

Oil, Gas and Chemicals

# ABB Subsea Power

## Powering increased recovery

# Subsea power to and from shore

## An investment in infrastructure

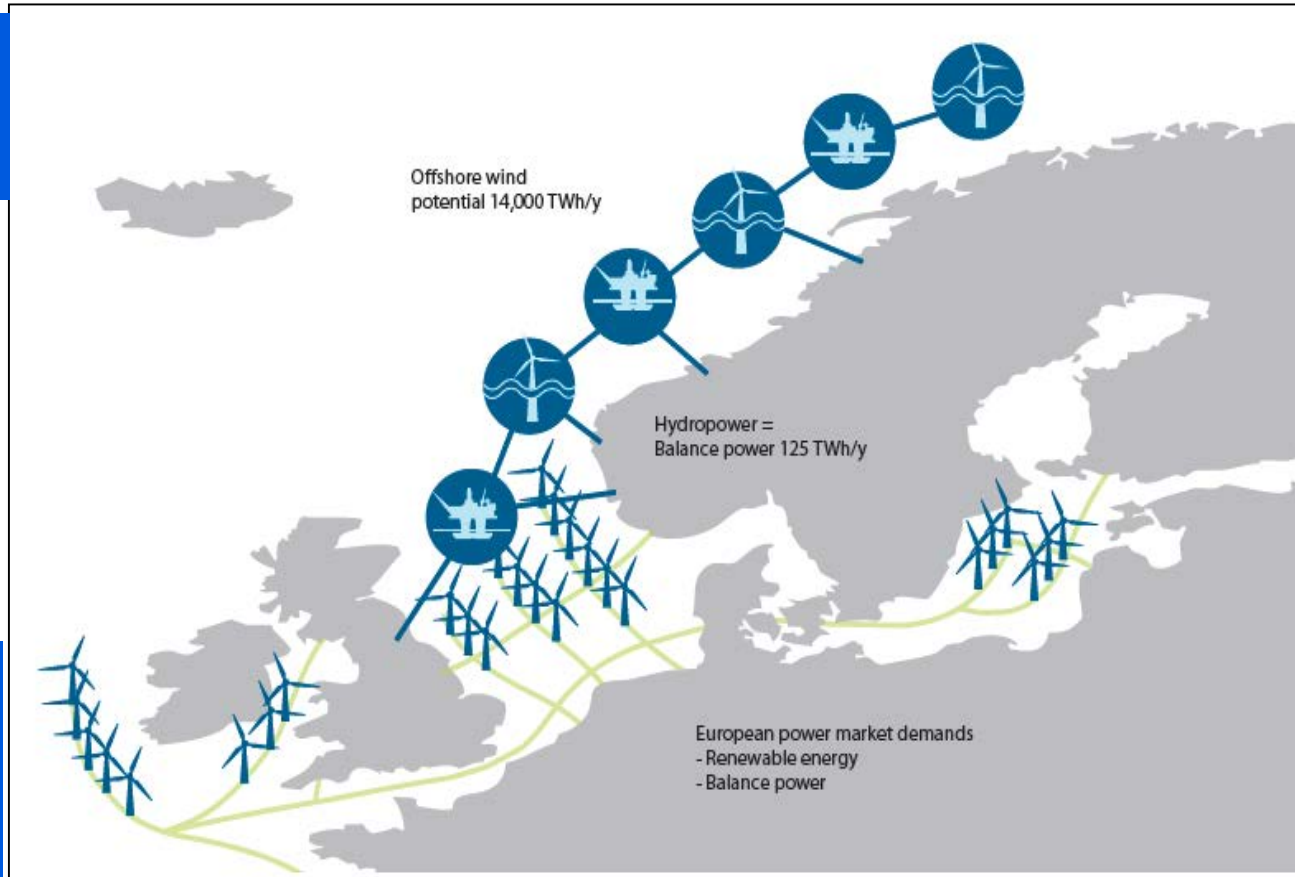
Technology

Synergies with offshore wind

Trends:

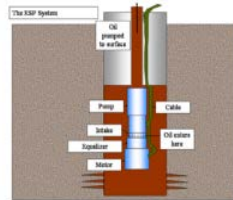
- More Power
- Longer
- Deeper
- Colder & older

Development of subsea process equipment



# ABB electrical subsea history

## Developing and partnering with the industry



### 1980-present ESP

More than 200  
electrical systems  
delivered



### 2000 SEPDIS

Subsea  
Frequency  
Converter



### 2000-2003 Topacio & Ceiba

First Systems  
With Subsea  
Transformers



### 2006-2009 Tyrihans

31 km tie-back  
Subsea  
Electrical system



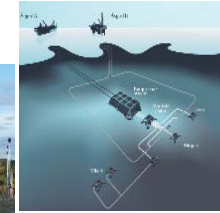
### 2007-2010 Ormen Lange

20MVA  
Subsea  
Transformer



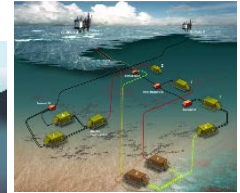
### 2008-2011 Åsgard/K-lab

Long Step-out  
Power Qualification,  
15MVA, 47km, 200Hz



### 2011- Åsgard

Long Step-out  
2x15MVA, 47km, 200  
Hz



### 2012- Gulfaks WGC

Long Step-out  
2x9MVA, 22km, 200Hz

Developing with the industry

Technology qualification

Industry collaboration

System knowledge

Project execution

Competence

# Statoil Åsgard

## Powering the world's first subsea gas compression project

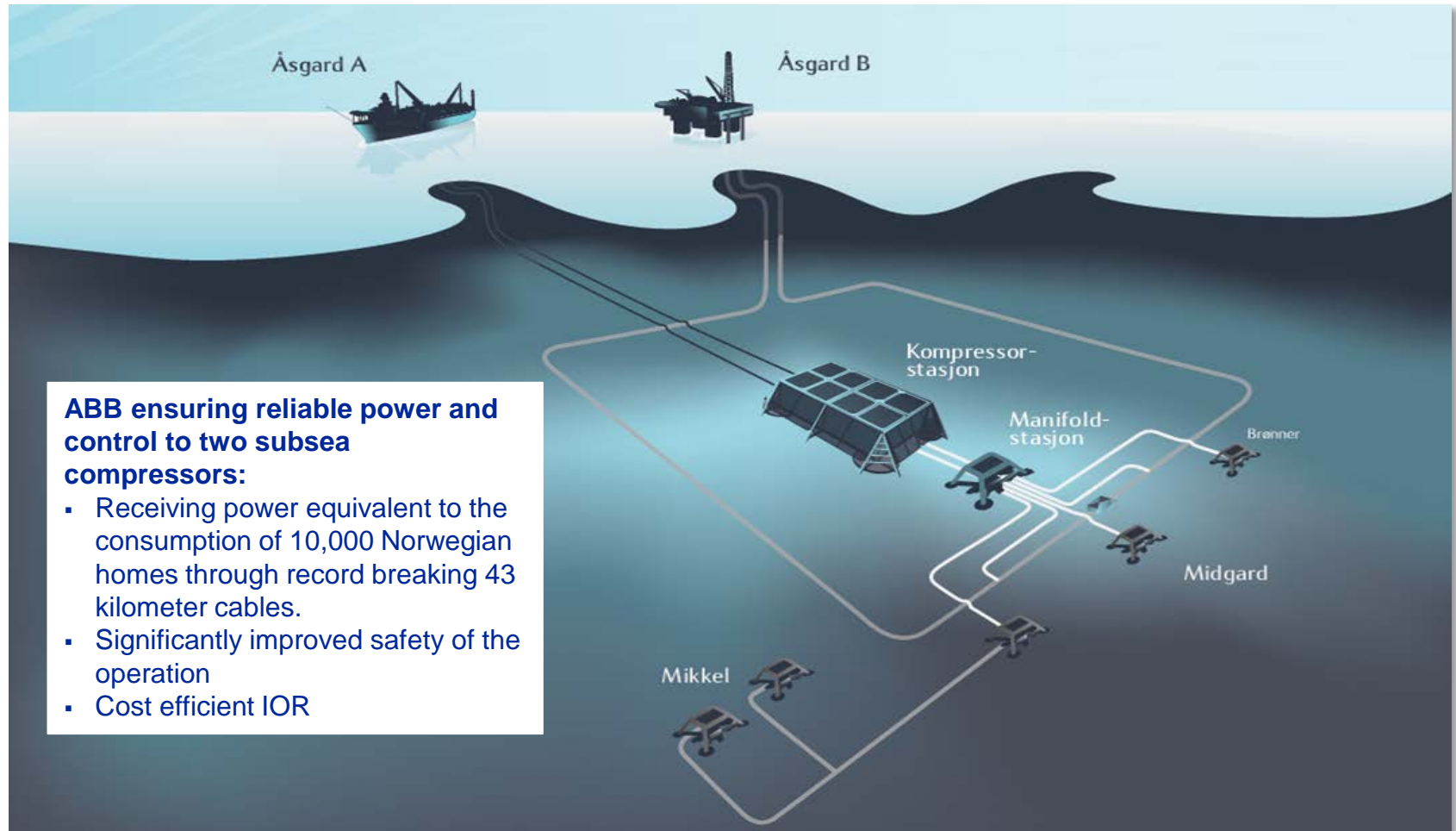
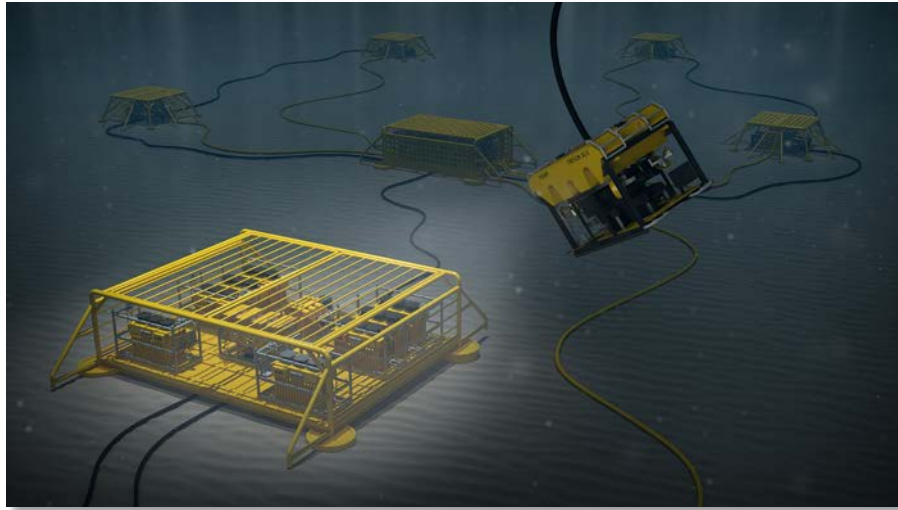


Photo credit: Statoil

# Subsea power Challenges



## Key success factors

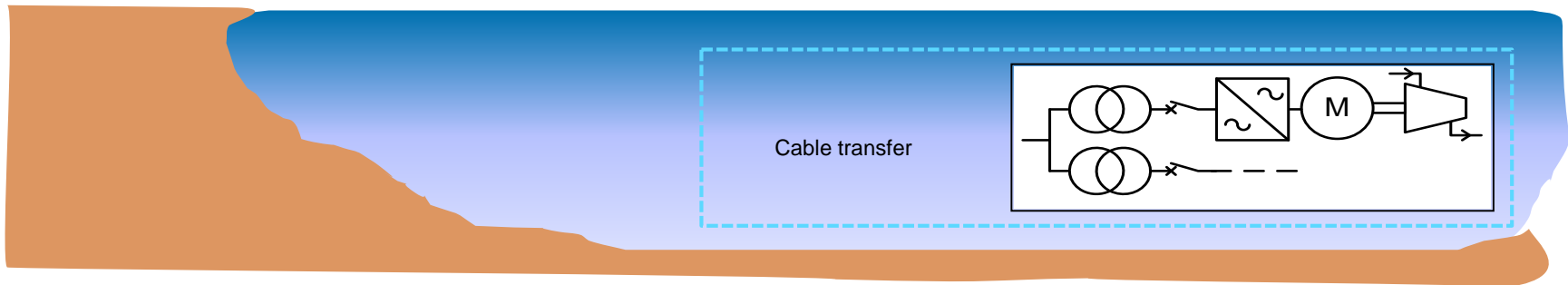
- Subsea gas compression
- Subsea separation
- Subsea power

## Challenges

- High pressure due to water depth
- Transmission distances
- Reliability

# Reliable subsea power

## Technology and competencies to leverage



### ***Project execution***

- Large offshore electrification, automation and telecom projects
- Advanced VSD & power electronics systems for subsea
- Life cycle services

### ***Products***

- Transformers
- Power Cable
- Motors
- Switchgear
- Flow Assurance

### ***Domain knowledge***

- Oil and gas process understanding
- Subsea
- Safety
- Marinization

### ***R&D***

- Power Electronics
- Material science
- Switching technology
- Complex systems



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