Case Study on UNFC-2009:

Testing of Norwegian Resource Classifications to UNFC.

Pilot Study performed by Statoil and Norwegian Petroleum Directorate (NPD)
Status Report

Intially delivered by Kjell Reidar Knudsen, NPD

3rd EGRC Geneva 2-4 May 2012

Modified and delivered by Karin Ask and Sigurd Heiberg at the UNFC workshop, Palais des Nations, Geneva, 23rd April 2013

Acknowlegdements

- The Pilot Study Group consists of:
  - Kjell Reidar Knudsen (NPD)
  - Astrid Nåvik (NPD, now Statoil)
  - Karin Ask (Statoil)
  - Magnar Haugvaldstad (NPD)
  - Omar Ali (NPD)
  - Per Blystad (NPD)
  - Tom Andersen (NPD)
  - Øystein Lie (Statoil)

Objective of the study:

To use the system in a full cycle real life for a complete national portfolio

- NPD : 800 projects representing all kinds of combinations
- Investigate if Government's needs are met by the UNFC system
- Propose improvements

Non-sales production potentials are not included

Norway 2012

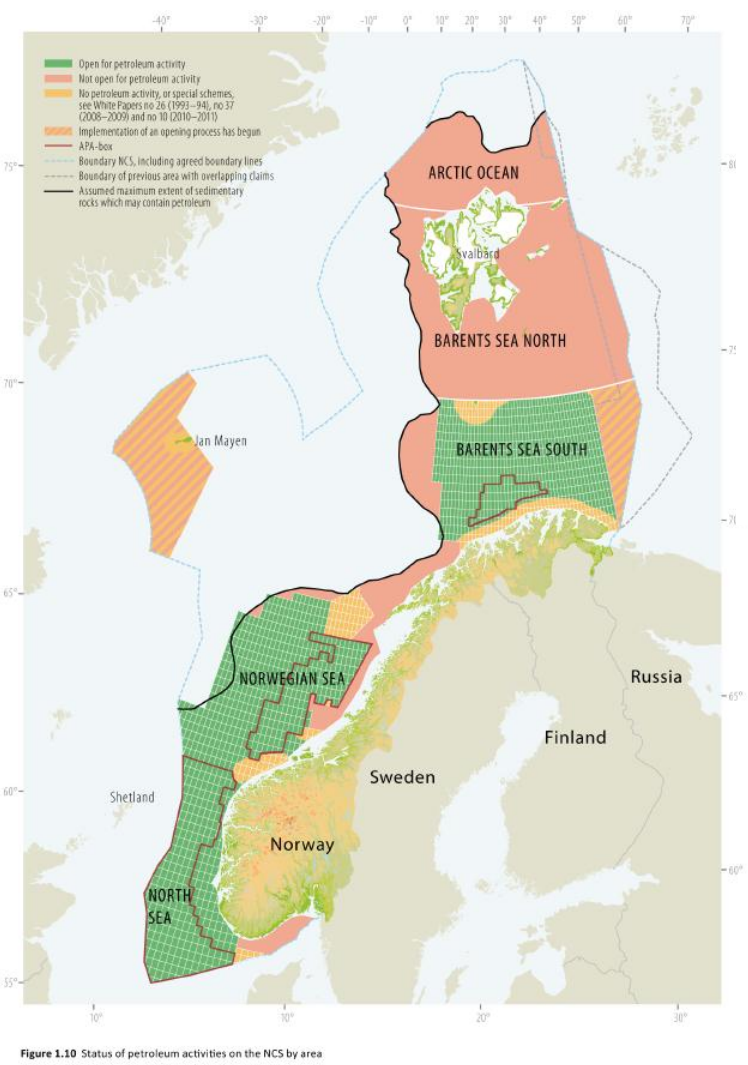
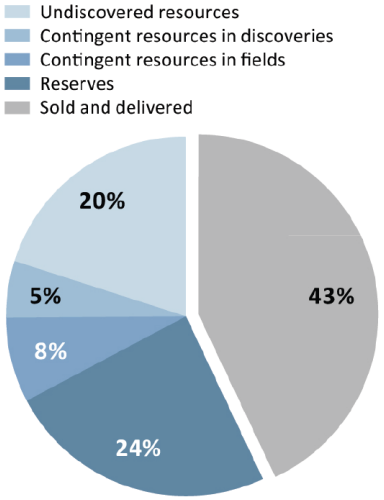
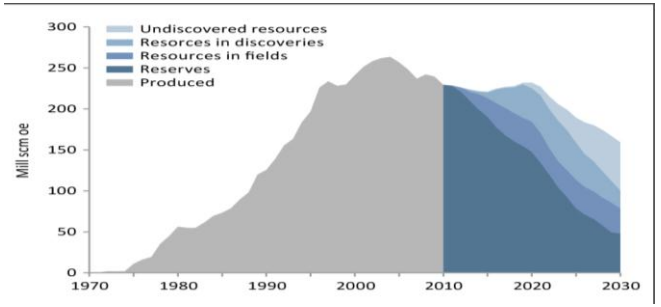


Figure 1.10 Status of petroleum activities on the NCS by area





- 70 producing fields
- 15 fields under development
- 1450 exploration wellbores
- 3600 development wellbores

The Norwegian Petroleum Directorate (NPD)

- A governmental specialist directorate and administrative body
- Established in 1972
- Reports to the Ministry of Petroleum and Energy (MPE)
- Headquarter in Stavanger and has an office in Harstad
- A staff of a little over 200

Statoil in a Nutshell (2012)

Statoil	Highlights	Financial	Operational
Integrated energy company with HQ in **Norway**	• The world's largest operator in **water depths > 100m**	• **Market cap:** ~USD 80 billion	• **Production** (2012): ~2.0 million boe/d
21,000 employees in **41 countries**	• The second largest **gas exporter** to Europe	• Listed in **New York** (NYSE) and **Oslo** (OSBX)	• More than **1000 employees** in North America
World's **40th largest** company*	• One of the world's largest **net sellers** of crude oil	• Norwegian government owns **67 percent**	• Transparency International: World's **most transparent** company

The resource classification system is a tool that NPD uses for:

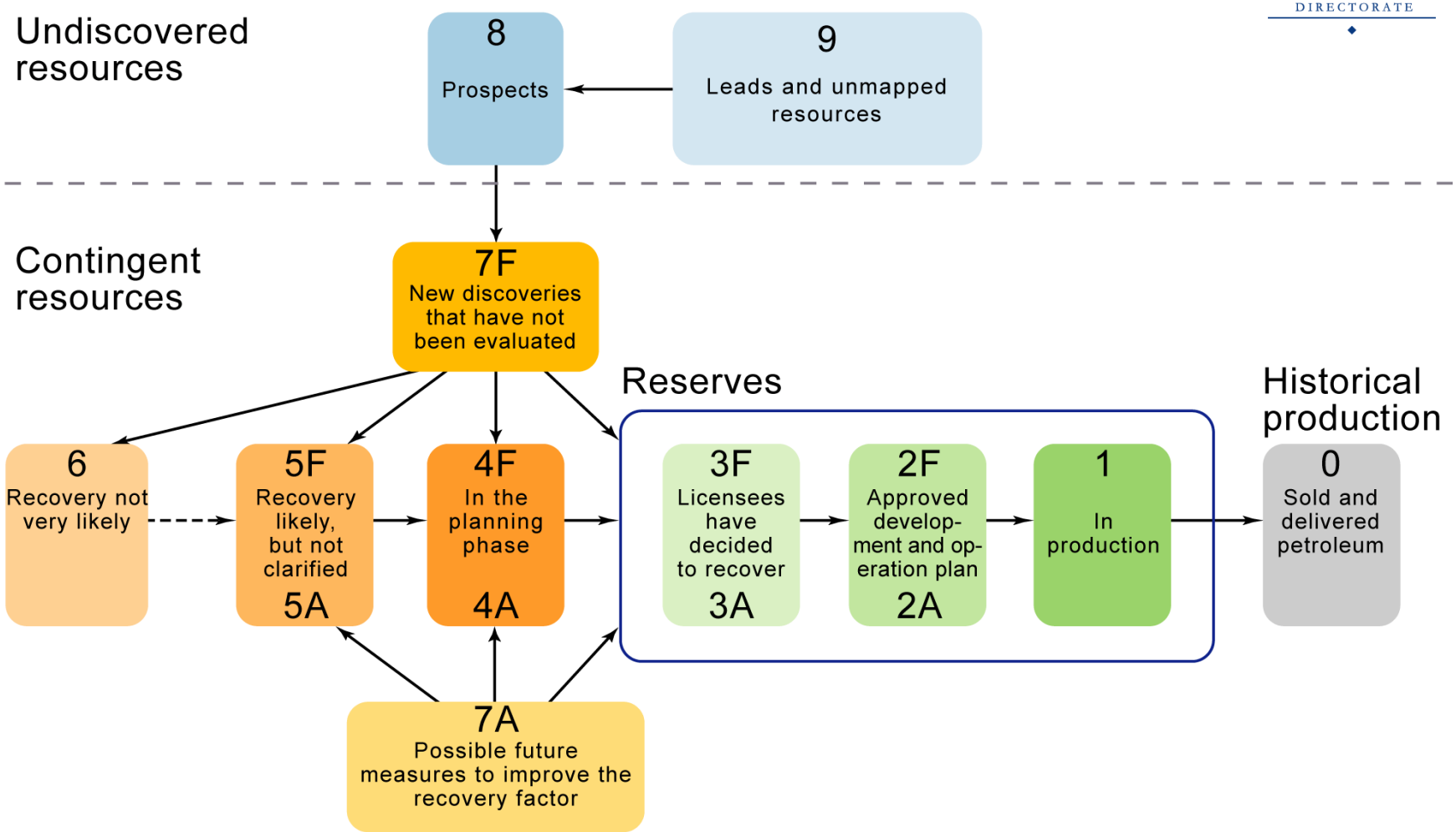
- Organizing the data in order to make relevant analyses
  - Short- and long term national financial planning
  - Evaluation of petroleum strategy, fiscal terms, opening of new areas etc
- Monitoring the oil companies obligations with regards to resource management
  - Progress in project maturation
  - Resource utilisation - Recovery factor
- Keeping overview of the Norwegian Petroleum Resource inventory
  - Presenting to the public (including changes since last year)
  - For reporting to national and international bodies and for comparison

Norwegian authorities' reporting requirement to oil companies:

- Pursuant to Section 50a of the Regulations to the Petroleum Act, operating companies shall submit data for use in the revised national budget (RNB).
  - ”Reporting shall include corporate financial data, projects, resource volumes and forecasts for production, costs and environmental discharges/emissions as specified by the recipient.”

NPD categories and classes (2001)

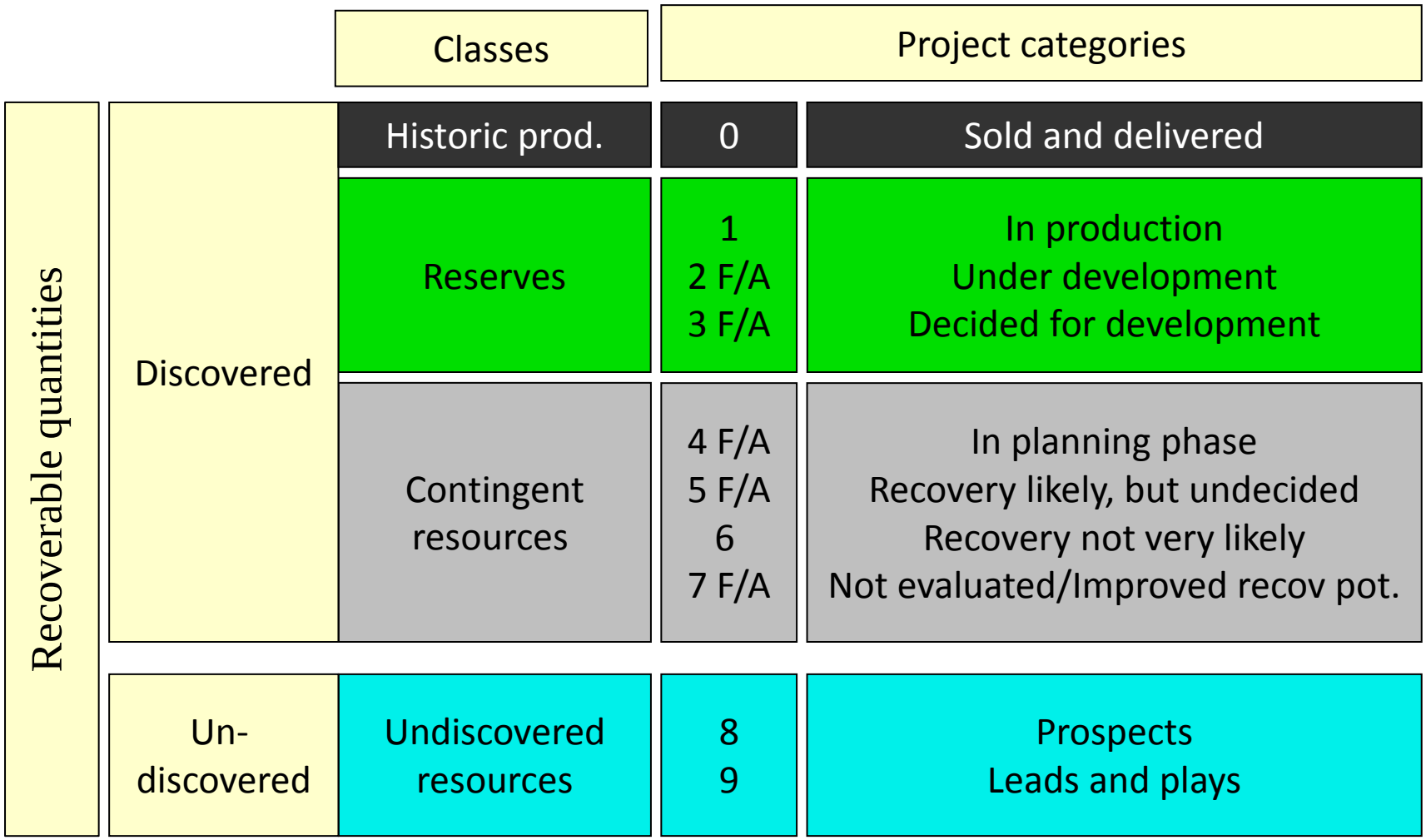
NORWEGIAN PETROLEUM DIRECTORATE



Classification system for petroleum resources at the Norwegian continental shelf

NPD classification (2001)

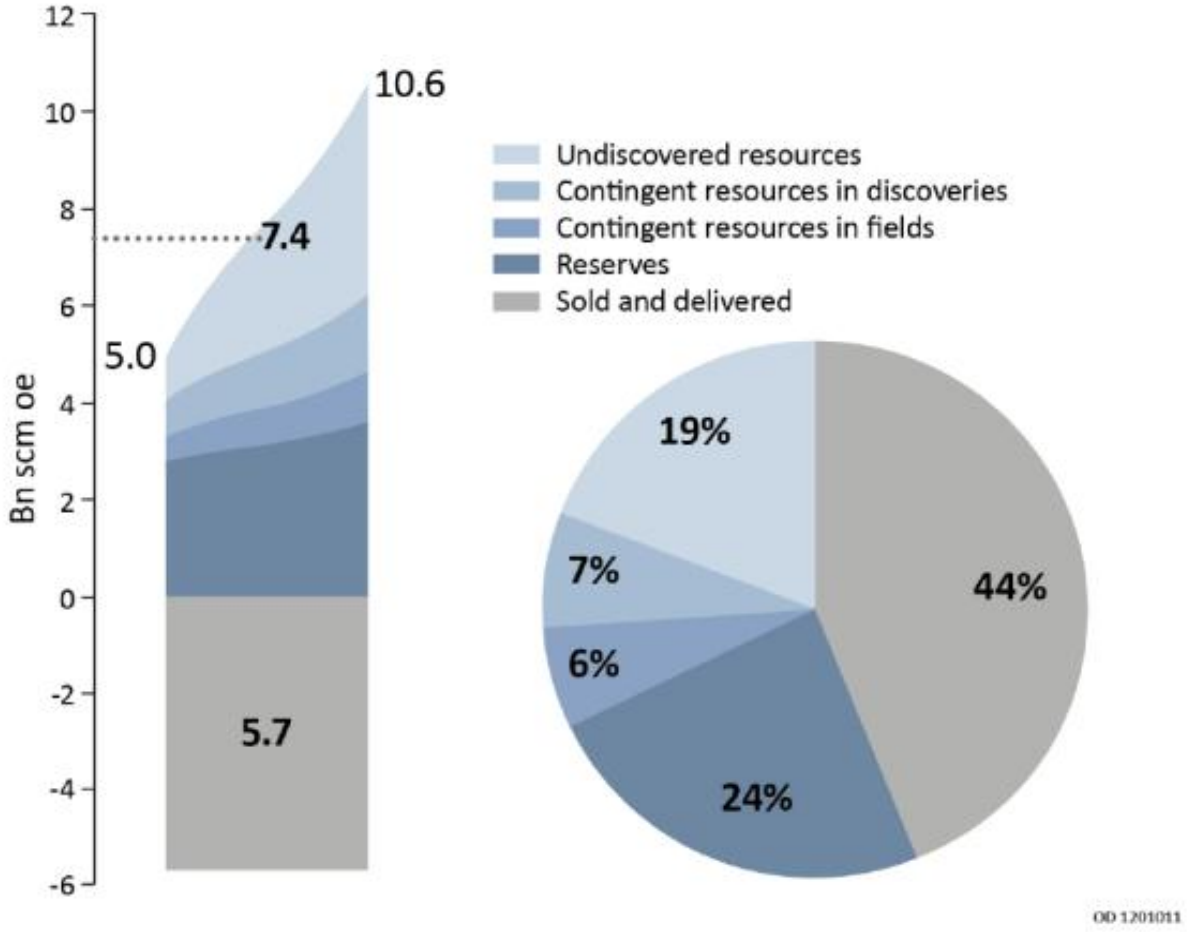
Categories and classes presented in 2D



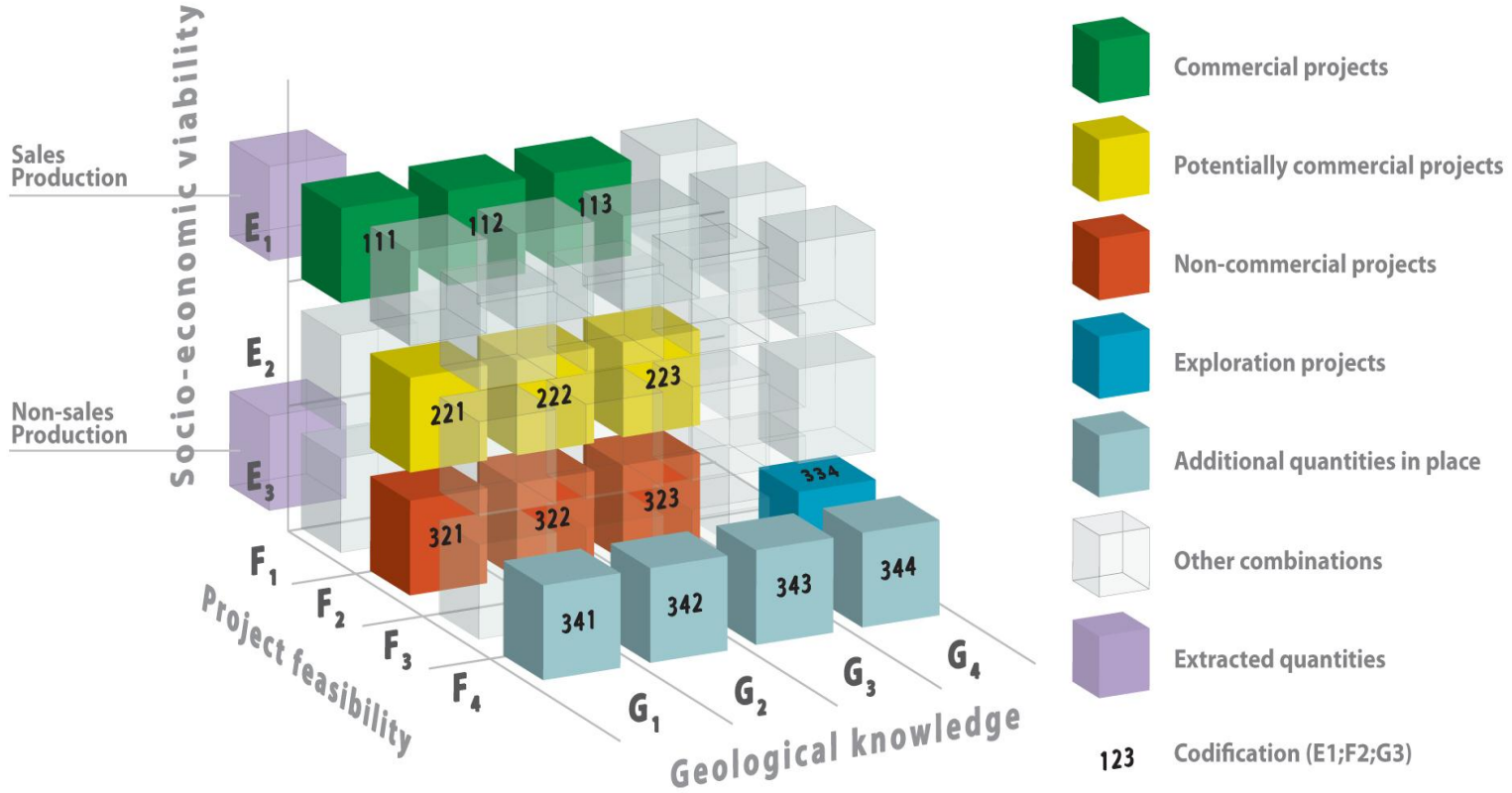
F = First, A = Additional

Norwegian Petroleum Resource Accounts

Recoverable resources per 31.12.2011



UNFC – 2009, with examples of classes



Pilot Study:
Testing NPD classification to UNFC

- General rule categorisation of NPD maturation categories
  - "Assign one set of UNFC codes (E-F-G) to each NPD category based on comparison of the two systems definitions"

- Individual project classification
  - Each project will be tested towards the complete definitions, supporting explanations and specifications of the UNFC
  - Requires detailed information on projects

Results of Project individual categorisation

Norwegian Resource figures of 31.12.2011 based on project individual categorisation to UNFC (2012) classes

UNFC Sub class	Project specific
E1.1F1.1	2347
E1.1F1.2	433
E1.1F1.3	384
E1.1F2.1	432
E1.1F2.2	139
E2F2.1	728
E2F2.2	284
E3.2F2.1	181
E3.2F3G4	2455
E3.3F2.3	0
Total	7382

The amounts represents the G1 + G2 except for E3.2F3

Unit: Million Standard Cubic Meter Oil Equivalents (Mill S m^3 O.E.)

Comparison

- General rules categorisation 2012
- Project individual categorisation 2012

Mapping to UNFC- classes defined by UNFC Sub-categories

UNFC Sub class	General rules categorisation	Project individual categorisation
E1.1F1.1	2347	2347
E1.1F1.2	433	433
E1.1F1.3	384	384
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E2F2.2	190	284
E3.2F2.1	182	181
E3.2F3G4	2455	2455
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Norwegian Resource Accounts per 31.12.2011 according to UNFC (2012)

Mapping results

Mapping the results to UNFC- classes defined by UNFC Sub-categories

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Aggregated mapping results to UNFC- classes defined by UNFC categories

UNFC class	General rules categorisation	Project individual categorisation
E1F1	3164	3164
E1F2	593	571
E1F3	0	0
E2F1	0	0
E2F2	988	1012
E2F3	0	0
E3F1	0	0
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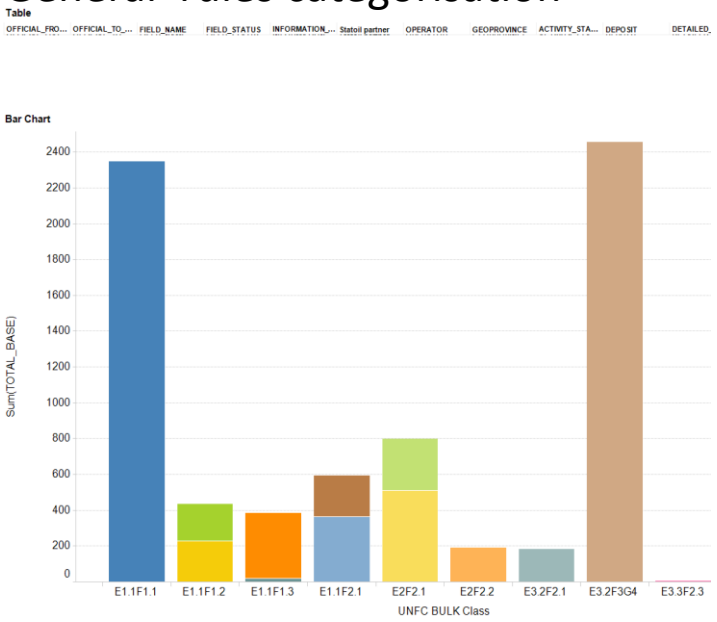
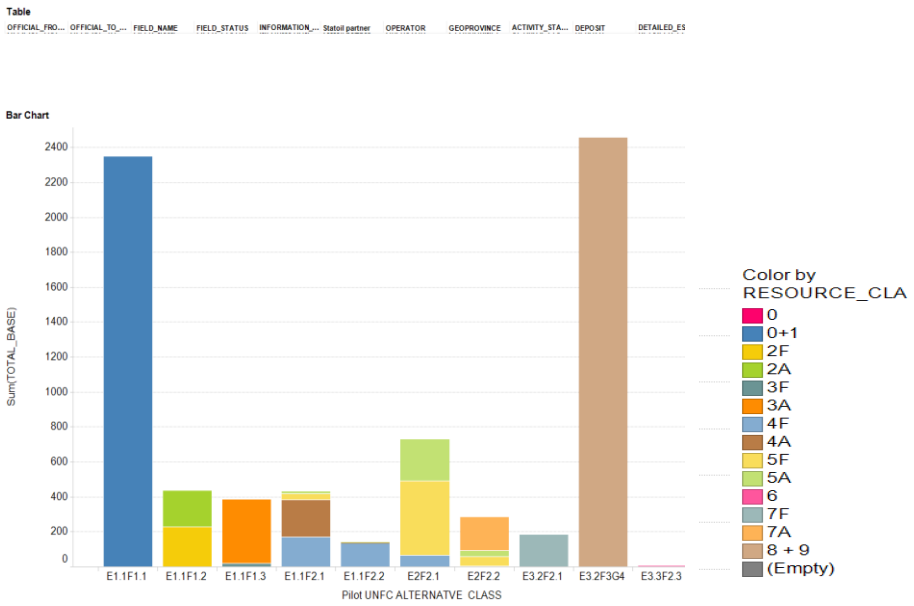
General rules categorisation



Project individual categortisation



Lessons learned

- The granularity of UNFC may make this a stronger tool for resource management than our current NPD system (especially if the F and A can be included as sub-categories)
- The usability of the UNFC is reduced dramatically if application is restricted to map the example classes given in UNFC fig 1
- The QC and guidelines of the Norwegian Reporting Regulations must be improved for the “Project stopper” attributes

Summary

- UNFC was successfully used to classify the 700 projects that constitutes the total Norwegian Resource Accounts
- Last years (2011) mapping of “primary” classes was not correct because important granularity was lost
- This year’s ”General rules categorisation” to smaller UNFC-classes and sub-classes was successful
- The differences between direct project classification and class mapping results are minor
- This demonstrate that the mapping between NPD system and the UNFC is acceptable

End