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Legal Appraisal of Marine Scotland and the Offshore Wind Industry Group as Legal Responses for Combating the Environmental Impact of Offshore Wind Development in Scotland's Territorial Waters

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Abstract
Combating the challenges occasioned by the environmental impact of offshore wind development in Scottish territorial waters has been a lingering problem for the Scottish government in its lofty bid to addressing the generation of power from offshore wind as a supposed climate-friendly power generation initiative. Marine Scotland and the Offshore Wind Industry Group are two major organisations in Scotland designed to achieve this laudable mission geared towards minimising the deleterious environmental impact of the alternative power-generation drive. This paper examines, identifies, appraises and analyses the imminent and immediate challenges such legal moves is billed to encounter within the ambits of the extant laws and policy and endeavours a holistic assessment of the groups' policy statements and recommendations as appropriate legal responses for achieving the environmental restoration and preservation of the Scottish offshore territory whilst making a set of recommendations to achieve the proper policy implementation and the environmental restoration objectives.
Keywords: Marine Scotland, Offshore, Wind, Scotland, Challenges, Environment.

1.0 INTRODUCTION

Scotland is one of the four component parts that make up the United Kingdom[1]. Other parts are Wales, England and Northern Ireland. Due to its failed attempt at independence vide referendum, it still remains an integral part of the United Kingdom. The Scottish Government is committed to achieving the generation of 50% of its electricity from renewable energy sources by the year 2020.[2] They are also to meet the 2020 renewable target of 50% of the total EU energy consumption from renewable sources by 2020.[3] How this will be achieved is an entire treatise on its own outside the purview of the instant analytical discourse. EU's commitment towards achieving a climate-compliant and an environmentally safe region is however particularly reinforced by the Kyoto Protocol to reduce greenhouse gas emissions by 8% compared to the 1990 levels.

There have been a number of graduated environmental protection and emission targets in the sub-region. For instance, the United Kingdom's commitment was pegged at 20% reduction as at 2010 and another 60% by 2050[4]. All these climate-friendly, environmental preservation drives would therefore require that they tap into alternative power-generation sources like renewable energy. But it must be noted that whilst these are plausible energy-saving, climate-friendly, power-generation schemes, they still sometimes inadvertently result in deleterious environmental consequences. Due to the strategic location of Scotland as a wind Island, there was therefore a massive drive to develop the wind potentials of Scotland in the quest to achieve success in offshore renewable energy development and generation.[5] This Scotland has done admirably to the applause of all and sundry.

1.1 ENVIRONMENTAL IMPACT OF OFFSHORE WIND DEVELOPMENT IN SCOTLAND

Offshore wind farm as a renewable energy resource is a relatively new initiative and as such its full environmental impact is yet deemed unknown largely due to insufficient knowledge in the field and because it is yet untested[6]. In spite of the benefits of lower carbon emissions and reduced dependence on finite fossil fuels, it has potential deleterious effect on the environment[7]. These deleterious environmental consequences would

[1] <http://www.scotland.org> Accessed 04 March 2017.
[2] <http://www.scotland.gov.uk/resource/0040/00400731.pdf.> Accessed 04 March 2017.
[3] Electricity Policy Generation Statement http://www.scotland.gov.uk/topics/business-industry/energy/EGPB2012 Accessed 06 April 2017.
[4] E. A. S. Linley, et al, 'Review of the Reef Effects of Offshore Wind farm Structures and Potential for Enhancement and Mitigation'. *(Report from PML Applications Ltd. to the Department of Trade and Industry* 2007).
[5] *Ibid* (n2).
[6] *Ibid* (n4).
[7] *Ibid* (n2).

therefore be discussed below.

1.1.1 Impact of the Wind Farm Equipment on Ecosystems and Wildlife

There is an inevitable incidence of the impact of the physical devices installed on the wind farm like turbines and ox blade rollers on the marine ecosystems and it is deemed that they also have huge detrimental consequences on wildlife conservation. These concerns have been largely expressed in several scientific reports detailing the environmental impact of such installations. For instance, the sudden emergence of gigantic structures like turbines in marine ecosystems have been found to result in serious changes in the aquatic habitat.[1]

1.1.2 Interference of wild life and special animals like migratory birds with large Turbines

It has been shown severally that many sea birds, waterfowl and other rare species like common scoter and red-throated diver are prone to avoidable deaths through "blade strike". Blade strike is the friction occasioned by the interference of flying birds with the sharp blades of a moving turbine in operation. RSBP (A wildlife Conservation Charity)'s Manager for North East Scotland raised the issue of threat to wildlife as a setback to offshore wind development in Scotland.[2] The main causes for concern were identified as mortality due to direct in-flight collisions with the turbine's blades; and mortality due to avoidance of feeding grounds because of the development of wind farms[3].

1.1.3 Disturbance of Energy Distribution due to the Interference with Transmission by Electromagnetically-Sensitive Animals.

Electromagnetic forces from cables for transmitting energy from offshore wind farms to distribution grid often times disturb species that are sensitive to them. Prominent and notorious examples include Eels and Salmon.[4]

1.1.4 Noise Pollution, Agitation and Habitat Location occasioned by Operational Noise.

Noise is a major concern of stakeholders regarding the effect of Offshore wind renewable energy development. Marine mammals of conservation interest have been found to especially respond by moving away from an area where construction takes place, not only due to the noise but the unusual alteration and interference with their aquatic habitat. Intense operational noise from pile driving, ramming, drilling, increased vessel activity from construction, increased vessel activities for maintenance [5], increased turbidity from cable laying and decommissioning of wind farms have been identified as potential environmental effects of an offshore wind power-generation development[6].

1.1.5 Threat to Marine Animals and Fish Life.

One major environmental challenge of the offshore wind development is threat to fish and other marine animals' life. The unavoidable disturbance of the fish in their natural aquatic habitat leads to starvation especially of the young which are usually abandoned by their scared mothers away from development area[7]. Also, the alteration in behaviour leads to reproductive reduction, the resultant stress reduces immune response, thereby increasing the aquatic organisms' vulnerability to pollutants and disease[8]. This is part of the conflicting clamour against offshore wind development by Scottish residents whose primary occupation is farming.

1.1.6 Loss of Habitat of Precious Animals

Many precious animals, which habitats are violated by the sudden siting of the offshore wind turbines eventually lose their natural habitat, thus making them homeless and rife as endangered species. This loss extends to both flora and fauna.

Apart from this loss of habitat occasioned by offshore wind development, there remains some other challenges like infiltration of the aesthetic value of recreation centres in the metropolis by the giant blades and turbines, desertification, erosion, dust invasion, redistribution of sediments around the base of turbines, accidental release of chemicals and hydrocarbons during turbine installations thereby causing severe environmental challenges[9].

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[1] G.W Boehlert and A.B Gill 'Environmental and Ecological Effects of Ocean Renewable Energy Development: A Current Synthesis' [2010] Oceanography Volume 23, 2.

[2] RSBP; Offshore Wind Development in Scottish territorial waters' <http://www.rsbp.org.uk/ourwork/casework/details.aspx?id=9.230686> accessed 18 March 2013.

[3] J. M. Kaiser 'Predicting the Displacement of Common Scotor *Melanitta nigra* from Benthic Feeding Areas due to Offshore Wind Farms'. *(Executive Summary of COWRIE Funded Report 2002).*

[4] *Ibid* (n7).

[5] F. Thomson, T. Ludemann, R. Kafeman, and W. Piper. 'Effects of Offshore Wind Farm Noise on Marine Mammals and Fish'. (*Report funded by COWRIE-Collaborative Offshore Wind Research into the Environment)*. <http//:www.offshorewind.co.uk> Accessed 16 April 2017.

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[7] Norfolk Offshore Wind, 'Cromer Offshore Wind Farm: Environmental Statement OSPAR Commission (2004) Problems and Benefits Associated with the Development of Offshore Wind Farms'. *(Biodiversity Series 2002).*

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[9] *Ibid*.

2.0 MARINE SCOTLAND'S EFFORT IN TACKLING THE ENVIRONMENTAL EFFECTS OF SCOTTISH OFFSHORE WIND DEVELOPMENT

The sea is a very complex environment to manage and impact travel faster in the marine environment.[1] As part of the focus of maritime spatial planning law, the need to preserve, protect, conserve and restore sea life is very rife. Another major problem with quantifying impacts on marine mammals is that there are very few reliable sets of baseline data in terms of numbers and movements in the surrounding waters[2]. The Scottish seas are prone to environmental challenges and many legal responses have been made for combating the potential environmental impact of offshore wind in Scotland[3], but the focus of this paper is the consideration and the assessment of Marine Scotland's efforts and the Offshore Wind Industry Group's policy recommendation for achieving an environmentally sustainable wind energy resource.

2.1 MARINE SCOTLAND

Marine (Scotland) Act, 2010 is the primary legislation responsible for the integrated management of Scotland's Seas in an economic and an environmentally sustainable manner. Thus, the Scottish Government is compelled by Law to ensure that offshore wind development is done sustainably.[4] Marine Scotland is empowered to allow the introduction of the offshore renewable industry into Scotland's seas through the Act which enables them to undertake Marine Spatial planning and offshore Licensing. The organisation is therefore saddled with the primary responsibility of the development of offshore wind and sea-power generation schemes. This on the face of it appears sufficiently robust as a policy initiative, but there appears to be no adequately laid out enforcement, response and strategic mechanisms for achieving the set out objectives.

However, notwithstanding the pessimism expressed by the present authors on the implementation of an environmentally sustainable, safe and an economically viable management of the Seas, there has been a number of recorded successes by the organisation. On 18 March 2011 for instance, the Blue Seas Green Energy, which is a sectoral marine plan for offshore wind energy in Scottish Territorial waters, was published.[5] The Biannual review of the Blue seas green energy was identified by the Habitats Regulation Appraisal and it has produced significant results including, but not limited to:

1. Scoping Study for offshore wind farm development in Scottish waters.
2. A draft Regional Locational Guidance and Draft Initial Plan Framework which was made available for comment in August 2012.
3. Marine Scotland Licensing Operations Team (MS-LOT) enhanced their resources by making use of the Marine Scotland Call-off Consultancy support to provide Environmental Assessment, EA Audit and collaboration with technical environmental challenges combating expertise to provide recommendations on the more technically challenging areas of offshore electricity-generating station applications[6].
4. Marine Scotland updated the existing licensing and consents manual which remains useful as licensing policy guidance for all the stakeholders.[7]
5. Marine Scotland Science has developed an electric and a magnetic field generating system to investigate the behavioural responses of migratory fish magnetic fields with alternating currents[8].
6. Marine Scotland has also established fisheries tri-lateral group in order to discuss policy issues of relevance across all sectors with a view to combating the threat to fisheries[9].

In spite of all these positive giant strides however, a number of challenges have also been identified as constituting a bulk of unaddressed development. These include the need to constitute and harmonise the internal mechanisms of measuring environmental impact by a fusion and collaboration of the efforts of scientists, environmental assessors and law and policy makers in order to achieve a measurable and workable impact assessment, the need to allow a longer time of assessment of the impact of the novel development as some impacts take longer time to manifest on sea and actuarial life.

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[1] Sue Kidd, *et al* 'The Ecosystem Approach and Planning and Management of the Marine Environment' in Sue Kidd, Andy Plater and Chris Frid (eds), *The Ecosystem Approach to Marine Planning and Management* (Earthscan 2011).
[2] J. A. Garcia-Charlton and A. Perez-Ruzafa, 'Ecological Heterogeneity and the Evaluation of the Effects of Marine Reserves'. (1999 *Fisheries Research* 420).
[3] *Ibid* (n8).
[4] Part 2, Sections 3 and 4, Marine (Scotland) Act 2010.
[5] *Ibid* (n8).
[6] Scotland Government Publication Release Report on Sea Planning and Development. <http://www.scotland.gov.uk/Publications/Recent> Accessed 24 March 2017.
[7] Marine Scotland Profile. <http://www.scotland.gov.uk/About/People/Directorates/marinescotland> Accessed 03 April, 2017.
[8] *Ibid* (n21).
[9] *Ibid* (n22).

2.2 OFFSHORE WIND INDUSTRY GROUP

One prominent step taken by the Scottish government in having a roadmap to continuously combat the social and environmental challenges of offshore wind development in Scotland is the Offshore Wind Industry group (OWIG) which was formed to provide a forum for the public sector and other relevant parties to drive the success of this industry and realising the fullest economic and environmental benefits for Scotland[1]. The Offshore Wind Industry Group is therefore the primary platform for public sector participation in sea policy-making for the utmost realisation of the economic and environmental objectives of Scotland.

2.3 RECOMMENDATIONS OF THE OFFSHORE WIND INDUSTRY GROUP, OWIG

The Offshore Wind Industry Group made a number of recommendations as basic law and policy responses geared towards the effective management of the sea energy and the effectual power-generation development of Scotland's offshore resources. An attempt is therefore made to set out the recommendations and assess them hereunder.

2.3.1 The Implementation of the Review of the Blue Sea Green Energy Plan.

An implementation of the review of the Blue Sea Green Energy which is a sectoral marine plan for the offshore wind energy in Scottish Territorial waters (0-12 nautical miles) was proposed as a laudable recommendation by the Offshore Wind Industry Group as a veritable means of extending and delineating the scope and territorial area of allowable renewable energy development of the Scottish offshore area[2]. How this extension would not interfere with the smooth coordination, interaction, transaction and operation of the other sea users like fishery, ship navigation and recreation was however not exhaustibly set out.

2.3.2 Resolution of Conflicts through the Collaborative Cooperation of Stakeholders.

The Scottish Government through the (Marine Scotland and the Energy Consents and Deployment Unit) was recommended to retain the strengths of her current consents system to facilitate a good, robust, effective, functional, workable and harmonious co-operation between industry and stakeholders particularly on conflicting issues[3]. How the collaboration between the industry and the stakeholders would be carried out was however not clearly stated and how the conflicting issues regarding the regulation drive of the government and the resistance move of the public owing to selfish public sentiments would be resolved were also not spelt out.

2.3.3 Advancement of the Cause of the Offshore Renewable Joint Industry Programme by the Scottish Government through Marine Scotland.

The Scottish Government is implored by OWIG to strive through Marine Scotland to play a key role in advancing the cause of ORJIP (Offshore Renewables Joint Industry Programme). The programme is stated to initially concentrate on two priority consenting risks: uncertainty about impacts on marine mammals from underwater noise; and uncertainty about the avoidance and collision rates of birds with large turbine and a serious research is therefore consequently required to research into them in a meaningful way.[4] Thus, there must be a closer collaboration between the knowledge of marine science and legislation.[5] This is to achieve an accurate and effective means of measuring impact and making functional laws predicated on actual and verifiable scientific projections rather than speculative conjectures.

2.3.4 Continuous Environmental Research to monitor, manage and minimise Risks.

A continuous environmental research to facilitate a sustainable development of the Scottish offshore energy through a strategic monitoring network, deployment of passive acoustic monitoring devices to minimise and detect future noise was deemed needed, required and therefore recommended by the group.[6] This restates the assertion that legal responses would be largely inadequate, ineffective and far-between if they are not swiftly accompanied by further, better and continuous scientific, technological and environmental research.

2.3.5 Encouragement of Renewable Energy and Technological Development of Offshore Wind Scholarships.

For there to be a rapid technological and scientific development of the renewable energy resource in an environmentally-friendly manner, renewable energy and engineering related modern apprentice and scholarship

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[1] Offshore Wind Industry Group, Scotland's Offshore Wind Route Map; Developing Scotland's Offshore wind industry to 2020 and Beyond (Report of Scottish Renewables January 2013). <http:www.scotland.gov.uk(resource/0041/00413483.pdf> Accessed 08 April 2017.

[2] *Ibid* (n25).

[3] *Ibid* (n25).

[4] *Ibid* (n25).

[5] S.A Jay, 'Planners to the Rescue: Spatial Planning Facilitating the Development of Offshore Wind Energy', [2010] 60 MPB 493.

[6]Offshore Wind Industry Group, 'Scotland's Offshore Wind Route Map; Developing Scotland's Offshore Wind Industry to 2020 and Beyond' (Report of Scottish Renewables January 2013) <http:www.scotland.gov.uk(resource/0041/00413483.pdf> Accessed 08 April 2017.

was recommended by the group to be encouraged by the government and other interested stakeholders[1]. This will go a long way in encouraging further participation through incentivisation and reducing the cost of learning renewable energy development.

2.3.6 Identification and Review of Best Practice Mechanisms for On-site Assessment by Marine Scotland

Marine Scotland was charged and implored by the group to review and identify best practice mechanisms for screening, scoping and assessment reporting. It states that it can make use of the Robin Rigg Offshore wind demonstrator for instance to execute the task of assessment, monitoring and surveillance[2].

2.3.7 Collaboration of Marine Scotland with the Renewable Energy Industry.

Marine Scotland was charged by the Offshore Wind Industry Group to collaborate with the renewable energy industry to develop proper guidance on the application of Rochdale Envelopes to combat potent 'unknowns'. This is an omnibus provision that appears encompassing and confusing. What constitutes 'potent unknowns' was also not defined by the group. It is thus the considered opinion of the present authors that a collaboration without a clear means of actualisation is nothing but a pre-emptory, flowery set of lofty ideals epitomising nothing.

3.0 FURTHER SETBACKS OF THE OFFSHORE WIND INDUSTRY GROUP'S SET OF RECOMMENDATION

It is one thing to have a road map, it is another thing to have the requisite mechanism for implementing such road maps, there is thus a noticeable lacuna in OWIG's roadmap for addressing the social and the environmental challenges of offshore wind development in Scotland as it does not give sufficient clarity on its identified programmes for implementing the prescribed road maps billed to address a yet novel renewable energy generation industry.

Also, the public-participation effort will be inevitably weakened by the seeming lack of knowledge of the renewable energy sector, especially the offshore wind industry which is in its novel and formative years by the public who are supposed to contribute to the reduction of its imminent environmental challenges. The public's sentiments and outcry also have the tendency of being prioritised over evidential consequences of offshore wind development.

The implementation paradigm based on constant observation, surveillance and monitoring will also be hampered by the coastal location of the offshore wind equipment. The total environmental impact will then consequently not be fully discoverable by the stakeholders who are mostly non-coastal residents but resident on land. The presumption that law and policy of land development through Town planning laws could be transferred for implementation on sea life vide maritime spatial planning would also be counter-productive as sea life is a much more complex and sophisticated territory. Another setback is the huge financial implication of scientific research into the endless solution to the environmental consequences of offshore wind development.

4.0 RECOMMENDATION AND CONCLUSION

In spite of the on-going efforts of MS and OWIG's route map for addressing the environmental impact of the Scottish offshore wind farm development, there is still a lot to be done. From the foregoing, it is evident that there is an urgent need to embark on vigorous scientific and technological research that will engender improvement to a better performance standards and monitoring requirements for application to commercial scale development and environmental standards to strike an appropriate balance between development and impact must be established.

There is a need for a closer collaboration amongst the stakeholders: Developers, Regulators, Scientists, Engineers, Environmental Impact Assessment experts, Ocean stakeholders and the general public in order to achieve the common dual objective of a clean renewable energy from offshore wind and a healthy marine environment.

The wind farms should first be tested on a smaller scale to ascertain its environmental fatality before the large farms of commercial magnitude are established.

Finally, every development has a corresponding effect, the law must be combined with the Scottish Government's political will in order to ensure the success of the development of renewable energy from offshore wind.

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List of Abbreviation and Acronyms

COWRIE	Collaborative Offshore Wind Research into the Environment
EA	Environmental Assessment
EIR	Environmental International Report
EU	European Union
MPB	Marine Pollution Bulletin
MS	Marine Scotland
MS-LOT	Marine Scotland Licensing Operations Team
ORJIP	Offshore Renewables Joint Industry Programme
OWIG	Offshore Wind Industry Group

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