



# KONKURRANSEKRAFT OG VERDIER PÅ NORSK SOKKEL

**Jo Husebye, Partner  
Rystad Energy**

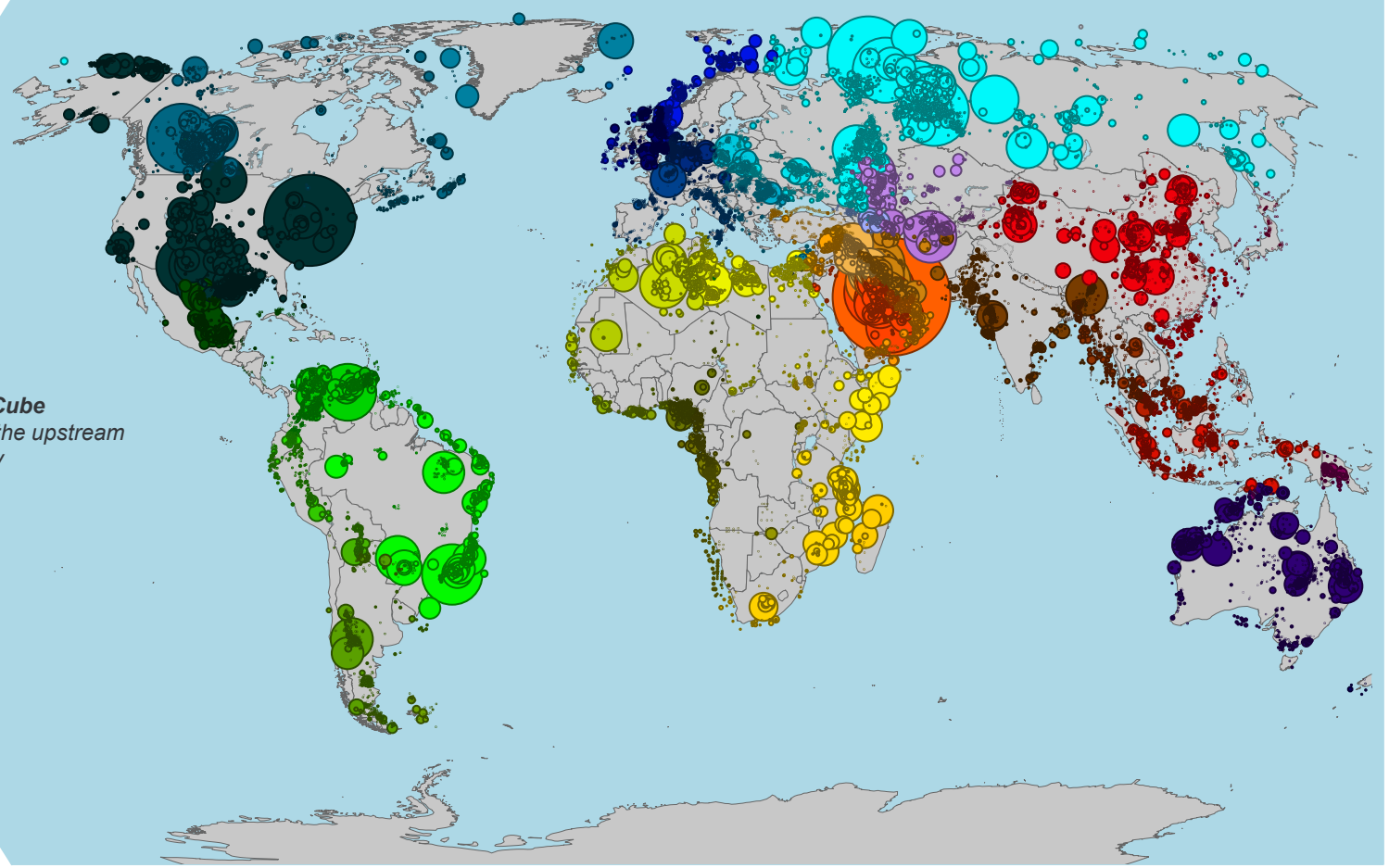
**Innlegg Klimafrokost:  
Hvordan avrunde oljealderen med stil?  
28. Februar, 2019  
Oslo**



RYSTAD ENERGY

# Rystad Energy provide bottom up databases covering more than 65.000 upstream projects

## APPROACH AND HERITAGE: A BOTTOM-UP DATABASE OF UPSTREAM ACTIVITY



**Rystad Energy UCube**  
*A microcosmos of the upstream  
oil and gas industry*

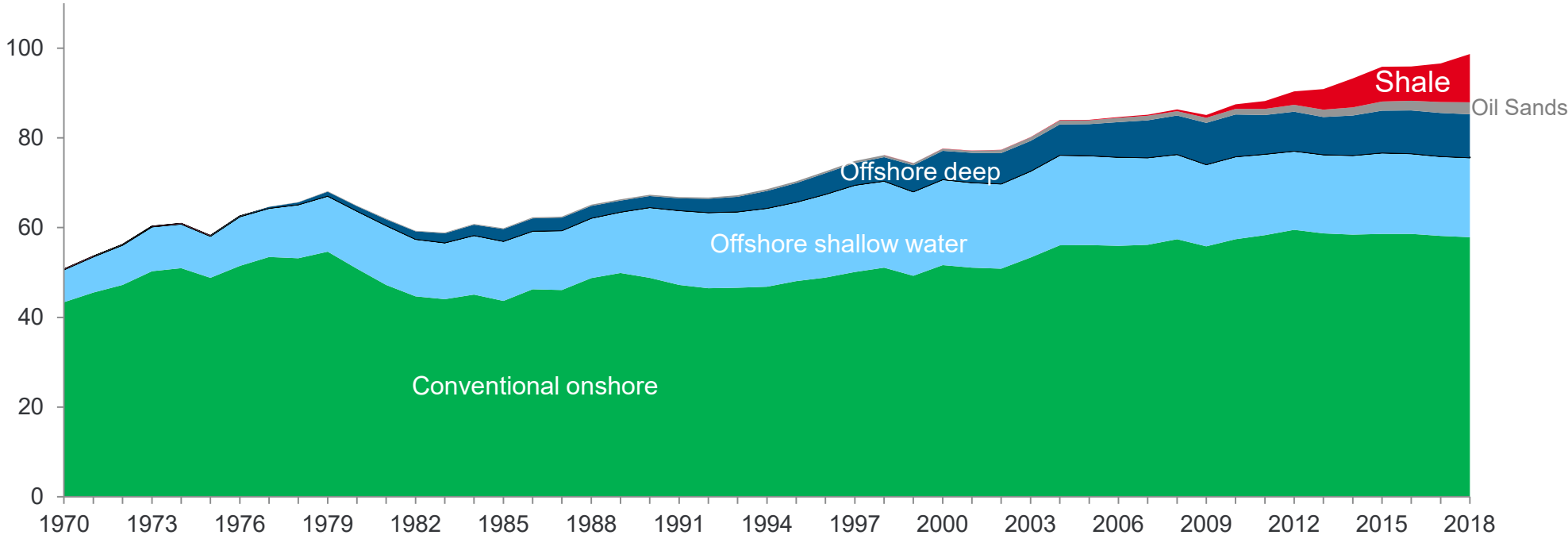
\* Map shows global remaining oil and gas resources, split by location of projects. Circle size indicates amount of resources.

# Agenda

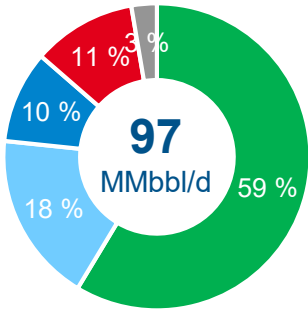
Cost competitiveness of Norwegian oil and gas  
Value of remaining oil and gas

# While shale captures most of the net growth, offshore largely maintains market shares

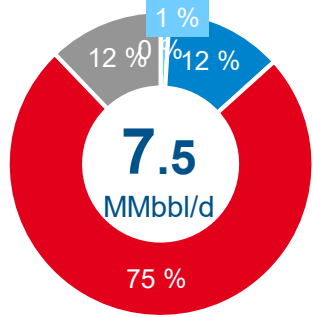
**Global liquids production split by supply source**  
 Million bbl per day



**Production mix 2017**



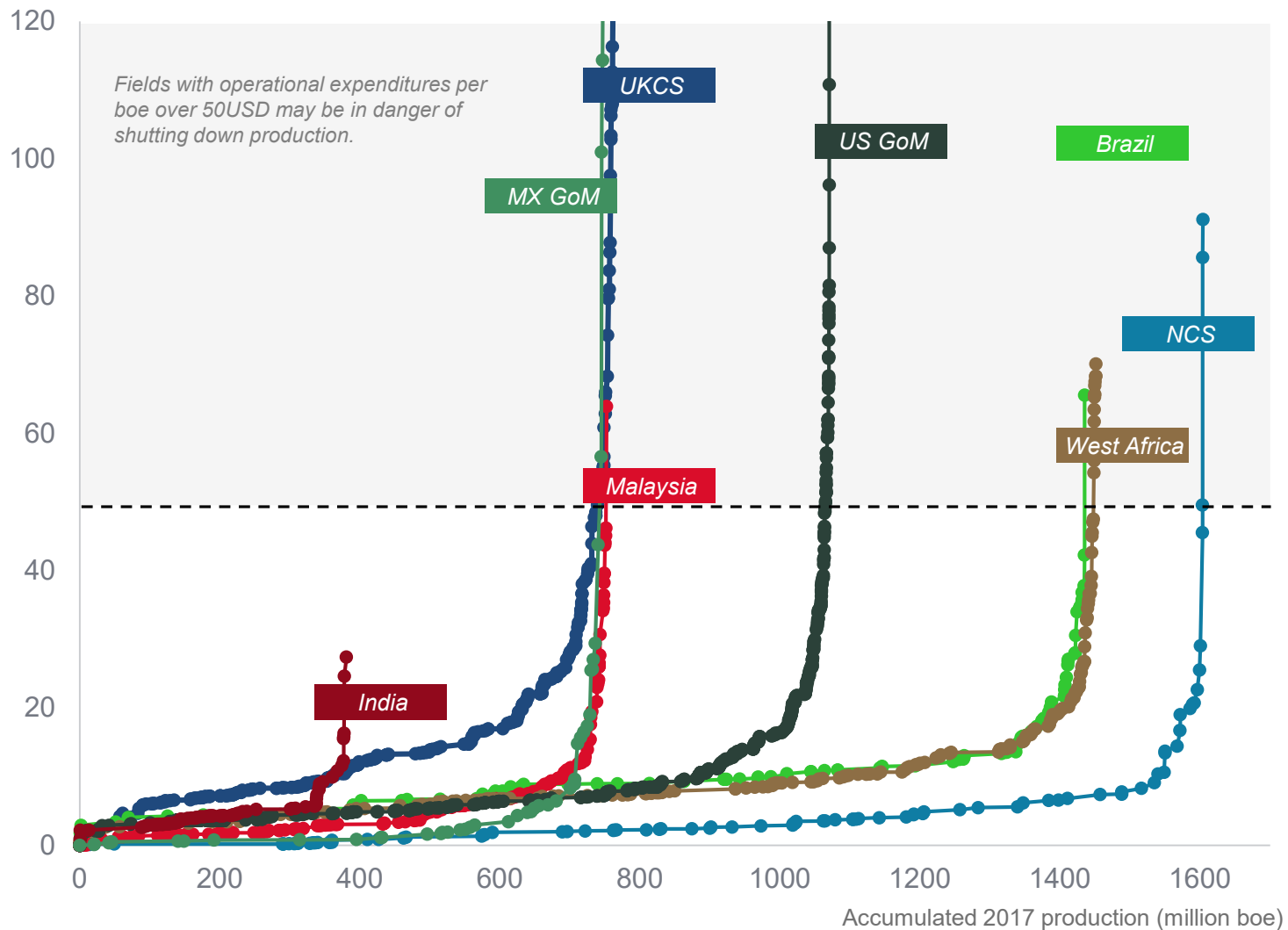
**Net new liquids 2012-2017**



Source: UCube

# NCS with highly competitive lifting costs compared to offshore peers

Opex for all offshore assets in 2017, key offshore regions  
USD/boe



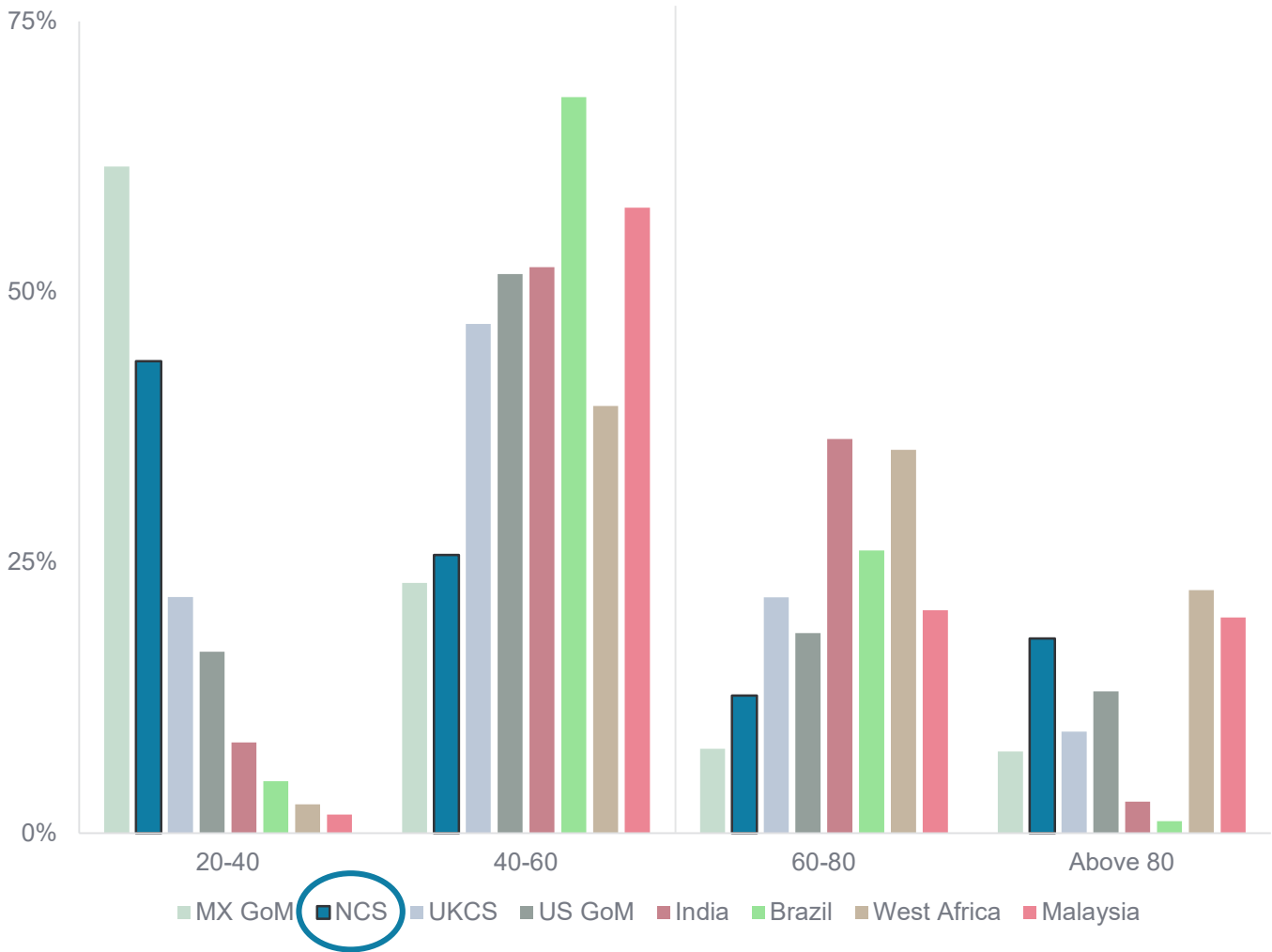
Fields with operational expenditures per boe over 50USD may be in danger of shutting down production.

For fields with start-up in 2016, 2017, production and opex from peak-production is used  
Source: Rystad Energy UCube; Rystad Energy research and analysis

# 45% of contingent resources on NCS competitive at prices below 40 USD/bbl

Share of contingent resources by break-even oil price group

Percentage



- High infrastructure density in North Sea allows for cheaper developments, utilizing existing processing and transport infrastructure
- Deep water regions more expensive to develop

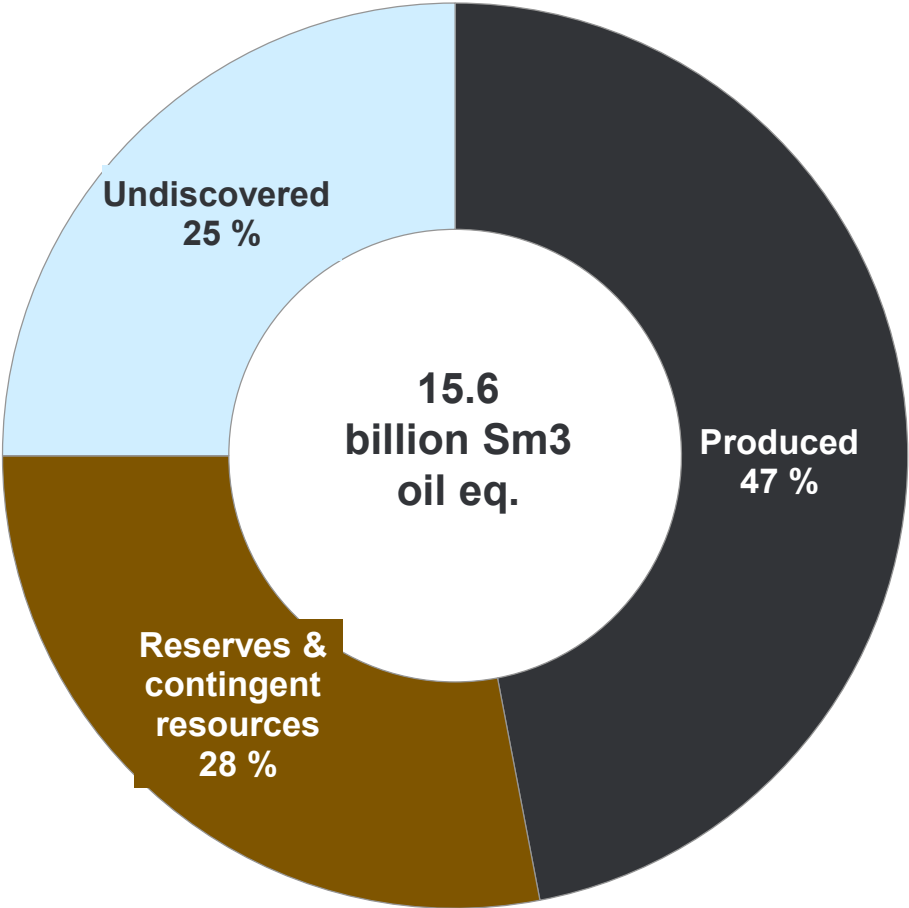
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# Agenda

Cost competitiveness of Norwegian oil and gas  
Value of remaining oil and gas

NCS resources: 47% produced, 25% yet to be found, 28% in fields and discoveries

Resources on NCS by lifecycle (31.12.2018)



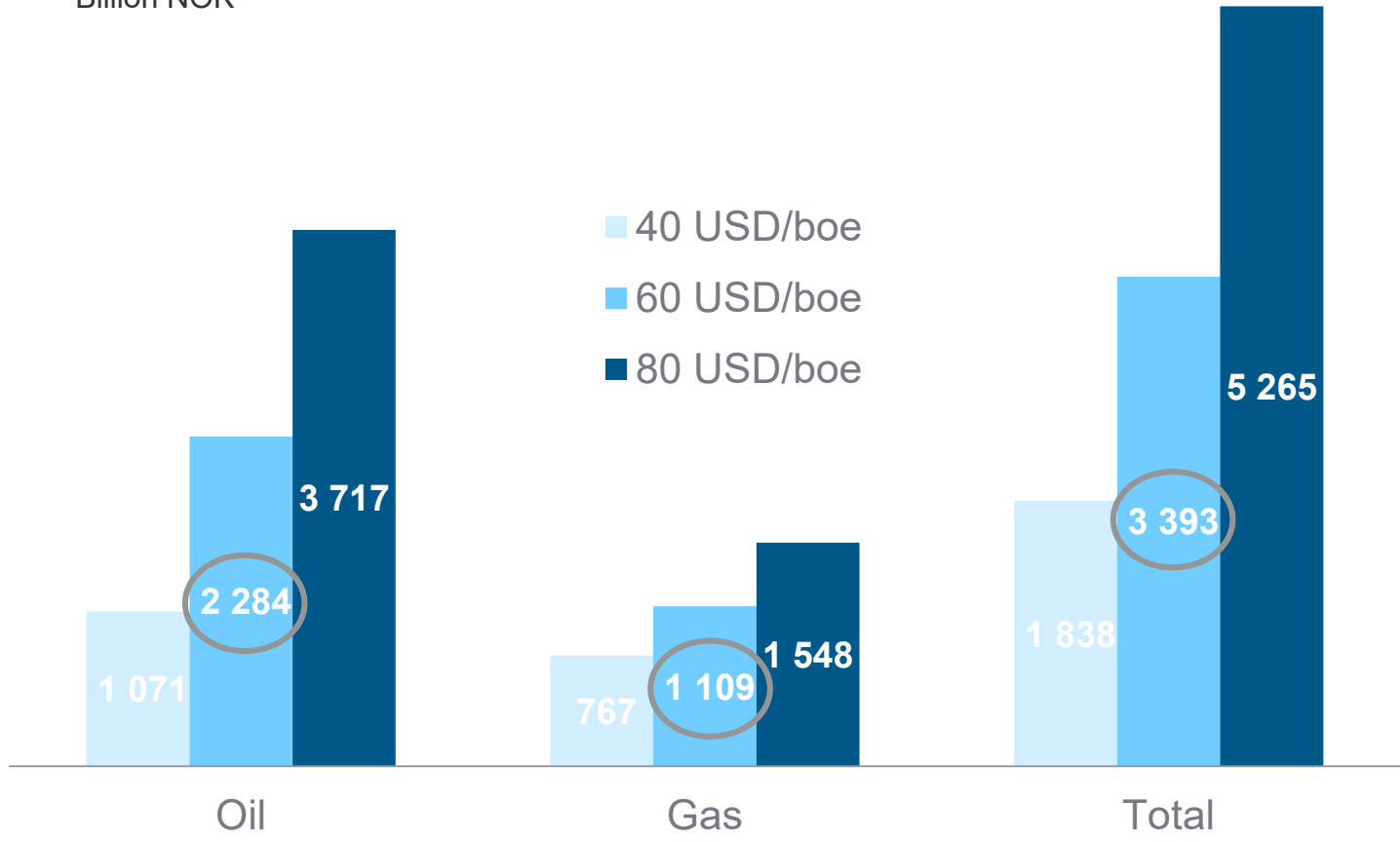
- Reserves – includes remaining resources in fields and discoveries under development
- Contingent resources – include discovered non-sanctioned resources in fields and discoveries

Source. Ressursregnskapet per 31st of December 2018 (NPD). Reserves include resource class 1,2 & 3 (in production, approved PDO or decided by licensees). Contingent resource exclude uncommercial resources.



~ 3400 billion NOK in value\* from remaining resources in fields and discoveries @ 60 USD/bbl

**Net present value of remaining resources**  
Billion NOK

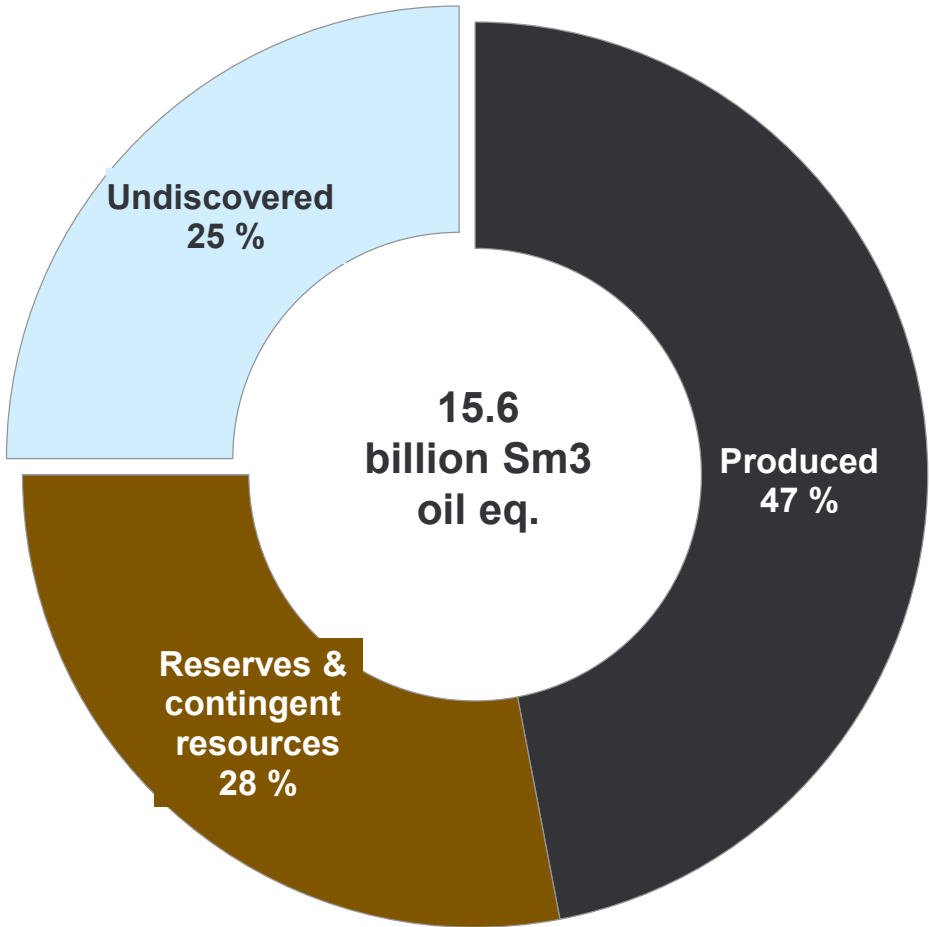


- Oil account for ~2/3 of remaining values
- ~90% of remaining values in producing fields and fields under development, only 10% in non-sanctioned discoveries
- Value as discounted free cash flow to companies and government take, with 10% nominal discount rate, excluding undiscovered resources.
- 4% real discount rate lift value @ 60 USD/bbl to by ~ 30%.

\*Value defined as net present value 1.1.2019 of government take and free cash flow to companies with nominal discount rate of 10%, excluding undiscovered resources  
Source: Rystad Energy Ucube

25% of remaining resource are undiscovered, what are the values found here?

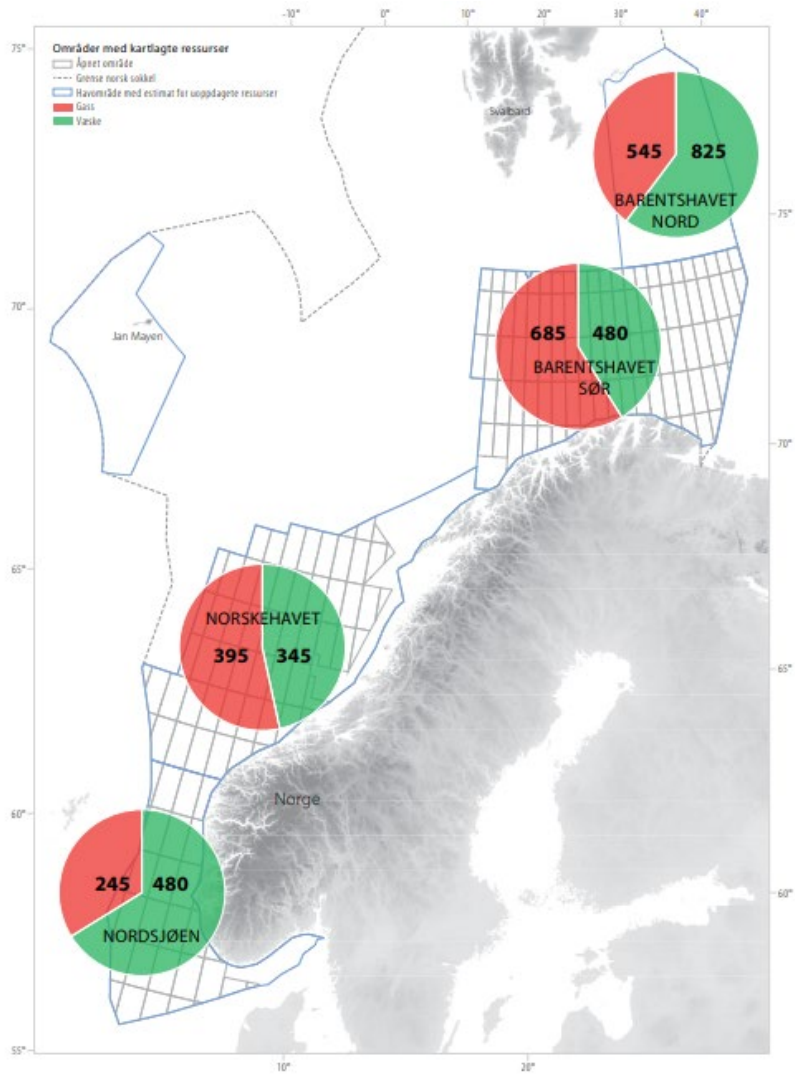
Resources on NCS by lifecycle (31.12.2018)



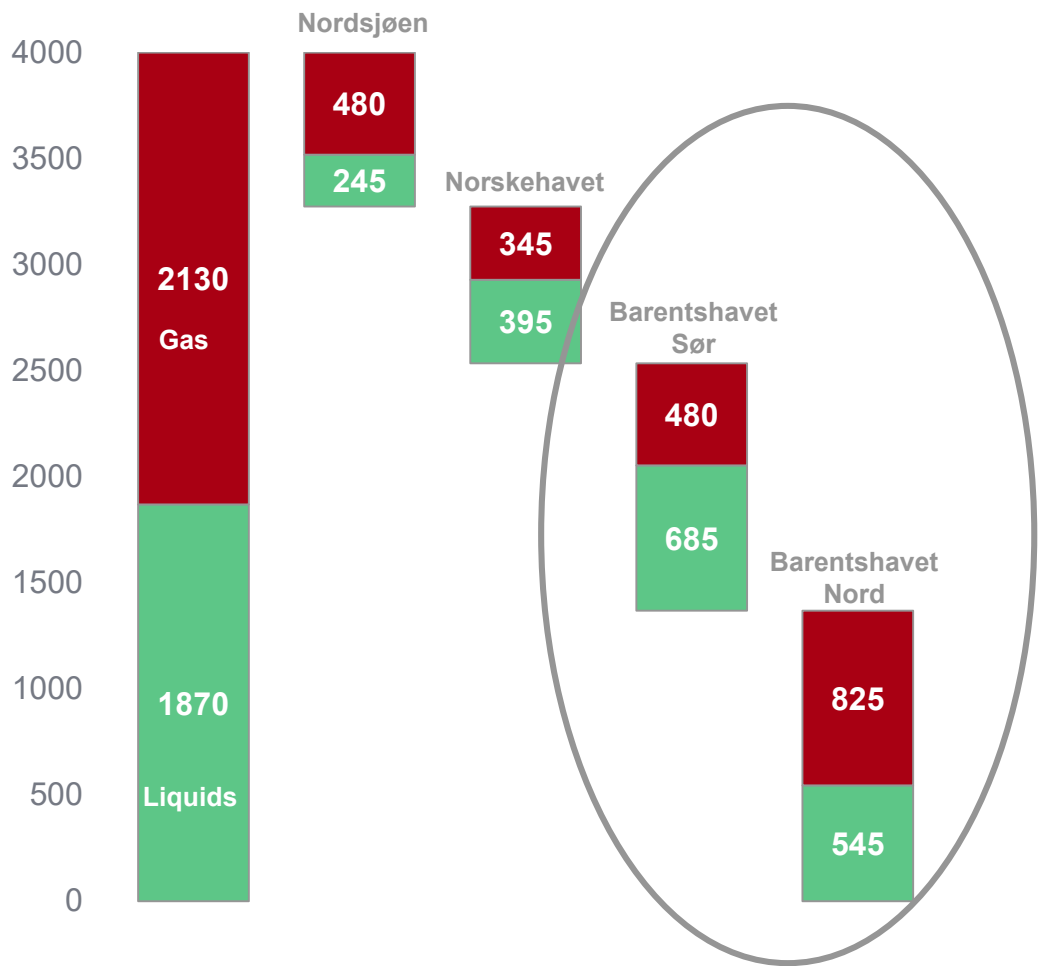
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~50/50 gas vs. oil, with ~2/3 of remaining undiscovered resources in the Barents Sea

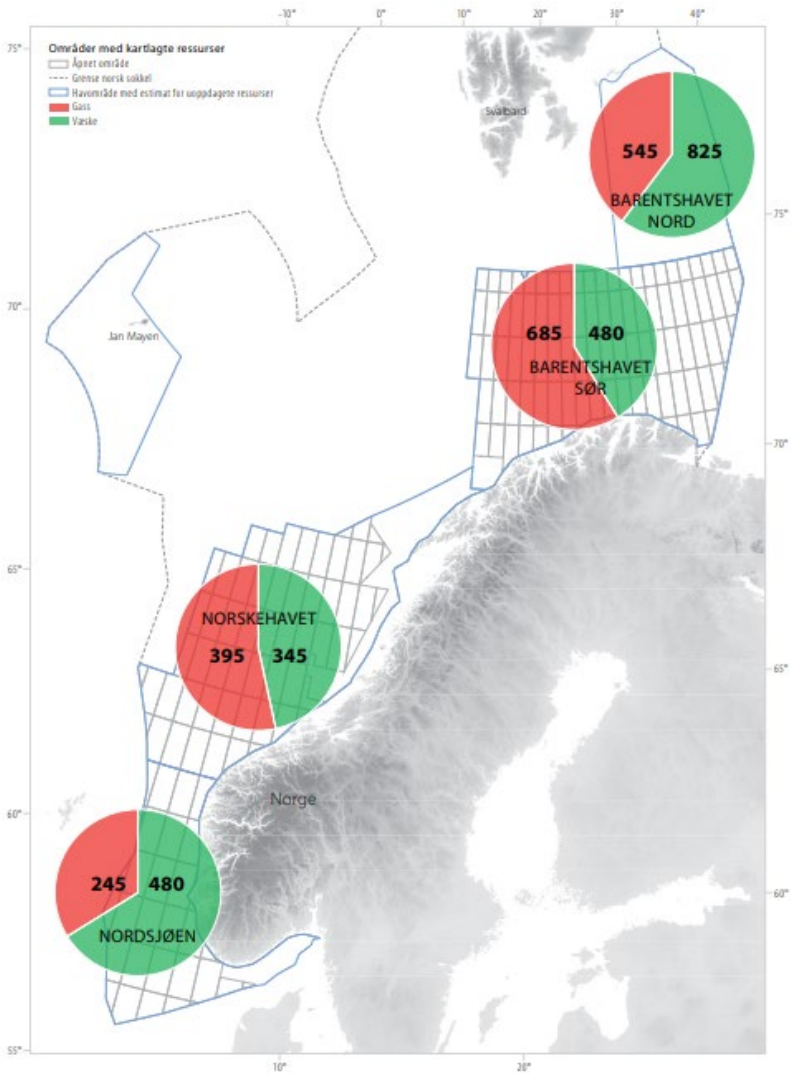


Undiscovered resources  
Million Sm<sup>3</sup> o.e

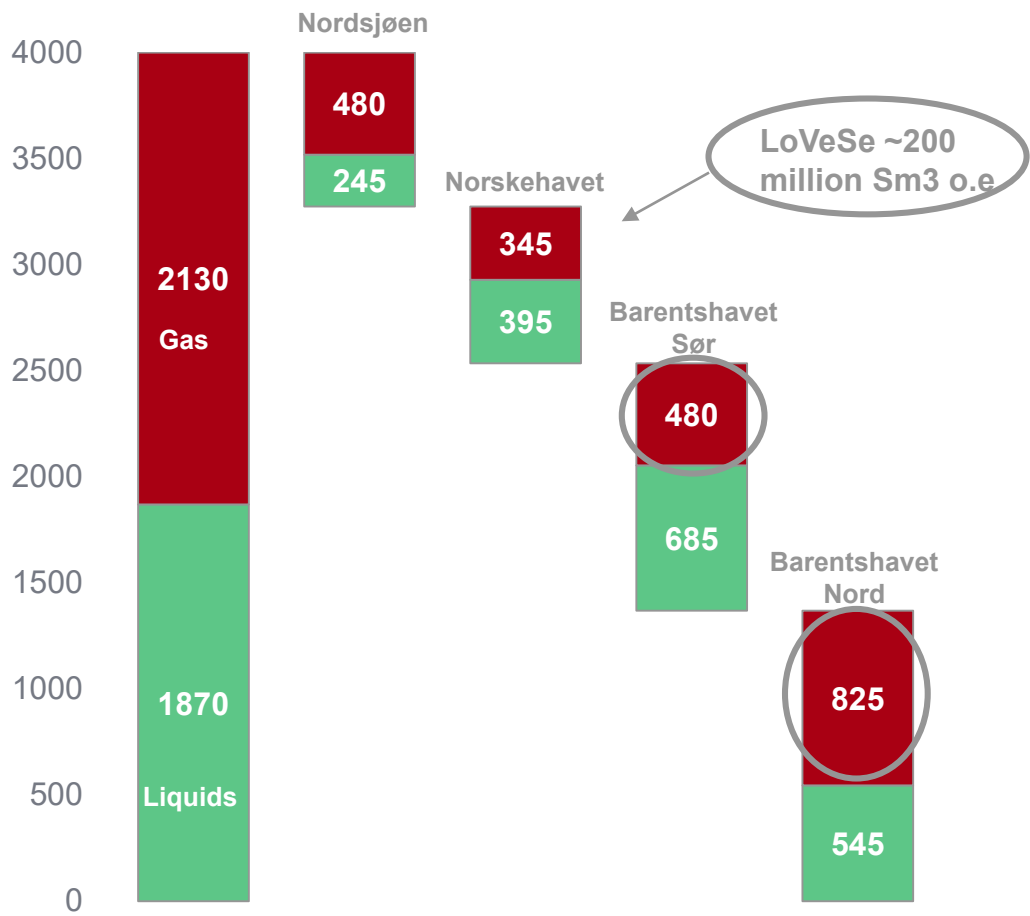


Source: Ressursrapporten 2018 (NPD)

# Barents Sea gas account for ~30% of undisc. resources, LoVeSe ~5% (part of Norskehavet)



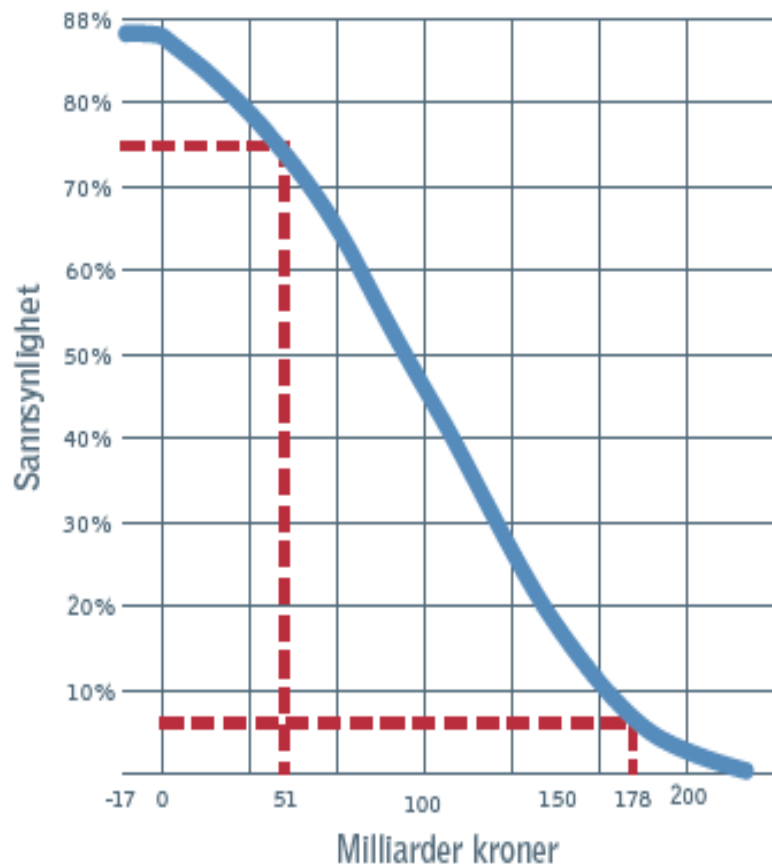
## Undiscovered resources Million Sm<sup>3</sup> o.e



Source: Ressursrapporten 2018 (NPD)

# No such thing as precise valuation estimates for undiscovered resources...

## NPV distribution for LoVeSe resources



## Key observations:

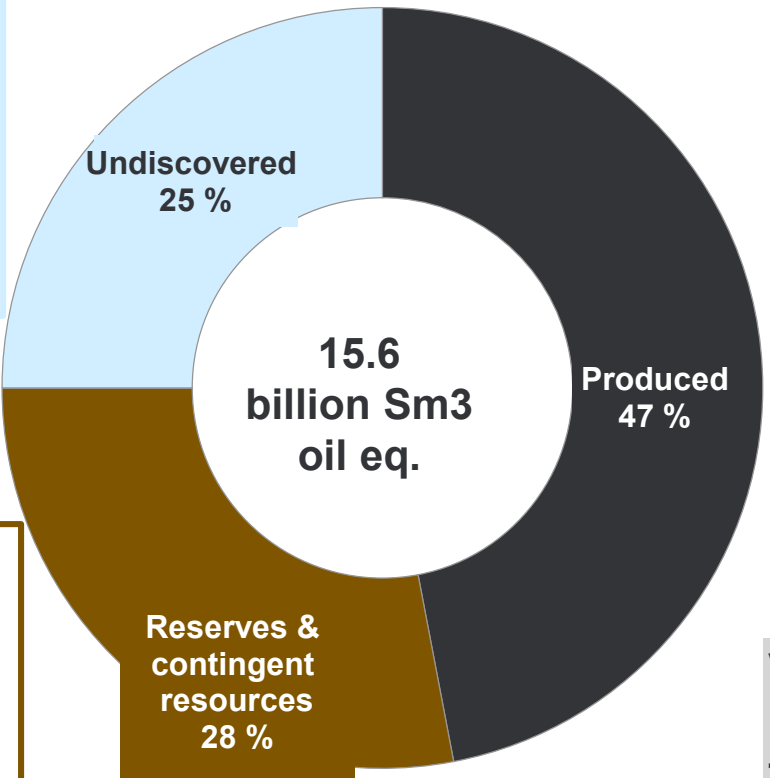
- Expected net present value 105 billion NOK
  - **10 USD/boe of undiscovered resource (200 Sm<sup>3</sup> o.e)**
- Limited downside relative to upside potential
- Significant geological uncertainty
  - Resource estimate
  - Resource distribution
  - Resource type (oil vs gas)
- Set of underlying assumptions:
  - 2010 oil price prognosis of 80-100 USD/boe
  - Exchange rate 6 NOK/USD
  - Development costs
  - Real discount rate 4%
  - Timing – when discovered
  - ++
- **5 USD/boe used as proxy at current price level**

# Significant value potential from undiscovered resource, reflected in ongoing exploration activity

Resources on NCS by lifecycle (31.12.2018)

**Indicative value potential:**

- @ 5 USD/boe remaining undiscovered
- 1 200 billion NOK
  - 5% LoVeSe
  - 30% Barents Sea gas



**Historical free cash flow to oil companies and tax income**

- Oljefondet with current value of 8 800 billion NOK

**Present value @ 60 USD/bbl:**

- 3 400 billion NOK
- 15 USD/boe remaining discovered

Valuation figures does not include profits and tax income from the supplier industry, which is typically higher per boe for undeveloped resources

THANK YOU



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