



Thailand

Renewable Energy Policy Update 10/15

www.renewables-made-in-germany.com



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 ([weblink](#)); including

1. Power Development Plan 2015-2036 ([PDP 2015](#))
2. Energy Efficiency Plan 2015-2036 ([EEP 2015](#))
3. Alternative Energy Development Plan 2015-2036 ([AEDP 2015](#))
4. Gas Plan 2015-2036 (Gas Plan 2015)
5. Oil Plan 2015-2036 (Oil Plan 2015)

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 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 NEPC on May 14 2015 and passed on to the cabinet for official announcement on June 30 2015. The official document in Thai can be found at ([weblink](#)).

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

1. 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.

2. 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.
3. 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 and peak demand of 326,119 GWh and 49,655 MW in 2036 respectively. The values are based on an average GDP growth rate of 3.94% per year, a slight revision from a growth rate of 4.49% in the previous 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 by the end of 2036, totalling the country's electricity capacity at 70,335 MW. 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 currently 64%. The proportion of renewable energy will rise to 15-20% from the current 8%. 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 developed further 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 ([weblink](#)).

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

AEDP 2015 was approved by NEPC on September 17, 2015. The original document in Thai can be found here ([weblink](#)).

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 for 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 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 for 65,558 GWh or 20.11% of the national electrical demand, projected at 326,116 GWh, 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* | (2014) | 65.72 | - | 2,451.82 | 311.50 | - | 224.47 | 1,298.51 | 142.01 | - | 4,494.03 |
| Target | (2036) | 500 | 50 | 5,570 | 600 | 680 | 3,002 | 6,000 | 376 | 2,906.40** | 19,684.40 |

* Including off grid power generation but excluding current (2014) installed capacity of large hydro

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

Source: http://www.dede.go.th/download/files/AEDP2015_Final_version.pdf

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

On 22th October 2014 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 in the governmental gazette for VSPP RE on February 22, 2015 ([link](#) to original document)

The FIT will be granted for 20 years, an exception being power systems fuelled by landfill gas which will receive support for 10 years only. The FIT rates differ greatly on power plant size 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.

The new FIT is composed of three components: $FIT = FIT(F) + FIT(V) + FIT\ Premium$.

FIT(F) is a portion of the remuneration that is fixed throughout the whole support period, while FIT(V) 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 were fixed for projects which dispatch electricity to the grid in 2017 (FIT(V2017), after that the FIT(V) will be revised on an annual basis in accordance with the core inflation to reflect actual feedstock costs. The last component is the FIT Premium which again is split into two categories:

- one is an additional FIT granted to promote the use of the certain renewable fuels and which is granted for the first 8 years of project lifetime
- the other one is a premium which is granted for the whole project duration for VSPPs located in three southern border provinces and four districts of Songkla province (i.e. Chana, Thepa, Saba Yoi and Na Thawi).

The selection of applications for projects will change from “first-come, first-serve” to a competitive bidding system. To this end, the suggested FITs will only serve as ceiling for the proposals made. Power producers are requested to make a competitive offer, not exceeding this ceiling. The most cost-competitive offers will be selected until the quota is reached.

The first FIT bidding scheme will be used for biomass and biogas projects. The ERC have drafted the detail and regulations for the scheme (more detailed information can be found in GIZ's Bioenergy policy update paper). It is expected that the ERC will announce the FIT bidding scheme in 2 phases. Phase 1 will be only for VSPP power plant projects located in the 3 provinces in the South.

Table 2: Overview of FIT

| | FIT(F) (1 € = 40 Baht) Baht/kWh | FIT (V2017) Baht/kWh | Total calculated FIT Baht/kWh | Period of support Years | FIT Premium | |
|---|---------------------------------------|-------------------------|-------------------------------------|-------------------------------|---|--|
| | | | | | For Bio-Energy (8 years) Baht/kWh | Southern Provinces ¹ (project lifetime) Baht/kWh |
| 1. Waste (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 |
| 2. Waste (landfill gas) | | | | | | |
| | 5.60 | - | 5.60 | 10 | - | 0.50 |
| 3) 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 |
| 4) Biogas (from wastewater / waste products) | | | | | | |
| | 3.76 | - | 3.76 | 20 | 0.50 | 0.50 |

| | FiT(F) (1 € = 40 Baht) Baht/kWh | FiT (V2017) Baht/kWh | Total calculated FiT Baht/kWh | Period of support Years | FiT Premium | |
|--------------------------------------|---------------------------------------|-------------------------|-------------------------------------|-------------------------------|---|--|
| | | | | | For Bio-Energy (8 years) Baht/kWh | Southern Provinces ¹ (project lifetime) Baht/kWh |
| 5) Biogas (from energy crops) | 2.79 | 2.55 | 5.34 | 20 | 0.50 | 0.50 |
| 6) Hydro power | | | | | | |
| Capacity ≤ 200 kW | 4.90 | - | 4.90 | 20 | - | 0.50 |
| 7) Wind power | 6.06 | - | 6.06 | 20 | - | 0.50 |

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

Source: <http://www.erc.or.th/ERCWeb2/Front/Law/LawDetail.aspx?sectionID=1&CatId=1&SubId=27&rid=327&muid=24&prid=25>

Contact

Deutsche Gesellschaft für Internationale Zusammenarbeit
(GIZ) GmbH

Thomas Chrometzka
Director Renewable Energy

Patwalai Ananjanich
Project Manager
patwalai.ananjanich@giz.de

Disclaimer

The information provided has been gathered in the context of the Renewable Energy Project Development Programme (PDP). The programme is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Affairs and Energy (BMWi). The programme's objective is to support the market development of renewable energies in the region by fostering sustainable German-South-East Asian business partnerships. This fact sheet is published as part of a series of project briefs to disseminate and promote viable renewable energy business opportunities in South-East Asia. Liability claims through the use of incorrect or incomplete information are excluded.