



“Values for the future – The Norwegian Petroleum Directorate’s outlook”

Alexey Deryabin

NFES meeting Solagården

October 4th, 2017

The Norwegian Petroleum Directorate (NPD)



Photo: Emile Ashley

- A Governmental agency reporting to the Ministry of Petroleum and Energy
- 45 years: Established in 1972, office in Stavanger and Harstad and approximate 230 employees
- Knowledge driven with strong competence environments in geology, technology, reservoir, economy, data management and more

The Norwegian Petroleum Directorate



Main goal

Contribute to realizing **maximum value for our society from the oil and gas activities** through prudent and efficient resource management which also safeguards consideration for health, safety, the environment and other users of the sea.

“With the law on our side”



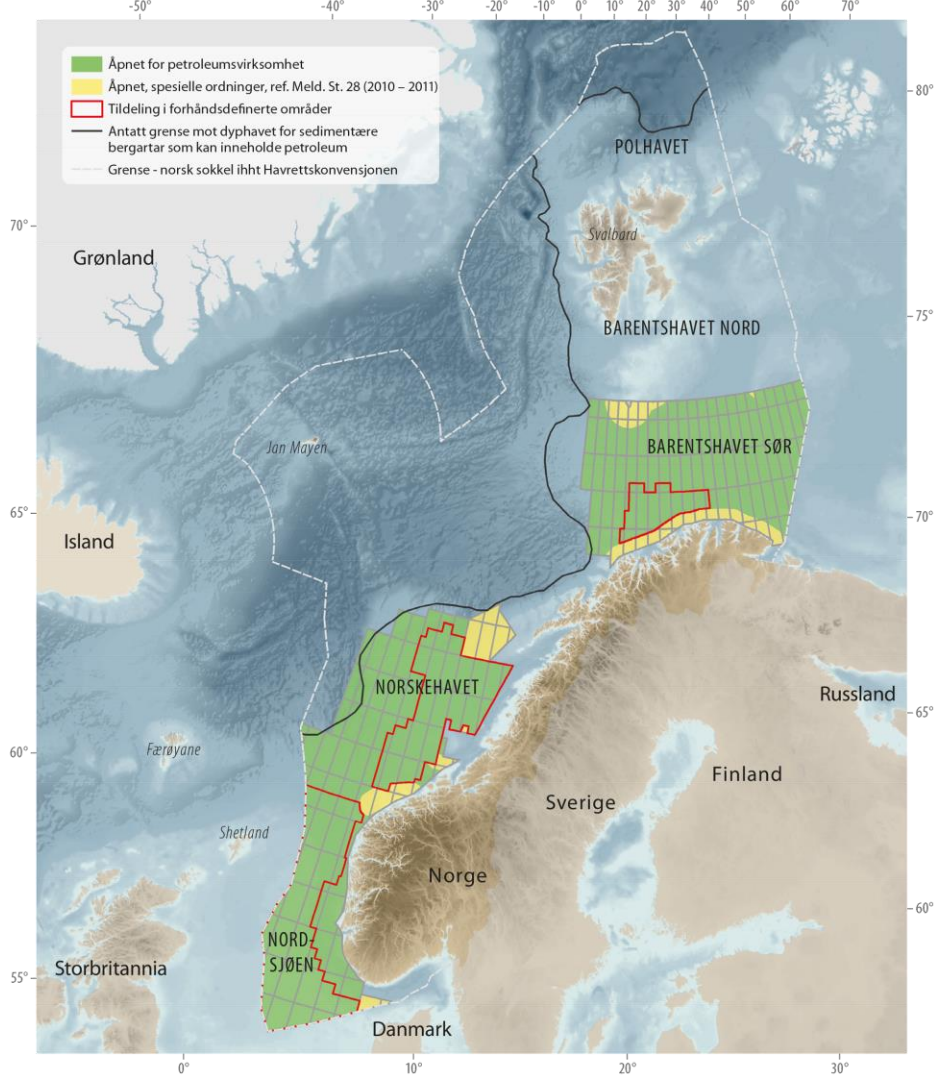
- The petroleum regulations enable State control and oversight
- **Tradition for governance through framework conditions, not orders**
- Regulations form basis for the NPD's tasks and roles

Fundamental principles for the petroleum management



Illustrasjon: Statoil

- State governance and management in all phases of the activity
- Values shall benefit the entire Norwegian society
- Activity requires a licence / concession
- The oil companies are responsible for the operational activity
- Instruments:
 - Taxes and fees
 - The Petroleum Act
 - Follow-up of the activity -> **ensure that as many resources as possible are recovered – in the most profitable manner**



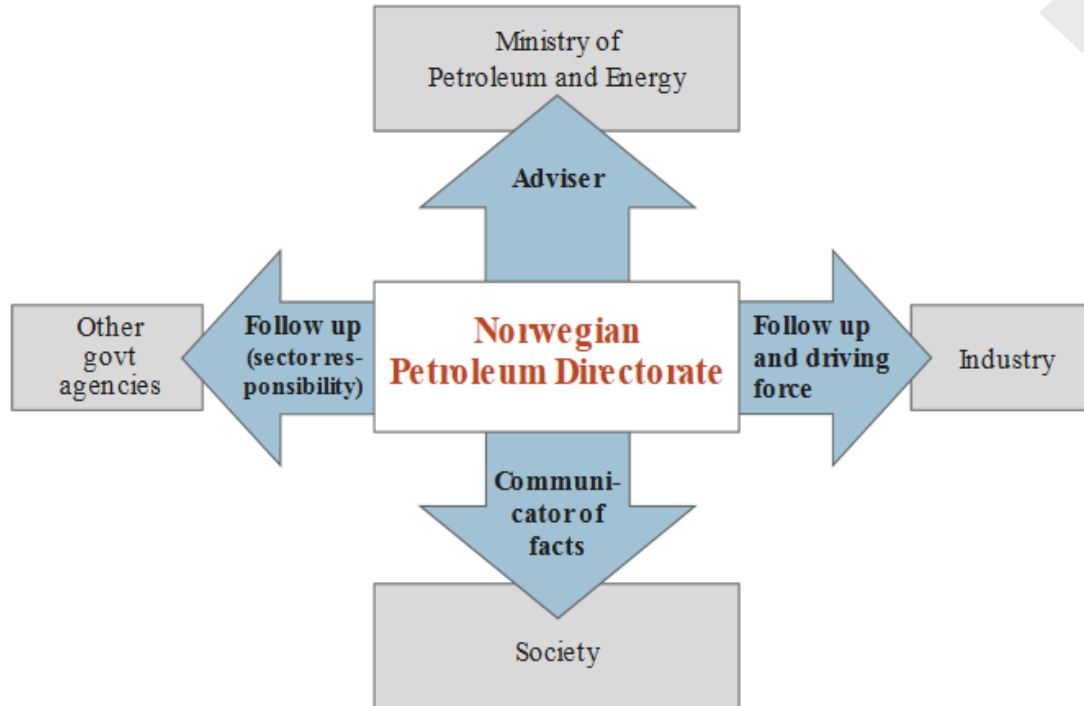
Our “playground” is NCS



- Access to exploration acreage through awards in licensing rounds:
 - **Numbered rounds**
 - Frontier areas
 - Every other year
 - **Awards in Pre-defined Areas (APA):**
 - Annual awards
 - Mature areas with infrastructure and exploration history

The Norwegian Petroleum Directorate (NPD)

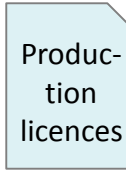
Various roles



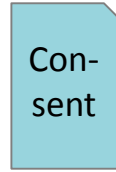
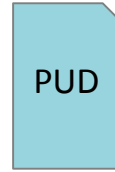
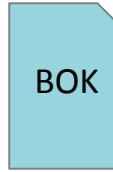
Involvement of the authorities in every stage of activities



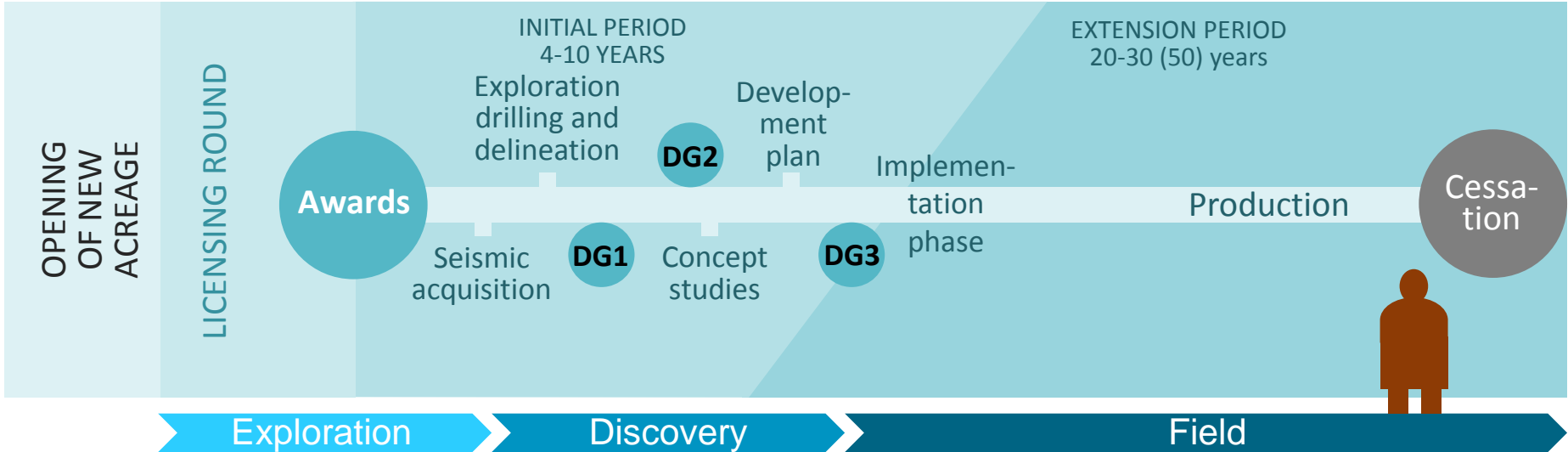
Authorities



Drilling permit



Annual production licence



National Shelf Library



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NORWEGIAN MINISTRY
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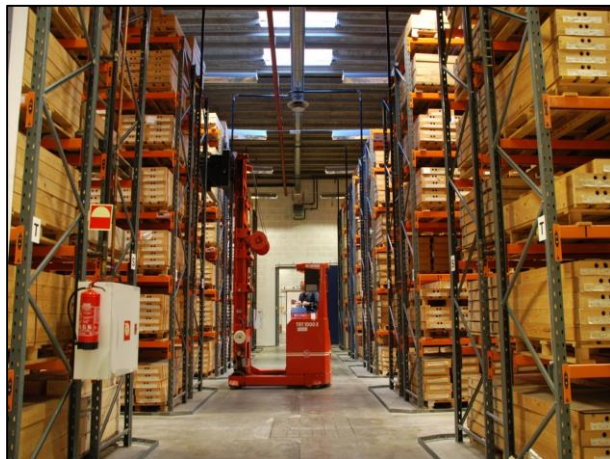
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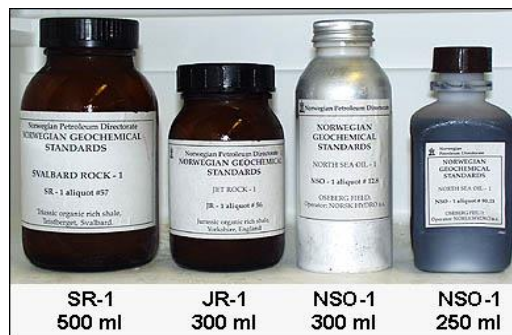
MAP

MAP

Core sample storage with viewing room and laboratory



- ◆ 132 895 meters of cores
- ◆ 639 631+ bags of samples
- ◆ Oil from 634 exploration wells stored at -24°C



Fact's about Norwegian Continental Shelf

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Mapping of the deep sea will continue >>

ONGOING SEISMIC

- List
- Map

Production figures May 2016

17.05.2016 Preliminary production figures for May 2016 show an average daily production of about 1 944 000 barrels of oil, NGL and condensate.

Exploration drilling results

- 09.06.2016 30/11-13
- 30.05.2016 30/11-12 S and 30/11-12 A
- 27.05.2016 16/1-26 S and 16/1-26 A

New development concept on Oseberg

15.06.2016 When Oseberg Vestflanken 2 starts producing in 2018, it will represent a new concept on the Norwegian shelf. Unmanned wellhead

FactPages FactMaps



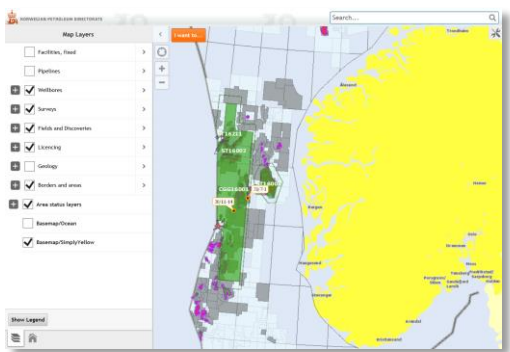
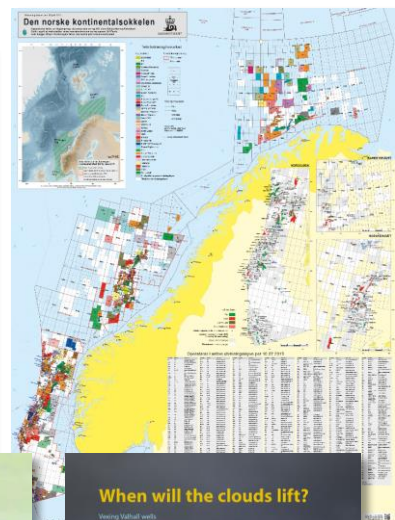
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Wellbore Licence BAA Field Discovery Company

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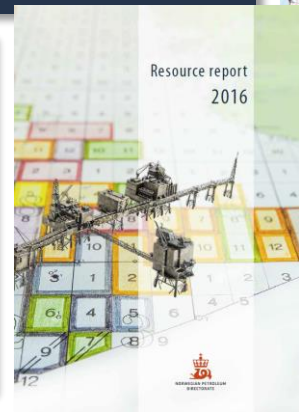
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Facts for mobile devices

The new website NorwegianPetroleum.no replaces the printed Factbook.

The app OilFacts is available in AppStore, Google Play and Windows Phone Store. [Read more >>](#)



Status for NCS 2017



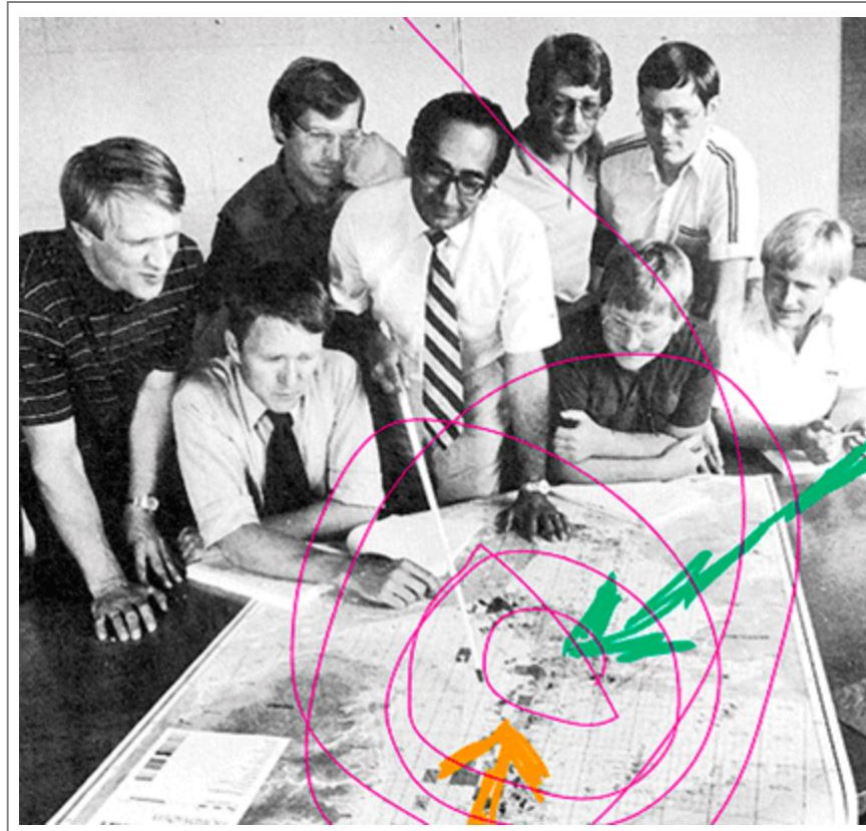
Her kommer Aasta Hansteen på verdens største tunglasteskip på vei til Høylandsbygd i Kvinnherad.

- 84 fields in production
- 4 new fields started production
- High oil & gas production as of 2016
- 11 fields under development
- 6 plans for development (PDO)
- 23 exploration wells
- 10 discoveries
- 56 new licenses in TFO 2016



Resource estimates
More than half remains

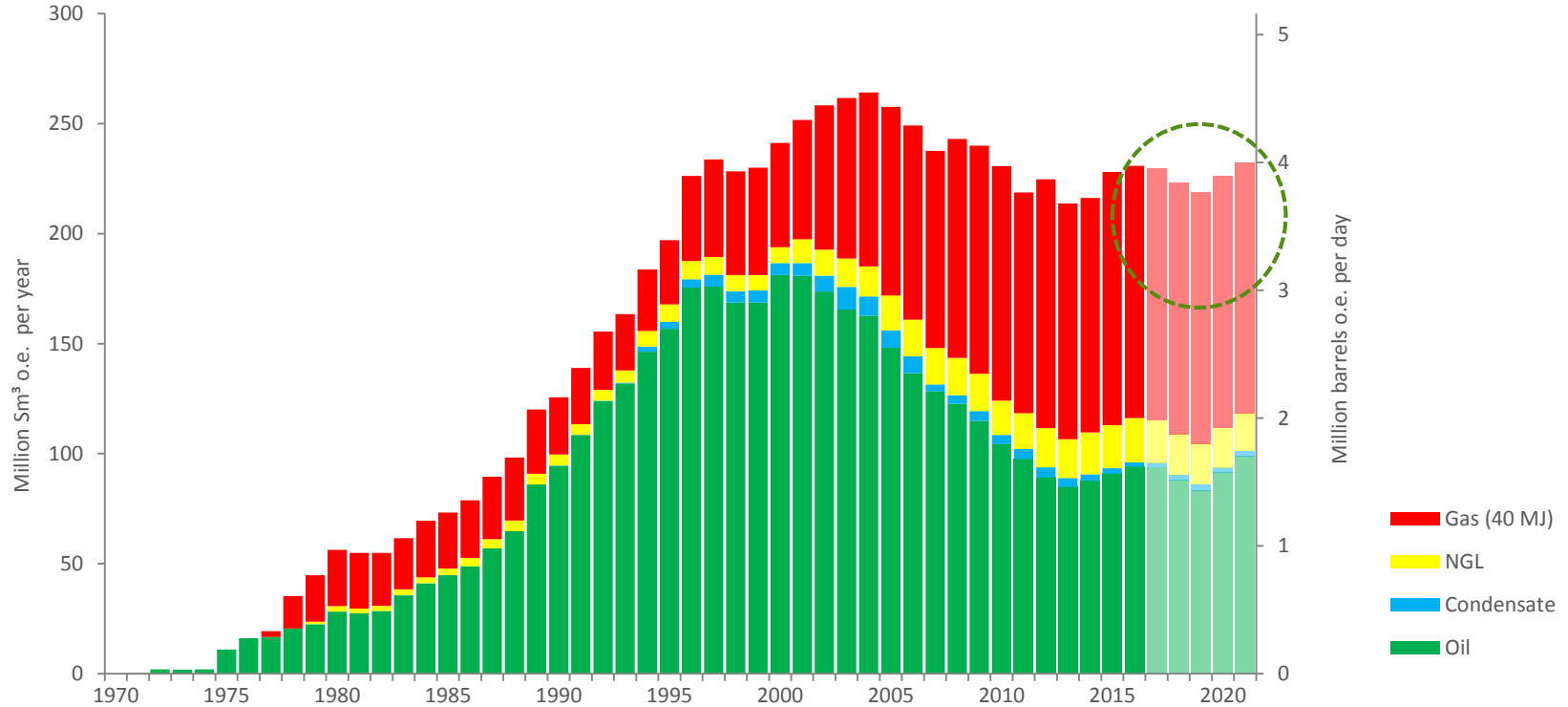
«Oljekontor» in the 1978 first resource outlook on NCS



Resource outlook still NPDs important task today



Stable high production over next five years

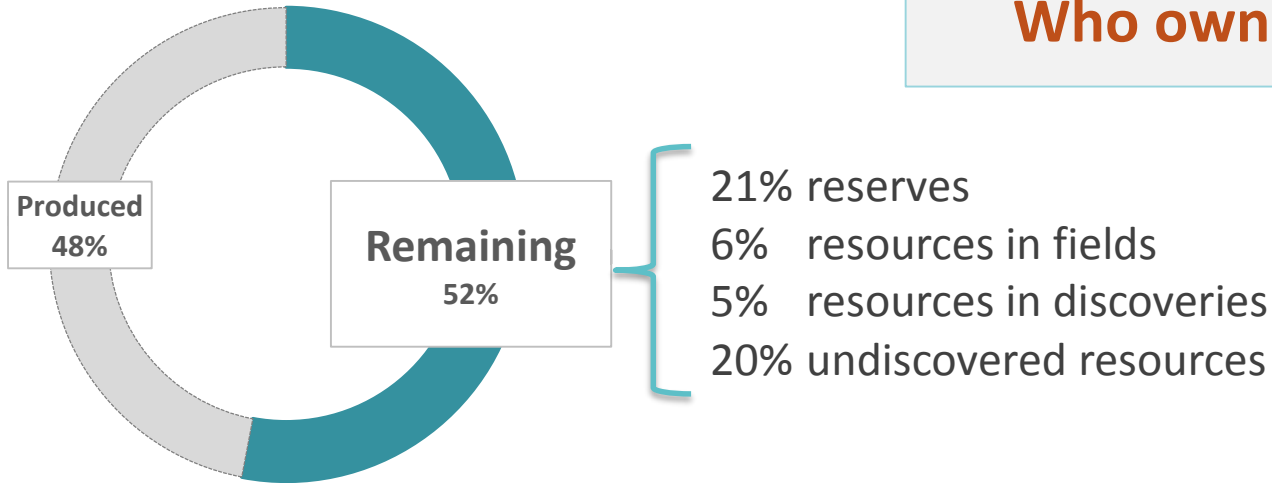


Resource Accounts 2017

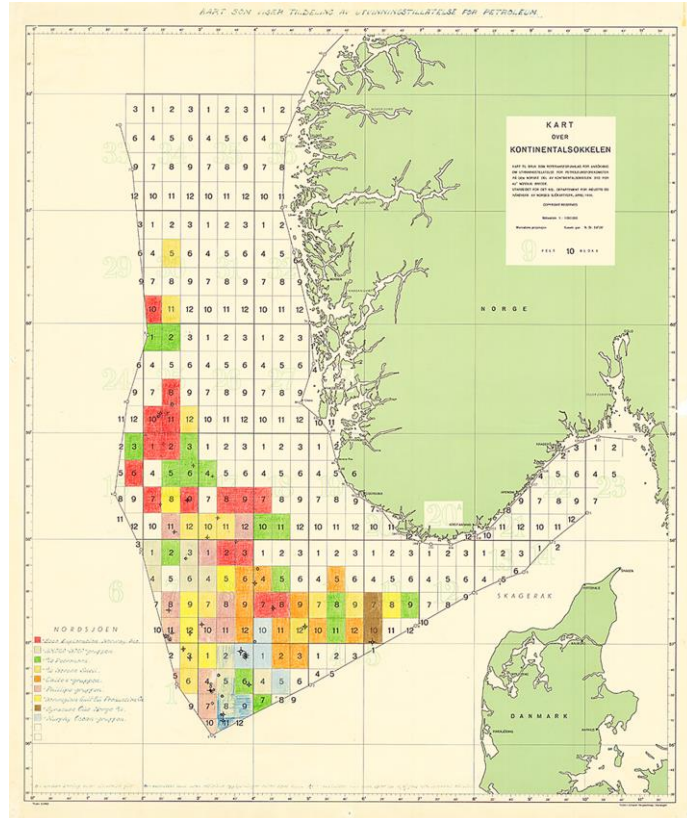
More than half remains to be recovered

Total 14.2 billion Scm o.e.

Who owns these resources?



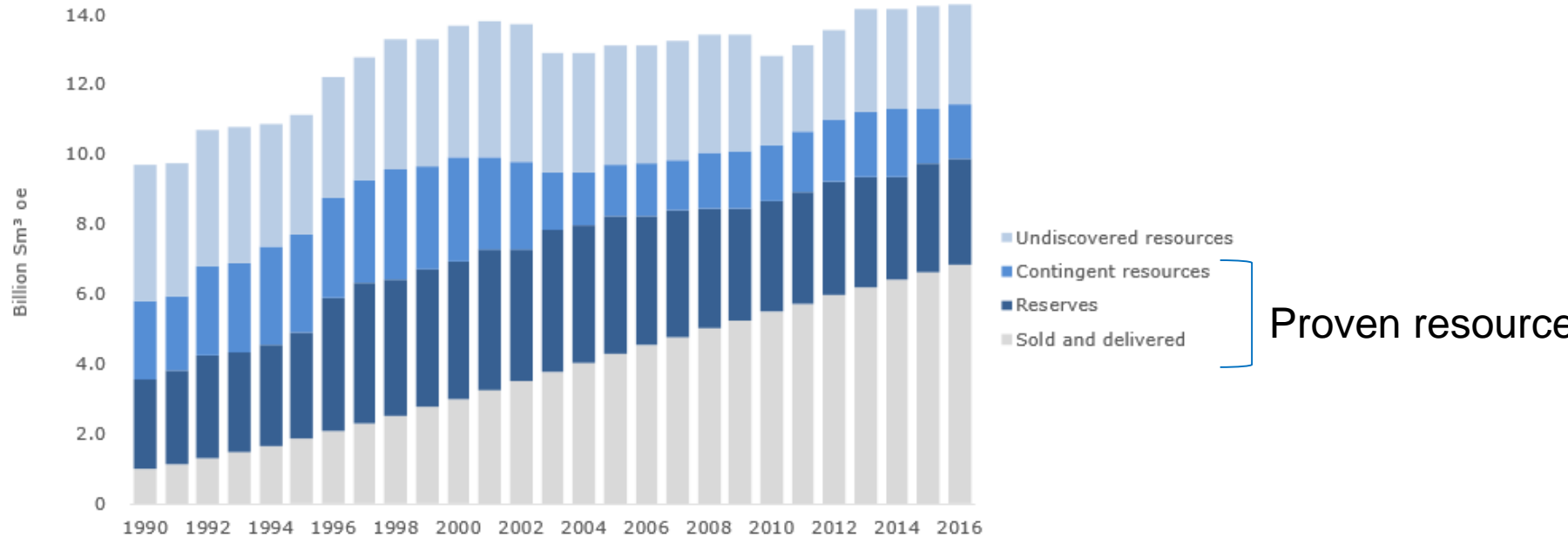
The State owns the resources on NCS



- May 1963:
 - The Government proclaimed Norway's sovereignty over the Norwegian continental shelf – and the petroleum resources belong to the Norwegian people
- Continental Shelf Act 1963:
 - The State is the landowner and only the King (Government) can grant licences for exploration and production

NPD's Resource Estimate

Significant increase since 1990



What does it take?

1

Exploration

2

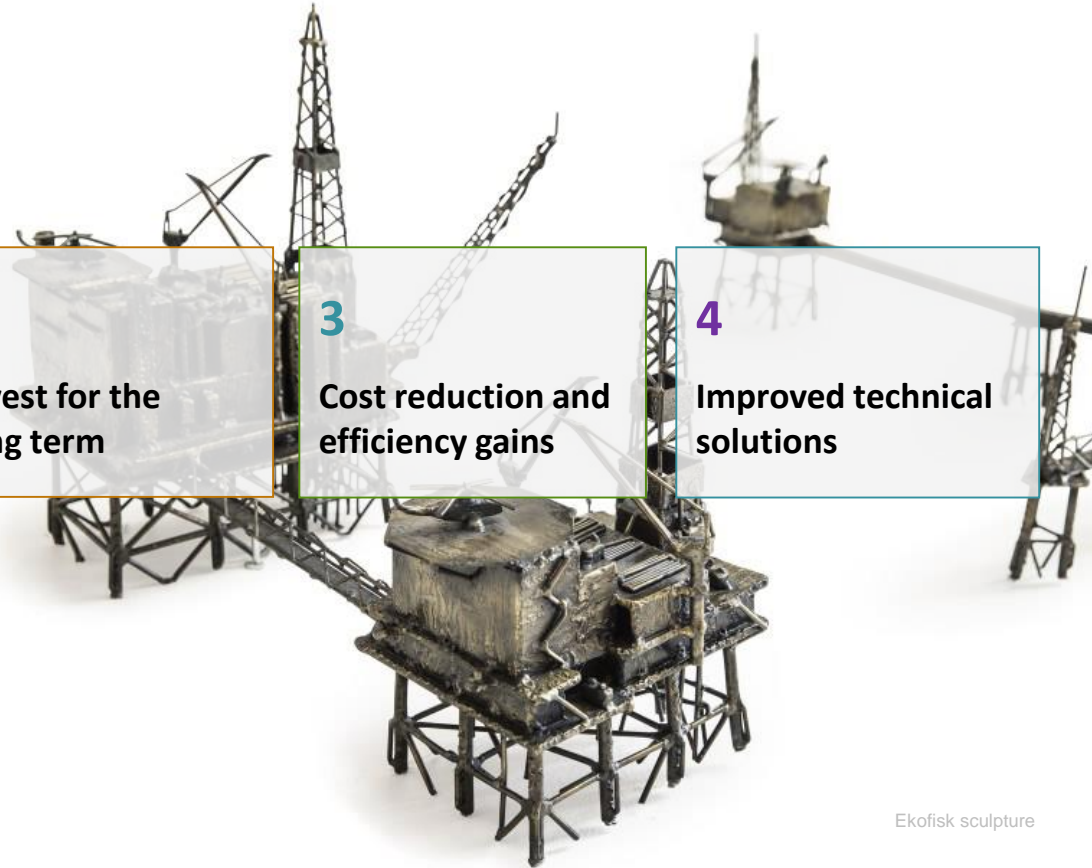
Invest for the long term

3

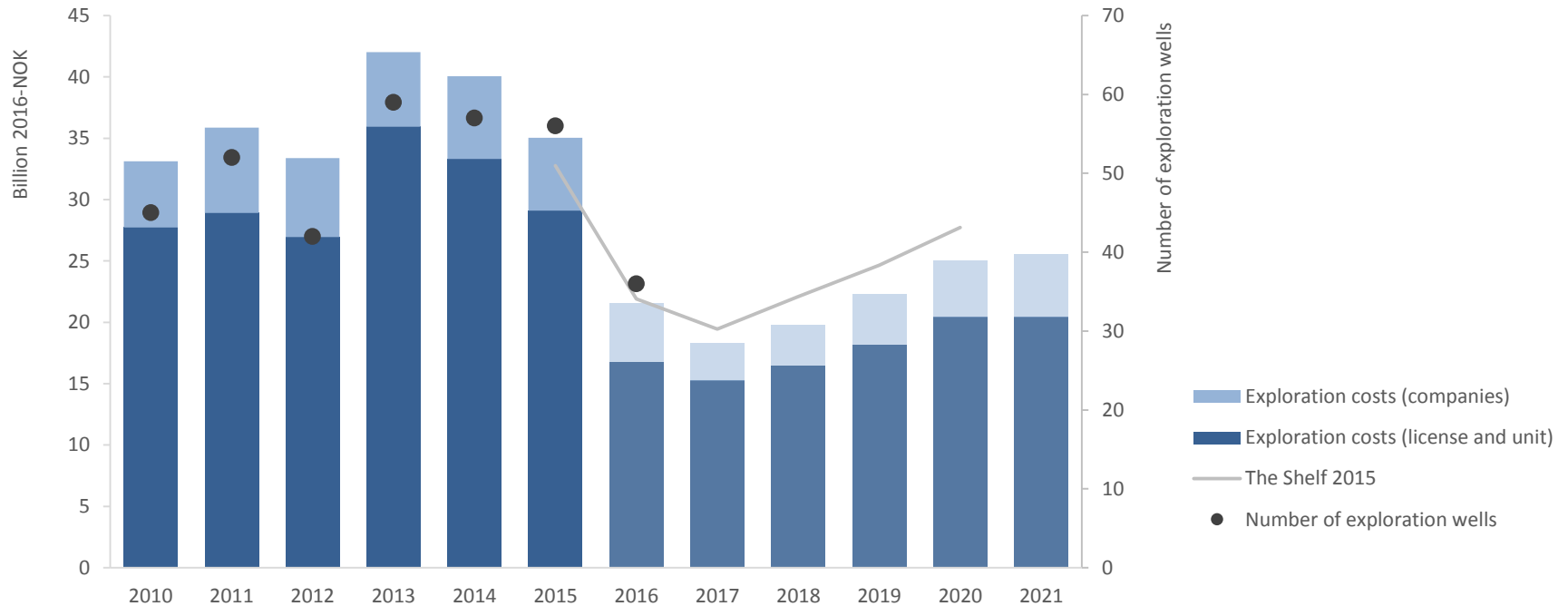
Cost reduction and efficiency gains

4

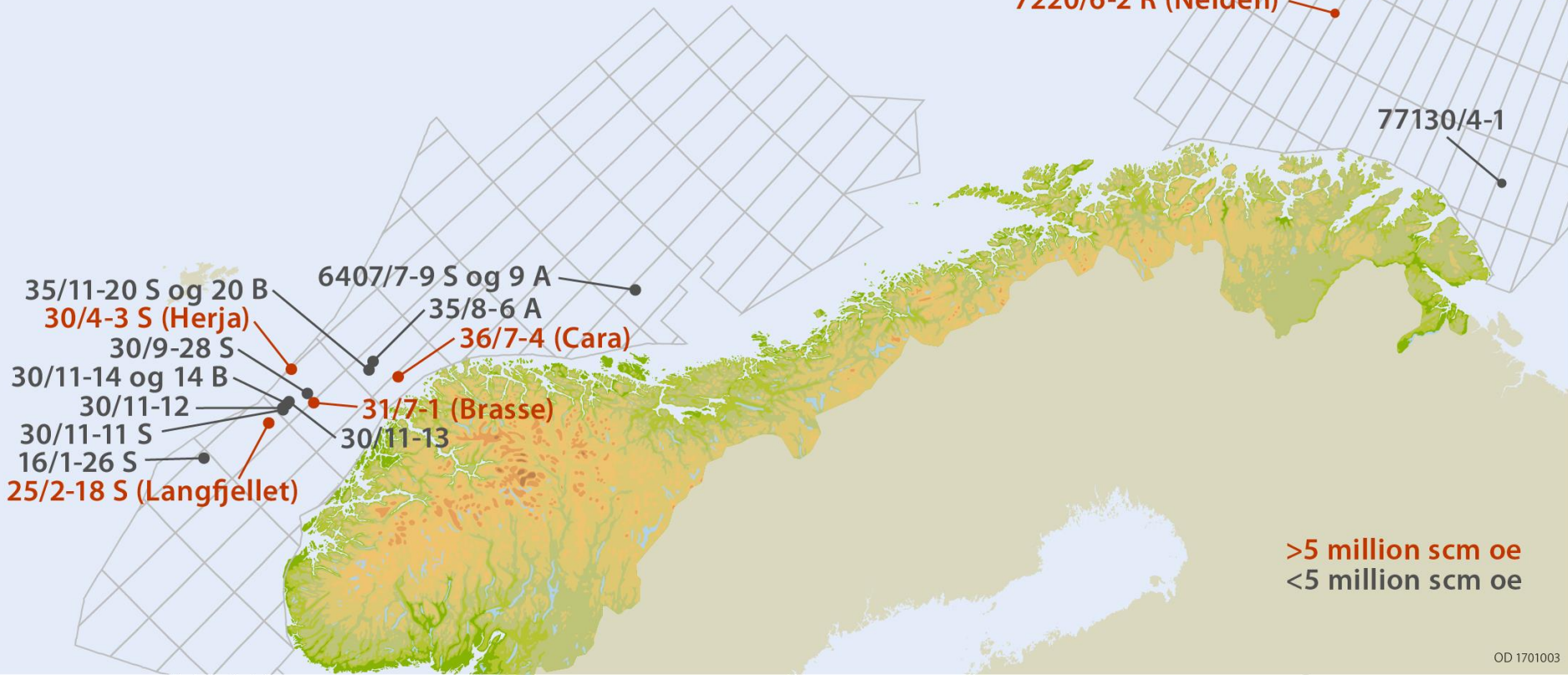
Improved technical solutions



Significant reduction in exploration activity



Refuelling is needed to maintain production

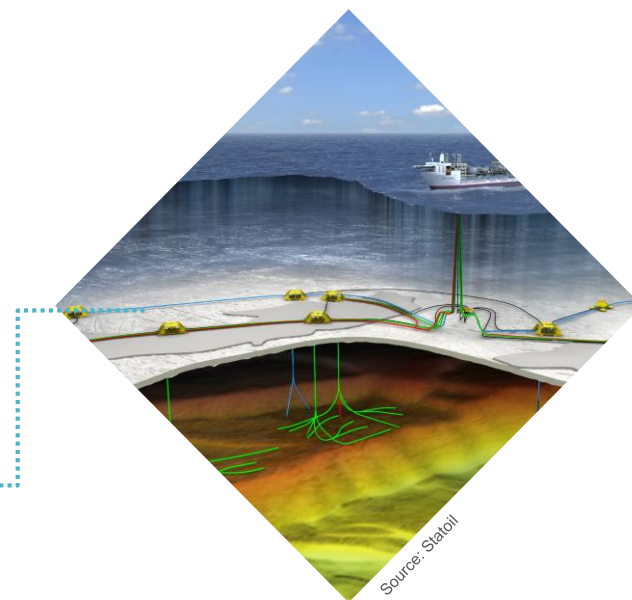


>5 million scm oe
<5 million scm oe

77 Discoveries in the Portfolio

Great opportunities

Region	Discoveries	Million scm oe
North Sea	42	276,8
Norwegian Sea	27	181,9
Barents Sea (ex Johan Castberg)	7	139,5
Johan Castberg	1	99,0
Total	77	697,2



What does it take?

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Exploration

2

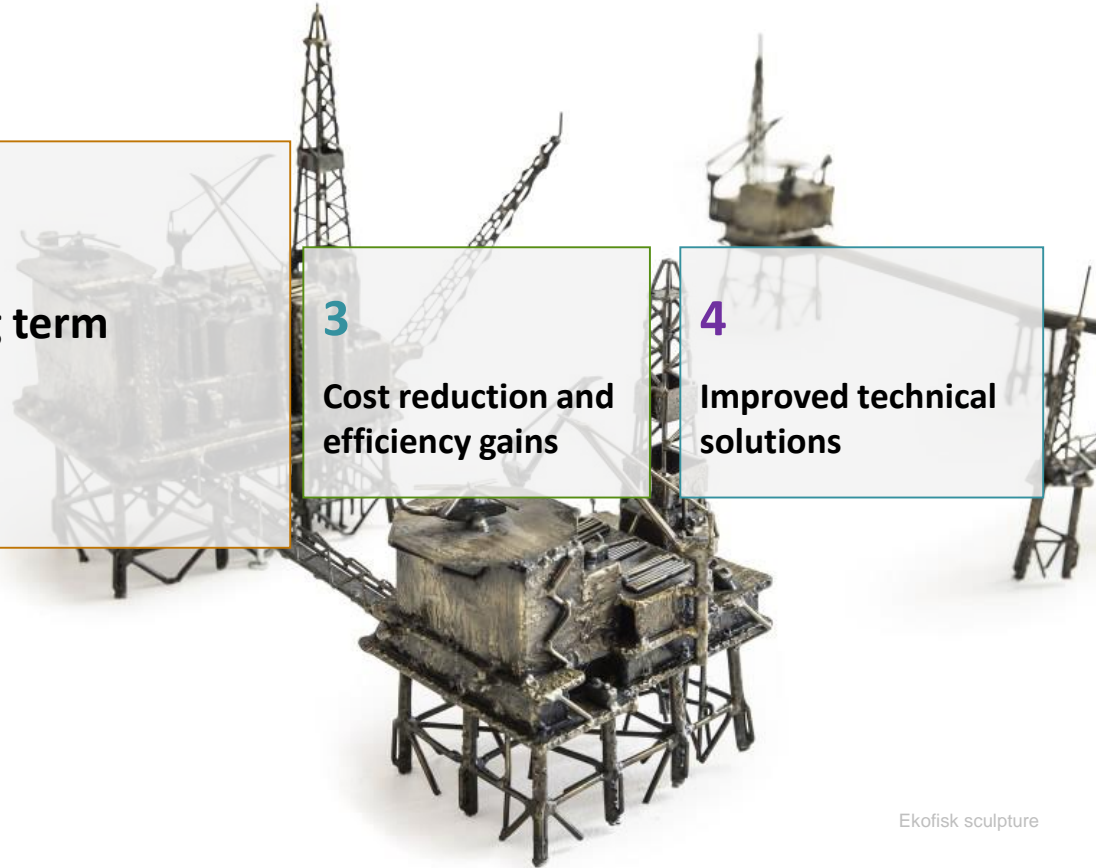
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Cost reduction and efficiency gains

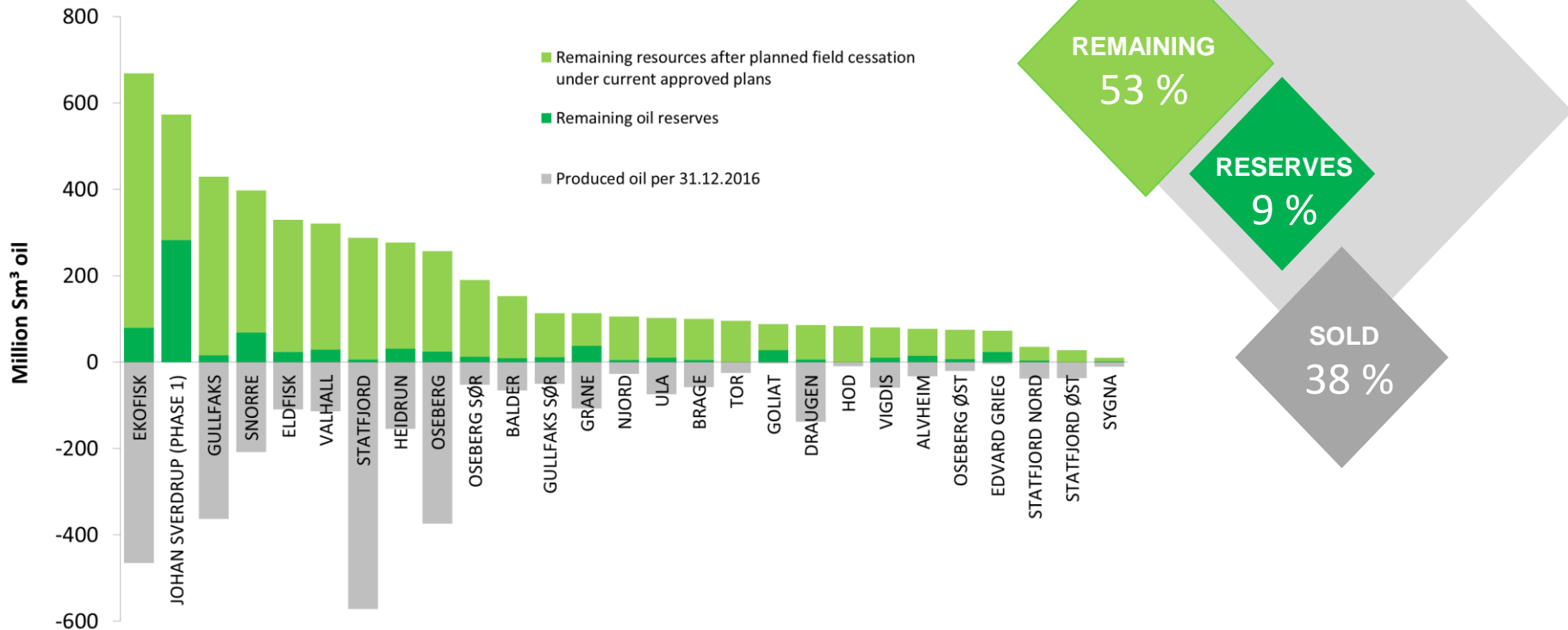
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Improved technical solutions

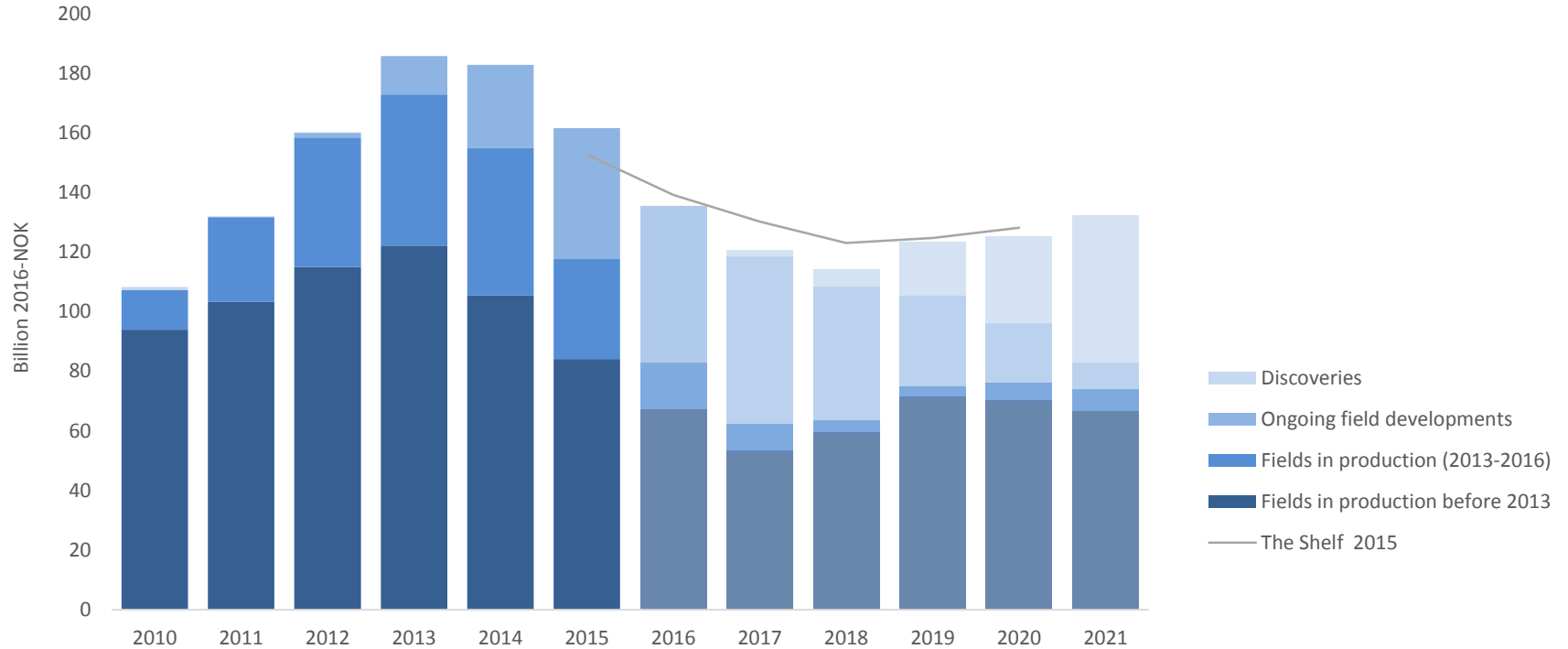


Oil Resources in Fields

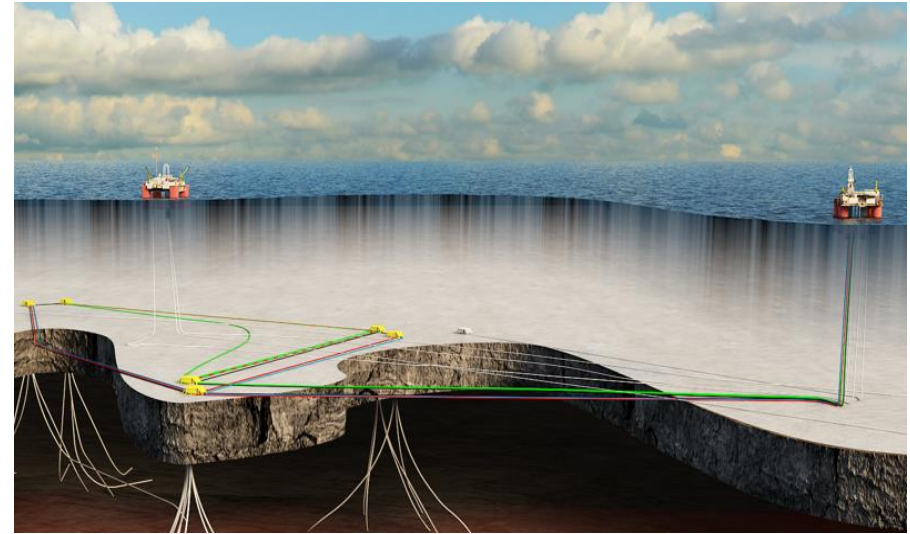
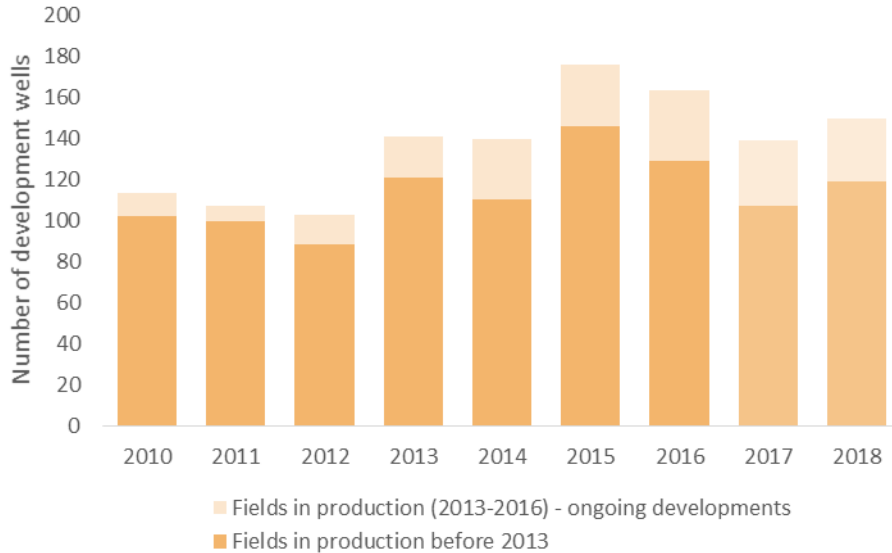
Large remaining volumes



Investments increase from 2019



New wells must be drilled to increase recovery



Source: Statoil

Even More to Gain

Requires know-how and
new technology

- Tight Reservoirs
- Enhanced Oil Recovery

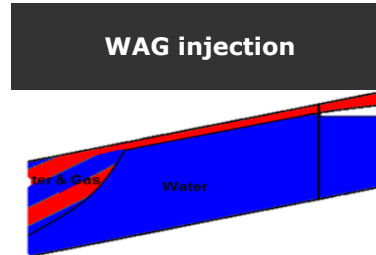
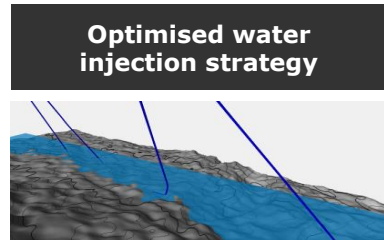
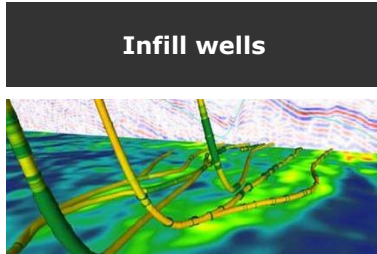
Tight Reservoirs

Large oil and gas deposits

Utilize new technology for profitable development

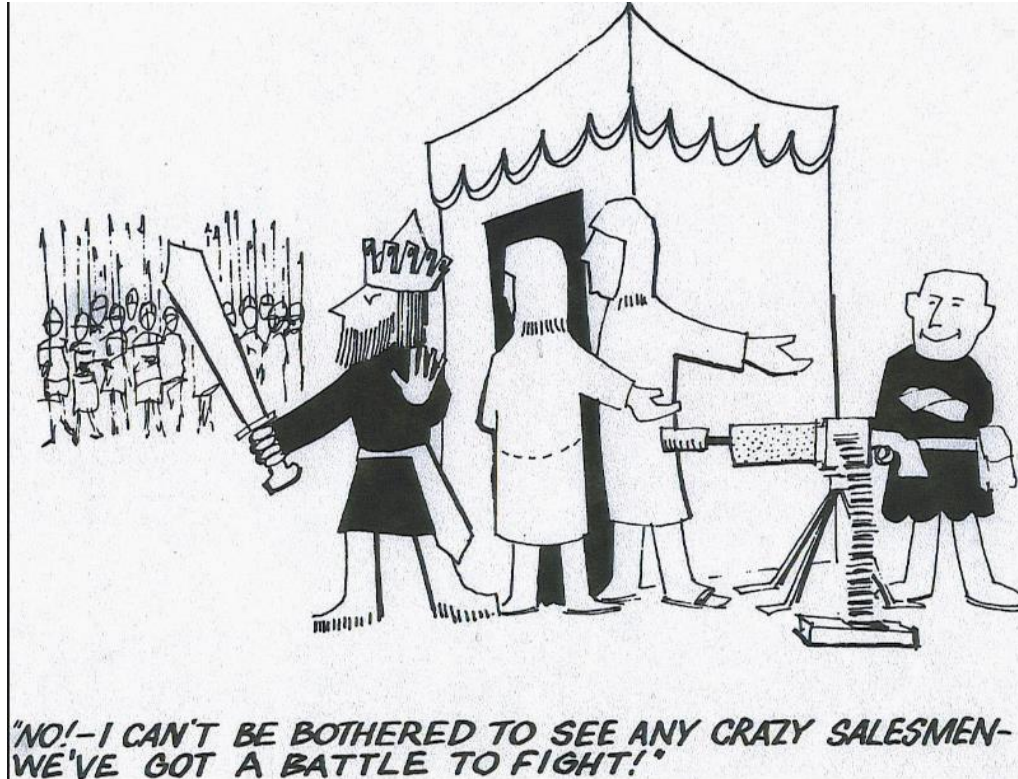
Illustrasjon: Fishbone

Toolbox for improved recovery in the production phase



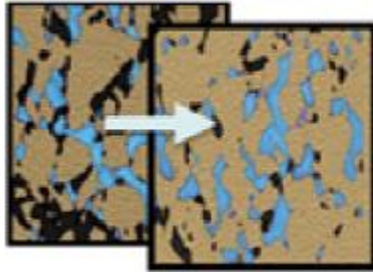
New Technology

Are we too busy to try out new technology?

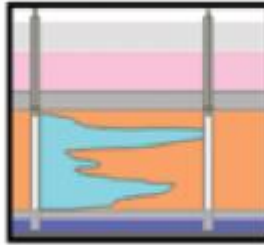


Enhanced Oil Recovery Recovery Factor (RF)

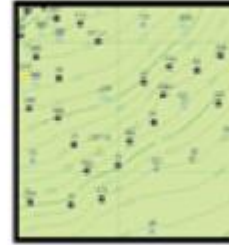
$$RF = R_m \times R_v \times R_d \times R_t$$



Pore scale displacement
(Microscopic sweep)



Reservoir scale displacement
(Macroscopic sweep)



Drainage



Cutoff

EOR focus

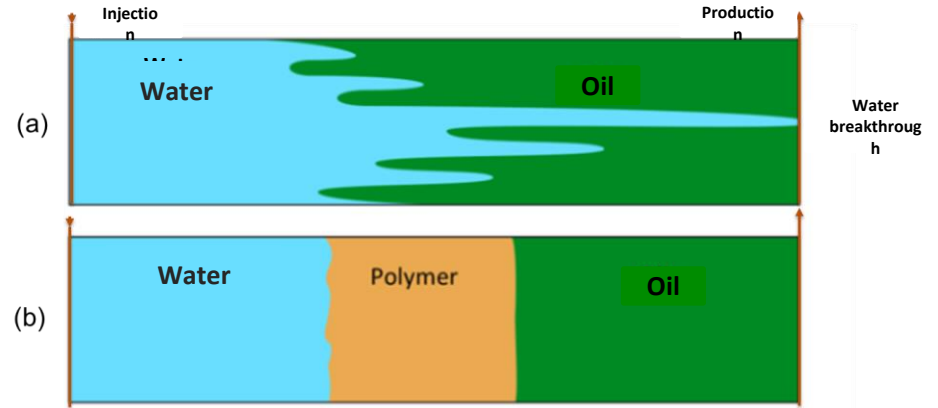
IOR focus

Polymer Injection

An opportunity for Johan Sverdrup



Source: Statoil



What does it take?

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Exploration

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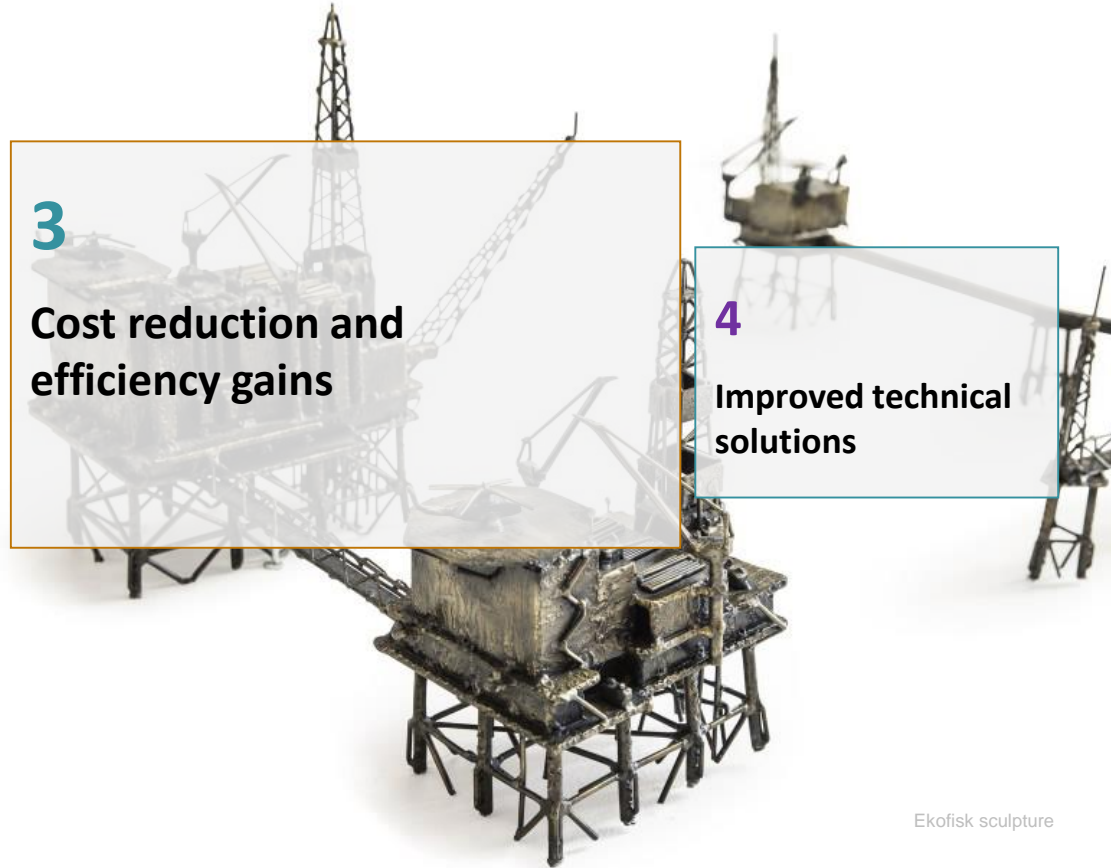
Invest for the long term

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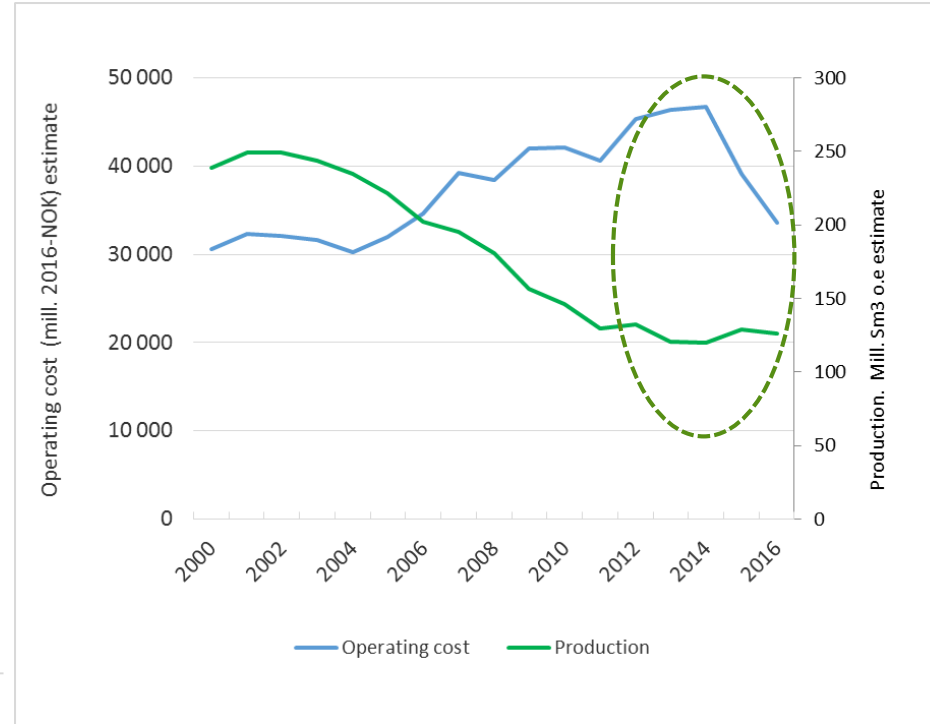
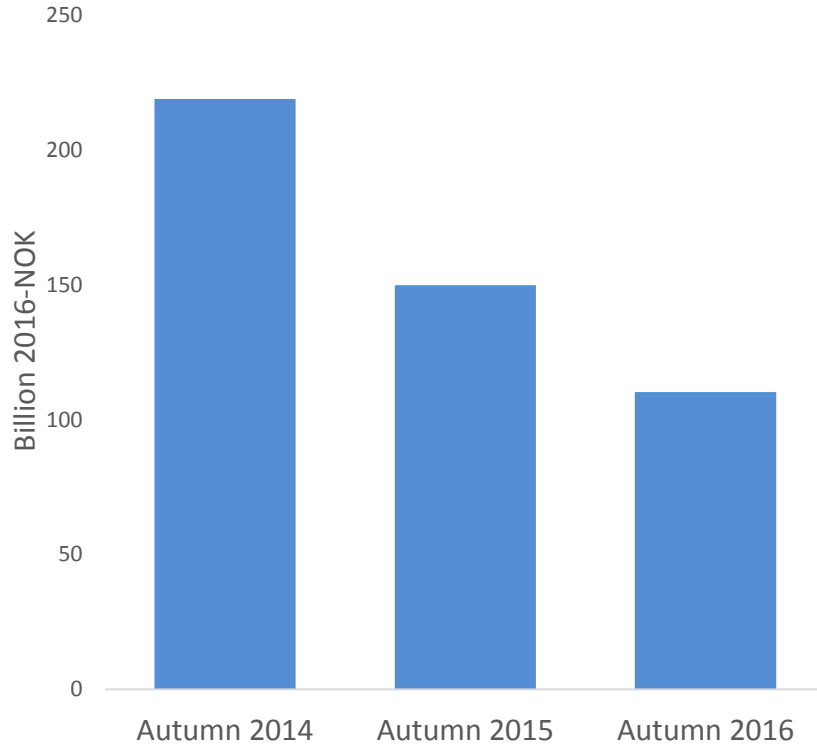
Cost reduction and efficiency gains

4

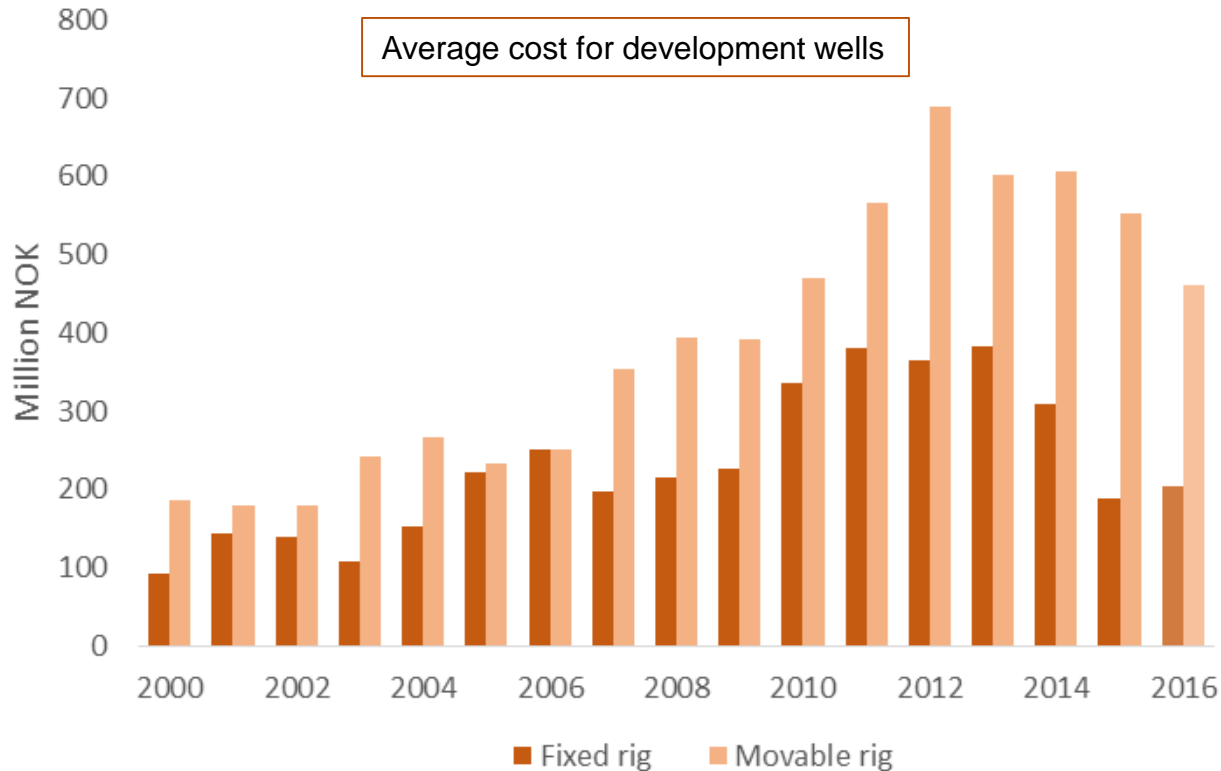
Improved technical solutions



Development- and operating costs are slashed



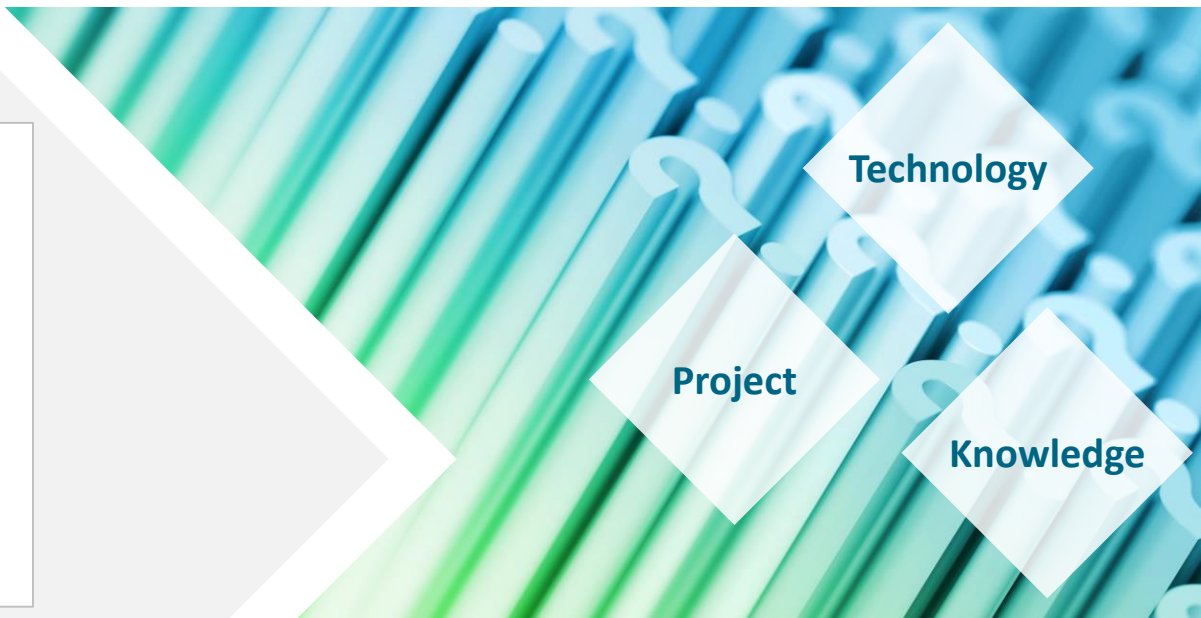
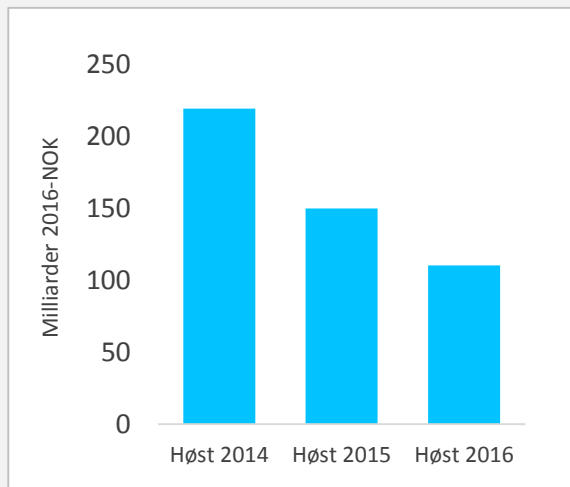
Increased drilling efficiency – reduced costs



Cost Control

Skru på langlysene

Investment (7developments)



What does it take?

1

Exploration

2

**Invest for the
long term**

3

**Cost reduction and
efficiency gains**

4

Improved technical solutions

Oil Resources in Fields

Large remaining volumes



New technologies to improve recovery

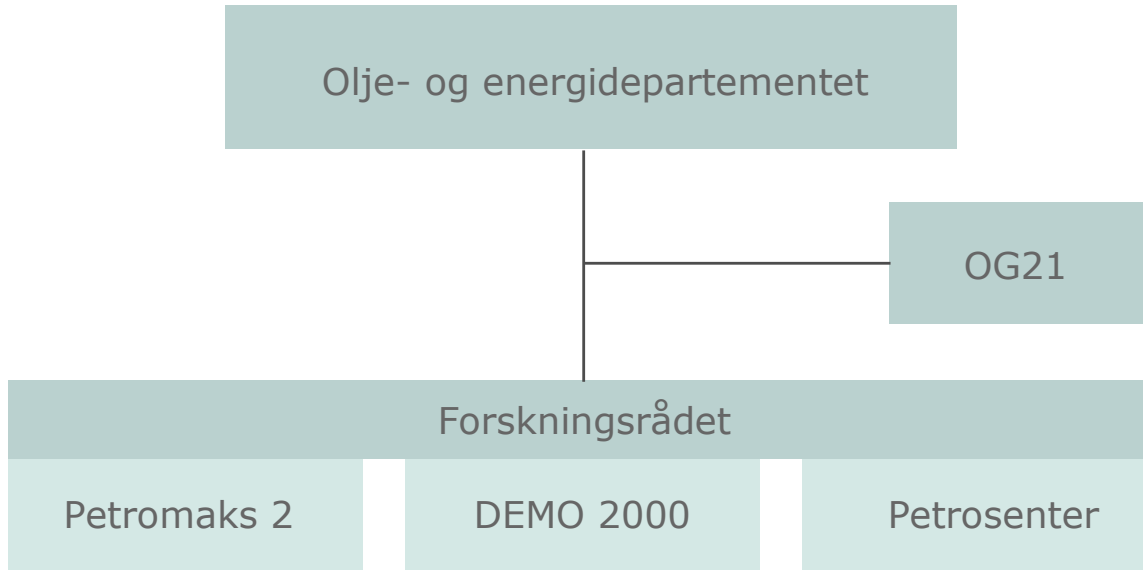


Foto: Statoil



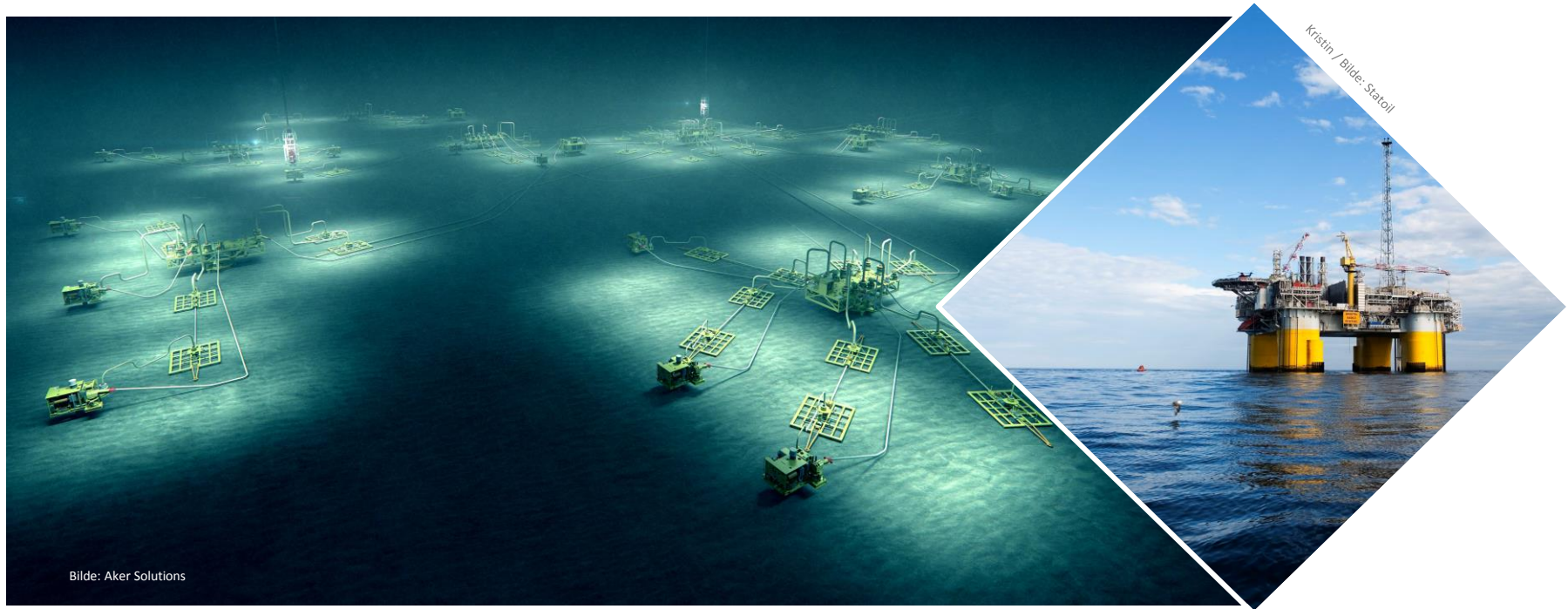
Develop, Qualify and Implement new technology

Need for more full scale field tests



Area solutions

Effective use of the existing infrastructure



Kristin / Bilde: Statoil

Bilde: Aker Solutions



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Course for the industry – what does the NPD do?

15.09.2017 **This autumn, the NPD will organise a one-day course for the oil companies on the NPD's responsibilities and roles. The course will be held in Norwegian on 14 November and in English on 15 November.**

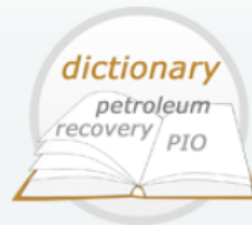


We had a corresponding course for the industry late last year. The target group is members of licence committees for exploration, discoveries and fields, other industry experts and authority contacts in the oil companies.

The goal of the course is to refresh knowledge about what the NPD does during the exploration, development and operations phases in relation to the industry. The course will place particular emphasis on follow-up of production licences.

A programme for the day along with registration will be published closer to the date.

DICTIONARY



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Questions?