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Challenges and issues of Taiwan's ambitious offshore wind power Policy

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Offshore Wind Power in Europe & Asia: Is a Single Regulatory Model Emerging?

23 February, 2021

Supported by:

Australian National University
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Strongly Advocating a good rule of law in offshore wind power since 2017

- In several ***parliament public hearing*** events on offshore wind power

Pubic Hearing at the Legislative Yuan(立法院公聽會專家)

2017/12/12(二)，「離岸風電產業鏈分析及在地化公聽會」，09:30-12:10，立法院紅樓301會議室，主辦單位：立法委員賴瑞隆、其他委員國會辦公室、立法院永續會

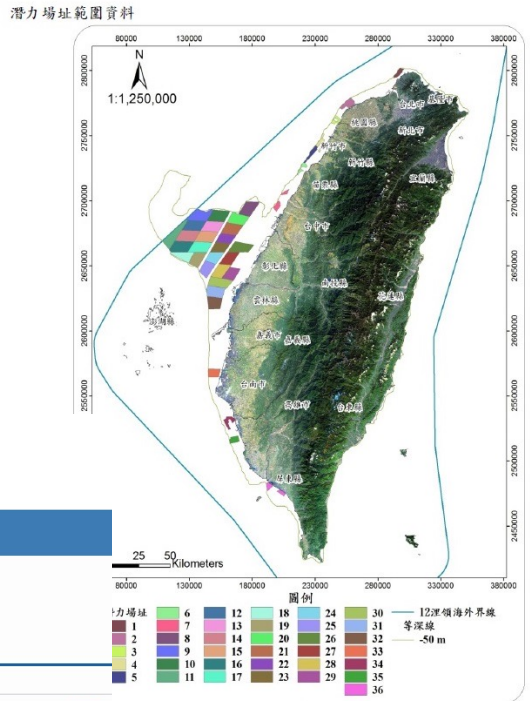
Pubic Hearing at the Legislative Yuan(立法院公聽會專家)

2017/11/17(五)，「離岸風電之未來路徑與國外典範」09:30-12:30，立法院紅樓201會議室

Helping organizing a parliament hearing on the needs of a “special bill for promoting offshore wind power” in December 2017

The key rule of law issue of Taiwan's offshore wind power

- Only legal basis for Feed in tariff
  - Renewable Energy Act of 2009 and 2019
- No legal basis:
  - Tendering/selection scheme
  - marine spatial planning
  - capacity allocation in 2018
  - LCR mandate
  - etc….



中華民國經濟部 Ministry of Economic Affairs, R.O.C.
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Content

Title :	Directions for Allocating Installed Capacity of Offshore Wind Potential Zones Ch
Date :	2018.01.18
Legislative :	1.Promulgated on January 18 , 2018
Content :	**Chapter 1. General Provisions** **Article 1 Purpose and Authorization** The Ministry of Economic Affairs (hereinafter referred to as MOEA) promulgates these Directions authorized by Articles 4 and 9 of the Renewable Energy Development Act, Article 5 of the Regulations on the Installation of Renewable Energy Power Generation Equipment, and Article 24 of The Electricity Act. The objective is to promote a steady and orderly development of offshore wind energy corresponding with the construction of domestic fundamental infrastructure in order to realize the offshore wind power targets effectively and drive domestic industry development.

ABC on Taiwan's administrative law and regulations

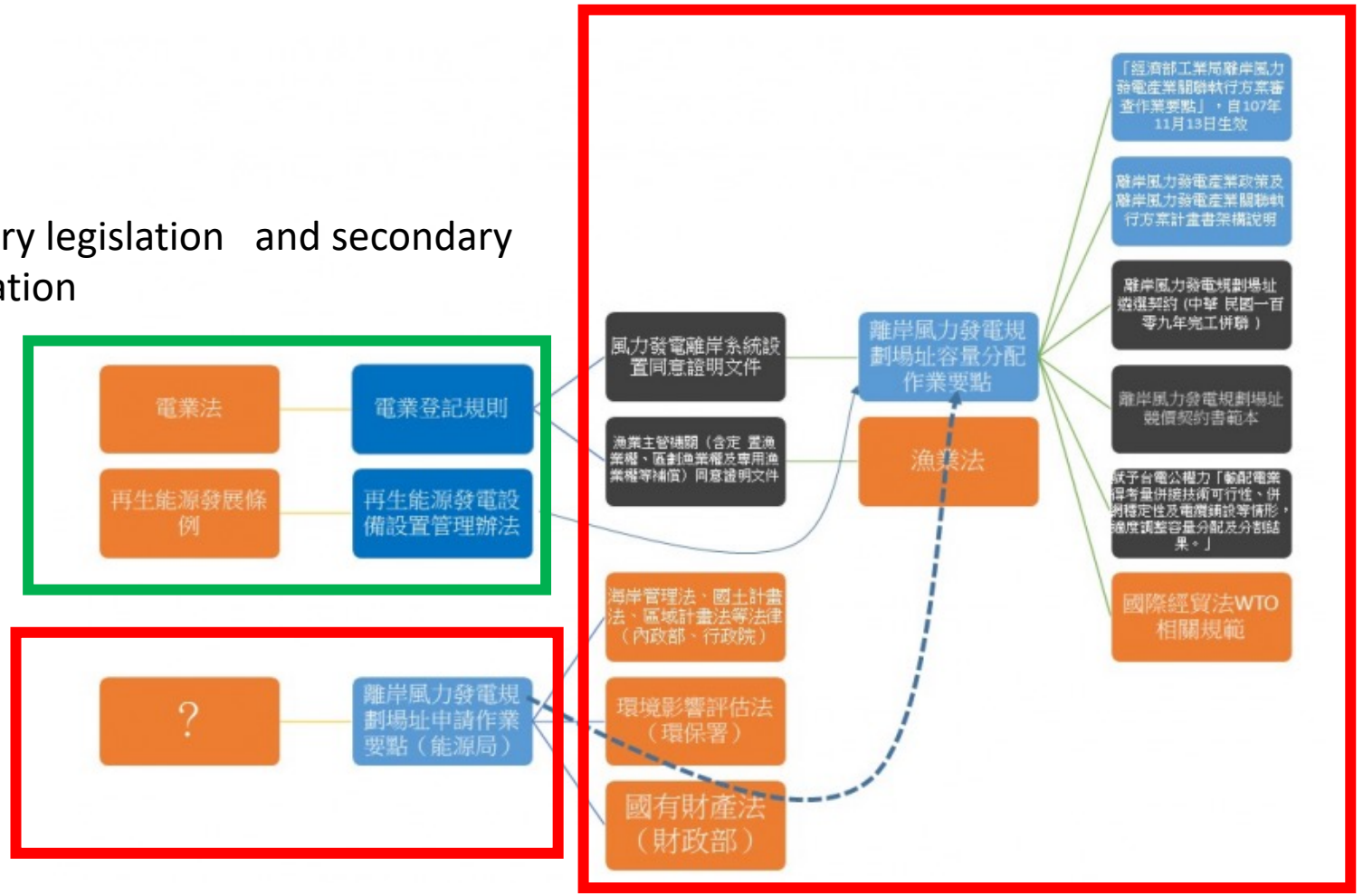
Primary Legislations(statue)

Secondary legislations: in order to have "external" legal effect, further Administrative Ordinances should be authorized by primary legislations.)

Third legislations: re-authorization is generally prohibited by the Constitution.

Yet not the case for offshore wind power

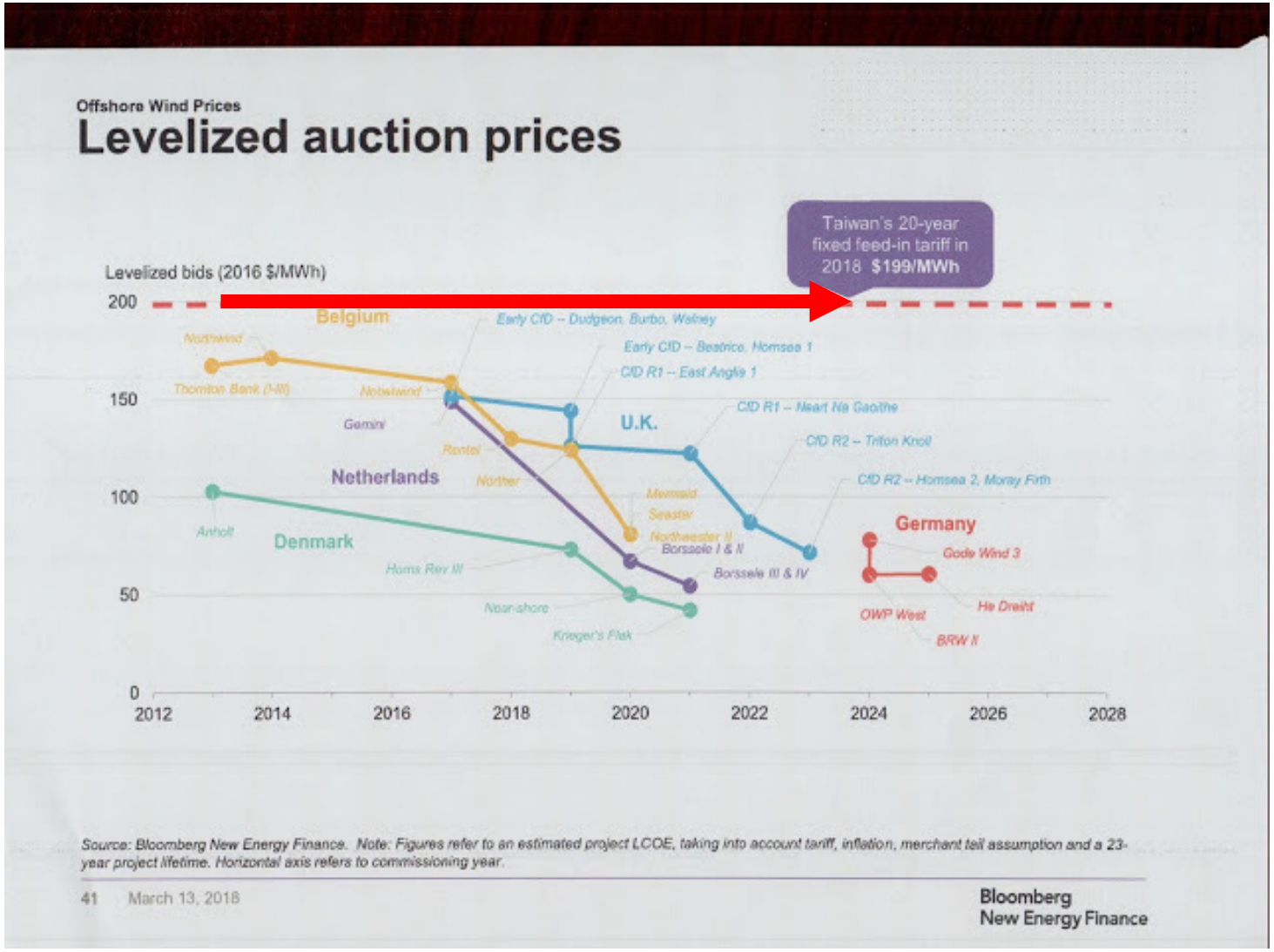
Primary legislation and secondary legislation



1. The widely use of **prohibitive** third, fourth legislations…..
2. Lack of proper authorization
3. Administrative “internal” ordinances, which are supposed to have only no legal effects on the rights and obligations

https://www.storm.mg/article/724636?mode=whole

Only incentive is the highest FIT in the world

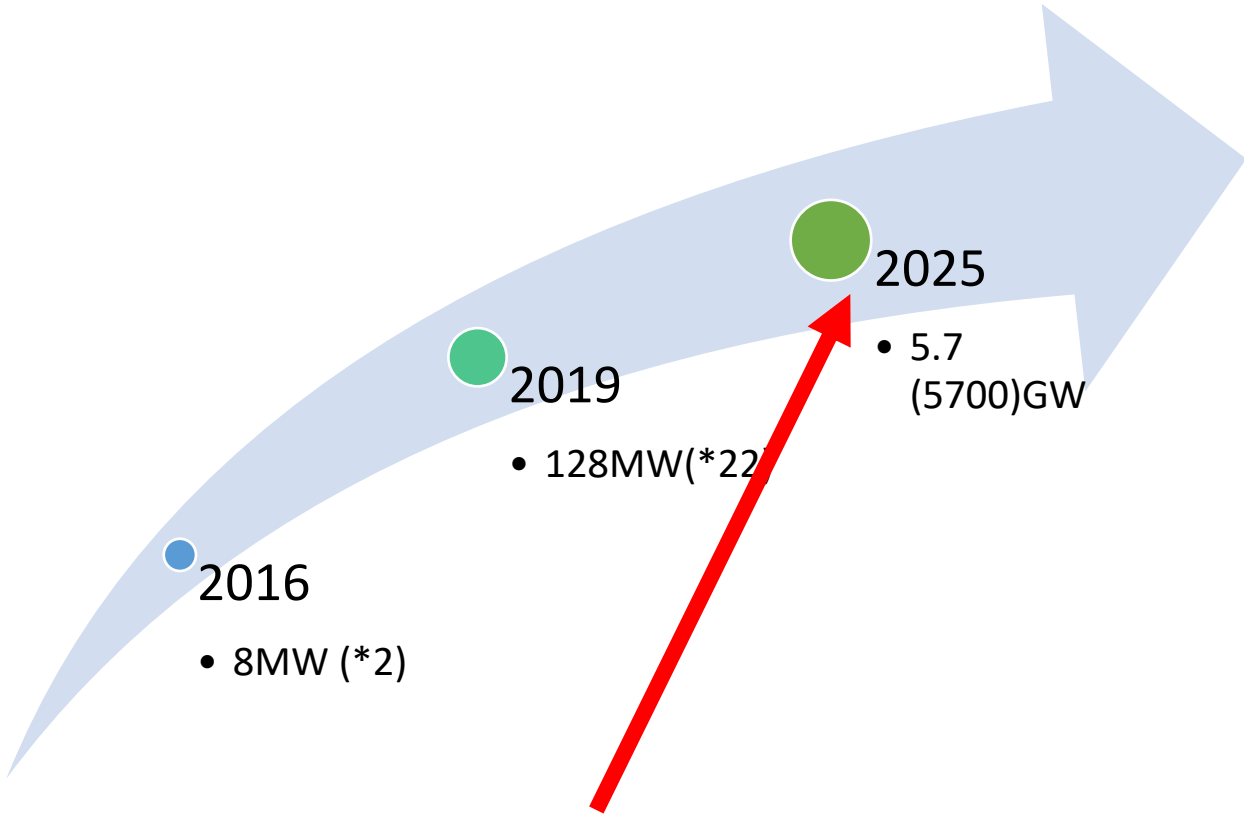


Failed to stop the unprecedented large scale of development right allocation in early 2018

- 5.7 GW by 2025 (from only 8MW (2*4MW) at that time.)
  - 3.098 GW subject to local content requirement

Source: https://www.artstation.com/artwork/xw21O

the LARGEST expansion of offshore wind power in Taiwan



Why 5.7 GW within 7 years should be considered to be leaping frog?

FIGURE 5
Cumulative Installed capacity (MW) and number of turbines by country

UK	44%	8,183 MW / 1,975 turbines
Germany	34%	6,380 MW / 1,305 turbines
Denmark	7%	1,329 MW / 514 turbines
Belgium	6%	1,186 MW / 274 turbines
Netherlands	6%	1,118 MW / 365 turbines
Others	2%	303 MW / 110 turbines

TOP 5 REPRESENTS
98%
OF ALL CAPACITY CONNECTED

Source: wind Europe

Source: WindEurope

Not to mention the LCR to develop wide-range of supply chain with less than 8 years

Development objective and schedule of the offshore wind power industry

In consideration of domestic companies' technical maturity and foreign companies' planning practice, the industry development items and schedule are summarized as follows.

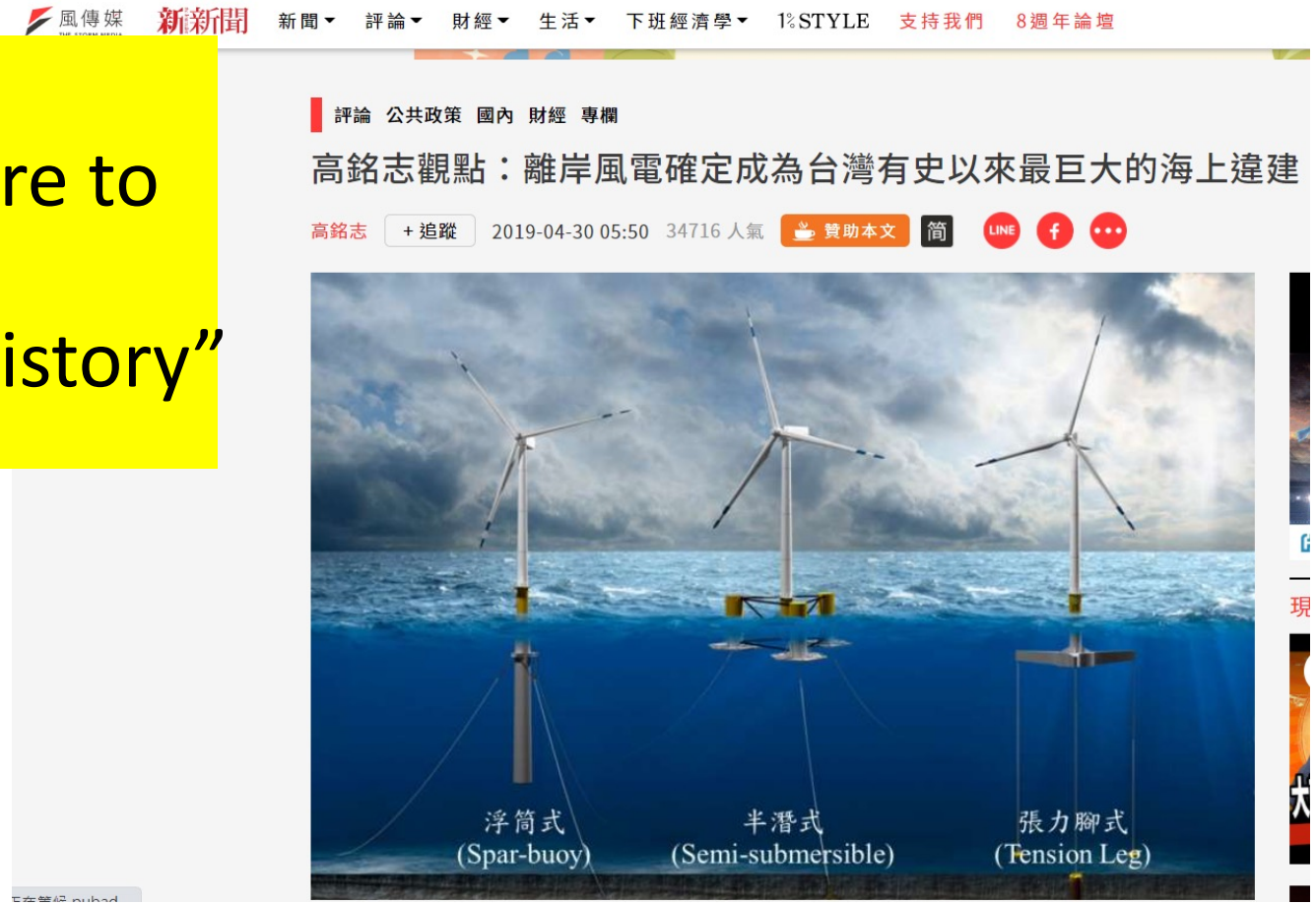
Timetable of grid connection	Year 2021	Year 2022	Year 2023	Year 2024	Year 2025
Phase	Pre-Stage	Pre-Stage	Phase 1	Phase 2	Phase 2
Industrial development items	➢ Tower ➢ Foundation ➢ Electrical Components: 1. Transformer 2. Switchgear 3. Distribution panel The above are on shore electric equipment. ➢ Marine Engineering planning, design, construction, supervision, and manufacturing： 1. Construction and supervision of investigation, cable laying, exploration, etc. Ship and machine tool planning design and safety management.(BOE) 2. Ship Building：provide the construction ship industry supply chain for new ships or ship restoration (including the ships for investigation, support, seabed preparation, transportation and cable laying.)(IDB)	➢ Pre-Stage Items for the year 2021	➢ Wind Turbine Components: Rotor Nacelle Assembly, Transformer, Distribution panel, Uninterruptible Power Supply, Spinner, Cable, Rotor Hub, Bolts ➢ Submarine High Voltage Cable ➢ Marine Engineering planning, design, construction, supervision, and manufacturing： 1. Construction and supervision of tower, foundation, etc. Ship and machine planning design and safety management.(BOE) 2. Ship Building：provide the construction ship industry supply chain for new ships or ship restoration (including the ships for transportation and construction)(IDB) ➢ Pre-Stage items for the year 2021 and 2022	➢ Wind Turbine Components: Gearbox, Generator, Power Converters, Rotor Blade &Epoxy Resin, Nacelle Cover, Nacelle Bed Frame/Plate ➢ Marine Engineering planning, design, construction, supervision, and manufacturing：Construction and supervision of wind turbines and others. Ship and machine tool planning design and safety management. (BOE) ➢ Pre-Stage items for the year 2021 and 2022 ➢ Phase 1 items for the year 2023	➢ Pre-Stage items for the year 2021 and 2022 ➢ Phase 1 items for the year 2023 ➢ Phase 2 items for the year 2024

(Note: The grid connection schedule announced by the Energy Bureau shall prevail)

http://www.cieca.org.tw/v_comm/inc/download_file.asp?re_id=2998&fid=35542

My last strong criticism to Taiwan's lack of rule of law offshore wind power in Taiwan's important online media (30 April 2019)

- "Offshore wind power installations in Taiwan are sure to become the largest offshore illegal buildings in Taiwan's history"



https://www.storm.mg/article/1212116?mode=whole

Beginning to work on academic article to evaluate the Taiwan offshore wind power policy and law

- First draft on October 2019
- Finally published in November 2021

https://www.sciencedirect.com/science/article/pii/S2211467X21001322

Predictions in this 2019 draft come true!

1. serious **project delay (cost overrun)**due to lack of sufficient RD&"D" experience, . the lack of early careful "site investigation", "marine special planning", "wind resource map"

2. **failed Local content requirement**?

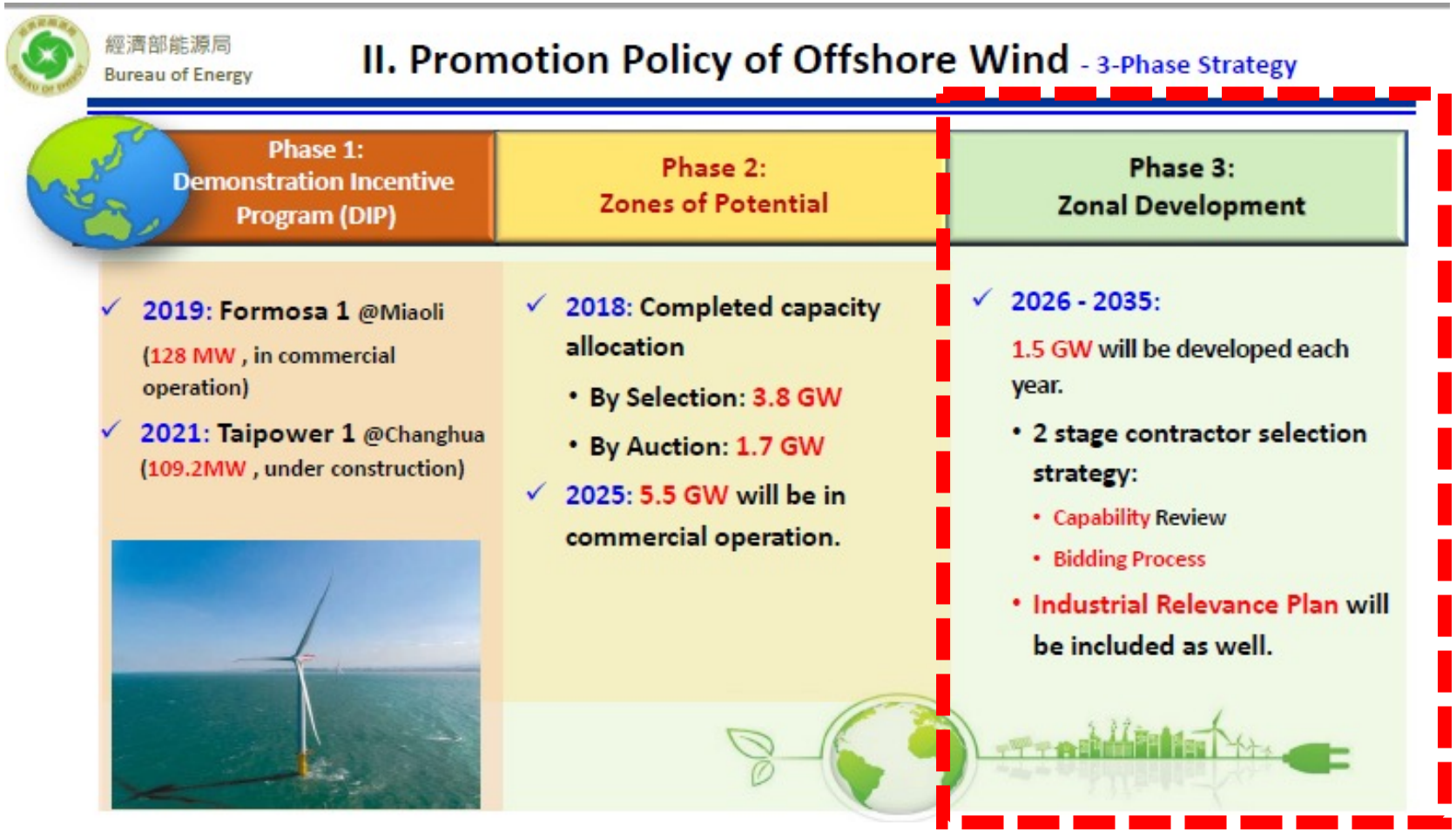
- E.g., Relying on South Korea made jacket foundations

3. the **lack of rule of law** led to regulatory uncertainty to developers

The rules on offshore wind power in **2017** < rules after 2018

Now, Taiwan is moving to more ambitious phase 3!

- Before 2025: average 800 MW each year **but only adding 109MW+120MW since 2018**
- 2025-2035: 1.5GW each year



Very attractive to developers

Tendering

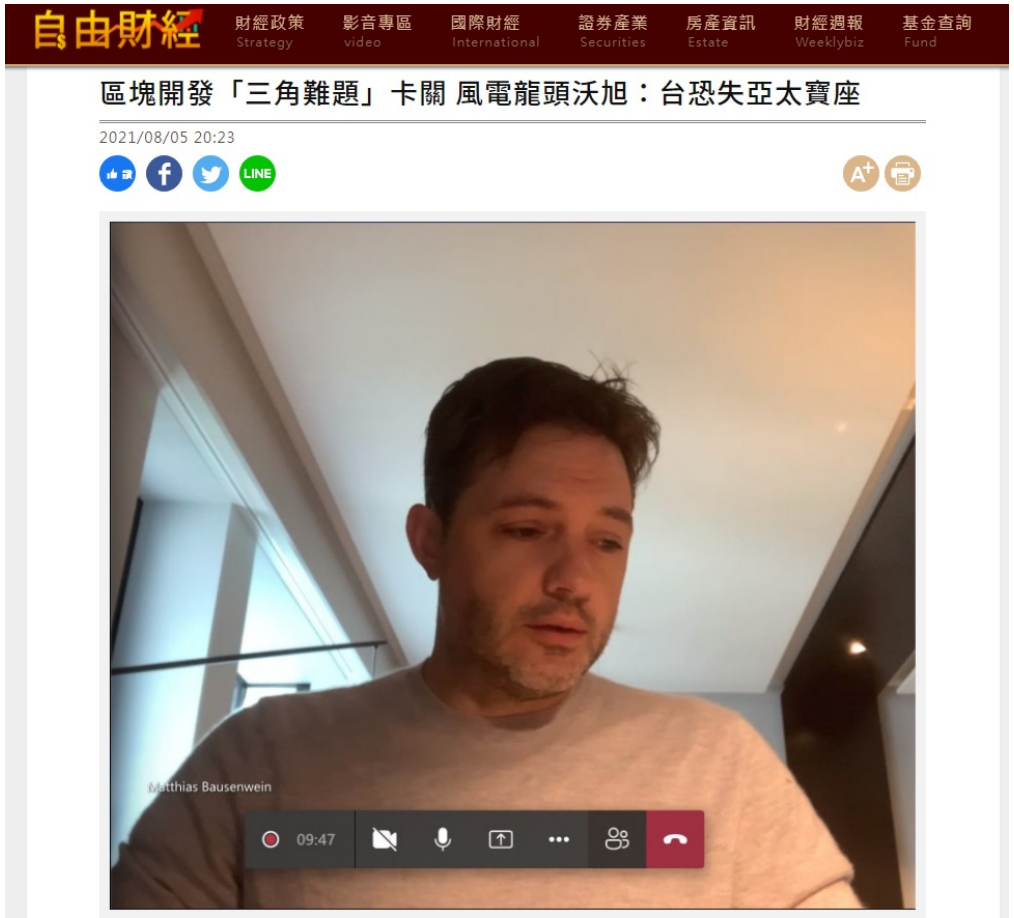
- Tender price **0-2.49 NTD/ per kWh (0.09 USD)**(vs. projects with LCR mandate located in 2018 by 2025: NTD 6.2795 (for the first 10 years) and 4.1422/kWh (for the subsequent 10 years))
- Capacity limit to each project: **500 MW** (and may expand to 600MW)
- LCR rules

Very attractive

- Scheduled grid connection capacity in 2026 and 2027 is **3GW**.
- **Flooding in 8 GW** so far

Complained by the former Orsted CEO and President Matthias Bausenwein

- Low tendering price with reference to the avoided cost of Taiwan electricity system
- 500MW cap for one project is too rigid.
- LCR is too rigid.



https://ec.ltn.com.tw/article/breakingnews/3628958

Yes. You may consider ANTON is WRONG and too critical on the offshore wind power policy and law in Taiwan!!!

- If policy and law are problematic, how come the foreign/local offshore wind power flooded in?
  - 2018: only **5.5 GW** is required but flooded in more than **10GW**
  - 2026-2027: only **3GW** but flood in **8 GW**.


Some questions and analysis

1.Highest FIT in the world but Run away?

- Most of offshore wind power developers receiving development right in 2018 sold their shares
  - 100% like Swancor holding
  - Only keeping 25% like WPD
  - Ørsted released 50% share in one project in Taiwan

1. Is this allowed in other countries for tender developers to sell their shares **before project completion**?
2. Why did they decide not to enjoy the full benefit of highest FIT in the world?

Benefit from FIT vs benefit from releasing shares

https://www.dreamstime.com/cartoon-boy-run-away-snake-art-image152600595

2.What's the incentive for OWP developers to develop a project with the low tendering price of price 0-2.49 NTD/ per kWh (0.09 USD)?

The rest of the world: it is mandatory to sell the RE in tendered price

Taiwan: not mandatory

- Thus, the OWP developers can use very low tendering price but not sell to the incumbent utilities (Transmission system operators).
- So OWP developers are free to sell their RE to non utilities under **the Corporate renewable power purchase agreements, CPPA) in higher price.**

3. Should OWP developers worry about the rigid LCR rules in Taiwan?

- No need: you can still enjoy high FIT without fulfilling LCR
  - Taiwan government, Ministry of Economic Affair can exempt your LCR duties without the application of the reduced FIT.
  - Thus, no penalty to not comply with LCR rules.

WTO compatible LCR !!!!! ☺

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Offshore

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Oil & Gas Production Facilities

Greater Changhua Offshore Windfarm 01 and 02

Client	Ørsted
Dimension	Type A : 32.2m(L) x 32.2m(B) x 67.53m(D) Type D : 32.2m(L) x 32.2m(B) x 76.76m(D)
Weight	Type A : 1197.0 ton Type D : 1235.1 ton
Class	DNV
Scope	Fabrication of Windfarm Foundations(28 Jackets)
Construction Period	20 Aug, 2019 ~ 09 Aug, 2021
Sail-away	Aug, 2021 ~ Oct, 2021

군산 대형 해상풍력 터빈 해상실증 지지구조물

Client	전북지방조달청/군산대학교 산학협력단
Project	군산 대형 해상풍력 터빈 해상실증 지지구조물 제작
Dimension	풍력기: 가로)35m X 세로)33m X 높이)60m 기상탑: 가로)19m X 세로)21m X 높이)49m
Weight	1,311ton
Scope	풍력기 및 기상탑 제작
Construction Period	Jan 2021 ~ Mar 2021
Sail-away	June. 12. 2021

Orsted, Great Changhua 01 & 02A Offshore Sub Station(OSS), 16 skirt piles

Client	KEPPEL FELS
Dimension	CHW01: OD)3.670m X (L)84m(8 sets, 4,001ton) CHW02: OD)2.604m X (L)90m(8 sets, 3,591ton)

4. Projects on paper vs projects in the sea

- The scheduled capacity for experienced countries like Germany is only **700 MW to 900 MW** each year

Offshore Wind Energy Act (WindSeeG 2017)

Section 17

Volume of auctions

- Entry into force on 1 January 2017 -

The Federal Network Agency shall from 2021 invite bids annually for a bid deadline of 1 September in line with the stipulations of the site development plan for a volume of 700 to 900 megawatts each year, whereby

1. on average no more than the average quantities stipulated in the site development plan may be auctioned,
2. the volume of the auction is distributed across the sites which have been subject to a preliminary investigation and which according to the site development plan are to be auctioned in the respective calendar year, and
3. the proportion of a site pursuant to number 2 in the volume of the auction shall be determined in line with the site development plan and the capacity to be installed on the sites as determined in the preliminary investigation.

https://www.bmwi.de/Redaktion/DE/Downloads/E/windseeg-gesetz-en.pdf?__blob=publicationFile&v=9

Final remarks

Again, if you wish to know more on the policy and legal issues in Taiwan, please read my article

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Outline

- Highlights
- Absract
- Keywords
- Nomenclature
- 1. Introduction
- 2. Evolution of onshore wind energy policy in Taiwan
- 3. Evolution of offshore wind power policy in Taiwan
- 4. Challenges and issues of Taiwan's ambitious offshore w...
- 5. Conclusions
- Credit author statement
- Declaration of competing interest
- Acknowledgements
- References

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Energy Strategy Reviews

Volume 38, November 2021, 100747

Review of recent offshore wind power strategy in Taiwan: Onshore wind power comparison

Anton Ming-Zhi Gao [a], Chung-Huang Huang [b], Jui-Chu Lin [c], Wei-Nien Su [c]

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https://doi.org/10.1016/j.esr.2021.100747

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Is a Single Regulatory Model Emerging?

Yes

- Single Regulatory Model could fix Taiwan's current legal and policy problems for offshore wind power
- The Special Act to promote offshore wind power is adopted in Japan, Poland, Netherlands, Germany

Message to investors

Winners and good news for:

- OWP developers
- Foreign&Taiwan supply chain/marine engineering
- Earlier share holders

Losers and bad news for:

- All electricity users in Taiwan: paying high FIT for non-LCR components
- Banks and insurance companies (?): high risk of project delay and cost overrun
- Later share holders

Thanks for your attention