Royal Norwegian Ministry of Petroleum and Energy

Valuation of State Direct Financial Interest, 2004

June 2005

WOOD MACKENZIE

Basis of Report

This report has been prepared for the Ministry of Petroleum and Energy by Wood Mackenzie Limited. The information upon which this report is based has either been supplied to us by Petoro or the Ministry of Petroleum and Energy or comes from our own experience, knowledge and databases. The opinions expressed in this report are those of Wood Mackenzie. They have been arrived at following careful consideration and enquiry, but we do not guarantee their fairness, completeness or accuracy. The opinions, as of this date, are subject to change. We do not accept any liability for your reliance upon them.

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Role of Wood Mackenzie

Wood Mackenzie Limited (Wood Mackenzie) has been appointed by the Ministry of Petroleum and Energy to undertake a valuation of the SDFI portfolio of oil and gas assets and to review the valuation of the portfolio carried out by Petoro.

The principal aim is to quantify the change in value over the course of 2004. As part of this process Wood Mackenzie has identified changes in value for individual assets and the reasons for those changes.

Approach

Wood Mackenzie has developed its approach in conjunction with the Ministry of Petroleum and Energy.

Petoro has provided Wood Mackenzie with datasets for SDFI assets at two points in time. The start year position was evaluated in the report prepared for the Ministry of Petroleum and Energy by Wood Mackenzie in June 2004 and this has been the source of the opening value used in this report. The data for this valuation was based on the Revised National Budget 2004 (generated in late 2003). The end year (2004) data is based on the Revised National Budget 2005 (generated in late 2004).

In both cases the Revised National Budget data is based on information provided by field operators, but Petoro has adjusted production and/or cost profiles on some projects due to a different perception. Changes to the data between start and end 2004 may be based upon differences in the operators' expectations from one year to the next, or changes to the field development plan.

The data has been run using the assumptions described in the methodology section.

Summary and Conclusions

Wood Mackenzie has undertaken a valuation of the SDFI portfolio of oil and gas assets as at the end of 2004 and calculated the change in value over the course of 2004.

The change in value of the SDFI portfolio over 2004 has been calculated by running valuations using the start and end year datasets, as supplied by Petoro. From this analysis the value of the SDFI portfolio has increased by NOK 214 billion during the course of 2004, but would only have increased by NOK 38 billion had price assumptions remained unchanged between the datasets.

Excluding the strong impact for 2004 of the more optimistic forward price assumptions, a number of different factors impact the value. The most important ones relate to changes to development plans by the operators and changes in production, reserves or cost assumptions for individual assets by both Petoro and the operator.

On an individual field asset basis the key drivers for the increase in value of the SDFI portfolio are Gullfaks, Åsgard, Heidrun, Norne, Grane and Troll Oil projects; whilst Gassled and Troll Gas showed substantial decreases in value. The key theme for value generation during 2004 has been the impact of new investment on existing fields, which is stimulating increased production levels over the short to medium term.

Valuations

Summary - Value Change Comparisons

In undertaking our valuation we have initially valued the datasets to show the value of the start 2004 dataset at 1 January 2004 and the end 2004 dataset at 1 January 2005. The opening value for the start year position is sourced from the equivalent report prepared for the Ministry of Petroleum and Energy in June 2004.

To ensure comparability of the value of the datasets, we have made the following adjustments as described below. The following table summarises the start and end year valuations of commercial assets as calculated and the reconciliation between the two figures.

1 Restated the start 2004 dataset value in start 2004 terms as described in the previous year's study. This gives a value of NOK 438.3 bn (step A in the table below).

2 Deducted the cash flows arising during 2004 from the start 2004 dataset (step B). These cash flows have been discounted to reflect the value of NOK 81.4 bn in start 2004 terms. The value arising is NOK 359.6 bn (step C).

3 Restated the end 2004 dataset value of NOK 625.7 bn to start 2004 terms by deflating the dataset to convert it into start 2004 terms and then discounting from the start of 2004. This gives a value of NOK 573.9 bn (step D).

The impact of these adjustments is such that if the 2004 actual cash flows and future expectations at the start of 2005 were those predicted at the start of 2004, there would be no change in value. A higher value for the end year dataset than the start year dataset plus 2004 cash flows, would show value increase. By contrast a lower value for the end year dataset would show value decrease. As a result of our valuation analysis, a value increase of some NOK 214.3 bn has been calculated (D minus C in the table below).

Reconciliation Between the Start and End Year Valuations of Commercial Assets

Value Component	Value (NOK Billion)*	Value (NOK Billion)*	
Start 2004 in start 2004 terms from previous study	438.3		(A)
Cash Flow 2004	81.4		
Discounted value of 2004 Cash Flow		78.7	(B)
Start 2004 value less 2004 discounted Cash Flow (A-B)		**359.6**	(C)
End 2004 in start 2005 terms	625.7		
Restated to start 2004 terms		**573.9**	(D)
Value Creation in start 2004 terms **(D-C)**		**214.3**	

* Discounted at 7% in real terms. For a detailed breakdown of the various items refer to Appendices 2 and 3. Totals may not add due to rounding.

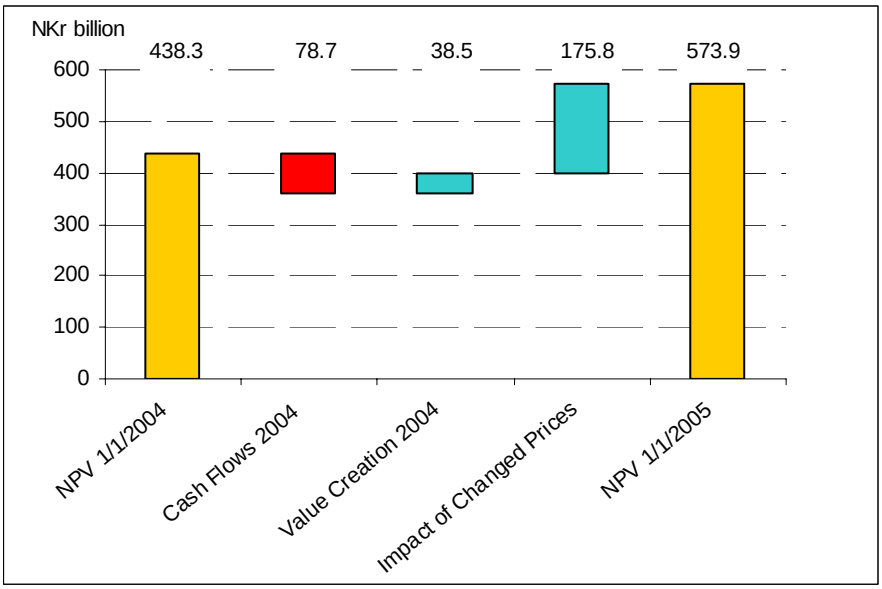
In addition to determining the overall value change, we have calculated the extent to which changes in oil and gas price assumptions have impacted on the value change. We have therefore run the end 2004 dataset using start 2004 oil and gas price assumptions, to isolate the impact of changes arising from different oil and gas price assumptions.

The following table summarises the analysis we have undertaken. Using start 2004 assumptions, the value of the end 2004 dataset falls from NOK 573.9 bn to NOK 398.1 bn. By changing the assumptions during the year, the value of the portfolio has therefore risen by NOK 175.8 bn. Thus the value increase of the underlying asset base excluding the impact of changes to the assumptions is NOK 38.5 bn.

Impact of Oil Price Assumptions

Value Component	Value (NOK Billion)
End 2004 restated to start 2004 terms	**573.9**
End 2004 as above using start 2004 prices	**398.1**
Value Increase due to revised prices	175.8
Total Value Increase from previous table	214.3
Value Increase based on constant price assumptions	**38.5**

Value Increase During 2004



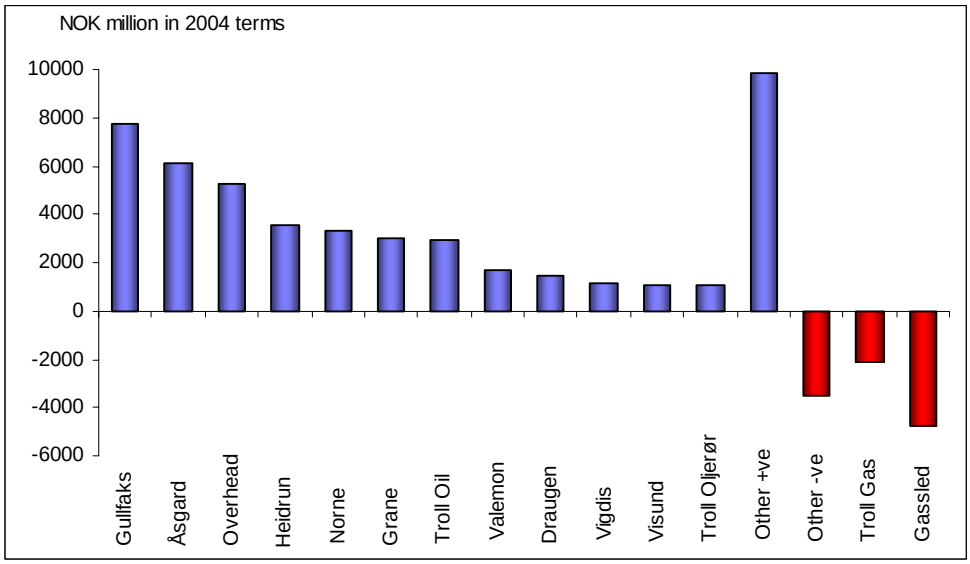
Key Value Change Drivers

The key assets that have driven the increase in the value of the State DFI portfolio during 2004 are Gullfaks and Åsgard as illustrated in the following chart. Heidrun, Norne, Grane and the Troll Oil project have also made substantial contributions, as has Valemon which is a discovery that was not considered to be commercial last year, but most of the assets within the portfolio contributed to the increase in value. The key theme for value generation within the portfolio is the impact of new investment on existing fields, which is stimulating increased production levels over the short to medium term.

Another significant factor in the value increase was the reduction in expected overhead cost items. This consisted of lower estimates for the costs of marketing gas and in the provisions for insurance that are expected to have to be made. The change in marketing costs reflects the updated methodology for modelling the impact of a gas storage facility in the UK and the Cove Point LNG re-gasification plant in the USA.

The main assets where value has decreased during 2004 (excluding the impact of higher oil price assumptions) are Gassled and the Troll Gas project. For Gassled the value is impacted by the inclusion this year of the Kollsnes facilities and in addition a higher level of capital expenditure is forecast. For Troll Gas the main reason for the decrease in value was a higher capital expenditure forecast, which is related to updated assumptions for the third phase of the project involving the exploitation of reserves in the Troll West gas province.

Value Change by Asset 2004 - Excluding Impact of Changed Price Assumptions*



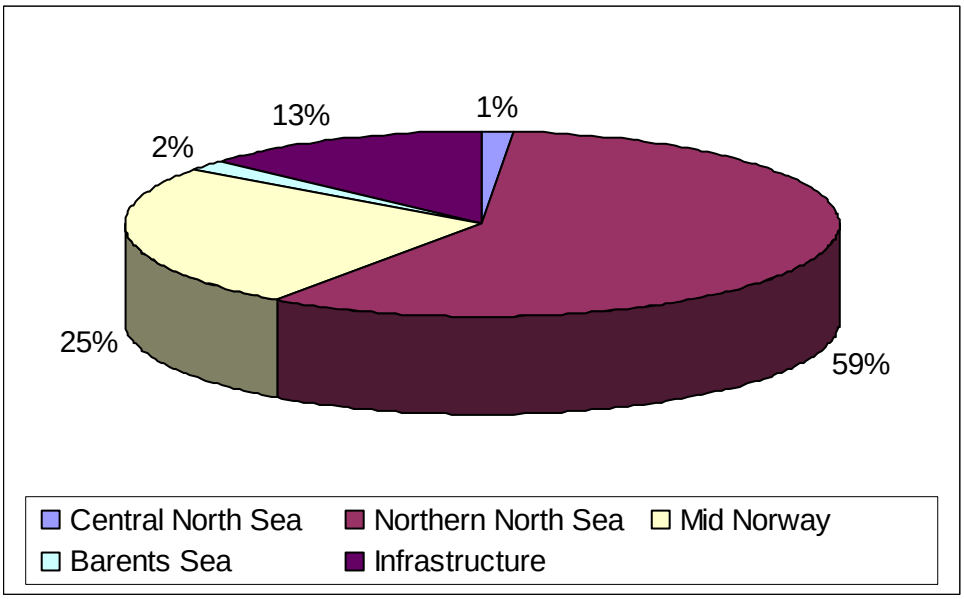
* The 'Other +ve' category represents the cumulative value increase for all the other assets (not shown individually) that showed a positive value change during the year, with the 'Other -ve' category reflecting the equivalent change for all the other assets that showed a negative change in value.

Portfolio Analysis

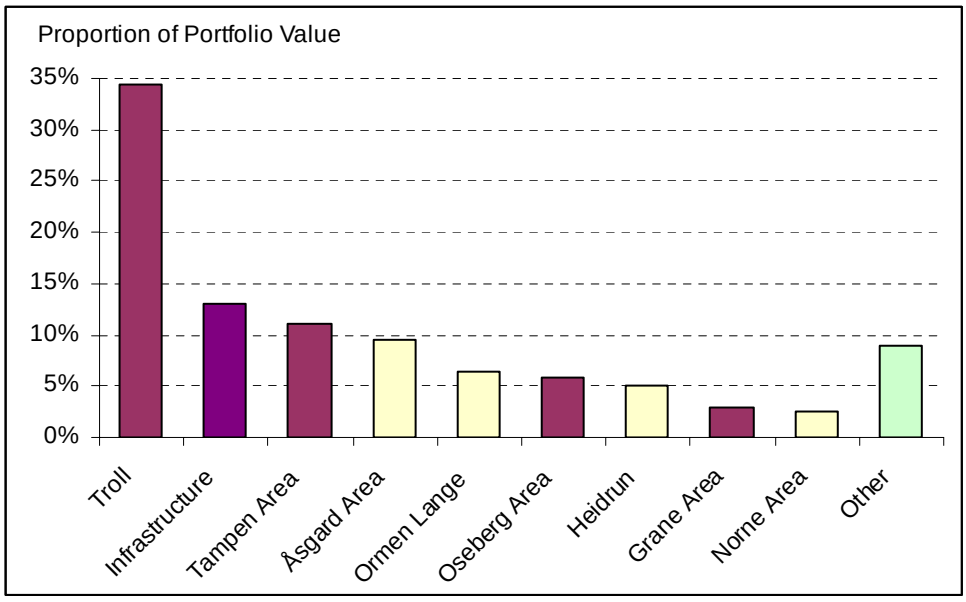
In the following charts the value distribution of the SDFI portfolio by location on the Norwegian Continental Shelf is portrayed. The first chart shows the split by region, whilst the second shows the split by core asset area.

The most significant changes over the course of 2004 is the increase in the emergence of significant value in the Snøhvit project, which was matched by the continued fall in relative value of infrastructure assets (down from 16 to 13%). The relative value of assets in the Mid Norway continued to edge upwards (up from 24 to 25%). Over a third of the value of the portfolio is accounted for by Troll, which is by far the most important asset.

Value Distribution by Region



Value Distribution by Core Area

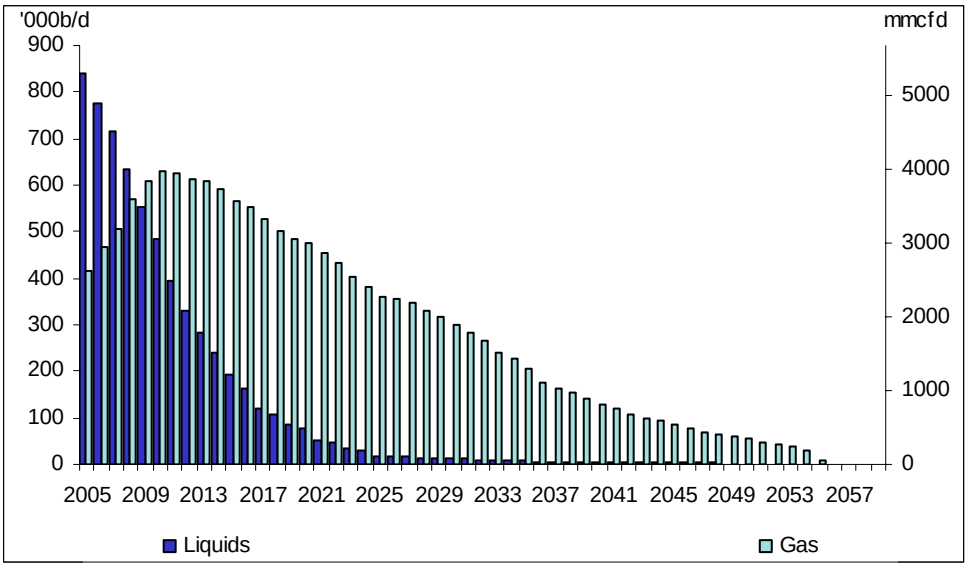


Comparison of Production Profiles for Start Vs End Year Datasets

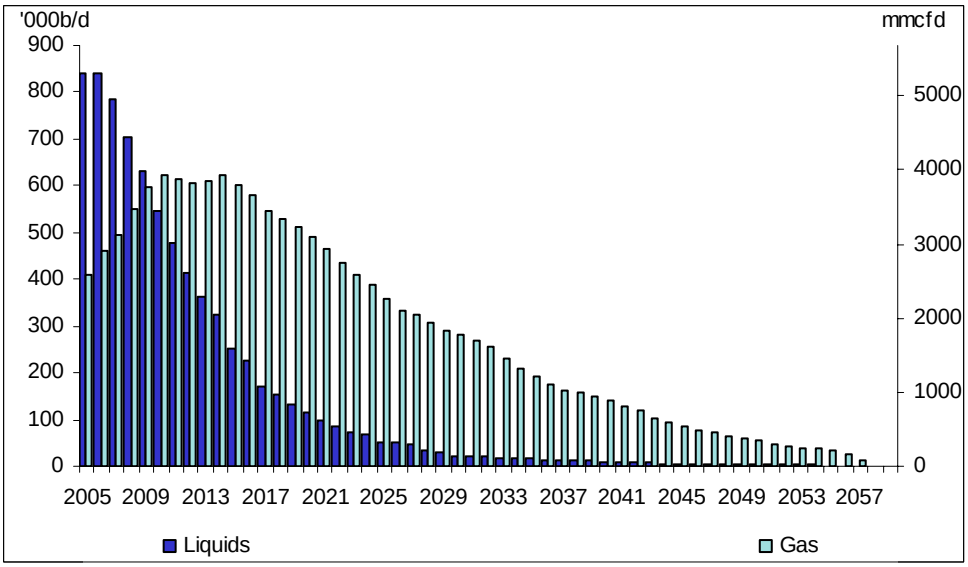
The following charts show the forward liquids and gas production profiles for the start year and end year datasets. Whilst the estimate for liquids production in 2005 is very similar in the two datasets, the profile for 2006 and beyond in the end year dataset is significantly higher. This reflects more optimistic assumptions for oil recovery from existing reservoirs as shown by the increased number of IOR projects being undertaken. However, there is no sign in this year's dataset that the higher oil price environment is yet encouraging new green field developments.

The gas production profile for the end year dataset is significantly higher over the short to medium term but similar to the start year dataset in the longer term. It shows a second peak around 2015 and the peak level itself is approximately 10% higher than in the start year dataset.

Start Year Dataset



End Year Dataset



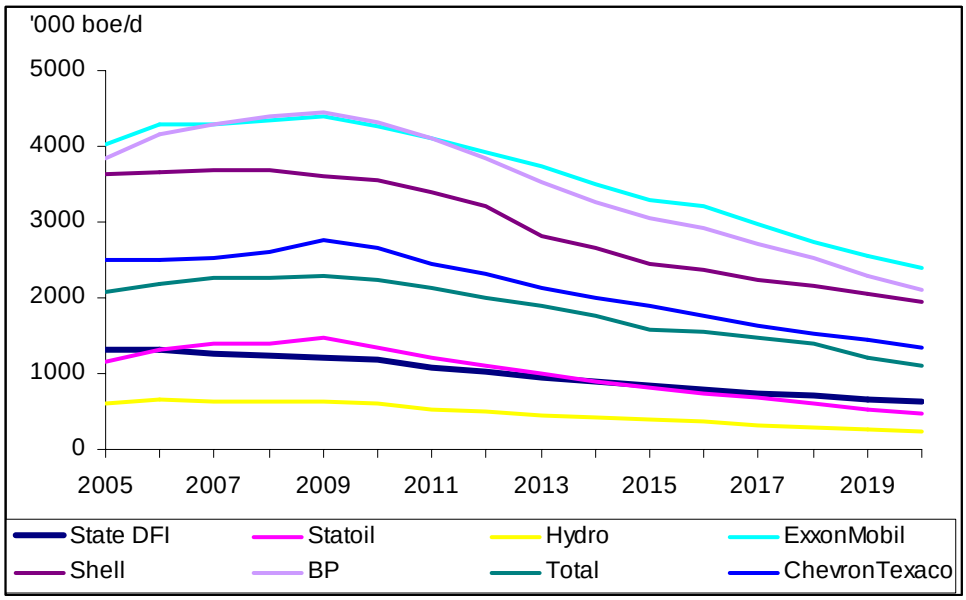
Benchmarking of Future Production Profile

In the following charts we benchmark the forward production profile and reserves/production (R/P) ratio of the State DFI portfolio against a peer group consisting of the main Norwegian players Statoil and Norsk Hydro and the major international players ExxonMobil, Shell, BP, Total and ChevronTexaco. The production profiles are based on output from each company's current portfolio of commercial fields and does not take account of likely additional production from finds that are categorised as technical discoveries or from future discoveries that might be made.

The State DFI's future production profile shows a very similar trend to Norsk Hydro in terms of global production, which reflects the heavy weighting of Norway within Hydro's portfolio. Statoil's profile shows a significant rise over the short term due to increased output from its West African assets, but its decline in the longer term is significantly steeper than for the State DFI. This pattern of near term increases followed by relatively sharp declines is mirrored by all the major international players with the exception of Shell, which has a profile that is already in decline.

This slower decline in the long term partly reflects the State DFI's interests in long-life gas projects such as Ormen Lange and Snøhvit. We would, however, expect this picture of longevity for the State DFI's production stream to be slowly eroded over time when compared to the major oil companies, given its relative lack of interests in new licensing rounds and hence access to new field developments.

Future Production – Comparison with Companies' Global Profiles

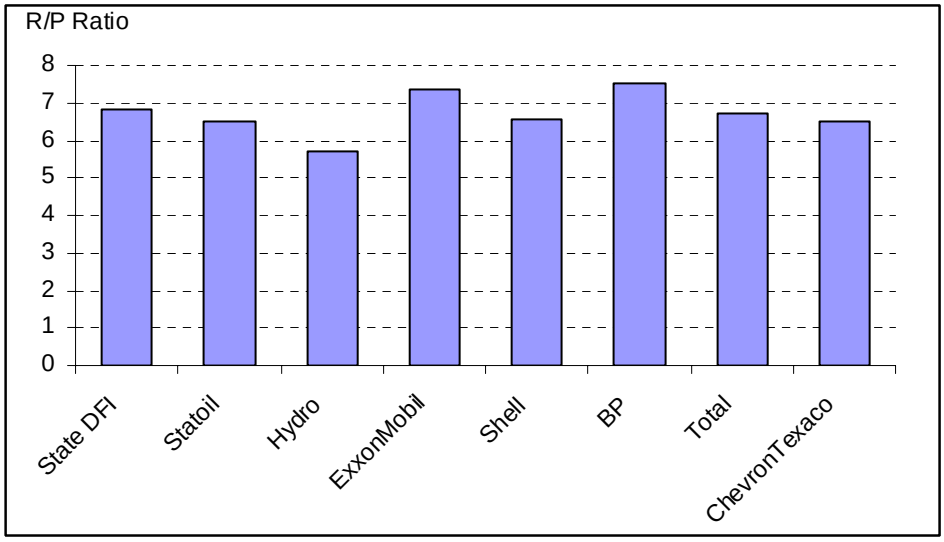


* Source Wood Mackenzie CAT product

R/P ratios, calculated in terms of the number of years the current production level can be sustained for, before the portfolio of commercial reserves is exhausted, are a commonly applied measure of the future health of a company's inventory of assets.

The State DFI's position, with an R/P ratio of 6.8 years, is in line with the international players, most of which currently have ratios of between six to seven years. BP and ExxonMobil have relatively healthy figures above seven years, whilst Norsk Hydro is the only company amongst the peer group with a figure of below six years.

Reserves/Production (R/P) Ratios



* Source Wood Mackenzie CAT product

Key Industry Trends in 2004

In this section of the report we reflect on the main trends that were seen in the upstream oil and gas industry during 2004. The issues have been grouped under two headings, to reflect those that impacted the industry globally as opposed to others that were more local to the North Sea area.

Global Themes

The issue of reserves replacement was key for the industry during 2004, which was highlighted by the furore over Shell's booking policy. This pointed towards the need for greater transparency by the industry in the reporting of reserves figures and there were calls for third party certification of reserves given the importance of this area as a proxy for a company's exploration performance.

The general lack of exploration success in recent years continued in 2004 and was reflected by results in Norway. This made it harder for companies to replace reserves and was partly due to the level of expenditure on E&A activity which remained low. The continued focus on cost-cutting following the period of mega-mergers at the turn of the century was evident during the year.

The lack of exploration success emphasised the need to maximise recovery from existing fields and discoveries and consequently there was a focus on investing in new developments and in existing fields in order to increase recovery and remaining reserves. This was also helped by the run of exploration success enjoyed by the industry over the period 1998 to 2000, which led to a backlog of projects to bring forward for development.

In Norway the focus was more on renewed investment on existing oil fields, as expressed by the initiation of new IOR projects, most notably on Gullfaks and by the expansion of infill drilling programmes, as seen for example on Brage.

This more bullish climate for investing in existing fields was also spurred by the higher oil price outlook. The uncertainty over oil prices, however, led to marked differences between the assumptions used for planning purposes and those in the forward market, with those being used for planning being much more conservative.

The strong oil price environment coupled with different perceptions of the future outlook for prices had a strong influence on the acquisitions and disposals market, which remained subdued.

Another theme during 2004 was the realisation that major volumes of LNG will be required by global gas markets, particularly in Europe and the eastern seaboard of the USA. This drove development activity in LNG projects in several regions of the world including the Middle East, West Africa and Australasia.

An increase in focus on heavy oil projects was evident during the year, for example in Venezuela and in Canada where some major investment decisions were taken to exploit oil sands reserves further. However, heavy oil projects of this type still contribute a small proportion of overall global output.

The industry in Russia also came to the fore in 2004. Some corporate changes were interpreted as a trend towards re-nationalisation and highlighted the potential difficulties in doing business in the country.

North Sea Area Themes

An important theme in the North Sea area in 2004 was the search for ways to increase worryingly low activity levels in the upstream industry, both with regard to exploration drilling and new field development.

Although E&A drilling activity increased in the UK it was from very subdued levels and drilling activity fell in other parts of the North Sea area including Norway. Development activity also generally proceeded at a relatively low level during the year and the average size of fields given development approval in the UK was half of that seen in 2003. Although the scale of new projects coming forward for development was disappointing the overall level of capital expenditure in the area was robust and indeed in Norway reached the highest level since 1998.

The lack of activity was tackled through the cross-border initiative undertaken by the Norwegian and UK governments. The agreement reached eliminated the need for complex cross-border tax agreements and should accelerate the process of bringing some fields to development, for example the Boa and Playfair fields, which both have small extensions across the median line.

The use of neighbouring infrastructure across the Norway/UK median line was an important element in the agreement, with the focus being on increasing the longevity of infrastructure in mature areas of the North Sea. This issue lay behind the introduction of the new Infrastructure Code of Practice in the UK, which hopes to build on the results from the 'Fallow Fields' initiative.

The new code is a voluntary agreement which aims to secure greater transparency in pipeline tariffs and operation as well as fair and reasonable terms for third party access to existing infrastructure. It covers all offshore infrastructure including pipelines and processing facilities and applies to both equity holders in the infrastructure and third parties interested in utilising the infrastructure for their future development opportunities. The code should help to ensure that marginal fields are not left undeveloped due to unnecessarily high tariffs and excessively long periods of negotiation.

In contrast to the relatively low levels of E&A and development activity, a positive trend was seen in the licensing of new acreage. In Norway, 2004 was the most successful year in terms of acreage and number of licences awarded since the first round in 1965. The number of companies taking up licences was also substantially up on previous rounds. This pattern was also repeated to a lesser extent in the UK but was not seen elsewhere in the North Sea area. Part of the increase in licensing in the UK was due to the continuing impact of the Promote Licence initiative, which accounted for the bulk of the 15 new entrants that were attracted to the sector during the year.

The increase in the number of new entrants was a theme of corporate activity in the North Sea area during 2004, not least in Norway where a further seven new participants became pre-qualified for involvement in the sector. The level of activity in the asset market in the region, however, showed a continued decline, with a significantly lower number of deals being concluded compared to the previous year.

Some generally minor changes were made to the fiscal and regulatory terms governing the North Sea area during 2004. In Norway the Government deliberated over the suggestions made by the Kon-Kraft Project and decided not to implement any reduction in the Special Tax rate for new fields or introduce a volume allowance for brown-field investments. However, some specific changes to Capital Uplift rates and a radical introduction of paying back exploration expenditure for companies without tax shelter were introduced.

In the Netherlands, the authorities decided in a similar fashion not to re-introduce the depreciation-at-will arrangement for investments made offshore. Although the Corporate Income Tax rate was reduced, this did not have a material impact on the overall level of taxation in the upstream sector due to its interaction with special petroleum tax.

The most important technology theme in the North Sea area during the year centred on advances in flow-assurance, as witnessed by the progression of projects which rely on long distance subsea tie-backs, such as Ormen Lange in Norway and Goldeneye in the UK. Steady advances were also seen in e-field applications but this was more of an ongoing trend.

Another issue during the year concerned the movement of exchange rates. The strengthening of local currencies against the US Dollar meant that the benefits of higher dollar oil prices did not feed through to revenues as strongly as might have been expected.

Methodology and Assumptions

The SDFI portfolio has been valued by Wood Mackenzie based on the methodology outlined below and in accordance with assumptions which are also set out in this section.

Standard Valuation Methodology

Wood Mackenzie's standard methodology for valuing oil and gas assets is designed to determine the price that would be paid by a willing buyer of assets in an open market transaction. Under this approach the valuations are not derived from a solely mechanistic valuation, but are adjusted to reflect market conditions at the time of the valuation.

Since the value of the SDFI portfolio is calculated on a pre-tax basis, the valuation is not intended to reflect the price that could be achieved in the marketplace, as any buyers would be subject to Norwegian upstream taxation. Therefore, the values we have calculated in this report are simply those which are arrived at using a mechanistic approach based upon field data provided by Petoro and economic assumptions provided by the MPE.

Commercial Fields, Pipelines and Onshore Assets

The SDFI portfolio contains interests in a number of "commercial fields" – defined by Wood Mackenzie as being those in production, under development or where government consent for the development is likely within the next 2-3 years. It also has an interest in a number of offshore pipelines which transport produced oil and gas to the market and in several onshore industrial projects directly related to its upstream activities.

The principal methodology used by Wood Mackenzie to value the commercial fields pipelines and onshore projects within the SDFI portfolio has been to construct a cash flow analysis for each field, pipeline and onshore project.

The cash flows have been run on the oil (and gas) price scenario pertaining to the relevant start or end year position and discounted using a 7% discount rate in real terms to derive a net present value ("NPV") for each asset.

Valuation Price Scenarios

The valuation of the assets has been undertaken on two different oil/NGL/gas price scenarios (as supplied by the MPE):

- one case, which is that used in the 2004 National Budget submission (autumn 2003) and which is relevant to the valuation of the SDFI portfolio as at 1 January 2004 (start year);
- a second case, which is that used in the 2005 National Budget submission (autumn 2004) and which is relevant to the valuation of the SDFI portfolio as at 1 January 2005 (end year);

These scenarios are outlined in more detail on the following page.

Data Sources

Petoro has provided all the data that we have used to form our conclusions on the valuation of the assets included in this report, with the exception of several minor cost items where Wood Mackenzie assumptions have been utilised. The data consists of, inter alia, production, sales volumes and cost profiles for individual fields and infrastructure projects.

The information has either been produced internally by Petoro for budgeting and planning purposes or has been supplied by other companies that operate the particular assets concerned. Petoro has also provided access to its personnel to discuss matters arising from our examination of the data.

Upstream - Key Assumptions

- **Oil, NGL and Gas Prices**

We have valued Petoro's oil and gas assets in this report using two sets of oil/NGL/gas price assumptions (as supplied by the MPE) which are those used in the 2004 and 2005 National Budget submissions respectively. The key oil price assumptions are set out in the following table:

Oil Price Assumptions in real (2005) Terms

Scenario	2004 Budget	2005 Budget	% Change
	Oil Price NOK/bbl	Oil Price NOK/bbl	
2004	175.2	254.0	+45
2005	154.6	230.0	+49
2006	144.2	210.0	+46
2007	144.2	190.0	+32
2008*	144.2	180.0	+25

*Oil prices are flat in real terms thereafter

Differentials to the Brent price (as supplied by Petoro) have been applied to specific fields in order to reflect crude quality/price differences beyond that of the portfolio average.

- **Inflation**

All the data has been compiled and run in real terms.

- **Exchange Rate**

All the data has supplied and run in NOK terms.

- **Discount Date**

Future cash flows have been discounted to 1 January 2004 or 1 January 2005 as appropriate.

- **Discount Rate**

The discount rate used for valuing all the assets is 7% per annum in real terms.

- **Corporate Overheads**

A forward estimate of corporate overheads (as provided by the MPE) over and above those applicable to specific assets has been modelled as a separate 'asset' within the SDFI portfolio. These take the form of three items: Petoro's Budget from the MPE, insurance provisions and costs related to Statoil's marketing of oil and gas.