



Department of Alternative
Energy Development and Efficiency

MINISTRY OF ENERGY

Thailand's Alternative Energy Development Plan and the Key Role of Renewables

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Department of Alternative
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Alternative Energy Development Plan (AEDP) 2015-2036



Thailand Integrated Energy Blueprint

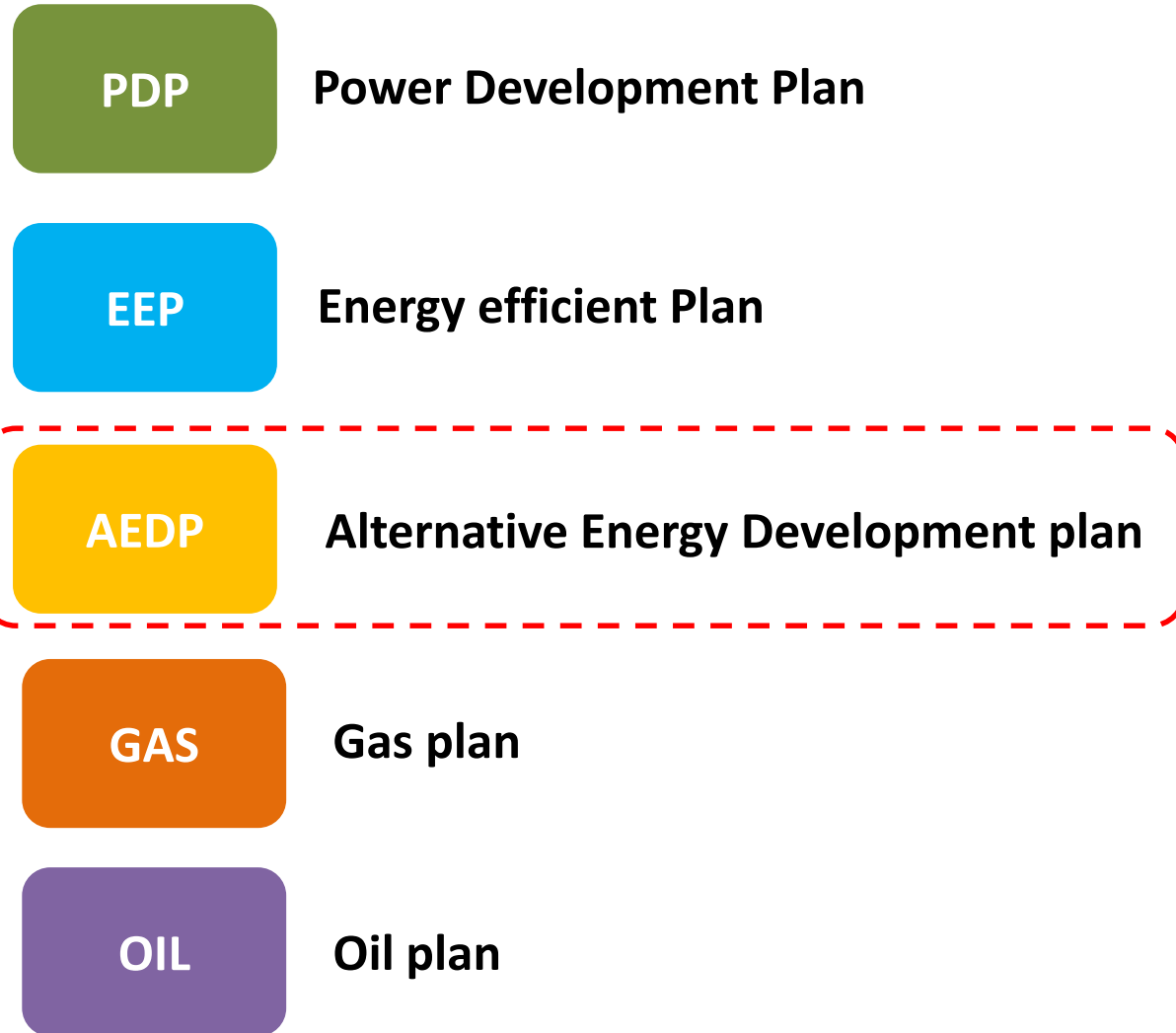


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TIEB

**THAILAND INTEGRATED
ENERGY BLUEPRINT**





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THAILAND INTEGRATED
ENERGY BLUEPRINT

Energy Security

- Supply energy in response to the energy demand
- Diversify energy to the appropriate resources

Economy

- Reasonable energy cost, not an obstacle to economic and social development
- Reforms in fuel prices structure

Ecology

- Increase renewable energy usage
- Reduce negative impacts to the environment



Overall targets: **30%** Renewable Energy
in total energy consumption by 2036

Power (4.27%)

19,684.4 MW

1. Municipal Solid Waste	500
2. Industrial waste	50
3. Biomass	5,570
4. Biogas (Waste water/sewage)	600
5. Small hydro	376
6. Biogas (Energy crop)	680
7. Wind	3,002
8. Solar	6,000
9. Large hydro	2,906.40

Heating (19.15%)

25,088 ktoe

1. Municipal Solid Waste	495
2. Biomass	22,100
3. Biogas	1,283
4. Solar	1,200
5. Alternatives Heat Source*	10

* Geothermal, pyrolysis oil, etc.

Transport (6.65%)

8,712.43 ktoe

1. Biodiesel (million l/d)	14.0
2. Ethanol (million l/d)	11.3
3. Pyrolysis oil (million l/d)	0.53
4. CBG (ton/d)	4,800
4. Alternative fuels* (ktoe)	10

* Bio-oil, Hydrogen and others

RE share 14% in 2016



- 20%RE in power generation in 2036
- Supporting measure: Feed-in Tariff for VSPP and SPP
- Define RE Zoning, supply-demand matching principle
- Electricity trade by competitive bidding
- Improve transmission system to accommodate electricity from RE
- Promote RE electricity for Self-consumption
- Develop hybrid electricity system
- Support R&D in energy storage



FiT for VSPP project						
Capacity (MW)	FiT (Baht/kWh)			Period (year)	FiT Premium (Baht/kWh)	
	FiT _F	FiT _{V,2560}	FiT		For bio-energy (year 1-8)	For 3 provinces in the south (Whole period)
1) Municipal Solid Waste						
≤ 1 MW	3.13	3.21	6.34	20	0.70	0.50
> 1-3 MW	2.61	3.21	5.82	20	0.70	0.50
> 3-10 MW	2.39	2.69	5.08	20	0.70	0.50
2) Landfill Gas to Energy	5.60	-	5.60	20	-	0.50
3) Biomass						
≤ 1 MW	3.13	2.21	5.34	20	0.50	0.50
> 1-3 MW	2.61	2.21	4.82	20	0.40	0.50
> 3-10 MW	2.39	1.85	4.24	20	0.30	0.50
4) Biogas						
Wastewater/sewage	3.76	-	3.76	20	0.50	0.50
Energy crop	2.79	2.55	5.34	20	0.50	0.50
5) Micro hydro (≤ 200 kW)	4.90	-	4.90	20	-	0.50
6) Wind	6.06	-	6.06	20	-	0.50



- Promote the use of other materials as fuel sources
- Develop supply chain management
- Define standard of renewable fuel for commercial
- Encourage more utilization of energy from waste and solar
- Set measure to promote the RE heat production



- R&D Non-food crop as an alternative feedstock
- Study and develop automobile technology to use more proportion of biofuel
- Develop high quality biofuel such as H-FAME and BHD
- Develop the CBG production system
- Increase biofuel station



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The Key Role of Renewables



- Solar PV in remote area
- Micro and mini hydro projects for rural communities
- Micro grid pilot project in Mae Hong Sorn province
- Biogas from animal waste and organic waste for cooking





- Less dependency on imported fossil fuel
- Increase the competitiveness of the market with more players of power producer
- Benefit to farmer by using feedstock from agricultural sector
- Job creation, contribution to local economies



- Clean energy, less impact on the environment
- Convert waste to energy
- GHGs mitigation

COP 21 “Thailand intends to reduce its greenhouse gas emissions by 20-25 percent from the projected business-as-usual (BAU) level by 2030.”



THANK YOU



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