

Offshore Wind Industry Policy and Development in Taiwan

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Agenda



**Offshore Wind Power Policy and
Implementation Approaches**



**Outcomes of Offshore Wind Power
Localization**



**Localization Planning for Zonal
Development**

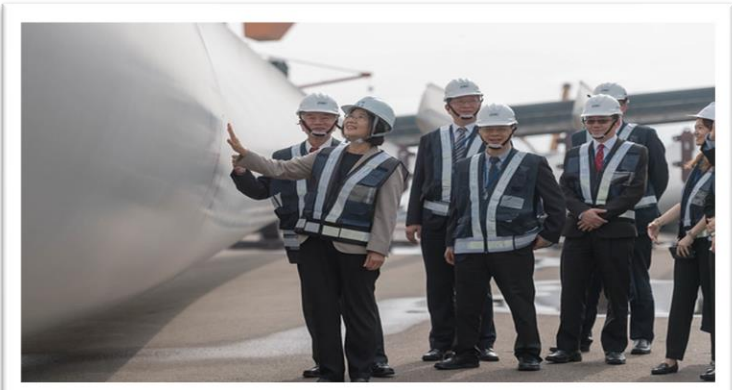


Conclusion

President Tsai: Transform energy and create an offshore wind power industry cluster in Asia



New Energy,
New Business Opportunities,
New Jobs



Offshore wind power is both an energy policy and a industry policy

Phase 1

Demo Incentives

1 Provide subsidies to accumulate experience

- 2017: 2 demo sets at Formosa 1
- 2019: 60 sets (120MW in total) at Formosa
- 2020: 21 sets (109.2MW in total) at Taipower

1 Guide supplier engagement

- ✓ Turbine components- Swancor, Fortune, Powercom, Walsin
- ✓ Foundation- Ming Rong Yuan

Phase 2

Potential Sites

2 Announce sites for application

- 2021-2024: wind farm selection (3.8GW in total)
- 2025: wind farm auction (1.7GW in total)

2 Facilitate industry cluster

- ✓ South-North foundation cluster (SDMS, Century)
- ✓ Taichung Port turbine cluster (SGRE、MVOW)

Phase 3

Zonal Dev.

3 Build the industry led by the government

- 2026-2035: release 1GW/year (10GW in total)
- Two-phase selection: first qualification assessment, then price comparison

3 Further industry dev.

- ✓ Continue the energy of potential site suppliers
- ✓ Optimize investment environment
- ✓ Become Asia-Pacific offshore wind power hub

Jan. 18, 2018: Announcement of Taiwan's Offshore Wind Power Policy

Goal

Promote the dev. of Taiwan's offshore wind power industry, build the supply chain, and compete in **Asia-Pacific markets**

Strategies

- (1) **Build infrastructure for the industry to develop upon:** plan offshore wind power zones to facilitate investment and form clusters.
- (2) **Facilitate the dev. of supply chain:** Attract international manufacturers to Taiwan via market incentives; encourage international and local suppliers to form partnerships in turbine manufacturing, foundation and vessel manufacturing, etc.; create a supply chain for the industry.

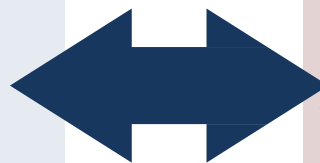
Year of Grid Connection	2021	2022	2023	2024	2025
Phase	Preparation	Preparation	Phase 1	Phase 2	Phase 2
Items	<ul style="list-style-type: none"> ➢ Tower ➢ Foundation ➢ Electrical components: <ol style="list-style-type: none"> 1. Transformer 2. Switchgear 3. Distribution panel The above are on-shore power systems. ➢ Marine engineering planning, design, construction and supervision, manufacturing: <ol style="list-style-type: none"> 1. Construction and supervision of surveying, cable laying, exploration, etc. Vessel and machine planning and design and safety management. (BOE) 2. Ship building: a supply chain of new or retrofitted installation vessels (for survey, supply, arrangement, transportation, cable laying) (IDB) 	<ul style="list-style-type: none"> ➢ Items for 2021 	<ul style="list-style-type: none"> ➢ Turbine component: nacelle assembly, transformer, distribution panel, UPS, canopy & spinner, cable, hub casting, fastener ➢ Submarine cables ➢ Marine Engineering planning, design, construction and supervision, manufacturing: <ol style="list-style-type: none"> 1. Construction and supervision of tower, foundation, etc. Vessel and machine planning and design and safety management (BOE) 2. Ship building: a supply chain of new or retrofitted installation vessels (for installation & transportation) (IDB) 	<ul style="list-style-type: none"> ➢ Turbine component: gearbox, generator, PCS, blade & resin, nacelle housing, nacelle bedframe casting ➢ Marine Engineering planning, design, construction and supervision: construction and supervision of turbines. Vessel and machine planning and design and safety management (BOE) 	<ul style="list-style-type: none"> ➢ Items for 2021 & 2022 ➢ Items for 2023 ➢ Items for 2024
			<ul style="list-style-type: none"> ➢ Items for 2021 & 2022 	<ul style="list-style-type: none"> ➢ Items for 2021 & 2022 ➢ Items for 2023 	

2. Outcomes of Offshore Wind Power Localization (1/5)

Wind farm developer- Ørsted, Denmark



- Tower
- Foundation (jacket)
- Onshore substation BOP
- Turbine nacelle assembly
- Vessel reconstruction/construction
- Offshore wind power supply chain matching platform
- Taichung Port O&M Center
- BESS
- Apprenticeship program
- DD Radar

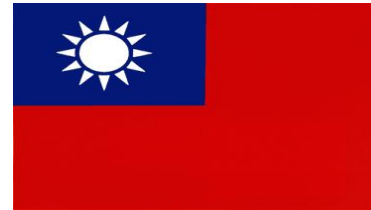


- ✓ CS Wind & Chinfong building tower factory
- ✓ 22 foundation component suppliers: SDMS, Century, FHI, CSBC, etc.
- ✓ Star Energy & local sub-suppliers (Chung-Hsin, Fortune, etc.)
- ✓ SGRE building nacelle factory at Taichung Port
- ✓ Port affairs (Lungteh CTV)
- ✓ 15-year SOV contract with Ta San Shang
- ✓ Delta providing overall energy storage technology and system integration service

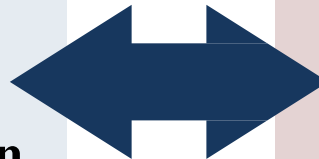


2. Outcomes of Offshore Wind Power Localization (2/5)

Wind farm developer- wpd, Germany



- Tower
- Foundation (monopile)
- Onshore substation BOP
- Vessel reconstruction/construction



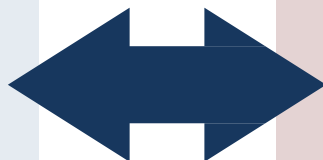
- ✓ CS Wind & Chinfong building tower factory
- ✓ 3 foundation component suppliers: FHI, Century, CTCI
- ✓ GE & local sub-suppliers (Chung-Hsin, Fortune, etc.)
- ✓ Lungteh (CTV)

Taiwan-Denmark foundation collaboration- joint venture



Century Bladt Foundations Co., Ltd.

- Major foundation supplier in Europe
- Responsible for project mgmt: foundation manufacturing process planning, foundation manufacturing technology & design



- ✓ Large steel structure manufacturing factory in Taiwan
- ✓ Invest & establish Century Wind Power
- ✓ Century Wind Power & Bladt establish joint venture Century Bladt
- ✓ Invest >NTD\$ 5 billion, build factory at Taipei Port
- ✓ Annual capacity: 35-50 jacket foundations, 150 piles

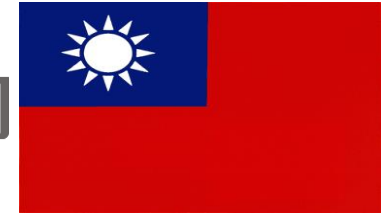
Taiwan-Spain foundation collaboration: technology transfer



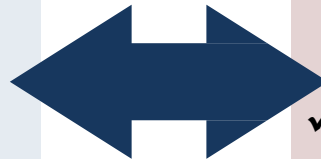
NERVIÓN
INDUSTRIES



中鋼公司

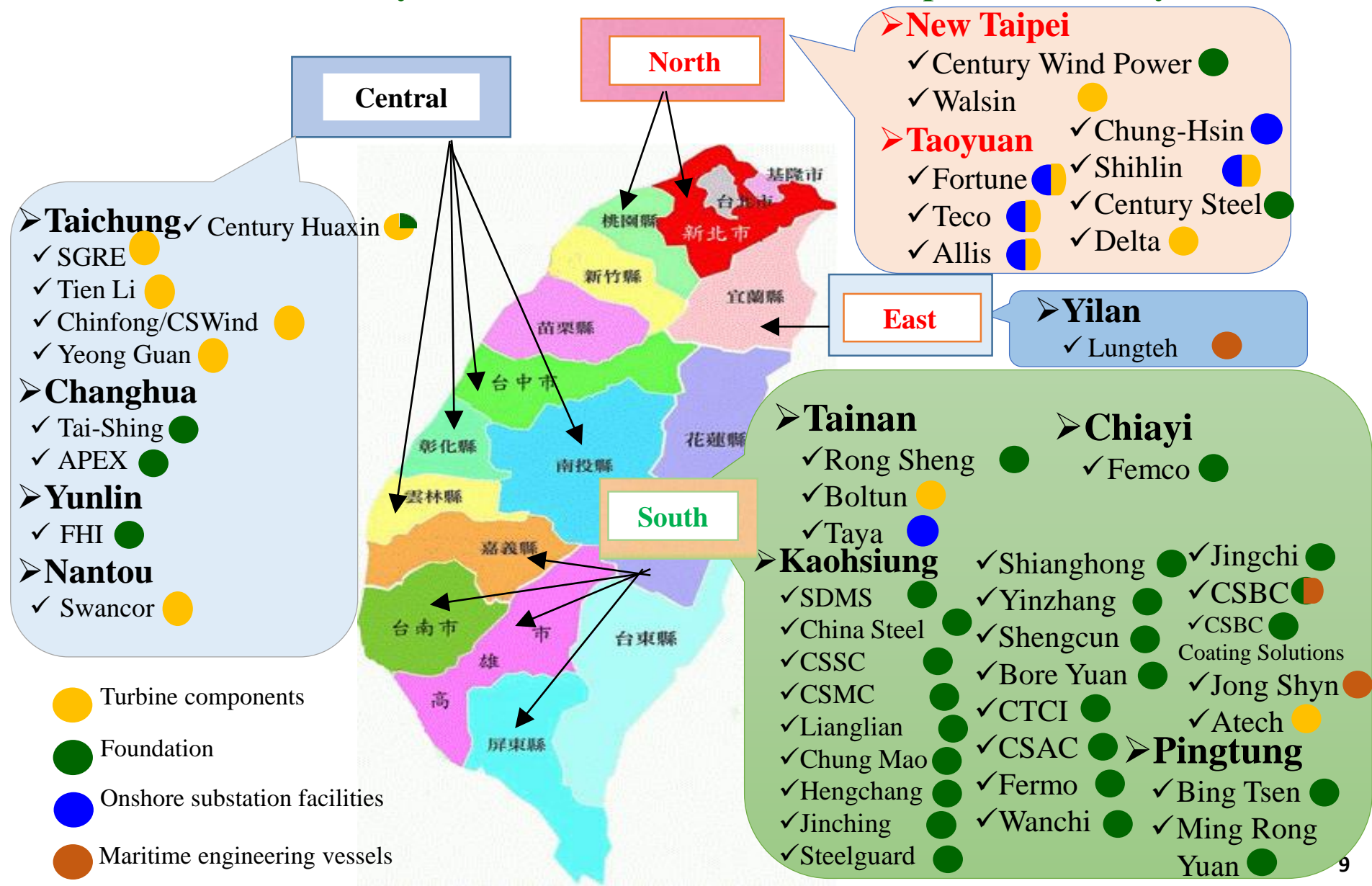


- Major foundation supplier in Europe
- Onsite professional technicians mentoring the manufacturing process
- ✓ Thank you for sending professionals to Taiwan for technical support during the pandemic
- ✓ Help Taiwan suppliers to shorten their learning curve and ramp up



- ✓ Largest steel company in Taiwan & the only one with blast furnace and integrated steel mill
- ✓ Invest NT\$ 3.421 billion to establish SDMS
- ✓ Hire DNV GL to ensure system & product quality
- ✓ Invest NT\$ 6.8 billion at Kaohsiung Xingda Port base (27.5 hectare) for production lines

Successfully create Taiwan's offshore wind power industry clusters



3. Localization Planning for Zonal Development (1/3)

Public Consultation on Industrial Relevance Program (IRP)

- ◆ IDB has hosted **75** public consultations to gather input from **86** stakeholders (domestic suppliers of foundation/onshore power facility/turbine component, developers, turbine manufacturers, trade associations) to inform policy-making on Zonal Development.

Suggestion	Key Points
<ul style="list-style-type: none"> ➤ Keeping existing localization-designated items 	<ol style="list-style-type: none"> (1) Keeping all: China Steel (CSC) (2) Keeping all, w/ modification on core technologies: CIP etc. e.g. “turbine assembly line” technology: targeting transformer, switchgear, UPS, spinner & canopy, cables, hub casting and fastener assembly (3) Keeping all, w/ substation allowed: wpd, NPI, Formosa III, Innogy, Chu Feng, TGP, etc. e.g. to include non-industrial items, such as talent development. (4) Keeping all, w/ new items added: CIP, EOLFI, Formosa III, Marubeni e.g. to add floating foundation, foundation grouting materials.
<ul style="list-style-type: none"> ➤ Do not keep the items ✓ Main component cost ratio ✓ Weighted scoring 	<p>Proposed by: Ørsted, SGRE etc, for example:</p> <ol style="list-style-type: none"> (1) Main component cost ratio: proportion of local procurement volume of turbine components (localization/full turbine costs); similar principles applicable for foundation & marine engineering (2) Item list: gov announces a localization item list (with weights specified), developers make own decisions.

Proposal of the designated items of IRP

(based on the willingness of companies in consultation meetings)

Sector	Electrical components	Foundation	Wind turbine components	Vessels
Industrial development items	<ol style="list-style-type: none"> 1. Onshore electric equipment <ul style="list-style-type: none"> ➤ Transformer ➤ Switchgear ➤ Distribution panel ➤ Cables 2. Submarine Cable 3. Other offshore electrical facilities 	<ol style="list-style-type: none"> 1. Transition piece 2. Main pipe 3. Pin pile 4. Other relative materials¹ 	<ol style="list-style-type: none"> 1. Nacelle Assembly 2. Tower 3. Transformer 4. Distribution panel 5. Uninterruptible Power Supply 6. Spinner & Nacelle cover 7. Cable 8. Casting <ul style="list-style-type: none"> ➤ Rotor Hub ➤ Bed Frame/Plate 9. Bolts 10. Generator 11. Power Converters 12. Blade & materials² 13. Other relative components³ 	<p>New ships or ship restoration for</p> <ul style="list-style-type: none"> ➤ Investigation ➤ Support ➤ Seabed preparation ➤ Transportation ➤ Cable laying ➤ Transportation ➤ Construction

Blue ones - the new items proposed by the industry based on 75 consultation meetings which included 86 manufacturers.

Noted : The floating platform is covered by “Foundation,” so we don’t add it to the list above.

Note 1: Grouting material 、Coating

Note 2: Epoxy resin 、Glass fiber/Carbon fiber

Note 3: Pitch system (Hydraulic cylinder). Yaw system(Cooling system. Cylinder in brake system) 、 Lubrication system

Noted: Items for “Marine Engineering” are governed by BOE.

3. Localization Planning for Zonal Development (3/3)

- With stakeholder feedback and **comprehensive analysis** results by **think tanks**, IDB is now formulating the IRP policy, and will align with **BOE** to hold public hearings. The final designated **items** & **core manufacturing technologies** will be announced **Q4 this year**.

- **IRP commitment** for Zonal Development: **developers required to comply with IDB's IRP policy for Zonal Development**.
 - ✓ Commitment to **localization** with **voluntary statement** on the **conditional/formal contracts** to be signed (**component, selected supplier, quantity, core technology, year** specified).
 - **Prior to financial close**, master contracts on **turbine (incl. tower)/turbine installation, onshore power facility EPC, foundation EPC, sea cable EPC** and **onshore substation EPC** should be submitted.
 - **6 months within financial close, all contracts** for the designated components should be submitted.

4. Conclusion

- At the inauguration ceremony on May 20, 2020, President Tsai announced her determination to build Taiwan into a green energy hub in Asia.
- NDC has included offshore wind power as one of the core **strategic industries** of **green** and **renewable energy**, and instructed the MOEA to propose a localization plan that meets the target of **10GW from 2026 to 2035**.
- As of Oct. 12, IDB has held **75 zonal development localization consultation** meetings (75 manufacturers, 11 industry associations) this year, and more are to be held.
- We'd like to **thank EU members** for **investing in Taiwan**, allowing Taiwan to **pioneer** in offshore wind power development in the **Asia Pacific** regions and drive economic growth.
- It is hoped that during the **zonal development phase**, EU can continue to **work with** Taiwan to help our industries to **compete in Asia-Pacific** markets.



Thank you for your attention !

