WIN WIN
- Wind-powered water injection

14th of November 2017
Johan Sandberg, Country Manager
Leveraging on experience - Offshore wind industry

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150 YRS SHIPPING

30 YRS ONSHORE WIND
WIN WIN - Wind-powered Water INjection

WIN WIN is a concept for a new generation of oil recovery technology. It comprises a floating wind turbine which supplies power to a water injection process.

Our ambition is that WIN WIN will reduce costs, increase flexibility, and reduce emissions for the oil industry, and create a commercially driven market for the floating wind industry.
Background - Inspiration for the WIN WIN project

Successful operation and developments of floating wind technology

The development of EOR technology / Tyrihans Raw Seawater injection for EOR

Winter 2013/2014
Idea developed internally

April 2014
Concept first presented at OTC with call for a joint industry project

February 2015
Partnership formed and project started

May 2016
Project results presented at OTC

--> Phase 2, pilot testing and commercial project

Image: Statoil

Image: OTC 20078
The system
Case study system specifications

Geographic location: North Sea
Water depth [m]: 200
Distance from production host [km]: 30
Reservoir conditions: 1 template, 2 injection wells, normal injectivity with specified injectivity index
Target injection rate [bbl/d]: 44 000
Maximum injection rate [bbl/day]: 81 000
Maximum pump discharge pressure [bar]: 130
Water treatment requirements: Water filtration / chemical injection
WIN WIN meets performance targets

![Graph showing injected volume and losses over months]

- **Injected Volume**
- **Loss due to Equipment Failure**
- **Loss due to wind variation**
- **Injection Target**
Subsea wells

- 95 subsea water injection wells in total on the NCS

- Ekofisk, with 16 wells, has continuously increased its recovery ratio, from 15-19% in the 1970s, to close to 50% now.
Develop the WIN WIN concept along four pathways
Validate, Innovate, Recommend and Explore

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<td>A.1</td>
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<tr>
<td>Electrical system validation</td>
<td>Detailed assessment of pump type, performance and reliability</td>
<td>Detailed technology assessment of water treatment systems</td>
<td>Identify and assess opportunities to improve reliability and reduce OPEX</td>
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<td>Identify other applications where wind could prove solutions for the oil and gas industry</td>
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- **Validate**: Detailed assessment of pump type, performance, and reliability
- **Innovate**: Detailed technology assessment of water treatment systems
- **Recommend**: Development of guideline for design and operation of WIN WIN
- **Explore**: Identify other applications where wind could prove solutions for the oil and gas industry
WIN WIN - connecting the offshore wind and oil & gas industries
Thank you

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