

## An assessment of Thailand's feed-in tariff program



Sopitsuda Tongsovit<sup>a,\*</sup>, Chris Greacen<sup>b</sup>

<sup>a</sup> Energy Research Institute, Chulalongkorn University, 12th Floor Institute Building III, Phyathai Road, Pratumwan, Bangkok 10330, Thailand

<sup>b</sup> Palang Thai, 44 Tuatara Rd, Lopez Island, WA 98261, USA

### ARTICLE INFO

#### Article history:

Received 19 January 2013

Accepted 16 May 2013

Available online 15 June 2013

#### Keywords:

Feed-in tariff

Adder

Thailand

Renewable energy policy

VSPP

SE Asia

### ABSTRACT

Thailand was one of the first Asian countries with a comprehensive feed-in tariff program, with streamlined interconnection regulations adopted by the Thai Cabinet in 2002 and technology-specific tariff 'Adders' in 2006. This paper presents an overview of the country's feed-in tariff, or Adder, program and its development. As of December 2011, Thailand has about 8000 MW of renewable energy projects in the pipeline seeking Adder and about 1000 MW already connected and selling power to the grid. Thailand's feed-in tariff program has undergone significant transitions especially since 2010 in tariff levels and screening criteria partly in response to applications for 471 solar electric power plants exceeding 2000 MW. A powerful new oversight committee comprising utility and Ministry of Energy representatives has raised concerns regarding transparency and consistency, and significantly reduced approval rates of new applications.

© 2013 Elsevier Ltd. All rights reserved.

### 1. Introduction

Feed-in tariffs (FiT) are the most widely used national renewable energy policy worldwide, and are recognized as one of the most effective and efficient drivers of renewable energy (RE) scale-up by creating investor security [1,2]. As of early 2012, feed-in tariffs are in place in at least 65 countries and 27 states [3]. Although most FiTs have been put in place in developed countries, 28 national FiTs are in place in developing economies [4].

Thailand was one of the first Asian countries to implement a feed-in tariff (FiT) program, with streamlined interconnection regulations and avoided-cost tariffs adopted by the Thai Cabinet in 2002 [5] and technology-specific renewable energy premium tariffs in 2006 [6,7]. The program is called "Adder" because it adds additional payment to RE generators on top of the normal prices that power producers would receive when selling electricity to the power utilities. This paper provides a summary and an analysis of Thailand's feed-in-tariff program, its strengths and weaknesses, and the evolving context in which it operates.

### 2. Thailand power sector and renewable energy policy

Compared with other Southeast Asian countries, Thailand has the highest electricity demand, with plans for increasing imports

from neighboring Laos, Myanmar, Cambodia, and China. Electricity consumption in 2012 was 150 billion kWh. Over the past 10 years, electricity demand has been growing at about 770 MW per year or about 3.2% per year. The current installed capacity is 32,200 MW, with the majority of energy sources from natural gas (66%) and coal (20%) [8]. Non-hydro renewable energy contributes a minor (around 5%) but increasing share of total electric power generation [9].

Over the past 20 years, Thailand's electricity sector has evolved from a government monopoly to a semi-unbundled structure called the "Enhanced Single Buyer" model. This model, shown in Fig. 1, consists of the state-owned Electricity Generating Authority (EGAT) of Thailand owning about 50% of generation assets and 100% of transmission assets. The other half of the generation assets are developed and owned by private companies, including Independent Power Producers (IPPs), Small Power Producers (SPPs), and Very Small Power Producers (VSPPs). IPPs and SPPs produce and sell power to the high-voltage transmission system owned by the only buyer, EGAT. VSPPs sell power through the two state-owned distribution systems, the Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA).

Thailand's policies related to energy, including electric power and renewable energy policies, are drafted and proposed by the Ministry of Energy (MoE). Policies related to electric power and natural gas transmission are regulated by the Energy Regulatory Commission (ERC).

Thailand's renewable energy policy is supported by the government's long-term renewable energy (RE) plans. The country's

\* Corresponding author. Tel.: +66 84 529 5581.

E-mail addresses: [tongsopit@gmail.com](mailto:tongsopit@gmail.com), [sopitsuda@eri.chula.ac.th](mailto:sopitsuda@eri.chula.ac.th) (S. Tongsovit), [chrsgreacen@gmail.com](mailto:chrsgreacen@gmail.com) (C. Greacen).

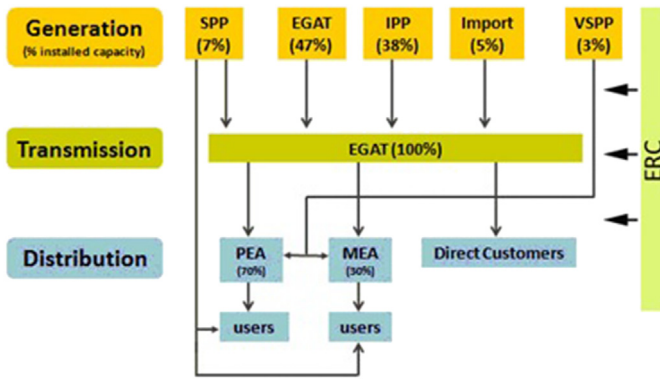


Fig. 1. The structure of Thailand's electric power industry. Source: Data as of December 2010, compiled from Ref. [10].

first RE plan, the 15-Year Renewable Energy Development Plan (REDP 2008–2022), sought to bring renewable energy to 20% of final energy consumption by 2020. In 2011, the REDP was subsequently replaced by the 10-Year Alternative Energy Development Plan (AEDP 2012–2021). The AEDP aims to increase the share of RE to 25% of final energy consumption, with the share of each type of renewable energy as shown in Fig. 2. Table 1 shows that many types of RE reached short-term targets of the original REDP plan.

A major impediment to Thailand's renewable energy development has been the lack of integration of RE plans with Thailand's long-term energy planning process. As shown in Table 2, Thailand currently has six separate long-term national energy plans for each type of energy, proposed and overseen by different government divisions. There is no overarching plan to ensure policy coordination and the accomplishment of policy goals. The most immediate manifestation of this policy ambivalence has been discontinuous support for the Adder measure, which – when operational – is one of the major mechanisms that will help the country meet its renewable energy targets. Discontinuous support for the Adder, in turn, has created a high level of uncertainty for investors.

### 3. Thailand's Adder program

Thailand's Adder program incentivizes renewable energy by guaranteeing attractive power purchasing rates. Eligible

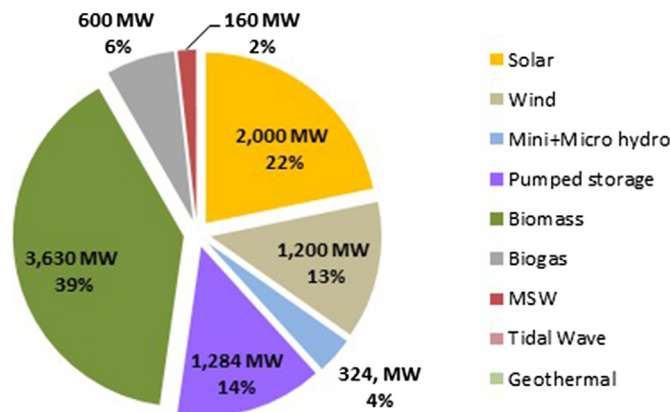


Fig. 2. Thailand's renewable energy targets according to the 10-Year Alternative Energy Development Plan (AEDP 2012–2021).

participants enter into long-term contracts with the local utility to sell electricity at a pre-specified tariff for a pre-specified period of time.

The program is implemented through Thailand's three electric utilities: the Electricity Generating Authority of Thailand (EGAT), the Metropolitan Electricity Authority (MEA), and the Provincial Electricity Authority (PEA). The three utilities purchase electricity from renewable electricity generators using two types of regulations:

- Very Small Power Producers (VSPP) regulations: for generators sized less than or equal to 10 MW. Electricity produced by the VSPP is sold to PEA or MEA.
- Small Power Producers (SPP) regulations: for generators sized greater than 10 MW and less than 90 MW. Electricity produced by the SPP is sold to EGAT.

Adder rates are distinguished by technology type, installed capacity, contracted capacity, and project location. The features of the program are summarized below.

#### 3.1. Basic features of Thailand's Adder program

##### 3.1.1. Eligibility

VSPPs and SPPs that utilize solar, wind, biomass, biogas, hydro, and waste energy are eligible to participate in the program. VSPPs and SPPs may be private or public entities, but not utilities.

##### 3.1.2. Rate structure

The rate structure of feed-in tariffs used in Thailand since 2007 is a "premium-price FiT payment" [11] paid on top of the utility's avoided costs. In June 2010 the Thai government approved a plan to switch from a premium-price FiT payment to fixed-price FiT payment, and studies to determine the rate for each type of RE are underway.

##### 3.1.3. Rates

Thailand's Adder rates are differentiated by technology, installed capacity, and geography. Higher Adders are paid in the three southernmost provinces which have experienced political unrest; and in off-grid areas where the PEA generates electricity from diesel power plants. The Adder rates are listed in Table 3.

##### 3.1.4. Cost control mechanism: cap and deadline

The first phase of the Adder program had a deadline for submitting applications at the end of 2008. In March 2009, the program was resumed to accept more applications with no new deadline but the National Energy Policy Commission (NEPC) imposed a broad guideline that new project approval would be subject to acceptable cumulative impacts on pass-through cost to ratepayers.<sup>1</sup> This broad guideline did not specify the level at which pass-through cost becomes unacceptable. In practice this means that utilities, which are tasked with approving project applications, are aware of this eventual ceiling, but have no rule to guide them when to stop approving applications.

##### 3.1.5. Approval process and criteria

In the early phase of the VSPP and SPP programs (from 2007 to 2009), the utility that owns the transmission or distribution system to which the applied project is to be connected was the sole party responsible for application approval and Power Purchase Agreement (PPA) signing approval. The main criterion for project

<sup>1</sup> NEPC Resolution 9 March 2009.

Download English Version:

<https://daneshyari.com/en/article/6769351>

Download Persian Version:

<https://daneshyari.com/article/6769351>

[Daneshyari.com](https://daneshyari.com)