



What the hell are oil reserves anyhow?

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When Exxon or Chevron report their proved reserves as X and Saudi Arabia and Nigeria report their proved reserves as Y what does that mean?

It is important to understand that publicly-traded companies and other entities have different meanings and different standards that they adhere to when they report their "reserves".

In general, countries have no legal standards to abide by when reporting reserves. For example, when Saudi Arabia says they have 260 billion barrels in "proved reserves", this statement is akin to the North Korean government saying that their citizens have an average life expectancy of 104 years. You and I might be skeptical of this, but there is no way to independently verify the claim.

We can take informal surveys, query the populace on an ad hoc basis, or relate this number to other populations that we have hard data about. In the end, however, the North Korean government will claim that 1) their population is special, 2) they have data that you don't, 3) they don't want to share this data with the world, and 4) no you can't come in and collect your own data. So in the end you have to decide based upon your belief in their credibility.

If you personally know five Korean individuals who are over 100 years old, you might be much more believing in the argument that the average life expectancy is 104 years. I, on the other hand, having read numerous books on statistics, am a strong believer in statistical analysis, hard data, and verification.

The point here is that when the Saudi's claim that they have 260 billion barrels in proved reserves you need to take both words "proved" and "reserves" with a grain of salt.

Now let's compare this to what are claimed by publicly-traded companies as their proved reserves.

Any company that trades securities (stock, bonds, ADRs, etc.) in the US is subject to the rules laid down by the Securities and Exchange Commission (SEC) ([Federal Securities Laws and the Energy Policy and Conservation Act of 1975 Reg. § 210.4-10](#)). The SEC has very specific rules as to what can be claimed as proved reserves of hydrocarbons. Those rules, [as discovered by Shell](#), and by [El Paso Energy](#) in 2004, are very specific and quite conservative. They have only a tenuous relationship to what a scientist might estimate to be the recoverable volume from a particular accumulation. Not only that, but straying from these rules can result in incurring real and painful penalties to a company concerned primarily with making money.

When I say the rules are conservative, I mean that they do not allow any extrapolation of the data, they do not allow any use of probabilistic modeling methods, and they do not, for the most

part, allow for the use of any modern seismic or petrophysical techniques, or well test information, or numerical modeling techniques to help establish the boundaries of an accumulation or how much of the accumulation might be recoverable.

Even more important, for a company to report discovered volumes in the ground as proved reserves, they must be able to demonstrate that these volumes are economically recoverable AND they must have taken a corporate decision to invest in the development of the resource. This last requirement is partly what got Shell into trouble when they booked a large reserve volume from the Gorgon gas field, offshore western Australia, as part of their proved reserve base before any of the companies involved had taken corporate actions to fund development of the resource. Shell had to write down the reserves, not because the resource did not exist or ultimately wouldn't be developed, but the demonstrated volume did not meet the SEC's definition of proved reserves. [Ultimately, some or all of those reserves will be rebooked.](#)

The last thing I want to say here is that the SEC allows companies to publicly disclose proved reserves only. They specifically prohibit the disclosure of unproved reserves (some of which are commonly referred to as "probable" and "possible" reserves). Consequently, the reserves quoted by most companies each year, I would argue, almost certainly underestimates the total volume of hydrocarbons that at company is likely to ultimately produce from its equity leasehold at any particular snapshot in time.

Now I know that many people who read the above statement will scoff at it and claim that companies have a strong financial incentive to overstate their reserves. I will not deny that this is so. However, even if their proved reserves are overstated, the sum of proved plus (undisclosed) probable reserves is, in most cases, significantly greater than most company's proved reserve base (even if inflated). This is certainly true for most of the majors who have discovered very large volumes throughout the world (especially in deep water), but have not taken corporate decisions to finance their development yet.

So getting back to the first question comparing Exxon's proved reserves to Saudi Arabia's "proved" "reserves" I hope that you can see that, whether or not you find Exxon to be a corporation to be admired or villified, the volumes that support the financial basis for their company are not going to disappear overnight into the ether. On the other hand, as Matt Simmons has been trying to point out for years, no one really knows what the Saudi's reserves are, proved or unproved. However, what they report as proved reserves is something very different than what Exxon reports.

For all those interested, a great resource to see how all of the different reporting entities describe reserves [can be found here.](#)



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