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Towards Energy Security and Sustainability: Developing a Legal Regime for Marine Renewable Energy in Africa - The Case of Ghana

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ABSTRACT

Energy security and sustainability has become a crucial part of the global order in the wake of the dangers posed by the threat of climate change and other debilitating activities that threaten the ecosystem. The current term "energy security and sustainability" has now in so many aspects come to mean clean or renewable energy. With the Gulf of Guinea's potential as a source of marine renewable energy (MRE), this paper seeks to look at the development of a legal regime for States along the Gulf of Guinea by using Ghana as a case study through the appraisal of the Renewable Energy Act 2011 (Act 832). This appraisal will adopt a doctrinal approach. It is important to note that there is no exclusive law on marine renewable energy in Ghana or any other country along the Gulf of Guinea. The study further focuses on the importance of MRE in securing energy supply and sustainability and developing policy frameworks with the aim of meeting the Sustainable Development Goals; 7,11 and 13 and also ensuring safety of life at sea.

Keywords*: (Marine) Renewable Energy, Energy Security and Sustainability, UNCLOS, Legal regime, Ghana.*

I. INTRODUCTION

Africa wields the prospects of new and substantial renewable resources along the lines of energy production. Most of these are under exploited. With countries aiming to attain a high level of development through industrialization, energy has become a widely sought-after commodity. Industries are growing at a rapid rate and sectors such agriculture is increasingly modernizing at the turn of each day with new improved seedlings and technologically advanced farming equipment and techniques. The current global order which has seen industrialization become the bedrock of development has given credence to assertion that energy and human development are in a way two sides of the same coin. Tracing back to history, it can be seen that the pioneers

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of industrialization have attained the summit of human development and even at present still maintain that status owing to their high consumption of energy per capita in the world.[2]

From the exploitation and use of fossil fuels, through to the purposeful exploration, exploitation and subsequent use of oil and gas, the energy sector has been involved in its own "soul searching" to counter the rapid environmental threat posed by the burning of fossil and other energy sourced environmental pollution. The push for renewable energy is one critically germane to not just the industrialized countries, but also developing countries. This is so, due to the emergence of transboundary pollution which can be; land, air or water based. Stemming from this, the principle of the common heritage of mankind looks like one hanging on the ends of a loose thread and thus, the need to fully and carefully graduate to the use of renewable energy. With interest constantly increasing with regard to the proper comprehension of energy in the context of demand and supply as well as environmental governance and sustainability, it is critically germane for us to delve deeper into what energy security really means and its potential impact on human and economic development.

The concept "energy security and sustainability" has intrinsically, to experts, consultants and stakeholders, conveyed mostly, the sense of securing access to sources of energy. These sources, mostly refer to oil and other fossil fuels. However, with the rise in technological advancement and coupled with the barrage of transnational environmental problems and challenges, the fundamentals of energy security have been dealt with a neo-energy security outlook which seeks to place renewable resources at its apex. Due to this, there is the need to define energy security in a more encompassing manner to address the current trend of issues relating to the use and source of energy. In furtherance of this, being energy sufficient or secured can be analyzed as the connection between a state's accessibility to natural resources of energy consumption at various levels and how this affects their overall State security. Emerging and for that matter modern economies rely on the availability of obtaining energy at low prices for the continued stimulation of the various sectors of their economies. Be that as it may, there still exist significant vulnerabilities among countries due to the irregular allotment of energy supply. The great paradox here is that, energy relations on the global stage has given rise to both energy security and vulnerability.[3]

The IEA puts the definition of energy security at, the constant access to, and availability of

[2] Pillot, B., et. al, (2013). Solar energy potential atlas for planning energy system off-grid electrification in the Republic of Djibouti. Energy Convers. Manag. 69 (0), 131–147.
[3] Indra Overland (2016) 'Energy: The Missing Link in Globalization', Energy Research and Social Science, 14, pp. 122–130.

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energy at an economical price. To grasp the concept of energy security, it is important for us to look at the various aspects it behooves. The various aspects of energy security include: (a) long-term energy security which in its entirety looks at investments that are expedient to the continual generation and supply of energy in consonance with laid down economic growth as well as environmental and sustainability necessities; (b) on the other hand, short-term energy security gravitates towards the potential of the energy infrastructure to address timely, the unexpected changes within the equilibrium of supply-demand. The absence of energy security therefore, is tied to the challenging social and economic effects of either substantial inaccessibility or extremely unstable or uncompetitive prices.[4]

Against the background of energy security, the surety of the supply distribution and supply of energy is one of great significance. Besides it is critically germane to elucidate an all-encompassing energy policy model of international standards which takes into consideration, the conservation and protection of the environment as well as the guarantee of energy security and supply.[5] The potential of renewable energy resources and their effectualness are widespread as opposed to other origins of energy that are mostly focused in a select number of countries. Gross energy security and compelling economic benefits can be realized through the expeditious distribution of renewable energy and technological variegation of sources.[6]

National energy systems have been viewed as assailable to natural disasters. Japan's Fukushima I nuclear accident brought a renewed focus to this issue with the careful assessment of climate variability and the issues embedded in it. These menaces clearly intimate the need to invest in new energy systems like renewable energies. Repositioning our source of energy consumption towards renewable energy has far reaching positives including its contribution towards the significant reduction in greenhouse gas (GHG) emissions which eventually has the potential to quell extreme climate variability impacts and furthermore ensuring value for money and a steady and timely delivery of energy. Renewable energy investments contribute significantly to the benefits derived from energy security.[7] This therefore, accentuates the need for a greater look at renewable resources in the quest to achieve greater energy security. The concept "energy security" has attained an essential outlook and has enjoyed continuous attention at the core of legal and policy debates associated with matters spanning, social, economic and development.[8]

[4] International Energy Agency, DefiningEnergy Security https://www.iea.org/topics/energysecurity/whatisenergysecurity/ Accessed on 10 January 2024.
[5] Eraldo B, et. al. (2017). Designing a global energy policy model, Proceedings of the Institution of Civil Engineers – Energy, Vol. 170, Issue 1, pp. 2–11.
[6] International Energy Agency (2012). "Energy Technology Perspectives 2012"
[7] Amanda Staudt (2011). "Climate Risk: Yet Another Reason to Choose Renewable Energy"
[8] Farah, P, D & Rossi, P (2015). "Energy: Policy, Legal and Social-Economic Issues Under the Dimensions of

Africa's interest in renewable energy was not in any way at all by magic. It is worthy of note that Africa's interest stimulation with regard to renewable energy came as a result of two very significant global environmental initiatives. The United Nations Conference on Environment and Development (UNCED) which took place in 1992, in Rio de Janeiro, Brazil was the first of these two initiatives. This conference saw the review of "Agenda 21"[9], a pioneering environment and development document. This review was carried out by and under one of the largest assembly of Heads of Governments and added to this, gained recognition for its solid seal of approval by an overwhelming number of multinational companies. The axis of Agenda 21 was the operationalization of the idea of sustainable development. Firmly added to this, the Rio Conference of 1992 offered the realization of the signing of the United Nations Framework Convention on Climate Change (UNFCCC). This was the second significant development. This was signed by 155 Governments. (United Nations, 1992). After ratification by 50 States in 1994, the Convention came into force.[10]

The African continent is currently experiencing unparalleled growth. It is estimated that by the year 2050, the African continent will hit at least 2 billion people-signaling twice as many as we have now. Forty percent (40%) of this estimated number will be living in the rural areas.[11] Statistics made available in 2010 showed that close to about 590 million Africans representing 57% of the African population had no access to electricity supply. From this same data, 700 million Africans representing 68% of the continent's population were living without access to clean and modern cooking infrastructure. Should these access curves run on, it has been projected that by 2030, 42% of the continent's population which statistically will be about 655 million people, will have no access to power with 866 million representing 56%, without access to clean cooking amenities thus, denying an overwhelming majority of the continent the chance to thrive in a productive, safe and healthy life. Economic and social developments are greatly underpinned by the access to and affordability of energy. It is highly impossible for a country to attain a high level of industrialization without a carefully planned and thought-out energy framework.

Consensus building with regard to the development of Africa's energy sector holds so much significance on its abiding consequences on matters such as GHG emissions, individual well-being and national socio-economic development. This is mainly so because investments in the

Sustainability and Security". *World Scientific Reference on Globalization in Eurasia and the Pacific Rim*

[9] Agenda 21 is a non-binding action plan of the United Nations with regards to sustainable development.

[10] Karekezi, S. Renewables in Africa: Meeting the Energy Needs of the Poor. African Energy Policy Research Network.

[11] The State of African Cities (2010): Governance, Inequality and Urban Land Markets, United Nations Human Settlements Programme, Nairobi.

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energy sector have seen myriad successes and failures alike. Nonetheless, the current advancement in technology coupled with reduction in costs, have seen an extensive distribution of renewable energy, offering countries in Africa, a thriving course to a sustained, equitable and rapid growth. It is however crucial to indicate that the cost of such energy varies from source to source.

II. Marine renewable energy (MRE) and sustainable development – a legal and socio-economic insight

MREs are a particular kind of renewable energy deriving their source from the various mechanisms and processes that occur naturally in the marine environment. This energy can be seen in four kinds namely: ocean energy, geothermal energy derived from submarine geothermal resources, wind energy from turbines located in offshore areas, and bioenergy derived from marine biomass.[12]Consequently, MRE can be traced to six clear-cut disparate which ultimately requires specific technologies for each kind. Instructively, the common denominating factor is that they are all derived from and through seawater energies like- kinetic, potential, as well as chemical and thermal. These six clear-cut sources include:

1. ocean currents
2. tidal currents
3. tidal range
4. waves
5. salinity gradients
6. ocean thermal energy conversion

Talking specificities, waves which are formed as a result of the wind's activity on water can be exploited and with tides, their maximum extent of vibration or oscillation brings about energy through the recurrent upward and downward motion in the height of the ocean. Tidal currents are equally brought about by the rise and fall of tide in horizontal movements. the open ocean also harnesses ocean currents as another source of MRE. One very important MRE technology which has been developed over the years is Ocean thermal energy conversion (OTEC). OTEC is a technology employed in generating energy by utilizing the solar energy taken in by the ocean as a result of the difference in temperature between the upper layers of water and those at the depth which most often than not are colder. This energy is somewhat limited in its

[12] Intergovernmental Panel on Climate Change (IPCC), "Special Report on Renewable Energy Sources and Climate Change Mitigation" (2011), 164.

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production space owing to the fact that a minimum of temperature difference of 20◦C between the layers is required in order to exploit this energy. The production of this is thus proper, to certain parts of the world like the tropical and equatorial regions. With salinity gradients, one is looking at the coming together of freshwater and seawater. This process lets off energy as heat. Energy from this process can be tapped either through inverse electrodialysis, hinged on the chemical potential difference between freshwater and seawater or through osmosis, hinged on the natural propensity of both seawater and freshwater to create a mixture.[13] Like all other renewable energy sources, MRE stands as a viable answer to two basic challenges that impact both the developed and developing world. These two challenges are; guaranteed access to energy (proper to developing countries) and the reduction of greenhouse gases, which until recently were deemed a problem of the developing world but due to transboundary pollution, there has been a shift in this thought.

Talking sustainably, in the rolling out of MRE, consideration must be given to the pillars of the sustainable development agenda, that is; economic, social and environmental. One would argue that sustainable development by indications is soft law in nature hence no need to pay it any importance. This assertion is wrong in that the current global order has institutionalized the concept of sustainable development in every aspect of governance and this is clearly demonstrated by the United Nations Sustainable Development Goals. The utilization of MRE would go a long way to addressing Goals 7, 11 and 13 of the SDGs.

In 2011, the International Tribunal for the Law of the Sea's Seabed Disputes Chamber adopted a proclamation in its consideration of the concept of the common heritage of mankind principle as a structural piece in the furtherance of global sustainable development.[14] This, indicates that in formulating any law or regulation with regard to MRE, care must be taken not to omit the needed importance of sustainability. Sustainable development in itself as opined earlier, forms an important crux of the plans accepted within the United Nations and invariably, its other agencies. Sustainability forms a significant part of The Sustainable Energy for All Initiative (SE4ALL), which was officially out doored in 2012, has at its core sustainability. The initiative was developed to shore up activities in support of three closely linked objectives planned to be achieved by 2030:

[13] Ibid.

[14] Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (Advisory Opinion), paras. 159 and 163, available at the International Tribunal for the Law of the Sea Web site, www.itlos.org/. See also P. Holcombe Henley, (2011). "Minerals and Mechanisms: The Legal Significance of the Notion of the 'Common Heritage of Mankind' in the Advisory Opinion of the Seabed Disputes Chamber," Melbourne Journal of International Law 12: 373, at 394.

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1. *providing universal access to modern energy services*
2. *doubling the global rate of improvement in energy efficiency*
3. *doubling the share of renewable energy in the global energy mix*[15]

The issue of sustainable development has been of key mention in numerous reports issued within the United Nations Framework. Reports like, the "Report of the U.N. Secretary- General on Oceans and the Law of the Sea";[16] the "Special Report on Renewable Energy Sources and Climate Change Mitigation by the IPCC;"[17] and the Secretary-General's Report on "New and Emerging Technologies all prominently featured and brought attention to the issue of sustainable development.[18]

Instructively, it is worthy to note that the concept of MRE does not feature prominently in the energy discussions of most African States. For those that make mention of it, it is done in passing. This is mainly owed to the evolving technology involved in the area of sustainable renewable energy as well as the capital cost and other significant challenges. These challenges however as would be seen in later paragraphs, should not hinder the development of a legal regime for MRE, fashioned after existing renewable energy laws.

III. RENEWABLE ENERGY ACT 2011 (ACT 832)- THE CASE OF GHANA

In order to have a functioning domain and to provide the requisite legal and regulatory framework for the realization of the set renewable energy goals, the government of Ghana passed the Renewable Energy Act 2011 (Act 832) of the Parliament of the Republic of Ghana. This Act lays out the rules regulating the sector and aside these laid down rules, stakeholders for that matter industry regulators, are charged by law, to come out with legislative instruments (LI), by which further regulation is to be established.

Ghana's renewable energy prospect is very significant and cuts across hydro, solar ocean, wind and biomass resources. The full potential of these RE sources are yet to be developed and thus the show of effort by the government in the promulgation of law to regulate this area is a testament to the changing scenes in the renewable energy sector. The development of such legal and policy framework is geared toward the institutionalization of a well-defined and well-

[15] U.N. Secretary General's High-Level Group on Sustainable Energy for All, available at www.un.org/wcm/content/site/sustainableenergyforall/home/Initiative. Accessed on 15 March 2024

[16] "Report of the U.N. Secretary-General," supra note 5

[17] IPCC, "Special Report," supra note 1

[18] Report of the Secretary-General, "New and Emerging Technologies: Renewable Energy for Development" (Economic and Social Council), UN Doc. E/CN.16/2010/4, 8 March 2010.

regulated renewable energy sector.

Act 832, guarantees:

1. *A feed-in-tariff rate*
2. *A renewable energy purchase obligation*
3. *Connection to the transmission and distribution systems*

Furthermore, the underpinning interest of Act 832 make possible proper management and exercise of such resources in a sustainable and environmentally friendly way.'[19] Incidentally, Act 832 serving the purpose of section 1 (1) espouses certain objectives to be achieved. These include[20]:

a) the provision of

i. a framework to support the development and utilisation of renewable energy sources; and

ii. an enabling environment to attract investment in renewable energy sources;

b) the promotion for the use of renewable energy;

c) the diversification of supplies to safeguard energy security;

d) improve the access to electricity through the use of renewable energy sources;

e) the building of indigenous capacity in technology for renewable energy sources;

f) public education on renewable energy production and utilisation;

g) *the regulation of the production and supply of wood-fuel and biofuel.*

Besides Act 832, these legislations have also been passed to assist in the development of renewable energy in Ghana, sustainably:

i. *Act 541 also known as the Energy Fund Act 1997, was passed to advance the growth and efficacious use of renewable energy*

ii. *Act 663 which is also known as the Public Procurement Act 2003, is an economic channel that seeks to recommend direct investment in renewable energy management*

iii. *The Ghana Investment Promotion Council Act 2013 (Act 865)- goes the mile to establish tax incentives for investments situated outside industrialized zones or*

[19] Obeng Darko, N.A. (2019). Why Ghana will not achieve its renewable energy target for electricity. Policy, legal and regulatory implications.
[20] ibid

hubs

iv. *Act 870, which is the Value Added Tax Act 2013, - prescribes exemption for imported equipment that are meant for renewable energy purposes*

(A) Regulation of the renewable energy sector

Act 832, requires that one acquires a valid license to engage in any commercial contract in the RE sector of Ghana. The Energy Commission owns the sole prerogative to grant such licenses. However, the power to prescribe such conditions lies beyond its jurisdictional realm. That power, lies with the energy minister.[21] Qualification standards are essential for operational licenses in the RE sector as provided for by the Act. In order to ensure some sanity in the industry, the transfer of licenses granted under the stipulations of the Act are not in any way transferable except in cases where prior consent has been sought, and approval given by the Board of the Energy Commission for onward transfer. The conditions set for a license to be granted, enjoins an individual to be a legal citizen, a partnership registered under Act 152 which is the Incorporated Private Partnerships Act, 1962, or a body of corporate registered under the Companies Act, 1963 (Act 179) or under any other law of Ghana.[22]

Under Act 832, a feed-in-tariff (FiT) system has been developed to guarantee generation flow for the sale of electricity derived from RE sources.[23] Three pivotal elements make up the FiT system or scheme in Ghana. These are; REPO- the renewable energy purchase obligation, the FiT rate and a connection to transmission and distribution systems.[24] Act 832 necessitates a transmission or distribution system operator to connect a producer of renewable energy sources for electricity within the coverage area on the transmission or distribution system where the renewable energy sources for electricity producers so requires. To ensure that all comitments are rightfully fulfilled, the law obliges transmission and distribution system operators to sign a connection agreement with the generators of renewable electricity in that locale.

(B) Who regulates?

The most important thing in ensuring the efficient workability of a framework as intended, be it legal or policy wise is to have a regulator that will enforce the laws or regulations put in place without fear or favour. I would argue here that it is equally important that such regulator be independent of government with a security of tenure in that successive governments may not

[21] Renewable Energy Act 2011 (Act 832), Section 50(b)
[22] Renewable Energy Act 2011 (Act 832), Section 9
[23] Renewable Energy Act 2011 (Act 832), Section 25 (1)
[24] Renewable Energy Act 2011 (Act 832), Section 25 (2)

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hold sway over his stay or exit from such position.

The regulation of Ghana's renewable energy sector is held by three offices namely; The sector minister, the Energy Commission and the PURC- Public Utilities Regulatory Commission. The structural obligations under Act 832, charges the sector minister with proffering a clear policy direction for the realisation of the letter and spirit of the Act. For the Energy Commission, its obligations lie with the technical management and guidance of renewable energy sources utilisation and advancement. To effectively carry out its mandate, the Commission is mandated with serving as an advisory organ for the sector minister. This mandate spans issues regarding renewable energy, establishing a plan for corporation and collaboration between government, quasi-government institutions, the private sector as well as civil society organizations for the development and advancement of renewable energy.

Last but not least, the PURC is given the responsibility of ensuring value for money through engagements and discourses that stress cost-efficient measures in the development if renewable energy resources. The PURC per Act 832 is detailed to approve charges for grid connection as well as those for electricity purchased from RE sources. In practice, there is always that friction that exits between these three very important actors. This makes it difficult for the core mandate of the Renewable Energy Act to be achieved.

(C) Lesson drawing for the development of a legal regime for marine renewable energy

Developing a legal regime for marine renewable energy is critical to Africa's quest for energy security and sustainability. It is obvious that there have been collaborations and partnerships in the formulation of policy and legal frameworks for the establishment and implementation of renewable energy. One may then then ask: What is the reason for the creation of a legal regime for the sole purpose of addressing marine renewable energy? The answer is quite simple but complicated.

Marine renewable energy (MRE) is different from the other types of RE sources. The potential of MRE is one that is vast and its technology still under discovery. MRE as the name suggests, is derived from the ocean and as such any installation at sea must conform to the provisions in the Law of the Sea Convention (LOSC) regarding installations.

In Article 56 (1) (a) of the Law of the Sea Convention, there is a subtle mention of marine renewable energy resource:

1. *"In the exclusive economic zone, the coastal State has: (a) sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the sea-bed and of the sea-*

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> *bed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds."*[25]

It can be seen now then, that one cannot formulate or promulgate a legal regime governing marine renewable energy without recourse to the UNCLOS. In addressing a legal regime for marine renewable energy resources, the need to adhere to safety of navigation is critical and must not be overlooked. Articles 60, 80, 11, 79 and 208 have provisions that talk about installations at sea and safety of navigation. These are spoken of in different maritime areas and also deals with different activities in those areas. Nonetheless, the mention of installations and artificial islands or structures instructively, brings to the fore the management of marine renewable energy resources and the legal status. Such a legal regime, should stipulate the need for protected areas around MRE installations in conjunction with stipulations of the International Convention on the Safety of Life at Sea (SOLAS), 1974.

Again, the formulation or promulgation of MRE law would be counter-productive without inputs from the International Civil Aviation Regulations. The safety, freedom and rights of overflight must all be taken into consideration. For obstacles higher than 45m, lights should be placed on them to serve as flash warnings. Likewise, an obstacle more than 60m high and 80m wide needs to undergo the same procedure to indicate to aircrafts the shape of the obstacle ahead. Electro-magnetic impact of marine renewable energy may also interfere with the functioning of the aircraft's radar. To ensure this is avoided, a legal regime should posit that if there is a turbine about 15km of a radar, impact assessment should be carried out to ensure that the aircraft is within the safety zone. The provision of traffic separation schemes in such a legal regime would help strengthen the base of marine renewable energy law.[26]

Instructively, precaution must be taken with regard to ocean noise that may arise as a result of underwater turbines. This challenge, puts at odds, the conservation and protection of marine biodiversity and the development of MRE. This is a challenge that my next paper shall seek to address in depth.

(D) The need for an independent regulator

As a special renewable energy source, marine renewable energy legislation to achieve its core mandate must first and foremost, ensure that the duty to uphold its legal standard is regulated by an independent body and not by the three key elements as seen in the regulation of Act 832.

[25] UNCLOS
[26] UNCLOS Article 22

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This is because one of the major impediments that has rendered inefficient, Act 832 has to do with its regulators.

The basis of my argument here is that, for a smooth running of an MRE regulation, the institutional structure should have with it, a competent and impartial regulator whose core mandate would be to advance the purpose of MREs as set out. The government of Ghana has intimated several times its desire to set up such an agency or authority. This body, is likely to be called the Renewable Energy Authority.

Currently and since the adoption of Act 832, the Renewable Energy Authority is yet to be established. Should it be eventually established, the Renewable Energy Authority according to stipulated laws, shall be accountable for: (i) an oversight role with regard to RE activities in Ghana.; (ii) carry out RE projects sanctioned by government or one that government has an involvement or interest; and (iii) the management of assets in the sector on the State's behalf. However, and per legal stipulations, Act 832 details the above functions to the Renewable Energy Directorate until the time the Renewable Energy Authority is established by an act of Parliament, the Parliament of Ghana.[27] In my assertion, when the Renewable Energy Authority is instituted, the Renewable Energy Directorate can now be renamed the Marine Renewable Energy Directorate to see to the needs of marine renewable energy owing to the exigencies marine renewable energy resources come with.

IV. LOOKING FORWARD

Marine renewable energy resource impacts the environment in a somewhat destructive way inasmuch as it also helps bring about a developed society and economy. The most common of such impacts to fisheries and the marine ecosystem are:

- *the alteration of benthic habitats and sediment transport or deposition by the construction activities and continuous presence of devices and structures;*
- *deaths or changes in the behavior of fish and mammals as a result of noise and electromagnetic fields;*
- *interference with the movement, feeding, spawning, and migration paths of fish, mammals, and birds;*
- *the release of toxic chemicals as a result of accidental spills, or leaks, or the accumulation of metals or organic compounds; and*

[27] Obeng Darko, N.A. (2019). Why Ghana will not achieve its renewable energy target for electricity. Policy, legal and regulatory implications.

- *the reduction of the velocity of marine currents and decreases in wave height resulting from the extraction of wave or tidal energy*[28]

In order to curb this, consideration must be given to the prevention and compensation of such issues. Marine spatial planning should be made an integral part of a marine renewable energy legal regime. This will help create some safe space for protected areas as well as sensitive habitats and migratory pathways. Following from this, specific measures should be put in place in the application of MRE devices and installations as espoused by the UNCLOS and other legal and policy documents of domestic or international recognition and application. Added to this, due to the evolving nature of knowledge and science surrounding the use of marine renewable energy as well as its overall environmental impact assessment, it is important for a marine renewable energy law to have enshrined in it, the precautionary approach.

This approach does helps put into context the necessary checks to ensure that impact assessments even though might differ, would have a stop gap measure tailored and enshrined in law to help protect the integrity of the marine ecosystem. The La Rance tidal barrage in France is a typical example. This obtains energy from the amplitude of the tide. One source is said to have referred to its impact as *"negligible"*[29] while another scrutinized the *"fairly serious"*[30] impact it has on the environment. Ocean noise and changes in salinity were some of the impacts recorded.

The Rio Declaration is arguably the embodiment of the spirit and letter of the precautionary approach, providing the most widely acceptable and relatable formulation of the approach.[31] Advocates of this approach contends that it offers the best option to minimize uncertainty about issues with causal effects on the environment. concerning the environment.[32] In formulating the

[28] According to a working paper of the IRENA, "Renewable Energy Jobs: Status, Prospects and Policies" (2011), 4, gross employment in the renewable energy industry in 2010 was estimated at over 3.5 million jobs.
[29] "Tidal Energy," Ocean Energy Council—News & Information About Ocean Renewable Energy, available at www.oceanenergycouncil.com. Accessed on 20 April 2024.
[30] Wilhelmsson, D. et al., eds., (2010) "Greening Blue Energy: Identifying and Managing the Biodiversity Risks and Opportunities of Offshore Renewable Energy" (International Union for the Conservation of Nature, 2010), 69–70. The Spanish Renewable Energies Plan admits that, in addition to the "visual and structural impact" on the coastal landscape of power generating installations of this kind, and the magnitude of the civil engineering work involved in their construction, they usually cause a 3-hour delay in the tidal cycle, with all the implications that this entails. "Plan de Energ´ıas Renovables 2011–20," Instituto para la Diversificaci´on y Ahorro de la Energia (IDAE), Madrid, 193, available at www.idae.es/index.php/mod.documentos/mem.descarga?file=/documentos 11227 PER 2011- 2020 def 93c624ab.pdf.
[31] Principle 15 of the Rio Declaration on Environment and Development, The United Nations Conference on Environment and Development, Rio de Janeiro, 1992: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."
[32] Goldstein, B, D, (1999). "The Precautionary Principle and Scientific Research are not Antithetical", (1999) 107 Environmental Health Perspectives A594, p. A594.

precautionary approach, there is often a three-part structure that is adopted; *(1) damage appraisal, identifying the conditions that warrant the use of this approach; (2) scientific basis, identifying the degree or level of knowledge depending on the correlation between a specific cause and a specific effect; and (3) a remedy, stipulating the action needed to be taken by decision makers in reaction to the specified activity.*[33] This will certainly serve as legal basis in structuring a regime for marine renewable energy.

Another challenge to the establishment of marine renewable energy legal regime has to do with the economic or investment challenges with regards to the technical know-how and management of the installations. There is a school of thought that holds the view that there is no need for a law when one has not been able to figure out how to bring to reality, the use of marine renewable energy due to the lack of capital resource.

MRE also faces challenges like opposition from communities with regard to the development, deployment and usage of such devices and structures for energy generation in their locale. Such objection or disapproval is influenced by preconceptions and sometimes genuine fear of the unknown which are, to some degree, totally unsubstantiated but to a little extent, real. From this, it is essential that community engagements are necessary to help the people of the area understand the need for such installations and also to give them a voice in the decision of where such installations will be placed.[34] Civic education should also be carried out to ensure that these communities understand the installations and the need for their presence.

The West African sub-region holds vast RE resources. Ghana is one of such West African countries that falls in this domain.[35] It is instructive to understand that a number of African nations have initiated or promulgated laws regarding renewable energy even though none has yet, according to the research I have carried out so far, promulgated one solely aimed at the regulation of MRE. With most African nations making diligent efforts to meet the Sustainable Development Goals, there is hope that much will be done in the years to bring to the fore, marine renewable energy.

V. CONCLUSION

There is no iota of doubt that the concept of a legal regime for marine renewable energy in Africa and for that matter the world, is one that is still at an infantile stage. Nonetheless, when

[33] Manson N, A (2002) Formulating the precautionary principle. Environ Ethics 24:263–264

[34] In the case of the United States, it is estimated that over half the total population lives on or near the coast. U.S. Commission on Ocean Policy, "An Ocean Blueprint for the 21st Century: Final Report" (2004), 1.

[35] Ankrah, I, Boqiang L. (2020) "Renewable energy development in Ghana: Beyond potentials and commitment", Energy.

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the fundamental characteristics of marine renewable energy is weighed and analyzed, the possibilities outstretch the eye. The current threat of climate change and global change cannot be fought off alone by other renewable energies but also by the development (science, policy and law) of marine renewable energy.

International law and for that matter UNCLOS, provides a structure or framework from which countries can fashion out legal regimes aimed at regulating the deployment and use of marine renewable energy. I argue that for any legal regime to thrive and meet its goals, there is the need for a strong and viable institutional framework that would harness the ideas of stakeholders as well as draw lessons from countries that have been successful at creating a marine renewable energy regime. The recommendation of an independent regulator to oversee issues or relations of marine renewable energy is one that should be given the needed consideration. The political setting should not be used in determining the competence or otherwise of the independent regulator. This must be done based on meritocracy and proper standard setting.

For Africa to achieve its energy goals, it has to know that relying just on the traditional forms of energy like coal, gas, oil and the like would not suffice. There is the need to think global, the need to think partnerships in the achievement of this goal. This is why I suggest the establishment of the Africa Marine Renewable Energy Consortium (AMREC) to look into the potential of trusted partnerships among African countries in the development of MRE. This institution, when established and managed carefully can lobby the international communities on issues of marine renewable energy not just in Africa but also in the world. Institutions research from bodies like the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) have already set the pace in the desire to achieve the goals of the SDGs.

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