



NORWEGIAN PETROLEUM  
DIRECTORATE



# Case studies

## Status and Future Activities

By

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Presentation at the 2<sup>nd</sup> meeting

Ad Hoc Group of Experts on Harmonization of Energy Reserves  
and Resources Terminology

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# Status Case Studies

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- ◆ Several case studies on UNFC for petroleum has been carried out and presented
- ◆ Case studies are voluntary based
- ◆ Scope of previous Case Studies:
  - ◆ To Demonstrate how UNFC can be used with different national classifications
  - ◆ To demonstrate that UNFC can be used at all levels:  
Deposit / Field  
National / Portfolio

# Case studies petroleum

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- ◆ UKRAINE: Status of Implementation of the UNFC in Ukraine (21.02.2001)
- ◆ United Nations Framework Classification (UNFC) Russian Case Study (31.10.2003)
- ◆ United Nations Framework Classification (UNFC) and National Classifications. National Case Study – Poland (30.10.2003)
- ◆ Application of United Nations Framework Classification (UNFC) to Hydrocarbons in Norway (30.10.2003)
- ◆ United Nations Framework Classification (UNFC) Applied to the Gullfaks Field, Norway (30.10.2005)
- ◆ Comparison of the Russian Classification and UNFC of Reserves and Resources (30.10.2005)
- ◆ The Norwegian Resource Account in UNFC Field case - National Resource Account (30.10.2005)
- ◆ The UNFC for Petroleum Applied to the Orinoco Belt Field (30.10.2005)
- ◆ National Case Study - Poland Barnowko-Mostno-Buszewo and Koscian Fields (30.10.2005)

# Scope of Case Studies (1)

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- ◆ To Demonstrate how UNFC can be used with different national classifications
  - ◆ (Norway, Poland, Russian Federation, Ukraine)
- ◆ To demonstrate that UNFC can be used at all levels:
  - ◆ Deposit / Field
    - Norway: Gullfaks Field
    - Poland: Barnowko-Mostno-Buszewo and Koscian Fields
    - Venezuela: Orinoco Belt
  - ◆ National / Portfolio
    - Norway
    - Poland
    - Venezuela

# Scope of Case Studies (2)

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- ◆ Setting
    - ◆ Onshore – Offshore
  - ◆ Petroleum type
    - ◆ Conventional oil
    - ◆ Non-conventional oil
    - ◆ Gas
  - ◆ Accumulation size
    - ◆ Very large → Medium → Small
- **UNFC has been demonstrated to be applicable in different settings.**
- **Focus upon Case Studies as support for the Guidelines / Specifications**

# Case studies and guidelines

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- ◆ Guidelines needs good Case Studies!
- ◆ A broad selection of case studies
  - ◆ Different setting, type of petroleum, maturity of field / contingent resources, etc..

# Case Studies

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- ◆ Previous Case Studies could be expanded by additional documentation according to the required level
- ◆ A candidate: The Gullfaks Field
  - ◆ Presented 2003, 2004
  - ◆ Extended case study:

Prospect → Discovery → Field development & Production

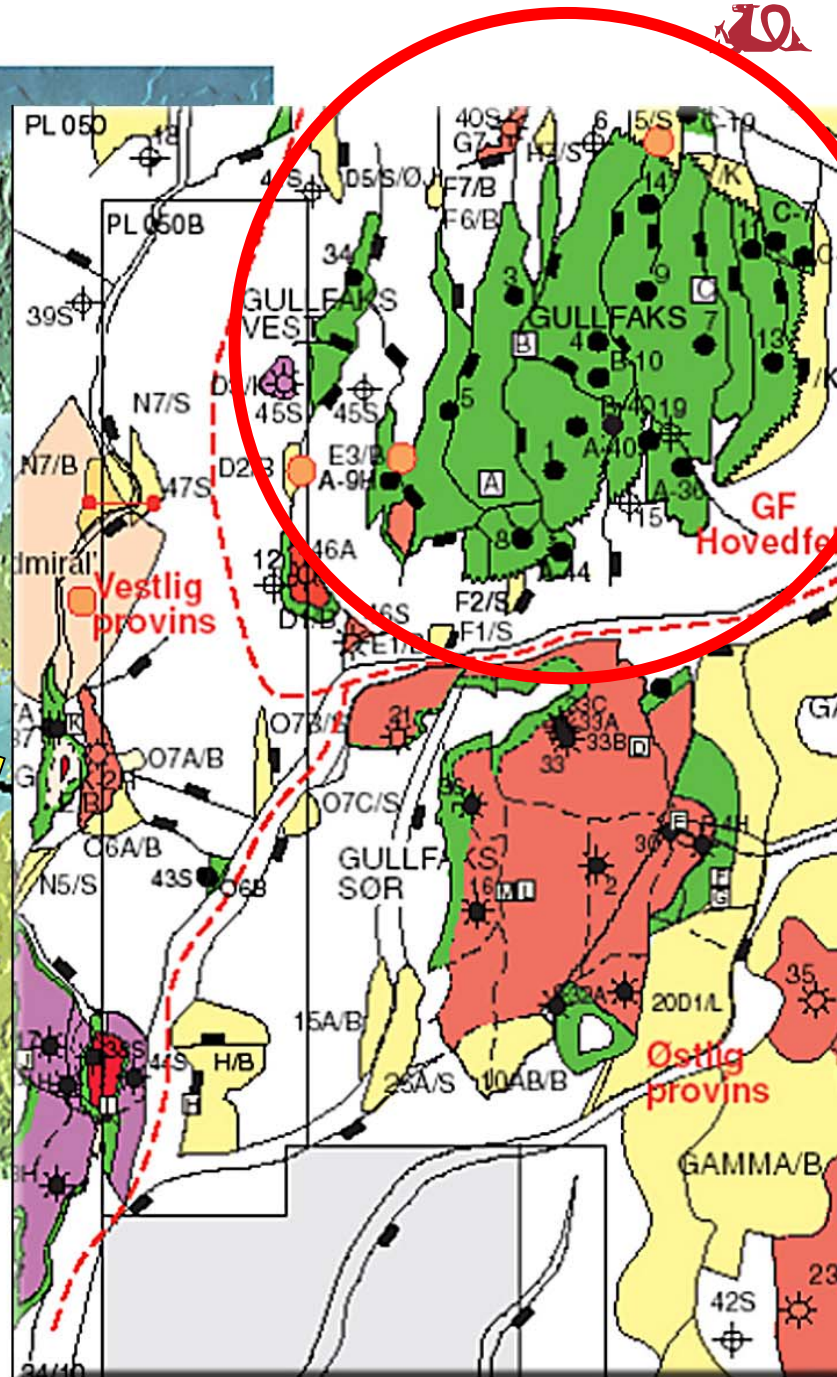
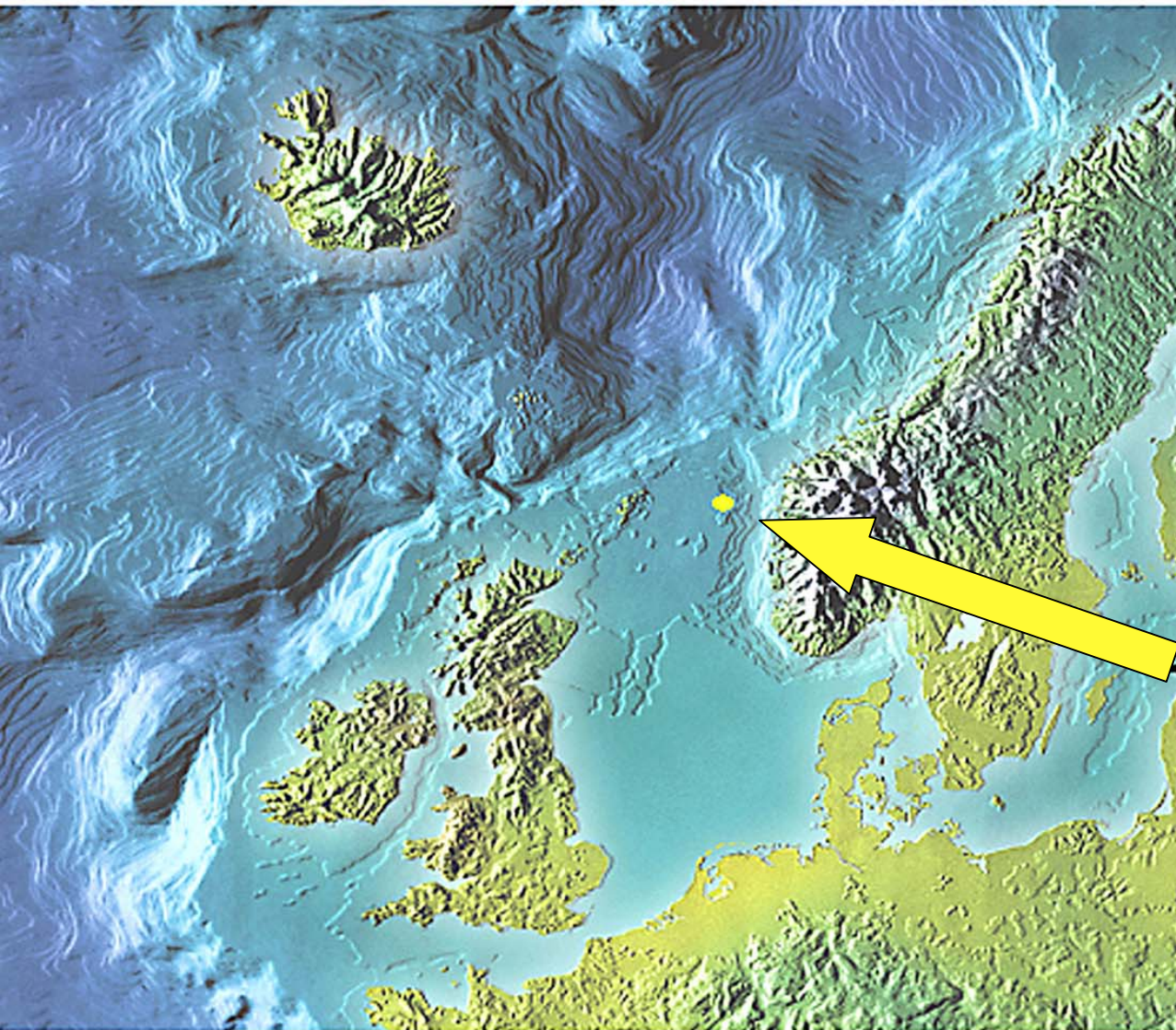
# Requirements to Case studies

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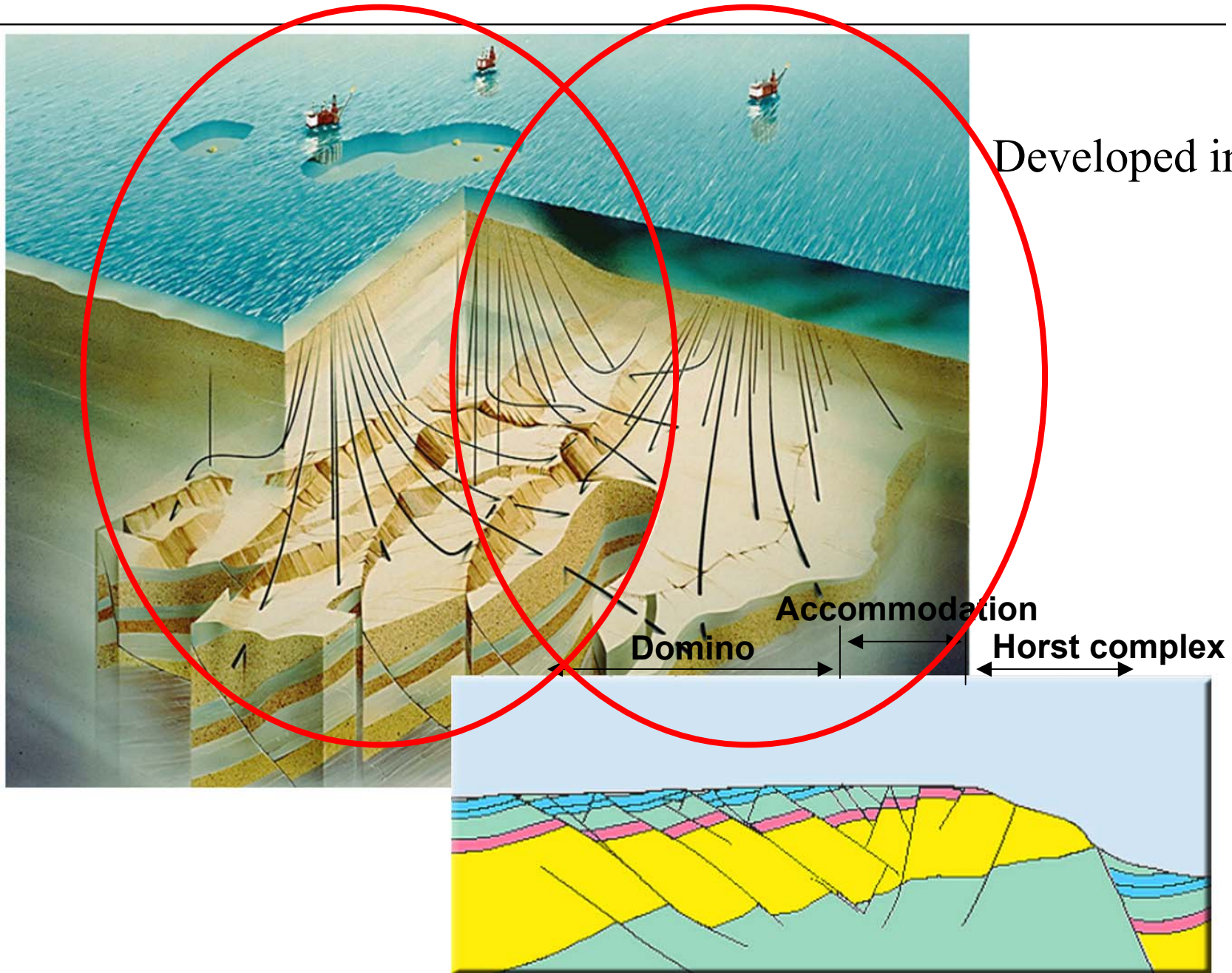
- ◆ What type of documentation is needed?
  - ◆ Geographical information
  - ◆ Geological information
  - ◆ Reservoir data
  - ◆ Project information
  - ◆ Production performance
    - Accumulated production
    - Production forecasts
  - ◆ Investments
    - Accumulated investments
    - Investments forecast

# NFC applied to the Gullfaks field, extended study

Setting



# Model of the Gullfaks field



# Gulfaks A, B and C platforms



# Facts about Gullfaks field

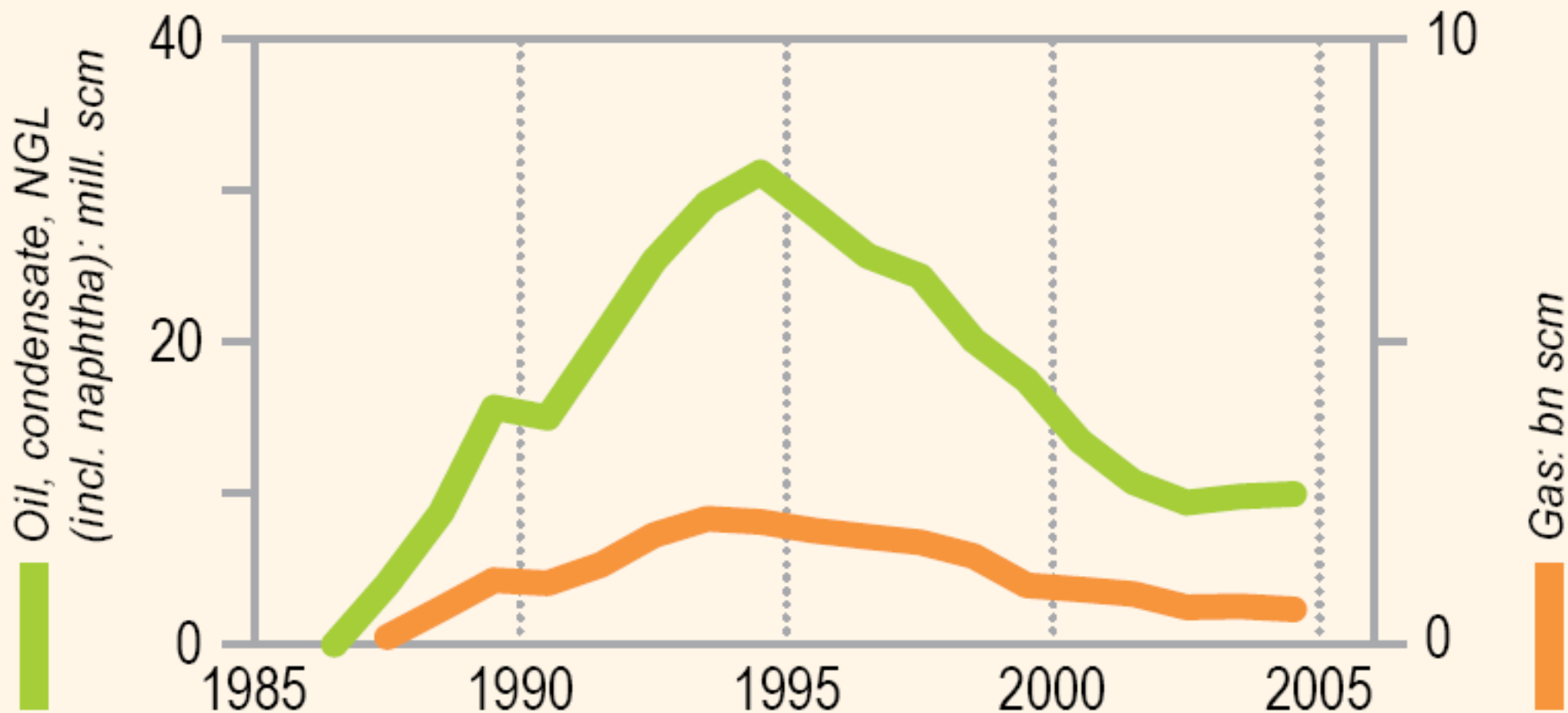


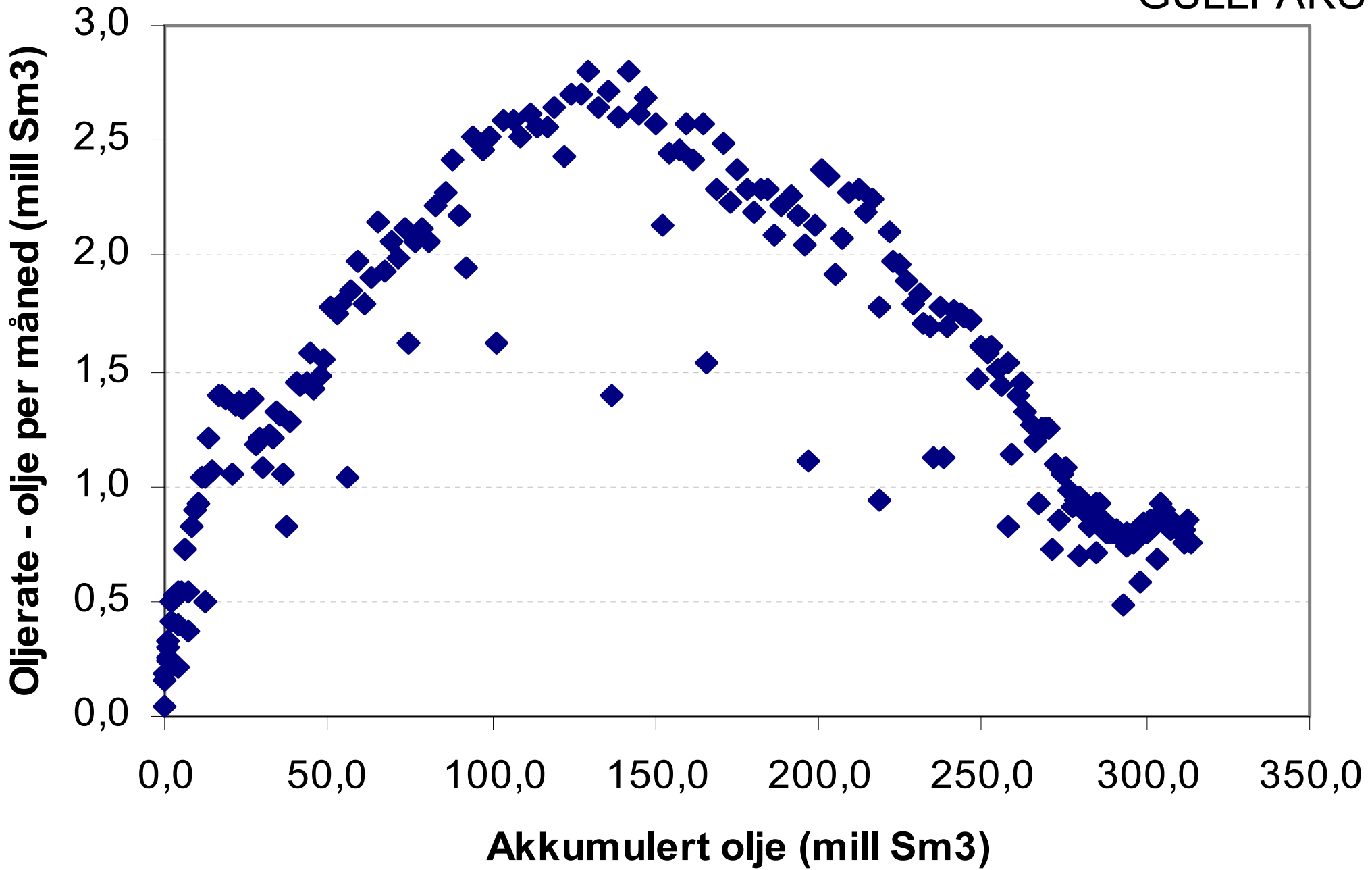
## Gullfaks

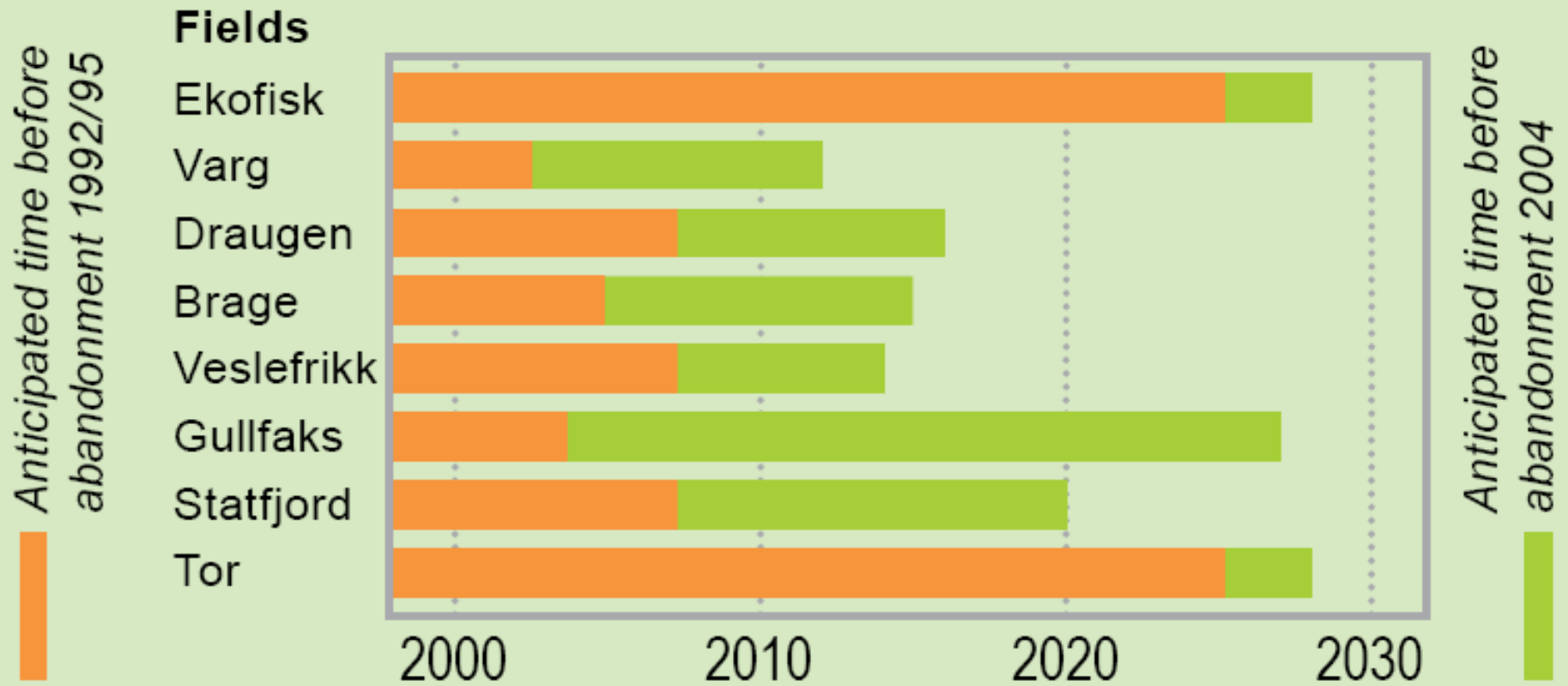
Blocks and production Licences	Block 34/10 - production licence 050. Awarded 1978. Block 34/10 - production licence 050 B. Awarded 1995.								
Discovered	1978								
Development approval	09.10.1981 by Parliament								
On stream	22.12.1986								
Operator	Statoil ASA								
Licensees	Norsk Hydro Produksjon AS 9.00% Petoro AS 30.00% Statoil ASA 61.00%								
Recoverable reserves	<table border="0"> <tr> <td><b>Original:</b></td> <td><b>Remaining as at 31.12.2004:</b></td> </tr> <tr> <td>351.9 million scm oil</td> <td>37.5 million scm oil</td> </tr> <tr> <td>22.6 billion scm gas</td> <td>1.3 billion scm gas</td> </tr> <tr> <td>2.6 million tonnes NGL</td> <td>0.3 million tonnes NGL</td> </tr> </table>	<b>Original:</b>	<b>Remaining as at 31.12.2004:</b>	351.9 million scm oil	37.5 million scm oil	22.6 billion scm gas	1.3 billion scm gas	2.6 million tonnes NGL	0.3 million tonnes NGL
<b>Original:</b>	<b>Remaining as at 31.12.2004:</b>								
351.9 million scm oil	37.5 million scm oil								
22.6 billion scm gas	1.3 billion scm gas								
2.6 million tonnes NGL	0.3 million tonnes NGL								
Production	<b>Estimated production in 2005:</b> Oil: 151,000 barrels/day Gas: 0.53 billion scm NGL: 0.06 million tonnes								
Investment	Total investment is likely to be NOK 107.9 billion NOK 101.7 billion had been invested as at 31.12.04 (2005 values)								
Operating organisation	Bergen								
Main supply bases	Sotra and Florø								

# Gulfaks production as of December 2005

## Gulfaks

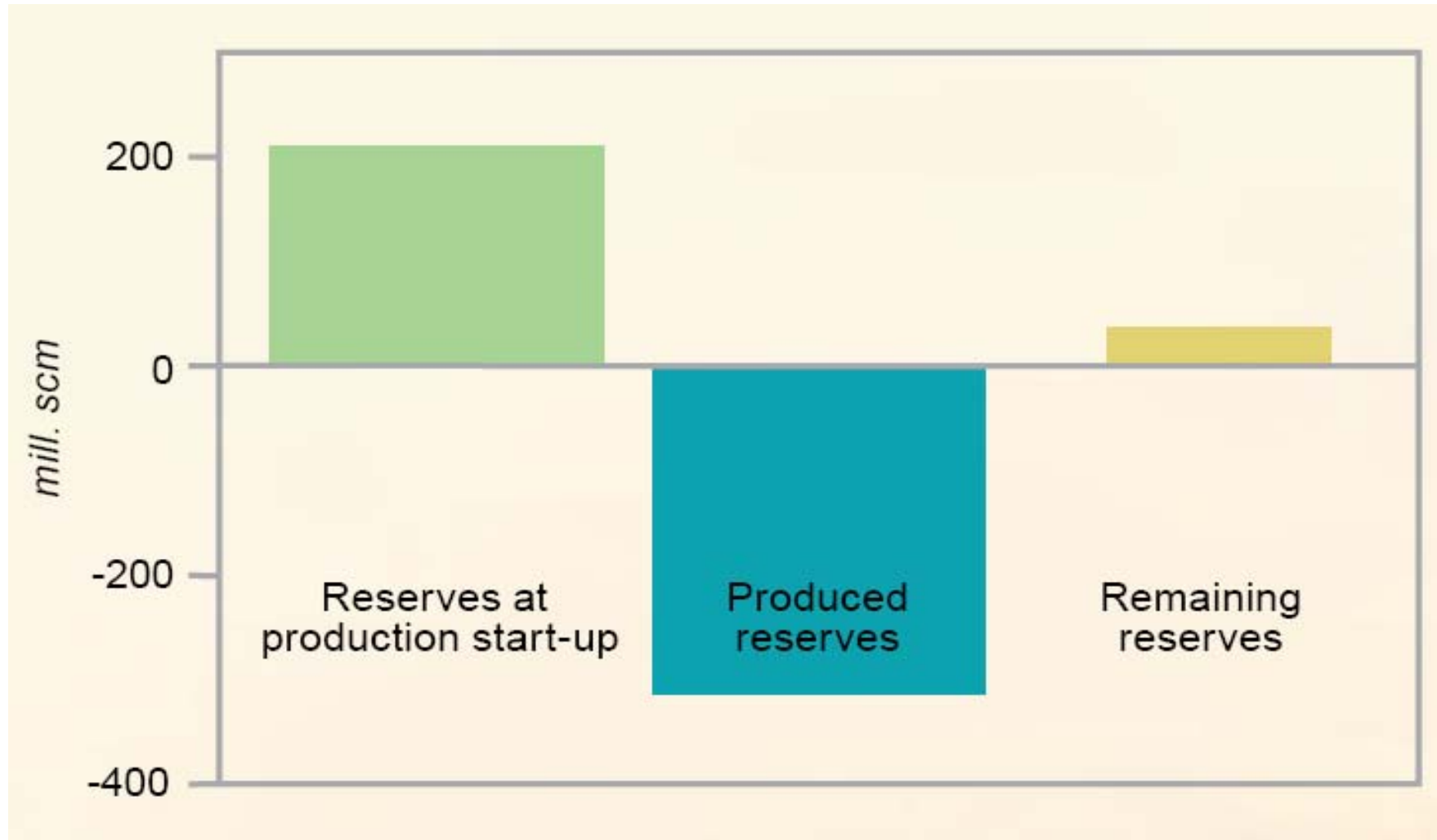




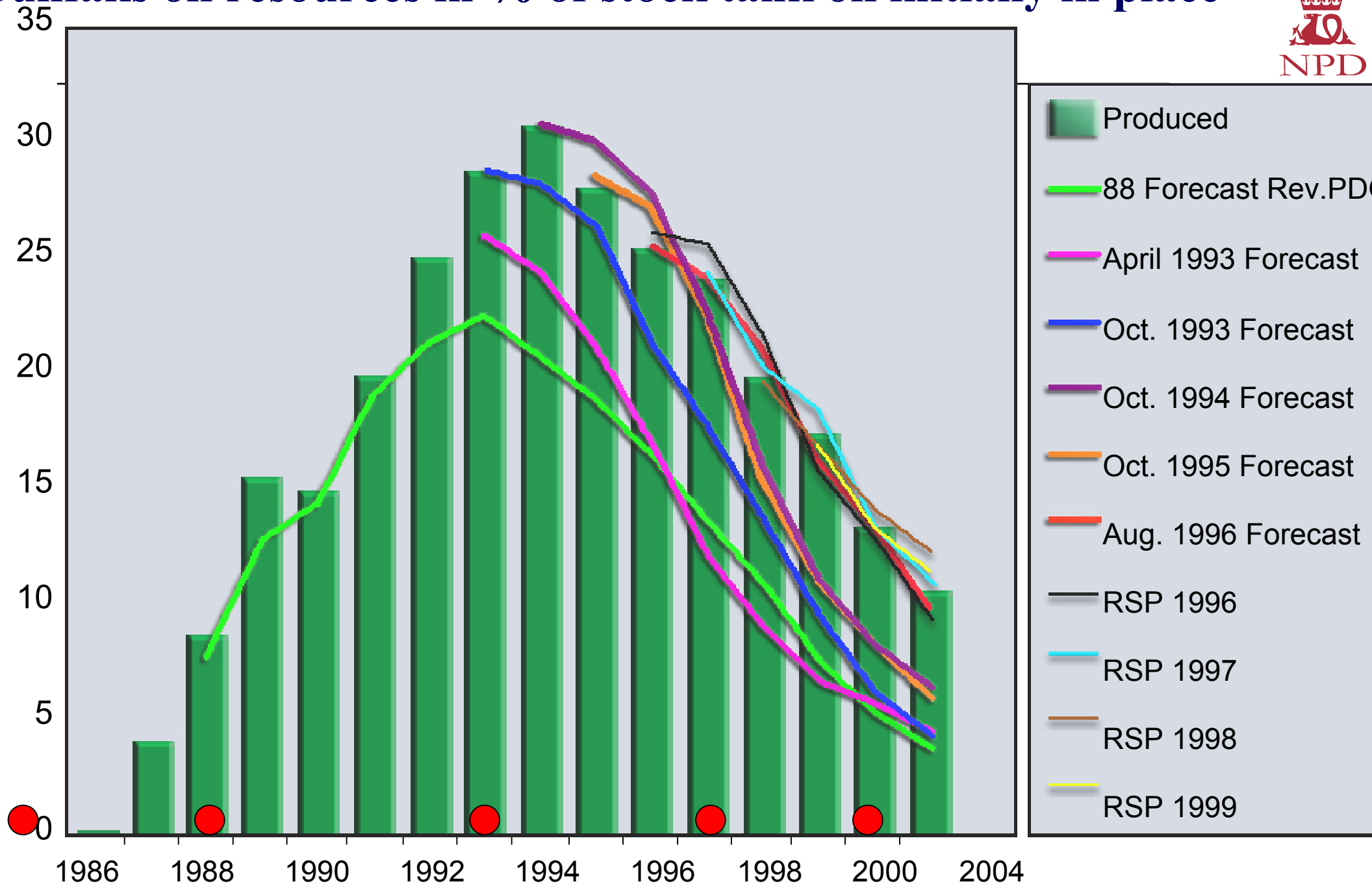


**Figure 4.4** Lifetimes for selected fields  
(Source: NPD)

# Gulfaks



# Gullfaks oil resources in % of stock tank oil initially in place



# Gullfaks Field - What information do we have?

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- ◆ Geology & reservoir
  - ◆ Geographical information, Maps
  - ◆ Geological information, Maps
  - ◆ Reservoir data
  - ◆ Project information
- ◆ Production
  - ◆ Performanse, Accumulated production
  - ◆ Production forecasts (at various times)
- ◆ Investments, CAPEX, OPEX
  - ◆ Accumulated
  - ◆ Forecasts (at various times)

# Case Studies for the Guidelines & Specifications

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- ◆ Prioritized by the Technical Group
- ◆ Ordered (& Coordinated?) by the Technical Group
  - ◆ What should be documented?
  - ◆ Which cases are needed?
  - ◆ Documentation level
- ◆ We need the Case Studies within **6 month To cope with the tight time schedule !**

# Wanted

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# Volunteers!

# Sign in for case studies:

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- ◆ Norway, Gullfaks Field
- ◆ Norway, consider additional field if needed
- ◆ .....
- ◆ .....
- ◆ .....
- ◆ .....
- ◆ .....
- ◆ .....



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# Break out session





