



Energy Policy
and Planning Office

MINISTRY OF ENERGY

SPP Hybrid Firm and VSPP Semi-Firm Feed-in Tariff (FiT) policy

1. NEPC's resolution on 17 FEB 2017

- **Approved FiT rate for SPP Hybrid Firm, and Semi-Firm and assigned ERC to announced regulations of SPP Hybrid Firm and VSPP Semi-Firm**
- **Approved purchasing target sequentially as follows**
 - **SPP Hybrid Firm 300 MW**
 - **VSPP Semi-Firm 269 MW**
- **Assigned ERC and DEDE to determine the purchasing quantity by region**
- **Announced FiT rate for SPP Hybrid Firm and VSPP Semi-Firm by ERC**

Note: NEPC is an abbreviation of the National Energy Policy Commission

2. Background

EPPO has studied the Policy concept to promote PPA with various sources of renewable energy generation electricity (Hybrid)

- To increase the security of power system**
- To reduce the variation of intermittent energy sources**
To be more dependable than traditional PPA
- To reduce the fuel supply demand in each type of RE**
By managing fuel and producing electricity from various sources of renewable energy, including installation energy storage technology

**EPPO, DEDE, ERC, EGAT,
PEA, MEA, F.T.I and Private
producers**

discuss and receive
comments to impose the
policy

**found the possibility
in execution.**

- SPP has an ability to produce power in “Firm” contract.**
- For VSPP, biofuels could be produced in “Semi Firm” contract (Firm in only some months of the year). Firm month period must comply with the season of agricultural product and Peak Demand of the country (in summer).**

3. The principle of FiT determination for SPP Hybrid Firm and VSPP Semi Firm

	SPP Hybrid – Firm	VSPP – Semi Firm
Condition of participation	Only new power plants, all kind of fuel type	Only new power plants, Type of biomass, biogas (sewage/waste) and biogas (energy crops)
Contracted capacity	10 – 50 MW	< 10 MW
Firm model	Firm all year* (*In Accordance to ERC's definition)	Semi Firm for 6 months (Covering Mar-Jun) Other 6 months are Non-firm
Characteristic of Firm-model	Peak 100% and Off-peak 65%* (*In accordance to ERC's definition)	Peak 100% and Off-peak 65%* (*In accordance to ERC's definition)
Mix-sources (Hybrid)	≥ 1 type(s) Trading at the same meter / UMM required (fossil fuel supplement is allowed only for start-up the power plant)	Only 1 type (fossil fuel supplement is allowed only for start-up the power plant)
proportion of Hybrid	No proportion determined	no Hybrid
Installation of ESS	Installation of ESS is allowed	Installation of ESS is allowed
SCOD	Within 2020	Within 2019-2020
Purchased price mechanism	single FiT rates for all kind of fuel type with competitive bidding mechanism	FiT rates by each type of fuel With competitive bidding mechanism (FiT Premium only for Firm-duration).
Fuel supply plan	There must be a plan to procure fuel, and energy crops must be involved, by defined proportion.	There must be a plan to procure fuel, and energy crops must be involved, by defined proportion.
Guarantee of Firm	✓	✓

Note: fuel type according to AEDP's plan

(1) FiT rate for SPP Hybrid Firm

❖ FiT for SPP Hybrid Firm

Consider the initial cost of mixing various sources of RE (Hybrid)

Installed capacity(MW)	FiT (THB/kWh)			Period (years)
	FiT _F	FiT _{V,2560}	FiT ⁽¹⁾	
SPP Hybrid Firm				
Installed capacity >10-50 MW	1.81	1.85	3.66	20 years

Note FiT rates will be applied for projects that COD within 2017. After that, FiT_V rates will continuously increase by core inflation.

(2) FiT rate for VSPP Semi-Firm

Installed Capacity (MW)	FiT (THB/kWh)			Period (years)	FiT Premium (THB/kWh)	
	FiT _F	FiT _{V,2560}	FiT ⁽¹⁾		Firm period not exceeding 6 months (<u>project lifetime</u>)	Projects in the southern border provinces ⁽²⁾ (<u>project lifetime</u>)
1) Biomass						
- Installed Capacity ≤ 3 MW	2.61	2.21	4.82	20 years	0.40	0.50
- Installed Capacity > 3 MW	2.39	1.85	4.24	20 years	0.30	0.50
2) Biogas (sewage/waste)	3.76	-	3.76	20 years	0.50	0.50
3) Biogas (energy crops)	2.79	2.55	5.34	20 years	0.50	0.50

Note (1) FiT rates will be used for projects that COD within 2017. After 2017, FiT_V rates will continuously increase by core inflation.

(2) Projects in province Yala, Pattani, Narathiwat and 4 districts in Songkhla, i.e. Chana, Tapa, Saba Yoi and Nathawee District

5. Purchasing target for SPP Hybrid Firm and VSPP Semi-Firm

- **The Purchasing target of SPP Hybrid Firm and VSPP Semi-firm is defined by DEDE.**

Type of plants	Installed Capacity (MW)	
SPP Hybrid	300.00	300.00
VSPP Biomass	125.25	} 268.36
VSPP Biogas	96.11	
VSPP Energy crop	47.00	
		568.36

Note: EPAC will determine the installed capacity and area that will be opened for the next purchase.



BIOMASS PLANT
generates electricity
from organic matter



SOLAR FARM
generates electricity
from sunlight



WIND TURBINE
converts wind's kinetic
energy into electrical
power



BATTERY
for energy storage
system



INVERTER
converts direct current
to alternative current



**TRANSMISSION
LINE**
Utility's electric power
distribution system for
community



FARM
for energy crop
cultivation or
harvesting animal
wastes for energy
production

PEAK

09:00 am - 10:00 pm



Biomass plant can generate continuously stable electrical power, i.e. 65% of the total energy generation.



Solar farm generates direct electrical power according to daily radiation.



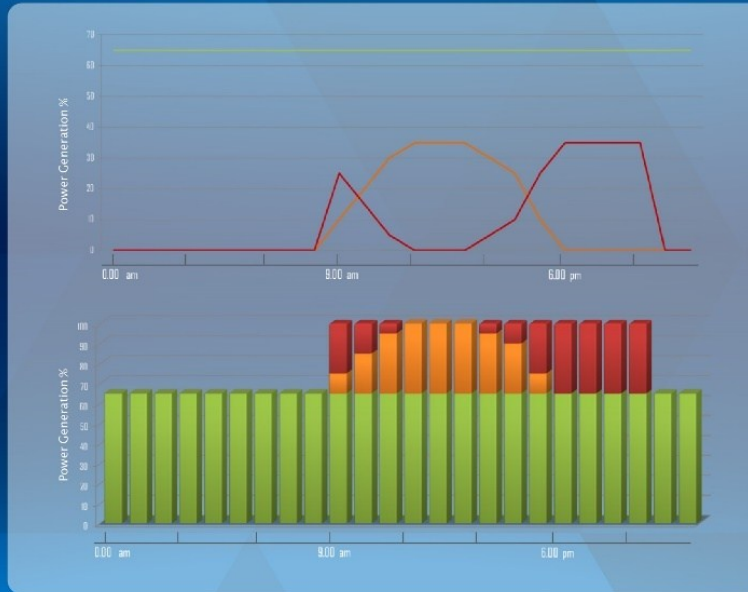
Batteries will transfer the additional power to the transmission line if capacity of solar farm is not sufficient.

The rest of solar energy is charged into batteries.

Wind turbines generate direct current to charge the batteries.

OFF-PEAK 10:00 pm – 08:00 am

Biomass plant generates continuous electrical power at 65% of the total energy generation.





Power Purchasing Terms

Power Purchasing Terms	SPP Hybrid Firm
Criteria	New power plants only All fuel types
Power Purchasing Quota	10 – 50 MW
Firm Period Firm Operation	“Firm” - throughout the year Peak 100% and Off-peak 65%* (* According to ERC)
Hybrid	Greater than or equal to 1 type of fuel supply 1 meter/ UMM installation (only allow fossil fuel for startup procedure)
Hybrid Ratio	No set ratio
ESS Installation	ESS can be installed
SCOD	Within 2020
Power Purchasing Mechanism	Same FiT Rate - Competitive Bidding for all fuel supply type
Fuel Supply Procurement Plan	Must have fuel supply procurement plan and energy crop plantation within specify ratio
Firm Guarantee	✓

THANK YOU