S and Dhingra T, 'Critique of offshore wind energy policies of the UK and Germany—What are the lessons for India' 63 Energy Policy [2013], 900; Dvorak MJ, Archer CL and Jacobson MZ, 'California offshore wind energy potential' 35 Renewable Energy [2010], 1244.

[40] Müller HK, Op. Cit. (n. 5)t; De Gendt S, 'Legal challenges concerning offshore wind installations along the coastline of the North Sea' (University of Gent (Master thesis) 2018); Woolley O, 'Governing a North Sea Grid Development: The Need for a Regional Framework Treaty' Competition and Regulation in Network Industries [2013], 73.

[41] Gibson E and Howsam P, 'The legal framework for offshore wind farms: A critical analysis of the consents process' 38 Energy Policy [2010], 4692.

[42] Topham E and McMillan D, 'Sustainable decommissioning of an offshore wind farm' 102 J Renewable energy [2017], 470; Aldén L and Barney A, *Decommissioning of wind farms-ensuring low environmental impact* (2016); Kaiser MJ and Snyder B, *Offshore wind energy cost modeling: installation and decommissioning*, vol 85 (Springer Science & Business Media 2012).

no rights concerning the exploitation of natural resources with regard to activities of production of energy.[43] Thus, they set a framework in which each national legal system may develop its rules further.

So far, most of the academic work concerning law of the sea and offshore wind has dealt with either the Territorial Sea or the Exclusive Economic Zone, in part because the average length of offshore wind placement from the coast is 41 kms, well within the Exclusive Economic Zone.[44] The offshore wind development in the High Seas remains relatively unexplored legally and in practice. Also, what little legislation applies seems to be quite underdeveloped and/or in conflict with offshore wind operations, even if it may be the sea area with the most energy production potential, particularly for the developing technology.[45] This create a legal vacuum concerning the extent that the current regime allows for offshore wind projects to be developed in the High Seas, and what ought to be the applicable (international) regulation.

This subsection of the project will focus on the interaction of the law of the sea with offshore wind production, in particular:

1. The determination of applicable jurisdiction, power and competences, legal regime, and the extension of the State and license holder's rights for offshore wind installations and grid networks in the Territorial sea, Exclusive Economic Zone, and High Seas.
2. Evaluate whether there are any differences concerning the treatment to floating or static wind farms at sea.
3. Analyze the interaction of principles of law of the sea, including but not limited to *the right of innocent passage* and the *mare liberum*, and their impact on the instalment and functioning of wind installations.

2.3 Comparing offshore wind to offshore petroleum licensing

The licensing of offshore wind and offshore petroleum operations share many characteristics. Both deal with exploitation of energetic natural resources in a designated marine space through the use of some infrastructure. Because of the experience on offshore petroleum operations, which traces back even to 1891,[46] and the apparent similarities between these offshore activities, legislators may be tempted to adopt a "copy-and-paste" attitude to offshore wind regulation from petroleum experiences. While this may seem reasonable, it could also be a risky strategy. Albeit similar in nature, the industries are quite different.[47] Not only because of the type of energy that is produced by these sources but because petroleum involves extraction of a good, exhausting it, while offshore wind employs a resource but does not consume it.

The project will compare the licensing of these two energy activities to evaluate to which extent legislators adopt similar regimes to authorize the survey/exploration, production and cessation of offshore wind and petroleum activities. This would allow me to identify and analyse to what degree the regimes differ, why they do, how much influence oil licensing has over ocean wind and whether such influence is warranted by the nature and the technology of the activity of offshore wind production. For this project I will collaborate with Prof. Tina S. Hunter, a specialist in oil and gas law. My legislative focus for this study will be centered in two countries: Norway and the UK. I have chosen these two countries for several reasons. First, Norway has a very developed, comprehensive, and well researched (and imitated) petroleum licensing system,[48] while the offshore licensing is still nascent (both legislative and in practice) under the Offshore Energy Act.[49] On the other hand, the UK is the world's leader in offshore wind production and has also many years of experience in offshore drilling with a robust licensing system. Moreover, Norwegian companies have offshore wind activities already in the UK and I expect that UK companies will enter the Norwegian offshore wind market in the future.

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[43] Article 56(1)(a) United Nations Convention of the Law of the Sea.
[44] European Wind Energy Association WindEurope, *Offshore Wind in Europe: key trends and statistics 2017*, February 2018. See also: Portman ME and others, 'Offshore wind energy development in the exclusive economic zone: Legal and policy supports and impediments in Germany and the US' (2009) 37 Energy Policy 3596.
[45] See also in this sense: Elsner P and Suarez S, 'Renewable energy from the high seas: Geo-spatial modelling of resource potential and legal implications for developing offshore wind projects beyond the national jurisdiction of coastal States' 128 Energy Policy [2019], 919; Rollini, Lucie, "Development of wind farms on the high seas: a new challenge for the international law of the sea"; https://spectrum.ieee.org/energywise/green-tech/wind/rechargeable-wind-power-over-the-open-ocean.
[46] https://www.offshoreenergytoday.com/offshore-drilling-history-and-overview/.
[47] Edwards I and Dalry CD, *Overcoming challenges for the offshore wind industry and learning from the oil and gas industry* (2011).
[48] Governed by the Act Relating to Petroleum Activities and to some extent by the Petroleum Act.
[49] Currently, there are are rumors of the drafting of a regulation on these issues.

□ Cluster 3: Introducing Offshore Wind Power in Energy Markets

Introducing offshore wind electricity and other renewable sources into the grid is a commendable objective but implies costs, market risks and changes. Traditional (European) energy markets were designed for single and vertically integrated suppliers who were usually publicly owned and enjoyed exclusive rights over a designated territory. This has changed. Since the mid 1990s both in the US and Europe, and latter across the world, policy makers decided to transform these monopolistic markets and expose them to competition – first at the wholesale level (generation), and then in some jurisdictions like the EU, to retail competition (distribution and sales of electricity to end consumers). To create competition in energy markets the legislator resorted to the imposition of regulatory third-party access requirements to transmission lines and unbundling rules over ownership of energy companies, often supported by competition rules. [50]

Beyond this regulatory framework to open energy markets to competition, energy trading has evolved and become dynamic. Even hour by hour electricity is traded in short and long term markets by generators, transmitters, energy retailers, distributors and investment funds. Some of these markets are organized in "power pools", like the case of Scandinavia's Nord Pool, or the US ISOs in which trading happens on day-ahead, intraday or even real time, while others are long term markets which usually are arranged through bilateral agreements between buyer and sellers.

Renewable electricity brings about new challenges for the regulatory landscape and the functioning of energy markets that need regulatory responses, as confirmed by the proposal of the CEP. For example, renewable's variability of production and forecasting difficulty affects system balancing, or now consumers participate actively producing them (prosumers/distributed generation) and connection is required as well. These changes are transforming how energy markets look like, which players participate in them, the geographical setting and, most importantly, the time-frame in which energy is traded.

3.1. Impact of offshore wind in the short-term energy markets

Variable energy supply from offshore wind will be incorporated into the wholesale energy markets and traded in either long term agreements or in the power pools in the day-ahead and intraday markets.[51] However, because of its variability and the difficulty in forecasting it, offshore wind creates issues concerning demand and supply balancing that need to be addressed by transmission system operators to avoid brown-outs and blackouts through balancing of load and redispatching of generators. Thus, it is likely that the short-term markets of balancing and ancillary markets will grow in importance and their regulation will become more complex and of paramount importance. [52] Also, while the effects are more often taking place in the short-term markets, they are likely to trigger a knock-on effect on long term markets and power purchasing agreements.

To appraise the extent of the impact of renewable wind power in short-term energy markets I will analyze the existing regime for balancing and ancillary markets through the existing "Market Network Codes"; namely the Electricity Balancing Code, the Capacity Allocation and Congestion Management Code and the Forward Capacity Allocation Code. Network Codes are binding technical rules drafted by ENTSO-E pursuant to the recommendation of ACER and approved and published by the European Commission that aim at creating a level-playing field for the harmonization, integration and efficiency of the electricity market.[53] This analysis will also serve to address more specific research questions, such as:

1. What is the regulatory policy and treatment for short-term markets?
2. Are they designed to foster and maximize the penetration of renewable energy or do they still favour traditional energy generators?

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[50] For some of my own work on these matters see, inter alia the following and the literature cited therein: Herrera Anchustegui I, 'Transmission Networks in Electricity Competition: Third-Party Access and Unbundling – a Transatlantic Perspective' in Ruiz Peris JI (ed), *Competencia en mercados con recursos esenciales compartidos: telecomunicaciones y energía* (2019 (forthcoming)); 1. Uses and Abuses of EU Competition Law in Energy. Bergqvist, C., Herrera Anchustegui, I, in Hunter T., Herrera Anchustegui, I, Crossley, P. and Álvarez, G. (eds) "Handbook of Energy Law" (Routledge, 2019 (forthcoming)).

[51] Article 6 Proposed Electricity Directive, - Analysis of the final compromise text with a view to agreement, version of 11 January 2019. See also: Mäntysaari P, *EU Electricity Trade Law* (Springer ed, 2015).

[52] Article 5 Proposed Electricity Directive, - Analysis of the final compromise text with a view to agreement, version of 11 January 2019.

[53] Vlachou C, 'New Governance and Regulation in the Energy Sector: What does the Future Hold for EU Network Codes?' 9 [2018], 268; Jevnaker T, 'Pushing administrative EU integration: the path towards European network codes for electricity' 22 Journal of European Public Policy [2015].

3. Do these market network codes have any provisions particularly addressing offshore wind power? If so, what is the nature of these? And in the negative case, is there a need for particular offshore wind power rules?

3.2. Nature and regulation of energy markets having their own legal culture?

Energy markets, such as Nord Pool or EpexSpot or the US ISOs, are legal bodies with their own internal rules, hierarchy mixing private and public law aspects, as well as having their own (internal) soft-law regulation and imposed hard law regulation.[54] In these markets power is bought and sold by the different players in different short term markets (the focus of sub-Cluster 3.1.) according to a set of rules, including trading, auction and market behavior from players,[55] that have evolved and emerged and combine both soft with hard law regulation. These bodies remain little studied from an institutional or legal culture perspective.

In this sub-project to be carried out along with legal historian Dr Andrew Simpson we will analyze the institution of energy markets as a legal culture object. Our focus will be the study of these energy markets to determine whether they have a legal culture of their own,[56] what is their nature as institutions, and what special characteristics they have that may make them different to other equivalent entities – such as stock exchanges.

Project timeline, expected output & dissemination plans

This research project has been designed to be fulfilled in 6 years running from early 2020 and finishing in late 2026 or early 2027. Also, its content has been designed so that it can realistically be completed in addition to my teaching and dissemination duties. Further, the Clusters are designed to have somewhat similar lengths of about two years and for them to be completed in succession. The project will prioritize high-quality research of strong societal impact on the legal aspects of offshore wind as described above. Its main output will be academic work combined with dissemination strategies to maximize the impact of the project and contribute to generating knowledge on offshore wind within and outside of academia.

Cluster 1 is expected to produce between 3 to 4 article publications and to be carried out between 2020 and 2022. These publications would deal with: the rules on support schemes, financing, and their suitability to offshore wind; the new provisions on priority dispatching; CRM rules incorporated in the CEP and how these rules affect or enable the use of offshore wind and renewables to secure sufficient capacity in the market; and lastly, the powers of ACER to decide cross-border issues and its relevance for offshore wind.

Cluster 2 will lead to one edited book publication on the comparative law analysis of offshore wind licensing, and two academic articles on the interaction of the Public International Law of the Sea with offshore wind farms operation and the comparison of offshore wind licensing to licensing of petroleum activities. This cluster will be carried out between late 2022 and early 2025.

Cluster 3 will lead to at least 3 academic publications in the form of articles and be carried out from late 2024 to late 2026. The first of them will be on the organization and regulation of short-term energy markets, while the second will deal with the role of offshore wind in the Market Network Codes and Guidelines. The third paper will deal with the legal culture of energy markets.

These publications will be submitted to high-quality energy journals in law and/or other disciplines such as: Energy, Energy Policy, OGEL, The Journal of World Energy Law & Business, Journal of Energy & Natural Resources Law, Electricity Journal, European Competition and Regulatory Law Review, etc. For the book publication I will

[54] For some literature on specific power pools from different perspectives, see:; Botterud, A., et al. (2010). "The relationship between spot and futures prices in the Nord Pool electricity market." Energy Economics 32(5): 967-978; Flatabo, N., et al. (2003). "Experience with the Nord Pool design and implementation." IEEE Transactions on Power Systems 18(2): 541-547; Weron R. SI, Wilman P, 'Modeling highly volatile and seasonal markets: evidence from the Nord Pool electricity market' in H T (ed), *The Application of Econophysics* (Springer 2004).

[55] Barker;, J. J., et al. (1997). "Regulation of Power Pools and System Operators: An International Comparison." Energy Law Journal 18(2): 231-332.; Spence, D. B. (2008). "Can Law Manage Competitive Energy Markets." Cornell Law Review 93(4): 765-818.

[56] For this, we will use the framework of legal cultures developed by Sunde in Sunde, Jørn Øyrehagen. 2017. Managing the Unmanagable - An Essay Concerning Legal Culture as an Analytical Tool in Koch, Søren; Skodvin, Knut Einar; Sunde, Jørn Øyrehagen. 2017. Comparing Legal Cultures. Fagbokforlaget.

contact international publishers such as Routledge or Edward Elgar, Wolter Kluwers, Hart, Intersentia to pitch the book concept.

Maximizing the visibility and impact of the project in the legal, social sciences academic community, as well as the general public is of great importance to me.[57] Beyond the use of social media to promote the project and its findings (a project website, Twitter, SSRN, etc), I have other concrete plans:

- I am a regular speaker at **international conferences** and I will continue to do so for this project, aiming to present the outcome of my research in 3-4 different conferences/seminars per year, for 20 or more speaker participations at international events during the project duration.
- For each Cluster I will arrange and host in the University of Bergen an international conference. These will be hosted in collaboration with Bergen Offshore Wind Centre and/or the Bergen Center for Competition Law and Economics. These **three conferences** will take place ideally **every 2nd year** of the project and will comprise of presentations by top academics, industry participants and other stakeholders. For its financing I will seek external funding, something in which I am experienced already.
- Also I will seek to **co-organize** with one of the project's collaborating partner several events (2-3) outside of Norway. Among them, I have already received confirmation of interest by the Aberdeen Centre for Energy Law and advance conversations with the Florence School of Regulation and the Tulane Center for Energy Law.
- For the **comparative book** project, I will organize ideally two workshops to gather and coordinate the content, format and style of the chapters and discuss the content of them to improve the quality of the chapters. Also, once the book is released, I will coordinate a conference for its launch.
- Additionally, I will contribute to the dissemination of the research results by participating in the **public debate** through the publishing of 'popular science' type of publications in newspapers, electronic blogs or magazines and/or participating in public events or fairs. Ideally, between 3 to 4 publications of this type are to be expected.

PhD research possibilities and supervision

As a related activity to this project, I will promote and seek opportunities to develop legal talent by junior academics in energy and offshore wind regulation. To do so, I will prepare or collaborate in the preparation of project proposals for external funding for the financing of PhD and/or post-doctoral positions at the University of Bergen, which I also hope to supervise.

In case you happen to have an interest in the project and have a PhD proposal that connects to it or would like to discuss the possibility of preparing one such proposal, please do not hesitate to contact me at: Ignacio.Herrera-Anchustegui@uib.no.

International collaborators

Confirmed international collaborators and contact persons: **Aberdeen Energy Law Centre**, University of Aberdeen, UK. Prof Tina Soliman Hunter; **Tulane Energy Law Center**, School of Law, University of Tulane, USA. Prof. Kim Talus; **Centre for Climate Change, Energy and Environmental Law (CCEEL)**, University of East Finland, Finland. Prof. Kim Talus; **Florence School of Regulation**, European University Institute, Florence, Italy. Prof. Leigh Hancher; **Departments of Administrative and Commercial Law**, University Carlos III de Madrid, Madrid, Spain. Prof. Antonio Robles Martín-Laborda; School of Law, **University of Georgetown**, USA. Prof. Scott Hempling; School of Law, **University of Bristol**, UK, Reader Dr. Albert Sánchez Graells.

Potential international collaborators: **Centre for Energy, Petroleum and Mineral Law and Policy**, University of Dundee, UK; **Groningen Centre of Energy Law**, University of Groningen, the Netherlands; **Wind Energy Center**, University of Massachusetts, USA; **Institute of Environmental and Resource Law and Center for Oceans Law and Policy**, KuGoan School of Law, Jiao Tong University, among others.

[57] See for example my track of public participation and dissemination for my on-going and past projects in: https://app.cristin.no/persons/show.jsf?id=584602.