Norsk gass og det skandinaviske energimarked

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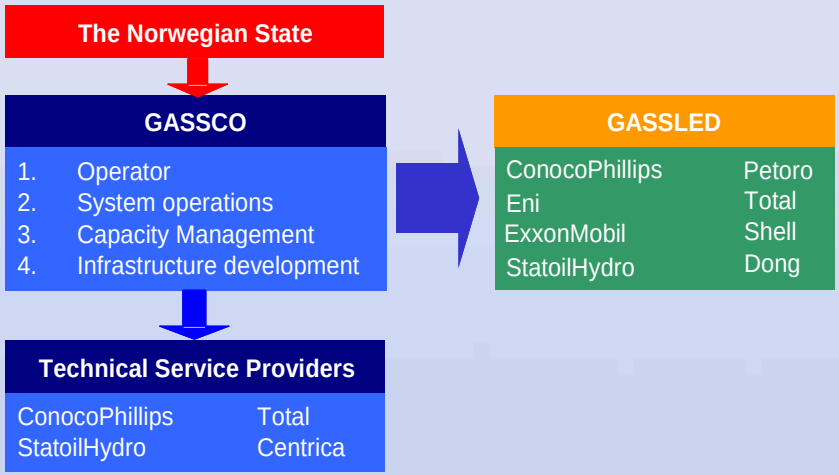
Fyn, 19. november 2009

Gassco

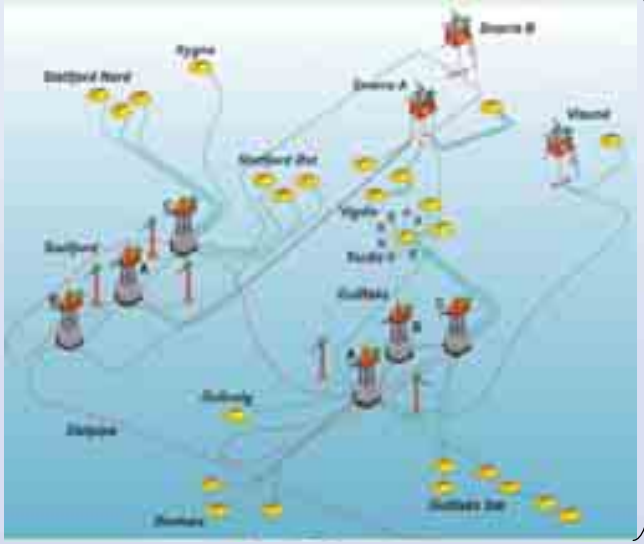
- A neutral and independent operator for the integrated gas transport system from the Norwegian continental shelf to European countries
- Owned 100 % by the Norwegian State
- Main tasks:
  - Operator (asset mgmt.)
  - System operations (flow mgmt.)
  - Capacity management
  - Infrastructure development
- Offices/operation in Norway, Germany, Belgium and France



The Norwegian gas value chain in a nutshell

Upstream | **Transportation** | **Processing**

Tampen area



Gas pipelines

Kårstø

The gas transportation system in more detail

- 7 470 km of offshore pipelines - large diameter high pressure
- 2 world scale gas processing plants – Kollsnes and Kårstø
- 7 gas terminals – Germany, Belgium, France and UK
- 387 mill. Sm^3/d gas export capacity

From annual report 2008:

FINANCIAL FIGURES (amounts in NOK million)	2008
Gross tariffs	26 616
Operating expenses	5 205
Operating investments	790
Major investments	2 676

Kollsnes gas processing plant

- 146.5 mill. Sm^3/d rich gas processing capacity
- 1.06 mill. tons of NGL production
- 33.8 BCM equal to 35 % of the Norwegian gas supplies in 2008

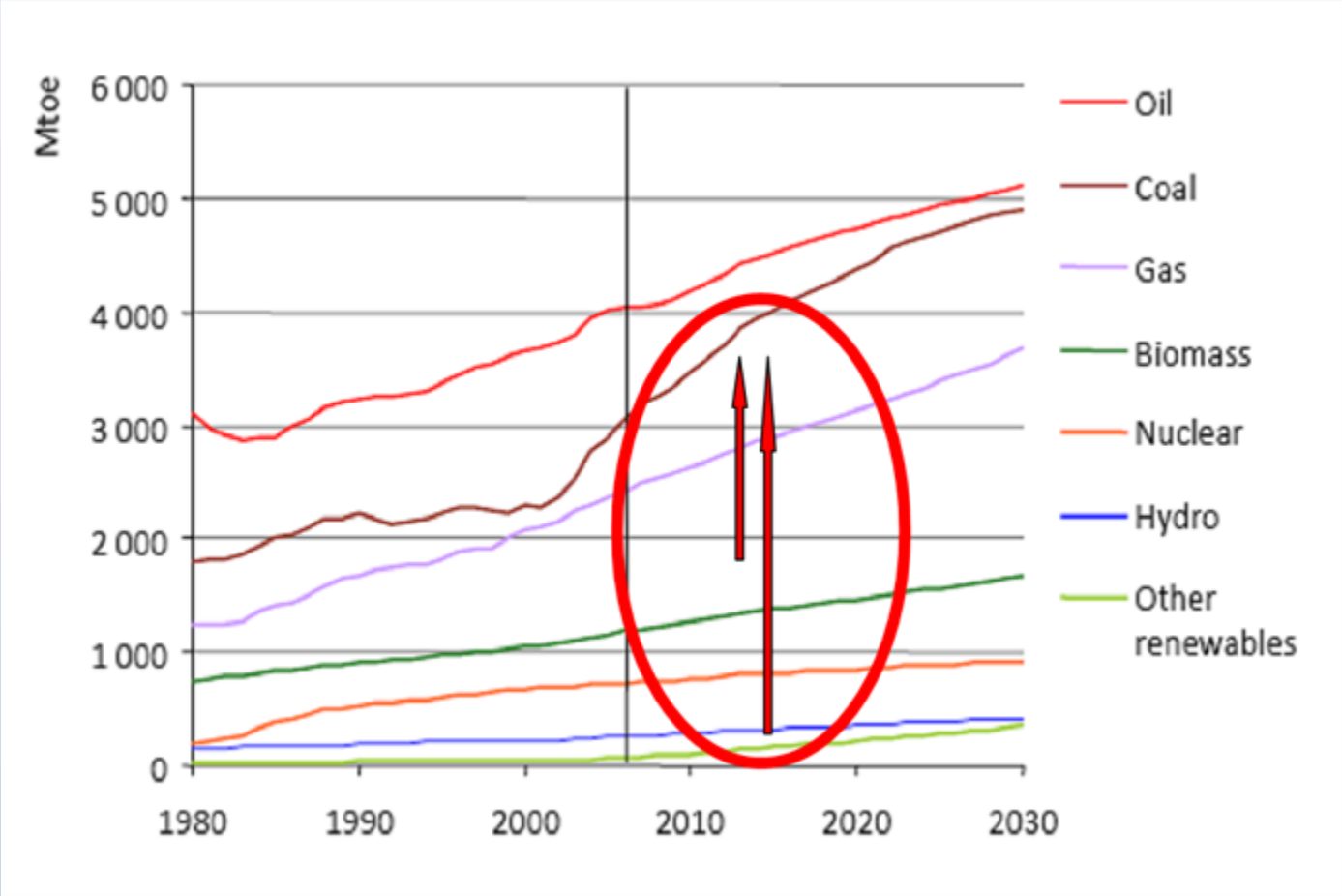
Kårstø gas processing plant

- 88 mill. Sm^3/d rich gas processing capacity
- 7.57 mill. tons of NGL production
- 25.1 BCM sales gas equal to 25% of the Norwegian gas supplies in 2008

Good track record

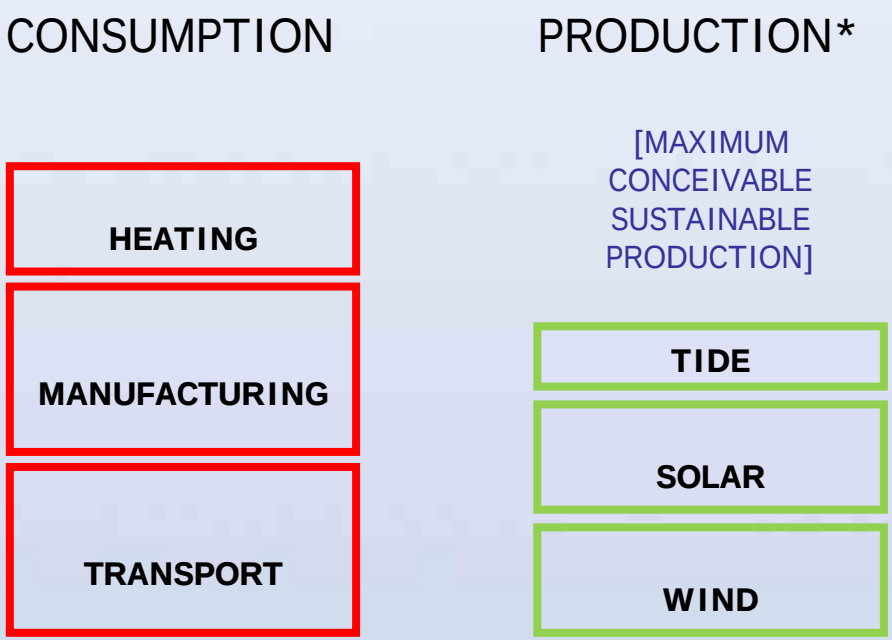
- Gas deliveries to Europe has almost doubled since Gassco was established
- No loss of life, no major accident
- Facilities and installations operated within prevailing emission permits
- 99.78 % regularity to market in 2008

Fossil fuels and gas will continue to dominate the energy balance towards 2030



Source: IEA World Energy Outlook 2008

Renewable energy - hard to increase output to a scale that will satisfy demand



All measured in kWh / day / person

Physics Professor David JC MacKay give us some indication on the potential for renewable energy in his book "Sustainable Energy – without the hot air"

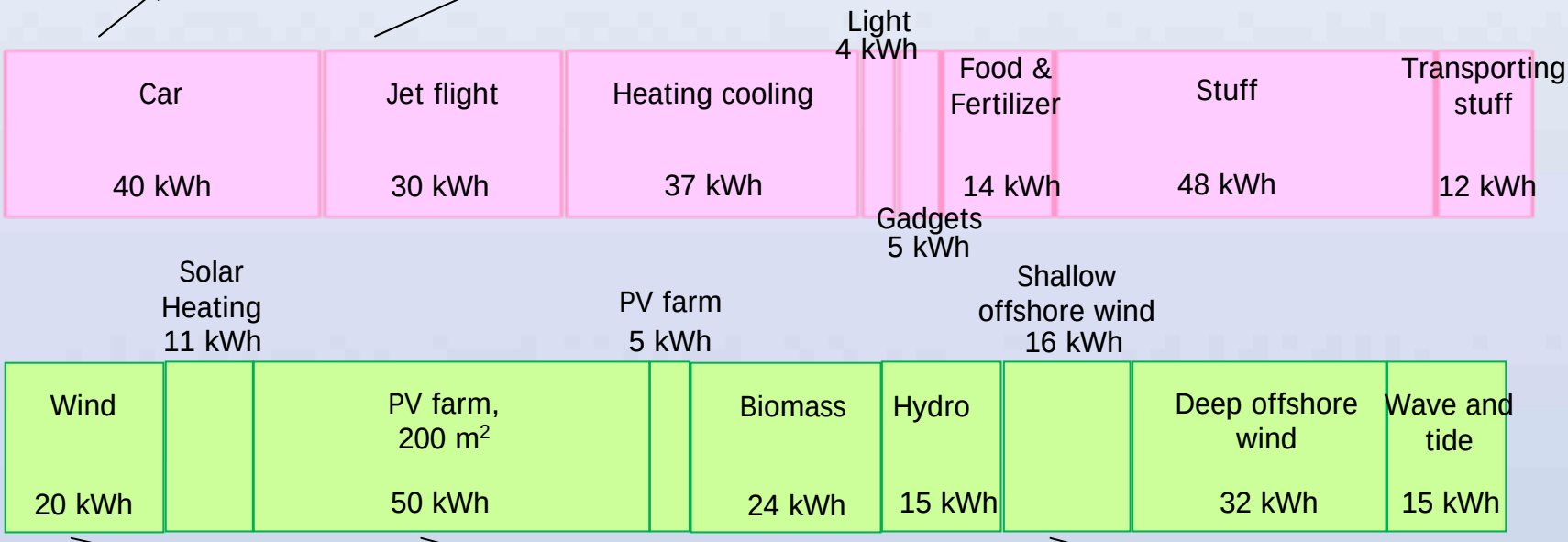
**) Ignoring economic, social and environmental contraints*

It will take very much renewable energy production to cover today's demand (example from UK)

Example:
50 km per day in an average car needs 40 kWh / d / p

Example:
One return flight London – Los Angles per year equals 30 kWh / d / p

kWh numbers are on a per day basis

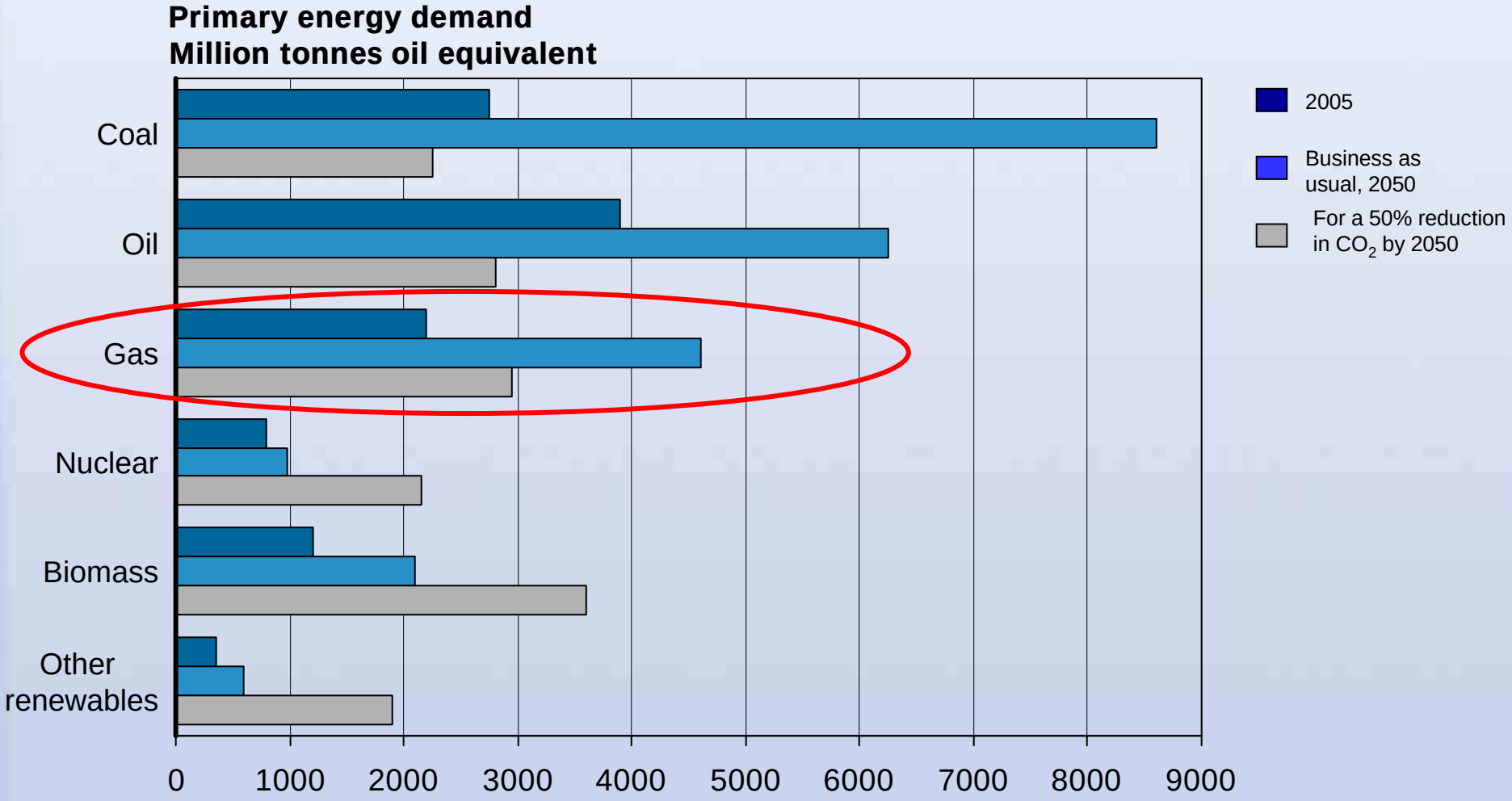


Example:
Wind mills covering 10% of UK will provide 20 kwh / d / p (equals 50 times Denmarks current production, and twice the world's total production today)

Example:
Solar panels on 5% of the country gives 50 kWh / d / p

Example:
15 offshore windmills per km along the whole coast of UK gives 16 kWh / d /p (total of 45 000 windmills)

In IEA's low carbon scenario, gas is the only fossil fuel to have higher demand in 2050 than today

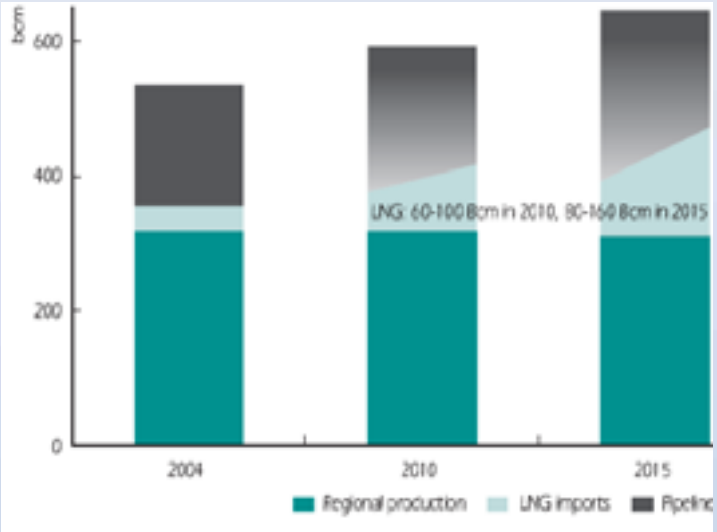


Source: IEA, Energy Technology Perspectives

European gas consumption is expected to increase

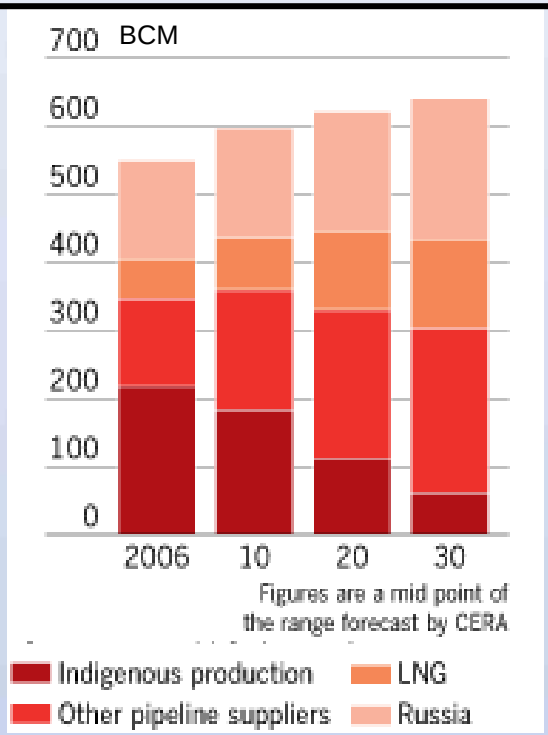
Forecasted European gas consumption

IEA



Source: IEA Natural Gas Market review 2008

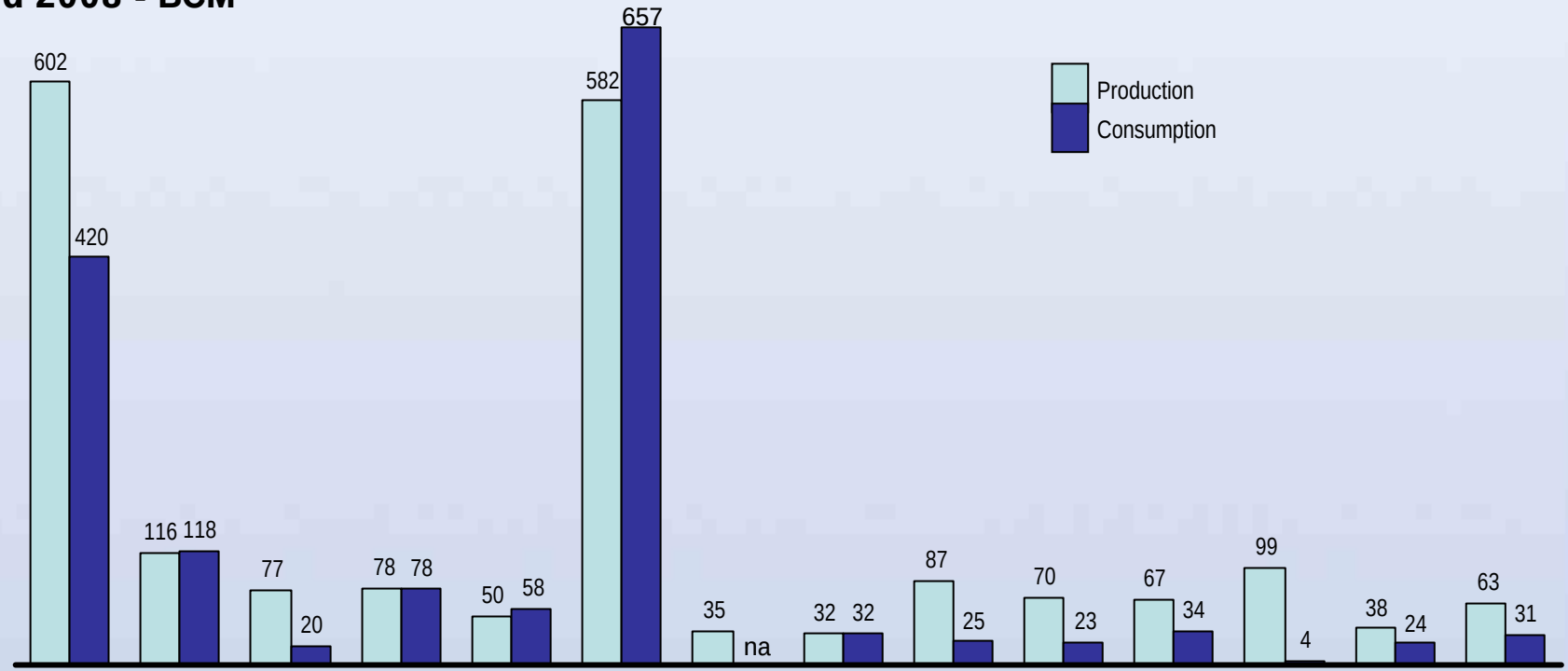
CERA



Source: Financial Times, September 5 2008

Where are the gas reserves?

Production and consumption of gas for top 14 gas reserve holders
End 2008 - BCM

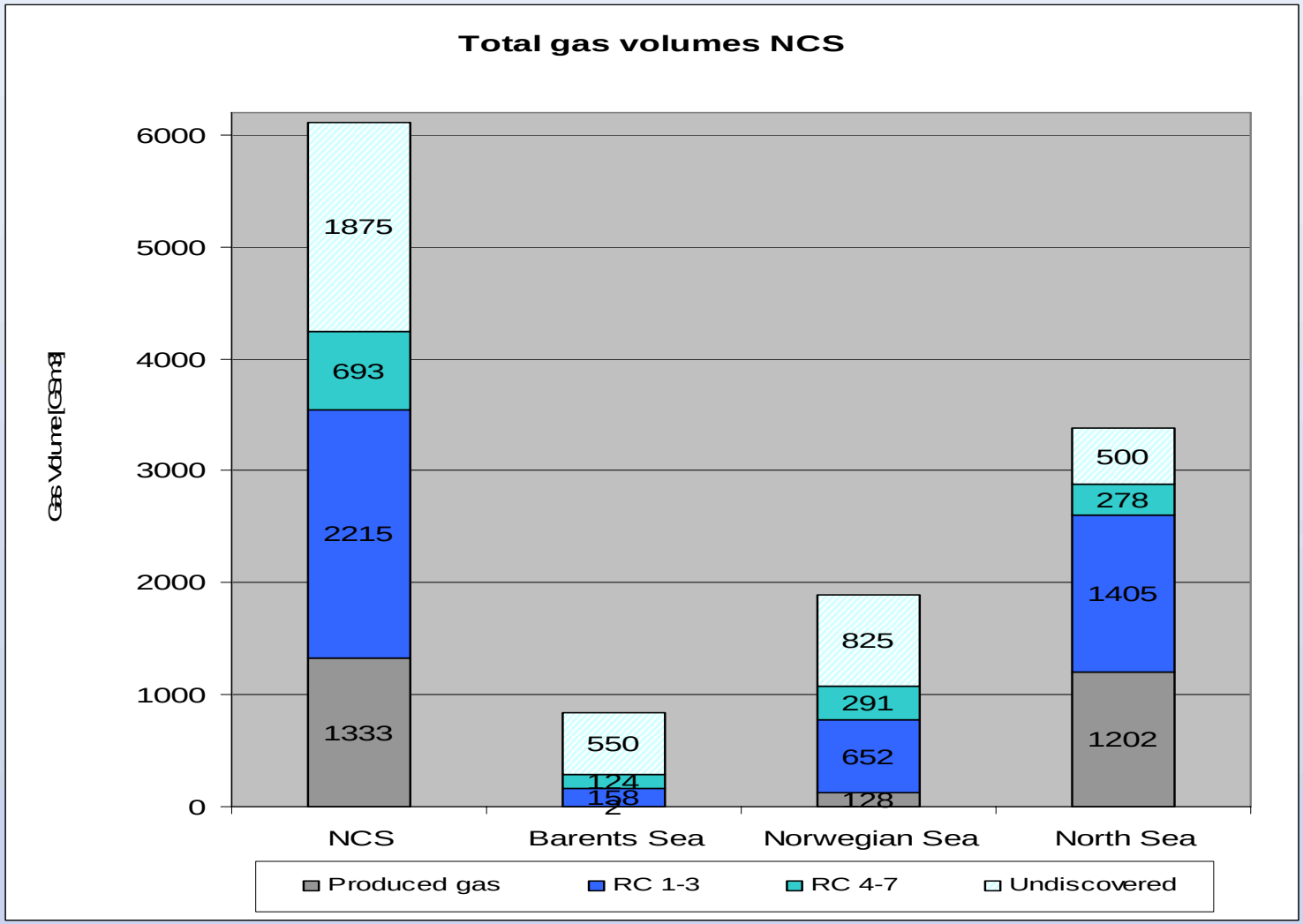


	Russia	Iran	Qatar	Saudi Arabia	UAE	USA	Nigeria	Venezuela	Algeria	Iraq*	Indonesia	Norway	Australia	Malaysia
Reserves - TCM	43	30	25	8	6	7	5					3		
R/P ratio	**72**	**>100**	**>100**	**97**	**>100**	**12**	**>100**	**>100**	**52**	**>100**	**>100**	**29**	**66**	**38**

Source: BP statistical review of world energy, June 2009

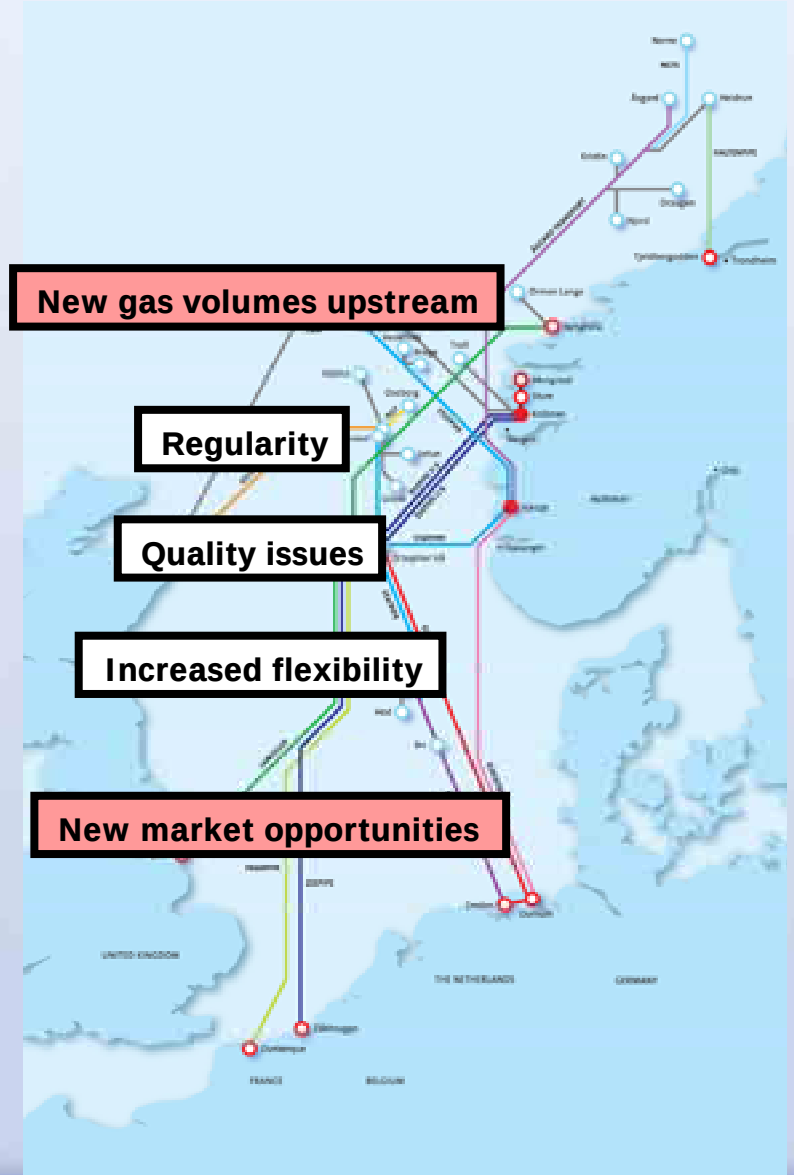
*) 2007

The Norwegian Continental Shelf has large gas volumes left



Source: NPD, status pr 31.12.2008

Several factors drive gas infrastructure development



Gas infrastructure development on NCS is a continuous task

- Upgrades of existing infrastructure
- New major infrastructure

What happened in the dry gas market

Oil linked (EBP Index) and traded prices have fallen

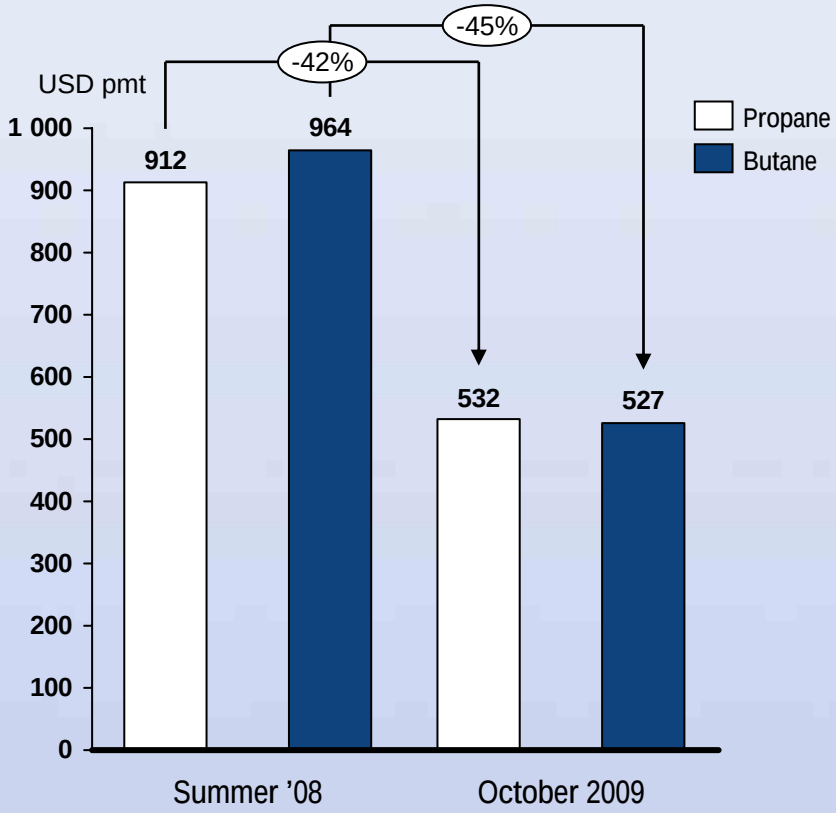
Eclipse Energy Group

www.EclipseEnergyGroup.com

- Gas demand in Europe and in other major economies is weakening
- Unconventional gas developments in North America have changed the scene
- More than 60 GSm^3 of new liquefaction capacity will come on line in 2009 putting further pressure on the market

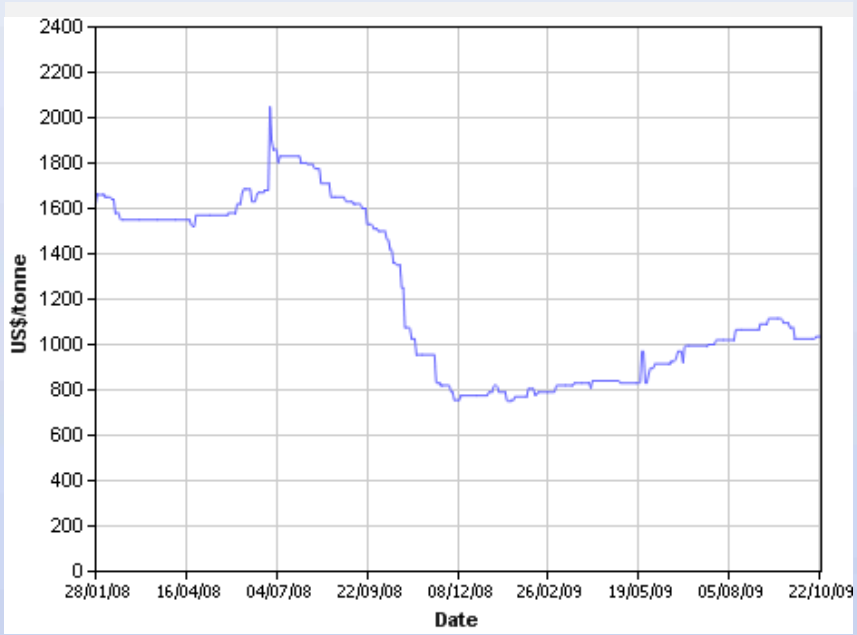
Wet gas and petrochemical prices have also fallen substantially

LPG free on board North Sea



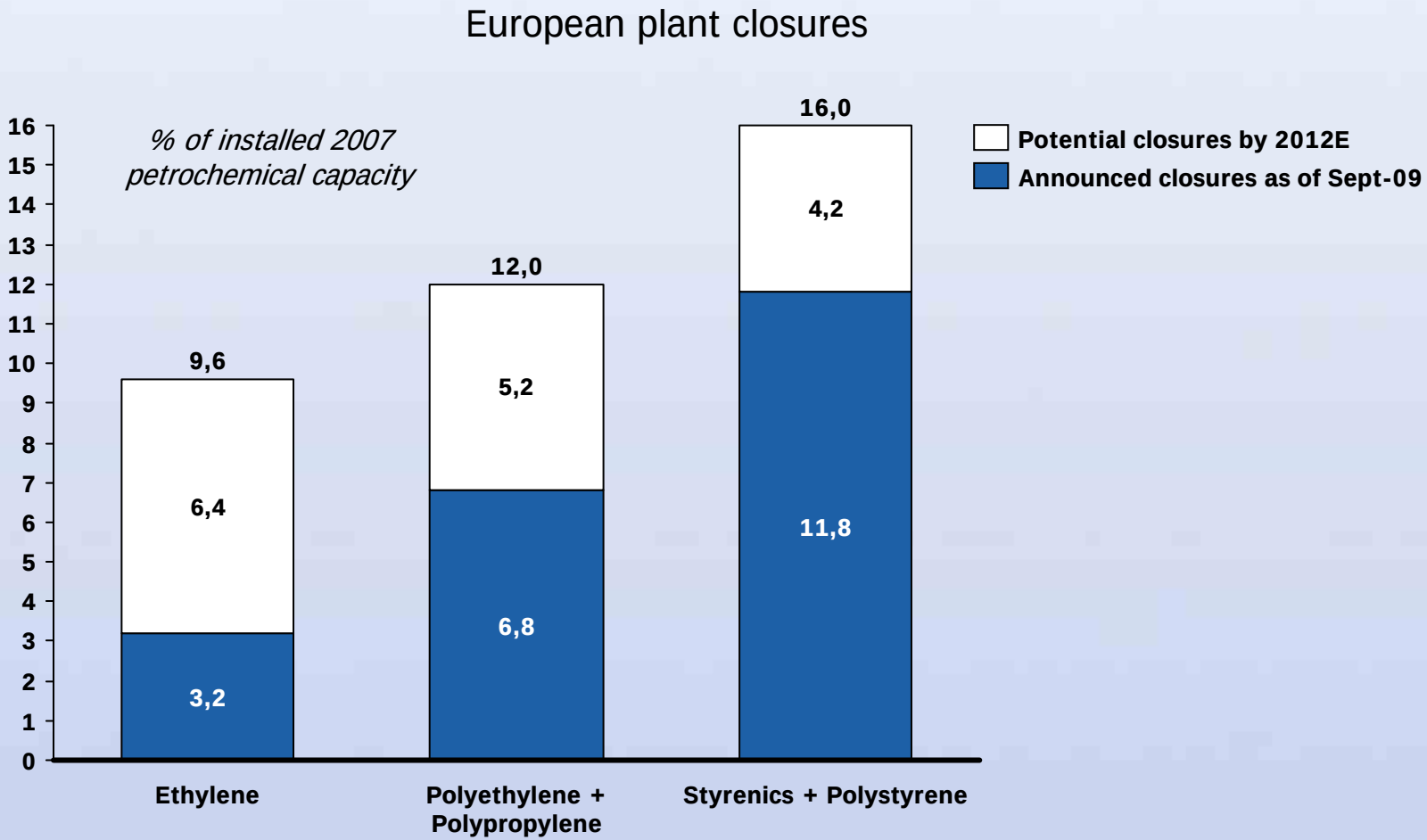
Source: Fearnleys

Polyethylene (PE) price, Europe



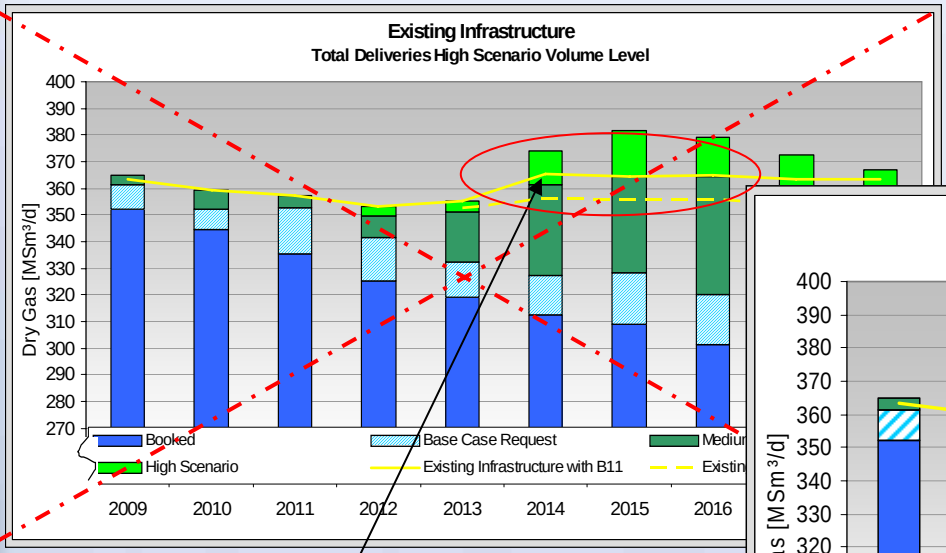
Source: London Metal Exchange

Petrochemical capacity is being closed in Europe

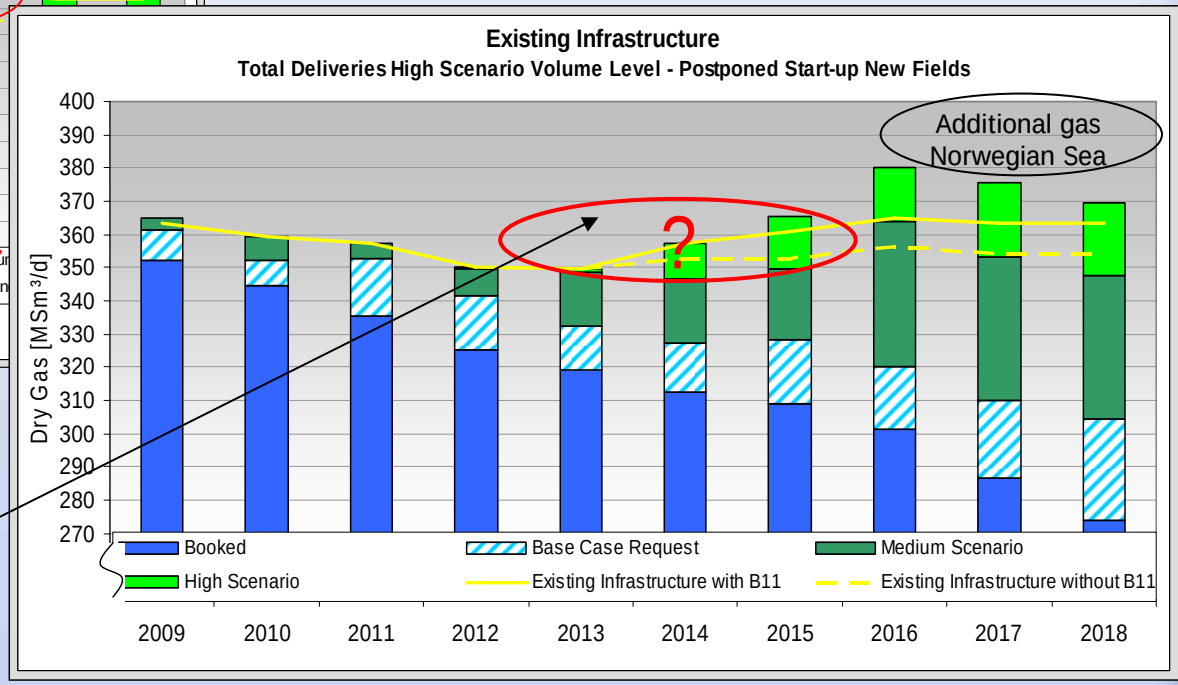


Source: Total Chemicals

Market changes influence Gassco's daily work

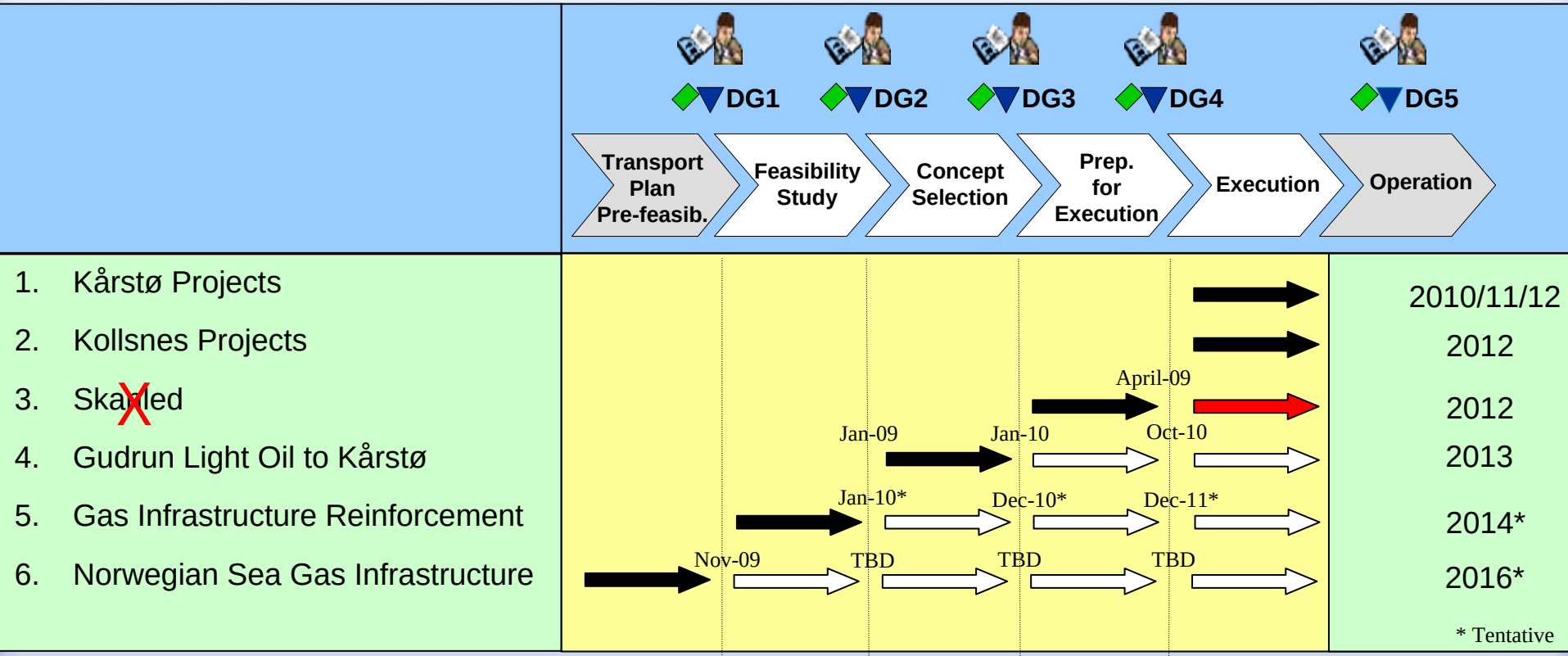


Transport Plan 2009



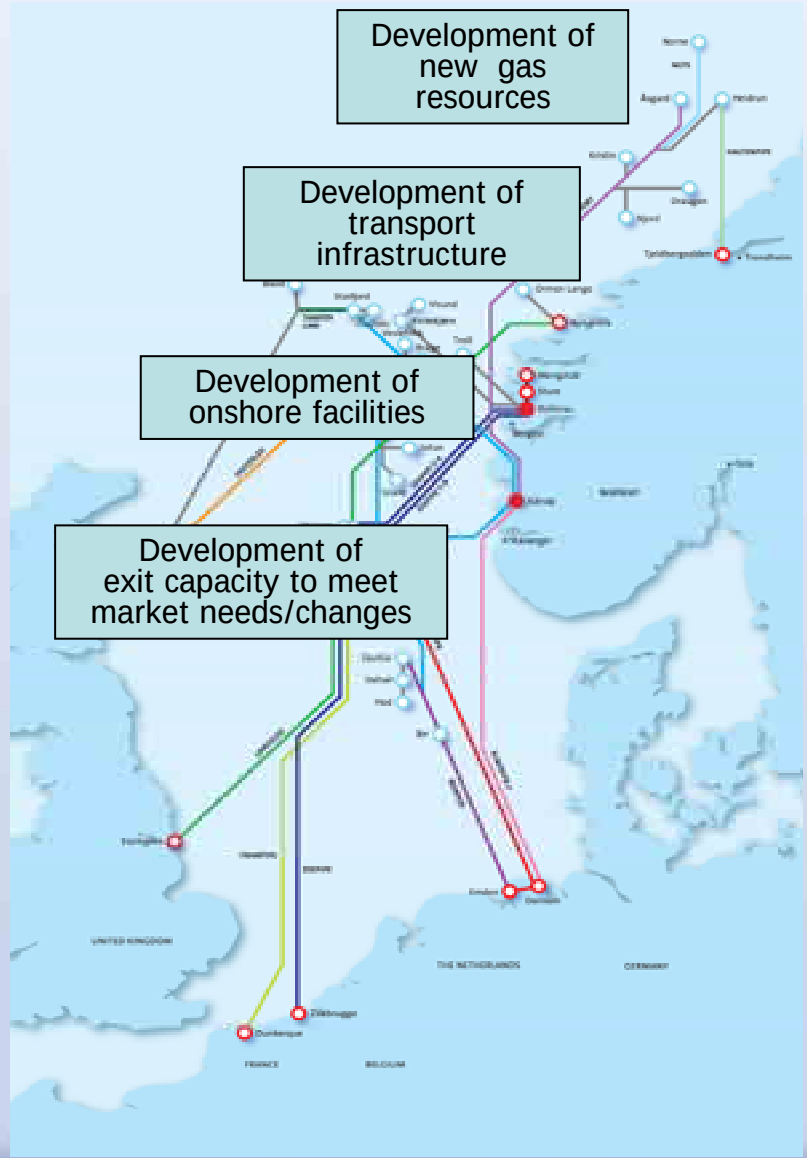
Projects delayed
New volume levels uncertain

Development portfolio – main projects



= Ongoing phase = Future phase = Discontinued = Prepar. to start phase

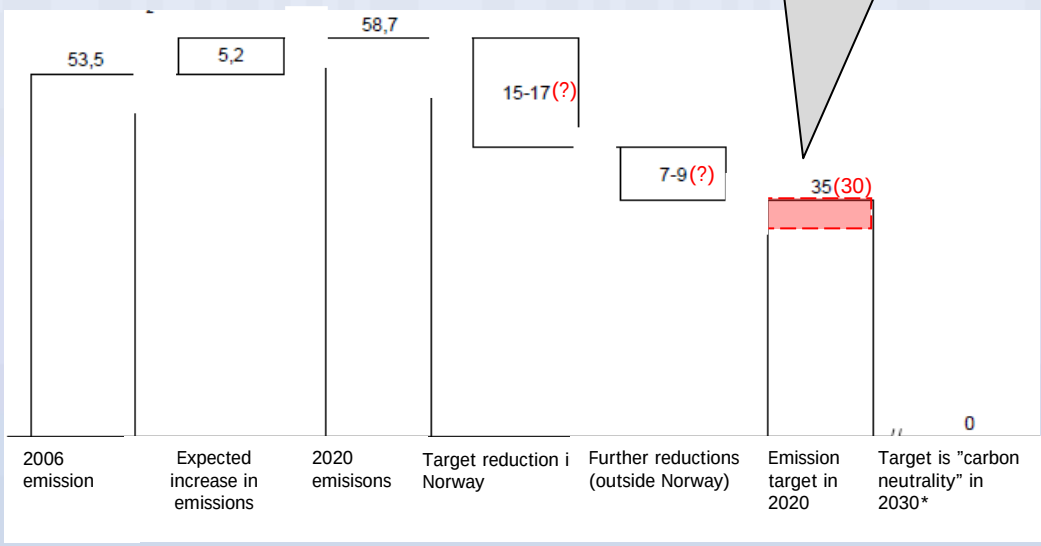
Development of gas in the Norwegian sea



Norway has set ambitious targets for CO_2 emission reductions

Domestic targets

*Norway's CO_2 emission targets for 2020/2030**



Soria Moria 2 further increased emission reduction targets

International targets

EU Climate and Energy targets:

"Reduce GHG emissions by 20% within 2020 (or 30% if global deal with firm and ambitious commitments from all parties is reached) relative to 1990 level"

IPCC :

"25-40% cut in developed country emissions by 2020, relative to 1990, is needed to set world on path to meeting a 2050 target (50% percent cut in emissions)"

CO_2 emissions in Mt per year

Sources: Konkraft report # 5, "Klimaforliket" , "Klimakur 2020 rapport: Vurdering av fremtidige kvotepriser", Financial Times 22.09.09

All costs, risks and opportunities related to CO_2 emissions are driven by regulation

Regulation range

Cost efficiency

Indirect regulation. Price on CO_2 (tax or quota) – full offset flexibility

Hybrid (Price on CO_2 and direct measures)

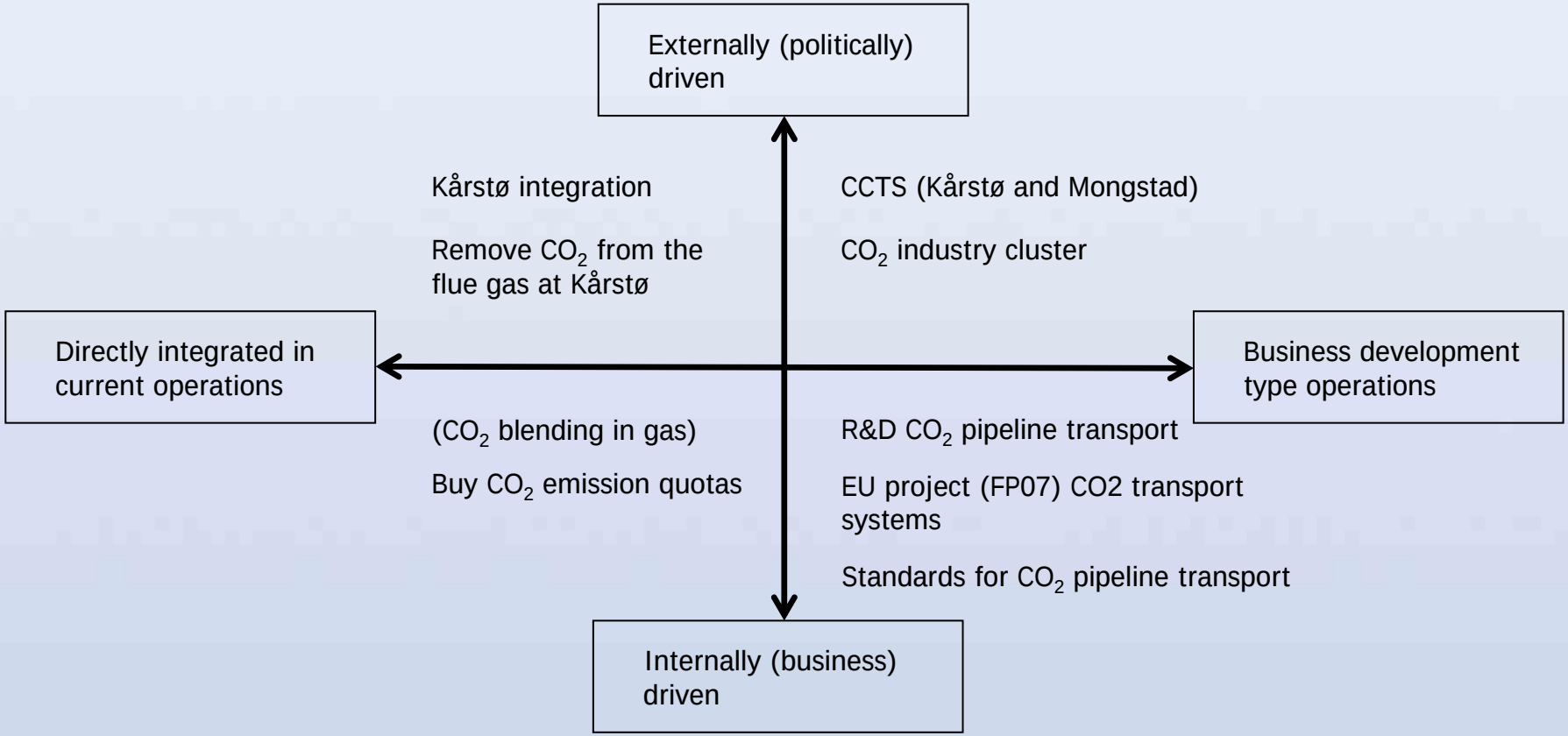
Direct regulation (imposed initiatives)

Control

Difficult to predict CO_2 - regulation. However, some issues should be taken for granted:

1. There will be a price of CO_2 emissions
2. Influencing direct regulation will be important

Gassco is involved in several projects related to reducing CO_2 emissions



Gassco believes that being closely involved in CO_2-related activities represents an opportunity for an active and value creating approach to the climate change challenge