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COST REDUCTION OF
FLOATING WIND TECHNOLOGY

# Pathway to cost reduction in floating wind technology

COREWIND webinar
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# Floating wind technology

## Main advantages

Exploitation of offshore wind in deeper sea water

Extensive wind resources in deep waters (>50m)

Scalability

Lower environmental impacts

Lower visual impact -> higher social acceptance

## Current challenges

Distance to shore

Cabling (export and dynamic)

Mooring lines

New materials

O&M activities

Research is still needed to achieve a meaningful cost reduction either CAPEX and OPEX.

Cost target: 40-60€/MWh in 2030

# Floating wind technology – Types of structures


COREWIND is focused on ActiveFloat (semisub) and WindCrete (spar).

# Semi submergible technology - Benefits

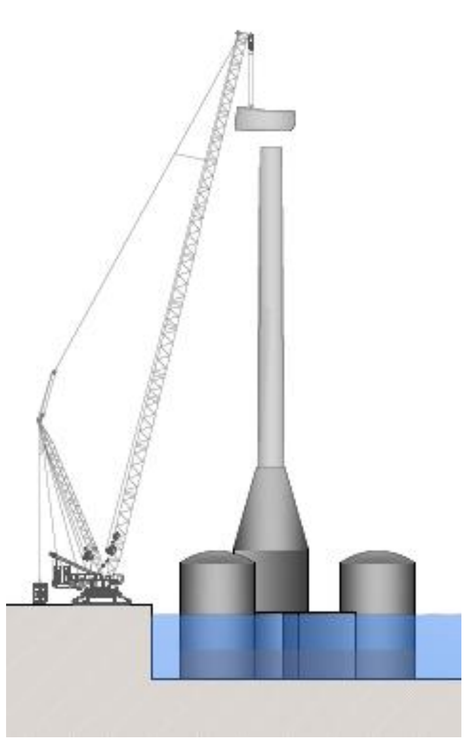
Full onshore manufacturing foundation and WT assembly.

Onshore operations avoiding costly offshore vessels and workforce.

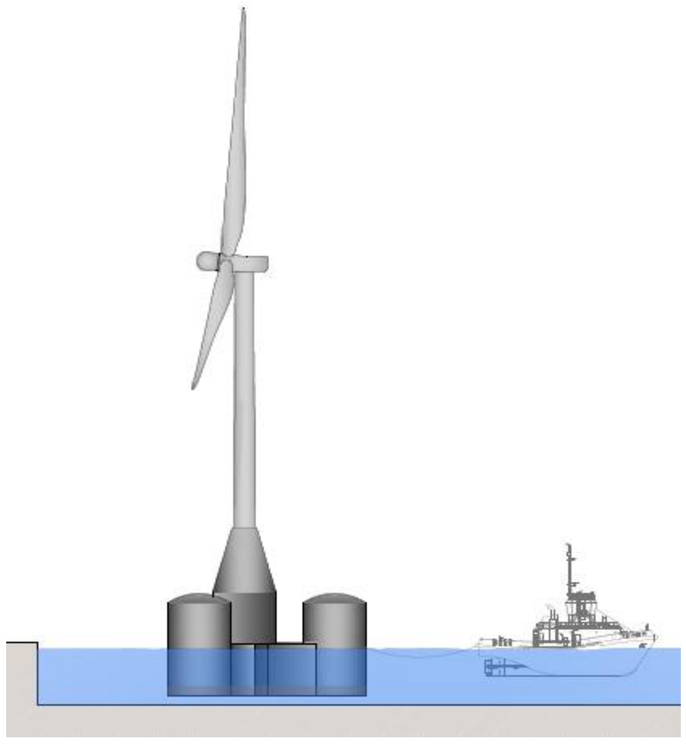
No need for heavy lift crane capacity vessels.

Mooring and cabling could be Pre-installed saving installation time.

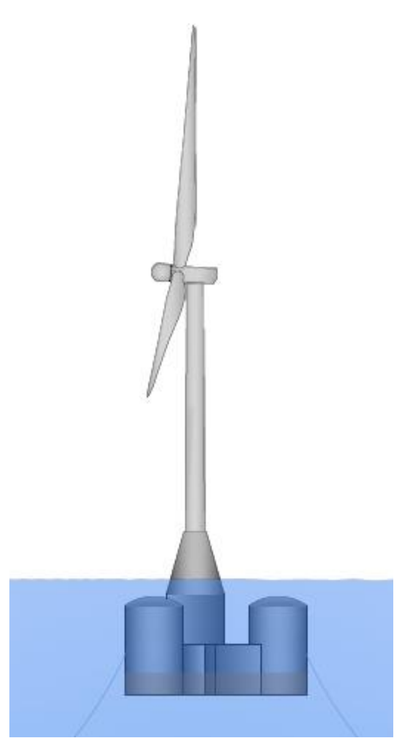
Self buoyant transport, only conventional tug boats.



**WTG Onshore assembly and Pre-commissioning**



**Wet tow of the whole system (Platform + WTG) to installation site**



**Installation at site**

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# Semi submergible technology - Materials

## Commercial solutions based on: steel foundations

**WindFloat (Kincardine Project)**

## New solutions based on: concrete foundations

**ActiveFloat**

## Why concrete?

Low construction and maintenance costs.

High durability in marine harsh conditions.

Serial production through industrialization process and precast concrete parts.

Intensive in local content raw material, workforce and installation means.

# Cost reduction through optimization of installation and O&M procedures

## Accessibility

To reduce downtime during boat landing.

To improve Health & Safety conditions during crew transfer.

## Plug & Play concept

To enhance mooring and dynamic cable connection allowing either installation, major maintenance and/or decommissioning in a cost-efficient way.

## Remote and Automated Inspections

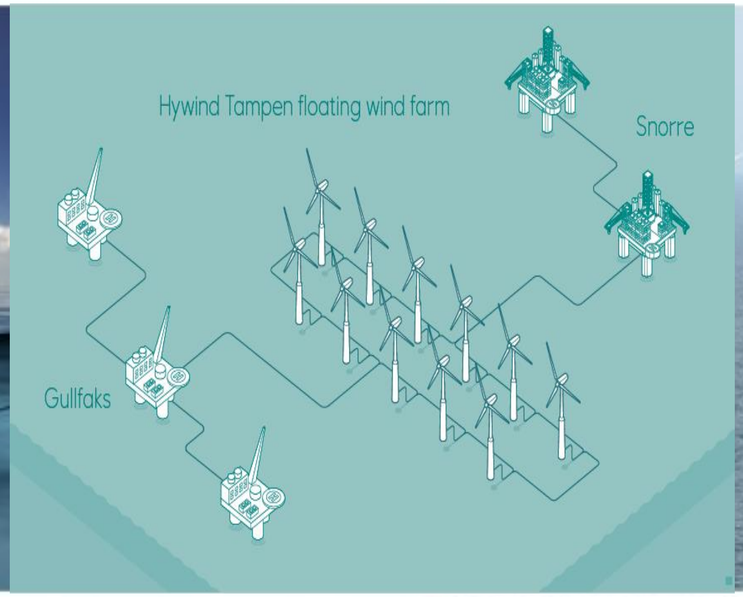
To increase remote monitoring system and data acquisition.

To avoid submerged inspections using sensors, ROVs and integrated cameras.

## Predictive Maintenance

Use of digital technologies (artificial intelligence) and more precise weather predictions to optimally plan maintenance/repair operations, trying to minimize offshore operations.

# Hywind’s journey towards commercialization (cost reduction)



Prototype

(Hywind Demo)

Pilot Parks

(Hywind Scotland, Hywind Tampen)

Large parks

Cost reduction

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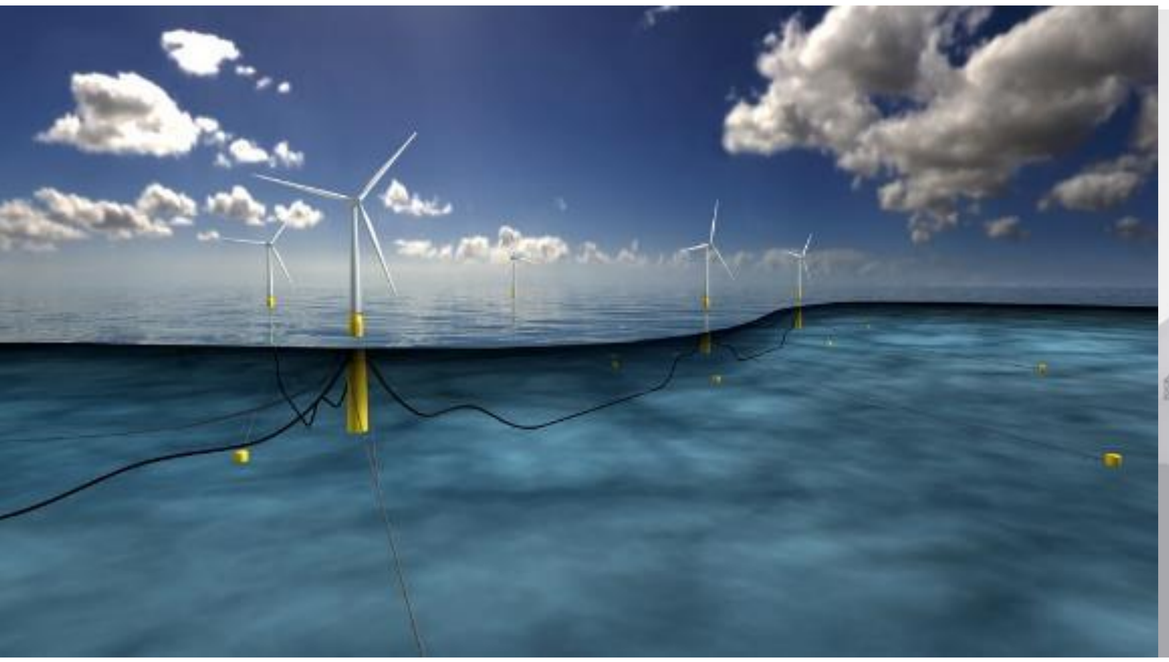
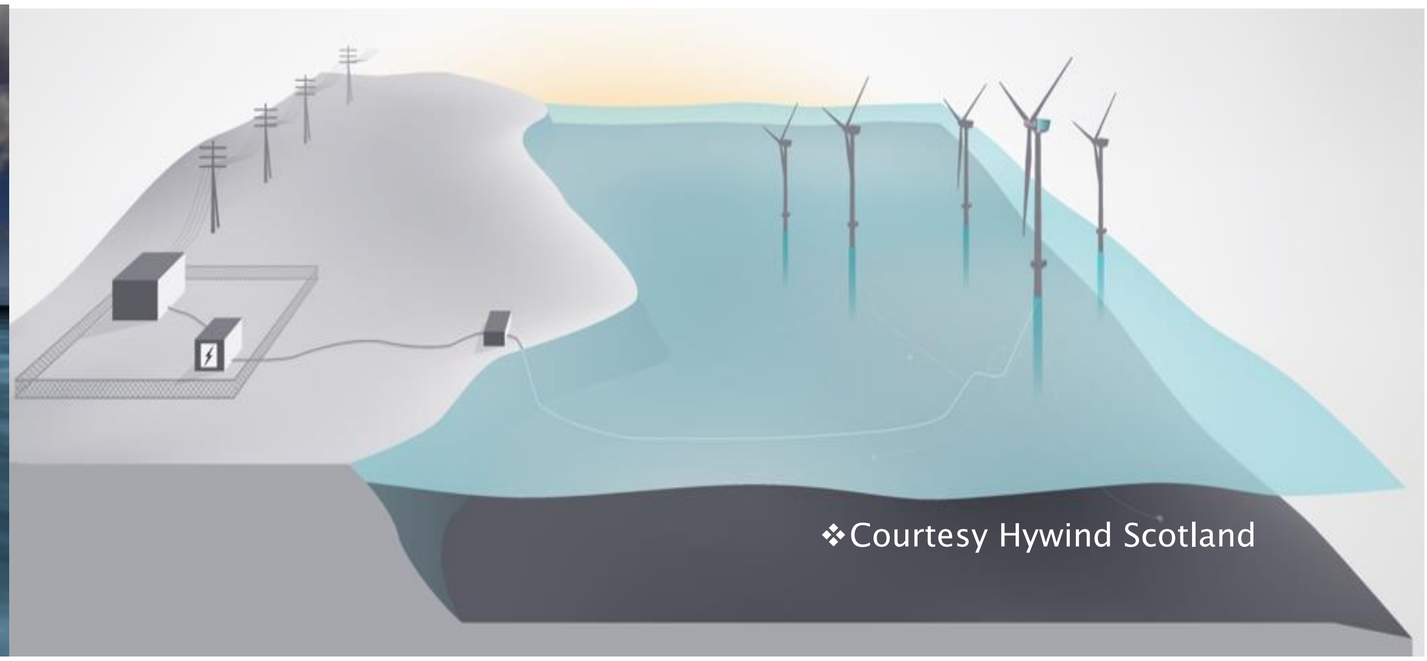
# Hywind Demo: more than 10-year’s successful operation!

- In operation from September 2009
- Excellent HSE record- no serious incidents
- Experienced wind speed over 40 m/s and maximum wave height of 19 m. Floater motions have positive impact on operations- in contrary
- All technical systems are working well – concept verified !

# Hywind Scotland Pilot Park (five 6 MW WT), Scotland

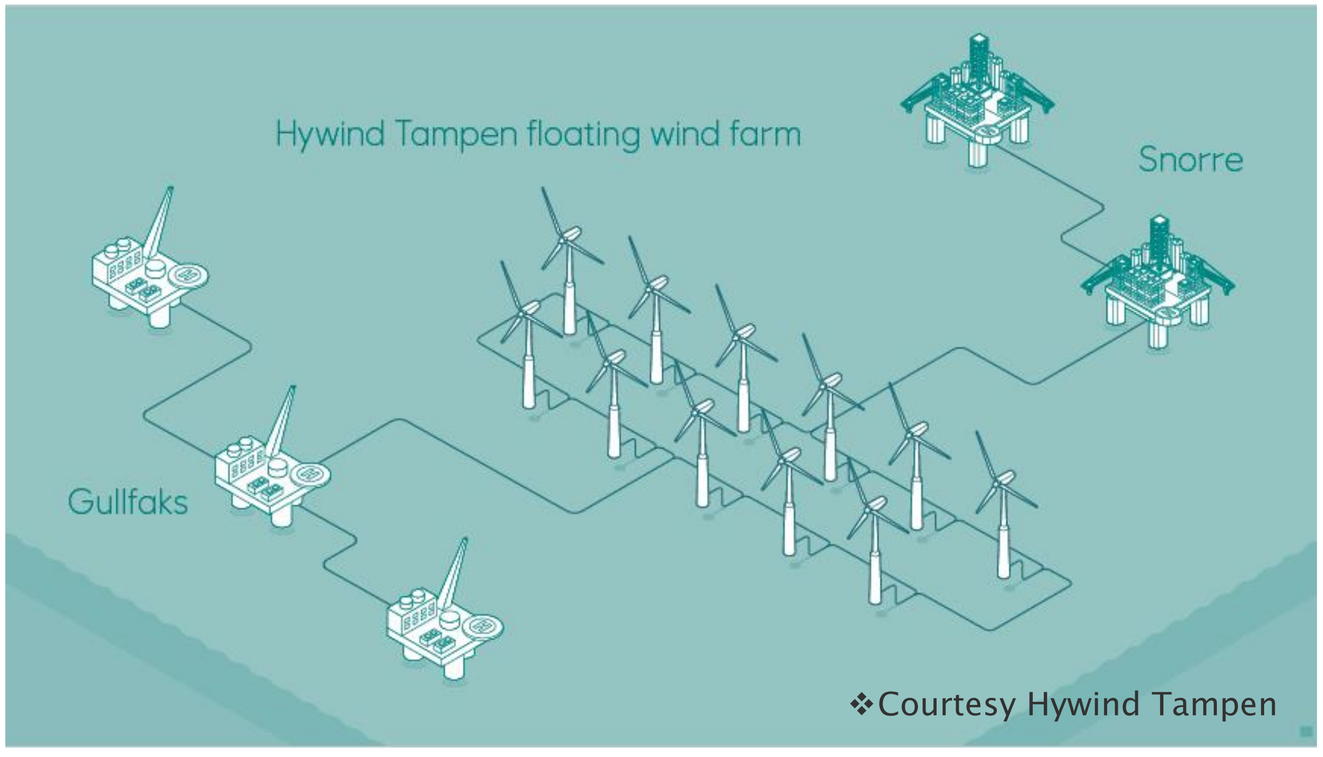
- A total installed capacity of 30 MW with a battery  (Batwind: 1.3 MWh), and a transmission voltage of 33 kV
- Five units of 6 MW wind turbine with rotor diameter: 154 m & height: 253 m
- The pilot farm covers around 4 square kilometres in water depths varying between 95—129 m
- The average wind speed: 10 m/s; average wave height: 1.8 m
- The export cable length to shore is 30 km
- Equinor and Masdar invested € 200 million (60—70% cost reduction compared with the Hywind Demo)





❖Courtesy Hywind Scotland

# Hywind Tampen Reaches Final Investment Decision!




The  11 units of 8 MW plus turbines to provide the supplement power for offshore oil/gas platforms

https://www.offshorewind.biz/2019/10/11/hywind-tampen-reaches-final-investment-decision/ October 11, 2019, by Nadja Skopljak

# Thanks for your attention

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