Historical Comparison of PD vs PUD: Largest Publicly Traded Oil Companies

ML Van Der Loop
Ammonite Resources, Inc.

“Royal Dutch Shell said yesterday that it was reducing its proven oil and gas reserves by 20 percent. . . .

. . .According to Shell, more than 90 percent of the reduction came from projects that are classified as undeveloped. . . .”
“I am becoming sick and tired about lying about the extent of our reserves issues. . . .”

Walter van de Vijver, Shell executive, email

Fear on Wall Street ;
Anyone else out there sick and tired of lying. . . .??
Reserves growth is highly correlated with market returns; ... regression analysis of reserves growth vs common stock returns has an 83% correlation to share price appreciation.

Source Bala G Dharan, Rice University Professor of Accounting, Energy Forum, Houston TX, October 2004
RESERVES

Proved Developed
Proved Undeveloped

Reported to SEC on Form 10K
In Annual Report
- Houston Public Library
- Annual Reports on CD
- 10K report
- Supplemental Information on Oil and Gas Producing Activities
10K report to SEC
<table>
<thead>
<tr>
<th>OIL AND GAS RESERVE DATA (UNAUDITED)</th>
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**Estimated Proved Reserves of Crude Oil and Condensate (Millions of Barrels)**

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**Proved Developed Reserves**

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<tr>
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<td>611</td>
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Ratio of PUD to Total Reserves

- Proved Developed and Undeveloped
- Subtract Developed
- = Undeveloped Reserves
- Undeveloped is what % of the total?
Royal Dutch Shell
Percent Proved Undeveloped Crude Oil Reserves, Worldwide
- Look at the ratio of PUD to PD. What is a normal ratio?

- Companies out of that norm might be suspect – or could have high PUD Reserves

- What drives that ratio?
Companies in this Study

- Shell, Exxon/Mobil, BP(Amoco/Arco), Chevron/Texaco, Conoco/Phillips, Amerada Hess, Apache, Burlington, Devon, El Paso, Enron EOG, Kerr McGee, USX Marathon, Occidental, Unocal, Anadarko
Exxon Mobil vs Shell
Pd vs PUD Ratio

Year

Percent PUDs

Exxon
Exxon Mobil
Mobil
Royal Dutch Shell
Percent Proved Undeveloped Reserves, 25 Largest Publicly Traded Oil Companies
What should we expect in PUD Reserve reporting?

- Mature producing areas
  - Low % PUD

- Immature producing areas
  - High % PUD
  - Some International areas Immature production

- Big Discovery - PUD % should increase
Phillips Africa,
Example History of a Discovery and Development Project
As Project Matures, % Developed Increases, and % Proved Undeveloped Decreases
What creates Proved Undeveloped Reserves and increases the Ratio?

- Discoveries
- Property Purchases with upside
- 3d, other methods, enhance existing fields
- Price increase
BP Discoveries increase PUD Ratio

The graph illustrates the trend of Percent PUDs over time for different oil companies: BP, Amoco, Arco, and Royal Dutch Shell. The x-axis represents time from 1985 to 2005, while the y-axis shows the Percent PUDs ranging from 0.00 to 0.90.
Giant Oil Discoveries Worldwide

Source: Horn, AAPG, 2004
What creates Proved Undeveloped Reserves and increases the Ratio?

- Discoveries
- Property Purchases with upside
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Amerada Hess Purchase Affects PUD Ratio

The graph shows the percentage of PUD (Proved Undeveloped) over time for different companies:
- **Shell** (represented by red squares)
- **Amerada Hess Gas** (represented by green triangles)
- **Amerada Hess Oil** (represented by black triangles)

The x-axis represents time from 1985 to 2005, while the y-axis represents the percentage of PUD from 0.00 to 0.80.
“A study by Credit Suisse First Boston reports that major companies have replaced more than half their depleted oil reserves by buying reserves from other companies or re-estimating existing reserves. In 1990, companies replaced two thirds of reserves with new discoveries. . .”

What creates Proved Undeveloped Reserves and increases the Ratio?

- Discoveries
- Property Purchases with upside
- **3d, other methods, enhance existing fields**
- Price increase
Are we really discovering more?

- **GOM 1983-1990** 70% of reserve adds were in older fields

- **GOM 1990-1998** 84% of reserve adds were in older fields

Source: NRG Associates, *The significant Oil & Gas Fields of the Gulf of Mexico Database*
Did technology actually increase the ultimate recovery of the original oil in place? Production changes are simply due to technological and price improvements. Large gains are just paper barrel changes.

Source: Matthew Simmons, Simmons International, April 14, 2004 Energy Forum, Reserves Reporting
Why is this entire trend going up?
What creates Proved Undeveloped Reserves and increases the Ratio?

- Discoveries
- Property Purchases with upside
- 3d, other methods, enhance existing fields
- **Price increase**
Price Increase causing upward trend?
“The Wall Street crowd demands quarterly results, but oil and gas is not a quarterly business. This essentially discourages drilling . . . prospects when the need to explore for new production and reserves is more pressing than ever.”

Source: Louise Durham, AAPG explorer. October 2004
“The exploration world is not a quarterly world”  Peirs Gormly, GXT vice president of marketing, APPEX 2004

“It seems the industry has forgotten about making discoveries and is focusing its efforts on anything but exploration”  John Seitz, Endeavour International Corp, APPEX
“Thanks to the [SEC] reporting rules, . . . . A comforting and convenient illusion of ever –increasing reserves. . . .”
“What is the relevance and importance of oil and gas reserve disclosures to investors? To national energy policy decisions?”

Congressman John Dingell, May 2004, letter to House Committee on Energy and Commerce
Importance to Investors

Increase in % Proved Undeveloped Reserves due to:
- Discoveries
- Purchases
- Technological Enhancements
- Price Increase
- Pressure from Wall Street
Importance to National Security

- Saudi Arabia, OPEC ???

- Reserves evaluation ?

- Anyone in OPEC pacing the halls saying “I am sick and tired of lying. . .” ???