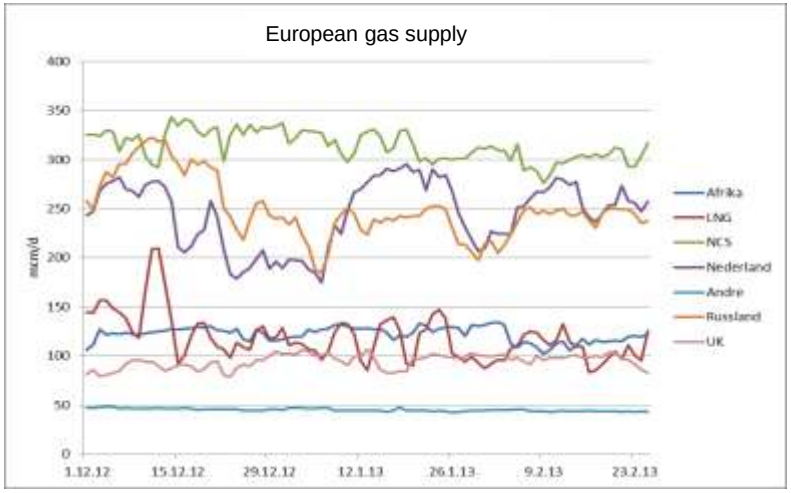
The successful Norwegian gas story

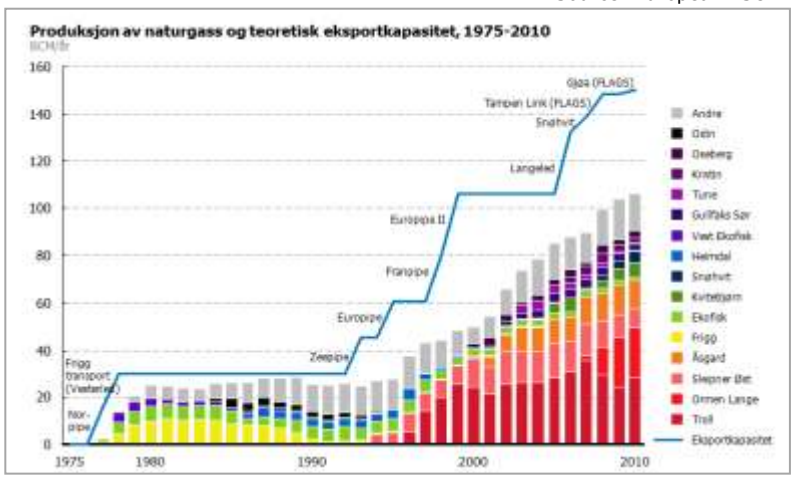
Thor Otto Lohne
CFO and Executive Vice President

GASSCO

The successful Norwegian gas story



Source: European TSO



- A major source of gas to western Europe:
  - 25% market share in the EU
  - Gas export to Europe is on the same level as Russia

- 108.7 GSm3 of natural gas was exported from the NCS during 2013, corresponding to ~1200 TWh
- Norway has developed a unique and cost efficient gas infrastructure

The Norwegian gas infrastructure

- 8 000 km of large-diameter, high-pressure pipelines, riser platforms, large processing facilities in Norway, receiving terminals in four European countries
- Connected to all major gas-producing fields on the NCS – approximately 50 fields
- Connected to major downstream gas transmission systems in Continental Europe and the UK
- Owned by Gassled JV, operated by Gassco

Complexity and uncertainty along several dimensions

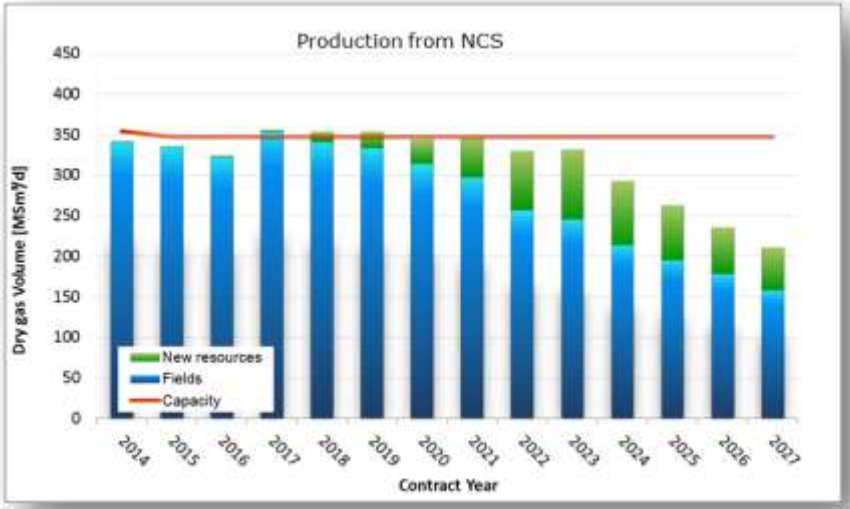
Gas markets

- European security of supply
- The role of gas in the energy mix
- Unprecedented variations in regional gas prices

Complexity and uncertainty along several dimensions

Norwegian Continental Shelf

- Participants
- Resources



These aspects represent both risks and opportunities for the Norwegian gas export

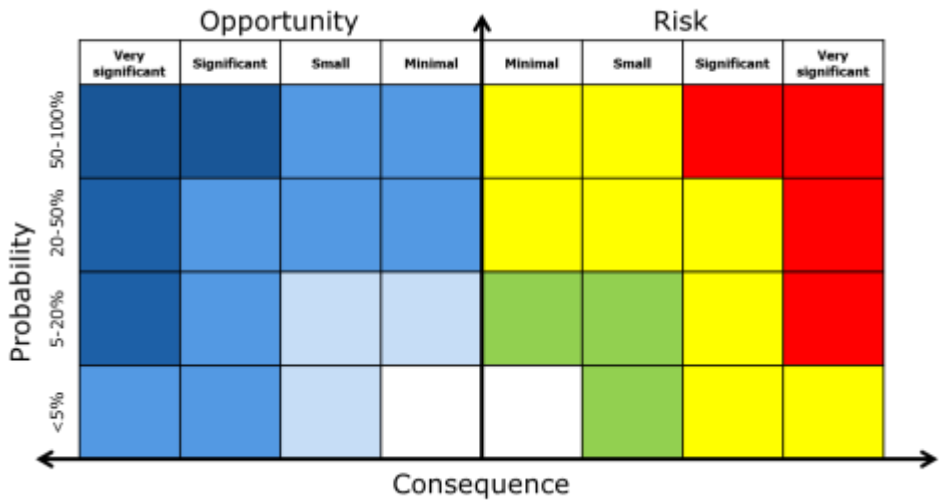
The role of gas in the energy mix

European security of supply

Unprecedented variations in regional gas prices

Resources

Participants



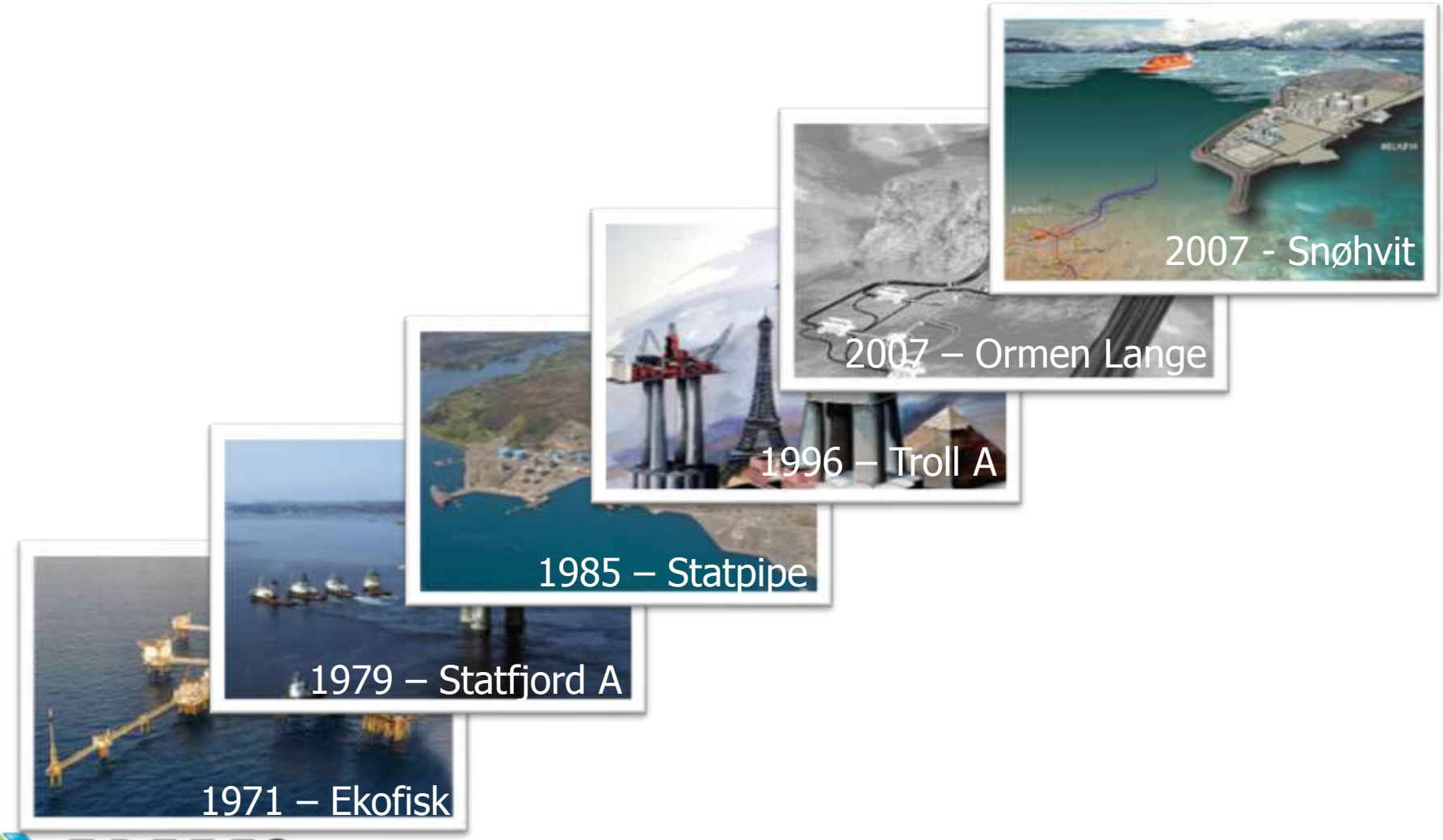
GASSCO

"Chance favors the prepared mind"
(Louis Pasteur)

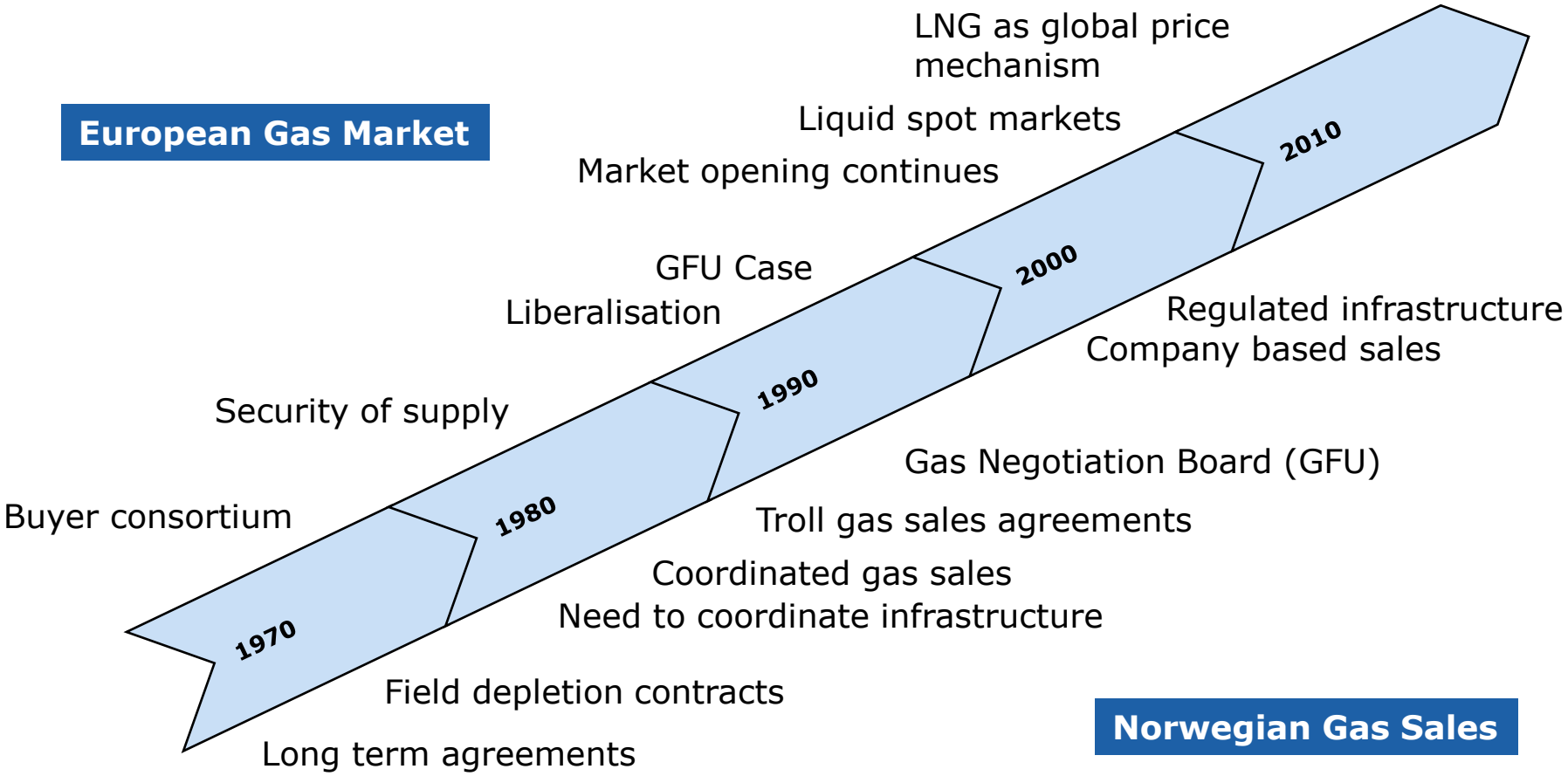
Or in other words;
"A mind is like a parachute. It doesn't work if it is not open"
(Frank Zappa)

Understanding the past for building the future

Technology has been essential



…so has the policy making and commercial environment



Prof. Poeshi; Nicola Tesla's teacher (1879) said;

"Mr. Tesla will achive great things, but he will never make a motor run on alternating current. It would be equivalent to converting a steady pulling force, like that of gravitaty, into a rotary effect.
It is an impossible idea."

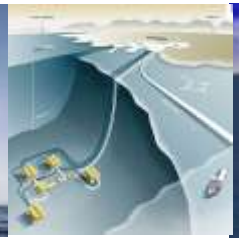
The Tesla is here, what else is here?

95 fields have started operation, 13 are under construction and 14 have ceased production since 1970

1970	1980	1990	2000	2010	→ 2020
Ekofisk	Murchison	Gyda	Oseberg Sør	Gjøa	Brynhild
Cod	Valhall	Hod	Sygna	Morvin	Bøyla
Frigg	Nordøst Frigg	Snorre	Glitne	Vega	Edvard Grieg
Vest Ekofisk	Odin	Brage	Huldra	Trym	Fram H-Nord
Tor	Heimdal	Draugen	Tambar	Atla	Gina Krog
Albuskjell	Gullfaks	Embla	Sigyn	Gaupe	Goliat
Edda	Ula	Mime	Tune	Islay	Gudrun
Eldfisk	Oseberg	Sleipner Øst	Vale	Marulk	Ivar Aasen
Statfjord	Tommeliten	Lille-Frigg	Fram	Oselvar	Knarr
	Gamma	Statfjord Øst	Grane	Visund Sør	Martin Linge
	Øst Frigg	Tordis	Mikkel	Hyme	Svalin
	Veslefrikk	Frøy	Kvitebjørn	Jette	Valemon
		Heidrun	Skirne	Skarv	Aasta Hansteen
		Statfjord Nord	Kristin	Skuld	
		Troll	Urd		
		Gungne	Gimle		
		Sleipner Vest	Ringhorne Øst		
		Yme	Blane		
		Njord	Enoch		
		Norne	Ormen Lange		
		Vigdis	Snøhvit		
		Gullfaks Sør	Tambar Øst		
		Varg	Alvheim		
		Balder	Vilje		
		Jotun	Volve		
		Oseberg Øst	Alve		
		Visund	Rev		
		Åsgard	Tyrihans		
			Volund		
			Yttergryta		








GASSCO

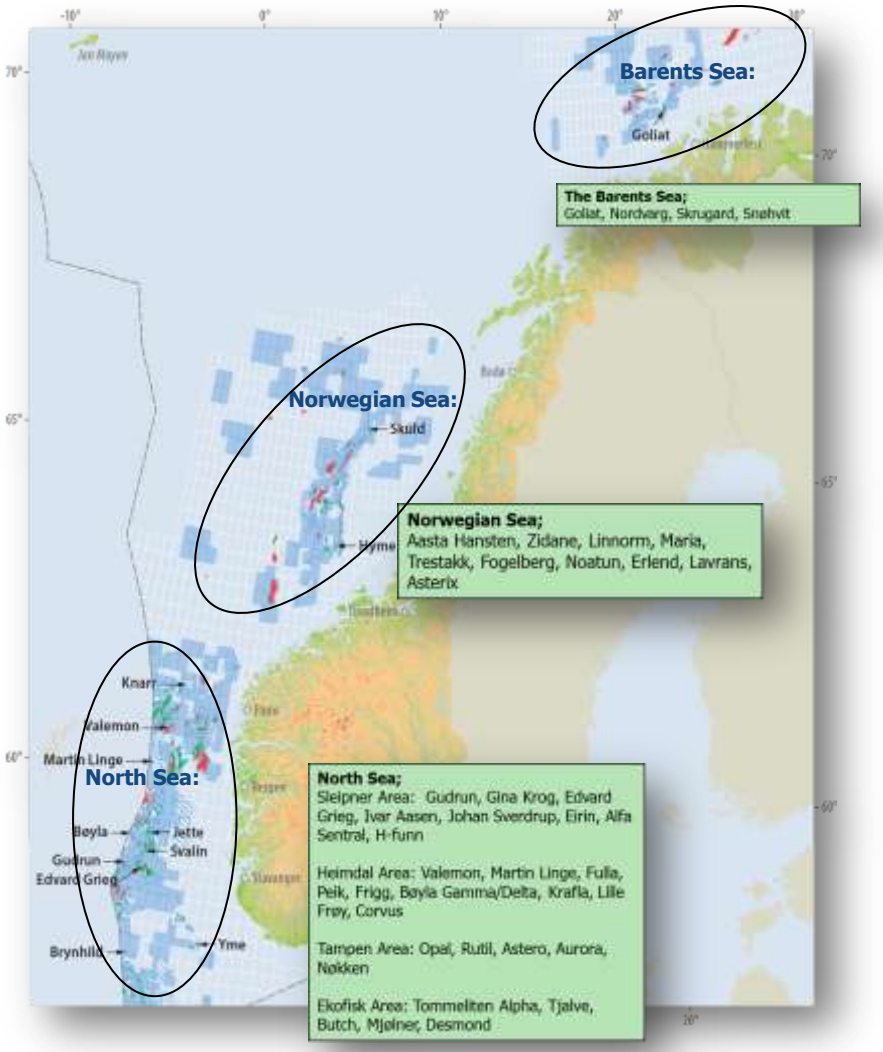
www.gassco.no

Several fields are under development

- 13 fields
- 88 discoveries being evaluated
- Number of exploration wells was record high in 2013 – with a success rate of 44%

Johan Sverdrup;

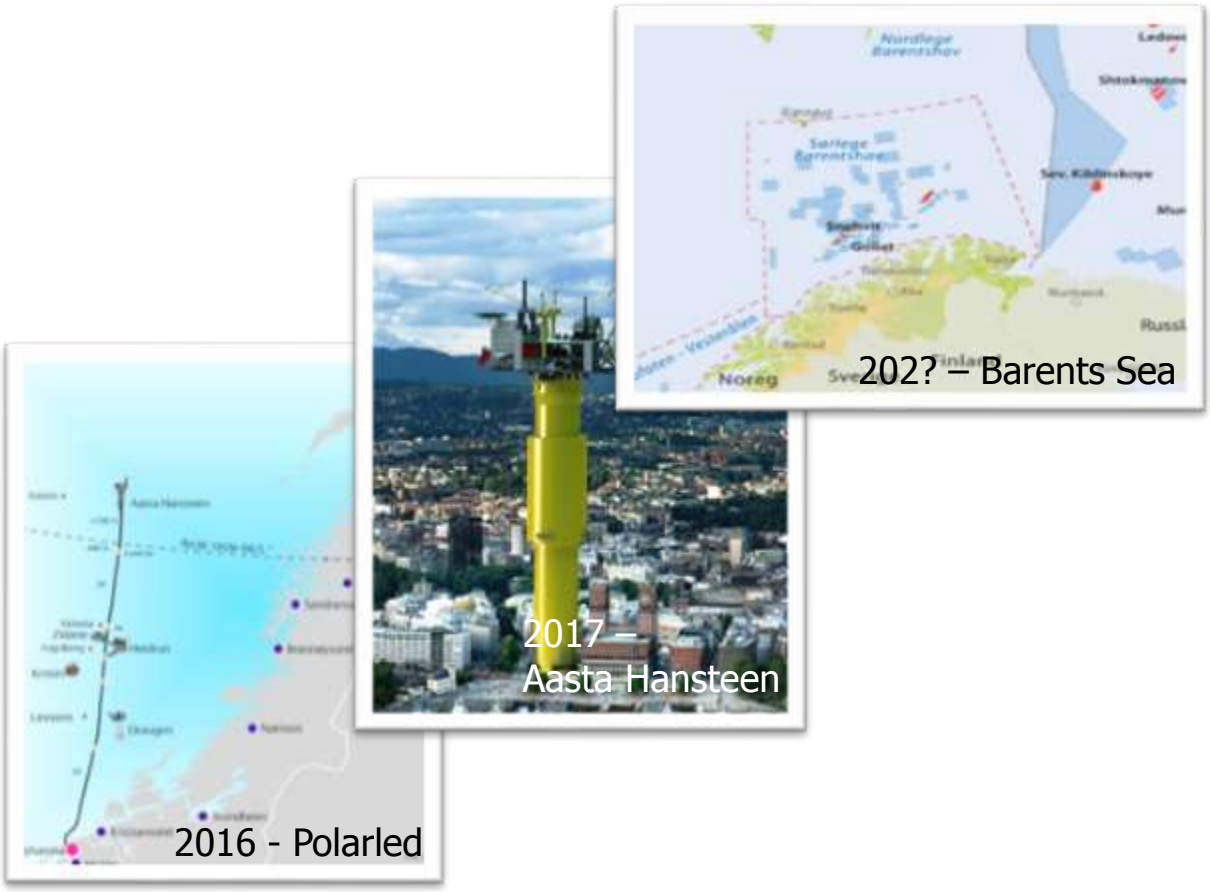
- One of the largest discoveries on the NCS
- Oil to Mongstad
- Gas to Kårstø
- Planned to produce for 50 years



"Science is the belief in the ignorance of experts"
(Richard Feynman)

Or in other words;
"If you end up with a boring miserable life because you listened to your mom, your dad, your teacher, your priest, or some guy on television telling you how to do your shit, then you deserve it."
(Frank Zappa)

.. to the north



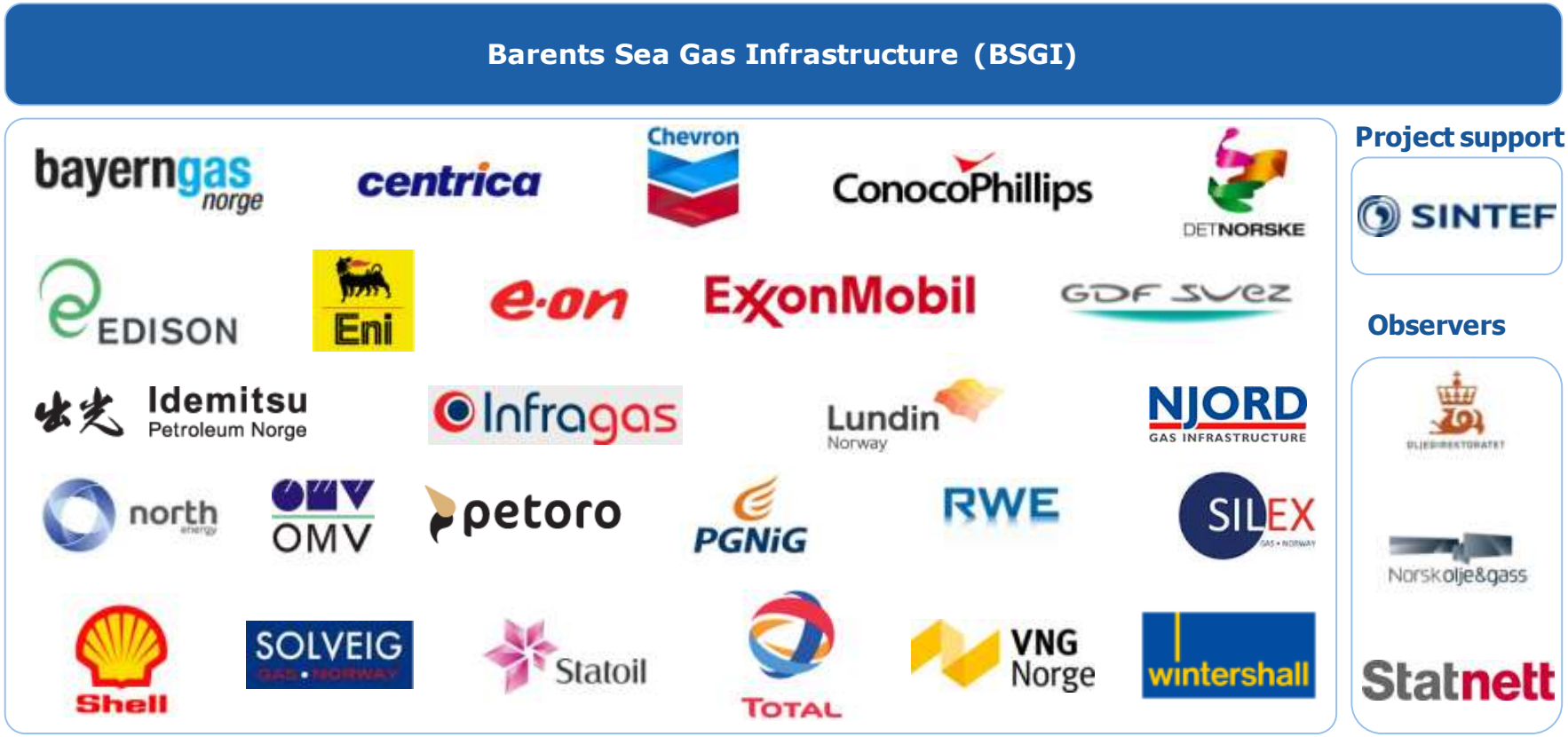
Extending the gas value chain northwards

- One of Europe's largest industrial projects the next years
- First crossing of Artic circle with a subsea pipeline
- Deepest field development and pipeline on NCS
- Increased processing- and export capacity at Nyhamna
- Investment decision 1Q 2013, start-up 2016

GASSCO

www.gassco.no

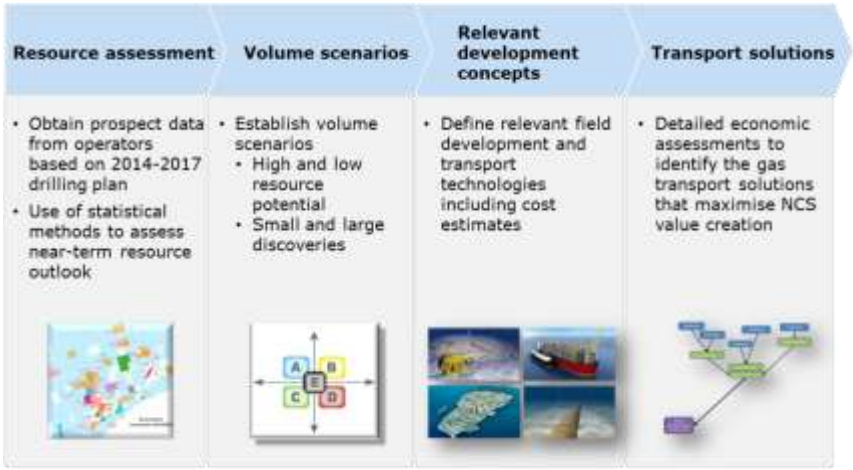
BSGI: An industry-wide forum to explore gas infrastructure solutions for the Barents Sea



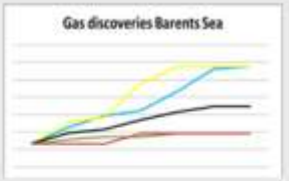
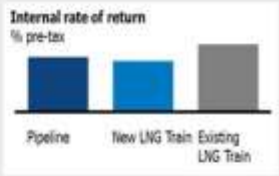
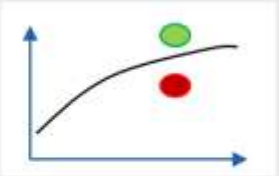
BSGI: An industry-wide forum to explore gas infrastructure solutions for the Barents Sea

- Six work groups have contributed to assess the full value chain economics of gas developments in the Barents Sea

- Innovative use of industry expertise across the value chain to identify the best transport solutions



Key questions addressed in the study

1	**Resources**	Will there be sufficient discoveries in the next 3-4 years for a new gas transport solution from the Barents Sea?	
2	**Income potential**	What is the value of having the flexibility to reach other markets than Europe?	
3	**Value creation pre-tax**	Do new infrastructure investments pass e.g. a 7% real rate of return threshold?	
4	**Value creation post-tax**	Will the return on investments be sufficient for companies given the risks needed to be taken?	
5	**Transport solution**	Which gas transport solution from the Barents Sea will give the best value creation for the NCS?	

GASSCO

Complexity and uncertainty along several dimensions

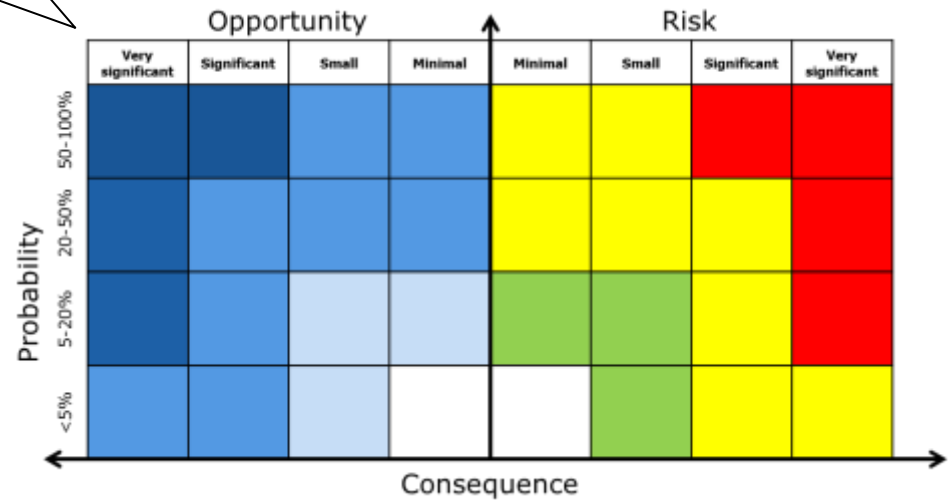
The role of gas in the energy mix

European security of supply

Unprecedented variations in regional gas prices

Resources

Participants



"Stupidity has a certain charm - ignorance does not" (Frank Zappa)

GASSCO