



Taiwan Energy Information Pack

Government and Infrastructure Advisory

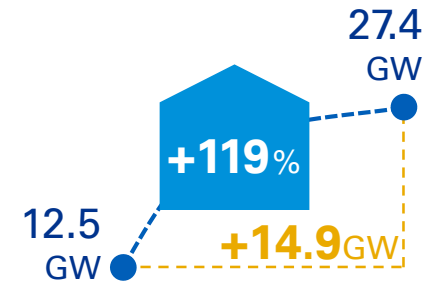


December 2017

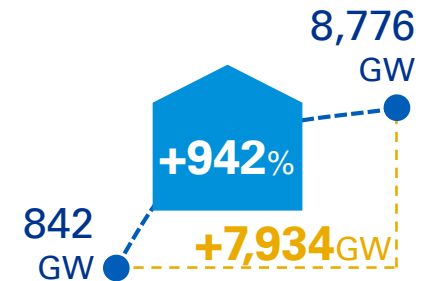
Taiwan Renewable Energy Development Target

Renewable energy targeted at 20% of total energy output of Taiwan by 2025

	2015		2020		2025	
	Capacity (MW)	Electricity Generation (100m kwh)	Capacity (MW)	Electricity Generation (100m kwh)	Capacity (MW)	Electricity Generation (100m kwh)
Solar	842	11	8,776	110	20,000	250
Onshore Wind	647	16	1,200	29	1,200	29
Offshore Wind	0	0	520	19	3,000	111
Geothermal	0	0	150	10	200	13
Biomass	741	54	768	56	813	59
Water	2,089	46	2,100	47	2,150	48
Fuel Cell	0	0	22.5	2	60	5
Total	4,319	127	13,537	273	27,423	515



Target for renewable energy output doubled as new government runs office.



Installation for the first 5 years increased 10 folds

Source: BOE

Feed in Tariff 2017



Category	Capacity	Phase I & II rate limit (NTD/kwh)	6% rate increase for high performance module (NTD/kwh)
Roof Top	1~20kw	6.1033	6.4695
	20~100kw (<100kw)	4.9772	5.2758
	100~500kw (<500kw)	4.5388	4.8111
	>500kw	4.4098	4.6744
Ground Mounted	>1kw	4.5467	4.8195
Floating	>1kw	4.9403	5.2367

2010 Taiwan implemented the power purchase policy in 2010, and since then the purchase rate has been dropping consistently.

Compared to last year, the FiT for PV producers **dropped 3-6%**, while wind on the other hand, **rose 2-5%**

Floating system was added as a new category. High performance module increase the FiT rate up to **6%**, of those installed in specified regions of northern Taiwan, the high performance module rate increase can go up to **15%**.

*The developer can choose between signing a fixed or a step-down FiT rate contract

Source: BOE

RE Type	Category	Capacity	Feed-in-Tariff (NTD/kwh)		
 Wind	Onshore	1~20kw (<20kw)	8.9716		
		>20kw	LVRT installed	2.8776	
	LVRT not installed		2.8395		
	Offshore*	N/A	20 years fix rate	6.0437	
			Step-down rate	1 st 10 years	7.4034
				2 nd 10 years	3.5948
ROR Hydroelectricity	N/A	N/A	2.9512		
Geothermal	N/A	N/A	4.9428		
 Biomass	With Anaerobic digestion equipment	N/A	2.6000		
	Without Anaerobic digestion equipment		5.0087		
Waste	N/A	N/A	3.9839		
Others	N/A	N/A	2.6000		

Feed in Tariff 2018 (draft) - Solar

2010

Taiwan implemented the power purchase policy in 2010, and since then the purchase rate has been dropping consistently.



Compared to last year, the FiT for PV producers **dropped 11.8%-13.5%**.

6%
15%

Incentive for high performance module and northern Taiwan development remains. Incentives for high performance module marks **up the FiT by 6%**, of those installed in specified regions of northern Taiwan, the high performance module incentive can go **up to 15%**.





Installations in offshore islands are incentivized with an increase on the FiT rate of **15%** before the sea cables are connected, and **4%** after the sea cables are connected.



For 10MW+ ground mounted or floating PV systems, 2018 FiT rate is applied to whichever projects completed by **2019 / 6 / 30**.

RE type – PV Solar

	Category	Capacity	Rate limit (NTD/kwh)	6% rate increase for high performance module (NTD/kwh)
First half of 2018  Later half of 2018	Roof Top	1~20kw	5.3848	5.707888
		20~100kw (<100kw)	4.7906	5.078036
		100~500kw (<500kw)	4.4564	4.723784
		>500kw	4.3264	4.585984
	Ground Mounted	>1kw	4.3785	4.64121
	Floating	>1kw	4.7723	5.058638
	Roof Top	1~20kw	5.2827	5.599662
		20~100kw (<100kw)	4.6885	4.96981
		100~500kw (<500kw)	4.3636	4.625416
		>500kw	4.2429	4.497474
Ground Mounted	>1kw	4.2943	4.551958	
Floating	>1kw	4.6901	4.971506	

Source: BOE

Feed in Tariff 2018 (draft) -Other REs



All of the RE technology, except geothermal, receives a FiT drop



Increase the capacity range of onshore wind to 30kw from 20kw



Offshore wind FiT is to utilize auction method.





Adjust Geothermal FiT to 2 options (20 yrs fixed or a step down rate)



Installation in offshore islands is incentivized with an increase on the FiT rate of 15% before the submarine cables are connected, and 4% after the submarine cables are connected.

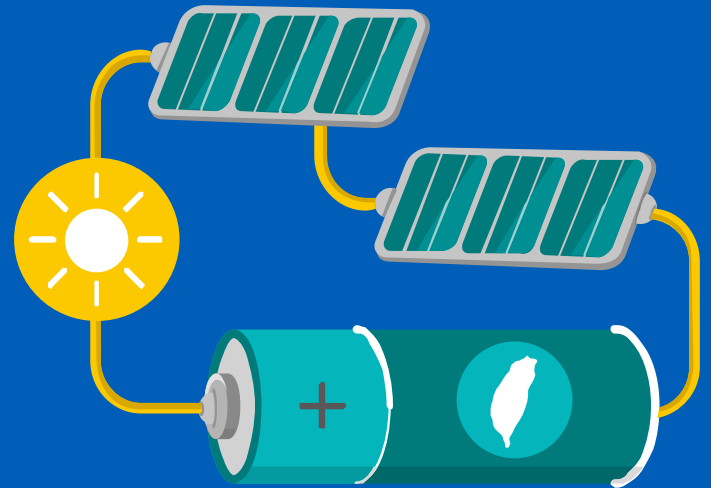
*The developer can choose between signing a fixed or a step-down FiT rate contract

Source: BOE

RE Type	Category	Capacity	Feed-in-Tariff (NTD/kwh)		
 Wind	Onshore	1~30kw (<30kw)	8.6685		
		≥ 30kw	LVRT installed	2.7669	
			LVRT not installed	2.7315	
	Offshore*	≥ 1	20 years fix rate		5.8141
			step-down rate	1 st 10 years	7.0622
			2 nd 10 years	3.5685	
ROR Hydroelectricity	N/A	≥ 1	2.7988		
Geothermal*	N/A	≥ 1	20 years fix rate		5.1956
			step-down rate	1 st 10 years	5.6447
				2 nd 10 years	4.4465
 Biomass	With Anaerobic digestion equipment	≥ 1	2.5765		
	Without Anaerobic digestion equipment		5.0161		
Waste	N/A	≥ 1	3.8945		
Others	N/A	≥ 1	2.3226		



Solar Policy Briefing & Market Dynamics



Policy Promotion

Solar aims to be the driving force renewable energy

Solar 2-year Expansion Plan



Type

~ 2017 / 6
Installation
Target (MW)

~2018 / 6
Installation
Target (MW)

Roof-top

Public Sectors	30	30
Industrial Parks / Factories	60	100
Agricultural Facility	200	250
Others	120	120
Subtotal	410	500

Ground-mounted

Salt Bay Area	100	130
Severely Subsidence Area	80	120
Reservoirs, Flood Detention Pools, Ponds	50	100
Landfills	10	20
Subtotal	240	370

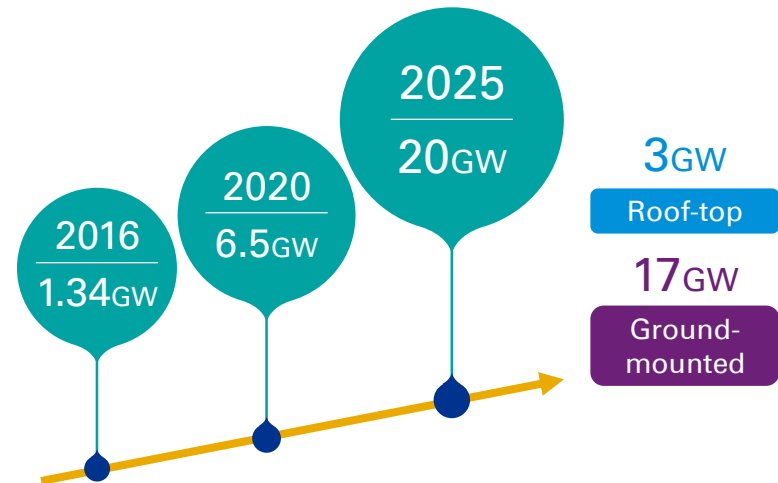
Total

650

870

1,520

Medium to Long-termed Target



Tai Power plan to initiate "Renewable energy transmission and distribution construction plan", aiming to improve current grid system in response to insufficient electrical load.

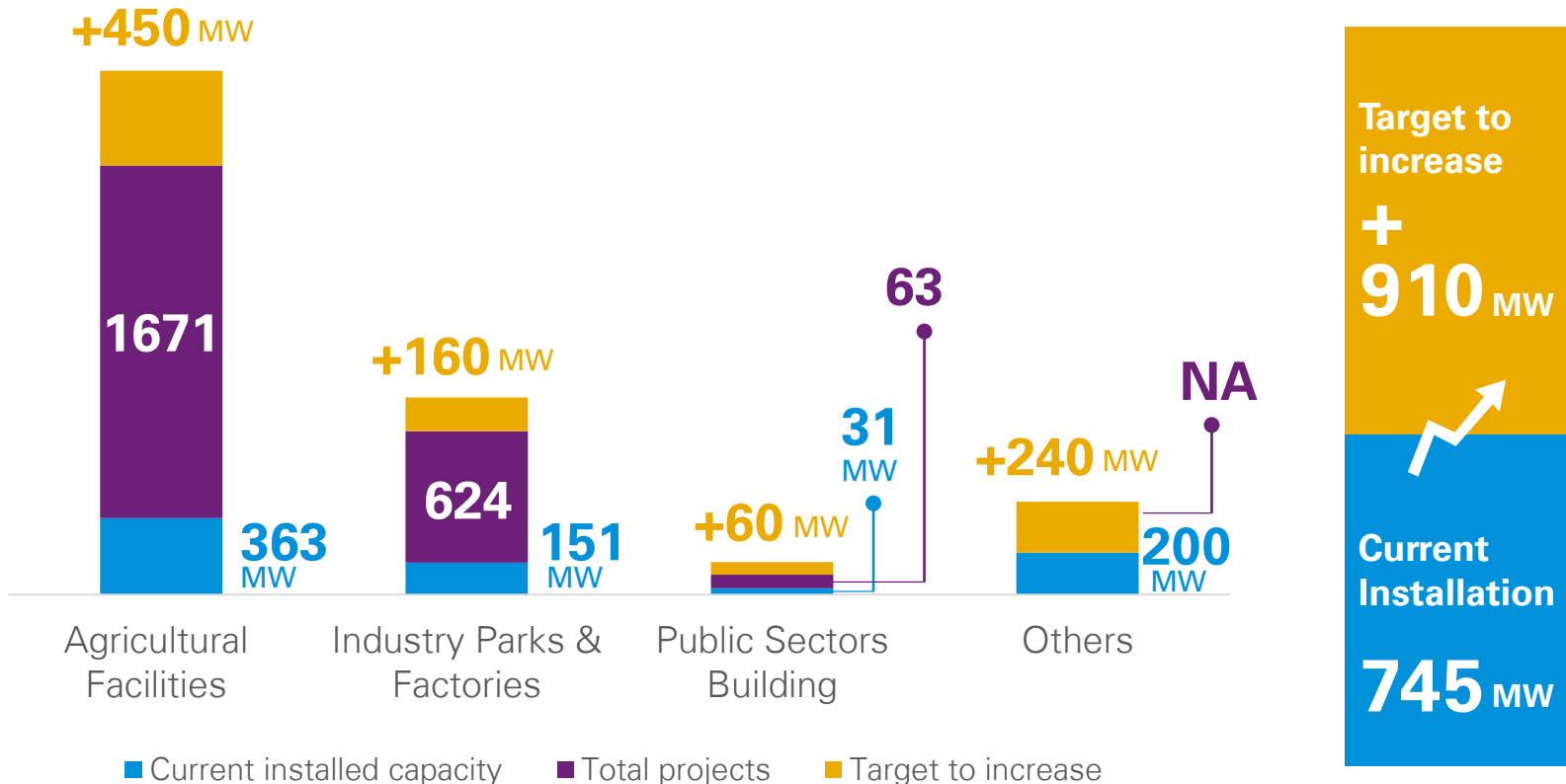


The Amendment of Electricity Act aims to liberalize renewable energy power generation and retails just finished first reading.

Source: BOE

Rooftop PV System Installation Target

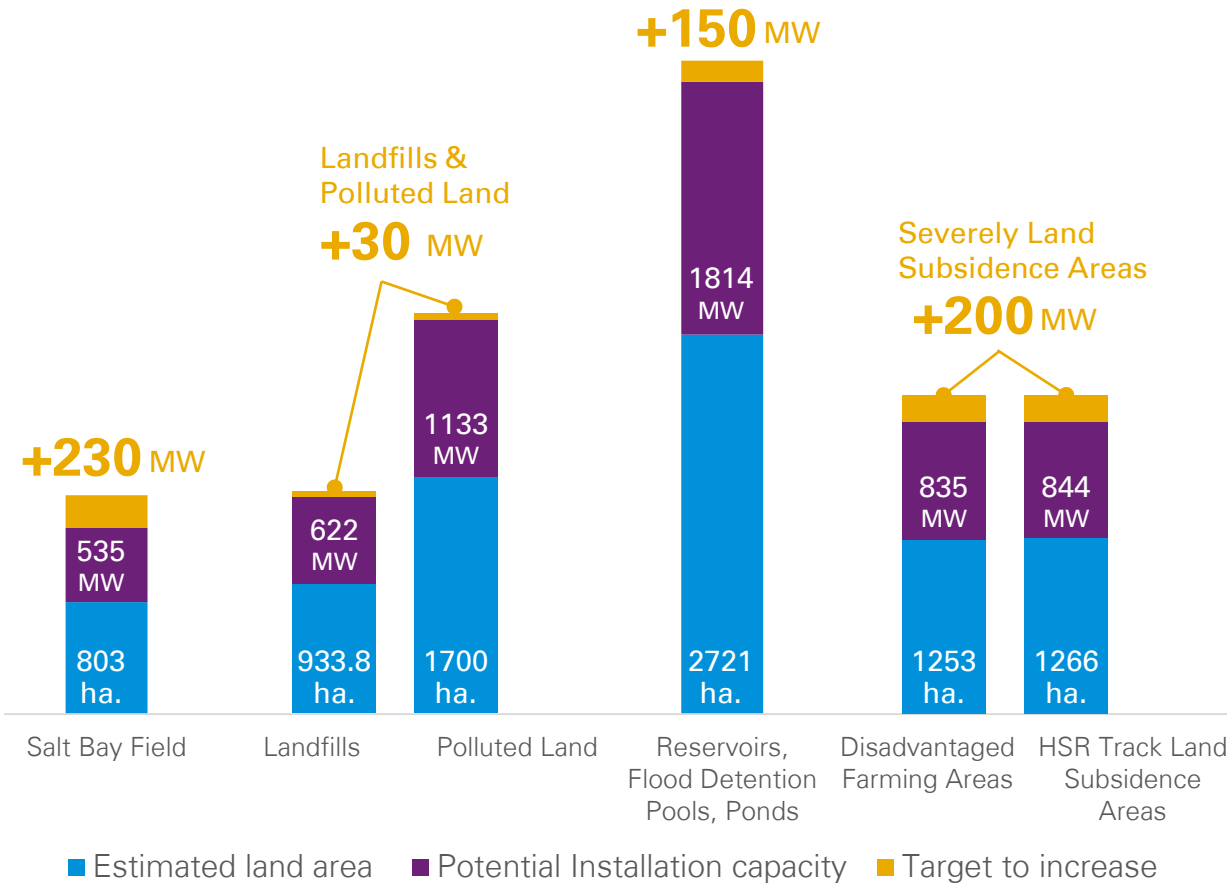
Solar 2-year Expansion Plan



Source: BOE

Rooftop PV System Installation Target

Solar 2-year Expansion Plan



Estimated land area for PV installation

8,677 ha. in total

Potential Installation capacity

5,783 MW in total

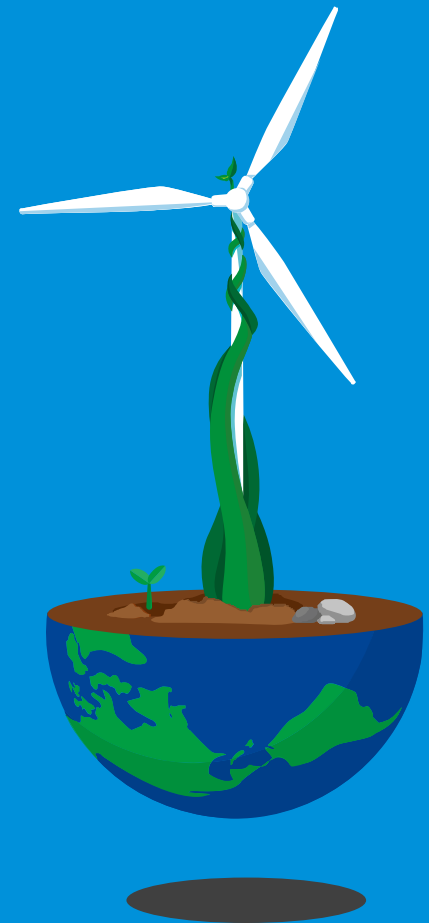
Target to increase

+ 610 MW

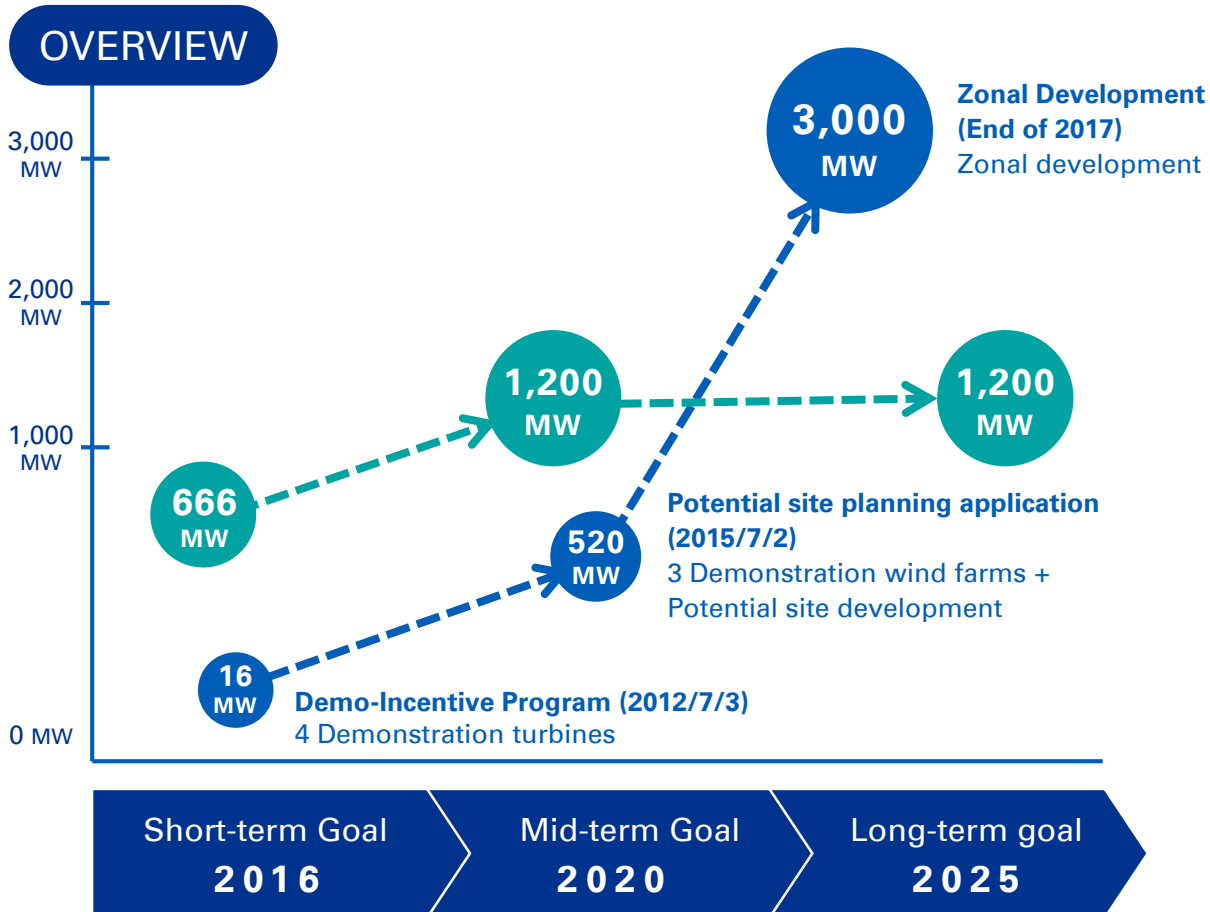
Source: BOE



Wind Power Policy Briefing & Market Dynamics



Taiwan's wind power development policy



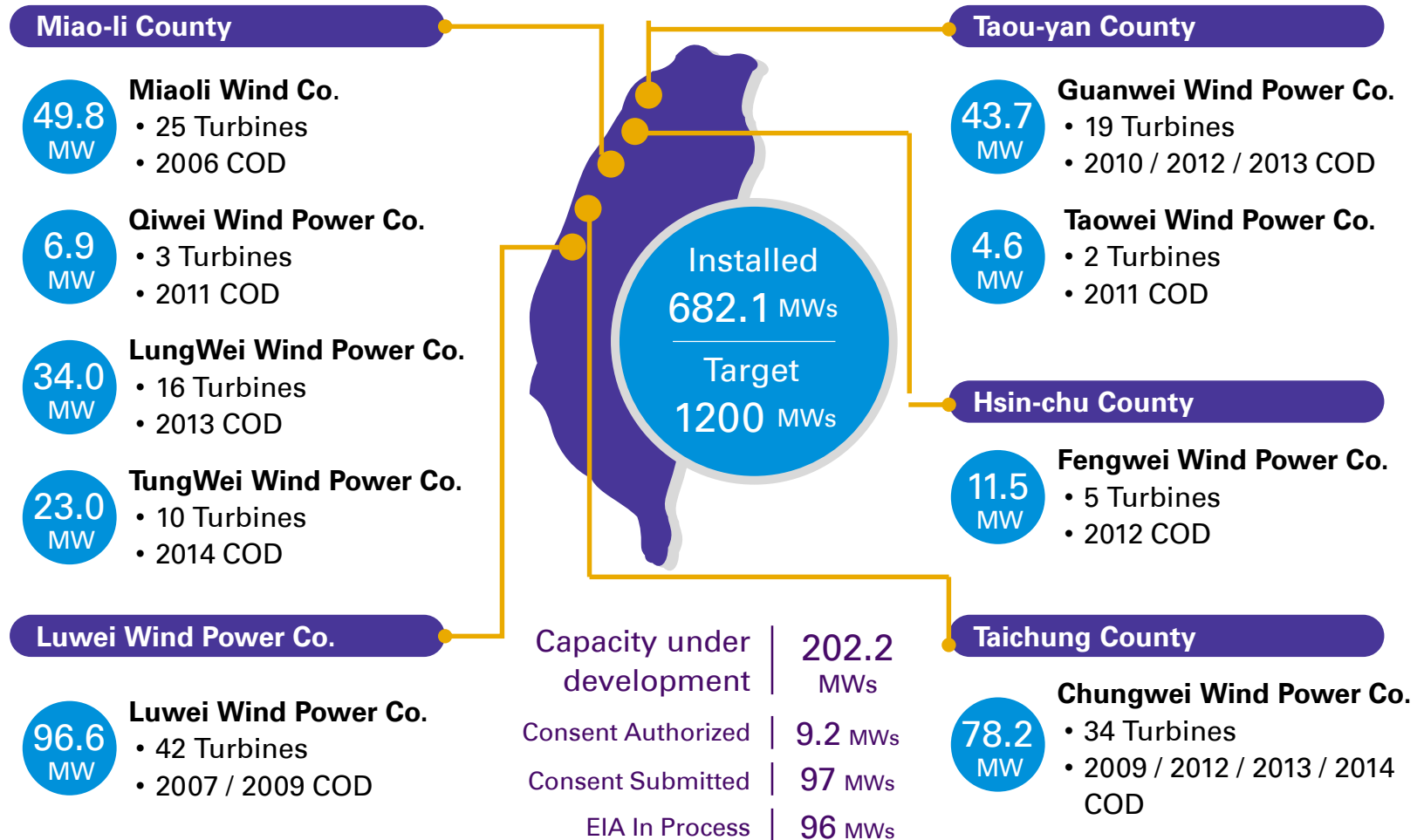
Onshore

- Develop prime wind farms first
- Develop secondary wind farms after

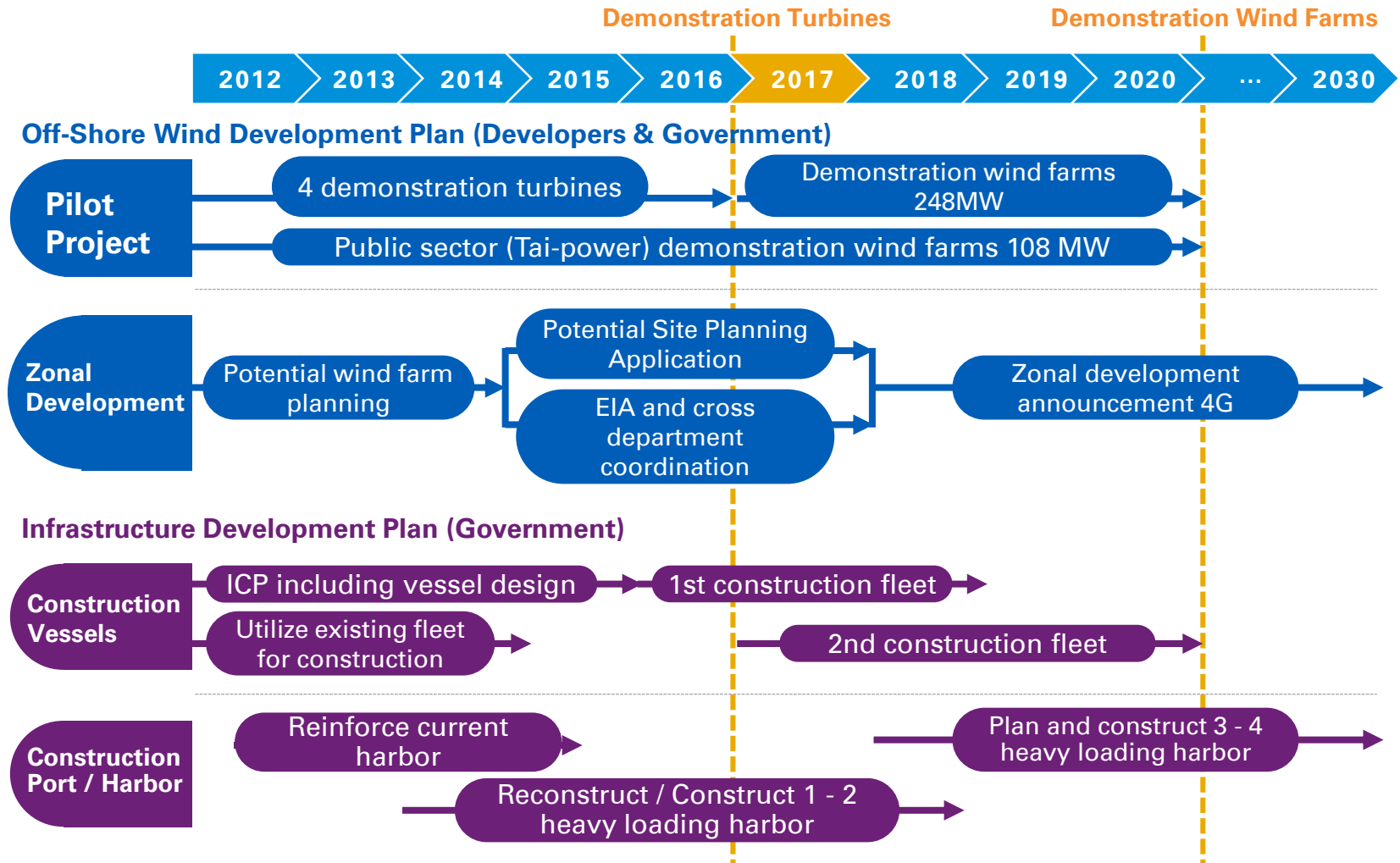
Offshore

- Develop shallow water than deeper water
- Demonstration, potential then zonal

Onshore wind development status















Development plan for offshore wind in Taiwan



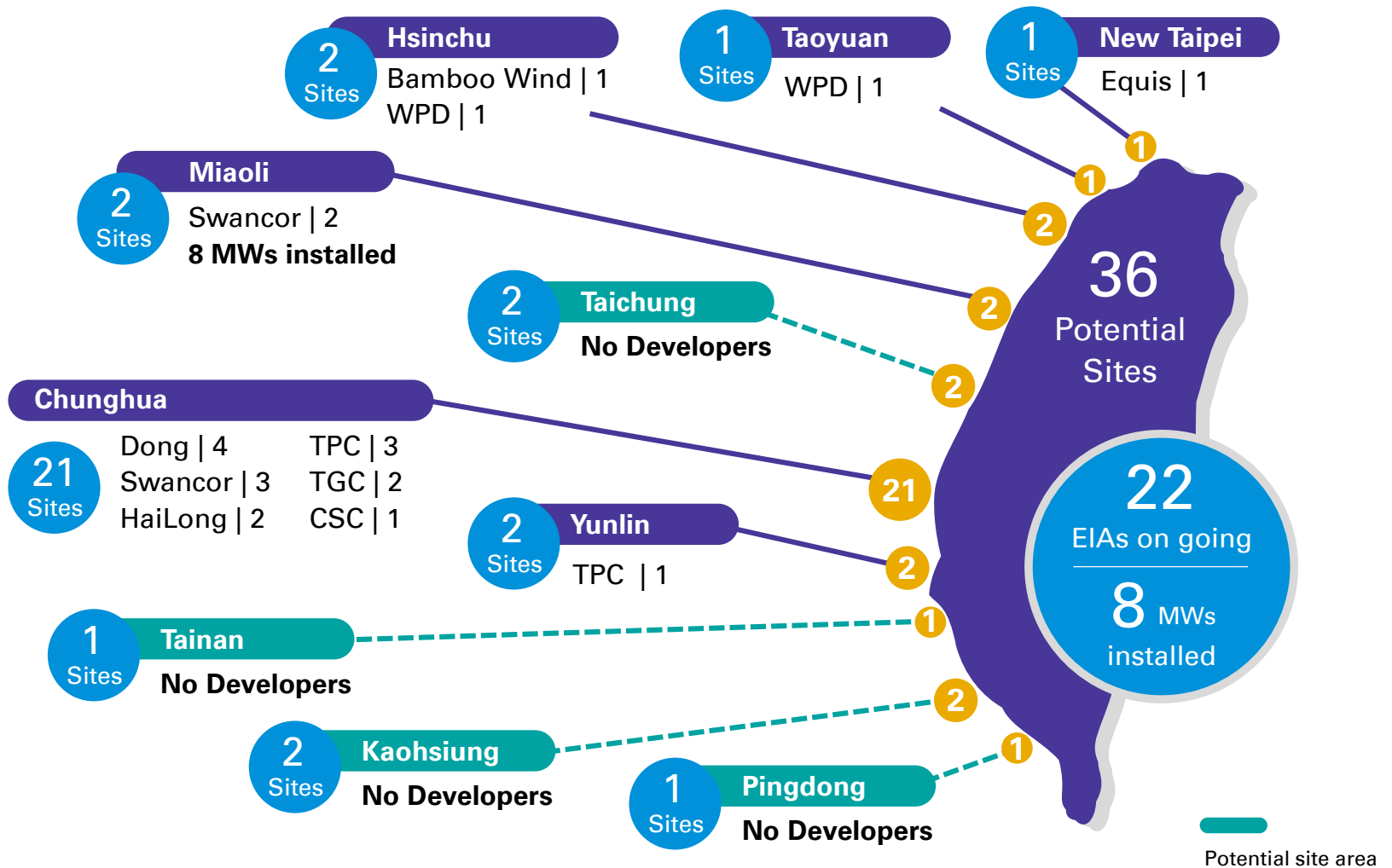
Current development of offshore wind market

Offshore Wind Power Demonstration Incentive Program

To kick-start Taiwan offshore wind power development, an incentive program was launched in 2012 to offer government subsidy of 250 million NTD per demonstration project. 3 awarded developers were selected to build 4 demonstration turbines (Phase I) by 2015 and 3 demonstration farms (Phase II) by 2020.

Company	Shareholders	Location	Capacity (MW)	Turbines	COD Date	Investment Amount (NTD)	Development Update
Formosa Wind Power Co., Ltd	<ul style="list-style-type: none"> Swancor Industry Co., Ltd Dong Energy Macquire Capital 	 Zhunan Township, Miaoli	 129.6	 34	<ul style="list-style-type: none"> Phase I (2 pilot turbines, 8MW) Dec 2016 Phase II (30 pilot turbines, 120MW) Est. Dec 2019 	 20 - 22 Billion	<ul style="list-style-type: none"> 2 turbines for phase I development COD date Dec 2016 Phase II obtained Environmental Impact Assessment approval
Fuhai Wind Farm Corp., Ltd	<ul style="list-style-type: none"> Taiwan Generations Corporation CSBC Corp Century Iron Steel Industrial Co., Ltd CIP 	 Fangyuan Township, Changhua	 108	 30	<ul style="list-style-type: none"> Phase I (2 pilot turbines) Dec 2017 Phase II Dec 2018 	 15 -16 Billion	<ul style="list-style-type: none"> Under going permitting process for construction permit
Taiwan Power Company	<ul style="list-style-type: none"> Government 	 Fangyuan Township, Changhua	 108	 22 - 36	<ul style="list-style-type: none"> June 2020 	 19.5 Billion	<ul style="list-style-type: none"> EIA passed in April, 2015. Extended to start pilot project in 2019

Offshore wind potential site areas



Infrastructure Construction | Electricity Transmission and distribution

Off-shore wind power transmission and distribution

Before 2020

- Developers are responsible to connecting the grid to the existing onshore substations.
- Current grid connection capacity is 758 MW, which is sufficient to meet the 520 MW connection demand of 2020.

Short Term (~ 2020)

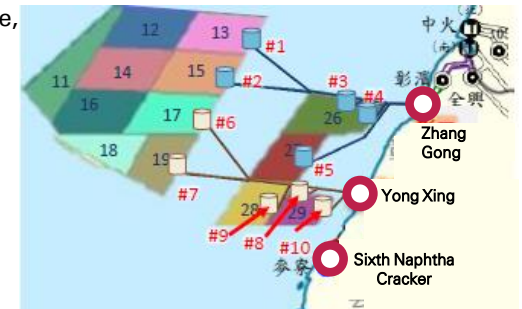
Taiwan Power Company (TPC) will review and approve the grid connection applications, while the developers are responsible for connecting to the onshore substations.

- 2021
- Construct Zhang Yi Switching Station and 161kV Zhang Yi (A) ~ Zhang Guang~ Zheng Bing two circuit line
 - ↓
 - Able to provide 1 GW grid connection capacity for the offshore wind farm around Changhua Area.
- 2023
- Construct 161 kV Zhang Yi (B) ~ Zhong Gang one circuit line, which can provide 0.5 GW grid connection capacity.
 - ↓
 - 2024
 - Construct 161 kV Zhang Yi (B) ~ Zhong Gang one circuit line, providing 1 GW grid connection capacity.

Mid Term (~2025)

Construct Zhang Gong (4.5 GW) and Yong Xing (2 GW) power grid, and provide a total of 6.5 GW grid connection capacity by 2025.

- Construct Zhang Gong booster station and 345kV Zhang Gong~Zhang Zhang Bing two circuit line, providing 2 GW grid connection capacity.
- Construct Yong Xing Switching Station, 161 kV Yong Xing~ Zhang Pi 8 circuit lines, Zhang Pi switching station and Zhang Pi~ Zhang Lin 5 circuit line, providing 2 GW capacity.
- A total of 6.5 GW accumulated grid connection capacity by 2025.



Actual location of off-shore electric substations might be adjusted in condition to future development.

Long Term (2026~)

3.5 GW additional grid connection capacity will be connected to Sixth naphtha cracker complex, accumulated grid capacity for off-shore wind connection will reach 10 GW.

- An additional 3.5 GW grid connection capacity will be connected to Sixth Naphtha Cracker Complex.
- Accumulated total grid connection capacity will reach 10 GW.

Resource | Bureau of Energy Ministry of Economic Affairs, 2017

Two stage Process (1/2)



1. Selection criteria: Local Supply Chain Development, Technical Capability, Social and Environmental Integrity, and Financial Capacity.

2. Objective: To allocate the available grid capacity and to guarantee provision of the infrastructure facility.

1. "Price" is the mainly consideration for getting the development right.

2. Comparatively flexible requirements. (e.g. Local Supply Chain is not required.)

- Develop local supply chain with actual market participation
- Develop off-shore wind market in align with the national infrastructure facility development timeline
- Effectively develop and manage the projects with precise construction and operation timeline
- Two stage allocation process will involve 3GW Selection, followed by 2.5 GW Bidding.

Notes The main criteria for the first 3 GW selection will be the localization. The later 2.5 GW is decided only by bidding (Selected process is not required.) This distribution is to ensure minimum electricity price shock and the expectation of 800MW installation per year.

Resource | Bureau of Energy Ministry of Economic Affairs, 2017

Two stage Process (2/2)

✈✈✈ Selection Stage - 3 GW

✈✈✈ Bidding Stage - 2.5 GW



Application Requirement



Required Documents



Selection Order

Developers who receive and maintain the validity of EIA approval

- ① Developers should receive EIA approval or conditional approval decision from the preliminary review team before Dec 31, 2017
- ② If more than one developer applied for the same zone, only the one that receives the approval or conditional approval by EIA Review Commission first is qualified.

- ① Proposal and TPC's connecting agreement
- ② Provide information on the COD between 2020 and 2025. And express willingness for zone segmentation.

- ① **Selection criteria: Local Supply Chain Development, Technical Capability, Environmental Integrity, and Financial Capacity.**
(Ratings will not be based on development zones. The one with the highest rating would be the first preferred. If there are 2 developers in the same rating, the one with the highest scoring on Local Supply Chain item will be selected as the priority.)
- ② The one with higher ratings could apply for the grid connection capacity first based on the proposed COD year.
- ③ The one who promises to reach COD before 2020 could receive priority in grid capacity allocation regardless of ratings.
- ④ If the annual grid connection capacity is not enough to meet the demand, developers with later priority will need to segment the grid connection amount to the next year (Grid connection amount less than 100MW can be exempted).

Developers not selected shall participate in the bidding stage

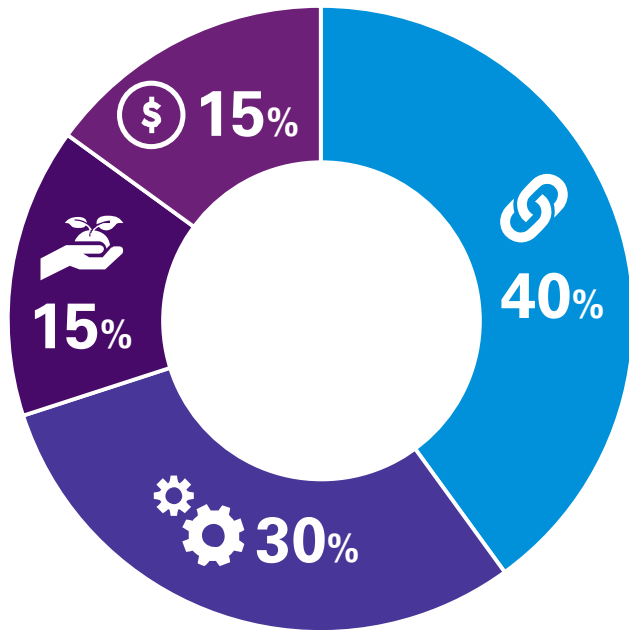
- ① Developers participated in 3 GW selection stage but not selected.
- ② Developers already selected in the first stage can not participate in the bidding stage.

- ① Bidding form and Notice of failure of Selection Stage
- ② Provide information on the COD between 2020 and 2025. And express willingness for zone segmentation.

- ① **Distribute the remaining grid connection capacity after the first 3 GW selection stage**
(If there are no remaining capacity after 3GW selection in that year, there will be no bidding stage.)
- ② **Scoring will be based on the lower price**
(Ratings will not be based on development zones. The lowest price would be the first preferred bid. If there are 2 developers offering the same price, the order would be decided by drawing lots.)
- ③ **Developer with the lowest price can apply for the grid connection capacity first.**
- ④ **If the annual grid connection capacity is not enough to meet the demand, developers with later priority will need to segment the grid connection amount to the next year (Grid connection amount less than 100MW can be exempted).**

Resource | Bureau of Energy Ministry of Economic Affairs, 2017

Selection Stage Criteria



- Local Supply Chain Development
- Technical Capability
- Social and Environmental Integrity
- Financial Capacity

Sub-criteria

Turbine	15%
Marine Engineering	10%
Subsea Foundation	8%
Local Industry Development	7%
Construction	12%
Engineering and Design	8%
Operation and Maintenance	10%
Environmental Integrity	10%
Corporate Social Responsibility	5%
Financial Solidness	8%
Local Financial Institution Involvement	7%

Current issues in offshore wind development in Taiwan

Critical obstacles faced by developers in Taiwan

Lack of local resource integration increases both project cost and contingency;

- There are currently no unloading harbors for turbines and foundation. Developers rented dock from CSBC for this purpose.
- No available vessels in the region. With political considerations developers are prohibited to hire Chinese vessels and can only opt to hire European vessels which reflects in high cost for construction.



Lack of confidence and experience in the local financial sector to support project development



Complex permitting process and inefficient communication with authorities



Harsh marine environment for construction with a half-year construction window



Lack of experience in marine engineering reflects in increase contingency for the project development



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- People & Change
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- IRM
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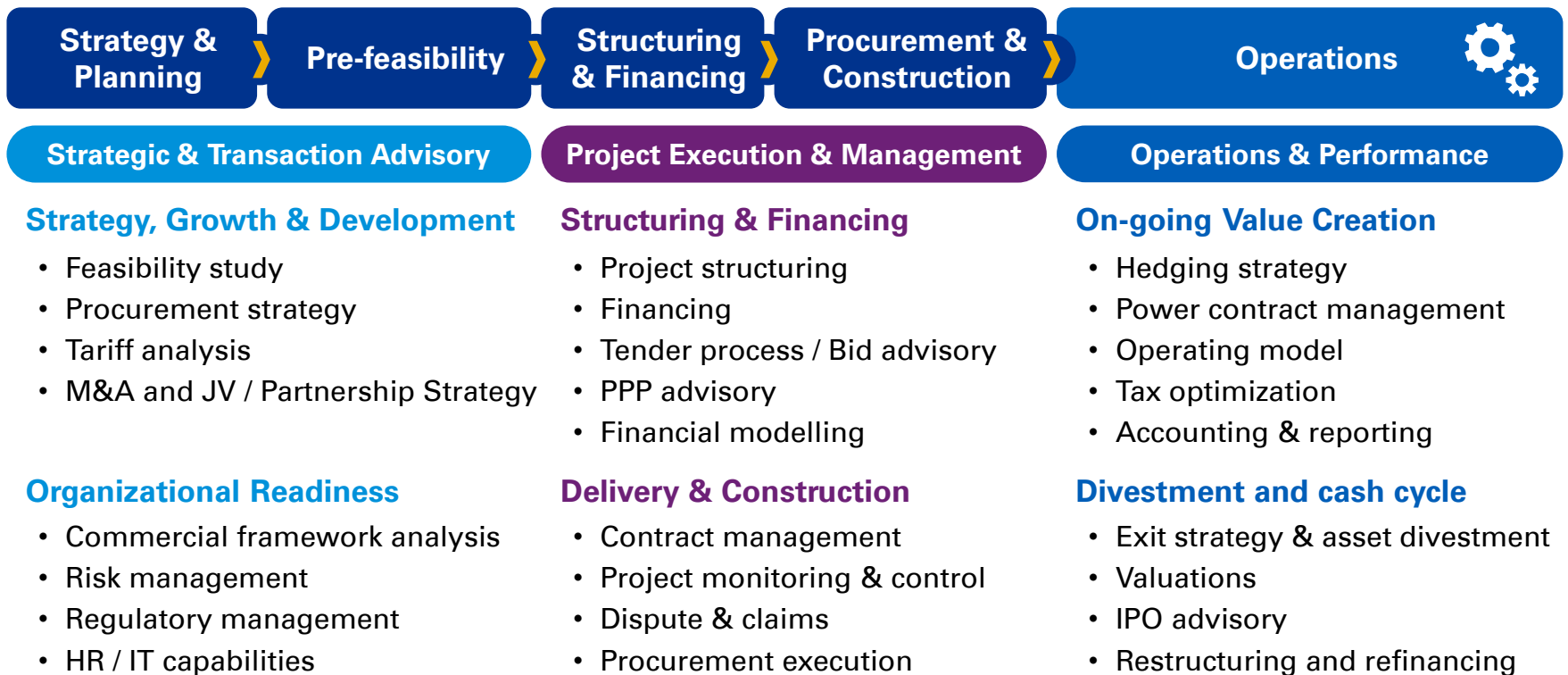
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KPMG Taiwan Power & Utilities Credentials



Challenger MBK Fund Management Pte Limited

KPMG Deal Advisory

assisted Challenger Emerging Market Infrastructure Fund Pte Ltd (EMIF) in connection with its acquisition of 100% interest in Miaoli Wind from Macquarie International Infrastructure Fund Limited (MIIF)

USD 0.07 million
January 2013



China-based Venture Capital

KPMG Deal Advisory

acted as financial adviser to the management team on their investment of a Taiwan-based solar cell manufacturer

Value not disclosed
November 2008



Marubeni Corporation

KPMG Deal Advisory

assisted Marubeni, the listed Japan-based trading conglomerate, in connection with its acquisition of 21% stake in Taiwan-based power plant operator Hsin Tao Power

USD 77 million
October 2008



Merrill Lynch (Asia Pacific) Ltd.

KPMG Deal Advisory

acted as financial adviser to the management team on their investment of Gintech Energy Corporation

Value not disclosed
December 2006



US listed company

KPMG Deal Advisory

acted as financial adviser to the management team on their investment of a Taiwan-based solar cell manufacturer

Value not disclosed
November 2002



A HK based electric company

KPMG Deal Advisory

assisted the Hong Kong based electronic company in its proposed acquisition of a Taiwan-based power plant operator

Deal not completed
August 2000



A Singapore power company

KPMG Deal Advisory

assisted the Singapore power company in its proposed acquisition of a Taiwan-based power cogeneration plant operator

Deal not completed
May 2002



KPMG Taiwan Power & Utilities Credentials

Titan Solar Limited
KPMG Advisory Services

Financial, Tax and Investment
 Structure Advisory Services for
 Investment in the Philippines



Value not disclosed
October 2015

SAS Sunrise Inc.
KPMG Advisory Services

Financial, Tax and Investment
 Structure Advisory Services for
 Investment in the Philippines

Value not disclosed
August 2015

ITRI
KPMG Advisory Services

Assisted ITRI in establishing
 international co-operation platform for
 solar power investment and financing
 and relative issues

Value not disclosed
April 2015

Marubeni Corp
KPMG Corporate Finance

Engaged by Marubeni to perform fair
 value estimates on Hsin Tao Power
 Corporation for impairment test
 purposes.

March 2013

Marubeni Corp
KPMG Corporate Finance

Engaged by Marubeni to perform
 pricing analysis on Taiwan Top Power
 AXIA Taiwan Holdings Co., Ltd..

April 2012

**Kyushu Electric
 Power Co., Ltd.**
KPMG Corporate Finance

Engaged by Kyushu to perform
 purchase price allocation exercise
 pursuant to ROC GAAP SFAS 25 and
 37 following Kyuden Hsin Tao Power
 Holdings Co. Ltd's acquisition of Hsin
 Tao Power.

July 2011

Marubeni Corp
KPMG Corporate Finance

Engaged by Marubeni to perform
 purchase price allocation exercise
 pursuant to US GAAP SFAS 141R
 following Taiwan Top Power 's
 acquisition of Hsin Tao Power.

December 2010

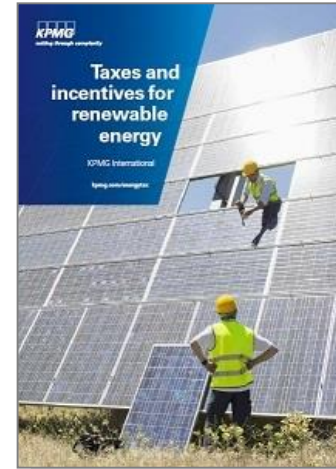
KPMG Thought Leadership

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Compiled by KPMG's Global Energy & Natural Resources tax practice, the 2015 edition provides updates on renewable energy promotion policies for 31 countries.

It also includes information on adoption trends for renewables, the growing prominence of emerging markets, new solar and wind initiatives, and key investments in renewable energy around the world.

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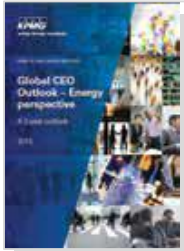
The 2015 edition provides updates on renewable energy promotion policies for 31 countries.



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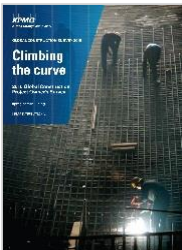


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Thank you

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