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# Renewable Energy in Thailand: Opportunity and Technology Allocation

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## Abstract

This paper talks the overview of opportunity of renewable energy generation in Thailand. Also, the technology suitability with area is concerned. Thailand promotes the renewable energy generation in commercial scale for the last few year ago. However, the renewable energy generation target is not met. Region of Thailand is considered with technology allocation. Government criteria for renewable generation are described. The 4 government offices are used to regulate the quality and installation standard that the power producer should be concerned.

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*Keywords:* Renewable Energy; Power Producer; Region of Thailand

## 1. Introduction

Renewable energy becomes important around the world to provide green energy. Thailand is one country that emphasizes on renewable energy generation. Adder cost has been used to inspire increasing renewable energy generation. However, renewable energy generation target is not met. Also, in some renewable energy technology such as solar farm is high growing while the vegetable area was encroached. Thus, renewable energy generation regulation should be revised for increasing socializes balancing. In side of renewable energy producer, the regulation revising method might be not concerned, only present regulation and technology should be addressed.

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In this paper, the renewable energy status in Thailand will be presented. Also, energy buying adder cost is included. Renewable energy technologies and region of Thailand is also relevant expressed. Then, the opportunity of energy project investment is introduced.

## 2. Renewable energy status in Thailand

Presently, overall energy consumption of Thailand is 71,728 ktoe. Next 10 years (2021), the forecast energy consuming will be increased to 99,838 ktoe. Thailand will try to produce the renewable energy for 25% of overall energy consumption in year 2021. This 25% can be potential categorized into each type of renewable energy technologies as followings Table

Table 1. potential renewable energy status and next 10 years target of Thailand [1-2]

Energy type/technology	Present power generation (MW), Sep. 2012	Next 10 years target (MW), year 2021	Opportunity (MW)
Solar	316.12	2,000	1,684
Wind	7.28	1,200	1,193
Small hydro	95.70	1,608	1,512
Biomass	1,828.48	3,630	1,802
Biogas	172.85	600	427

In Table 1, only potential renewable energy in electricity form is presented. All technologies are still running promoting by government excepting solar energy. Adder costs of those potential renewable energies that use to motivate are as following Table

Table 2. adder cost for renewable energy buying [3]

Energy type/technology	Adder cost (Baht/kWh)
Wind	4.5 ( $\leq 50\text{kW}$ ) 3.5 ( $> 50\text{kW}$ )
Small hydro	1.5 ( $< 50\text{kW}$ ) 0.8 ( $\leq 50 - \leq 200\text{kW}$ )
Biomass and Biogas	0.5 ( $\leq 1\text{MW}$ ) 0.3 ( $> 1\text{MW}$ )

Solar energy is not shown in Table 2 since the government try to rearrange the buying regulation. The solar PV roof top will be also introduced for promoting. Feed In Tariff (FIT) might be considered to buy energy instead adder cost. FID will be around 5-6 Baht/kWh. However, this FIT is still in considering process.

Presently, all sizing of renewable generation is needed to allow from government for energy selling into the grid. 4 offices are used to regulate namely Provincial Electricity Authority (PEA) (at the plant locate), Electricity Generation Authority of Thailand (EGAT) (more than 10MW), Energy Policy and Planning Office (EPPO) and industry ministry of Thailand. These contacting might be rearranged especially solar PV  $< 1\text{MW}$ . [4]

## 3. Region and technology allocation

Region of Thailand is divided into 5 regions according to suitable energy allocation. However, each region might be not suitable for all renewable energy technologies. These 5 regions are shown in following figure.

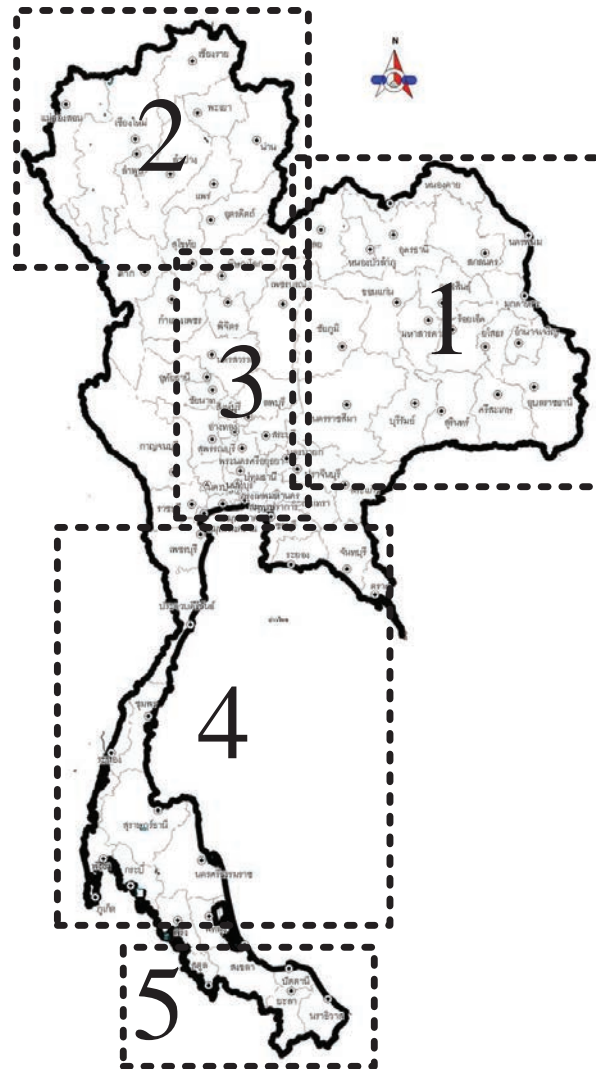


Fig. 1. Thailand map with region of renewable energy allocations

Region 1 in Fig. 1, northeastern of Thailand, this area is called “Isan” that most rainless in Thailand. Many MW of solar PV grid connected have been installed. Also, many MW of wind power have been installed at high land. Moreover, biomass from rice industry and biogas from cassava industry are favorites.

Region 2, the most area is high land. However, some company installed solar PV grid connected system for energy selling. Biomass and biogas have been used to produce electricity.

Region 3, many MW of PV were destroyed by flooding in year 2011 since most area are lying with the river.

Region 4, the offshore area, the wind turbine should be considered to install. However, only small wind mill for salt field have been installed.

Region 5, the government is highest try to motivate for renewable energy generation by highest adder cost criteria. However, there is smallest investment of these situations.

#### **4. Conclusion**

This paper talks the status and technology allocation according with region of Thailand. In next 10 years, the renewable energy generation must be increased. The higher investment will be introduced. However, region area should be considered. Also, the research relating renewable energy should be more importance for sustainable green energy utilization.

#### **References**

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