

[How Much Oil Is Really Down There? Oil And Gas Reserves Accounting Needs Updating](#)

The disclosure of "proved reserves" has been one of the great rituals of the reporting season for oil and gas companies, and one carefully monitored by investors. It's recently taken on even more significance with high and jittery prices, concerns about energy security, and plain fear of running out.

In a world of uncertainty, these disclosures seem to provide direct, quantitative information on the future oil "inventory"-at least for companies reporting to the US Securities and Exchange Commission (SEC)-and a basis on which investors can evaluate companies.

The reality is different. The current system mandated by the SEC for reporting "proved reserves" has become antique, and the information it provides to investors increasingly diverges from the actual resource position of many companies. Nor does it serve the original intent of disclosure-energy security.

The issue should not be confused with recent cases and settlements involving the practices of certain companies. The significant problem is generic, and it is with the rules themselves, which need to be modernized if they are to regain their relevance. The current system is roughly analogous to a doctor restricted to making a diagnosis only on the basis of invasive surgery rather than with a CAT scan.

Surprising as it might be, the current rules for reporting reserves-what might be called the "1978 System"-essentially insist on 1970s technology and methodologies. Back then there was no digital revolution, and the frontier for offshore development was 600 feet of water; today it is 12,000 feet.

The rules do not recognize the vast technical progress over the past 30 years, and as a result, standard techniques used today by companies to set multibillion dollar investment programs are not approved, or only partly approved, for use in describing proved reserves for disclosure purposes to investors.

In addition, the rules simply have not kept up with the globalization of the industry. They were devised for onshore operations in "Texlahoma," the "oil patch" of Texas, Louisiana, and Oklahoma that was the center of industry activity in the 1950s and 1960s.

Today more than 80 percent of the total of companies' proved reserves are outside the United States; and differences among the fiscal regimes in several countries make it harder, not easier, to compare domestic and international reserves.

As perverse as it may sound, under the "production sharing agreements" that are common in many oil-producing countries, when the price goes up, proved reserves go down.

Major projects today dwarf those in the past, both in size and complexity. "Nontraditional projects" are drawing an increasing share of capital, but they are not adequately accommodated under the "1978 System." This includes a significant part of Canadian oil sands, gas-to-liquids, and projects in what's called the "ultra-deep water." And yet these "nontraditional liquids" will account for as much as 45 percent of oil production capacity in North America by 2010.

Nor does the current system fully account for the larger, commodity-driven liquefied natural gas business that will be critical to future US natural gas supplies.

The current rules were laid out in response to the 1973 oil embargo that shook not only world politics and the global economy, but also American confidence. How much oil was left in the United States?

This was an urgent matter of energy security, and Congress told the SEC to implement a system for reporting on the resource base. The SEC in turn viewed its mandate through the lens of investor protection.

Though the word audit is customarily used for these evaluations, oil and gas reserves cannot be "audited" in the conventional sense of a warehouse inventory or a company's cash balances.

Rather, "proved reserves" are an approximation about formations thousands and even tens of thousands of feet below ground. Their size, shape, content, and production potential are estimated in a complex combination of direct evidence and expert interpretation from a variety of scientific disciplines and methodologies.

Added to the science is economics; if it costs more to produce oil from a reservoir than one can sell it for profitably, then one cannot "book it" as a

reserve. Reserves are "proved" if there is a 90 percent chance that ultimate recovery will exceed that level.

In the face of such complexity, the SEC adopted technical definitions developed by an independent group, the Society of Petroleum Engineers (SPE), the key technical and professional group whose members are experts from both the academy and industry.

Specifically, in setting its own standards, the SEC relied on SPE definitions promulgated in 1965 and consultations in the 1970s. This became the basis of the "1978 System." And that is the system still in place today, despite the fact that the SPE has revised the definitions three times since in response to major advances in measuring reservoirs, and is in the process of doing so once again.

For the most part, however, the SEC continues to rely on the technology and "best practices" of the 1960s and 1970s.

The rules describe proved reserves in terms of "reasonable certainty"-but ties this to direct physical measurement for estimating the volume of oil or gas in a specific reservoir. That works for onshore or shallow-water wells, but is not effective for large offshore projects, where the reservoirs may lie below 7,000 feet of water and another 20,000 feet beneath the seabed, and where gathering the SEC-mandated direct physical data is immensely expensive and also poses physical risks.

Yet in the meantime, the industry has expanded the standard for "reasonable certainty" to include noninvasive means of measure and estimation. Think CAT scan. And very large amounts of money are invested on the basis of these methods.

The result is a disconnect between the mandated reserves disclosure and the reality of companies' plans, strategies, and activities-and how they are spending many billions of dollars.

Owing to the current rules, much of what they are working on, though particularly relevant to their futures, cannot be counted. That divergence hardly helps investors understand the position of a company and its future prospects.

An example: One company judged that it had 658 million barrels of oil classified as proved, or reportable, under current SPE guidelines using a widely accepted technique called the pressure gradient method. Under SEC guidelines, based on the older technological approach, it could only disclose 261 million barrels of proved reserve.

At \$50 a barrel, this represents a \$20 billion difference in future reserves. On the pure science, it is generally agreed that over the 20- or 30-year life of the field, it will bring to market a volume much closer to 650 million barrels.

The current system also insists on using year-end prices to calculate whether oil and gas reserves count as "economic" and thus as proved, rather than some kind of average. But this is no sure guide either to what happened during the year or to what will happen in the coming year-or even to what happened on that particular day.

The price for Canadian heavy oil dipped at the very end of 2004, owing to particular short-term pricing conditions, and so a substantial amount of heavy Canadian oils lost their standing as proved because they were temporarily no longer profitable, and thus two billion barrels had to be "debooked." Yet the price quickly bounced back, and those reserves once again counted as "proved."

Current estimates are that the oil and gas industry will spend some \$6 trillion over the next 25 years to meet the future demand for oil and gas. The accuracy and reliability of reserves data are at the heart of the industry's capabilities and its funding of these projects. The real beneficiaries from reforming the system for disclosing proved reserves will be investors, of course-and the consumers who are counting on the availability of future supplies. And as recent events remind us, it will also be important for energy security.

About the Author

Daniel Yergin, chairman of CERA, received the Pulitzer Prize for "The Prize: The Epic Quest for Oil, Money & Power" and the United States Energy Award for lifelong achievements in energy and the promotion of international understanding. Vist [CERA](http://www.cera.org).

Source: <http://www.onlineearnings.net>