



Thailand

Renewable Energy Policy Update 01/2017

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1. Thailand's main energy regulatory framework: Thailand Integrated Energy Blueprint (TIEB)

In 2015 Thailand aligned all of its energy plans into 'Thailand Integrated Energy Blueprint' (TIEB). TIEB consists of five master plans as the pillars of long-term energy development; including

- Power Development Plan 2015-2036 ([EN](#) / [TH](#))
- Energy Efficiency Plan 2015-2036 ([TH](#))
- Alternative Energy Development Plan 2015-2036 ([EN](#) / [TH](#))
- Gas Plan 2015-2036 ([TH](#))
- Oil Plan 2015-2036 ([EN](#) / [TH](#))

The PDP 2015 and EEP 2015 was developed by the Energy Policy and Planning Office (EPPO), the AEDP 2015 by the Department of Alternative Energy Development and Energy Efficiency (DEDE). The overview of PDP 2015 and AEDP will be explained in the following sections.

2. Thailand Power Development Plan (PDP: 2015-2036)

The Power Development Plan (PDP) is at the core of Thailand's energy policy. The PDP includes the projection of electrical demand, allocation of future generation capacity (conventional fuel) and the development of the transmission grid. It also serves as the foundation for the development of other plans.

The PDP 2015 was approved by the National Energy Policy Council (NEPC) on May 14 2015 and passed on to the cabinet for official announcement on June 30 2015. The official PDP2015 document can be found at ([EN](#) / [TH](#)).

The plan is set out until the year 2036 and is based on three principles:

- **Security:** the security of power supply, transmission system and distribution system in response to the demand of electricity to support economic and social development plan is a guiding principle. A greater variety of fuels shall be used to avoid relying too much on gas

Facilitator

- **Economy:** Adjusting the electricity price to reflect the cost of energy more appropriately and ensuring an efficient energy consumption is considered to slow down the construction of new power plants and to reduce energy imports and is thus followed as a rationale for the new PDP.
- **Ecology:** To reduce negative impacts on the environment and communities the new PDP aims to reduce carbon dioxide emissions per unit of electricity production by promoting electricity production from renewable energy and promote energy efficiency.

PDP 2015 projects an average electrical demand growth of 2.67% per year, resulting in an energy demand of 326,119 GWh and peak demand of 49,655 MW in 2036. The values are based on an average GDP growth rate of 3.94% per year, a slight decrease from a growth rate of 4.49% used in the former PDP. The projection also took into account the 30% energy intensity (EI) reduction target by the EEP2015.

As of December 2014, the installed capacity of all generation amounts to 37,612 MW. PDP 2015 aims to install an additional capacity of 57,459 MW throughout the plan, totalling the country's electricity capacity at 70,335 MW in 2036 (after excluding power plants that will be decommissioned). It focuses mainly on the increase of so called "cleaner fuels" and reduce reliance on natural gas. According to the plan, added capacities should mainly come from gas-fired power plant, renewable energy, imported hydro power and "clean coal". By the end of the PDP 2015, the aim of policy makers is to cut natural gas to a share of 30-40% from the current 64%. The proportion of renewable energy will rise to 15-20% from 8% (as of 2015). The new plan foresees a rising share of coal and lignite, up from currently 20% to 20-25% in 2036. An unspecified amount of this capacity is supposed to be delivered as "clean coal" by carbon capture and storage technology (which is currently at 0%). Imported hydro power should deliver 15-20% and a share of 0-5% is supposed to come from nuclear power. All shares mentioned refer to total electricity production.

In addition, the transmission system is supposed to be extended and smart grid technologies should be implemented to support increasing shares of renewable energy. For this reason Thailand's Smart Grid Development Master Plan 2015-2036 was announced in February 2015 (TH).

3. Alternative Energy Development Plan (AEDP 2015-2036)

AEDP 2015 was approved by NEPC on September 17, 2015. The original document can be found here ([EN](#) / [TH](#)).

The AEDP 2015 overall target is to increase the share of renewable energy to 30% of final energy consumption in 2036. This includes the utilization of renewable energy in electricity generation, heat generation and biofuels.

To focus on the section of electricity generation, the plan targets an installed capacity of renewable energy at 19,635 MW in 2036, which would be a significant increase from 2014 installed capacity of ~4,495 MW. It has to be noted, however, that current installed large hydro capacity of 2,905 MW for some reason was not counted into the figure of 2014 total installed RE capacity, but it is included in the 2036 target number. The current capacity (as of 2016) and 2036 targets for each generation source is shown in [table 1](#). In terms of energy, the current electricity generation from renewable energy amounts to 17,217 GWh or 9.87% of the national electrical demand at 174,467 GWh. The target for 2036 is 20.11% of the national electrical demand, or 65,558 GWh out of the 326,116 GWh demand, to be produced by renewable energy.

Key summary of AEDP 2015-2036:

- Target 30% share of renewable energy
- Set timeline of the plan to match other energy plans (PDP, EE Plan, Oil plan, Gas plan)
- Set up merit order by RE source of generation
- Allocation of renewable energy generation capacity according to the demand and potential in regions/provinces (RE zoning)
- Competitive bidding will be employed as a selection process for FIT application instead of first-come first-serve
- Support net-metering to support self-consumption usage of RE

Table 1: AEDP Targets by RE Source of Generation

Type	Community waste	Industrial waste	Biomass	Biogas (waste/wastewater)	Biogas (Energy crops)	Wind	Solar	Mini hydro	Large hydro	Total (MW)
Current Capacity* (2016)	145	-	2,812	412	-	306	2,761**	182	2,906	9,424
Target (2036)	500	50	5,570	600	680	3,002	6,000	376	2,906.40***	19,684.40

* Figures are in including off grid power generation. Data as of October 2016, Source: DEDE, http://www.dede.go.th/ewr_news.php?nid=42079

** Data as of October 2016, source

*** This value is the installed capacity in 2014 and until then there will be no added capacity.

Source: <http://www.eppo.go.th/images/POLICY/ENG/AEDP2015ENG.pdf>

4. Renewable Energy Support Scheme: Feed-in Tariff replaces Adder Tariff

Adder Scheme (2007-2014)

Since 2007, adder tariff was introduced as the main renewable energy support scheme for each RE technology. The technologies supported under this scheme include; biomass, biogas, waste, wind, small hydro and solar. The adder tariff is a premium price feed-in tariff that is paid on top of the wholesale electricity rates for each RE technology. The adder tariff is paid to the power producer for a duration of 7 years, so after the duration the power producer receives a tariff equal to the wholesale electricity rate. Adder tariffs were adjusted over the years as they were deemed too high, so there were suggestions to change from a premium price feed-in tariff (Adder scheme) to a fixed price feed-in tariff (which is now commonly referred to as the FIT scheme).

Feed-in Tariff Scheme, “FIT Scheme” (2014 – Present):

On 22th October 2014, the NEPC acknowledged the principle for employing a new feed-in tariff (FIT) developed by Ministry of Energy which replaces the former adder program that has been in place since several years. The full policy for the FIT for Very Small Power Producer (VSPP) of less than 10 MW installed capacity was approved by NEPC on 15th December 2014 (find the original document [here](#)). Following NEPC’s resolution, ERC announced the regulatory framework for purchasing power from VSPP RE projects in the governmental gazette on February 22, 2015 ([link](#) to original document).

The main changes from the adder scheme to the FIT scheme is 1) Tariff structure 2) Support duration 3) Selection by competitive bidding. The FIT tariff differ greatly depending on power plant capacities and fuel types and different bonuses are being granted for certain systems, shown in [table 2](#). The FIT rates favour smaller size systems (less than 1 MW) which is in line with the government direction to promote renewable energy uptake in communities. It also corresponds with the guidelines for AEDP (2015-2036), which would focus on waste-to-energy, biomass and biogas as a priority.

FIT Tariff Structure:

The new FIT is composed of three components:

$$\text{FIT} = \text{FIT(F)} + \text{FIT(V)} + \text{FIT Premium}$$

FIT(F), or FIT fixed, is a portion of the remuneration that is fixed throughout the whole support period.

FIT(V), or FIT variable, is a portion that varies according to the inflation rate. Variable portions are applicable only for certain technologies for which the feedstock price is considered to be volatile such as for biomass and biogas from energy crops as well as waste-to-energy projects (excluding landfill gas projects). The FIT(V) rates are predetermined for projects which dispatch electricity to the grid in 2017 (FIT(V2017), after that the FIT(V) will be updated on an annual basis in accordance with the core inflation to reflect actual feedstock costs.

FIT Premium, the last component is given for projects that match the its criteria:

- For projects that use bioenergy fuel/feedstock will be granted an FIT Premium for the first 8 years of project lifetime
- For projects that are located in the three southern border provinces (Yala, Pattani, Narathiwat) and four districts of Songkla province (i.e. Chana, Thepa, Saba Yoi and Na Thawi) are also granted the FIT Premium for the whole duration of the project.

[Table 2](#) shows the current FIT rates for each RE technology.

Support Duration:

The FIT will be granted for 20 years, an exception being power systems fuelled by landfill gas which will receive support for only 10 years. The PPA with the utility is also 20 years.

Competitive Bidding:

The bidding process has now been introduced to better select projects. The selection of applications for projects will change from “first-come, first-serve” to a competitive bidding system. Meaning that the most cost-competitive offers will be selected until the quota is reached. Power producers have to hand in bids for FIT(F) component, the rates specified in [Table 2](#) are the ceiling price for the bids. The other 2 components, FIT (V) and FIT Premium, are not subject to bidding.

Even though the FIT rates have been announced since 2014, power producers cannot automatically apply for the FIT. Application rounds and available areas for each technology have to be announced by ERC.

The first FIT bidding scheme came out in 2016 for biomass and biogas projects. More information on the FIT bidding scheme can be found in GIZ’s Bioenergy Policy Update paper.

However, solar FITs are not announced under the FIT scheme because there are other regulations governing FIT for solar projects. An overview of FIT for solar projects are shown in [Table 3](#). More information on support scheme for solar energy can be found in [GIZ’s Solar Policy Update paper](#).

NEW! SPP Hybrid Scheme (2017-2018)

Currently MoEN is considering to impose a new power purchasing scheme from projects which uses a hybridization/combination of RE technology under a single firm PPA contract on the SPP scale (10-90 MW), so called ‘SPP Hybrid Scheme’. A firm PPA contract means the power plant is obliged to supply a defined amount of power during certain peak and off-peak hours. The scheme could also use a competitive bidding process with an expected quota of 1000 MW. These power plants should come be connected in 2019-2020. However, the scheme will have to be conceptually approve on the policy level first, by the NEPC.

Table 2: Overview of current FIT

(1 € = 40 THB)	FiT(F) THB/kWh	FiT (V2017) THB/kWh	Total calculated FiT THB/kWh	Period of support Years	FiT Premium	
					For Bio-Energy (8 years) THB/kWh	Southern Provinces ² (project lifetime) THB/kWh
1. Industrial Waste						
Existing WTE plants ¹	2.39	2.69	5.08	20	0.70	0.50
New WTE plants	2.39	2.69	6.08	20	0.70	0.50
New WTE plants using plasma technology	2.39	2.69	6.08	20	1.70	0.50
2. Municipal Solid Waste, MSW (e.g. incineration, gasification)						
Capacity ≤ 1 MW	3.13	3.21	6.34	20	0.70	0.50
Capacity > 1-3MW	2.61	3.21	5.82	20	0.70	0.50
Capacity > 3 MW	2.39	2.69	5.08	20	0.70	0.50
3. Waste (landfill gas)						
	5.60	-	5.60	10	-	0.50
4. Biomass						
Capacity ≤ 1MW	3.13	2.21	5.34	20	0.50	0.50
Capacity > 1 to 3MW	2.61	2.21	4.82	20	0.40	0.50
Capacity > 3MW	2.39	1.85	4.24	20	0.30	0.50
5. Biogas (from wastewater / waste products)						
	3.76	-	3.76	20	0.50	0.50
6. Biogas (from energy crops)						
	2.79	2.55	5.34	20	0.50	0.50
7. Hydro power						
Capacity ≤ 200 kW	4.90	-	4.90	20	-	0.50
8. Wind power						
	6.06	-	6.06	20	-	0.50

¹ Waste-to-energy power plants that are operational before 16 February 2015

² Including the provinces of Yala, Pattani, Narathiwat and 4 districts in Songkla province (i.e. Chana, Thepa, Saba Yoi and Na Thawi)

Source: Derived from NEPC Resolution 15th December 2015 ([Link](#)) and NEPC Resolution 16th February 2016 ([Link](#))

Table 3 : Solar FIT

(1 € = 40 THB)	FiT /kWh	Period of support Years	FIT Premium Southern Provinces ¹ /kWh
1. Ground Mounted (2016)			
	4.12 THB (11.09 €Cent)	20	0.50 THB (1.35 €Cent)
2. Solar Rooftop (2015)			
Residential Rooftop (0-10 kW)	6.85 THB (18.44 €Cent)	20	-
Commercial Rooftop (10-250 kW)	6.40 THB (17.23 €Cent)	20	-
Commercial Rooftop (250-1000 kW)	6.01 THB (16.19 €Cent)	20	-

¹ Including the provinces of Yala, Pattani, Narathiwat and 4 districts in Songkla province (i.e. Chana, Thepa, Saba Yoi and Na Thawi)

Source: Compiled from NEPC Resolution 22 October 2014 ([Original document](#)) and NEPC Resolution

Exchange rate = 1 Euro : 37.14 THB

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