



EUROPEAN PARLIAMENT

DIRECTORATE-GENERAL INTERNAL POLICIES OF THE UNION
- DIRECTORATE A -
ECONOMIC AND SCIENTIFIC POLICIES

Workshop on the economic impact of rising oil prices

28 June 2006
European Parliament Brussels
9.30h – 18.00h

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**Workshop on the economic impact of rising oil prices
*Draft Programme***

28 June 2006
European Parliament Brussels
Room ASP 5G3
9.30h – 18.00h

9.30 - 12.30 Session 1

Macroeconomic consequences of rising oil prices

- Comparing previous oil price shocks to the current situation: Why does the economy react differently this time round (low inflation, so far no second-round effects)?
- What macroeconomic consequences can be expected from the current oil price situation?
 - inflation
 - demand
 - employment
 - growth
- Which macroeconomic policies would be appropriate?

Guest speakers:

- Dietrich Domanski, Head of Macroeconomic Monitoring Unit, BIS
- Marcelo Sanchez, Senior Economist, ECB
- Drs Han. de Jong, Chief Economist, ABN Amro

10.45 - 11.00 Coffee break

Consequences of rising oil prices for financial stability

- Is there speculation going on in the financial markets in a noticeable volume? Are new instruments being created to speculate on oil price changes? Can speculation or the use of speculative instruments seriously endanger financial stability?
- How can the lack of transparency be tackled (Joint Oil Data Initiative)?
- Recycling of petrodollars
- Peak oil discussion

Guest speakers:

- Mr. Jeffrey Currie, Goldman Sachs, Managing Director and Head of Commodities Research
- Christie Sanders, Managing Director Sanders Research
- Pekka Lössönen, Eurostat - Joint Oil Data Initiative Representative
- Dr C. Campbell, Chairman & Founder of the Association for the study of Peak Oil (ASPO)

14.30 - 18.00 Session 2

Microeconomic consequences of rising oil prices, competitiveness and taxation

- Sectoral impacts due to substitution effects based on the assumption of high standing oil prices. Who will be the winners/losers? Which are the impacts on economic sectors, notably on transport, petrochemicals, automotive, farming, tourism etc. Which types of substitution effects might occur?
- Potential impacts on trade due to rising transportation costs. Which are the impacts on division of work within firms and among firms, their current organisation being based on cheap transportation costs?
- How to take advantage of the move towards a new era of high oil prices in terms of competitiveness and new economic activities for the EU? Can public policies speed up the adaptation of the EU economy to an era of high oil/fossil energy prices? Which are the best policy tools: industrial policy, R&D policy, taxation? Is there room for economic policy to decrease the level of uncertainty about future energy situation? Which are the links with environmental considerations, notably environmental taxation?
- How to take into account all costs related with energy production, consumption and use, notably negative side effects (negative externalities) so that economic decisions are based on all parameters? How to better 'internalise' negative externalities due to oil consumption? Opportunity for an EU tax?

Guest speakers:

- David Baldock, Institute for European Environmental Policy
- Stephan Herbst, Toyota Motor Europe, Manager Environmental Analysis and Strategy
- Dr Manfred Meier, Director Technology Science, Volkswagen,
- Olivier Schaeffer, Policy Director, EREC

Panellist:

- Robert Klotz, European Commission, DG Comp, Unit Energy and Water

16.00 - 16.15 *Coffee break*

Geopolitics and Security of Supply

- Visionary and strategic assessment of the situation
- Are there competition issues on a global level? (oligopoly structure)
- Which would be the best structure of the EU energy market taking into account the need for security of supply?
- Oil versus gas – repercussion on the gas market and gas price changes
- New industrial revolution, futuristic visionary thinking, moving towards an exit from oil dependency
- To which extent can renewable energy contribute to security of supply? Which renewable energy should be preferred? Which are the drawbacks of renewable energies? Are all renewable energies neutral for the environment?

Guest speakers:

- Dr Hasan Qabazard, Director Research Division, OPEC
- Mr Pierre Sigonney, Strategy Department of Total
- Raphael Sauter , SPRU Energy Group University of Sussex (author of Exploiting the oil GDP effect to support renewables redeployed)
- Alexandre Clauwaert, Strategy department Suez (gas, electricity and renewables)

Panellist:

- Ioannis Samoulidis, European Commission, DG Tren, Energy Policy and Security of Supply

Session I

Part 1: Macroeconomic consequences of rising oil prices



Why is the current oil price shock different? A macroeconomic assessment

Workshop on the economic impact of rising oil prices
European Parliament
Brussels

Dietrich Domanski
Head of Macroeconomic Monitoring
Bank for International Settlements

28 June 2006

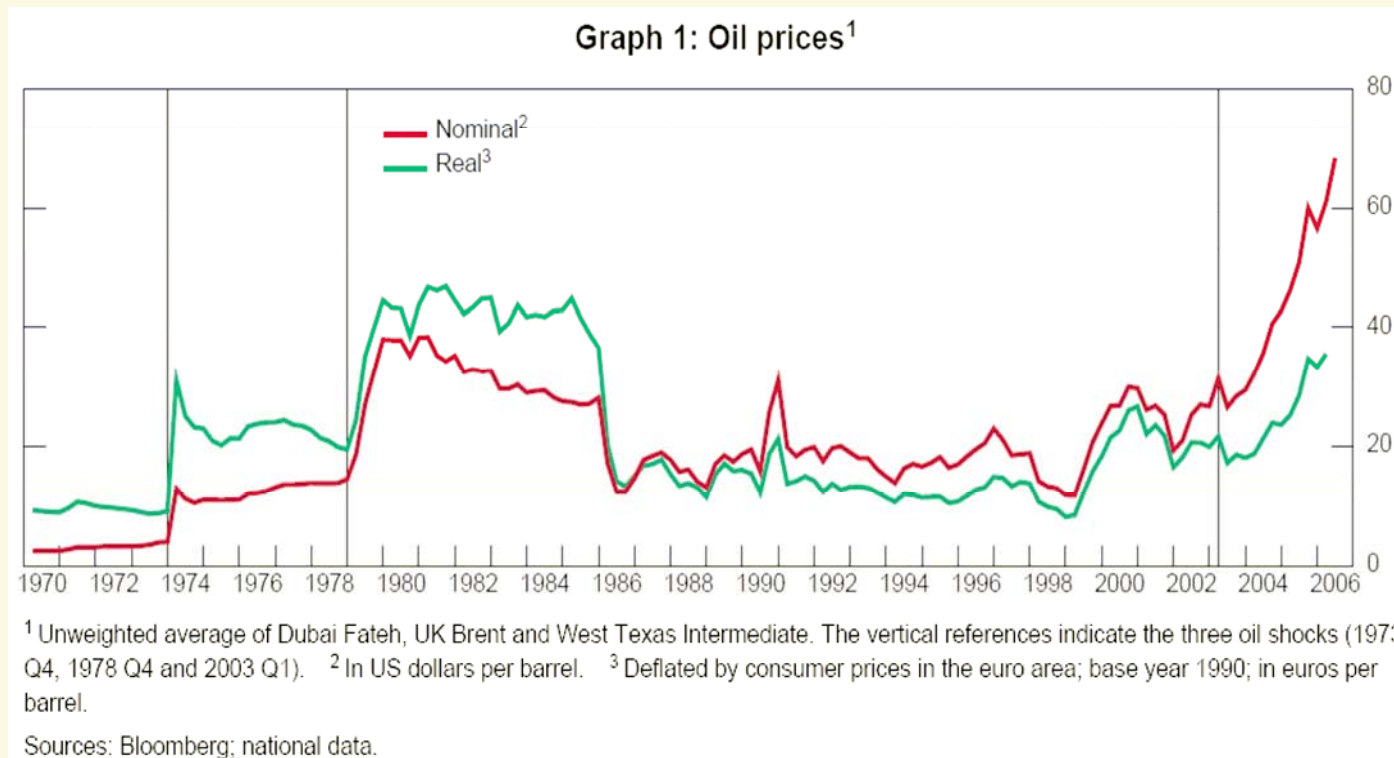


Overview

- How large is the current oil price shock compared to those in the 1970s?
- Why have oil importing economies been much more resilient than in the past?
- Will the effects of high energy prices remain benign?

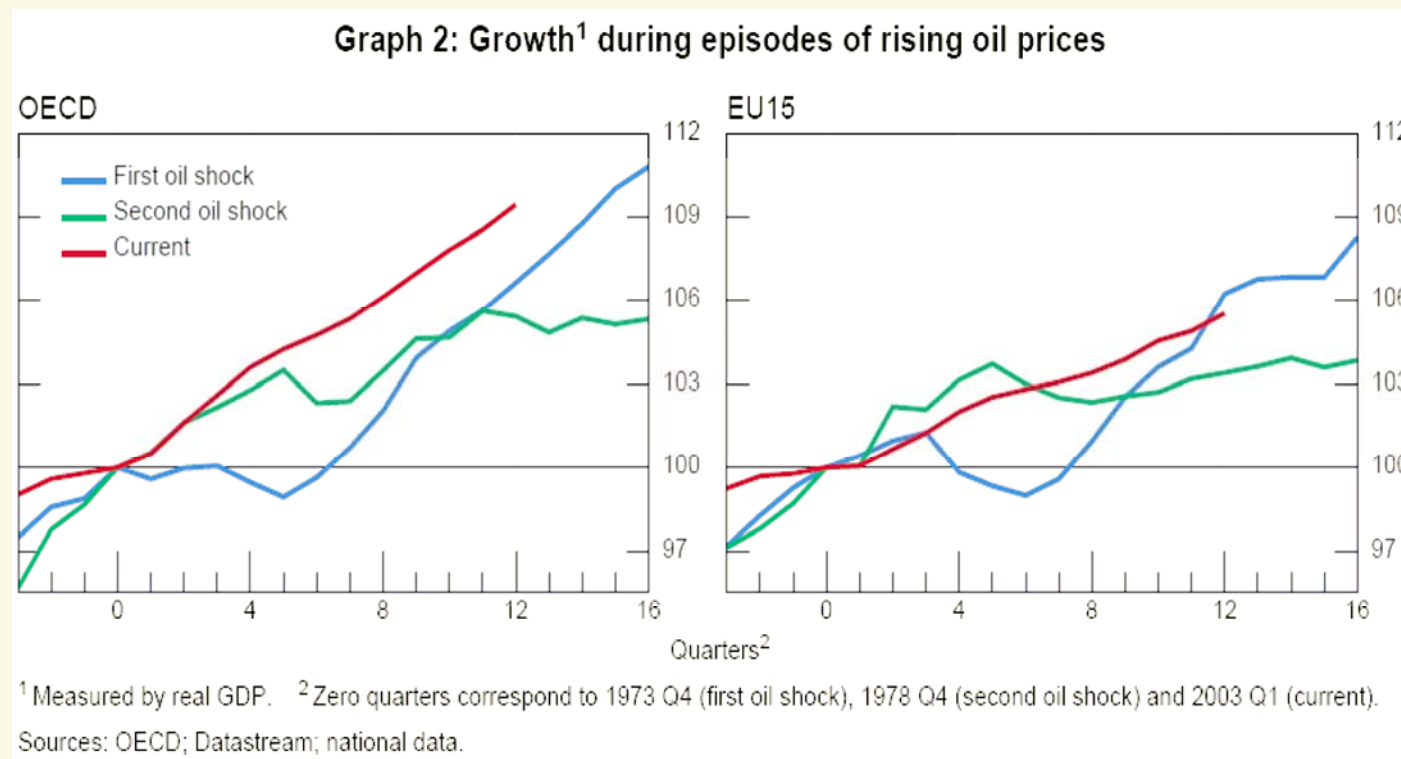


Oil prices have reached new record highs in nominal terms and have risen sharply in real terms...





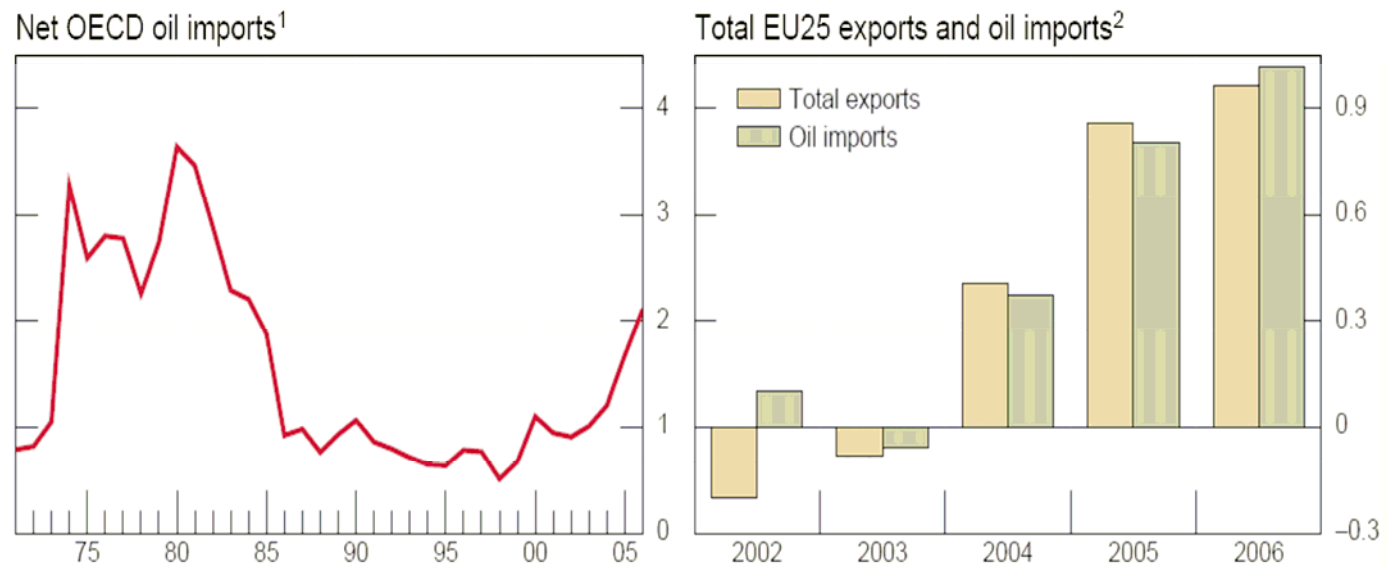
...while the economic upswing has remained intact in oil importing countries





The income effect of rising oil prices has been much smaller than in the past...

Graph 3: Income transfers and EU exports



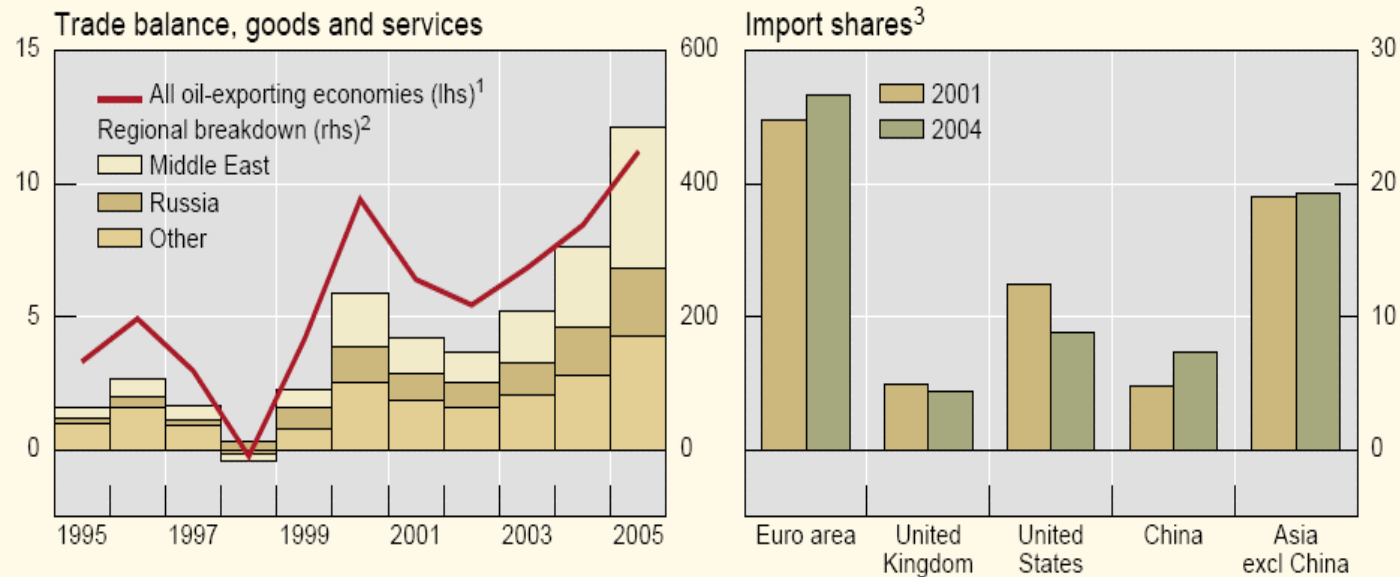
¹ As a percentage of OECD GDP. ² Changes, in percentage points of GDP.

Sources: Eurostat; OECD.



...and the re-spending of petrodollars has helped European exporters

Graph 4: Indicators of oil revenue spending

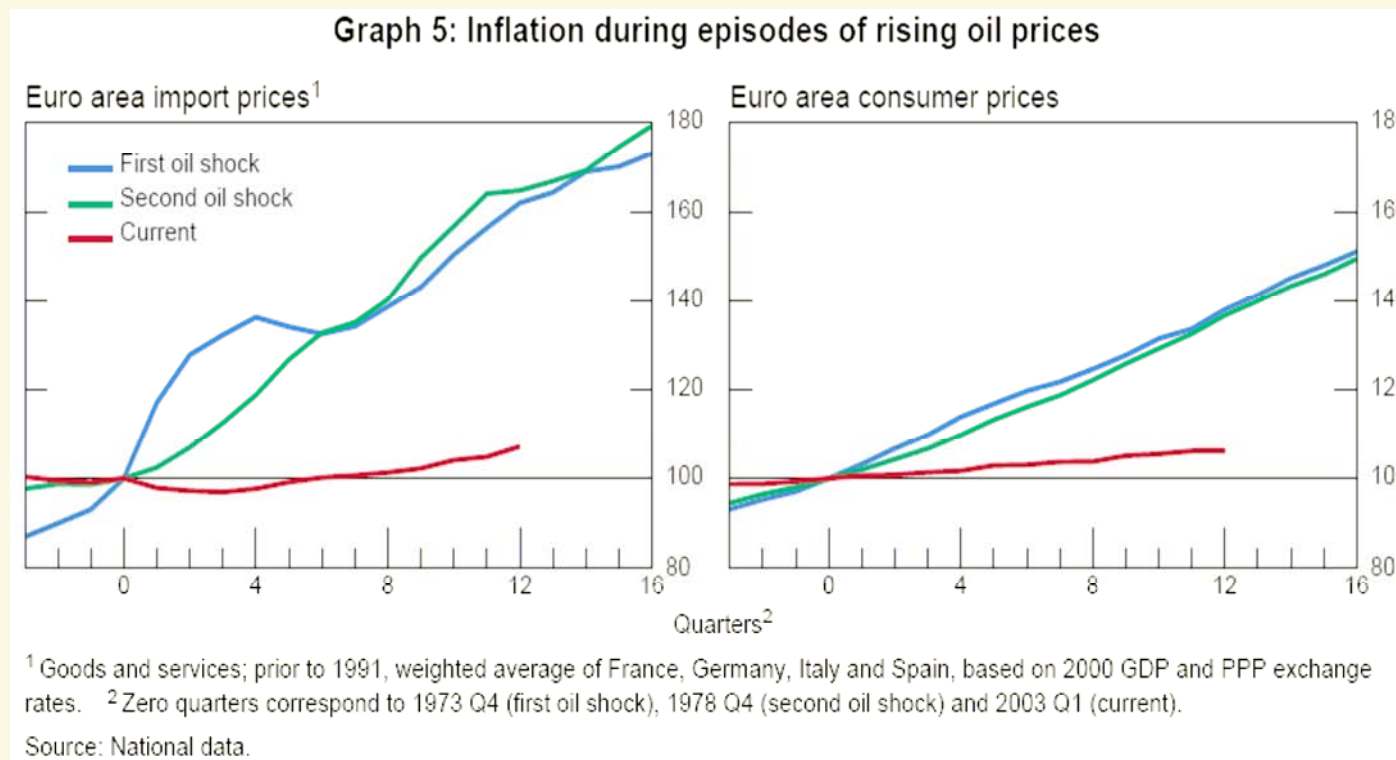


¹ As a percentage of GDP. ² In billions of US dollars. ³ Market share of selected economies in OPEC imports.

Sources: ECB; IMF.

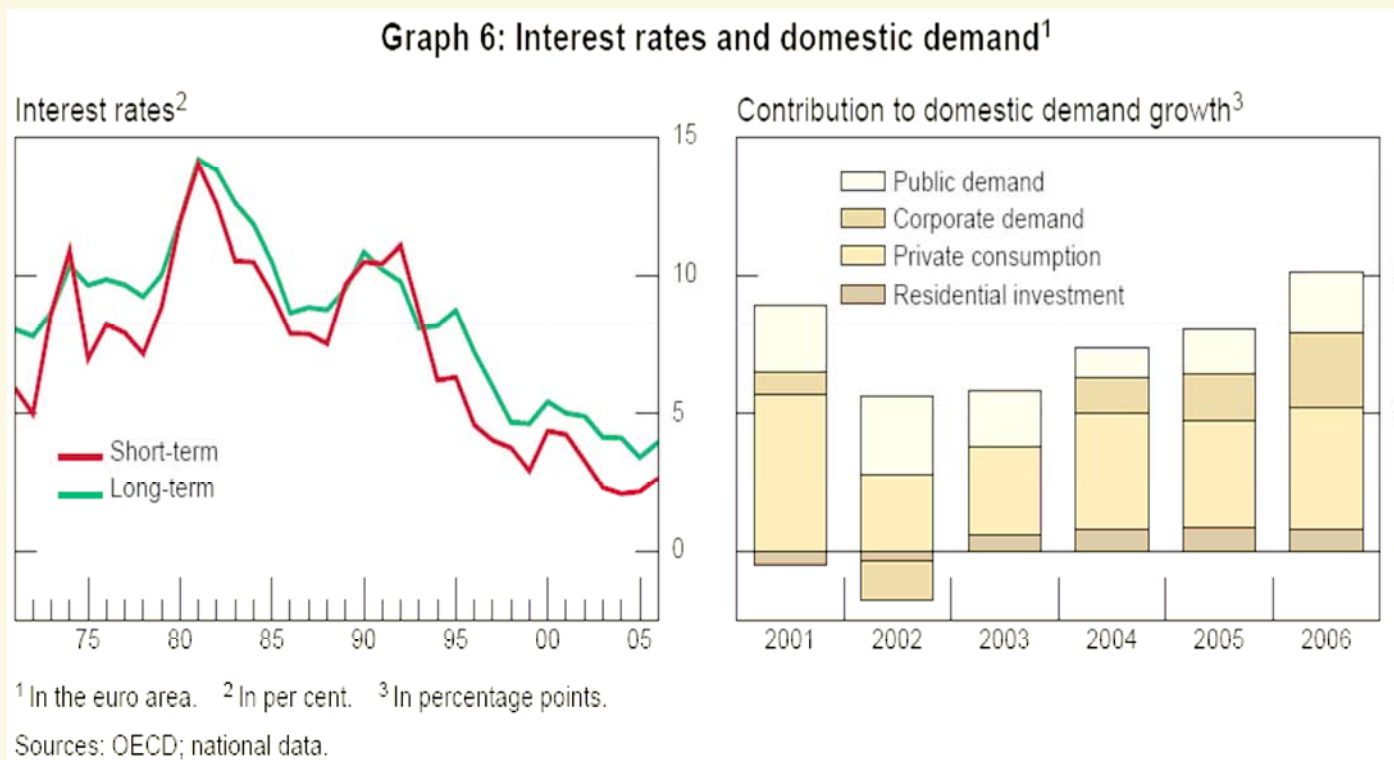


Inflation has remained subdued...





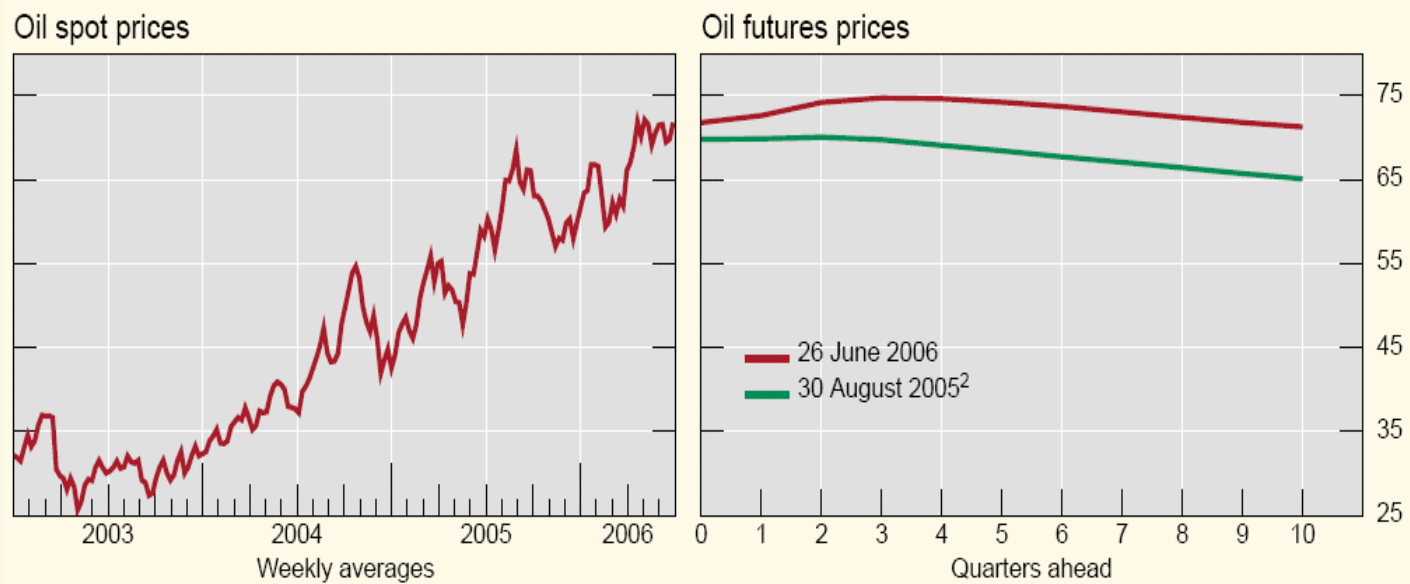
...supporting domestic demand growth through easy financing conditions





Oil prices are expected to remain high...

Graph 7: Oil spot and futures prices¹



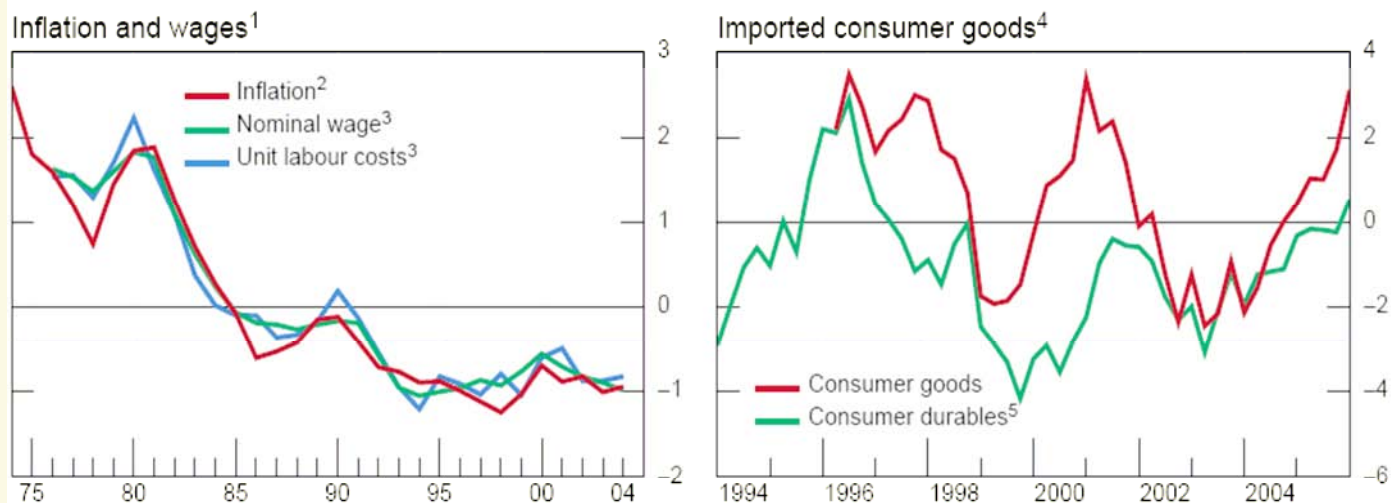
¹ West Texas Intermediate; in US dollars/barrel. ² Date of peak in WTI spot price prior to 2006.

Source: Bloomberg.



...while inflation risks might at some point rise

Graph 8: Inflation indicators



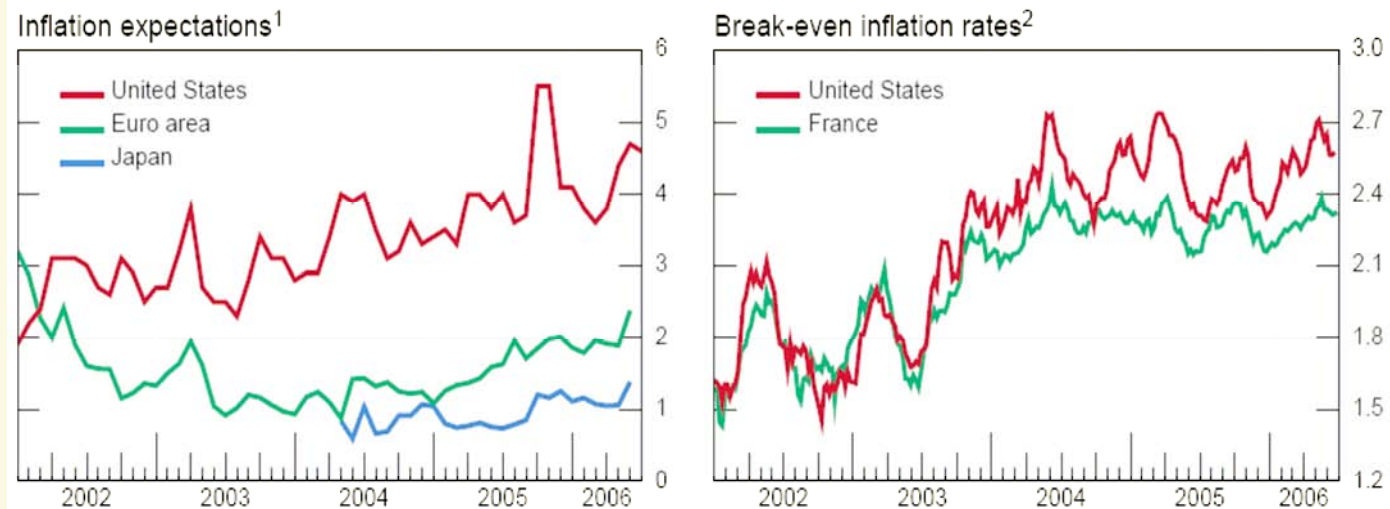
¹ Common factors among OECD countries. Normalised data, measured as the difference between the indicator and its sample average, expressed in points of standard deviation. ² Changes in consumer prices. ³ Business sector. ⁴ Weighted averages of the United States, the euro area and Japan, based on 2000 GDP and PPP exchange rates; changes over four quarters, in per cent. ⁵ United States and Japan.

Sources: National data; BIS calculations.



Credible monetary policy has helped to avoid second round effects

Graph 9: Indicators of inflation expectations



¹ Expected change, in per cent, in consumer prices over the next 12 months, based on consumer surveys; for the euro area, figures are normalised by mean and variance of actual HICP inflation rate; for Japan, figures are calculated from shares of ranges in the questionnaire.

² Difference between nominal and index-linked yields on 10-year government bonds; index-linked yields are based on TIPS for the United States and OATi for France.

Sources: Cabinet Office, Government of Japan; European Commission; University of Michigan; Bloomberg; national data; BIS calculations.



Conclusion

- Oil prices have risen primarily because of strong global demand growth and not disruptions of oil supply.
- Low and stable inflation has mitigated the impact of rising energy prices on oil importing countries.
- But concerns about oil supply have grown and inflation risks seem to have increased recently.



EUROPEAN CENTRAL BANK

Oil price shocks and macroeconomic developments

Marcelo Sánchez
European Central Bank

Workshop on the economic impact of rising oil
prices

Outline

- Transmission channels
- The evidence
- Additional remarks

Outline

- Transmission channels
- The evidence
- Additional remarks

Transmission channels

Oil price shocks are expected to have

- supply-side effects: higher inflation and lower real output
- terms-of-trade effects: support aggregate demand in oil exporting countries and lower it in oil importing countries

Outline

- Transmission channels
- The evidence
- Additional remarks

The evidence

Empirical analysis favours non-linear models

- non-linear models predict larger macroeconomic impact than the linear one
- “scaled” model rescales oil prices taking into account their changing variability over time

The evidence: A 100% oil price shock

A) Linear model				
Economies	real GDP growth		inflation	
	after 1 year	after 2 years	after 1 year	after 2 years
Euro area	-0.5	-1.3	1.7	1.6
France	-0.7	-2.0	2.5	3.1
Germany	-0.2	-0.5	1.1	1.2
Italy	-0.5	-1.8	3.9	4.4
US	-1.2	-2.7	3.2	4.4

B) Scaled model				
Economies	real GDP growth		inflation	
	after 1 year	after 2 years	after 1 year	after 2 years
Euro area	-2.2	-4.3	3.3	2.2
France	-2.4	-4.7	5.7	7.4
Germany	-2.6	-3.7	1.5	1.3
Italy	-3.7	-5.4	9.8	12.7
US	-3.4	-5.0	5.0	5.9

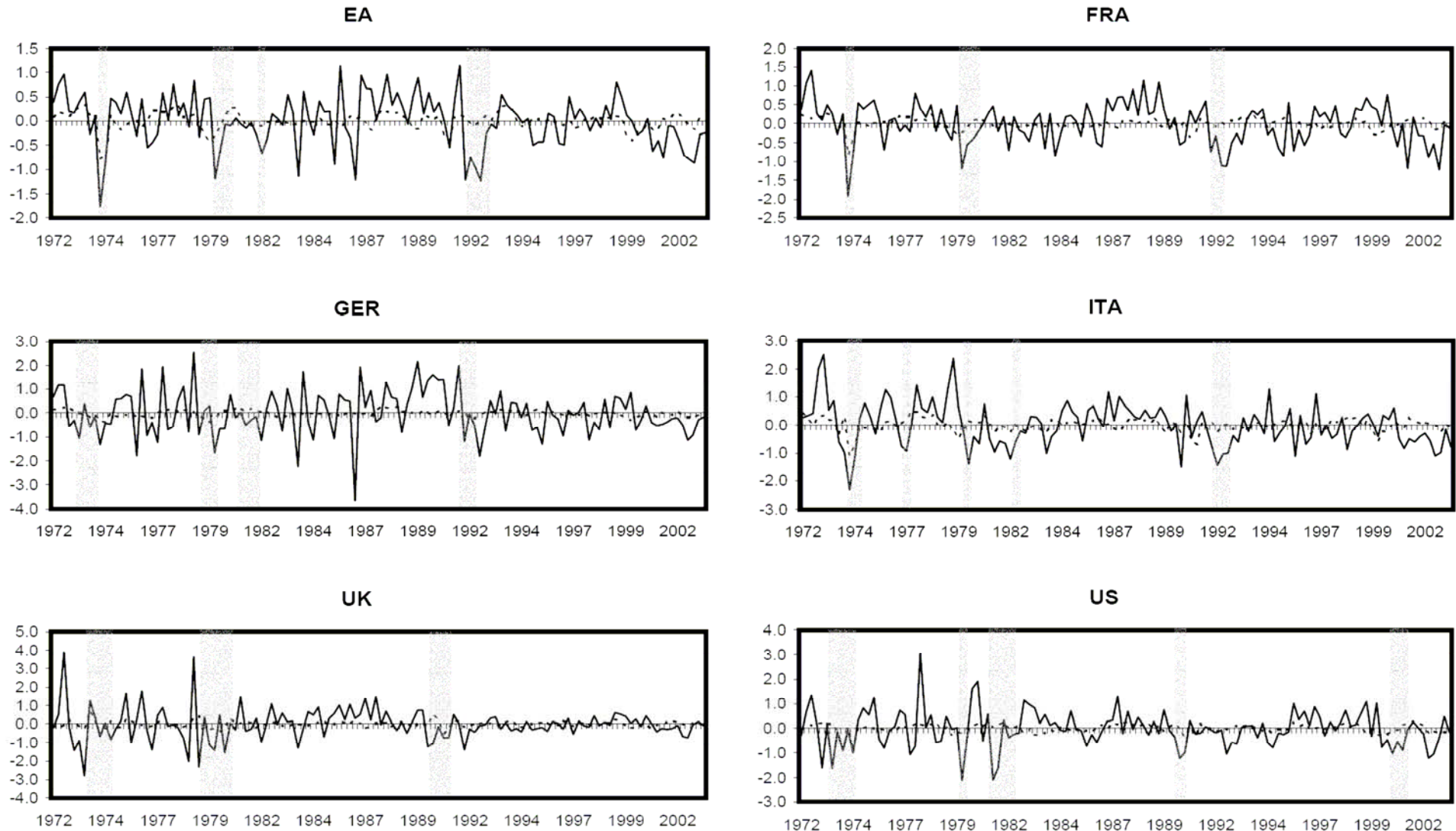
The evidence: How much the shock explains

Non-linear model				
Economies	real GDP growth		inflation	
	after 1 year	after 2 years	after 1 year	after 2 years
Euro area	6.0	9.1	10.1	6.7
France	6.0	8.7	16.1	12.3
Germany	1.0	1.9	3.1	2.6
Italy	6.2	7.7	14.2	10.1
US	3.8	5.0	8.4	5.9

The evidence: Does oil still shock?

Figure 1. Historical decompositions of real GDP growth

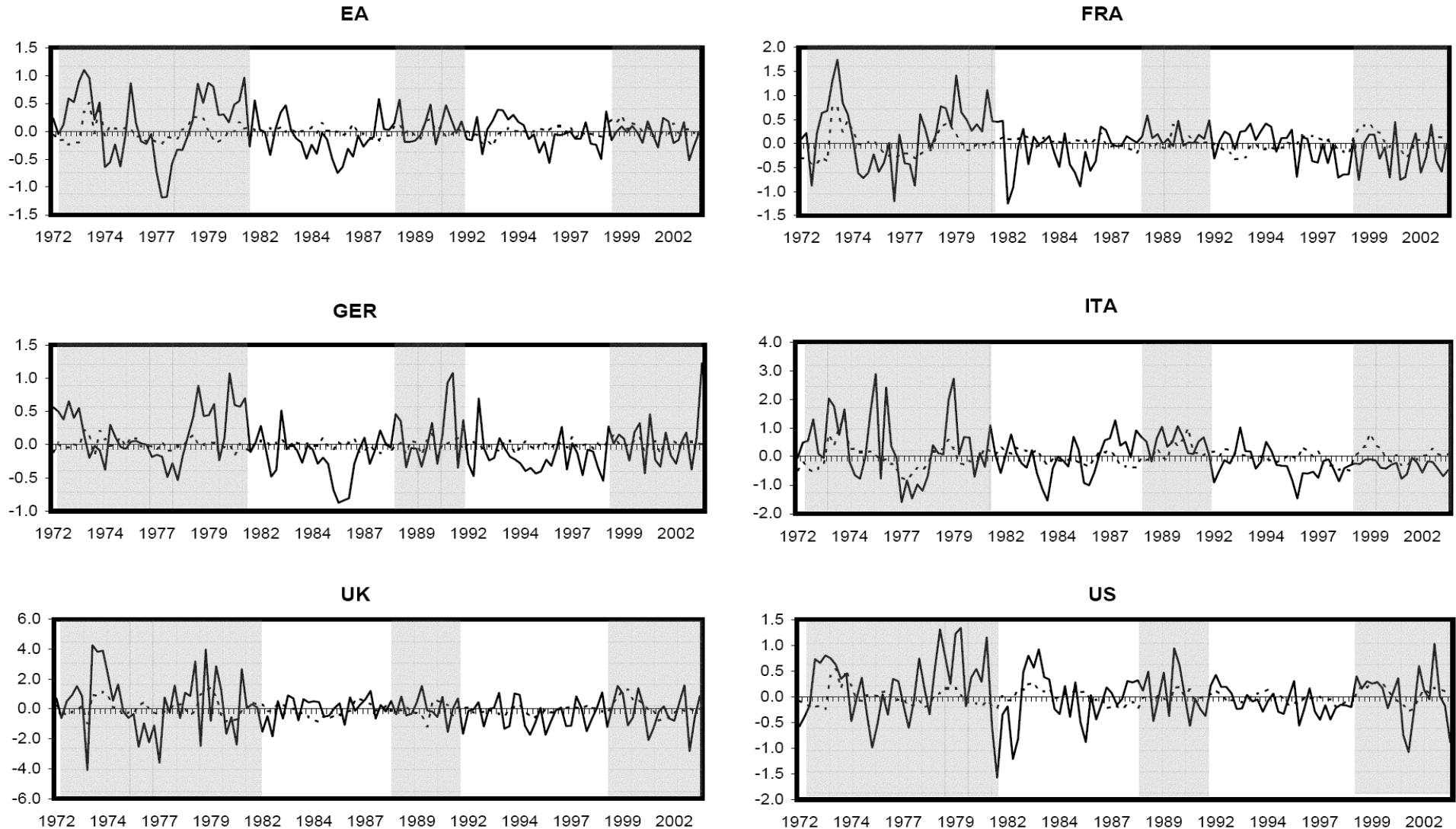
— Actual - - - - Contribution of oil prices



The evidence: Does oil still shock?

Figure 4. Historical decompositions of inflation

— Actual - - - - Contribution of oil prices



Outline

- Transmission channels
- The evidence
- Additional remarks

Additional remarks

- Labour market
 - oil shocks found to lower real wages and raise unemployment
- Long-run growth
 - oil shocks seen as discouraging investment, with an adverse effect on capacity expansion
- First versus second round effects
 - hard to disentangle; both likely to play a role

[The end]



ABN·AMRO

Economic impact of rising oil prices

Presentation to workshop of the European Parliament

28 June 2006

Han de Jong, Chief Economist

Key areas of focus

- ◆ **Differences between various oil price shocks and the implications**
- ◆ **Desirable policy response**

Different impact 70s/80s versus now

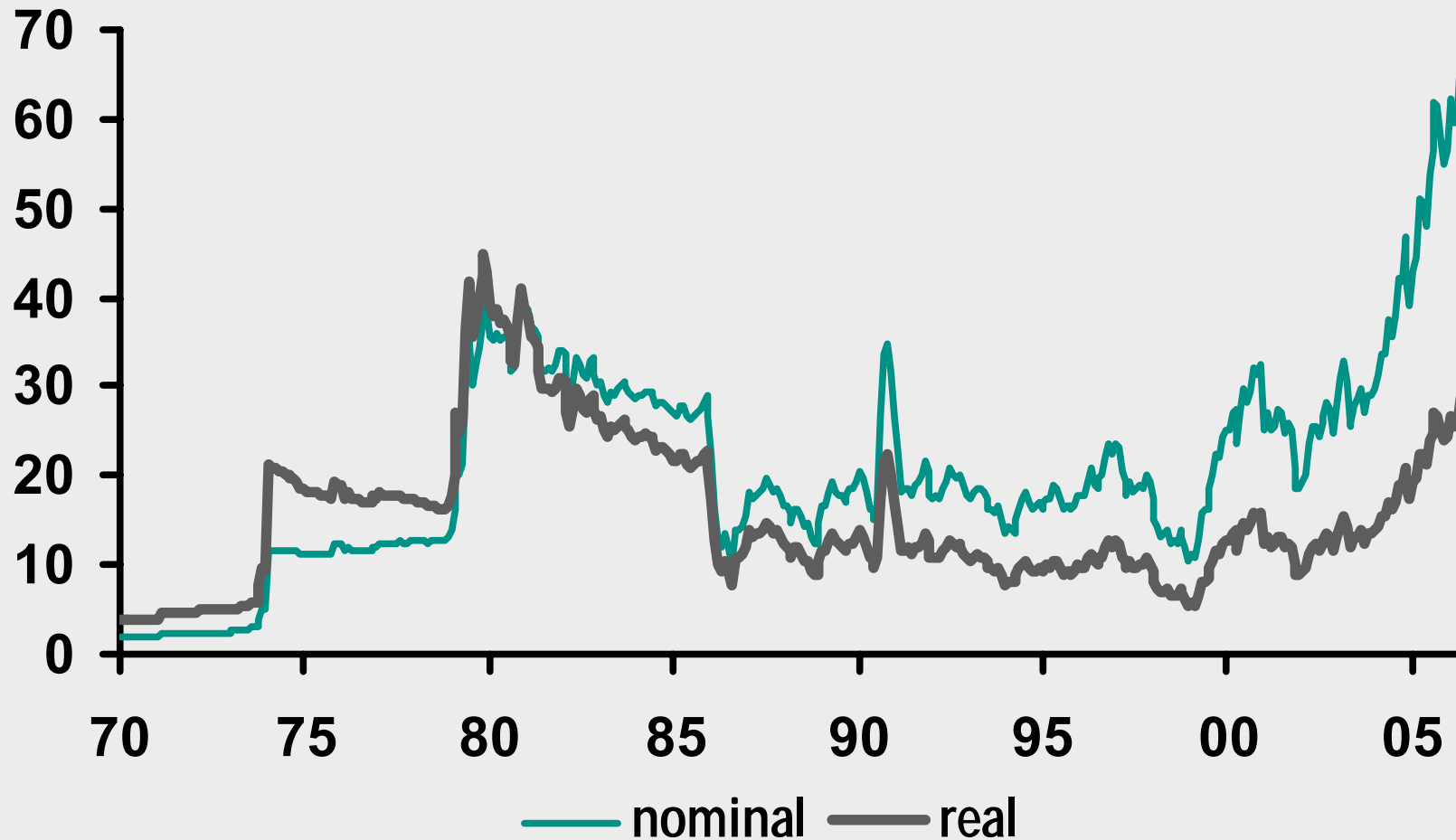
- ◆ **Smaller impact on inflation**
- ◆ **Smaller negative impact on economic activity**

Differences with 1970s and 1980s

- ◆ **Magnitude of oil price rise**
- ◆ **Importance of the oil price**
- ◆ **Cause of the oil price rise**
- ◆ **Economic setting**
 - Transmission process
 - Policy setting

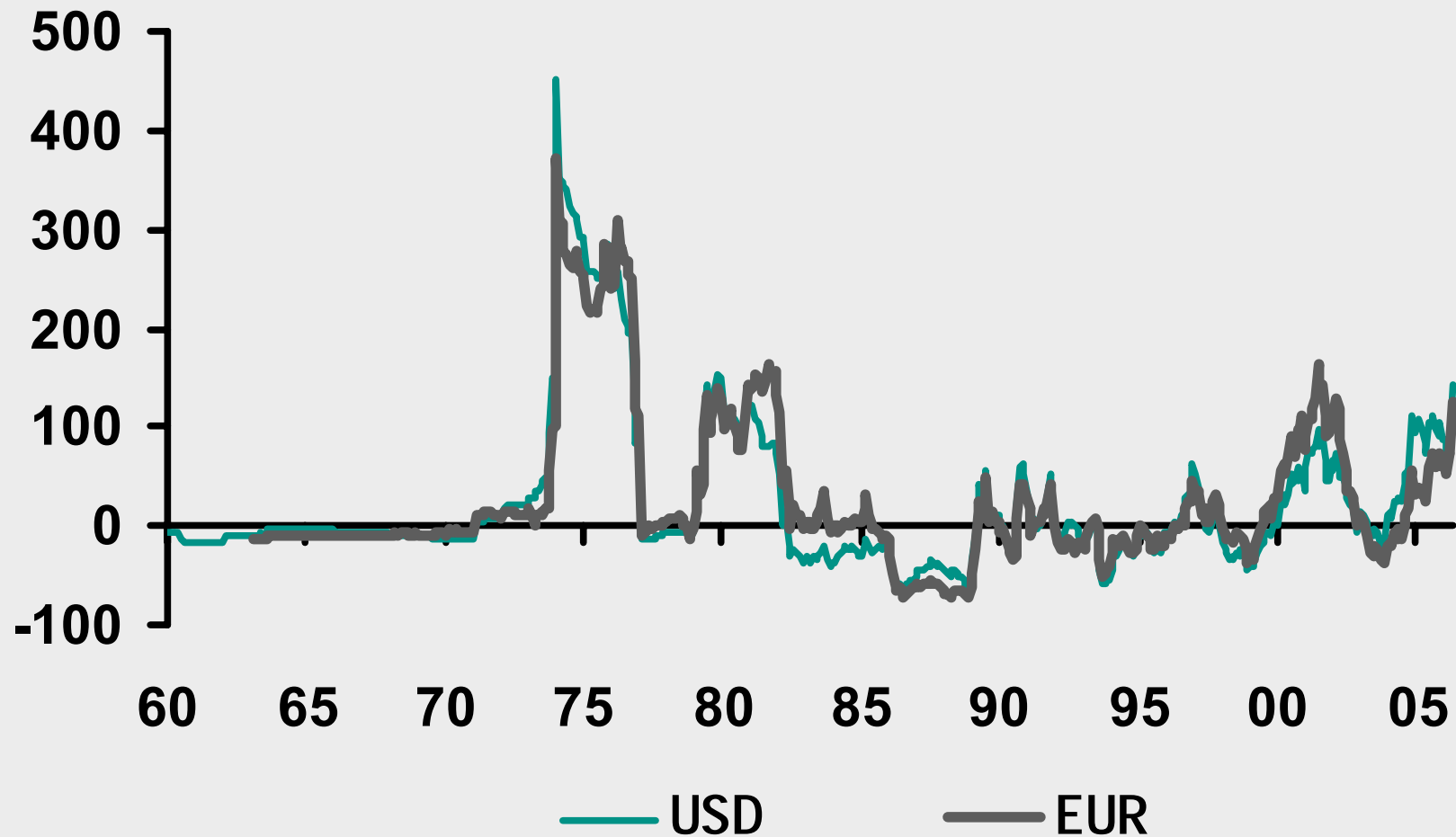
Oil price (USD/barrel)

1980: real = nominal



Source: Thomson Financial

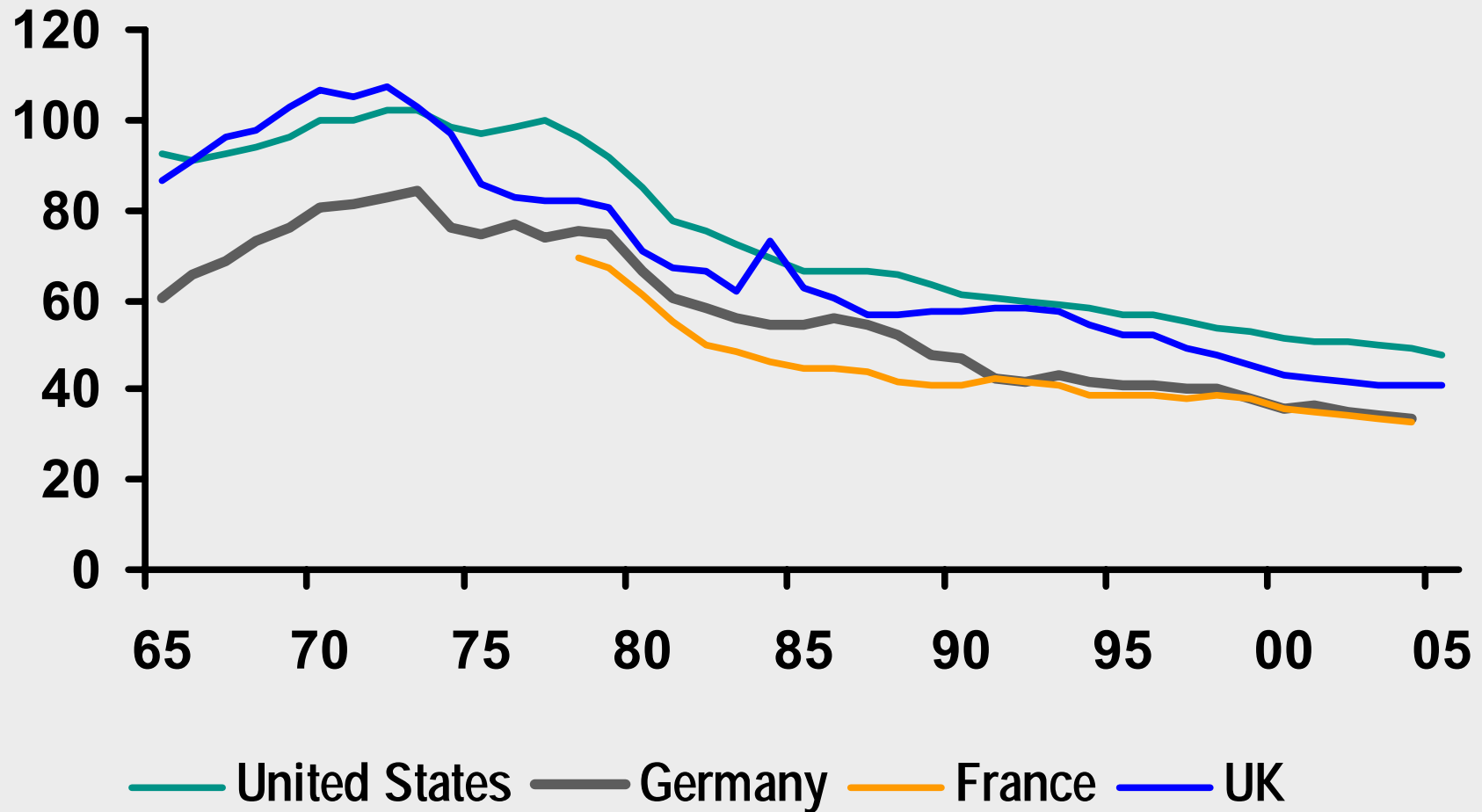
36 months cumulative change of real oil price



Source: Thomson Financial

Oil use per unit of real GDP

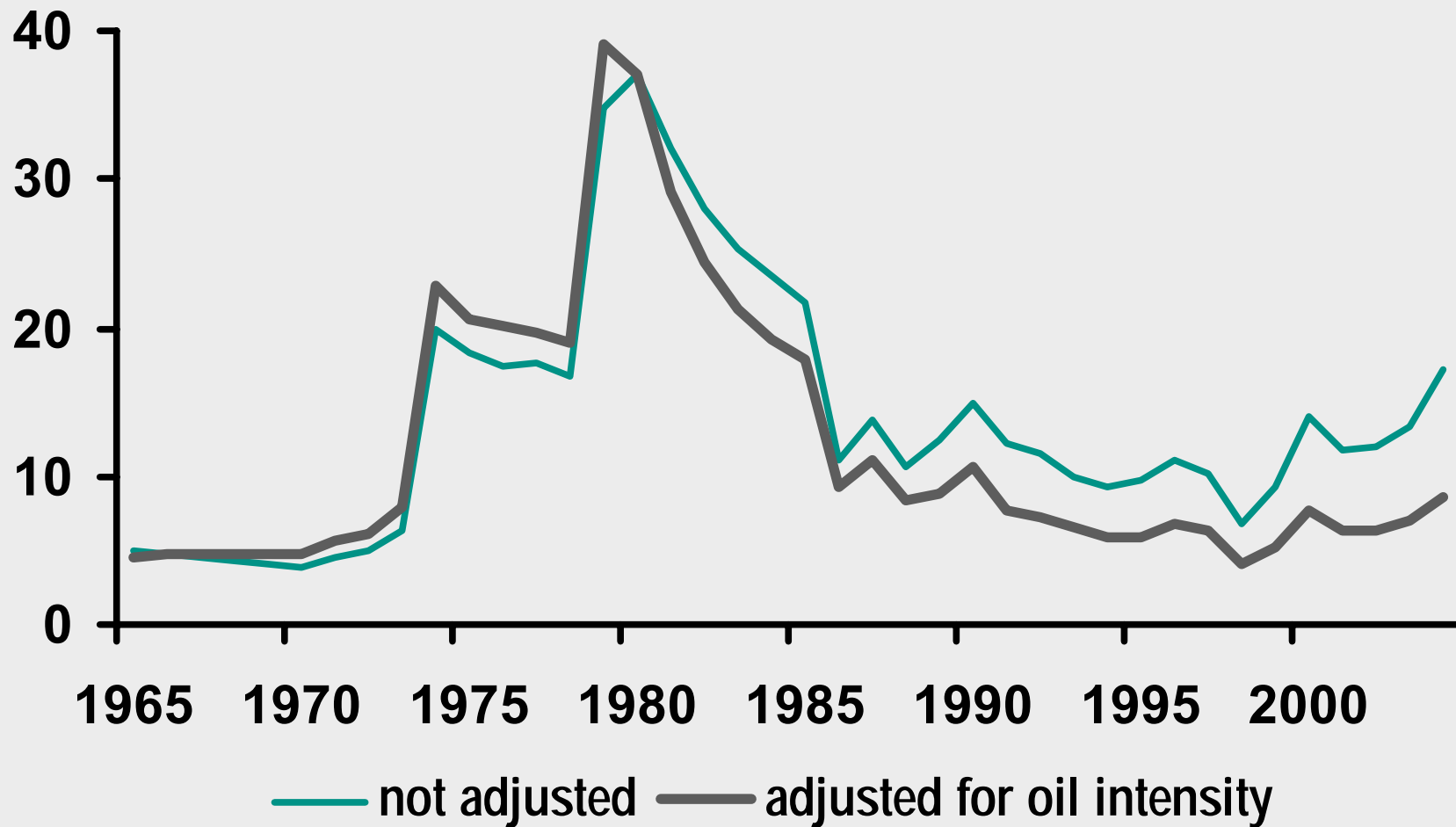
US 1970=100



Source: Thomson Financial, BP

Real oil price

USD/barrel



Source: Thomson Financial, BP

Cause of oil price increase

- ◆ **70s and 80s: exogenous shocks**
- ◆ **Now: demand driven disturbance of supply-demand balance**

Economic setting

- ◆ **Transmission process globalisation has put a lid on inflation (temporary or permanent?)**
- ◆ **Policy setting: monetary policy**

Conclusions economic impact

- ◆ **Inflation remains a risk**
- ◆ **Modest growth impact**
- ◆ **Redistribution of wealth to oil exporters**

Desirable policy response

- ◆ **Monetary policy?**
- ◆ **General government**
 - Lower fuel taxes?
 - Budgetary stimulus?
 - Tax oil industry's profits?
 - Market transparency?
 - Stimulate alternatives?

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Session I

Part 2: Consequences of rising oil prices for financial stability

Reassessing long-term commodity prices

June 2006

Jeffrey Currie Goldman Sachs International 44 (0)20 7774 6112 jeffrey.currie@gs.com

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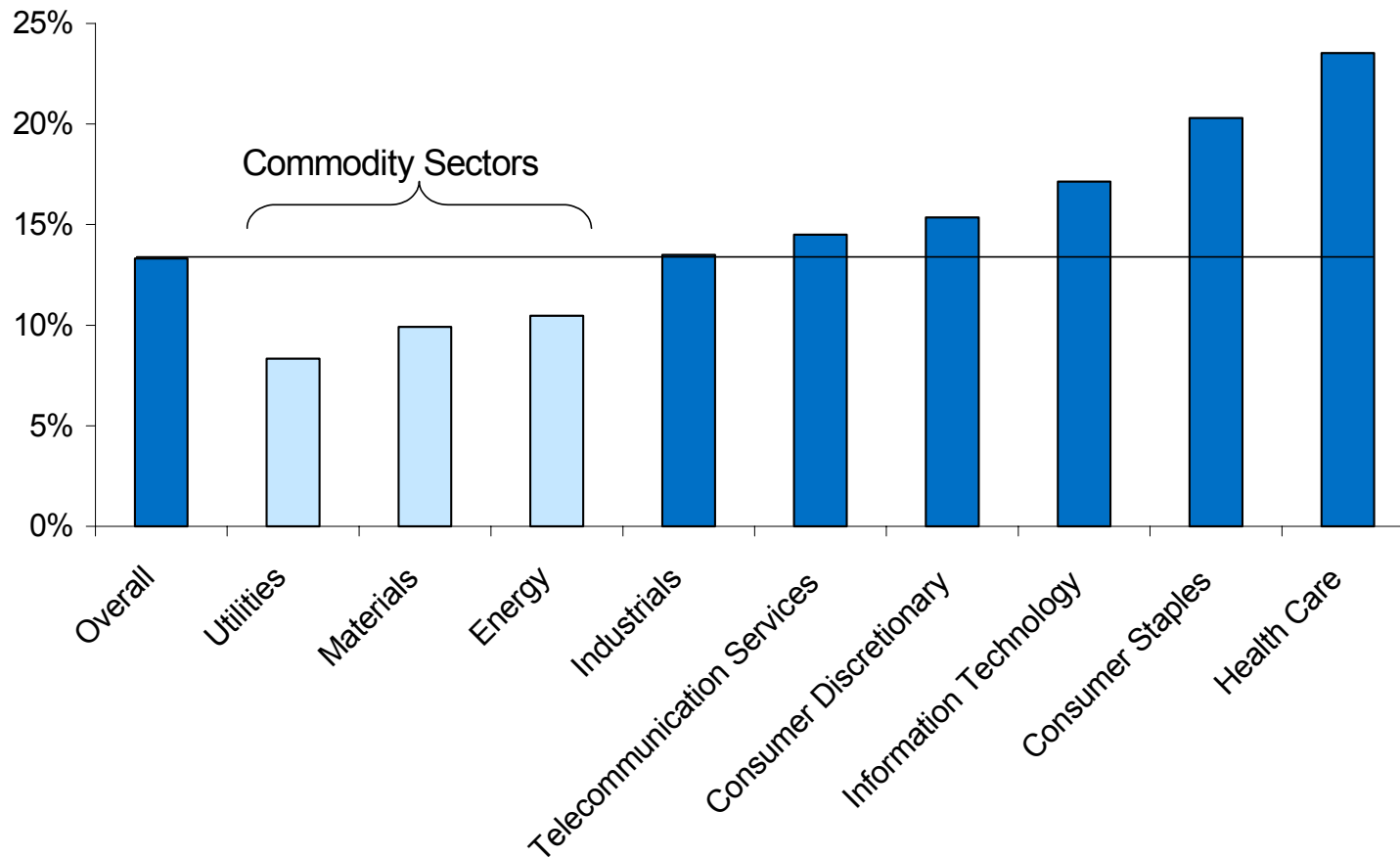
For important disclosures, see page 55, go to <http://www.gs.com/research/hedge.html>, or contact your investment representative.



The revenge of the old economy

Poor returns in commodity sectors led investment to flow elsewhere

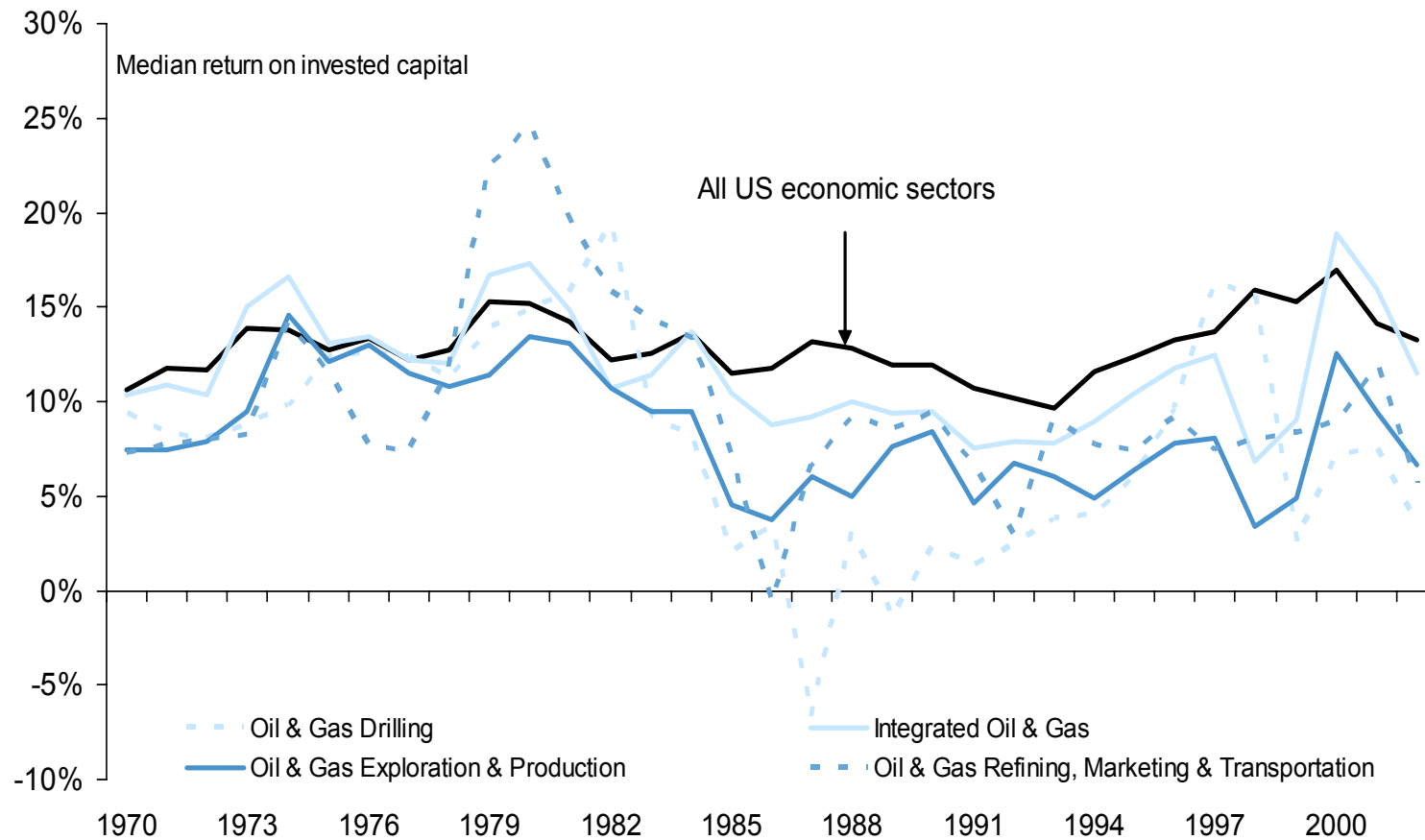
Cash Return on Cash Invested
S&P 500 excluding Financial sector, 1991- 2000 Average Return



Source: Compustat and Goldman Sachs Commodity Research.

Return on capital employed in energy sectors has remained below that in the rest of the economy, leading to underinvestment in energy market infrastructure

percent return

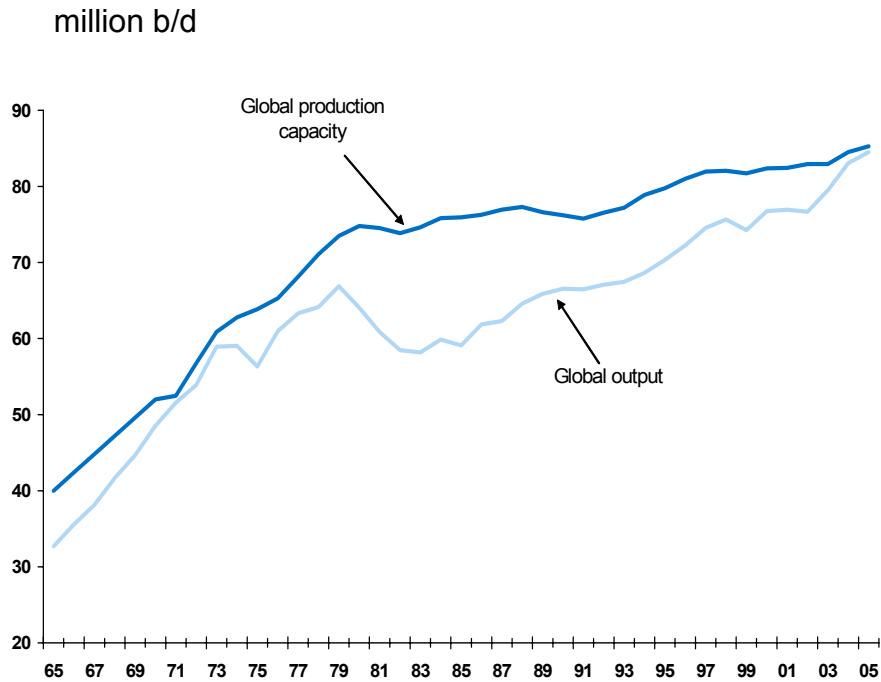


Source: Compustat and Goldman Sachs Commodity Research.

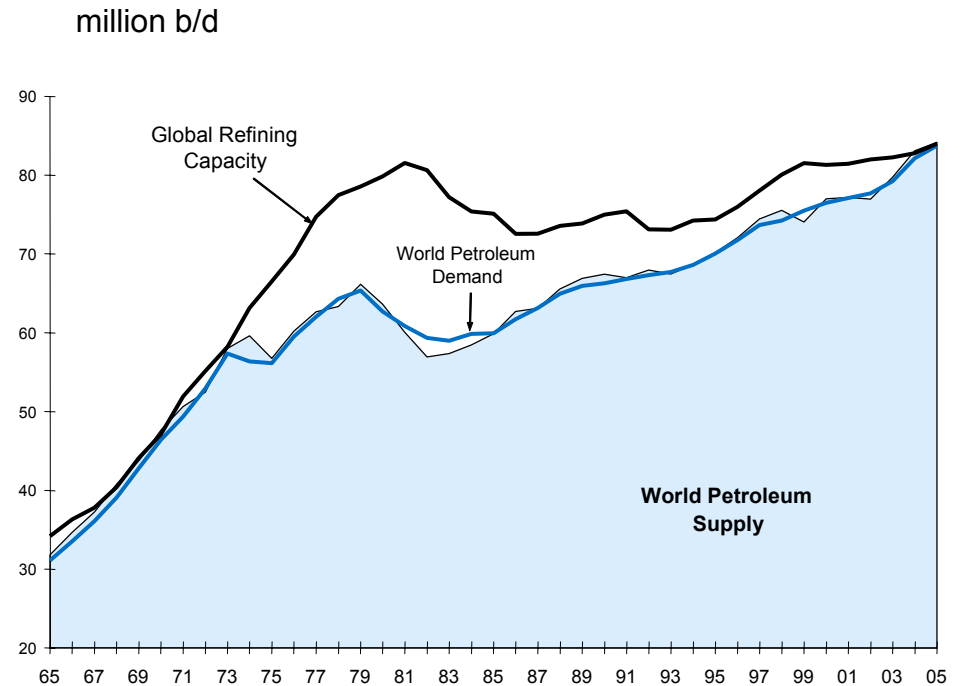
The transition between an exploitation phase and an investment phase: The revenge of the old economy, Part II

The industry has exhausted spare capacity, ending an exploitation phase and beginning a new investment phase

Global oil production and capacity

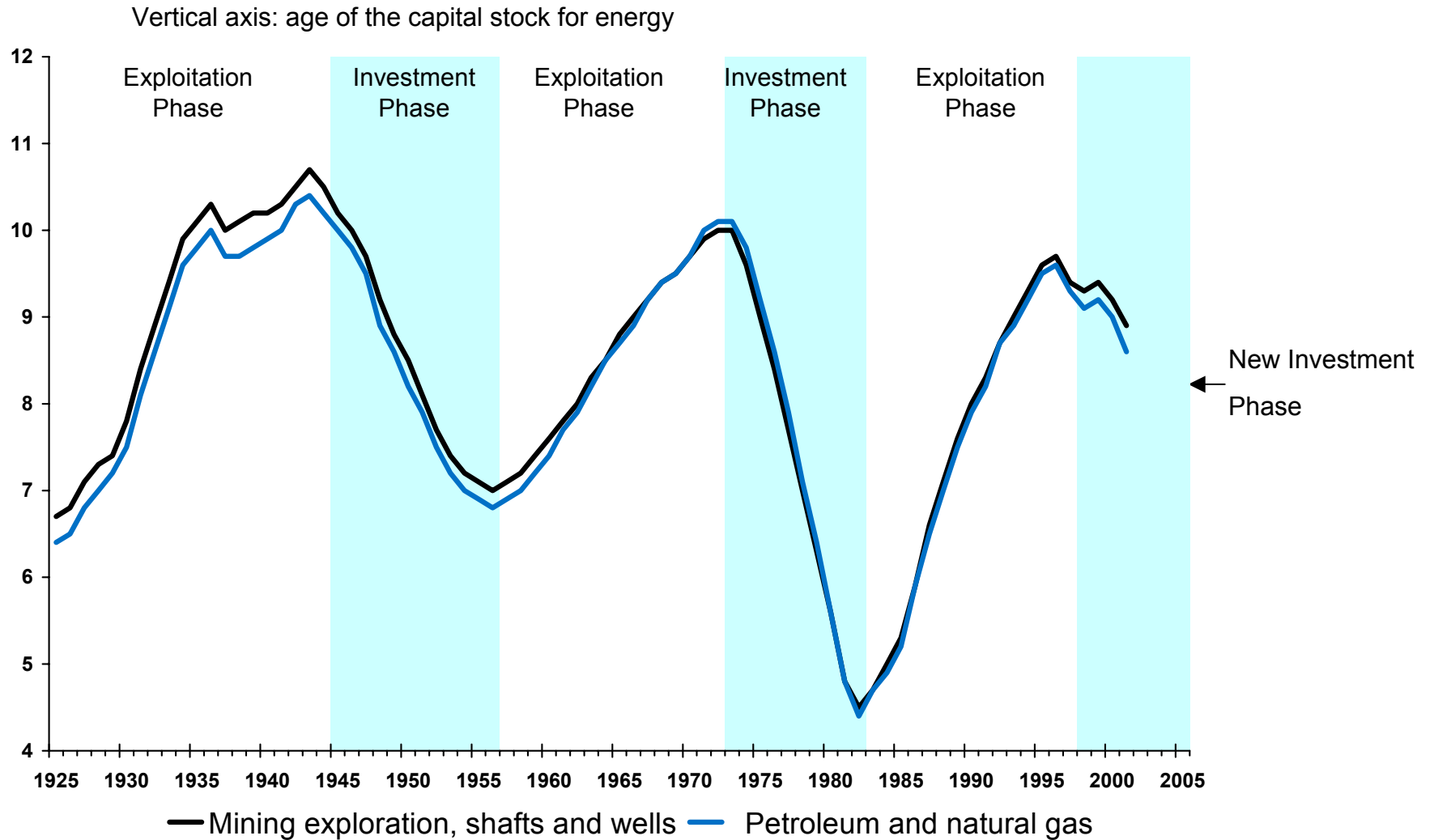


Global refining capacity



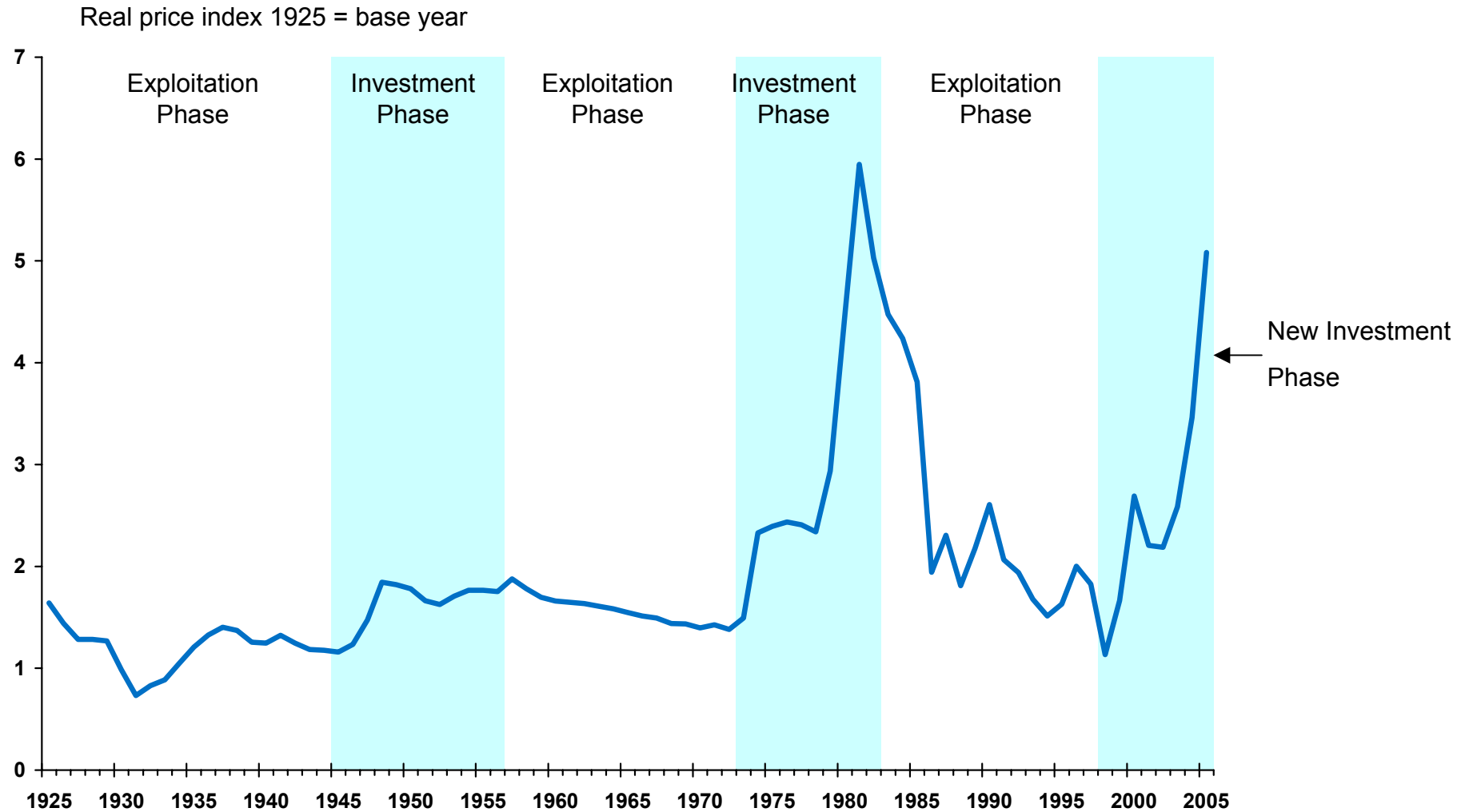
Source: International Energy Agency (IEA) and Goldman Sachs Commodity Research and DOE.

The market has experienced similar investment phases in the past that lasted c. 10-15 years



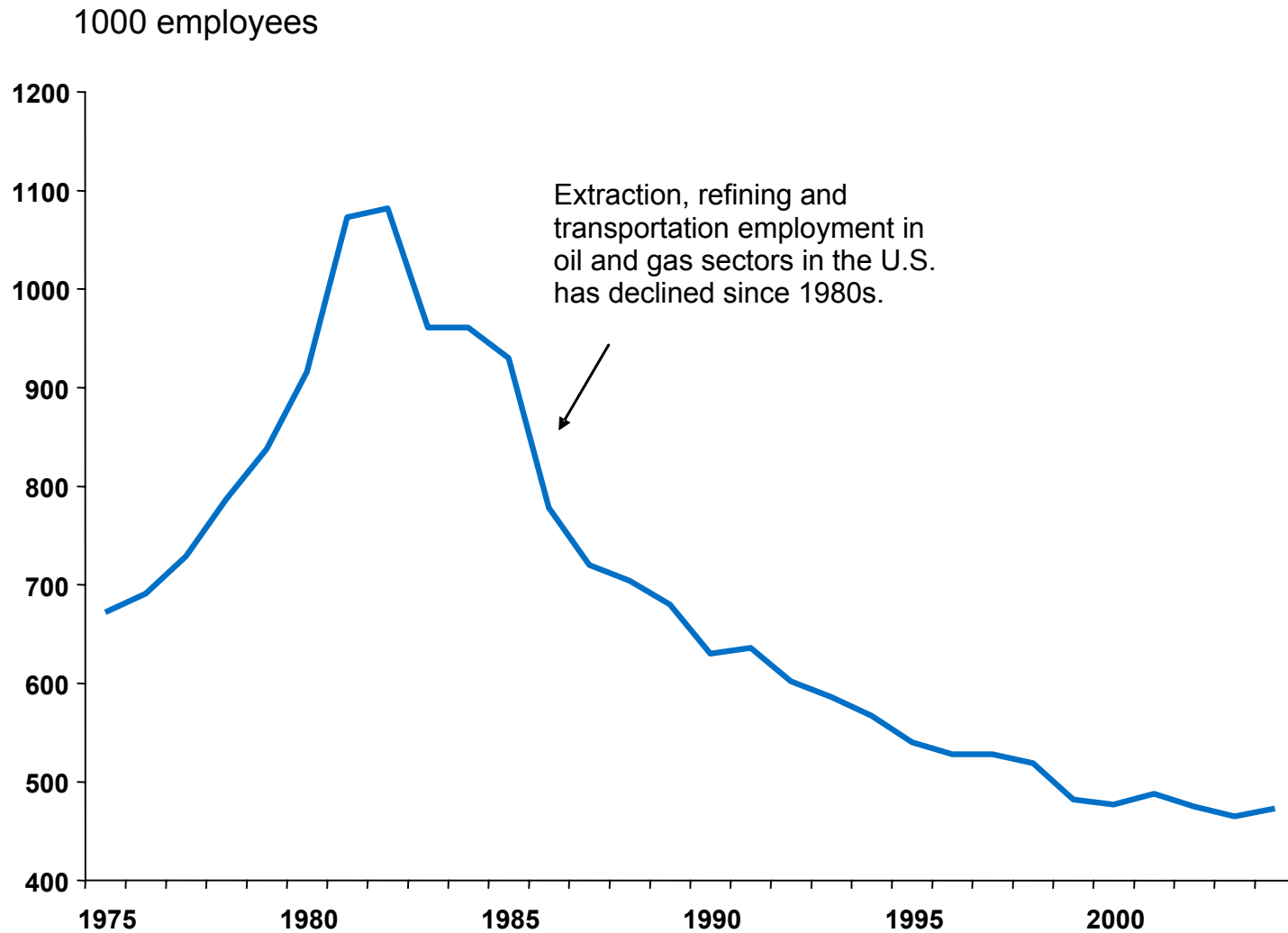
Source: BEA and Goldman Sachs Commodity Research.

Investment phases are typically characterised by rising prices, while prices decline during exploitation phases



Source: Goldman Sachs Commodity Research.

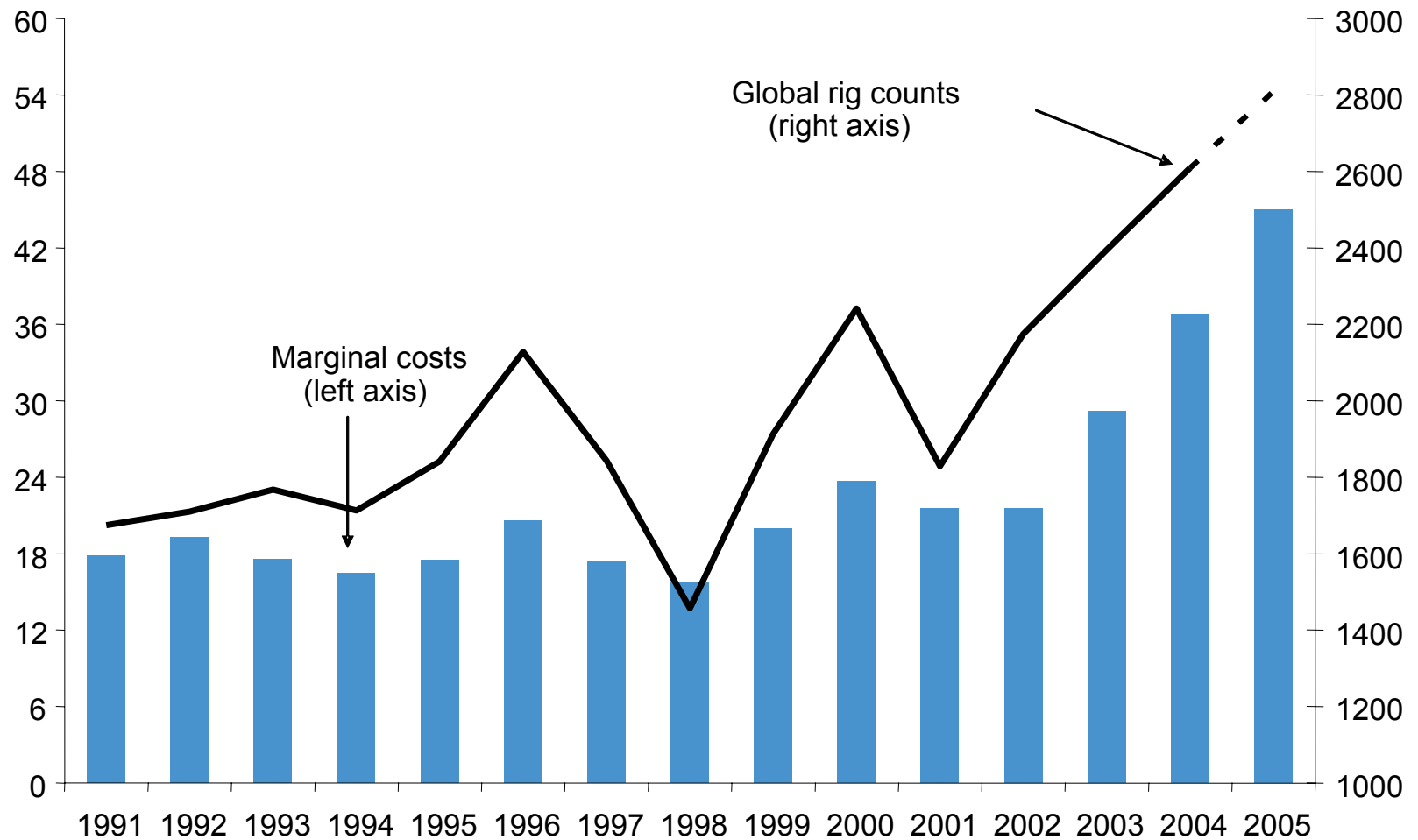
Project complexity requires a well-trained labour force, which is currently very limited



Source: IPAA and Goldman Sachs Commodity Research.

As investment rises, costs rise as demand for greenfield projects increases against limited resources: reserve access, technology and labour

Left axis: \$/bbl, right axis: rig count

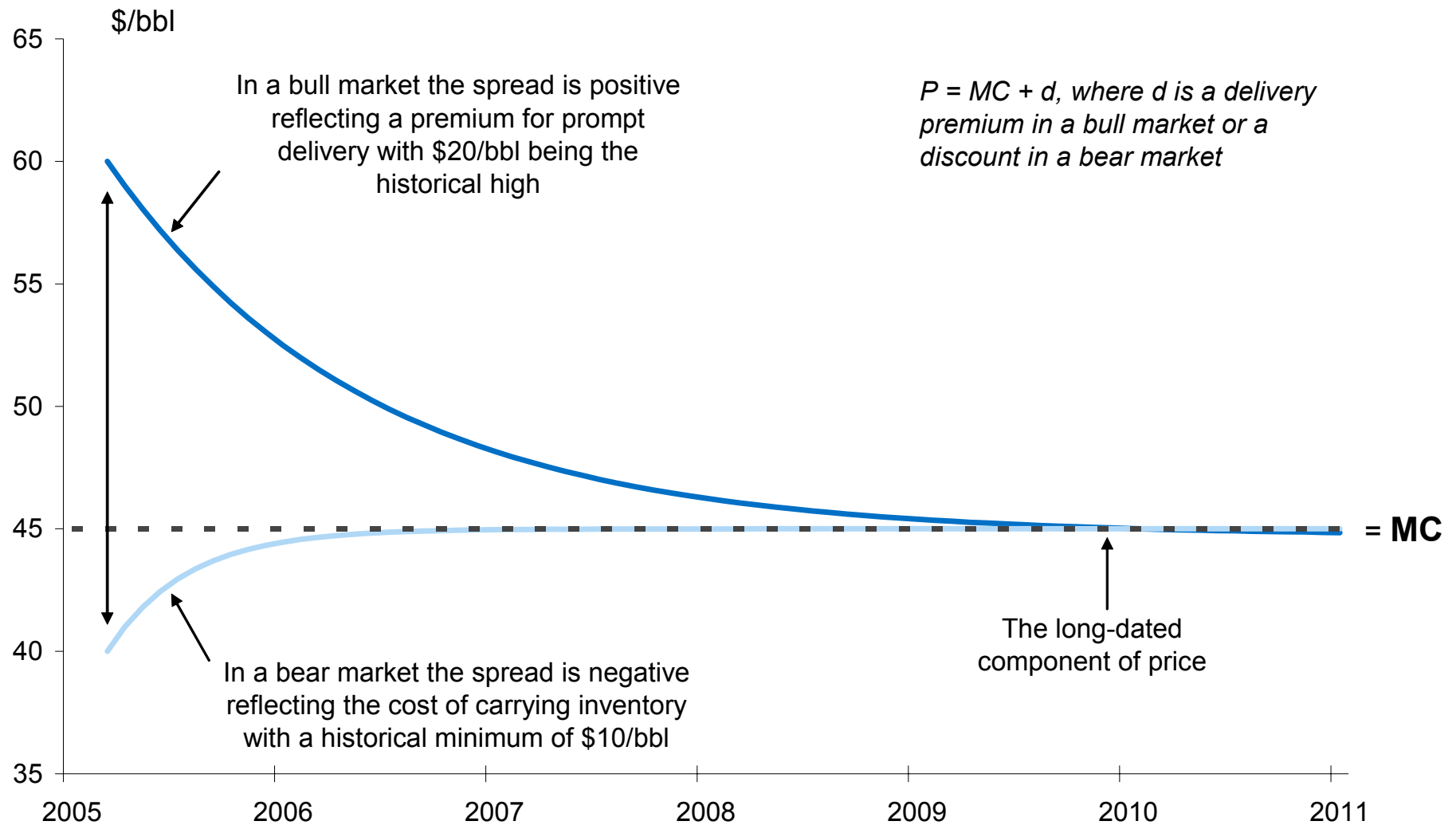


Source: Baker Hughes and Goldman Sachs Commodity Research



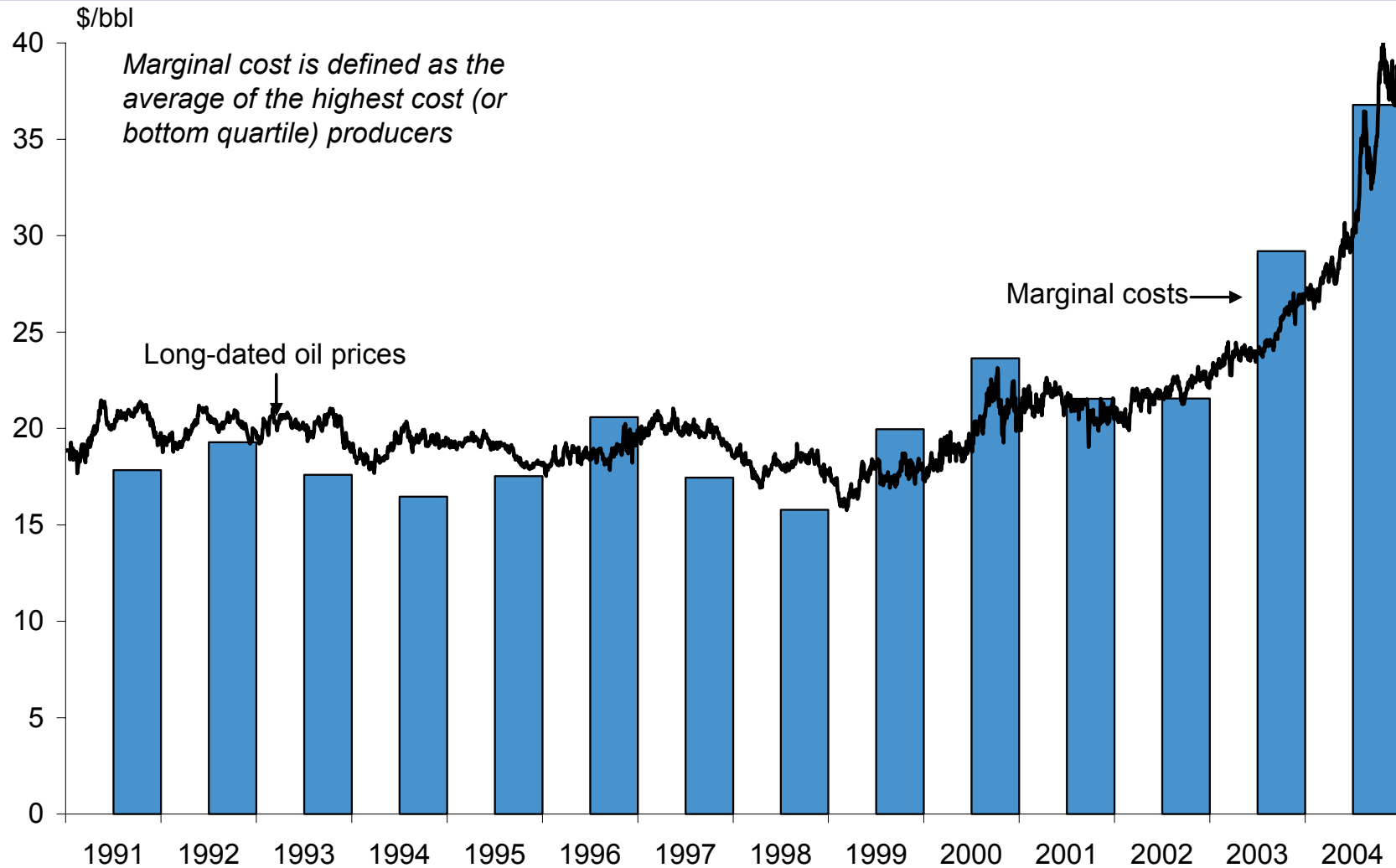
Cost structure drives long-term price while
fundamentals drive curve shape

The key is to decompose the long-term oil price into (1) the long-dated oil price, and (2) the spread between the spot and long-dated oil price



Source: Goldman Sachs Commodity Research.

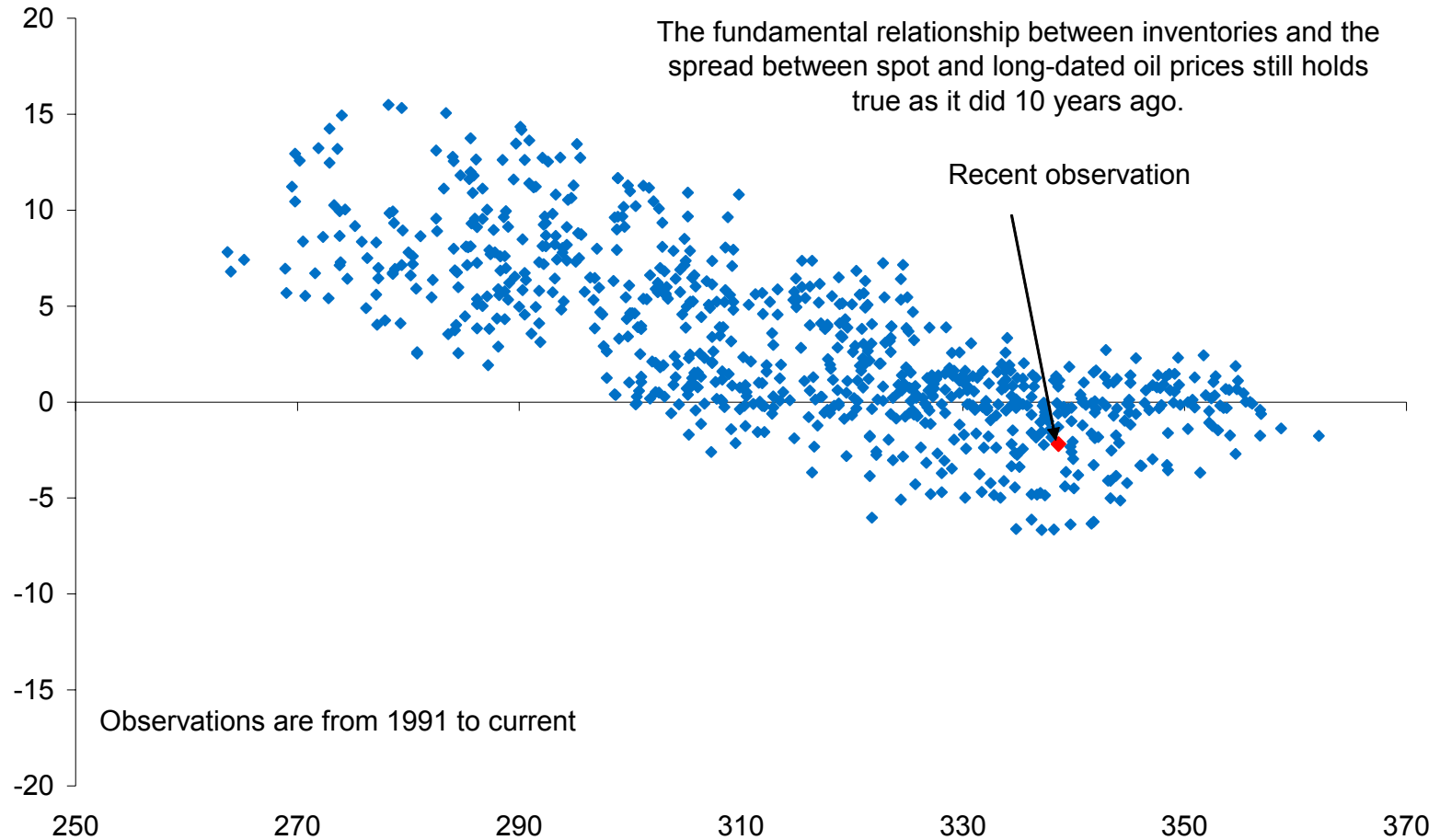
The rise in marginal costs has pushed up long-dated oil prices



Source: Department of Energy and Goldman Sachs Commodity Research.

The fundamentals are priced into the spread between spot and long-dated prices

Spot – 5-yr forward price in \$/bbl (vertical axis); US crude stocks in millions of barrels (horizontal axis)

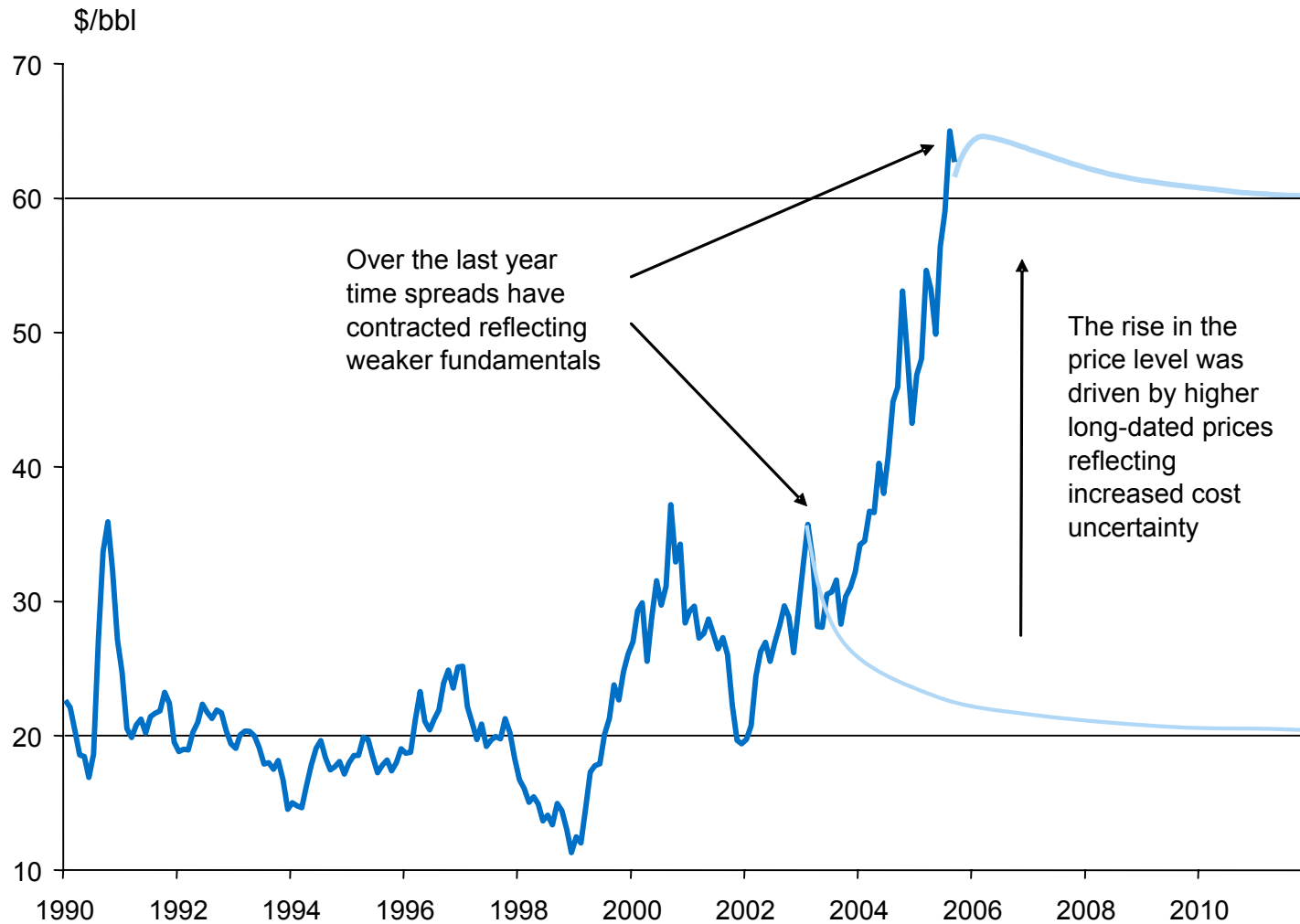


Source: Department of Energy and Goldman Sachs Commodity Research.



A cyclical bear market at \$70/bbl

The rise in long-dated prices has dragged up spot prices despite weakening time spreads



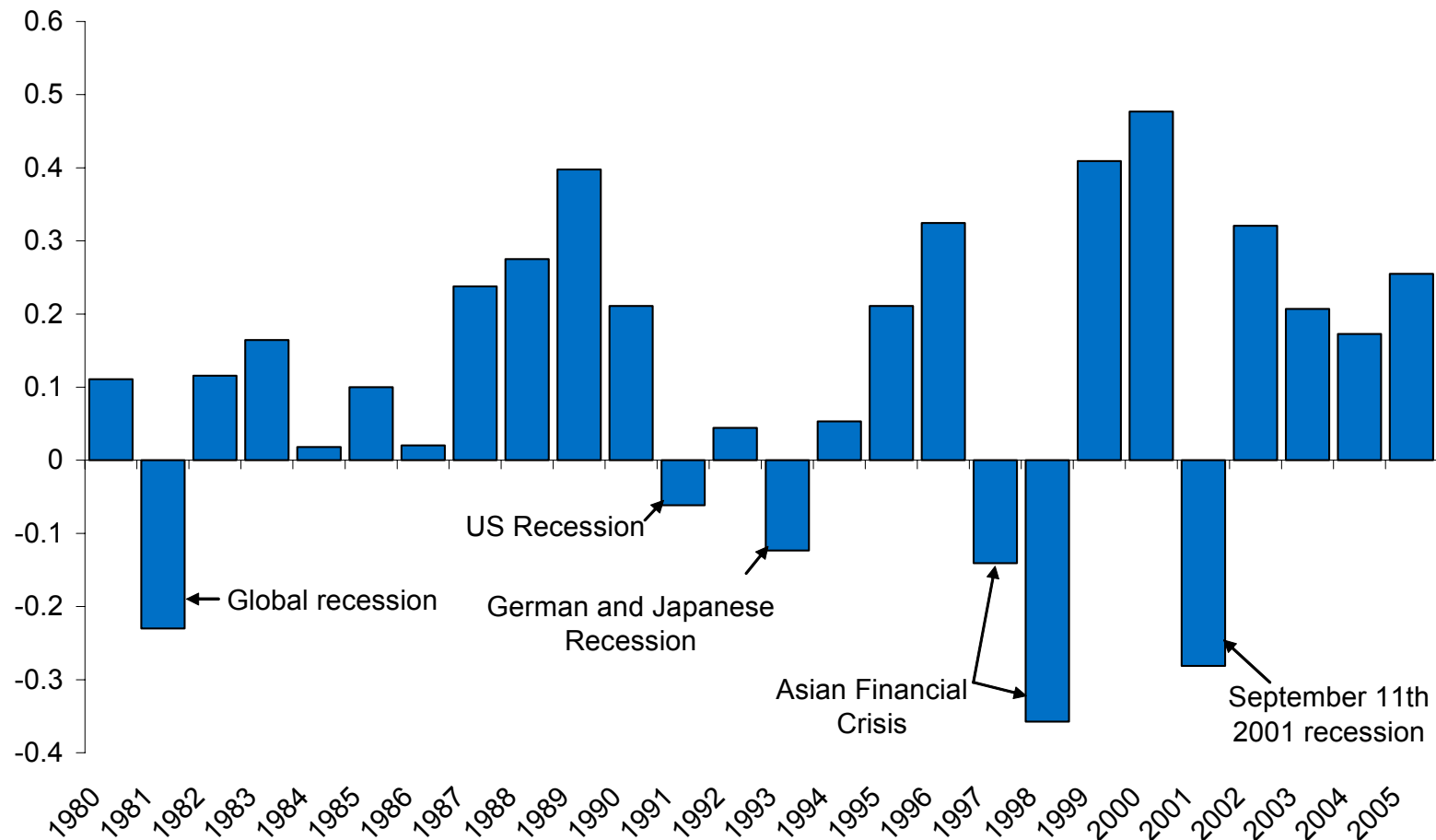
Source: Goldman Sachs Commodity Research.



Rebalancing the oil market

Rule of thumb: Commodity returns are pro-cyclical as negative returns are mostly associated with economic downturns

Annual GSCI returns



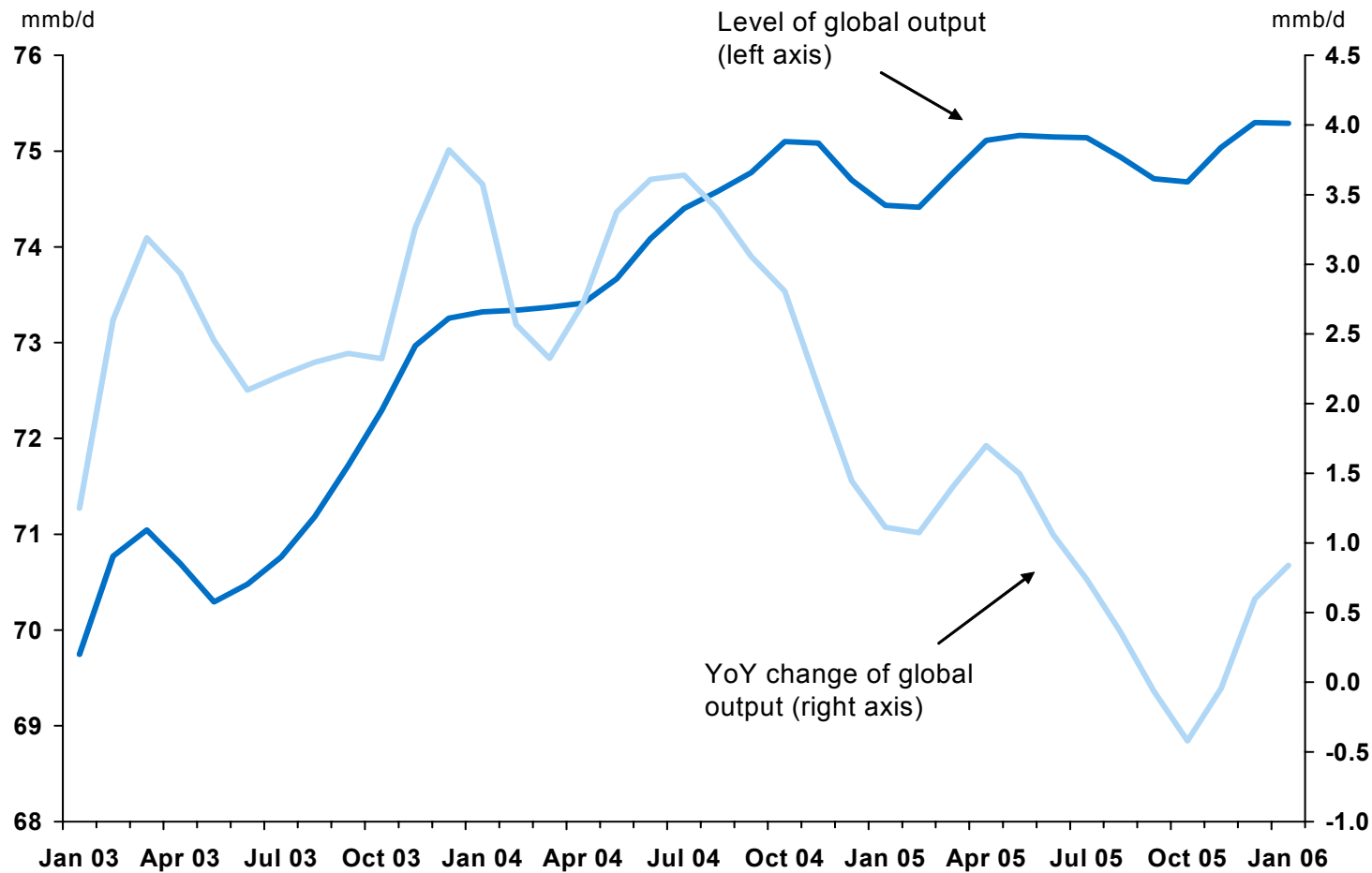
Source: Goldman Sachs Commodities Research.

Is the secular repricing of oil complete? If so, we expect a cyclically strong market for energy in 2006



Source: Goldman Sachs Commodities Research.

As global oil output has not grown since November 2004, only modest demand growth will shift the balance



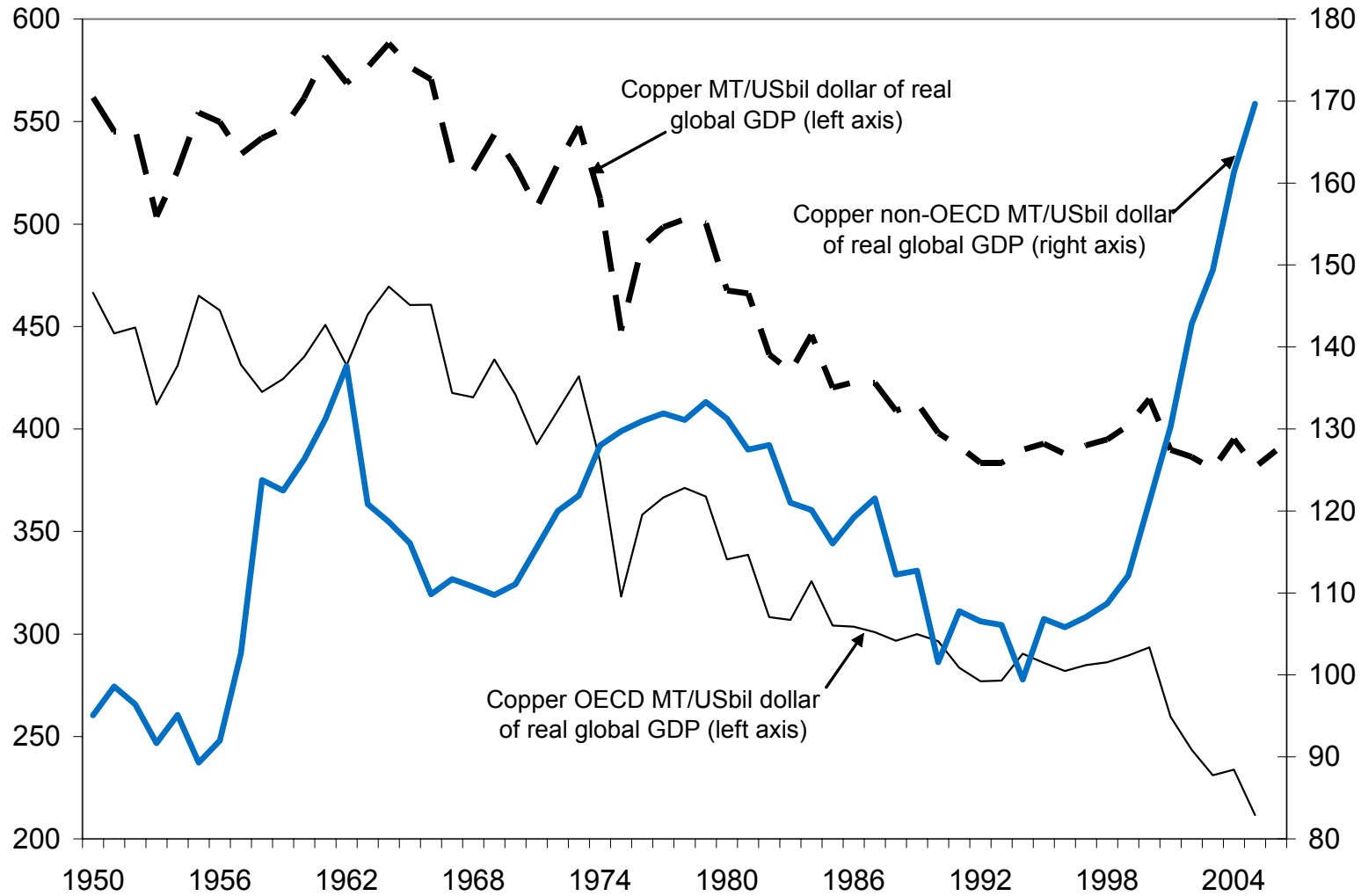
Source: Goldman IEA and Sachs Commodities Research.



Are metals going to follow energy in 2006?

Metals consumption has been driven by a massive infrastructure boom in the Non-OECD

Copper consumption in MT/US bil dollar in real global GDP

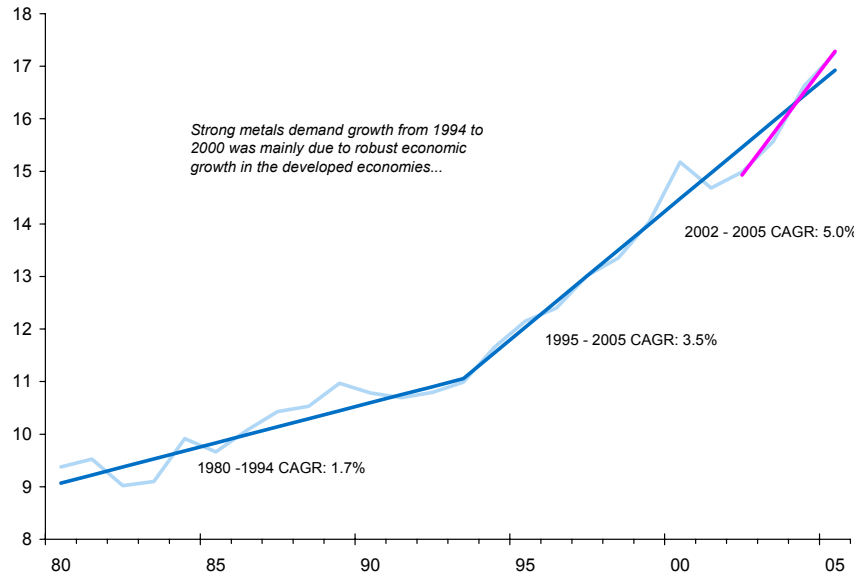


Source: WBMS and Goldman Sachs Commodity Research

This has created an acceleration in global metals demand since the mid-1990s

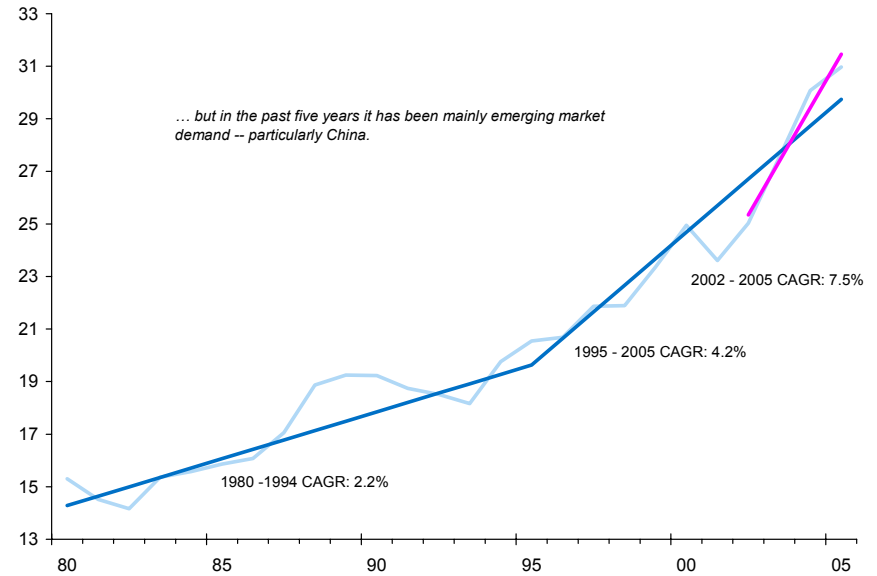
Global copper consumption

Thousand metric tons



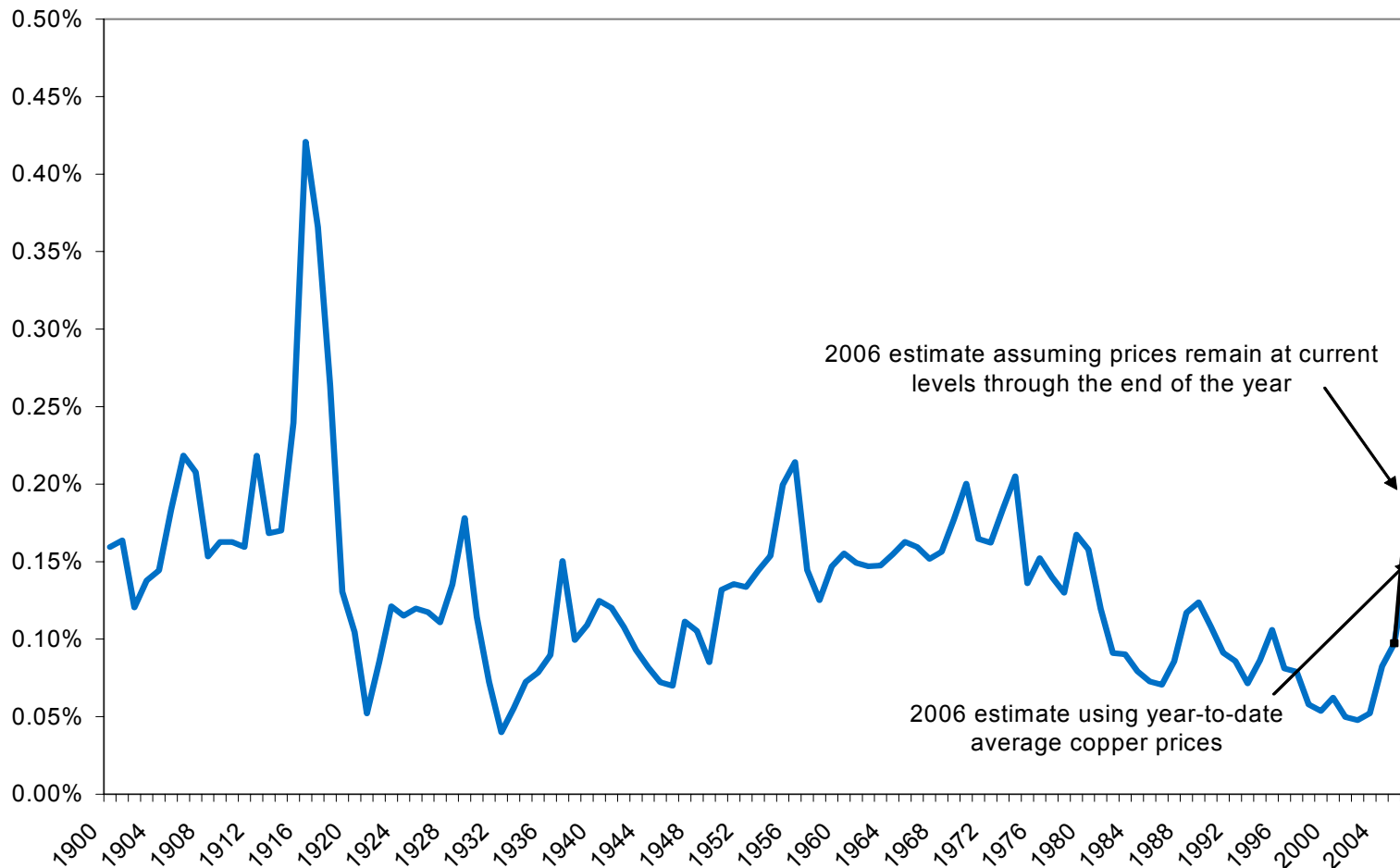
Global aluminum consumption

Thousand metric tons



Source: CRU, WBMS, Goldman Sachs Commodities Research.

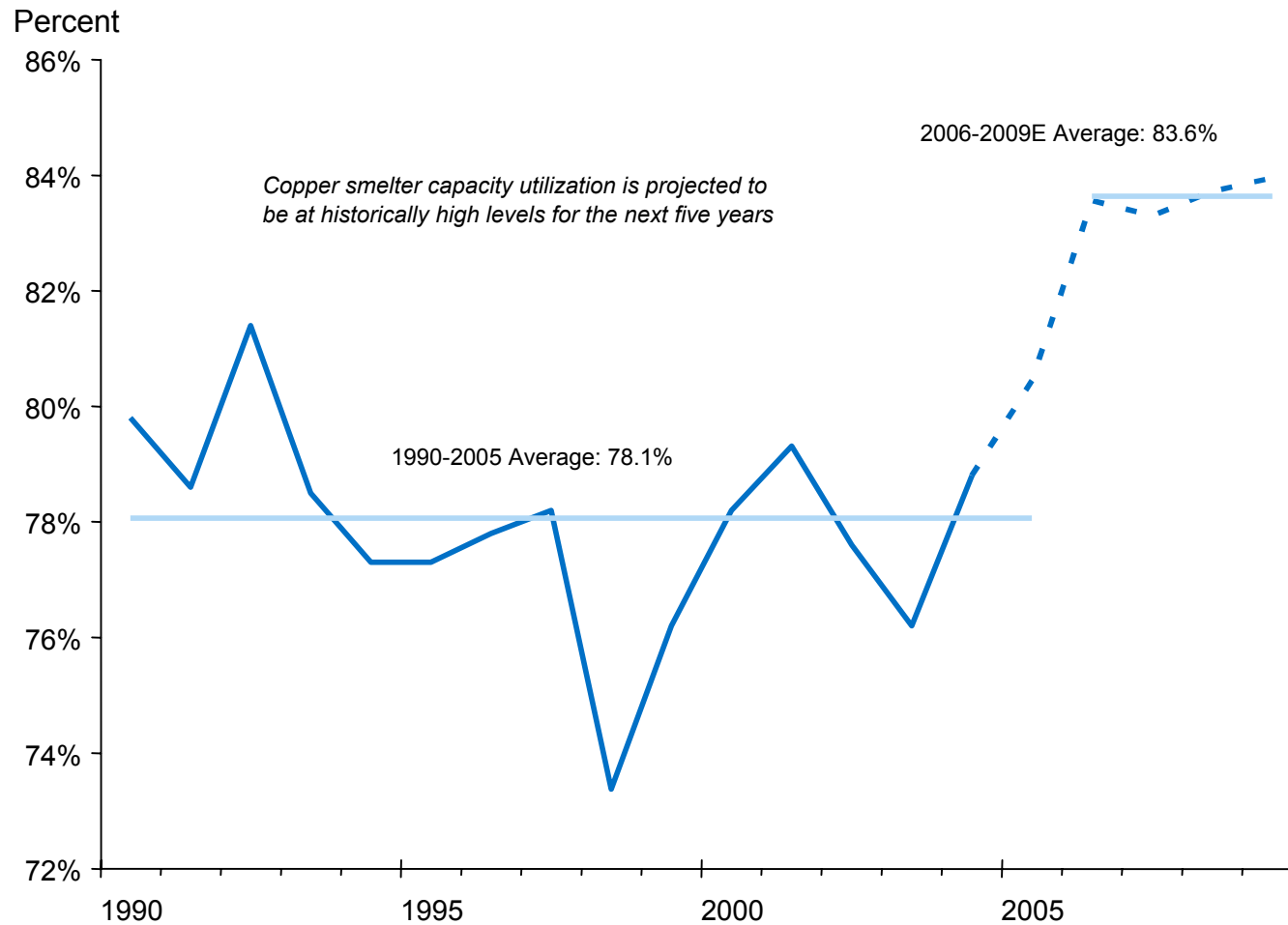
Globally, the value of copper consumption as a share of GDP is still below the levels of the 1960/70s when Japan built infrastructure



Source: United States Geological Survey (USGS), World Bureau of Metals Statistics (WBMS), A Maddison, Contours of the World Economy: the pace and pattern of change, 1-2030AD, Cambridge University Press, 2007, Louis Johnston, Saint John's University; Samuel Williamson, The Miami University and Goldman Sachs Commodity Research

Strong demand growth and a modest pace of investment suggest production bottlenecks will become more frequent

Copper smelting capacity utilization

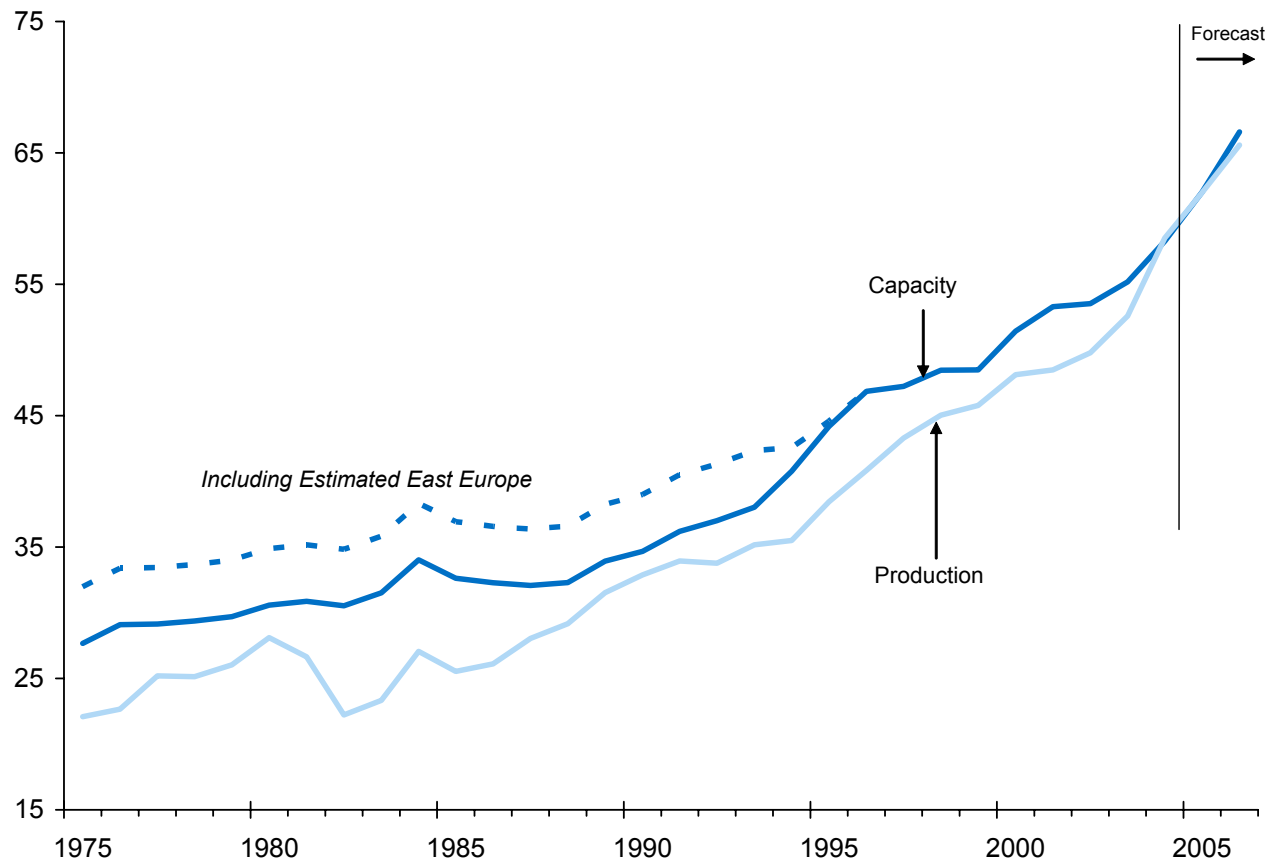


Source: CRU, Goldman Sachs Commodities Research.

Alumina capacity is now exhausted

Global alumina capacity and production

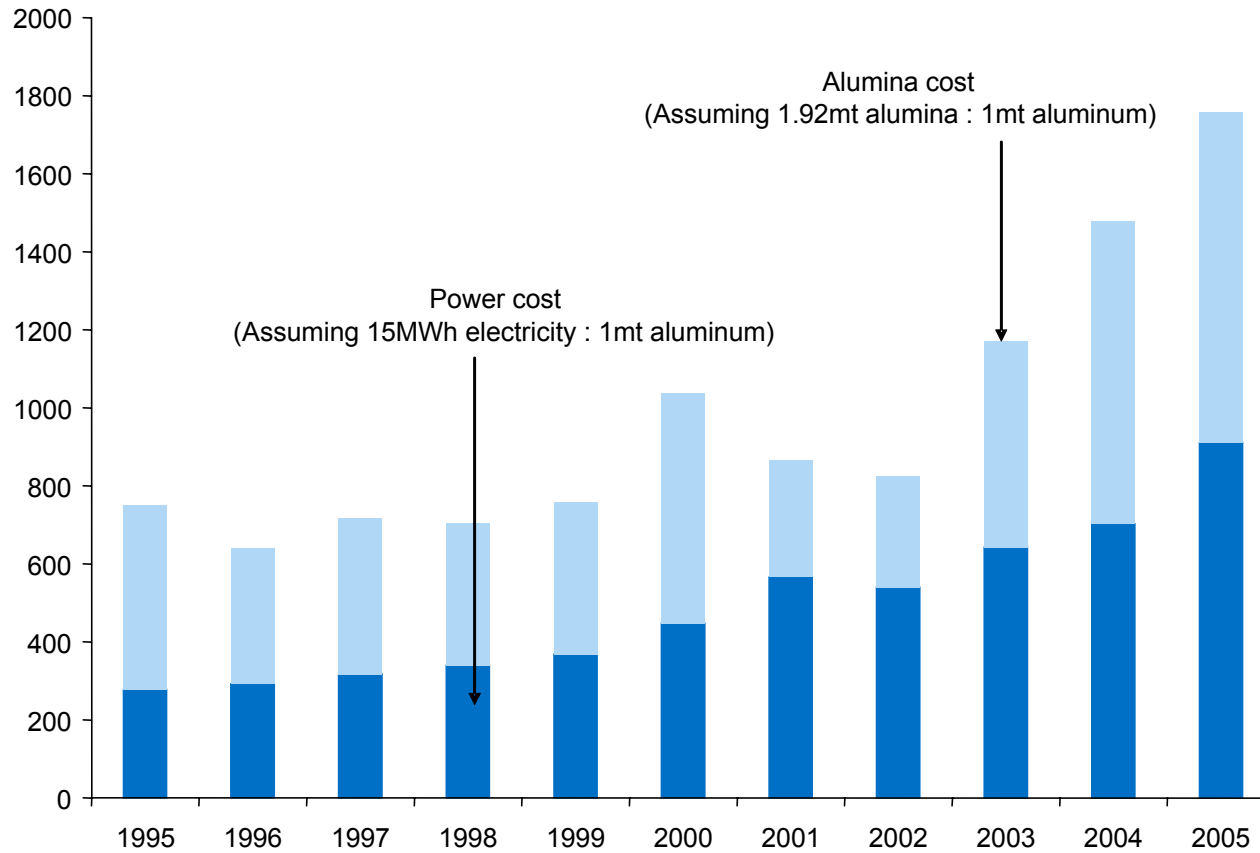
Million metric tons



Source: Brook Hunt, IAI, Goldman Sachs Commodities Research.

Production costs for metals are up sharply

Input costs for aluminum production
US\$/mt



Source: Platts, Metals Bulletin and Goldman Sachs Commodity Research.

Metals producers are facing an increasingly difficult operating environment

- **Producer country governments are raising taxes**

Examples: Chile has just adopted a new tax law which will require mining companies to pay up to 5% of operating income, while the new Peruvian tax requiring payment of up to 3% of mineral sales has just become effective

- **Labour unions are demanding higher pay**

Examples: Just in copper in recent months, we have the strike at Asarco, as well as labour actions at KCM and Chambishi in Zambia, and Zaldivar and Escondida Norte in Chile

- **Opposition from local communities is increasing**

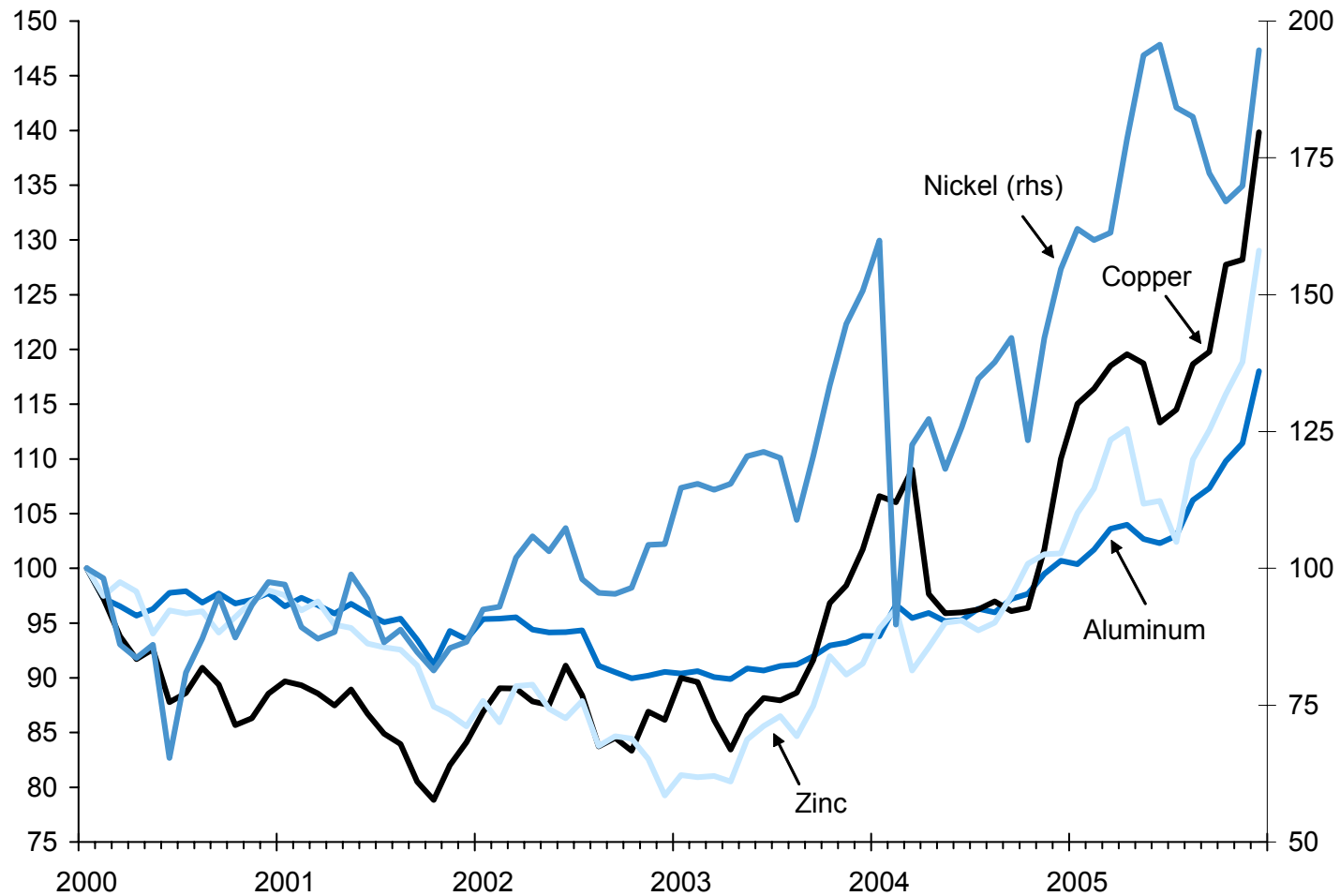
Example: BHP pays 3% of the Tintaya mine's profits to Peruvian community groups, but unrest continues

- **Infrastructure to support mining operations is inadequate**

Example: Heavy Chinese investment is needed in Brazilian rail and port infrastructure to allow the further development of the Brazilian resource extraction industry

As a result, long-dated prices are beginning to rise in metals as well

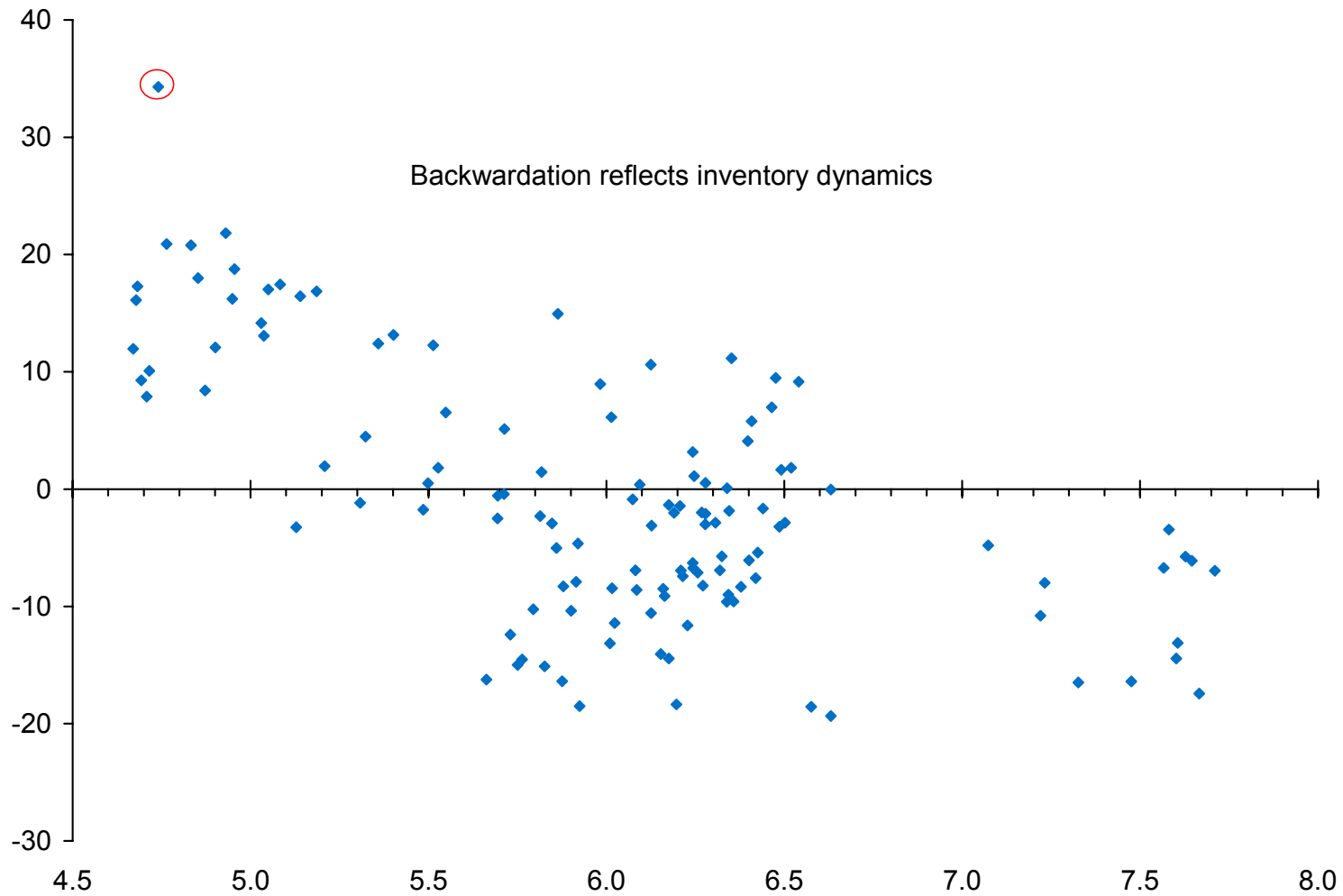
Five-year forward prices
Index, January 2000 = 100t



Source: Goldman Sachs Commodity Research.

Aluminum 3mo to 5yr backwardation vs. visible inventories

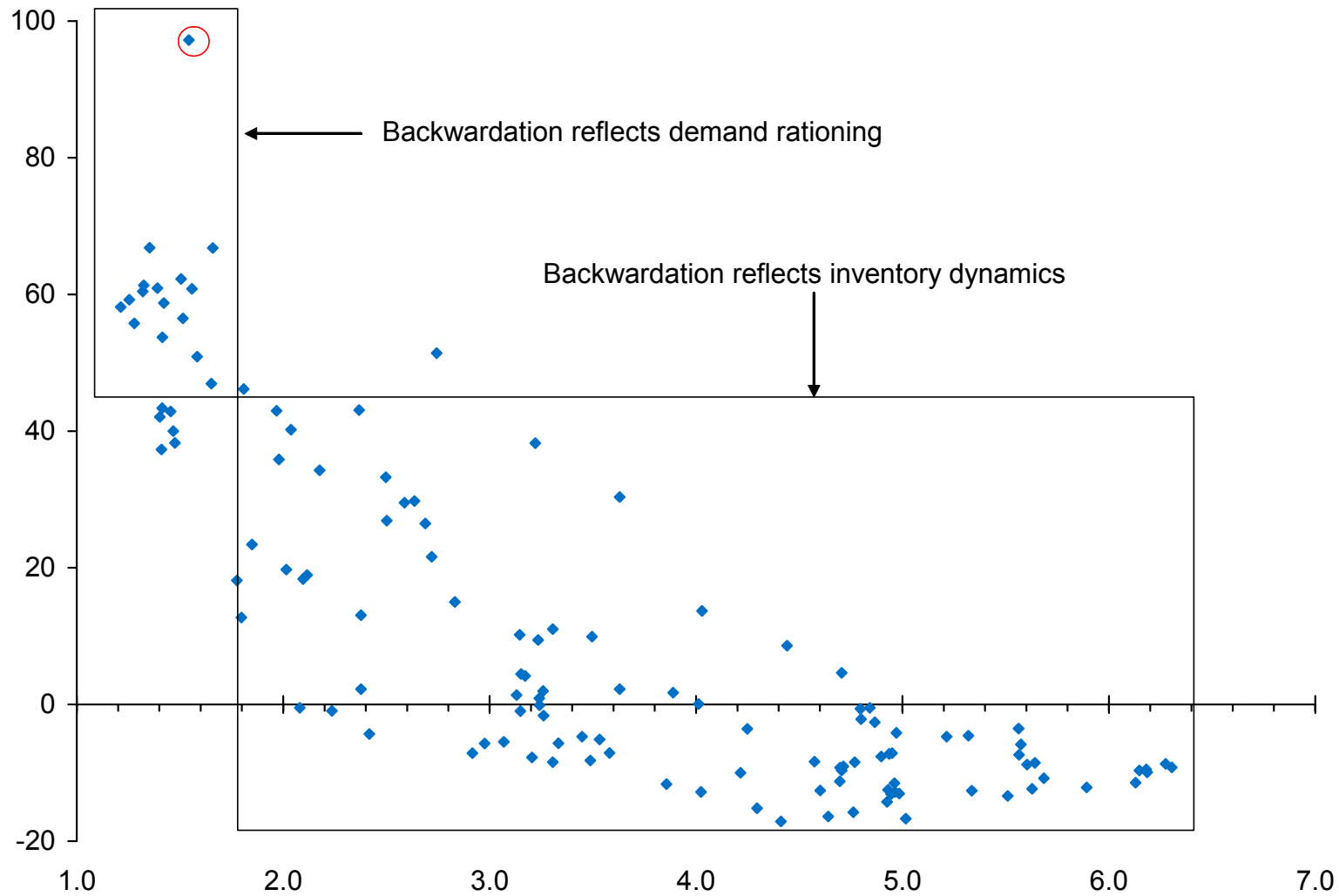
Vertical axis: percent backwardation; horizontal axis: weeks of consumption



Source: Goldman Sachs Commodity research

Copper 3mo to 5yr backwardation vs. visible inventories

Vertical axis: percent backwardation; horizontal axis: weeks of consumption



Source: Goldman Sachs Commodity research

Prices across most of the commodities remains well below historical real peaks with the exception of zinc

Real prices in 2006 dollars

	Crude oil NYMEX \$/bbl	Gold COMEX \$/oz	Silver COMEX \$/oz	Copper LME \$/MT	Zinc LME \$/MT	Nickel LME \$/MT	Aluminum LME \$/MT
Monthly prices							
Max	84.04	1748	90.98	11930	3057	29254	4785
Max Date	Mar-81	Sep-80	Jan-80	Apr-74	Feb-89	Feb-89	Jun-88
April 2006	70.16	612	12.65	6320	3041	18047	2647
April 2006 % Max	83%	35%	14%	53%	99%	62%	55%
Daily prices							
Max	NA	2091	104.06	13103	3470	30173	5396
Max Date	NA	1/21/80	1/21/80	5/6/74	5/9/06	1/3/89	6/1/88
Recent peak	NA	702	14.52	7815	3470	20000	3012
Recent peak % Max	NA	34%	14%	60%	100%	66%	56%

Source: BP, NYMES, R Shiller, Irrational exuberance, Princeton 2005 and Goldman Sachs Commodity Research

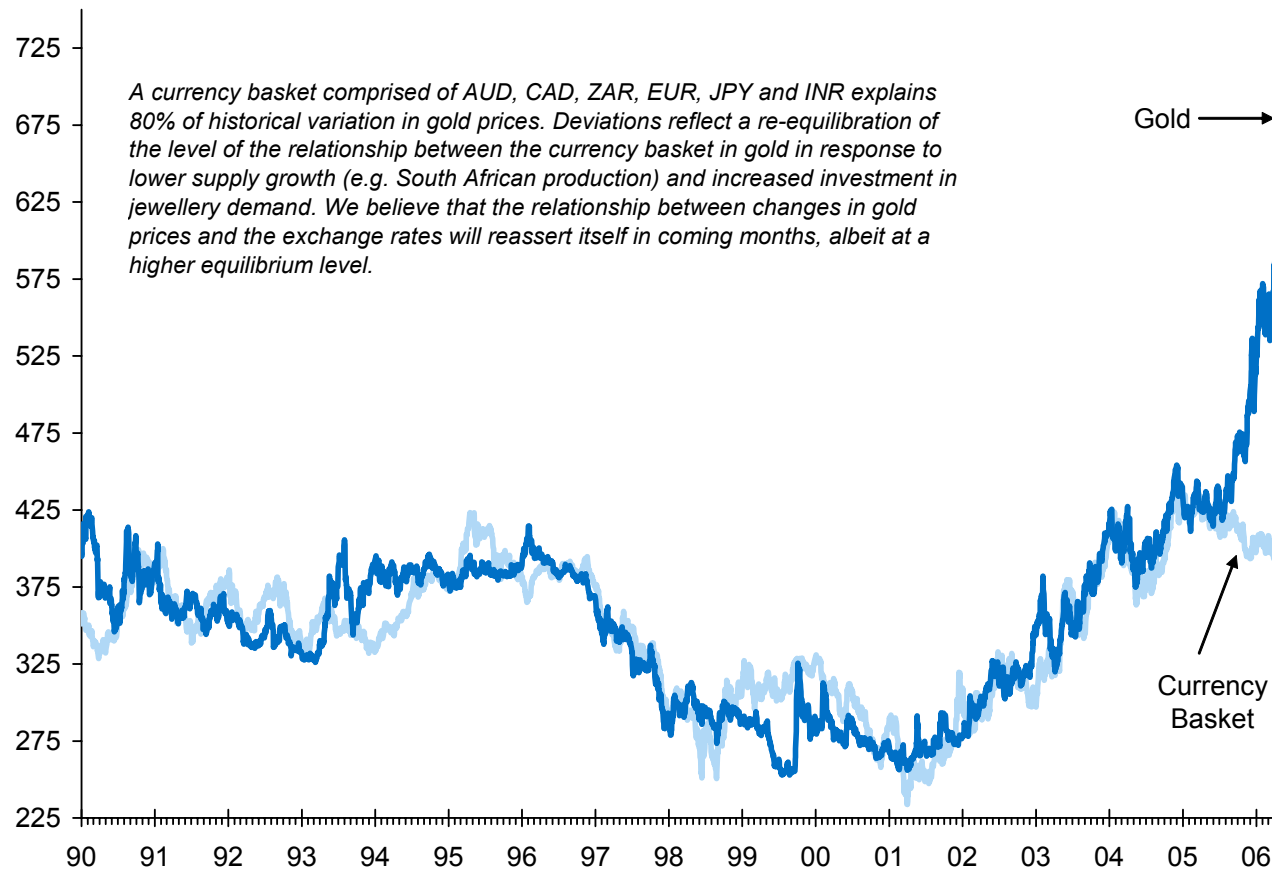


Gold has diverged from fundamentals

We believe gold is well supported over the long run

Gold actual and estimated fair value price

US\$/toz

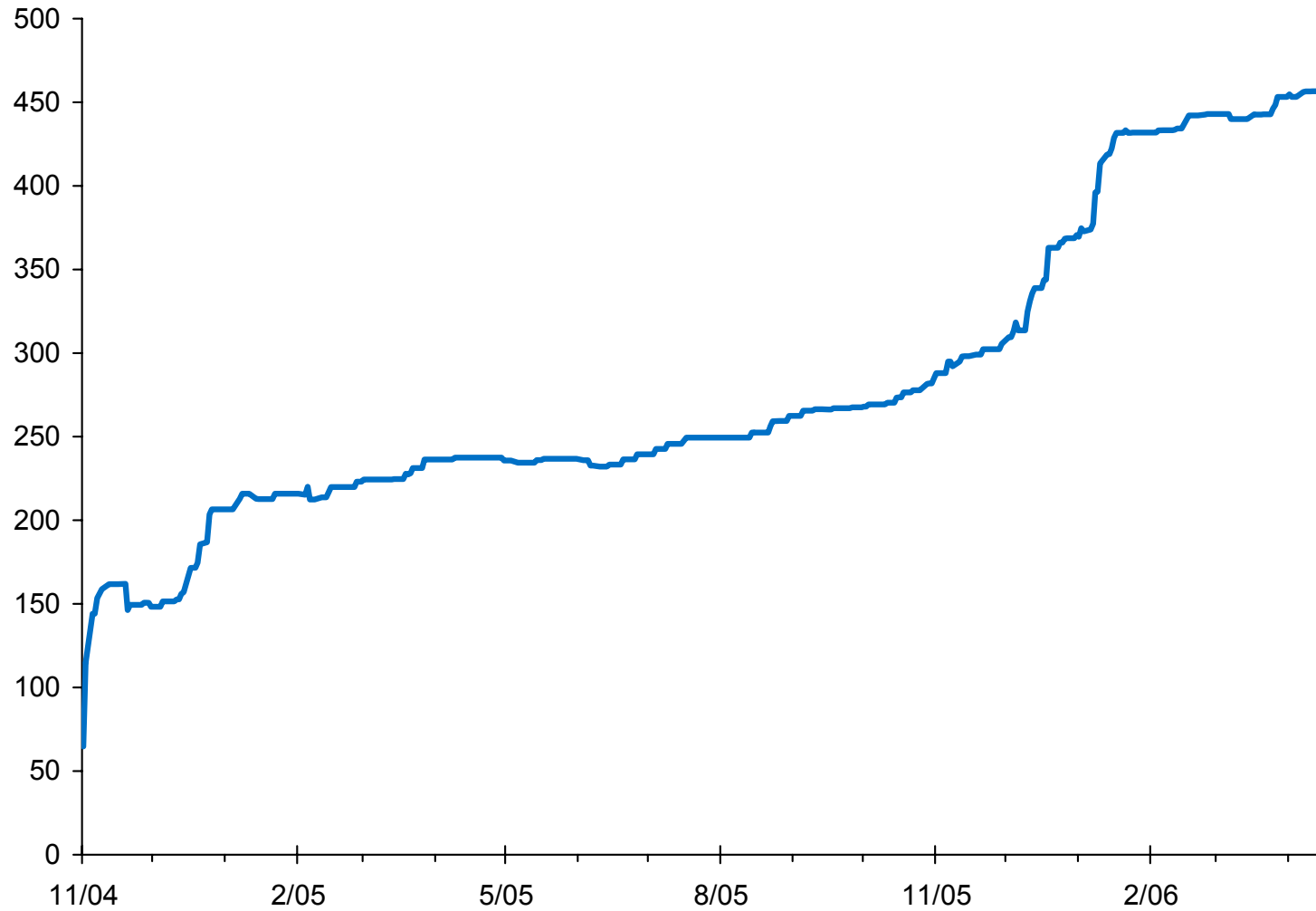


Source: LBMA and Goldman Sachs Commodity Research.



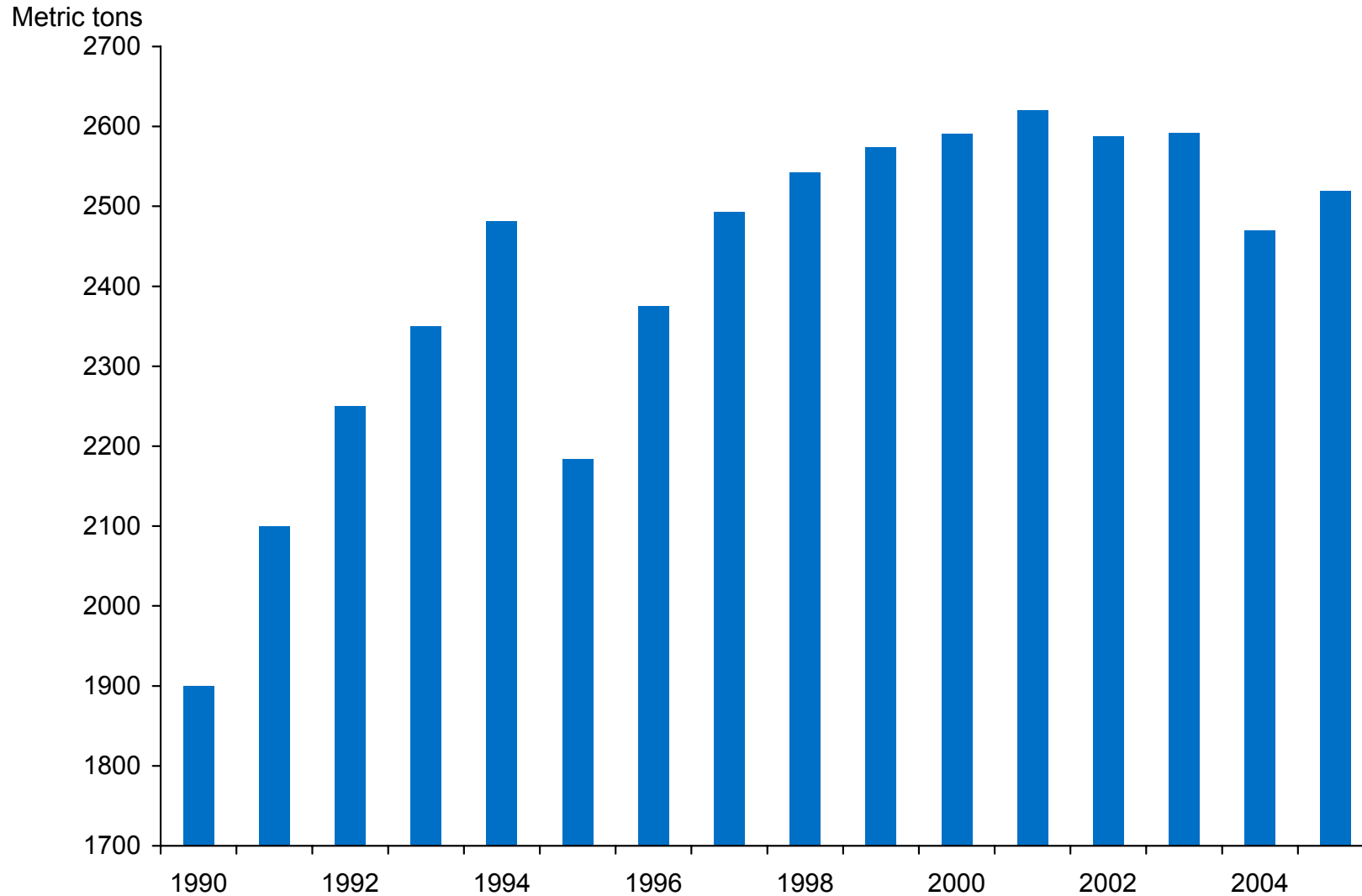
ETFs have added significantly to gold demand

Metric tons



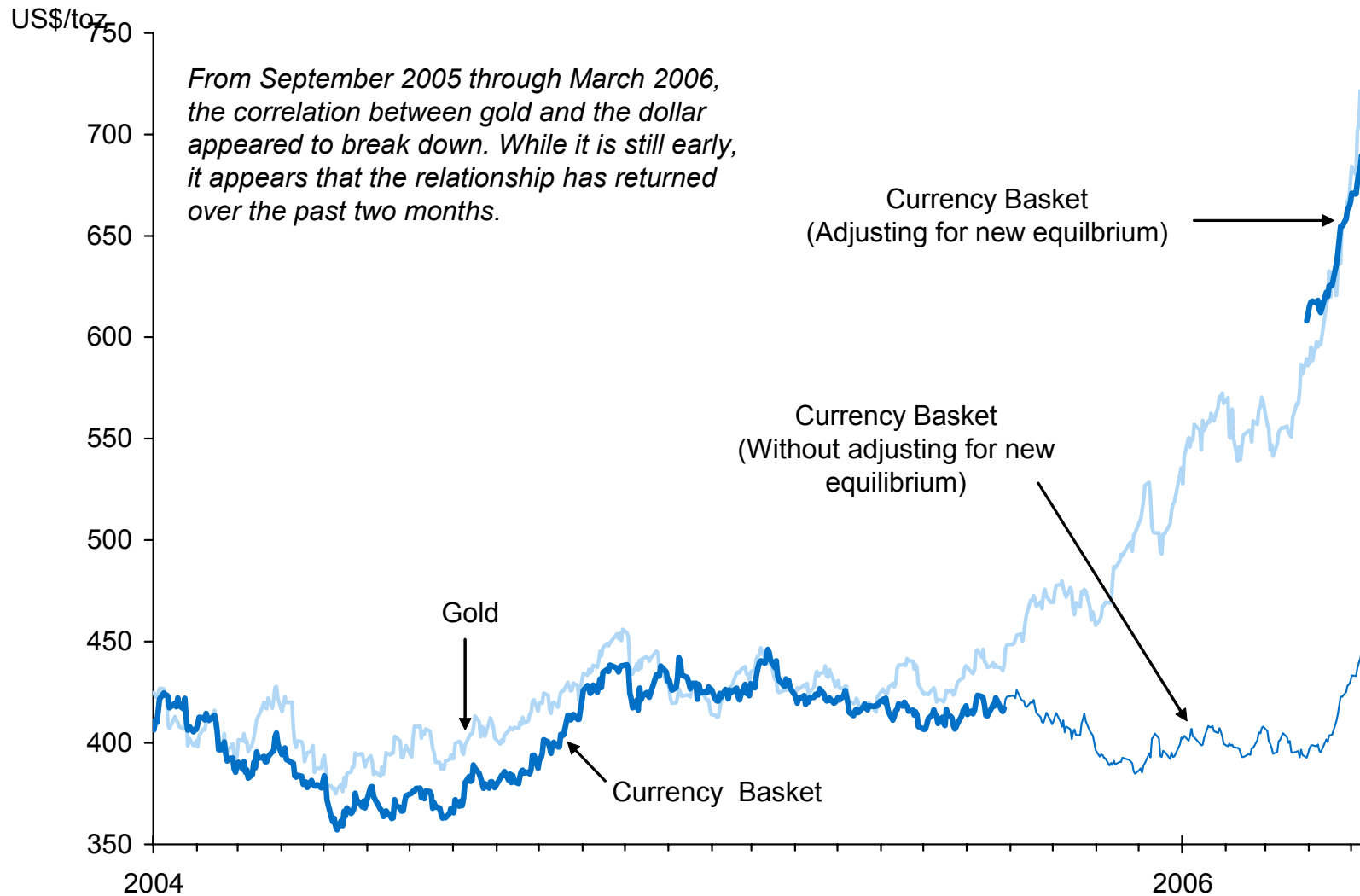
Source: World Gold Council and Goldman Sachs Commodity research

Global mine production has slipped in recent years



Source: GFMS and Goldman Sachs Commodity research

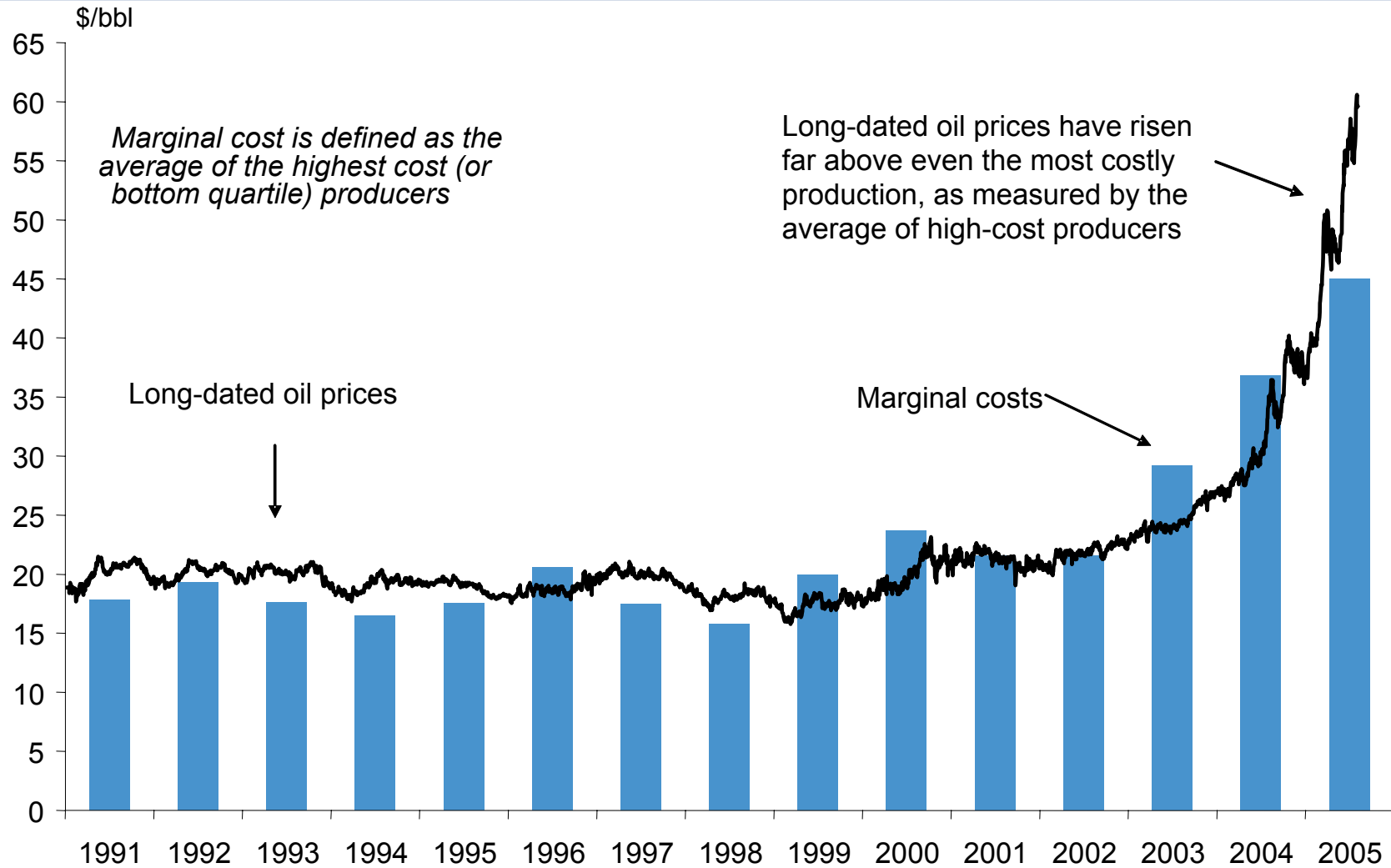
The relationship appears to have resumed after a period of re-equilibration



Source: Goldman Sachs Commodity research

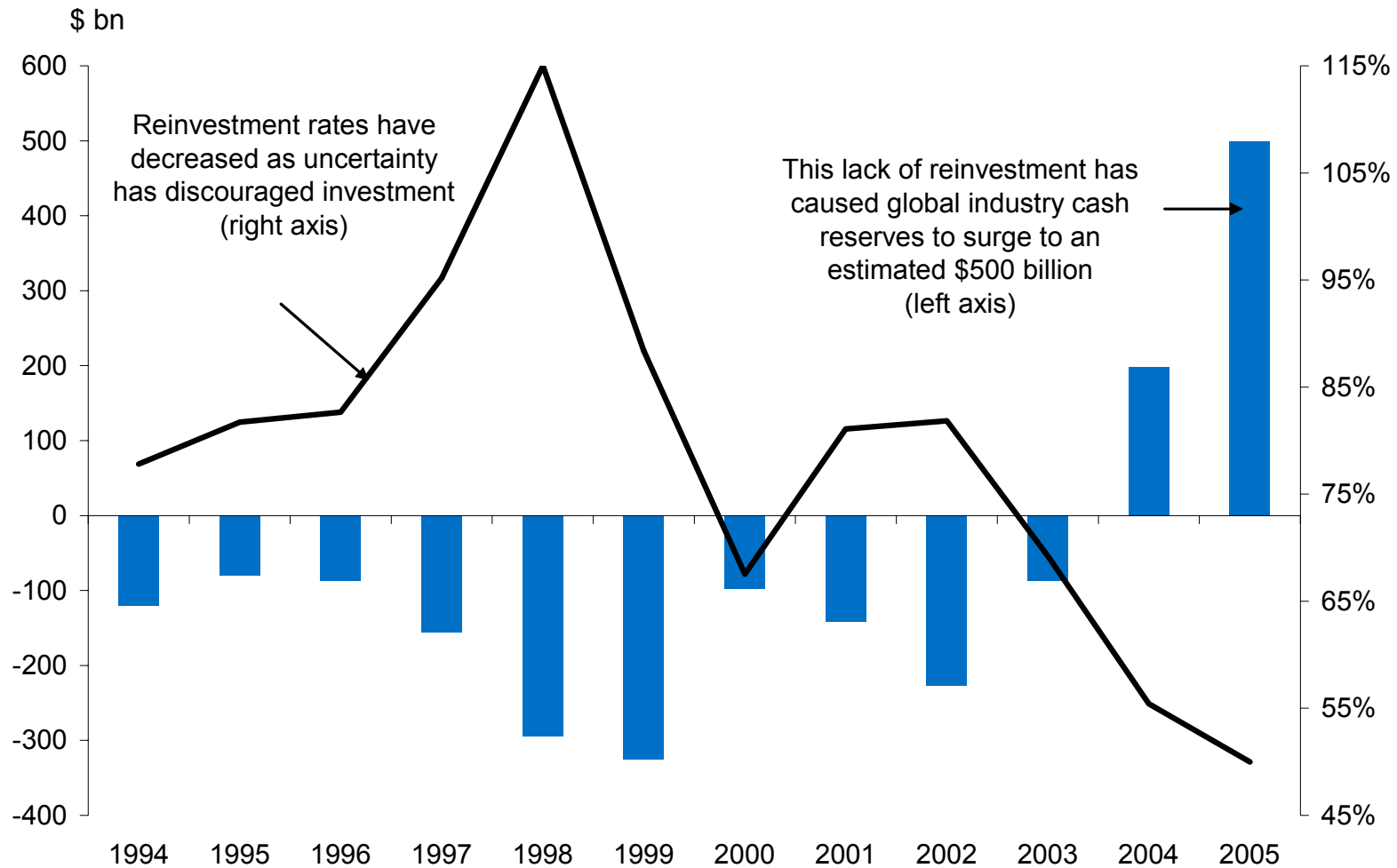
Investment uncertainty makes finding a new equilibrium difficult and generates significant upside risk

In the current environment, long-dated prices now exceed the highest cost projects ...



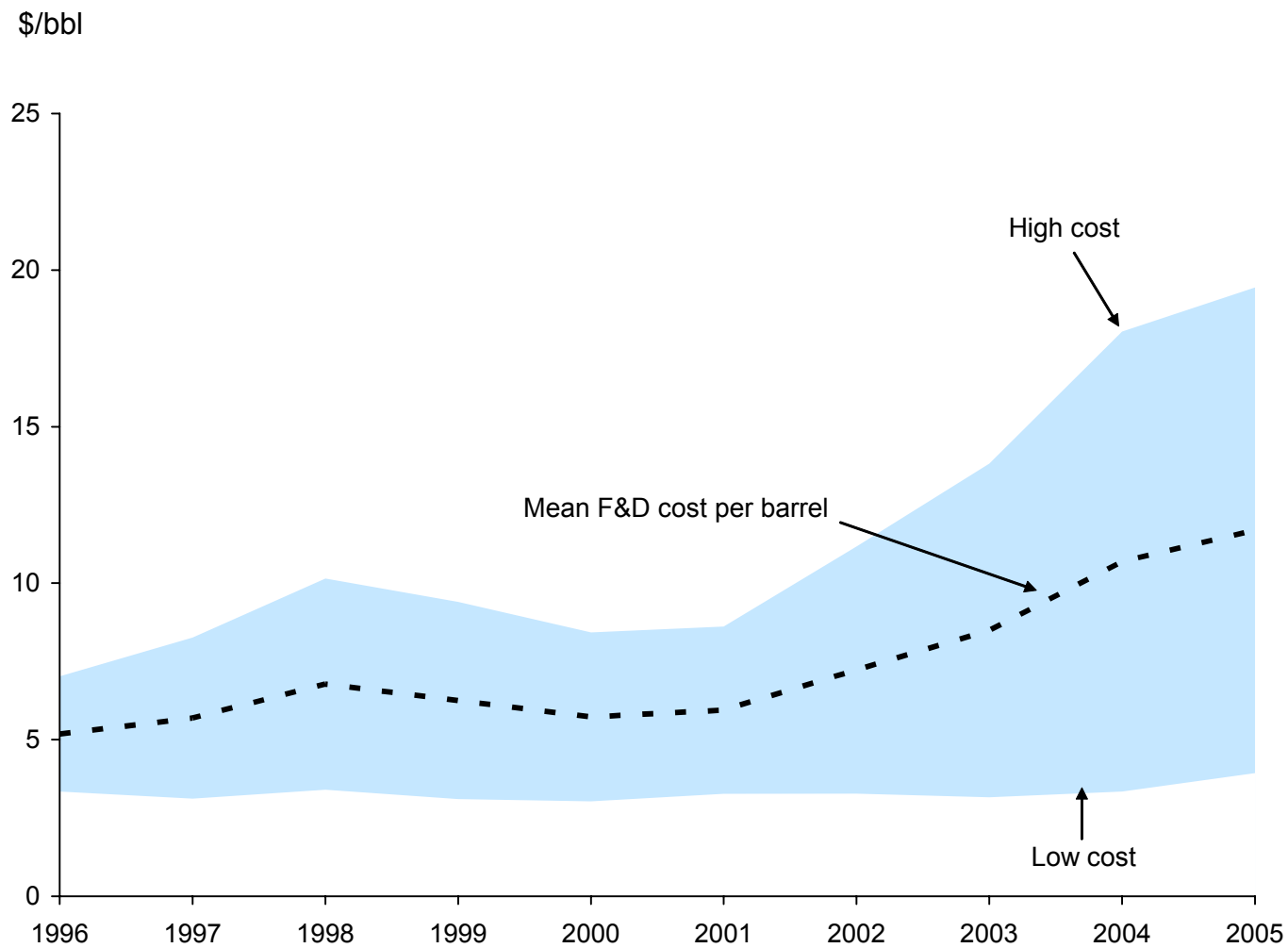
Source: Department of Energy and Goldman Sachs Commodity Research.

... while reinvestment rates have fallen and cash reserves have surged



Source: Goldman Sachs Commodity research.

This overshoot reflects increased uncertainty in the industry's cost structure



Source: Goldman Sachs Commodity Research.

A simple example of investment under uncertainty

A simple example explained

Investment under uncertainty

Project has a \$40/bbl breakeven cost today
with a 50% chance of dropping to \$20/bbl next year

Prices are \$50/bbl and are expected to remain at these levels

If we invest today,
Project has an NPV of \$1.1 billion

However, if we delay investment, then there is a
50% chance that costs decline and the NPV of the delayed project is \$3.0 billion
50% chance that costs are unchanged and the NPV of the delayed project is \$1.0 billion

The expected NPV of the delayed project is \$2.0 billion
Expected NPV = 50% low-cost NPV + 50% high-cost NPV
($\$2,000 = 0.50 \times \$3,000 + 0.50 \times \$1,000$)

If prices remain at \$50/bbl we will delay investment until next year, as
Expected NPV of a delayed project > NPV of investing today in the project
(i.e., $\$2,000 > \$1,100$)

This implies that the value of the option to wait is \$900 million
The difference between the NPV of delaying investment and the NPV of investing today
($\$900 = \$2,000 - \$1,100$)

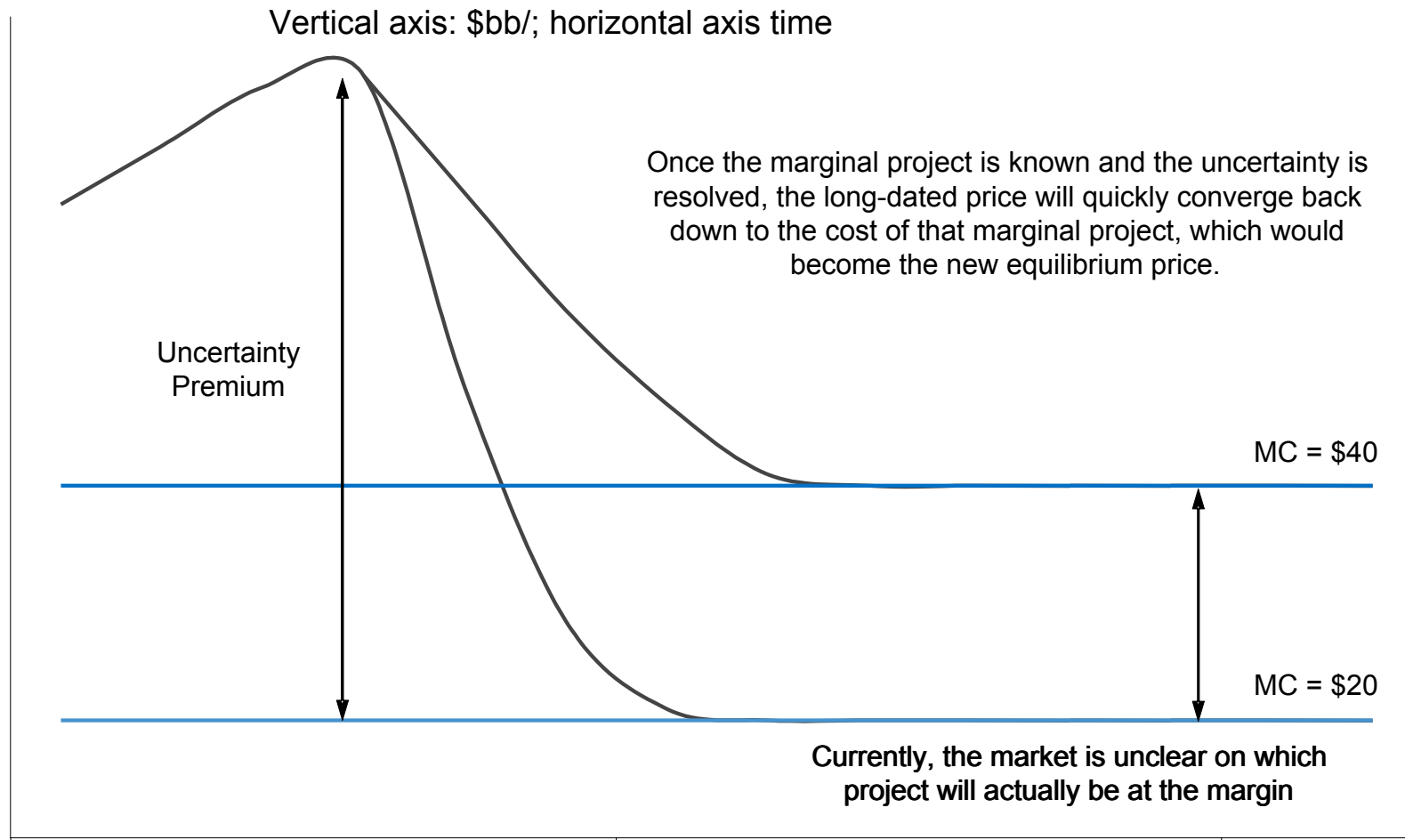
To incentivize investment today the price would need to rise such that the
NPV of investing today is equal to the NPV of delaying investment at a price of \$50/bbl

Prices would need to rise to \$58.50/bbl to increase the NPV of investing today to \$2.0 billion

As a result, the uncertainty has pushed prices up nearly \$9/bbl to incentivize investment today

Source: Goldman Sachs Commodity Research.

Once uncertainty is resolved, the premium will disappear as long-term oil prices find a new equilibrium



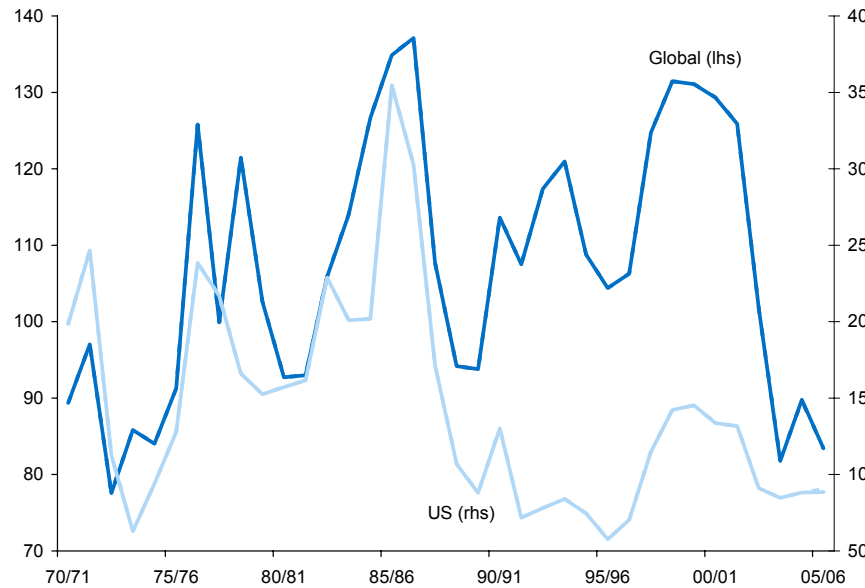
Source: Goldman Sachs Commodity Research.

Agriculture prices are likely to be supported by low inventories, Chinese draught, and bio-fuel demand

Low inventory levels suggest further upside for wheat

Wheat inventories

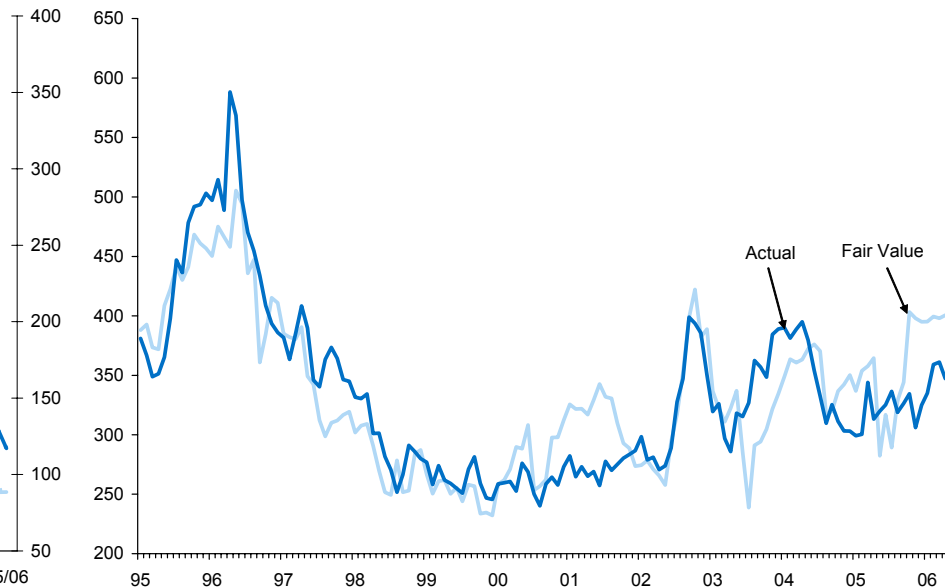
Days of forward coverage



Source: USDA and Goldman Sachs Commodity Research.

Wheat, actual and fair value

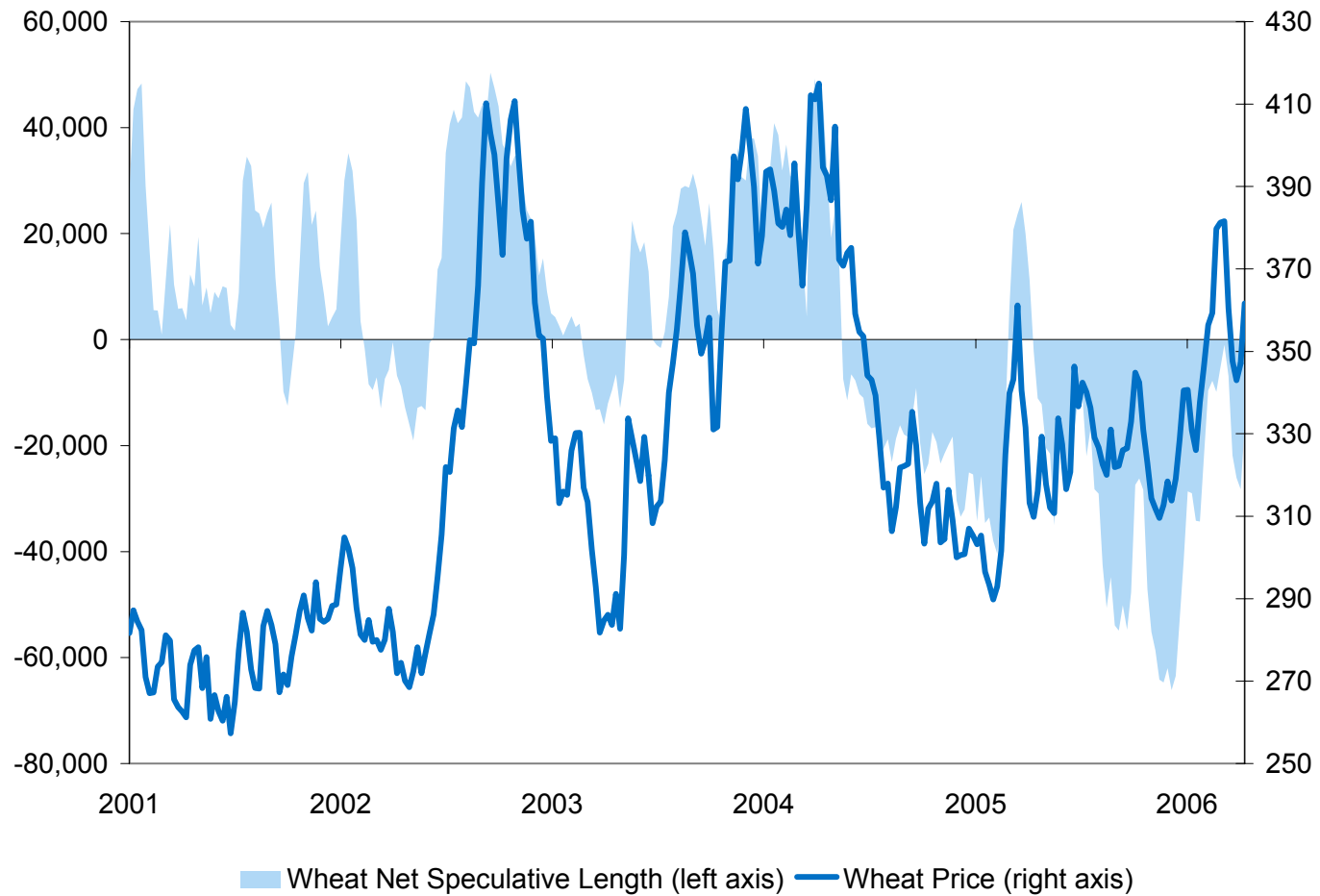
Cents per bushel



Source: CBOT and Goldman Sachs Commodity Research.

Increasing speculative interest is also a support for wheat prices

Left axis: number of contracts; right axis: cents per bushel

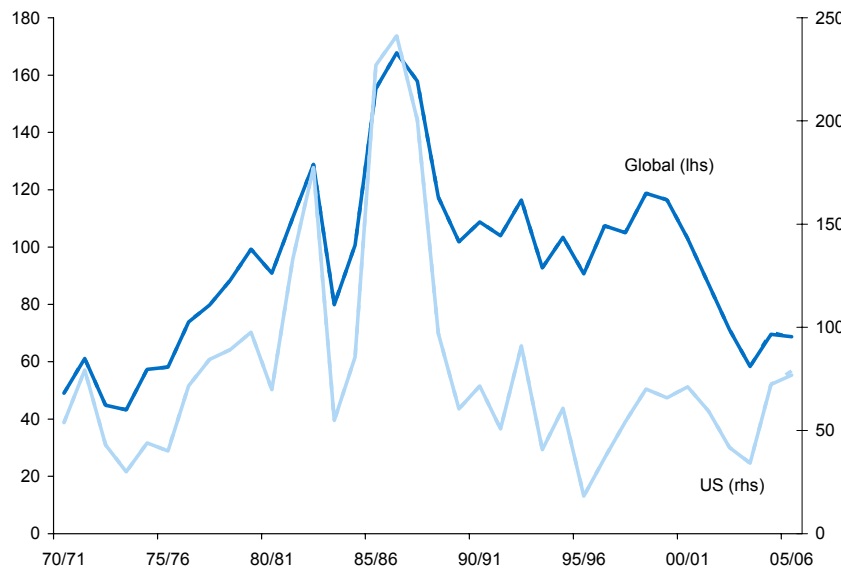


Source: CFTC and Goldman Sachs Commodity Research.

Corn prices have converged to our fair value estimates

Corn inventories

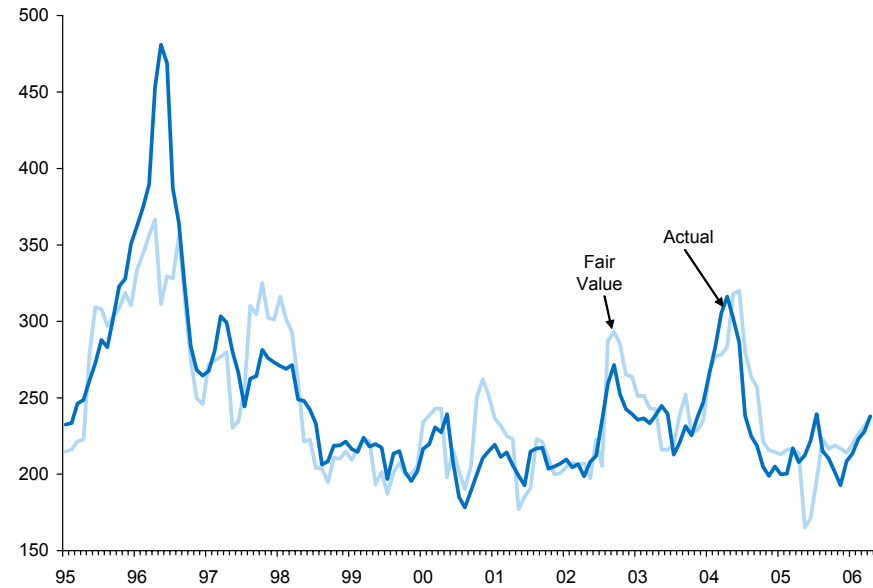
Days of forward coverage



Source: USDA and Goldman Sachs Commodity Research.

Corn, actual and fair value

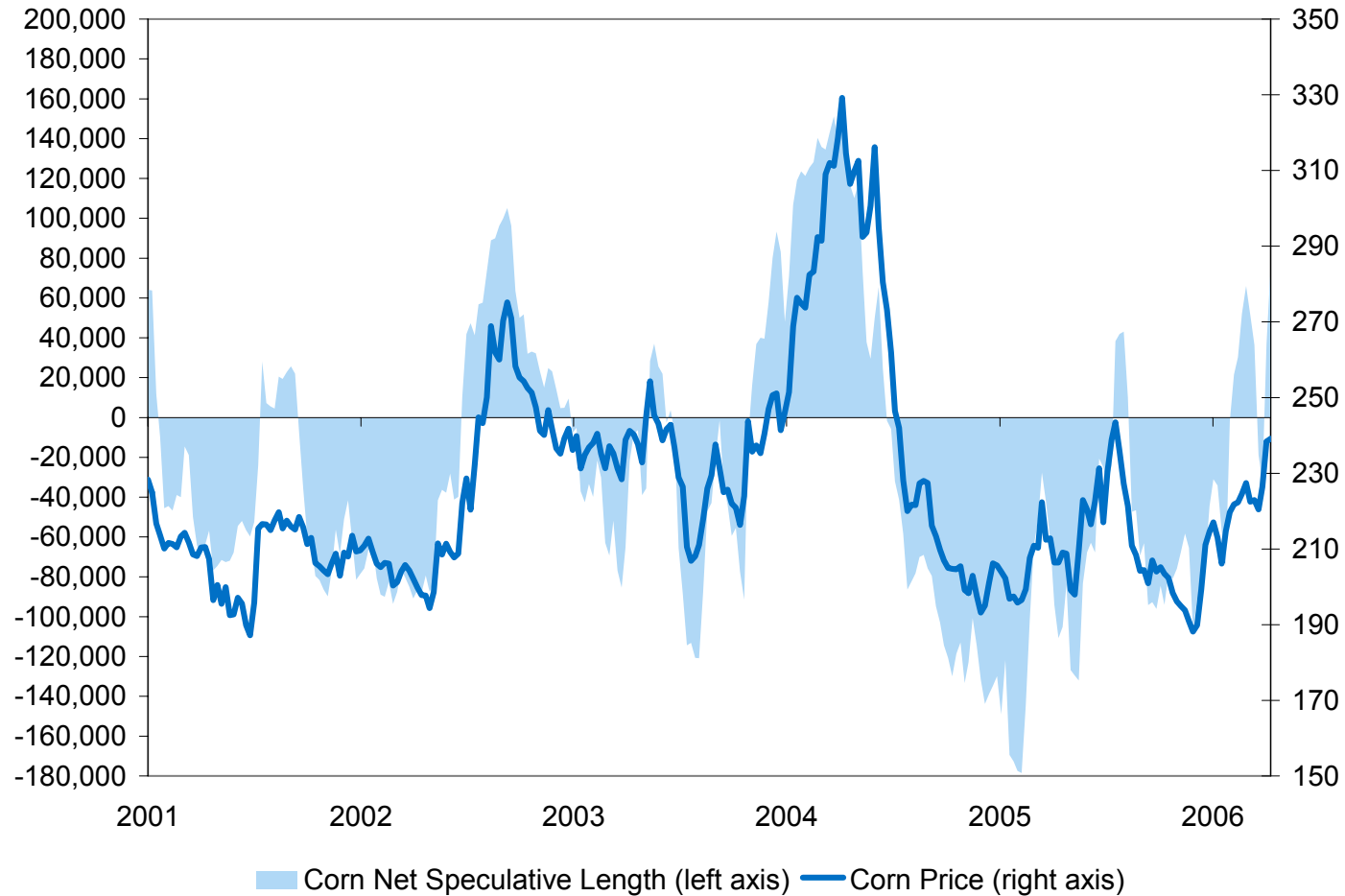
Cents per bushel



Source: CBOT and Goldman Sachs Commodity Research.

Net speculative length for corn has increased recently

Left axis: number of contracts; right axis: cents per bushel

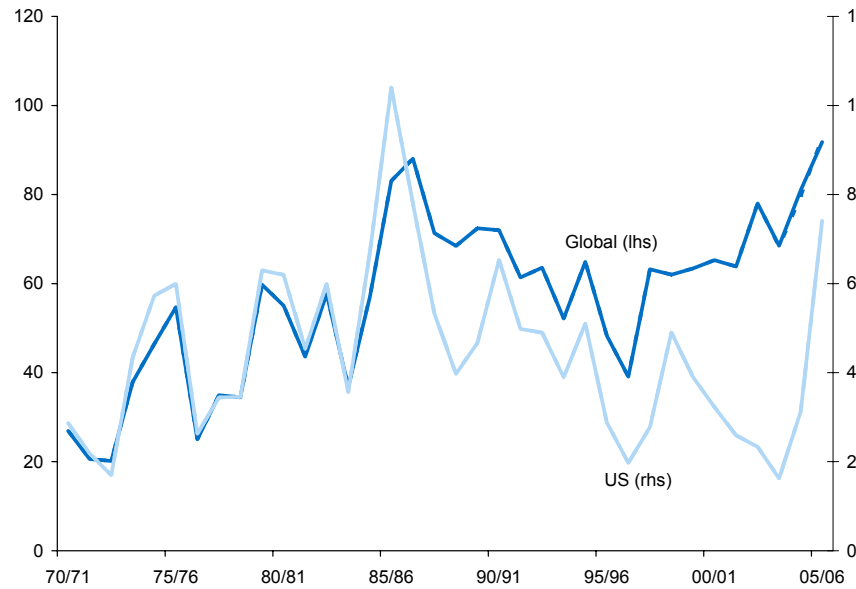


Source: CFTC and Goldman Sachs Commodity Research.

Soybean inventories are expected to be higher next year

Soybean inventories

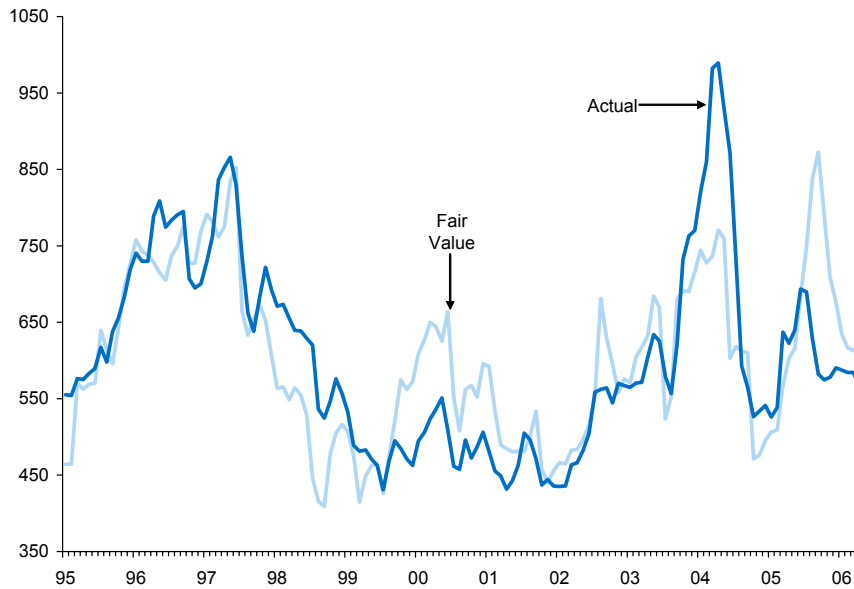
Days of forward coverage



Source: USDA and Goldman Sachs Commodity Research.

Soybean, actual and fair value

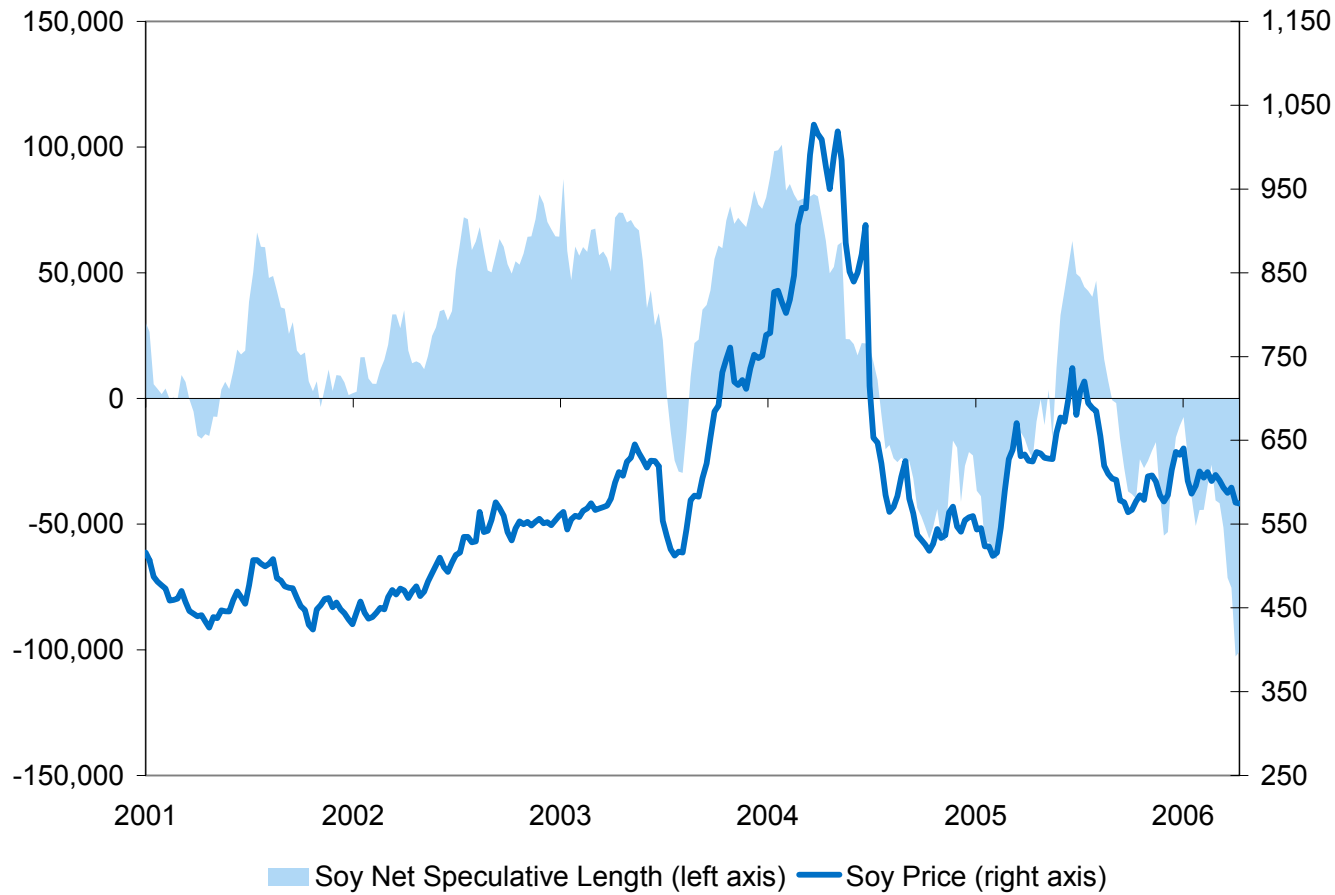
Cents per bushel



Source: CBOT and Goldman Sachs Commodity Research.

Speculators are short soybeans

Left axis: number of contracts; right axis: cents per bushel

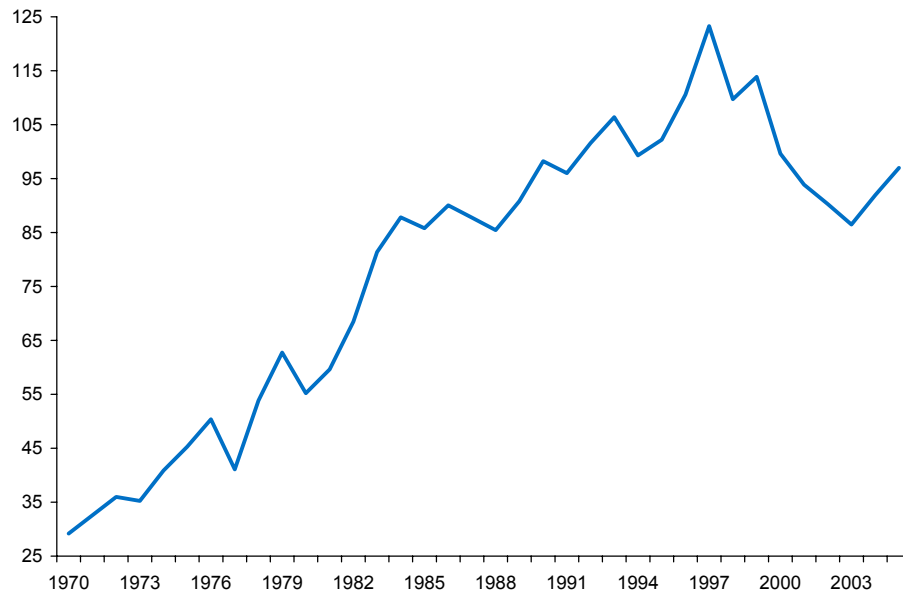


Source: CFTC and Goldman Sachs Commodity Research.

China may take the opportunity to rebuild historically low grain inventories

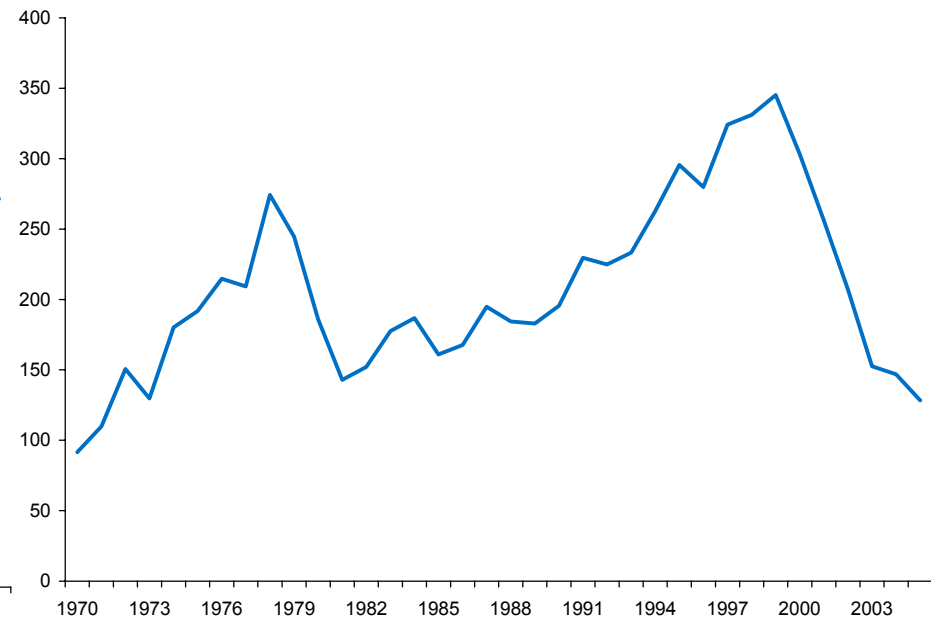
Chinese wheat production

Million metric tons



Chinese wheat inventories

Days of forward coverage

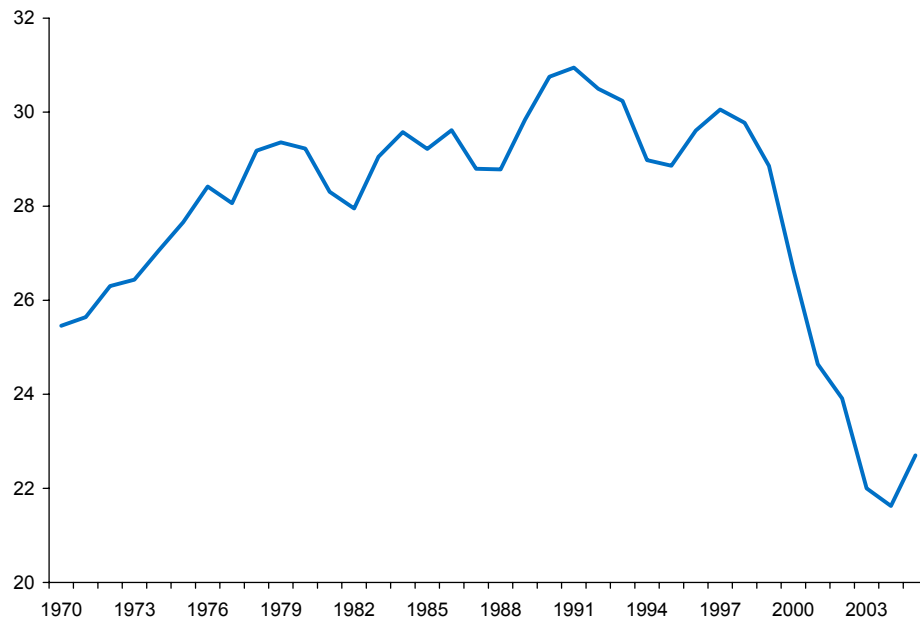


Source: USDA and Goldman Sachs Commodity Research.

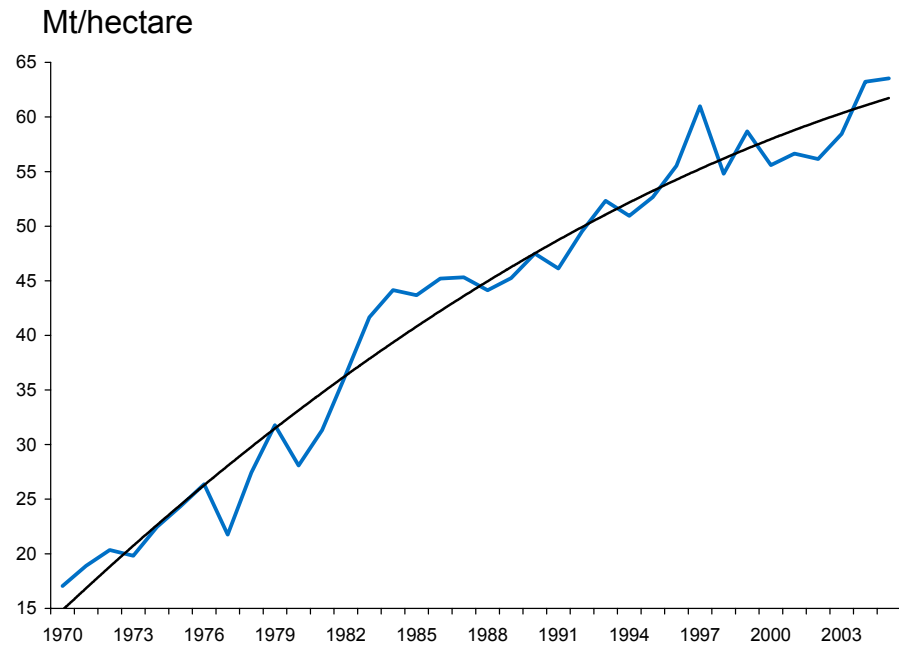


Supply constraints have resulted from lacklustre acreage growth and stable yields

Area harvested for wheat in China
Million hectares



Wheat yields in China have stabilized, further curtailing the ability of production to meet demand

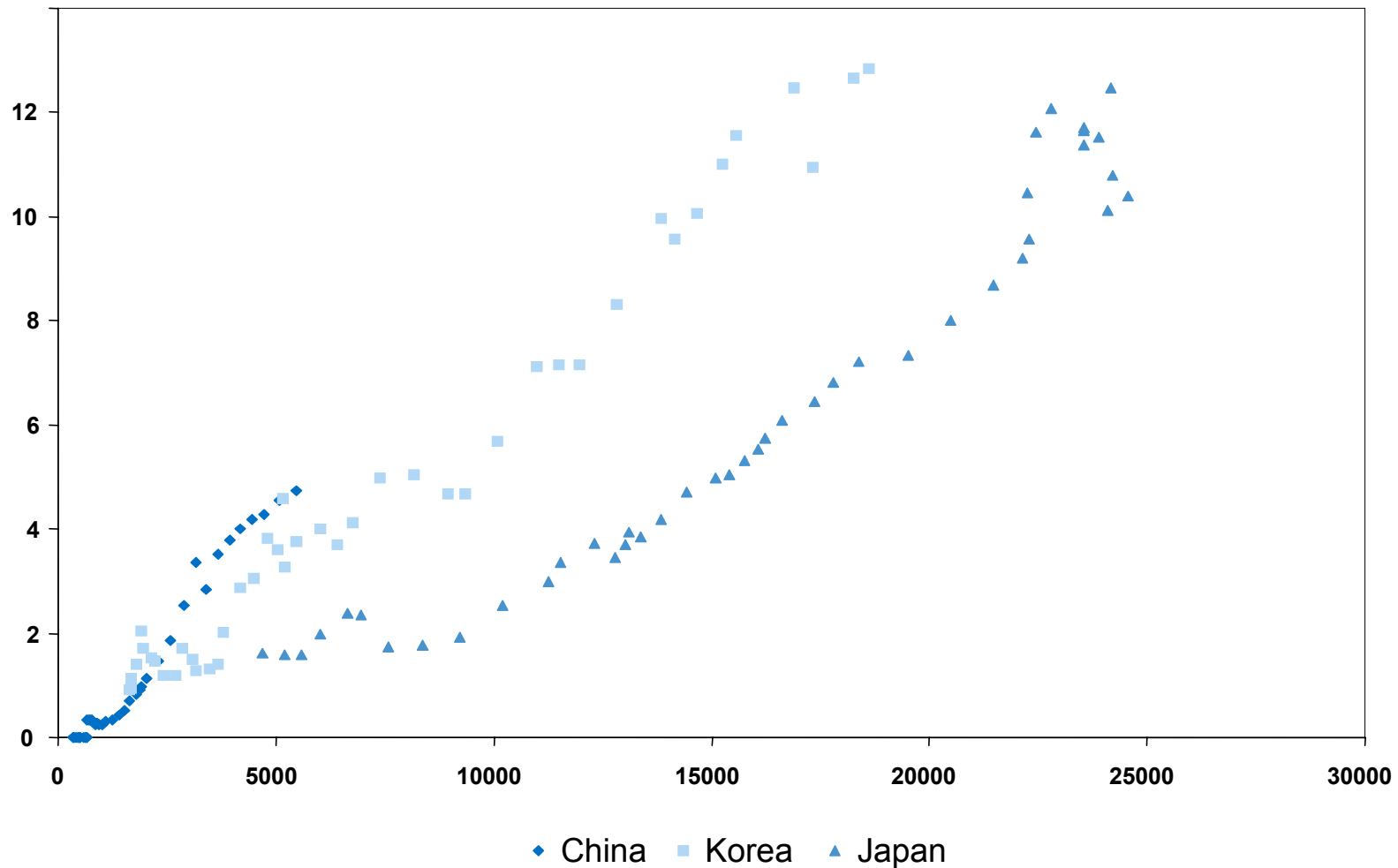


Source: USDA and Goldman Sachs Commodity Research.

Agriculture demand is tied to economic expansion

Chinese demand for beef is likely to continue to grow as the country becomes wealthier

kg of beef per capita (vertical axis); Real GDP PPP per capita (horizontal axis)



Source: USDA and Goldman Sachs Commodity Research.



Disclosures

June 26, 2006

Disclosures

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	Rating Distribution			Investment Banking Relationships		
	OP/Buy	IL/Hold	U/Sell	OP/Buy	IL/Hold	U/Sell
Global	26%	59%	15%	58%	52%	47%

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Losing Control

*A presentation to the EC Workshop on the
Economic Impact of Rising Oil Prices*



June 28, 2006

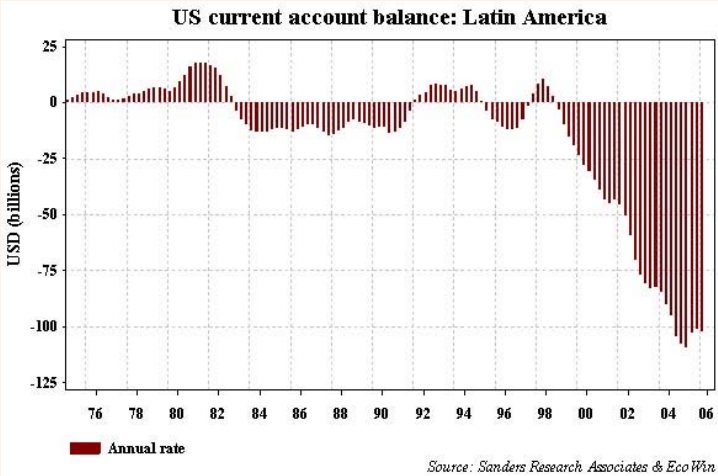
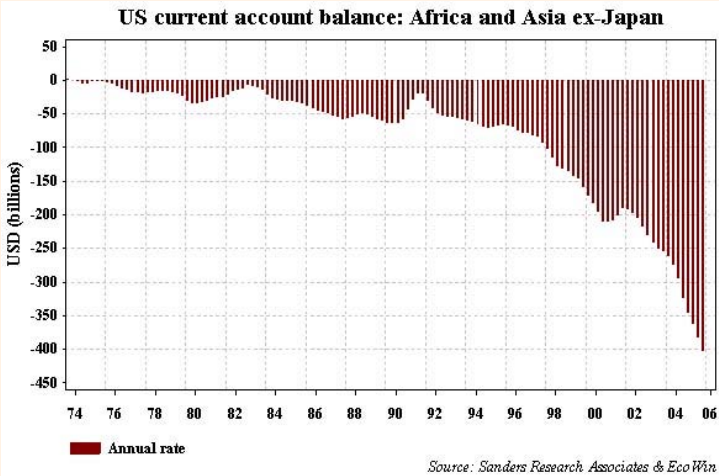
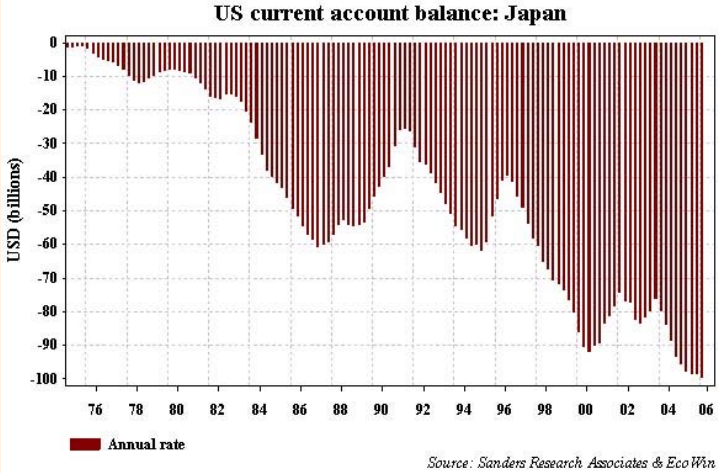
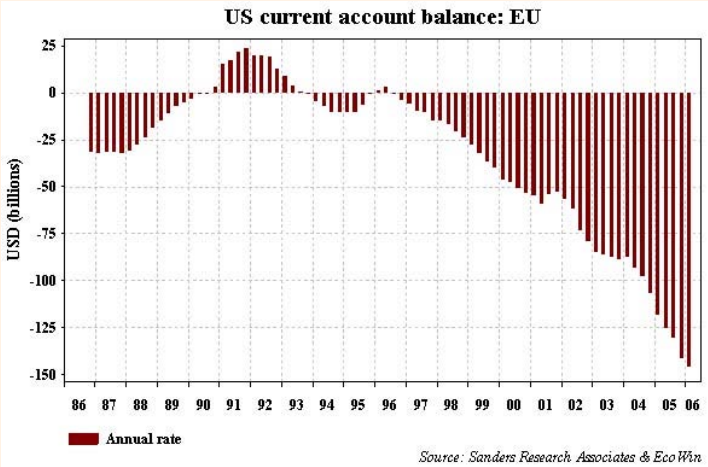
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- **The world financial system can recycle petrodollars easily**
- Now the destination is the United States, unlike the 70s, when it was third world borrowers
- Derivatives are a potential problem, but for the real economy, not the financial sector per se
- Peak oil changes everything

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US Current Account Deficit with World Regions



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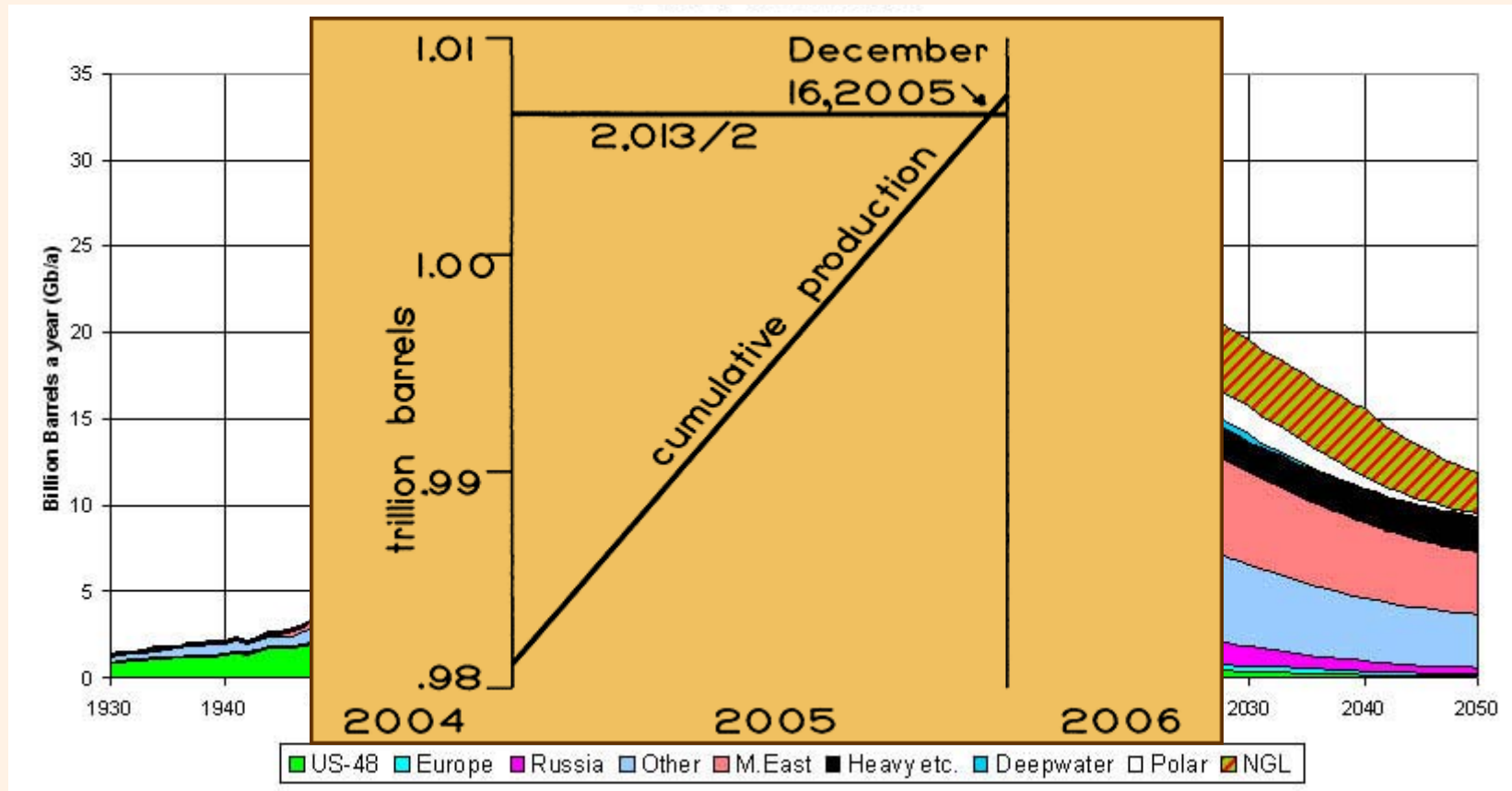
- **Peak Oil is with us now**
- Production probably topped out between early November 2005 and late January 2006
- Even if it didn't, production of light sweet crudes has peaked
- This means costs are rising
- Prices are not yet reflecting this
- For the first time in the Age of Oil, the Anglo-Saxon (UKUSA) countries do not control the world's marginal barrels of crude and units of natural gas

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Oil and Gas Liquids 2004 Scenario



Source: Kenneth Deffeyes www.princeton.edu/hubbert

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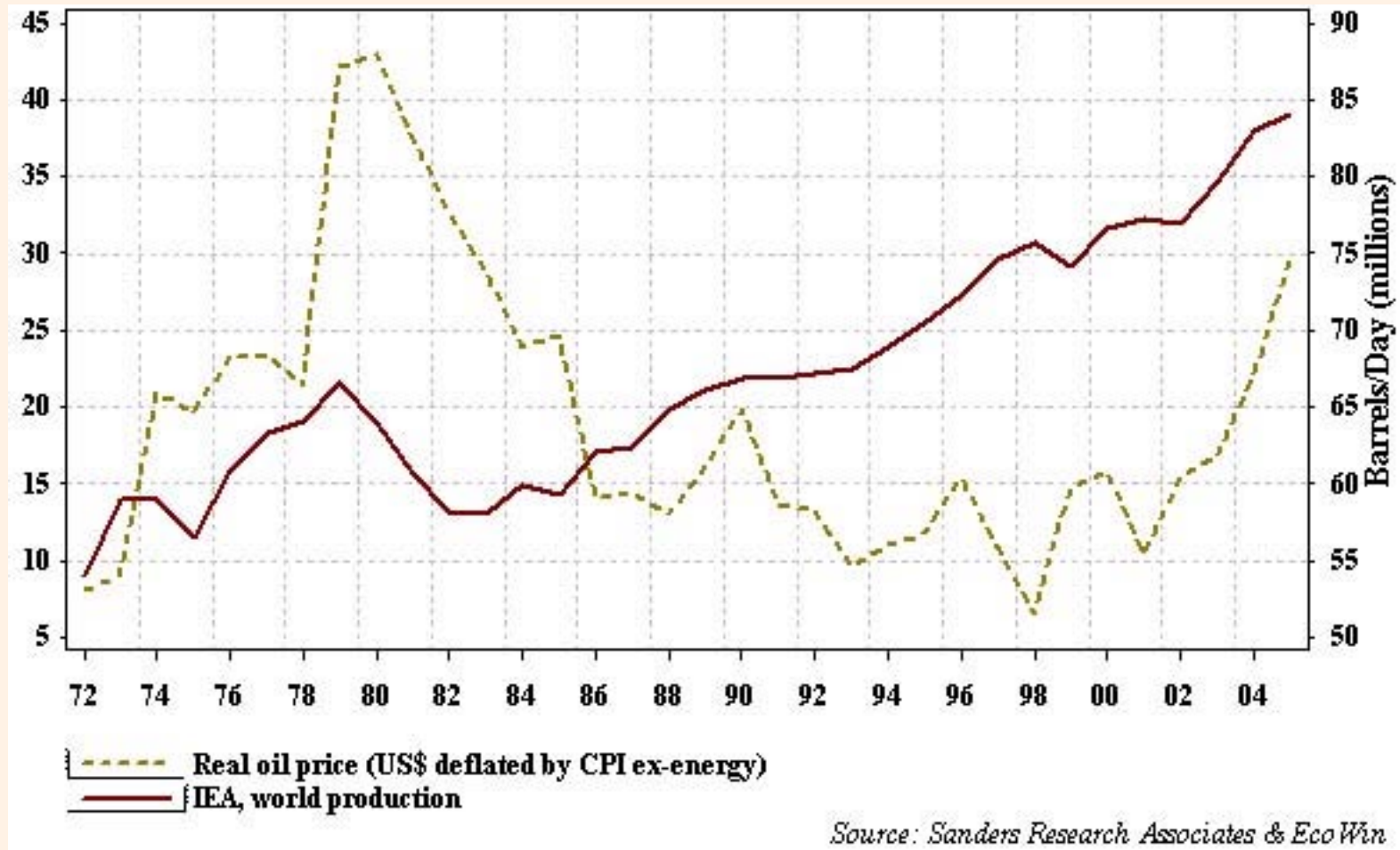
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World Oil Production & Real Oil Price



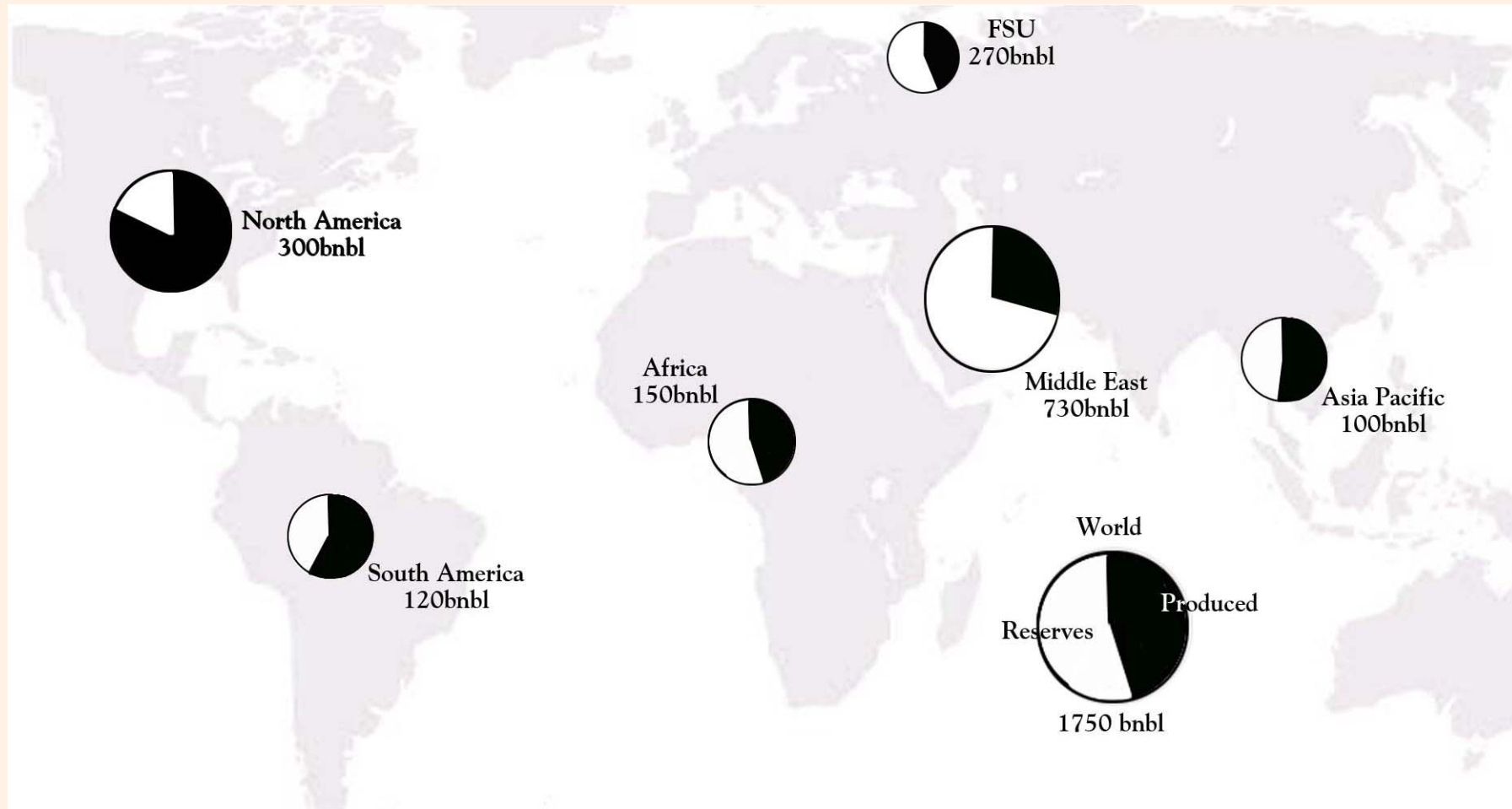
Sanders Research Associates

- Peak Oil is with us now
- Production probably topped out between early November 2005 and late January 2006
- Even if it didn't, production of light sweet crudes has peaked
- This means costs are rising
- Prices are not yet reflecting this
- **For the first time in the Age of Oil, the Anglo-Saxon (UKUSA) countries do not control the world's marginal barrels of crude and units of natural gas**

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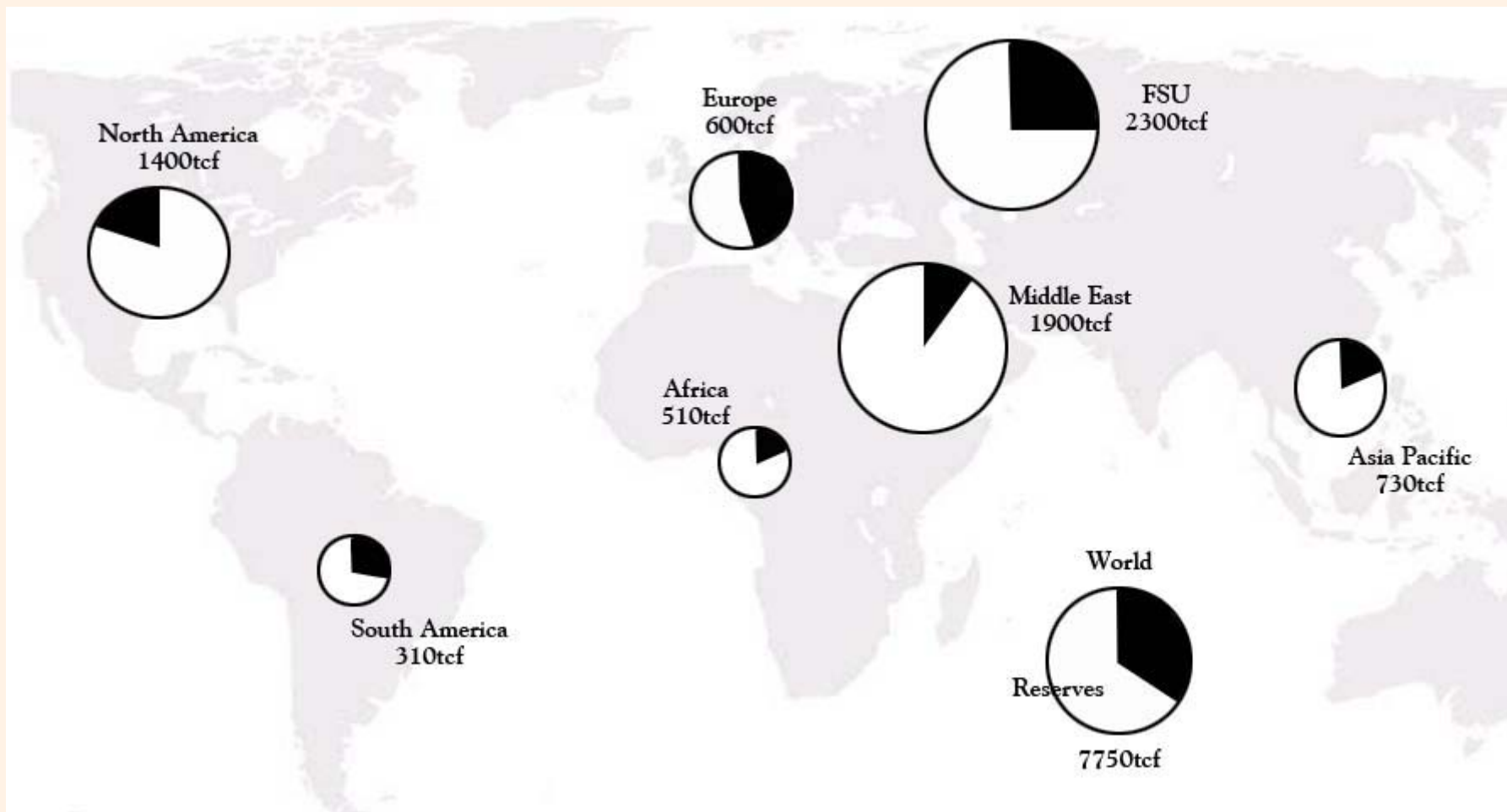
The Oil Clocks



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Sanders Research Associates

The Gas Clocks



Sanders Research Associates

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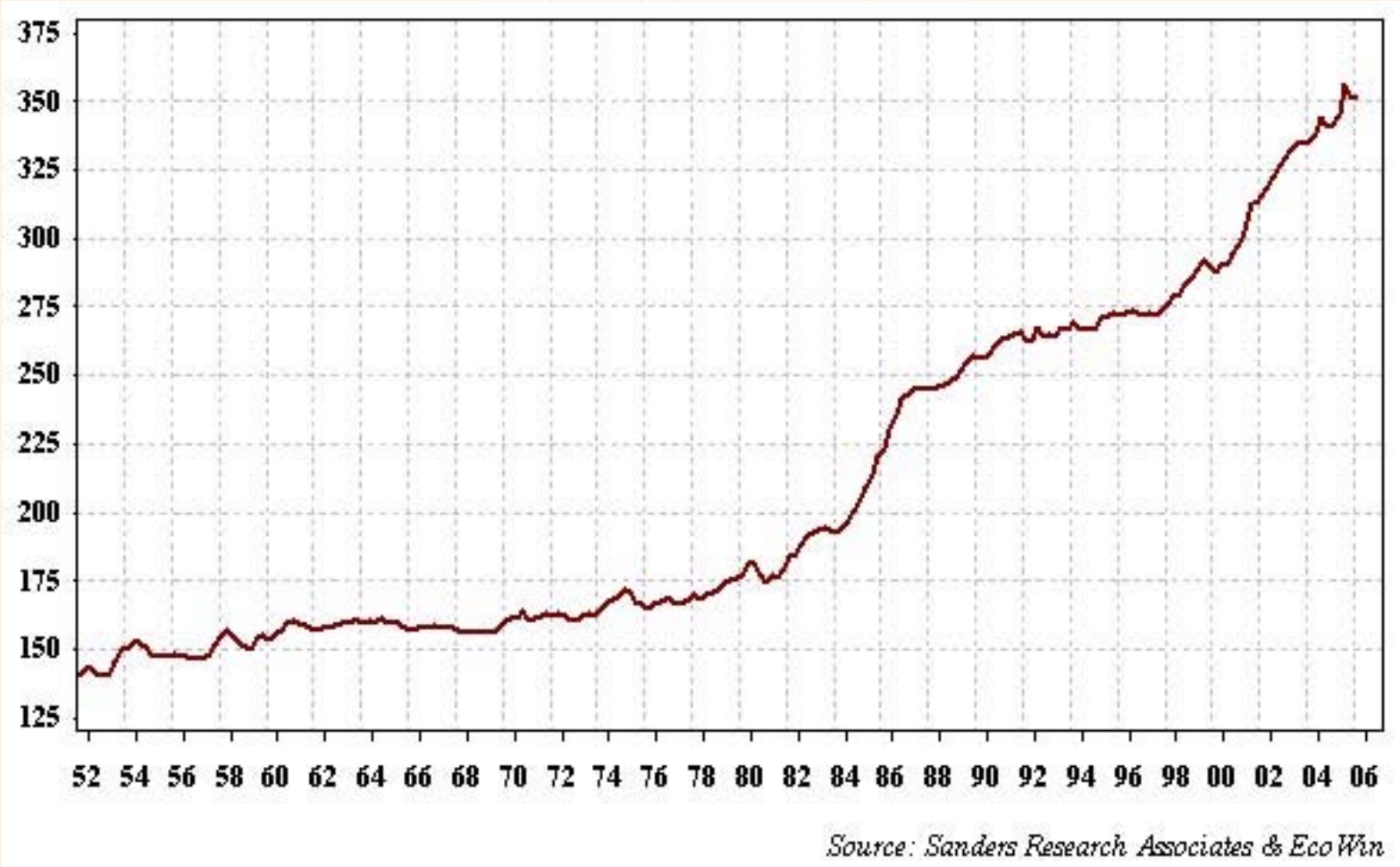
- **Oil Power is moving East**
- **Shanghai Cooperation Organisation is an alternative framework for Eurasia**
- **Iran is an observer, and wants permanent membership**
- **Between them, Russia and Iran control over 40% of world gas reserves**

Sanders Research Associates

- **The problem for the West is not access, but control**
- The western political economy is based on a growth model dependent on debt expansion
- US political economy is organised on twin assumptions of free space and energy that validate increasing debt levels
- These can no longer be taken for granted

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US: Total Debt as % of GDP



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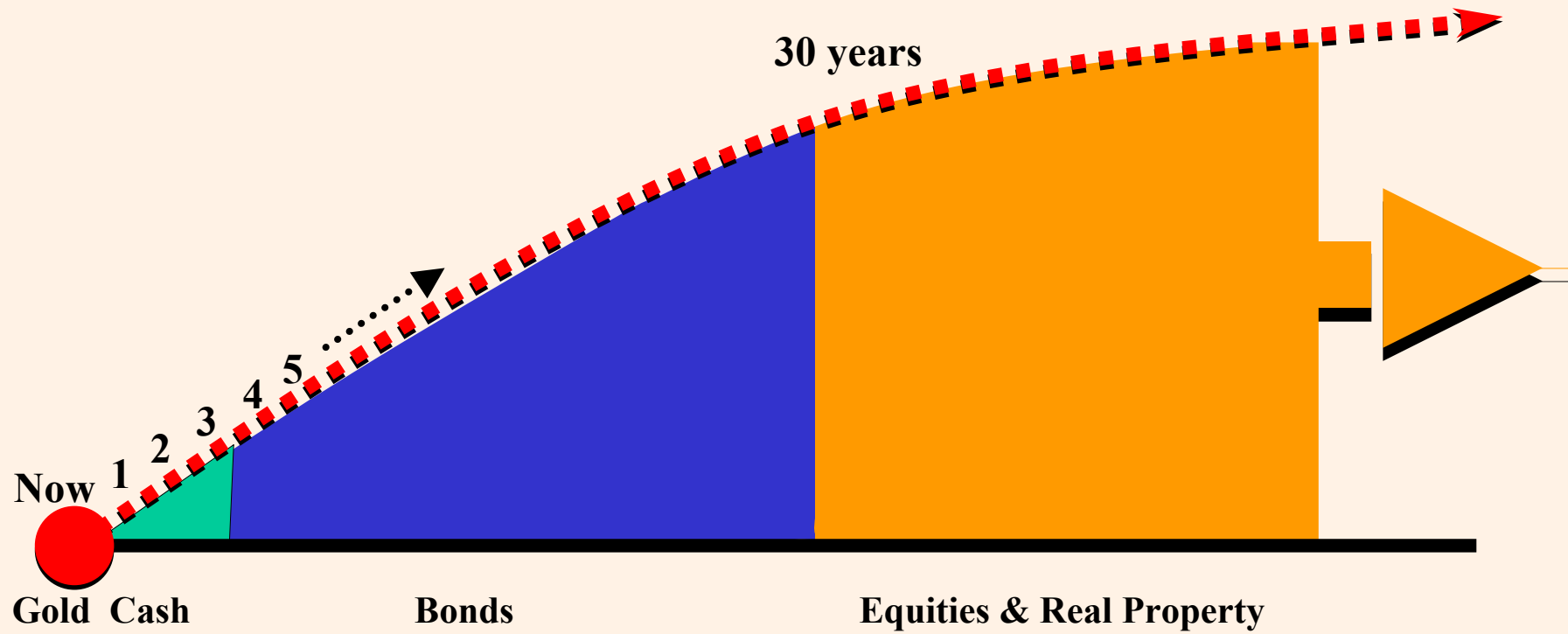
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- **Ultimately the problem is the value of the collateral underlying the debt**
- The value of the equities and the real estate at the end of the yield curve is the mathematical underpinning of the West's debt structure
- With structurally higher energy prices, there is more of a burden on labour to absorb increased costs through lower wages and compensation

The Real Yield Curve



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- **The value of the equities and the real estate at the end of the yield curve is the mathematical underpinning of the West's debt structure**
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- **US to introduce national universal conscription, i.e. corvée**
- **US is building labour camps**
- **North America is consolidating into a regional bloc with UK and Japanese wings**
- **Europe and US are moving to enlarge and centralise when better solutions are to get smaller and decentralise**



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The Joint Oil Data Initiative

A concrete action to improve transparency in oil markets

Workshop on the economic impact of rising oil prices
European Parliament, 28 June 2006

P. Lösönen, Eurostat





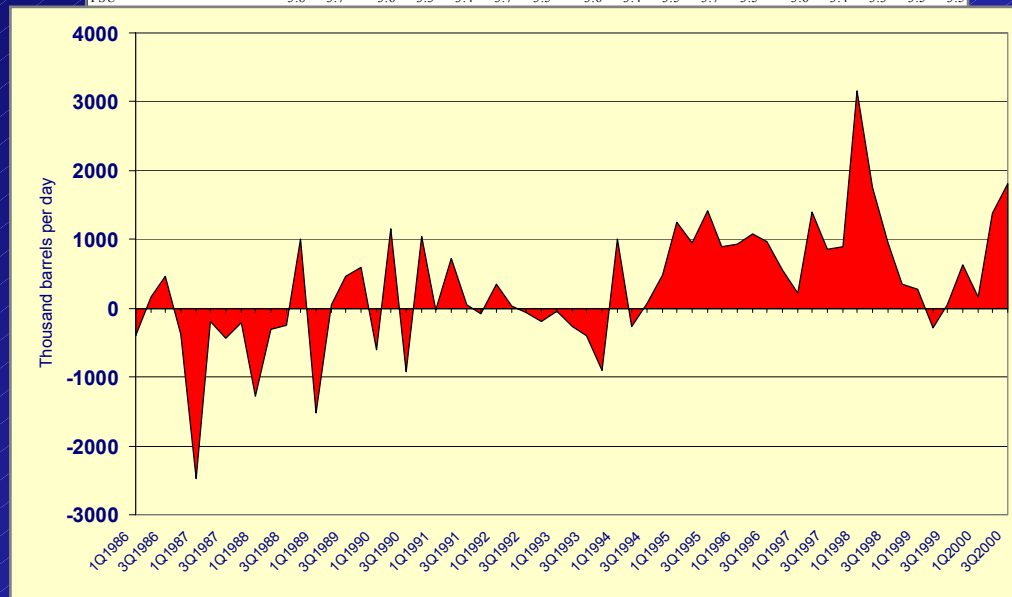
Background

- **At the end of the 90's**
 - there was an unusually high volatility of oil prices
 - At the same time quality of global oil statistics was not satisfactory:
 - Supply did not match with demand
 - Real production, stocks and demand were not known
 - The poor quality of oil statistics was identified as an aggravating factor for the volatility
- **The need for reliable oil data became evident to have more transparency in the oil market**



**Table 1
WORLD OIL SUPPLY AND DEMAND**

	1997	1998	1Q99	2Q99	3Q99	4Q99	1999	1Q00	2Q00	3Q00	4Q00	2000	1Q01	2Q01	3Q01	4Q01	2001
OECD DEMAND																	
North America	22.7	23.1	23.6	23.5	24.1	24.3	23.9	23.6	23.7	24.3	24.4	24.0	24.3	23.9	24.5	24.7	24.3
Europe	15.0	15.3	15.8	14.4	14.7	15.6	15.1	15.1	14.5	15.0	15.3	15.0	15.3	14.6	15.1	15.6	15.2
Pacific	9.0	8.4	9.4	7.9	8.2	9.1	8.6	9.3	8.0	8.3	8.8	8.6	9.5	8.1	8.4	9.0	8.7
Total OECD	46.7	46.8	48.7	45.7	47.0	49.0	47.6	47.9	46.3	47.7	48.4	47.6	49.1	46.6	48.0	49.3	48.2
NON-OECD DEMAND																	
FSU	3.8	3.7	3.6	3.3	3.4	3.7	3.5	3.6	3.4	3.5	3.7	3.5	3.6	3.4	3.3	3.5	3.5



	1997	1998	1Q99	2Q99	3Q99	4Q99	1999	1Q00	2Q00	3Q00	4Q00	2000	1Q01	2Q01	3Q01	4Q01	2001
Total Supply	74.4	73.3	73.3	73.1	73.0	74.3	74.1	73.2	70.2	71.0	78.3	70.7					
STOCK CHANGES AND MISCELLANEOUS																	
Reported OECD																	
Industry	0.3	0.2	-0.7	0.4	-0.2	-2.4	-0.7	-0.3	0.9	0.4	-0.1	0.2					
Government	0.0	0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	-0.3	-0.1					
Total	0.3	0.3	-0.7	0.4	-0.3	-2.5	-0.8	-0.3	0.9	0.4	-0.4	0.2					

Miscellaneous to balance 0.9 1.6 0.2 -0.3 0.0 0.5 0.1 0.1 1.4 0.7 1.9 1.0

Memo items:

Call on OPEC crude + Stock ch. ¹	25.9	26.0	28.3	26.1	26.7	28.2	27.3	26.7	25.4	27.3	27.0	26.6	27.8	25.6	27.2	28.0	27.2
Total Demand ex. FSU	69.3	69.8	72.1	69.6	70.6	72.9	71.3	71.9	70.5	72.4	72.7	71.9	73.7	71.6	73.3	74.7	73.3
Total demand exc. FSU (% ch) ⁶	3.1	0.7	3.7	1.8	1.5	1.7	2.2	-0.3	1.2	2.6	-0.2	0.8	2.5	1.6	1.2	2.7	2.0

1 measured as deliveries from refineries and primary stocks, comprises inland deliveries, international marine bunkers and refinery fuel and includes crude for direct burning.
 2 oil from non-conventional sources and other sources of supply
 3 net of volumetric gains and losses in the refining process (excludes net gains/loss in former USSR, China and non-OECD Europe) and marine transportation losses
 4 includes changes in non-reported stocks in OECD and non-OECD areas
 5 equals total demand minus total non-OPEC supply minus OPEC NGLs and thus includes "Miscellaneous to balance" for historical time periods
 6 year on year % growth in global oil demand excluding FSU

OIL MARKET REPORT

www.eomarketreport.org

11 February 2004

HIGHLIGHTS

- World oil supply held level in January at 80.1 mbpd. Total OECD demand rose for the second month, while growth fell for the third. The rise in OECD production came from rising European growth and increases in both North America and Asia-Pacific.
- OECD oil usage performance was 27.2 mbpd in January, a 1.1 mbpd gain on December usage. Production in the United States, Canada and Mexico rose 0.2 mbpd, while output in the rest of the OECD fell 0.1 mbpd.
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Next Issue: 11 March 2004



JODE (2001)

- 7th International Energy Forum (IEF) meeting in Riyadh, 2000
- In 2001 six international organisations (APEC, Eurostat, IEA, OLADE, OPEC and UNSD) launched the Joint Oil Data Exercise (JODE)
- A small questionnaire including main flows of crude oil and petroleum products
 - ➔ Deadline one month after the reference month (M-1 reporting)
 - ➔ Organisations collect the data from their member countries



From JODE to JODI

- 8th IEF meeting in Osaka, 2002
 - Full political support to continue the efforts to increase transparency of oil data
- The six organisations made the exercise permanent and renamed it **Joint Oil Data Initiative (JODI)**
 - Rotating coordination
 - Inter-secretariat meetings
 - Conferences



Milestones of JODI after the IEF meeting in OSAKA 2002

- Creation of JODI database in 2004
 - Data quality (timeliness, completeness and accuracy) had improved significantly
- IEF secretariat (IEFS) situated in Riyadh, Saudi Arabia started its work in December 2003
 - IEFS took over the coordination role of JODI in 2005 (the 7th international organisation in JODI)
- Comprehensive quality evaluation of the JODI data in 2005 (world top-30 oil producers, consumers and stock holders)
- Opening of the World Jodi Database to public, 19 November 2005



King Abdullah of Saudi Arabia launching the JODI World Database



King Abdullah launches the database of world oil producers and consumers in Riyadh on Saturday. Riyadh Governor Prince Salman and Oil Minister Ali Al-Naimi, left, are also seen. (SPA)



World JODI database

- **Accessible to public**
 - www.jodidata.org
 - **Currently production, stocks, stock change and demand of crude oil and petroleum products are in public domain**
- **Data covers more than 90% of the world crude oil production and consumption**
- **Includes data from 92 countries**
- **Indication of the quality of the data by the color of the cell, a unique feature**



A View of the Live Database

Beyond 20/20 WDS - Table View - Microsoft Internet Explorer

Address: http://iefs-cmn/WDS/TableViewer/tableView.aspx

English

Reports Joint Oil Data Initiative Global data Help

Actions

OTHER: Unit - Thousand Barrels (kbbl) Product - Total Products Balance - Demand

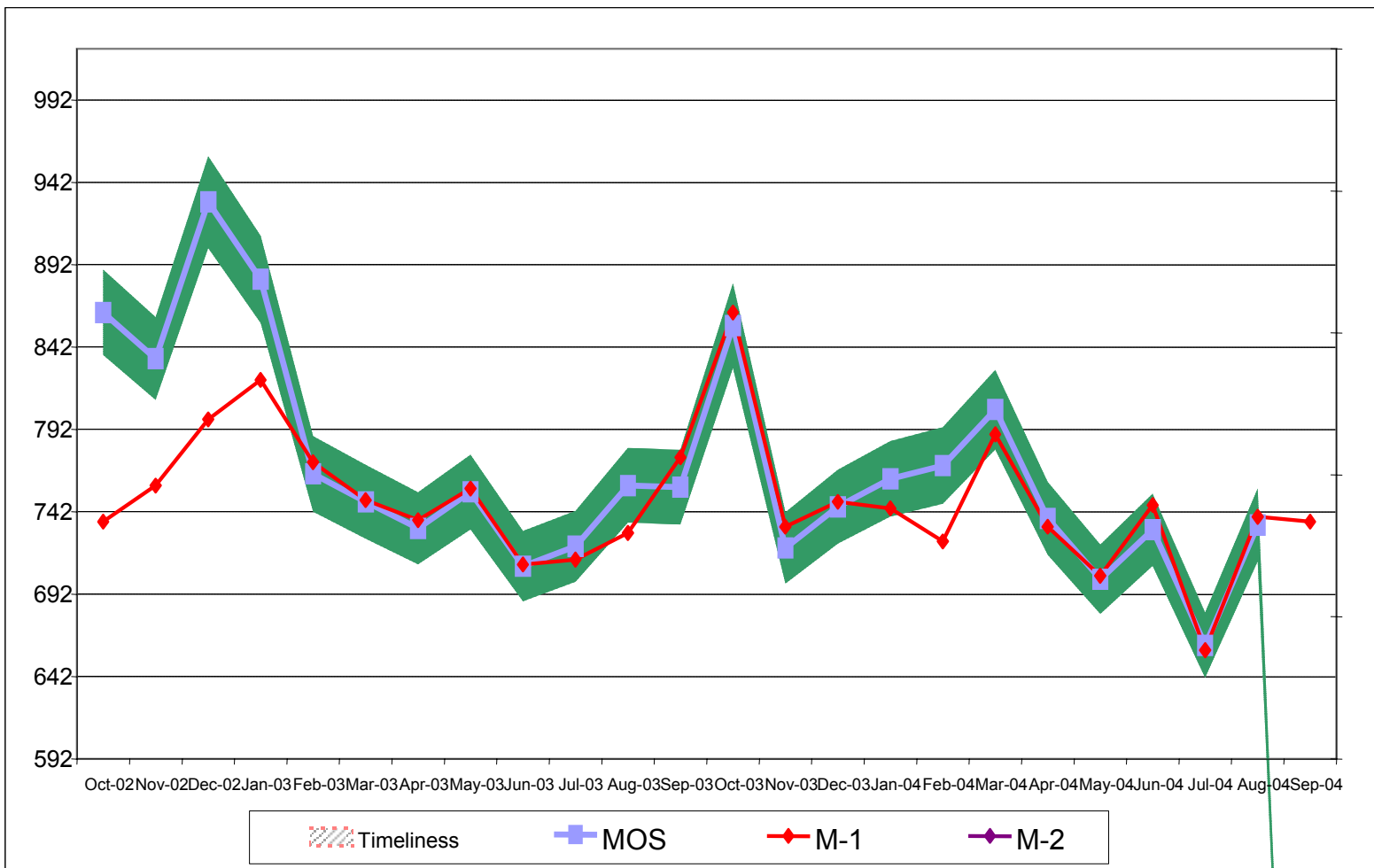
TIME	Jul2004	Aug2004	Sep2004	Oct2004	Nov2004	Dec2004	Jan2005	Feb2005	Mar2005	Apr2005	May2005	Jun2005	Jul2005	Aug2005
Country	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓
Hong Kong	9,978	9,737	9,818	8,795	10,067	10,087	10,810	8,426	8,513	8,279	9,435	8,322	8,320	8,917
China														
Hungary	3,902	4,018	4,047	4,388	4,316	4,482	3,750	3,518	4,105	4,120	4,526	4,279	4,627	4,120
Iceland	645	1,118	533	510	630	105	653	34						
India	71,116	61,773	67,294	70,736	68,626	78,457	71,314	67,09						
Indonesia	38,037	36,270	0	37,603	36,810	0	37,820							
Iran (Islamic Rep.)	33,294	37,262	35,340	35,340	35,700	37,603	38,068	36,960	43,338	35,310	36,828	0	40,424	41,819
Iraq	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	4,762	4,790	5,191	5,473	4,881	5,670	5,121	5,339	5,945	4,952	4,938	5,530	4,649	5,241
Italy	59,715	52,889	57,379	58,602	54,046	58,187	52,416	51,878	56,586	52,613	51,936	52,205	55,036	51,041
Jamaica	1,188	1,123	995	1,170	1,204	124	1,145	1,145	0	0	0	0	0	0
Japan	160,497	166,360	151,021	161,008	158,607	187,922	183,288	177,169	189,948	157,929	144,998	154,802	157,841	158,375
Kazakhstan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Korea	61,557	65,631	64,743	69,214	69,113	78,6								65,600
Kuwait	10,230	11,067	8,640	8,928	7,8	8,9								12,183
Latvia	704	837	829	1,048	1,0	1,3								1,212
Libya	5,983	6,293	5,550	6,634	6,660	6,386	7,533	6,356	7,285	7,080	7,006	6,780	0	0
Lithuania	1,775	1,947	1,939	1,837	1,697	1,861	1,533	1,548	1,736	1,689	1,775	1,767	1,814	1,986

Monthly update, M-1 data

Color code indicating data comparability (blue, yellow, white)



Denmark

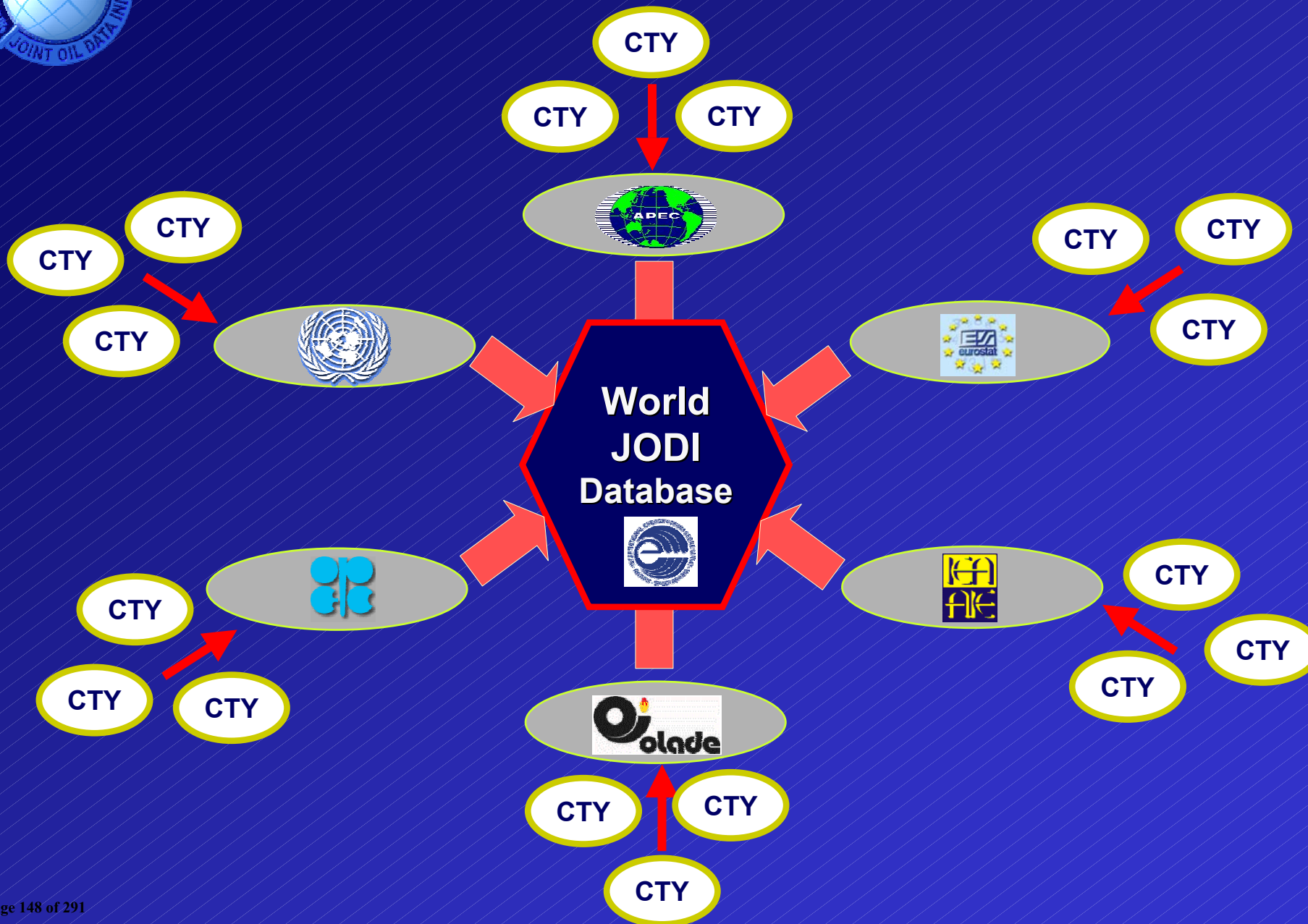


Timeliness
 MOS
 M-1
 M-2

MOS Range: 3.0%
 Product: **Total Oil**
 Flow: **Demand**
 MOS
 M-1
 M-2
 Timeliness



Six Organisations plus the IEFS as Co-ordinator





Ongoing activities

- **Creation of JODI user and methodology manual**
 - **First edition scheduled by the end of June 2006**
 - **Data providers and data users**
- **Training of statisticians**
 - **Venezuela in August 2006 for Latin American countries**
 - **South Africa at the end of 2006 for African countries**
- **Enlargement of public part of JODI database**
 - **Currently crude oil production, stocks, stock change and demand of petroleum products are in public domain**
 - **Quality evaluation of refinery input and output data in view to opening this data into public in 2006**
- **Preparation of the 6th JODI conference at the end of November in Riyadh**



Main achievements of JODI beyond data collection

1. Political **awareness** of the difficulties encountered in improving data quality has risen
2. Statistical **systems** in many countries are improving / have improved
3. **Attitudes** towards confidentiality and reliability are evolving
4. A world-wide **network** of oil statisticians have been created multiplying contacts between oil companies, countries and organisations paving the way for the global harmonisation of energy statistics
5. **JODI has demonstrated that oil producer – consumer dialogue is has lead and is further leading to concrete actions**



And then, what's next?

- Expanding the JODI Questionnaire
 - ➔ Horizontally: more products (NGLs, ...)
 - ➔ Vertically: more flows (stocks, trade,...)
- Duplicating the approach to gas?
- Using a similar approach to reserves?




Can transparency in oil statistics improve financial stability

- High volatility of oil prices can create instability in economy
- There are several possible reasons for fluctuating oil prices
 - Uncertainty in supply / demand
 - Natural disasters, for example hurricane Katrina in the US in 2005
 - Wars, for example Iraqi war
 - Political instability, case Venezuela
 - **Unknown oil stock level, production and demand = POOR STATISTICS**



Can transparency in oil statistics improve financial stability

 JODI has certainly improved the transparency in oil markets

 Policy makers and other stake holders can be more sure about the stocks levels and have a better view the probability of real shortage in supply

 Natural disasters etc. cannot be predicted

 Speculation of oil futures cannot be stopped just by improving the statistics

- *Feedback from the data users is essential*
 - If the data does not fulfill expectations,
 - Proposals for improvements are welcome
 - More resources have to be engaged



Strong political support reaffirmed + launch JODI database

Strong political support

Decision to make the exercise a permanent reporting mechanism (JODE => JODI)

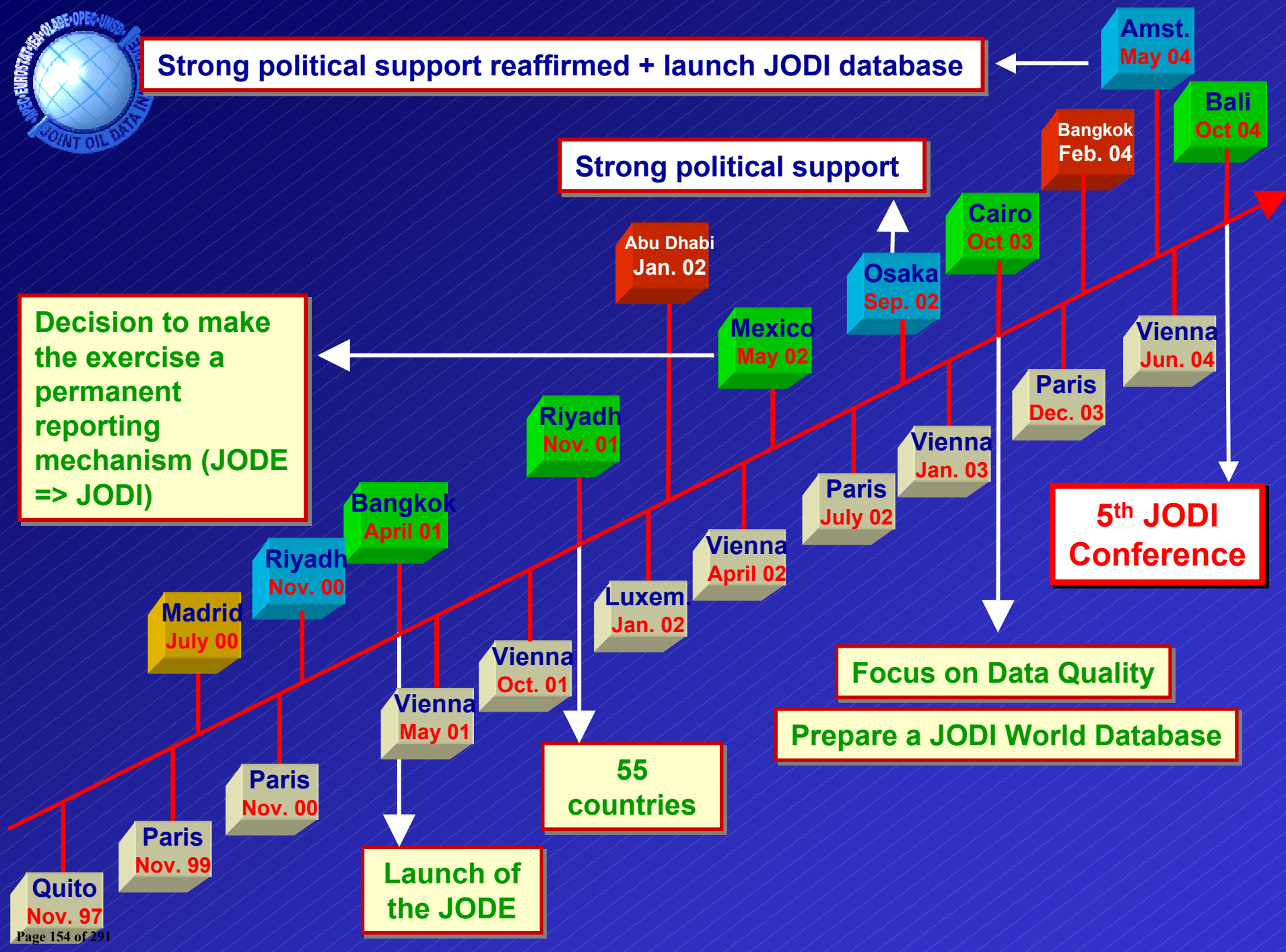
5th JODI Conference

Focus on Data Quality

Prepare a JODI World Database

55 countries

Launch of the JODE





Lessons from the Initiative

- A lot can be achieved by working together
- A close interaction between organisations, countries and the industry is key to move a process
- Improving data transparency will not happen over night
- Transparency will not happen if not all the parties do not full participate



www.jodidata.org



Thank you

Peak Oil & The Impact of Oil Depletion

By
C.J.Campbell

ASPO IRELAND
www.peakoil.ie

Find it first

- It costs money to find oil
 - \$10 - 20 million a *wildcat*
- But it takes **much more than money**
- It takes the right geology
 - We have new sophisticated methods to search
 - But the same rocks and essentials

The Essentials

- Oil & Gas formed in the geological past
 - A finite resources subject to depletion
 - Each gallon used means one less left
- Production mirrors discovery
- Many different categories
 - Some: easy, cheap and **fast** to produce
 - Others: difficult, expensive & **slow**

It is so obvious

- Depletion is easy to grasp
 - We are born, we die and pass middle age
 - The glass starts full and ends empty

A Pint of Murphy's Stout



The same applies to Oil

- How has such an obvious and important truth been **obscured and confused** ?
 - Ambiguous definitions
 - Misunderstood reporting practices
 - Different mindsets

Mindsets : who to listen to?

- The **Geologist** measures Nature
 - He can't change the Cretaceous
- The **Economist** measures Money
 - He can manipulate behaviour
- The **Engineer** does things
 - Give him a screwdriver & he goes to the Moon
- The **Manager** makes money & image



The Eternal Conflict between

Fact of Faith

People once thought the
Earth was flat

and greeted science
with suspicion and
resentment.

Some still do.

The Economist's Faith in Market Forces

What the High Priest says

Minerals are inexhaustible and will never be depleted. A stream of investment creates additions to proved reserves from a very large in-ground inventory. The reserves are constantly being renewed as they are extracted.....

Professor Adelman (M.I.T)

Petroleum Geology
in
three minutes

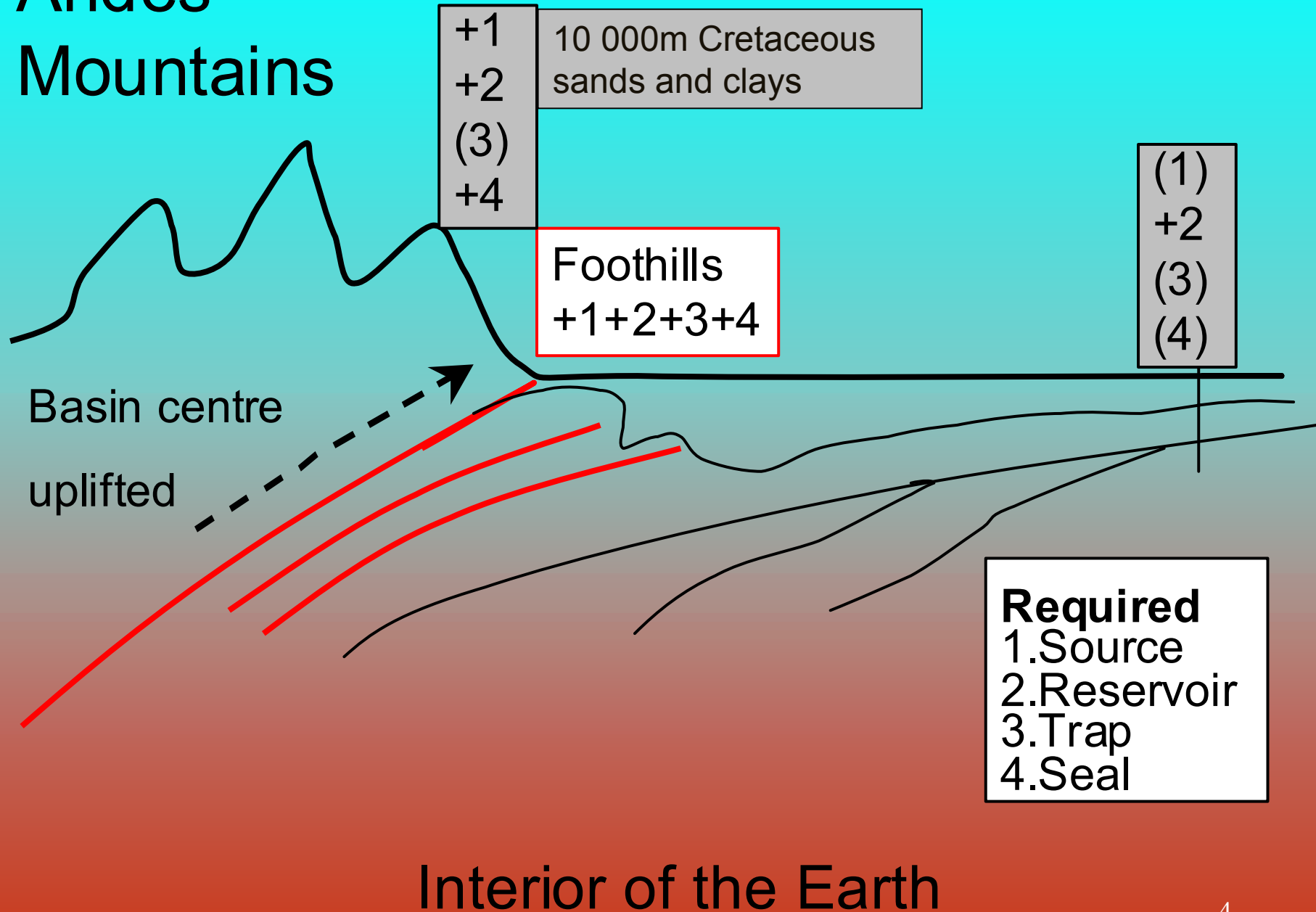
One Viewpoint

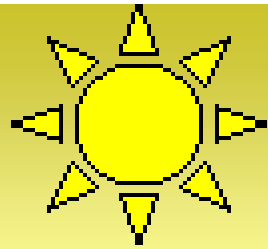
On a mule in Colombia in 1960



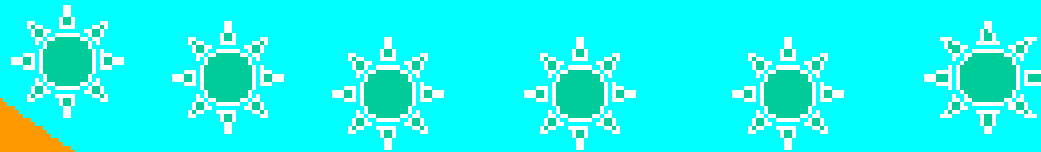
**Technology - no more advanced than the hammer,
hand lens and mule - found much of the world's oil**

Andes Mountains

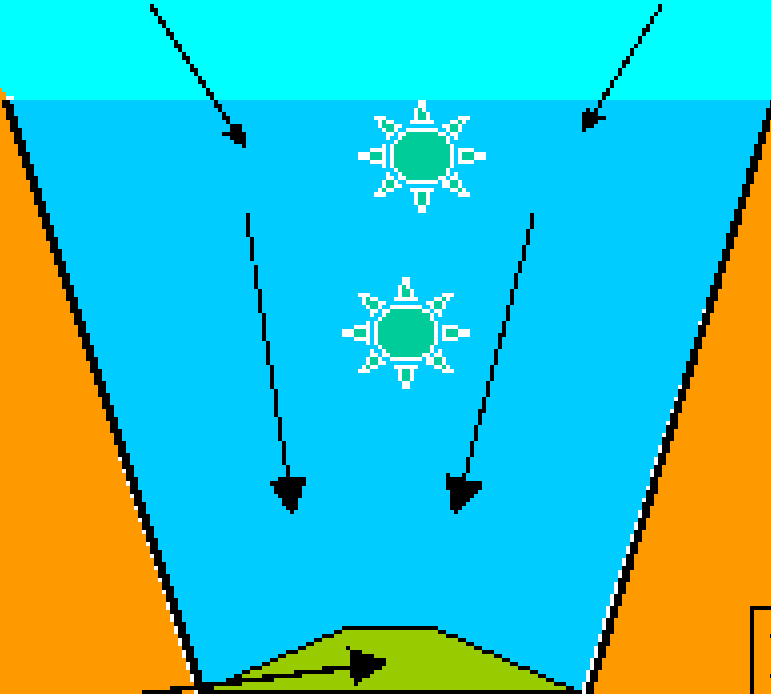




Extreme Global Warming gave excessive Algal Growths



90 & 150 million
years ago



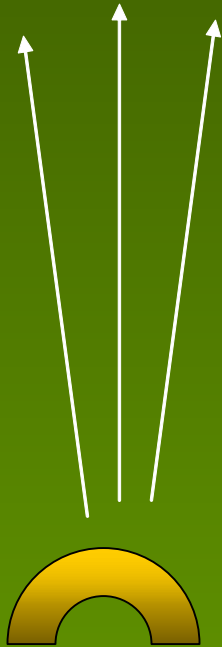
Organic debris



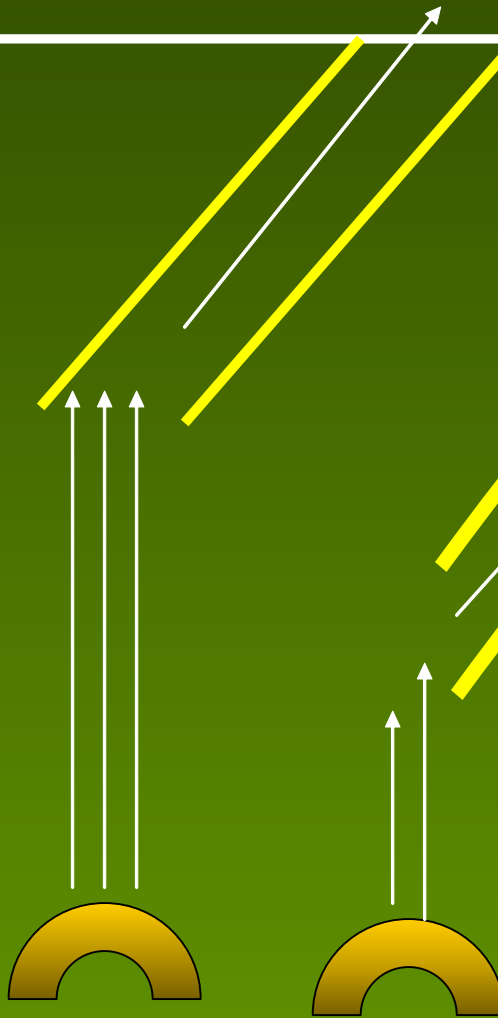
Rifts formed as
the Continents
moved apart

Migration of Oil

1. Dissipation

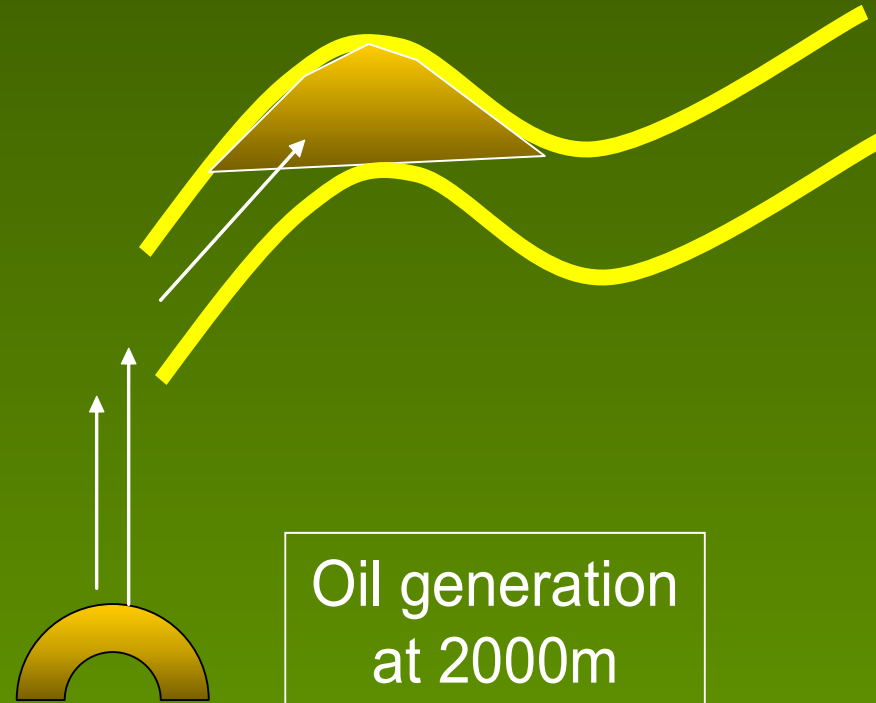


2. Escape



Surface of the Earth

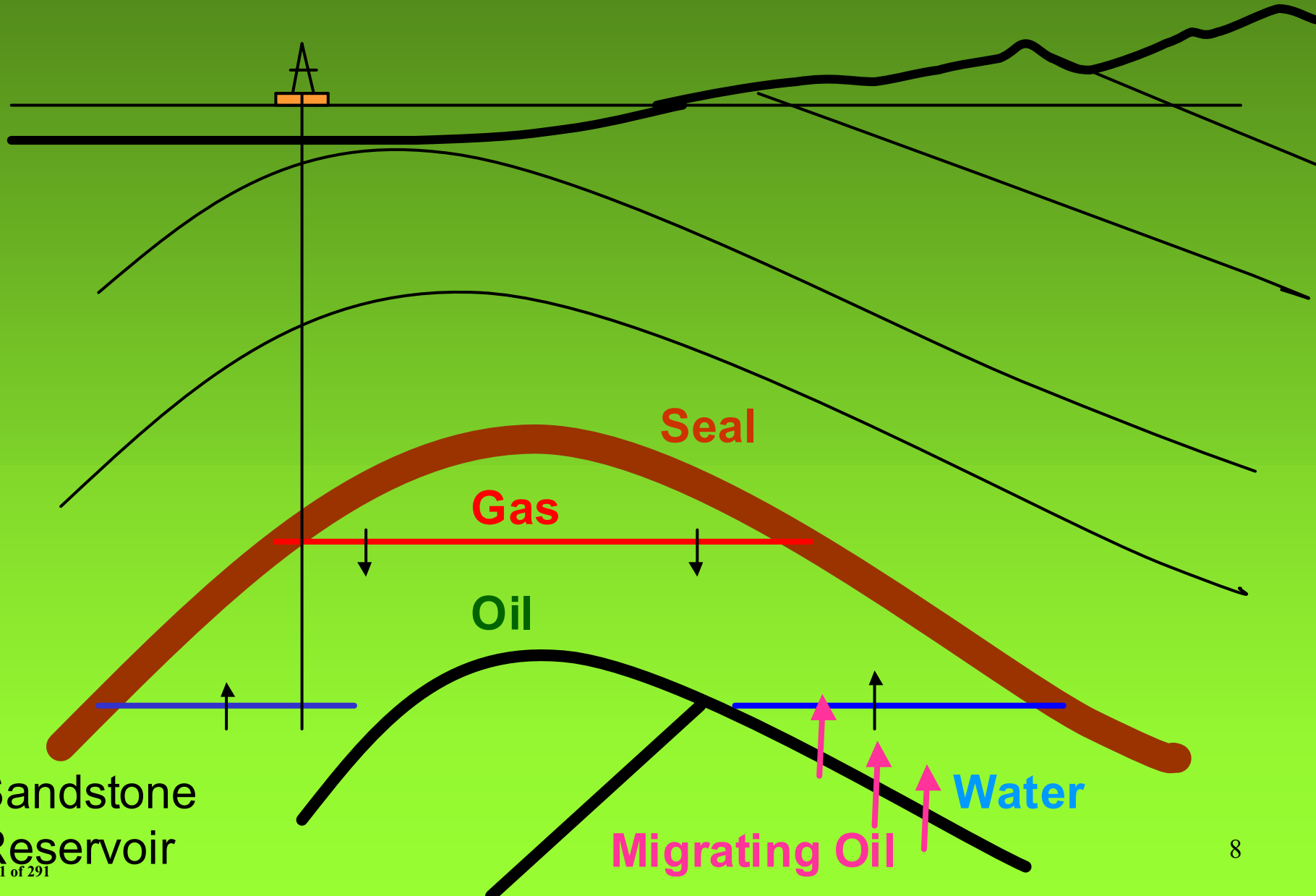
3. Oilfield



Oil generation
at 2000m
depth

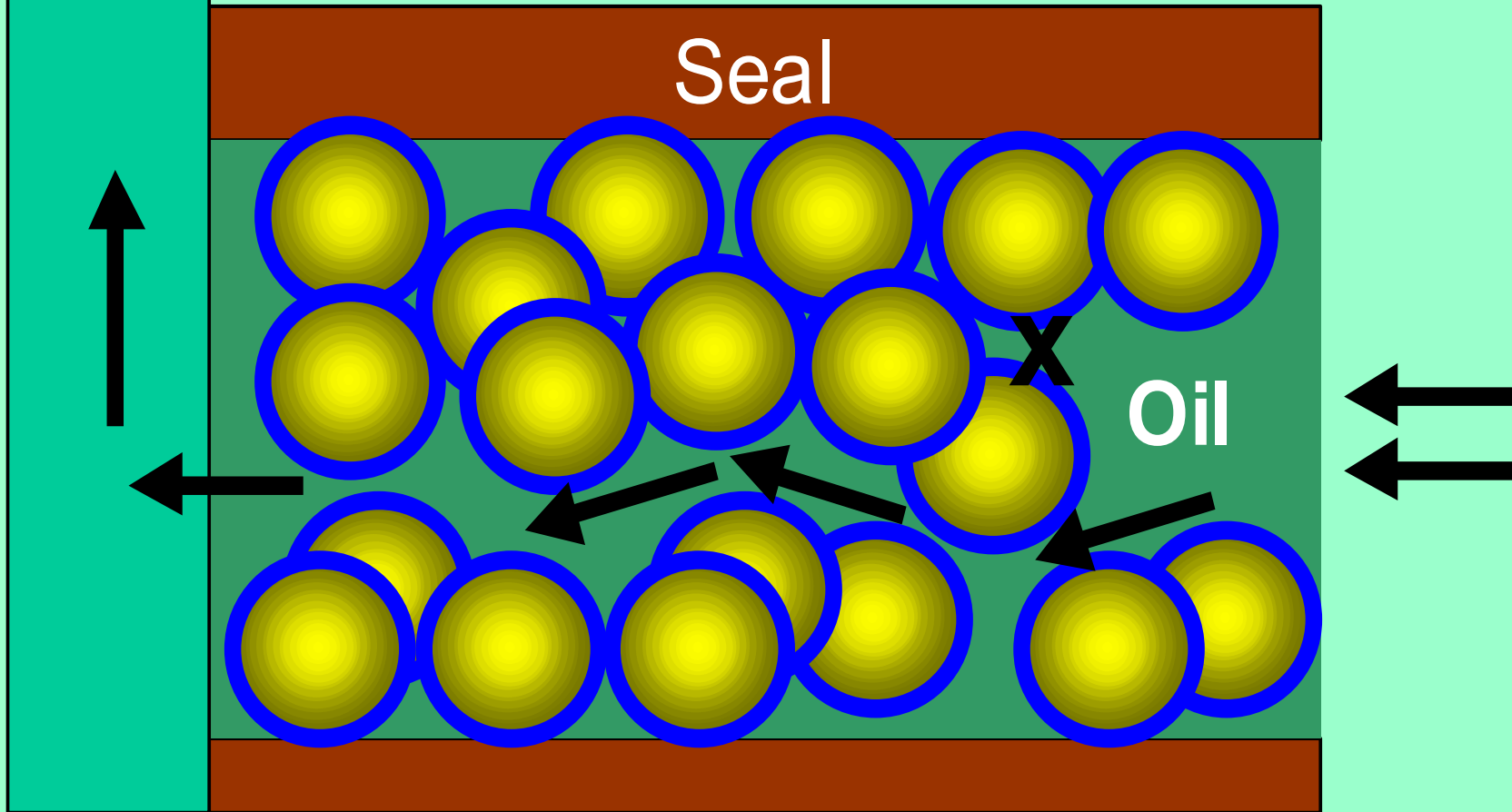
Source

Geology of an Oilfield



Well

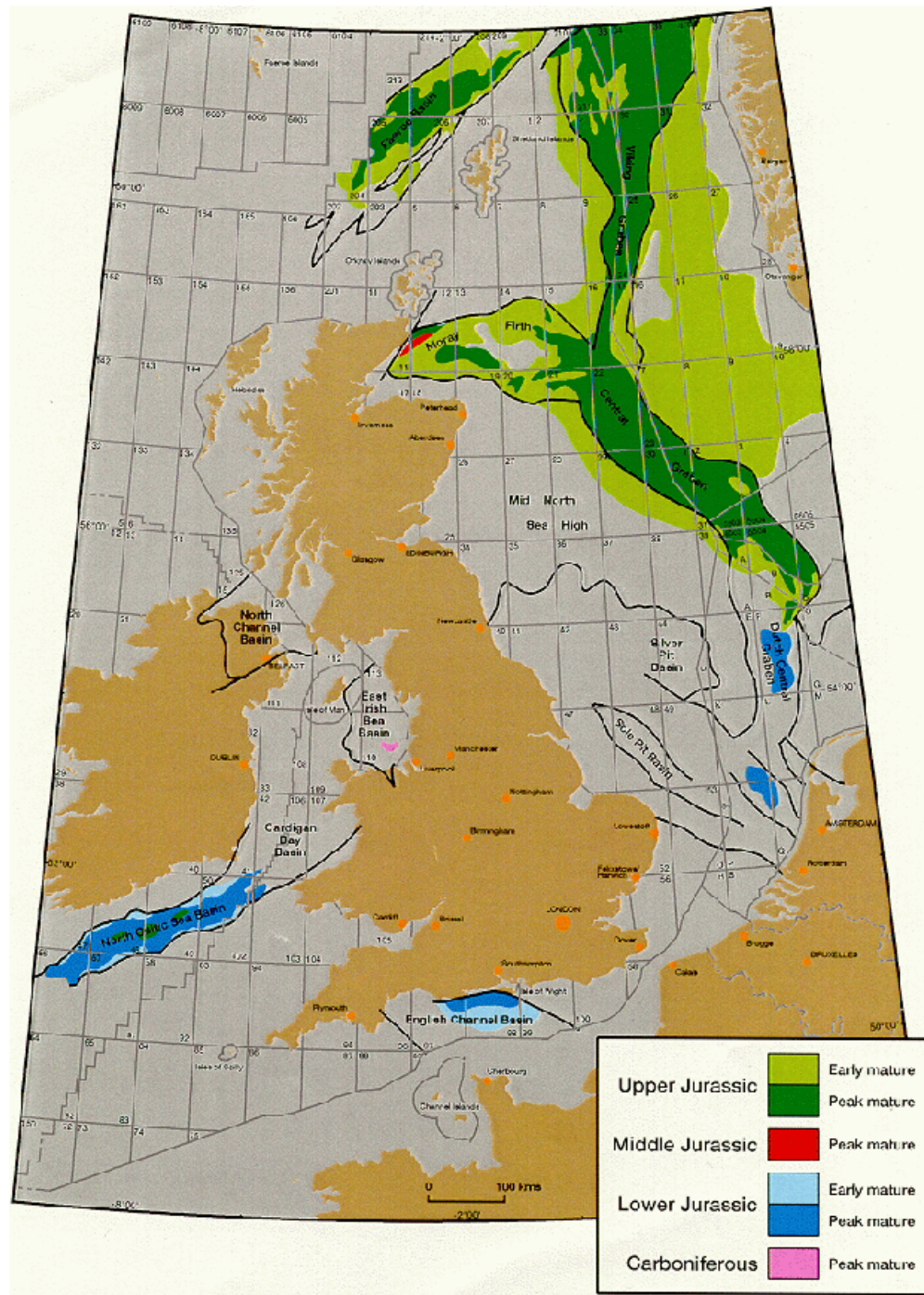
What an Oil Reservoir looks like



Oil fills the pore-space between the grains of sand, which are coated in a film of water. The oil has to flow through these constrictions.

N.W Europe Oil Generating Zones

*Where oil is
and
where it is not*



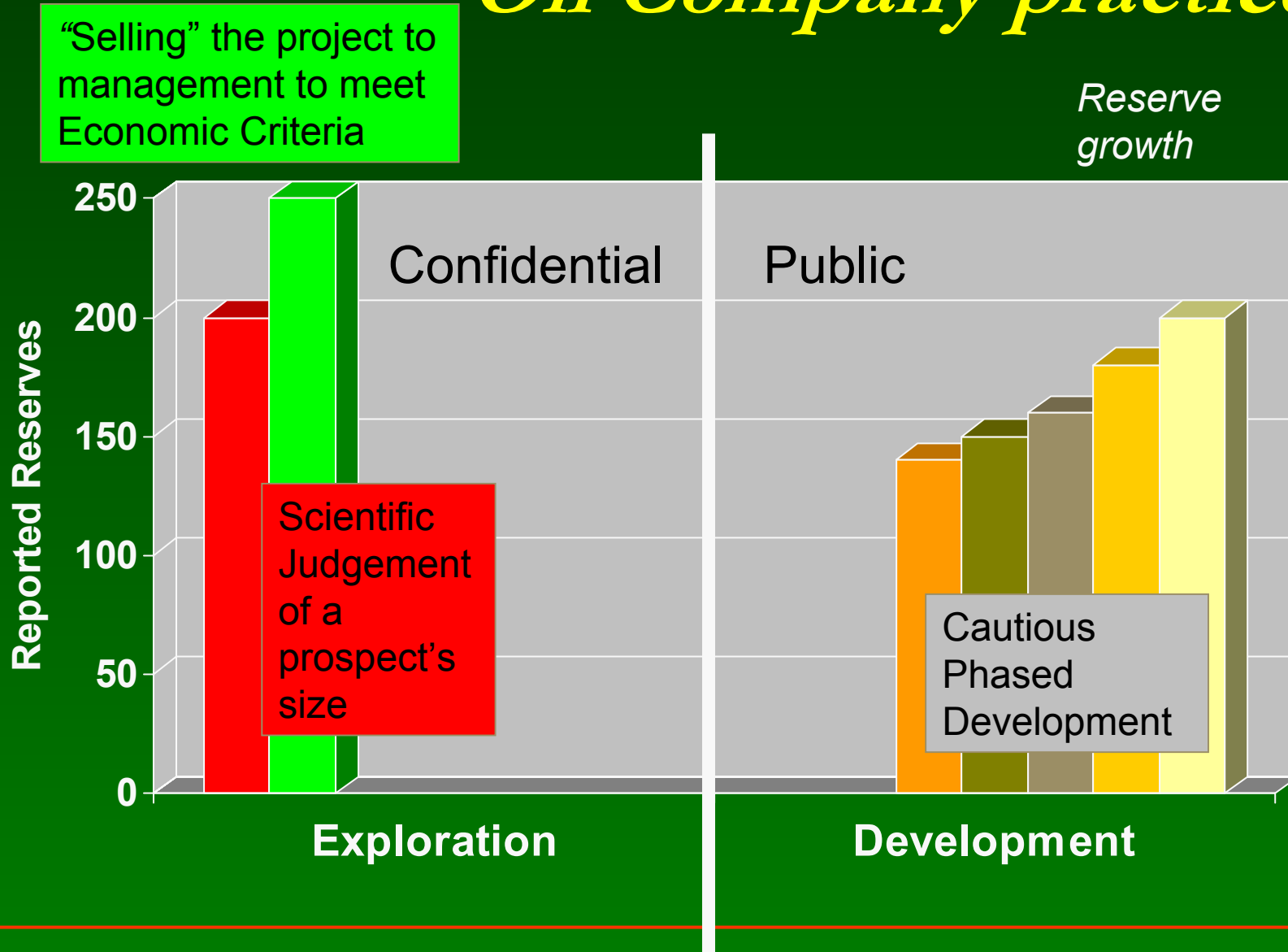
Reporting Reserves

Three kinds of report

- Scientific Estimates of Volume
- Financial Statements
- Political Postures

All valid within their spheres but deeply confused.

Oil Company practice



What Oil Companies say now

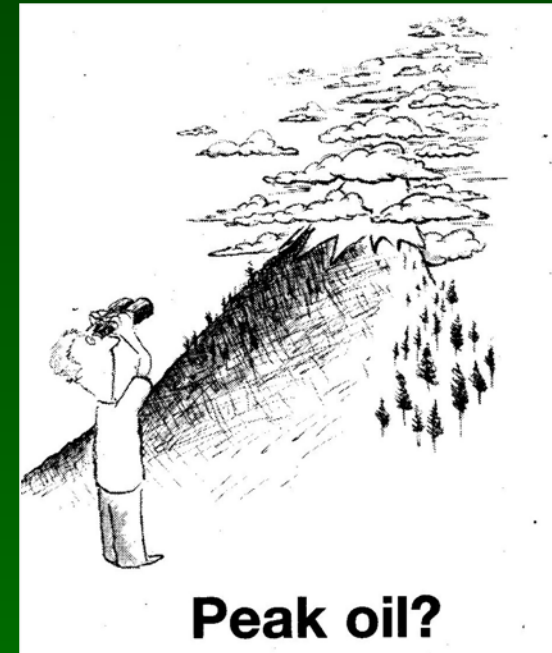
From denial to acceptance

- Chevron – deserves a medal
- Exxon – hidden messages
- Shell – “*easy oil has peaked*”
- BP – the most obtuse

New messages in different

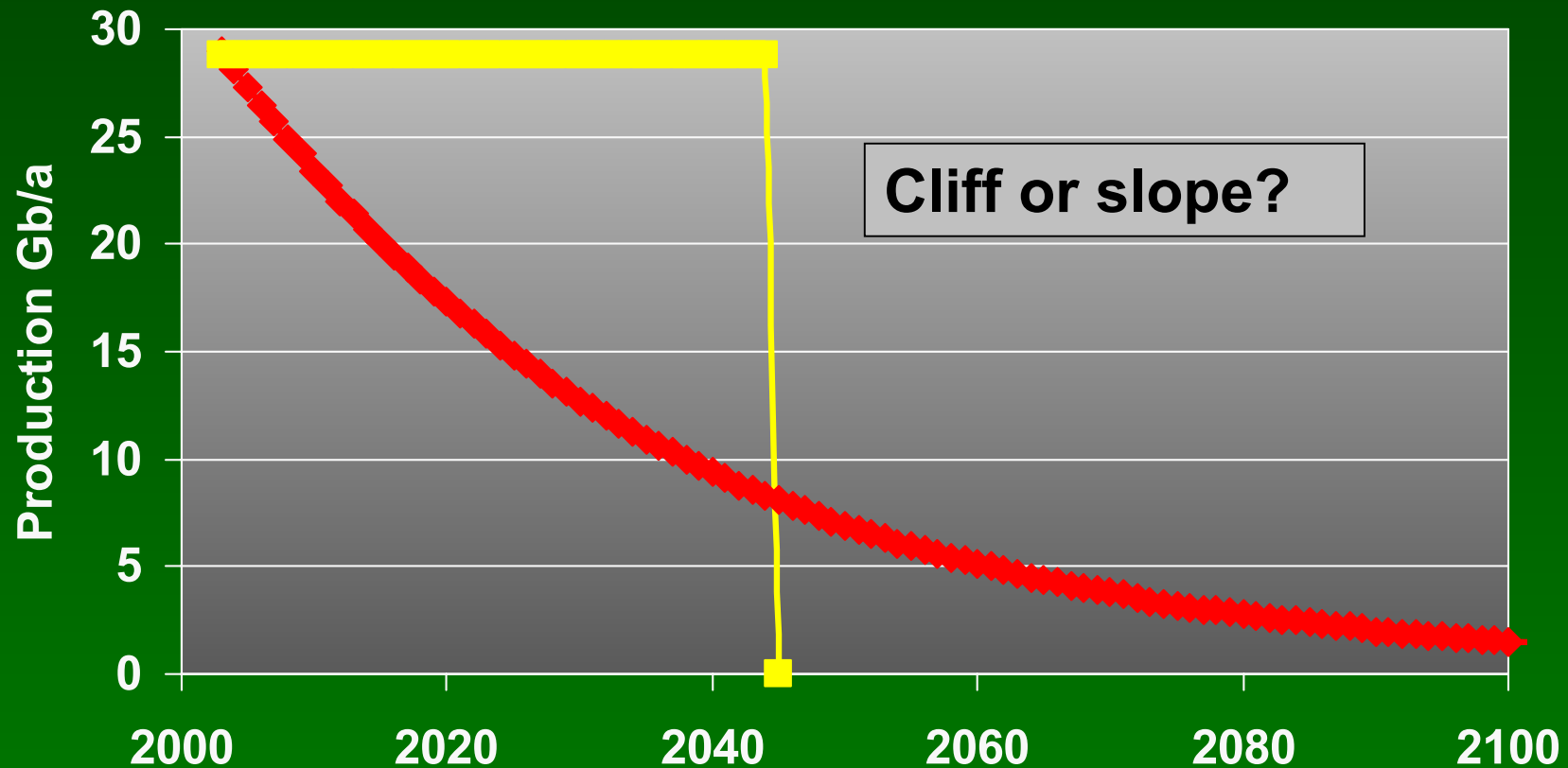
words and deeds

- Reason for mergers
 - 14 major oil companies reduced to 5.



How Lord Browne Misleads

“Reserves support current production for 41 years”



But BP now stands from *Beyond Petroleum*

	A.Dhabi	Iran	Iraq	Kuwait	N.Zone	S.Arabia	Venezuela
1980	28	58	31	65	6.1	163	18
1984	30	51	43	64	5.6	166	25
1985	31	49	45	90	5.4	169	26
1986	30	48	44	90	5.4	169	26
1987	31	49	47	92	5.3	167	25
1988	92	93	100	92	5.2	167	56
1989	92	93	100	92	5.2	170	58
1990	92	93	100	92	5.0	258	59
1991	92	93	100	95	5.0	259	59
1992	92	93	100	94	5.0	259	63
1993	92	89	100	94	5.0	259	65
1995	92	88	100	94	5.0	259	65
1996	92	93	112	94	5.0	259	65
1997	92	93	113	94	5.0	259	72
1998	92	90	113	94	5.0	259	73
1999	92	90	113	94	5.0	261	73
2000	92	90	113	94	5.0	261	77
2001	92	90	113	94	5.0	261	78
2002	92	90	113	94	5.0	259	78
2003	92	126	115	97	5.0	259	78
2004	92	126	115	99	5.0	259	77
2005	92	132	115	102	5.0	264	80

OPEC Reserve Reporting

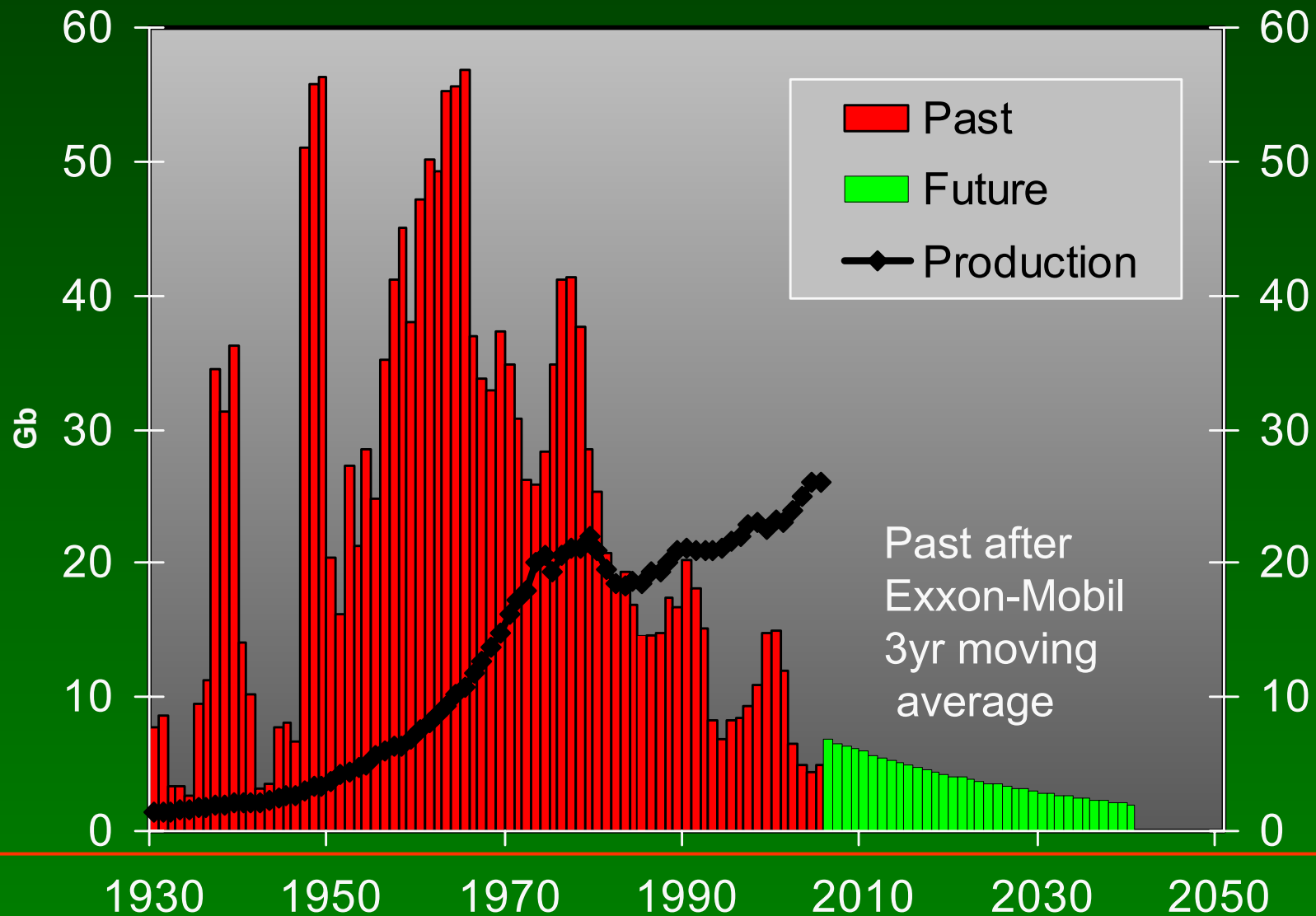
Competing for Quota

Kuwait 1984
 Produced = 22 Gb
 Remaining = 64
Found = 86 (~ 90)
 or
 Increasing Recovery from
 30% to 40%

But Nature does not lie

- A field contains what it contains
- The term *Reserves* is confused for financial, commercial and political reasons
 - Valid in their contexts but misleading
- The **discovery trend** is critical
 - Need to backdate revised estimates and overcome the illusion of “*Reserve Growth*”

Real Discovery Trend



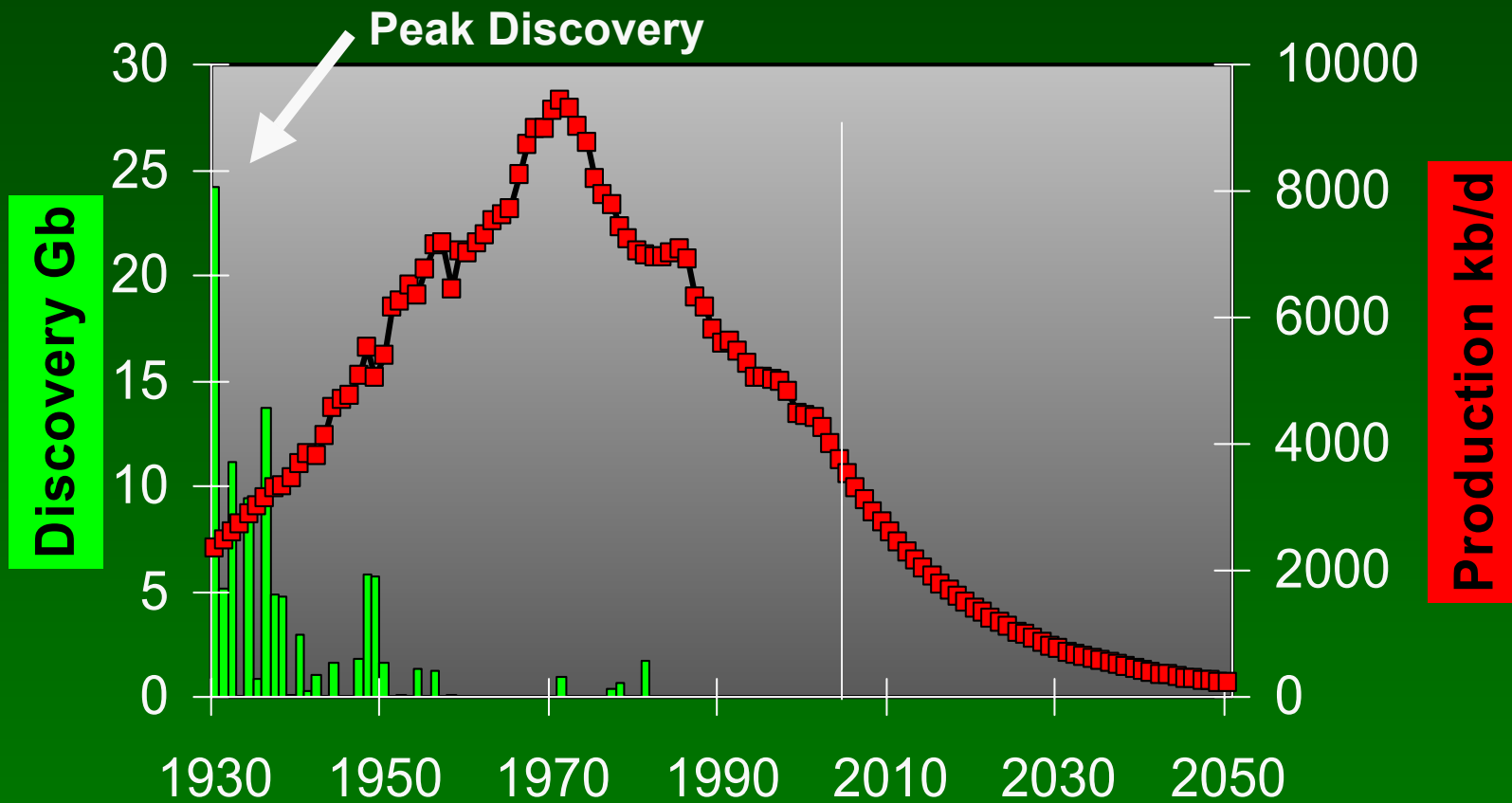
Examples

Production mirrors discovery

- After 20-45 years.
- Discovery peaked in most countries long ago.
- The larger fields were found first
 - Too big to miss

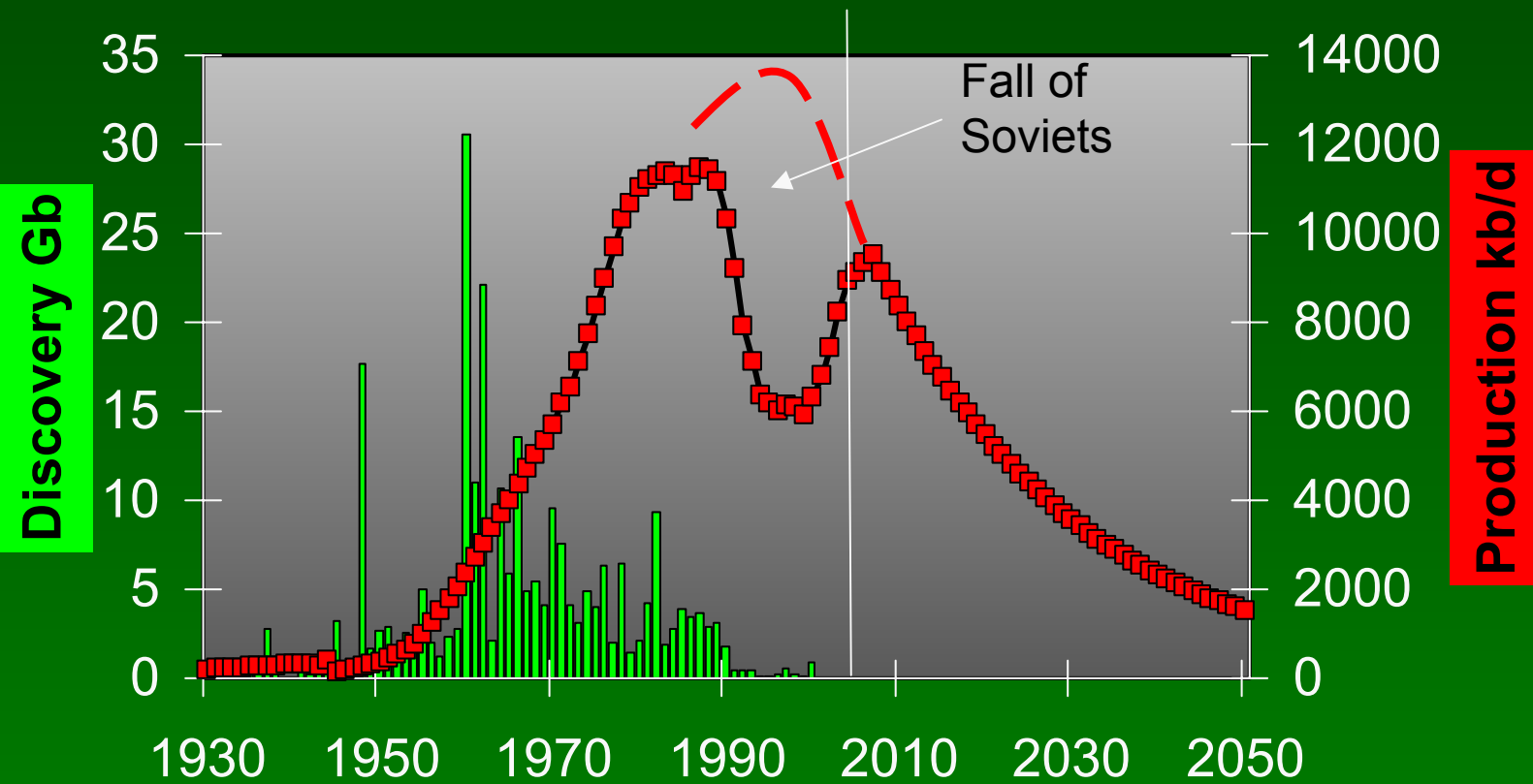
US-48

Peak to Peak 40 years



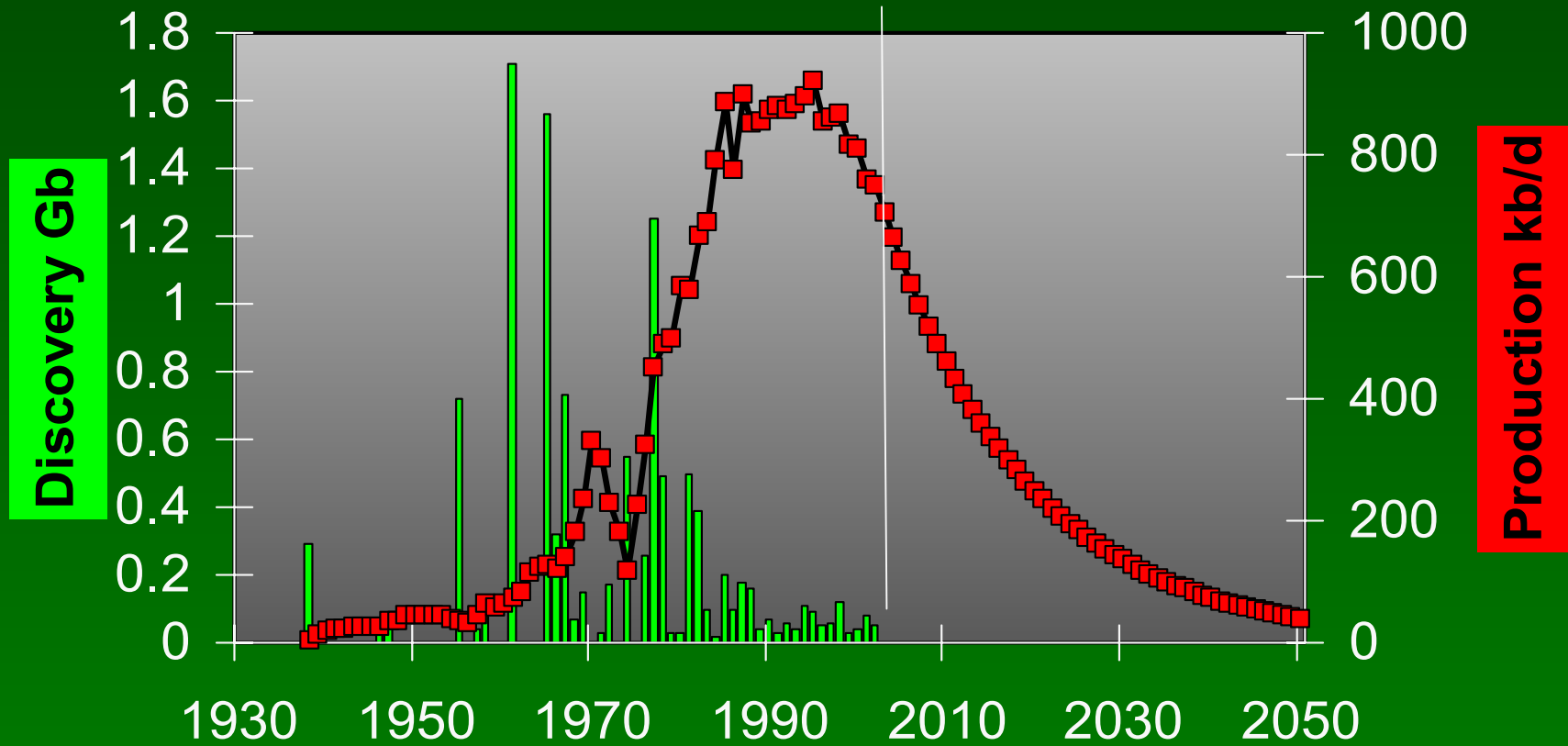
Russia

Peak to Peak 27 years



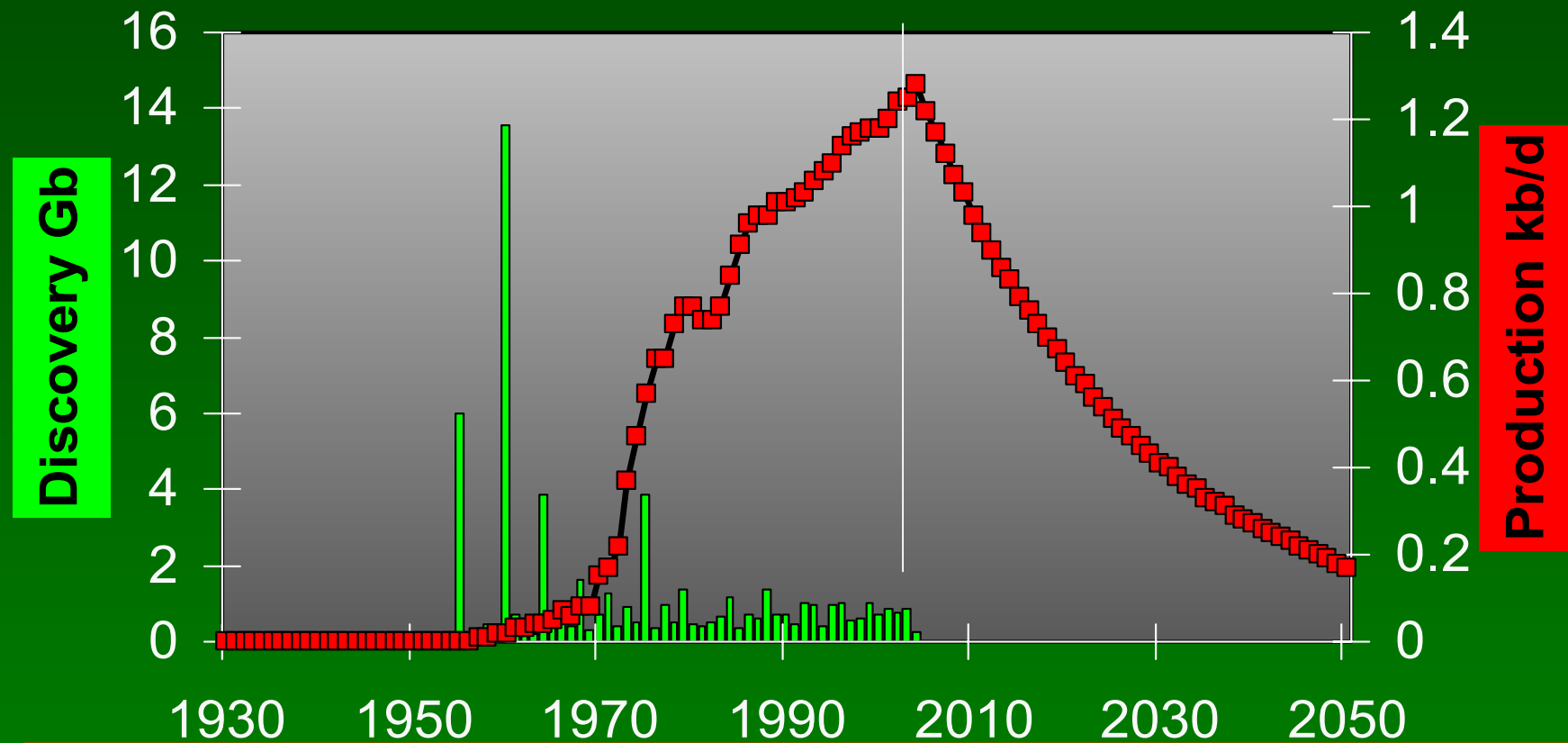
Egypt

Peak to Peak 30 years



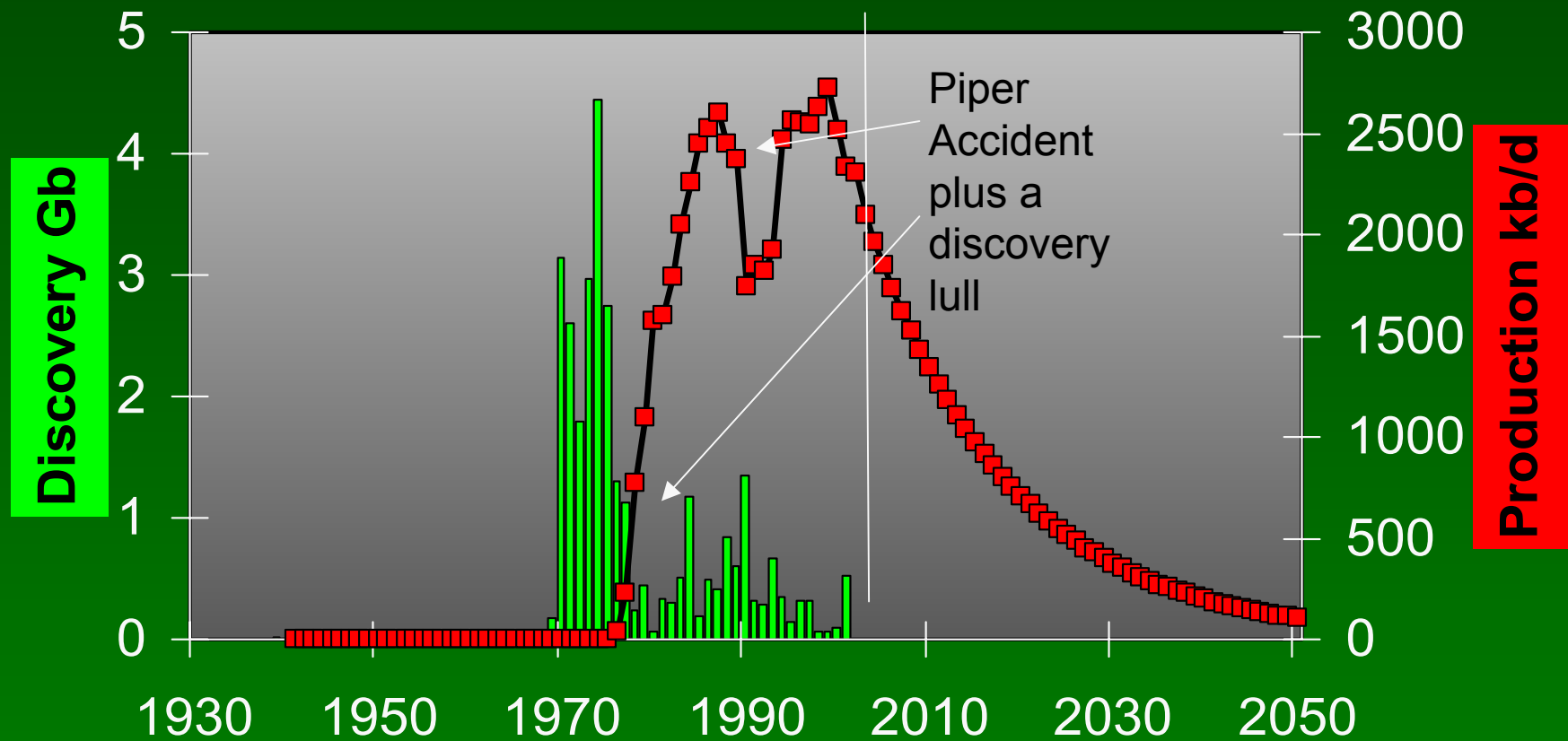
China

Peak to Peak 44 years

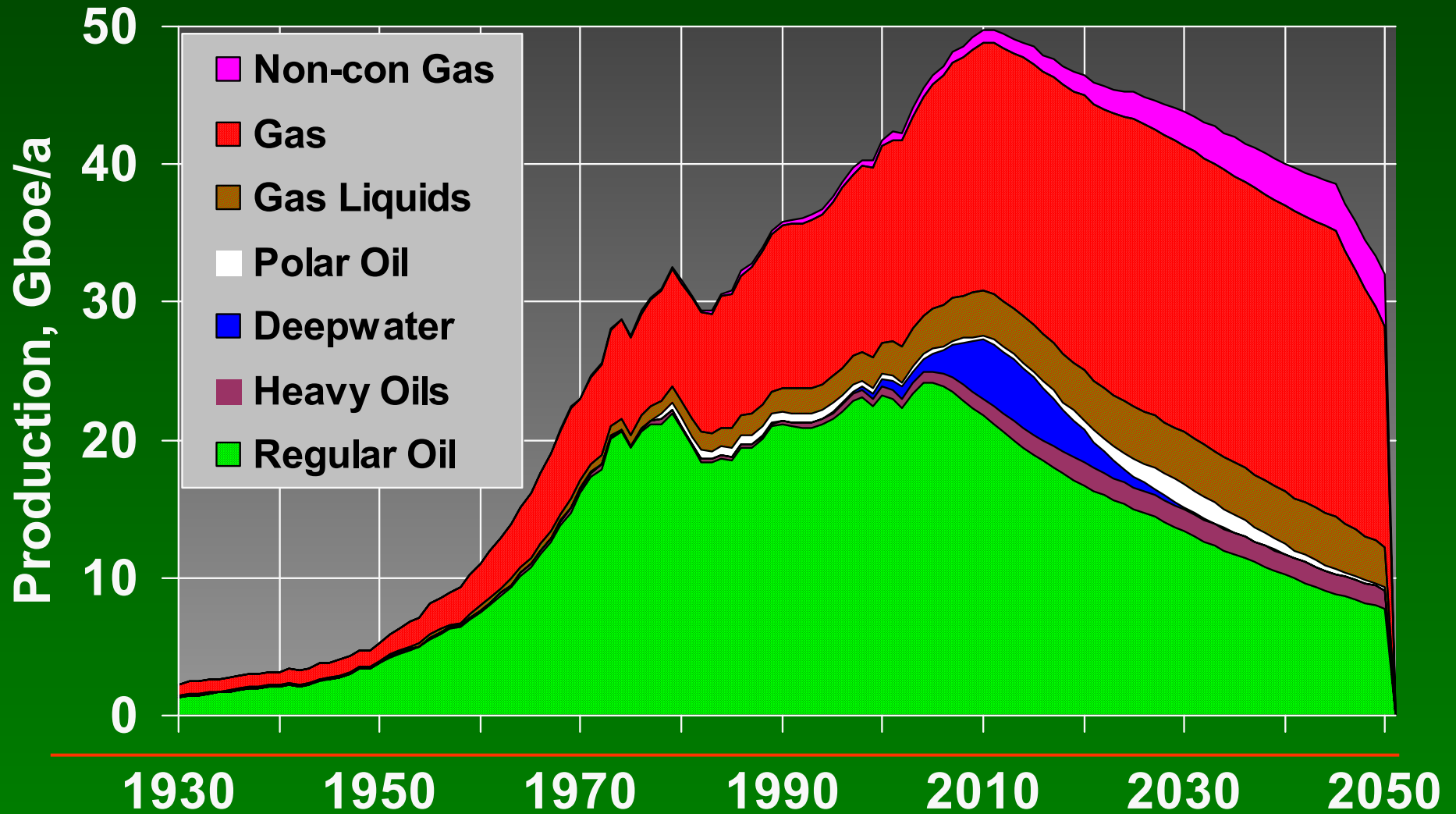


United Kingdom

Peak to Peak 25 years



All Oil & Gas



First Half of the Age of Oil

The End of the First Half of the Oil Age

- It lasted 150 years
 - A short span of history.

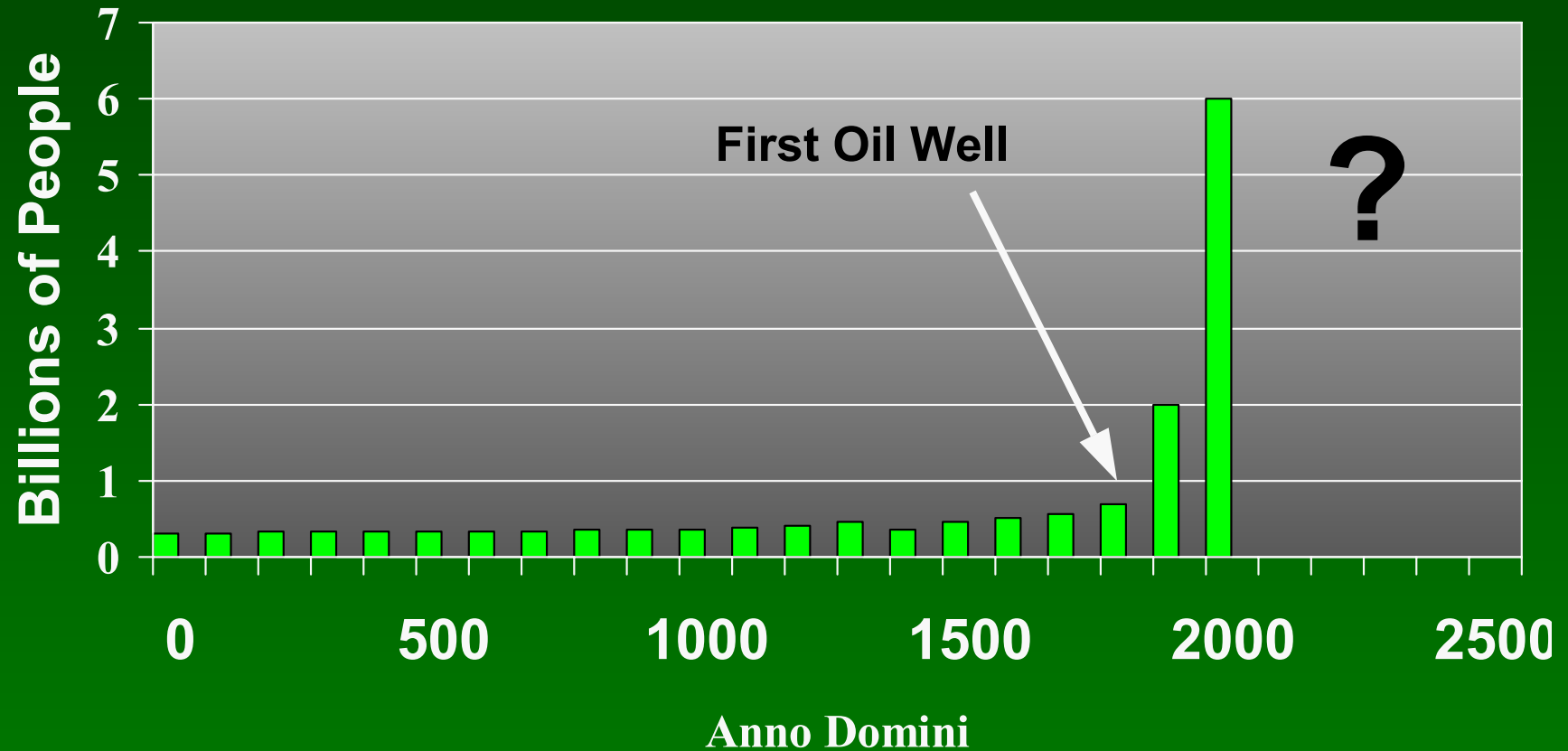
It stimulated rapid expansion of:

- Industry
- Transport & trade
- Agriculture
- Population
- **Financial Capital**

Population

All animals use energy from their muscles

But *Home Sapiens* was the first to use external sources

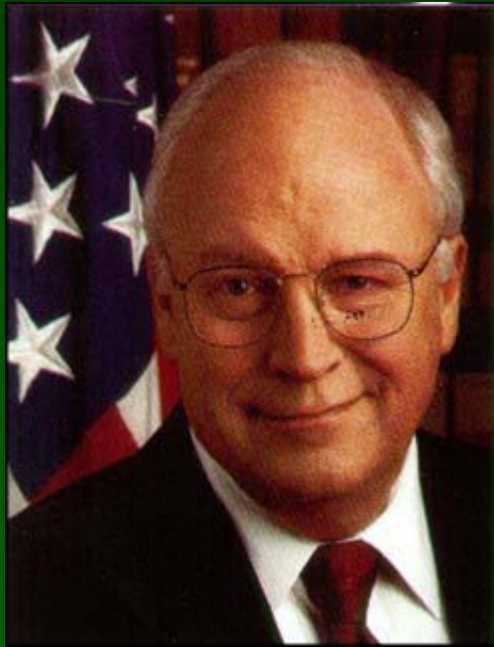


Evolution of Money

Homo Sapiens: the first animal to use external energy & trade

- Simple barter
- Gold and silver coins
 - Owning the mine = unearned wealth
 - Conquest for gold & silver
 - The Spanish Empire in Latin America
- Paper money
 - At first backed by gold : but later faith alone
 - **Effectively a licence to use energy**
 - Much previously minted by the Federal Reserve
 - Now, Middle East governments through petrodollars

Wall Street & War



Wall Street needs energy supply: prompting more resource wars to take what is left.



The Second Half Dawns

Marked by the decline of oil and all that depends on it

- Including **Financial Capital**

Physical decline of oil is gradual

but the turning point is unprecedented.

- Debt is losing its collateral.
 - Was based on oil-driven expansion
- All quoted companies are over-valued
 - Tacitly assume business-as-usual energy supply

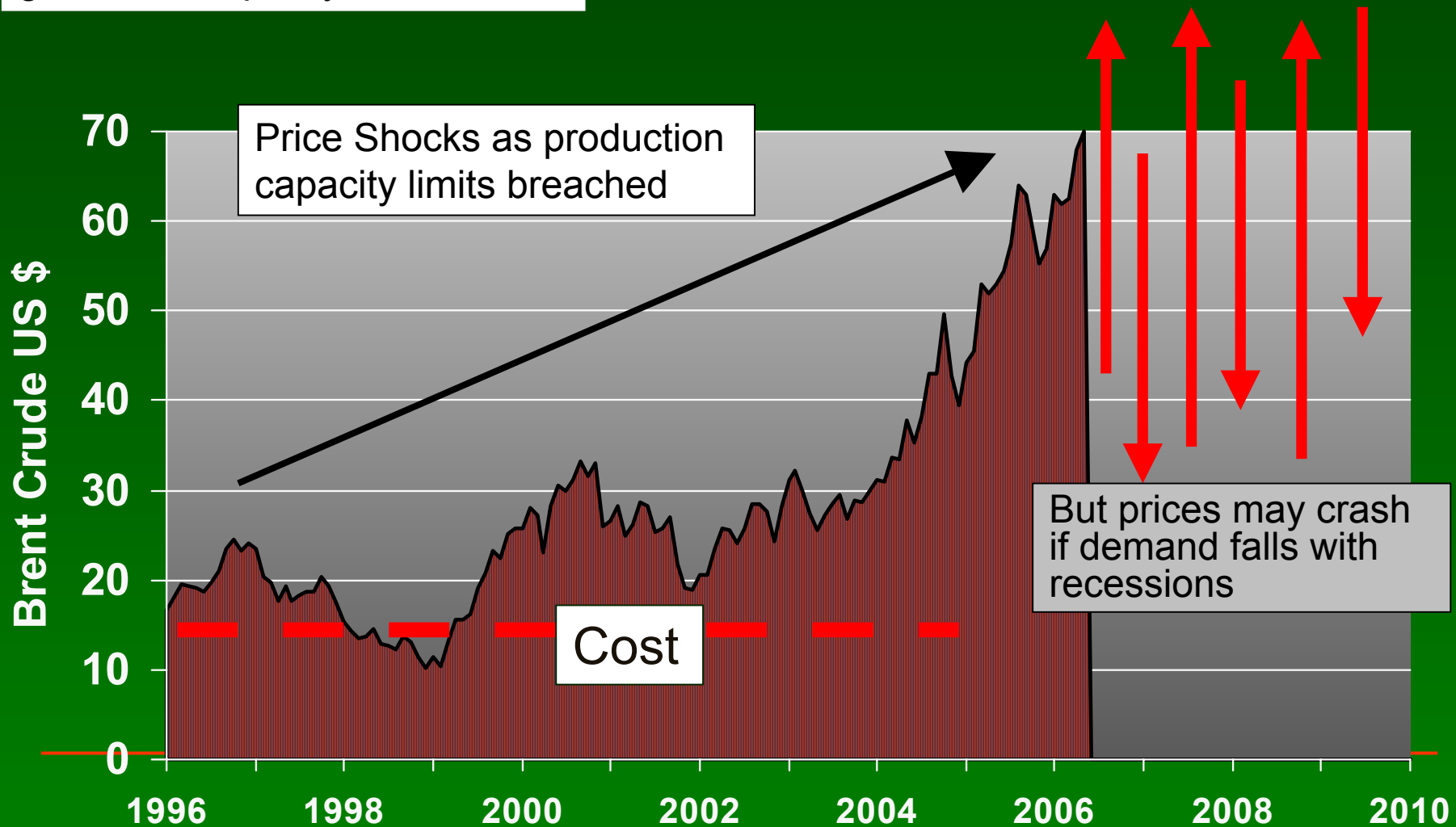
Does it herald - **Stock Market Crash ?**

The Second Great Depression ?

Price Shocks

First Signs of Crisis

Price - six times cost to produce gives false liquidity



Plan of Action

Collect proper data.

- Use Foreign Service to secure.
- Resign from International Energy Agency.

Inform the public.

Cut waste

- Especially in transport sector.
- New building standards; town planning.
- Live differently: end consumeristic ethic.

Turn to new energy sources from

- from tide, sun, wind, bio-mass, ? nuclear.

Regionalise and Ruralise

- Rediscover the regions
 - New Community Spirit
 - Living within their resources
 - Change Mindset from “poverty” to success in sustainable living
- Urban living becomes more difficult
- Migration ceases to be viable

Depletion Protocol

Importers to **cut imports** to match current
Depletion Rate (2.5% a year)

Consequences:

- Stops destabilising false liquidity
 - From profiteering from shortage
- Forces consumers to face reality
- Allows poor countries to afford needs

Thank You
and
Good Luck

Session II

Part 1: Microeconomic consequences of rising oil prices, competitiveness and taxation

Oil Prices and Transport Sector Responses

David Baldock
Director

The Institute for European Environmental Policy

**Workshop on Economic Impacts
Of Rising Oil Prices**

28 June 2006

www.ieep.org.uk



**Institute for
European
Environmental
Policy**

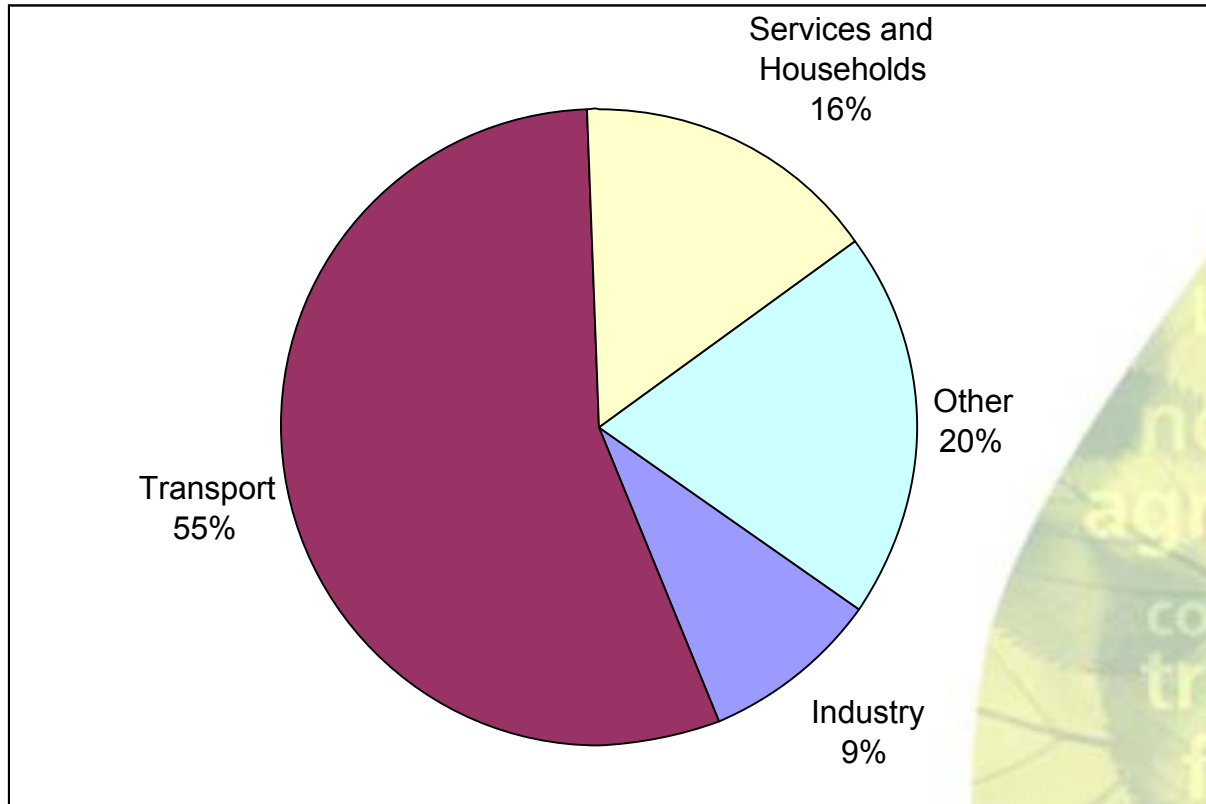


Outline

- **Context**
 - Transport and oil dependency
 - Elasticities of demand
 - Decoupling
- **Substitution**
 - Alternative fuels
 - Efficient vehicles
- **Policies and Choices**



Transport and Oil Dependency in the EU



Easy Wins are Possible

- **In Road Transport**
 - Correct tyre pressure could save 125,000 bbl/day
 - Enforced 90kph speed limit could save over 0.5 mbbl/day
- **In Maritime Transport**
 - Slower ship speeds could save 23% of fuel used
- **A wide range of technical and operational responses available**



Alternative Fuels

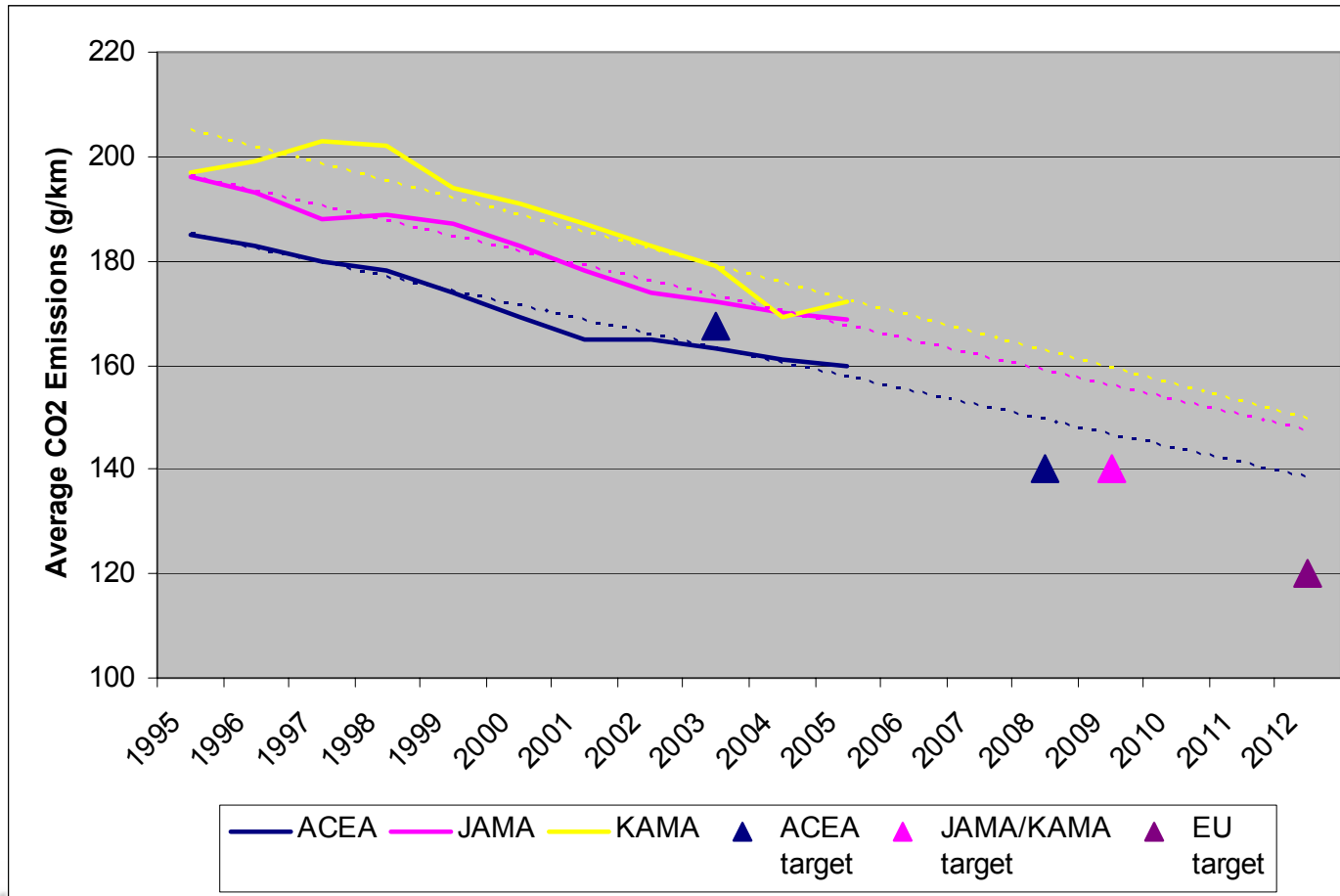
- **Alternative Fossil Fuels**
 - A range of sources eg oil shales, tar sands
 - Likely high energy costs to extract
- **Biofuels**
 - '1st generation' offer some CO₂ benefits
 - '2nd generation' likely to be much better
 - A wider range of feedstocks will be usable
- **High oil prices make the alternatives more attractive**
- **There is a choice between high and low carbon routes**

Vehicle Efficiency

- **A ‘win-win-win’ option**
 - Reduced cost
 - Reduced fuel dependency
 - Reduced greenhouse gases
- **Enormous technical potential**
 - Dieselisation
 - Improved engines and drivetrains
 - Lighter and more streamlined vehicles
 - Hybrids
 - Fuel cells
- **... but progress is not fast enough**



Voluntary Agreements with Carmakers



Future Choices

- **Stronger policies are likely to be needed**
 - A mandatory requirement on carmakers
 - Continuing development of advanced biofuels
 - Better use of vehicle and fuel taxes
- **Significant change is possible in transport**
 - Some operational changes could be cheap and easy
 - Bigger technical changes may be cost-justified by high oil price
- **Potential benefits are large**
 - Reduced oil dependency
 - Reduced greenhouse gases
 - Reduced running costs
- **... and so are the risks of inaction!**

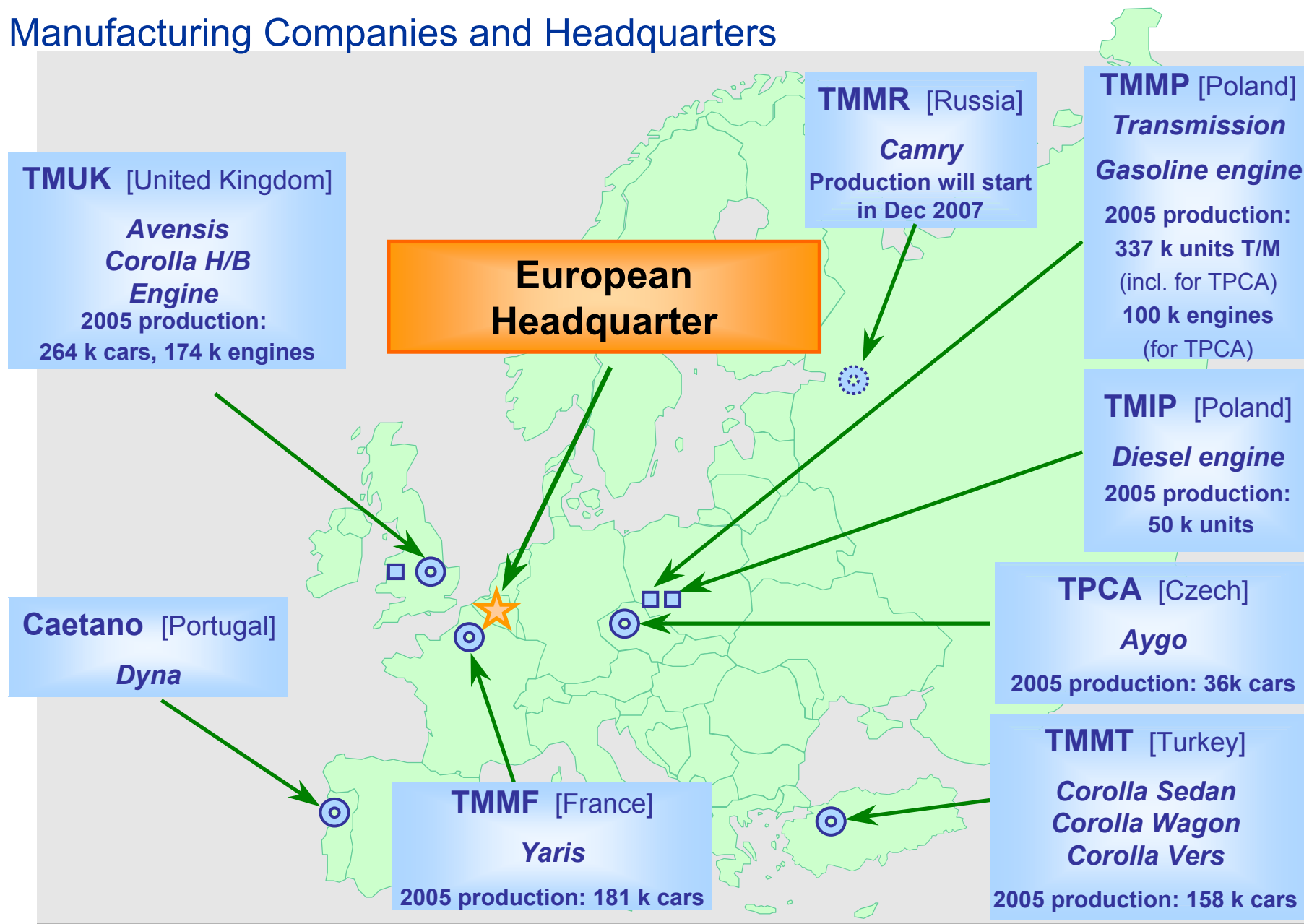




Impact of oil price and climate change on the car industry

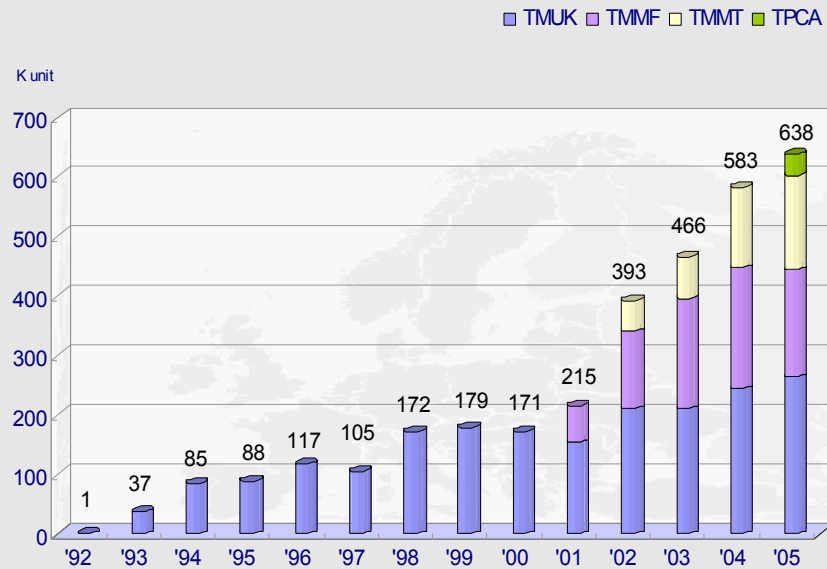
Dr. Stephan Herbst
Manager Analysis & Strategy – Environmental Affairs
Toyota Motor Europe

Manufacturing Companies and Headquarters

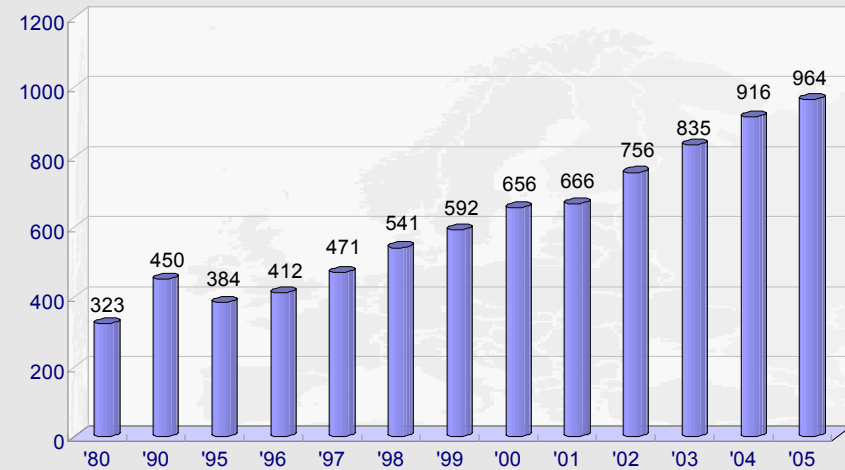


Toyota Motor Europe

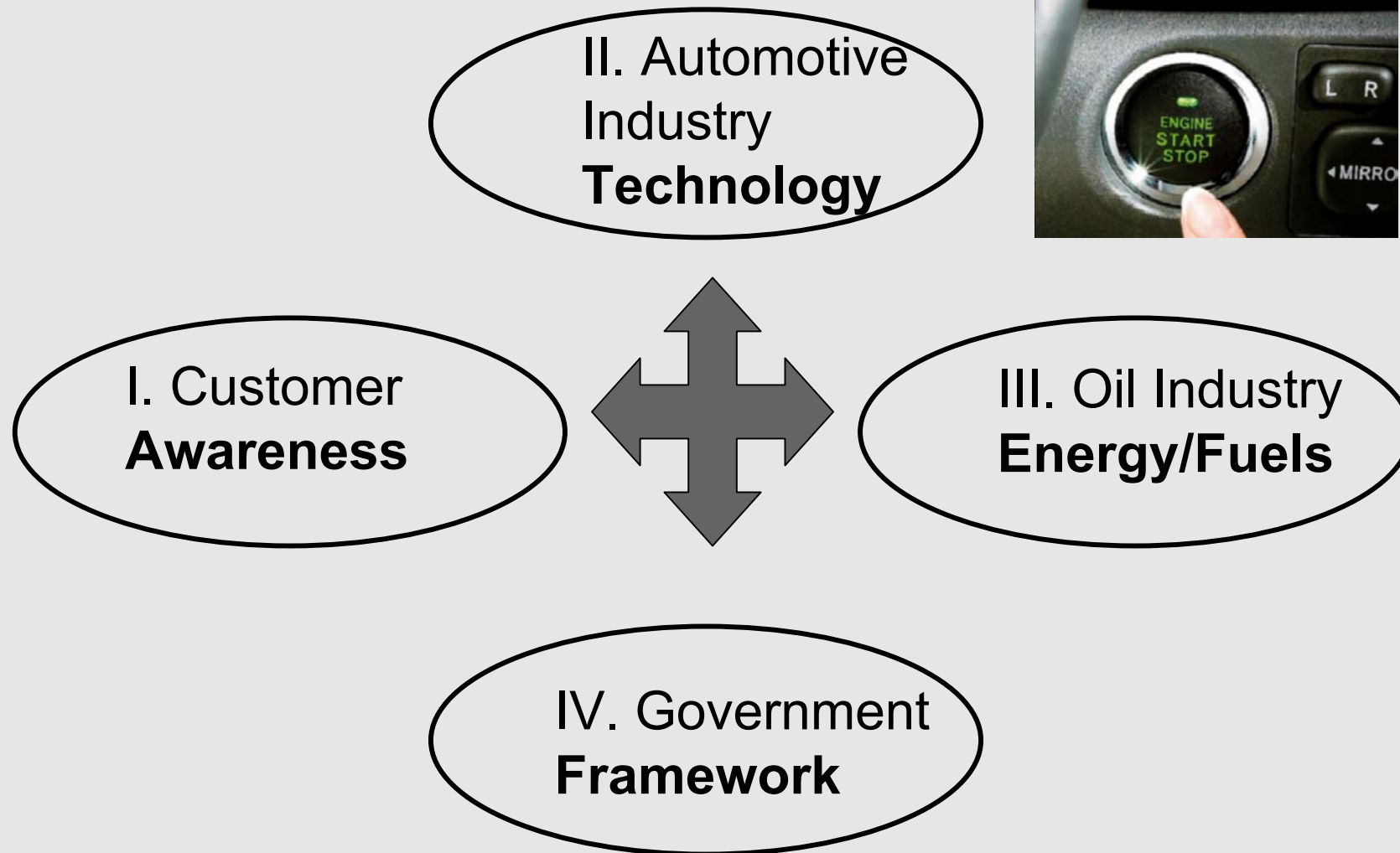
Production



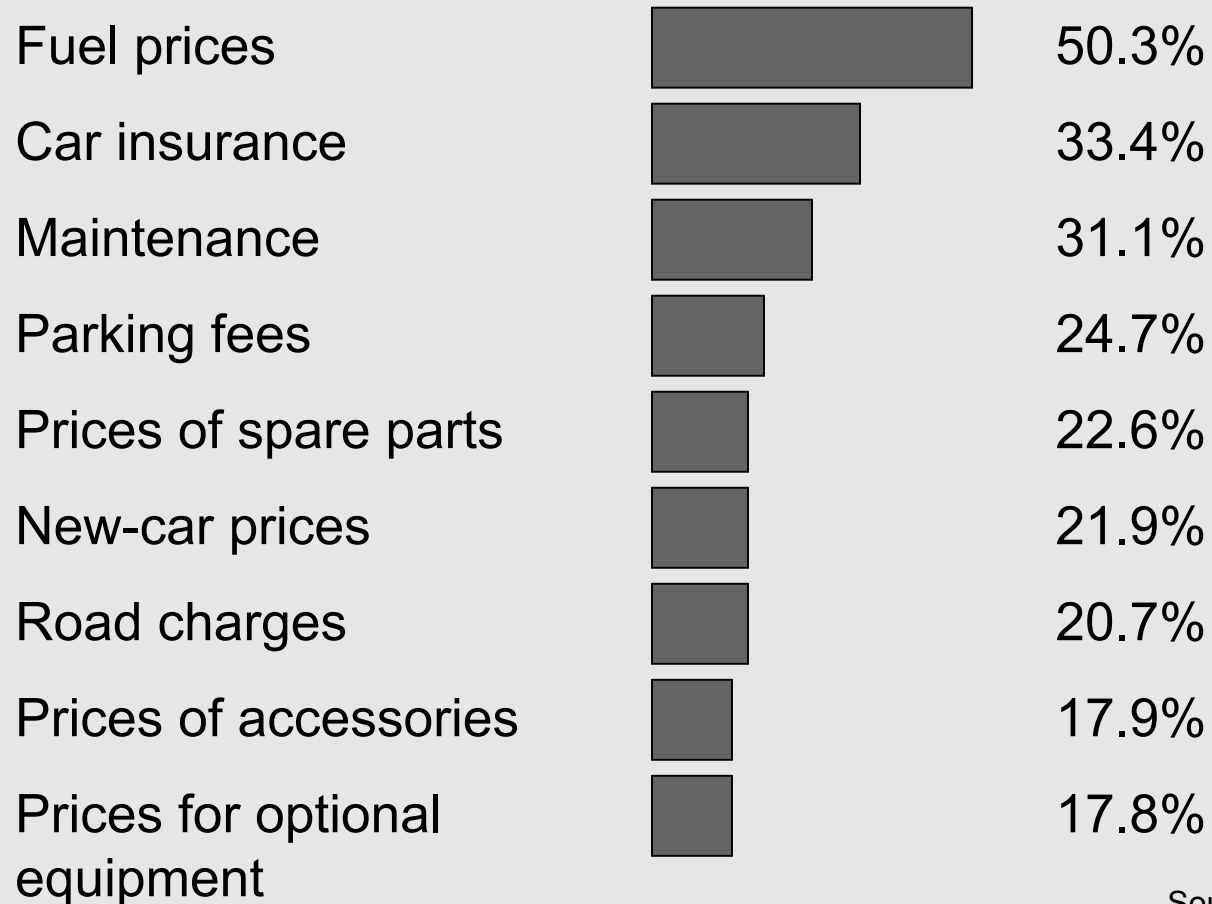
Sales



Different perspectives

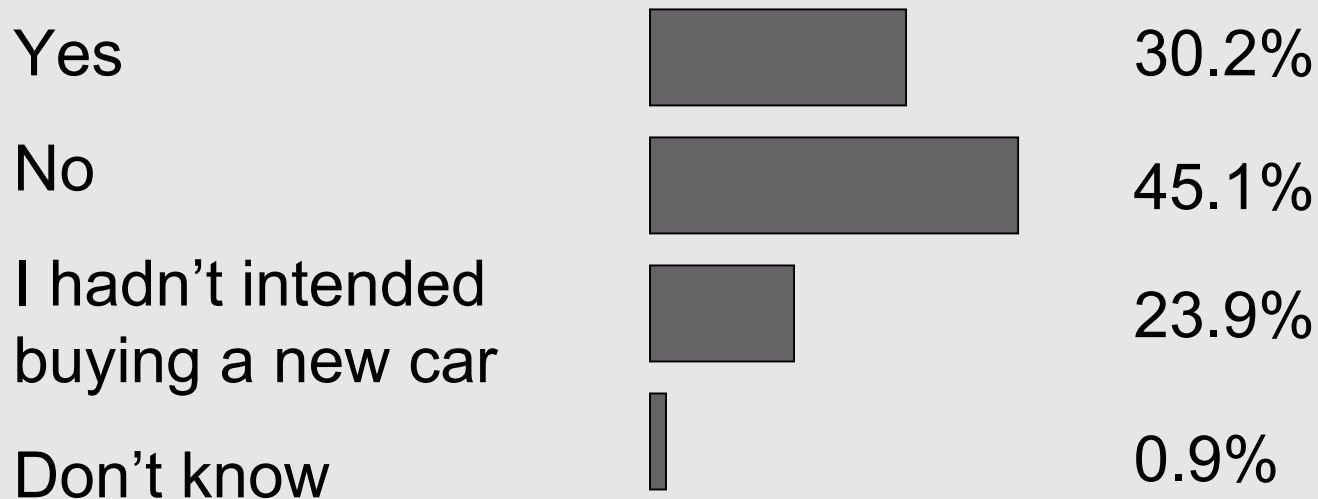


To what extent are you personally affected by various increases in the cost of driving a car?



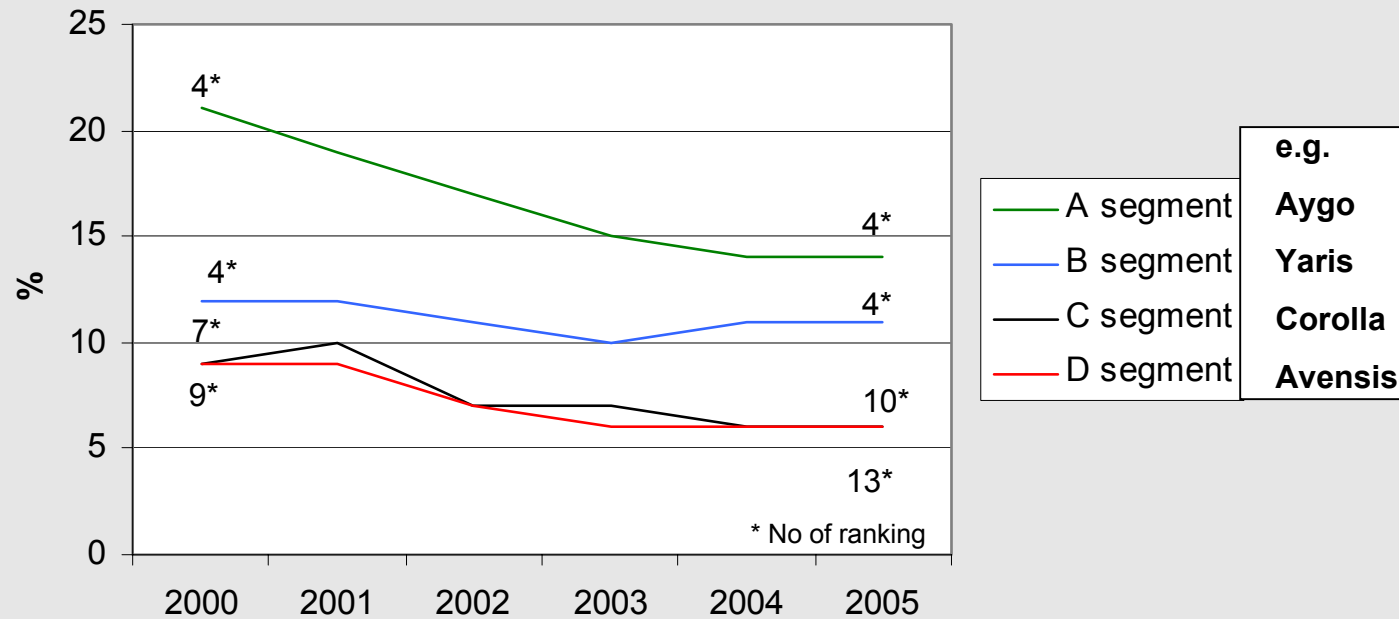
Source: Internal source 2005.

Have the rising costs of driving stopped you from buying a new car?



Source: Internal source 2005.

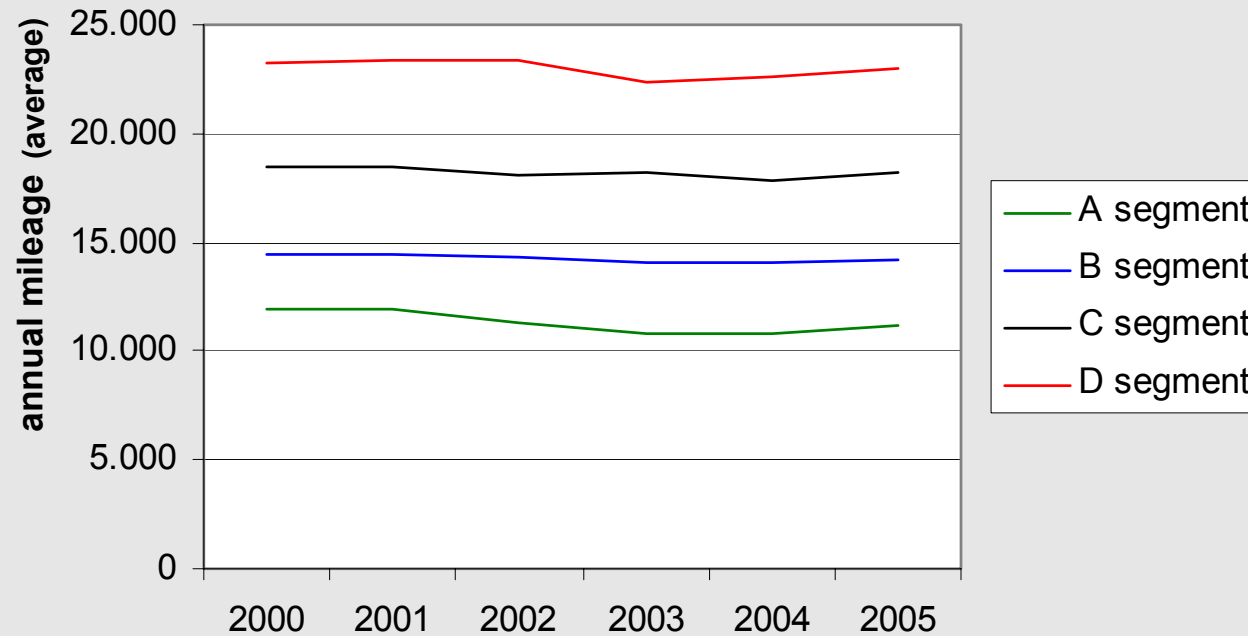
Importance of Low Fuel Consumption when buying a new car



Source: Internal source – MM5

- The importance of low fuel consumption as a purchase reason decreased in all segments. However, it has started to increase slightly.
- Low fuel consumption is most important in the A segment

Expected annual mileage



Source: Internal Source 2005 – MM5

- Expected annual mileage (average) decreased slightly

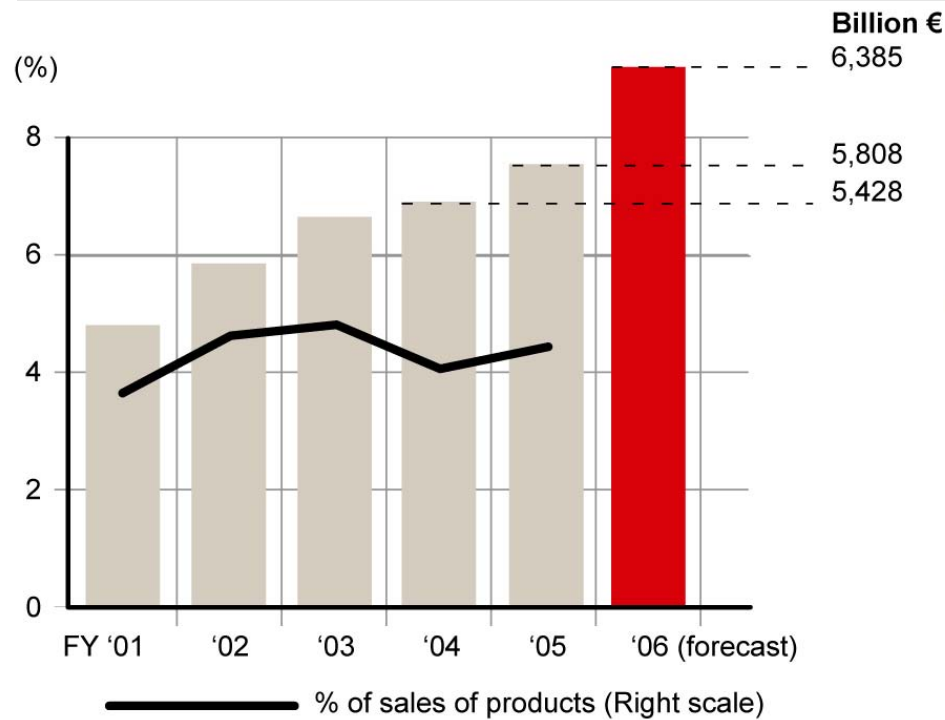
TMC Environmental Forum

June 13, 2006

President Watanabe's Key Messages

1. We recognize that **Mobility entails negative aspects** caused by environmental issues, congestion, and traffic accident
2. Responding to issues of **Energy and Climate Change** is one of the biggest challenges
3. It is essential to realize a **'Sustainable Mobility Society'**
4. Toyota will give top priority on the **development of technologies and products** that contribute to tackling environmental and safety issues

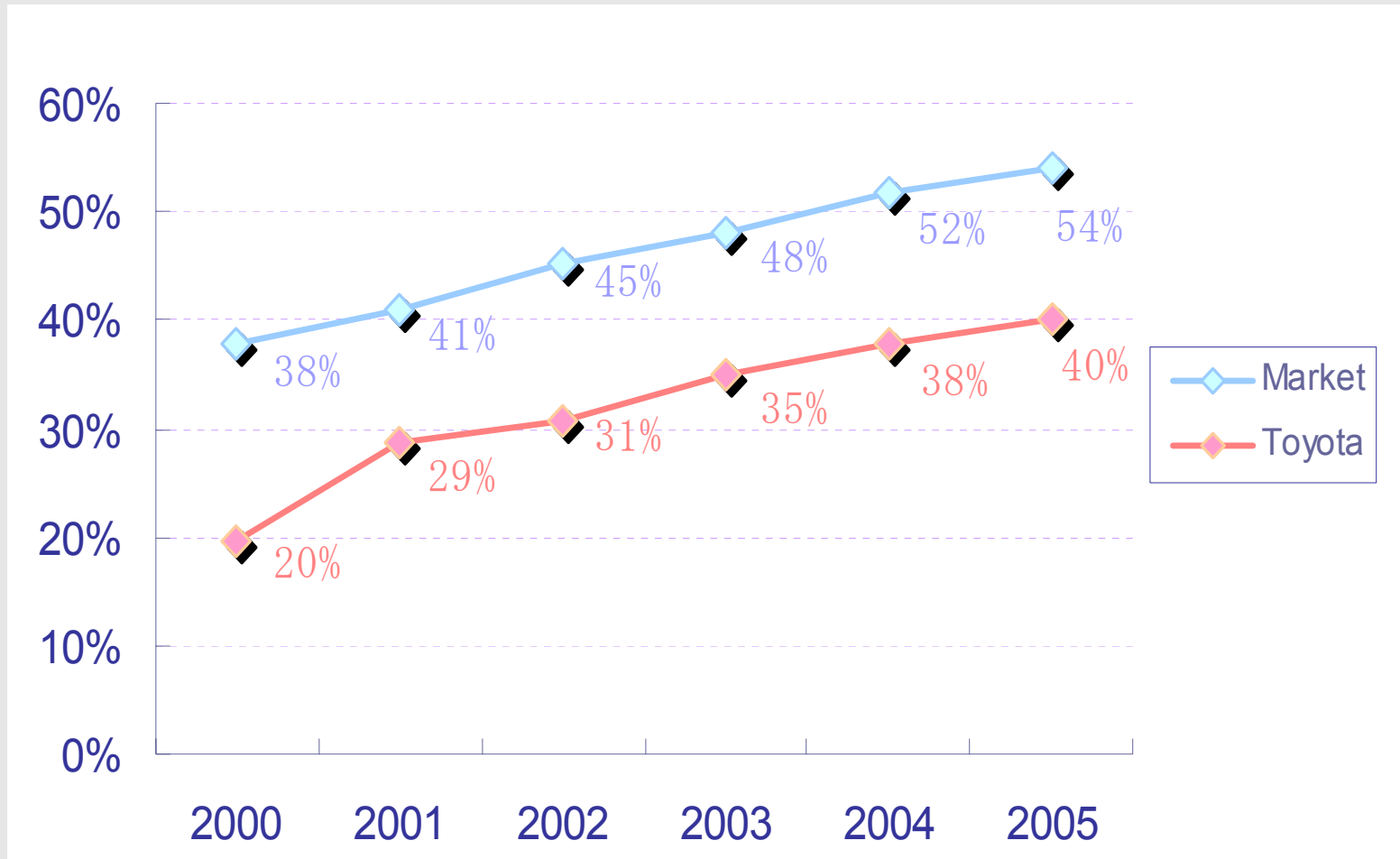
Investments in R&D (global)



Encouraging our Engineers to push the boundaries

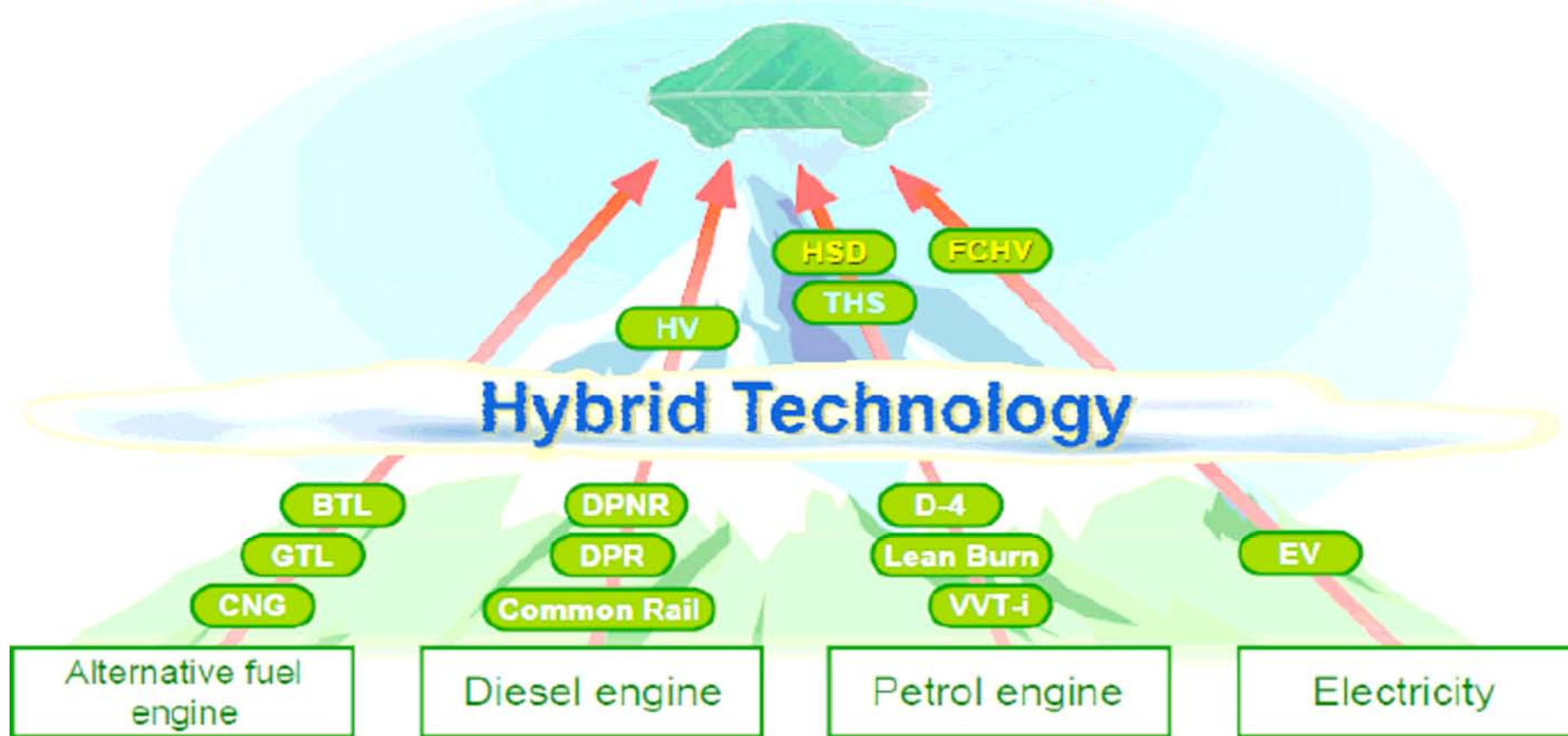


Evolution of Toyota Diesel Market Share



Towards the Sustainable Mobility

The Ultimate ECO-Car



“Today for Tomorrow”

40 years history of Toyota hybrid development

More than 500,000 hybrid vehicles sold worldwide

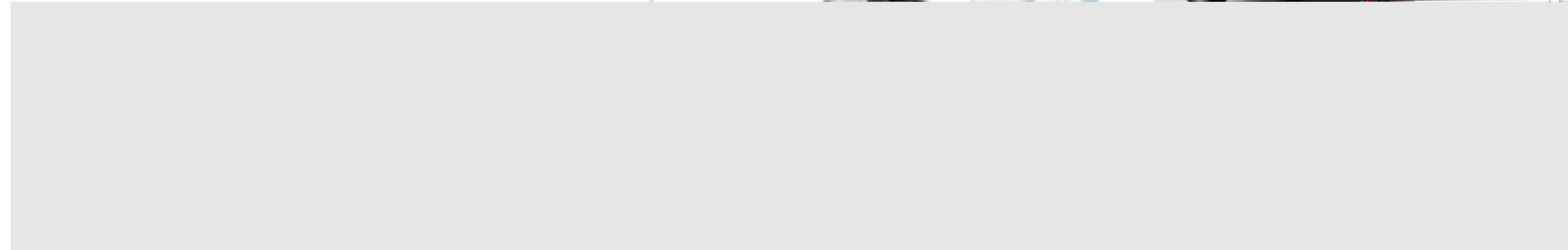
50.000 hybrids sold in Europe

Fuel cell hybrids

Toyota Highlander HV



2005



1966 Toyota Sports 800 Gas turbine hybrid prototype

1977

1997

2005 Car of the year

Toyota Prius Launched in US and Europe

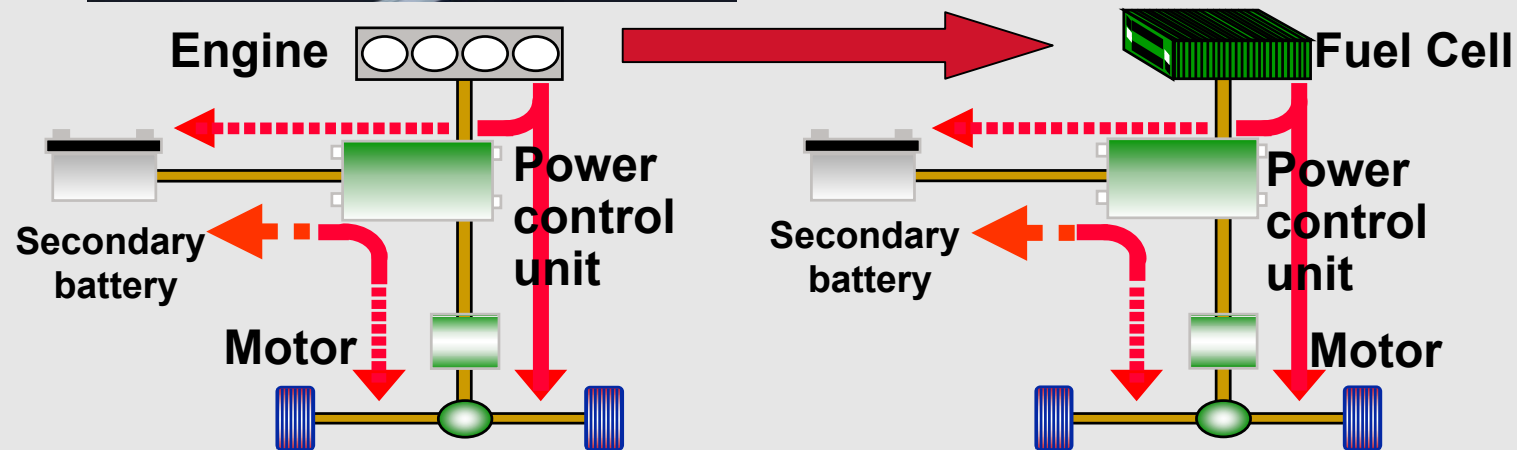
1st mass production hybrid vehicle

Toyota's Fuel Cell Technology

Prius



FINE-X

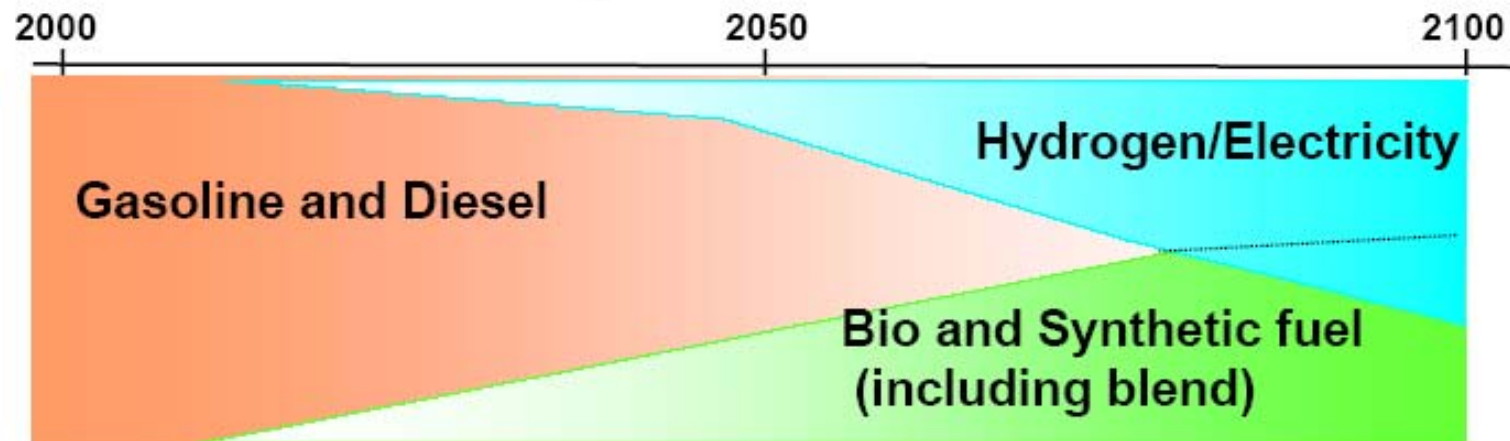


Requirement for Automotive fuels

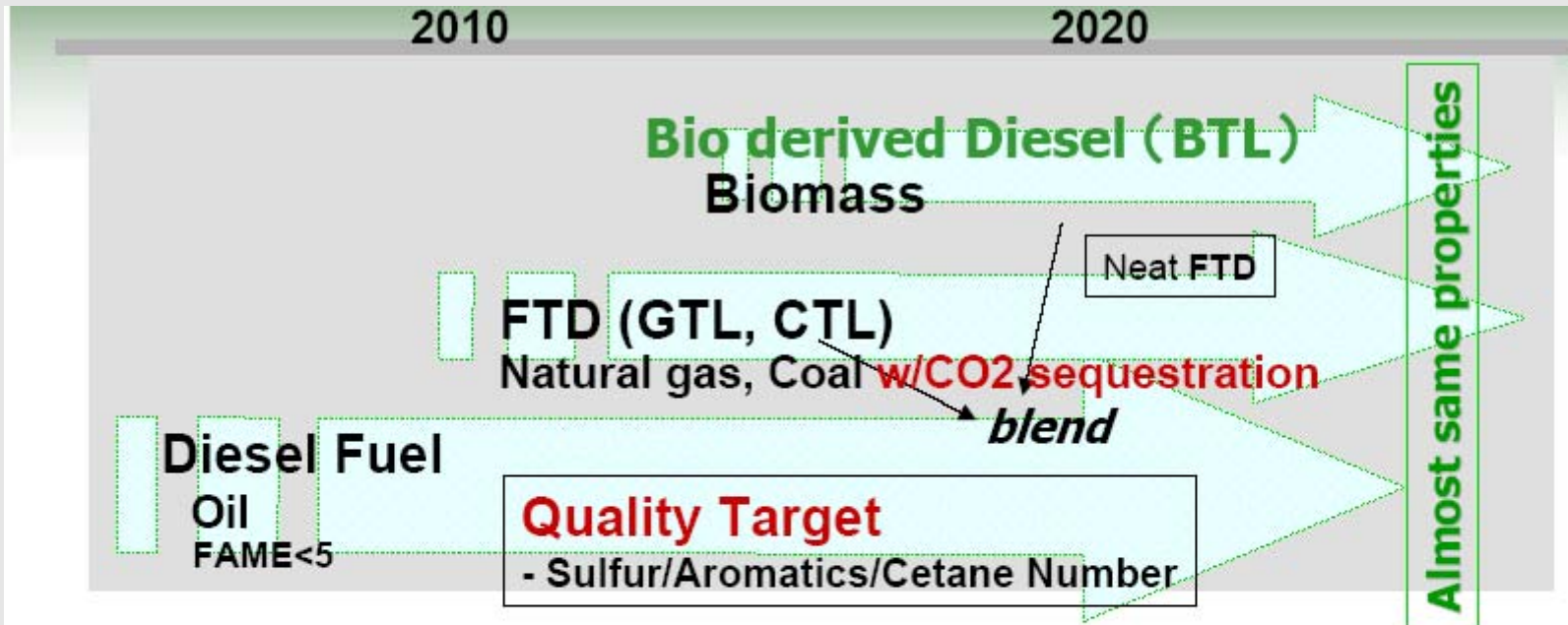
Automobile fuel should be

- (1) High energy density and easy to handle
- (2) Reasonable cost for society
- (3) Enough and a sustainable supply capacity

Automotive fuel perspective



Toyota's diesel fuel scenario



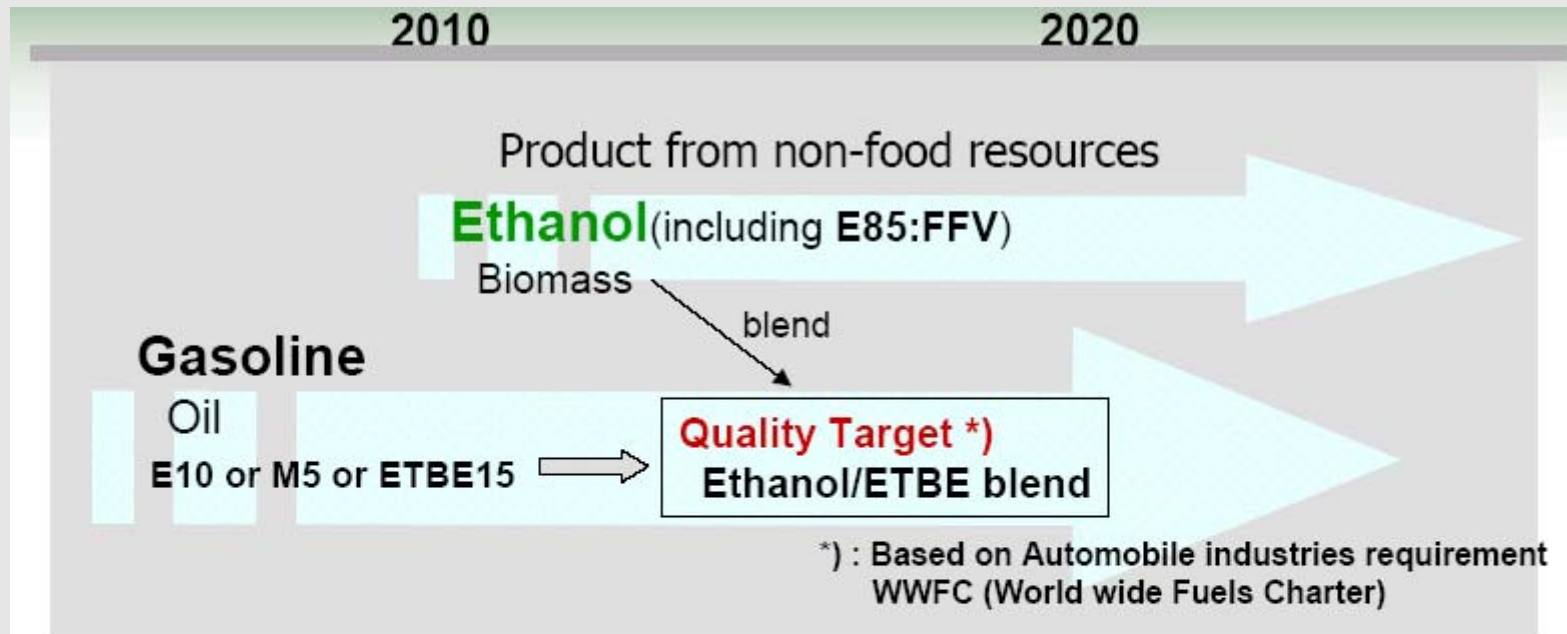
Short term :

- Cleaner properties (S, Aromatics, CN) for emission reduction.

Long term :

- Introduce FTD to reduce automotive fuel diversity.
- Expand usage of BTL to reduce CO2 and improve vehicle performance

Toyota's gasoline scenario



Short term :

- Continue lowering sulfur to expand NOx Catalysts usage.
- Limit ethanol blend in gasoline is E5/E10.

Long term :

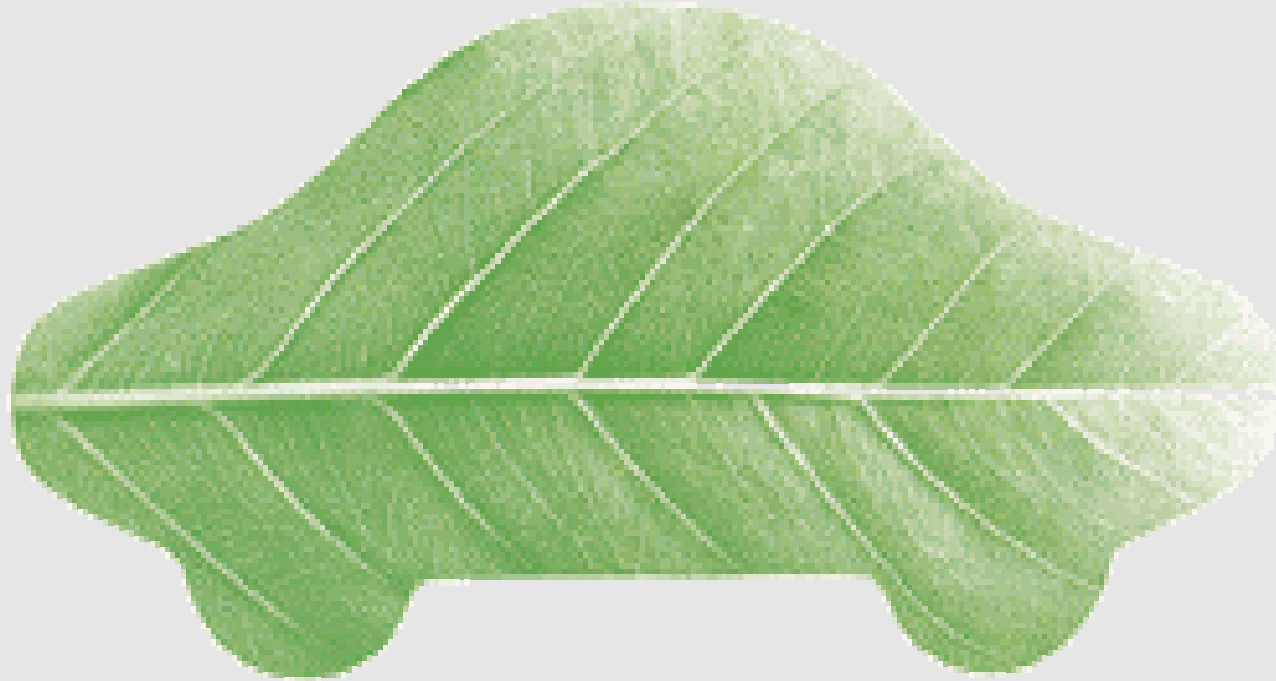
- Higher Ethanol blend (CO2 reduction & High RON)

Government

- Consistent and long-term policy approach based on sustainable mobility criteria (e.g. emissions, safety, access to mobility, affordability, competitiveness)
- Harmonised car taxation in Europe (CO₂ based) (vehicle excise duty, company car tax)

Conclusion – impact of oil price & CO₂

1. Consumer awareness & behaviour is unclear (no major changes)
2. Further Technology & fuels development is important for Toyota
 - Revamping of the entire **engine** and **transmission** line-up
 - Making **hybrid vehicles more widespread** and developing new technologies
 - Doubling number of hybrid models
 - Plug-in hybrid
 - Initiatives towards the **diversification of energy sources**
 - Bio-ethanol / Flex Fuel Vehicles (FFV)
 - Fuel cell development
3. Government support needed



Thank you for your kind attention !

Economic impact of rising oil prices

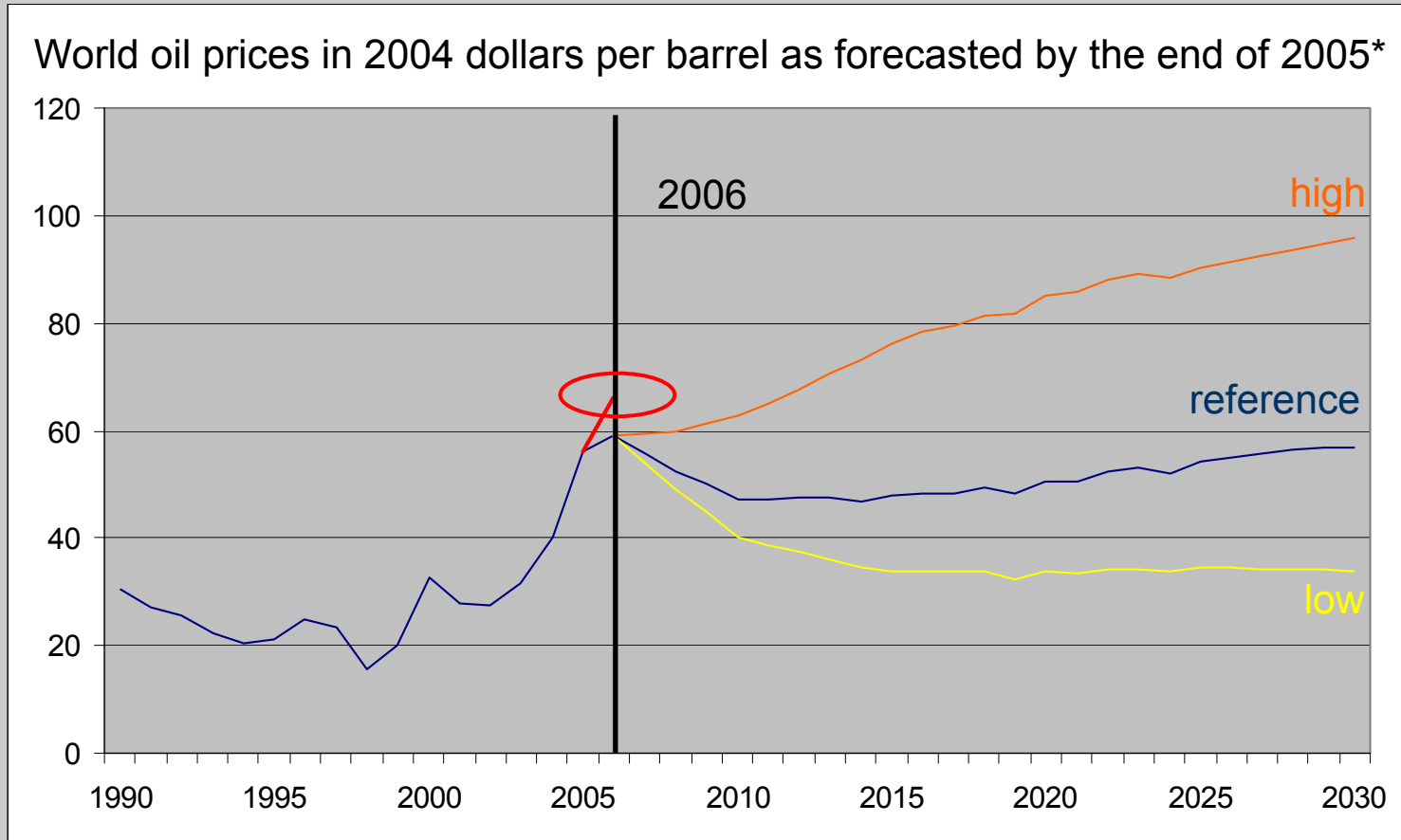
Microeconomic consequences of rising oil prices, competitiveness and taxation

28th June 2006

Key data January – December 2005

Volkswagen Group		2005	Change %
Deliveries to customers	th. vehicles	5,192	+ 1.0
Production	th. vehicles	5,219	+ 2.5
Workforce	thousand	344.9	+ 0.7
Production sites		44	
- thereof in Europe		31	
Sales revenue	million €	95,268	+ 7.1
Profit after tax	million €	1,120	+ 60.7

Development of oil prices



high = world conventional crude oil resource base is 15 percent smaller than the USGS mean oil resource estimate, production more costly, OPEC contribution to total oil production = 31%

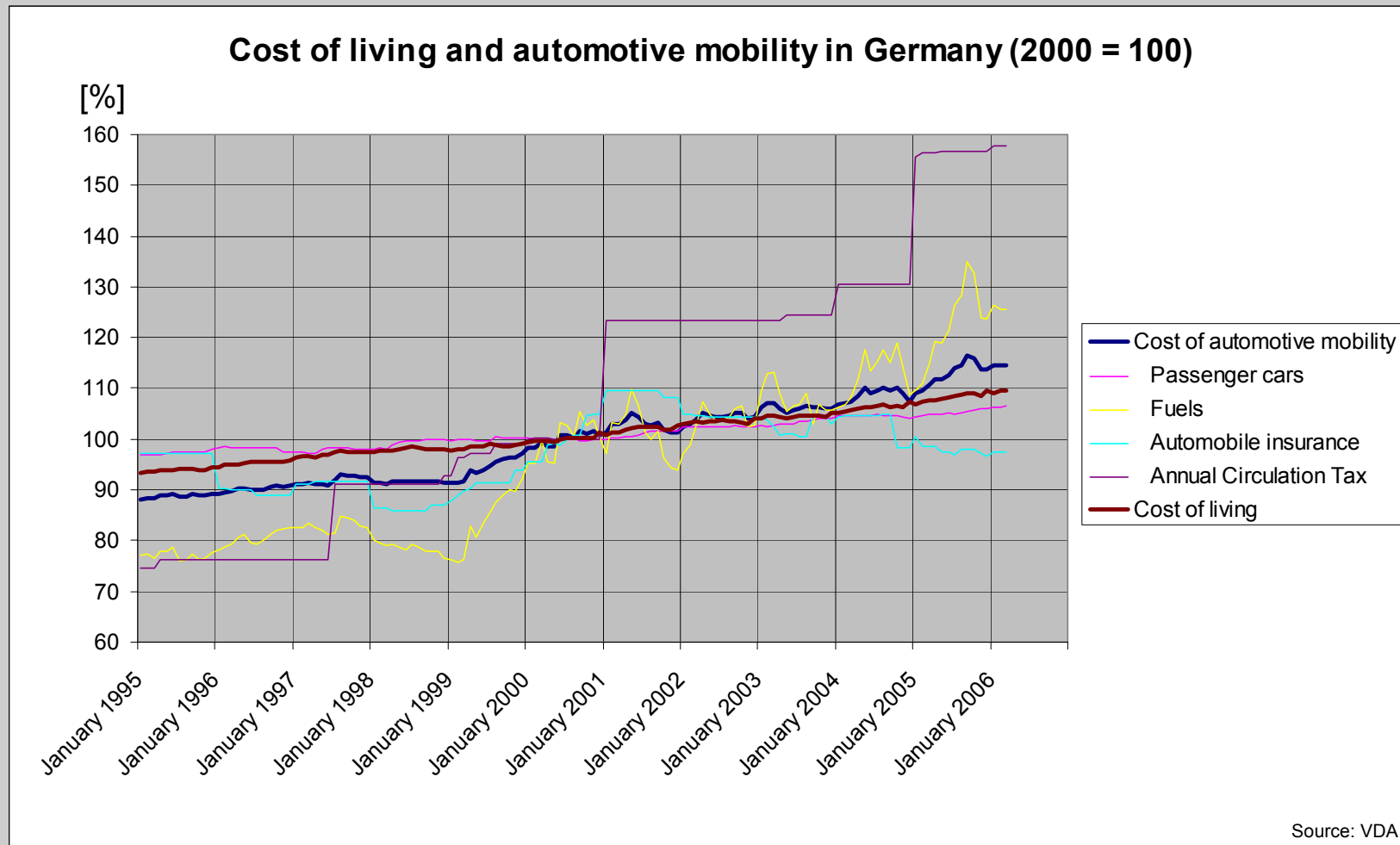
low = world conventional crude oil resource base is 15 percent larger than the USGS mean oil resource estimate, cheaper production, OPEC contribution to total oil production = 40%

* weighted average price of all crude oil containing less than 0.5% sulphur by weight that is imported by US oil refiners

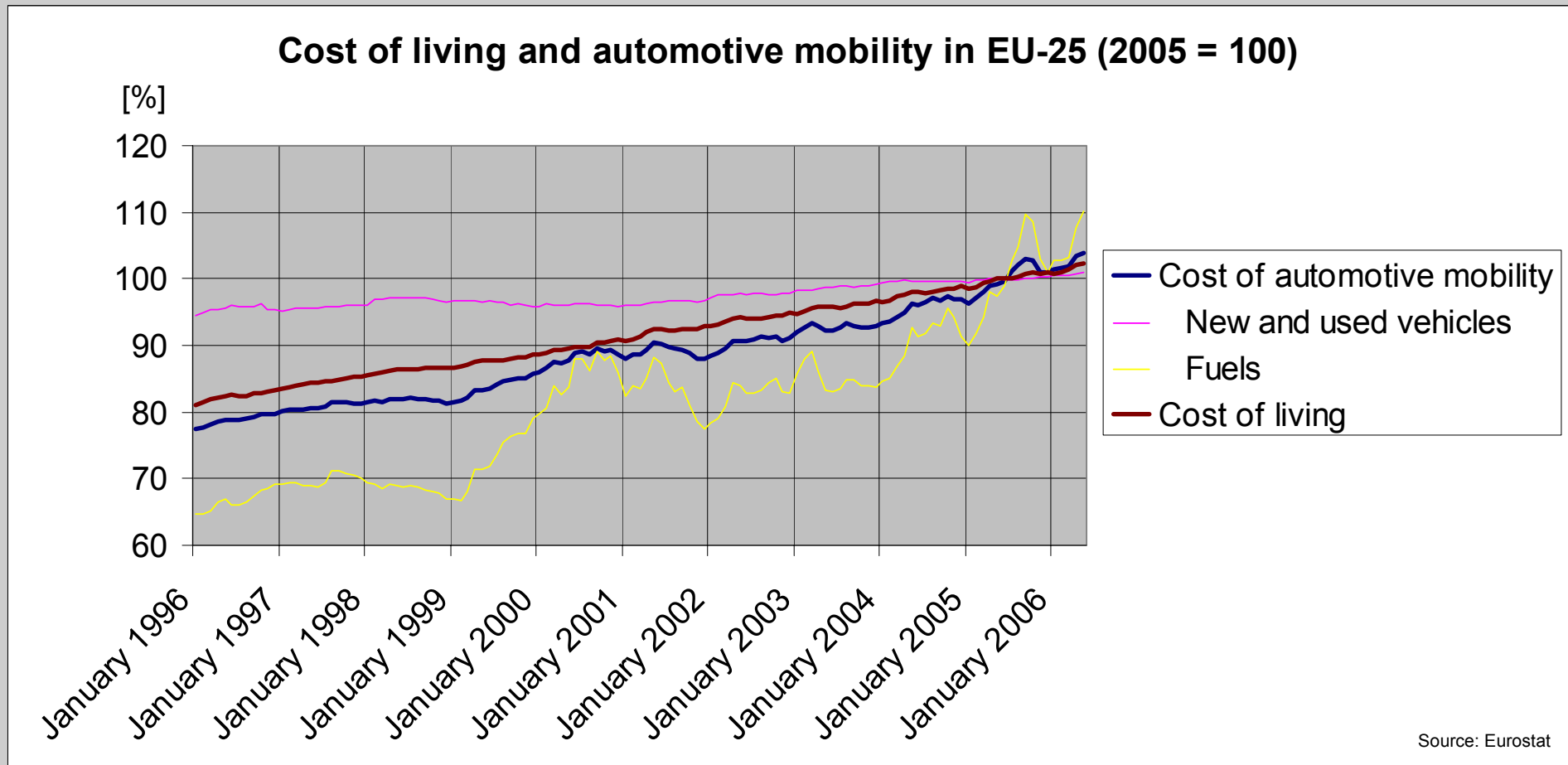
USGS = U.S. Geological Survey

Source: Energy Information Administration – Official Energy Statistics from the U.S. government

Cost of automotive mobility – Germany



Cost of automotive mobility – Europe



Operating costs of mobility within EU-25 have increased above average, by 34%, in the last decade while the costs of living have only risen by 26% in the same period.

Cost of automotive mobility

The cost of automotive mobility is influenced by several developments:

- ▶ Fuel prices
- ▶ Fuel taxation system
- ▶ Car taxation system
 - The taxation system should be harmonised throughout the EU.
 - At present, there are luxury tax, registration tax and additional taxes in several countries.
 - The car taxation system is currently based on different aspects within the EU (cylinder capacity, CO₂ performance, kilowatt, exhaust emissions, fuel consumption, weight).
- ▶ Road pricing
- ▶ Vehicle prices which are heavily influenced by requirements on vehicle characteristics set out by EU regulation, e.g. in the areas of CO₂, safety and recycling.





Integrated Approach

=

**achieving goals in the most
cost-efficient way**

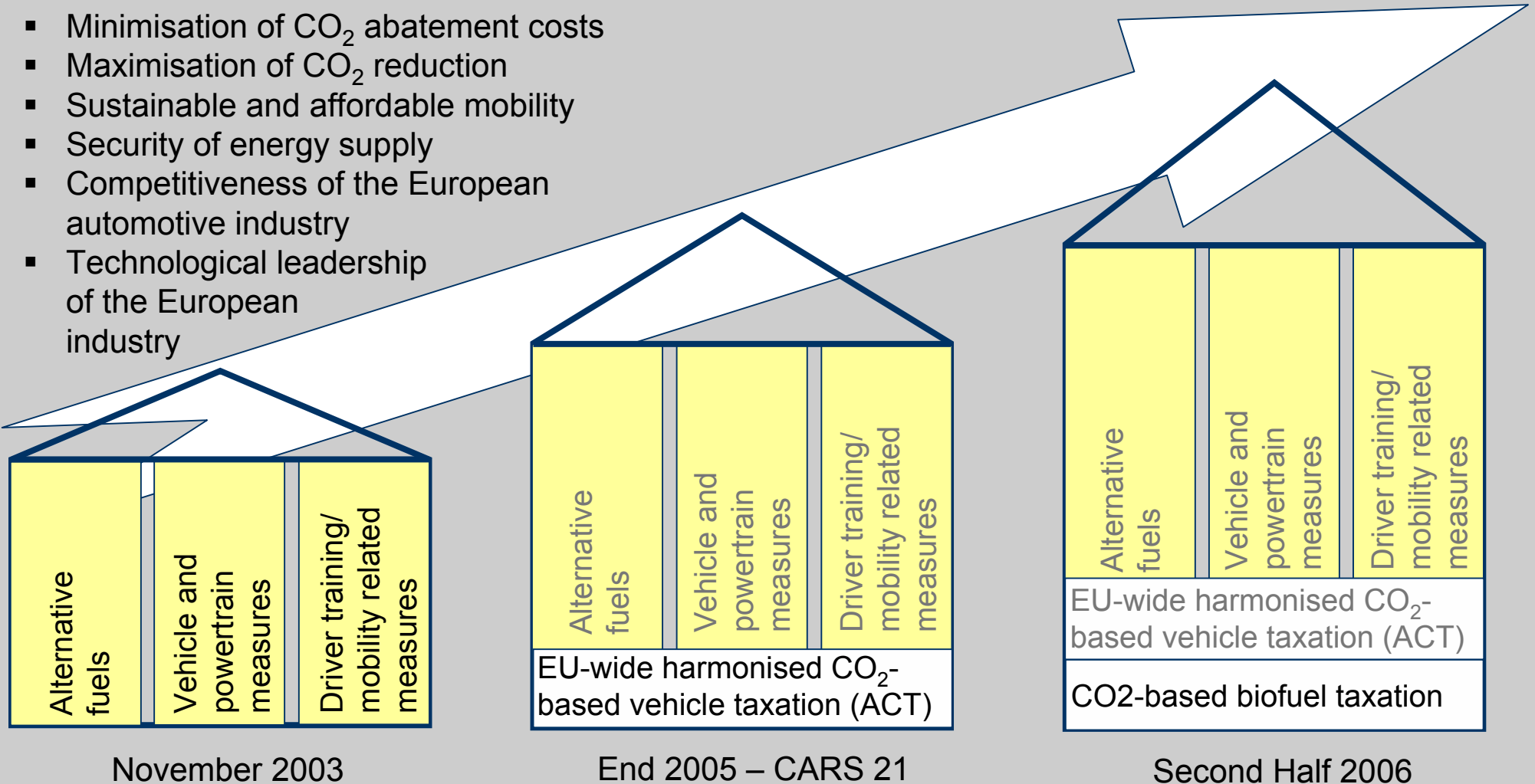
**(macroeconomic minimisation of costs impacting
on the microeconomic situation, e.g. in the area
of CO2 reduction)**

CO₂ – Climate Protection 2008 – 2012

Evolution of the ACEA Integrated Approach (as in June 2006)

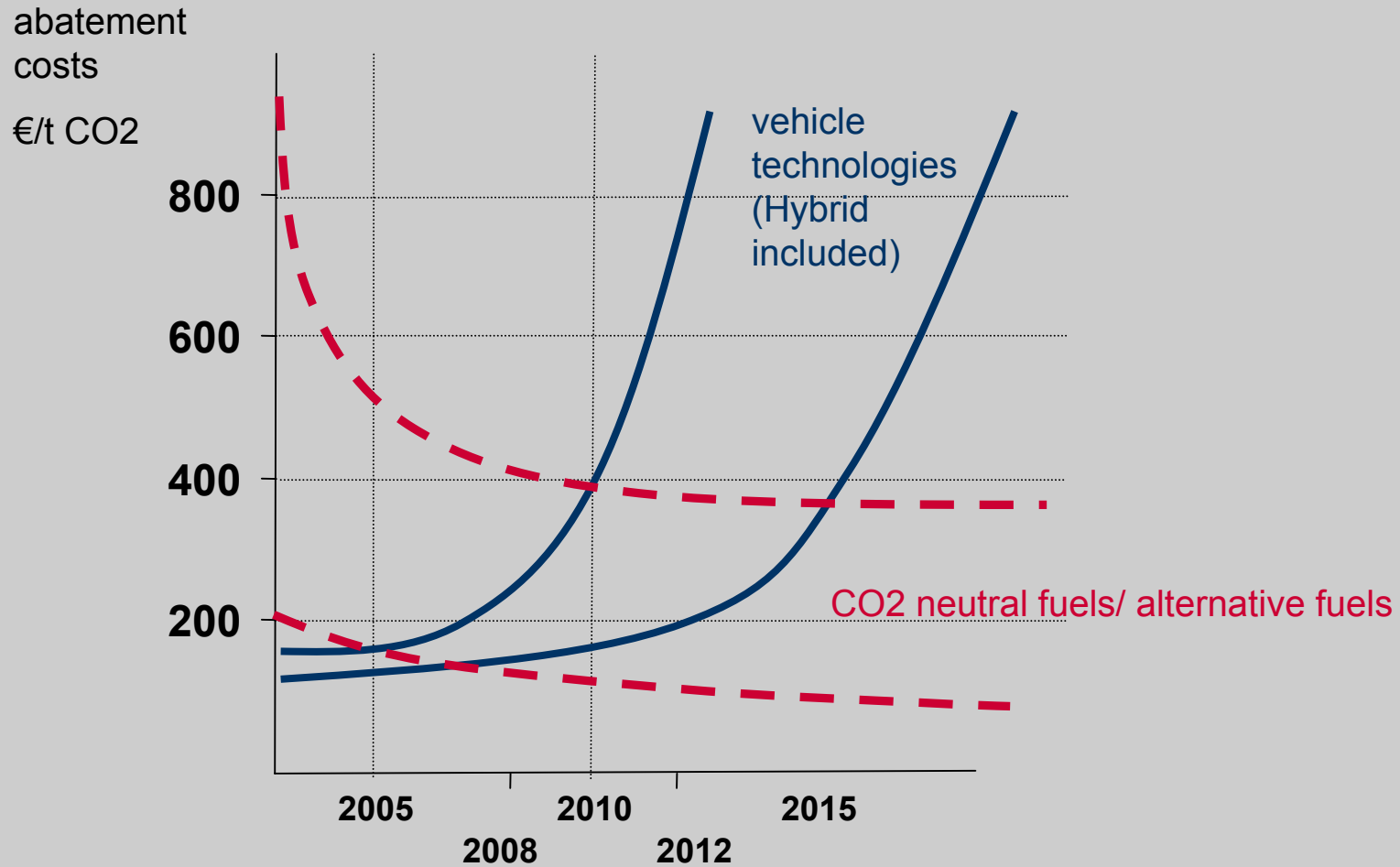
Objectives of the Integrated Approach as a multi-stakeholder-approach:

- Minimisation of CO₂ abatement costs
- Maximisation of CO₂ reduction
- Sustainable and affordable mobility
- Security of energy supply
- Competitiveness of the European automotive industry
- Technological leadership of the European industry



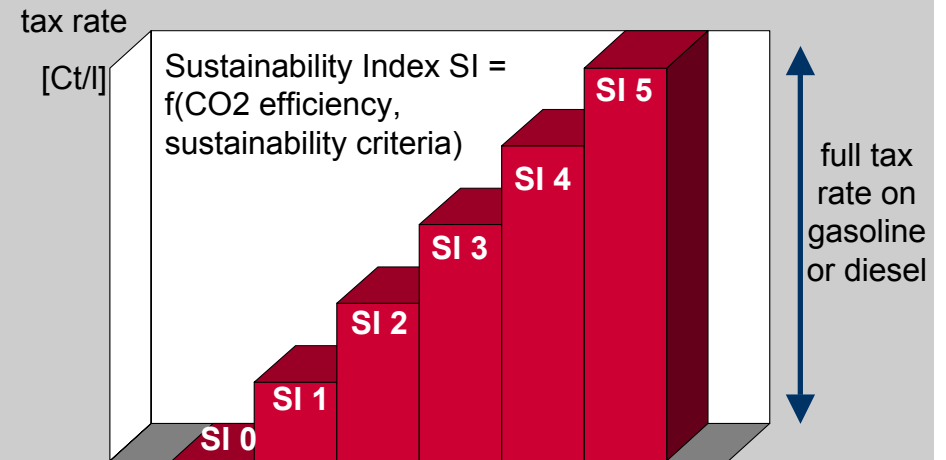
ACEA CO₂ agreement

Structural characteristics of CO₂ abatement costs (societal costs) with increasing CO₂ reduction, as in June 2006



Biofuel taxation – Proposal VW

- Comprehensive and market-driven incentive system, level-playing field for 1st and 2nd generation biofuels.
- Avoidance of excessive incentives and of a long-term misallocation of economic resources.
- Long-term framework conditions, only gradual alteration through re-evaluation of sustainability in order to ensure the investments made.
- Basis for the harmonisation of fuel taxation within the EU/ at present: amendment of the directive on biofuels.



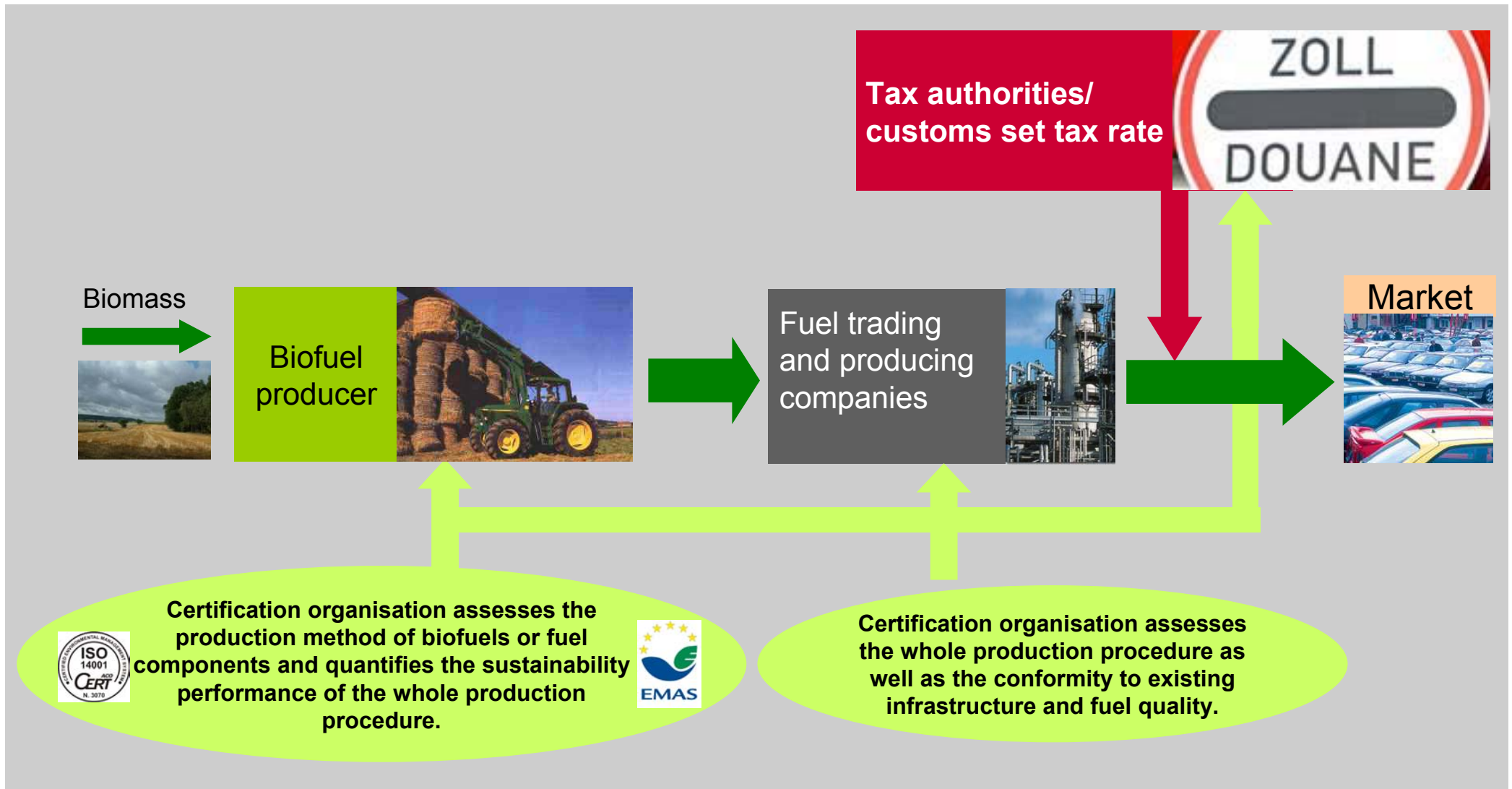
Sustainability Rating for biofuels according to their:

- CO2 efficiency (WtT)
- sustainability criteria (biodiversity, avoidance of rainforest deforestation, reduction of the use of fertilisers and pesticides, complexity of supply etc.)
- Classification into sustainability classes (e.g. six SI classes*) as a basis for taxation (full tax rate ↔ highest tax allowance).
- Obligation to produce certification on SI classes is with the biofuel producer.

* SI Sustainability Index

Biofuel taxation

Certification and taxation practices



Conclusion

If the current development continues, the economic challenge for the consumer will be to earmark an increasing part of the budget for mobility.

Against the background of a constant purchasing power, the rise of automotive mobility costs leads to an increasing risk for the competitiveness of the European automotive industry and European growth and employment.

Request: No further increase of mobility costs.

- ▶ **Lean and Better Regulation – Enforcement of CARS 21.**
- ▶ **Integrated approach in order to achieve objectives in the most cost-efficient way.**
- ▶ **EU-wide harmonisation of passenger car taxation.**
- ▶ **Market introduction of and level-playing field for biofuels as an accompanying measure in order to contain the crude oil market's speculative elements.**

Session II

Part 2: Geopolitics and Security of Supply



Geopolitics and security of supply

Presented by
Dr. Hasan M. Qabazard
Director, Research Division, OPEC

European Parliament, Brussels
June 28, 2006



- ⇒ **This is so fundamental to life in the 21st century that every effort should be made to:**
- **Clarify its meaning**
 - **Gain a consensus on it**
 - **Embody its true principles in decision-making across the energy sector**



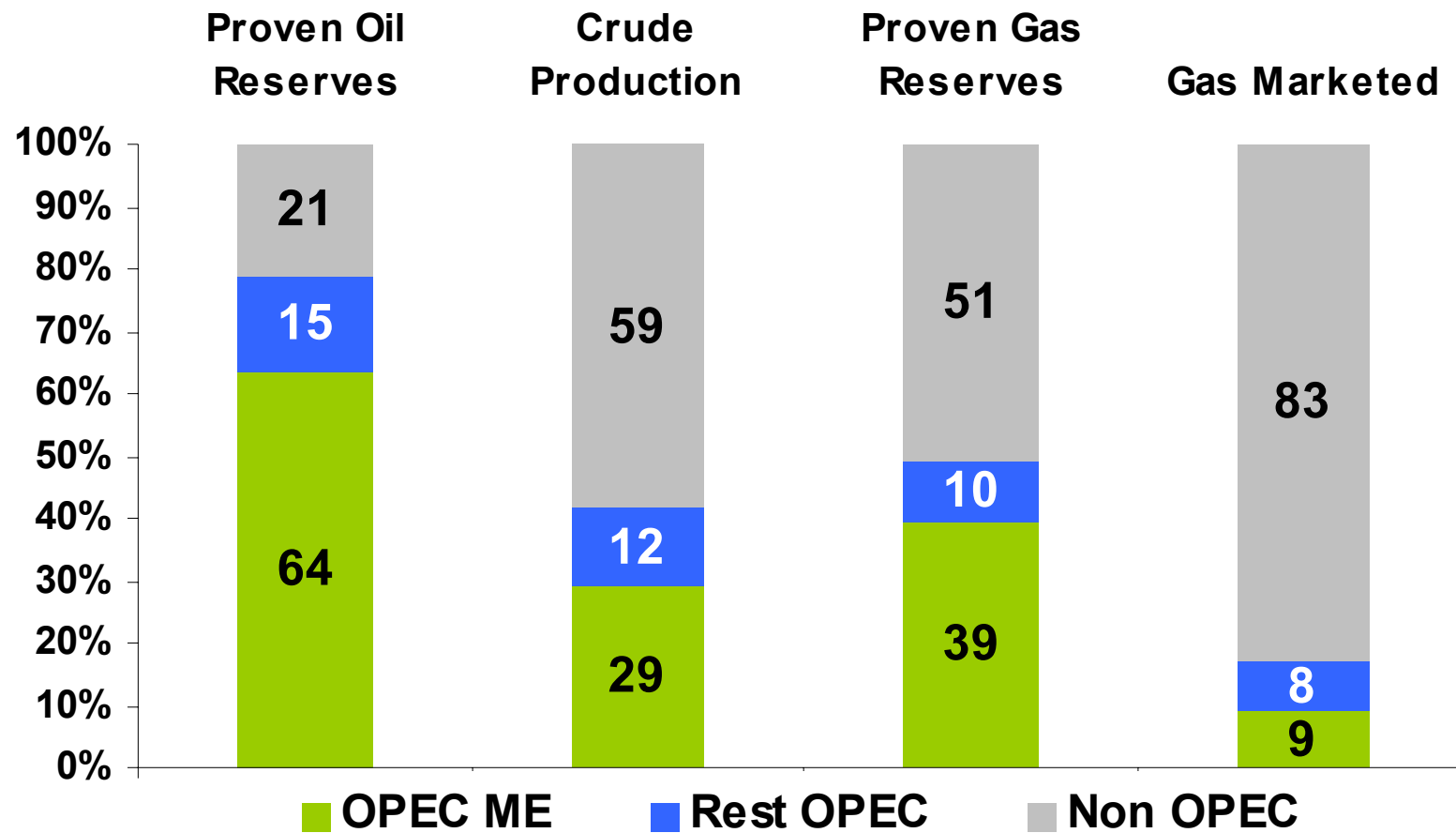
This should ...

- **Be reciprocal – security of demand is as important as security of supply**
- **Apply to all energy sources free from prejudice**
- **Extend across the entire supply chain**
- **Cover all foreseeable time-horizons**
- **Focus on the most modern products, with the highest environmental standards and latest technology**
- **Apply to rich and poor nations alike**
- **Be openly receptive to dialogue and cooperation**

OPEC oil and gas reserves versus production



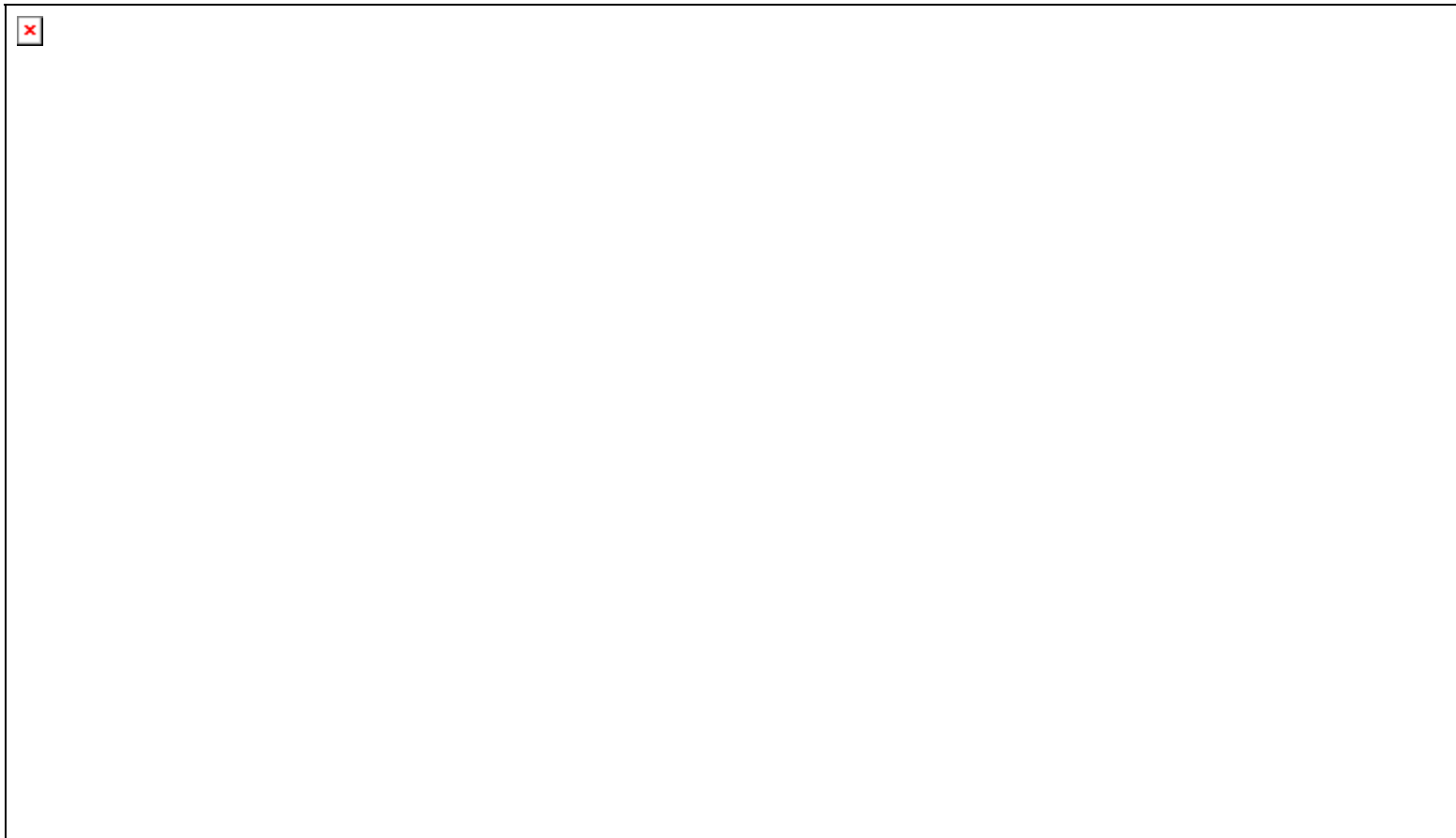
- Proven oil reserves 897 billion barrels > 78% of world share
- Crude oil production 30 million barrels a day about 42% of world share
- Crude oil exports > 21 million barrels a day > 50% of world share



There is considerable uncertainty over how much oil OPEC will need to produce (mb/d)

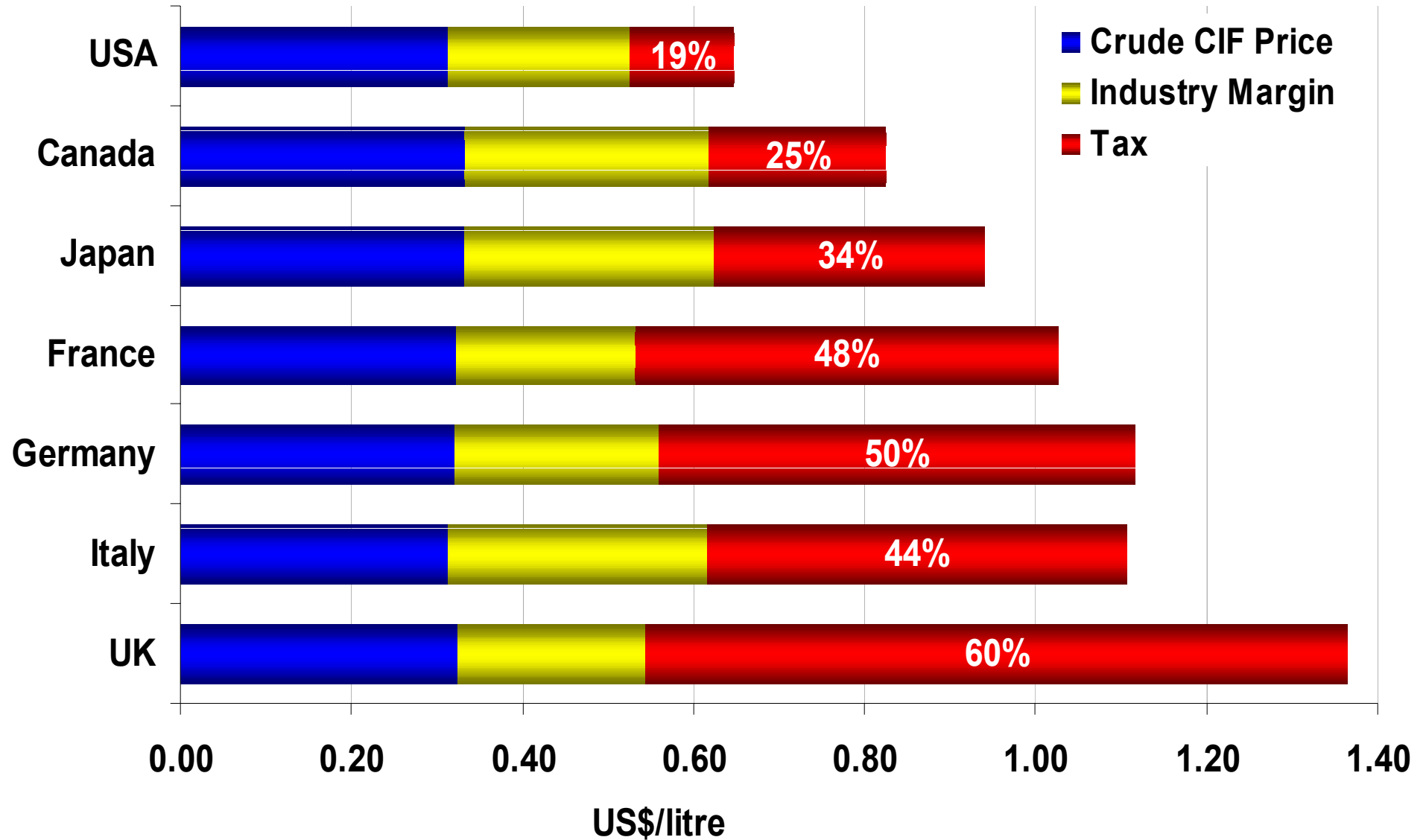


- **Significant uncertainties with substantial downside risks.**
- **Considerable implications on the scale and timing of investments!**
- **“Road-map” for oil demand is called for!**



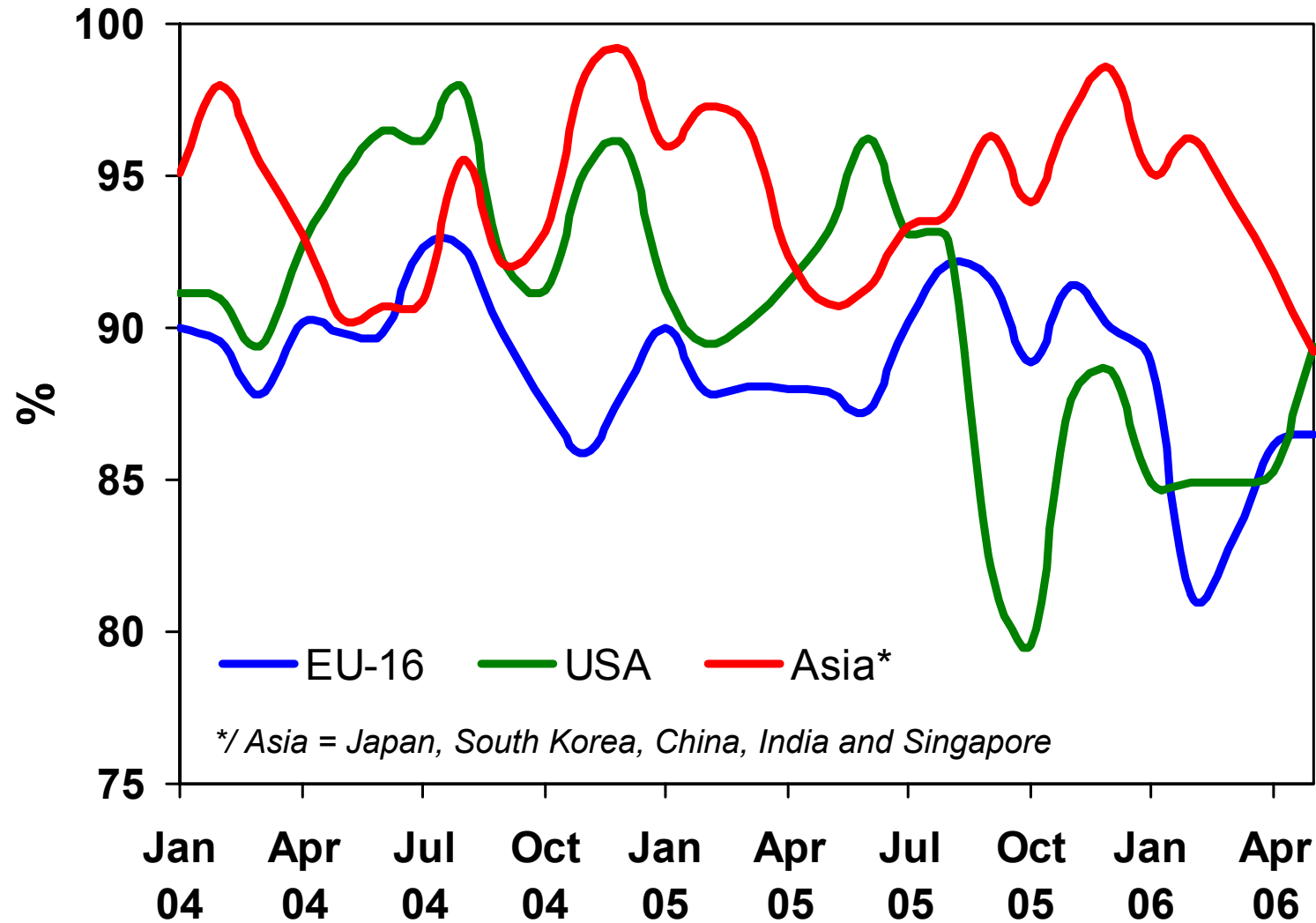
Taxation of oil products

Diesel prices and taxes, December 2005



Supply chain tightness: downstream bottlenecks

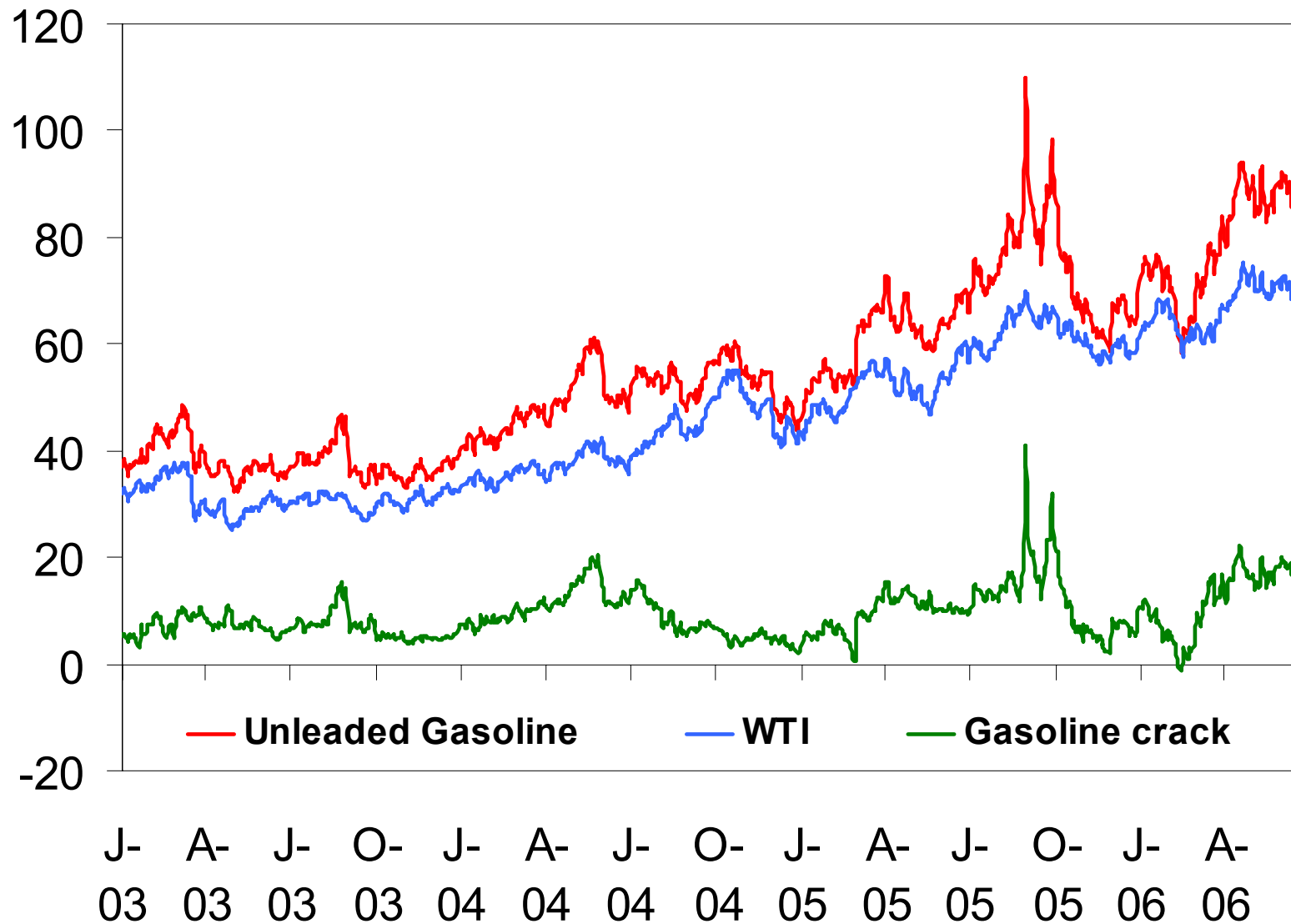
High capacity utilization rates



Crude oil prices: much affected by products markets, too!



US \$/b





- **The way forward for all players**
- **OPEC continues to make big effort**
- **Widened and deepened in open and constructive manner**

Examples

- **New OPEC energy dialogues with European Union, China and Russia**
- **International Energy Forum, with Joint Oil Data Initiative**
- **Non-OPEC at OPEC Conferences; OPEC and non-OPEC experts' meetings ...**
- **Joint annual workshops organised by OPEC and International Energy Agency**



Follow the path of order and stability in the international oil market.

Adhere to a broader vision, embracing such issues as sustainable development and environmental harmony.

In this way, it would be possible to imbue the industry with an enriched experience of energy security.



OPEC

Thank you

www.opec.org



Stability in the oil market



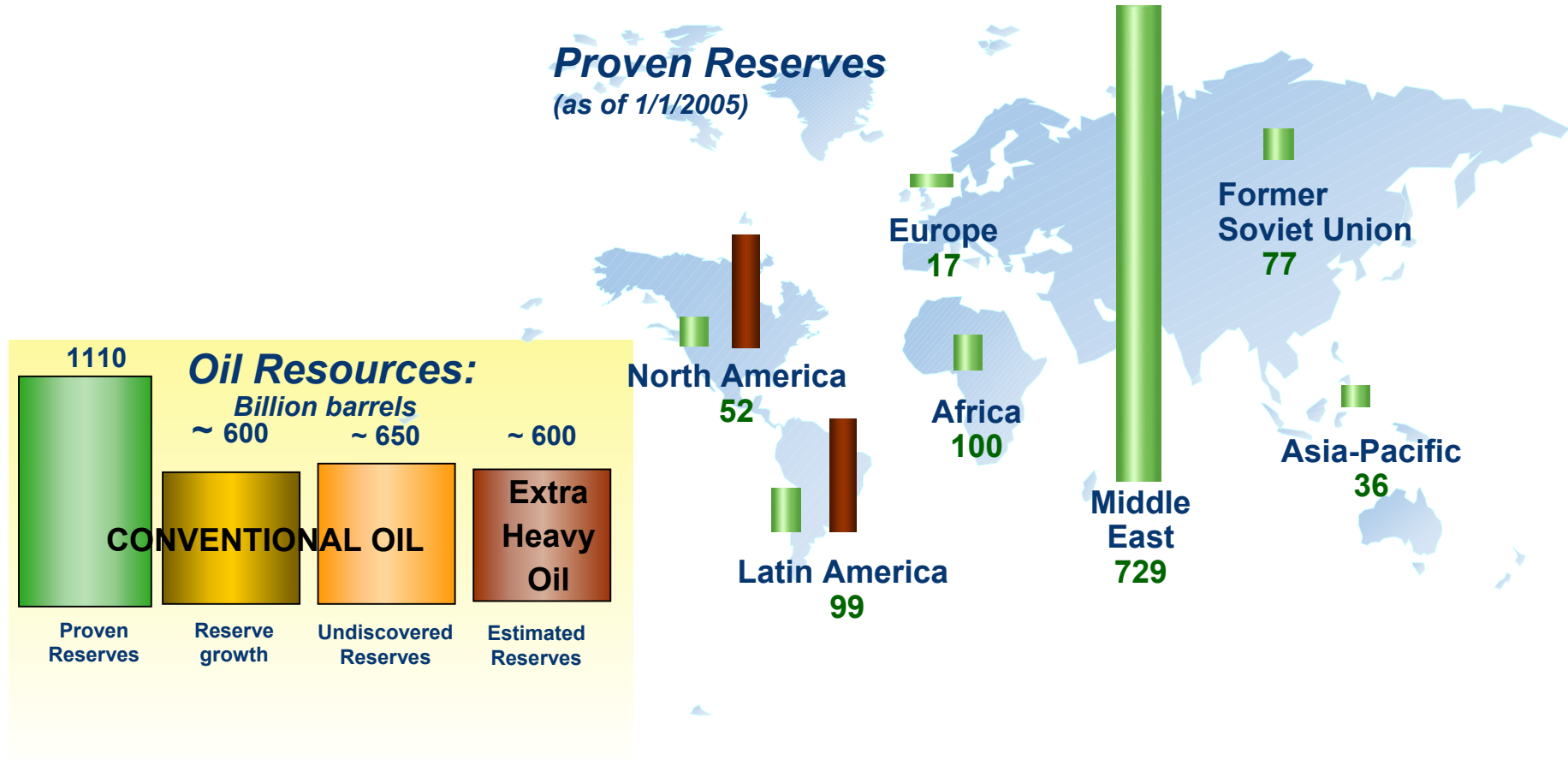
TOTAL

Workshop on the impact of oil prices
Session on Geopolitics and Security of Supply
European Parliament
Bruxelles 28 June 2006

Pierre Sigonney

DSER/DSP
June 28, 2006

Proven oil reserves cover today more than 40 years of demand...



... but are very concentrated in the Middle East

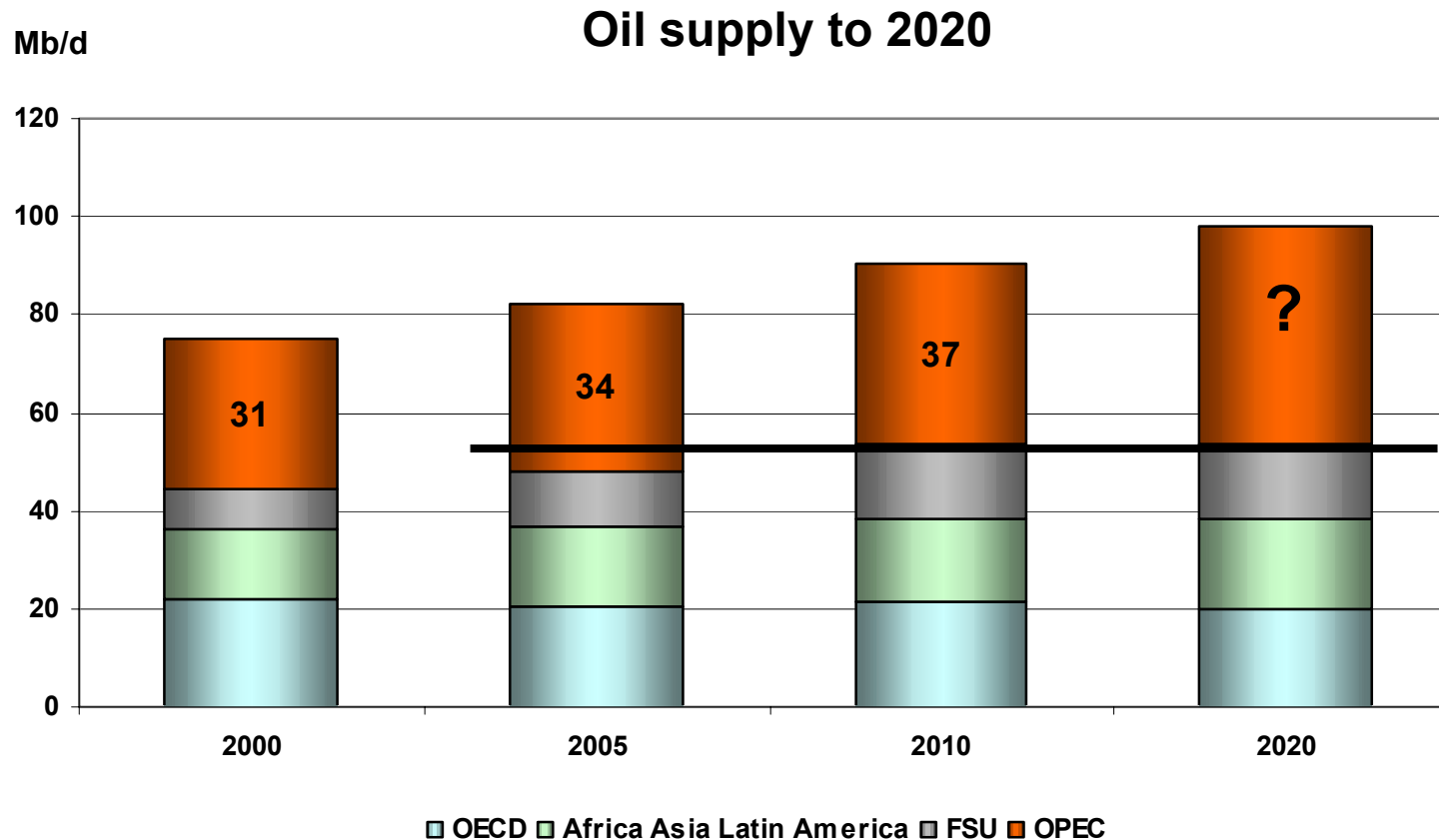
Source: O&G Journal, USGS 2000, IEA

Émetteur

30/06/2006

Page 252 of 291

After 2010, a growing dependence on OPEC production



- A significant decrease in OECD oil supply after 2010
- Global production from non OPEC should be at best stable after 2010
- OPEC decisions will define oil supply (growth in Irak, extra-heavy oil in Venezuela...)

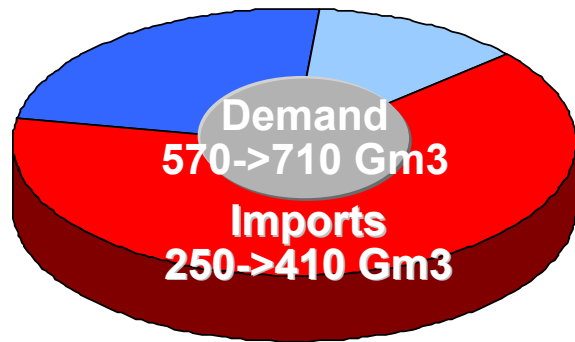
Gas supply in Europe relies on diversification and high investment

Gas flows in 2005 and 2015



Source : Total

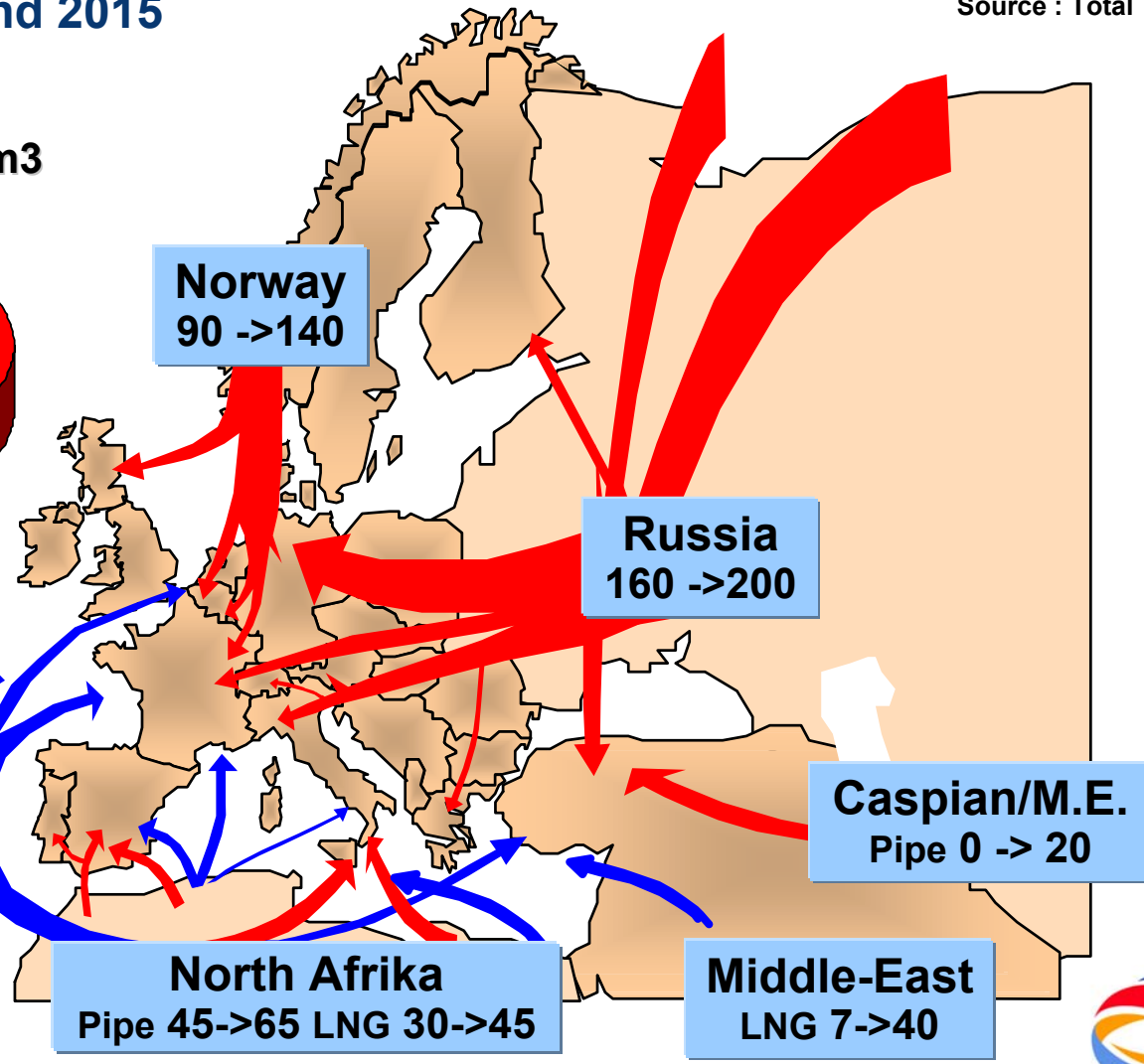
Production excluding Norway
240->160 Gm3

Norway
90->140 Gm3



Atlantic LNG
Nigeria, Trinidad
10 -> 30

 LNG
 Pipelines
 Billions of m3



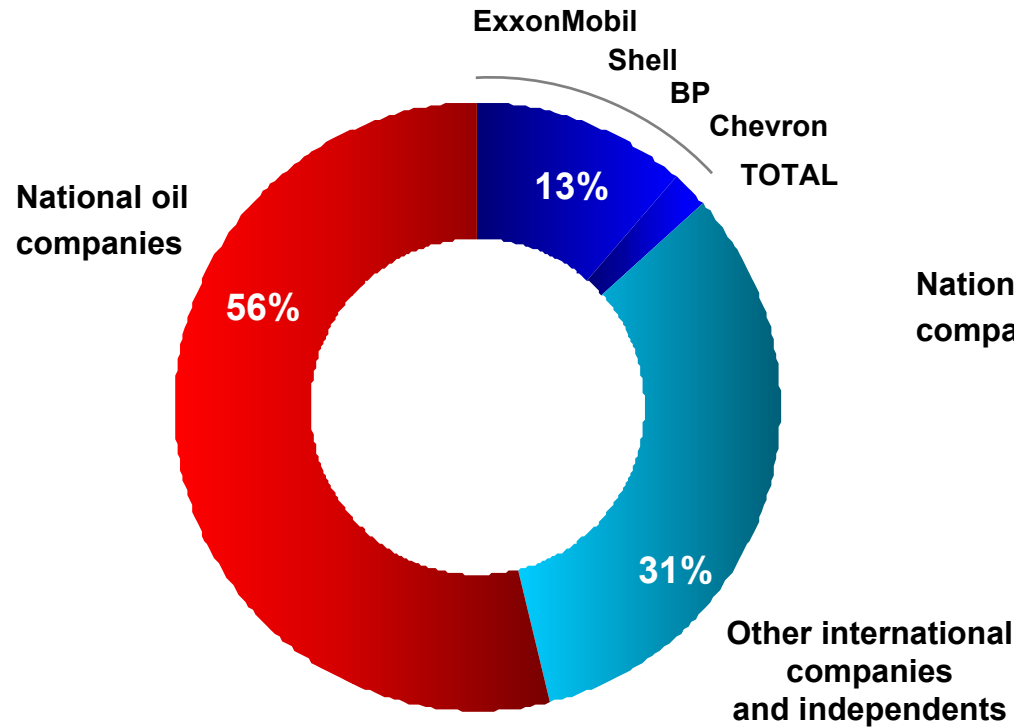
Émetteur

30/06/2006

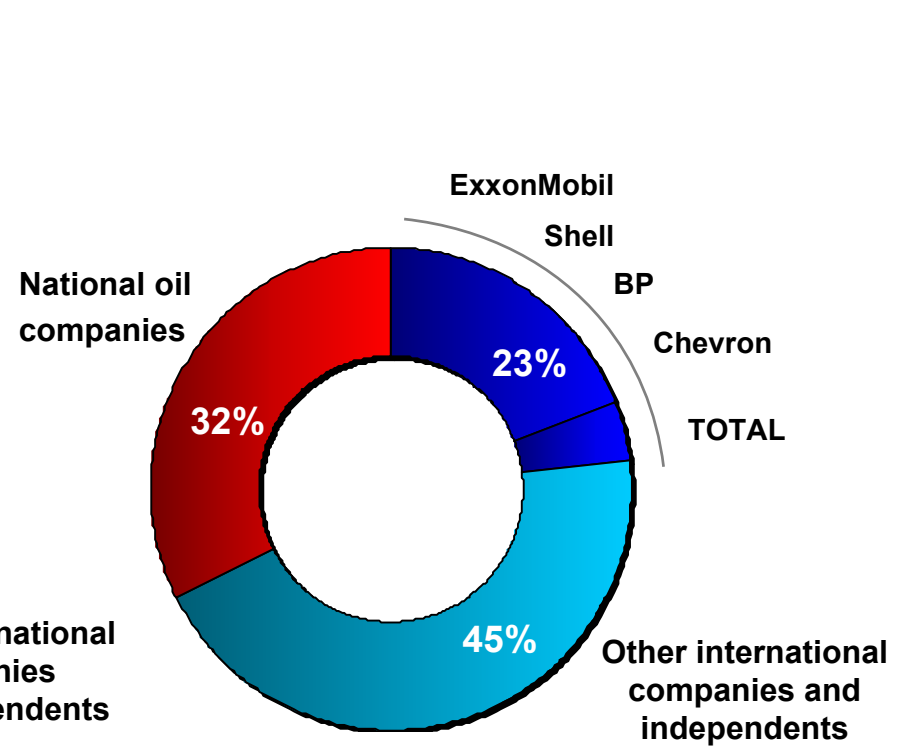


Oil & gas majors : small players in terms of production, big players in terms of investment

World oil production in 2005
(82 million barrels per day)



Global E&P capex in 2005
(\$225 billion)



5 Majors:

- 13% of oil production
- 23% of E&P capex

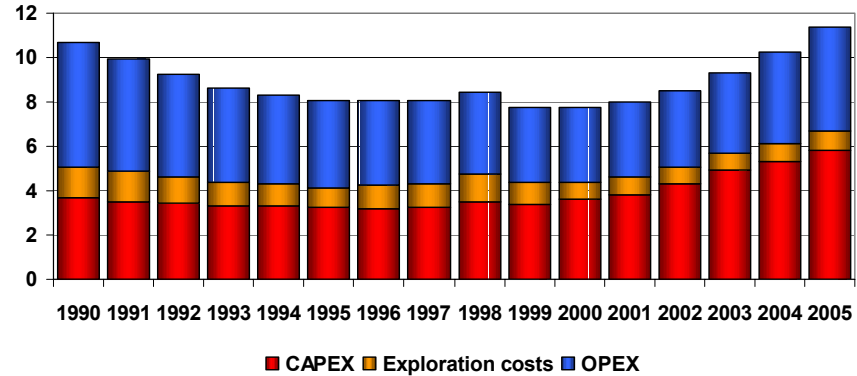
Source: Reported data, Total estimates.

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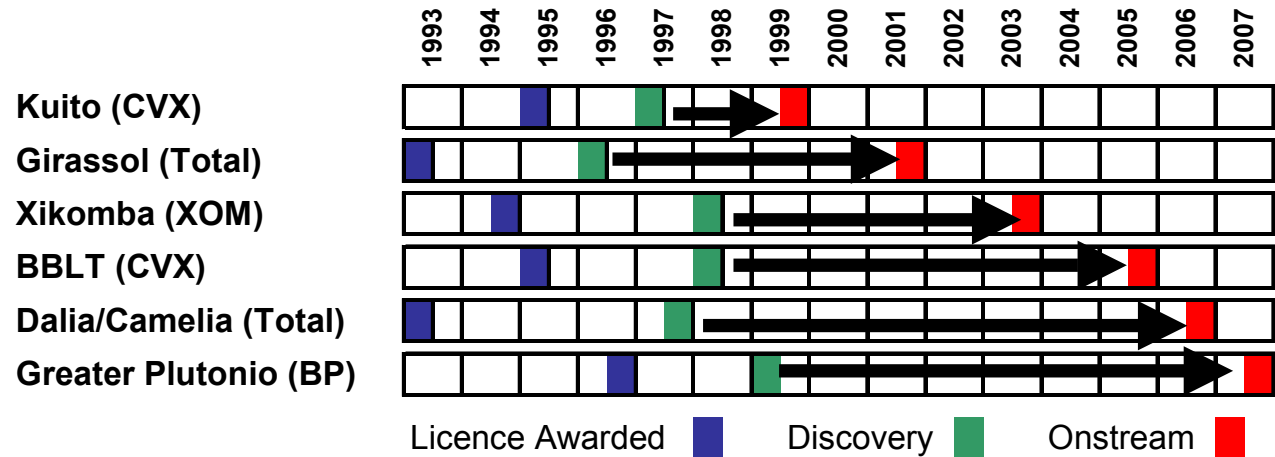


International companies : increasing field complexity is driving up technical costs and project timescales

Oil & gas technical costs: \$/b



Angola oil projects timescales:

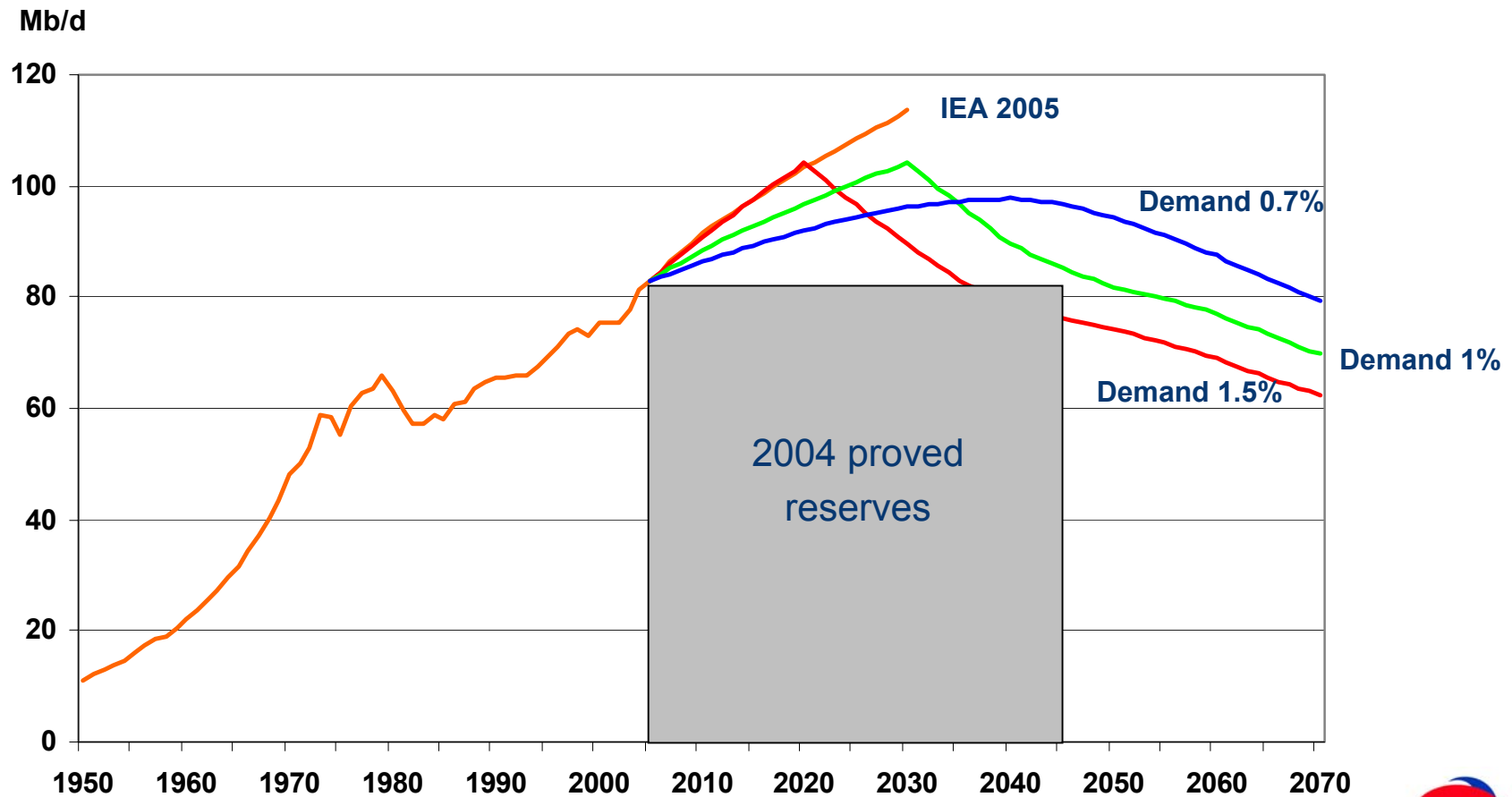


Notes: Technical costs: consolidated subsidiaries (FAS 69); Wood Mackenzie data on development timescales



Slowing demand growth would help manage the tensions on oil markets

Reducing oil demand growth to less than 1% per annum would be the best solution. But is it realistic?



Source: IEA, TOTAL

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TOTAL

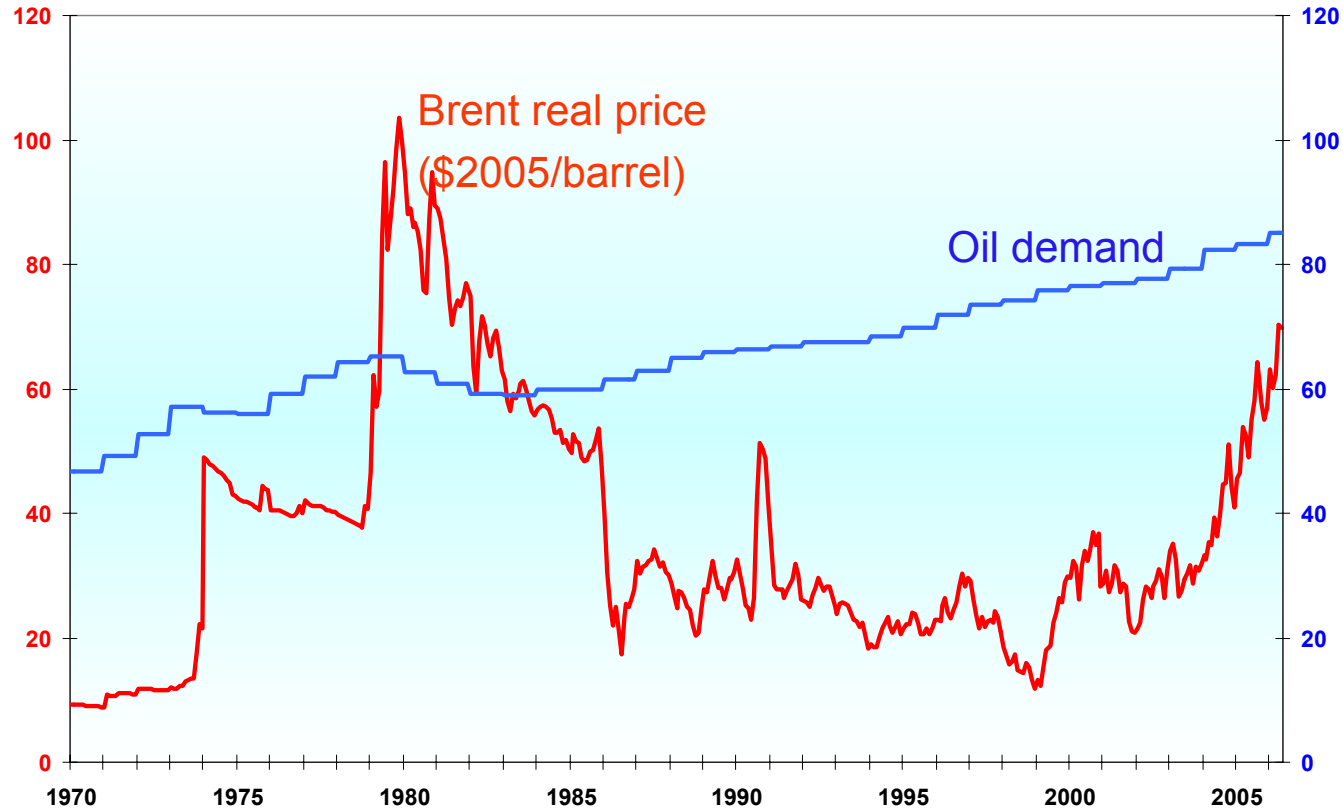
Back up

DSER/DSP
June 28, 2006

Oil prices are volatile: today's price is no guide to the future !

\$₂₀₀₅/b (monthly average)

Mb/d



Sources : IEA, Total

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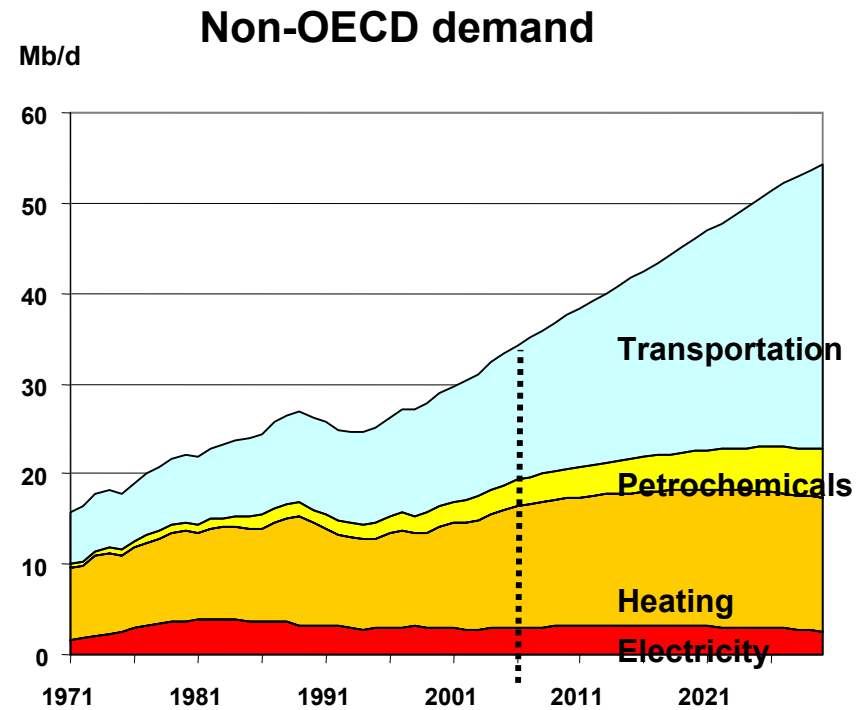
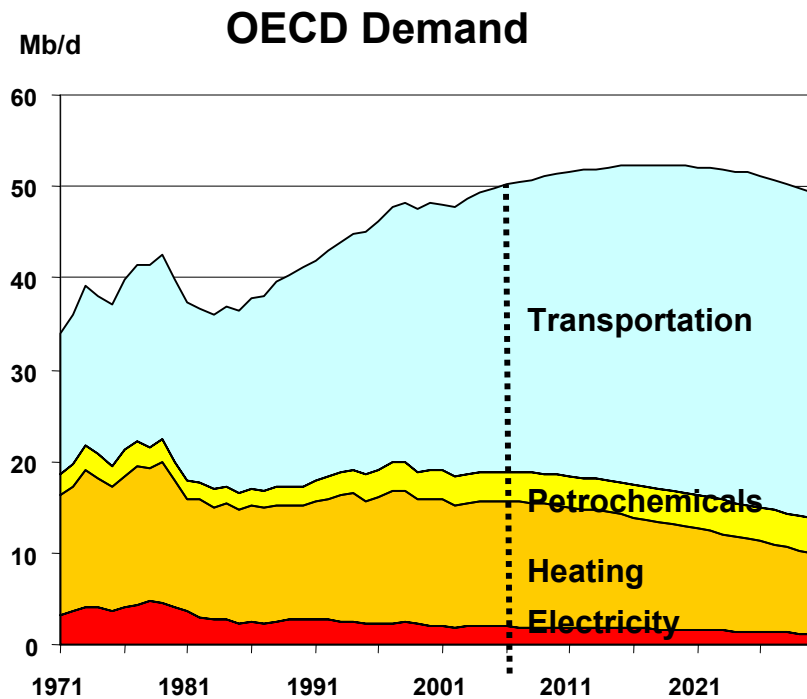
Page 259 of 291



TOTAL

To avoid a crisis, oil demand should stabilise in the OECD to allow demand to grow in the non-OECD

Oil demand growth of 1% over 2005-2020

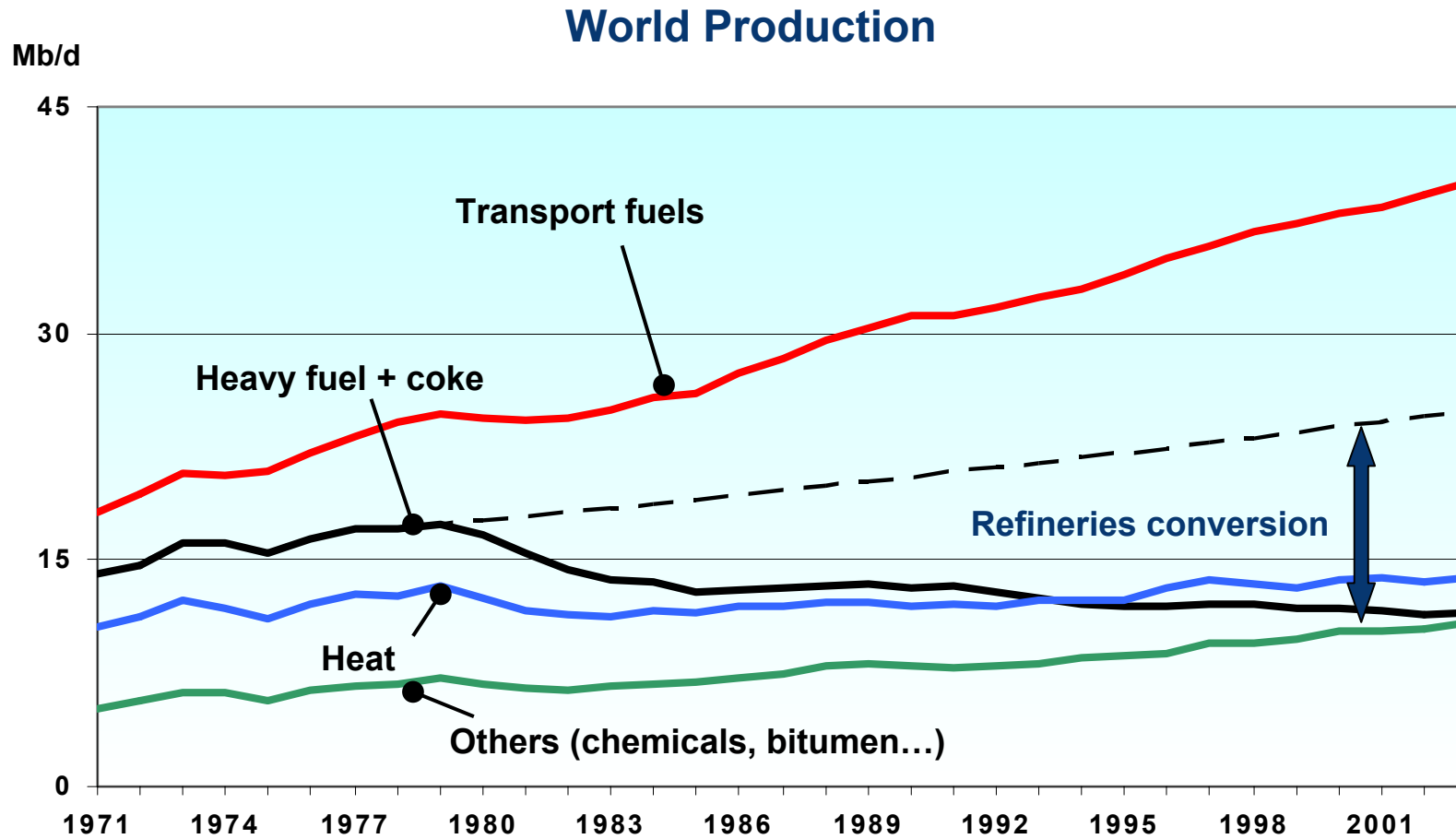


Source: IEA; TOTAL

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A lighter product mix will necessitate new refining conversion capacities



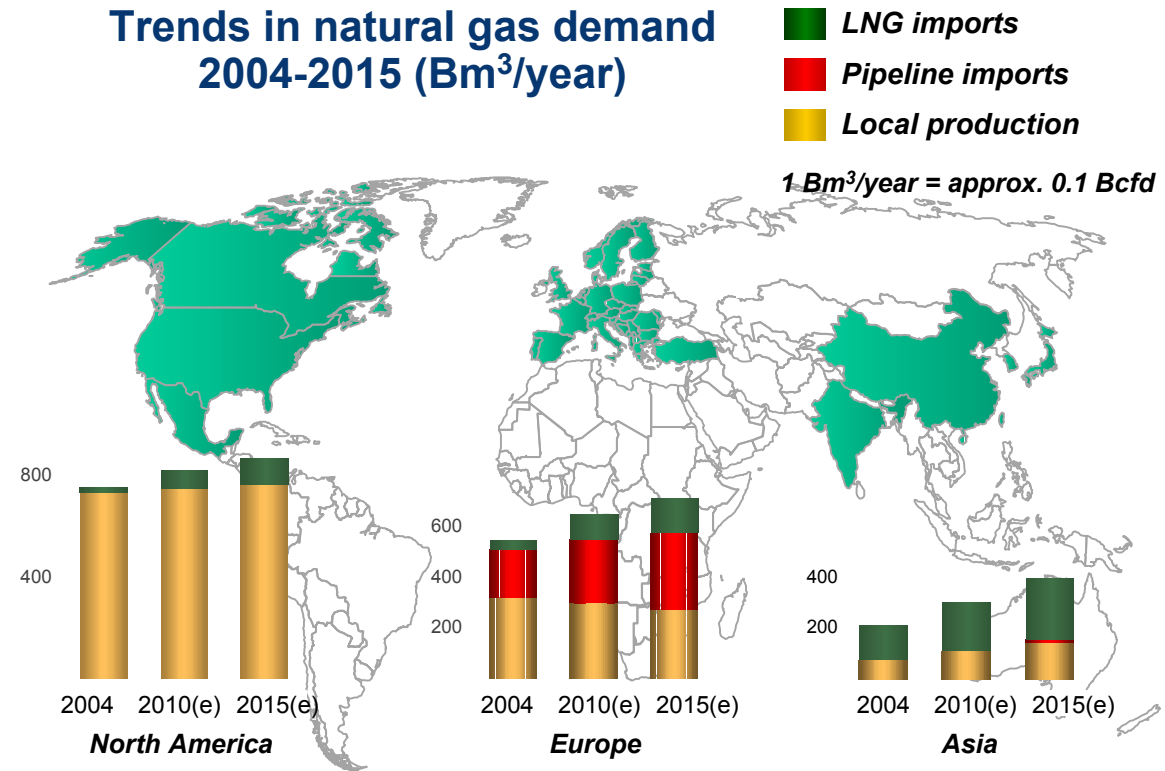
Total is developing a hydrocracker at the Normandy refinery to produce 40 000 b/d of diesel to help answer Europe demand

Source: IEA
Émetteur

The growing role of gas in power production means a global market with a key role for LNG

- Natural gas reserves are relatively abundant - proven reserves equal ~65 years of today's production
- 'Peak gas' should not occur before 2040
- Gas markets are highly reliant on transport logistics - a worldwide gas market requires the development of a strong LNG network

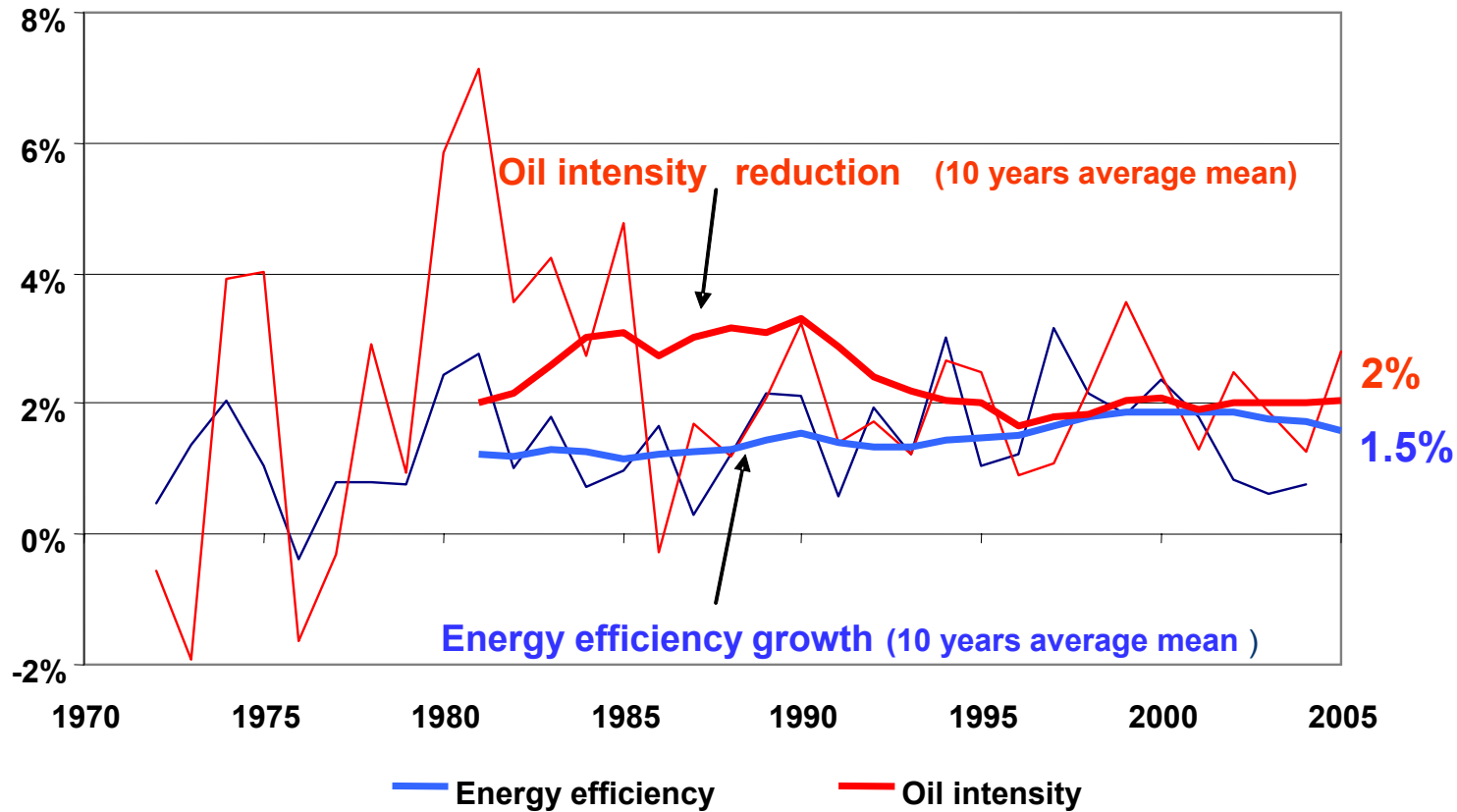
Trends in natural gas demand 2004-2015 (Bm³/year)



Total is a key player in the LNG market with participations in 6 export projects (Qatar, Indonesia, Yemen, Iran, Nigeria, Norway)

Accelerating energy efficiency improvements is necessary for oil and all the other sources of energy

Annual change in energy efficiency*



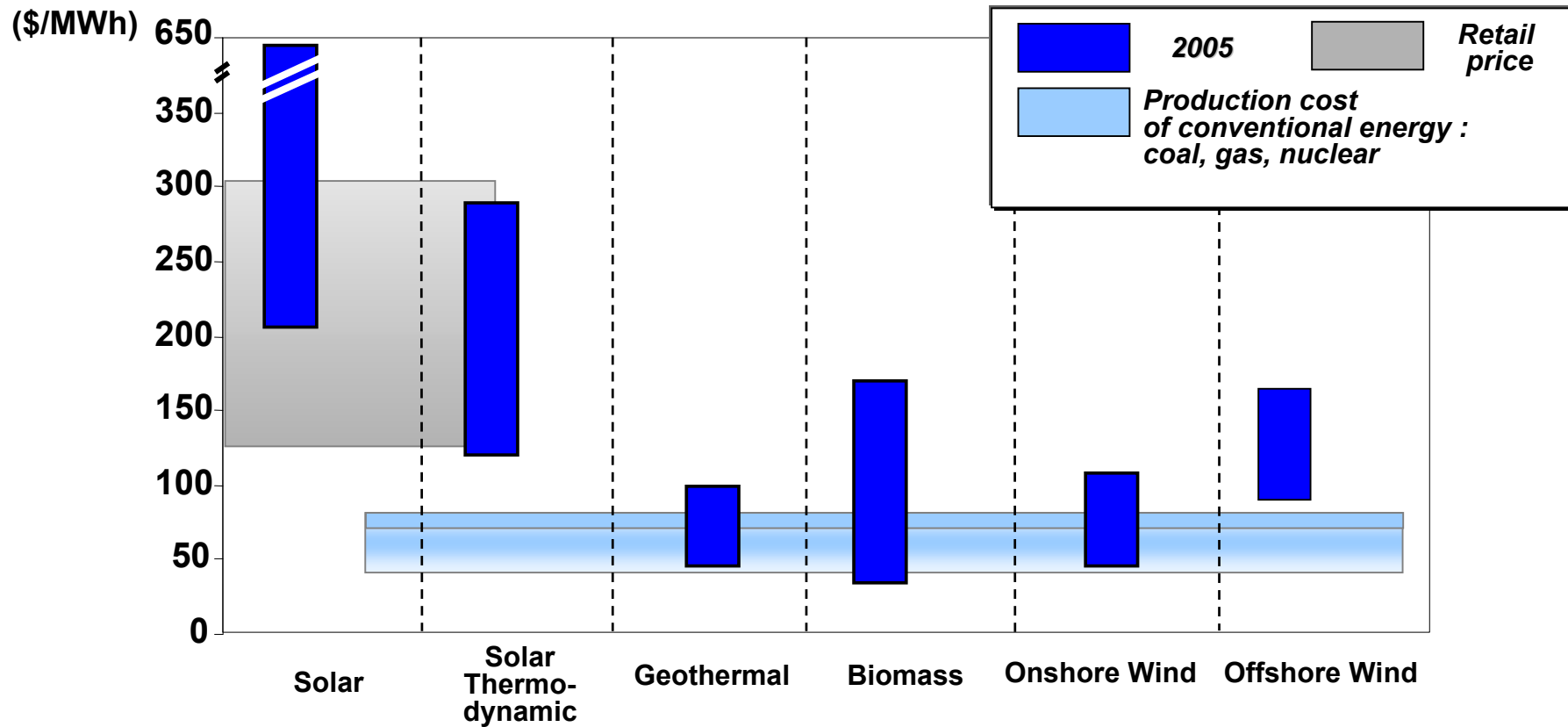
We've been achieving 1.5/2.0% p.a. Can we get to 2.5/3.0% p.a. ?

* Energy efficiency is calculated as the ratio of world GDP, at constant prices, over world energy demand, in tonnes oil equivalent.



Improvements in renewable power generation cost are made to match conventional electricity costs, especially if distribution costs are high

Generation Costs



Sources: IEA, Total

Émetteur

30/06/2006



TOTAL

The Oil-GDP effect and its implications for the deployment of renewable energies and security of supply

Raphael Sauter and Shimon Awerbuch

SPRU, University of Sussex

Workshop on the economic impact of rising oil prices
European Parliament, Brussels 28th June 2006

Sussex Energy Group
SPRU - Science and Technology Policy Research

- **The Oil-GDP effect**
- **Investment in renewable energy as a way to mitigate the fossil fuel price risk**
- **Avoided GDP losses**
- **Implications for security of supply**
- **Conclusions**

The Oil-GDP effect



University of Sussex

- **Oil price increases and volatility dampen economic growth by raising inflation and unemployment**
- **Since the mid 1980s not only oil price levels but also volatility is an important factor**
- **Asymmetric relationship between oil price increases / decreases and GDP**
- **Despite changes in the oil-GDP effect, there is no doubt about the negative impact of oil price fluctuation on GDP**
- **Doubling in oil prices reduces GDP by around 5% - however very different for individual countries:**

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Oil-GDP effect: % GDP change for oil price doubling



Importers		Exporters	
Country	GDP Elasticity	Country	GDP Elasticity
Taiwan	-8.4 %	Indonesia	-4.3 %
Hong Kong	-6.5 %	Malaysia	-5.6 %
Japan	-5.8 %	Norway	5.1 %
South Korea	-8.7 %		
Philippines	-3.6 %		
Singapore	-4.2 %		
Thailand	-8.4 %		
France	-9.8 %		
Germany	-8.1 %		
Greece	-2.4 %		
U.K.	-3.8 %		
Average	-6.3 %	Average	-1.6 %

Source: Paul Leiby, IEA ASEAN Workshop, April 2004

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Investments in renewable energy sources to mitigate oil-GDP effect

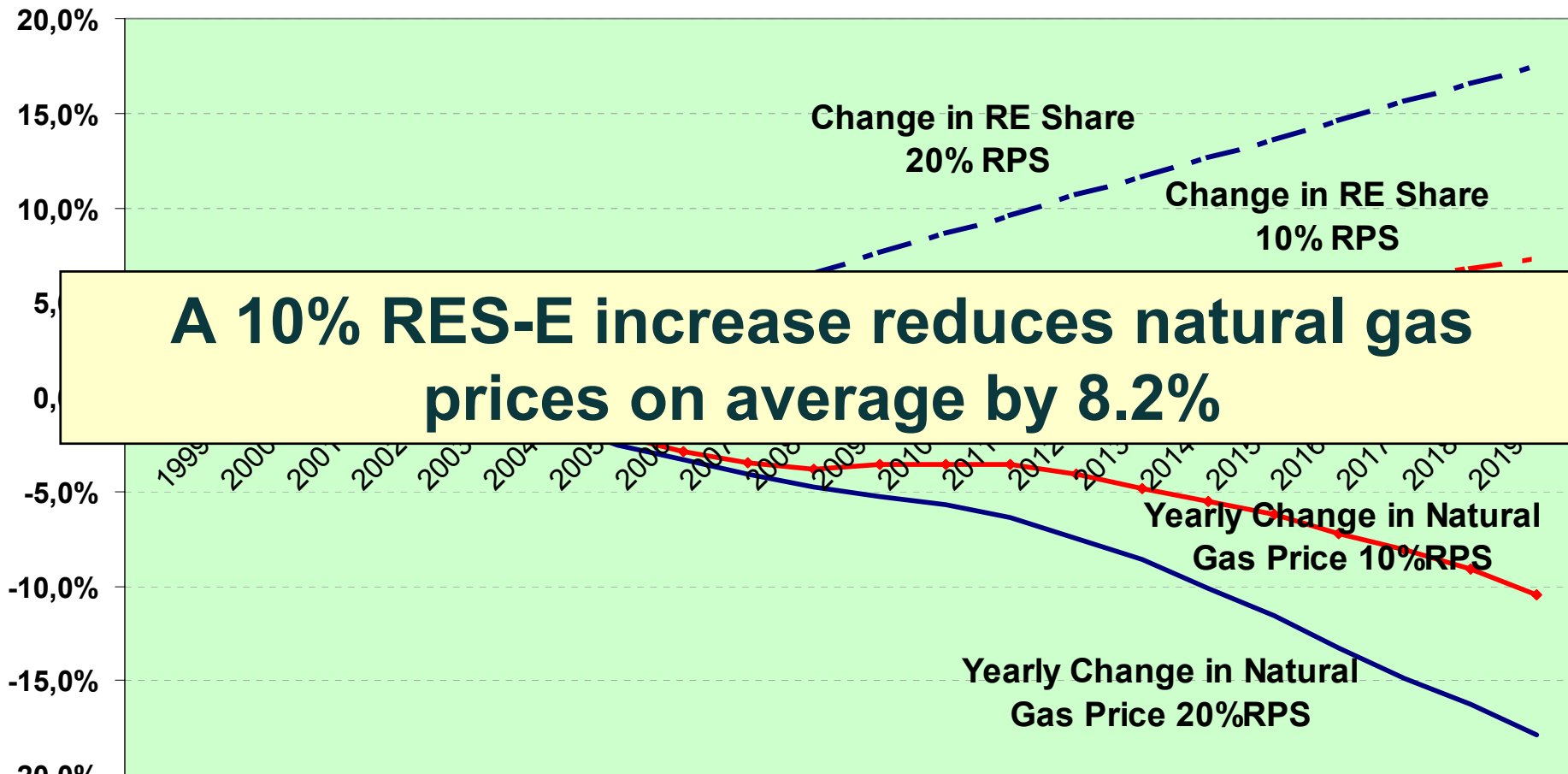


Investments in renewable energy sources create benefits in terms of avoided GDP losses:

- **A higher share of renewables in the electricity supply reduces demand for natural gas which reduces natural gas prices**
- **Through the gas-oil substitution effect oil prices will come under pressure**
- **Avoided oil price increases and volatility produce avoided GDP losses**

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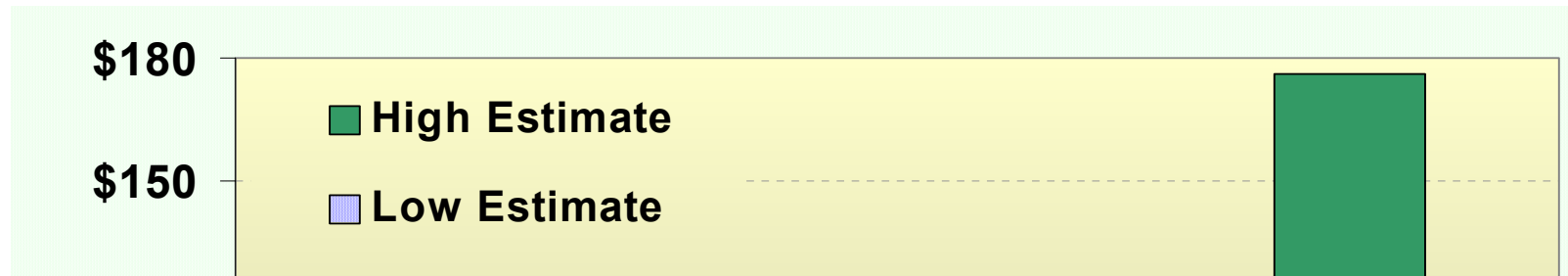
% changes U.S. Gas Wellhead Price and additional RES-E share



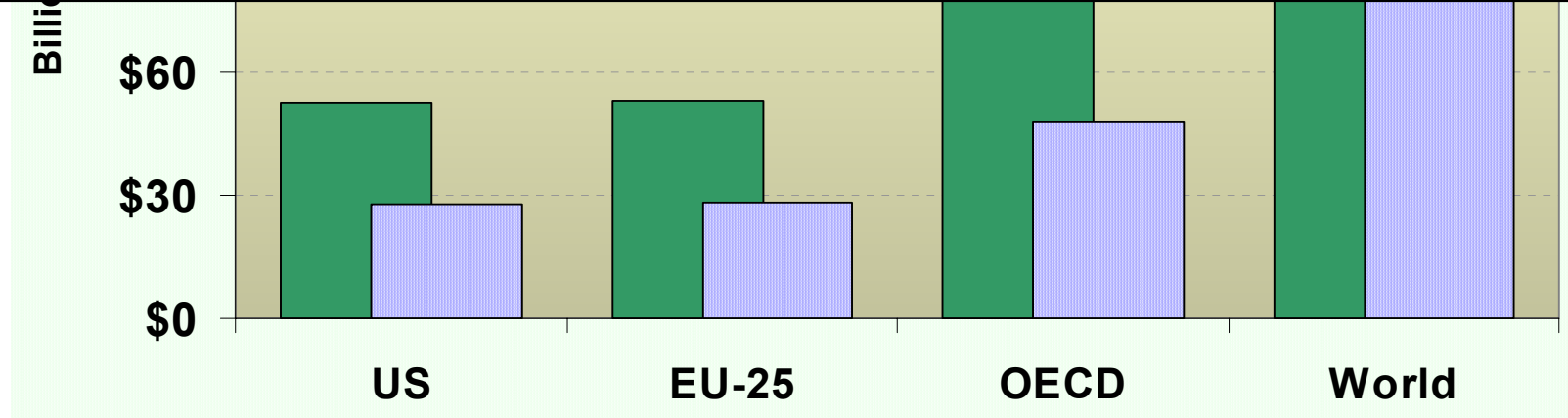
Source: Own calculations based on Union of Concerned Scientists, 2002

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Avoided GDP losses for 10% RES-E addition



Avoided GDP losses would offset 32 - 38% of investment in renewable energy in the EU



Source: Awerbuch and Sauter (2005), *Energy Policy*, in press

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Investments in renewable energy sources enhance energy security:

- by helping reduce exposure to oil-GDP losses
- by contributing to an optimized generation portfolio and therefore mitigating *risk* due to minimised exposure to fossil fuel price volatility
- by providing a form of ‘national insurance’ (Lind/Arrow) in that prices move against the value of other financial assets

Conclusions

- **Investment costs in renewables can partially be offset by avoided GDP losses**
- **Currently fuel price risks in the electricity supply system are passed through to consumers and reduce their disposable income**
- **European oil and gas market structures will have to change to fully allow for the potential of avoided GDP losses**
- **An increased share of renewable energy sources in the supply portfolio constitutes a *no regrets policy***
- **Similar conclusions apply to investments in energy efficiency measures**

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Thank you for your attention!

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Suez

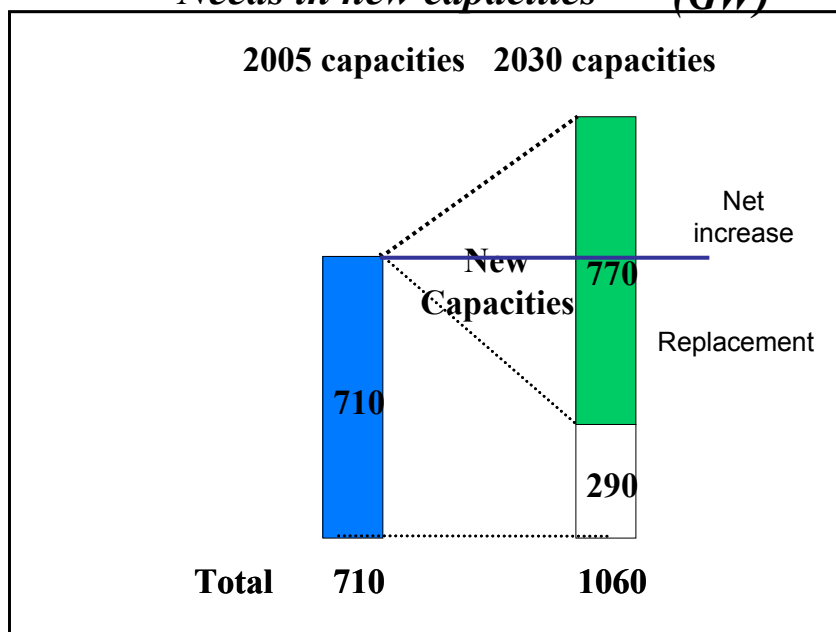


Geopolitics and
supply security

Alexandre Clauwaert
June 2006

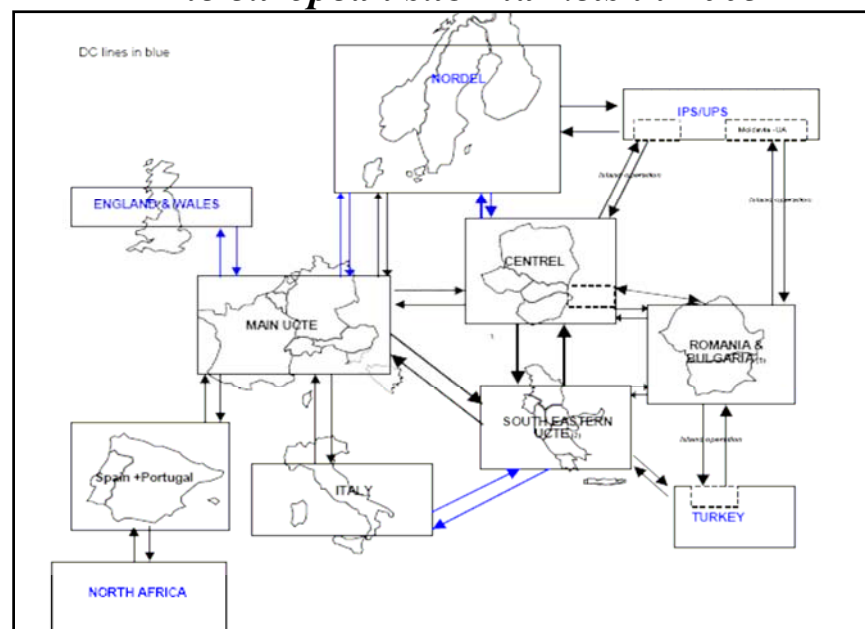
Current situation : Growth of the electric and energy needs

*Electricity Production – UE 25
Needs in new capacities (GW)*



Sources: Estimations AIE

*Electricity Transport
The european sub-markets in 2003*



Sources: UCTE

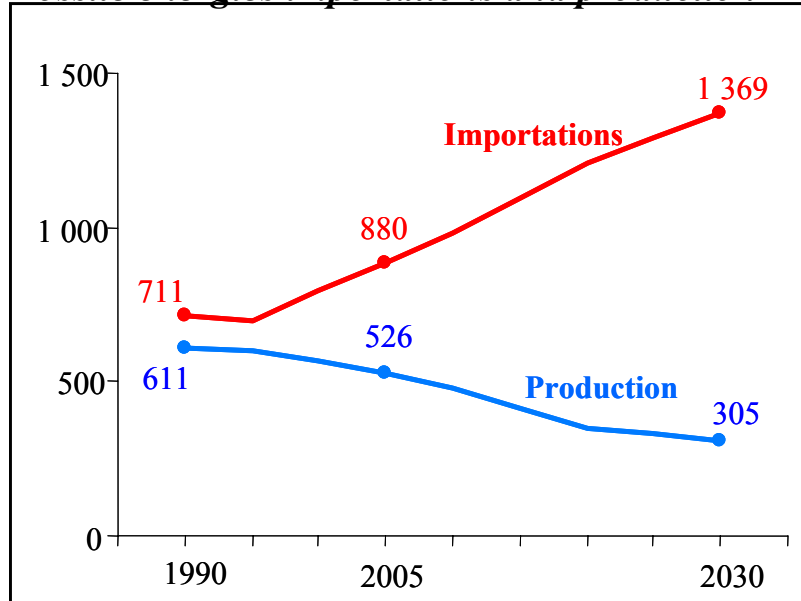
Investments needs for electricity infrastructures are estimated at **750 B €**
by AIE for the period 2005-2030 for EU-25

Increased pressure on energetic independance



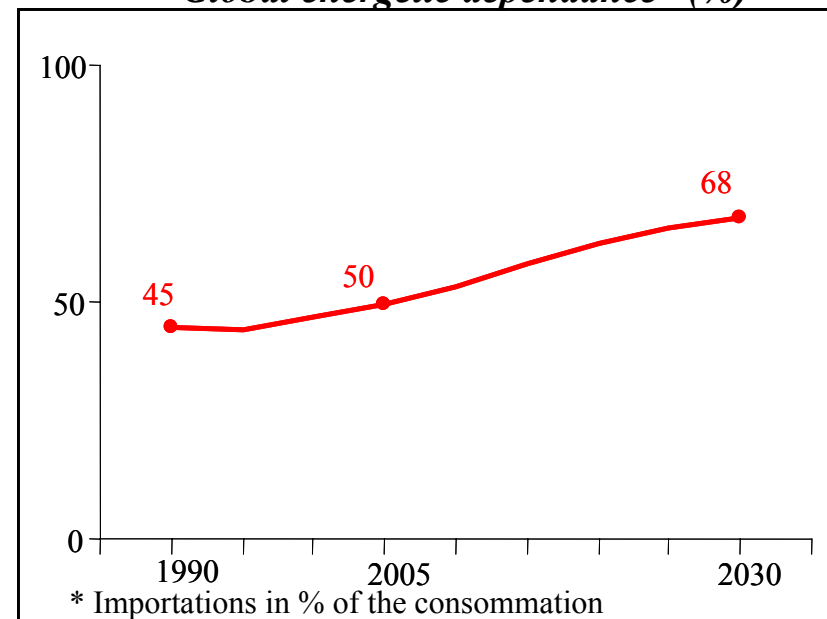
Growth of direct and indirect demand of natural gas, coal and oil products (transport)

Fossile energies importations and production Mtep)



Sources : European Commission estimations

Global energetic dependance (%)*



* Importations in % of the consommation

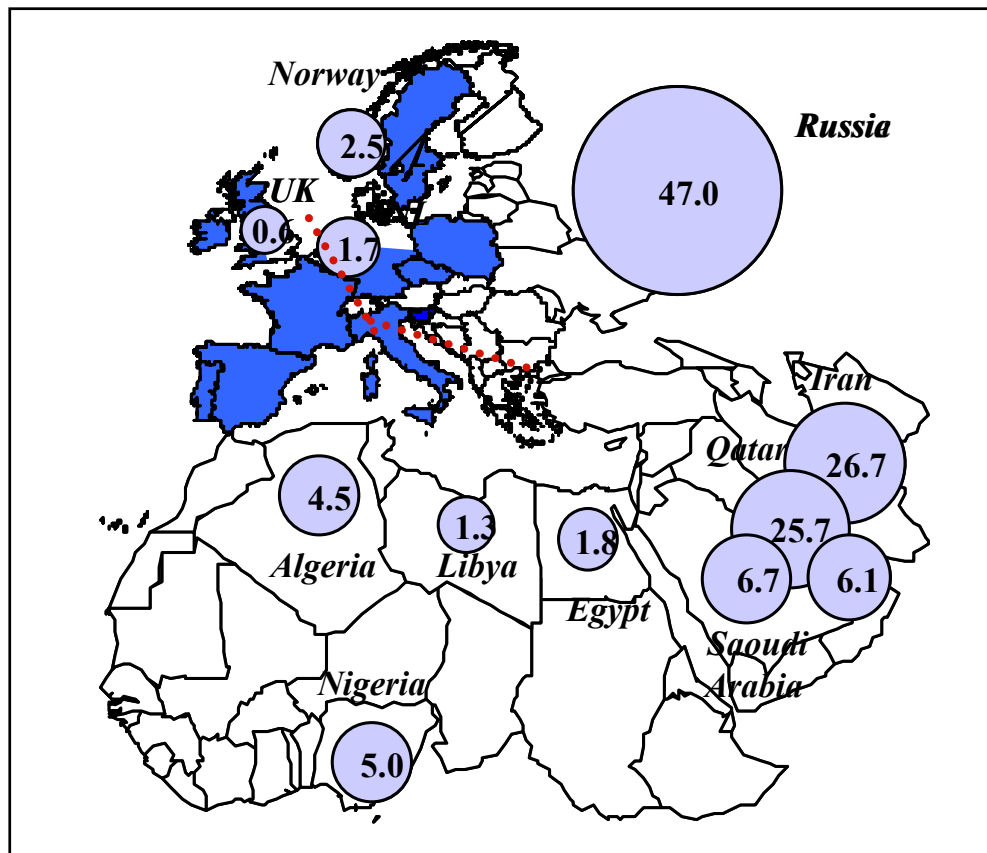
Sources : European Commission estimations

- An energetic dependance that has increased since 10 years....
- ...and that may reach 70% in 2030...

Preserving an energetic independance

Natural gas

Main gas reserves available for Europe (in Tm³)



Source : BP Statistical Review

Main risks :

- Geopolitics risk
- Technical risk
- Arbitration risk unfavourable to Europe

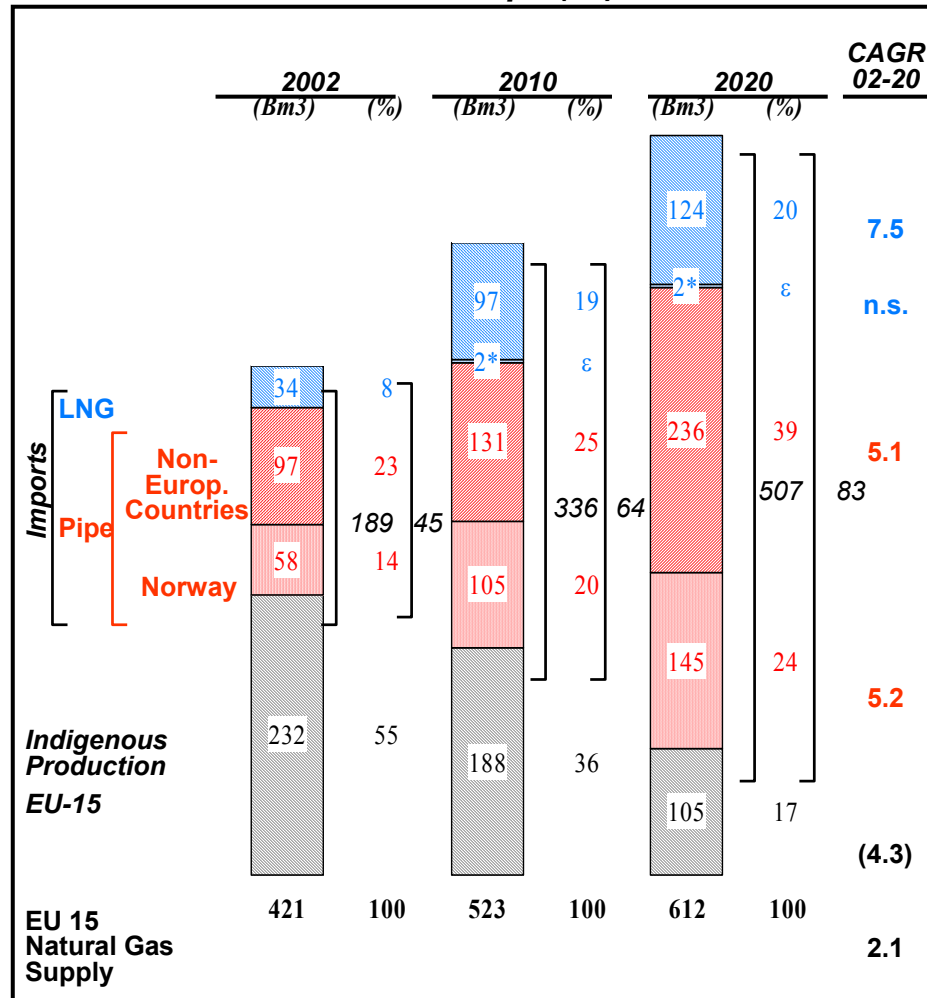


Tension on gas supplies ?

Sources of natural gas



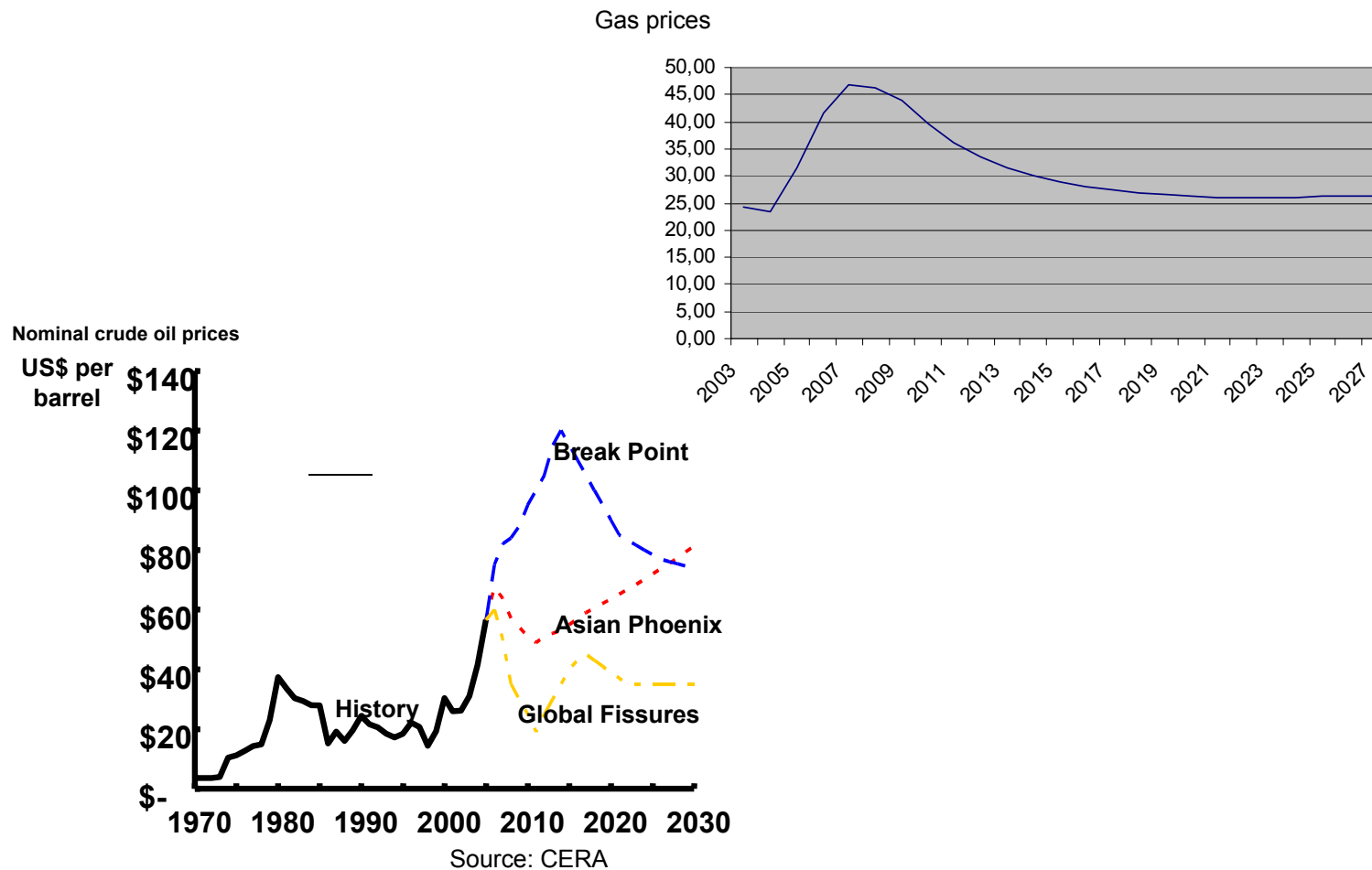
Europe (15)



A key-role to play for the LNG in the diversification of the gas supply sources which explains the expected growth in this sector.

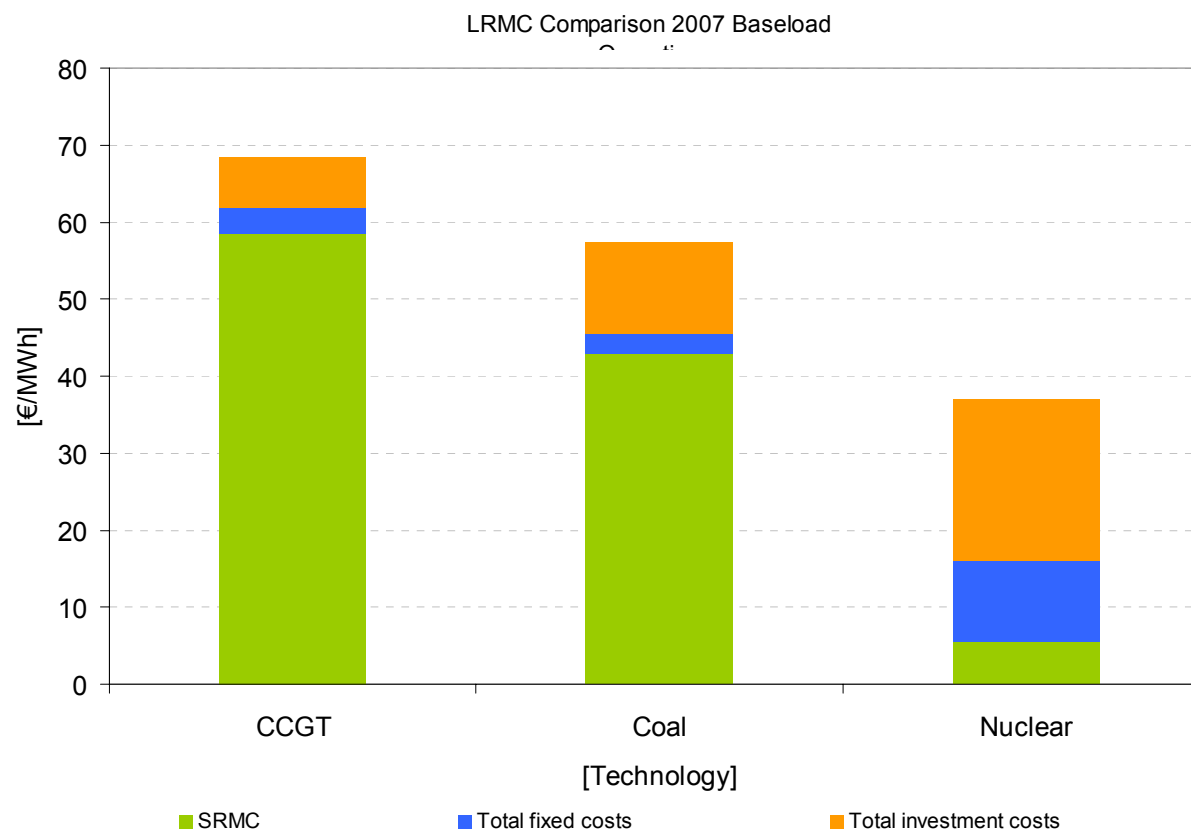
* Imports from Norway

Economical competitiveness



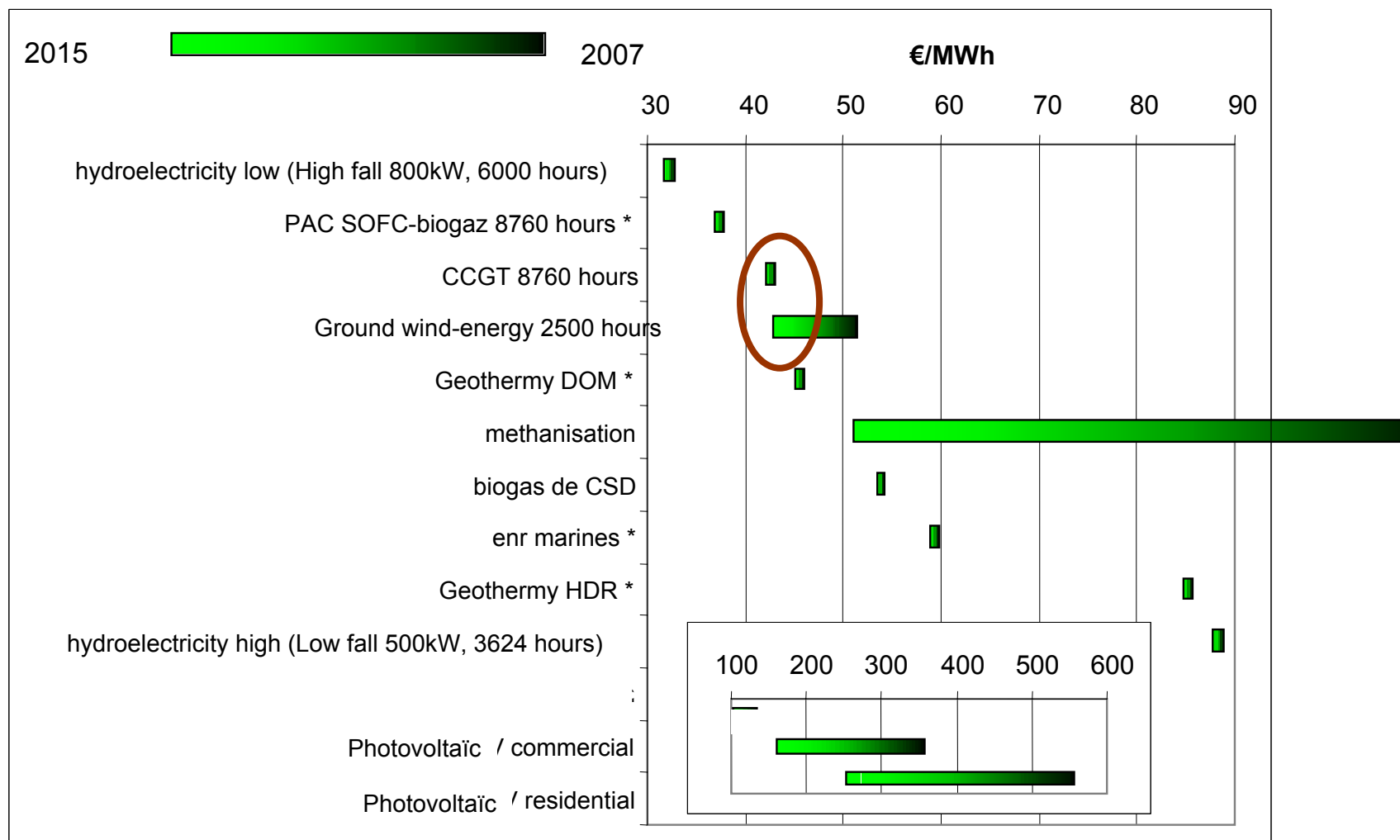
Long-lasting high oil price prospects

Economical competitiveness of electrical production costs

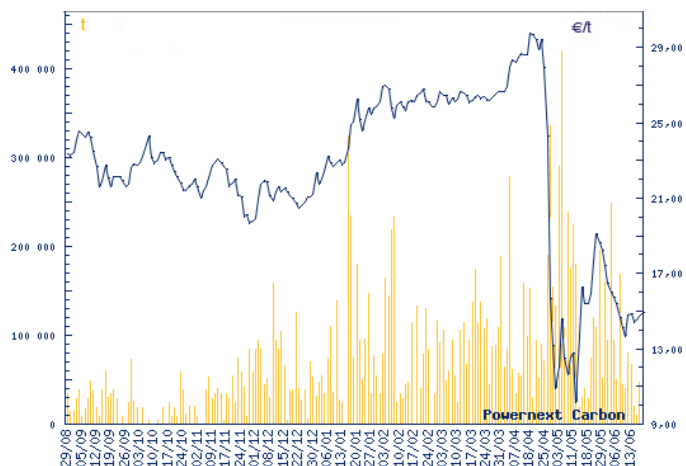


Source : Suez Electrabel june 2006 forwards

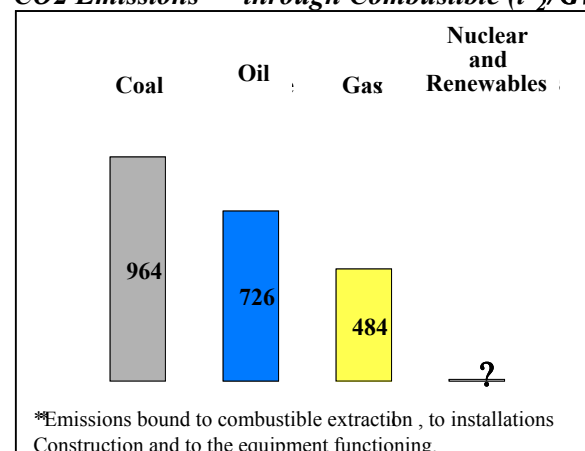
Economical competitiveness of renewable production costs



The environmental stakes



Electricity Production
CO2 Emissions* through Combustible (t₂/GWh)



*Emissions bound to combustible extractibn , to installations Construction and to the equipment functioning.

Sources : AIE

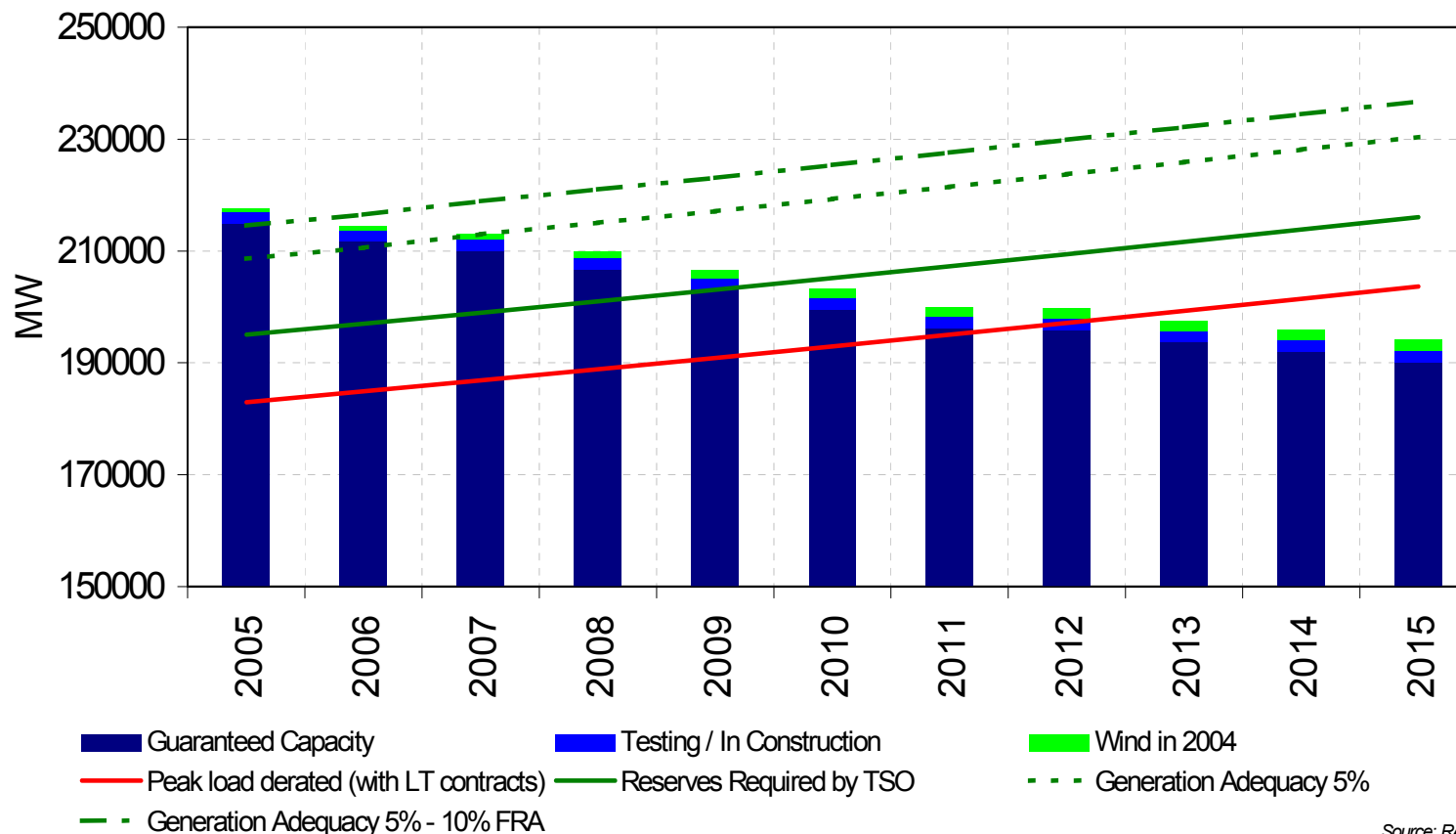
- Kyoto Protocol
 - 5% reduction of GES emissions in 2012 in regard to 1990...
 - ...until now the electrical sector is responsible for 39% of the emissions
 - European system EU-ETS

- Combustion directive (SO₂, NO_x) ‘Large combustion plants’

A strain on the reserve margins on the scale of the continental block (NWE)...

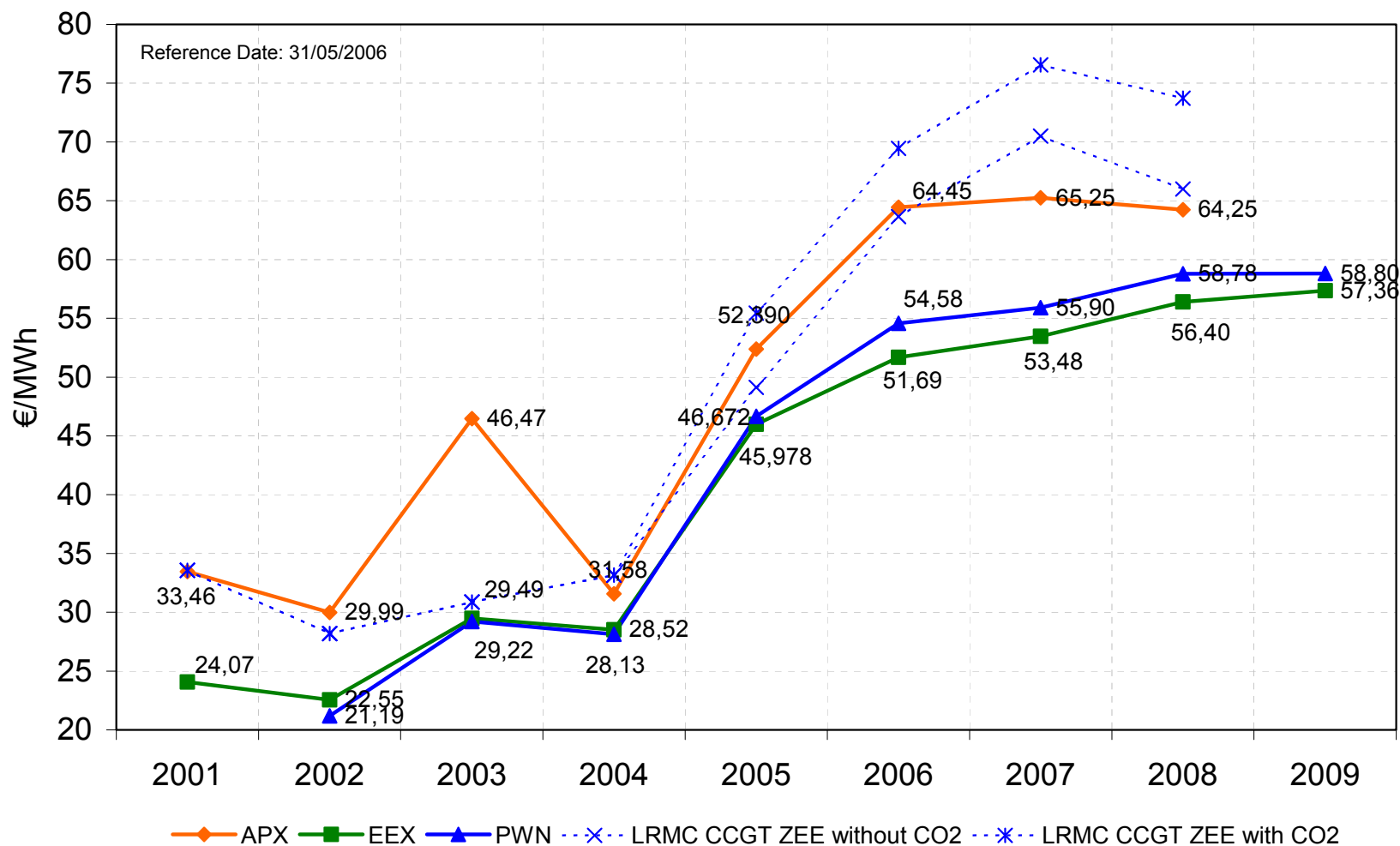


Supply and Demand Balance: NWE with LT contracts



Estimated needs between **16 et 22 GW (2010)**

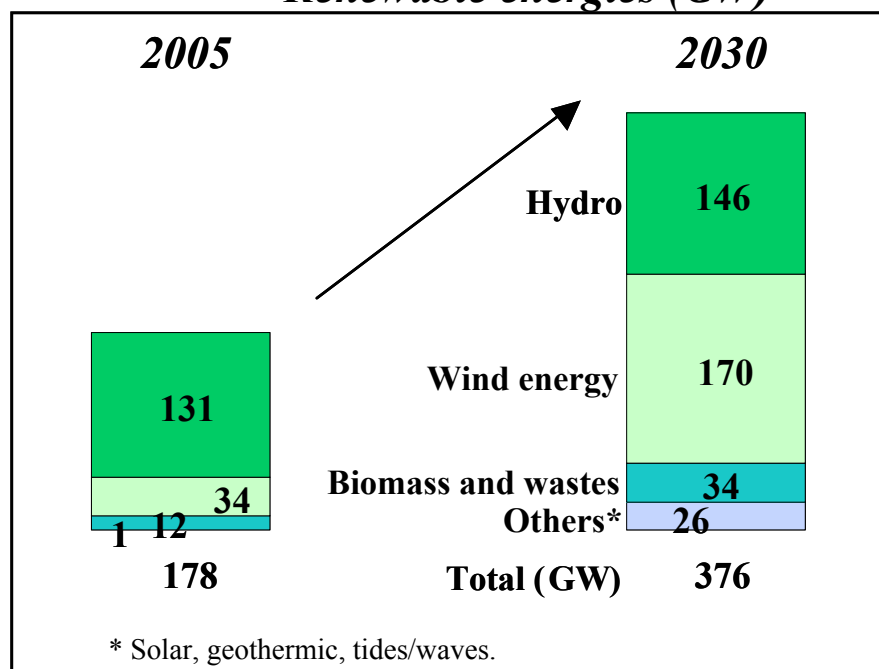
...until now the prices have not yet reached the long-term marginal cost (LRMC)



The energy mix problem

The renewable energies stakes

Electric Production Capacities in Renewable energies (GW)

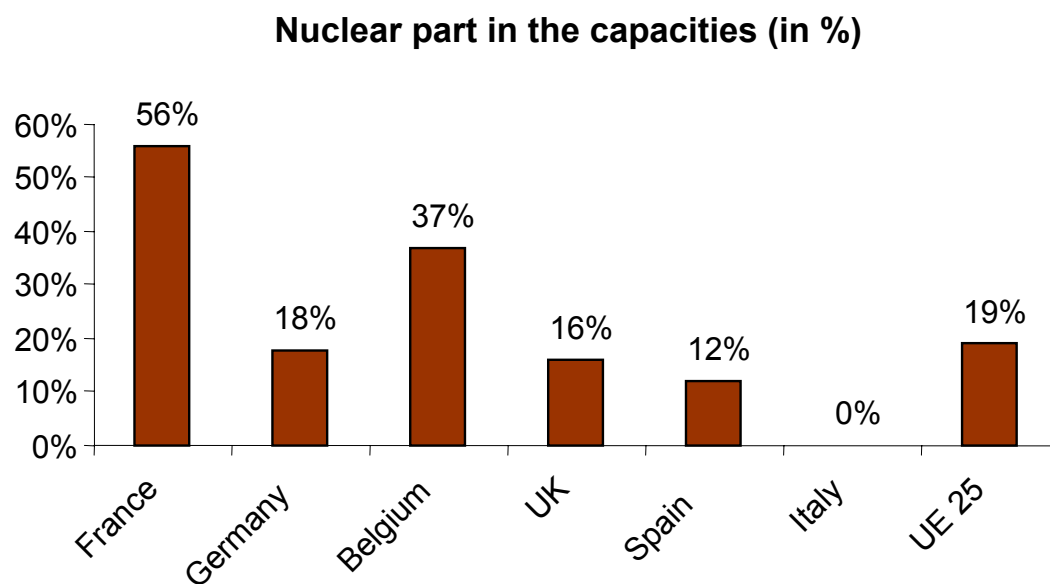


Sources : Estimations AIE

- Part of the answer to the environmental stakes...
- ... but a potential partially limited by:
 - Potential largely exploited in hydraulic
 - A photovoltaic solar development not very credible in the short-term
- **Developing prospects are thus centered on wind energy and biomass (co)firing**

The energy mix problem

The nuclear stakes



- The historical nuclear development depends on local european countries policy.
- Strongly divided positions in relation to nuclear relaunch
- An element of answer to the Kyoto constraints, but environmental elements still to be clarified (spent fuel)

The energy mix problem

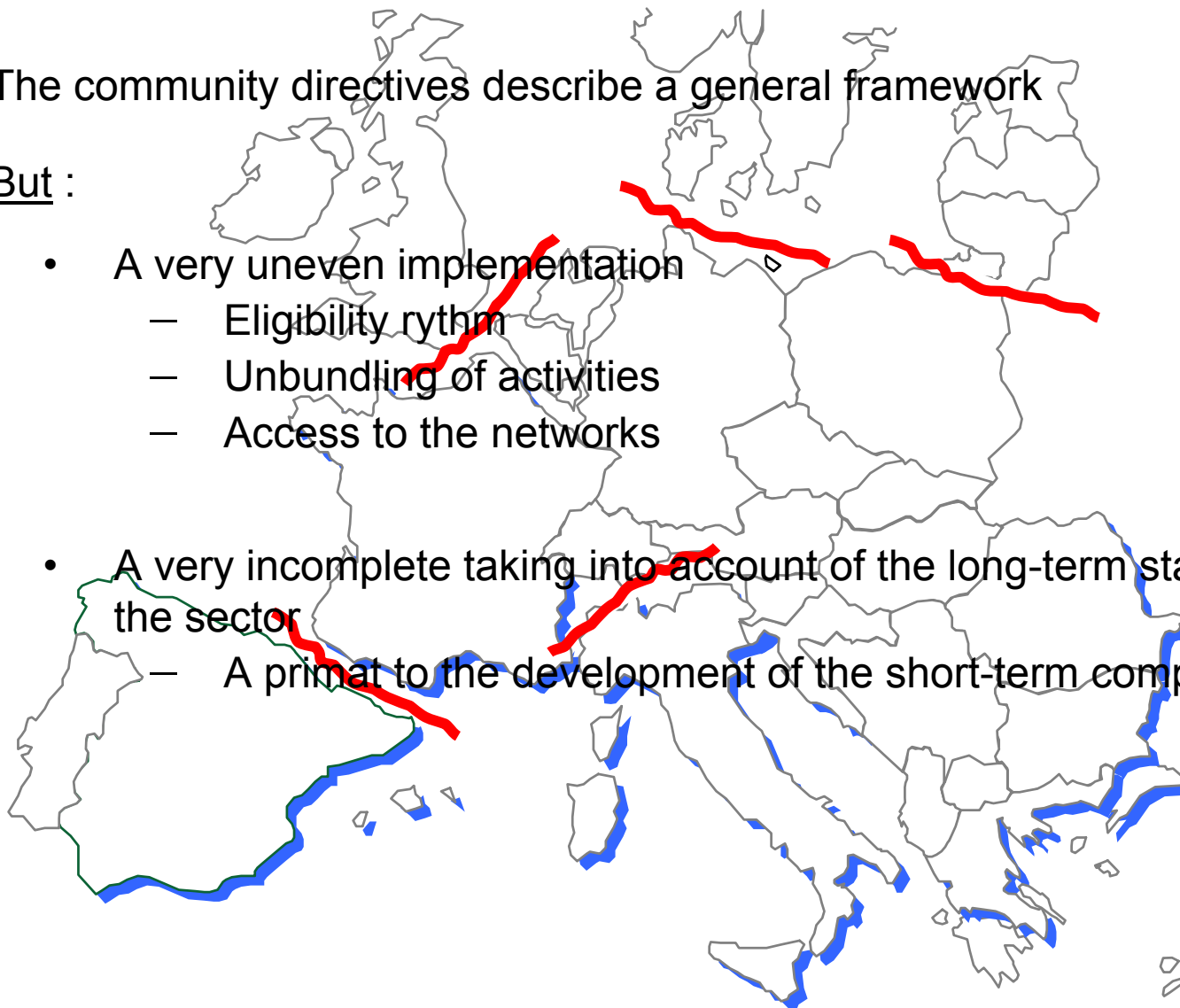


The fossil energy stakes

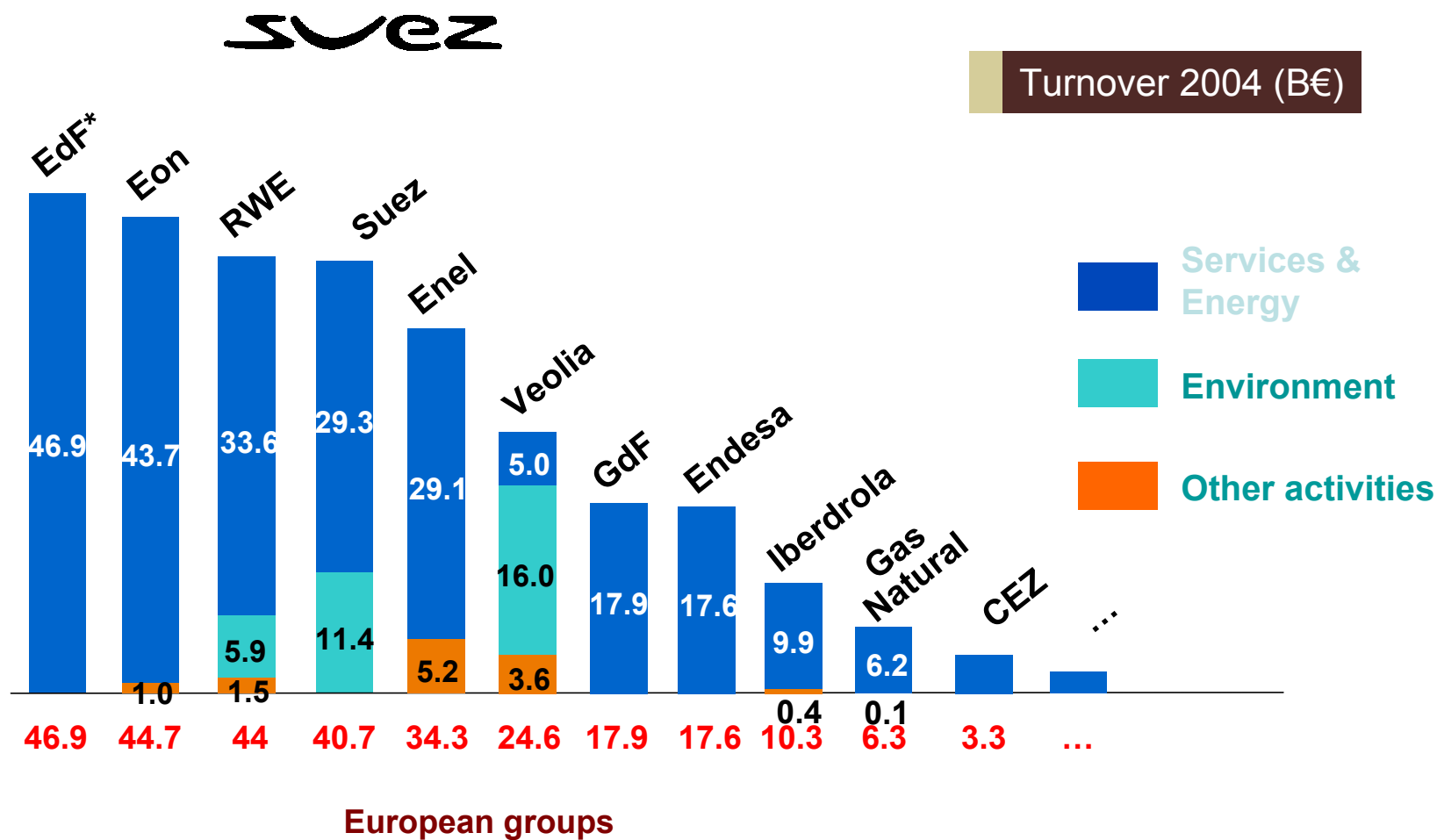
- A contribution that remains important for the countries who choose to abandon the nuclear...
- Major stakes in terms of R&D needed to assure the competitiveness of this technology → *Zero Emission Technology problem*
 - Integration of the technologies in the working of the existing power plants (i.e Tests-projects)
 - Increase of the efficiency of the coal power plants
 - Reduction of the costs of the captation/sequestration technologies

A european market being developed... requiring a greater technical and regulatory coordination

- The community directives describe a general framework
- But :
 - A very uneven implementation
 - Eligibility rythm
 - Unbundling of activities
 - Access to the networks
 - A very incomplete taking into account of the long-term stakes of the sector
 - A primat to the development of the short-term competition

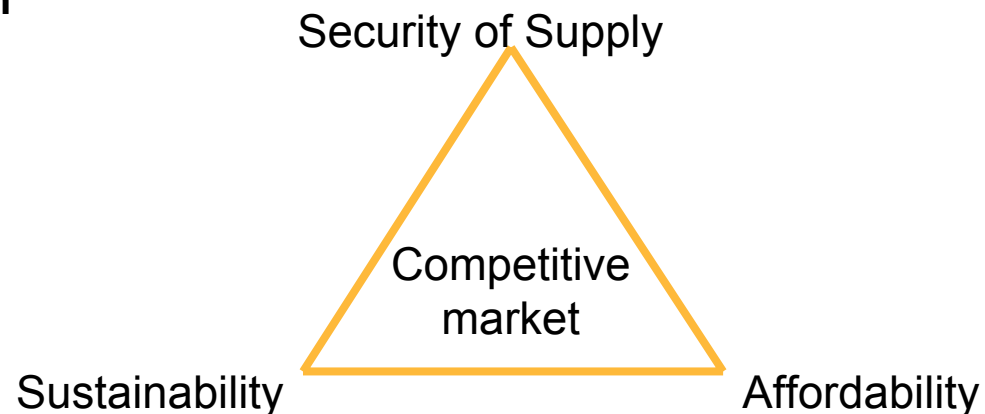


A market structured around large actors and undergoing consolidation movements ...



Synthesis

-Strategic vision



-What we need:

- Certainty on governments' behaviour in uncertain matters, like CO2, market design, acceptable energy mix, external relations with major supplying countries...

-European market design and structure, investor friendly environment

-Demand reduction methods

-Diversification, role of LNG, rebirth of nuclear generation

-Renewable energies