A review of exploration activity and results 2015-2017 on the NCS
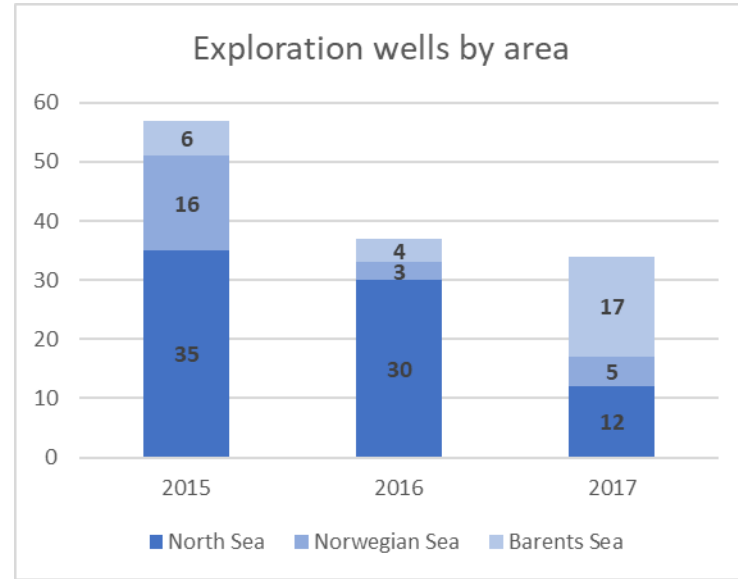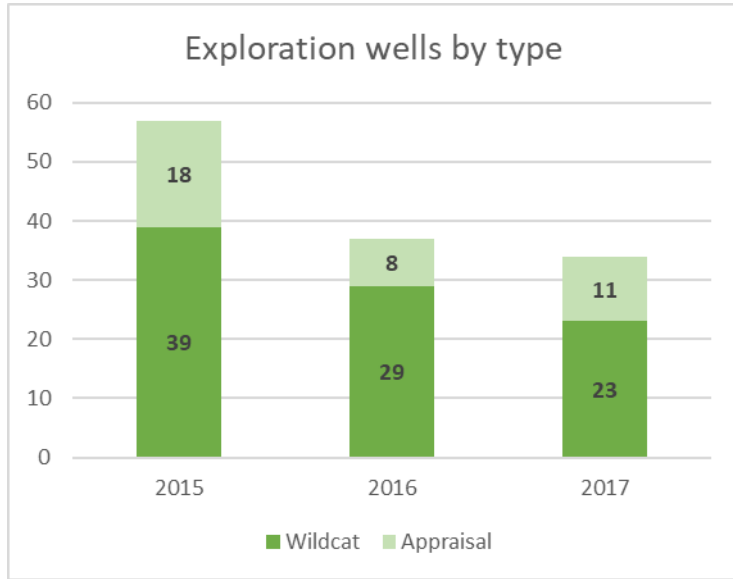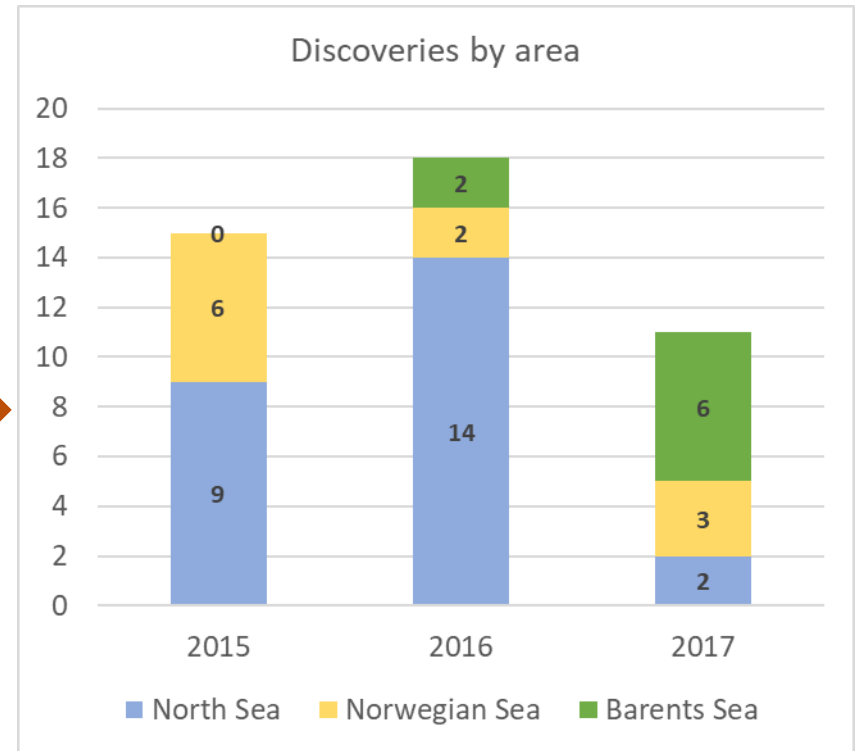
Hans Martin Veding

NORWEGIAN PETROLEUM DIRECTORATE

Exploration activity follows the oil price

2
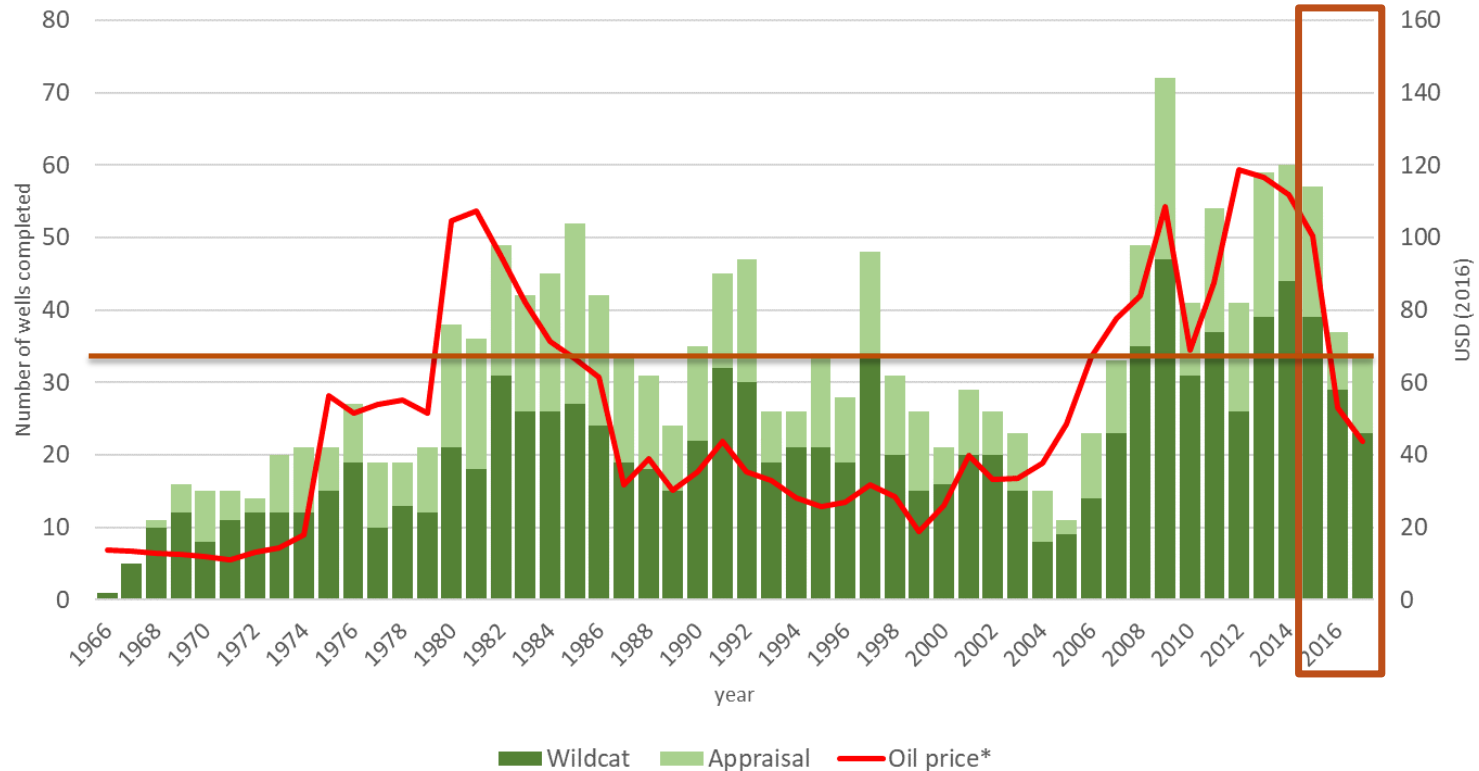
Drilling activity the last 3 years

Exploration wells by type

	2015	2016	2017
Appraisal	18	8	11
Wildcat	39	29	23

Exploration wells by area

	2015	2016	2017
Barents Sea	6	4	17
Norwegian Sea	16	3	5
North Sea	35	30	12

From wells to Discoveries – what did we find?
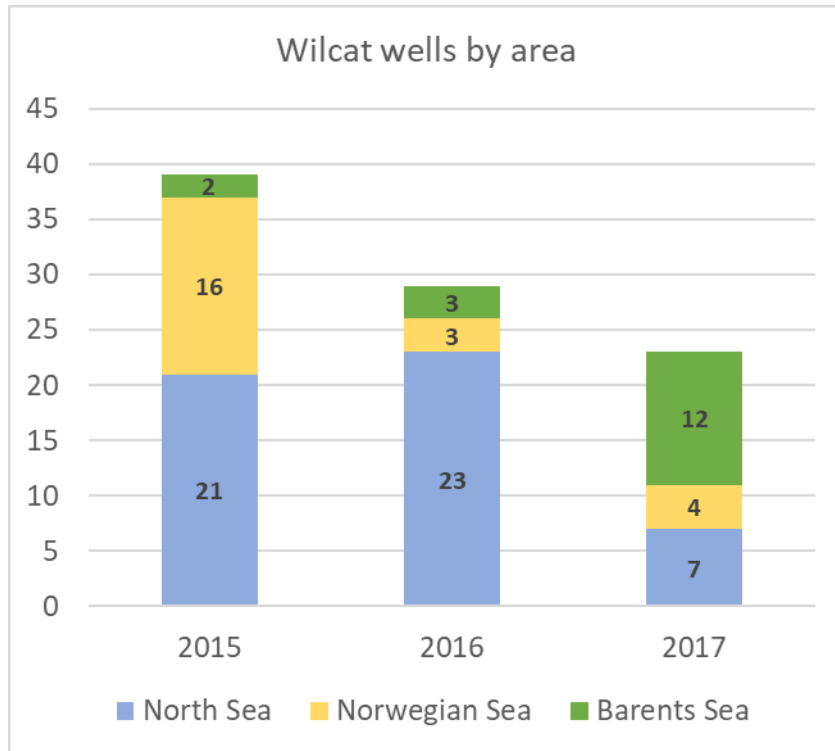
From wells to Volumes – what did we find?

Wilcat wells by area

Year	North Sea	Norwegian Sea	Barents Sea
2015	21	16	2
2016	23	3	3
2017	7	4	12

Discovered volume by area

Year	North Sea	Norwegian Sea	Barents Sea
2015	10	15	0
2016	49	1	8
2017	3	6	33
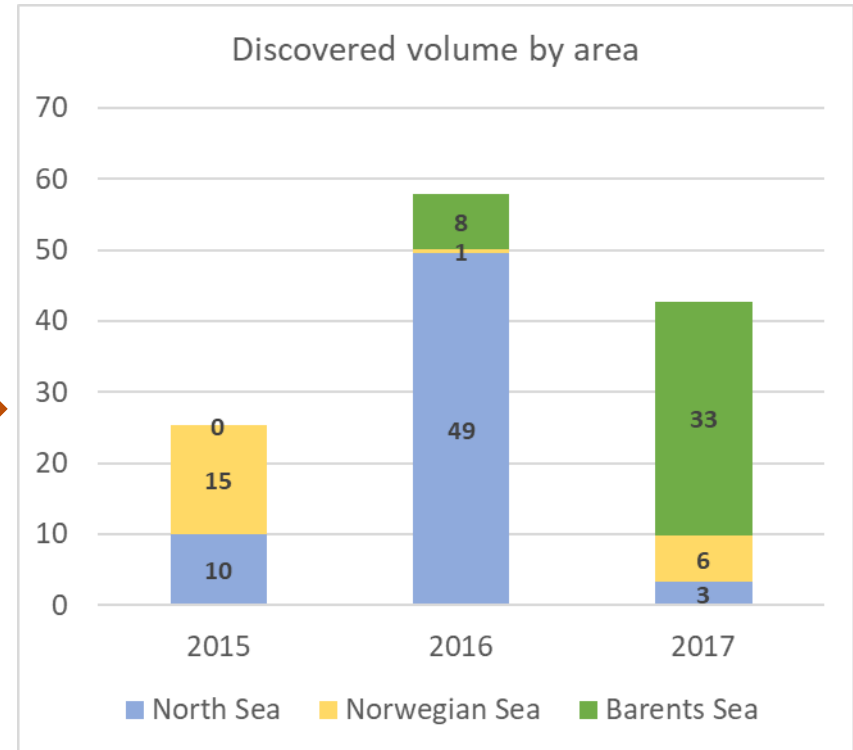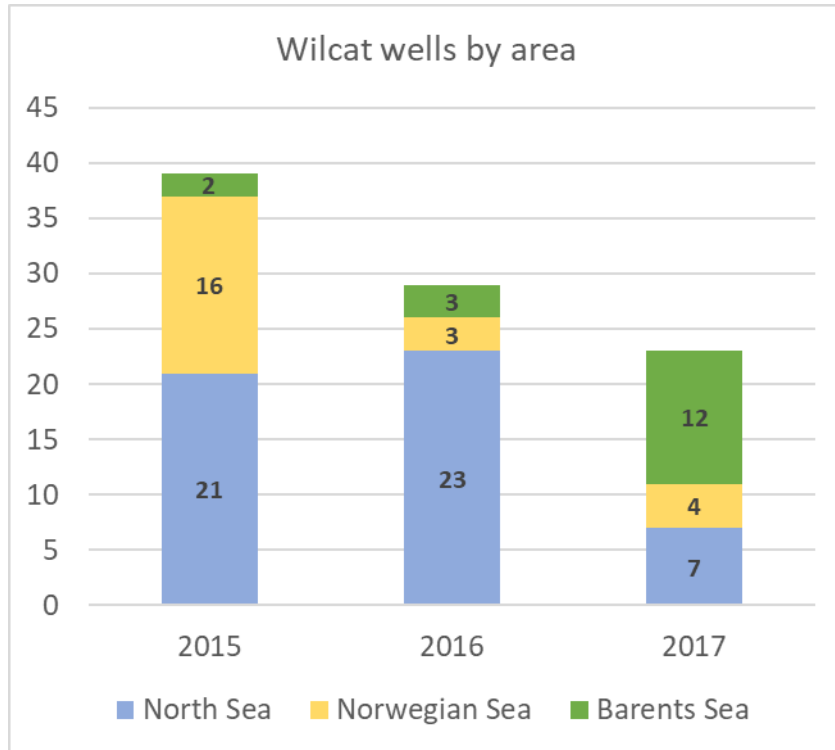
From wells to targets – what did we drill?

Wilcat wells by area
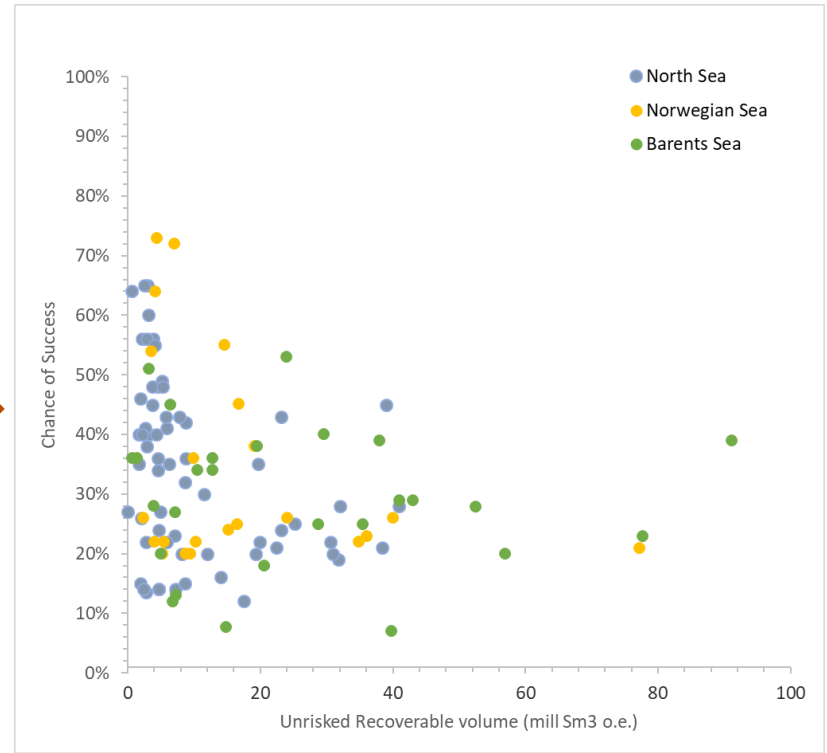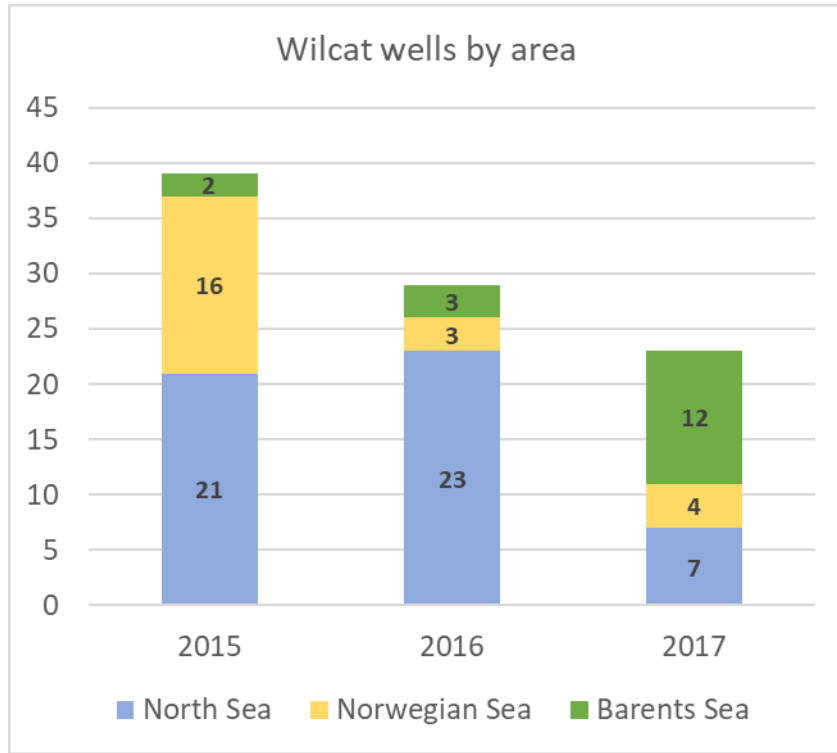
Reporting of data from operators

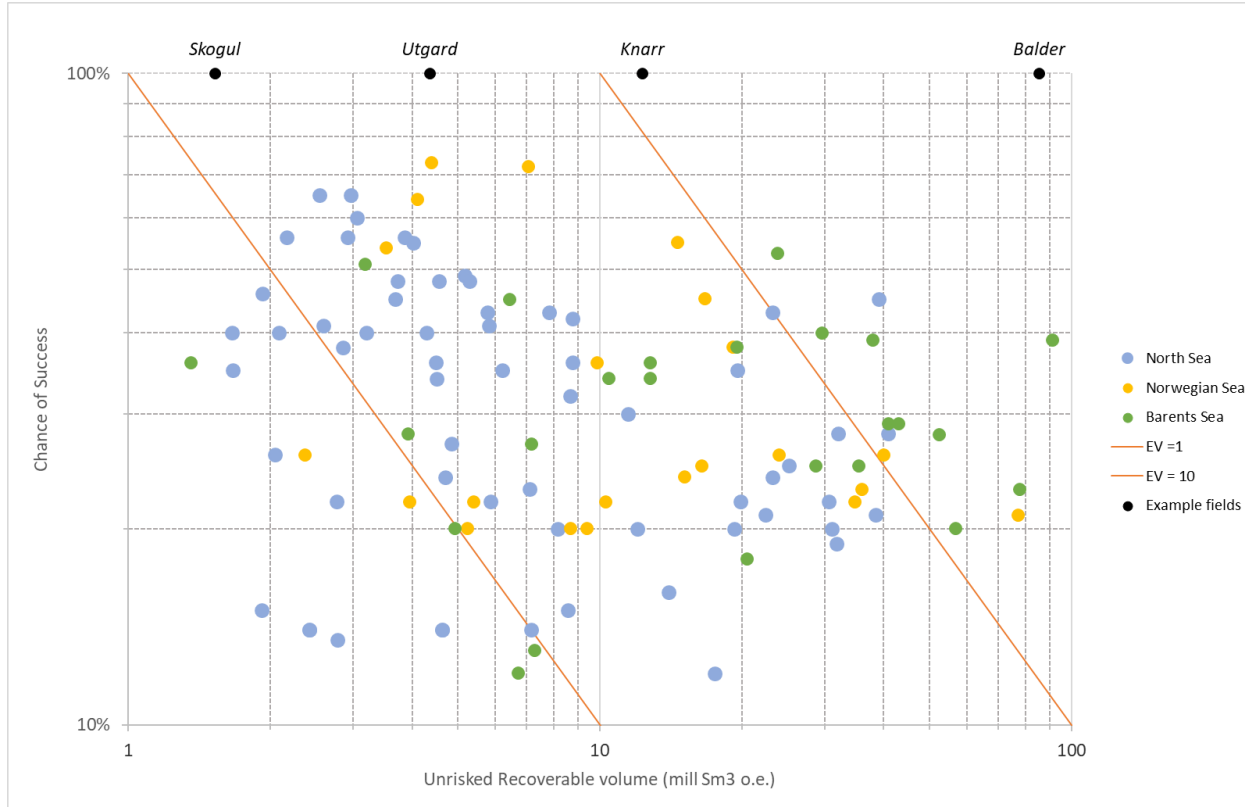|			If there is more than one prognosis per prospect, please duplicate the prognosis column (column " i ")	
Section: "Well data"	Comments	Comments	Prognosis	Result
Well Name	Always fill in	NPD approved name	16/2-6	16/2-6
Production Licence Number	NPD input	NPD approved name		
	NPD input	NPD approved name		
Operator				Lundin Norway AS
Well type: required/committed as a part of the licence award?		Yes/No		Yes
Well classification		Wildcat / appraisal		Exploration
License round	NPD input			
	NPD input			
Seismic database (2D/3D)		2D/3D		3D
Frontier area?	NPD input	Yes/No		
Structural element/Province				Utsira High
Spud date	NPD input			
Completion date	NPD input			
Water depth		meter		115.00
Stratigraphic age at TD				Permian / Zechstein
Paragraph: prospect				
Prospect name	Always fill in	Operators name	Avaldsnes	Avaldsnes
Prospect ID	NPD input	NPD code		
Distance to nearest relevant well		km	11.2	
Nearest well Name		NPD approved name	16/3-2	
Prospect Priority if several in well		number 1,2,...	1	
SubParagraph: prognosis // result				
Prognosis ID (if several)		Operators name	Avaldsnes	

Directorate must receive both
digital format as an appendix
the discovery evaluation

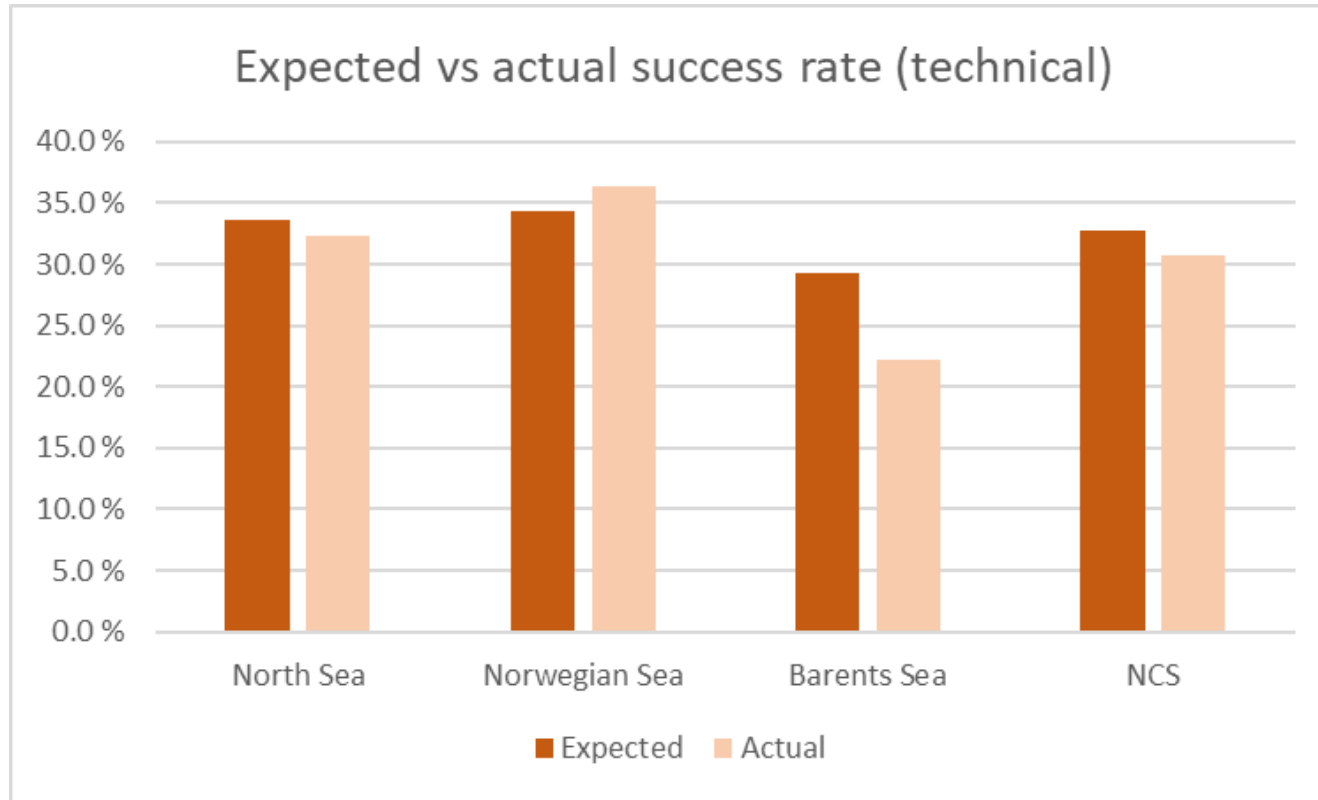*e petroleum activities*
ervoir well data
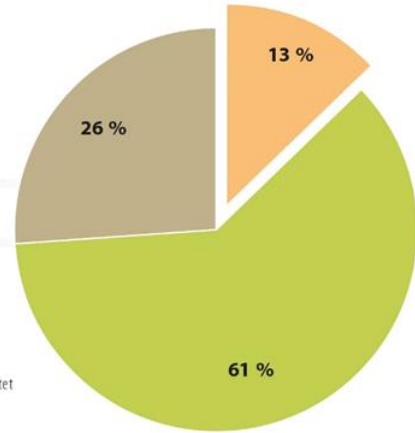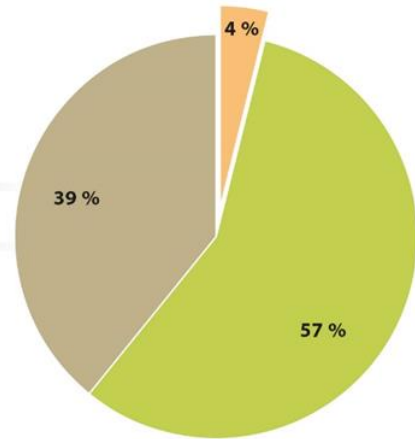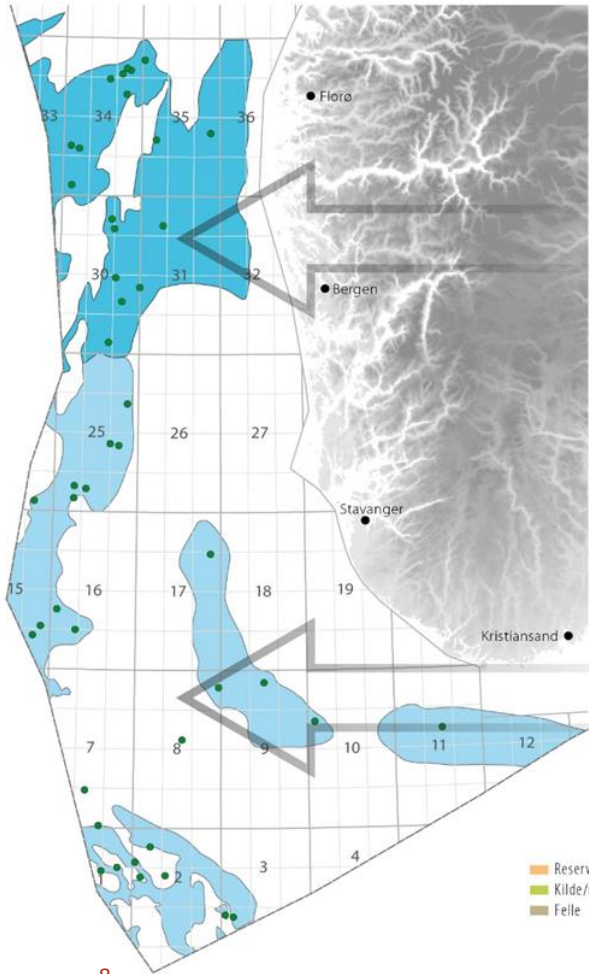
Reasons for dry targets in selected NPD plays in the North Sea
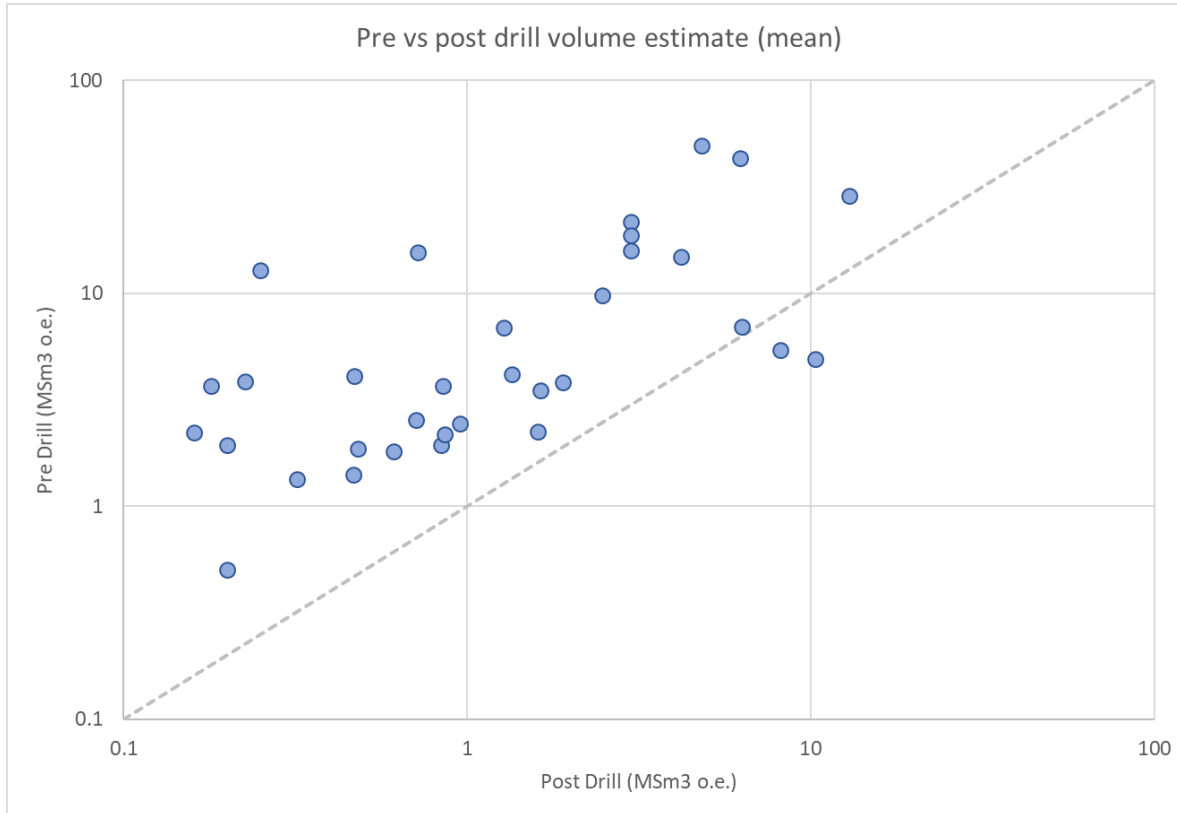
Reported drilling targets 2015-2017 – Pre drill

Discovery rates – prognosis vs result
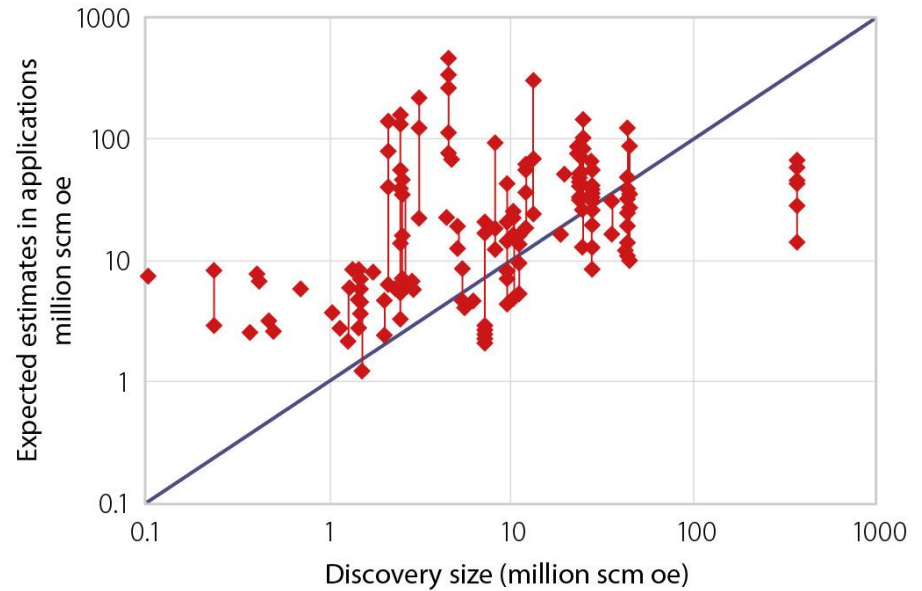

Expected vs actual success rate (technical)

Very concistent – and very optimistic

Pre vs post drill volume estimate (mean)

We have seen it before
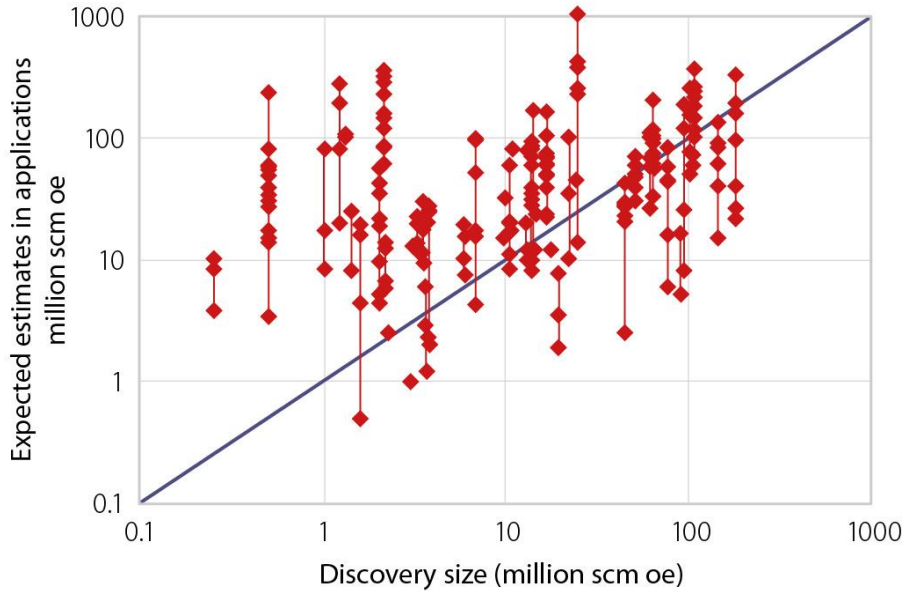
8th through 14th licensing round

16th through 22nd round and APA2003-2011

Why are the volume prognoses so poor?

- Methodology?
    - The way we do post mortem analysis?
    - Current prospect evaluation methodology and tools?
    - The way we use our tools?
    - Too complex or too simple models?

- Different biases?
    - Are explorerers optimistic by nature?
    - Are we just fulfilling management expectations?
    - Company internal competition?

Some shortcomings with the current dataset

- How is success defined, in relation to the CoS? (above a minimum value or that the well will be classified as a discovery)
    - No data on the minimum value of the volume estimate
- Is the CoS adjusted according to well placement, i.e. is there a chance that the well misses an actual accumulation?
- No data on possible DHI adjustment of the CoS

Definition of sucess vs volume prognosis
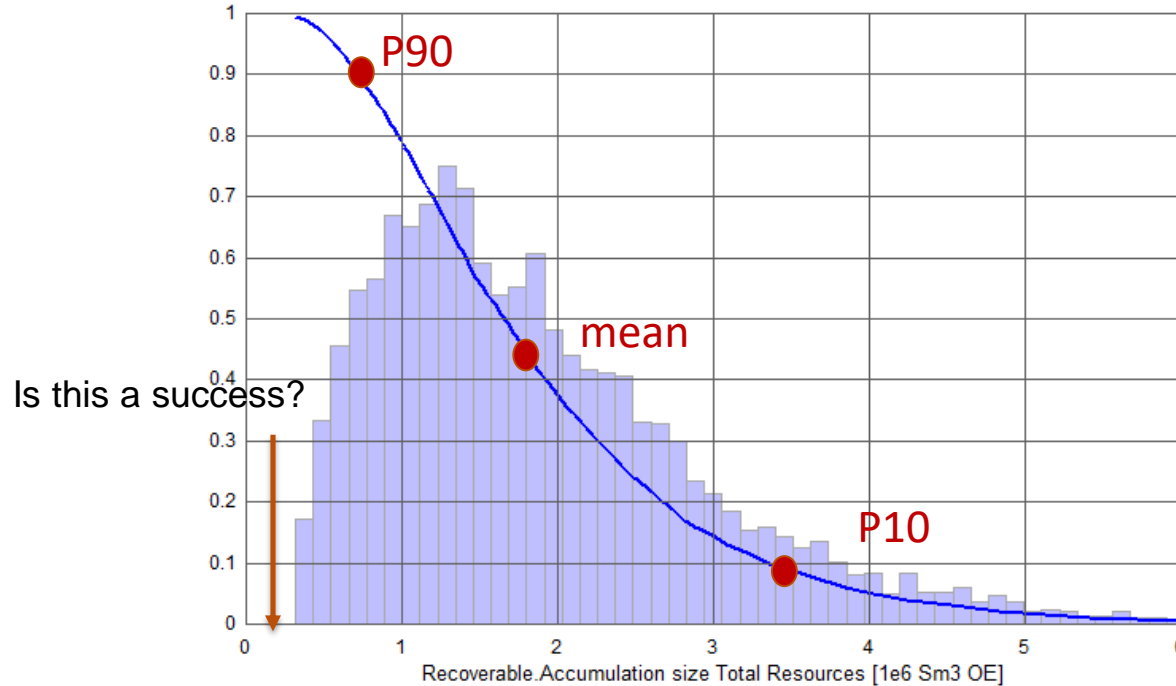
Prospect 36/7 C3-E (Norsk Hydro, 2002)
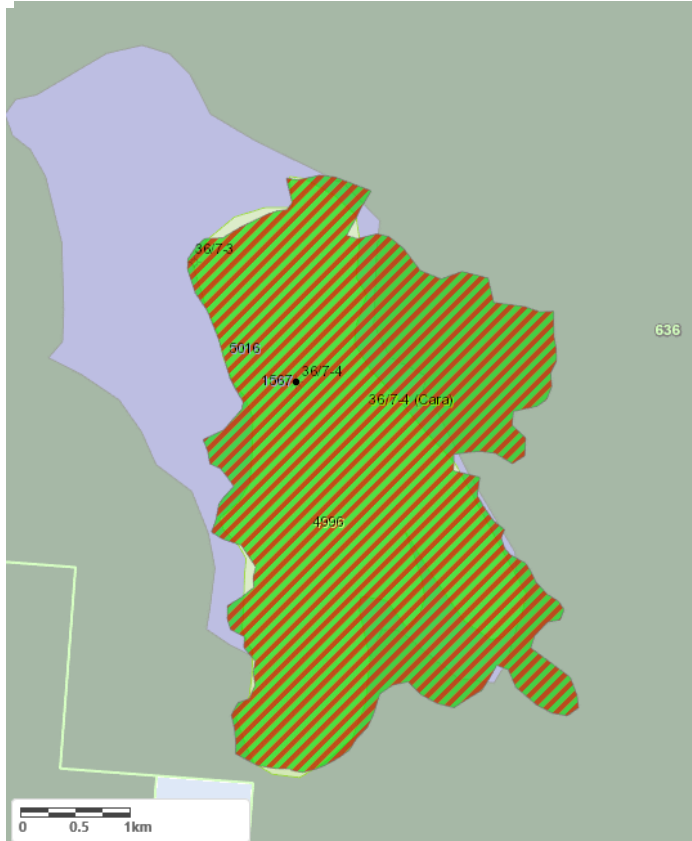
E&P Norway
TROLL UTFORSKNING

Classific.: INTERNAL E&P

Title:	WELL 36/7-3	No. :
	PL 153	Rev. : 0
	FINAL WELL REPORT	Page : 34 of 54
		Date : 2002-07-29

On the basis of the currently available data, about 2 m of net pay are interpreted in the interval 2530 - 2545 m RKB (Rødby-Agat formations). The analysis also indicates hydrocarbons in the interval 2555 - 2570 m RKB and if real are likely to be residual hydrocarbons. Currently it is not clear in which phase (gas or oil) these hydrocarbons are present

Do we need a FIND2 on the NCS?

Evaluation of Well Results

FIND

FIND:
- Forum for Exp
- 21 oil compan

Evaluation of W
- One of four pr
- 20 oil compan

FIND - Presentation No. 1

Evaluation of Well Results

FIND

Background for the Project

Prognosis vs. results:

The industry in general:
- overestimate resources
- underestimate the probability of discovery

No apparent improvement with time

FIND - Presentation No. 1

Proposal

The NPD proposes to form a forum to share learnings across the industry. This could be organized under the FORCE umbrella.

Topics that could be covered could be (but not limited to):

- Prospect volumetrics and risking
- Performance tracking and post well anlysis
- Case studies – lessons learned
- Peer review processes

Questions?