Subsea Expo

Friday 9th February 2018

OGTC Facility of the Future: Energy Integration
OGTC Facility of the Future: Energy Integration

1887

Source: Wind Power: the story so far, Dr Peter Musgrove (first BWEA Chairman)
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Boeing 747-B
Length: 76m

<table>
<thead>
<tr>
<th>Year</th>
<th>Facility</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>Vindeby</td>
<td>0.4</td>
</tr>
<tr>
<td>2000</td>
<td>Middelgrund</td>
<td>2</td>
</tr>
<tr>
<td>2003</td>
<td>Nysted</td>
<td>2.3</td>
</tr>
<tr>
<td>2009</td>
<td>Horns Rev 2</td>
<td>2.3</td>
</tr>
<tr>
<td>2012</td>
<td>Anholt</td>
<td>3.6</td>
</tr>
<tr>
<td>2014</td>
<td>Westernmost Rough</td>
<td>6</td>
</tr>
<tr>
<td>2016</td>
<td>Burbo Bank Ext.</td>
<td>8</td>
</tr>
</tbody>
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Cumulative Capacity (GW)

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Monopile
0-30m, 1-2 MW

Jacket/Tripod
25-50m, 2-5 MW

Floating Structures
>50m, 5-10 MW

Spar
>120m, 5-10 MW

Source: Deep water - The next step for offshore wind energy, European Wind Energy Association, July 2013
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Installed Floating Wind Capacity (MW)

Source: Hywind Scotland Pilot Park, The world's first floating wind farm, Leif Delp, Project Director - All Energy 2016
Onshore wind

Floating wind

Offshore wind (fixed)

Onshore wind

LCOE projections (£2014 real)

Statoil Remotely Operated Factory (ROF)™ Roadmap
Driven by innovation and technology

Asgard
In operation

Oseberg Vestflanken 2
Ongoing

Subsea Compression

Early phase projects
Ongoing projects

Unmanned Production Platform (UPP™) supported by host

Future projects
Ongoing studies

Stand alone Unmanned Production Platform (UPP™)

Source: Statoil Remotely Operated Factory (ROFTM) Safe, high value & low carbon intensity concepts, Arild Samuelsberg: Manager Process Technology, Statoil Research & Technology, 8 August 2017
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Source: Indigo Power website
Wind-powered water injection is an important niche market...

WIN WIN is cost-competitive for suitable fields

**Lifecycle cost per barrel of water, WIN WIN vs alternative, EUR**

![Graph showing cost comparison]

- $3 saved per barrel of oil
- 17,000 tCO₂ avoided per year

**OGTC Facility of the Future: Energy Integration**

**Lean Semi – New design based on proven technology**

- Designed to make **marginal field developments** viable in a low oil price environment
- Based on **proven building blocks** with conventional standard equipment
- Topside capacity up to **60,000 bbls** of liquids
- **30 percent weight reduction** compared to traditional solution
- Down to **29 months** delivery time
- **6,000 metric tons** topside
- North Sea/world wide application
- Low manning – 20 LQ Capacity
- Possibility for refurbishment and relocation

Sources: MINIFLOAT: A Novel Concept of Minimal Floating Platform for Marginal Field Development, Cermelli et al, 2004; Technology for developing marginal offshore fields, Fee & O’Dea, 2006; Lean Semi – A Low Cost Solution for Marginal Fields, Aker, 2017
Please direct any questions or feedback to Martyn Tulloch at: mt@highlandpotential.com

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