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E-B Environment - Behaviour Proceedings Journal

CSSR 2021

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8th International Conference on Science & Social Research
8 - 9 December 2021, Virtual Presentation

e-IPH e-International Publishing House Ltd., United Kingdom

Laws Governing Renewable Energy Production of Malaysia and Canada

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Abstract
The transition of the usage of fossil fuels to renewable energy after centuries of technological and economic support requires a set of efficient legal frameworks. Achieving widespread implementation of renewable energy involves substantial challenges, namely inefficiency of policies, lack of financial assistance, and unsecured economic instruments. Adopting the comparative method and research interviews, this research compares the comprehensiveness of the laws governing renewable energy in Malaysia with Canada. Further, to critically analyze the correlation on the effectiveness of legal frameworks on the production of renewable energy and to provide critical insight into the legal frameworks governing renewable energy in Malaysia.

Keywords: law; renewable energy; Malaysia; Canada

DOI: https://doi.org/10.21834/ebpj.v7iSI8.3920

1.0 Introduction

In comparison to Malaysia, Canada has a high production rate of renewable energy. It is presumed that Canada's legal framework is more comprehensive and more effective. Especially looking at Canada's energy consumption and products consist of 67.5% of renewable energy resources. When both countries have the same renewable energy laws but are significantly different in terms of renewable energy production, there is a need to understand the reasons behind such disparities. Hence, the purpose of this research is to critically analyse the issues and to provide some recommendations to improve the comprehensiveness of Malaysia's legal framework on the renewable energy.

2.0 Literature Review

2.1 Laws and Policies Governing the Production of Renewable Energy

According to Heffron et al. (2018), even though legal frameworks exist, these existing laws and policies might not be sufficient and efficient in governing renewable energy production. Bujdoiu (2015) stated that the debate on the effectiveness of the law is directed in two directions, which are focusing on the judicial system and the legislative system. However, in executing the law, there might be a

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DOI: https://doi.org/10.21834/ebpj.v7iSI8.3920

conflict between these two systems where the judiciary must decide on laws which the ministries in office have given a contradictory order.

Energy Law is a legal framework regulating matters on energy usage such as electric, gas, solar and other energy resources. The law exists to ensure energy companies and the public use energy resources properly and conserve the resources for future use. The United Nations Environment Programme (UNEP, 2007) defined renewable energy sources as energy sources that are sustainable, unlimited, and not subject to depletion. In statutory context, the phrase renewable energy carries the meaning of "electricity generated or produced from renewable resources."

It is stated in the 10th Malaysia Plan that Malaysia is blessed with few Renewable Energy resources, such as biomass, biogas, mini-hydro, and solar that can be used to ensure a sustained energy supply. However, some barriers prevent the improvement of the growth process in implementing policies regarding renewable energy in countries.

One of the main challenges in implementing renewable energy is the financial barriers that countries need to face. Curtis Johnson (2012) stated that undeniably renewable energy brings a lot of benefits in improving the environment; however, the cost for the implementation is expensive compared to other energy sources. Costly innovative technologies are needed to implement renewable energy sources however stockholder prefers to invest in low-cost conventional energy, which leaves renewable energy technologies a low investment. In Canada, subsidies were given for using hydropower in electrical sources; nevertheless, the author states that if subsidies were not given, stockholders would prefer conventional energy sources rather than costly renewable energy sources. Besides, Corina Pirlogea (2011) also says that 27 European Union countries, including Romania, have similar financial problems in implementing renewable energy. Production of Renewable energy using modern technologies is costly and causes the demand for these technologies to be low. If the countries continue the costly production with low demand, hence, the country needs to bear the excessive cost in their economies.

Therefore, it can be inferred that most of the existing literature which stipulates the effect of the legal framework on the production of renewable energy is from various countries. The two key issues highlighted in the literature are the insufficiency of laws and policies as well as the inefficiency of the existing frameworks. An imperative point to note is that legislations play a significant role in the production of renewable energy. This is because private investors and other countries depend on the national policies when investing in renewable energy of a certain country. Therefore, it is pertinent to analyze the application of laws in Malaysia, specifically the Renewable Energy Act as well as other policies to determine the efficiency of these laws and policies.

2.2 Legal Framework Governing the Production of Renewable Energy in Malaysia

In Malaysia, the production of renewable energy is governed by the Renewable Energy Act 2011. However, before the enactment of the law, there were various policies made by lawmakers to encourage the use of renewable energy and to introduce sustainable energy in Malaysia. For example, the establishment of the National Energy Policy 1979, National Depletion Policy, Four Fuel Diversification Policy and most importantly, the National Renewable Energy Policy and Action Plan where Renewable Energy Act 2011 was introduced.

Furthermore, the development of law must be in line with international legal frameworks on renewable energy such as the Paris Agreement of Climate Change Mitigation, The United Nations Framework Convention on Climate Change, and the Kyoto Protocol. These treaties determine to what extent the application of these international standards has been applied at the national level which is in Malaysia through its law.

Before the establishment of the Renewable Energy Act 2011, the government had enacted an act which provides an excellent framework to promote biofuels in Malaysia which is Biofuels Industry Act 2007. The enactment of the Renewable Energy Act 2011 shows the government's commitment to accelerating renewable energy development in the country. However, this Act is only limited to Feed-in Tariff (FiT) implementation as provided in the long title of this Act, that "the purpose of the Act is to implement the feed-in tariff in RE generation". This system provides an incentive for up to 30 megawatts (MW) of RE generation projects. This system is applicable across Malaysia, except Sarawak as Sarawak's energy and electricity sector, is governed by the Sarawak Electricity Ordinance 2007.

"Feed-in Tariff" was introduced in the 10th Malaysia Plan to increase public awareness on the implementation of renewable energy. Feed-in Tariff (FiT) program was first introduced by the United States and established in Malaysia for the first time in 2011. This program is under the supervision of the Sustainable Energy Development Authority of Malaysia (SEDA), an organization under the Ministry of Energy, Green Technology and Water. The program plan to upkeep the development of renewable energy is by making 1% of the electricity tariff from the consumer invested in the program. Their goals were to make sure renewable energy can be run economically and aside from that, can increase the public awareness of this sustainable energy. The FiT system is not imposed on low-income consumers whose energy consumption is less than 200 kW.h per month. FiT is a strategy of the government to drive RE investment in Malaysia. Four main renewable energy sources, solar photovoltaic (PV), biomass, biogas, and mini-hydro have a distinctive features under the FiT law. The FiT law is an incentive strategy to encourage investor involvement in this sector in the economy of the country.

The introduction of FiT in Malaysia has estimated that up to 50,000 new jobs will be created using renewable energy. FiT reduces the investment risk in the Malaysian energy sectors by promising a fixed interest. This plan aims to stabilize the future economy of Malaysia. The investors will accomplish their main goals if the government maintains stability. They can also be guaranteed a reasonable return on investment. FiT thus ensures an atmosphere of investment return and energy supply in the country.

2.3 Canadian Laws and Policies Governing the Production of Renewable Energy.

Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States have pledged to revamp their energy sectors and accelerate renewable energy distribution on a bigger scale (United Nations, 2015). According to the findings in the Journal of Clean

Energy Technologies (2016), Germany and the United States have fewer difficulties in implementing renewable energy compared to Malaysia because their governments provide strong enforcement and support.

Canada was a global leader in total production of hydroelectricity in 2015, second only to China. Canada is also a major wind producer; more modest is Canadian solar and biomass generation. The Ontario feed-in tariff (FIT) program provides Canada's largest solar incentive, which is why 98% of Canadian photovoltaic capacity (PV) is in Ontario. As of June 2016, FIT will charge 22.5 to 31.3 cents per kW.h to PV generators for each grid-connected generation kW.h, although prices may differ depending on the scale and timing of the project in Canada, in response to the global call to reduce greenhouse gas (GHG) emissions, the Province of Ontario established its Green Energy and Green Economy Act 2009 (GEGEA 2009), commonly referred to as the Green Energy Act (GEA).

The policy aimed to create green jobs in the province while expanding the production of renewable energy and promoting energy conservation. When the Green Energy and Green Economy Act (GEGEA) of Ontario were enacted in May 2009, it marked the beginning of a new era of clean energy policy aimed at increasing the production of renewable energy, encouraging energy conservation, fighting climate change, and boosting the economy.

Nonetheless, in November 2011, the initial implementation of the GEGEA received significant criticism from the Ontario Auditor General because the plan had not been thoroughly evaluated and little statistical data on program results had been released to the public by Ontario's energy institutions.

3.0 Research Methodology

The primary data collection was conducted through semi-structured interviews to gather a better in-depth understanding of the issue while a comparative legal document analysis of both legal frameworks and policies was conducted.

4.0 Research Findings

4.1 Differences between Malaysia's and Canada's Production of Renewable Energy.

Hydro is one of the renewable energy available in Malaysia and Canada. It is considered one of the most economical and environmental-friendly energy generation. Malaysia has plentiful streams and rivers flowing from the highlands, and 149 sites for small hydropower installation have been discovered through studies carried out in 2010, with an estimated capacity of 28.9 MW with its mountains and highlands. It has been provided under Feed-in Tariff that the national utility company, Tenaga Nasional Berhad (TNB) are willing to buy electricity through the distribution grid system from small power generation plants that use Renewable Energy through the RE Power Purchase Agreement (REPPA).

In May 2016, the installed capacity of small hydro reached 18.30 under the country's Feed-in Tariff program. Nevertheless, Malaysia also seems to be facing several obstacles in developing small hydropower. Heavy rainfall causes flooding and overflow, unproductive designs to filter out sand and fragments before it enters the turbine, complex regulatory requirements in terms of land procurement and environmental impact, and a high chance of water pollution during construction work due to logging activities. Not only that, the right to land and water is subjected to state and federal regulation. Thus, the challenges affected the development of hydropower in Malaysia.

In contrast with Canada, Canada is the third-largest hydropower producer in the world after China and Brazil. The hydro substructure in Canada extends from coast to coast and accounts for about 60% of all the electricity produced. Canada presently has an installed capacity of about 78,000 megawatts and has the capability to double that total to 160,000 megawatts to decrease carbon emissions to fulfill greenhouse gas emissions reduction targets. Canada has hydropower in all regions because there are many rivers across the country.

Not only that, the developments of hydropower are being studied thoroughly and planned throughout the country. They vary from major projects to smaller ones, from run-of-river to pumped storage, and from well-established and recognized technologies to innovative technologies by tidal and wave power. Developed turbines make it conceivable to operate run-of-river projects in sites with a small flow and no height variances. In Canada, the size of run-of-river facilities differs from less than 1 MW to almost 1 900 MW.

Comparing another type of renewable energy available in both Canada and Malaysia is biomass. Biomass has an advantage over other types of renewable energy as it can easily be stored due to its accessibility and large resources. Biomass potential in Malaysia can be generated by up to 2400 MW. Malaysia produces around 168 million tons of renewable energy along with resources from palm oil waste, sugar cane waste, rice husks, municipal waste, forestry waste and coconut waste. Nonetheless, financing schemes must be resolved to maximize the usage of available technologies due to the lack of available and promising financial, institutional, and legal issues.

However, fewer support policies and information also lead to difficulty in obtaining biomass-based power generation projects in Malaysia. Meanwhile, in Canada, Biomass has a 36% share of renewable energy production which is the largest among the countries in The Organization for Economic Co-operation and Development which consist of 36 different countries. In 2014, Canada had a total installed capacity of 2 408 MW and 70 biomass generating power plants. Most of these amenities rely on wood, wood by-products, and landfill gas. As of 2017, there were 41 Independent Power Providers (IPP) and more than 30 operational co-generation units at paper mills using biomass.

Not only that, there are also 364 bioheat projects, of which 70% are less than 1MW in which the governments such as schools and hospitals, are the largest market for bioheat in Canada. Plus, Canada has access to forest industry by-products and residues and a large supply of renewable forest biomass. For instance, New Brunswick, Quebec, and Ontario are the provinces with the largest biomass

capacity and generation hence that is why biomass in Canada accounts for the largest share of renewable energy production among countries in The Organization for Economic Co-operation and Development.

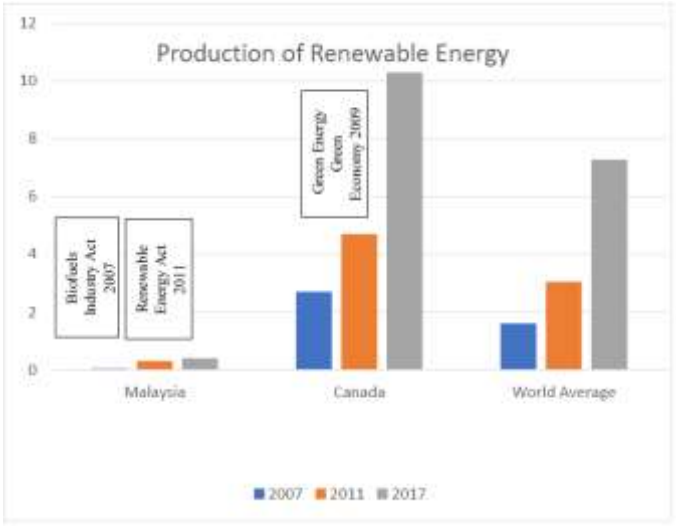

Fig. 1: Production of Renewable Energy in Malaysia and Canada in 2007,2011 and 2017
(Source: BP Statistical Review of World Energy 2018)

Based on the data obtained from BP Statistical Review of World Energy 2018, it can be seen that the production of renewable energy in Malaysia in 2017 was so much lower compared to Canada. Although Renewable Energy Act was drafted in 2011, the total production in 2017 only increased by 0.1% compared to 2011. In contrast, Canada shows how effective Green Energy Green Economy is when the total amount of production went up from 2.7% in 2007 to 10.3% in 2017. On top of that, Figure 1 shows that the amount of renewable energy production in Canada had always been above standard, unlike Malaysia which was far behind the medium of the world average in 2007,2011 and 2017.

This may be due to Canada being an ardent supporter of the Paris Agreement. The Canadian government ratified this convention in October 2016 and it was enforced a month after the ratification. Following this ratification, Canada has put forward $2.5 billion to aid developing countries in the research, development, and manufacturing of renewable energy technologies in line with working toward adapting to climate change. Furthermore, pursuant to the ratification of this agreement, the nation developed a plan called the Pan-Canadian Framework on Clean Growth and Climate which puts a cap on carbon pollution as well as incorporates investments in clean technologies. The Paris Agreement imposes an obligation on developed nations to give a helping hand towards developing nations in terms of funding to encourage these developing countries to work towards a zero-carbon environment, where renewable energy acts as a substitute for oil and carbon.

Canada is one of the major key players who carried on a significant role in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations which was working towards the establishment of the Paris Agreement. Canada's effort in working toward curbing climate change can be seen when the government established the Environment and Climate Change Canada which is built on the adaptation of international conventions into national frameworks. To emphasize the fact that Canada incorporated the convention in their national framework, Canada is in support of the Action Plan which supports regional workshops to improve climate change and the development of renewable energy technologies. Canada works hand in hand with the United Kingdom alongside 70 other members to phase out the use of coal power. This encourages states to opt for renewable energy rather than coal and oil.

Malaysia had signed the UNFCCC in 1993 and it was ratified in 1994. In line with the obligations imposed in the ratified convention, the government of Malaysia had formulated policies and development plans namely Vision 2020, Third Outline Perspective Plan (2011 – 2010), Eighth Malaysian Plan (2011 – 2015), Fuel Diversification Policy and the National Energy Policy 1979. Since Malaysia is a participant of the UNFCCC, Malaysia had agreed to commit to the Kyoto Protocol as well as the Paris Agreement.

Nevertheless, it can be seen that the commitment of Canada in implementing the renewable energy policy and adherence to the international conventions outright the Malaysian progress in the goals of production of energy through renewable energy.

4.2 Weaknesses of the Malaysian Renewable Energy Law and Repercussions

The Renewable Energy Act 2011 was drafted only to focus on the establishment of the FiT system in Malaysia. It reflects Malaysia did not have enough economic instruments governing the renewable energy sector because of its overreliance on the FiT system. Based on Schedule (section 2) of the Act167, a list of renewable sources that are granted Feed-in Tariff is provided, however, based on the SEDA where there is a quota to apply FiT for each of the resources in the list. This is the most substantial weakness of this Act. Once the quota was filled, there would be no more use of the said Act. There is no intention from the legislative branch to amend the law to include other concerns other than quota. Furthermore, the FiT system was only granted for a specific year for each of the resources and although the FiT is expiring, the government still did not show interest in amending it. Besides that, the renewable sources that are granted FiT listed in the list are also pricey and not easily generated. The return also will need a long term and therefore making people

afraid of the risks. Furthermore, the FiT is sustained by the fund from the Renewable Energy Fund (KWTTB) and it is only collected at 1.6% which, therefore, caters to only a small portion to help to sustain renewable energy law in Malaysia. The fund, however, is divided for each of the resources mentioned in the Schedule of the Act.

Secondly, another factor contributing to the less production of renewable energy in Malaysia is the lack of resources to generate renewable energy. This is due to geographical factors. The Renewable Energy Act is only applicable in Peninsular Malaysia where only a few resources can be generated due to the topography and geography of East Malaysia. This makes only the island of Borneo where Sabah and Sarawak are at the advantage of generating more renewable sources as compared to Peninsular Malaysia. Furthermore, although the FiT system includes geothermal energy as one of the resources, it still cannot be developed in the Peninsular as there is no volcanic mountain, unlike in Sabah, where the government had built Malaysia's first geothermal power plant, though it was later abandoned. Whereas, wind energy is still unable to generate substantial energy.

Thirdly, investors. Investments play a huge role in renewable energy. Production equates to the investment made. However, private companies and sectors are not willing to shift and invest in renewable energy due to the cost of production of renewable energy. Furthermore, the Renewable Energy Act did not provide much assurance towards stakeholders because the Renewable Energy Act 2011 had become stagnant 2011. This affirmed the view that investors are not willing to invest because of the insecurity and exposure to risk as the Act did not significantly protect their rights as investors. Comparatively, Canadian laws are seen as sufficient and investors have more confidence to invest in their country.

Fourthly, the most popular factor is funding. As mentioned earlier, banks are not willing to give out loans to the user of renewable energy to buy renewable energy sources. Private companies and sectors are also not willing to shift to renewable energy because of the cost and similarly, households would opt for the cheaper alternative which is non-renewable energy.

5.0 Discussion

In ensuring the production of energy progresses significantly, several actions have been identified in improving the effectiveness of Malaysia's legal framework on renewable energy. The Renewable Energy Act 2011, which is the statute governing renewable energy should be amended constructively.

Furthermore, the FiT for sources such as solar energy has been fully utilized and as of now, no application for solar energy production is being approved as the quota is full. Seeing that solar energy is the most invested in, we suggest more allocation of FiT towards solar energy and the allocation can be obtained from allocation towards sources that are not viable such as geothermal energy as well as wing energy. This would encourage more investors to invest in solar panels whereby sources are abundant. A reallocation of the FiT should be done constructively whereby the viability of other sources should be taken into consideration. Apart from that, another factor to be considered is the previous investments in renewable energy. Since solar energy is the most invested in, a higher allocation should be allocated towards this source of energy as compared to the rest.

6.0 Conclusion & Recommendations

Throughout the research, we managed to explore all possible venues with respect of renewable energy in Malaysia and we found that several actions should be taken to improve the effectiveness of Malaysia's legal framework. Firstly, as discussed above, we recommend for the FiT allocation on the renewable energy sources stipulated in the statute to be amended in a way that more allocation is provided towards sources which are abundance in Malaysia such as solar energy. Seeing that FiT allocation for solar energy has been fully utilized, we suggest for more funds and quota in the statute to be allocated towards the solar energy and the allocation can be obtained from the unused quota towards sources that are evidently not viable such as geothermal and wind energy. This way, more investors will be encouraged to invest in solar panels whereby there is an abundance of source.

Further, to fully rely on the FiT would be a burden to the government. Since the Renewable Energy Act 2011 was adopted by the Germany's Act, Malaysia should also follow the Germany's action amending the act to improve the comprehensiveness by incorporating other economic instruments apart from FiT. We found that Auctions are already being used as an economic instrument in Malaysia as well as Net Energy Metering yet these economic instruments are still not incorporated in the Renewable Energy Act. Thus we would highly suggest for these economic instruments to be governed under the same Act because one of the major barriers in the production of renewable energy is that the law is not extensive enough to govern all the economic instruments. Hence, it is pertinent for the Renewable Energy Act 2011 to govern all forms of economic instruments available.

Funding plays a crucial role when it comes to the production of renewable energy as the cost of production is high. Despite that, banks are not willing to give out loans for the purpose of production of renewable energy as it is a long term investment. We would highly encourage for a budget specifically for the production of renewable energy to be included in federal funding in which the government could develop a financial scheme to aid the financial sectors in funding the production of renewable energy. Further, the government should also incentivize private sectors as well as financial departments and bodies to encourage them in providing financial assistance such as loans because the existence of the financial scheme would give assurance to the private sectors that the government is behind their back.

We have done our best to come out with analysis of the problem and possible solutions. Any further research on the topic is commendable to enhance the research deeper and manage to come out with better solutions. The new research would also able to discover any weaknesses with respect to methodology adopted by this research and produce better results that can successfully contribute to the renewable energy generation in Malaysia.

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