

Aegis Comparative Analysis: Petrobras Vs. International Majors

Select Operating and Financial Comparisons



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- A boutique investment bank providing strategic, merger, acquisition, and divestiture advise to the energy industry

– www.aegisenergy.com

- **Affiliate: Aegis Muse Associates, LLC**

- An advisory organization dedicated to the downstream energy business

- a Joint Venture founded in 1998 with Muse, Stancil & Co.

- Muse, Stancil & Co.

- A leading international consulting company specializing in the technical and economic assessment of downstream energy-related matters

- www.musestancil.com



– *The intersection of insights required to respond to strategic issues In the 21st century*



- Strategic financial advisory expertise with few peers
- Operational knowledge rooted in experience
- Commercial credentials and ideas required to deliver creative solutions

- **The purpose of this document is compare Petrobras to other large, open capital integrated energy companies in order to gain insights into the company's financial and operating attributes and its relative market valuation**

- **The financial statements on which the analysis contained herein is based are for the year ended 2002.**

- **Conclusions:**
 - **Petrobras is comparable in physical size and configuration to the integrated major companies but smaller than the three super majors**
 - distinguishing characteristics
 - liquids oriented reserve base; much higher oil than natural gas
 - longer reserve lives; consistent with a reserve base at a comparatively early stage of development
 - geographically and geopolitically concentrated; an inevitable consequence of the company's history as Brazil's national oil company

PETROBRAS COMPARATIVE PERFORMANCE (CONT'D)

- **Conclusions (cont'd):**

- **The company's financial performance lags its peers in revenues and EBITDA but is comparable in Net Income**

- lower revenues and EBITDA
 - lower revenues attributable to proportionately higher intra-company transfers and the resulting elimination of related revenues in financial consolidation
 - lower EBITDA consistent with high cost E&P
 - both revenues and EBITDA reduced by relatively high government take
- lower EBITDA offset by lower depreciation and lower income taxes, resulting in **net income comparable to other Integrated Majors**
- higher cost, lower profit E&P operations; consistent with heavier crudes and deep water offshore development
- more profitable refining & marketing operations, a result of the Brazilian market being short product and long crude, similar to the California market just as the North Slope production came on stream in the mid '70s
 - relative refining margins influenced by Real/\$US exchange rate
 - depreciation of the Real versus the dollar from December '01 to December '02 reduced Petrobras' R&M performance when expressed in \$US/bbl.

PETROBRAS COMPARATIVE PERFORMANCE (CONT'D)

- **Conclusions (cont'd):**

- **Dissimilar to other privatizing state oil companies**

- many fewer employees

- **Deeply discounted in the stock market**














- in part explained by sovereign and currency risk
 - Latin America
 - change of administrations (and senior executive corporate management) following presidential elections
- also due to high sensitivity of E&P results to crude price volatility
 - lower valued, heavy crudes
 - high cost deep water development
 - high government take
- depreciation of Real versus \$US reduces contribution of very sizeable domestic R&M operations

- **The stock appears undervalued**

- valued cheaper than the other privatizing companies
- valued cheaper than Repsol, a Latin American analogue

PETROBRAS COMPARISONS

- Aegis compared Petrobras to other publicly traded integrated oil companies
 - Companies were categorized into groupings
 - Super Major: Global oil companies distinguished by their size
 - Integrated Major: International integrated oil companies
 - Privatizing: Integrated oils with continued state participation
 - Although Petrobras was grouped with the Privatizing companies, its size and performance is consistent with that of the integrated majors
 - Comparisons were made in the following five categories
 - Absolute Size
 - Operating Characteristics
 - Operating Performance
 - Financial Performance
 - Stock Market Performance

Super Major	Integrated Major	Privatizing
 BP	 ChevronTexaco	 Eni
 ExxonMobil	 ConocoPhillips	 Petrobras
 Royal Dutch Shell	 Repsol-YPF	 PetroCanada
	 TotalFinaElf	 PetroChina
		 Sinopec
		 Statoil

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ABSOLUTE SIZE COMPARISONS

- Petrobras is comparable in size to the Integrated Major companies in terms of physical assets
 - before the ChevronTexaco and ConocoPhillips mergers, Petrobras was one of the largest Integrated Majors
- When measured by revenues, EBITDA, and total assets, Petrobras is smaller than the other major integrated companies

	Petrobras	Super Majors	Integrated Majors	Petrobras vs Super Majors	Petrobras vs Integrated Majors
Reserves (million BOE)	10,534	19,148	8,895	55%	118%
Oil and Gas Production (mBOE / day)	1,711	3,906	1,861	44%	92%
Refining Capacity (mbpd)	2,021	4,467	2,084	45%	97%
Employees (no.)	40,848	107,917	65,398	38%	62%
Total Assets (\$ billions)	\$32,018	\$154,820	\$70,893	21%	45%
Revenues (\$ billions)	\$22.6	\$179.0	\$79.8	13%	28%
EBITDA (\$ billions)	\$6.2	\$25.3	\$10.8	24%	57%
Net Income (\$ billions)	\$2.3	\$9.1	\$2.3	25%	101%

 **Petrobras**

 **Super Majors**

 **Integrated Majors**

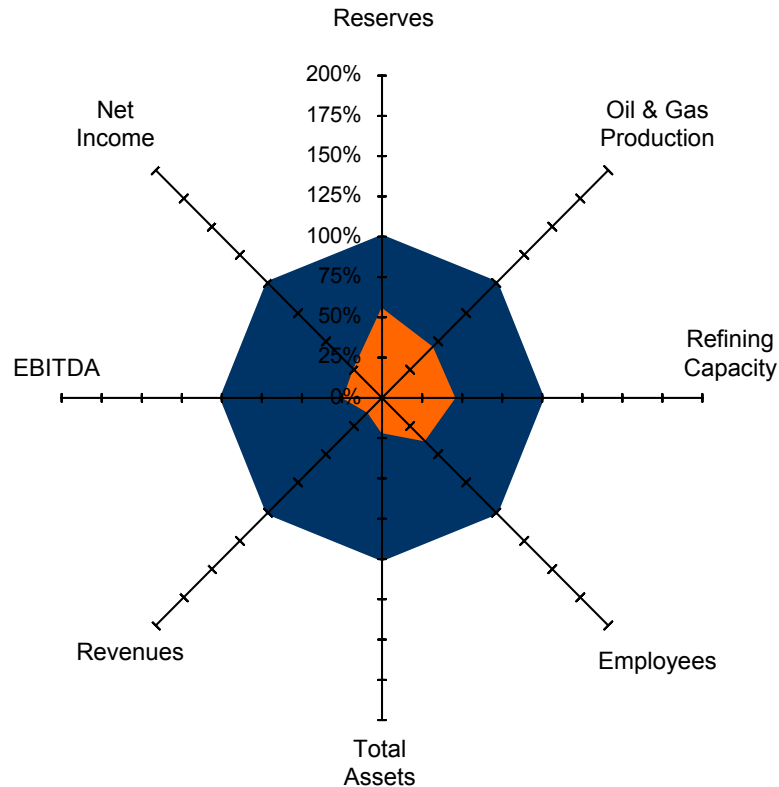
BP
ExxonMobil
Royal Dutch Shell

ChevronTexaco
ConocoPhillips
Repsol-YPF
TotalFinaElf

Note: Data for full-year, and/or end-of-year, 2002

ABSOLUTE SIZE COMPARISONS

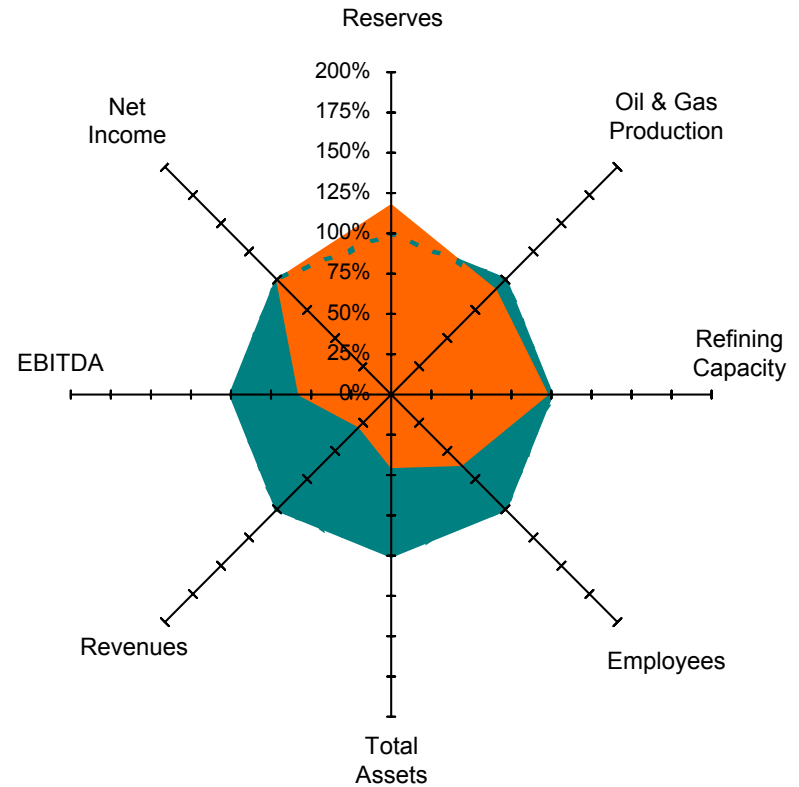
- Petrobras is comparable to the integrated majors in terms of reserves, production and refining capacity
- Petrobras is smaller than the integrated majors in terms of assets, employees, EBITDA and revenues



Petrobras

Super Majors

BP
ExxonMobil
Royal Dutch Shell



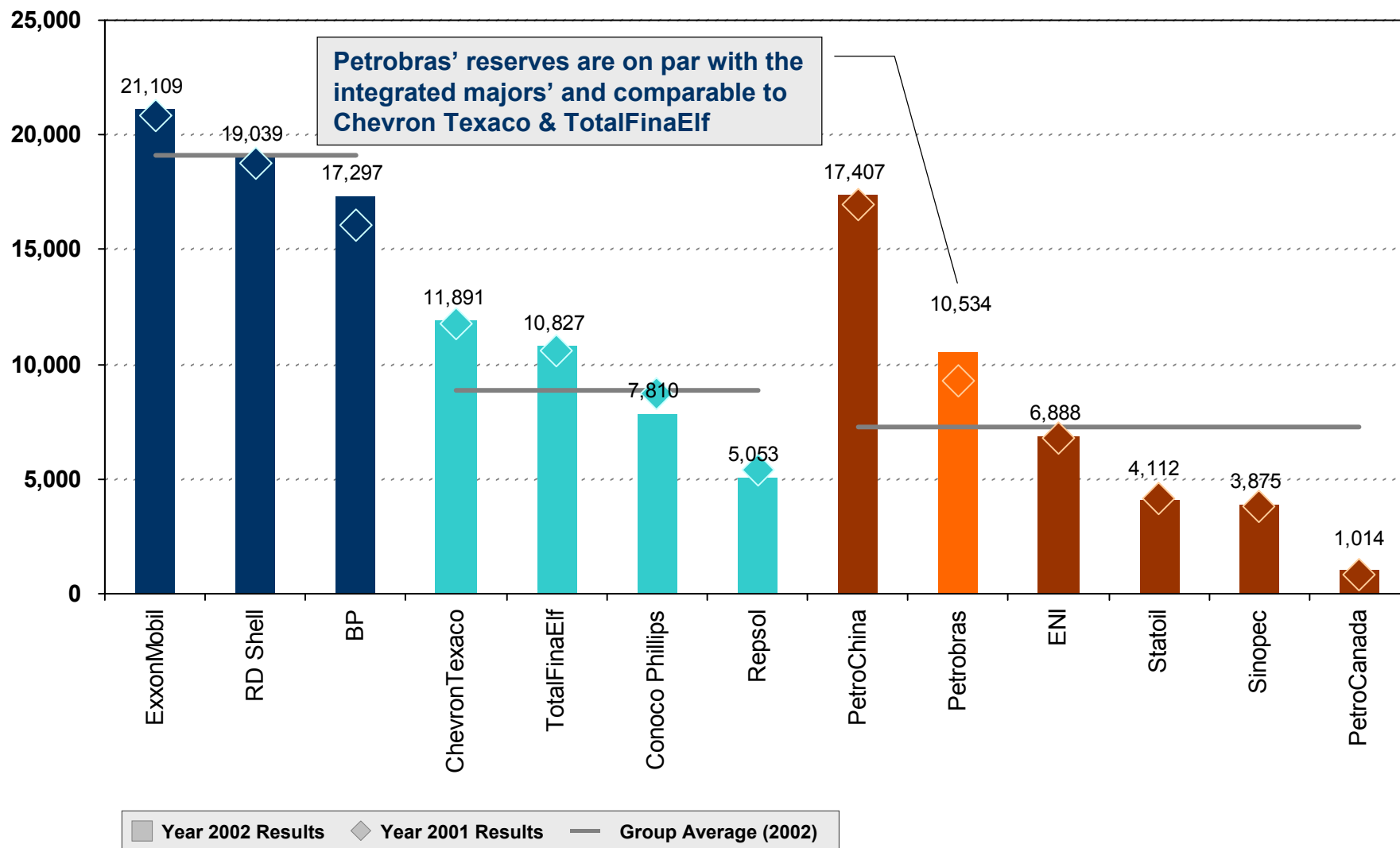
Integrated Majors

ChevronTexaco
ConocoPhillips
Repsol-YPF
TotalFinaElf

See appendix for note on interpreting spider diagrams

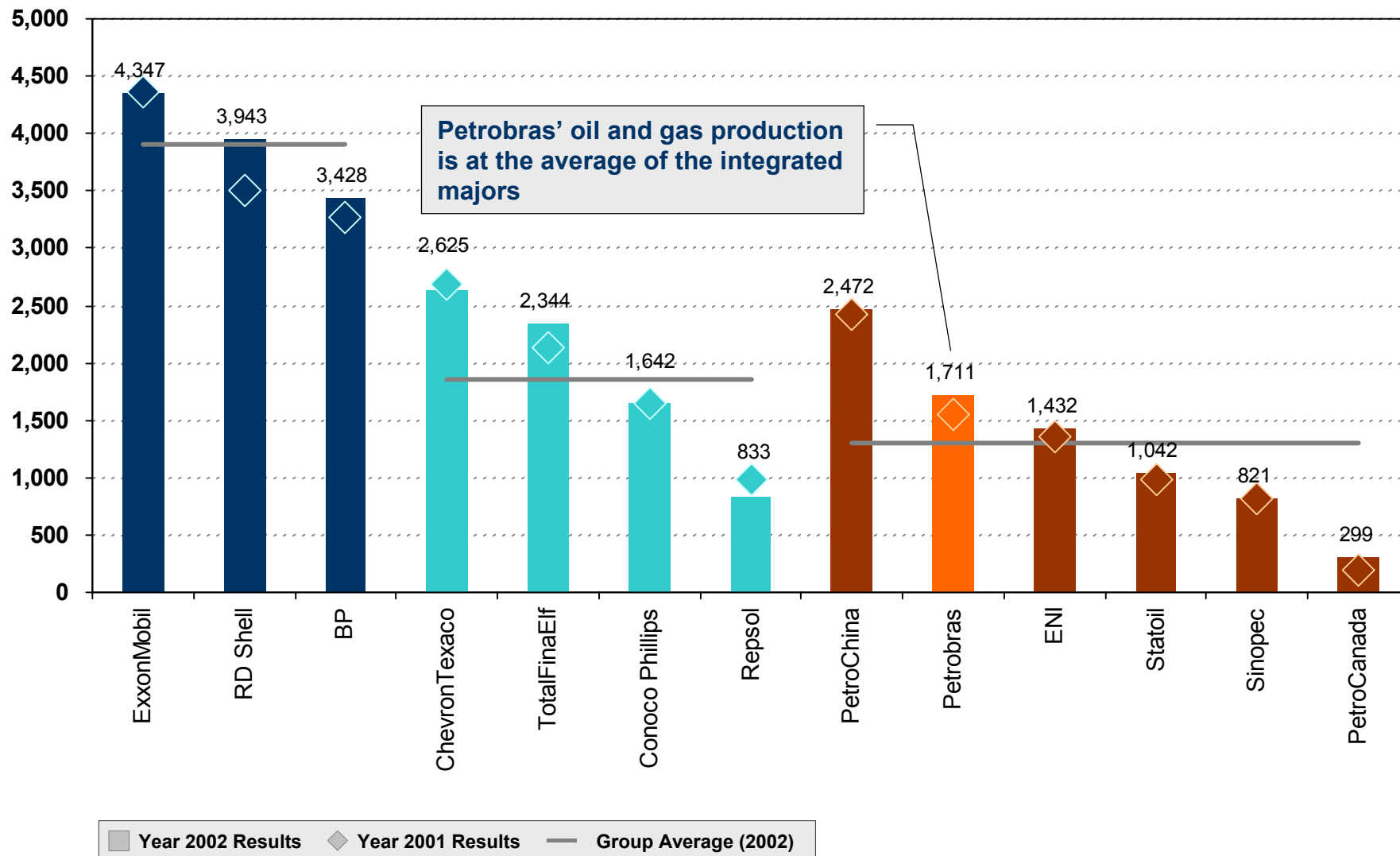
RESERVES

▪ Liquids & Gas Reserves (*Million BOE*)



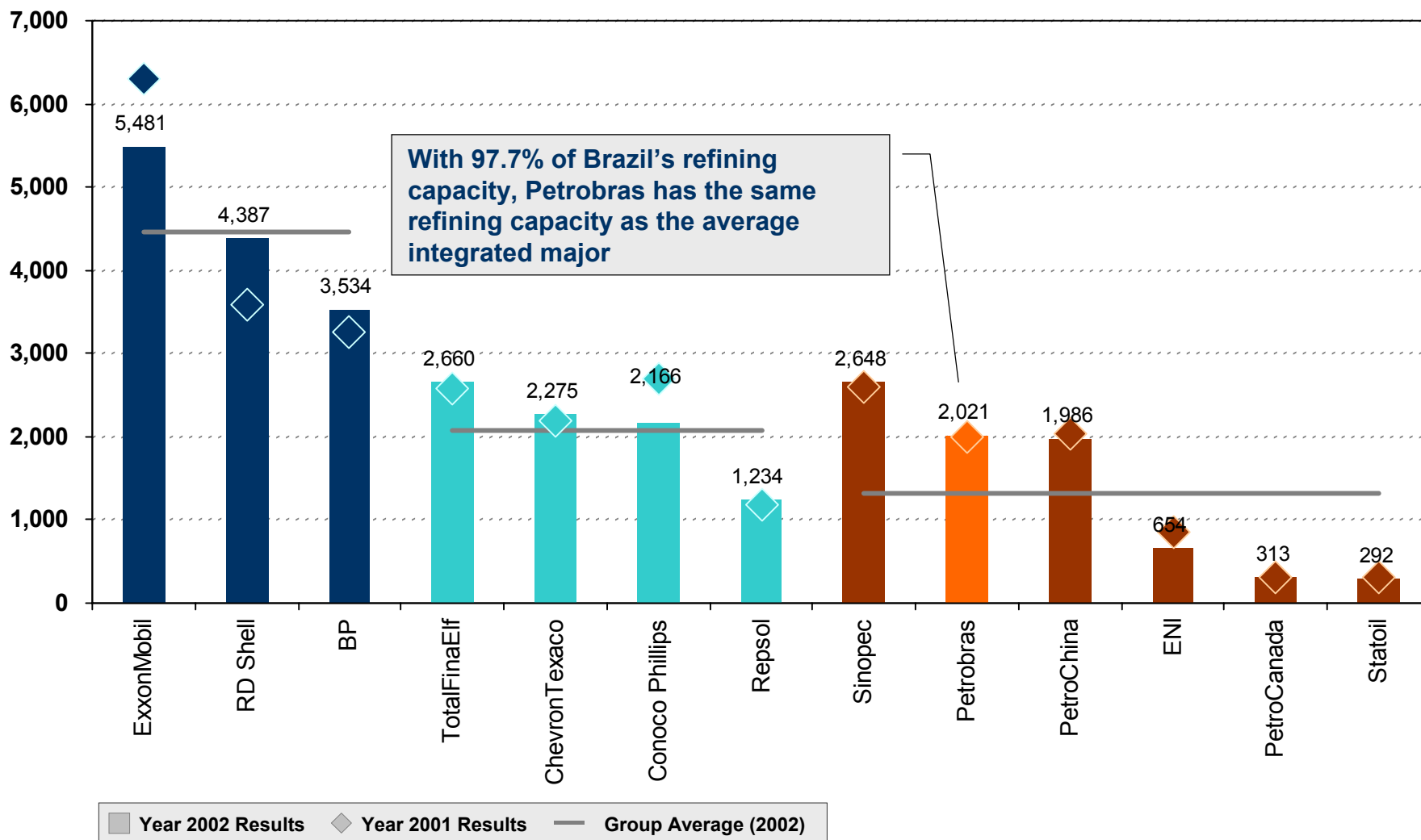
OIL & GAS PRODUCTION

▪ Annual Oil and Gas Production (*Thousand Barrels of Oil Equivalent (BOE) / Day*)



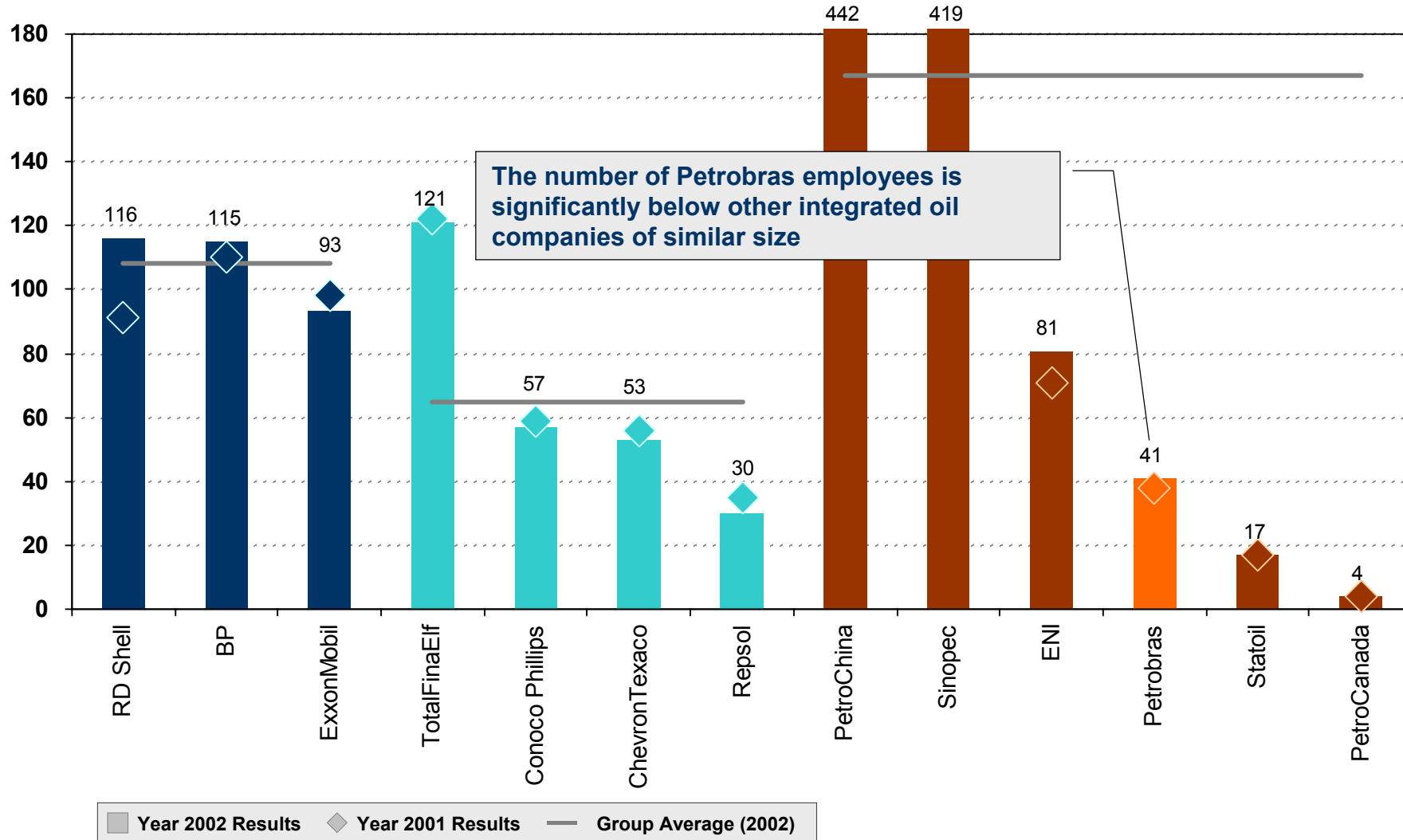
REFINING CAPACITY

▪ *Thousand Barrels Per Day*



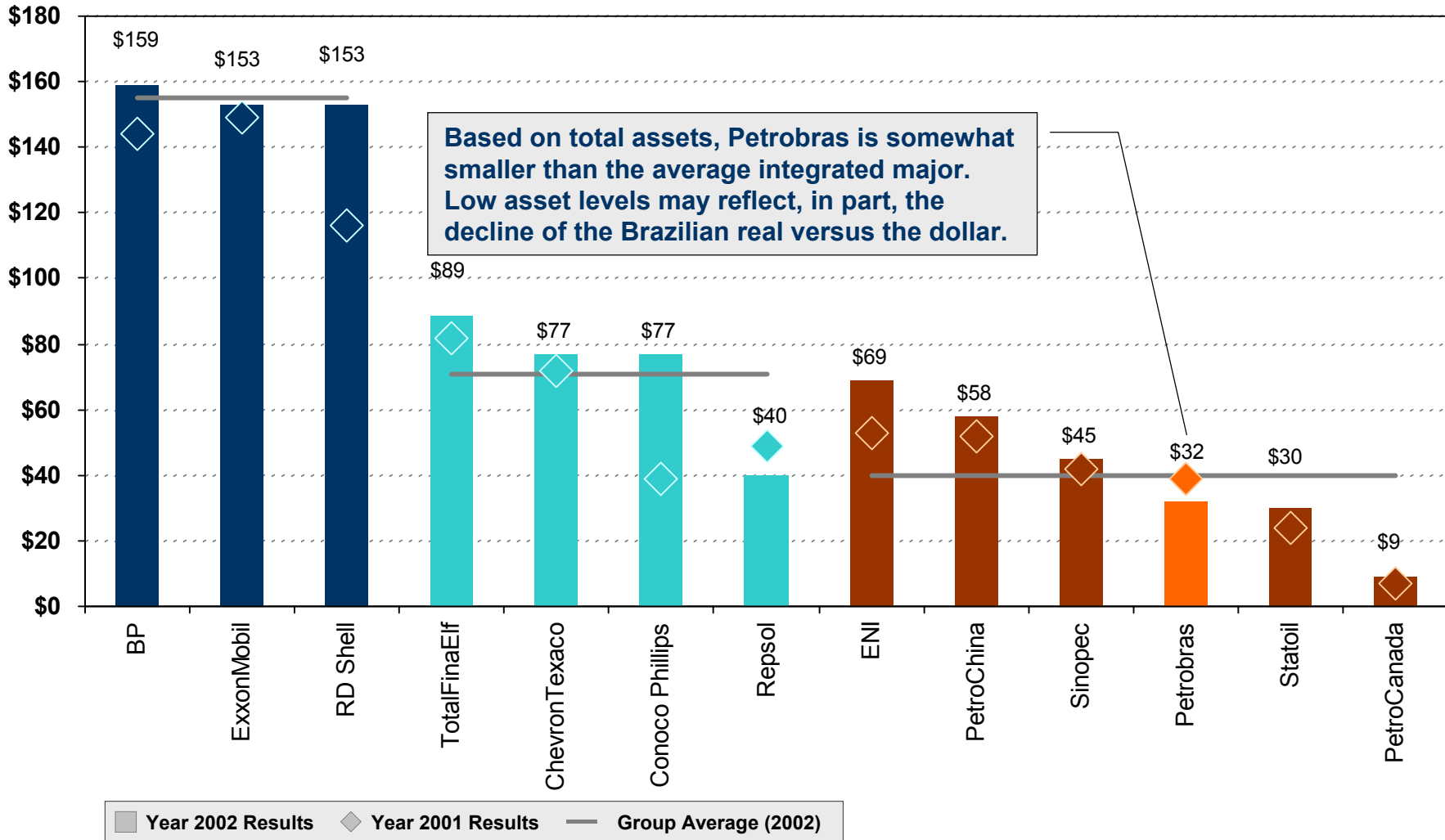
EMPLOYEES

- Number of Company Employees (*thousands*)



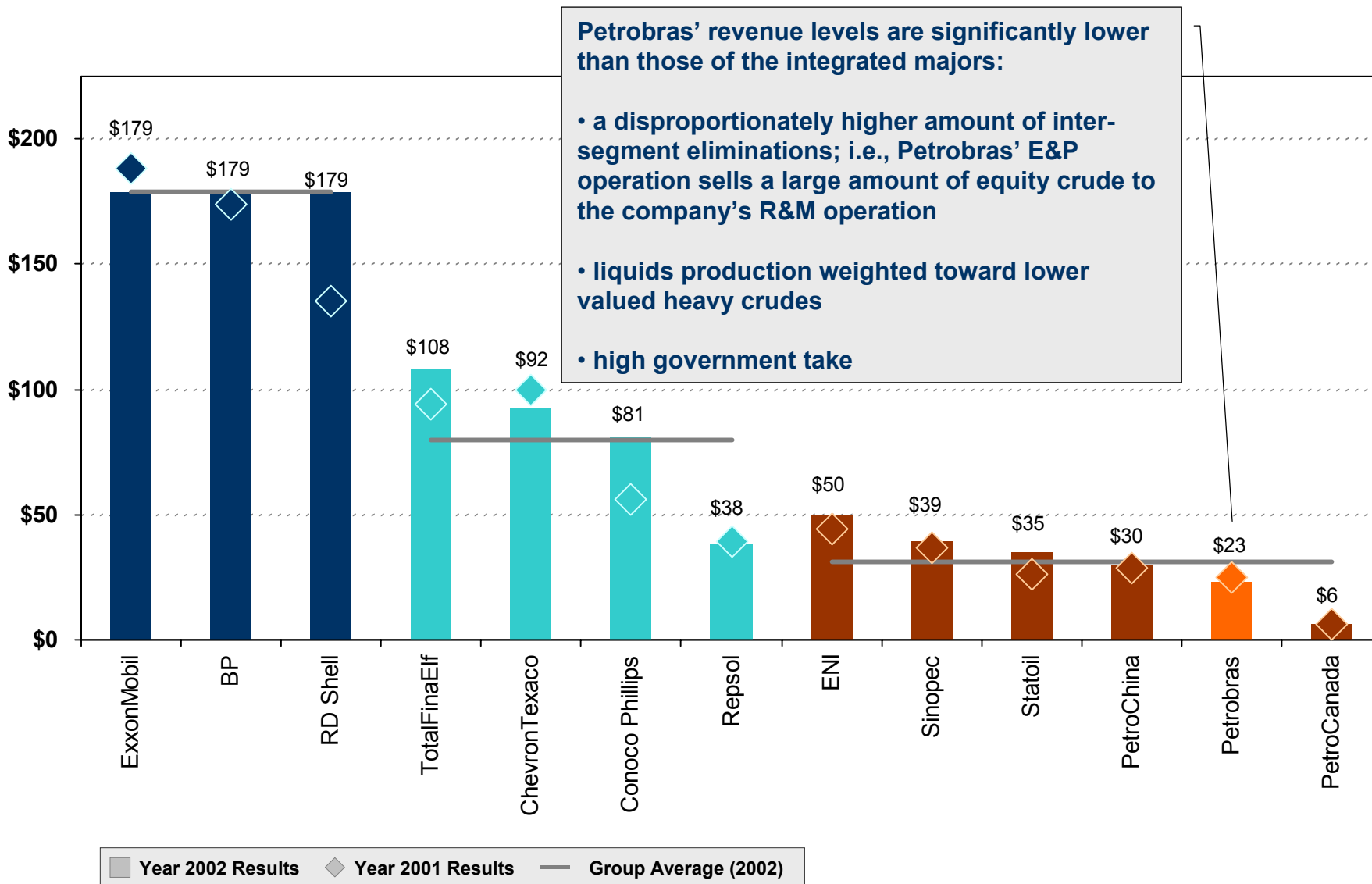
TOTAL ASSETS

▪ TOTAL ASSETS (\$ billions)



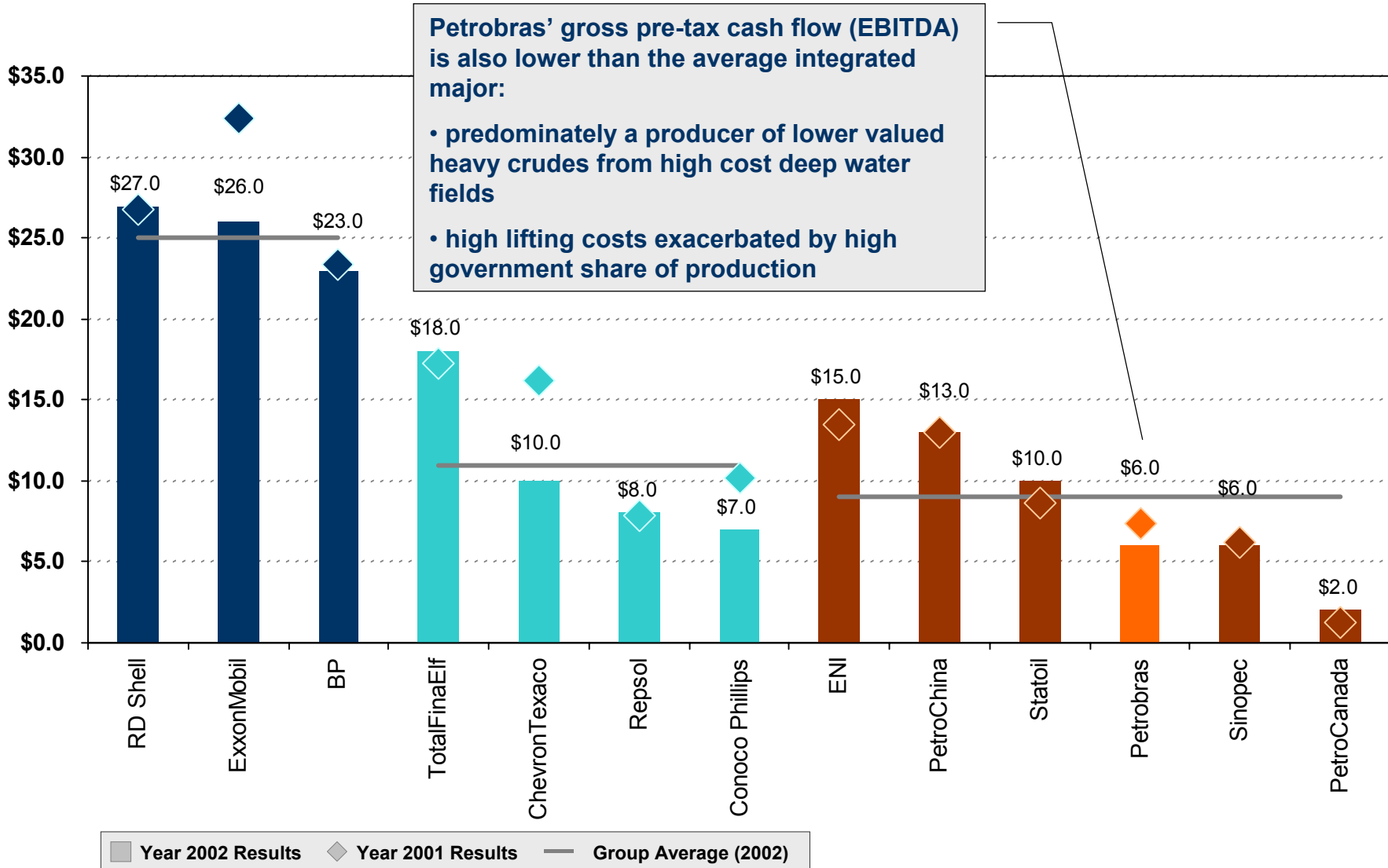
REVENUES

▪ REVENUES (Excluding Excise Taxes) (\$ billions)



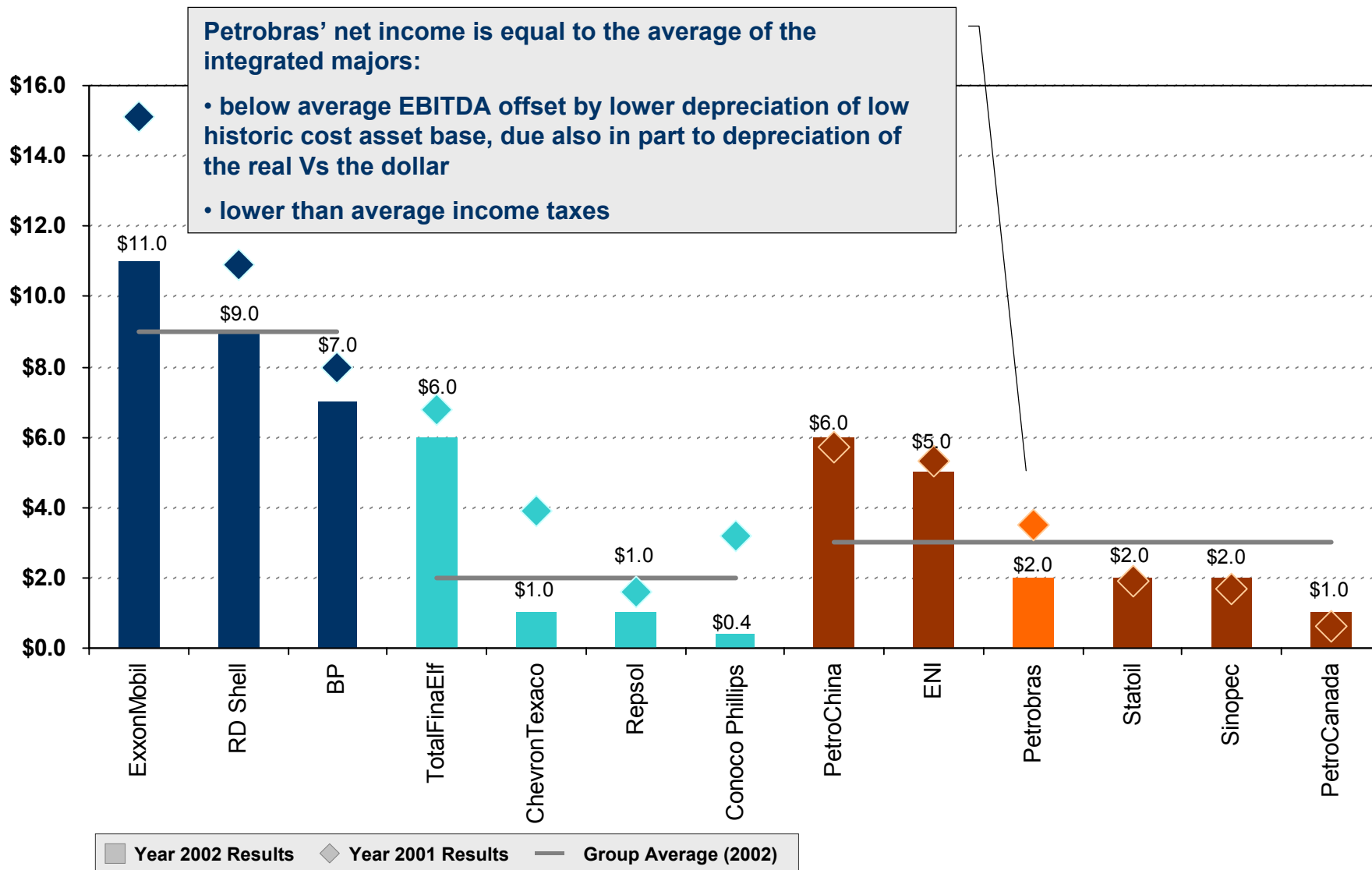
EBITDA

▪ EBITDA (Earnings Before Interest, Taxes & Depreciation) (\$ Billions)



NET INCOME

▪ Net Income (\$ billions)



OPERATING PROFILE

- **Petrobras reserves are heavily weighted toward liquids**
 - comparable to the super majors in terms of liquids reserves
 - comparatively lower gas reserves
- **Petrobras' oil and gas reserve life is longer than the majors**
- **Petrobras' is less integrated downstream; other companies have proportionately more refining capacity relative to liquids production**

	Petrobras	Super Majors	Integrated Majors	Petrobras vs Super Majors	Petrobras vs Integrated Majors
Liquid Reserves (mmbbls)	8,955	10,374	5,764	86%	155%
Gas Reserves (bcf)	9,473	52,648	18,789	18%	50%
Percent Liquid Reserves (%)	85%	54%	65%	157%	131%
Percent Liquids Production (%)	87%	57%	67%	151%	130%
Liquids Reserve Life (years)	17	13	13	130%	130%
Gas Reserve Life (years)	19	14	14	132%	139%
Refinery Integration (%)	136%	199%	168%	68%	81%

Petrobras

Super Majors

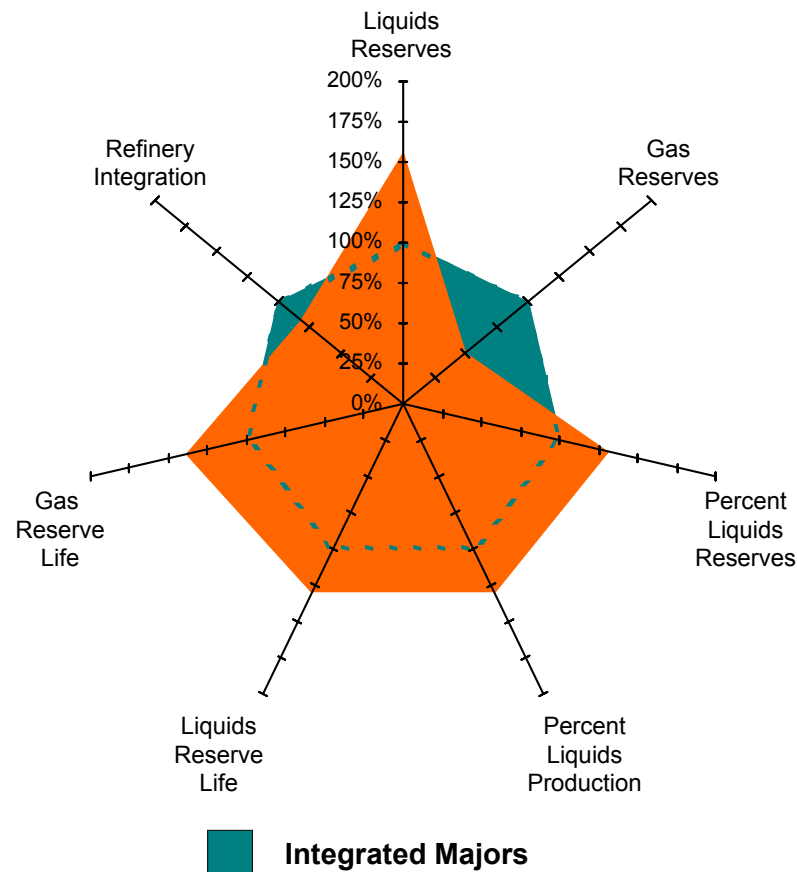
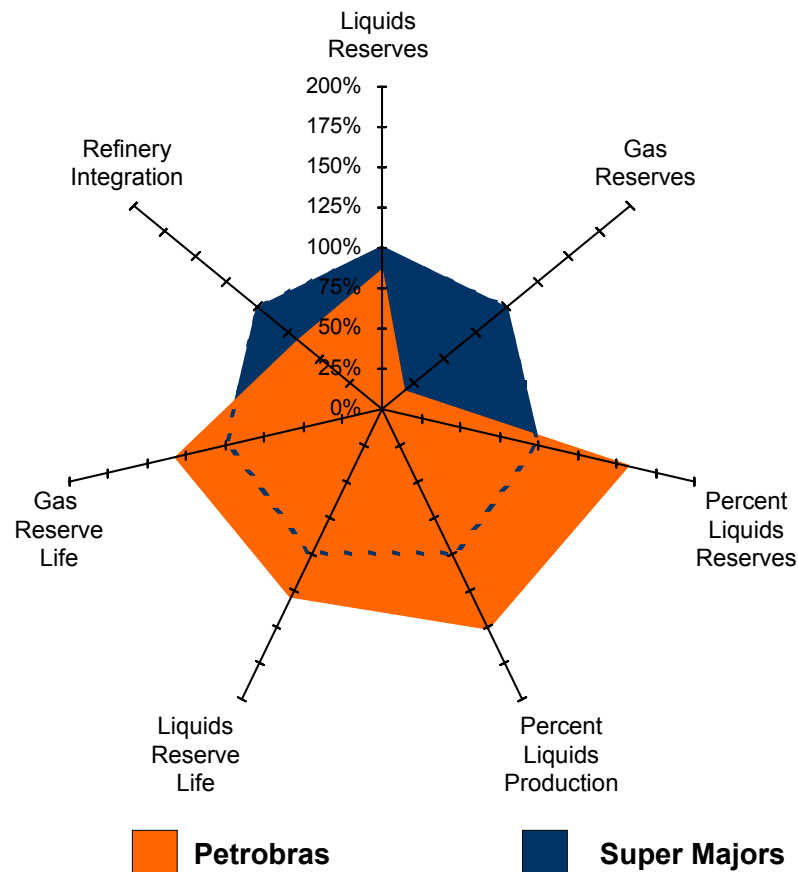
Integrated Majors

BP
ExxonMobil
Royal Dutch Shell

ChevronTexaco
ConocoPhillips
Repsol-YPF
TotalFinaElf

OPERATING PROFILE

- Petrobras' reserves and production are heavily weighted toward liquids



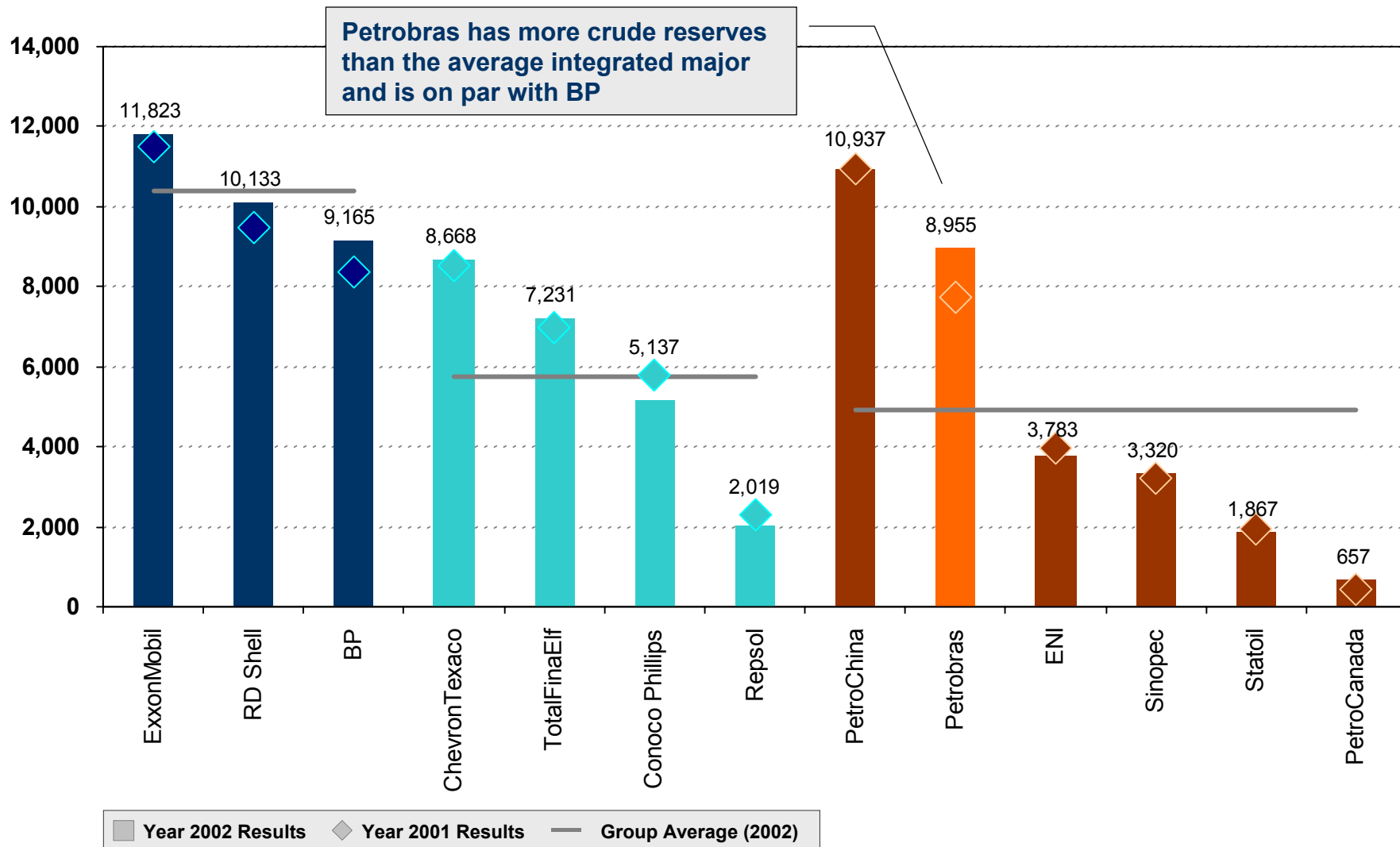
See appendix for note on interpreting spider diagrams

BP
ExxonMobil
Royal Dutch Shell

ChevronTexaco
ConocoPhillips
Repsol-YPF
TotalFinaElf

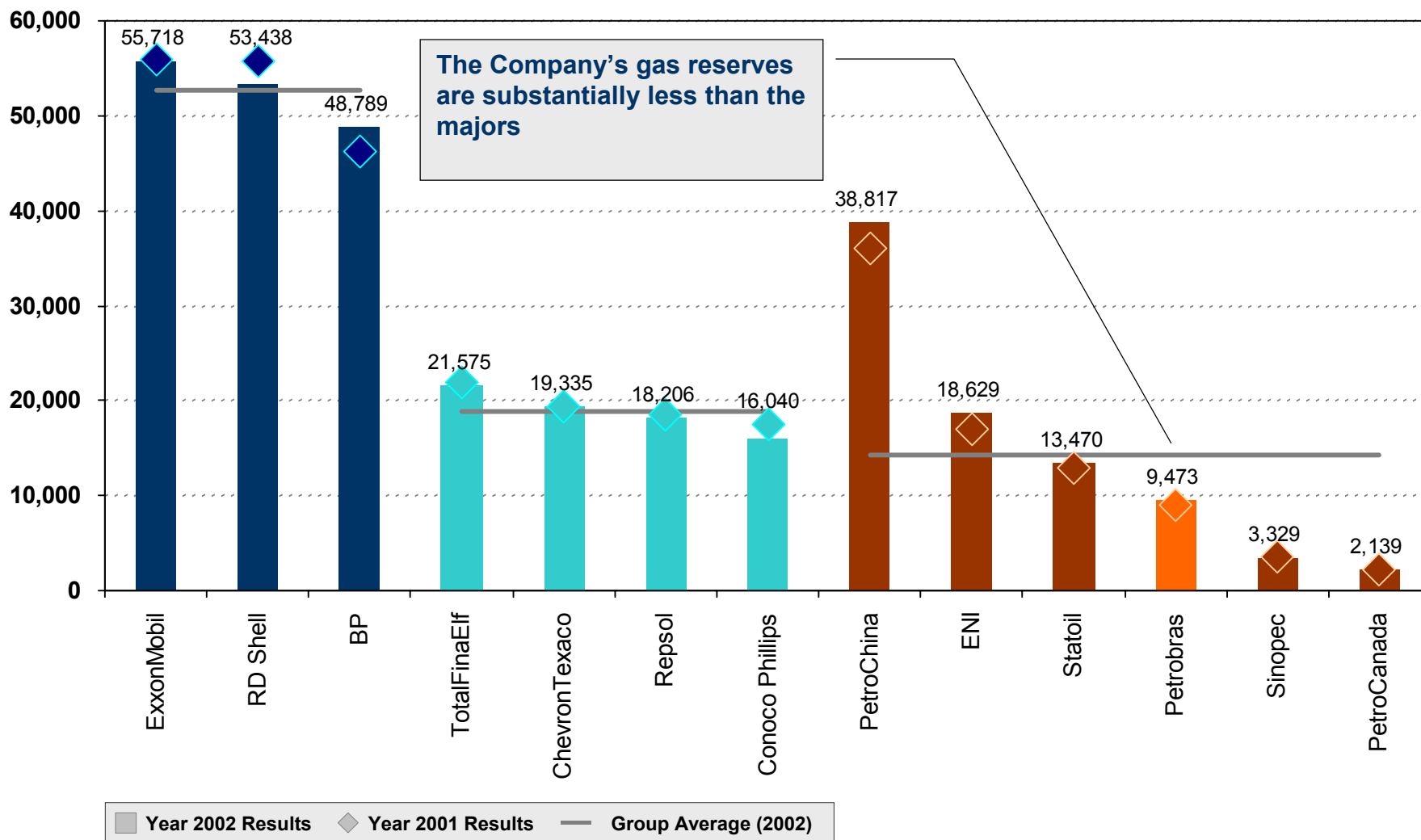
LIQUIDS RESERVES

▪ Liquids Reserves (*Million BOE*)



GAS RESERVES

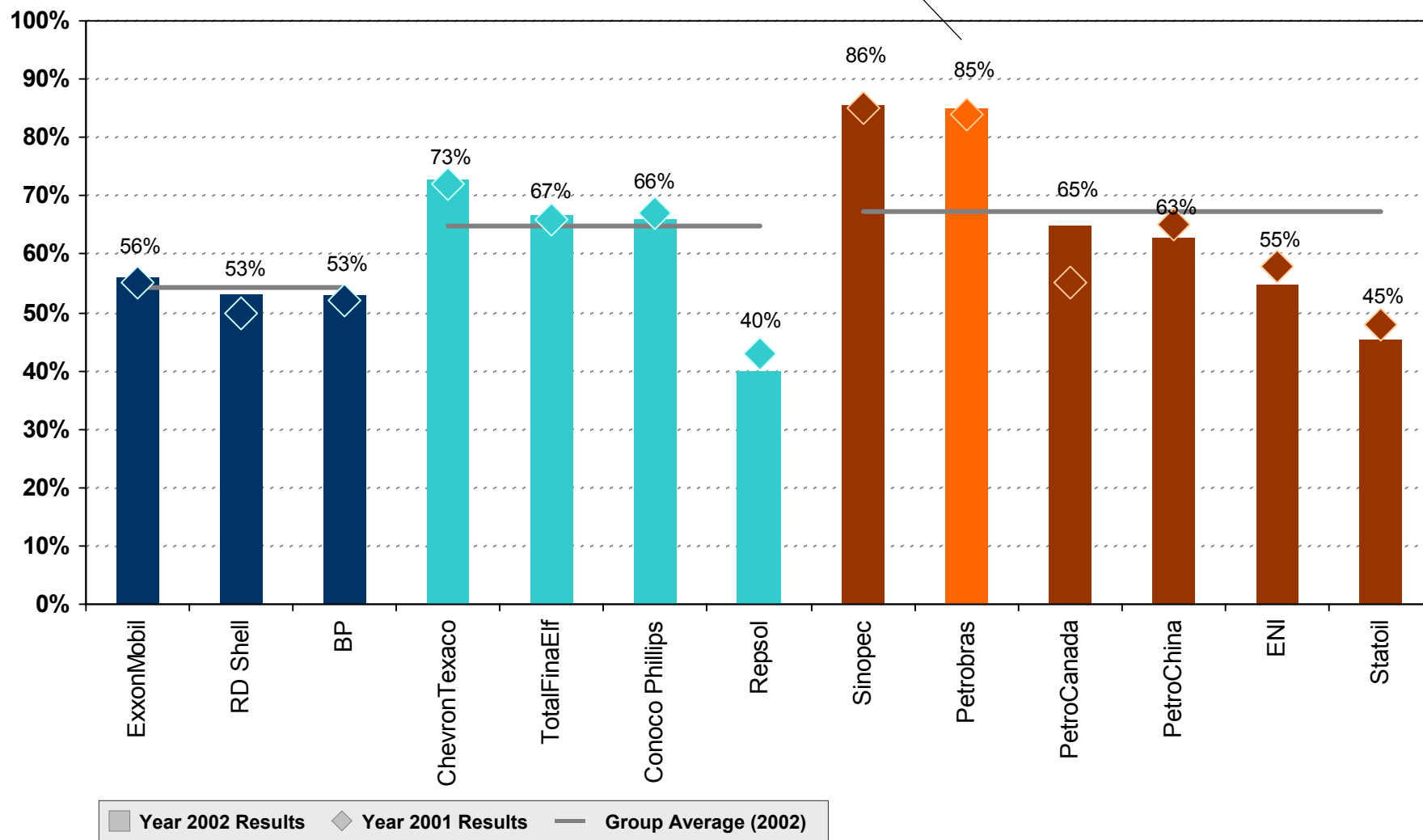
Gas Reserves (Billions Cubic Feet)



PERCENT LIQUIDS RESERVES

- Liquids Reserves / (Liquids & Gas Reserves (BOE))

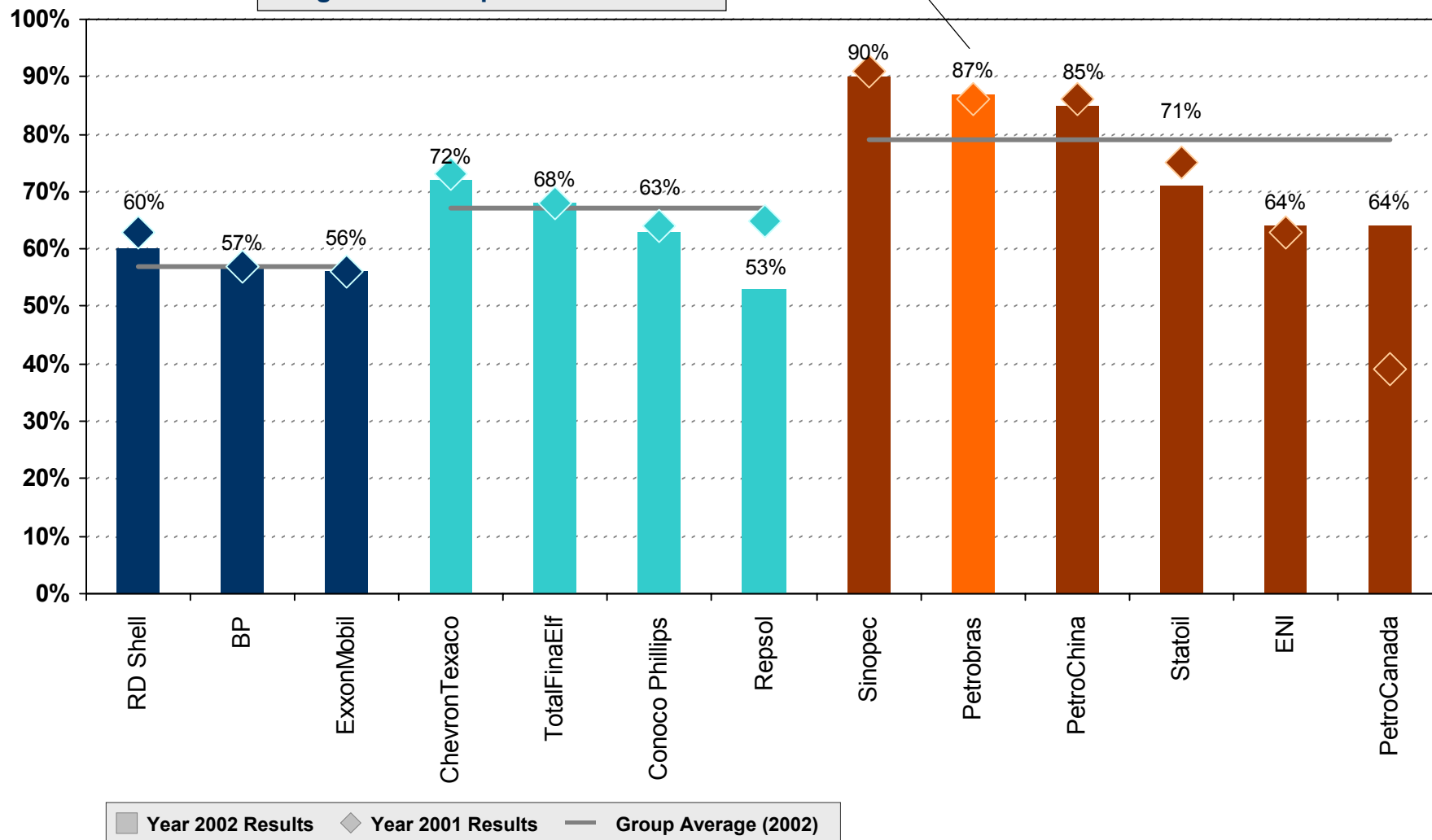
Petrobras' reserve base is heavily biased toward crude



PERCENT LIQUIDS Production

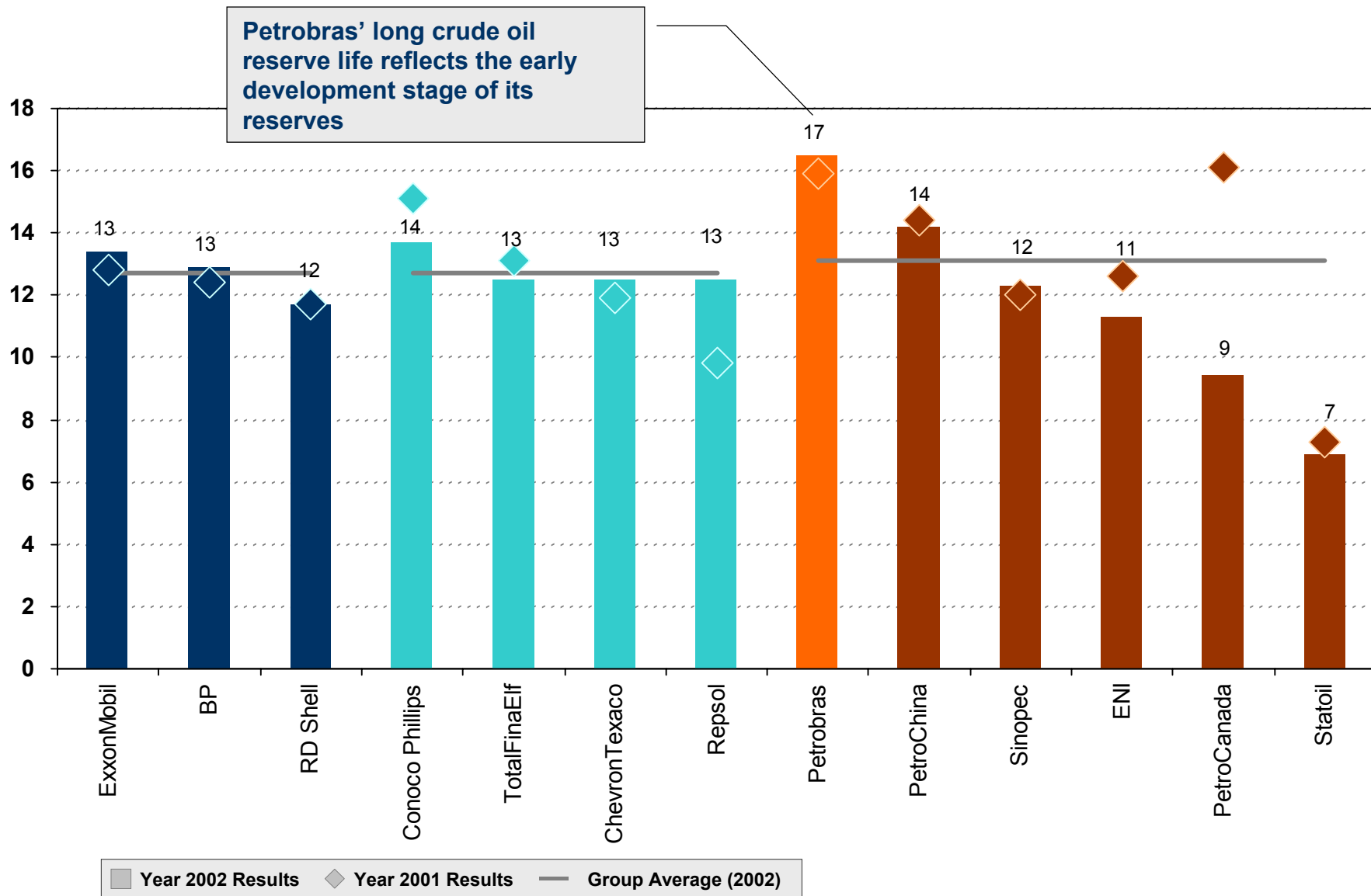
▪ Liquids Production / Total Production

The Company's production is also weight toward liquids



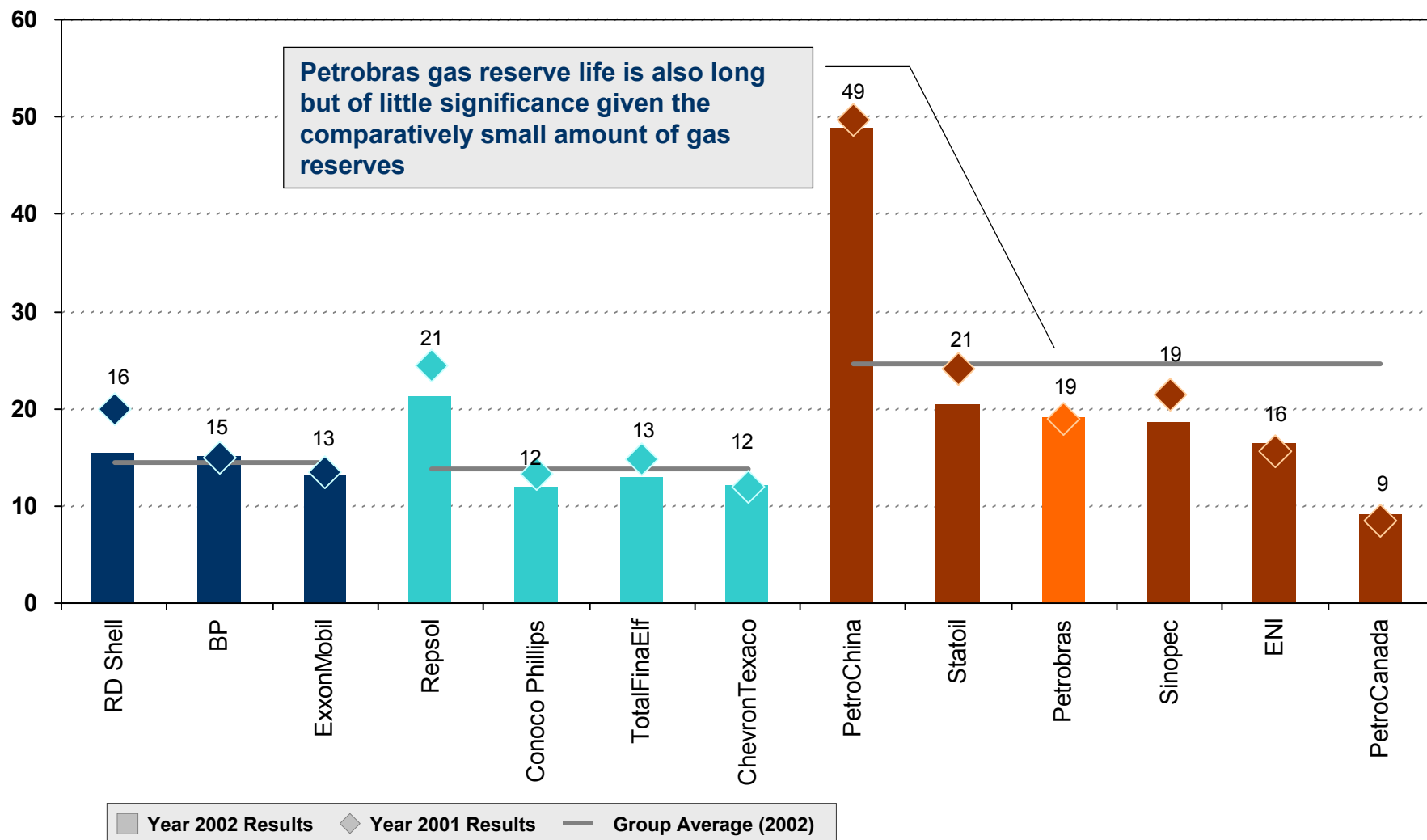
LIQUIDS RESERVE LIFE

▪ Liquids Reserves / Annual Liquids Production (Years)



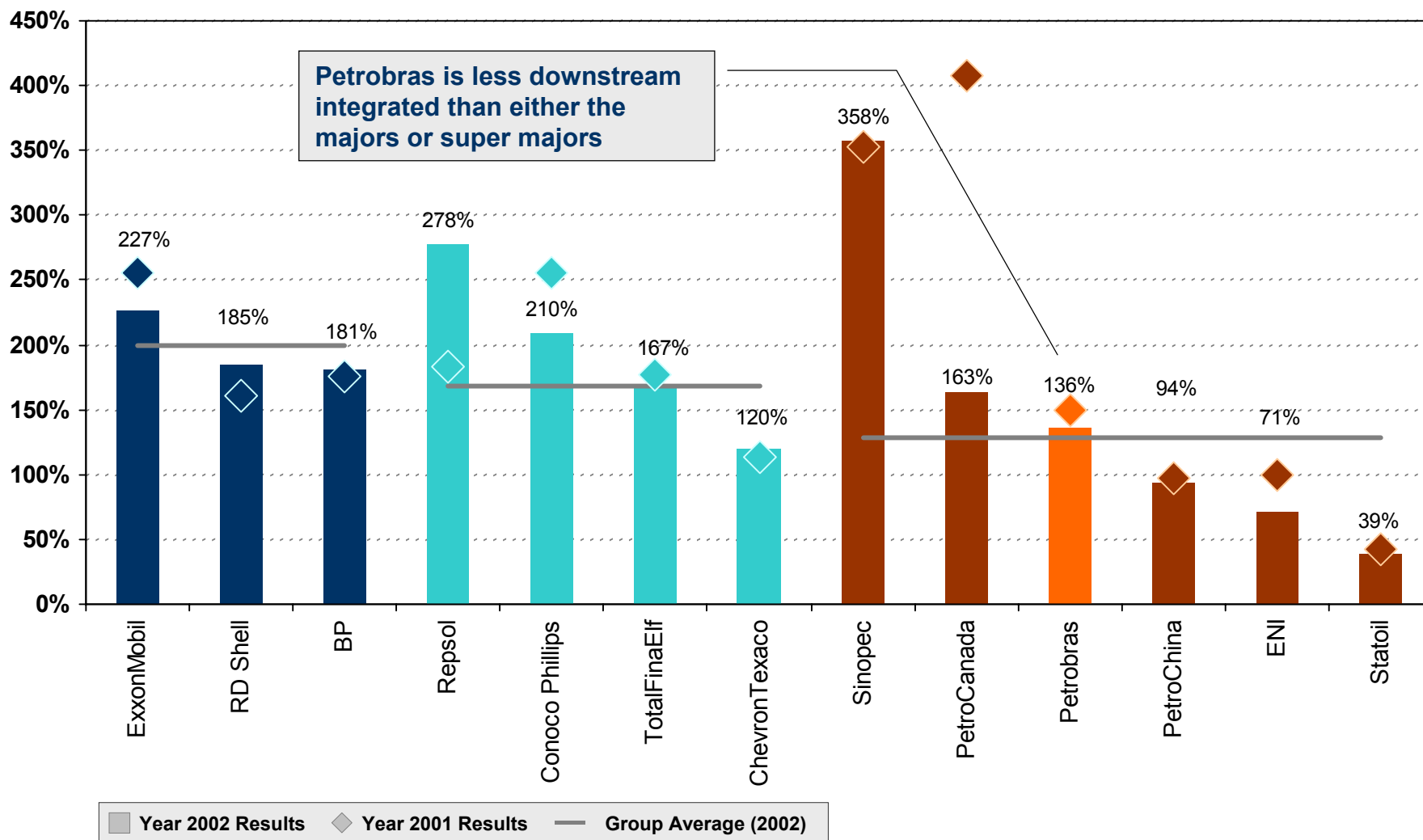
GAS RESERVE LIFE

Gas Reserves / Annual Gas Production (Years)



REFINERY INTEGRATION

Refining Capacity / Liquids Production



OPERATING PERFORMANCE

- **Petrobras' upstream operations are somewhat less profitable than those of the majors**
 - a relatively high level of heavy oil production
 - production is primarily off-shore in deepwater; i.e., high lifting costs
 - the Brazilian government has a relatively high take
- **Petrobras' downstream performance is very profitable, although less-so following the liberalization of product markets and the year-to-year depreciation of the real**
 - comparatively short refining capacity
 - long crude supply
- **Employee profitability is consistent with the majors**
 - lower number of employees offset by lower EBITDA

	Petrobras	Super Majors	Integrated Majors	Petrobras vs Super Majors	Petrobras vs Integrated Majors
Total EBITDA / Production (\$/BOE)	\$9.88	\$17.77	\$15.83	56%	62%
E&P EBITDA / Production (\$/BOE)	\$11.98	\$12.89	\$13.09	93%	92%
E&P EBITDA ROA (%)	50%	31%	30%	162%	104%
RM&T EBITDA / Capacity (\$/bbl)	\$2.36	\$2.69	\$1.82	88%	129%
R&M EBITDA ROA (%)	17%	9%	7%	184%	237%
RM&T EBITDA / Total EBITDA (%)	27%	16%	12%	163%	219%
Lifting Costs per Barrel (\$ / BOE)	\$7.85	\$4.77	\$3.96	61%	50%
Reserve Replacement Costs (\$/BOE)	\$1.89	\$5.56	\$5.37	294%	284%
Reserve Replacement Rate (%)	301%	109%	95%	276%	317%
Employee Profitability (m\$ / employee)	\$151	\$235	\$164	64%	92%

 **Petrobras**

 **Super Majors**

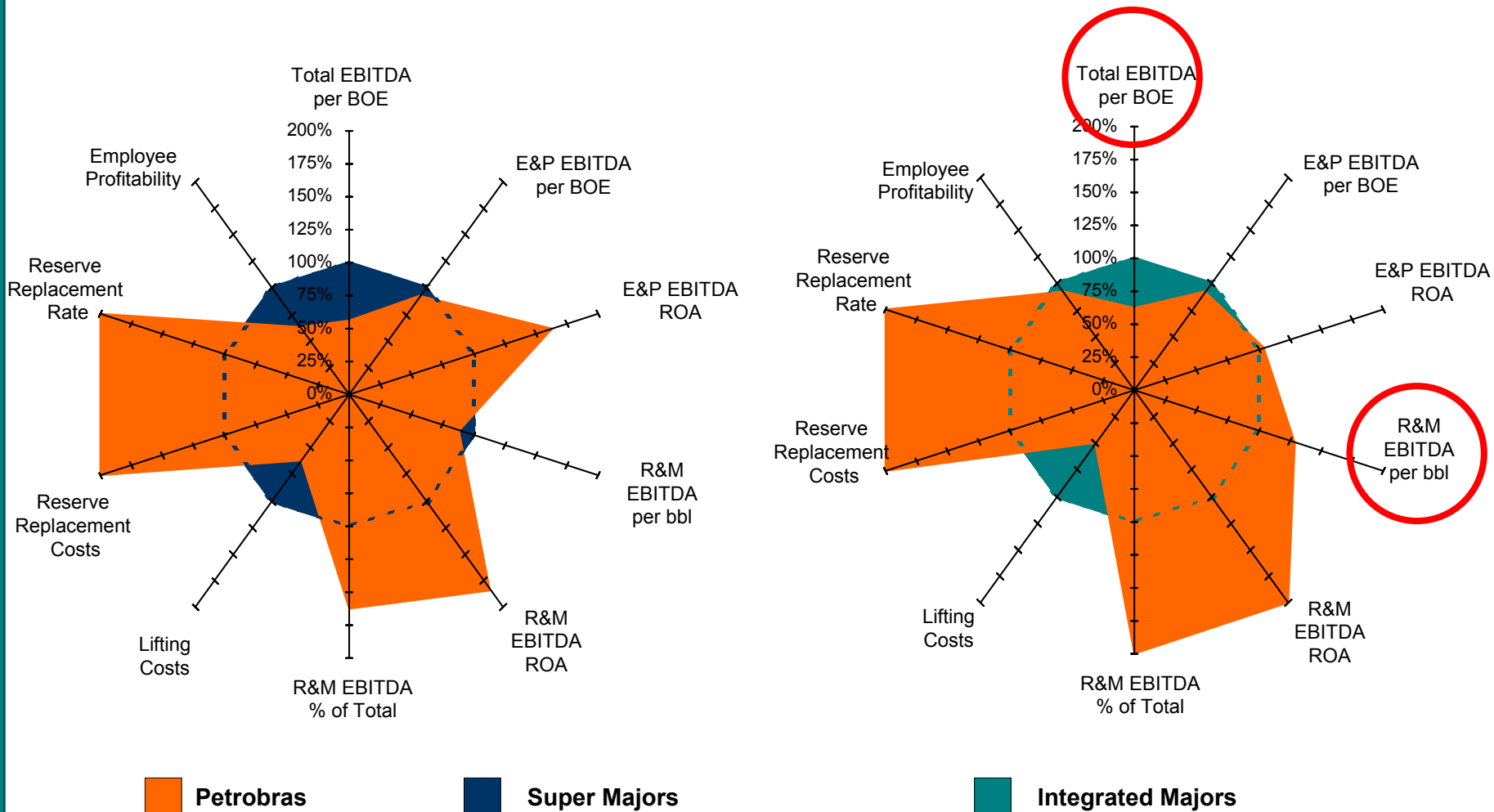
 **Integrated Majors**

BP
ExxonMobil
Royal Dutch Shell

ChevronTexaco
ConocoPhillips
Repsol-YPF
TotalFinaElf

OPERATING PERFORMANCE

- While Petrobras upstream profitability lags the majors, its downstream performance leads the group and accounts for a disproportionately high percentage of overall cash flow



See appendix for note on interpreting spider diagrams

BP
ExxonMobil
Royal Dutch Shell

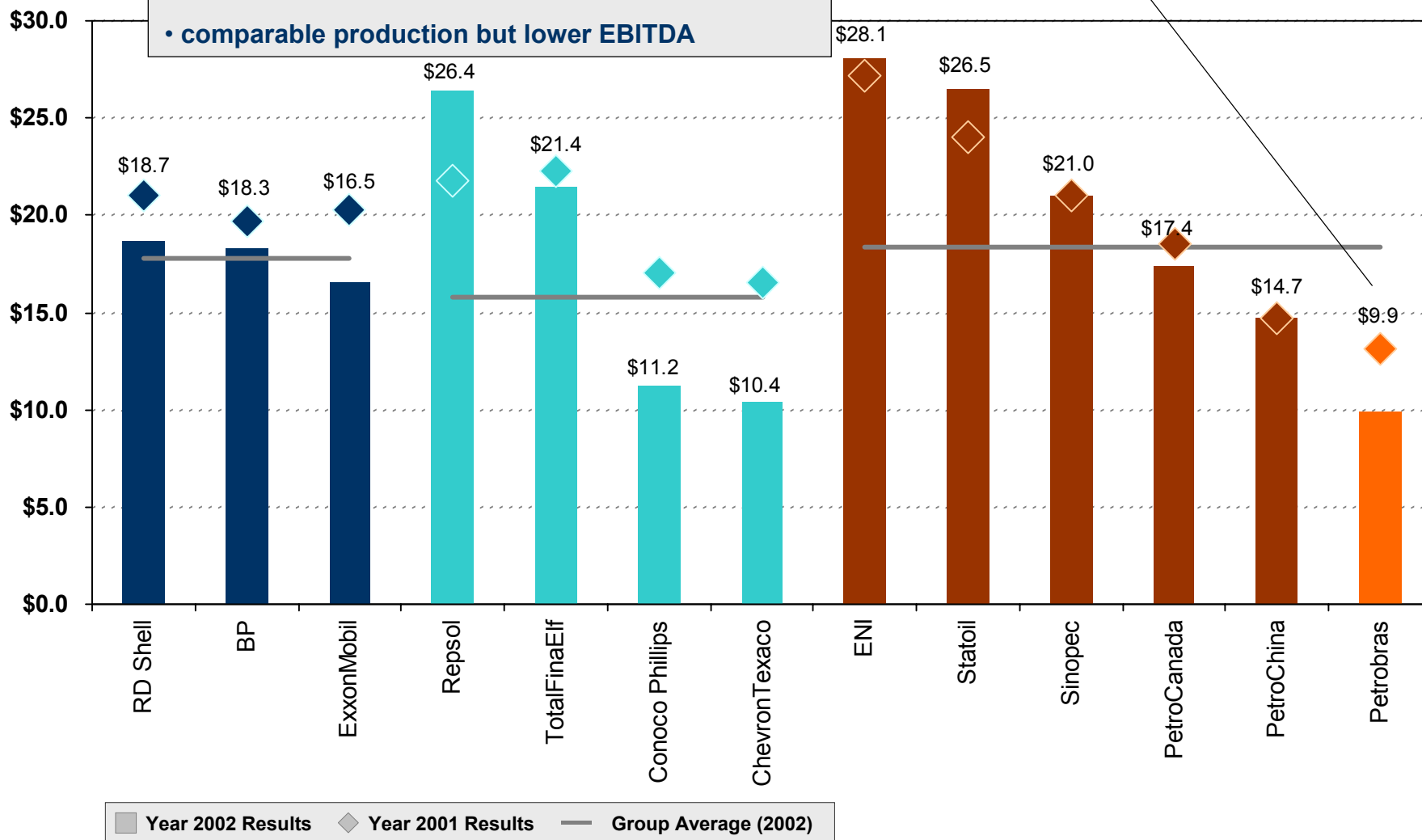
ChevronTexaco
ConocoPhillips
Repsol-YPF
TotalFinaElf

EBITDA PER BARREL

- Total EBITDA (Earnings Before Interest, Taxes & Depreciation) / BOE (Barrel of Oil Equivalent) Annual Production (\$/bbl)

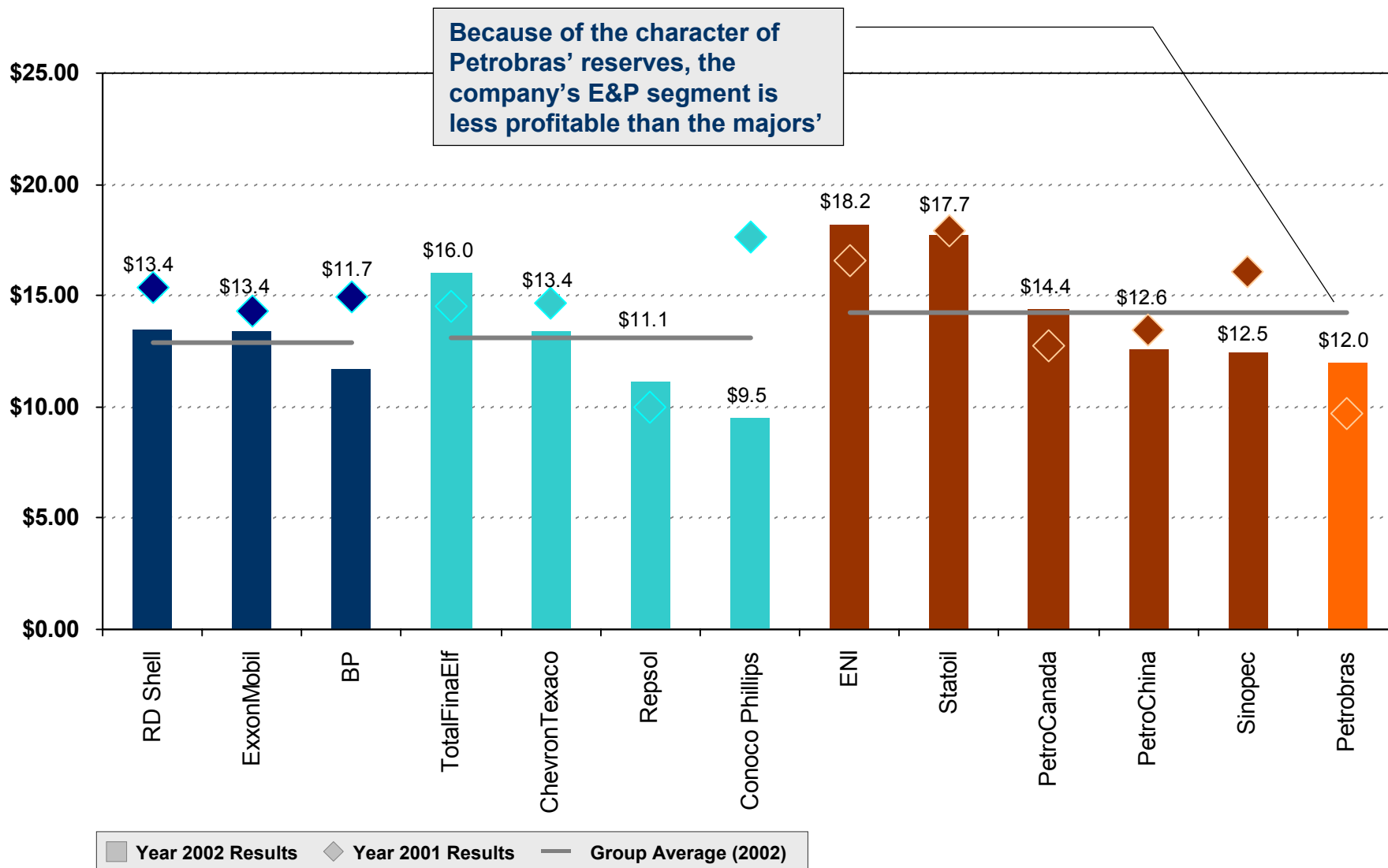
Petrobras' total EBITDA per BOE production is below the integrated and super majors

- comparable production but lower EBITDA



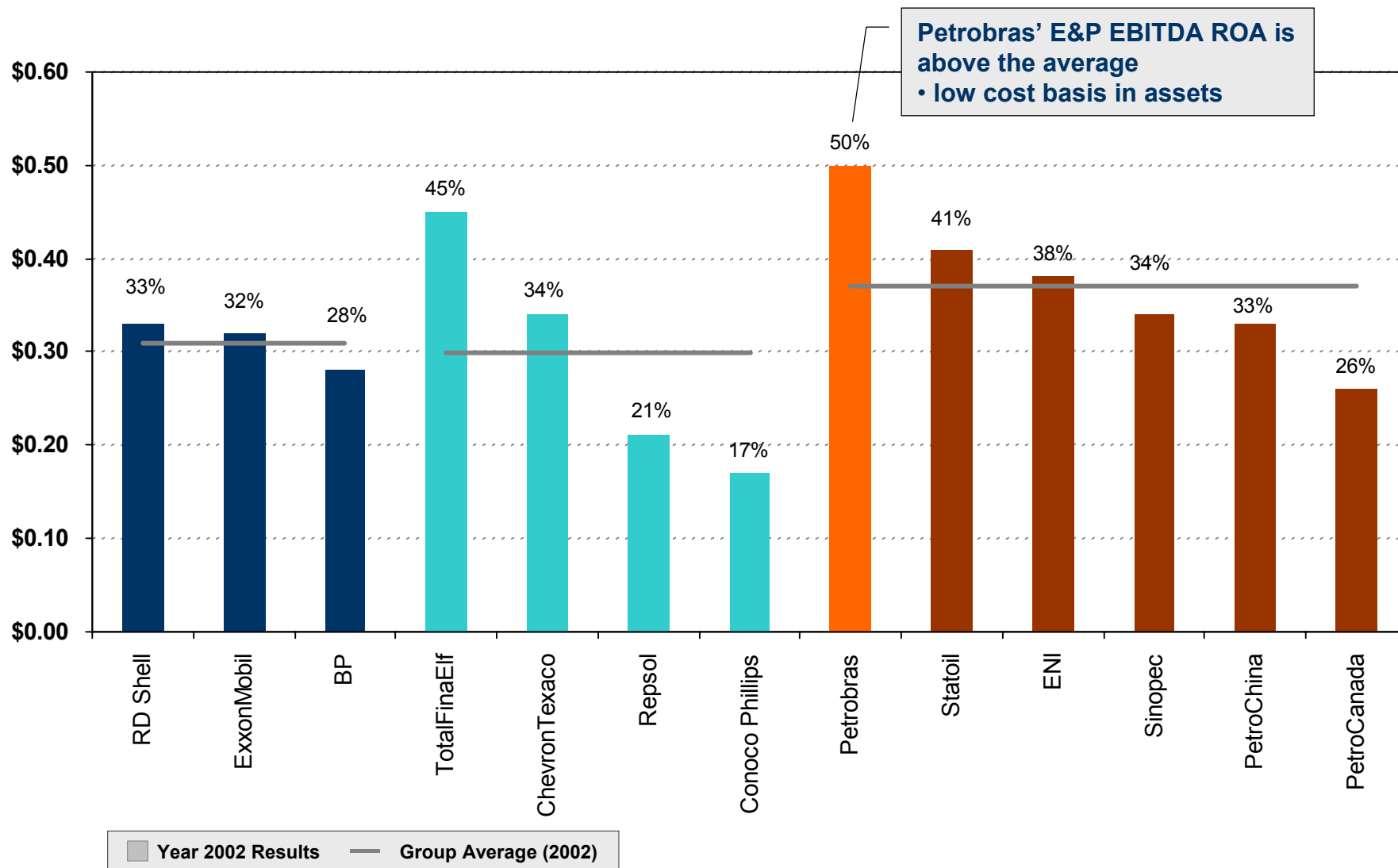
E&P SEGMENT PERFORMANCE

▪ E&P Segment EBITDA / Total Production (BOE) (\$/bbl)



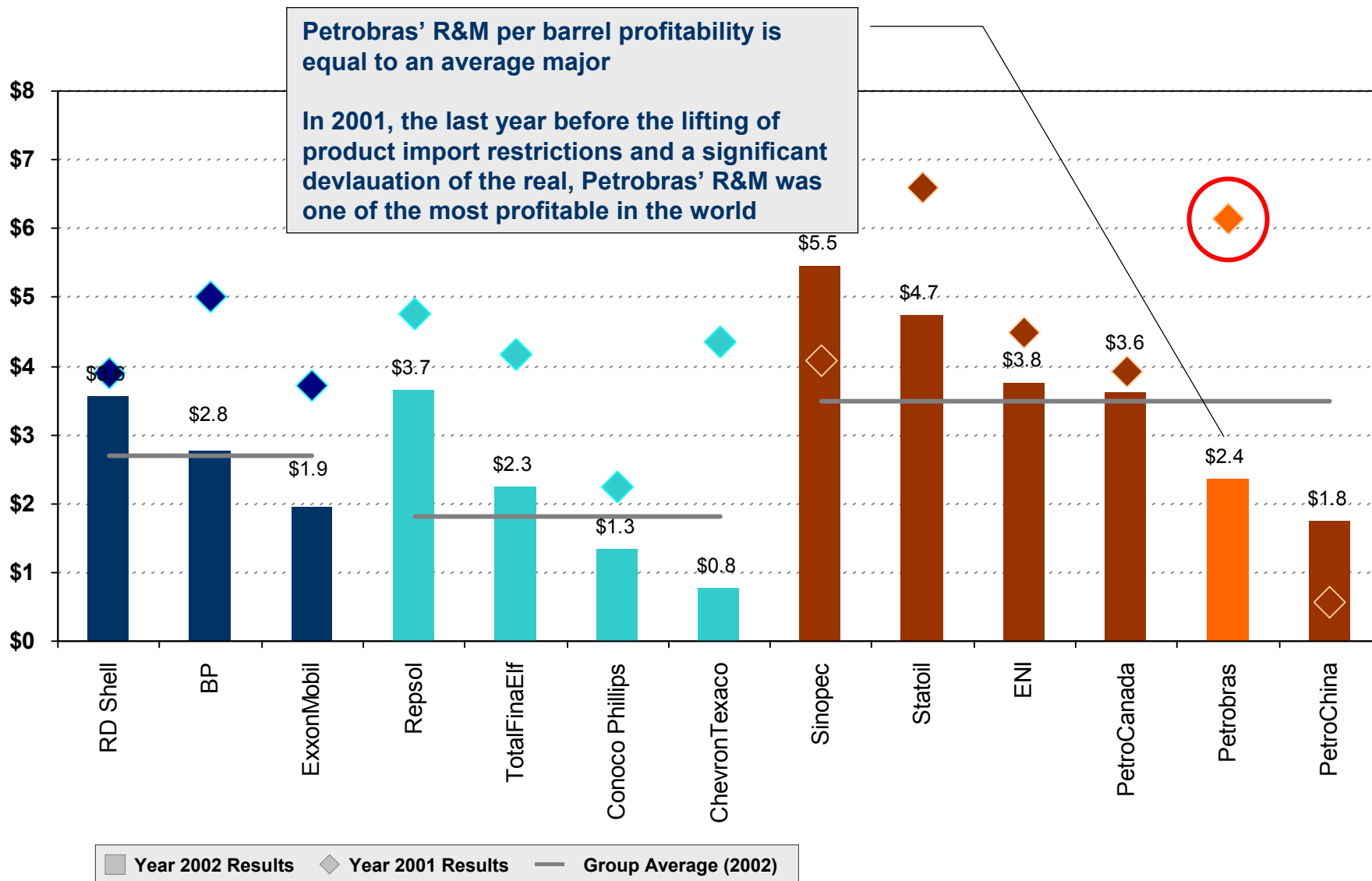
E&P EBITDA ROA

▪ E&P Segment EBITDA / Total E&P Assets (%)



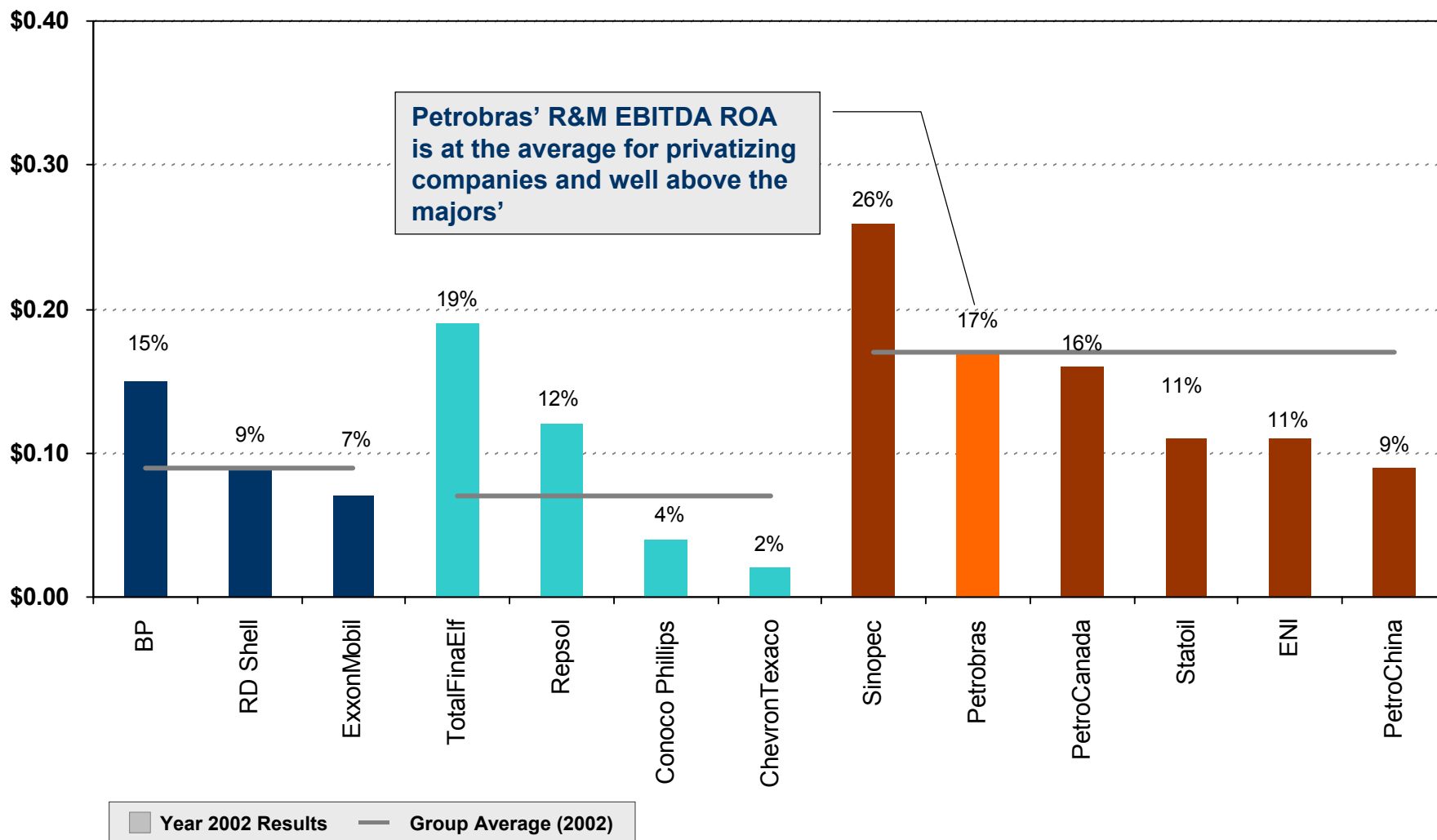
R&M SEGMENT PERFORMANCE

▪ R&M Segment EBITDA / 95% of Refining Capacity (annualized) (\$/bbl)



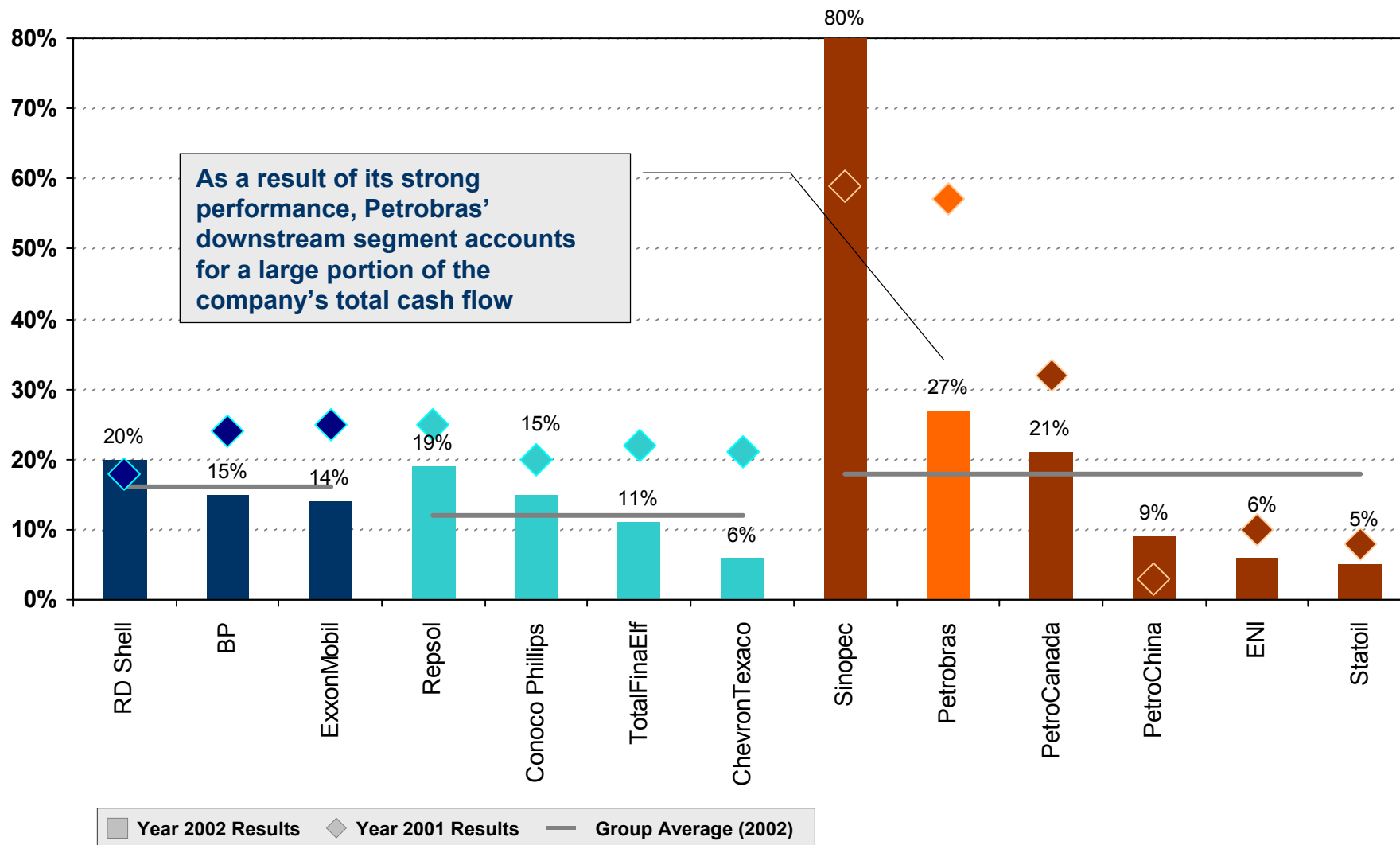
R&M EBITDA ROA

▪ R&M Segment EBITDA / R&M Total Assets (%)



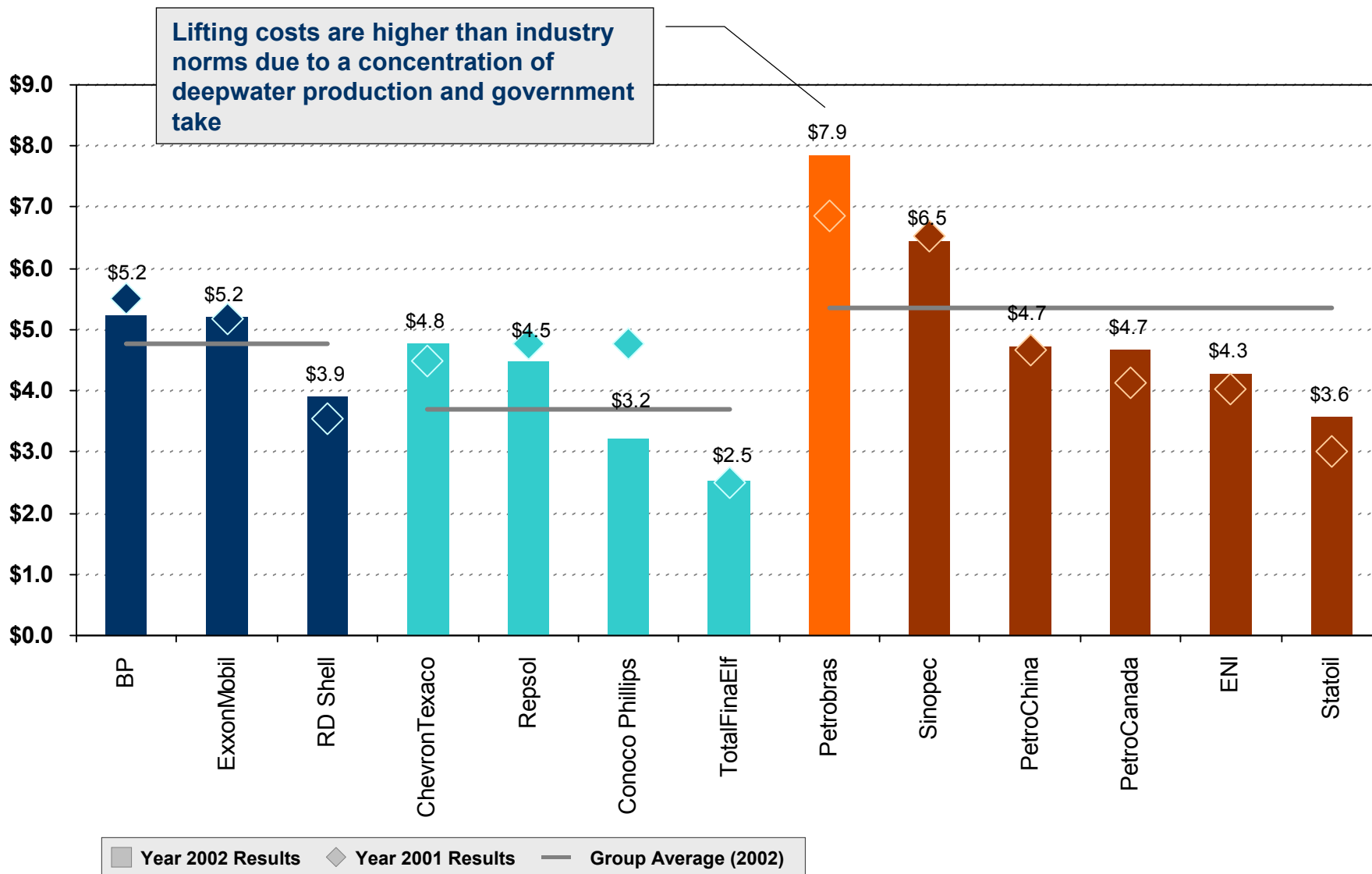
PERCENTAGE R&M EBITDA

- R&M Segment EBITDA / Total Corporate EBITDA (*percent*)



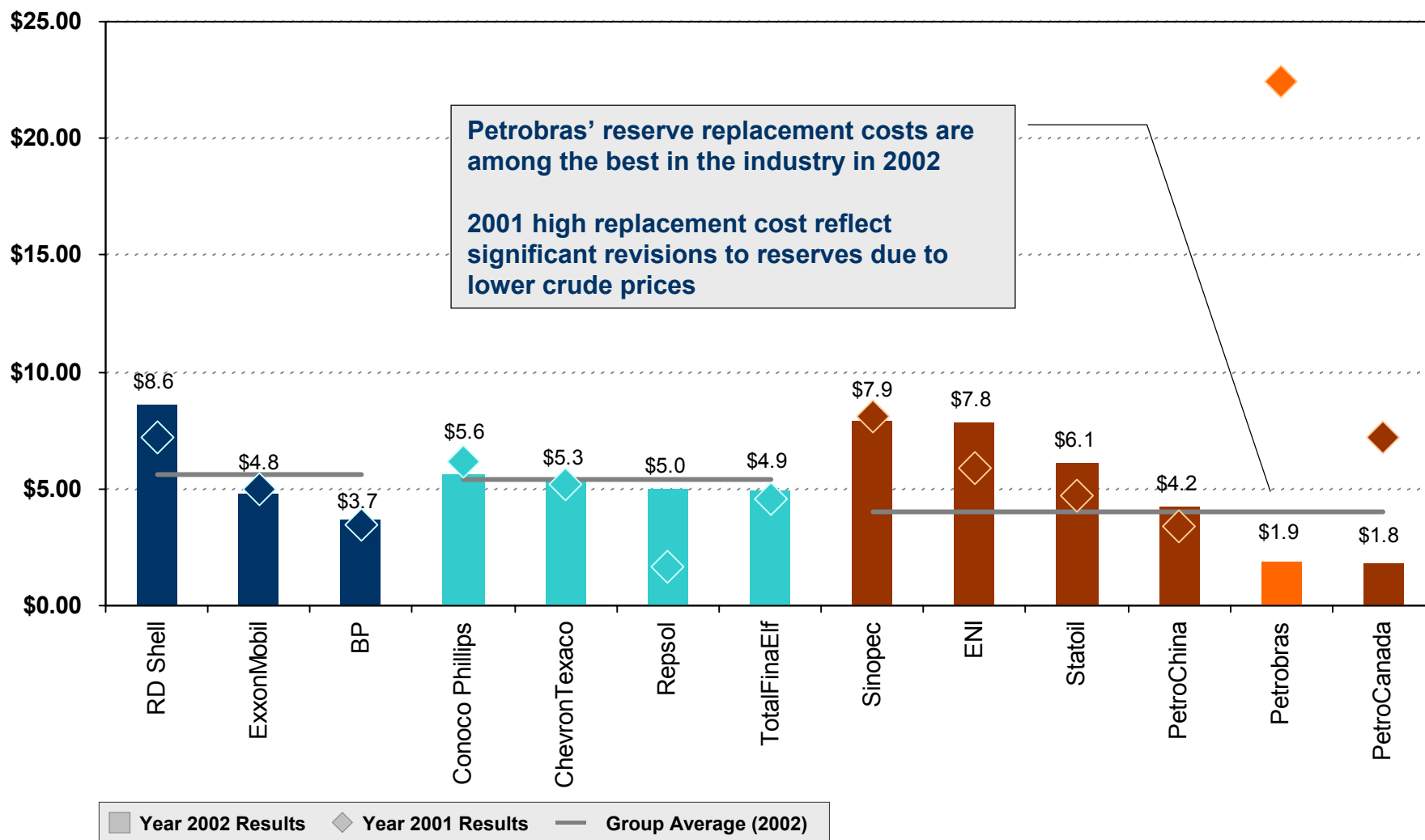
LIFTING COSTS

- Production Costs (including royalties) / BOE (Barrel of Oil Equivalent) Annual Production (\$/bbl)



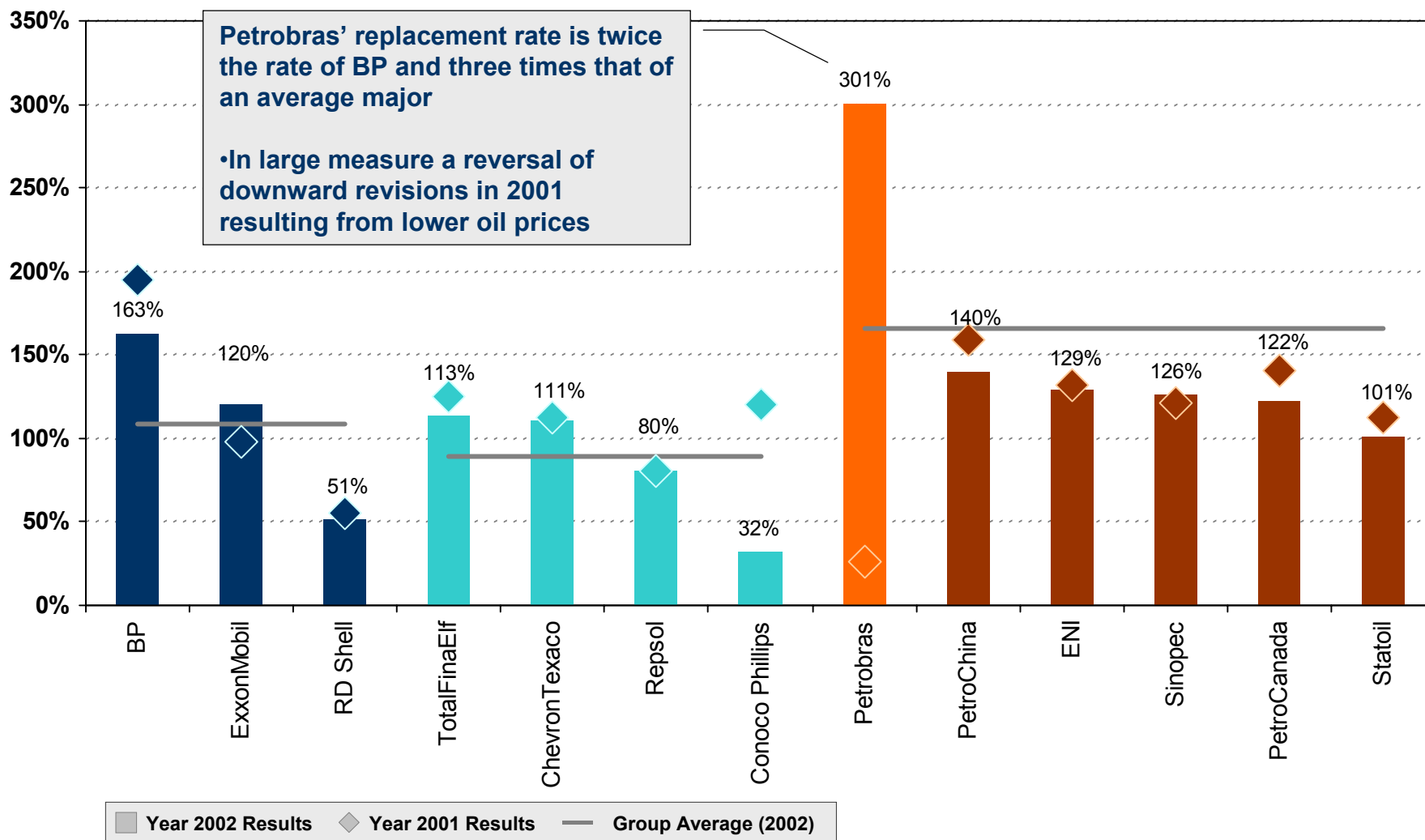
RESERVE REPLACEMENT COSTS

- Total E&P Costs (including acquisitions) / (Revisions + Purchases + Extensions & Discoveries + Improved Recovery) (\$/bbl)



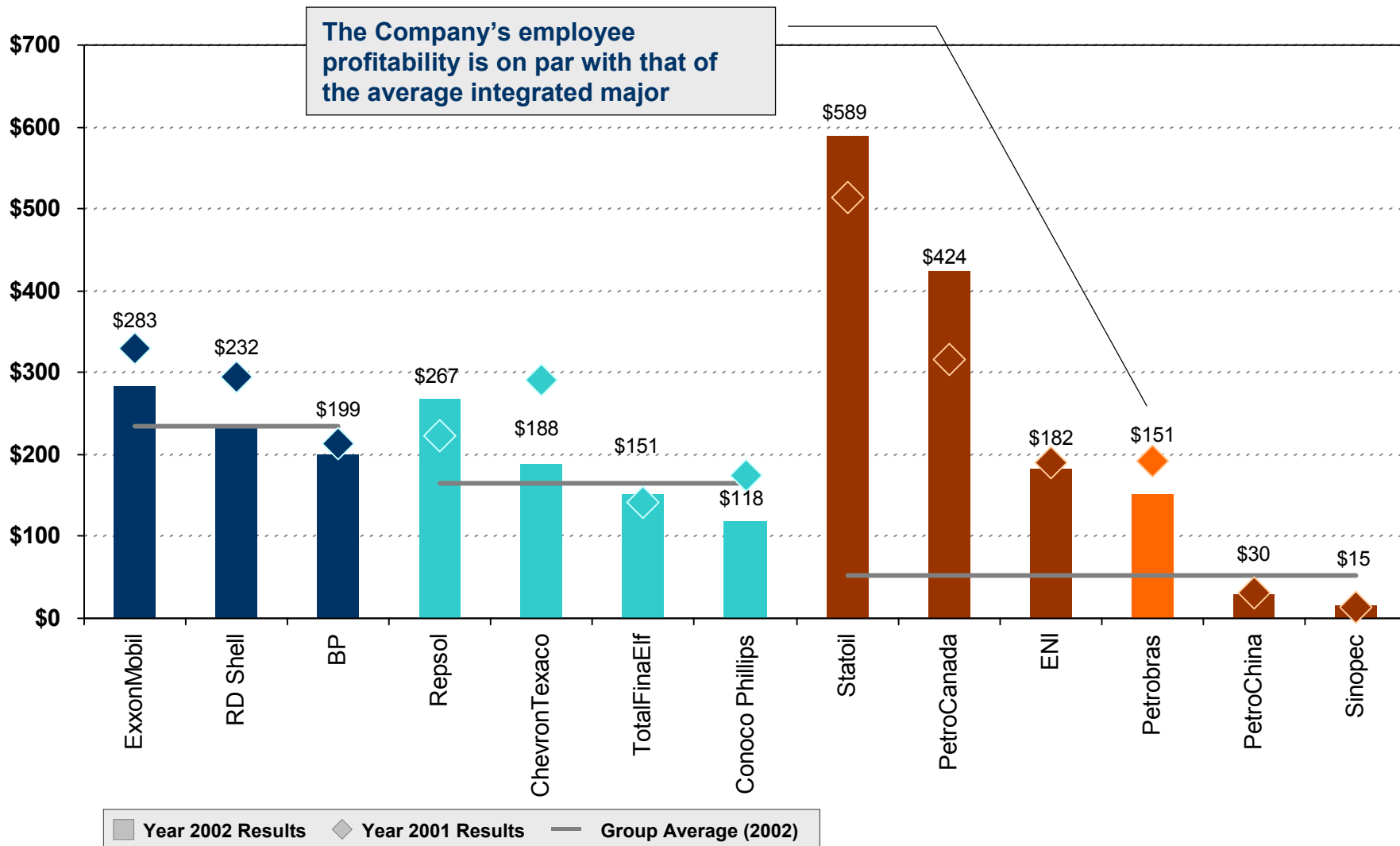
RESERVE REPLACEMENT RATE

▪ (Revisions + Extensions & Discoveries + Improved Recovery) / Oil & Gas Production



EMPLOYEE PROFITABILITY

▪ EBITDA (Earnings Before Interest, Taxes & Depreciation) / Company Employee (\$ thousands)



FINANCIAL COMPARISONS

- **Petrobras' EBITDA ROCE is on par with the majors**
 - substantially lower turnover (lower revenues relative to the majors)
 - substantially higher gross margins (large intracompany transfers and very profitable R&M)
- **Petrobras' ROE is substantially greater than its peers**
 - lower depreciation deductions (low historic cost asset base)
 - lower income taxes
- **The company is reinvesting a greater portion of its cash flow than the majors (peak development stage for offshore reserves)**
- **Petrobras' leverage is comparable to the average integrated major**

	Petrobras	Super Majors	Integrated Majors	Petrobras vs Super Majors	Petrobras vs Integrated Majors
Turnover (%)	0.9x	1.6x	1.5x	55%	61%
Gross Margin (%)	27%	14%	13%	193%	202%
EBITDA ROCE (%)	25%	23%	20%	107%	123%
EBIT ROCE (%)	17%	15%	12%	114%	142%
Return on Equity (%)	25%	13%	8%	185%	298%
Cash Flow Reinvestment (%)	107%	51%	52%	208%	205%
Book Debt Ratio (%)	43%	11%	31%	26%	73%

 **Petrobras**

 **Super Majors**

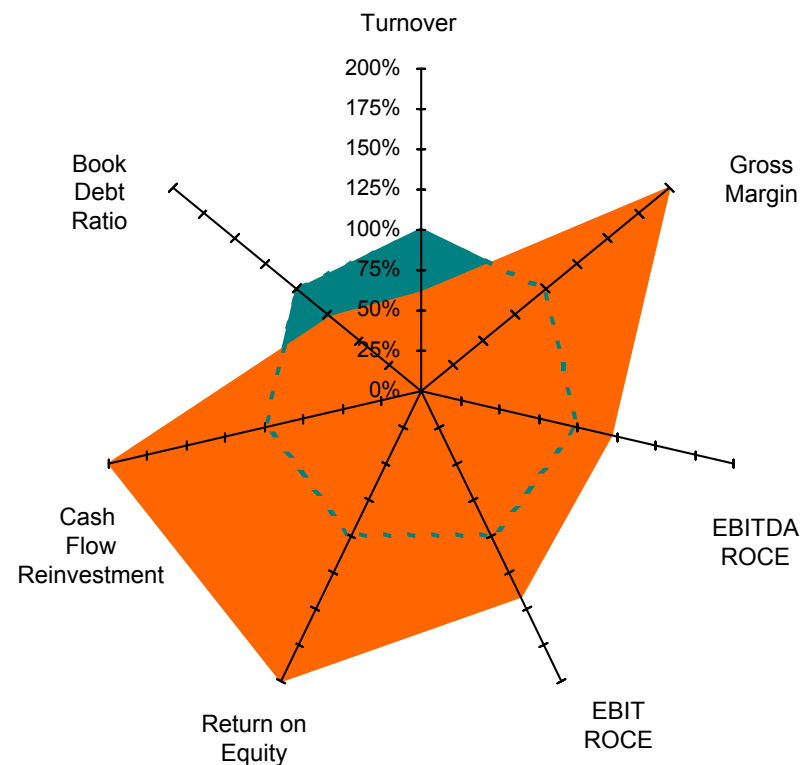
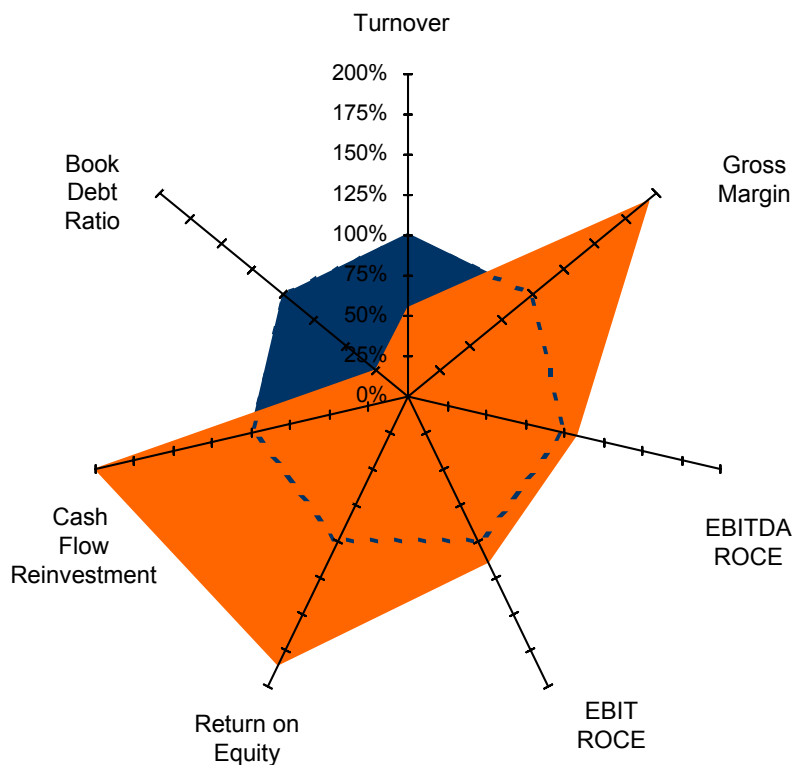
 **Integrated Majors**

BP
ExxonMobil
Royal Dutch Shell

ChevronTexaco
ConocoPhillips
Repsol-YPF
TotalFinaElf

FINANCIAL COMPARISONS

- While Petrobras' ROCE is comparable to the majors, its turnover is substantially lower and its margins are significantly higher



Petrobras

Super Majors

Integrated Majors

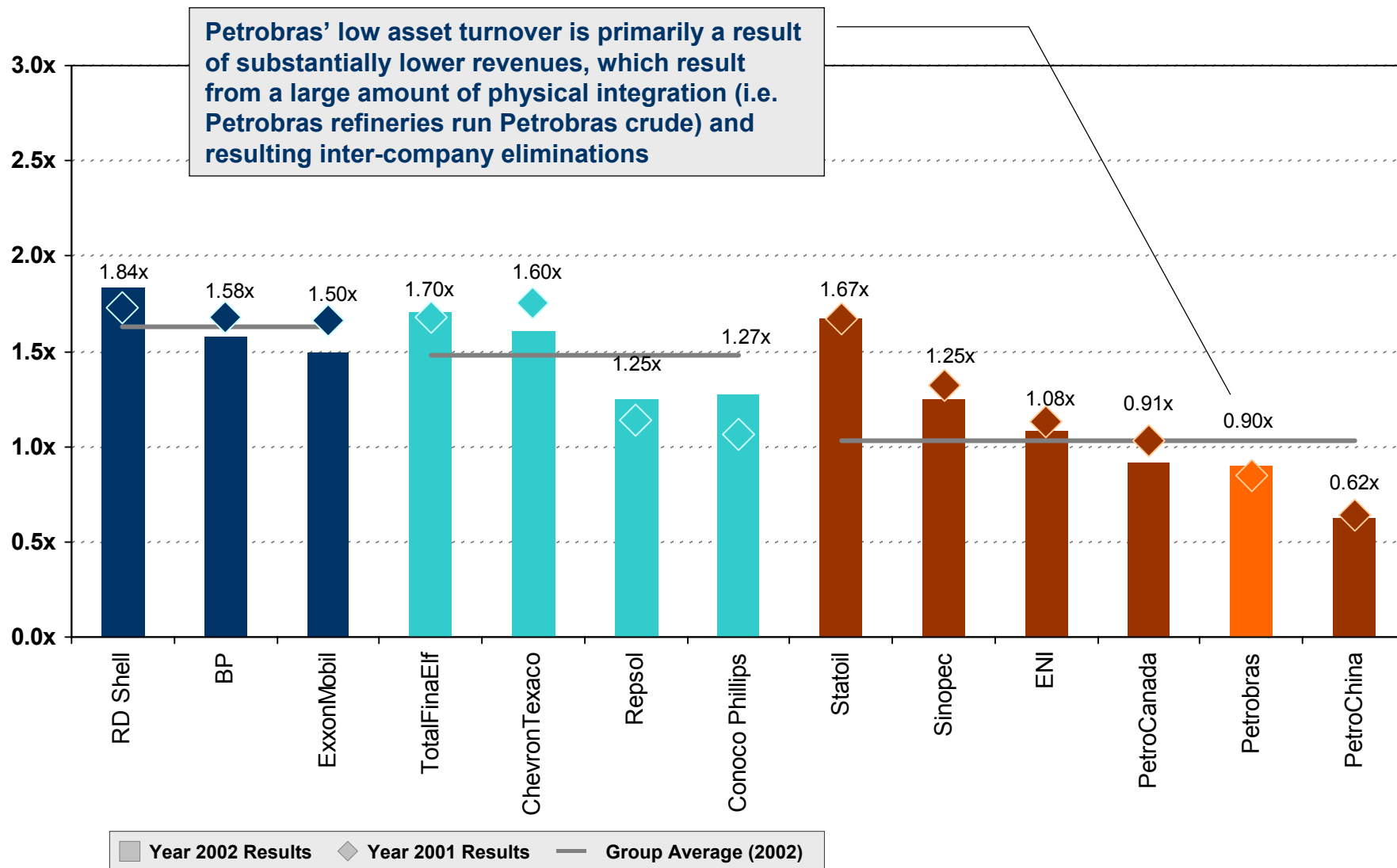
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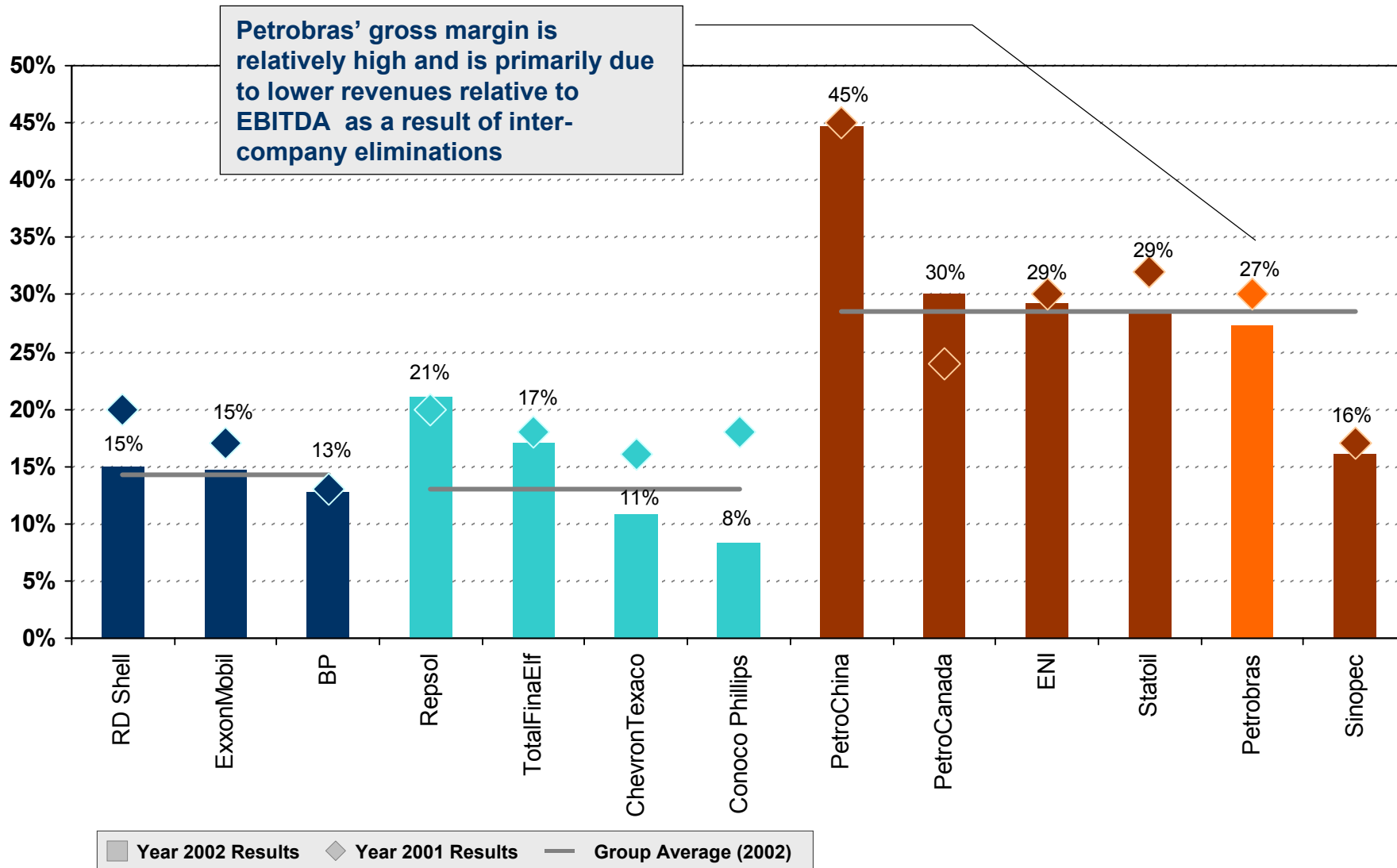
TURNOVER

▪ Revenues / Capital Employed (*Total Assets - Current Liabilities*)



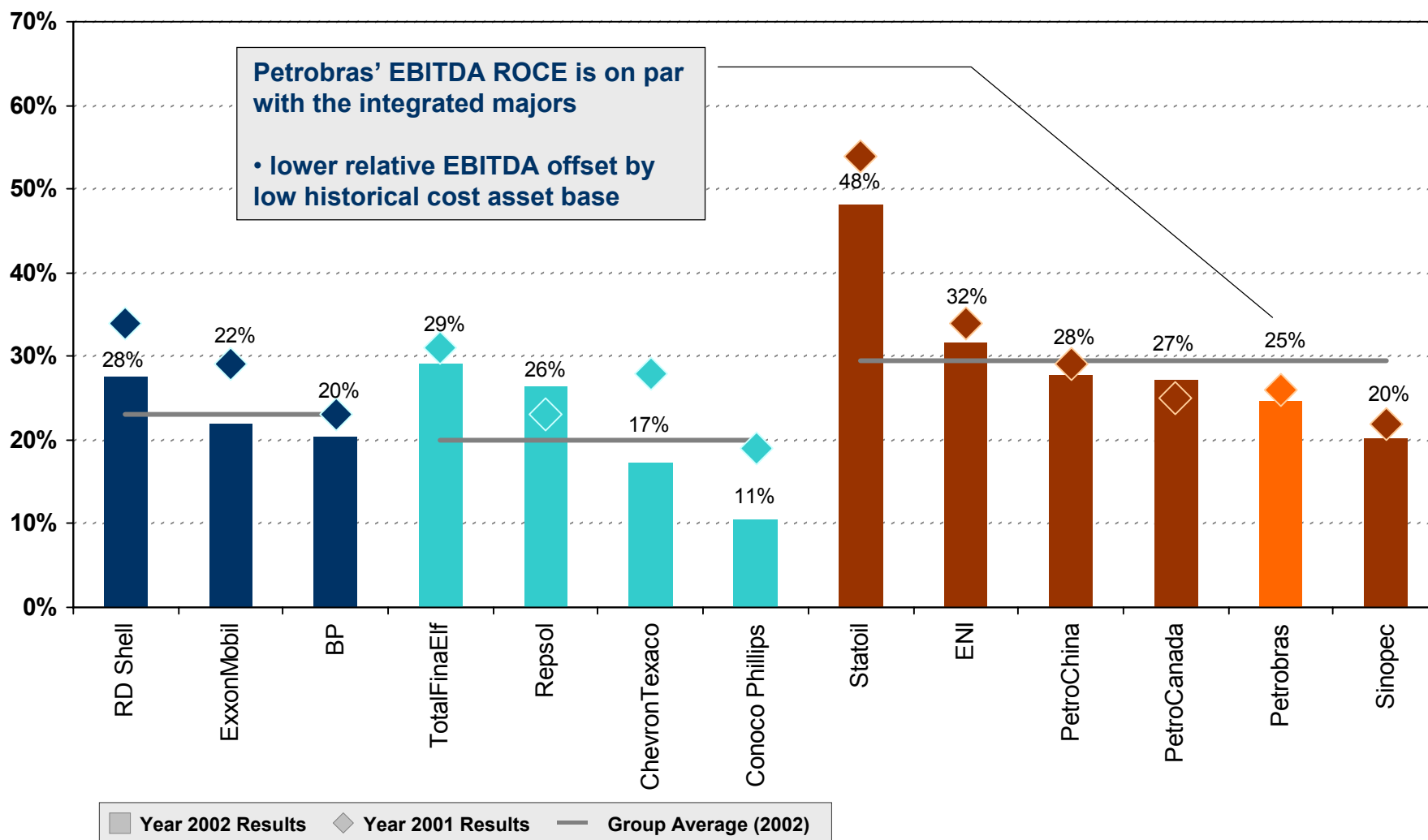
GROSS MARGIN

- EBITDA (Earnings Before Interest, Taxes & Depreciation) / Revenues



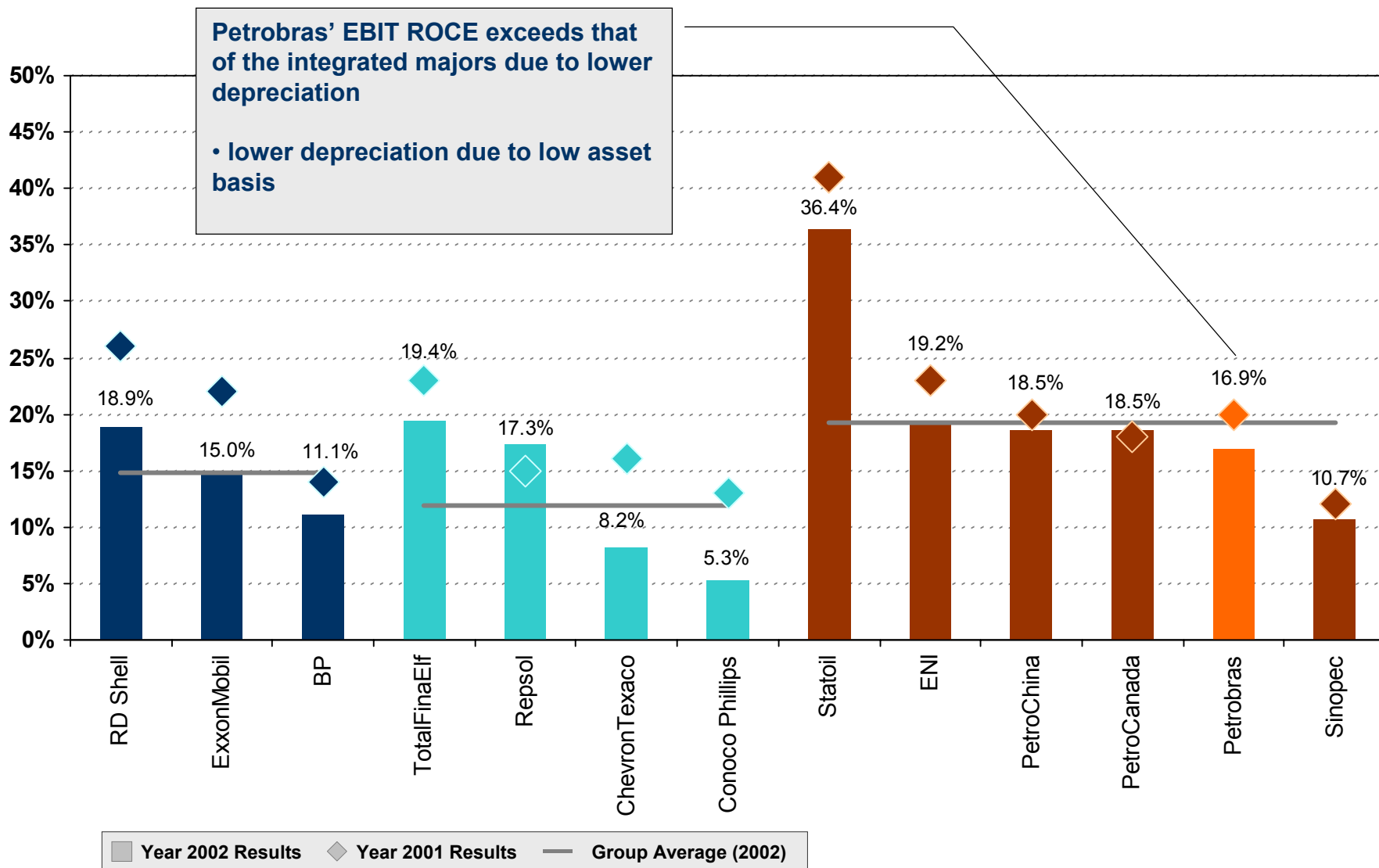
EBITDA RETURN ON CAPITAL EMPLOYED

- EBITDA (Earnings Before Interest, Taxes & Depreciation) / Capital Employed (Total Assets - Current Liabilities)



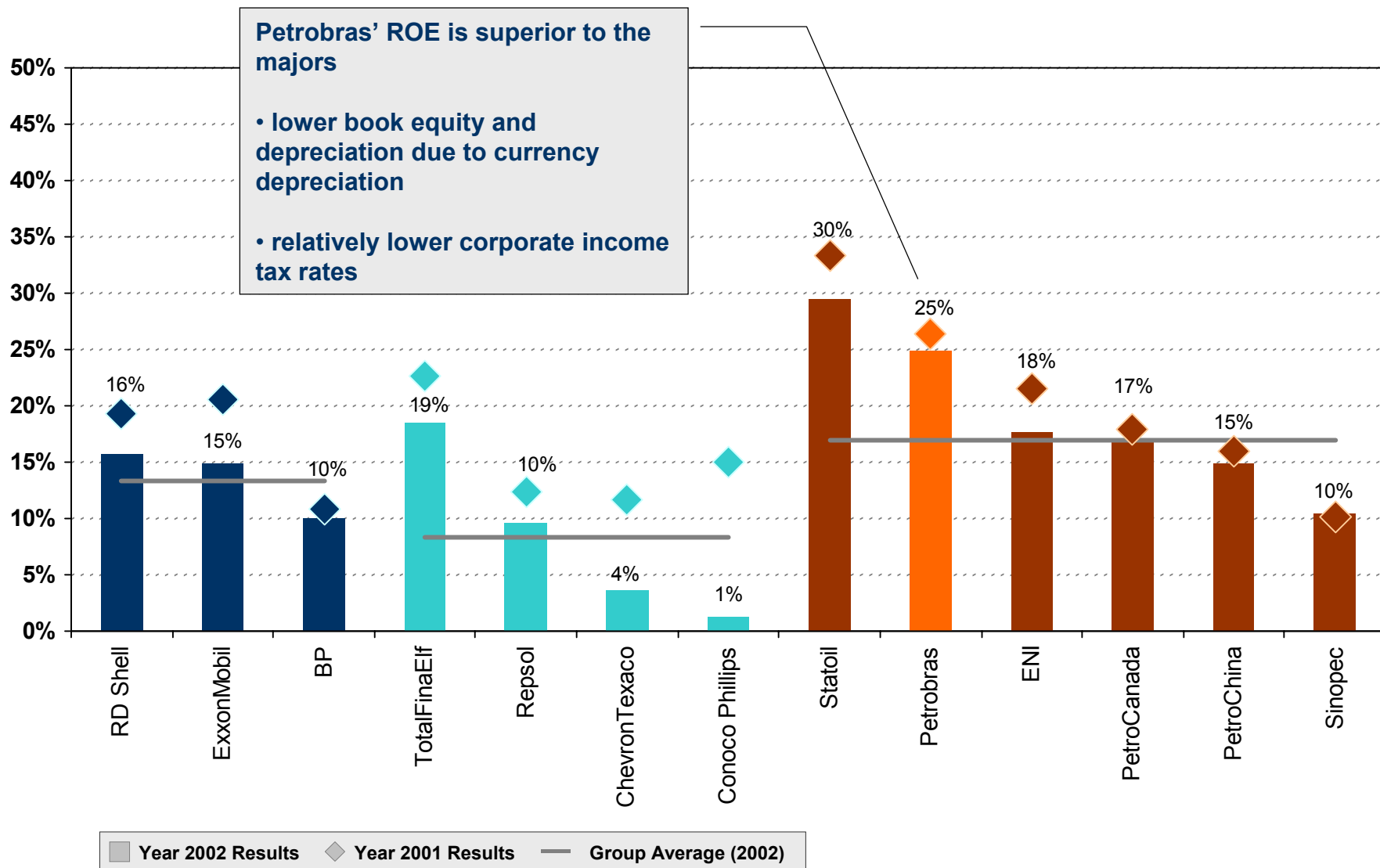
EBIT RETURN ON CAPITAL EMPLOYED

▪ EBIT (Earnings Before Interest & Taxes) / Capital Employed (Total Assets - Current Liabilities)



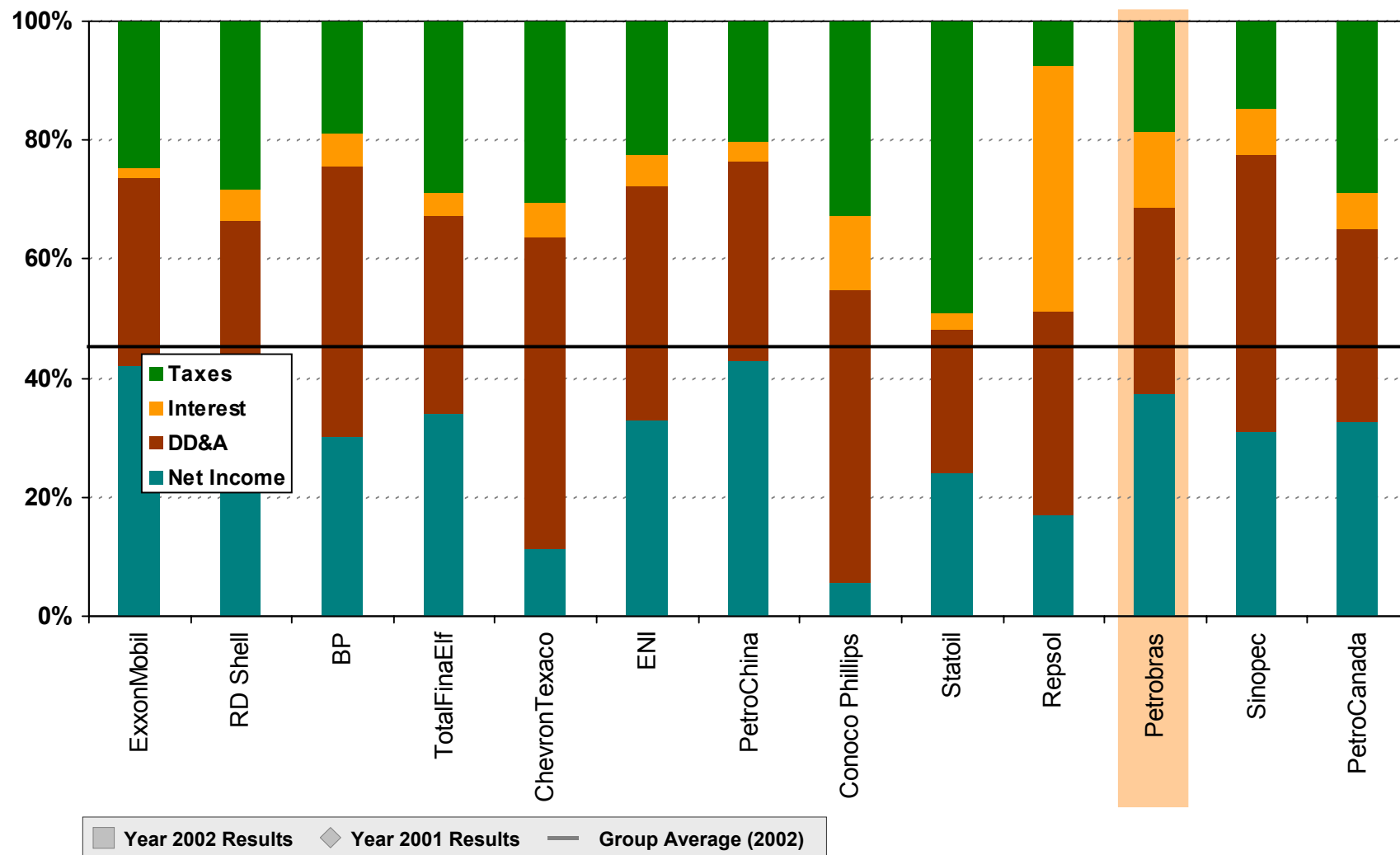
RETURN ON EQUITY

▪ Net Income / Book Value of Equity



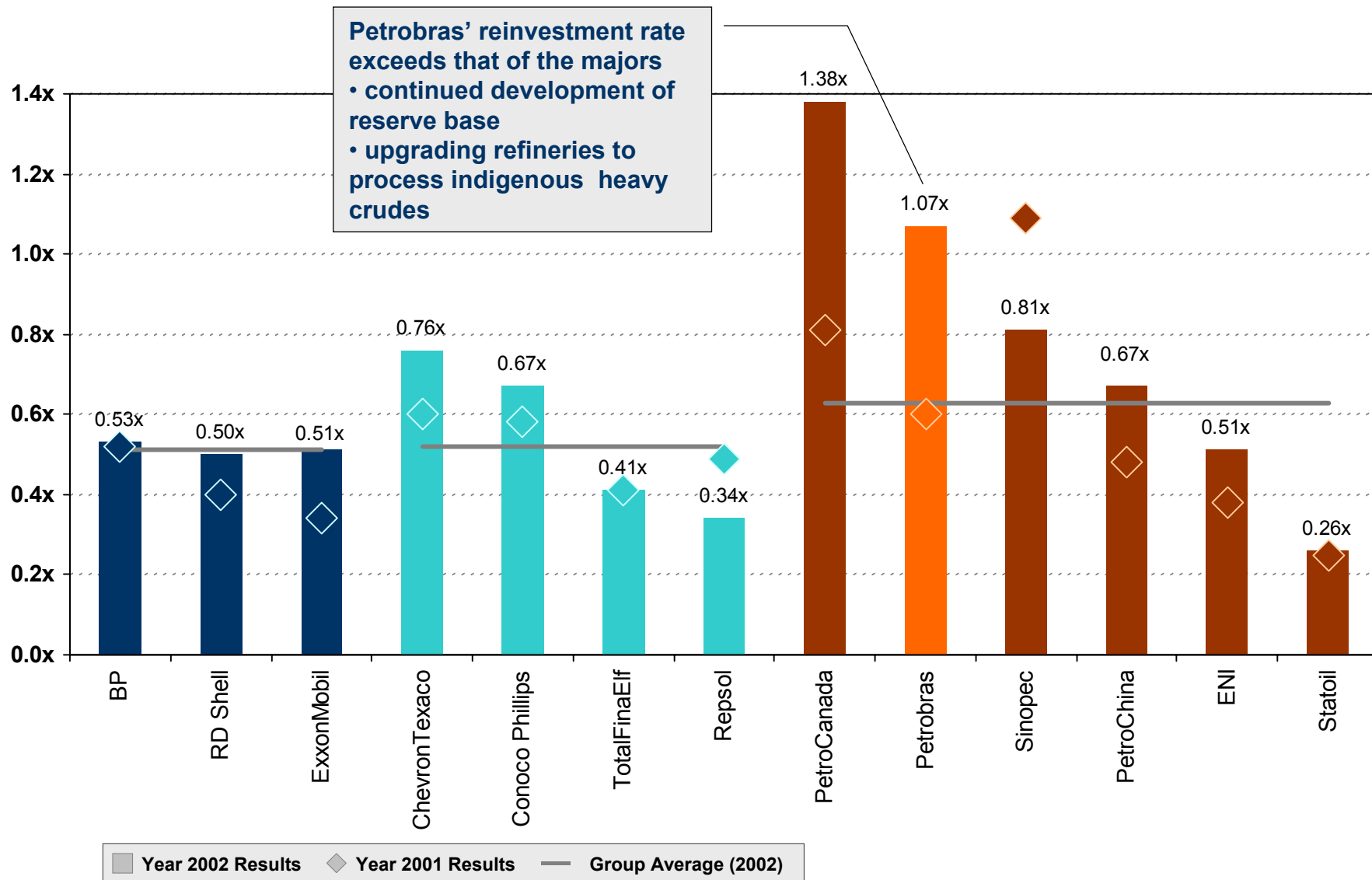
EBITDA COMPONENTS

- As a result of relatively low depreciation and income taxes, Petrobras' net income relative to EBITDA is the highest among the comparable companies.



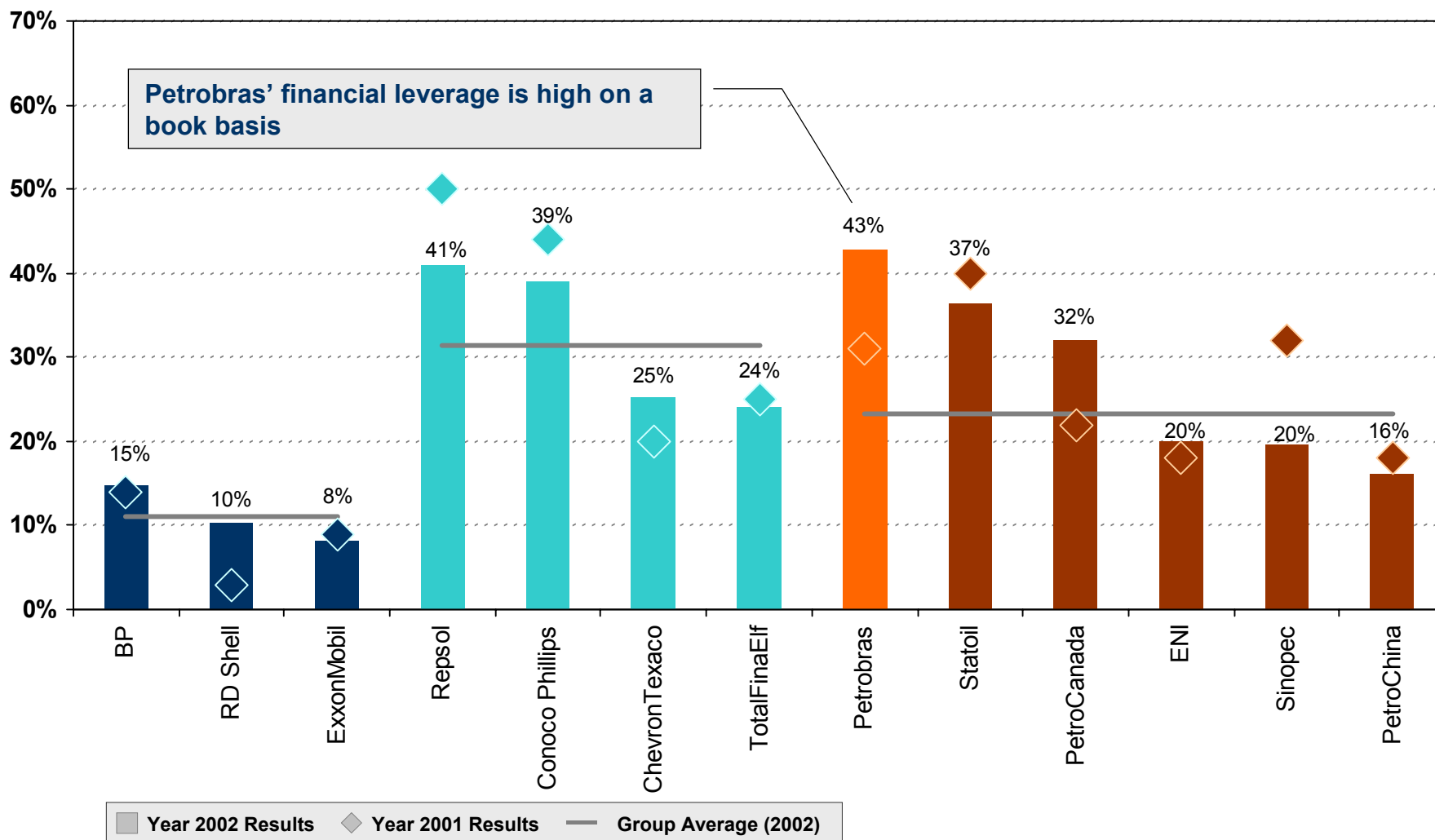
CASH FLOW REINVESTMENT

▪ Capital Expenditures / EBITDA (*Earnings Before Interest, Taxes & Depreciation*)



BOOK DEBT RATIO

▪ LTD / LTD + Book Value of Equity



STOCK MARKET COMPARISONS

- Petrobras suffers on all market value metrics due to the low level of its share price relative to its peers

	Petrobras	Super Majors	Integrated Majors	Petrobras vs Super Majors	Petrobras vs Integrated Majors
Market Capitalization (\$ billions)	\$27	\$183	\$62	15%	43%
Firm Value (\$ billions)	\$34	\$192	\$74	18%	45%
Reserve Market Valuation (\$ / BOE)	\$2.83	\$8.70	\$6.67	33%	42%
Dividend Yield (%)	3.3%	3.6%	3.2%	93%	104%
Price to 2002 Est Earnings (%)	4.7x	13.1x	10.1x	36%	47%
Price to 2003 Est Earnings (%)	6.4x	15.3x	12.4x	42%	51%
One Year Shareholder Return (%)	95%	9%	21%	998%	456%

Note: stock performance metrics are based on closing prices on November 24, 2003

 Petrobras

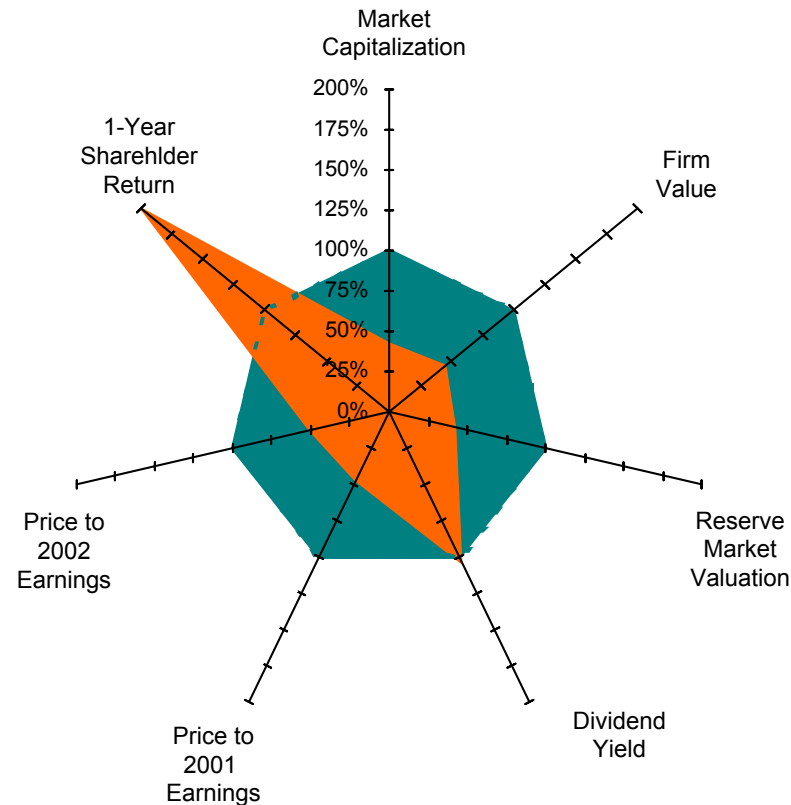
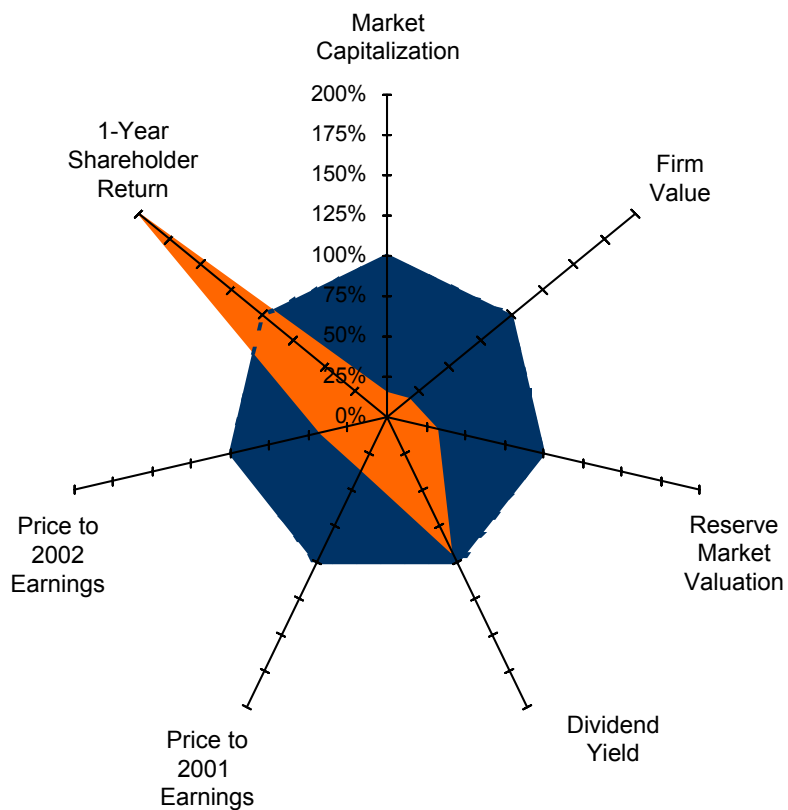
 Super Majors

 Integrated Majors

BP
ExxonMobil
Royal Dutch Shell

ChevronTexaco
ConocoPhillips
Repsol-YPF
TotalFinaElf

STOCK MARKET COMPARISONS



Petrobras

Super Majors

Integrated Majors

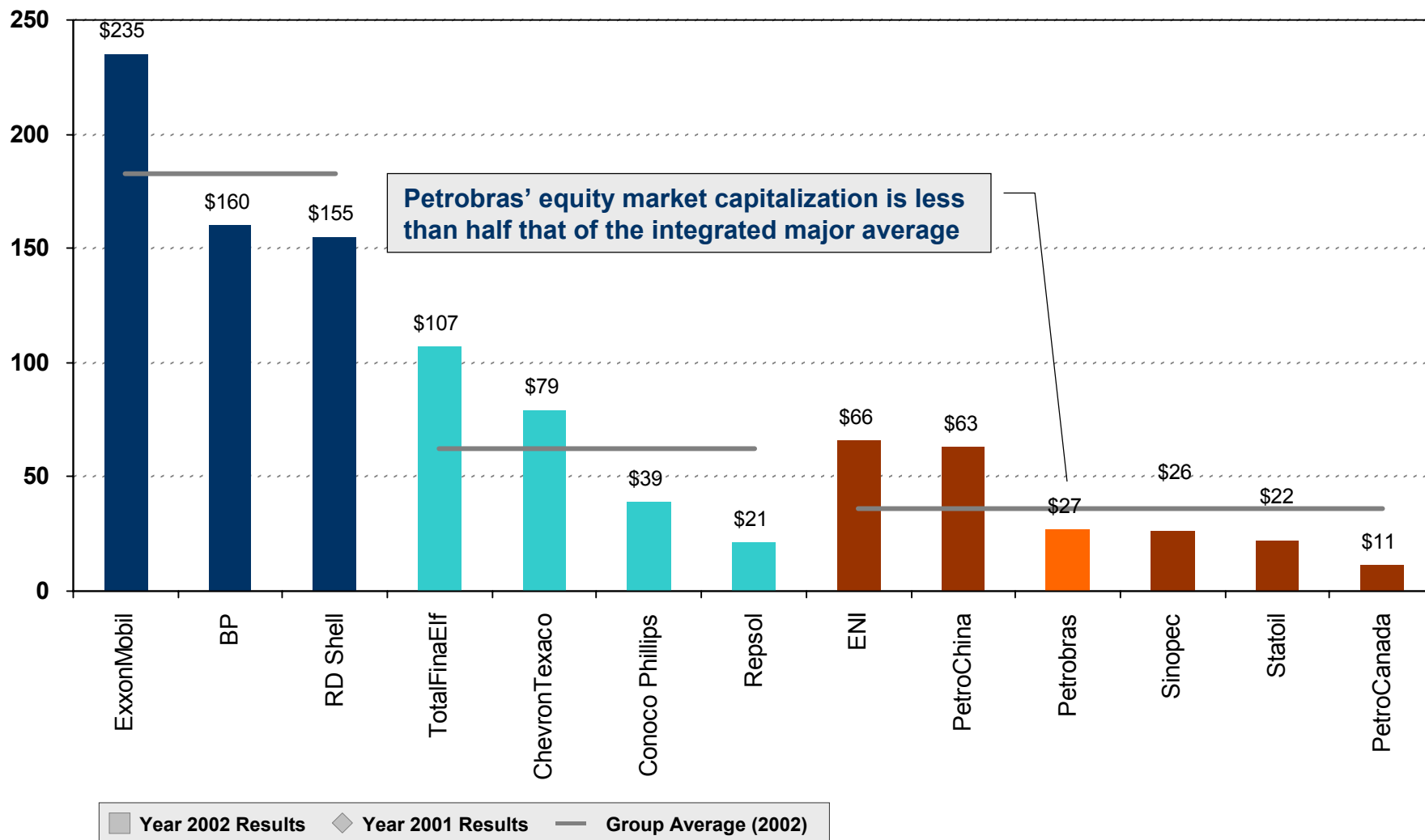
BP
ExxonMobil
Royal Dutch Shell

ChevronTexaco
ConocoPhillips
Repsol-YPF
TotalFinaElf

See appendix for note on interpreting spider diagrams

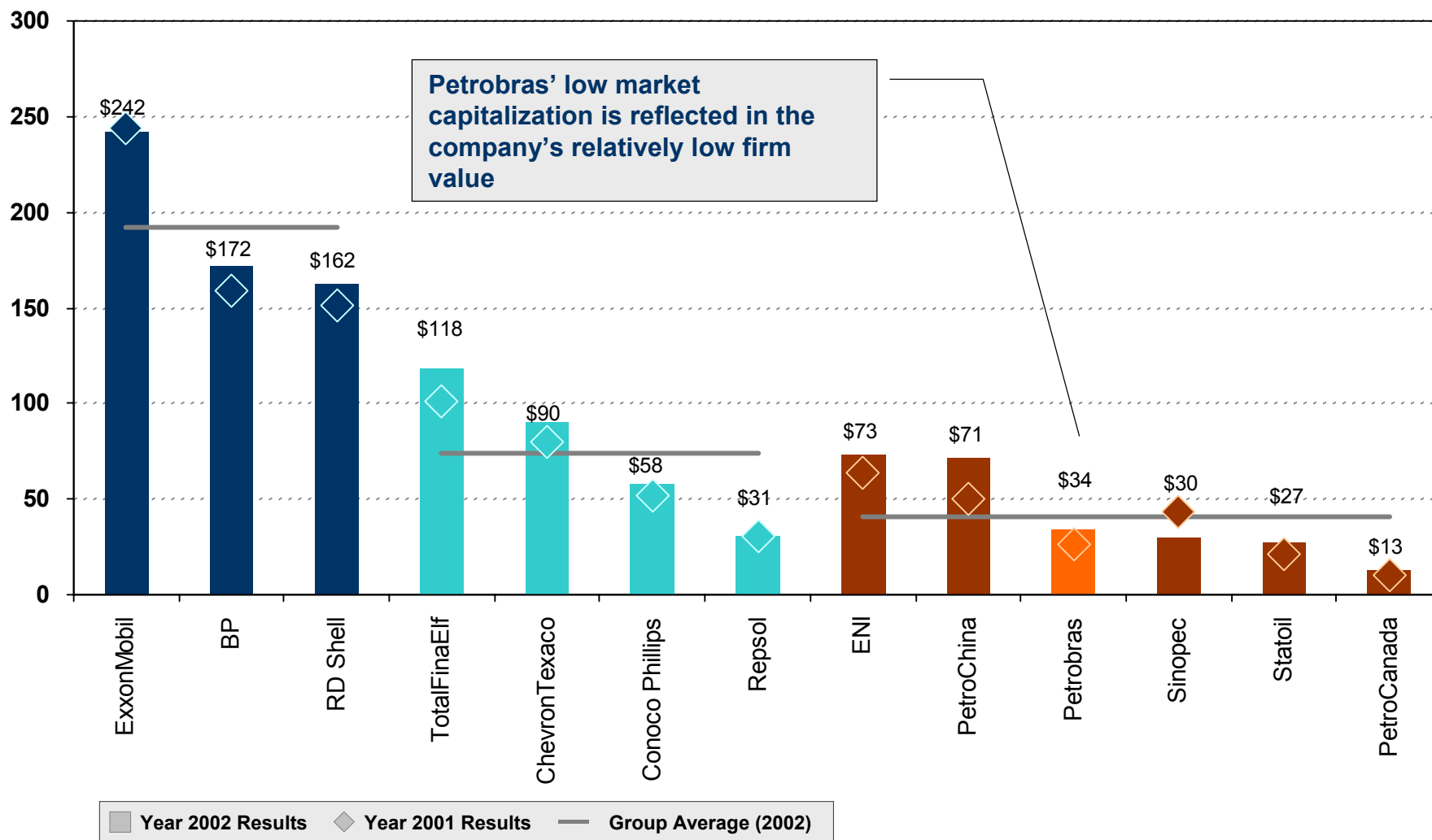
MARKET CAPITALIZATION

▪ Shares Outstanding * Price per Share (*\$ Billions*)



FIRM VALUE

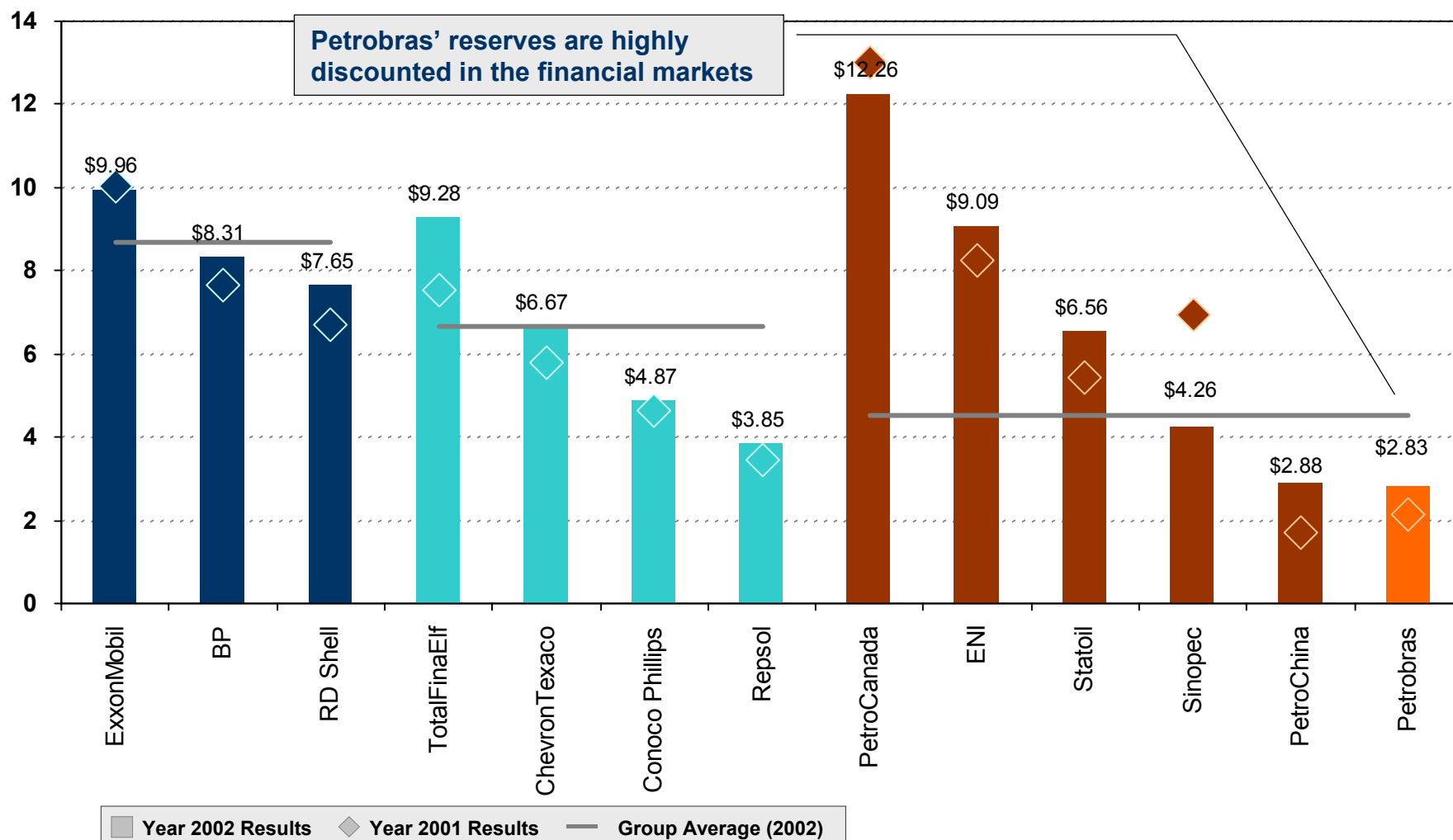
- Market Capitalization (Shares Outstanding * Price per Share) + Long-term Debt (\$ Billions)



RESERVE MARKET VALUATION

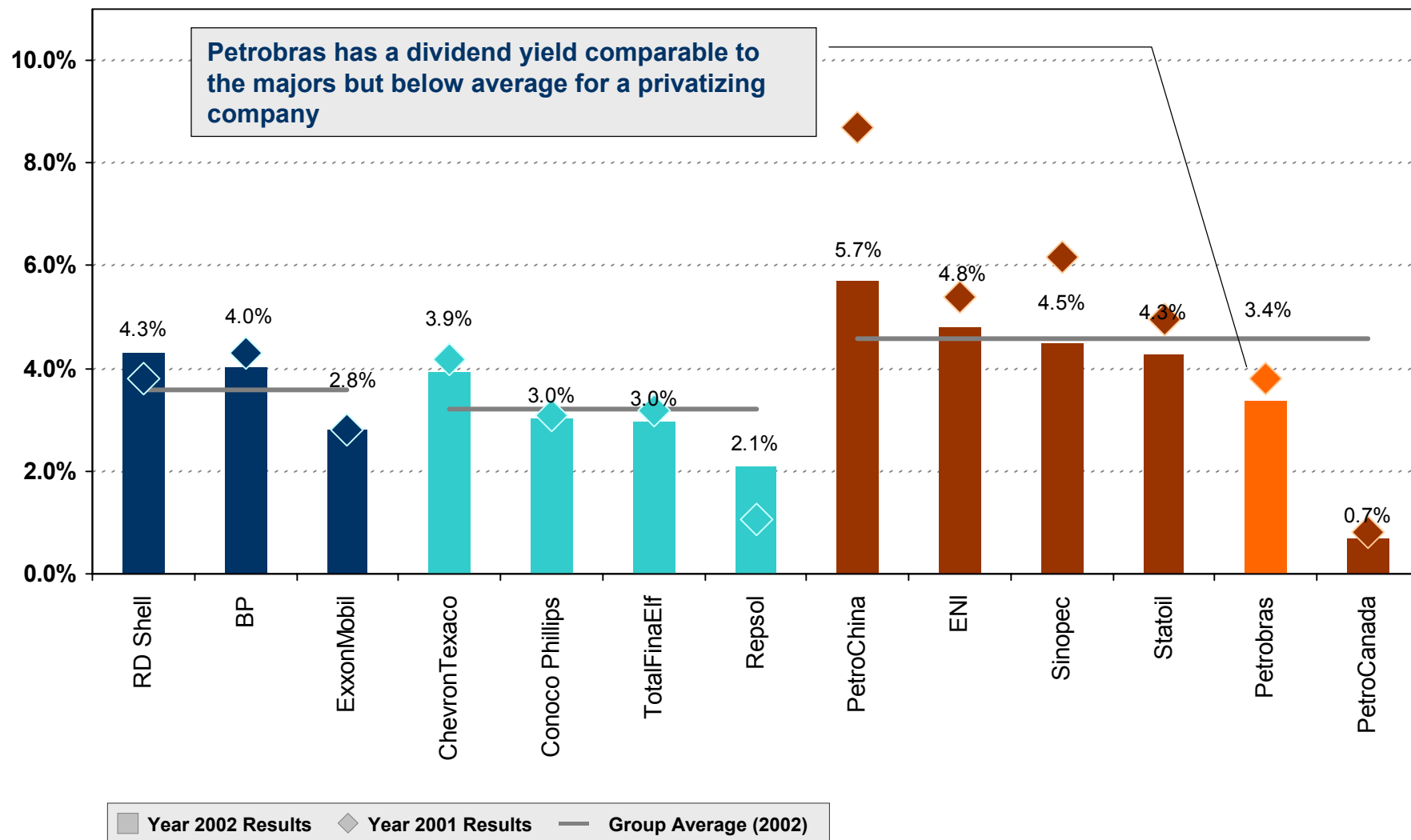
Market Capitalization - Book Value of Equity + E&P Capitalization / Barrel of Oil Equivalent Reserves (\$/bbl)

– assumes the difference between market capitalization and book value is attributable to the value of reserves in the ground; i.e., all other assets and liabilities are worth book value



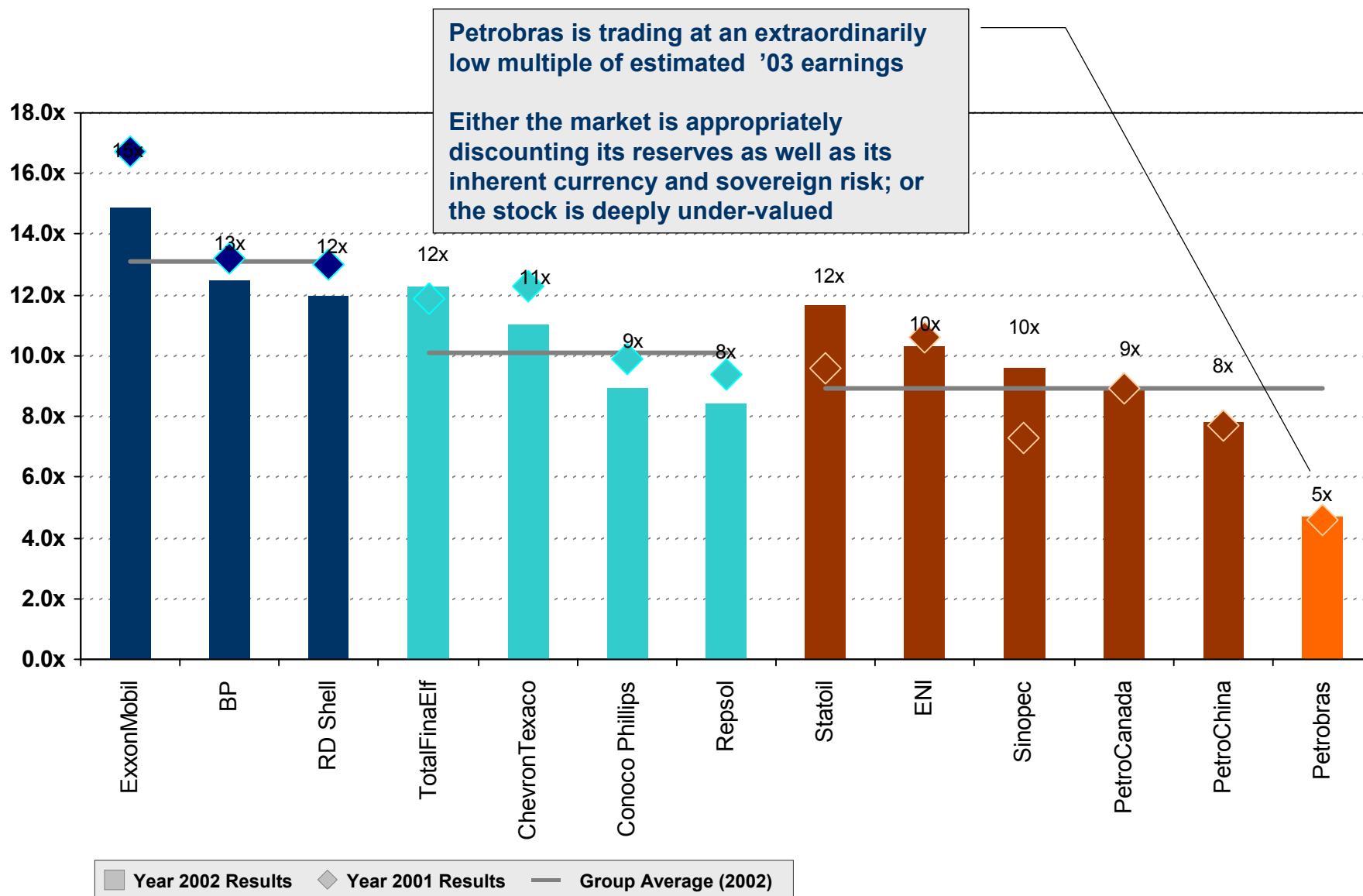
DIVIDEND YIELD

▪ Annual Dividend Per Share / Price Per Share



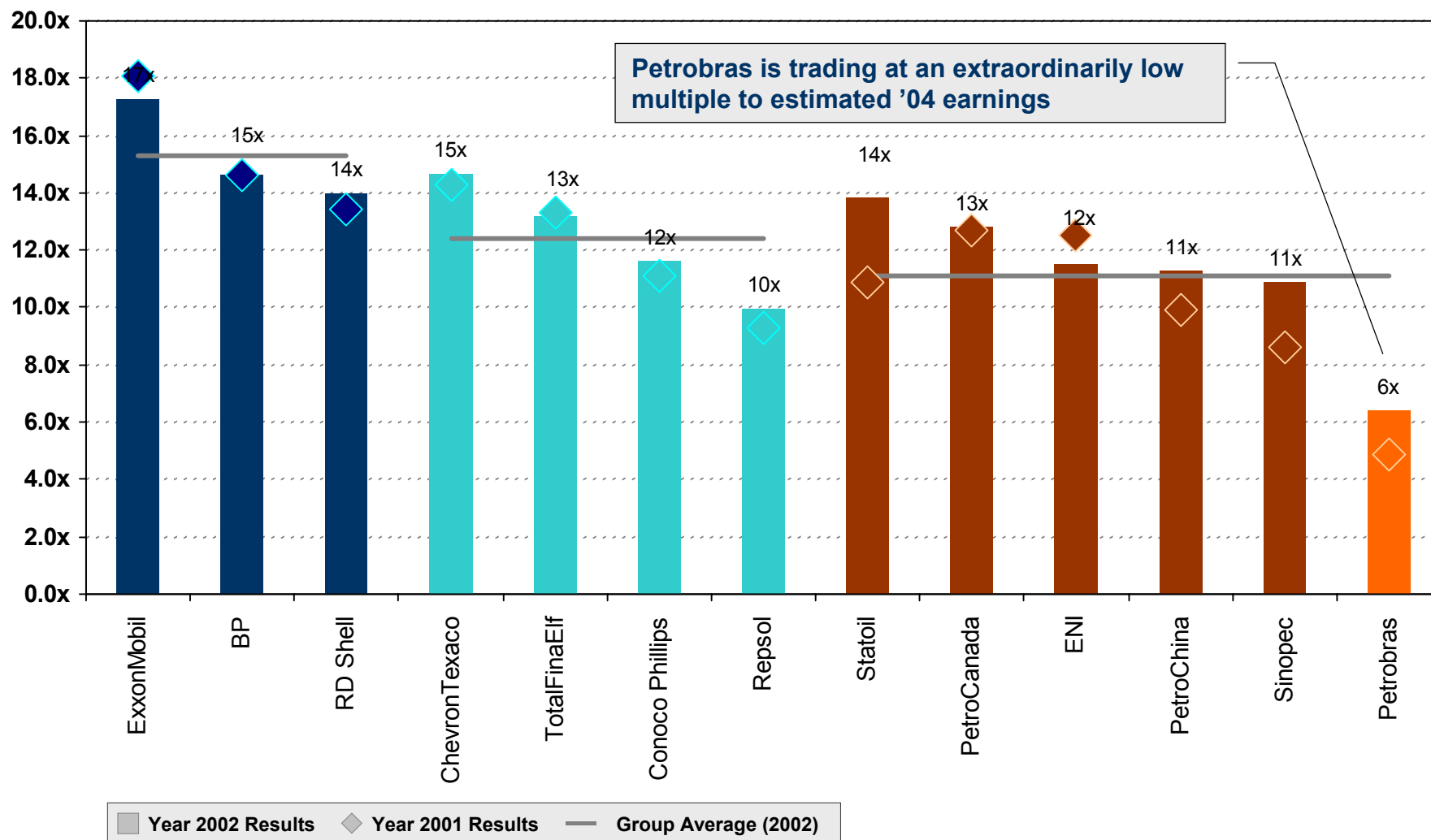
PRICE TO 2003 EARNINGS ESTIMATES

Price Per Share / Estimated 2003 Earnings Per Share



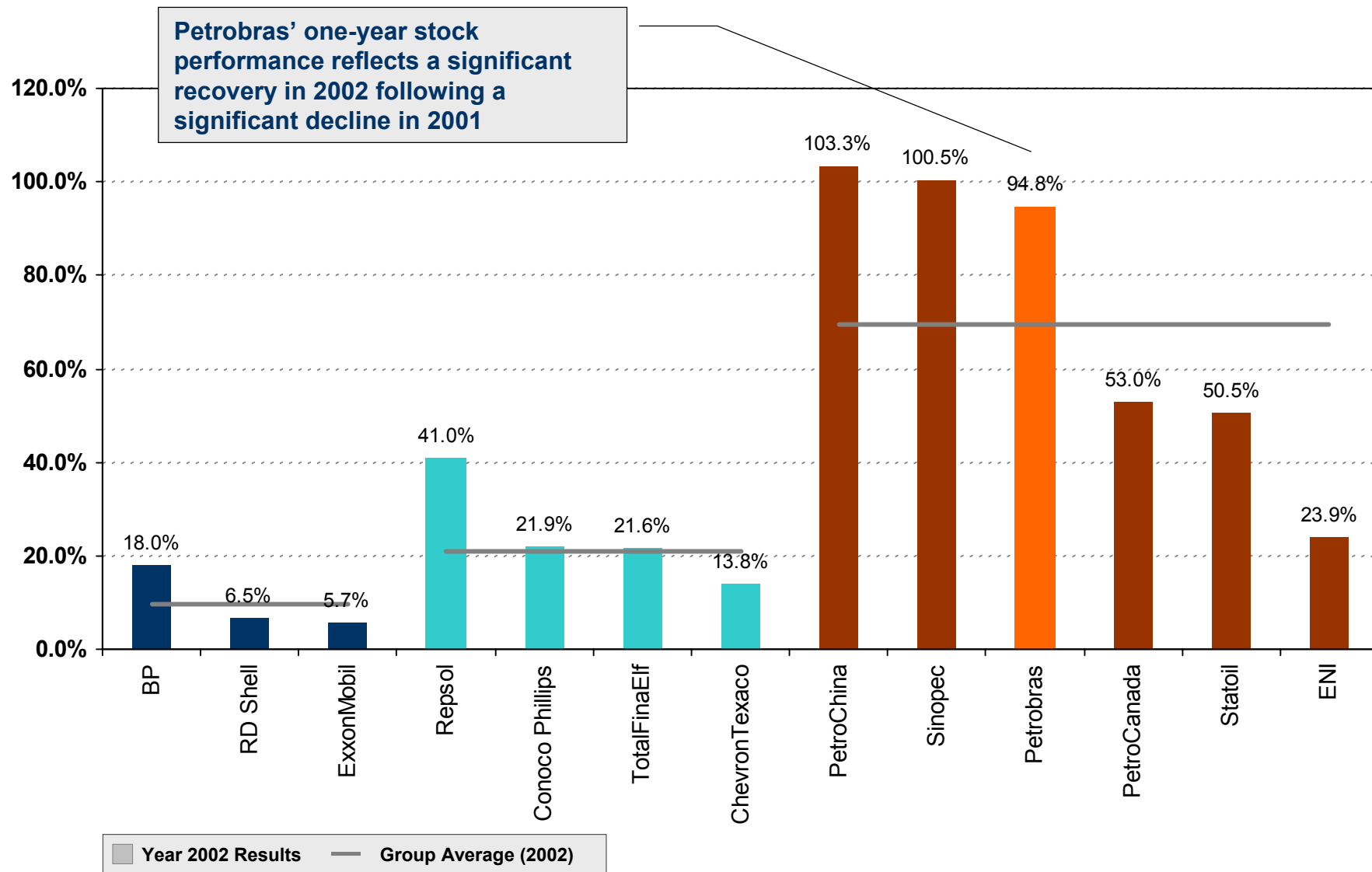
PRICE TO 2004 EARNINGS ESTIMATES

▪ Price Per Share / Estimated 2004 Earnings Per Share



ONE-YEAR SHAREHOLDER RETURN

- One-Year Annual Rate of Return (adjusted for dividends and splits)

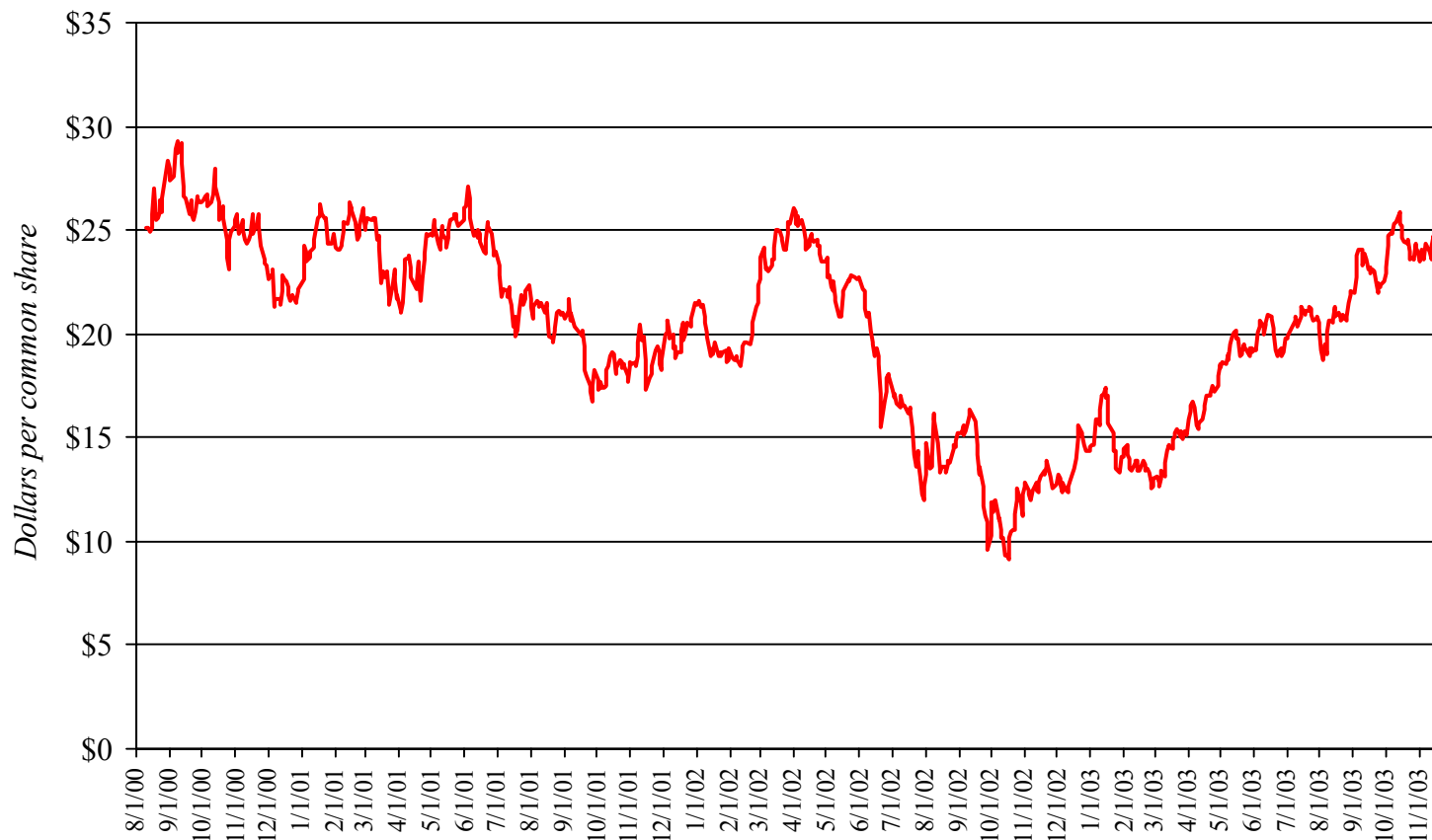


Historical Equity Price Performance

- Since the listing of its ADR on the NYSE in August 2000, Petrobras' stock price has fallen and subsequently returned to its original price level

Petrobras Historic Price

(From the date of ADR Listing on NYSE, August 10, 2000)

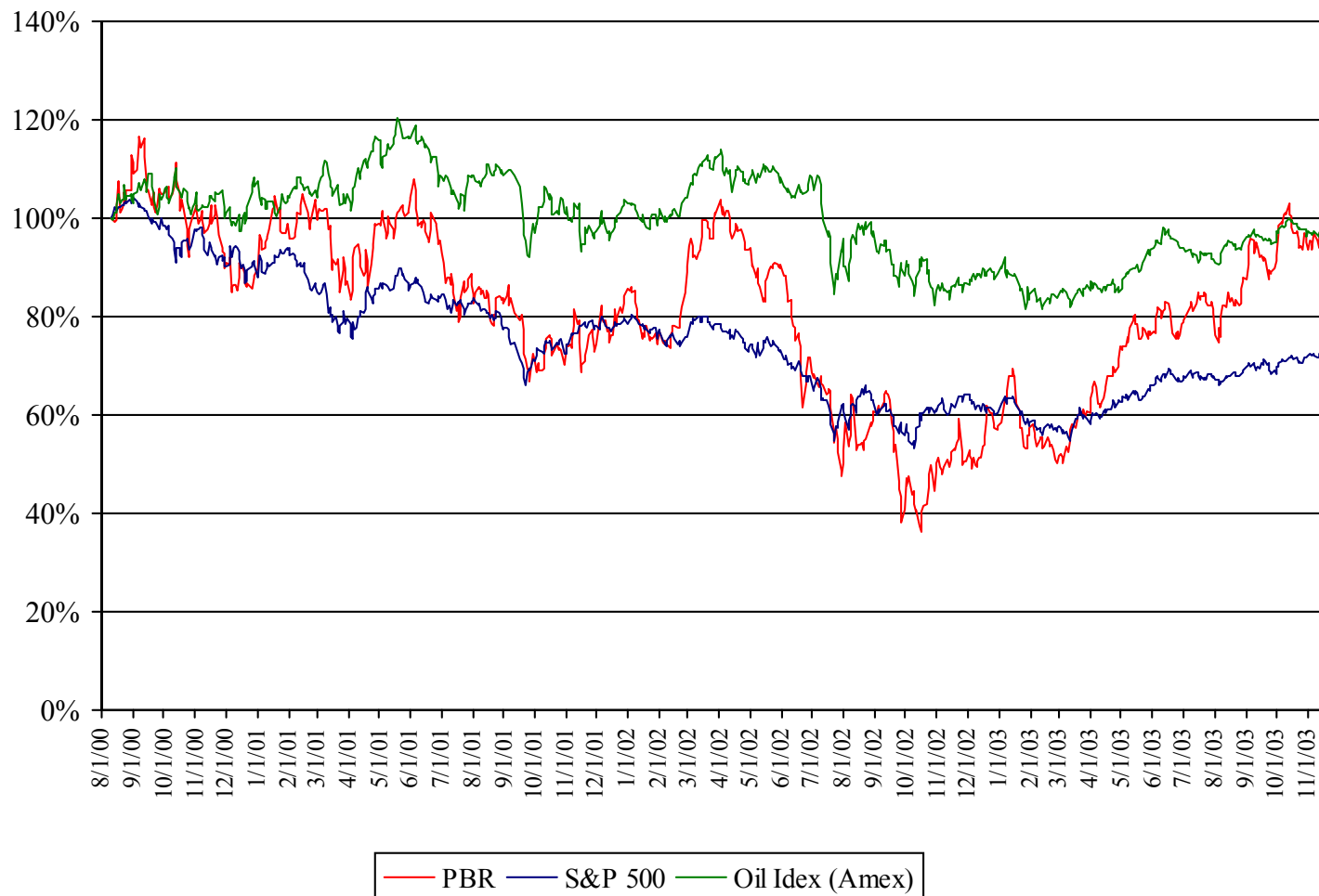


Historical Equity Price Performance

- Petrobras' stock price has – overall – kept pace with its peers and outperformed the Amex Oil Index over the same interim

Petrobras Price Performance vs. S&P 500 and Oil Indices

(From the date of ADR Listing on NYSE, August 10, 2000)

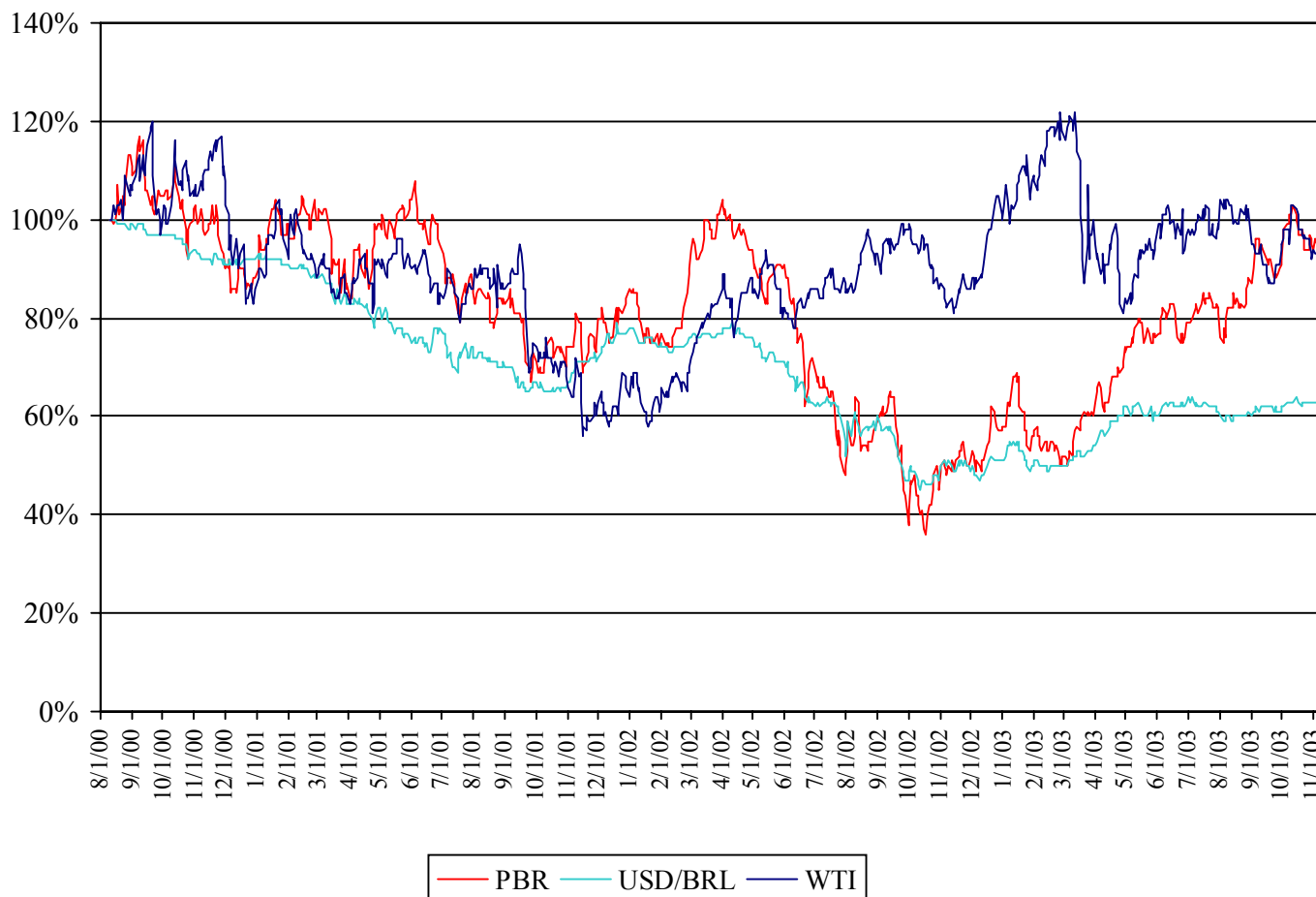


Historical Equity Price Performance

- Petrobras' relative performance is influenced by both the price of crude and the \$US/Real exchange rate, as a majority of Petrobras' revenues are denominated in Reais
 - Devaluation of Real from 2000 through 2002 resulted in comparatively weaker equity price performance
 - Subsequent appreciation of the Real has caused Petrobras ADR to outperform its peers over the last twelve months

Petrobras Price Performance vs. WTI and USD/BRL Exchange Rate

(From the date of ADR Listing on NYSE, August 10, 2000)



- Three overarching factors appear to be impacting Petrobras' stock performance

1. Governmental Agency Costs

- By Brazilian Law, the federal government must maintain a controlling interest in Petrobras
 - Historically, Petrobras has been a vehicle for federal macroeconomic and social policies; objectives that may compete with the goal maximizing shareholder value
 - In periods of high inflation, the government has set prices for oil and oil products below world market prices
 - Current price-control guidelines must be consistent with gradual achievement of price deregulation
 - Petrobras holds U.S. \$3.5 billion in National Treasury Bonds as consideration for the privatization of certain subsidiaries
 - The bonds accrue interest and mature from 2007 through 2012
 - The government may roll those bonds over at maturity
- ***Typically, successful national-oil privatization programs eventually lead to a relinquishment of governmental control to shareholders***
- *Markets anticipate the eventual offering of large blocks of government shares*
 - *In any case, the Brazilian government intends to maintain regulatory control over Petrobras*

2. Continued Oil & Gas Sector Deregulation

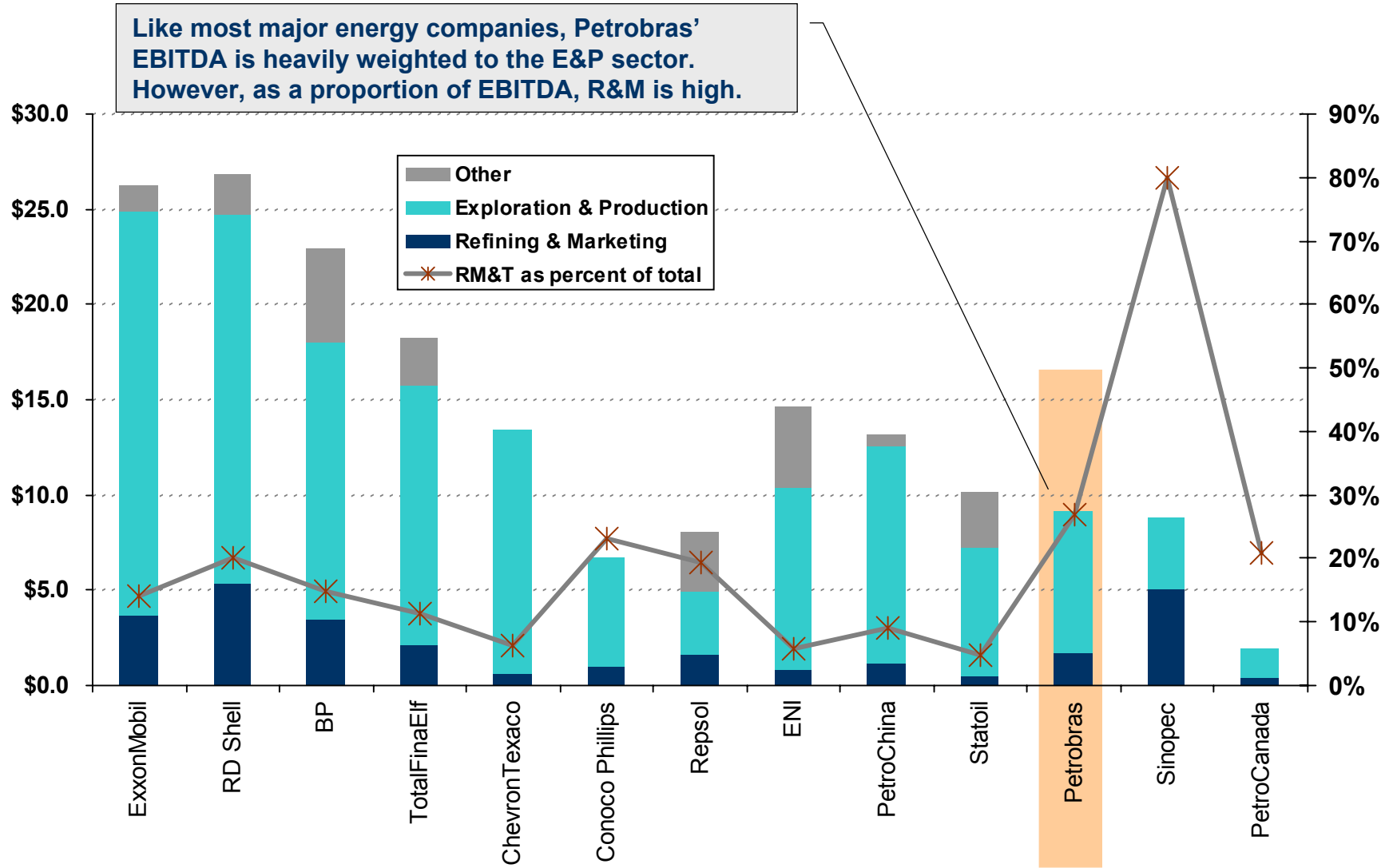
- Federal government has initiated an auction process for new exploration areas, and further deregulation in the downstream sector is expected
 - Brazil's antitrust agency may require Petrobras to reduce its ownership of Brazilian refining capacity, currently at 97.7%
 - Deregulation may increase competition for and salaries of skilled employees in the Oil and Gas Sector
 - Petrobras' employees are represented by a union, and further attempts at deregulation may result in protest strikes
 - Brazilian refined product import tariffs have been reduced from 6% to 0% in 2001, decreasing Petrobras' competitive price advantage
- ***Continued deregulation and the movement toward competitive markets will erode Petrobras' competitive advantages in Brazil***
- *Petrobras has participated in some asset swaps, most notably with Repsol-YPF, to reduce its exposure to the Brazilian markets and increase its international diversification*
 - *The introduction of competitive forces in Brazil afford Petrobras the opportunity for numerous joint ventures in the E&P and downstream sector. Such ventures will allow Petrobras to adopt the best practices of the world's leading oil companies*

3. Brazilian Sovereign Risk

- Brazilian economic and political conditions have a direct impact on Petrobras' business
- Exchange Rates
 - 85% of Petrobras' revenues are denominated in Reais
 - A substantial portion of the company's debt is denominated, or indexed to, the U.S. dollar
 - The Brazilian Central Bank allowed the Real to float versus the U.S. dollar on January 15, 1999
 - The Real has depreciated 35% versus the U.S. Dollar in 2001
 - December 31, 2001: R\$2.31 = U.S. \$1.00
 - December 31, 2002: R\$3.54 = U.S. \$1.00
 - 52% of the company's total indebtedness consists of floating rate debt and short-term debt
- ***Previously successful national-oil privatization programs led to aggressive international diversification and growth***
 - Repsol-YPF; ENI; TotalFinaElf; BP

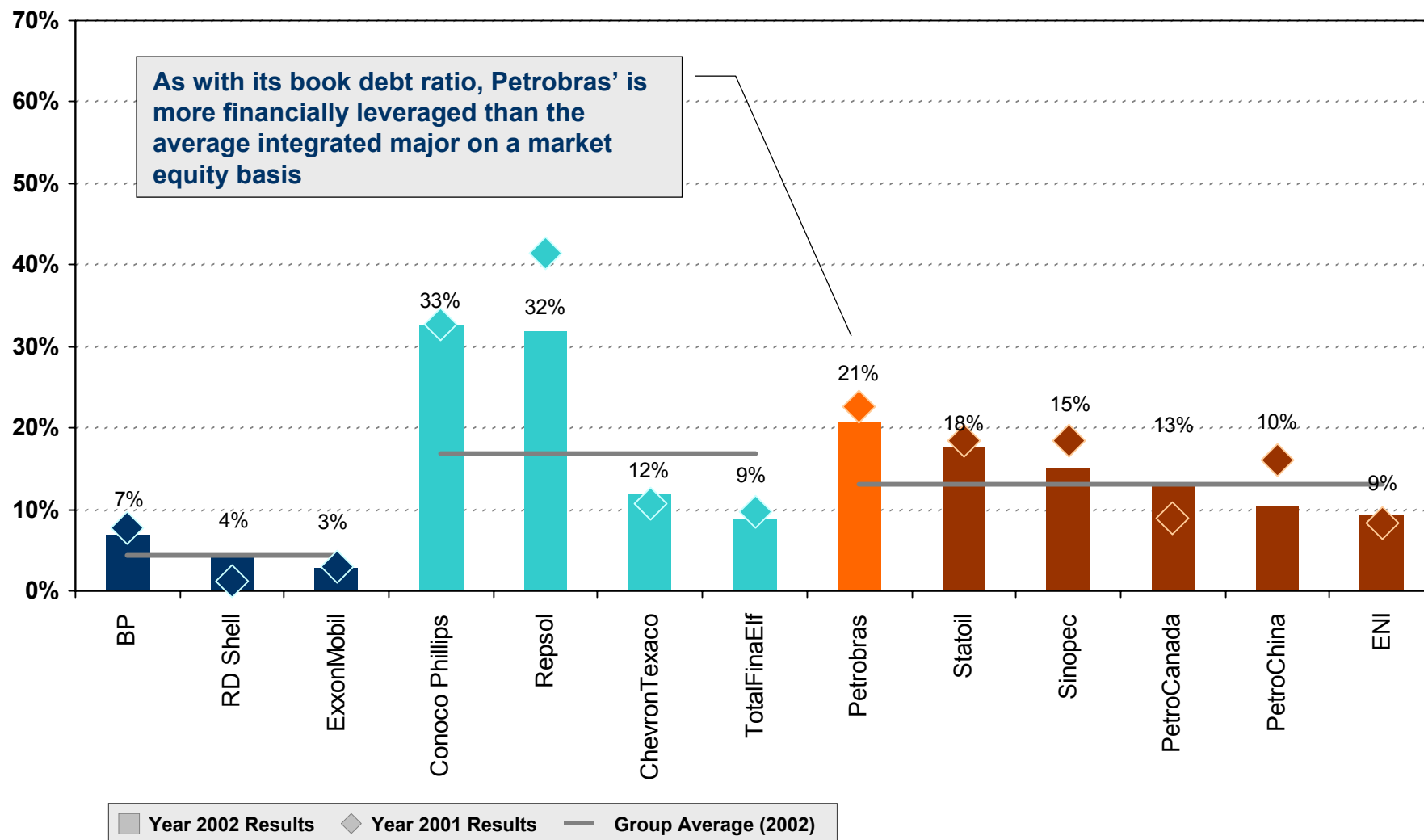
Supplemental Slide: SEGMENT EBITDA

- EBITDA (Earnings Before Interest, Taxes & Depreciation) (\$ Billions)



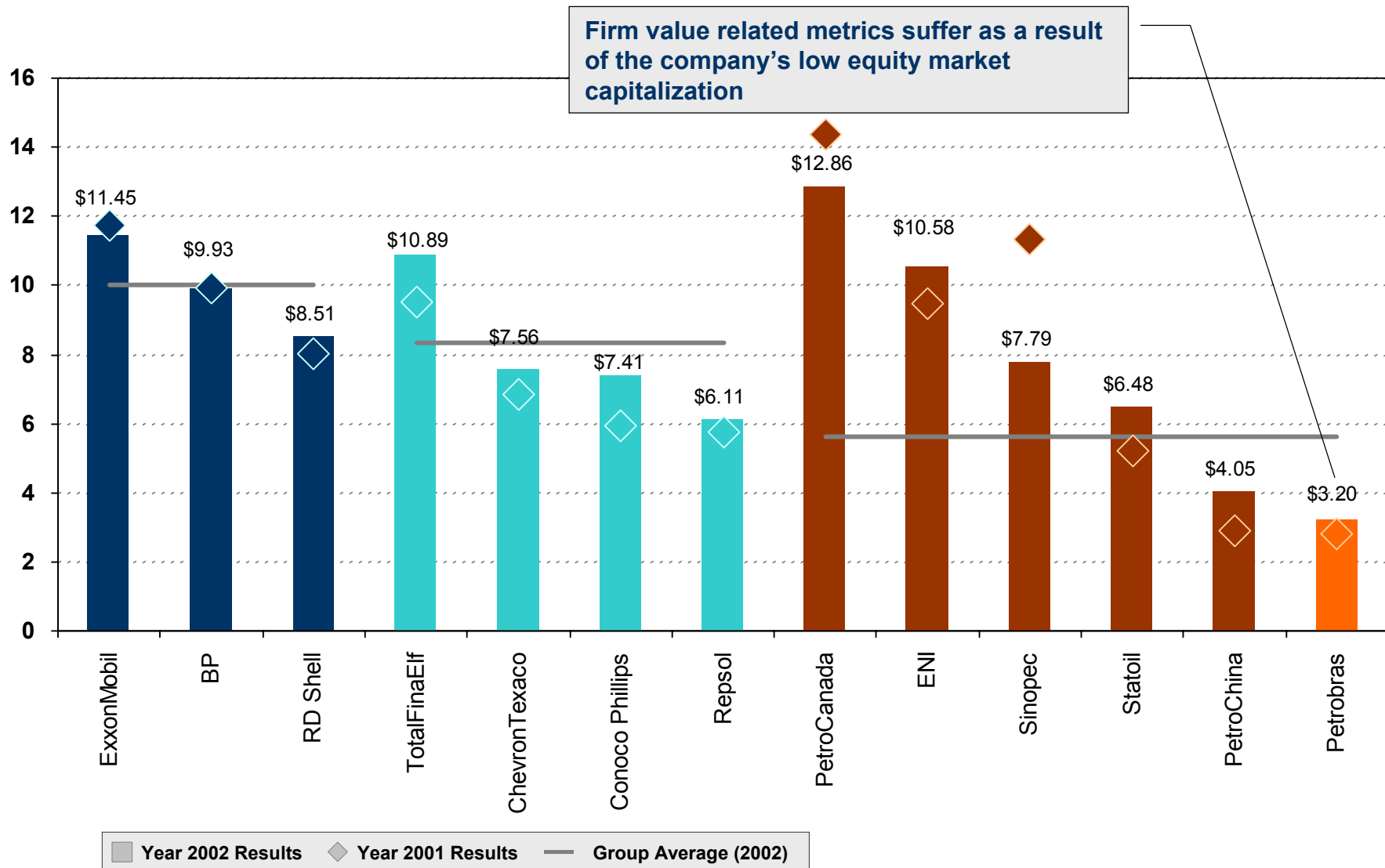
Supplemental Slide: MARKET DEBT RATIO

- Long-term Debt / (Long-term Debt + Market Capitalization)

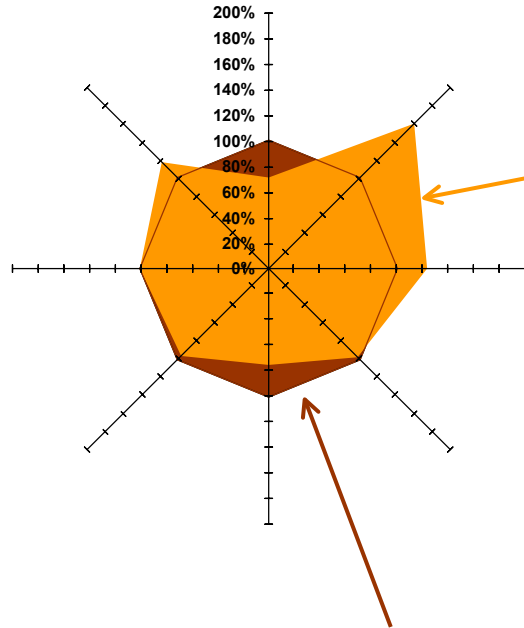


Supplemental Slide: FIRM VALUE PER BARREL

- Firm Value (Market Capitalization + LTD) / Barrel of Oil Equivalent Reserves (\$/BOE)

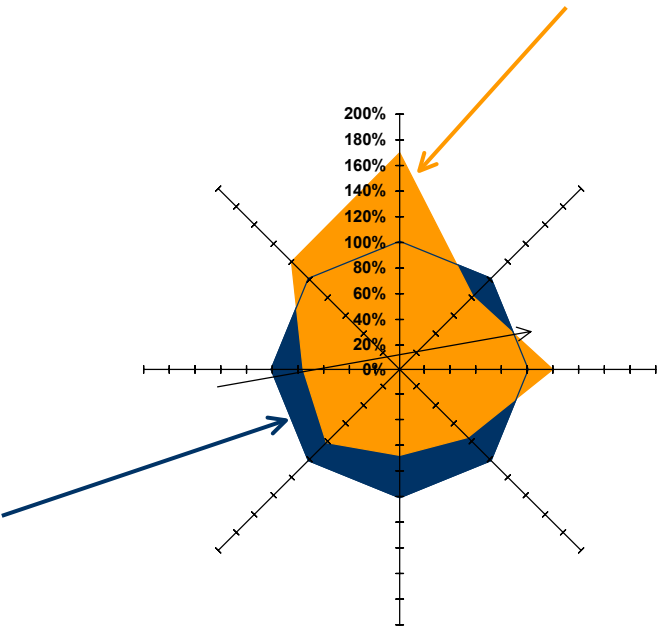


▪ **Note on interpreting Spider Diagrams:**



- The overlapping irregular polygon represents the individual R&M company's performance relative to all R&M companies.
- Points lying outside the underlying equilateral polygon indicate a higher-than-average measure.
- Points lying inside the underlying equilateral polygon indicate a lower-than-average measure.

• The underlying equilateral polygon represents the average performance of all R&M companies for which information could be compiled.



▪ Please note that for scaling purposes, the axes for the relative comparison of the subject company to the average of the group are limited graphically to the range 0 to 200%. The actual calculated values may be less than 0 or greater than 200%.