



**Asia-Pacific  
Economic Cooperation**

---

**2017/EWG/EGNRET48/020**

## **Renewable Energy Development in Thailand**

Purpose: Information  
Submitted by: Thailand



**48<sup>th</sup> Expert Group on New and Renewable Energy  
Technologies Meeting  
Jeju, Korea  
29-30 March 2017**



Department of Alternative  
Energy Development and Efficiency

**MINISTRY OF ENERGY**

# **RE Development in Thailand**

**Karnnalin Theerarattananon, Ph.D.**

**Engineer**

**Department of Alternative Energy Development and Efficiency**

**Ministry of Energy, Thailand**



Integration



Harmonized Time Frame



Better Balanced Focus

## Security Economy Ecology

**PDP**

POWER DEVELOPMENT PLAN

แผนพัฒนากำลังผลิตไฟฟ้าของประเทศไทย\*

**EEP**

ENERGY EFFICIENCY PLAN

แผนอนุรักษ์พลังงาน\*

**AEDP**

ALTERNATIVE ENERGY DEVELOPMENT PLAN

แผนพัฒนาพลังงานทดแทนและพลังงานทางเลือก

**GAS**

GAS PLAN

แผนบริหารจัดการก๊าซธรรมชาติ

**OIL**

OIL PLAN

แผนบริหารจัดการน้ำมันเชื้อเพลิง



**PDP**

**EEP**

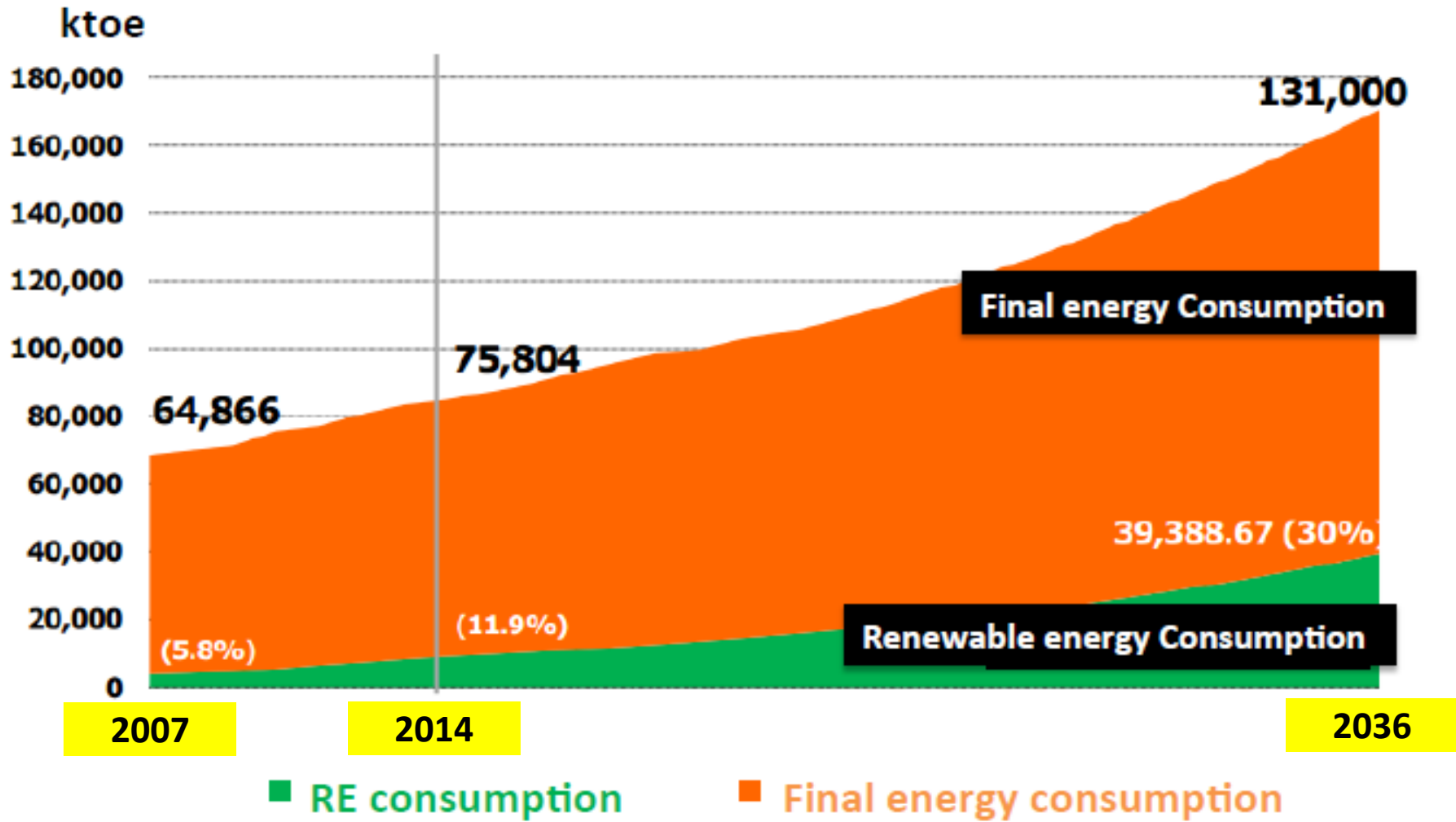
**AEDP**

**GAS**

**OIL**

# TIEB

**AEDP 2015 target is to achieve 30% Share of RE in Final Energy Consumption by 2036**



# RE Target Allocation by Fuel Type

**Foundation:** Commitment to the development of a low-carbon society

**Facilitator:**  
Private-led investment

**Alternative Energy Development Plan 2015-2036**

**Facilitator:**  
Government funded RD&D

**Goal: Target 30% renewables in Total Energy Consumption by 2036**

**Bio-Energy**

E. Crop	Biogas	Biomass	MSW	Ind.Waste
680 MW	600 MW	5,570 MW	500 MW	50 MW
	1,283 ktoe	22,100 ktoe	495 ktoe	

**7,776 MW Power | 23,878 ktoe Heat**

**Bio-Fuel**

Ethanol	Biodiesel	CBG	Others*
~ 11 ML/Day	14 ML/Day	4,800 Ton/Day	~ 10 ktoe

\* Other RE sources such as bio-oil, hydrogen, etc.

**Solar**

6,000 MW
1,200 Ktoe

**Wind**

3,002 MW
----------

**9,002 MW Power | 1,200 ktoe Heat**

**Hydro**

Small Hydro	Large Hydro
376 MW	2,906.4 MW

**3,282.4 MW Power**

**Alternative RE Source\***

**10 ktoe Heat**

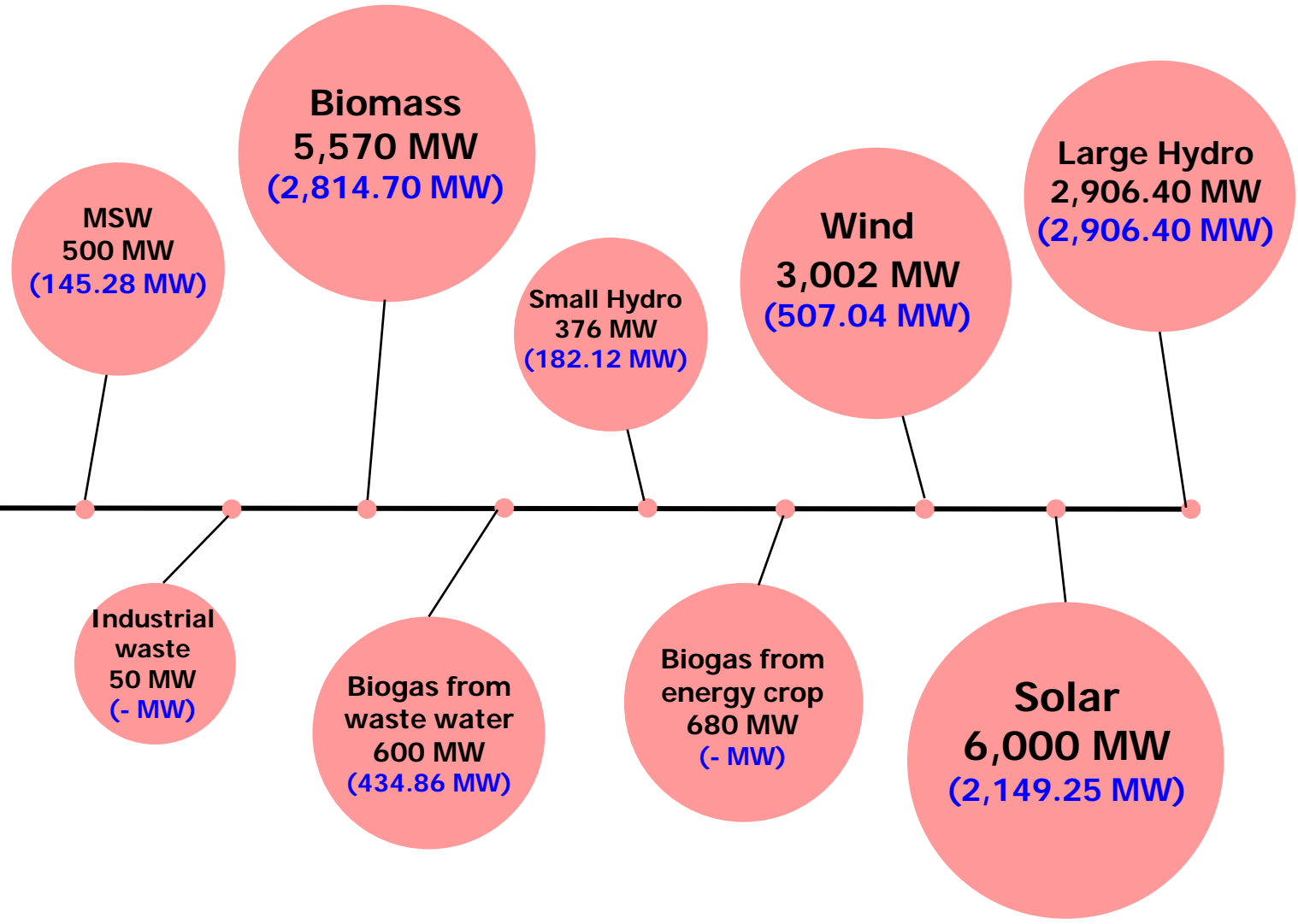
\* Alternative RE sources such as geothermal energy, etc.

# Target and current RE status : Power

RE proportion in power sector  
**20%**



**19,684.40 MW**  
**(9,139.65 MW)**



Source: DEDE



# Target and current RE status : Heat

RE proportion  
in heat sector

36.67%



25,088.00 kteo  
(7,182 ktoe)

MSW  
495 ktoe  
(75 ktoe)

Biogas  
1,283 ktoe  
(593 ktoe)

Alternative  
Sources\*  
10 ktoe  
(- ktoe)

Biomass  
22,100 ktoe  
(6,507 ktoe)

Solar  
1,200 ktoe  
(6.72 ktoe)

Source: DEDE

Note : Blue is the result in the end of 2016

\*Alternative RE Sources such as geothermal energy, etc.

# Target and current RE status : Biofuel

RE proportion in biofuel sector  
**25.04%**



**25.83 ML/day**  
**4,800 ton/day**  
**10 ktoe**  
**(7.04 ML/day)**

**Biodiesel**  
**14 ML/day**  
**(3.37 ML/day)**

**Ethanol**  
**11.3 ML/day**  
**(3.67 ML/day)**

**Other Sources\***  
**10 ktoe**  
**(- ktoe)**

**Pyrolysis Oil**  
**0.53 ML/day**  
**(- ML/day)**

**CBG**  
**4,800 Ton/day**  
**(- Ton/day)**

Source: DEDE

Note : Blue is the result in the end of 2016

\*Other sources such as bio-oil, hydrogen, etc.





# Tools to stimulate RE investment

- Exemption of imported duty of equipment or machines
- Exemption of income-corporate taxes resulting from Selling RE or saving energy for periods up to 8 years

- Provides lower risk capital to renewable focused businesses
- Equity investment (ESCO venture capital)
- Equipment leasing
- Credit guarantee facility

## Investment grants (DEDE/EPPO)

**BOI**

**ESCO fund  
(DEDE)**

**Data Support  
(DEDE)**

**ADDERS/ FiT  
(EPPO)**

- One stop service center
- Data on renewable development progress
- Resource data maps, such as solar and wind

- Adder/FiT /FiT- bidding for renewable power generation tariff based on
  - Technology
  - Area
  - Merit Order



## Market Design

### Access to Finance

SPP Hybrid-Firm/ VSPP Semi-Firm Program  
Solar Rooftop Pilot Project

### Support Mechanism (FiT)

RE Zoning + Reverse Auction

Market Exploration for RE in Heat Sector

## RE Resources

- Availability
- Continuity (non-dependable RE)
- Accessibility (feedstock management, site-specific resource)

## Infrastructure

- Grid Accessibility
- Grid Stability
- Grid Flexibility (VRE issue)

## Institutional framework and capacity building

- Readiness for Adoption of New technology
- Inter-Ministry Coordination

## Technology

- RE Technology Cost Reduction
- Energy Efficiency Improvement
- Moving towards Energy 4.0  
(SG, ESS, SPP Hybrid-Firm, Smart City)

*Thank you for you attention*



[www.dede.go.th](http://www.dede.go.th)



Department of Alternative  
Energy Development and Efficiency  
**MINISTRY OF ENERGY**