



# Technology development and the Norwegian model

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EQUINOR



# Outline

- Energy transition
- Automation and digitalization
- The Norwegian model
- Equinor Technology Missions
- Key messages



# A leading company in the energy transition

Turning natural resources into energy for people, and progress for society

## With global reach

>21,000

Employees

26

Countries



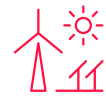
2.079

Million barrels of oil equivalent per day

1,562

GWh Renewable energy equity production

## Accelerating our transition



High value growth in renewables



New market opportunities in low carbon solutions



Optimised oil and gas portfolio

## How we will get there - together



Safe and secure operations



Guided by our values

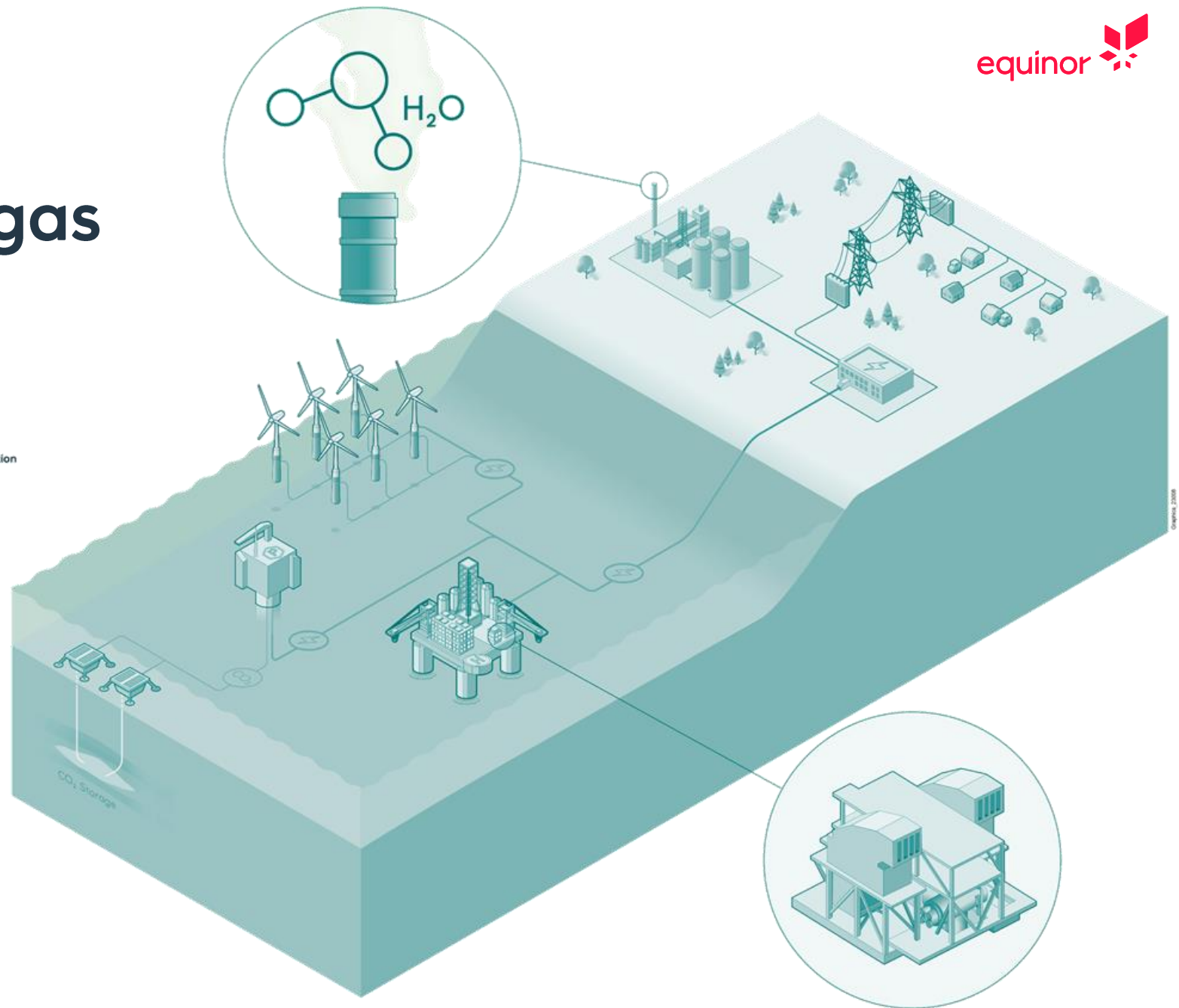
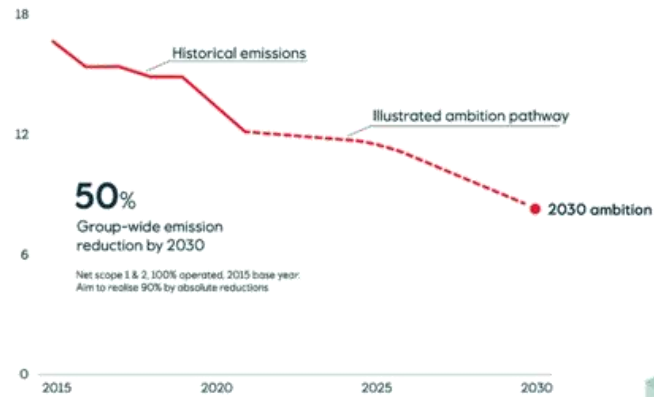


Building on competencies and our experience



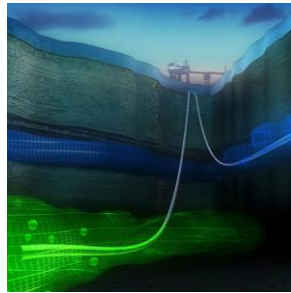
Together as one team – engaging partners and society

# Reduce CO<sub>2</sub> in upstream oil and gas

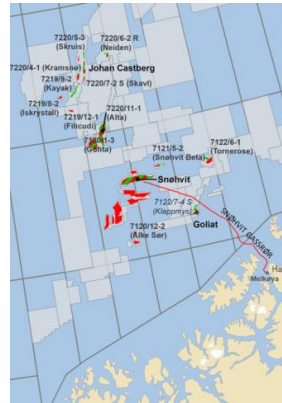


Carbon under target in 2030

# Transforming through technology



CO<sub>2</sub> removal and storage



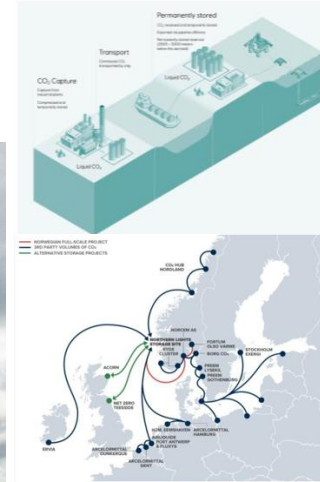
Hammerfest LNG



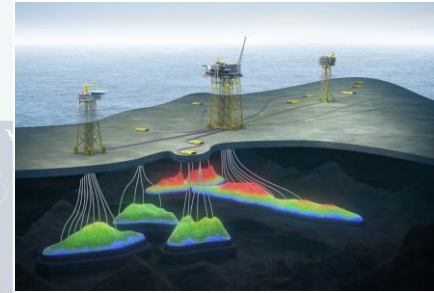
Åsgard subsea compression



Floating wind power



Northern Lights

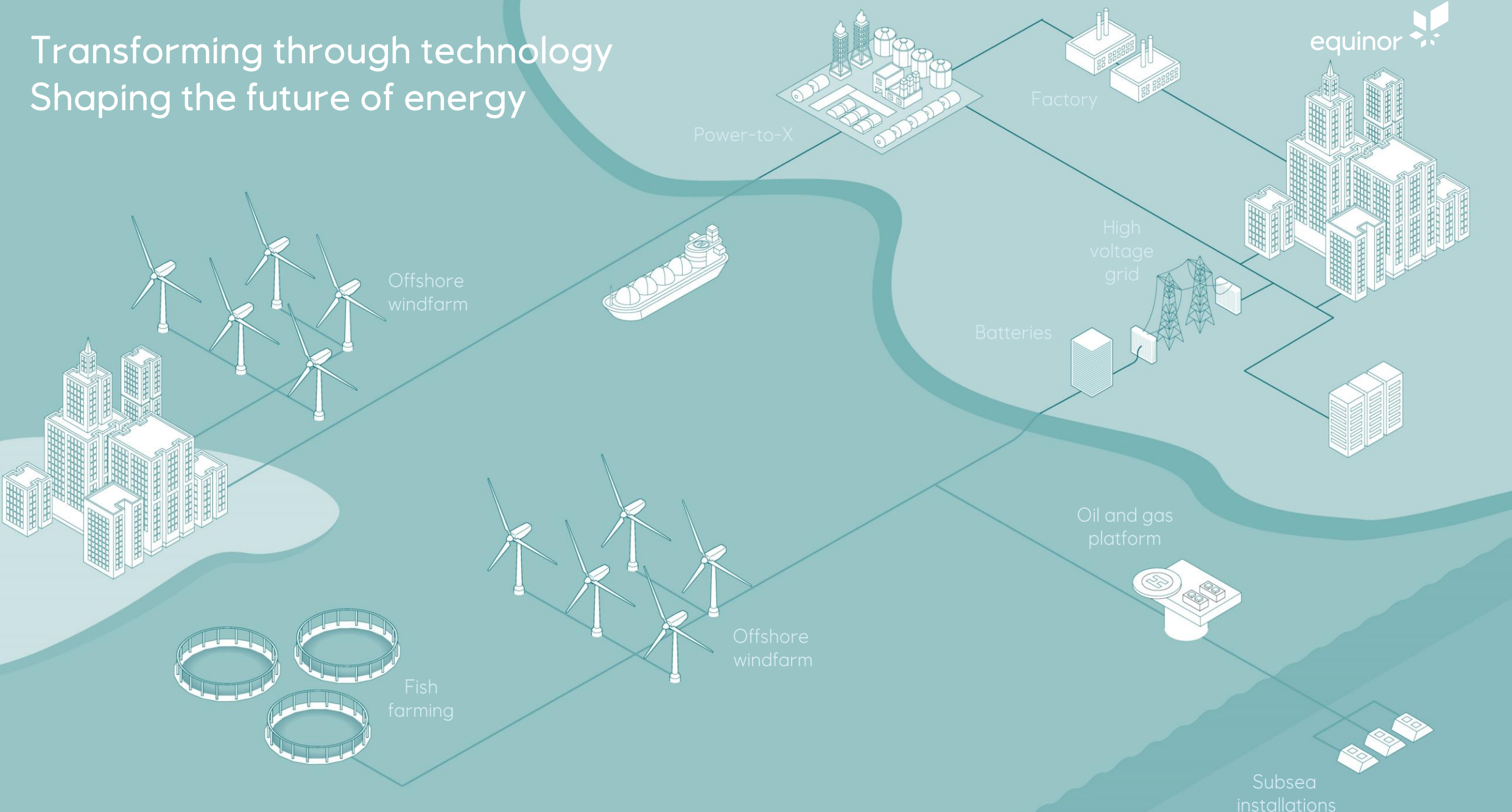


2023  
Unmanned field developments

**50 years of industry history, realised by innovation, research & technology developments and project execution excellence**

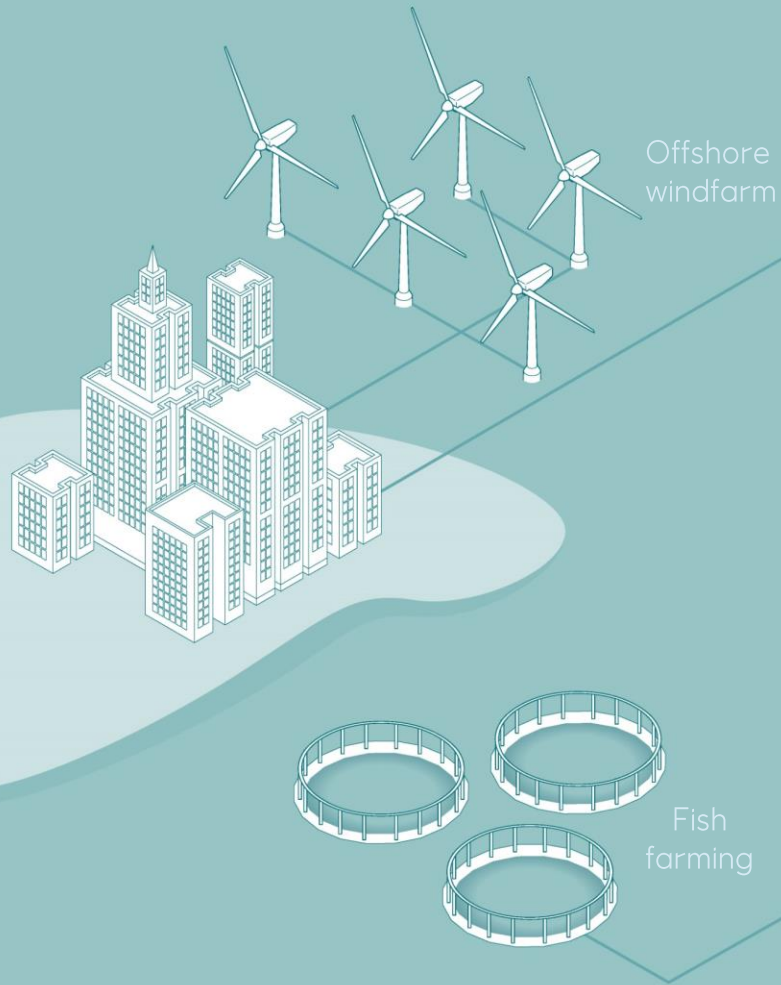
# Transforming through technology

## Shaping the future of energy



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## Shaping the future of energy

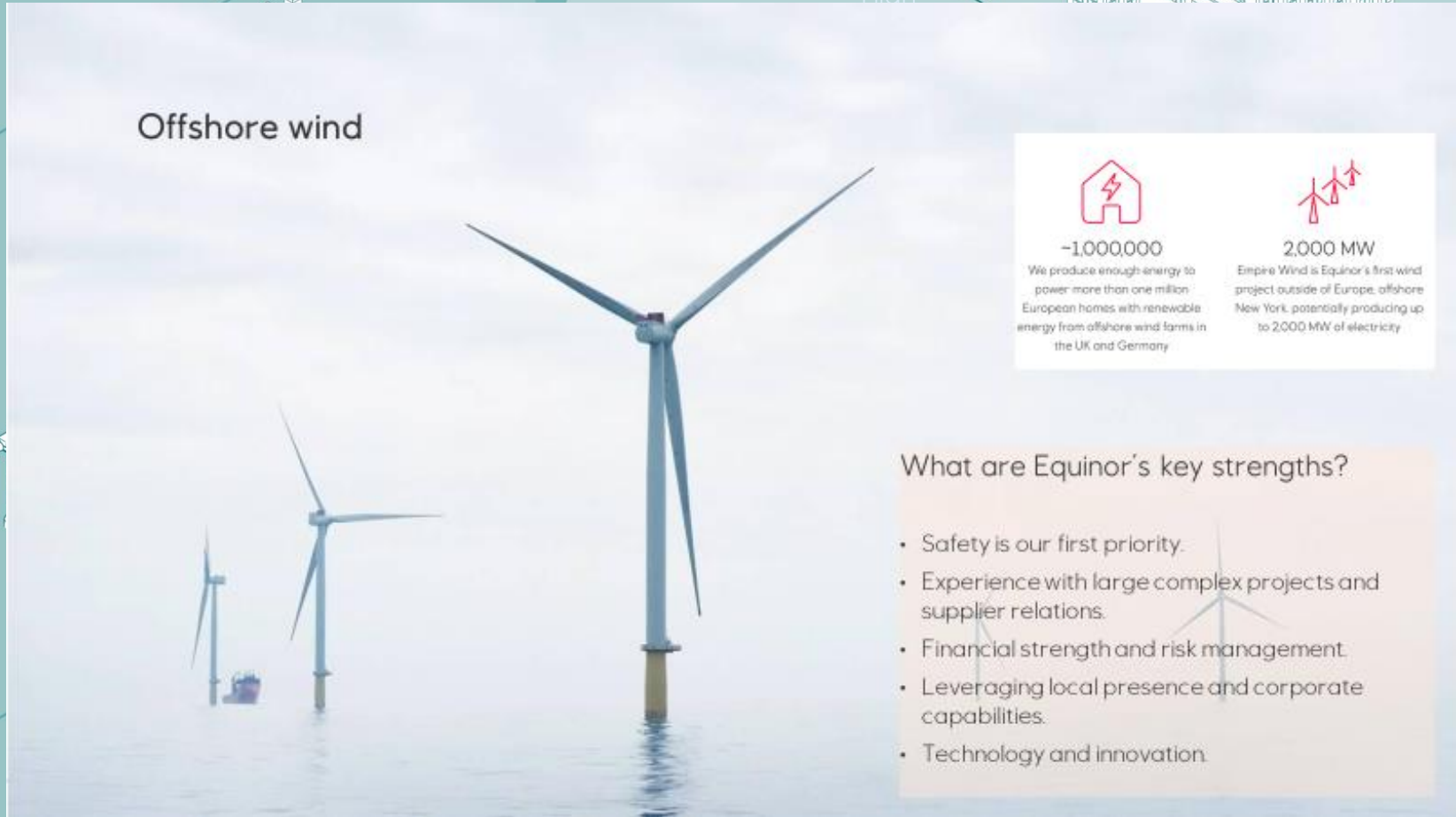


Power-to-X

Factory

High

### Offshore wind



-1,000,000

We produce enough energy to power more than one million European homes with renewable energy from offshore wind farms in the UK and Germany



2,000 MW

Empire Wind is Equinor's first wind project outside of Europe, offshore New York, potentially producing up to 2,000 MW of electricity

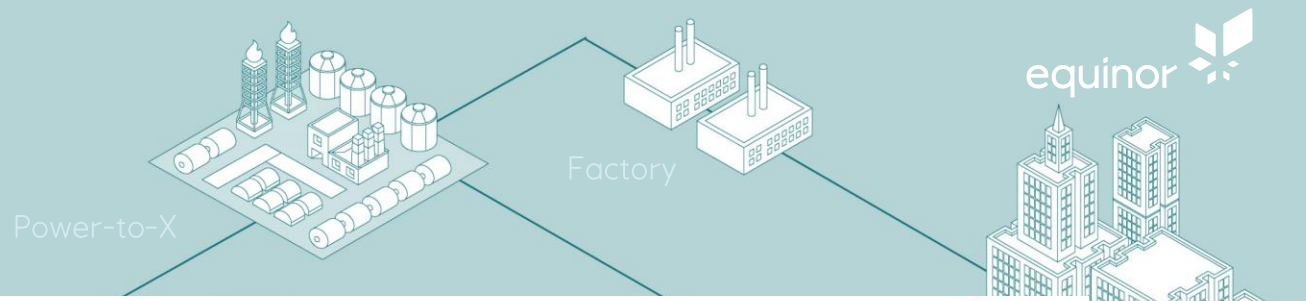
### What are Equinor's key strengths?

- Safety is our first priority.
- Experience with large complex projects and supplier relations.
- Financial strength and risk management.
- Leveraging local presence and corporate capabilities.
- Technology and innovation.

installations

# Transforming through technology

## Shaping the future of energy



### Solar - Building capabilities and capturing opportunities through partnership

equinor

- Adding resilience to our renewables portfolio
- Cost competitive power tailored to market needs
- Providing portfolio flexibility
- Applying power market capabilities

The Stepien solar plant, Poland. 58 MW. Wento, Equinor's 100% subsidiary

RayGen Power Plant, Carwara, Australia. Project in operation

2,000 MW

Empire Wind is Equinor's first wind project outside of Europe, offshore New York, potentially producing up to 2,000 MW of electricity

strengths?

ex projects and

management and corporate

12 | New Energy Solutions

- Technology and innovation

installations

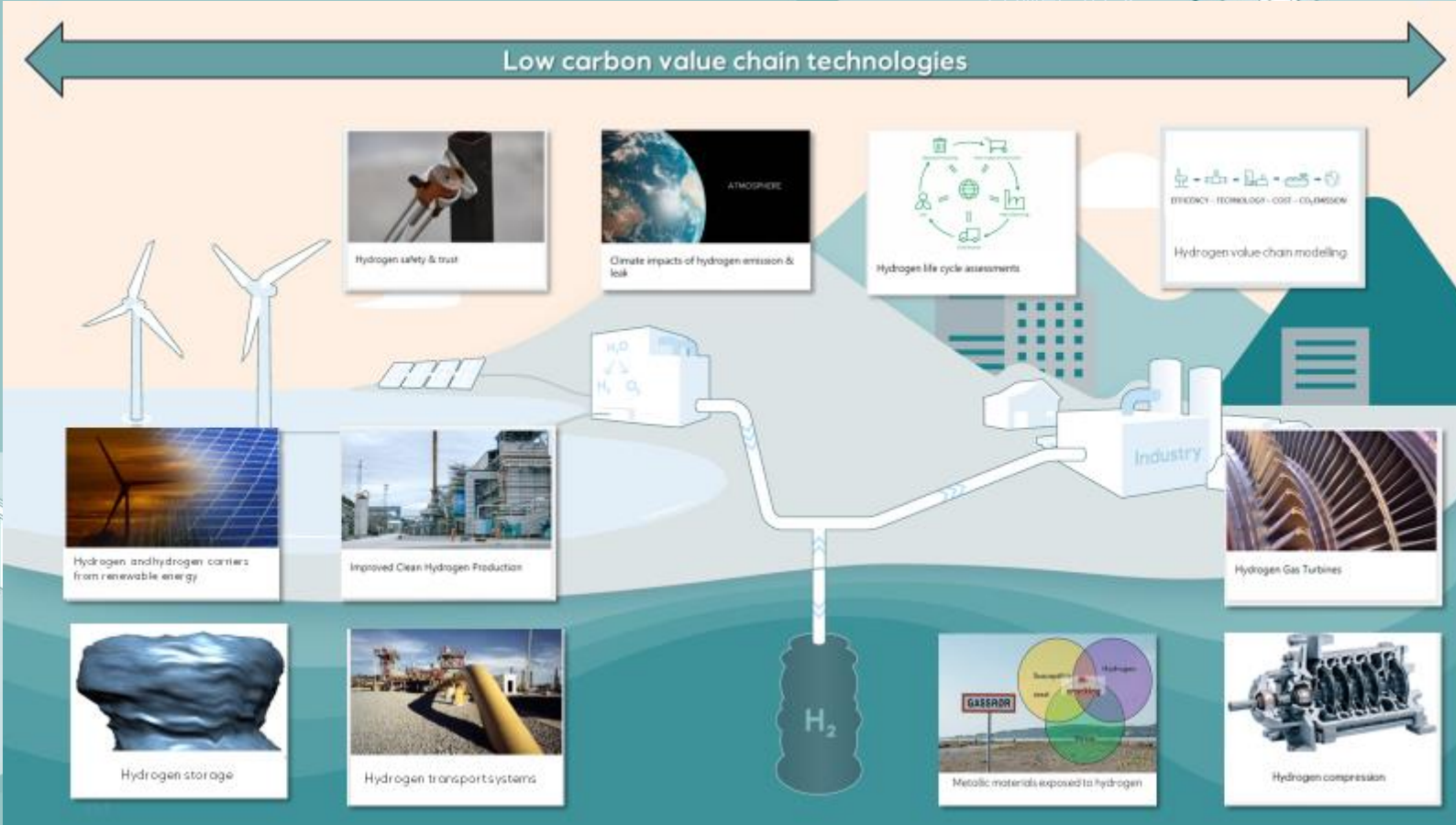


# Transforming through technology

## Shaping the future of energy

Power-to-X

Factory

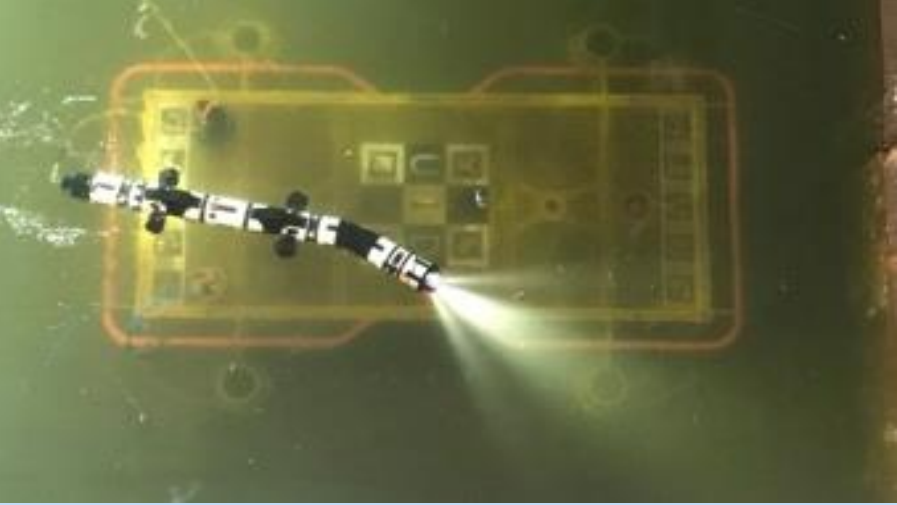
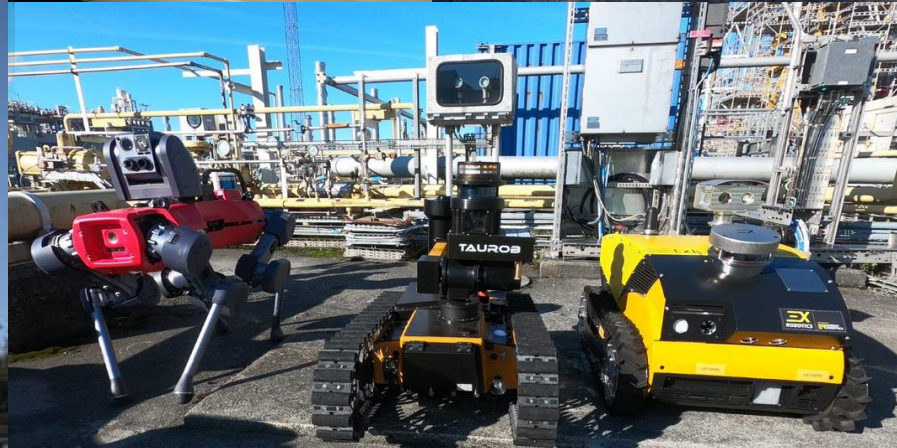
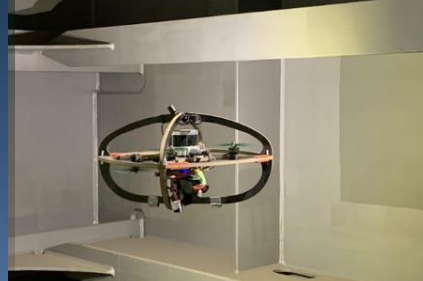


Strengths?

- Technology and innovation

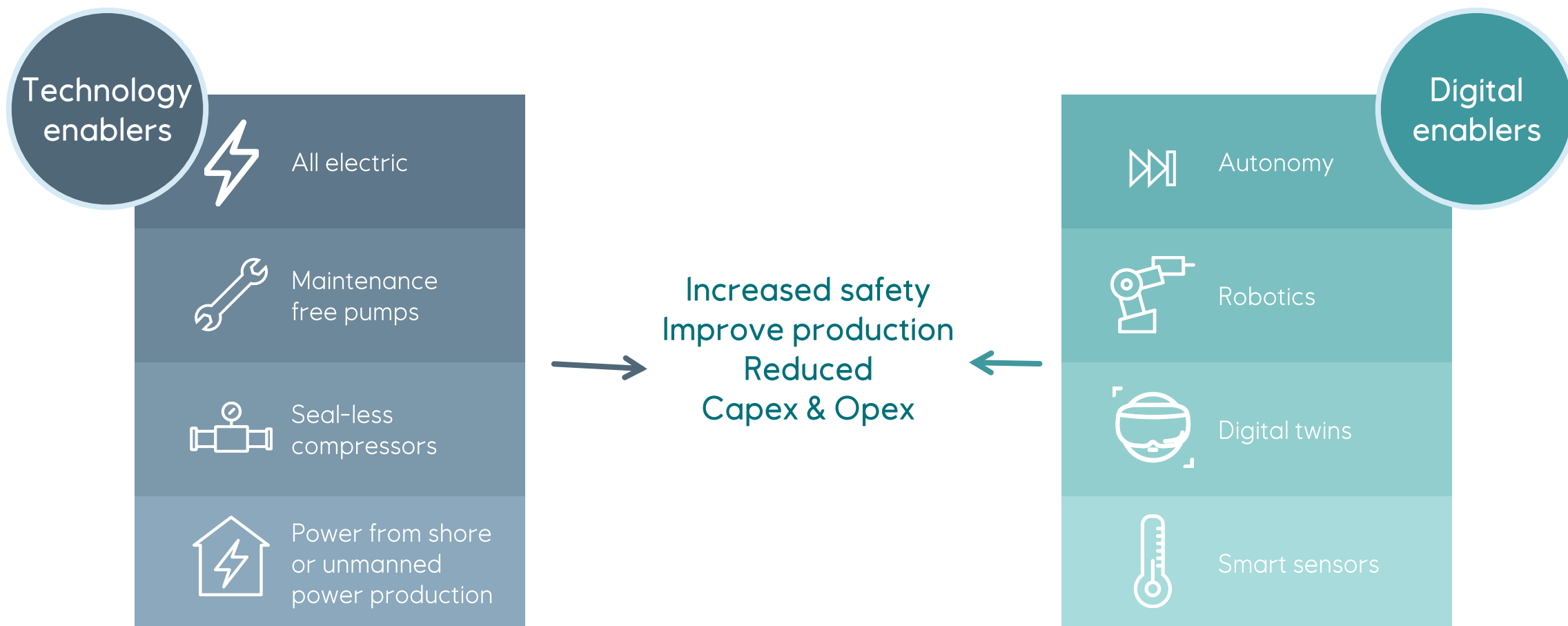
installations

New technologies:  
Robots make our  
operations safer



# Digitalization & automation

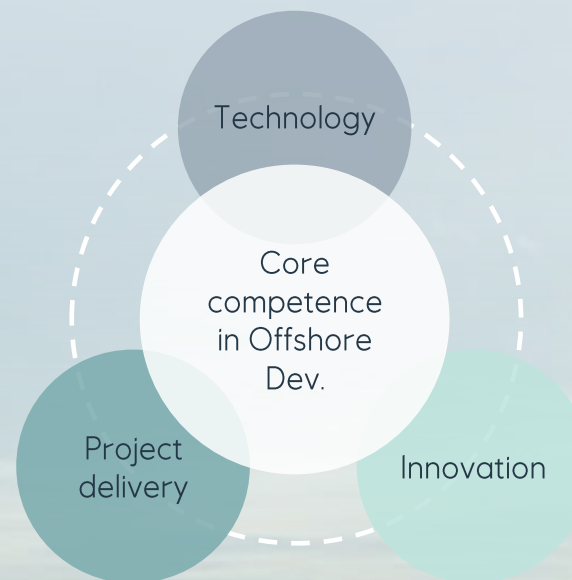
Digitalization and automation will dominate technology for the foreseeable future



SETTING NEW INDUSTRY STANDARD FOR THE FUTURE

# First unmanned production platform<sup>TM</sup> – Munin<sup>1</sup>

- Value driver at scale in future field development
- Enhancing value and safety via Automation, Interoperability & Robotics
- Applying know-how across energy value chains



**Early bold technology moves  
built on our legacy**

~30  
PERCENT

Facility capex  
reduction

~50  
PERCENT

Opex reduction

0.4  
KG CO<sub>2</sub> / BOE

Among world's lowest  
CO<sub>2</sub> emissions from  
production

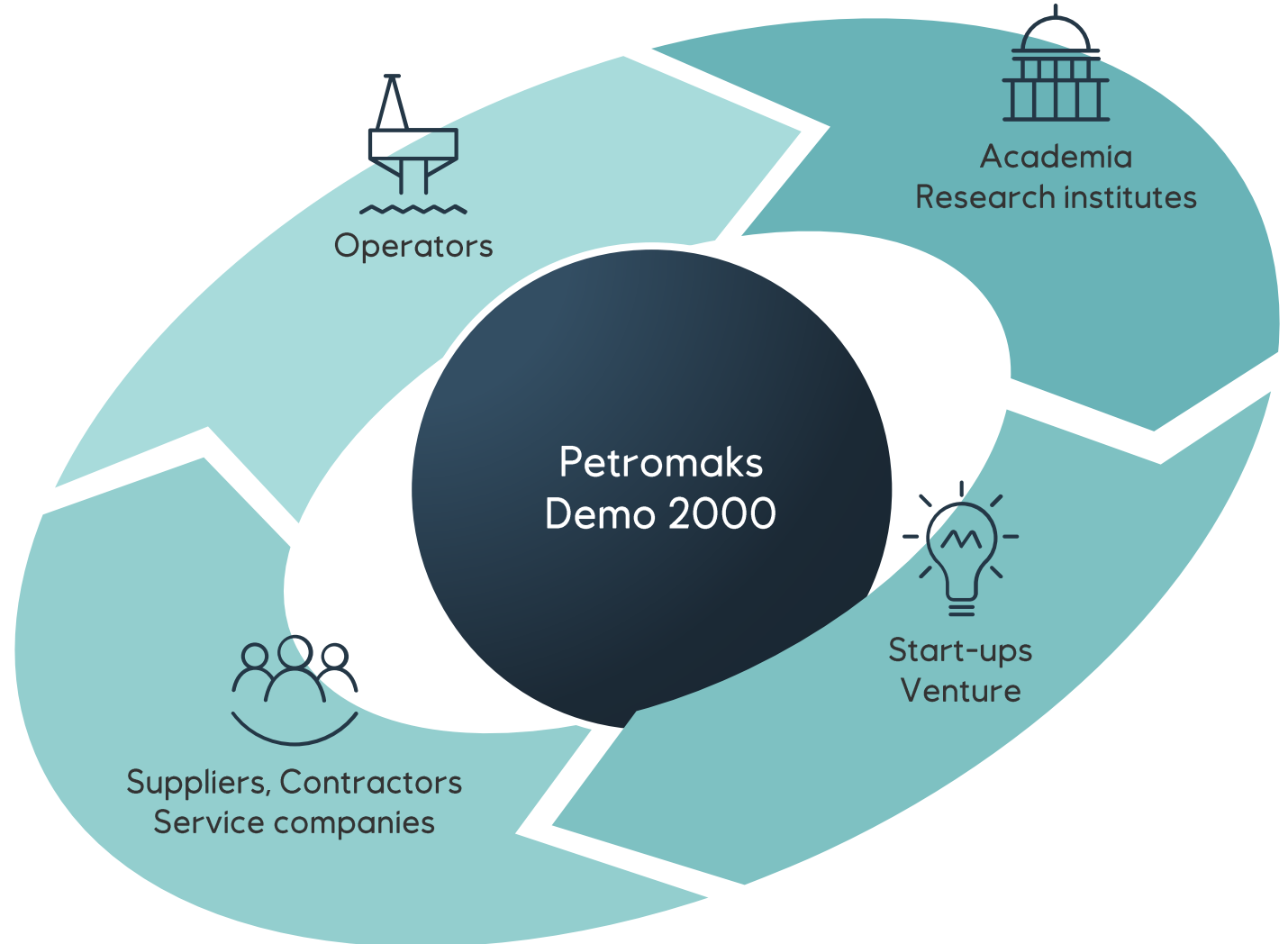
1. Formerly Krafla

Concept compared to conventional factory.

# Collaboration

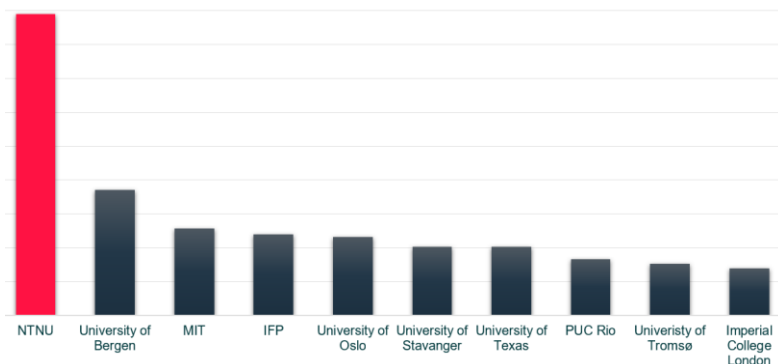
## The Norwegian model – Technology Development

Collaboration between academia, government, suppliers and operators continues to be fundamental for development and implementation of new technologies

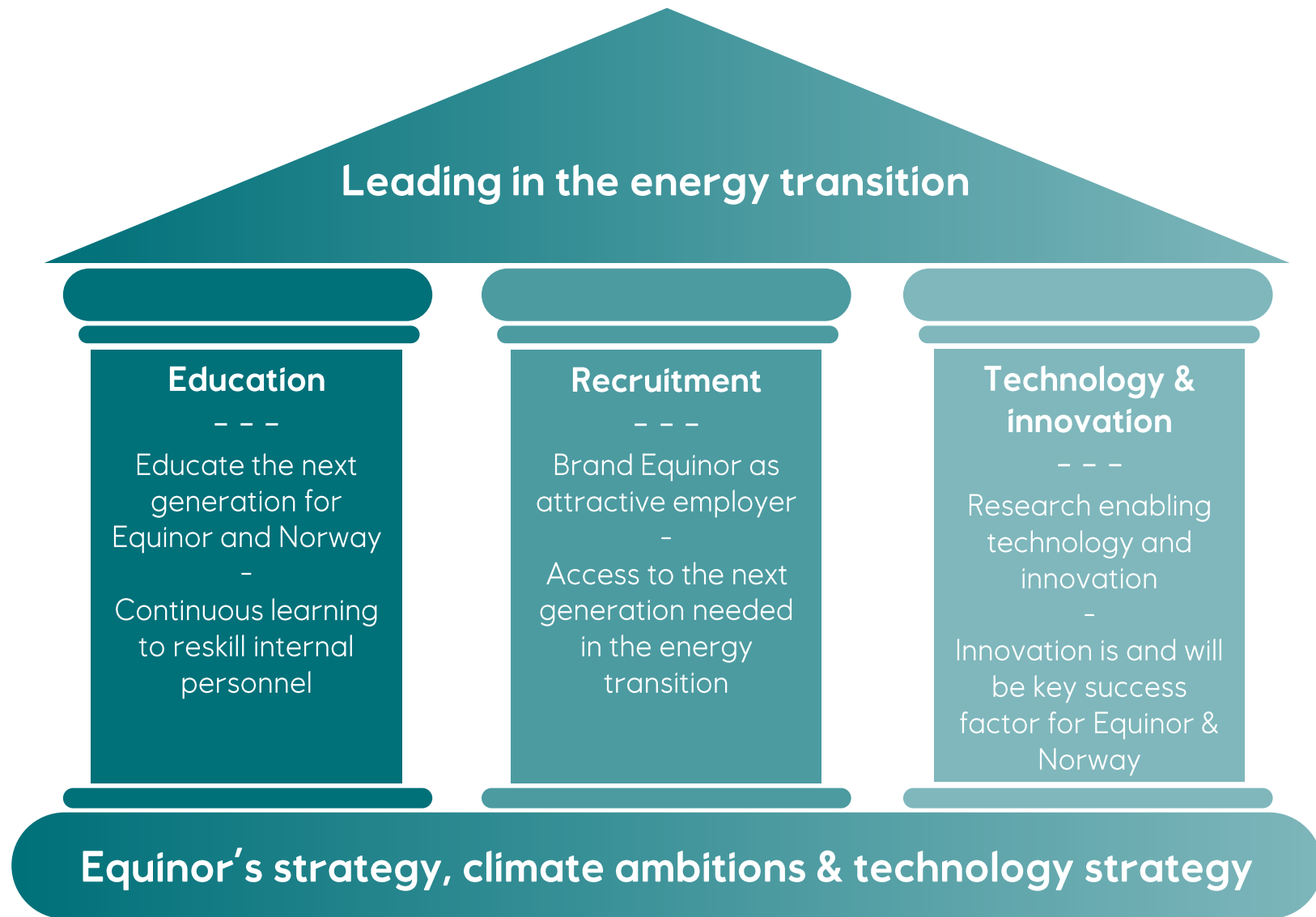
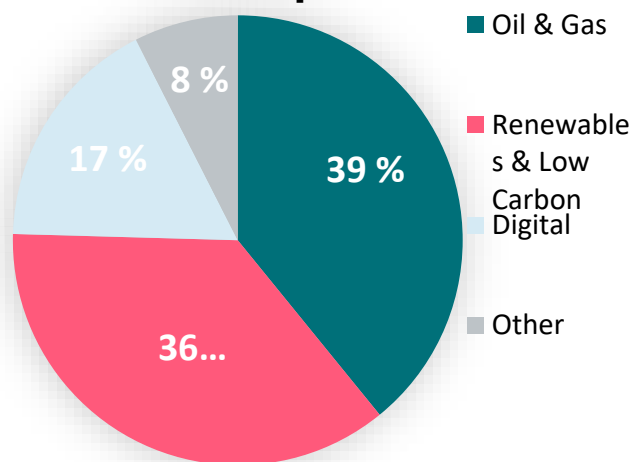


# University Engagement

Equinor collaborates with many universities across the world:



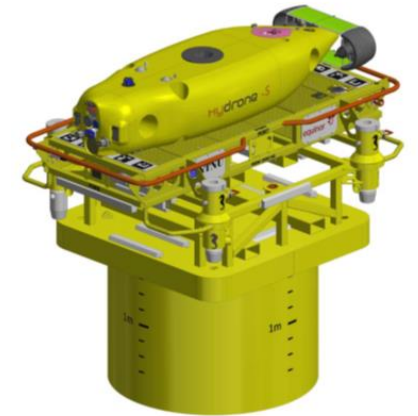
## Academia spend



# Working with suppliers



## STANDARD INTERFACES



# Our technology 'strategy on a page'

Introducing our 11 strategic themes

## EQUINOR'S TECHNOLOGY MISSION

### 'Transforming through technology'

#### GUIDING PRINCIPLES | TRANSFORM THE WAY WE OPERATE

**Embed:**  
data and  
digital

**Scale:**  
for competitive  
advantage

**Integrate:**  
technology

**Deliver:**  
distinctive  
expertise

**Modernise:**  
our delivery  
models

**Co-innovate:**  
with partners

#### STRATEGIC THEMES | FOCUS FOR CREATING DIFFERENTIATION

*Strategic themes across three pillars that articulate what the technology strategy is solving for*

##### Delivering impact to the businesses today

Discover and utilise the total near and in field resource potential

Extend lifetime and re-use of infrastructure

Optimise energy production through next gen operations

Reduce CO2 emissions from our activities

Drive cost-efficient scaling of offshore wind

##### Applying solutions to build the company of tomorrow

Develop large-scale value chains for hydrogen and derivatives

Capture synergies through energy system integration

Build scalable solutions for carbon capture, transport and storage

Develop competitive solutions for trading and supply

##### Transforming into a data-driven company

Develop a resilient and scalable digital foundation to drive business agility

Accelerate data-driven decision making

#### INFORMED CHOICES | ACROSS KEY ENABLERS

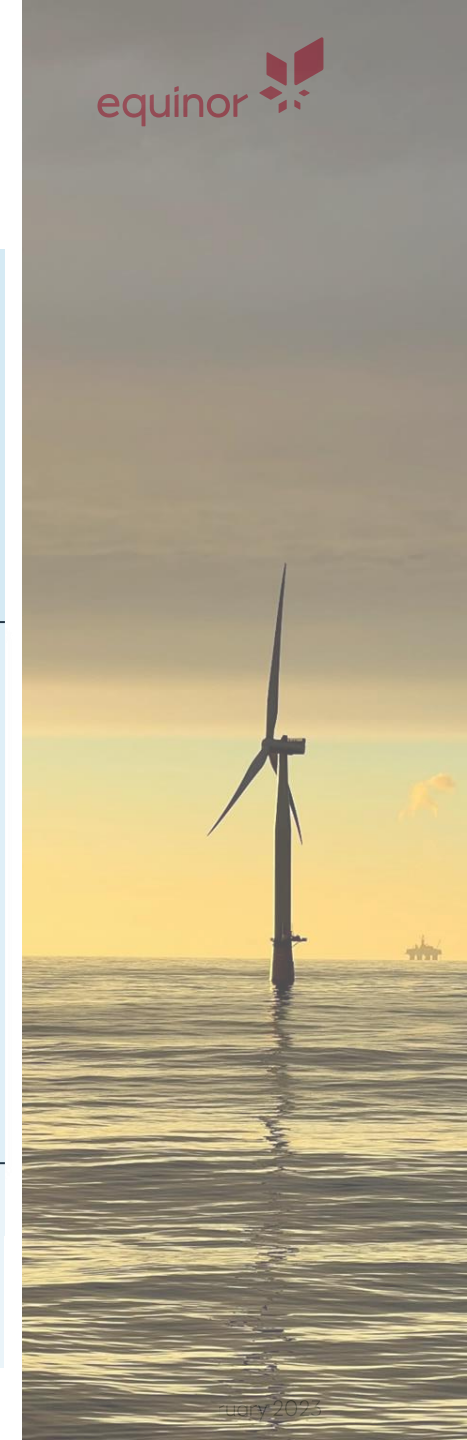
People and  
capital prioritisation

Internal delivery  
models and  
ways of working

New business models  
& strategic  
partnerships

Capability  
building

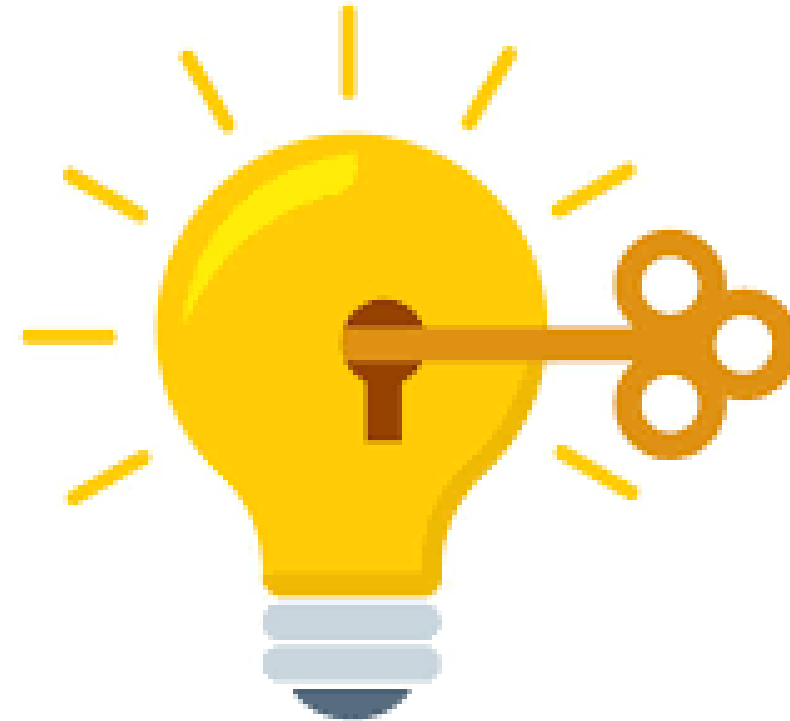
Safety improvement  
& technology  
resilience





## Key Messages

1. In general, very good match between Technology efforts in Equinor and BRU program areas!
2. Potentially BRU could increase focus on:
  - Optimise energy production through next gen operations
  - Capture synergies through energy system integration
3. Need for speed – more important than ever!



# Technology development and the Norwegian model

Per Gerhard Grini, Technology Manager

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