

## RENEWABLE ENERGY DEVELOPMENT AND CLIMATE CHANGE MITIGATION IN MALAYSIA: A LEGAL STUDY

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**Abstract:** The devastating impacts of climate change have driven the development of renewable energy (RE), and it is seen as a game changer to preserve the environment for generations to come. The commitment under the Paris Agreement to the United Nations Framework Convention on Climate Change has indirectly forced many countries to support the efforts for RE generation. This energy transition from unsustainable fossil fuels to RE was demonstrated by the promulgation of various laws and policies at national, regional and international levels. Aligned with that, Malaysia has also taken several measures in mitigating climate change impacts and accelerating RE development. Thus, this study focuses on the importance of RE generation as part of the climate mitigation regime with reference to the Renewable Energy Act 2011 (Act 725). This study adopts a black-letter approach through statute analysis. Throughout this paper, it was suggested that the Renewable Energy Act 2011 failed to address climate change issues properly. Therefore, this paper calls for a reform to incorporate climate change mitigation and sustainable development in the existing law.

Keywords: Climate change, renewable energy, environment, sustainable development, law

### Introduction

Conventional energy sources like oil, gas and coals are often associated with environmental issues. Many countries have announced their renewable energy generation goals and have worked to decrease their reliance on fossil fuels. As a developing country, Malaysia needs a secure energy supply to support the need for an increasing population, industry and commerce. At the same time, Malaysia has shown its commitment towards international obligations in reducing carbon emission in parallel with the notion of promoting sustainable and clean energy for the coming generations (Yatim *et al.*, 2016).

Renewable energy (RE) has been part of the 5th fuel strategy in the energy-mix under the National Energy Policy 2001. Biomass, solar and hydro have been identified as potential RE in Malaysia. Albeit, the fact that Malaysia is known as an agricultural

commodity production hub in Southeast Asia, the utilization of biomass as a renewable energy source in Malaysia was not significant. Furthermore, Malaysia's strategic location supports solar radiation which is among contributory factors for the most optimum solar energy systems especially solar photovoltaic (PV) (Shamsuddin, 2012). Table 1 provides a summary of the primary energy supply in Malaysia from 2011 to 2015. Since the promulgation of the Renewable Energy Act 2011, RE generation has increased gradually with only 24 kilotonnes of oil equivalent (ktoe) in 2011 to 671 ktoe in 2015. However, RE still represents only a small fraction of the energy supply in Malaysia. Natural gas remains the primary fuel, contributing roughly a third of the energy produced, followed by crude oil. Hydropower's share continues to increase in Malaysia while the supply for coal and coke dropped in 2013 but increased since 2014.

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Table 1: Summary of Primary Energy Supply in Malaysia from 2011 to 2015 (Malaysia Energy Information Hub)

| Year | Primary Energy Supply (ktoe) |                    |             |               |             |  |
|------|------------------------------|--------------------|-------------|---------------|-------------|--|
|      | Crude Oil                    | Petroleum Products | Natural Gas | Coal and Coke | Hydro-power | Renewable Energy (Biodiesel, Solar, Biomass, Biogas) |
| 2011 | 24679                        | 2224               | 35740       | 14772         | 1850        | 24   |
| 2012 | 28053                        | 1449               | 38648       | 15882         | 2150        | 313  |
| 2013 | 27154                        | 5320               | 39973       | 15067         | 2688        | 529  |
| 2014 | 26765                        | 6699               | 40113       | 15357         | 3038        | 555  |
| 2015 | 24945                        | 4218               | 39365       | 17406         | 3582        | 671  |

Increasing economic, health, environmental and energy security challenges, as well as climate change, have led the international community to move away from conventional sources of energy and to look for alternative energies. Although energy sources are closely linked to the climate crisis, it was believed that energy sources could resolve the issues through clean and sustainable energy development. As a small country in Southeast Asia, Malaysia has a vast potential for RE exploitation, especially for electricity generation (Ong *et al.*, 2011; Shamsuddin, 2012; Petinrin & Shaaban, 2015). Yet, lack of integration between climate change mitigation measures and RE development might jeopardize Malaysia's ambitious targets as embedded in the National Determined Contributions ("NDC"). Therefore, this paper seeks to explore the functions and effectiveness of the Renewable Energy Act 2011 (Act 725) ("RE Act") as part of a climate change mitigation regime in Malaysia through a doctrinal approach.

### **Towards Sustainable Development**

Environmental protection and sustainable development have always been the agenda of the government in promulgating new laws and policies for energy (von Hippel *et al.*, 2011). Environmental problems, including the occurrence of acid rain incidents in Europe 40 years ago, have paved a new path in the energy sector by addressing the utilization of RE and energy efficiency ("EE") (Leach & Deshmukh, 2012). The Brundtland Commission's 1987 Report has defined the term sustainable development as, "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Bell *et al.*, 2013). As in the case of *New Zealand v France (the Nuclear Test II case)* [1995], it was suggested that the concept of sustainable development should be part of the customary international law and therefore, an interminable environment impact assessment will be required (Bell *et al.*, 2013).

One should not understand this principle as merely avoiding pollution. This principle requires the amalgamation of approaches including scientific,

economic, social and legal instruments. Through this principle, the government is able to construct a comprehensive legal framework in order to safeguard the interest of the present and the future generations. This principle has received a good response at the international level as could be observed in the case of *Gabcikovo-Nagymaros (Hungary v Slovakia)* which involved the construction of a hydroelectric dam at the Danube River and subsequently caused environmental damage. Judge Weeramantry, in this case, has extended his opinion on the concept of sustainable development (Merkouris, 2012) as:

The principle of sustainable development is thus a part of the modern international law by reason not only of its inescapable logical necessity but also by reason of its wide and general acceptance by the global community.

Renewable energy (RE) for electricity generation is considered one of the effective measures to support the climate change regime and sustainable development (World Future Council Hamburg, 2008). The growing deployment of wind and solar energy worldwide reflects the international interest in exploiting these sources to replace conventional sources strongly linked to the effects of climate change (PricewaterhouseCoopers, n.d.). These transitions could be achieved by reducing the demand for energy and increasing the production of renewable energy (RE). However, it is not possible to reduce energy demand. As the country grows, the demand for energy would increase in line with the growing population and industries (IRENA, 2017). Therefore, the use of RE is necessary to successfully achieve the objectives of the climate plan by increasing the share of RE in various sectors.

Price volatility and scarcity of fossil fuel supply have prompted many countries to utilize RE as an alternative measure. In addition, the use of RE benefits the energy security of a country as well as the environment, as it is able to address climate change issues. Various steps have been taken by the stakeholders including providing assistance especially for non-developing countries to adopt the appropriate

RE support policies (Baldwin *et al.*, 2016). Based on the report by the Intergovernmental Panel on Climate Change (IPCC), the mitigation of climate change has become a driver for addressing RE sources in many jurisdictions (Kalkuhl *et al.*, 2011). Although there are negative perceptions on its development, RE has continued to play a dynamic role in the electricity generation along with the conventional ones and many developing countries have adopted similar RE policies that have been successfully implemented in developed countries (Azuela *et al.*, 2012). This study will later observe the RE law in Australia and Germany that explicitly indicates the link between RE deployment and climate change mitigation.

From the environmental lens, RE prevails upon fossil fuels as it prompts a positive effect on greenhouse gas (GHG) emissions (Manish *et al.*, 2006). It can be evidenced as RE and its twin EE have become an agenda for European countries to achieve a 20% reduction in CO<sub>2</sub> emissions by 2020. There is an implicit consensus among the world nations that RE

could contribute to climate change and to decrease harmful emissions and it was reflected in the Paris Agreement. Through this Agreement, governments and local authorities have embarked on various measures to promote RE technologies on a large scale (REN21 Secretariat, 2016).

Table 2 demonstrates the relationship between CO<sub>2</sub> reduction and RE generation. The rising of RE generation leads to the increasing pattern of CO<sub>2</sub> avoidance. This data proves that RE deployment provides a concrete solution for climate problems and also brings some economic advantages such as reducing the risks of the volatility of fossil fuel prices (Cherrington *et al.*, 2013). Furthermore, the United Kingdom has moved many steps ahead to solve the issues mentioned above through various financial incentives to induce more investment in RE generation (Couture & Leidreiter, 2014). Other than that, the United Kingdom's Climate Change Act 2008 has navigated the country in reducing carbon intensity.

Table 2: Annual Power Generation (MWh) of Commissioned RE Installations (SEDA Malaysia)

| Year | Biogas<br>(including<br>landfill/<br>Agri-waste) | Biomass<br>(including Solid<br>Waste) | Small Hydro | Solar PV  | CO <sub>2</sub><br>Avoidance<br>(tonne) |
|------|--|---------------------------------------|-------------|-----------|---|
| 2017 | 155393.18  | 750045.97                             | 184517.38   | 579751.01 | 1669707.54                              |
| 2016 | 132206.86  | 662430.11                             | 172976.81   | 525422.38 | 1493036.16                              |
| 2015 | 99497.7  | 554863.87                             | 150912.73   | 339493.00 | 1144767.3                               |
| 2014 | 59401.08   | 406308.47                             | 112682.33   | 164453.94 | 742845.82                               |
| 2013 | 23785.57   | 247232.96                             | 68143.07    | 39805.23  | 378966.83                               |
| 2012 | 8076.49  | 95052.2                               | 17750.91    | 5003.44   | 125883.04                               |

Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States have pledged to refurbish their energy sectors and to accelerate RE deployment in a larger scale (United Nations, 2015). This commitment was later reflected in the Paris Agreement through the United States and China's plans to embark on a new policy to address RE and EE initiatives. However, in 2017, the new US government had declared to pull out from the Paris Accord. As a way forward, many countries have begun to diversify their energy sources not only to combat climate issues but to overcome energy threat (Kuzemko, 2009). Moreover, as the Malaysian government has commenced a study to transform Langkawi into Malaysia's first low carbon island by 2030, it is indispensable to critically scrutinize issues on climate change.

#### Climate Change Mitigation Regime in Malaysia

The National Policy on Climate Change 2009 (NPC) is the main framework for managing climate issues in

Malaysia. It drives government agencies, industry, community as well as other stakeholders and major groups in addressing the challenges of climate change in a holistic manner. The National Policy will navigate the nation towards sustainability aligned with international conventions such as the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. Among strategic thrusts of the NPCC are to achieve climate-resilient development through low carbon economy and to encourage global competition and sustainable socio-economic development and to integrate measures in accelerating deployment of renewable energy (RE) and energy efficiency (EE).

This policy also has underlined several measures in relation to energy such as encouraging RE utilization and implementation of EE in electricity generation and the transportation sector. This policy also benefits rural communities with regard to the electrification through mini and micro-hydroelectric schemes. However, in the absence of proper legislation for climate change mitigation, the policy seems like a tiger without teeth

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and claws as the policy provides less enforcement and no sanction for failure to adhere to the policy. To introduce this new law, the government should refer to the United Kingdom's Climate Change Act 2008, in which the law has set the target for reduction of greenhouse gas (GHG) emission by 2050. This law has extensively regulated matters on trading scheme, programmes for climate change adaptation, waste reduction schemes as well as renewable transport fuel obligations.

### **Renewable Energy Law and Policies in Malaysia**

To address the failure of the Small Renewable Energy Power Programme (SREP), the National Renewable Energy Policy and Action Plan (NREPAP) was introduced in 2009 with the notion to "enhancing the utilisation of indigenous renewable energy (RE) resources and to contribute towards national electricity supply security and sustainable socio-economic development". This policy also has immense benefits in mitigating environmental ramifications, including climate issues. Providing the dire impacts of climatic problems, this policy has called for to the enactment of the Renewable Energy Act 2011 (Act 725) which focuses on RE deployment for electricity generation in Malaysia.

Malaysia, located near to the equator, is blessed with various natural sources including RE sources. Renewable energy as defined in the RE Act 2011 means electricity generated or produced from renewable resources. This energy is not depleted and will be renewed from natural sources such as the sun, wind and water. Examples of RE sources are solar, wind, tidal, wave, biogas, biomass, and geothermal. Nevertheless, RE sources under the Act are limited to the Schedule to Section 2 of the RE Act, which is biogas, biomass, mini-hydro, solar photovoltaic (PV) and geothermal. Prior to the RE Act, the government has enacted the Biofuels Industry Act 2007 which provides an excellent framework to promote biofuel in Malaysia.

The enactment of the RE Act 2011 indicates the government's commitment to accelerating the development of RE in the country. Yet, this Act is limited to feed-in tariff (FiT) implementation as stated in the long title, "the purpose of the Act is for implementation of the feed-in tariff in RE generation". This mechanism provides an incentive for RE generation projects of up to 30 megawatts (MW). This mechanism is applicable throughout Malaysia, except Sarawak as Sarawak's energy and electricity sector is governed by the Sarawak Electricity Ordinance 2007. Given a glance at the long title and the whole construction of the Act, it is possible to dispute that climate regime under this legal instrument is not intended. Through the principle of *expressio unius est exclusio alterius* (the express mention of one thing

excludes all others) the presumption that could be derived is that the solitary object of the Act is to implement and monitor FiT in Malaysia.

Pursuant to the enforcement of the FiT, Sustainable Energy Development Authority (SEDA) has been established under the Sustainable Energy Development Authority Act 2011. SEDA is the main regulatory body in promoting RE development and to implement and monitor FiT programme in Malaysia. Another important feature of the RE Act 2011 is the RE Fund. Section 17 (1) and (2) of the Sustainable Energy Development Authority Act 2011 stated that SEDA is responsible for the administration of the RE Fund. To support the FiT programme, funding and financing to RE power producers are crucial. The sources of RE Fund are varied including collectable from SEDA and also income from investments made from the Fund as stated in Section 23 (2), Section 22 (4) and Section 24 of the said Act. Any expenditure from the RE Fund is permissible in accordance with Section 25 of the RE Act 2011. In another aspect, additional charges of 1.6% were also collected from electricity consumers through the electricity bill as a contribution to the said fund.

This fund was established based on the principle of the polluter pays, derived from the environmental law (Tan, 2014). The principle was originally initiated by the Organization for Economic Cooperation and Development (OECD) in 1972 and reaffirmed in the Principle 16 of the Rio Declaration on Environment and Development 1992, where the duty exists for a polluter to bear the cost of pollution. This rationalizes the duty of electricity consumers to contribute to the RE Fund through their electricity bills as GHG emissions were predominantly caused by fossil fuels from the electricity sector.

Apart from the RE Act 2011 and NREPAP 2009, the National Green Technology Policy (NGTP) was established to increase the utilization of alternative and RE sources as well as to promote sustainable development by integrating energy, environment, economy and social factors (Ansari, 2011). In line with the NGTP, Green Technology Financial Scheme (GTFS) was introduced to reassure engagement of local companies in the green technology industry, especially in the energy, water and waste management, building and transportation sectors. Through this scheme, Green Technology producer is eligible for a loan for a maximum of RM50 million and the green certified projects under this scheme have significantly reduced carbon emission (KeTTHA, 2016). Table 3 shows GTFS achievement in the energy sector as of 31 December 2015. Three hundred and twenty-seven projects have received green certificates under this scheme and subsequently have reduced approximately 4.053 tCO<sub>2</sub>e of carbon emission, while 180 projects have received the loan from financial institutions and contributed to 2.323 of CO<sub>2</sub> reduction.

Table 3: GTFS Achievement in Energy Sector as of 31 December 2015

|   |        |
|---|--------|
| Number of Projects that Received Green Certificate              | 327    |
| Total Cost of Green Component (RM million)                      | 4,615  |
| CO <sub>2</sub> reduction (tCO <sub>2</sub> e / yr)             | 4.053  |
| Number of Projects Getting Financing From Financial institution | 180    |
| Total Cost of Green Component (RM million)                      | 2.4193 |
| Total Financing (RM million)                                    | 215.08 |
| CO <sub>2</sub> reduction (tCO <sub>2</sub> e / yr)             | 2.323  |

### Integration of Climate Change and Renewable Energy Law

Health is vital for human life and evidence shows that climate change could adversely influence health problems in society (Panwar *et al.*, 2011). Numerous vector-borne infectious diseases, for instance, malaria, filariasis and dengue fever, were found to increase tremendously due to climatic problems in various regions (Haines *et al.*, 2006). On the other hand, several studies have revealed the benefits of RE to human health (Buonocore *et al.*, 2015; Wang & Orris, 2015). RE was found to cause less detrimental health impacts compared to conventional energies (Wang & Orris, 2015). In addition to that, RE and EE have improved public health through reduction in air pollution (Buonocore *et al.*, 2015). This energy transition benefits society in various areas including environment, health and occupational safety and RE undeniably promotes a better life through a healthier approach for the society (Wang & Orris, 2015).

Revert to the RE Act 2011, no significant amendment has been embarked since its introduction except for tariff revision and insertion of tariff for geothermal energy. Though the NPCC has provided RE as one of the tools to combat climate issues and the NREPAP has enumerated climate problems as one of the main concerns, the RE Act 2011, in contrast, shows no rooms for any environmental protection and climate regime.

It was suggested that a specific goal for CO<sub>2</sub> reduction, RE generation installation capacity, as well as EE implementation, should correspond with the climate change mitigation policy (Özdemir, 2014). Well-crafted climate policy must adhere to three fundamental aspects which embrace energy security, sustainability and market viability and should not compromise in determining the direction of the national energy policy (Behrens, 2010). Moreover, it is important to deliberate on the relationship between

energy and climate issues in both climate and energy policy. The proximity between these two aspects is entangled and responsive to each other. For instance, the European Union (EU) has successfully amplified technology through climate regime and RE deployment (Behrens, 2010). To achieve sustainable development and to combat climate change, one should not neglect RE potential (Behrens, 2010). Through RE and EE, the common goals to reduce carbon intensity is conceivable, thus, unswerving efforts and commitment are crucial for every nation (Parikh, 2012). The EU has successfully achieved targets as in the Kyoto Protocol many years ahead. In this respect, developing countries should equip themselves with a concrete framework that assimilates RE and climate mitigation (Hermwille *et al.*, 2015).

Multiple factors may have contributed to the development of RE and effective climate regime. For instance, Germany has proven itself as the leader in the RE technology advancement. Apart from the EU directives, Germany's legal instruments stand among the contributory factors to its success. Germany has constantly reviewed its RE law. The Renewable Energy Sources Act (EEG) never fails to integrate climate mitigation measures in this principal act. Section 1 of the EEG (Amendment) 2017 indicated that:

(1) The purpose of this Act is to facilitate a sustainable development of energy supply, particularly for the sake of protecting our climate and the environment, to reduce the costs of energy supply by incorporating external long-term effects, to conserve fossil fuels and to promote the further development of technologies for the generation of electricity from renewable energy sources.

In addition, the Australian government has also expressed its commitment to climate change mitigation through RE law. The underlying purposes of the Act exhibited in Section 3 of the Australian Renewable

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Energy (Electricity) Act 2000 are as follows:

- (a) To encourage the additional generation of electricity from renewable sources
- (b) To reduce emissions of greenhouse gases in the electricity sector
- (c) To ensure that renewable energy sources are ecologically sustainable X full stop

Of particular relevance to these two legislations, RE generation has significant impacts on the climate regime and subsequently promotes sustainable development especially in the energy sector. Several international conventions, such as the UNFCCC, the Kyoto Protocol and the Paris Agreement, have stressed upon measures to combat climate change. There are no clear international legal provisions that allocate sanctions for the emitters or any country that failed to carry out its duty under such conventions. Therefore, either a specific law on climate change or an integrated law on RE and climate is urgently desirable at the national level.

### Conclusion and Recommendation

Climate issues, international commitment to reduce carbon emission, national target to provide sustainable energy for the future and energy security have led several countries, including Malaysia, to pursue the goal of increasing the share of RE generation in order to support the demand for economic growth. Although Malaysia has abundant natural resources like oil and natural gas, these sources are insufficient to accommodate increasing demands. This energy transition will not only be able to reduce the country's dependency on fossil fuels but also promote sustainable development for the future generation.

This paper proposes for the amendment of the current RE Act 2011 by incorporating other support mechanisms and climate change mitigation objective. Suggestions for an additional draft in the RE Act 2011 are:

- (1) The purpose of this Act is to implement Feed-in Tariff and other support instruments for the purpose of renewable electricity generation in Malaysia.
- (2) The purpose pursuant to Section 1 also serves to increase the share of electricity generation by renewable energy sources in a manner to promote sustainable development, climate change mitigation and environmental protection.

Whether or not the RE Act 2011 has been an effective instrument to combat climate change is equivocal as no clear provision in this Act has indicated "climate". Though RE generation is closely linked to climate change mitigation, a presumption should not be made based on these probabilities. The NPCC and the NREPAP have clearly assimilated RE and climate regime. Yet, the same concept has not been reflected in

the RE Act 2011. Hence, the future amendments to the RE Act 2011 should be called and a clear objective inserted. A well-structured legal instrument, coupled with fiscal incentives, is needed in accelerating RE development and to contribute to a more resilient energy sector.

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