ideol winning solutions for offshore wind

Floating Offshore Wind – intro and status

Taipei – September 2018

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Asia Wind Energy Association

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Chief Sales & Marketing Officer

ideol winning solutions for offshore wind

Chairman – Floating Offshore Wind Taskforce

Wind EUROPE

Chairman – Scientific & Technical Commitee

FOWT 2018 Floating Offshore Wind Turbines

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TODAY'S TOPICS

Today's Topics

- floating wind?
- key technologies?
- key geographies?
- current industry status?
- where is the market going?
- tomorrow's key challenges?

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FLOATING WIND?

- **evolution … not revolution**
- **opportunity to harnass the best wind ressources without depth constraints**
- **lesser visual impact**
- **lesser impact on other users of the maritime environment**
- **option for shallow depth sites with challenging seabed conditions**

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FLOATING WIND?

- use of **cheaper** vessels
- more **on-shore** construction and operations
- particularly suitable for **tomorrow's XXL** offshore wind **turbines**
- **only option** for certain geographies

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FLOATING WIND?

▶ tremendous resources … worldwide

Country/Region	Share of offshore wind resource in +60m depth	Potential for floating wind capacity
Europe	80%	4,000 GW
USA	60%	2,450 GW
Japan	80%	500 GW

Source: Carbon Trust

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KEY TECHNOLOGIES?

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PROBABLE CONSOLIDATION?

- **floating 2.0**
- **2023 / 2025 (commercial-scale)**
- **new generation of turbines (12/15MW)**
- **extended design-life (≥ 30 yrs)**
- **larger arrays (≥ 1GW)**
- **high local content expectations**
- **shallow water compatibility**
- **delivery of 50+ units in 18 months (or less)**

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PROBABLE CONSOLIDATION?

- impact on floating structures and their dimensions
- impact on constructability and launchability
- impact on temporary storage of finished floaters
- impact on turbine installation
- impact on choice of material, O&M, etc…

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KEY TECHNOLOGIES?

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KEY GEOGRAPHIES?

- Japan
- France
- Scotland
- Portugal
- “shallow” Northern Europe
- Ireland
- Norway
- Taiwan
- South Korea
- US (CA, HI)

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KEY GEOGRAPHIES?

- Japan
- France
-

What do they have in common?

- Norway
-
-
- US (CA, HI)

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KEY GEOGRAPHIES?

- Japan
- France
-
- Portugal

Leapfrogging !!

- Norway
-
-
- US (CA, HI)

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INDUSTRY STATUS?

- **8 full-scale demonstrators in the world in 2018**
  - **5 in Japan**
  - **1 in Norway**
  - **1 in Portugal**
  - **1 in France**

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INDUSTRY STATUS?

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INDUSTRY STATUS?

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INDUSTRY STATUS?

- 8 full-scale demonstrators in the world in 2018
  - 5 in Japan
  - 1 in Norway, Portugal and France
- 1 pilot farm off Scotland operating since Sept 2017
- 5 pilot farms under development
  - 3 in France
  - 1 in Scotland and Portugal
- world's 1st commercial-scale wind farm scheduled for construction in 2023 (Japan)
- commercial-scale tenders upcoming in France (2019) and several pre-commercial and commercial-scale farms under development worldwide

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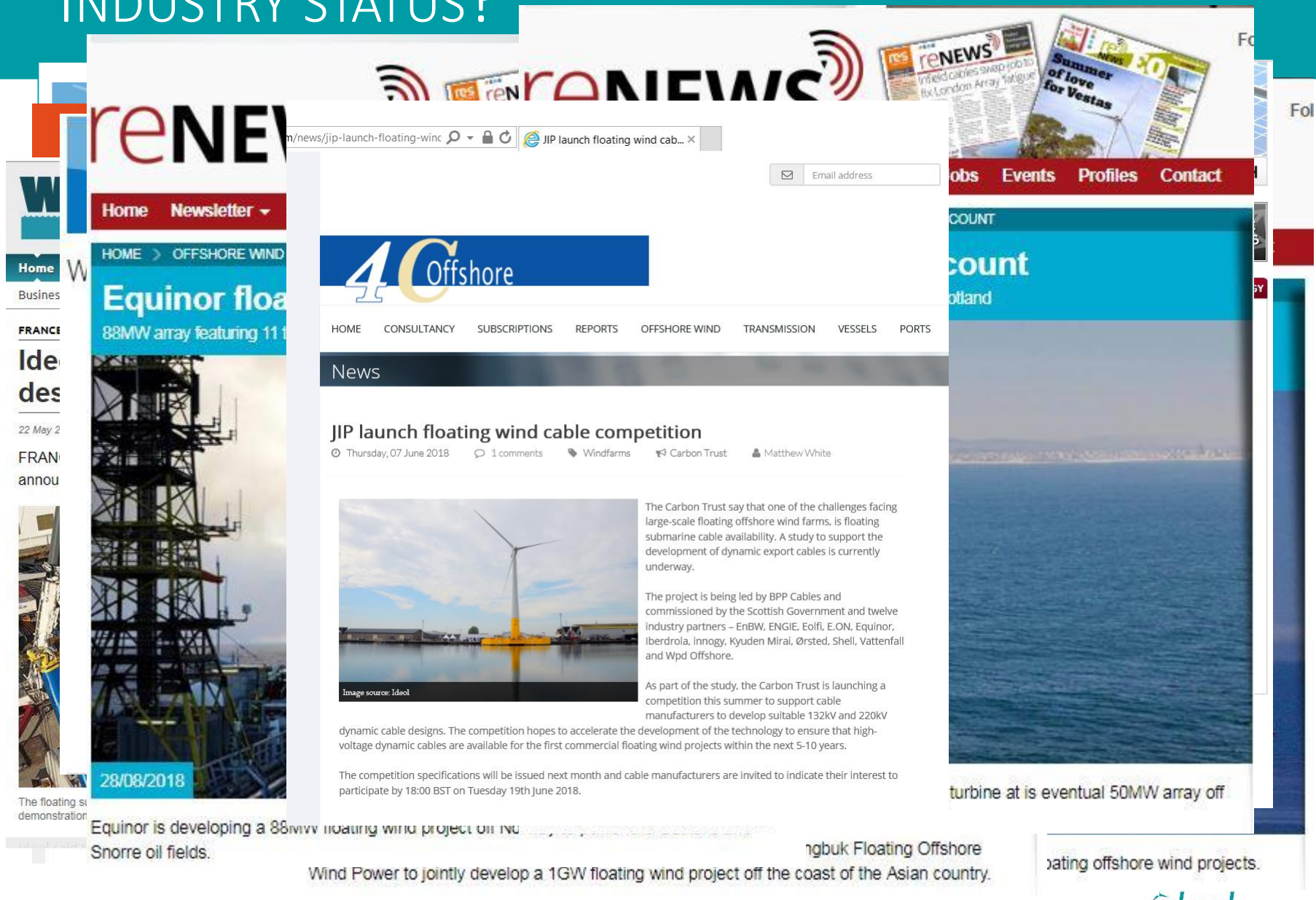
INDUSTRY STATUS?



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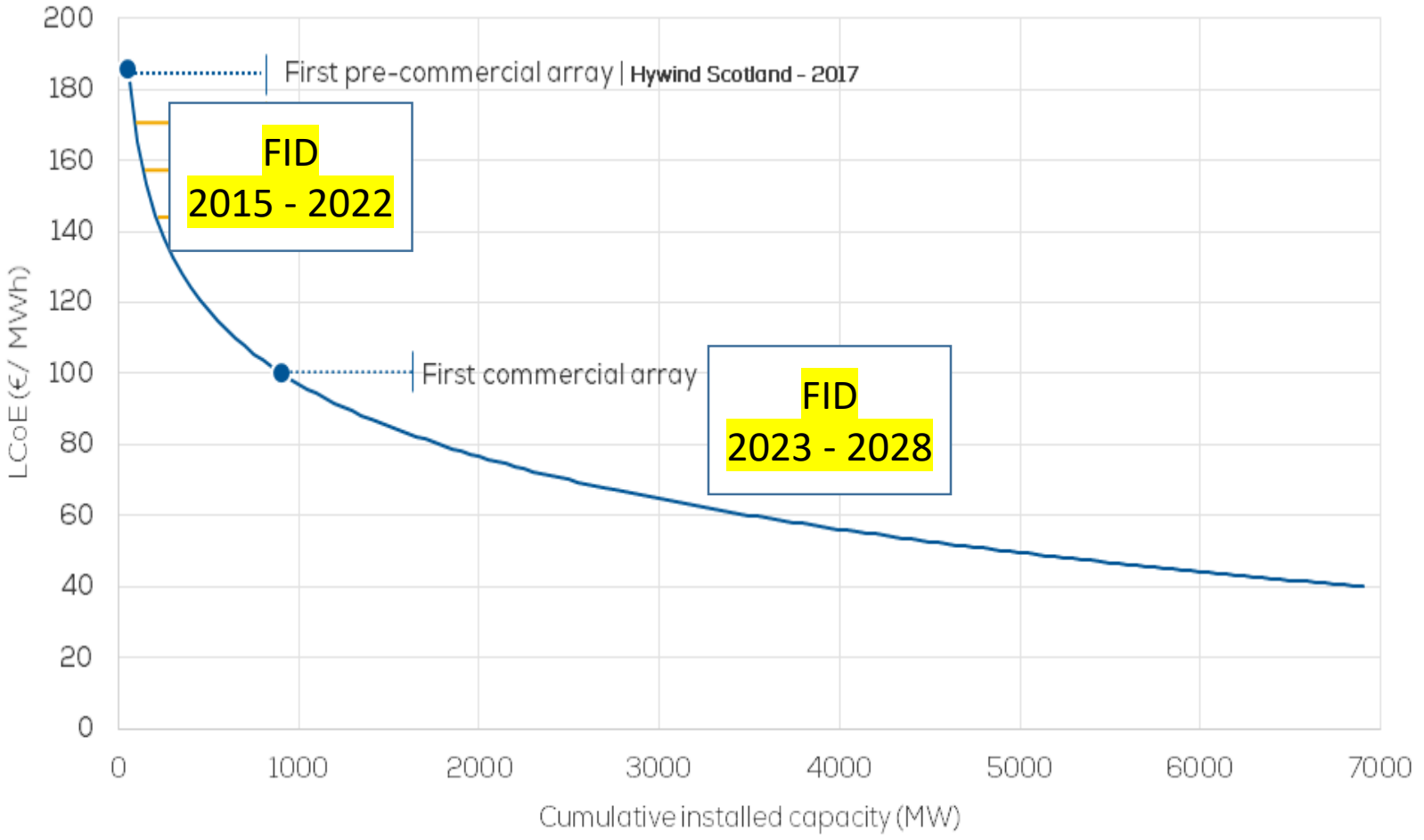
INDUSTRY STATUS?



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KEY GEOGRAPHIES?

- Japan
- France
- Scotland
- Portugal
- “shallow” Northern Europe
- Ireland
- Norway
- Taiwan
- South Korea
- US (CA, HI)

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KEY GEOGRAPHIES?

- Japan
- France
- Scotland

What else do they have in common?

- Norway
-
-
-

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KEY GEOGRAPHIES?

- **Japan**
- **France**
- **Scotland**

Valuable demonstrator and precommercial-scale exposure /experience

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KEY GEOGRAPHIES?

- validation of contractual structure and contractual interface between key stakeholders, supply-chain, etc.
  - Floater movement impact on wtg
  - Partial hand-overs between wtg mfr and floater fabricator / supplier
  - Etc…
- endorsement by contractors of educated liability risks / financing by lenders
- testing and validation of the supply-chain
- streamlining of the permitting / admin process
- continuous improvement implementation
- etc…

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WHERE IS THE MARKET GOING?

- **accelerating … even leapfrogging**
- **project financing is available … for the right technologies**

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ONGOING CHALLENGES?

- government support and adequate regulatory framework
- cost-reduction / LCOE targets
- supply-chain ramp-up, harbor infrastructure, etc…
- floating sub-stations, etc…

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SAVE THE DATE

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THANK YOU FOR YOUR ATTENTION

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