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LEGAL CONSIDERATIONS ON OTEC DEPLOYMENT IN MALAYSIA

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Abstract

It is predicted that the world's primary energy demand would rise to 37% higher by the year 2040, and this would consequently increase current pressures on the global energy system. This would in turn make renewable energy more viable against non-depletable and sustainable energy. Malaysia has made an effort to meet this energy forecast by reducing the reliance on biomass for energy production, and is committed in making it a reality. The ocean thermal energy-driven development based on the ocean thermal energy conversion technology (OTEC) has great potential in leading the Malaysian renewable energy industry. However, this cannot effectively take place until certain legal impediments are identified. Thus, a legal analysis must be conducted to provide the Malaysian government or any government authority in the world to be aware of such legal impediments in ensuring success of their OTEC venture. Given the industry is at its infant stage, such a legal review is hoped to eventually promote further legal analysis on OTEC-related activities.

Keywords: Sustainable development, renewable energy, energy security, social development, energy law

■1.0 INTRODUCTION

Every nation's economic activities are known to be regulated, at one point or another. This is to ensure the proper administrations of events occurring within the overall activities of that country are optimal to its development. In a sustainability sense, it is about the co-relationship of economic growth, social security and environmental protection. In the legal sense, the sustainable development law is where these three major area overlap; ensuring proper balance of action taken by the legal fertility to achieve balanced results, since justice is not always consistent. Generally, however, the importance of sustainability is about a global agenda in influencing nations towards universal solidarity in protecting future generations' resources. Thus, laws and regulations on economic activities have greater roles, not just on the latter, but also towards the other two spectrums, at the micro and macro levels.

Hence, creating reliable legal provisions is mandatory for the purpose of investors' protection, local and international (McLean et al., 2012), the need for protecting the environment (Ashford and Hall, 2011), ensuring and enabling opportunities to embrace sustainable energy goals (Cambini and Jiang, 2009; Department of Economic and Social Affairs, 2013; Posner, 1974; Stigler, 1971), and ensuring public interest protection (Posner, 1974; Stigler, 1971). A lack of such awareness would not ensure economic success and social amalgamation (European Parliament, 2011; Ocampo, 2006; OECD, 2010; Spencer and Rudiger, 2003). It may even lead to the collapse of the economic activity of such a country (Brunnermeier et al., 2009; Jessop, 1997).

Ocean thermal energy-driven development (OTEDD) has the potential of creating a probable investment of hundreds of millions of dollars (Vega, 2010). Thus, there is a requirement to promote the protection of investments, while at the same time ensuring the protection of marine environments and all stakeholders involved in the development. Legal adequacy would avoid adverse impacts on all parties (Jaafar Bakar, 2013). Law on OTEC should be in line with the universal principle of natural justice, which ensures the promotion of fairness and equality towards each individual affected by the activity (Rawls, 2009). This would help meet the 'global goals' of sustainable development through OTEC (Jaafar Bakar et al., 2014).

■2.0 OCEAN THERMAL ENERGY-DRIVEN DEVELOPMENT

OTEC technology is not a new concept, and has been revived through technological capabilities and updates, making harnessing the temperature differential of the ocean a reality (Boehlert and Gill, 2010; Hoogwijk and Graus, 2008; Masutani and Takahashi, 2001; Sukhatme, 2011). OTEC has the potential of producing more energy than the combination of the waves and wind energy (Spellman, 2014). The principle of the OTEC system functions to create electricity from converting power derived from the movement of a turbine that is linked and solely powered by a working fluid.

OTEDD denotes economic activities which include the entire spectrum of activities, upstream and downstream, deriving from Ocean Thermal Energy Conversion (OTEC) deployment for electricity production. Ever since OTEC was formulated as a method to produce energy, it has been recognised to be a major source of renewable energy (Arcuri et al., 2015; Boyle, 2012; Fujita et al., 2012; Vega, 2002). It is found that it can also be used not just to generate electric energy, but also to further convert it into hydrogen. On top of energy producing capabilities, there are other significant downstream activities that could be used to generate economic advantages such as producing drinking water, cheap cooling systems, temperate climate produce, cosmetic products, and aquaculture high-value fish produce (Elsevier Oceanography Series, 1993). OTEC can further support spin-off activities as the result of the cold sea water to industrial conditioning, such as chill-soil agriculture where temperate produce could be harvested at sea level plus fresh water supply (Giff Johnson, 2015; Koto and Negara, 2016).

All these activities require careful legal foresight and planning that must be regulated through proper laws, because the commercialization of OTEC would mean allowing the establishment of various plants to operate with the protection of the law.

■3.0 OTEC LEGAL CONSIDERATIONS

This research is focused on the laws associated with Ocean Thermal Energy-driven development (OTEDD) as a means of producing energy from the sea. The potential is worthy to be further investigated and capitalised upon by Malaysia, with the abundant existence of deep-sea bed off its territorial water (Sabah Trough). This would require an exclusive economic zone for such activity to take place (Figure 1).

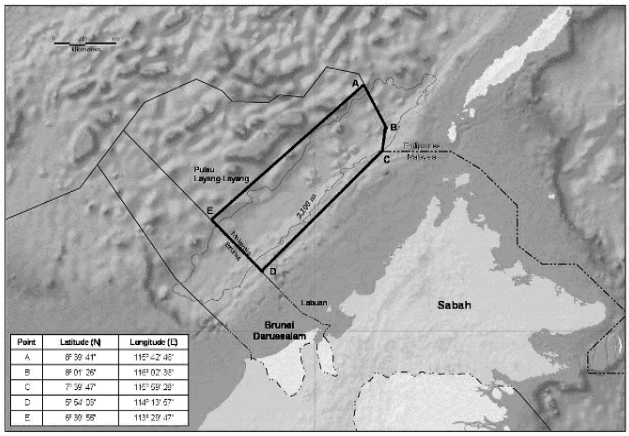

Figure 1. Sabah Trough location (areas inside the darkened line) within the Malaysian Exclusive Economic Zone (EEZ) (Source: OTEC UTM Centre)

The Tenth Malaysia Plan (2011 – 2015) (Economic Planning Unit, 2010) aims for a high-quality, cost-effective and reliable supply of energy (including renewable energy). Therefore, it needs the ability to attract investments and expansions of similar industries into a high value-added activity. It is also in line with the latest 11th Malaysia Plan (2016 – 2020) to ensure the exploration of ocean energy (Economic Planning Unit, 2015).

The strategic thrust that corresponds to the five strategic pillars was based on the forecast of energy needs for Malaysia. In the National Energy Security Conference (2012) (Economic Planning Unit, 2011), it was acknowledged that, with the current status of energy demand and supply balance, Malaysia is projected to be a nett energy importer by 2019. This would indeed be a grave condition for the Malaysian energy security scenario.

Since there is no prior study on OTEDD in the context of Malaysia, this makes the current study crucial on the investigation of whether the currently available regulations governing OTEDD activities within Malaysian waters are adequate. The fundamental research employs legal examinations to determine and appraise various problems to evaluate the need for enhancing the existing regulatory framework.

■4.0 METHODOLOGY

The methodology used to investigate the issues involves adopting the doctrinal legal research (Hutchinson and Duncan, 2012). This is conducted by adopting a comparative and descriptive study on all related legal provisions (laws) to clarify the related issues. Data on any legal impediments gathered from this approach is then discussed critically and judgmentally to ensure the adequacy of all currently available related legal provisions in regulating ocean thermal energy-driven development in Malaysia.

Research was conducted by first reviewing several materials on the International regulatory framework, especially on the United Nations Convention on the Law of the Sea (UNCLOS), to find out about the possible legal issues that revolve around this OTEC study. These issues include jurisdictional; National–International issues; Federal-National, on regulatory issues; and environmental considerations.

Twelve Acts were reviewed for evaluation, namely; 1) Federal Constitution, (2) Renewable Energy Act 2011 (Act 725), (3) Energy Commission Act 2001 (Act 610), (4) Sustainable Energy Developing Authority Act 2011 (Act 726), (5) Exclusive Economic Zone Act 1984 (Act 311), (6) Territorial Sea Act 2012 (Act 750), (7) Baseline of Maritime Zones 2006 (Act 660), (8) Continental Shelf Act 1966 (Act 83), (9) Electricity Supply Act 1990 (Act 447), (10) Gas Supply Act 1993 (Act 501), (11) Atomic Energy (licencing) Act (Act 310), (12) Petroleum Development Act (Act 144).

■5.0 RESULTS

The results demonstrate that the rights under the Constitution of Malaysia in respect to all energy matters are given to the Federal Government through the Ninth Schedule, List I, Item no. 11(c) to formulate laws within its jurisdiction. It is the only term mentioning energy within the entire text. This provision is clearly identified in the Federal Constitution in demarcating areas of Federal or States jurisdictions. They are indicated in the 9th Schedule, and comprise three lists, namely; the “Federal List”, the “State List” and the “Concurrent List”. Energy is categorised as matters concerning national jurisdictions such as agreements, conventions, international treaties and those signed with other nations, together with military, defence, internal security and civil and criminal law (Ninth Schedule, List I – Federal List). Therefore, this grants exclusive rights for the Parliament of Malaysia to create laws on energy, thus enabling OTEC to fall within the purview of the Malaysian Federal Government to legislate laws on it.

This position is to be welcomed, as it will avoid any disagreement on such issues between the States and the Federal Government, or even between States. Such clarity will promote transparency towards the formulation of a specific regulation on OTEDD and OTEC development programmes, thus eliminating any overlapping legal issues.

It is known that ambiguities and indefinite issues are not conducive for the promotion of a robust business environment. In contrast, clear and unambiguous legislation contributes positively to the development of a strong economy. The Petronas Berhad, a corporation created as a result of the Petroleum Development Act 1974 (Act 144) as the custodian of petroleum development in Malaysia, is a good example of control by the federal Government.

Meanwhile, the Renewable Energy Act 2011 (Act 725) does not clearly state “ocean thermal energy” in its schedule of renewable resources. Instead, the list of renewable resources listed are “biogas”, “biomass”, “small hydropower”, and “solar photovoltaic energy”, but impliedly could be seen from its usage in the “renewable energy installations” definition section, where thermal was identified. Irrespective of the argument, the terms used are not exhaustive, as the Minister has the right either to amend the schedule as provided in section 63 of the Act, to make or amend regulations.

■6.0 DISCUSSIONS

6.1 International

Prows (2007) mentioned that the 1982 UNCLOS represents the culmination of various international law issues, and is seen as the most significant achievement in international law since the U.N. Charter. It enables the establishment of an international property law *erga omnes*, and shall ultimately be dependent on a series of bargained consensuses in order to become effective. He summarized all this as “yet whether UNCLOS in fact, and in law, is now living up to this bidding is in doubt”. The *erga omnes* norms refer to the right to legal claims against states which violate them. These norms were violations that caused injuries to multiple states, and those states that might be free riders rather than ensure justice against the perpetrator.

Another legal point is on the issue of increased usage of bottom trawl fishing, causing destruction to coral and seabed areas. people were exploiting the status of high sea fishing freedom, and the very structure of common heritage status and the rights granted individual State responsibility, as stated in Part XI. This view is also supported by other authors (Taylor, 2010; Rogers, 2004). The intended research and development of OTEC offshore over the depth of Sabah Trough could raise issues, as the intended research increases fishing activities surrounding the area of development, due to plankton enrichment by OTEC activities.

As for the OTEC related regulations elsewhere, the U.S. Government involvement in OTEC research and its congress has enacted the Ocean Thermal Energy Conversion Act of 1980 and OTEC Research, Development, and Demonstration Act, giving the National Oceanic and Atmospheric Administration (NOAA) power on matters related to ocean energy. Facilitating operations under OTEC would not require a lease or even payment of royalties to the Federal Government. This was intended to stimulate the development of OTEC as a renewable energy source (Murray et al., 2011). Unfortunately, NOAA did not receive any application for any license application. Therefore, the licensing program was dismantled and OTEC licensing regulation must be rescinded (National Oceanic and Atmospheric Administration, 2010).

Environmental concerns have been raised concerns on the closed-loop or the hybrid systems that would be running on ammonia or chlorine as their working fluid in creating energy (Etemadi et al., 2011; Finney, 2008). The leakage of these harmful chemicals into the sea is a possibility, and is expected whenever the pipes are damaged. Habitat destruction should also be a risk as a result of environmental hazards, as ammonia is toxic in moderate concentrations, and has been banned by the Montreal Protocol, because its properties of depleting stratospheric ozone (Masutani and Takahashi, 2001). Even with the possibility of danger looming over ocean thermal energy-driven development and the destruction of the sea and its valuable contents of flora and fauna, with a proper design research and upkeep, such negative impacts can be reduced or may even be avoided. The existence of comprehensive legal provisions in the form of regulations would help to ensure a better management of the operational OTEC, thus confirming security and safety factors.

The Coastal Response Research Center has written in their report concerning OTEC activities in the United States that cold water intake from the deep ocean was expected to be around 1000 m, which is a huge amount that causes concern about the content of certain chemicals or heavy metals that could potentially affect the surface water status. There is also some apprehension that such huge distributions of water which are unique to OTEC activities would cause pollution, and might end up being an environmental issue (Coastal Response Research Center, 2012).

6.2 Local

All in all, the literature above touches similar issues that hover over the effectiveness of UNCLOS, Sovereignty and OTEC to date. The researcher has, however, not come across a study on regulatory framework for OTEC in Malaysia. Malaysia rectified UNCLOS on the 14th of October, 1996, which gives her an area beyond and adjacent to the territorial sea, to be recognised as the exclusive economic zone (EEZ). It acts as an exclusive sea zone under the regulatory framework of the UNCLOS. Mandate and rights are given to all states to explore and use marine resources located within 200 nautical miles from the state baseline. The baseline is calculated using the Baseline of Maritime Zones Act 2006 (Act 660).

The Malaysian Government has enacted the Exclusive Economic Zone Act 1984 (Act 311) and Continental Shelf Act 1966 (Act 83), which establish Malaysian sovereign rights over exploration, exploitation, management and conservation of marine resources. It further provides Malaysia with ample means to enforce jurisdictional powers over the establishment and the use of artificial islands. This includes its installations and structures, marine scientific research and the protection and preservation of the natural environment.

As far as the environmental issues concerning OTEC system are about, the main argument relating to the close-loop or hybrid system is about the working fluid that adopts ammonia or chlorine as a medium to facilitate heat exchange (Takahashi and Trenka, 1992). Nevertheless, the Environmental Quality Act 1974 (Act 127) would be able to cater for the regulation of such chemical usage. “You need to have landed before you can have rights to the sea. It is as simple as that. You cannot just have rights to the sea without owning land,” according to Solicitor General of the Philippines, Francis Jardeleza, March 2014 (Santos, 2014).

The results support OTEC activities to be carried out in Malaysia, given the support of the available laws. A review of the legislations indicate minimal legal impediments, but note that further unclear issues like establishment and abandonment of OTEC structures and companies should further be investigated. Perhaps the best method to advance this deployment is to ensure that a proper Act is established in order to give absolute authority in governing all OTEC activities in the future.

The case of Petronas Berhad creation through the Petronas Act could be taken as an exemplary step into establishing a central body to administer all activities, while the regulatory requirement needed to regulate OTEC activities could be given to a supervisory council. Perhaps through establishing an Ocean Thermal Energy Development Act (OTED Act), and together with it, the establishment of governmental linked companies (GLC) under the name OTEC Nasional (OTENAS) could centralise all administrative matters and tackle issues like royalty, concession, issuance of zone blocks and other related issues; and regulate all upstream and downstream activities of OTEC.

■7.0 CONCLUSION

In addressing the issue of whether the existence of an ideal sustainable development of this new economic activity could be realised, the current preliminary research found it to be adequate. Despite having further challenges in the midst of its implementation, these preliminary findings are crucial to potential investors’, especially foreign parties interested in venturing into this project and the various stakeholders. This is in particular of the impact this endeavour would have towards their daily lives. With the strong support of the laws and policies, it

encourages countries such as Malaysia to move forward to secure its energy demands in order to ensure positive economic growth. While doing this, it is important not to neglect its social and environmental commitments.

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