Offshore Wind and Gas – a perfect match?

Aker Offshore Wind
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World electricity mix 2050
- Wind, Solar and Hydro dominating the power production
Global Offshore Wind Resources

Source: International Energy Agency (IEA)
IEA Offshore Wind Outlook 2019
**Drive down cost (LCoE) to ~50 EUR / MWh by 2030**

### 2020 LCOE
- LOCE for pilot-scale projects commissioned in 2020

### Turbine
- Increased turbine size, larger swept-area, high hub-height and increased capacity factory

### BoP
- Economies of scale: Fewer turbines and foundations required, industrialization of foundation construction, and simpler installation (at shore assembly)
- System integration and subsea technologies to reduce CAPEX/OPEX

### O&M
- More efficient and digitally enabled O&M operating models

### Devex
- Re-use and digitalization of project development and engineering process
- Offshore capabilities used to effectively navigate immature regulatory frameworks
- Collaborative approach to supply chain and integration of local content

### 2030 LCOE
- Target LCOE for prime acreage industrial-scale projects commissioned in 2030

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Wind powered Oil & Gas operations

**Autonomous - Wind for Gas Compression**
- Subsea compression powered by wind
- Two Manifolds and Separator, Two floating 10/12 MW wind turbines
- Two production lines - condensate and gas
- In case of “no wind” the gas is bypassing the compression at reduced rate

**Direct Feed - FPSO powered by wind**
- FPSO powered by 3 floating 12 MW wind turbines
- Powering topside processing equipment and subsea separation / pumping system. Gas turbines kept in partial load to quickly step in if needed due to wind conditions.
- Potential of developing an offshore grid connecting surrounding facilities and adding turbines
Clean Hydrogen – Essential to decarbonize our economy

GLOBAL CO₂ EMISSIONS PER SECTOR 2019

- Power: 38%
- Industry: 25%
- Transport: 22%
- Buildings: 9%
- Other: 6%

Clean hydrogen is the only viable alternative for decarbonation of several industry users

Fertilizer
Feedstock → H₂ → NH₃ → Products

Metal processing
Metal Ore + H₂ → Metal + Water

Methanol
CO₂ + H₂ → CH₃OH + Water

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ZEEDS – Zero Emission Energy Distribution at Sea

ZEEDS - an open innovation project initiated by Wärtsilä, to explore the opportunities with zero emission shipping