

Renewable Energy Policy Development in Thailand

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Abstract

This paper is attempting to explore renewable energy policy development in Thailand. Renewable energy is mostly derived from natural resources and hence considered clean and environmentally friendly. However, there exist some hindrances to the development of renewable energy and the costs of harnessing renewable energy resources are still high compared with the costs of using commercial energy, particularly, the development of solar and wind energy which require the use of high-cost technology. Renewable energy that has high potential to be used in place of fossil energy includes, for example, hydropower, biogas and biomass energy, solar energy and geothermal energy. Studies and development on these energy sources have continuously been undertaken by several agencies, both at the local level initiated by local intellect and at the government level. At present, the development of renewable/alternative energy has become a focus of interest and wider utilization has been promoted to replace conventional energy consumption in parallel with the efforts to stimulate people to use energy efficiently and economically.

Keywords: Thailand's Renewable Energy; Thailand's Alternative Energy Development Plan; Energy Policy in Thailand.

Introduction

Thailand's demand for energy has been rising from past. The energy usage is switched to renewable energy sources. Thailand is still dependent on import of fuel. However, there is a huge potential for solar and wind power in Thailand but until recently a lack of funding and technology prevented them from becoming commercially viable. Both of these options are now being invested in to meet government targets. There are several solar photovoltaic (PV) projects operating successfully, even though they typically incur large start-up costs. Small scale hydro-power systems have proved promising but high costs of materials, equipment and expertise are limiting their construction. Biomass offers one of the most promising sources of potential energy. Sources of biomass in Thailand include fuel wood, rice husks, bagasse, coconuts, corn cobs and distillery slop. Biogas can also be derived from animal dung and cassava.

With the advent of economic recovery after the 1997 economic crisis, Thailand's energy consumption has remarkably increased. The GDP growth rate has continuously increased, reflected by the increasing growth rate of the industrial output index. The industrial sectors which have a high growth rate include the construction material sector and

the automobile and transportation equipment sector. Particularly, automobile and motorcycle manufacturing for commercial purpose has continuously increased since early 2002.

Thailand's commercial energy demand in 2002 totaled 1,283 thousand barrels per day of crude oil equivalent, an increase of 6.6% from the demand in 2001. The demand increased for all energy types, especially for natural gas and coal/lignite. The shares of commercial energy demand were the following: petroleum products, 46%; natural gas, 37%; coal/lignite, 14%; and electricity/import electricity, 3%.

Thailand's expenditure on petroleum imports dropped from 15.4 percent of the gross domestic product (GDP) in 2004 to 10 percent in 2008. This figure shows the potential of government renewable energy policy to support alternative energy usage. Thailand's annual growth in primary energy consumption from 1999 to 2004 was more than double the world average of 2.9 percent. In 2007, Thailand's energy consumption was 47 percent from oil, 33 percent from natural gas, 14 percent from coal, 2 percent from hydropower and 4 percent was from other sources. In the end of 2014 Thai Royal Government had issued Thailand Power Development Plan 2015-2036 (PDP2015) which also includes developing renewable energy. (Energy Policy and Planning Office, Ministry of Energy, Thailand, 2015).

This paper focuses on legal framework relevant to renewable energy in Thailand, energy policy in Thailand, impacts on climate change and Thailand's renewable energy policy, the Alternative Energy Development Plan (AEDP) as well as trade agreements within the framework of energy between Thailand and neighboring countries.

Relevant Legal Framework to Renewable Energy Development in Thailand

Institutional set-up of the Energy Sector

The energy sector in Thailand is administered by the Ministry of Energy which was established in 2002 in accordance with the Restructuring of Government Organization Act (2002). The National Energy Policy Council (NEPC) was established under the National Energy Policy Council Act (1992) which is responsible for operating the energy sector in Thailand. This council also has a right to bestow energy operating licenses and issuing energy pricing regulations. Council members with ministers from all relevant sectors as well as from defense, energy, foreign affairs, transport, science and technology, finance, agriculture, commerce, industry and the National Economic and Social Development Board and also government agencies which are working under the Council which are the Energy Conservation Promotion Fund Committee (ECPFC), Energy Policy Committee (EPC) and Energy Policy and Planning Office (EPPO). (Ministry of Energy, 2015).

Renewable energy research is supported by The National Energy Policy Council administers the Energy Conservation Promotion Fund (ECON Fund) which this fund was set up under the Energy Conservation Promotion Act (1992). This fund provides financial support to specified factories and buildings which are involved in energy conservation programs and renewable energy projects. The Energy Conservation Promotion Act determines renewable energy to comprise the energies obtained from biomass, solar power, firewood, geothermal power and so on. (Sitdhiwej, 2005).

Energy Laws

The legal framework ruling the energy sector is bolstered by the Energy Industry Act of 10 December 2007. This act aims to encourage the use of renewable energy with good quality and with reasonable price. This act also focuses on renewable energy development and domestic energy resources for social, economic and environmental sustainability and to reduce dependency of energy import. The Energy Industry Act (section 51) grants the Energy Regulatory Board the authority to issue licenses for energy industry operation and to define

the criteria, processes and conditions of energy industry action which related to efficiency of energy and resource utilization. (Thailand Law Forum, 2011).

The PDP2015 aims to reduce natural gas power generation, to boost a share of coal power production through clean coal technology, to import electricity from neighboring countries, and to enhance renewable energy. Furthermore, the plan also focuses to develop transmission and distribution system in order to develop renewable energy and ASEAN Economic Community.

The plan also deals with energy conservation measures in the transport division. Regarding to renewable and alternative energy, the purposes of this plan are:

- Maintain the procure of power which generated by renewable energy including very small producers
- Diffuse relevant information concerning to alternative energy to public
- Promote research and development of efficient and compatible alternative energy for society and economics situation
- Push private sector initiatives and public cooperation in energy policymaking and,
- Set up a public institution to implement the support of renewable energy use

A Renewable Portfolio Standard enacting new power plants that must have 5 percent of their generation capacity acquired from renewable energy. The Thai government has also encouraged the purchase of power which is generated by renewable energy together with provision of tax credits and privileges and aids to small power producers from the Energy Conservation Promotion Fund. Moreover, it has also supported special investment in virtue of the Board of Investment. For instance, favorable tax and duty exemption and loans as well as land proprietorship rights for oversea investors.

Environment and Natural Resource Laws

Thailand has various aspects of environmental and natural resource laws and regulations regarding to alternative energy. They are Forest Act (1941), Land Code (1954), Factory Act (1969 which revised later in 1992), the Land Reform for Agriculture Act (1975), the Enhancement and Conservation of National Environment Quality Act, Public Health Act and Hazardous Substances Act (1992) and Community Forest Bill (2007).

(<https://thailand.opendevelopmentmekong.net/topics/environment-and-natural-resources/>)

In this section, I will only give the information on the Enhancement and Conservation of National Environment Quality Act. This act institutes general environmental principles which take the position the foundation for all legislation relevant to environment and national programs. The environmental principles in the Act are deemed in Laws and regulations with respect to the industrial, transport and energy sectors. It gives term that help will be furnished for public education in regard to statutory environmental protection requirements and regulations.

The act establishes a National Environment Board to control cooperation between ministries as well as to escort conservation of national environmental quality (section 13). The act holds an environmental impact assessment (EIA) and environmental quality standards.

International Commitments

In 1982, Thailand joined the General Agreement on Tariffs and Trade (GATT) and in 1995 Thailand became a member of the World trade Organization (WTO) as well as Thailand is a member of multilateral environmental agreements concerning to bioenergy, the United Nations Framework Convention on Climate Change (UNFCCC) in 1994 and the Convention on Biological Diversity in 2003.

Thailand submitted an Initial National Communication on 13 November 2000 containing: its greenhouse gas inventory as of 1994; greenhouse gas projections and identification of mitigation option; existing assessments on vulnerability and adaptation; and policies, measures and other aspects related to financial resources, technology transfer and capacity building. (Ministry of Science, 2000).

In 2002, the Cabinet authorized the creation of National Commission on Climate Change Policy to be presided by the Prime Minister and be placed under the authority of the Office of Environmental Policy and Planning of the Ministry of Natural Resource and Environment. (Office of Natural Resources and Environmental Policy and Planning, 2020)

Clean Development Mechanism (CDM)

Thailand had ratified Kyoto Protocol in August 2002 and the state has issued policies to support energy reservation at national level along with the allocation of US\$ 10 million in the current National Economic and Social Development Plan to raise environmental recognition and energy preservation in the primary school curriculum. (Office of Natural Resources and Environmental Policy and Planning, Ministry of Natural Resources and Environment, 2020).

By using of renewable energy and CDM project have led Thailand to Sustainable Development. Thailand's CDM project policy is outlined as

- The development of energy by using bioenergy such as biodiesel and factory wastewater and to convert these energies into energy as well as applying renewable energy sources such as solar and wind powers.
- Increasing and improving energy efficiency as well as swapping the types of fuel consumption to produce energy.
- Transformation waste into energy and waste into bio-fertilizer.
- Growing transport efficiency and reduction of greenhouse gas emissions.

It is important capability to apply the CDM to reduce GHG emissions in the energy section in Thailand. Mostly, Thailand's total net GHG emissions are carbon dioxide, which is largely created by energy sector. CDM aims to generate electricity and heat from biogas and to produce liquid from biomass. However, CDM project does not include afforestation and reforestation even though the Ministry of Natural Resources and the Environment is doing the research for potentiality to apply CDM project to afforestation and reforestation. (Office of Natural Resources and Environmental Policy and Planning, Ministry of Natural Resources and Environment, 2020)

Thailand Energy Policy

Currently the Royal Thai Government carries out its policy in several areas to solve the urgent problems which is leading to the sustainable development of the country. As the Thai Government attempts to enhance the quality of life of Thai people so in energy issue, the government is taking an action which is based on three disciplines which is described as follows:

1. Energy Security: increasing power consumption in the form of various types of fuel in order to lessen the dependency of a specific type of fuel.
2. Economy: remain a proper cost of electricity generation and accomplishing energy efficiency.
3. Ecology: turning down environmental and social impacts by decreasing carbon dioxide intensity of electricity generation.

In addition, the Thai government strongly promotes renewable energy development such as waste, biomass, biogas, wind and solar power production. Competitive investments in

power transmission and distribution system is expected to serve renewable energy and smart-grid development.

Moreover, there is research, development, and establishing standards for electrical instrument and energy preservation building. The Thai government also supports the development of mass public transportation and railway system to boost productive energy use, which will decrease the cost of energy purchase of investment in Thailand. (Energy Policy and Planning Office, Ministry of Energy, 2020).

Impacts on Climate Change and Thailand's Renewable Energy Policy

Thailand faced the heightened precipitation during rainy season and Thailand has also experienced with longer dry season period. The rainfall pattern during the last 25 years has been frequently increasing which is leading to either floods or drought. The Thai government has spent up to 13 million Thai Baht (Ministry of Energy, Thailand, 2009, 4-5) to assist people who encounter natural disaster in the last 10 years. As a result, this matter generates the environmental impact such as landslides and river bank erosion as well as generating social impact.

During the last 20 years, Thailand has a big role in energy and environment in the South East Asia region. In the last decades, Thailand had a low level of GHG emissions but now it has been increasing and there is a tendency that GHG emissions will go up in the future because of increasing of population and continuity of economic development [GHG emissions reduction potential: Thailand GHG emissions from the consumption and flaring of fossil accounted for 1% of world's GHG emissions; ranking 22nd in the World's top GHG emitters. Thailand is the second largest contributor to fossil fuel GHG emissions in ASEAN after Indonesia (Ministry of Energy, Thailand, 2009). Consequently, Thailand should alleviate the impact of climate change by decreasing GHG emissions from activities in the country.

In order to cope with the above issues, the Ministry of Energy has set up the program to incline investments, production, and consumption in renewable energy e.g. wind, solar, biomass and so on. One project which is concerning to this issue is 15-Year Renewable energy Development Plan (REDP) 2008-2022 and also the achievement following to the Energy Conservation Program, Phase 3 (2005-2011). This program importantly focuses on energy saving supporting in the transportation and industrial sectors. These instruments will support energy security of the country by decreasing energy imports and increasing energy resources as well as establishing competitive energy market for sustainable economic development and in the long term, this can reduce the GHG emission.

15-Year Renewable Energy Development Plan (REDP)

In February 2009, Thailand set up the alternative energy development plan which is the 15-Year Renewable Energy Development Plan (REDP). Currently we are enthusiastic to implement the 15-Year Renewable Energy Development Plan (REDP) with possible explicit action plan. We will promote ethanol and biodiesel to become the energy for Thai people. Apart from that, biodiesel and ethanol are renewable energy from crop so in this case it can increase the price of agricultural products as well as reduce the energy import. Further at the retail price of biofuel is reasonable and using biofuel which is clean energy will lessen the global warming and environmental problems.

The 15-Year Renewable Energy Development Plan will be carried out in three phases. The short term (2008-2011) concentrates on supporting potential technologies for renewable energy such as biofuels and power and heat generation from biogas and also biomass. The second phase is the medium term between 2012 and 2016. This phase emphasizes on

renewable energy technology industry and promoting the development of new prototypes of alternative energy technologies with low cost and supporting new instrument, program, and technologies for biofuel production. The final phase of REDP is from 2017 to 2021. This phase will conduce to the promotion of new technologies for renewable energy which are low cost. For instance, hydrogen energy and expanding the area of Green City. Within this time, it is expected that Thailand will become a regional hub within the Association of South-East Asian Nations (ASEAN) for biofuel and renewable energy technologies. (Ministry of Energy, 2020).

Trade Agreements within the Framework of Energy

There are several trade agreements and cooperation between Thailand and neighboring countries within the framework of alternative energy sources along with the promotion of South-South technology transfer for ethanol and biodiesel production and consumption. Due to the rapid growth of bioenergy sector in the Asia-Pacific region, trade and investment in bioenergy and trade cooperation sector between some countries in this region is occurred.

There have been some trade agreements and cooperation which have been operated in Asia-Pacific region.

1. Association of Southeast Asian Nations

The ASEAN free trade Area was started in 1992 to get rid of tariffs and integrate regional economics into a single production base and regional market of 550 million people among the ten member countries. Established in 1967, ASEAN consists of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. An ASEAN Economic Community (AEC) is envisaged in 2015.

Alternative energy issues were talked for the first time at the 26th ASEAN Ministers in Energy Meeting in Bangkok on August 7, 2008.

As regards to expanding external energy collaboration, ministers stated to support sustainable energy development in the region and to increase energy costs in order to fulfill these objectives:

- a) To enhance energy efficiency and conservation
- b) To promote biofuels for transportation sector and other objectives
- c) To increase energy market integration
- d) To enhance renewable and alternative energy sources and
- e) To improve oil stockpiles

Particularly the increasing significance of bio-fuels was known as an alternative to reduce ASEAN's fossil fuel use. Ministers focused on the demand for better cooperation and experience interchange in promoting biofuel production and consumption together with concerning fiscal inducements, regulatory infrastructure, and supporting facilities.

The Ministerial Statement showed the ASEAN Member States could potentially be the regional hub for biofuel production and trade including intra ASEAN and inter-region. Furthermore bio-fuels has been talked in the context of ASEAN cooperation to react to the impacts of climate change, along with a new initiative on ASEAN Strategy which deals with the impact of climate change on Agriculture, Fisheries and Forestry. (ASEAN, 2008)

2. Asia – Pacific Economic Cooperation (APEC)

Since May 2006, APEC Energy Working Group has encouraged members to substitute petroleum in the transportation sector. The APEC Energy working group has set up

standards for ethanol and biodiesel. APEC has also established demonstration projects to encourage second – generation biofuels (APEC, 2008).

The aim of the APEC Energy Working Group is to increase to the highest degree of promoting of the energy sector to the region's economic and well social standard through the operations related to energy demand and supply. Energy and the environment, new and renewable energy technologies, energy efficiency and conservation, and liquid biofuel production and progress (APEC, 2008).

3. Greater Mekong Sub-region (GMS)

The GMS members are Thailand, Cambodia, Lao PDR, Vietnam, Myanmar, and China (Yunnan Province and Guangxi Autonomous Region). GMS governments have launched the Roadmap for Expanded Energy Cooperation in the area in order to avoid troubles such as the energy poverty, fluctuating energy prices, geopolitical uncertainties of energy supply, constraint on the environment, interconnectedness of global energy markets. (<https://greatermekong.org/about>).

4. Japan-Thailand Economic Partnership Agreement (JTEPA)

Thailand and Japan concurred on JTEPA to enhance cooperation in trade and investment and to set up a free trade agreement between countries. The Thailand Development Research Institute (TDRI) completed a study on the potential impacts and opportunities of JTEPA for economy in Thailand. The outcomes pointed to the potential for Thailand to gain advantage from energy cooperation. Bio-energy aspect has not been obviously talked under the JTEPA scope. Nevertheless, there is provision in Chapter 13 of JTEPA concerning to the cooperation in the subject of science, technology, energy and environment together with a sub-committee set up for this matter. In this respect, Japan and Thailand have concurred to talk about technology transfer in relation to bioenergy. (Department of Trade Negotiations, 2019).

Future prospects

Trade and investment in bioenergy in Asia has promoted since regional cooperation has been increased, especially in the Mekong region. However, socio-environmental considerations have been neglected. In this matter, paying attention to the social and environmental sustainability of bioenergy generation should be elaborately considered. Legal clarity should be provided and coherence of system for trade and investment in bioenergy should be stressed regarding to food and fuel competition for agricultural land as well as biodiversity and forest conservation connected with increasing of agro-industrial energy crops.

Policy makers ought to arrange feasible constant plan to enhance the investment in bioenergy progress in the region with keeping the sustainability of social and environmental aspects.

Conclusion

As Thailand is an agricultural country which produces a large amount of waste residues that can be transformed into the important energy and electricity sources. The Thai government issues energy policies to allow the use of alternative energy sources including efficient technologies for electricity generation, particularly since the Small Power Producer program has been introduced.

The demand of alternative energy in Thailand has been increasing and also the trade and investment in renewable energy business are expanding as well as Thailand has become green energy leader in ASEAN by being the first country of this region to bring in gasohol.

Thailand is promoting biofuel production and consumption in the transport sector and providing tax incentives for biofuel producers and automobile manufacturers and also the Thai government provides low interest loans to palm oil producers. Gasohol has become the main energy source for transportation sector which Gasohol has accounted almost 60 percent of petrol sold in Thailand. However, there is an excess in ethanol supply which interrupts the production in many factories. On the other hand, an energy policy ensures the price of palm oil and oblige the use of biodiesel. The plan aims to raise plantations including in neighboring countries for sustaining adequate supply to meet the national aims. The Thai government has a plan to continue to contribute gasohol and biodiesel by establishing the Oil Fund to assist a competitive price concerning to conventional gasoline.

The Thai government issues national legal and policy plans which are related to the use of bioenergy in a nationwide fashion. Thailand has enthusiastically followed alternative energy sources as well as Thailand has shown up itself as a leader in biofuel development in Southeast Asia. The government cooperates with the private sector to carry out the goal of national roadmaps for biodiesel, biogas and ethanol. Nuclear energy is also a better alternative source to produce power. However, promoting nuclear energy will surely be opposed by the public as several countries have experienced earlier. Therefore, Thailand must go on to work for better policy integration between different ministries and think about domestic and international factors linked to several aspects of bioenergy policies and regulations.

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