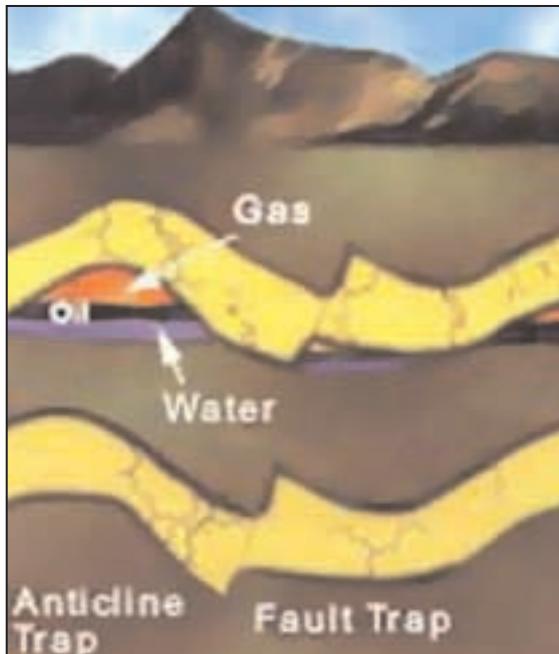




Oil and Gas Reserves: Communication with the Financial Sector

Rob Arnott



Outline and summary

- Oil company reserves disclosures are one of the most important pieces of information that the financial sector requires in order to analyse, compare and contrast the past and prospective operational performance of oil and gas exploration and production firms.
- Recent reserves re-categorizations by several companies have only served to highlight the inadequacy of the published information.
- Several recommendations are made that could help improve communication between oil and gas companies and the financial sector with regard to reserves reporting.

Introduction

Numerous debates surround the issue of oil company reserves from the point of view of the financial markets. Issues include the role of the reserves report, the adequacy of company reserves disclosure, the interpretation of the existing Securities and Exchange Commission (SEC) rules and consequently whether recent concerns are industry-generic or limited to certain companies, or both. It is not the intention of this paper to discuss any of the governance issues that surround reserves reporting, save to say that it is the duty of each company to comply with the local exchanges rules, which can vary significantly from country to country. Instead the paper focuses on the role of the reserves report in communicating with the financial sector.

Oil company reserves accounting has hit the headlines in recent months largely because of Royal Dutch/Shell's 'proven reserves re-categorization'. Royal Dutch/Shell is not unique. Exploration and production (E&P) firms regularly adjust their estimates of proven reserves; recent examples include El Paso, Nexen and Forest Oil. In addition, there has been the widely publicized debate around the reserves booking for the Ormen Lange gas development in Norway, and a critical debate as to how Norsk Hydro and BP have been able to reflect the same reserves numbers in their annual US financial filing (20F) as in their Annual Reports. A debate has also commenced as to why Exxon did not downgrade its reserves when the oil price collapsed in 1998.

The role of the reserves report

Oil and gas companies need all the information they can get about their petroleum prospects. They spend money on exploration activities, including regional geological studies, seismic surveys, drilling, sampling and pressure testing, reservoir modelling. Their analysis and interpretation of these data constitute *internal* information, because it is of competitive value to the upstream business department (which is competing within its corporation for resources) as well as to the corporation itself, since it may reflect on the prospects of neighbouring or analogous territory where exploration rights are owned by others or may be the subject of lease bidding or negotiations. The 'owners' of this information – the upstream departments – have great flexibility in how they structure this information. They would typically use a variety of different methods to match their expertise to the particular problem in order to maximize their understanding as new information is developed by their exploration and analytic activities.

This 'internal' knowledge is too detailed, too dynamic, and too complex for 'outsiders' to share in full, and in many cases is subject to confidentiality

agreements between partners or with the host state, but information made public is drawn from this database. There is thus a shared need for some rules of discourse, some common vocabulary, and a degree of trust or verification between 'insiders' and 'outsiders' so that the 'insiders' can communicate, and the 'outsiders' interrogate, the internal understanding. Uncertainty about the information is a major problem in the discourse, as is imprecision in the use of a clear and standard terminology.

A key problem in structuring information about reserves is that relatively objective estimates of reservoir characteristics must be combined with subjective forecasts of project feasibility and commerciality. Within a company, the management knows, or should have the capacity to know, how this is done so that it knows what risks it is taking when it sanctions further expenditure on exploration and development. ExxonMobil, for example, describes their process (but not its content). Its integration within company management procedures is given in the explanatory notes to their reserves data in their filing on Form 10K with the New York SEC.

Companies may use corporate planning assumptions to limit the range of the commercial uncertainties which are considered, and exhaustive internal debate may limit the range of technical development options. A company's internal information structure of future production estimates is not suitable for communication outside the company for many reasons:

- It would be dynamic, complex and difficult to interpret without full knowledge of all the company's practices and parameters – in other words without being inside the company.
- It would prejudice the company in competitive bids and negotiations if this information were available to its competitors and counter-parties in negotiation.
- It is often subject to confidentiality agreements.

Obviously some communication with respect to reserves is necessary for private companies with equity or bonds held on public stock and bond markets, since:

- The expectations of future production are an important predictor of a company's future capacity to reward shareholders and repay debt-holders.
- The reported current profits depend on the allocation of exploration and development costs between depreciation (charged over the lifetime of production) and current expense (charged to current profits). Reported accounts therefore require a definition of expected future production – typically described as '*proven*' reserves (see Figure 1) on a base which can be understood by investors and creditors of the company.

Figure 1: SPE/WPE/AAPG resource classification system

		Production		
		RESERVES		
		Proven	Proven + Probable	Proven + Probable + Possible
DISCOVERED COMMERCIAL		CONTINGENT RESOURCES		
DISCOVERED SUB-COMMERCIAL		Low	Best	High
UNDISCOVERED		PROSPECTIVE RESOURCES		
		Low	Best	High
		Unrecoverable		
		Unrecoverable		
← Range of Uncertainty →				

As a result of these requirements, the reserves report should aim to reduce some of that uncertainty by providing 'outsiders' with a small window into the company's resource base. It should attempt to balance the requirements of shareholders to learn more about the underlying value of their investment against the requirement of the company to maintain a level of confidentiality, essential in maintaining a competitive edge. The trouble lies in determining what level of disclosure is necessary.

For most companies, reserves will only be disclosed once capital has been committed. However, even this simple rule is subject to interpretation, and once this is combined with the fact that nearly every stock exchange globally has a different set of rules for reserves accounting, it only goes to demonstrate that reserves estimation, whether for internal or for external purposes, is an art and not a science.

Do reserves reports reflect underlying value?

Reserves reports should provide a better reflection of the underlying value of the company than its balance sheet. The balance sheet records the historical costs associated with drilling for, development of or acquisition of oil, and not the value of the oil and gas interests. The reserves disclosure, while not perfect, helps investors to fill this information gap. Thus by monitoring movements in the reserves report in terms of both volume and value, in the case of SEC reports, the investor should have a clearer understanding of

both the current value and the historical performance of the management in adding value.

The classification of petroleum resources as defined by the SEC, WPE and the AAPG (Figure 1) highlights the fact that when it comes to reserves reporting for the major oil and gas companies only the 'proven' reserves are usually disclosed, and these can comprise a very small part of the total resource base that the company might own at any one time. In the context of this classification it can be argued that a reserves report focusing solely on the 'proven' reserves does not fully and fairly reflect the full value of the company.

Furthermore, the reserves report can be used in a different way by different sections of the financial markets. For example, the viewpoint of a lender and that of an equity investor in the corporation will be very different. Even assuming that both sets of investors are considering the same 'proven and probable' reserves estimate, their preferences in terms of the distribution and probability of such estimates could well be different. The debt investor would be more concerned that the 'proven' level provides reassurance that the principal and interest will be repaid, whereas an equity investor may be prepared to take more risk here if there were a greater potential upside from the 'proven and probable' to the 'proven plus probable plus possible' level. So even when there is agreement on the most likely reserves estimate, different user groups will have different priorities and preferences.

There is a *caveat emptor* argument which should compel lenders and investors to exercise their own due diligence to estimate this potential underlying or

upside value of estimates beyond the 'proven' level, and not expect hand-holding from public authorities to require this speculative work to be done for them. After all, they too are in a competitive and risk-taking business investing in or lending to firms that succeed on the basis of how well they use this detailed internally generated information. To compel full disclosure could simply shift the 'game' from one of reporting relatively precise information about a limited part of companies' assets that have a reasonable assurance of generating returns to one of asking for a flood of very extensive and imprecise information about the resources that might or might never generate anything. The latter's absence of boundaries and scope for gaming may not be an improvement on the game. We all see the tip of the iceberg; but trying to ascertain what lies underneath is the essence of the competition that drives all who sail these waters – E&P companies, analysts, investors, lenders and punters alike.

Different reserves disclosures

Given that some level of disclosure is necessary, there remains the issue of reliability. This is of particular importance as there are a number of reserves disclosures and standards around the world with differing probabilistic reserves disclosures allowed in the UK, Norway, Canada and Australia, among others, and deterministic disclosures required by the SEC in the United States.

This last is the most widely used disclosure, owing to the importance of US capital markets and the fact that most major private oil companies have a US listing. Here companies are required to report their 'proven' reserves in a deterministic way, quite different from the probabilistic ways allowed on other exchanges. Thus the 'proven' reserves under the SEC definition can be different from the 'proven' (P90) reserves defined probabilistically elsewhere.

A clear example of this is presented by the disclosure required of companies by Canadian securities exchanges. With effect from the beginning of 2004, companies have been required to switch their disclosures from a qualitative to a quantitative basis. However, cross-border companies can apply for an exemption from reporting reserves under the new classification in recognition of the fact that the change would require them to disclose two widely varying sets of numbers.

Elsewhere, from January 2005 European- and Australian based companies will adopt IFRS (International Financial Reporting Standards), but at present there is no IFRS that specifically addresses the accounting for the exploration and evaluation of mineral resources. In addition, mineral rights and mineral resources including oil and natural gas are excluded from the scope of IAS 16 (Property Plant and Equipment).

A move to International Accounting Standards will provide an opportunity to harmonize, re-evaluate the data presented and, in the view of some, update the information relative to that currently presented under US Generally Accepted Accounting Principles (GAAP). However, the fact remains that the market will remain dependent on the requirements under US disclosure and the work of the SEC. It is debatable whether a number of non-US companies would be as forthcoming with information without the requirements of their US listing. Thus even if there are limitations with the data presented, it provides a useful source of information for the market-place.

Do reserves reports reflect economic reality?

Although US disclosure requires 'proven' reserves to be reported to the SEC, the complaint is that this does not reflect economic reality or the reserves that the company is using when formulating its internal plans and projects. One consequence is that companies have to maintain two reserves databases (the real reserves for planning and investment purposes, and those being allowed for financial reporting), and as a result a conservative view of the companies' resource position emerges. Investors are interested in the real economic data and, as shareholders, have no wish to see companies spend money unnecessarily and would broadly concur with these complaints.

However, the surprise from an investor standpoint is the extent and magnitude of the downward revisions to these 'conservative' reserves. Press reports suggest that the recent SEC enquiries into company reserves accounting were initiated because companies were booking reserves but then paradoxically failing to increase production, meet production targets or carry out further work on the announced 'discoveries'.

The conundrum from the investors' standpoint is whether the discrepancy between the reserves and the production represents timing differences (the lag between booking and production coming on-stream), over-optimism on the reserves, estimates, or a problem with the existing reserves with higher decline rates or lower recovery factors than previously realized.

Surprise has also been expressed in respect of reserves downgrades. If reserves are conservatively estimated, then by definition there should be more upgrades than downgrades. Thus downgrades happen rarely and occur because a fundamental error must have been committed or the original claims of conservatism were invalid. If this problem were just affecting small companies with one or two assets it would be more easily understood, but the fact that larger and more diversified portfolios have also been affected by significant changes (which the SEC is believed to define as greater than 10 per cent) is very surprising. The conclusion must be that there are certain issues related to specific companies.

SEC rules interpretation

It should always be remembered that the SEC rules were introduced with the sole purpose of protecting shareholders. They were brought in at a time when most of the US oil industry was still onshore, where regular grid well-spacing was common and therefore it was fairly easy, using deterministic methods, to calculate not just the volume of remaining oil in place but also its value. However, the oil and gas industry has subsequently witnessed a major technological revolution. It is therefore ironic that at the very time that the oil and gas industry is basing more and more of its investment decisions on the results of measurements from new technologies, the SEC has tightened up its definition of what can or cannot be reported and by inference has ruled out measurements from these technologies.

For example, the SEC has come under fire for disallowing the convention of 'lowest known hydrocarbons' and the use of 3D seismic to estimate reserves. This does appear to be an area in which the SEC is being unduly conservative or where its rules (dating back to 1978) need to be updated. The SEC has also been criticized for allowing certain technologies to be used for reserves estimations (e.g. 3D seismic) in the US Gulf of Mexico and disallowing the same technology when used elsewhere in the world. This implies that the same technology is somehow more believable in US territory than in non-US territory, which is clearly absurd.

Particular issues arise in the case of deepwater offshore deposits, where it would be very expensive (and physically and environmentally risky) to obtain flow data by the extensive pattern of drilling which is prescribed by the SEC, for onshore US fields; some relaxation has now been granted. Another issue relates to oil produced in Canada from mining operations in tar sands. The SEC does not allow such oil to be booked as petroleum reserves on the grounds that it is a mining product – although it is at least as predictable as the oil from underground reservoirs. It is noteworthy that the new Canadian reserves disclosures appear to allow a great deal of flexibility, and in this respect the booking of oil from tar sands is not ruled out. It just has to be identified under a category of 'unconventional', thereby allowing investors to know what they are investing in, because unconventional oil and gas have their own risk and cost profile.

The SPE/WPC system (Figure 1) distinguishes between 'developed' and 'undeveloped' 'proven' reserves. This distinction is also acceptable, though not required, by the SEC and companies filing with the SEC normally report both categories. 'Developed proven' reserves are those where the production and transportation systems are in place or there is a 'reasonable expectation' that they will be installed. The agency may require, as the SEC does, that

'reasonable expectations' be substantiated by the existence of sales contracts (for example for natural gas) or significant commitments to development expenditure (in the case of oil to be sold on the open market or through the producers' downstream facilities).

'Undeveloped proven' reserves are those where the geological evidence is similar to that of 'proven' reserves, but where production and transportation systems are not in place at the location of the reserves (but there is a reasonable expectation that they will be developed).

What is 'reasonable' commercially may be subjective. It is arguable that evidence of a company's commitment to development expenditure may be sufficient evidence, even if sales contracts are not yet in place. It is also perfectly possible for different companies to have different views of the probability of volumes of sales, as evidently occurred in the case of the different SEC filings by the partners in the Ormen Lange gas field in Norway.

The different levels of reserves booking for the Ormen Lange gas field development in Norway have received considerable press, industry and investor interest. In terms of economic reality, it is not a case of some companies being more conservative than others by 'booking' lower reserves numbers for the financial accounts. The five partners (Statoil, Norsk Hydro, BP, Royal Dutch/Shell and ExxonMobil) have all agreed to a development plan and to finance their respective shares on the basis of a common view of the P50 reserves and associated development costs. Thus if the lower 'conservative' reserves bookings turned out to be correct, the economic disaster – namely that all five partners had invested \$12bn in an uneconomic project – would afflict them all.

However, this issue has highlighted another industry practice – that of when and how companies book reserves. The practice of 'smoothing' reserves bookings in order to show steady reserves growth can be just as misleading to investors as over-booking. While companies may state that the 'proven' + 'probable' (P50) reserves estimate is the most likely, the industry does not appear to book 100 per cent of the 'proven' (P90) reserves level once a field is recognized, preferring instead to recognize different and usually increasing volumes over time. 'Smoothing' effectively understates the reserves volumes, compounding the problems of a reserves definition that the industry complains is too conservative in the first instance.

How are the reserves reports utilized?

For financial analysts, reserves are an indicator of future production potential and therefore of income. The ratio of 'undeveloped' to 'developed' reserves is an indicator of a company's capacity to bring forward new development projects: a falling ratio would indicate

the company was running out of projects. Metrics derived from reserves reports are also key indicators of a company's ability to create value through its exploration efforts and provide future production growth.

The success of a company's exploration and development programme and its ability to generate future projects is measured by the rate at which the programme adds to the company's 'proven' reserves. The company 10K filings with the SEC reveal categorically whether reserves additions are due to new discoveries, purchases of reserves, revision to reserves in currently proven reservoirs, and so on, with some information about the years in which these have taken place. The 'reserve replacement' ratio compares net additions to depletion by production: a falling ratio would simplistically indicate a declining future production, though the spasmodic nature of the opening of new acreage for exploration, the discovery process, technical innovation, and changes in prices and costs mean that single-year results could be equally misleading.

Taking Royal Dutch/Shell as an example, the re-categorization exercise points out extremely clearly the need for consistency and transparency. By re-stating reserves on a consistent basis, Royal Dutch/Shell's 10-year organic reserves replacement performance reduces from 112 per cent to 76 per cent. However, if the company had been more transparent about what was being included in its reserves bookings (i.e. greater 'granularity') the problems would have come to light from the perspective of an outside investor sooner than they did. A review of the SEC rules to clarify any existing areas of ambiguity, therefore, together with a move to a greater level of disclosure from companies (which has already been evident), will greatly improve the value of reserves reports.

Given the time lags, do the SEC reports reliably reflect near-term exploration performance? Again, in the case of Royal Dutch/Shell, its underlying exploration performance – in other words the reserves it actually discovered through new field exploration from 1999 to 2003 – was actually comparable to BP's despite widely differing exploration bookings in the SEC reports. Thus merely providing 'proven' reserves gives no indication of a company's resource position and its potential for future bookings.

What about the value of reserves?

A separate SEC issue is that it requires companies to report an estimate of the present value of their 'proven' oil reserves, with estimated production profiles, a 10 per cent discount rate, and the prices, taxes and costs prevailing at the close of business on 31 December of the year for which the company reports results. Few analysts would conduct commercial analyses under such assumptions, given the volatility of oil prices. Although these NPV calculations by

definition must fluctuate with year-end oil prices, reserves volumes need not do so. ExxonMobil's 10K filing states that, when revising its reserves numbers 'in general', the corporation does not view temporarily low oil prices as a triggering event for conducting the impairment tests (of reserves numbers).

The issue of SEC year-end pricing remains a contentious issue for both companies and financial markets alike. On the one hand the valuation compels all companies to use the same assumptions and has its origins in 1978 when spot markets for crude oil and gas did not exist. Now, with most oil and gas sold on the basis of spot markets, the use of a single spot point can lead to abnormally high or low valuations and well-lives. For example, in only two of the past 14 years, 1992 and 1994, did year-end oil price fall within 10 per cent of the average price for the year. There are industry practices including accounting conventions that, for example, induce refiners to reduce inventories, an activity that can influence oil and gas prices. The fact that gas prices are determined in northern hemisphere markets in December tend to tilt the price calculation to the high side, and therefore estimates of reserves of companies that are 'gas-long' could be distorted. (This raises another issue: the use of 'boe' (a figure which includes gas) which can mask a company's declining oil position. High year-end oil prices give a lower figure for reserves attributable to 'cost oil' under Production Sharing Agreements (PSAs). To the extent that prices are rising and more oil is produced under PSAs, the industry's reported reserves will decline faster than they would if average rather than year-end prices were used.

Given that the SEC reserves report, by its own definition, will underestimate the true extent of the resource base, it will result in an overstatement of unit costs. Therefore if the original intent of the reserves report was to inform investors of the underlying exploration performance of the company, then as it stands the SEC report falls well short.

Key Recommendations

The magnitude of certain reserves re-statements suggests that there are also company-specific issues which need to be addressed by the companies concerned. However, the real question is 'what should companies have to disclose?' Highlighted below are several recommendations that might help improve the level of communication between companies and the financial sector.

1. A simple adjustment to the existing SEC disclosure would eliminate much of the debate on which a company is conservative or aggressive in its reserves booking. This adjustment could require companies to show in greater detail, at a field level, the level of reserves booked. Norsk Hydro and Pemex both

detail the complete list of fields and the reserves quantities associated with their overall reserves booking. Companies will rightly respond that this reserves information is confidential or cannot be disclosed under the terms of licence/operating or partner agreements. However, this is debatable when the information being disclosed is not the 'real' 'proven + probable' (P50) reserves estimate (it is the 'proven' or P90 reserves estimate) and the financial or fiscal terms are not being disclosed

2. In addition, given that many Western governments and NGOs are pressing for greater disclosure by the industry of their financial and tax payments to developing countries, it might be useful for companies to disclose movements in reserves on a country-by-country basis. This would have the additional benefit of allowing investors to discriminate in more detail between the relative risks of investments in different countries. Such reserves reporting should also discriminate between oil and gas reserves.

3. Among the many issues the International Financial Reporting Standards will have to address is whether the disclosure of reserves should be supplemented with greater financial and value disclosure, as reserves have very different values depending on their location and maturity, and the fiscal regime.

4. In terms of the volumetric disclosure, the reconciliation of annual reserves movements already presented under US disclosure would form a strong framework from which to start. However, the disclosure could be augmented to disclose movements in the total company 'proven plus probable' (P50) reserves estimates in addition to the more detailed movements in

'proven' (P90) reserves that are already required. It is interesting to note that many companies will refer to 'proven plus probable' reserves as being the more useful estimate upon which to base investment decisions but that they are unwilling to disclose such data on a regular and annual basis.

5. Ultimately, it is important that reserves information presented in support of financial filings should adhere to three key considerations: consistency, transparency and utility.

- Consistency is important so that everyone is reporting on the same basis under a clearly understood framework with maximum objectivity. Given the competitive pressures to match peer group performance, any latitude to increase reserves through an ability to manipulate subjective judgments must be limited.

- Transparency is equally important and companies should provide as much transparency as possible with regard to geographical breakdown and the booking of material projects. At present only a few companies show real granularity in their reserves reports.

- Consideration should be given to how investors use this reserves information and how its disclosure in financial reports should be tailored accordingly. There is a real case for companies to provide additional information beyond the 'proven' reserves definition discussed above. This is already provided in some countries (e.g. Australia and Canada) and perhaps it is time for the SEC requirements to take this into account.

Rob Arnott is a Senior Research Fellow on Oil, Gas and Corporate Strategy at the Oxford Institute for Energy Studies. He Joined the Institute in December 2001 and focuses his research on all aspects of mature oil and gas provinces, as well as the corporate strategies of the major energy companies. For further details: <http://www.oxfordenergy.org/arnott.shtml>

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Sustainable Development Programme

Royal Institute of International Affairs

Chatham House

10 St James's Square, London SW1Y 4LE, UK

www.chathamhouse.org.uk/sustainabledevelopment

sustainable-development@chathamhouse.org.uk

Oxford Institute for Energy Studies

57 Woodstock Road

Oxford, OX2 6FA

www.oxfordenergy.org

publications@oxfordenergy.org

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