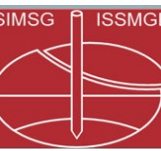


# IITT Speakers - TC209 Offshore Geotechnics



**Phil Watson**

Shell Professor of  
Offshore Engineering &  
Director of ARC TIDE  
University of Western  
Australia  
(Chair of TC209)

Foundation design  
Site characterisation  
Carbonate sediments  
Physical modelling



**Elisabeth Palix**

Offshore Technical Lead  
for APAC at EDF  
Renewables. Previously  
Offshore geotechnical  
engineer (20 years)  
(TC209 member and co-  
chair of ISFOG 2025)

Offshore Wind Foundation  
Site characterisation  
Foundation installation



**Zack Westgate**

Associate Professor of  
Civil and Environmental  
Engineering  
University of  
Massachusetts, Amherst  
(Corresponding member of  
TC209)

Offshore foundations  
Site investigations  
Challenging seabeds  
Cable/pipeline/riser geotechnics



**Christelle Abadie**

Research Fellow at  
Gustave Eiffel University,  
France  
(Corresponding member of  
TC209, Lead editor and  
co-general secretary of  
ISFOG 2025)

Offshore Wind Foundation  
Physical modelling  
Monitoring of geohazards  
Geotechnical research

# Geotechnics for Offshore Wind

Setting the scene – Phil Watson

A developer's perspective of geotechnics for offshore wind – Elisabeth Palix

An overview of ‘new’ challenges facing offshore wind – Zack Westgate

Geotechnical research to support offshore wind – Christelle Abadie

Close – Phil Watson

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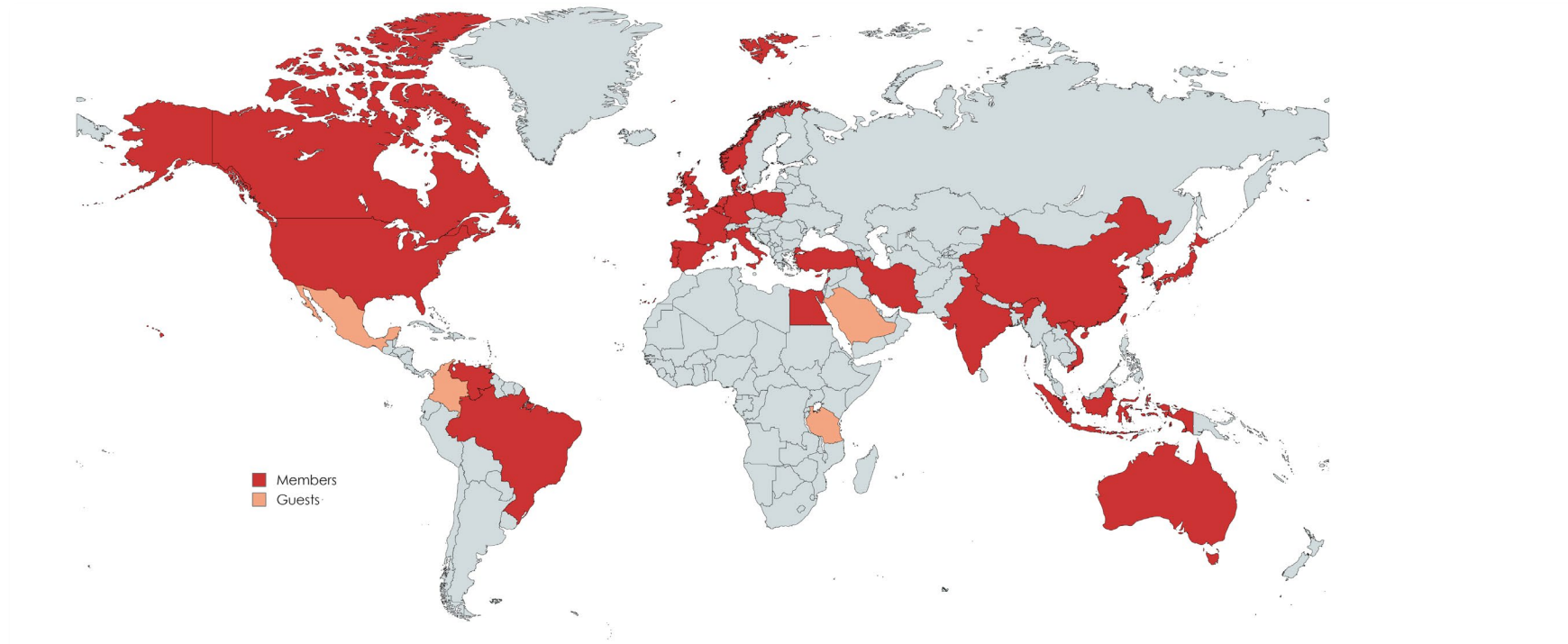
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# Introducing TC209

Re-established in 2009 under the leadership of Dr Philippe Jeanjean – and rapidly grew  
Current membership is ~ 100 – active committee managed by Chair and executive



## Introducing TC209

### Current highlights

McClelland honour lecture (next lecture in 2025)

International conferences run every 2-3 years

- International Symposium on Frontiers in Offshore Geotechnics (ISFOG)
- Offshore Site Investigation & Geotechnics (OSIG)

Various country led events:

- Vietnam Symposium on Advances in Offshore Engineering (Dec '24)
- Indian Symposium on Offshore Geotechnics (Nov '24)
- Japan workshop on Geotechnics for Offshore Wind (watch this space)

Special issues

- Ocean Engineering 'State of Practice – Geotechnical Considerations for Offshore Wind'





Next event organised by TC 209



# 5<sup>TH</sup>

## INTERNATIONAL SYMPOSIUM ON FRONTIERS IN OFFSHORE GEOTECHNICS

**9<sup>TH</sup>-13<sup>TH</sup> JUNE 2025**

LA CITÉ NANTES  
CONGRESS CENTRE

5 rue de Valmy  
44000 Nantes, France





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### CALL FOR SPONSORS

If interested  
contact a member  
of the organising  
committee

**Matthieu Blanc**  
[matthieu.blanc@univ-eiffel.fr](mailto:matthieu.blanc@univ-eiffel.fr)





Next event organised by TC 209



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### CALL FOR ABSTRACTS

Open until  
**31<sup>st</sup> May 2024**

Via ISSMGE Platform





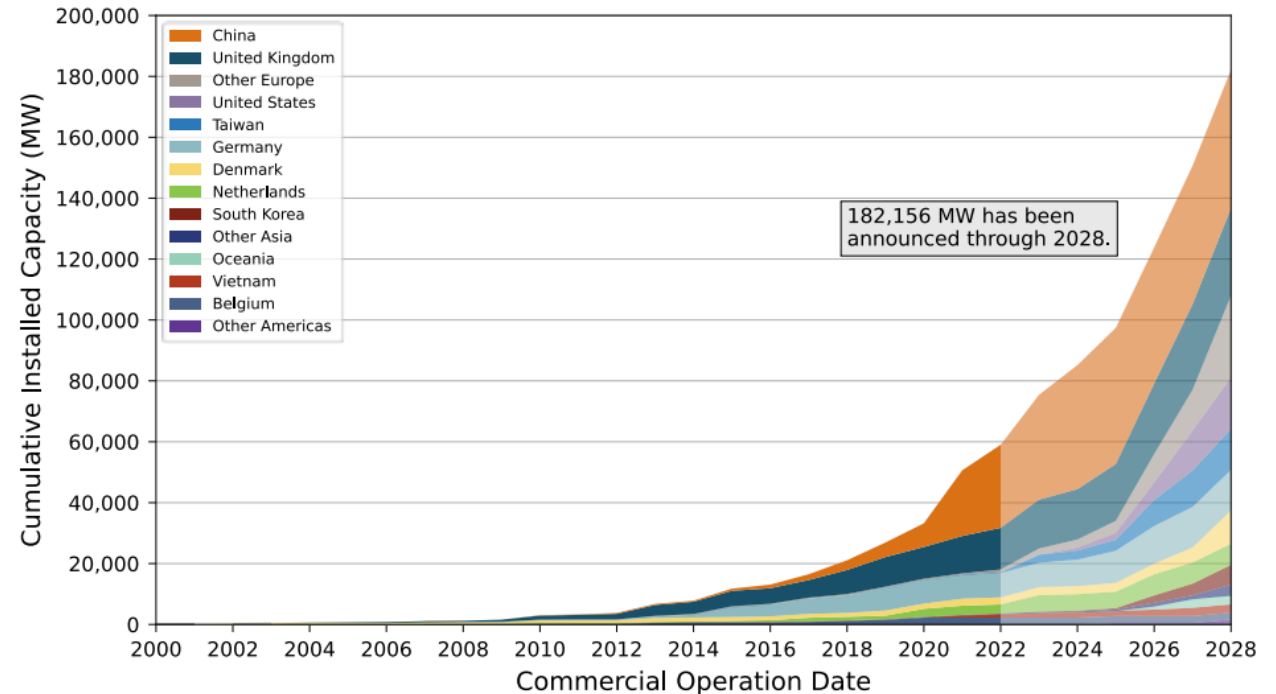
# Setting the scene



## History of offshore wind

1990 – first offshore turbine

1991 – first offshore wind farm



... offshore wind is here to stay (and growing)

Reference

Membership

**Time Capsule Project**

Contact

Objective: Past to present an enduring framework to celebrate milestones in offshore geotechnics over time. Available via the TC209 webpage, they are designed to enable all contribute new content by (a) adding details to an existing entry; or (b) providing additional timeline will be maintained into the future, thereby providing a framework to capture future milestones.

The following (preliminary) timelines have been prepared:

- Europe / Renewables
- Europe / Oil & Gas
- Asia / Renewables
- Australia / Oil & Gas
- South America (Venezuela) / Oil & Gas
- North America / Renewables

Content for other timelines has been received and will be released shortly watch this space.

We welcome additional contributions on the above. Please email TC209 Chair ([phillip.watson@uwa.edu.au](mailto:phillip.watson@uwa.edu.au))

<https://www.issmge.org/committees/technical-committees/applications/offshore>

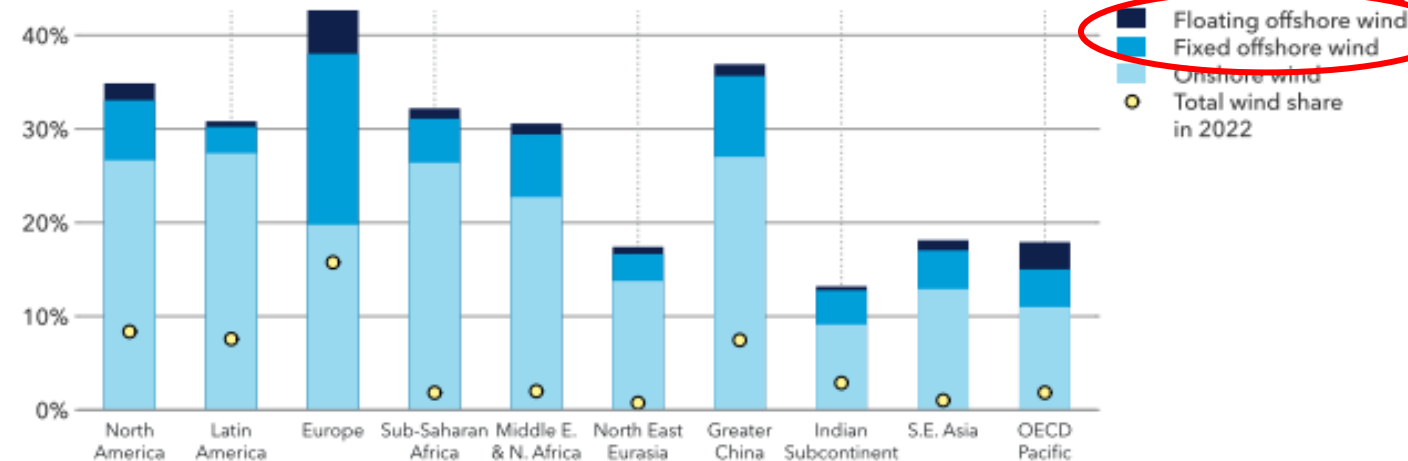
## Future growth of offshore wind

The urgency to address climate change is evident – and offshore geotechnics has a role (refer to Prof. Dave White's wrap up of OSIG 2023)

FIGURE 3.9

Share of wind in electricity generation in 2050 by region

Units: Percentages



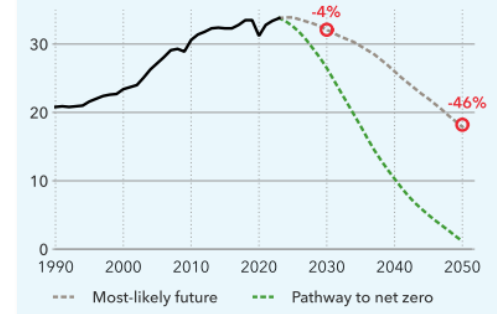
Historical data source: IEA WEB (2023) GlobalData (2023)

One of many levers that need pulling ... roughly 10% of electricity generation from offshore wind by 2050

FIGURE 6

World energy-related CO<sub>2</sub> emissions, after DAC

Units: GtCO<sub>2</sub>/yr



Source: DNV Energy Transition Outlook 2023

... room for improvement!

# Offshore geotechnics is important

The offshore is facing headwind (pun intended)

- Inflation, supply chain, reliability = impact on profit margins
- Permitting, regulations = uncertainty

Geotechnics is a major contributor to cost

- Site characterisation
- Foundation design, fabrication & installation
- Operations

We need continual technological advancement to deliver outcomes – it's an exciting (but urgent) time



# What don't we know already?

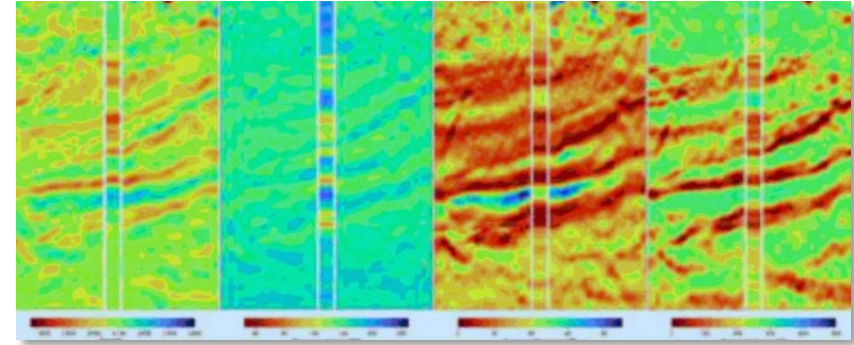
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- Large spatial extent
- Lack of historical data
- Variable ground / 'new' soils

Further, it is often said there are ...

- not enough boats for a CPTs per site
- not enough labs for all the tests that need doing

How do we solve this?



Quantitative geophysics



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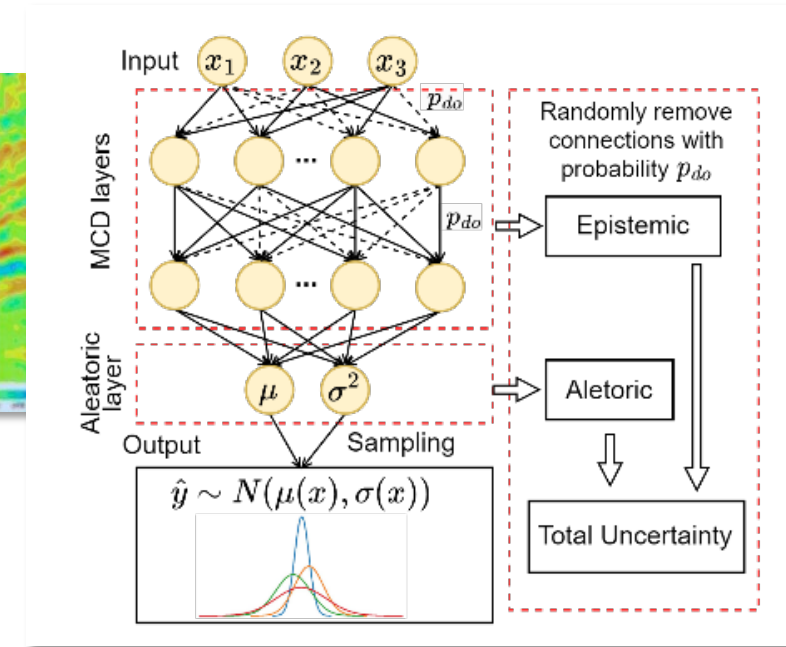
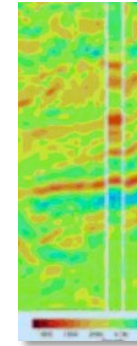
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Datascience

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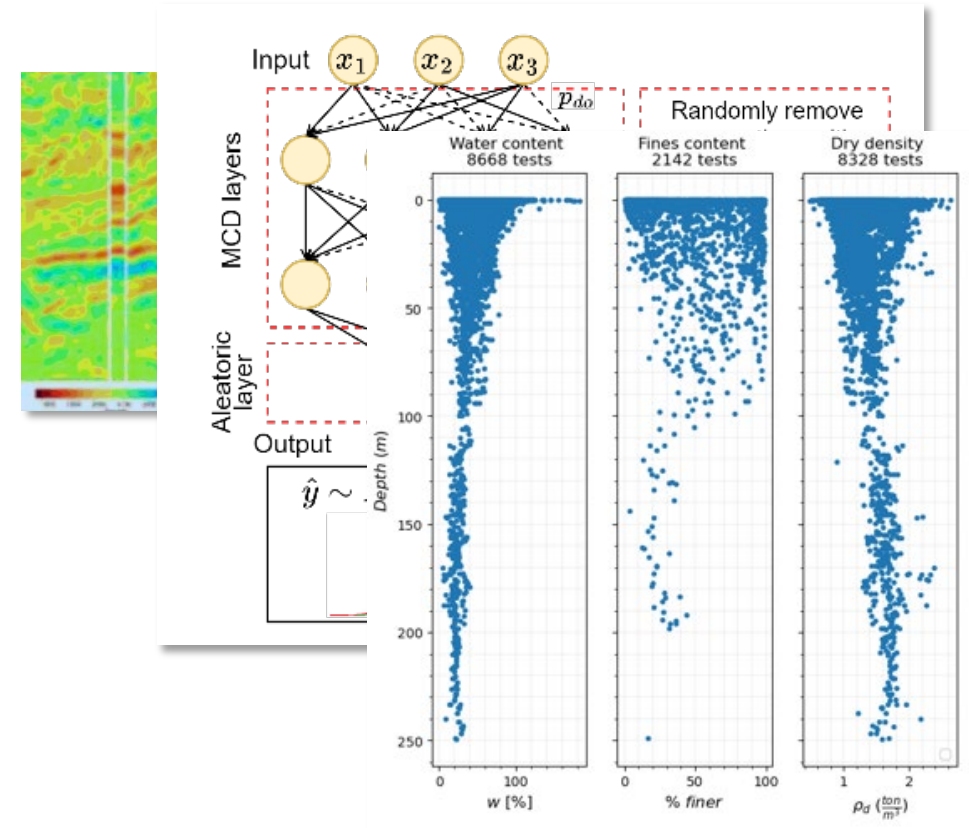
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Leveraging databases

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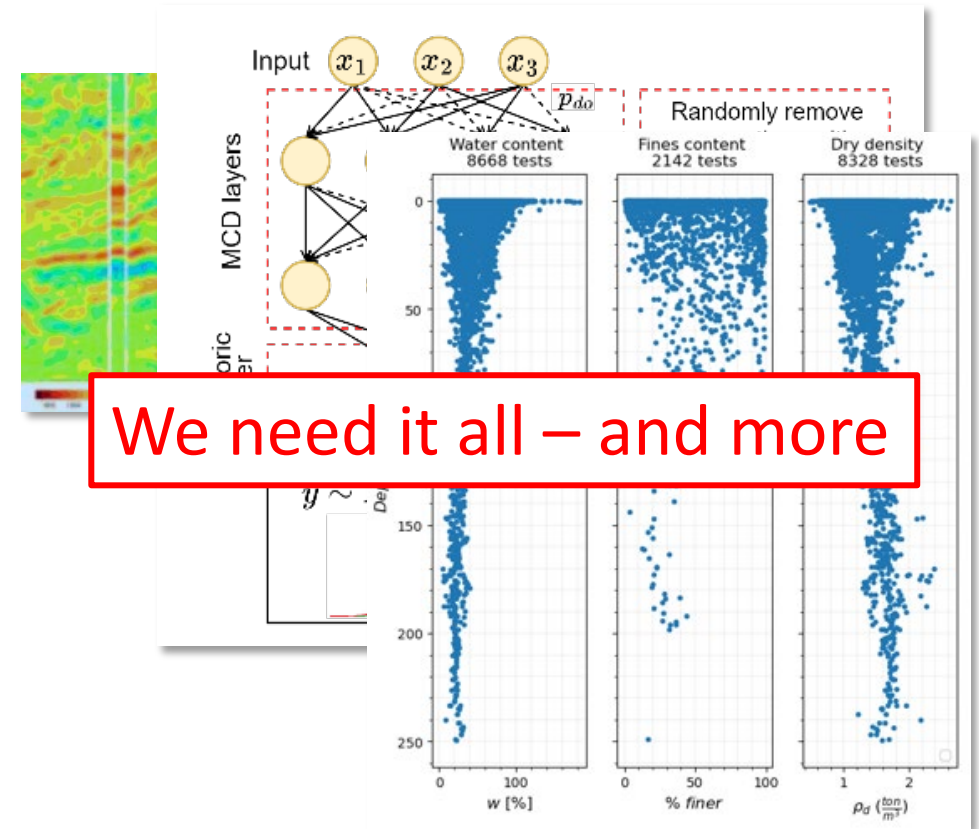
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Leveraging databases

# What don't we know already?

**Fixed wind** dominated by monopiles (80%)  
but also includes pile & suction bucket jackets,  
gravity structures

Long history of offshore foundation design,  
complemented by **new research** and **local practice**

Even within monopiles there is work to do ...

- Reduced L/D
- Rate effects, partial drainage, cyclic, fatigue
- Installation reliability ... and noise!



Source: OffshoreWIND.biz  
(Ocean Wind 1, New Jersey)





# What don't we know already?

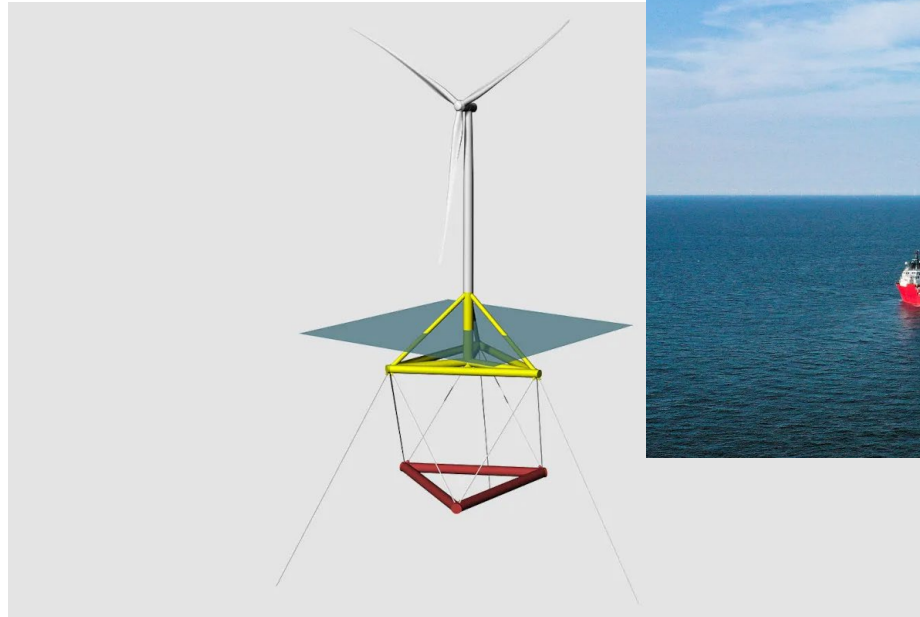
**Floating wind** demonstrators are in progress, and many future projects

Anchoring options well studied

New challenges from

- 'New' options
- Shared moorings
- Reliability

... and much more



[www.stiesdal.com](http://www.stiesdal.com)

# Setting the scene

## What don't we know already?

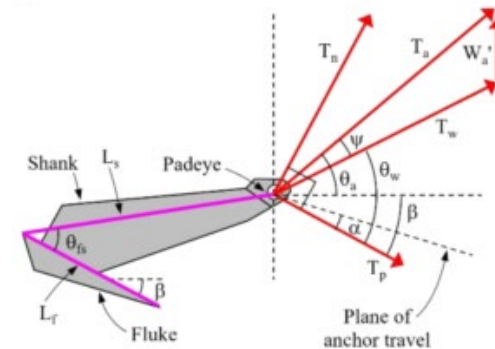
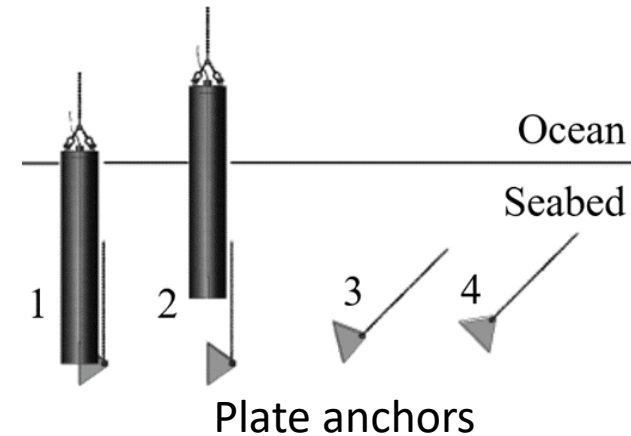
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Drag anchors

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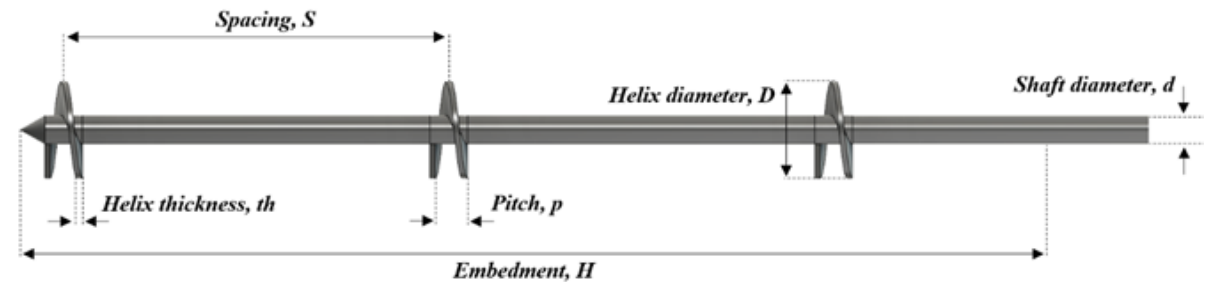
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<https://torcsill.com/industries/>

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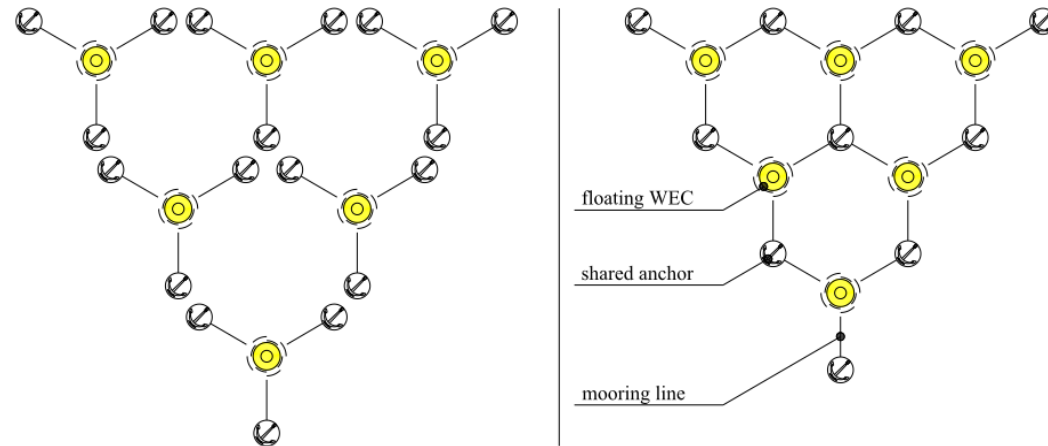
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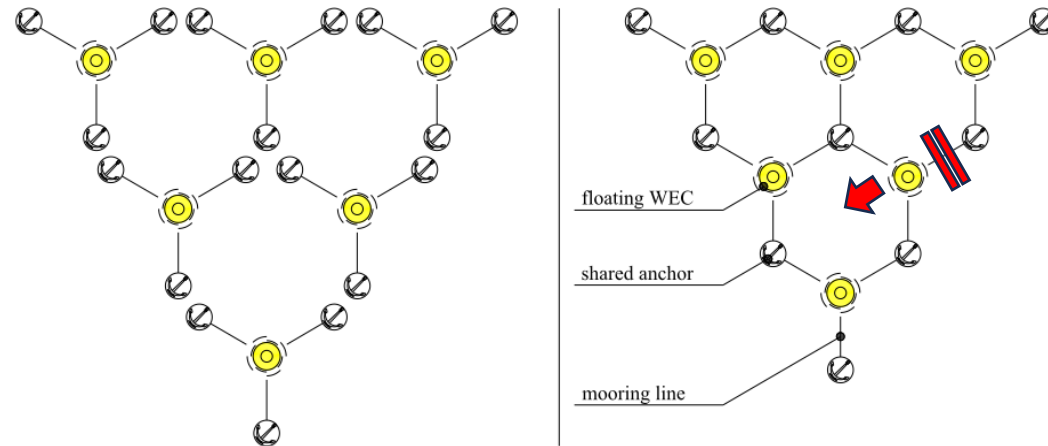
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