

SAAC Singapore
Accountancy And Audit
Convention Series

PAIR Conference 2020

GEARING UP TO REBOOT IN A NEW WORLD

Infrastructure Finance – Focus on Renewable Energy Financing In Asia

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Renewable Energy Financing

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A Look at the Covid-19 Crisis

Renewable Energy Infrastructure Financing Can Lead Economic Recovery After Covid-19

“We’re seeing a major shift towards low-carbon sources of electricity including wind, solar PV, hydropower and nuclear. Low-carbon technologies are now set to extend their lead as the largest source of global electricity generation, reaching 40% of the power mix in 2020.”

– International Energy Agency, 5 May 2020



Infrastructure Finance Remains Strong

- Infrastructure financing during this challenging period is still ongoing
- In April 2020, DBS successfully financed Taiwan’s largest floating solar project

“The current pipeline of investment could create over 50,000 new jobs, lower power prices, and inject over \$50 billion worth of investment to revitalise economic activity in regional and rural communities.”

– Clean Energy Council on its renewables-led recovery, 5 May 2020



Impact of Global Lockdown

- Manufacturing activities and supply chains are affected due to lockdowns
- Travel restrictions have also impacted construction and project development schedules

“There is another trend driving renewables development that will prove to be more immune to lower oil and gas prices. A growing number of companies, including many large, global firms, have made commitments to use growing shares of renewables to meet their captive power needs.”

– Eurasia Group, 18 May 2020



Preparation Work On-Track

- Preparation work for financing Taiwan’s offshore wind farms in H2 2020 are still ongoing and on-track

“Climate change will continue, regardless of Covid, we should use this opportunity that we have been given when restarting and recovering the economy to have the strategies in place that align with climate goals.”

– Annica Bresky (President and CEO of Stora Enso Oyj), Bloomberg Green, 19 May 2020



Potential to Participate

- Singapore firms can participate in Taiwan’s offshore wind farms
- PSA Marine, Sembcorp Marine and Keppel O&M have supported past projects based on its unique capabilities

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Case Study: 180MW Floating Solar PV Project in Changhua City, Taiwan

Transaction Summary



- DBS was appointed Joint Financial Advisor and Mandated Lead Arranger
- DBS also raised financing from 2 international banks and 4 local Taiwanese banks



- Innovatively structured term loan facility
- Underpinned by 20-year PPA with Taipower



- World's largest floating solar project when completed by end 2020
- Taiwan's first international-style, non-recourse loan for large-scale floating solar project



- Total debt raised was NT\$ 7.2bn (~US\$ 240m)

Relevance of this Transaction

- Building on DBS' capabilities in Taiwan for solar PV, DBS was appointed as Joint Financial Advisor for this transaction. There were multiple first-of-its-kind technical and legal issues that had to be structured around.
- This unique transaction showcases DBS' ability to display thought leadership in structuring a project financing for the adoption of a new technology in Taiwan.
- DBS also assisted to garner interest from 6 other banks to close the deal in compressed timelines. DBS' multiple roles¹ in the transaction also demonstrated its wide range of banking products.



Wind Turbine Generators

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Wind Turbine Generators

Fun Facts about Wind Turbine Generators

Did You Know...



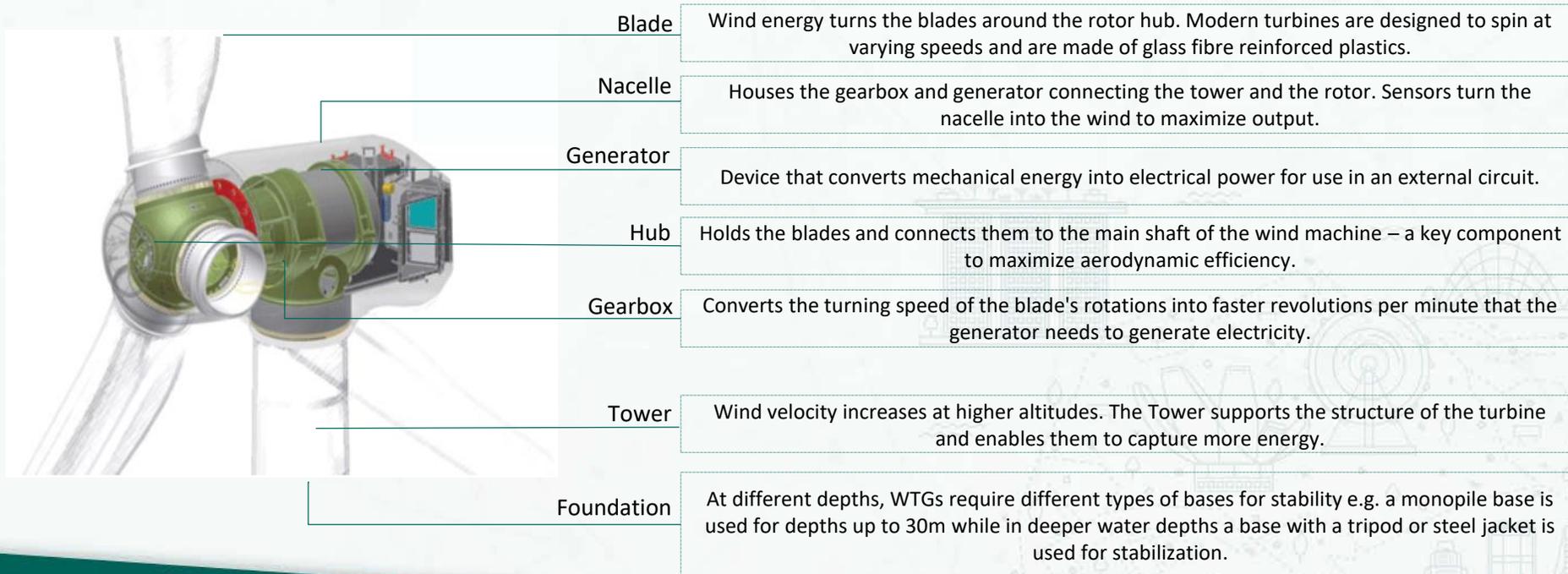
Offshore Wind Farms are Huge
Rotor diameters can be more than 160m, and turbines can be installed up to around 50m of sea depth



New Commissioned Capacity
In 2019, 60.7GW of capacity was installed. 88% was onshore additions and the remaining was offshore



Market Share
Over half are dominated by MHI Vestas, Siemens Gamesa, Goldwind and General Electric



Taiwanese Offshore Wind Market



Taiwanese Offshore Wind Market

An Overview of the Renewable Landscape

A Commitment to Renewable Energy

By 2025, the government aims to install 20GW of solar capacity, 1.2GW of onshore and 5.5GW of offshore wind capacity.

The government’s agenda of **phasing out nuclear plants** and **reducing reliance on thermal fuel imports** are facilitating renewables development.

Taiwan Strait receives **top ranking globally for wind speeds** from 4C offshore.

Supportive regulations via the Renewable Energy Development Act (“REDA”) and Electricity Business Act (“EB Act”) which provides for **priority of grid dispatch and FIT regime**

Challenges

- Large-scale renewable energy projects require participation from international lenders with ECA involvement given amount of funding required.
- Increasing local content requirements may result in reduced ECA participation, testing international lenders’ interest. This can be further impacted by the current lack of local expertise and congestion of projects coming onstream.
- Annual adjustments in future FITs and potential political risk arising from change in ruling party may dampen investor interest.
- Hedging market is currently available for up to 10 years.

Opportunities

- Strong pipeline of projects and government support, including FITs, tax breaks and tradable energy certificates.
- Strong investment potential due to investment grade offtaker² and established renewable energy regulatory regime.
- Plenty of opportunities to partner with existing sponsors via partial acquisition.

Country Profile

PPA Term/FIT	20 years
Offtaker Rating	Investment Grade ¹
Bankability of PPA	Yes (model PPA supported by local legal framework ²)
ECA Cover	Possible
Currency	NTD
Resource Type	Onshore/Offshore Wind, Solar, WTE (limited), Geothermal (limited)

Solutions

- Corporate PPA, when structured well, may generate interest for financing.
- Potential to develop bonds as part of debt capital structure in refinancing transactions as seen in the more mature UK market.

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1. State-owned power utility company Taiwan Power Co. Ltd (“Taipower”) is rated AA- (Stable Outlook) by Fitch Ratings
 2. Takes into account elements under local law and regulations that are supportive of renewables.

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Taiwanese Offshore Wind Market

Overview of Offshore Windfarm Projects in Taiwan

	Project	Map Label	Connection Year	Sponsor	Capacity (MW)	Tariff (NT\$/kwh)
Phase 1	Formosa 2	●	2021	Macquarie, Swancor	378	7.12 / 3.57
	Formosa 1	●	2017	Macquarie	128	7.11 / 3.46
	Yunlin	●	2022	wpd	708	7.12 / 3.57
	Guanyin	●	2022	wpd	350	TBD
	Greater Changhua Southeast	●	2021	Orsted	605	6.28 / 4.14
	Greater Changhua Southwest	●	2021 / 2025	Orsted	295	6.28 / 4.14
	Changfang & Xidao	●	2022 / 2023	CIP	600	6.28 / 4.14
	Zhong Neng	●	2023	CIP, CSC, DGA	300	6.28 / 4.14
	Taipower		TBD	Taipower	300	n/a
	Hai Long 2	●	2024	Northland Power	300	6.28 / 4.14
Phase 2	Hai Long 2	●	2025	Northland Power	232	2.23
	Hai Long 3	●	2025	Northland Power	512	2.50
	Greater Changhua Northeast	●	2026	Orsted	583	2.55
	Greater Changhua Northwest	●	2025	Orsted	337	2.55

Locations of Offshore Wind Farms in Taiwan



Taiwanese Offshore Wind Market

Typical Project Risk Allocation

RISK	CONSIDERATIONS	ALLOCATED TO		
		PROJECT CO	EPC	O&M
Similar to the UK offshore wind market				
Construction Cost Overrun / Interface Risk	<ul style="list-style-type: none"> Single lumpsum turnkey EPC contract is not available Multi contracting approach required Contingencies, LDs and sponsor experience to be considered 	✓	✓	
O&M Risk	<ul style="list-style-type: none"> WTG O&M typically undertaken by WTG supplier Long term supply agreement to ensure availability of spares O&M contractor responsible for vessel charter for site access 			✓
Wind Resource Risk	<ul style="list-style-type: none"> Energy yield assessment typically requires more than 12 months of data Seasonality changes may affect short term generation and cash flows 	✓		
Different from the UK offshore wind market				
Local Supply Chain	Local supply chain not as developed; longer lead time for equipment supply and transportation, hence increasing risk for construction delay		✓	
Tariff (Inflation) Risk	Tariff is fixed under Taipower PPA but no indexation to CPI (e.g. in the UK, for the CfDs)	✓		
Interest Rate Risk	NTD IRS tenor could be up to 10 years vs longer tenors available in UK	✓		
Natural Force Majeure Risk	<ul style="list-style-type: none"> Seasonal risks (i.e. typhoon) affecting contingency sizing in terms of costs and construction schedule Reliance on insurance for natural catastrophe (eg seismic) in both markets but capacity for TW market may be constrained 	✓		

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Role of Other Singapore Based Companies



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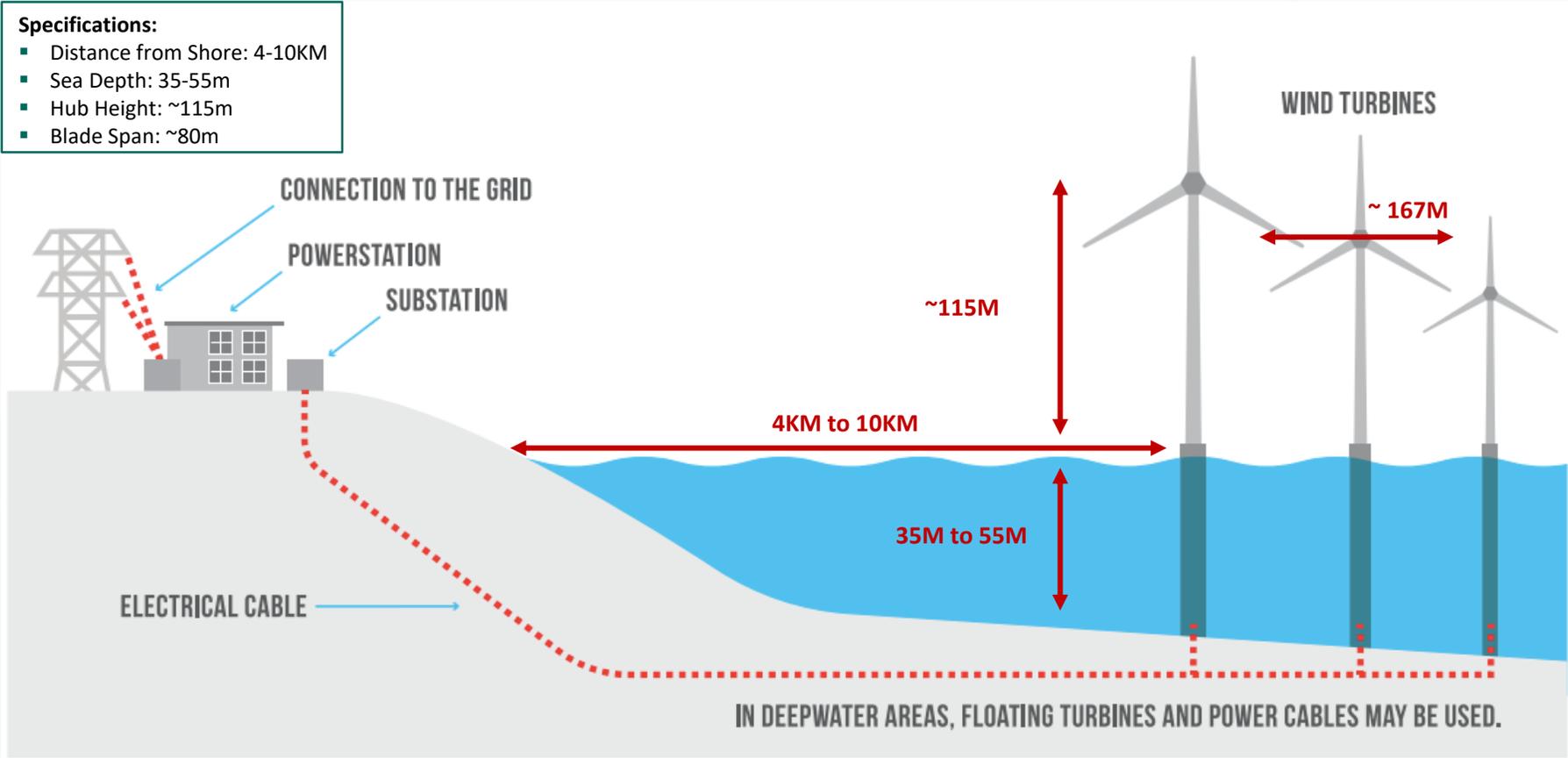
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Role of Other Singapore Based Companies

Simplified Layout of An Offshore Windfarm

Pictorial Representation of an Offshore Wind Farm Project



- Electricity produced by the wind turbine generators are transmitted via offshore electrical cables to an onshore substation which connects the Project to the Grid

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Role of Accounting & Audit Firms

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Role of Accounting & Audit Firms

Tax and Model Audit Advisory Services

 Assurance	Review and confirm the integrity, logic, methodology and mathematical accuracy of the Financial Model
 Tax/Accounting Standards	Review the Financial Model and confirm it complies with the applicable local taxation regime and accounting rules
 Consistency	Review and confirm the key input and formulae used in the Financial Model are consistent with the relevant portions of the documentation and information provided
 Documentation	Review and confirm the calculations of relevant financial ratios and covenants in the Financial Model to ensure they correctly reflect the definitions in documentation
 Sensitivity	Review and confirm that the Financial Model when stressed under the designated sensitivity analysis, is able to run the defined scenarios and changes correctly flow through to the results
 Macros	Review and confirm that any macros in the Financial Model to govern relevant calculations are correct and appropriate

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Role of DBS – Case Study

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**Formosa 2,
Confidential (2019)**



MLA, Co-Technical Bank, Hedge Provider and Onshore/Offshore Security Agent Bank for the 376MW offshore wind farm in Taiwan.

- DBS was appointed as **Mandated Lead Arranger, Co-Technical Bank, Hedge Provider and Onshore/Offshore Security Agent Bank** for the financing of 376MW offshore wind farm in Taiwan.

Deal Summary

- Formosa 2 is a joint venture between Macquarie Capital and Swancor Renewable Energy.
- Debt is arranged by a club of Export Credit Agencies (“ECAs”) and international and local commercial banks.

Project Data

Location	Chunan Town, Miaoli County, Taiwan
Total Capacity	376MW
Off-take	20-year PPA with Taipower
Energy Resource	Wind
Project Cost	Confidential

Noteworthy Features

- Facilities were structured as typical non-recourse project financing despite the lack of a single turnkey EPC contract to wrap a complex construction process.
- Formosa 2 will provide Taiwan with clean energy and assist its transition towards renewable energy. The offshore wind farm will generate enough electricity to power 380,000 households each year.
- Comprehensive cover was provided by ECAs for ~50% of the term loan facilities.

Role of DBS and Other Singapore FIs

- DBS appointed as MLA, Co-Technical Bank, Hedge Provider and Security Agent Bank – demonstrates skill and expertise in managing structured deals.
- In line with DBS’ support in the sustainability and renewable sector, this is the third (out of four) offshore wind project in Taiwan that DBS is financing.
- Besides DBS, other Singapore-based FIs (such as OCBC and Siemens Bank, Singapore Branch) also played instrumental roles in the financing via provision of term loan and letter of credit facilities.

Appendix

Appendix

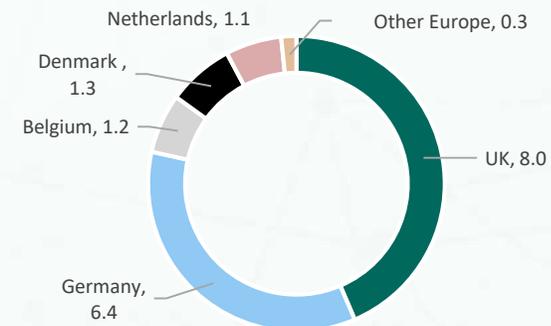
Evolution of Offshore Wind Farms

Overview

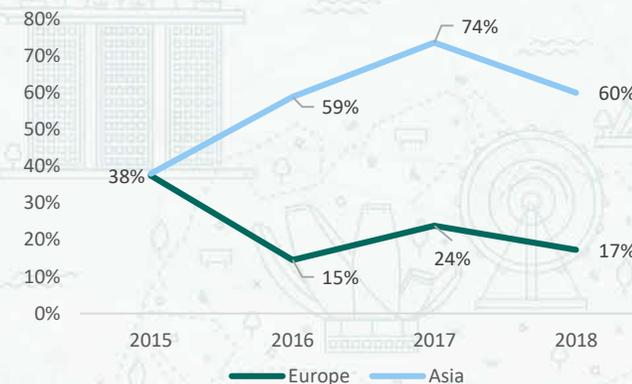
- Europe was an early adopter of offshore wind with the world’s first wind farm installed in 1991 off the coast of Denmark¹.
- As of 2018, Europe has installed capacity of ~18.3GW in offshore windfarms, which is roughly 80% of all offshore wind installations globally.
- With improving efficiency and lower costs, offshore wind development has become a key focus for countries with ample coastlines as part of their energy mix².
- Europe is expected to add 3 – 4GW per annum and Asia is expected to 5 – 7GW per annum if governments remain committed and investments are executed.
- Key growing offshore wind markets in Asia include Taiwan, South Korea and Japan.
- For the first time in 2018, China installed and connected more offshore wind capacity than any other country.
- By 2025, global offshore wind capacity is expected to reach ~100GW.

Cumulative Installed Capacity (GW)	2014	2015	2016	2017	2018
Europe	8.0	11.0	12.6	15.6	18.3
Asia	0.8	1.1	1.7	3.0	4.8

2018 Total Installed Capacity Breakdown, Europe (GW)



Annual Growth Rates of Offshore Wind Capacity (%)



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1. The 4.95MW Vindeby Offshore Windfarm by Dong Energy (now known as Orsted).
 2. According to the International Renewable Energy Agency (IRENA), the levelized cost of energy for offshore wind in 2018 was 20% lower than it was in 2010.

Sources: Global Wind Energy Council – Global Wind Report 2014-2018, Environmental and Energy Study Institute, IRENA

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