**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

Illustrative project economics (USD/boe)

- 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
- Illustrative for NCS Projects pre-2014 oil price drop and potential for future projects

Target production cost below 7 USD/boe
Target full cycle break-even below 35 USD/bbl

Development cost\(^1\) (USD\(\text{bn}\))

Break-even (USD/boe)

- OPEX (10 yrs)
- Facility CAPEX
- Drilling CAPEX

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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 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

Remote Operated, Unmanned, Zero Discharge
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

Aker Solutions
Subsea 7
Seabed Separation
FSubsea
National Oilwell Varco
Seabox™ SIT Project (2018)
SmST
Siemens
Aker Solutions
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
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

Partners active on platform today

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

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Reaching Field of the Future:
We want close collaboration with vendors to foster innovative ideas and smart solutions

- Field of the Future
- How to get there
- Digital Journey

Unmanned
Remote operated
Expanded subsea
Zero discharge

- Strategic alliances, partnerships and collaborations.
- Sharing data, #data liberation

- Digital roadmap embracing radical improvements. Develop through step-by-step and specific use cases
- Develop mindset, competence & processes —> Digital is part of the company’s DNA