FOWPI Status Update

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FOWPI Project Management Team

FOWPI
FIRST OFFSHORE WIND PROJECT OF INDIA

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Agenda

- Updates from March 9 stakeholder consultation event
- FOWPI in brief
- Preliminary results of selected WPs
- Ongoing work

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Updates from March 9 stakeholder consultation event

- White paper, to be published in the spring, will address roadmap for offshore wind in India
- 1 GW is targeted for Gujarat and later another 1 GW for Tamil Nadu
- EoI will be published after white paper

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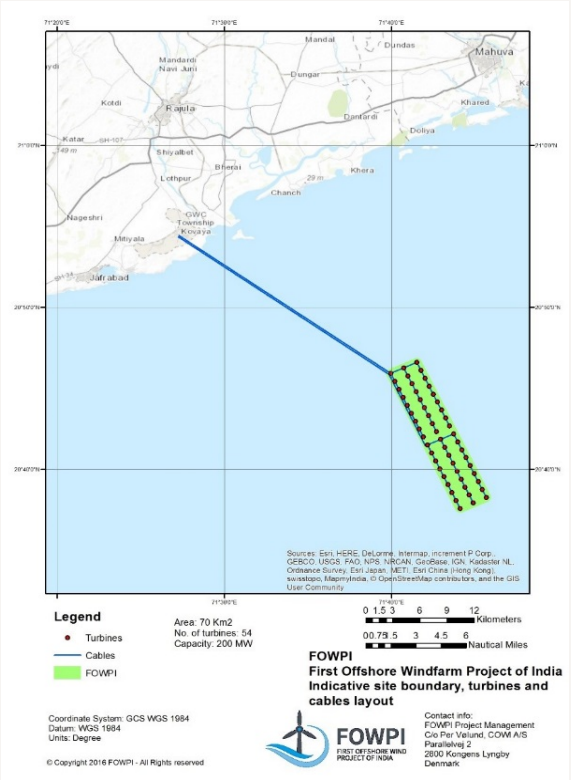
About FOWPI

Technical WPs
- Site Layout
- Yield Estimate
- Environmental & Consenting
- Metocean Assessment
- Foundation Design
- WTG Technology
- Electrical Design
- Coastal / Onshore Assessment
- Soil Conditions

Non Technical WPs
- Knowledge Bank
- Financial Modelling
- Capacity Building
- Secretariat Services



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FOWPI GeoSurvey

The survey area is located off Pipavav, Gujarat in the west coast of India.

Fugro Survey (India) PVT. LTD
Vessel MV Kamrup

Mobilization: December 9th 2017
Demobilization: January 21st 2018

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Survey configuration

Method

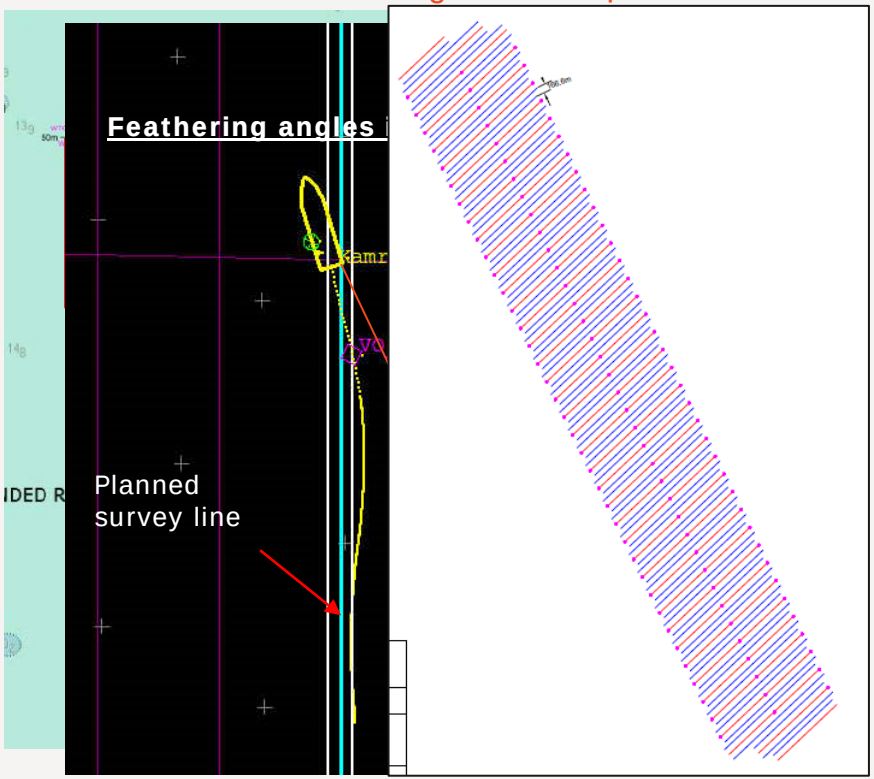
- Bathymetric and Magnetometer survey
  - Multibeam Echosounder
  - Side Scan Sonar
  - Magnetometer
- Seismic
  - 2D Ultra High Resolution Seismic (UHRS)

Coverage

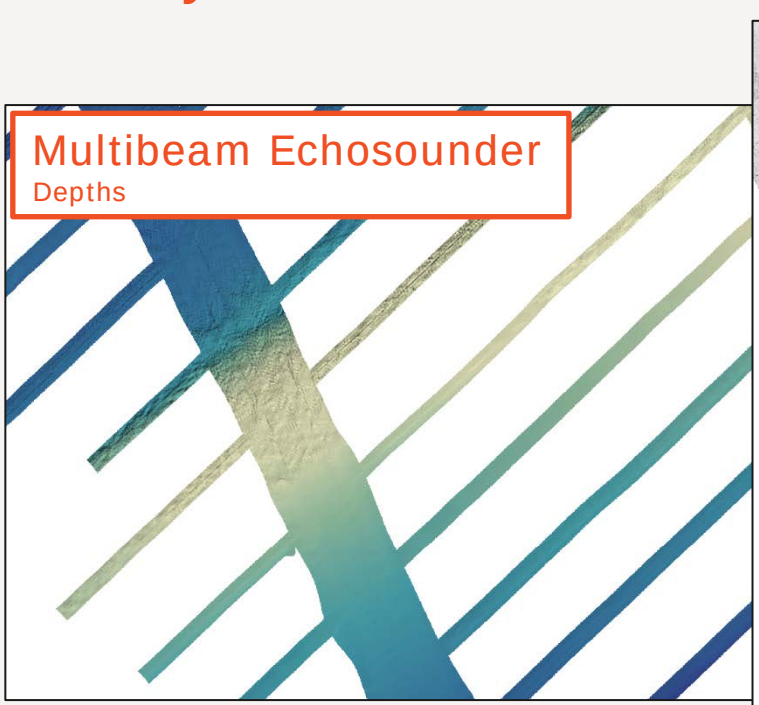
  - 430 line kilometres

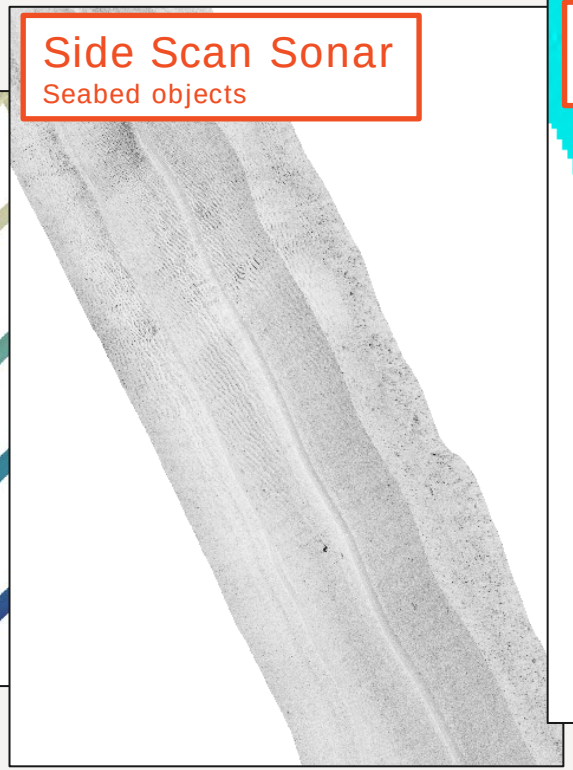
Planned 2D UHRS coverage

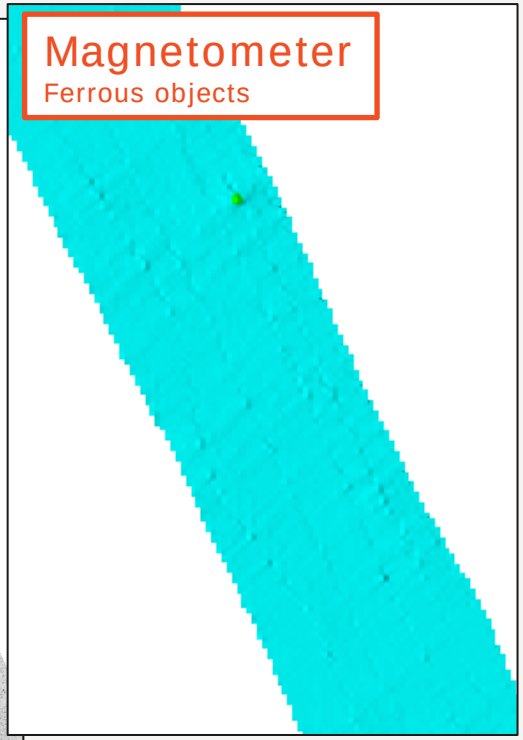
Revised lane plan - 2D UHRS



Bathymetric data examples







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Preliminary 2D Seismic profile example

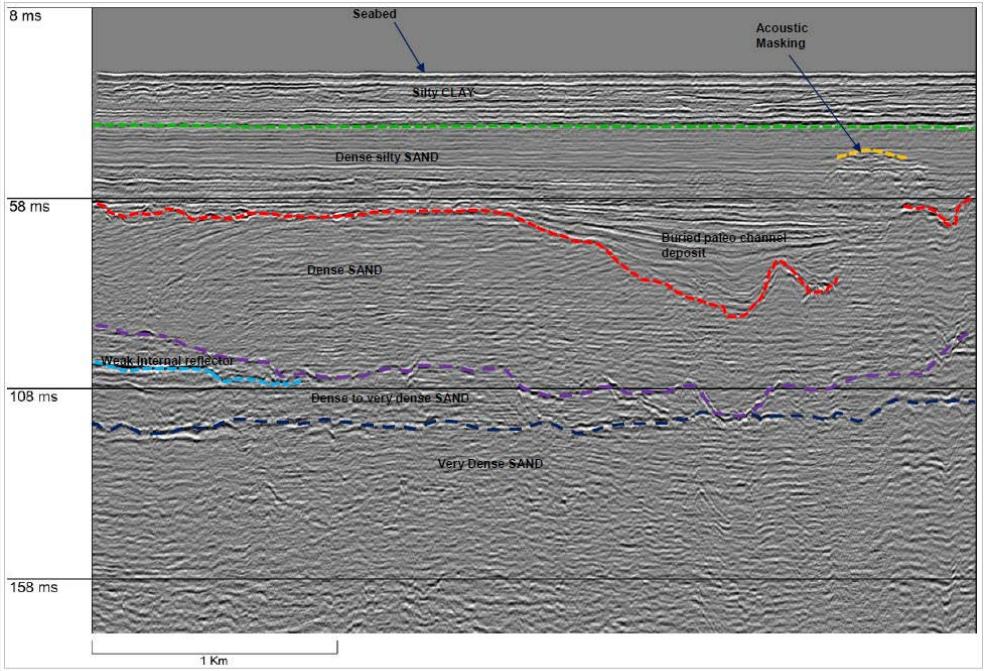

Figure 3.49: Preliminary Brute stack SEG-Y image from XL34 across the proposed wind farm

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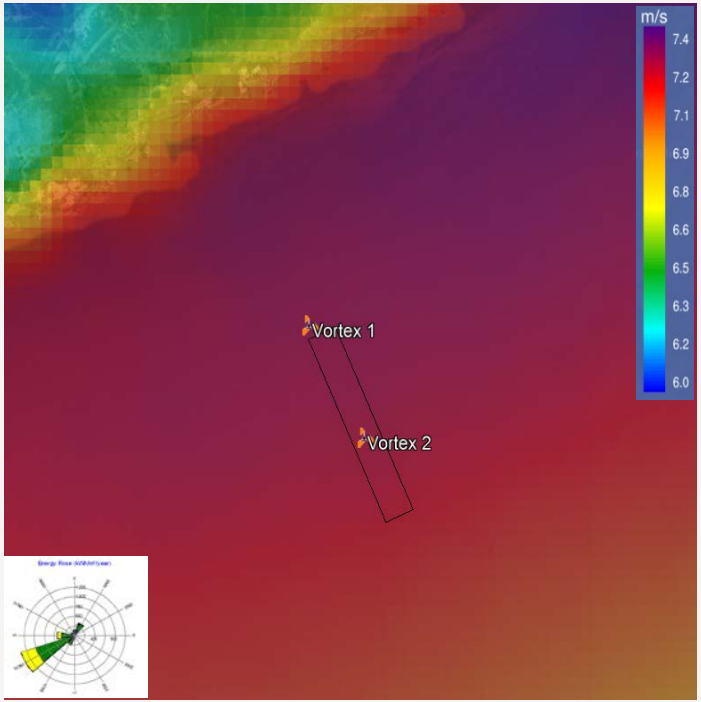
Conclusions

- Initial results from the geophysical campaign shows **high quality data** (close to European standards)
- Nearby borehole information shows thick (~9 meter) **soft clay sediments** that could pose a challenge to engineering and jackup operations
- Only **few seabed objects** and **few magnetic anomalies** observed
- Acoustic masking due to **shallow gas** observed **but no other hazards** such as faults or folds observed

Ongoing works:

- Final processing and interpretation ongoing. **Final results expected during 2Q 2018**

Wind resource modelling – **non validated**



Vortex 1:

› Mean wind speed at 100 m ASL: 7.1 m/s

Vortex 2:

› Mean wind speed at 100 m ASL: 6.9 m/s

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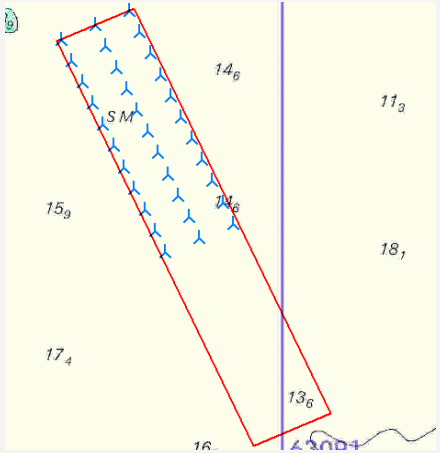
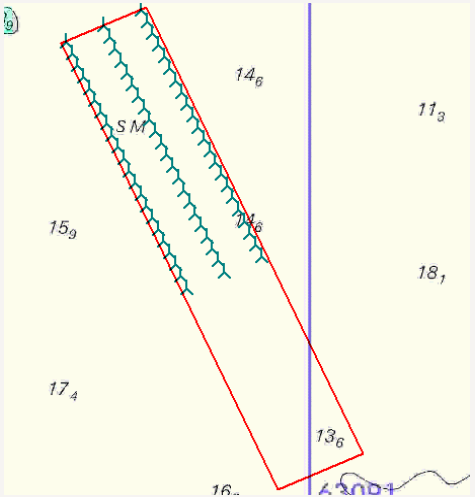
Layout Basis

6 MW: 3 x 11, 1500 x 1000 m



Net AEP (P50): 409.3 GWh/y
Capacity factor: 24%

3 MW: 3 x 22, 1500 x 500 m



Net AEP (P50):517.6 GWh/y
Capacity Factor: 30%

Net AEP (P50) and Capacity factor to be re-calculated when measurements are made available

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Economic considerations for base layouts

In consideration of wake losses, cable losses and costs, foundation costs, etc:

- Potential marginal economic losses for three row layouts with more in-row spacing and potential marginal economic gains for 2 row layouts
- Spacing of base layouts are found to be fairly optimal, although subject to more detailed investigations and detailed project design

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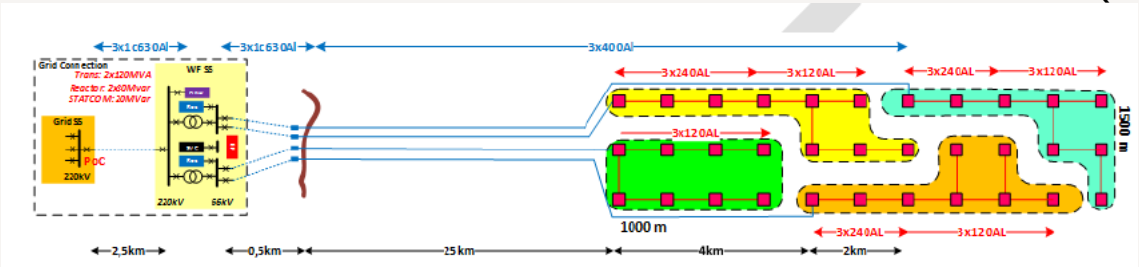
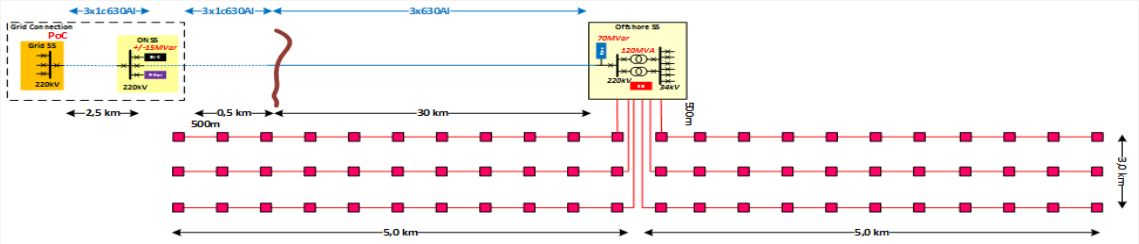
Electrical design

1) Onshore Substation + 4 cables to shore at 66 Kv (Optimal for 6 MW)



2) Offshore Substation + 1 cable to shore at 220 kV (Optimal for 3 MW)



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Ongoing work

- Environmental & Consenting
- Financial Modelling
- Harbour Assessment
- Knowledge Bank V2

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Thank you!

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