



**Asia-Pacific
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Achieving the Renewable Energy Goal in APEC Region - Chinese Taipei's Approach

Purpose: Information
Submitted by: Chinese Taipei



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EGNRET 48th Meeting

Achieving the RE goal in APEC Region - Chinese Taipei's Approach -

Bureau of Energy
Ministry of Economic Affairs

March 29, 2017 **Chinese Taipei**





Outline

- I. Current Status
- II. Renewable Energy Policies
- III. Strategies of Renewable Energy Development
- IV. Future Outlook

I. Current Status





Current Status

- The installed capacity of renewable energy is **4,763.8 MW** at the end of **January 2017**.
- A significant growth in **PV** installations, **over 110 folds**, since the Renewable Energy Act came into force in 2009.

	Wind Power	Hydro Power	Biomass	PV	Total
Installed Capacity (MW)	682.1	2,089.3	740.5	1,252.9	4,763.8

Source: Bureau of Energy

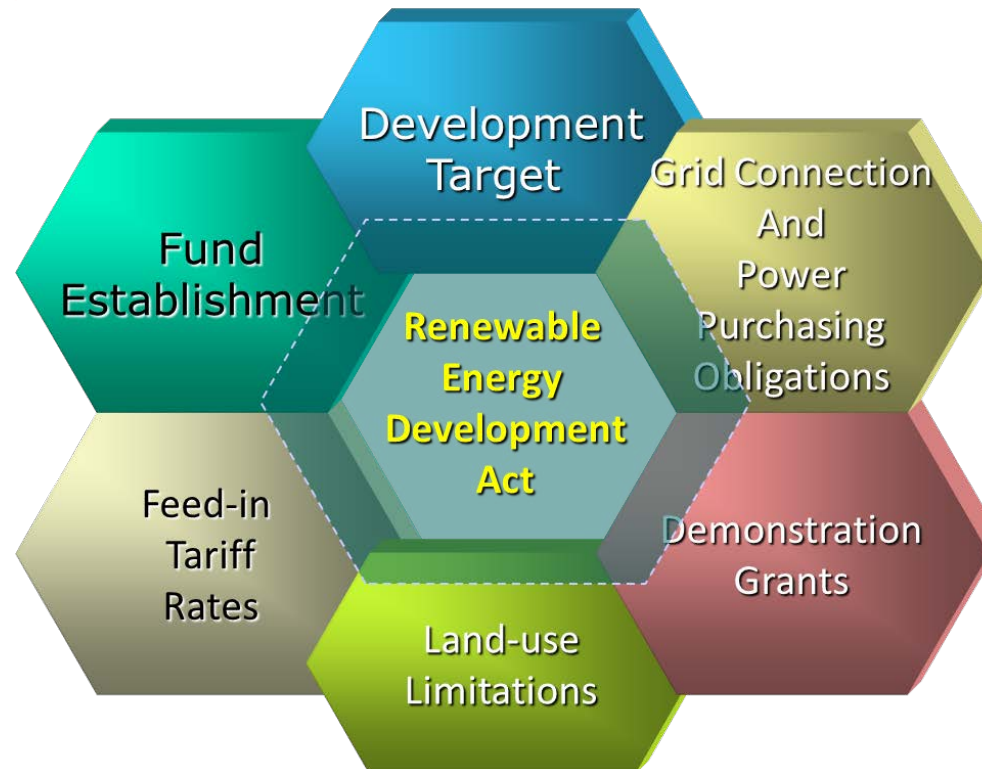
II. Renewable Energy Policies





1. Renewable Energy Development Act

- ◆ In order to systematically promote renewable energy, in July of 2009, the government promulgated the ***Renewable Energy Development Act***.
- ◆ **The core strategy of the Act is a Feed-in-Tariff system.**





2. Mechanism of Feed-in Tariffs

- ◆ A Committee is formed to decide the calculation formula and feed-in tariffs. Tariffs and formula should be reviewed annually, referring to **technical advancement, cost variation, goal achievement status**, etc.
- ◆ Current, only Solar PV tariff rates are set on date when generating equipment installations are completed. Other technologies have tariff rates set on the Power Purchasing Agreement (PPA) signing date.
 - ➔ **tariffs applied for 20 years**
 - ➔ **PPA is a very important credit for banks to provide project financing**

3. FIT for Renewables

Item	Type	Capacity (kW)	2016 FIT (US ¢/kWh)	2017 FIT (US ¢/kWh)
PV	Roof Type	$\geq 1 \sim < 20$	20.2541	19.0728
		$\geq 20 \sim < 100$	16.2897	15.5538
		$\geq 100 \sim < 500$	15.0191	14.1838
		≥ 500	14.5872	13.7806
	Ground Type	—	14.5872	14.2084
	Floating Type	—	—	15.4384
Wind Power	Onshore	$\geq 1 \sim < 20$	26.5931	28.0363
		≥ 20	8.7809	8.9925
	Offshore**	—	17.9391	18.8866
Hydropower	Stream-Type	—	9.0869	9.2225
Geothermal	—	—	15.4463	15.4463
Biomass	No biogas equip.	—	8.4919	8.1250
	With biogas equip.	—	12.2534	15.6522
RDF	—	—	9.1997	12.4497
Others	—	—	8.4919	8.1250

Source: Bureau of Energy

* Exchange rate: USD 1 = NTD 32

** For offshore wind power, another option of US¢23.1356/kWh for the first 10 years and US¢11.2338/kWh for the second 10 years is also available in 2017.

4. Renewable Energy Targets

- ◆ Renewable energy development in Chinese Taipei is toward increasing renewable energy supply and raising renewable energy target to achieve **20%** renewable electricity generation by **2025**.

		Power Capacity (MW)			Electricity Generation (TWh)		
		2015	2020(f)	2025(f)	2015	2020(f)	2025(f)
Solar PV		842	6,500	20,000	0.9	8.1	25.0
Wind	Onshore	647	800	1,200	1.5	1.9	2.9
	Offshore	—	520	3,000	—	1.9	11.1
Geothermal		—	150	200	—	1.0	1.3
Biomass		741	768	813	3.6	5.6	5.9
Hydro Power		2,089	2,100	2,150	4.5	4.7	4.8
Fuel Cell		—	22.5	60	—	0.2	0.5
Total		4,319	10,861	27,423	10.5	23.4	51.5

III. Strategies of Renewable Energy Development





1. PV Development and Promotion (1/2)

Solar PV Promotion Project

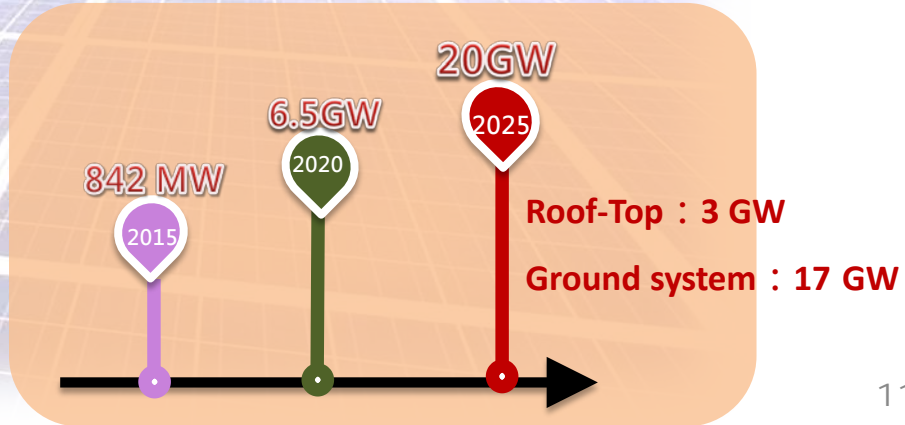


Two-Year Photovoltaic Promotion Project (2016)

July,2016~June,2018

- ☑ Roof-Top Type : 910 MW
- ☑ Ground Type : 610 MW
- Total : 1,520 MW

The power capacity of solar installations will be increased to 20GW in 2025.





1. PV Development and Promotion (2/2)

- Encouraging participation from local governments
- Assist local governments to facilitate public participation
- Encouraging public buildings equipped with PV

- Establishment of PV-ESCO mechanism
- Encouraging banks financing and providing soft loans

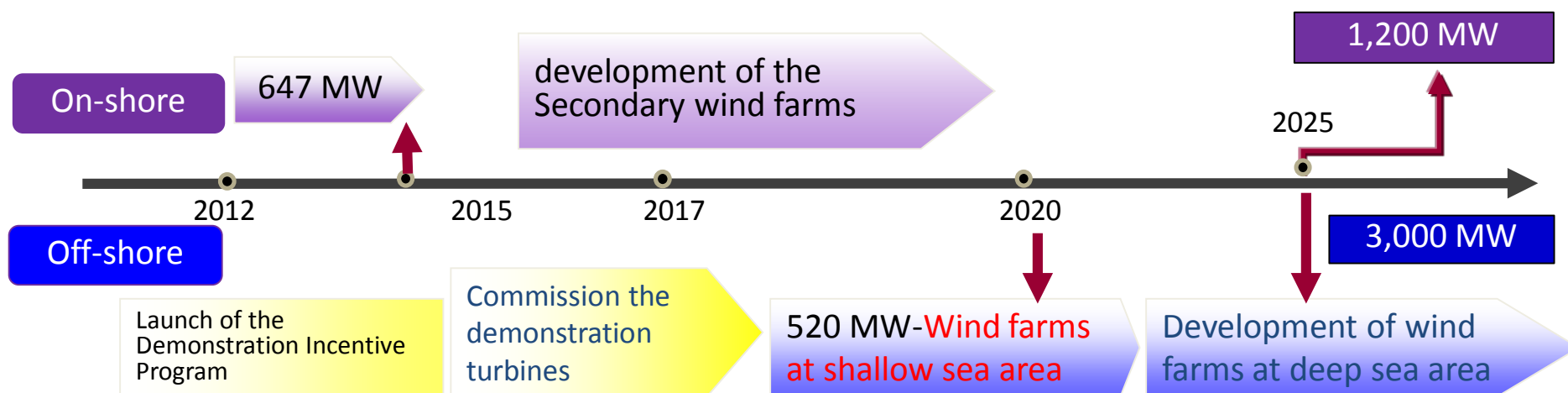
Establish Solar PV Installation Environment

- Strengthen public advocacy
- Provision of advisory services

- Simplify application processes
- Loosening bidding limitations
- Reduce application cost
- Simplify barriers between PV system and power grid
- Professional training course

2. Wind Power Development and Promotion (1/3)

Wind Power Promotion Project



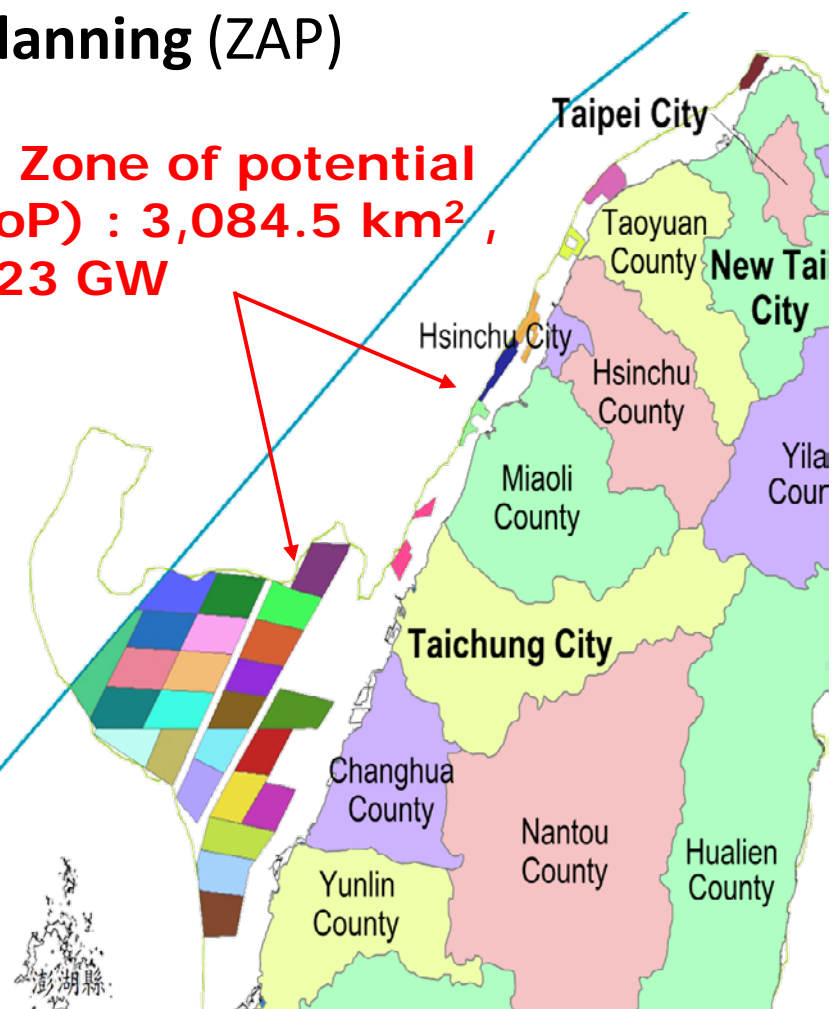
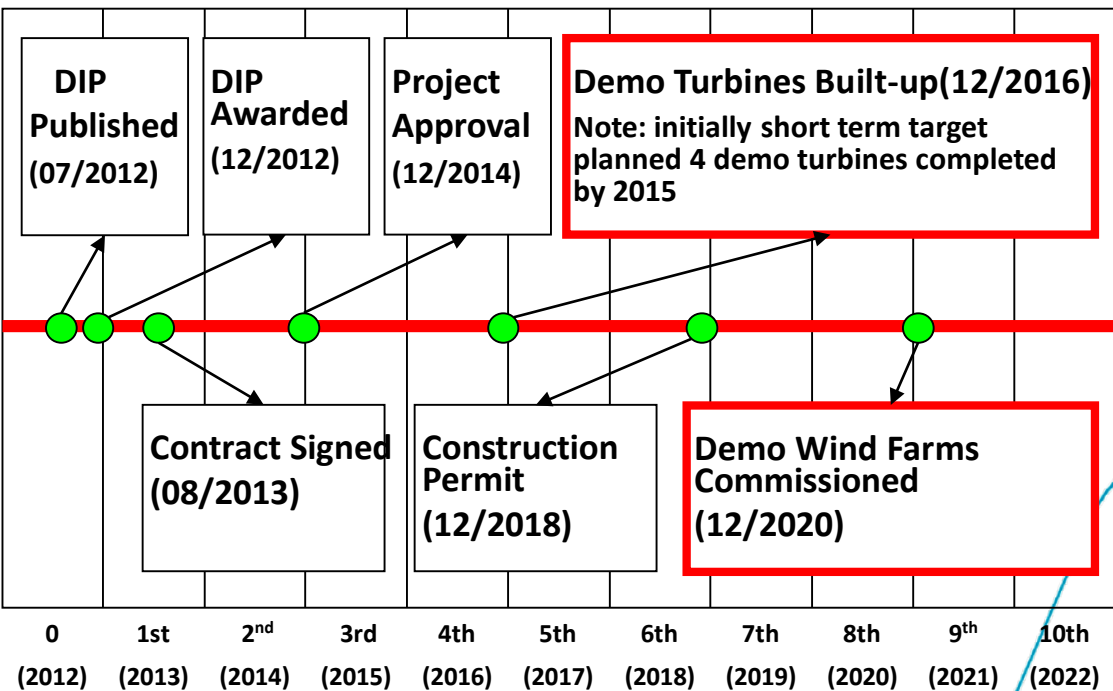
■ Strategy:

- for onshore wind power, first develop best wind farms and then secondary ones
- for offshore wind power, first demo projects, then Zones of Potential, then Zonal Development

2. Wind Power Development and Promotion (2/3)

- Offshore **D**emonstration **I**ncentive **P**rogram (DIP)
- Directions of **Z**one **A**pplication for **P**lanning (ZAP)
- Offshore Zonal Development

36 Zone of potential (ZoP) : 3,084.5 km² , ~ 23 GW



2. Wind Power Development and Promotion (3/3)

■ Demonstration Incentive program :

3 pioneering offshore wind farms in shallow water area

➤ Formosa (海洋) @Miaoli

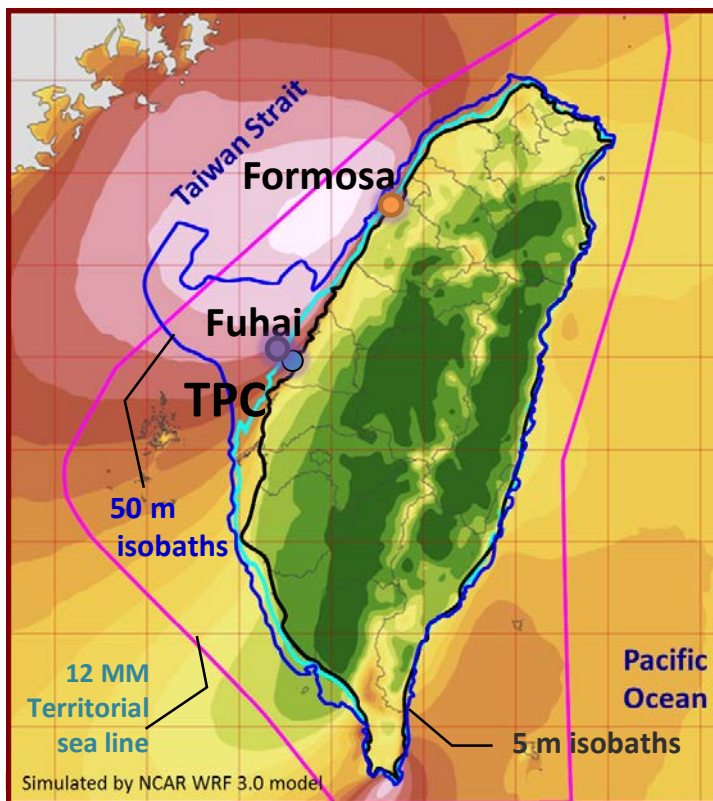
- Capacity: 128 MW (32 turbines)
- Distance from Shore: 2-6 km
- Water Depth: 15-35 m

➤ Fuhai (福海) @Changhua

- Capacity: 120 MW (30 turbines)
- Distance from Shore: 8-12 km
- Water Depth: 20-45 m

➤ TPC (台電) @Changhua

- Capacity: 108-110 MW (18-30 turbines)
- Distance from Shore: 7-9 km
- Water Depth: 15-25 m



Demo Turbine



Met Mast



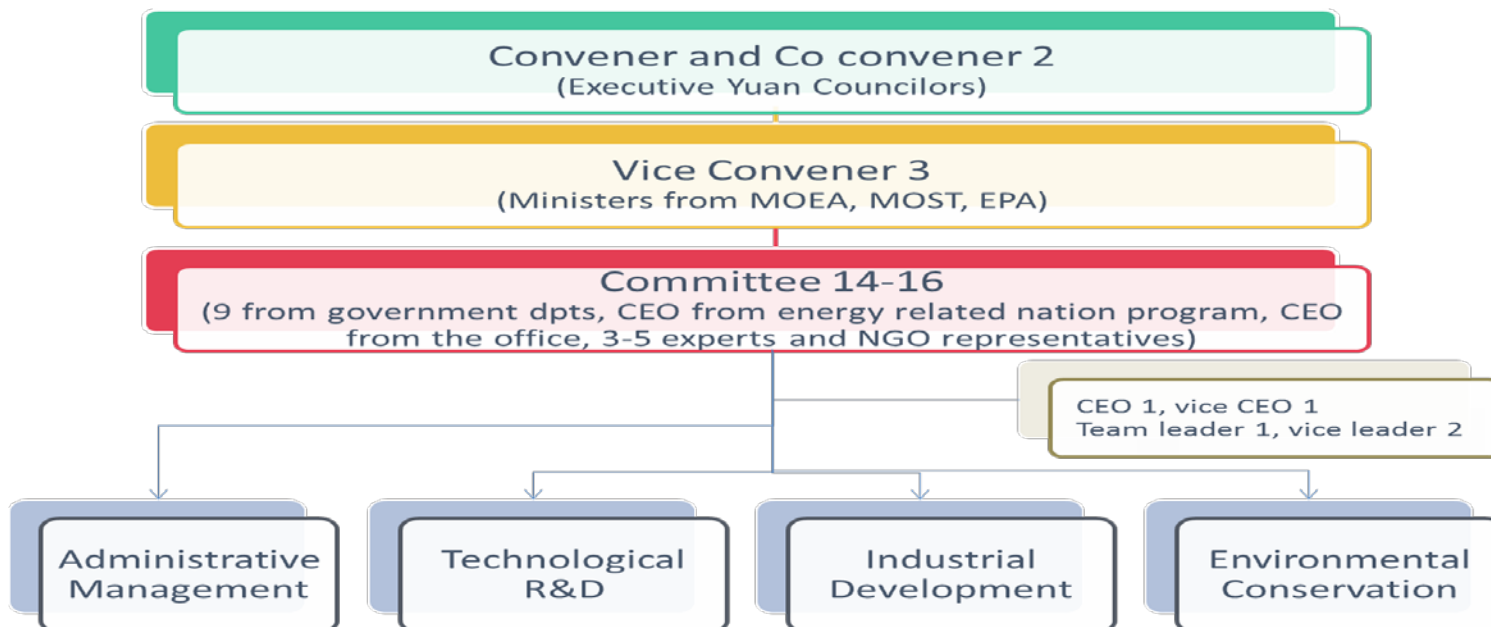
IV. Future Outlook





A win-win-win for the environment, energy, and economy

- Governmental determination to achieving **20% the target share for renewables by 2025**.
- To facilitate the offshore wind power and solar photovoltaic implementation, a intergovernmental subsidiary body “**energy saving and carbon reduction office**” set up under the Executive Yuan, to settle related problems like land usage, marine spatial planning, fishing rights, pier construction, working fleet, etc.





Thank you for your attention.

