Technology and digitalizaton

GCE Subsea Møteforum 2018

01.11.2018, Håkon Skofteland, Aker BP

AKER BP ASA

A focused portfolio on the NCS

Skarv / Ærfugl
Solid base performance and area upside potential

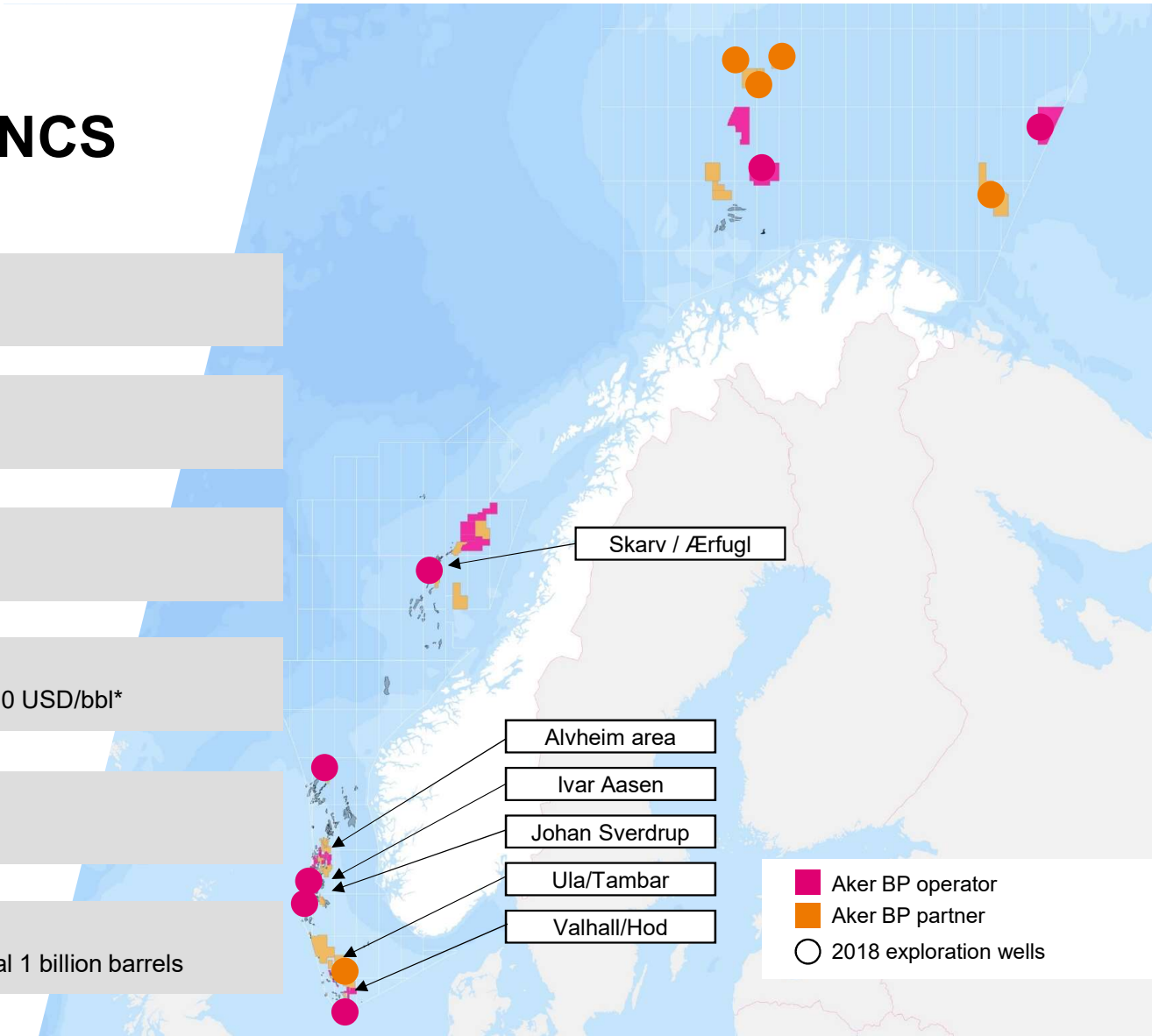
Alvheim area
High production efficiency and low operating cost

Ivar Aasen
Production ramp-up and IOR opportunities

Johan Sverdrup
World class development with break even price below 20 USD/bbl*

Ula/Tambar
Late life production with significant upside potential

Valhall/Hod
1 billion barrels produced, ambition to produce additional 1 billion barrels



** Full field*

CORPORATE STRATEGY

Targeting significant efficiency improvements

Great savings possible – requires new way of thinking

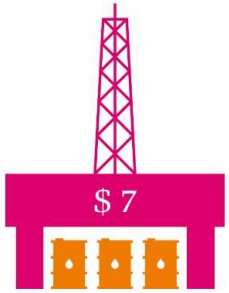
Strategic Alliances

Digitalization

Lean operations

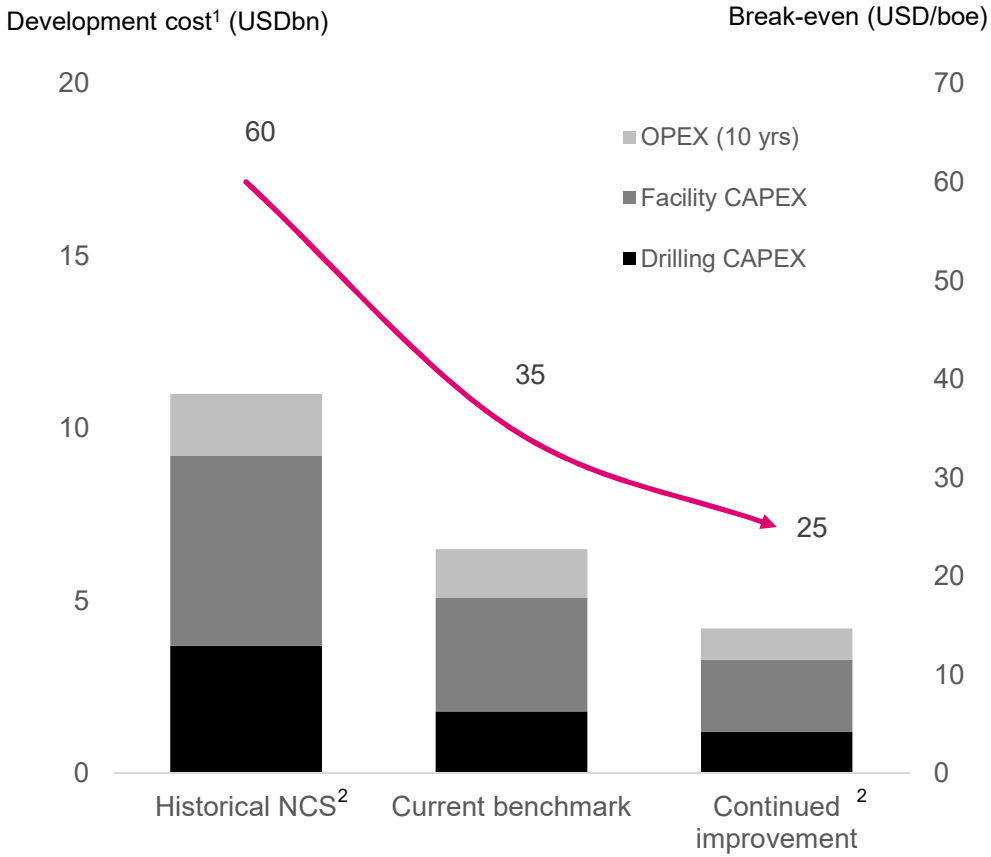
Flexible business model

Target production cost below 7 USD/boe



Target full cycle break-even below 35 USD/bbl

Illustrative project economics (USD/boe)



1. *Total CAPEX over Life of field and OPEX for 10 operating years. Current base case assumes 20 years of operation, depending on oil price. All numbers in real terms 2017*
2. *Illustrative for NCS Projects pre-2014 oil price drop and potential for future projects*

DIGITALIZATION TOWARDS FIELD OF THE FUTURE

Field of the Future

Vision

Field of the Future

Remote Operated, Unmanned, Zero Discharge

Remote Operations

- Autonomous operation
- Robotics for inspection
- Predictive analytics, digital processes and workflows

Unmanned Installation

- Simpler, cost effective and inherently reliable designs
- No maintenance requirements
- Modular design – Plug&Play
- Competitive material selection

Expanded Subsea Facilities

- Boosting and processing
- Subsea power
- Long distance tie-backs

Zero Discharge/Emission

- All electric
- Alternative energy sources
- No discharge to sea or air
- Energy management

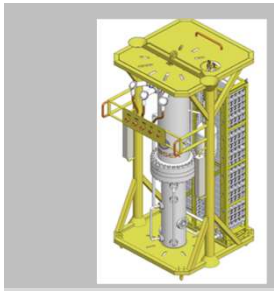
FIELD OF THE FUTURE

Need for technology development

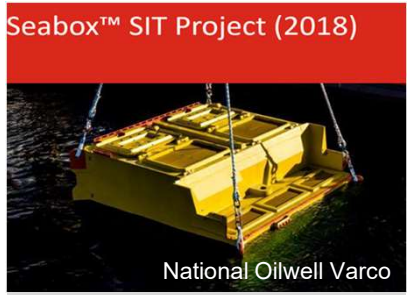
Expanded subsea facilities

Subsea separation solutions

Subsea produced water treatment



Subsea pump solutions



Subsea seawater treatment

Unmanned installations

Alternative energy sources

All electric

Remote operations

Digital twin

Walk to work

Zero discharge / emissions

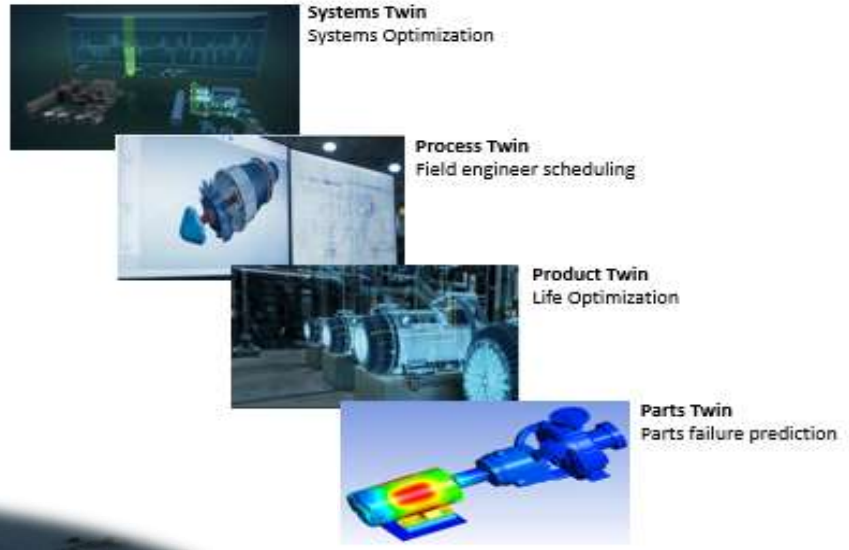
Electric lifeboats

Remote inspection

Digital tools

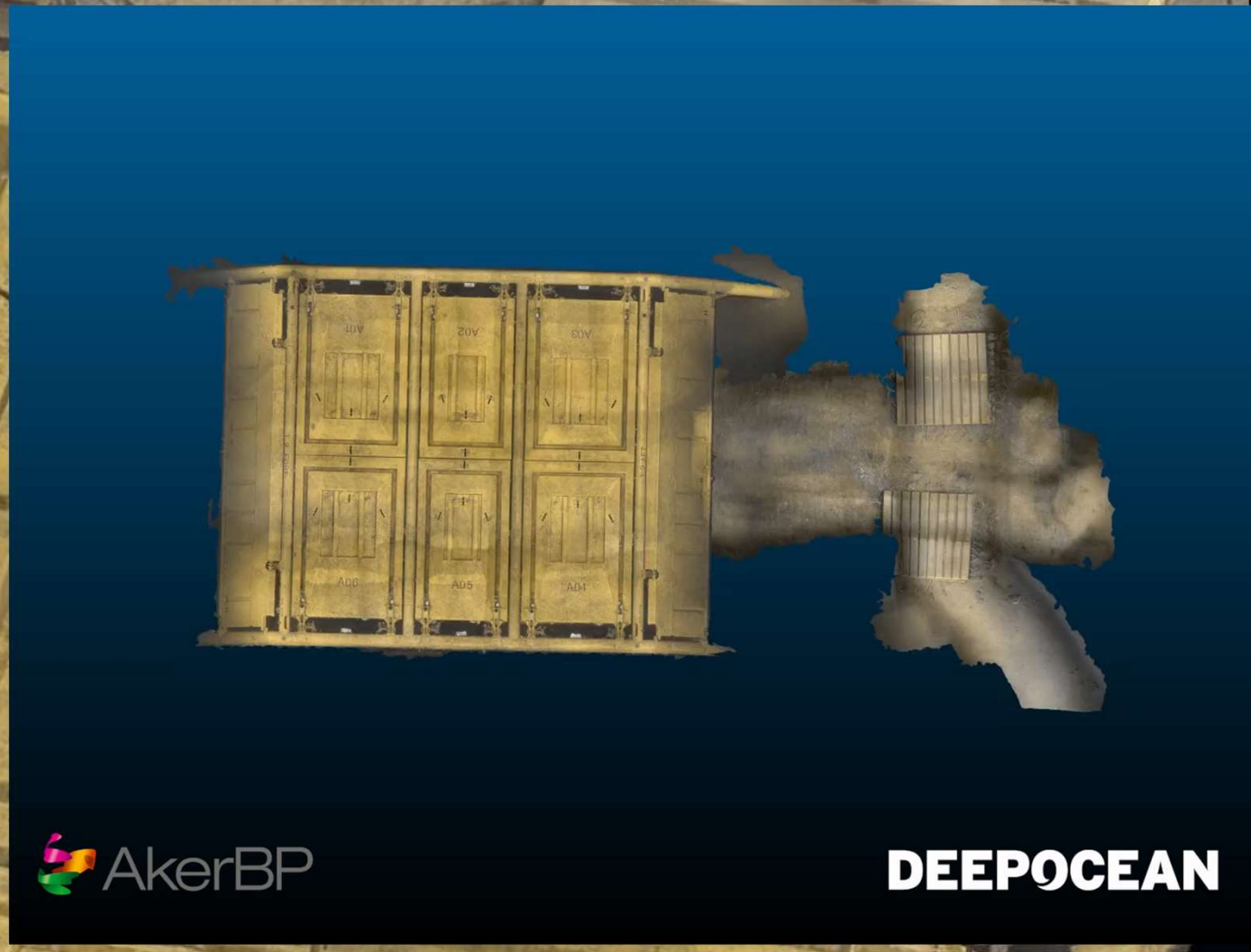
Example: Digitalization in Subsea – Digital Twin

- Definition of a Digital Twin: “A digital replica of physical assets, processes and systems that can be used for various purposes. The digital representation provides both the elements and the dynamics of how an IoT device operates and lives throughout its life cycle
- The Digital Twin is a geometric (3D) representation of an asset which is enriched with data relevant to end users.



Example: Structure from motion by Deep Ocean

- Highly realistic 3D-model created from ROV video footage
- True representation of as-installed condition

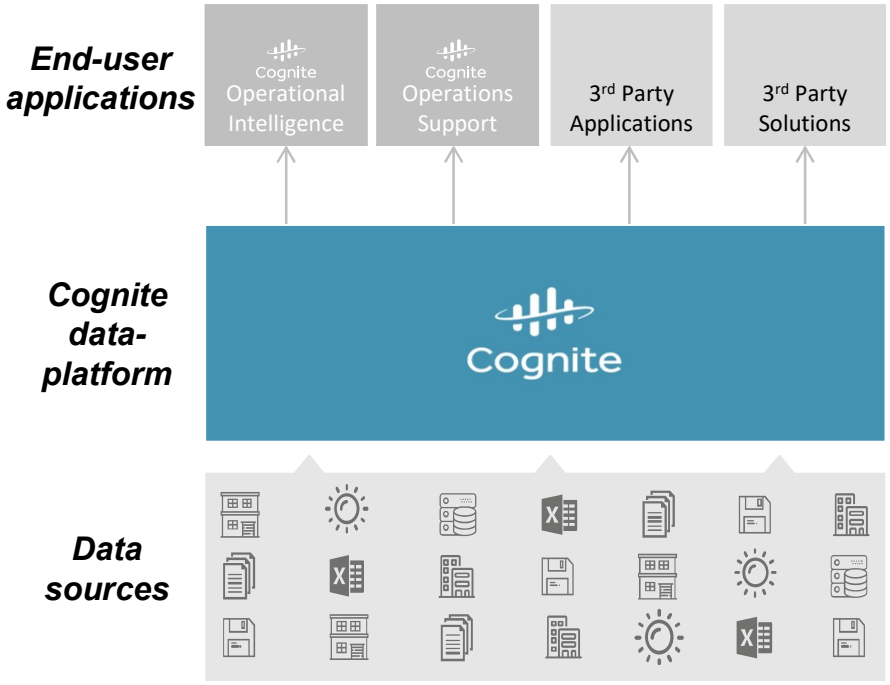


AkerBP

DIGITALIZATION TOWARDS FIELD OF THE FUTURE

Established a data platform together with Cognite

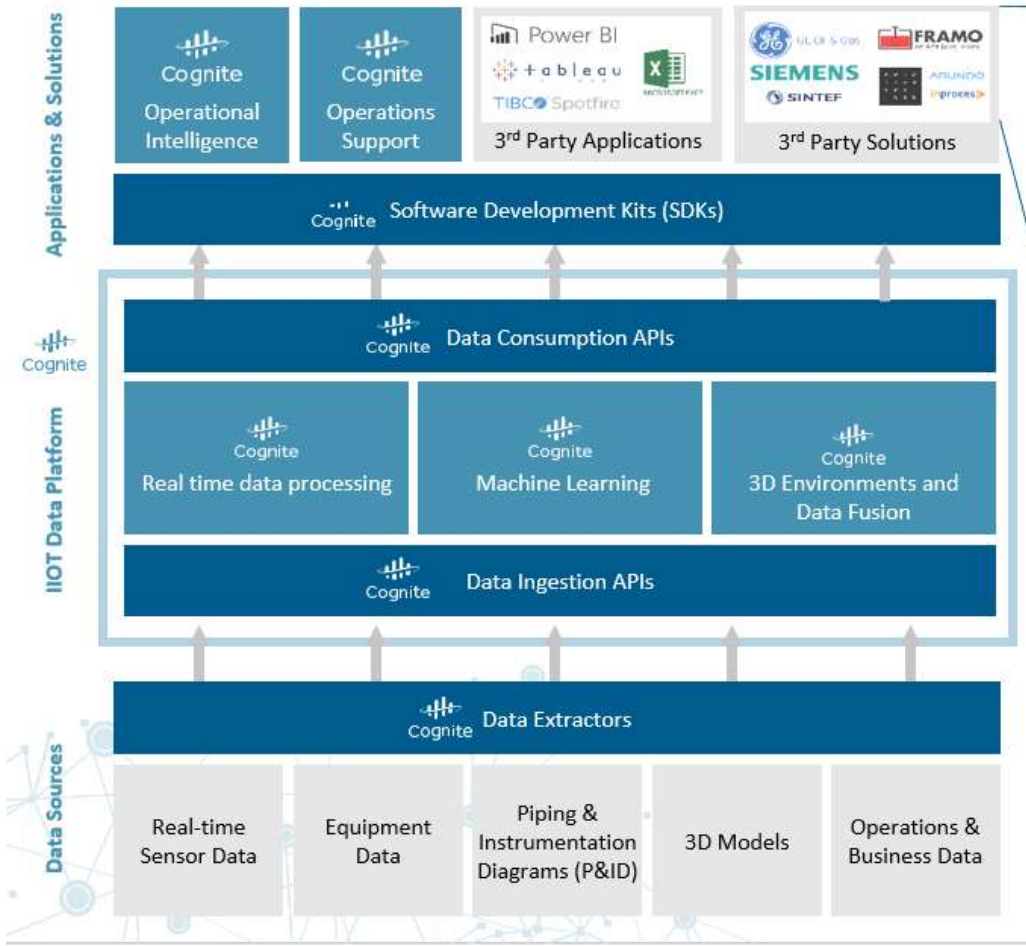
It is all about data - #dataliberation



- **Design criteria for the data platform**
  - Open architecture, uniform to access all industry data
  - Remove data siloes and liberate data
  - Scaleable, flexible and robust
  - Cloud-based
- **Data feed established from ~200.000 sensors**
  - Live data from all Aker BP's installations
  - Complete historic data
- **About Cognite**
  - Norwegian IT company
  - Strategy: Develop world-class horizontal industrial data platform, making data a strategic asset in the industrial's own terms
  - Aker BP is Cognite's first customer and has 10% ownership

DIGITALIZATION TOWARDS FIELD OF THE FUTURE

Partners with access to data through the platform



Cognite

Partners active on platform today

- Predictive Maintenance
- Production Optimization
- Remote monitoring
- Simulations and visualization

FRAMO an Alfa Laval brand

KARSTEN MOHOLT

SOLUTION SEEKER

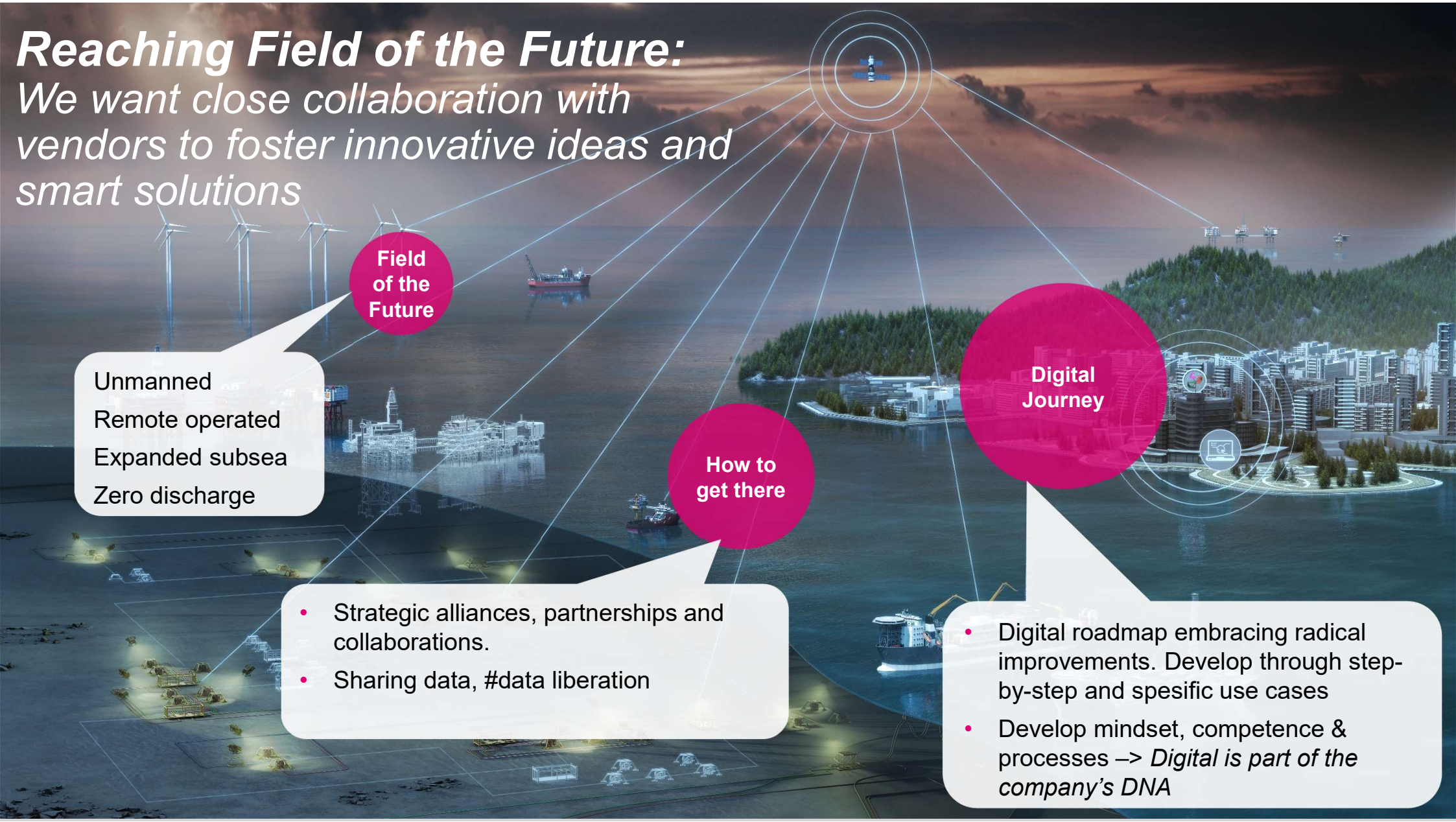
ARUNDO

Honeywell

SIEMENS

SINTEF

inprocess


Reaching Field of the Future:
We want close collaboration with vendors to foster innovative ideas and smart solutions
Field of the Future
Unmanned
Remote operated
Expanded subsea
Zero discharge
How to get there
Strategic alliances, partnerships and collaborations.
Sharing data, #data liberation
Digital Journey
Digital roadmap embracing radical improvements. Develop through step-by-step and spesific use cases
Develop mindset, competence & processes –> Digital is part of the company's DNA

www.akerbp.com