



GLOBAL Petroleum SEER Alert:

The Shell Reserve Downgrading: Year of the Monkey Business?

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Last week, Royal Dutch Shell, one of the biggest private oil companies in the world, announced that it was revising its reporting of reserves, and moving 3.9 billion barrels of oil equivalent from the proved to the probable category. This sent a shock into the stock market, which immediately dropped Shell's share price by 7%, and raised questions about the reporting of reserves throughout the industry and fears of a wave of revisions in the future.¹ Shell, for its part, argued that the amount of the petroleum present was not in question, but rather the timing of its development, while some other companies rushed to state that they had not been so aggressive in their accounting and would not need similar revisions.

Looking more closely at this issue suggests that Shell is largely right, but that it is possible that analysts had been misled (or misunderstood) the value of Shell's reported reserves. Largely, this is due to reporting conventions and any discrepancy should not be large.

Reserve classification

First, the word reserves is often used in a careless manner. "Reserves" should refer to discovered oil, as opposed to "resources" which refers to discover it an undiscovered oil. The term "proved reserves" is intended to have a more narrow, carefully defined meaning and is distinct from probable and possible reserves. In theory, the term reserves refers to proved plus probable plus possible and even potential, but typically it is just used by laymen who do not understand the distinction.

Proved reserves is a term chosen to refer to oil or gas which has been discovered and whose amount is known with a high degree of certainty, particularly as a result of drilling, and which is considered recoverable in both the technical and economic sense. Some refer to this as P90 reserves, meaning there is a 90% chance that this level of reserves will be recovered from the field. Companies usually refer to reserves which have been developed as proved reserves.

Probable reserves are those which are believed to exist with reasonable certainty but which are not developed for production or been shown to exist through drilling. This can include natural gas in a remote field which has not yet been declared commercial but which is known to exist. Some also use the term P50 to indicate and even probability that reserves will ultimately reach this level.

(The SEC has also begun an investigation into whether or not some US companies are inappropriately booking reserves in the deepwater Gulf of Mexico that haven't been drilled but whose presence the companies feel have been demonstrated through the use of advanced seismic techniques. This is a completely separate issue, although the SEC may now become more conservative.)

¹ A few suggested this was evidence of imminent geological scarcity of petroleum, but that is untrue.

Economics

For oil or gas to be considered a reserve it must be profitable to produce, which for oil almost always means only that the costs are low enough to make production profitable. Unless there are problems with the reservoir or the field is very small or unusually remote, oil is economical to produce and simple to market. In cases where very small fields are found or the oil is judged uneconomical, the exploration well may be described as dry or plugged and abandoned, as opposed to indicating that oil was found but in insufficient quantities for production to be economically viable.

This distinction between cost and marketability is much more important for natural gas, whose transportation costs are extremely high due to its low density. The need for specialized equipment to liquefy, transport and regasify natural gas for long distance transportation means that markets are relatively limited, even when the consumer price netted back to the field makes it profitable to produce. Thus, large cheap natural gas fields may go undeveloped for many years, as is often the case in Asia, Africa, and Latin America. In such a case, the gas is not considered a *proved* reserve because, lacking customers, it is not economically viable. Companies usually wait to declare these gas fields as proved reserves until they have solid sale prospects.

(At the national level, more attention may be given to field size, technical produceability, and cost rather than strict economic viability. Thus, countries like Iran and Russia have huge gas reserves which have gone unproduced for many years and which have no immediate prospects for development, but the government reports them as proved reserves.² In the US on the other hand, when it became clear in the 1980s that there would be no development of the Prudhoe Bay gas cap in the near future, the government dropped it from its reserve estimates. The gas is, of course, still there.)

The Shell Case

This particular case has caused a lot of concern primarily because of the size of the revision, both an absolute and in relative terms. In the past, revisions have occurred due to falling oil prices, as in 1998, or when production problems suggest a field will not experience the recovery initially anticipated. But I can recall no instance where a large company downgraded its reserves [sic] by 20%.

And it seems that the mistake was mostly one of listing reserves as proven when they were found but not guaranteed to be developed and sold, that is “proved undeveloped”. Shell says that approximately half of the revision was due to the Gordon gas field in Australia and its Nigerian operations, with the former being gas intended for LNG project and the latter being deepwater fields whose development the government has not yet approved. This implies the change was a financial one not a geological one: the company has no less expectations that the oil and gas are in the ground, they are just reducing the certainty about the production, and especially the imminence of its cash flow.

This highlights the role of imprecise financial reporting and analysis in this controversy. First, it suggests that shareholders will now view Shell’s reserves portfolio as being substantially less valuable. Coming after the financial scandals of the last few years, the revision will be held to a much higher ethical standard that might have been otherwise. Shakespeare commented that Caesar’s wife should be above suspicion, but in the Enron case, even Caesar did not appear to be subjected to scrutiny, while now it appears that Caesar’s dog must be above suspicion. Shell’s CEO may survive this controversy, but the attacks are no doubt more virulent than they would have been a few years ago.

Of course, the recent failure of a number of oil companies to meet production targets does not help the company’s case, making sector analysts much more skeptical about industry pronouncements. And the fact that Watts was head of the exploration and production division when the aggressive booking of reserves occurred is another strike against him.

Oranges and apples, seeds and trees, carats and carrots

² The *Oil & Gas Journal* is the primary source of proved reserves at the national level.

There is a real issue here, however, regarding the value of reserves as reported by oil companies. An aggregate report of reserves in barrels of oil equivalent is not quite useless, but nearly so--if not misleading. Too many analysts focus on company reserves and so-called finding cost, usually at a very aggregate level, which can over or understate company performance and value very substantially. The wellhead values of oil and gas--which is the only number that should matter to the analyst--vary substantially over time and especially by location. The much higher transportation and distribution costs of natural gas makes it worth much less at the wellhead in heat equivalent terms. Yet in reporting "barrels of oil equivalent" companies and analysts are converting on the basis of heat equivalence, not price or value equivalence.

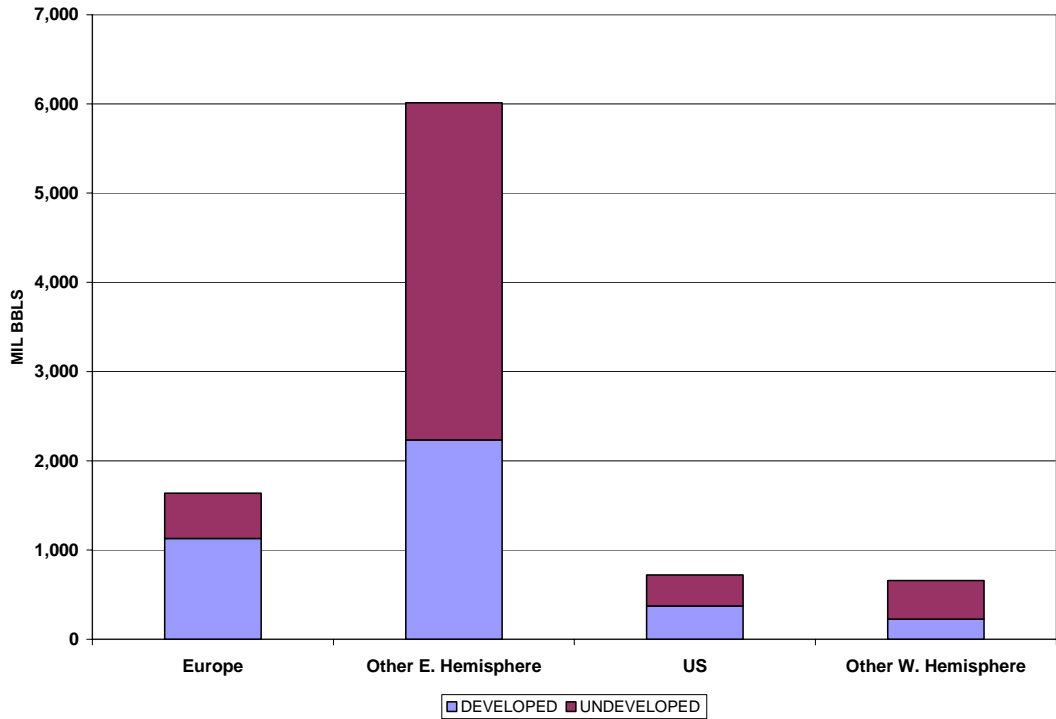
For example, the wellhead price of natural gas in Indonesia or Australia can be as low as \$0.50 to \$1 per Mcf, or \$3-6 per barrel of oil on a heat equivalent basis. Converting natural gas to a liquid and transporting it overseas can cost as much as \$10-\$15 per barrel of oil equivalent, 10 times the cost for liquid petroleum. Thus, a 6 trillion cubic feet gas field in Australia would be worth a fraction of the value of 1 billion barrel oilfield in the same location. If analysts do not break out reserves by oil and gas, and by location, they will reach a very misleading estimate of the value of the Company.

But Shell's primary sin is the manner in which it implied that the cash flow from its reserves would occur sooner than is likely to be the case. An analyst would reasonably expect that proved reserves would be produced sooner than probable reserves, meaning their discounted value would be noticeably higher given any reasonable discount rate, say 10 or 15% per year. If the analysts judging Shell's stock were looking only at estimates of proven reserves, and not projections of when those reserves would deliver cash flow, they would probably overvalue the stock.

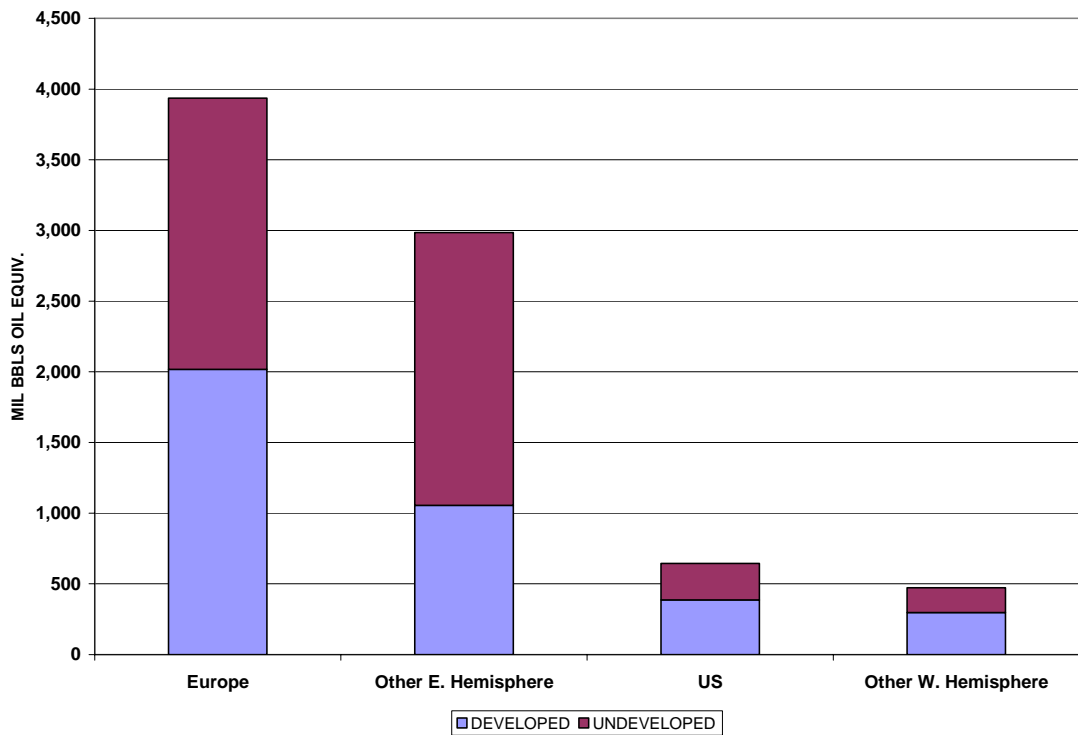
Shell's Numbers

In fact, by looking at Shell's annual report for 2002, two things become apparent. First, although Shell does show "proved developed and undeveloped reserves" they also list "proved developed" allowing "proved undeveloped" to be measured with a simple calculation, as is done in the two graphs below. Breaking out developed and undeveloped is very informative in terms of understanding the relative value of the reserves, although it hardly provides precise estimates of the timing of production (and cash flow).

Proved Oil & NGL Reserves, Shell, Year-End 2002



Proved Gas Reserves, Shell, Year-End 2002



Reserves converted on a Btu basis.

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And without question, a much greater geographical disaggregation would be more precise, especially for gas, where Canadian gas reserves are far more valuable than Peruvian, for example, but both fall under “other W. Hemisphere”. Overall, the use of “proved undeveloped” does confuse matters somewhat, but it is one of a number of factors that prevent a precise understanding of the value of an oil company’s petroleum holdings. A far greater error would be that of investors who, if they truly ignored these distinctions, will have erred significantly. But the chef cannot be blamed if the diner eats his peas with a knife.