

The Oil Market Today:
the current price shock, the cause and the impact
*How will demand from southeast Asia
and the US be affected?*

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International Energy Agency
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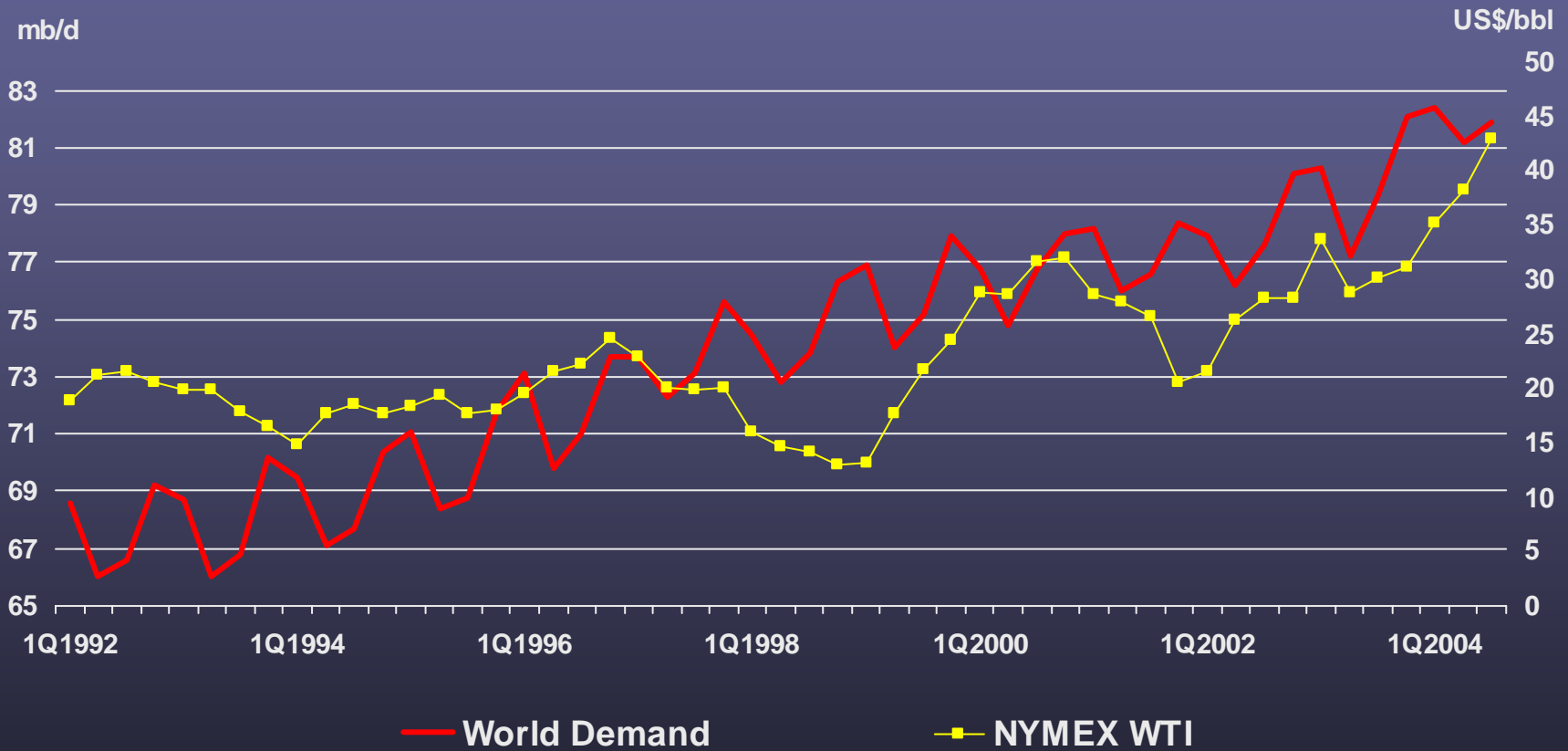
Center for Global Energy Studies
25th Executive Retreat Meeting
Pennyhill Park Hotel, Bagshot, Surrey
2nd December 2004

'New Paradigm'?

Record high prices & record high demand

- Nominal crude prices at record highs, lifted by rare congruence of bullish factors:
 - Synchronous economic growth fuelling global demand
 - Supply disruptions (Venezuela/Nigeria/Iraq/Iran) compounding effect of decline rates, project delays & production restraint
 - Stretched capacity across the supply chain from the oil well to the pump
 - New financial actors reshaping the playing field
- Market-defying demand growth shows little sign of price effects – so far
 - Demand growth relentless despite steadily rising headline prices
 - 2004 strongest growth since 1976 (3.29 mb/d)
 - Beginning of a slowdown evident in preliminary 3Q04 data?
- Have oil economics entered a 'new paradigm'?
- Is this sustainable?

Global Product Demand versus Crude Prices

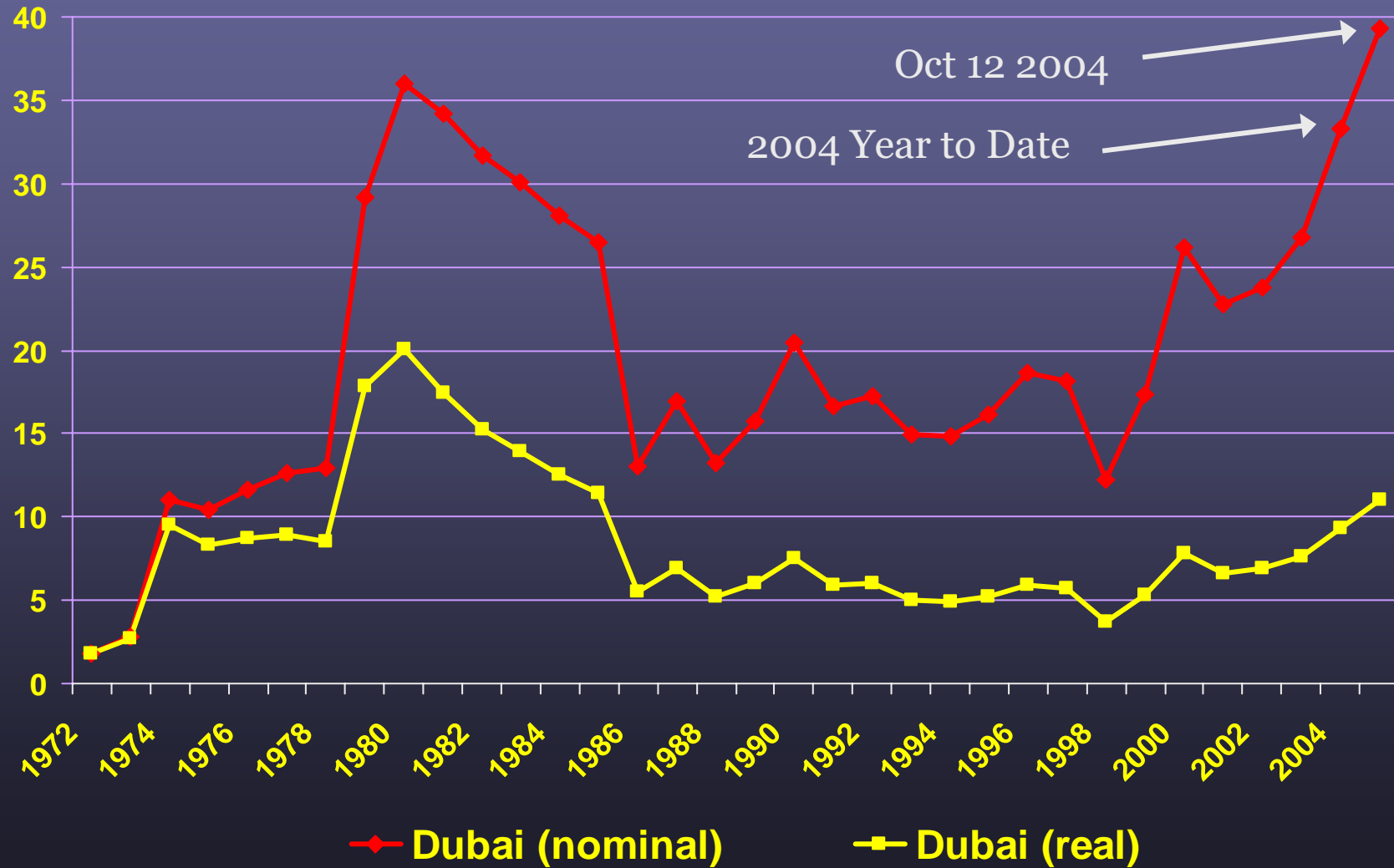


Making Sense of the High Price/High Demand Paradox

- **Conventional explanations don't hold water:**
- **The inflation argument:** “Prices are not so high in real terms”...
 - ... not as high as post-2nd oil shock, but well past the 1st oil shock highs of the 1970s
- **The foreign exchange argument:** “ Prices are not so high in euro terms”...
 - ...but most of the demand growth comes from US\$-denominated economies
- **The ‘new economy’ argument:** “oil’s share of GDP has fallen, energy intensity has dropped, GDP growth comes from the service sector”...
 - ...but not in China and the region, where most of the oil growth is coming from; OECD economies are merely exporting their oil intensities...

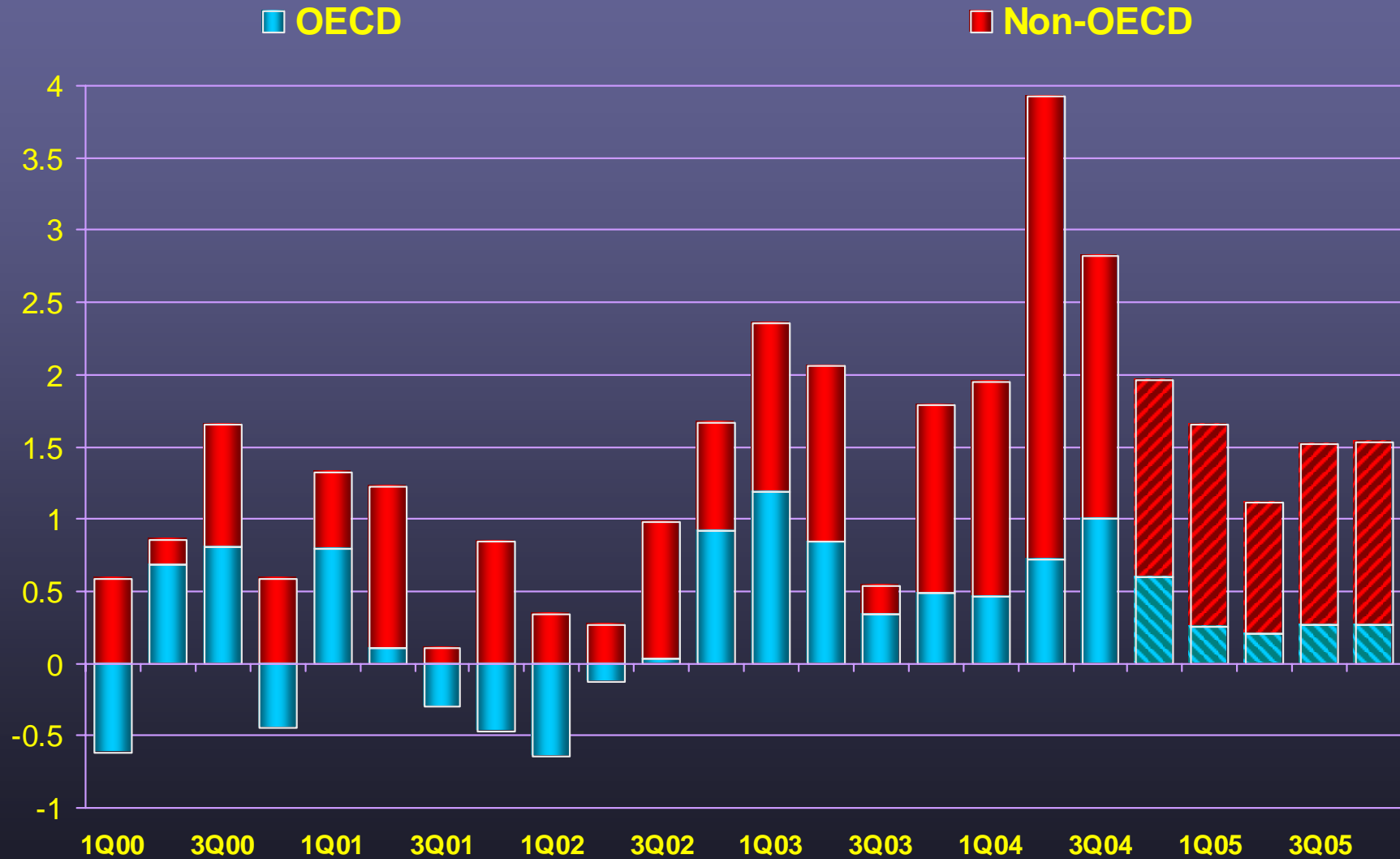
Nominal versus Real Prices

base 1972, \$US/bbl

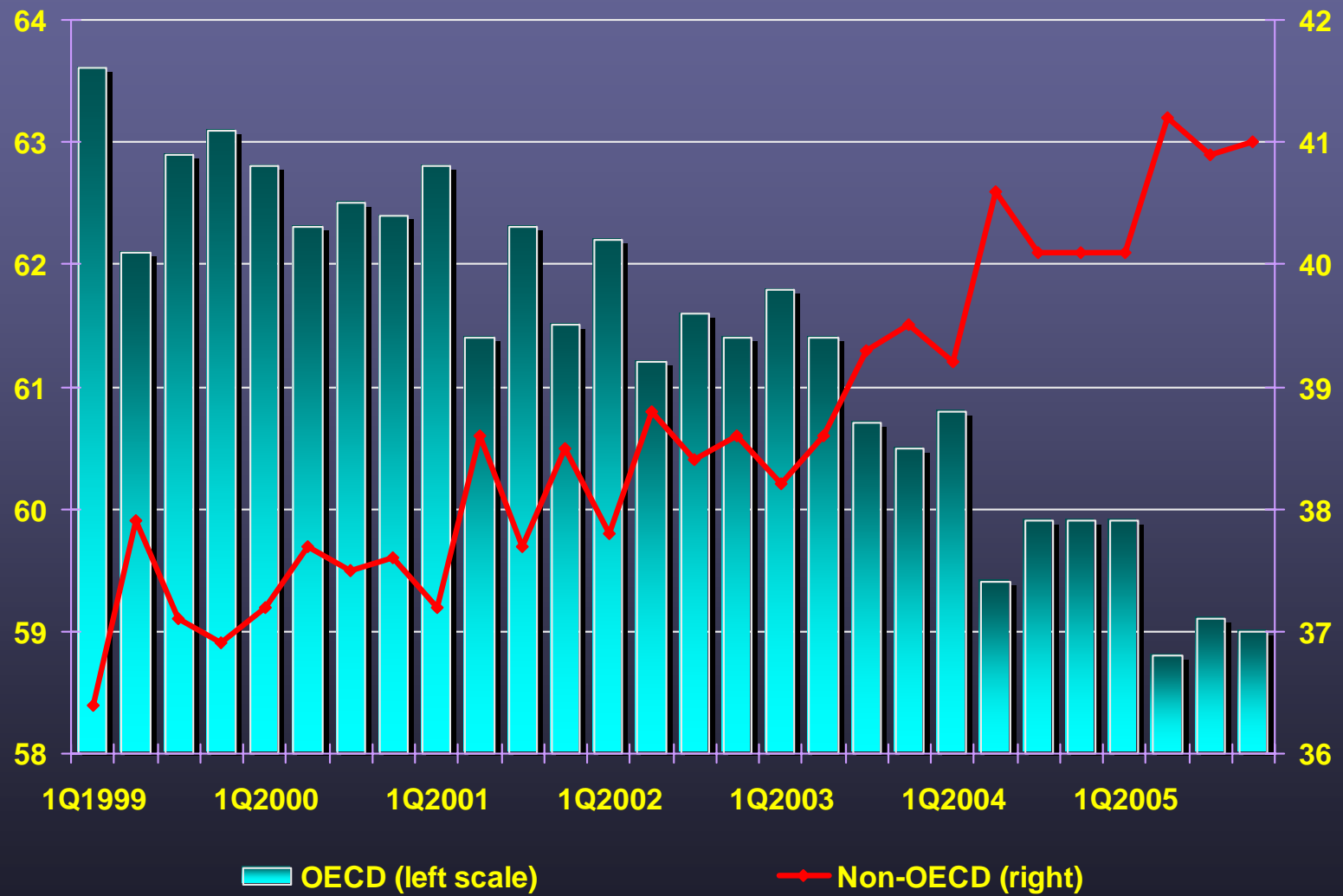


Demand Growth Led by Non-OECD

OECD vs non-OECD oil demand (mb/d)

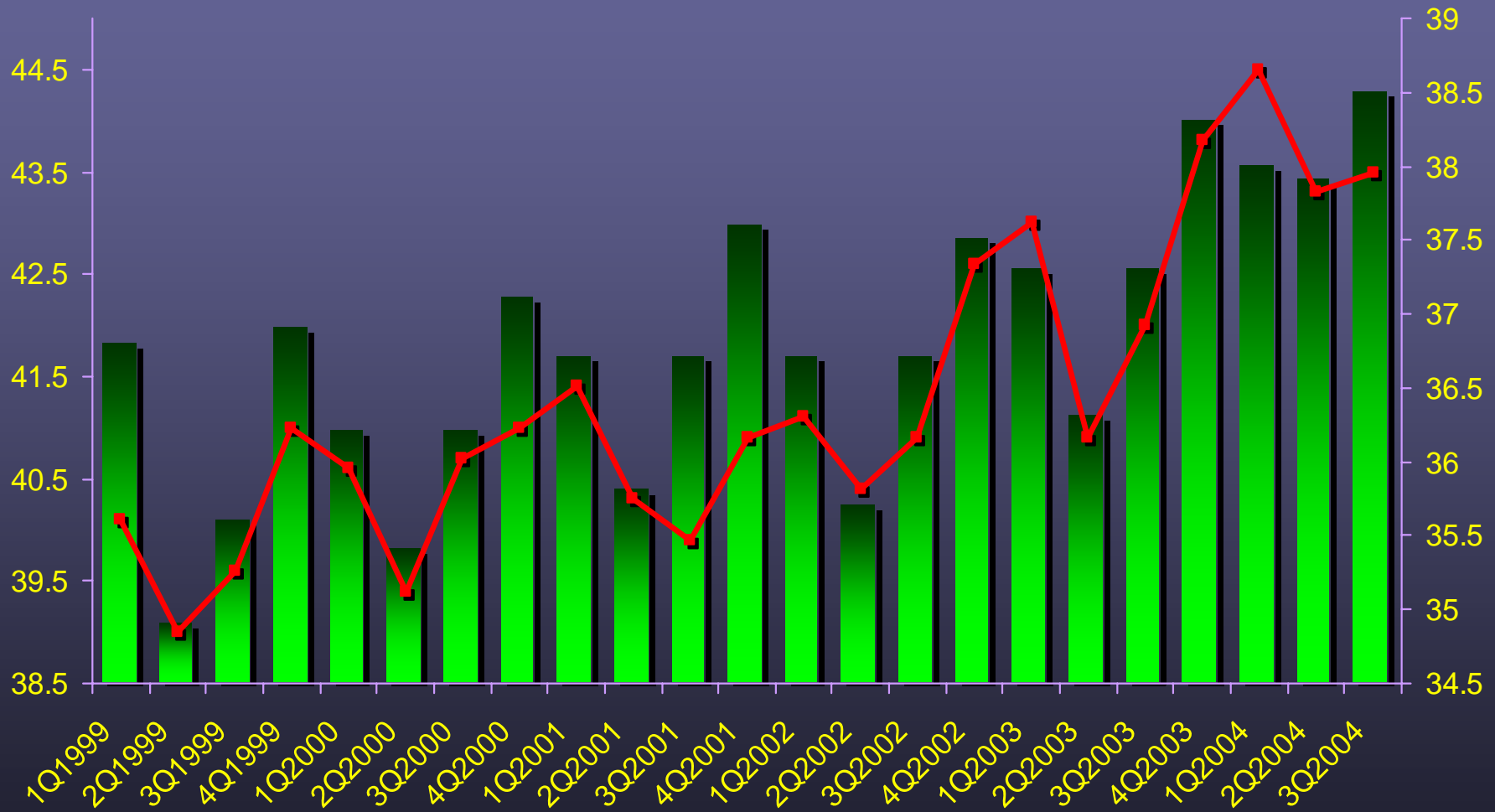


OECD vs. Non-OECD % of World Demand



Drivers of Global Demand: US and Asia

(mb/d)

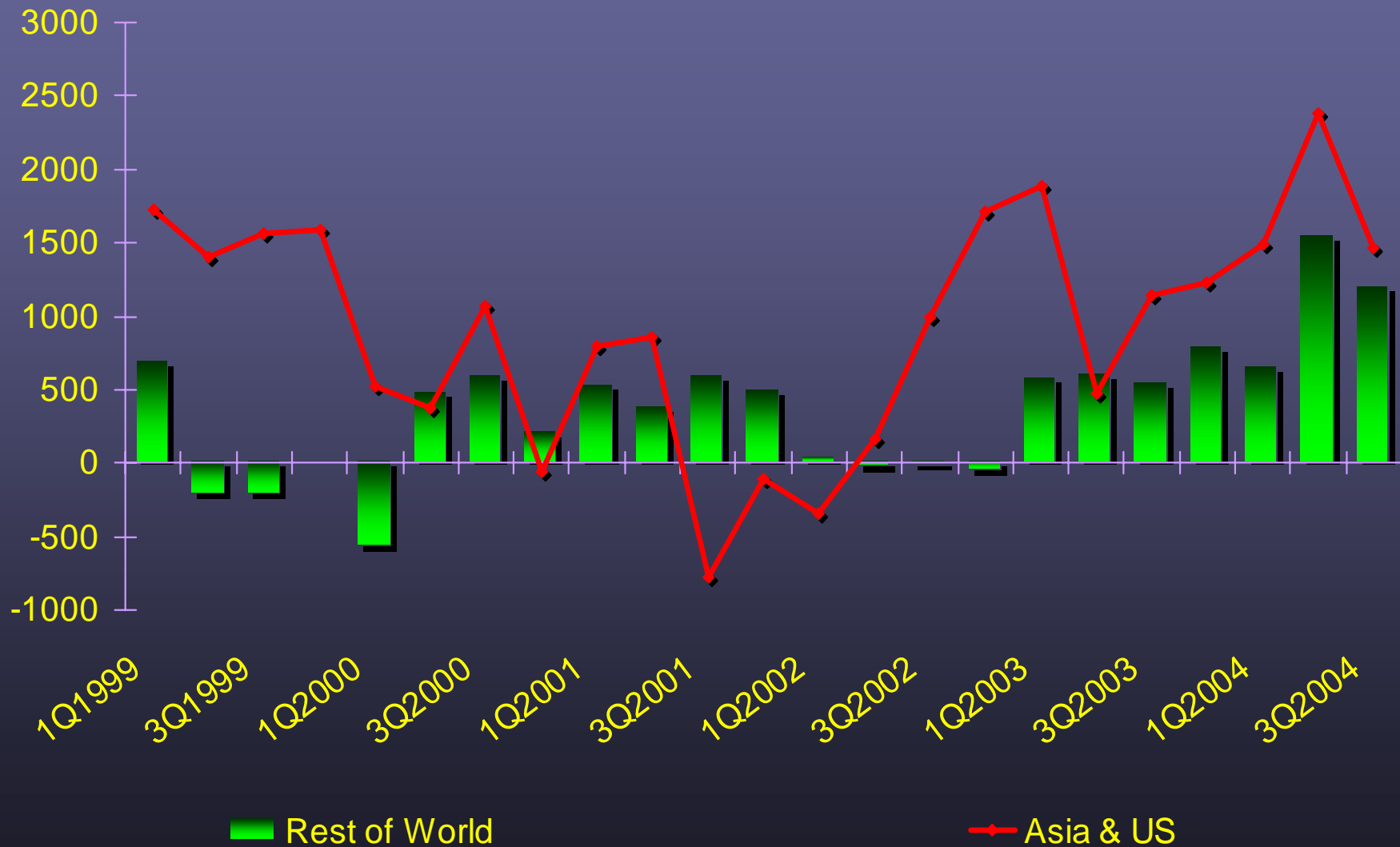


Rest of World (right scale)

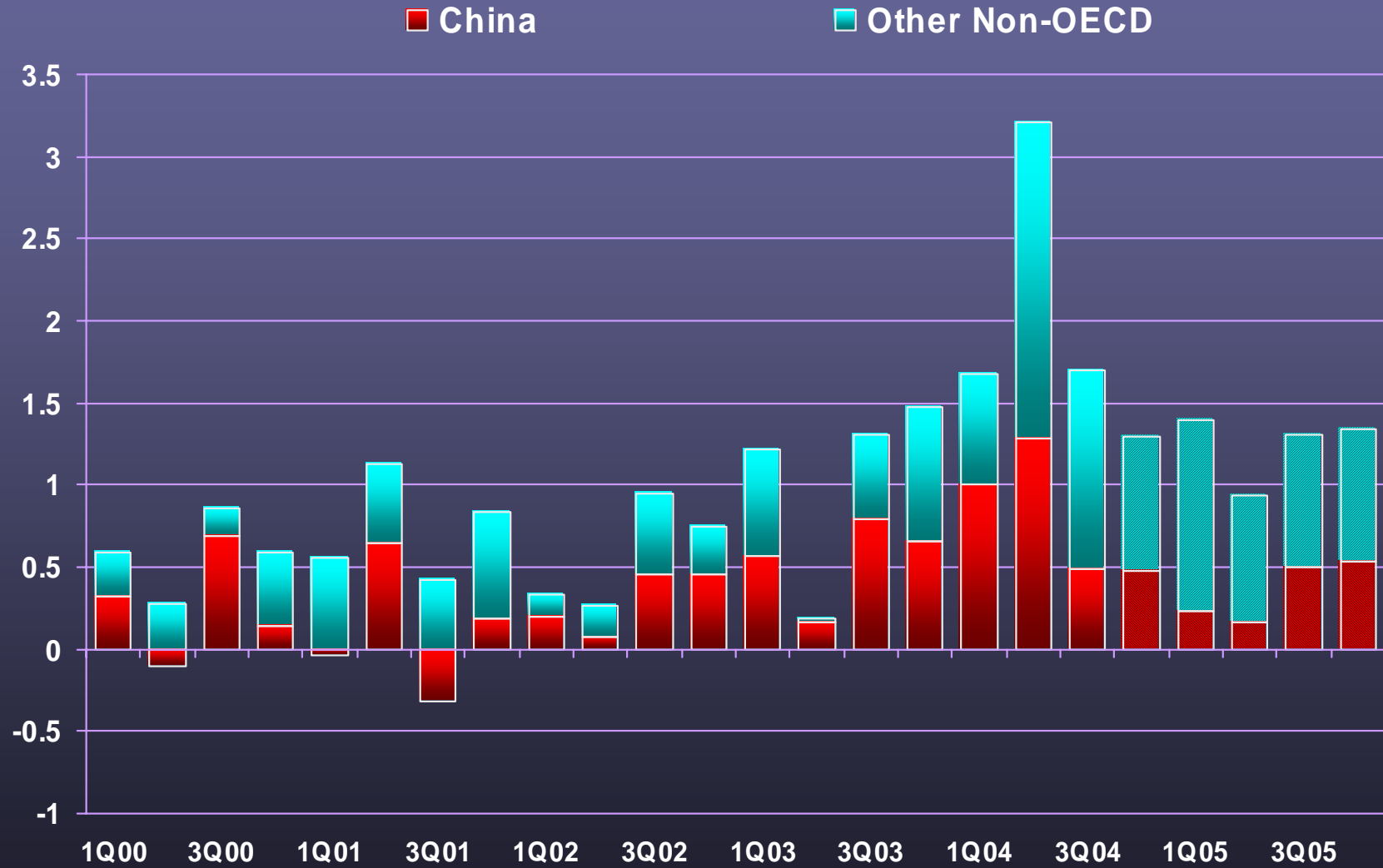
Asia+US (left)

US & Asian Demand Growth v. Rest of the World

(kb/d)

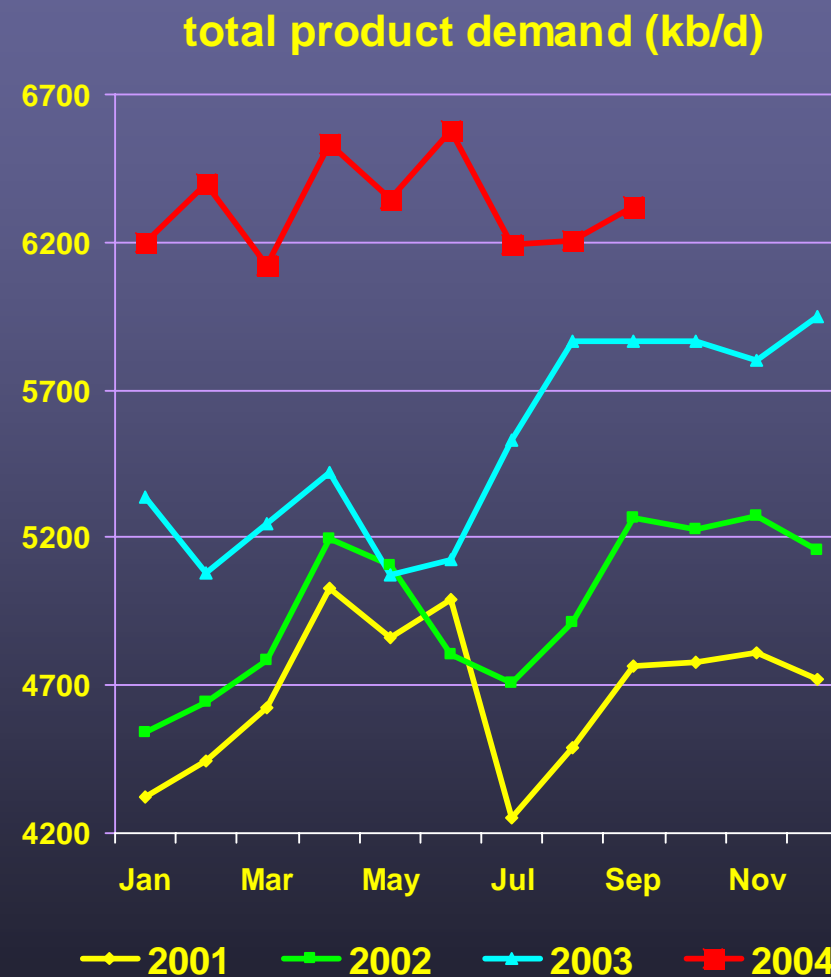


China vs. Other Non-OECD demand growth (mb/d)



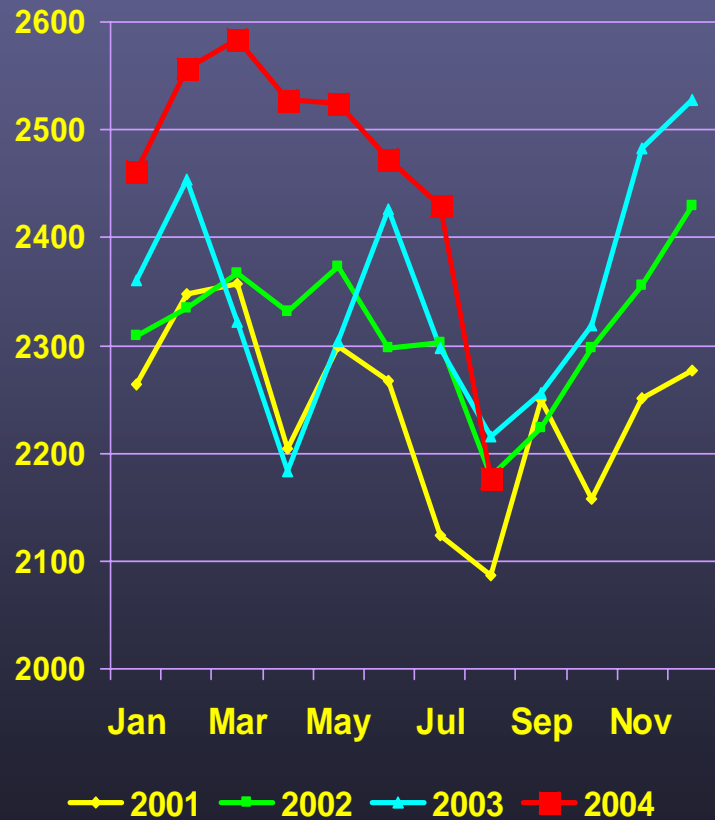
Chinese Demand: Sustainable growth rates?

- Economy
- Export demand
 - Manufacturing
 - Petrochemicals
 - Transportation
- Domestic demand
 - Pent-up consumer demand
 - Automobile penetration
 - Changes in consumer culture/behaviour
- Oil vs energy demand
 - Powergen: residual fuel oil for power plants
 - Powergen: diesel for back-up generators
 - Residual fuel oil as feedstock for off-spec diesel
- Ripple effects
- Price effects

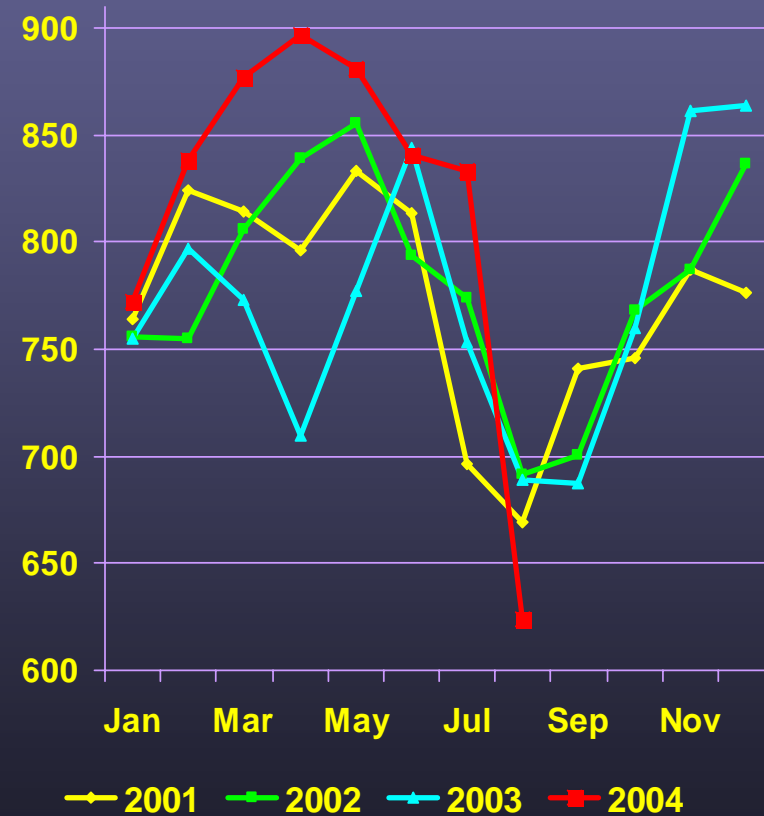


Indian Total v. Gasoil Demand (kb/d)

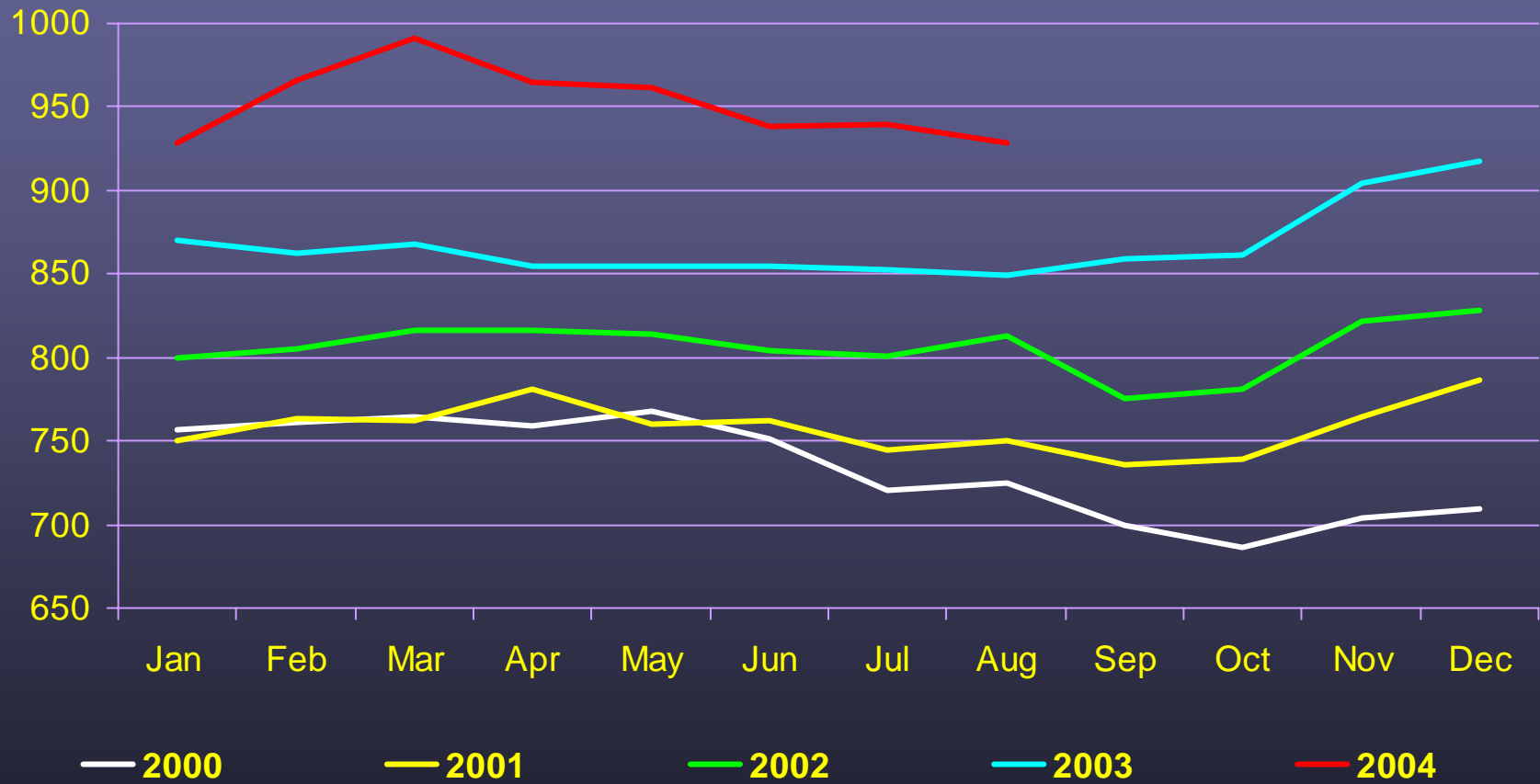
Total product Demand



Gasoil Demand

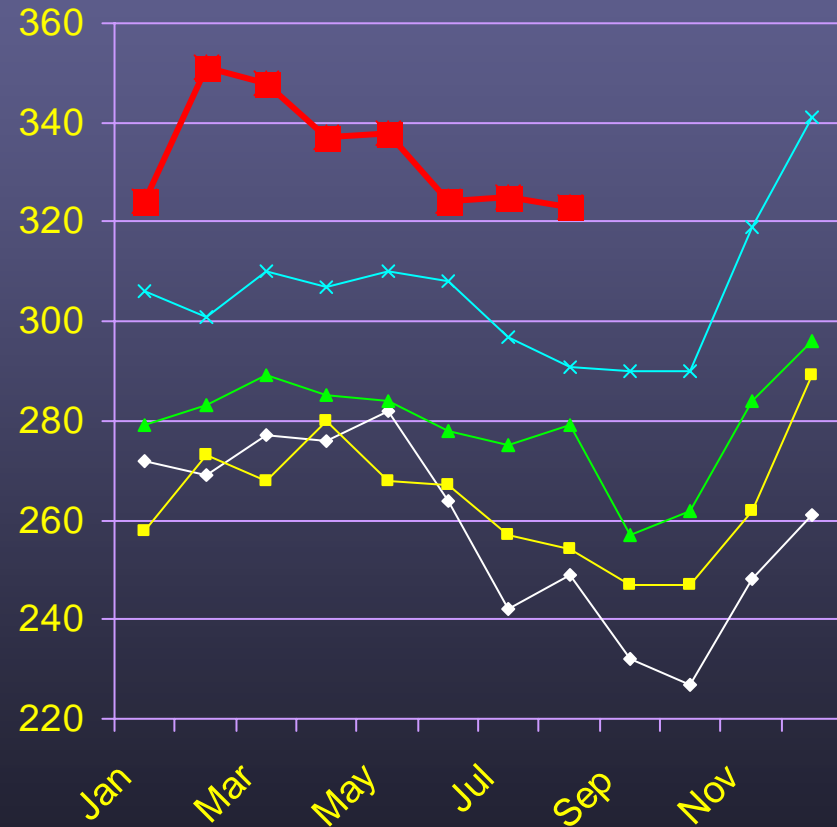


Thai Total Product Demand (kb/d)



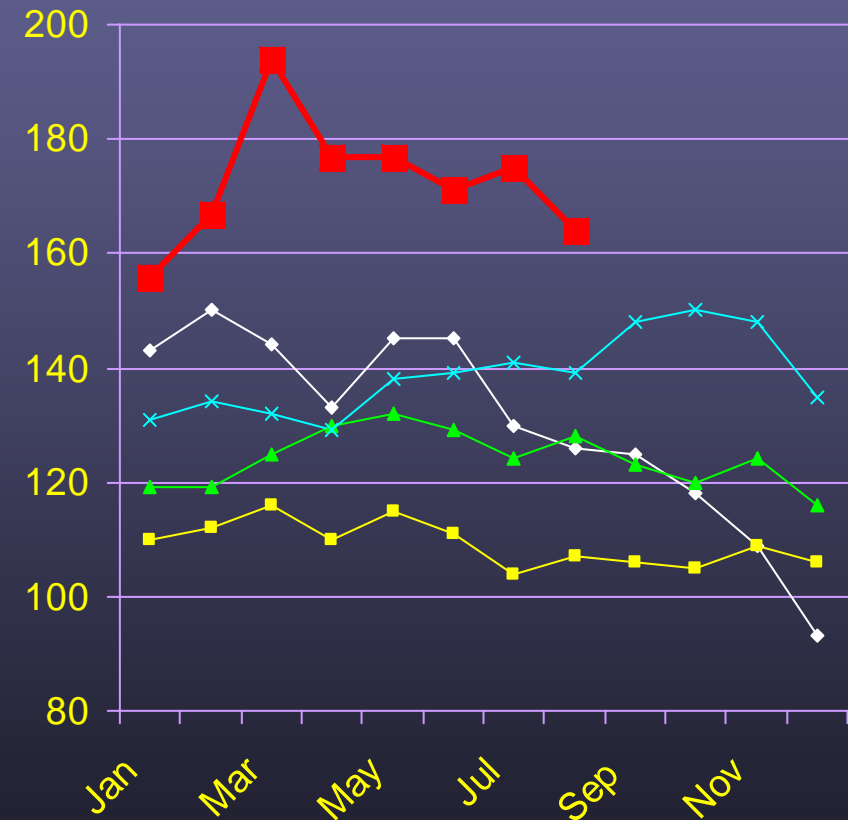
Thai Demand: main products (kb/d)

Gasoil



—◆— 2000 —■— 2001 —▲— 2002 —×— 2003 —■— 2004

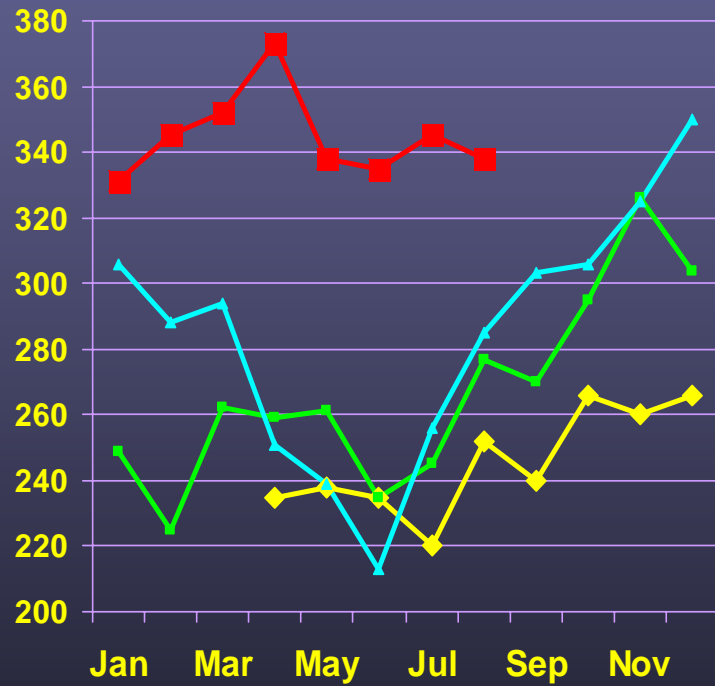
Residual Fuel Oil



—◆— 2000 —■— 2001 —▲— 2002 —×— 2003 —■— 2004

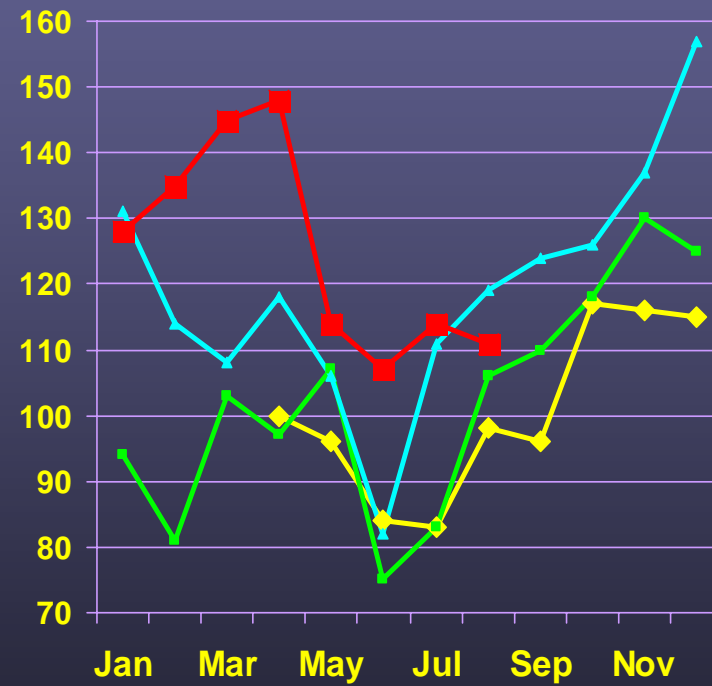
Hong Kong Total v. Gasoil Demand (kb/d)

Total products



◆ 2001 ■ 2002 ▲ 2003 ■ 2004

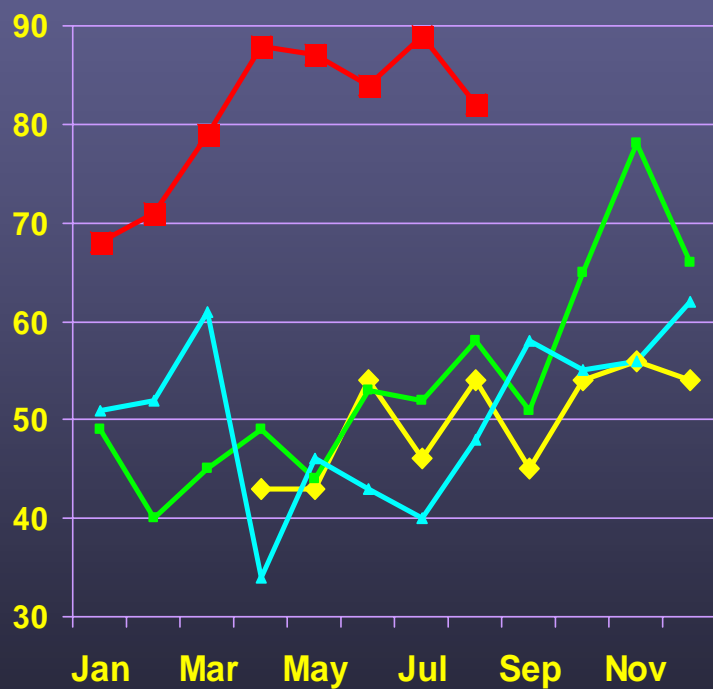
Gasoil



◆ 2001 ■ 2002 ▲ 2003 ■ 2004

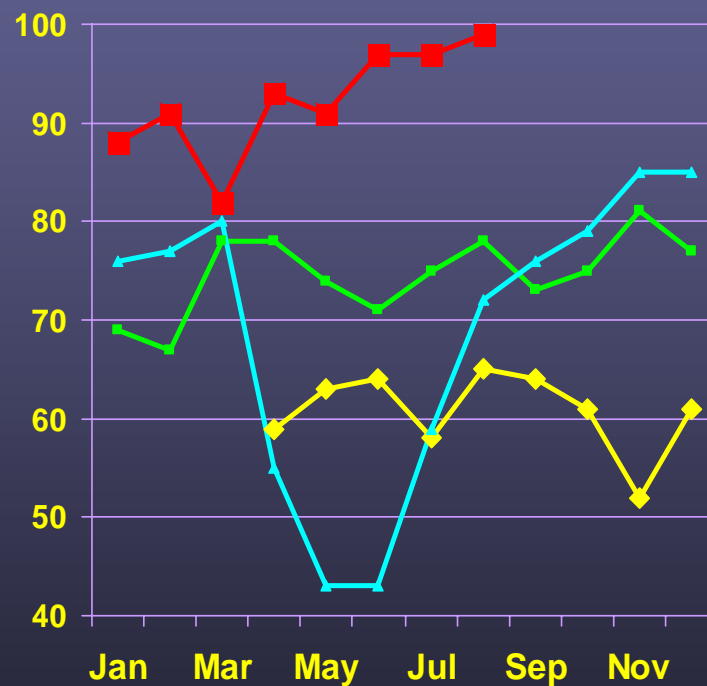
Hong Kong Demand: RFO v. jet fuel/kerosene (kb/d)

Residual fuel oil



◆ 2001 ◆ 2002 ▲ 2003 ■ 2004

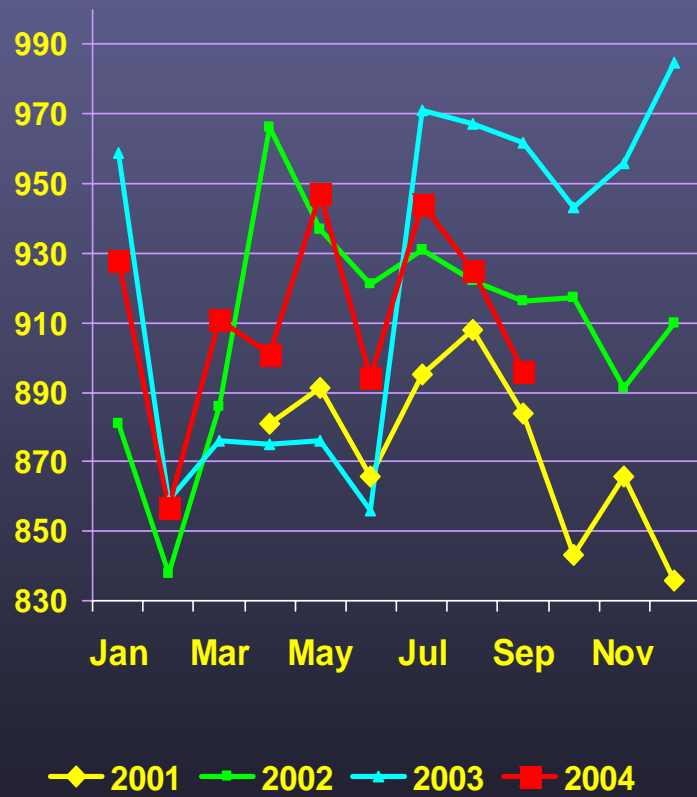
Jet fuel/kerosene



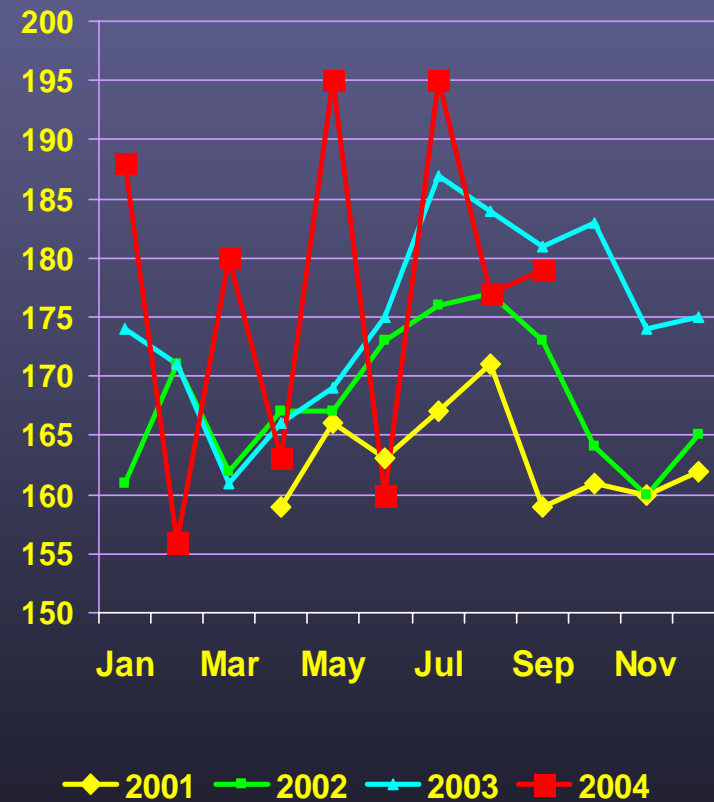
◆ 2001 ◆ 2002 ▲ 2003 ■ 2004

Taiwan Total v. Gasoline Demand (kb/d)

Total products



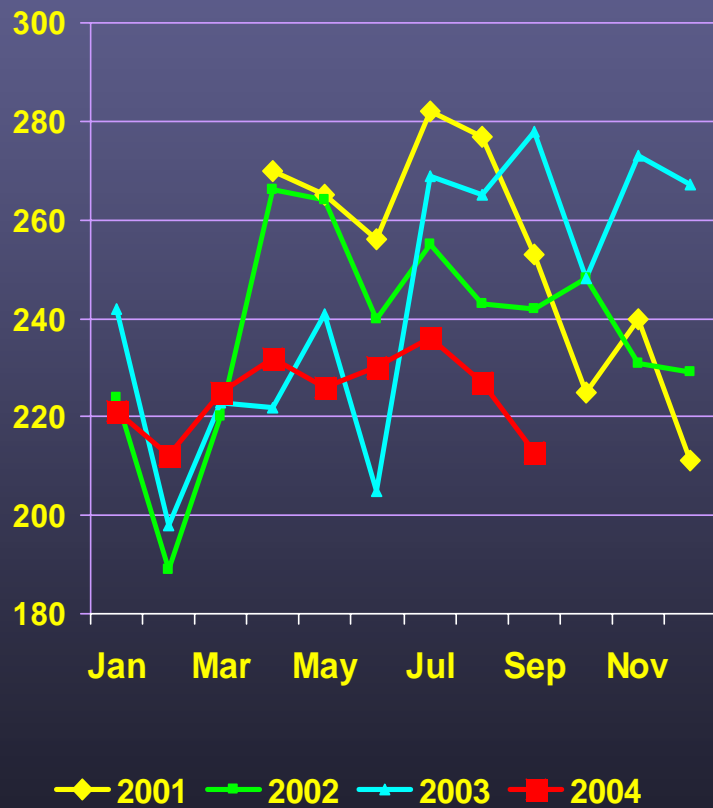
Gasoline



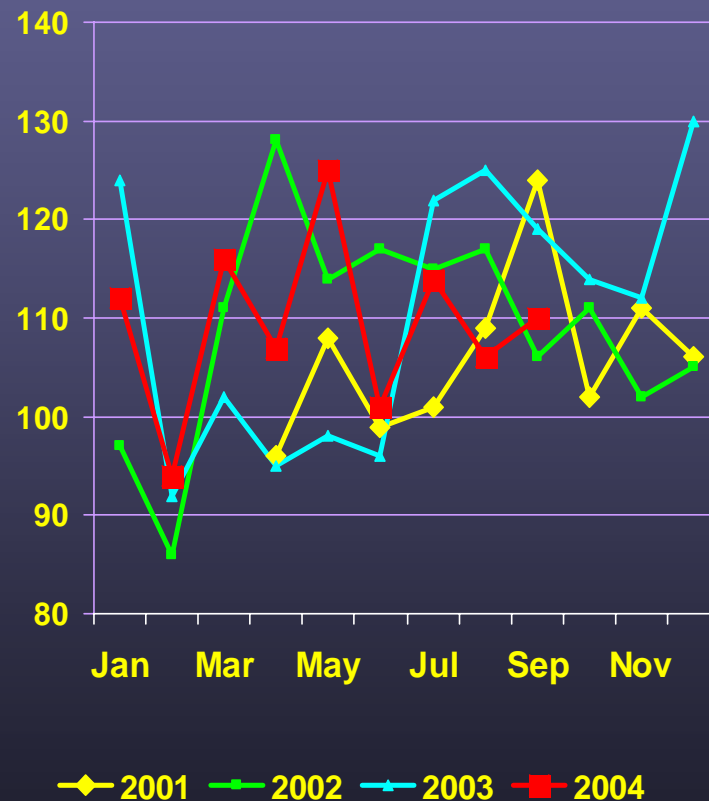
Taiwan Product Demand: RFO v. gasoil

(kb/d)

RFO

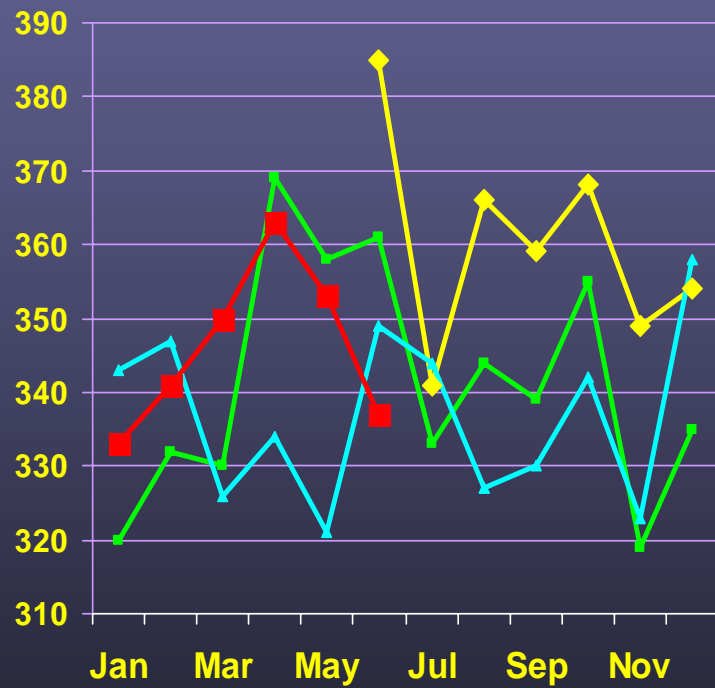


Gasoil



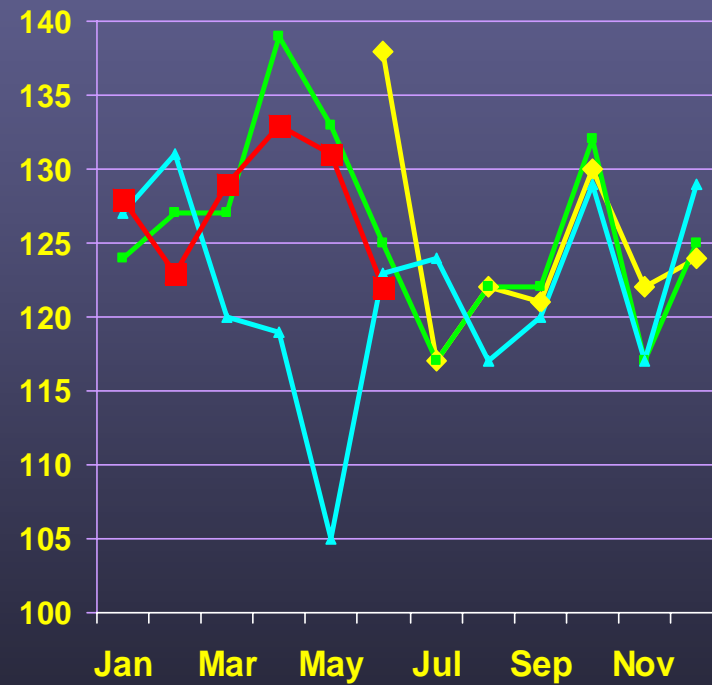
Philippines Total v. Gasoil Demand (kb/d)

Total products



◆ 2001 ■ 2002 ▲ 2003 ■ 2004

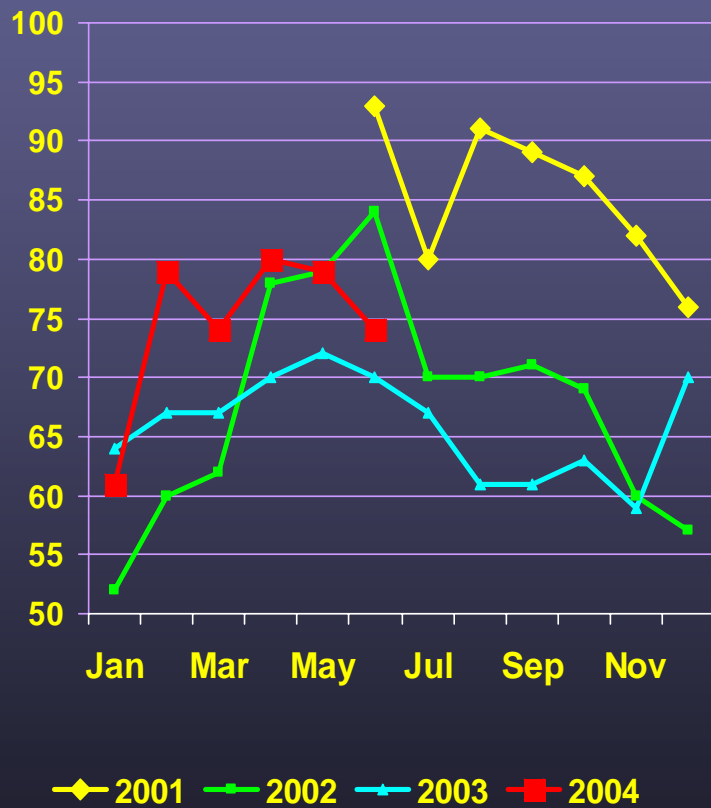
Gasoil



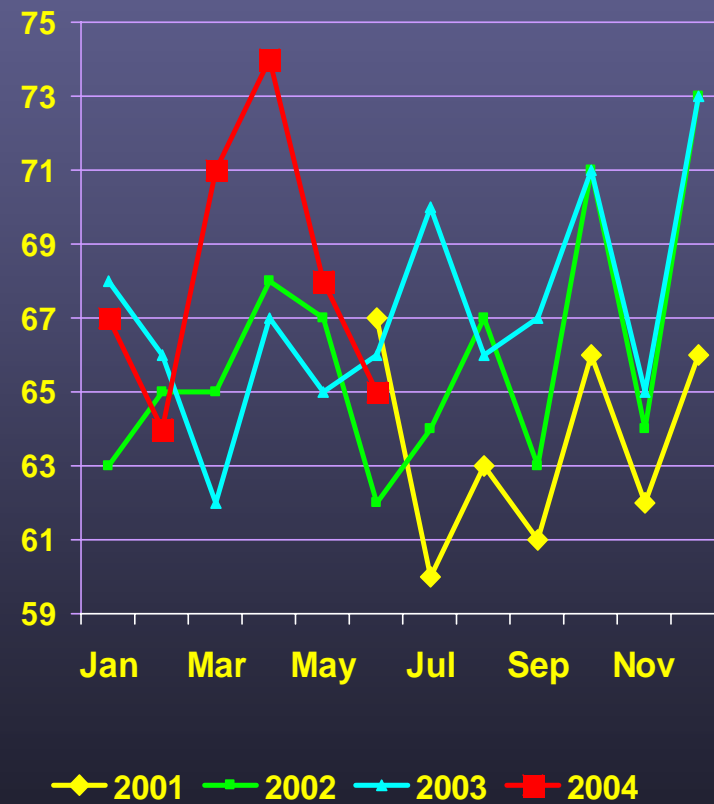
◆ 2001 ■ 2002 ▲ 2003 ■ 2004

Philippines Demand: RFO v. gasoline (kb/d)

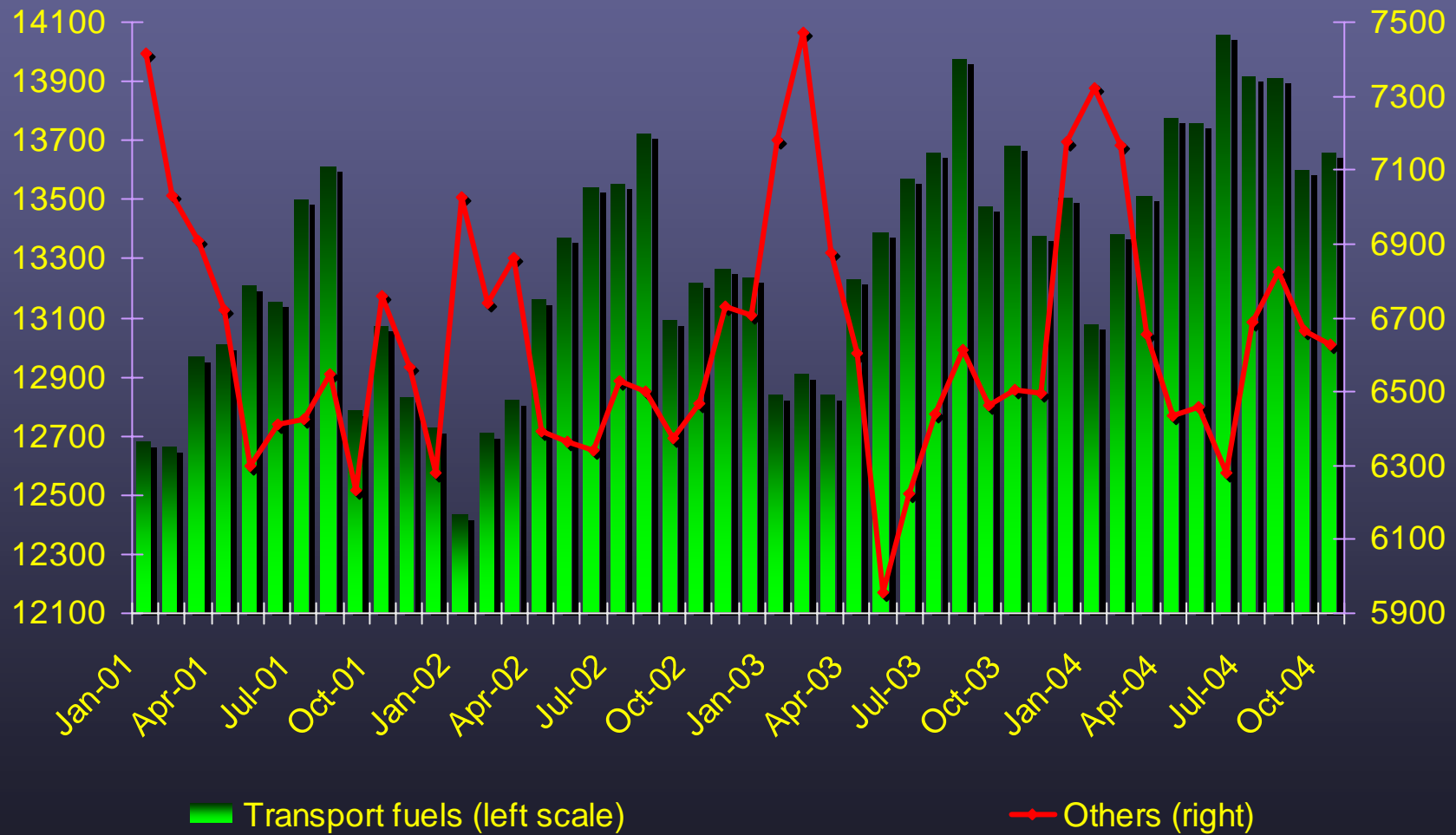
Residual Fuel Oil



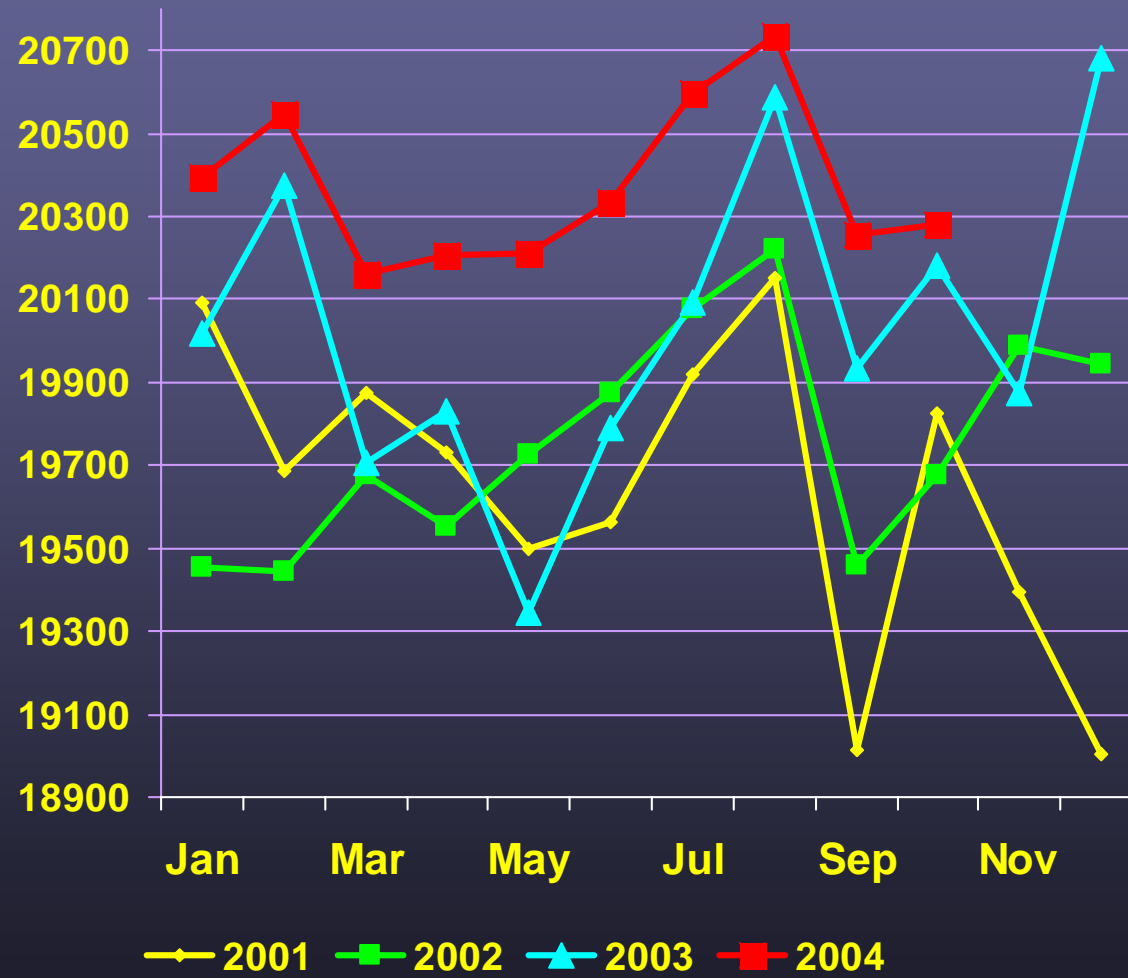
Gasoline



US Demand: transportation fuels versus others (kb/d)



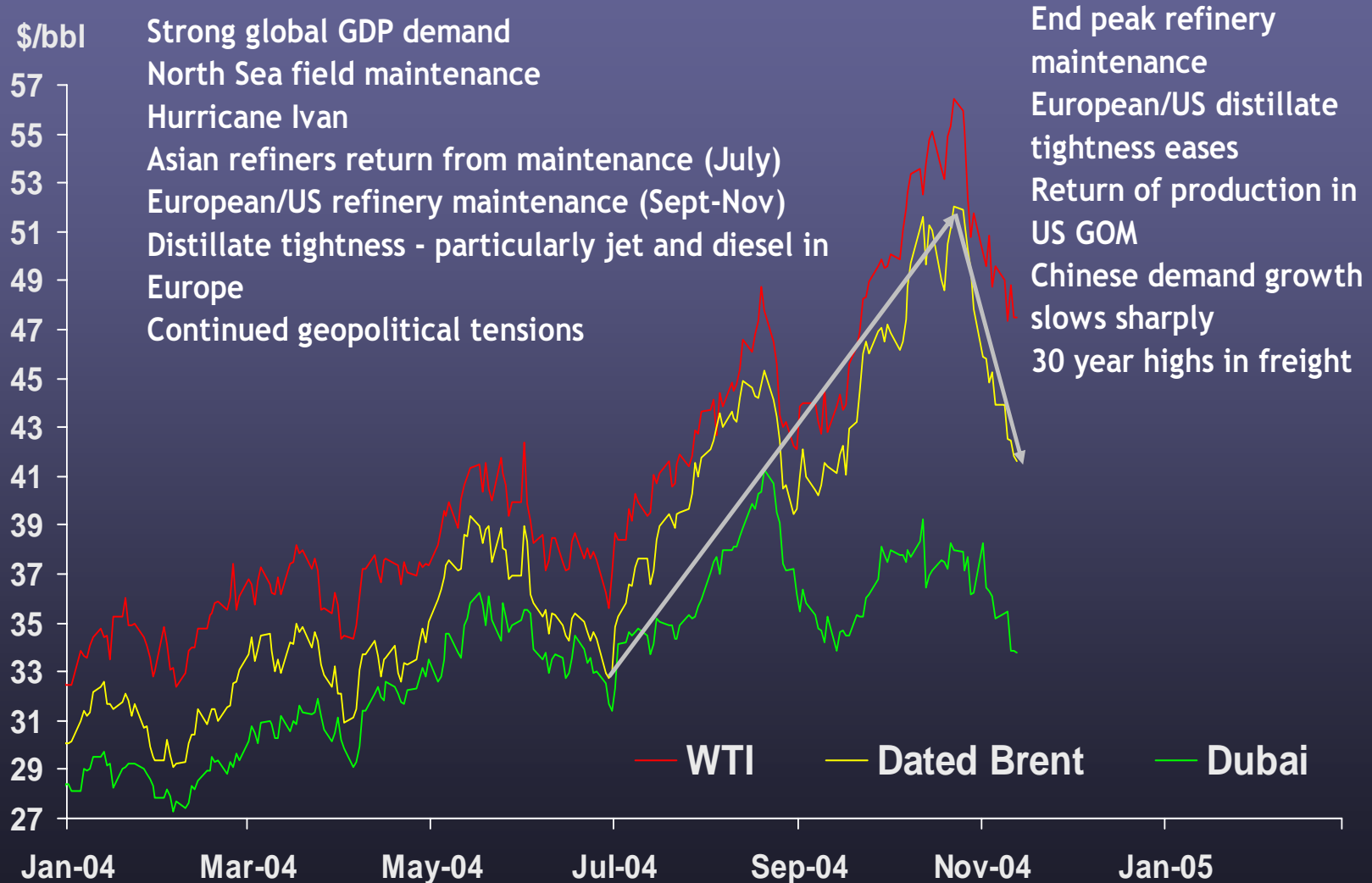
US Total Product Demand (kb/d)



The High Price/High Demand Paradox: alternative explanations

- Price effects versus income effects
- Price riddles: crude quality discounts & premiums
 - From Asian premium to Asian discount
 - Residual fuel oil trading at deep discount for feedstock and powergen
 - US coking advantage
- OECD rigidities: dominance of transportation fuels limits scope for short-term price effects
- Non-OECD price politics: price controls, tax cuts, administered prices, government grants & other subsidies
- Non-OECD paradox: supply constraints versus price

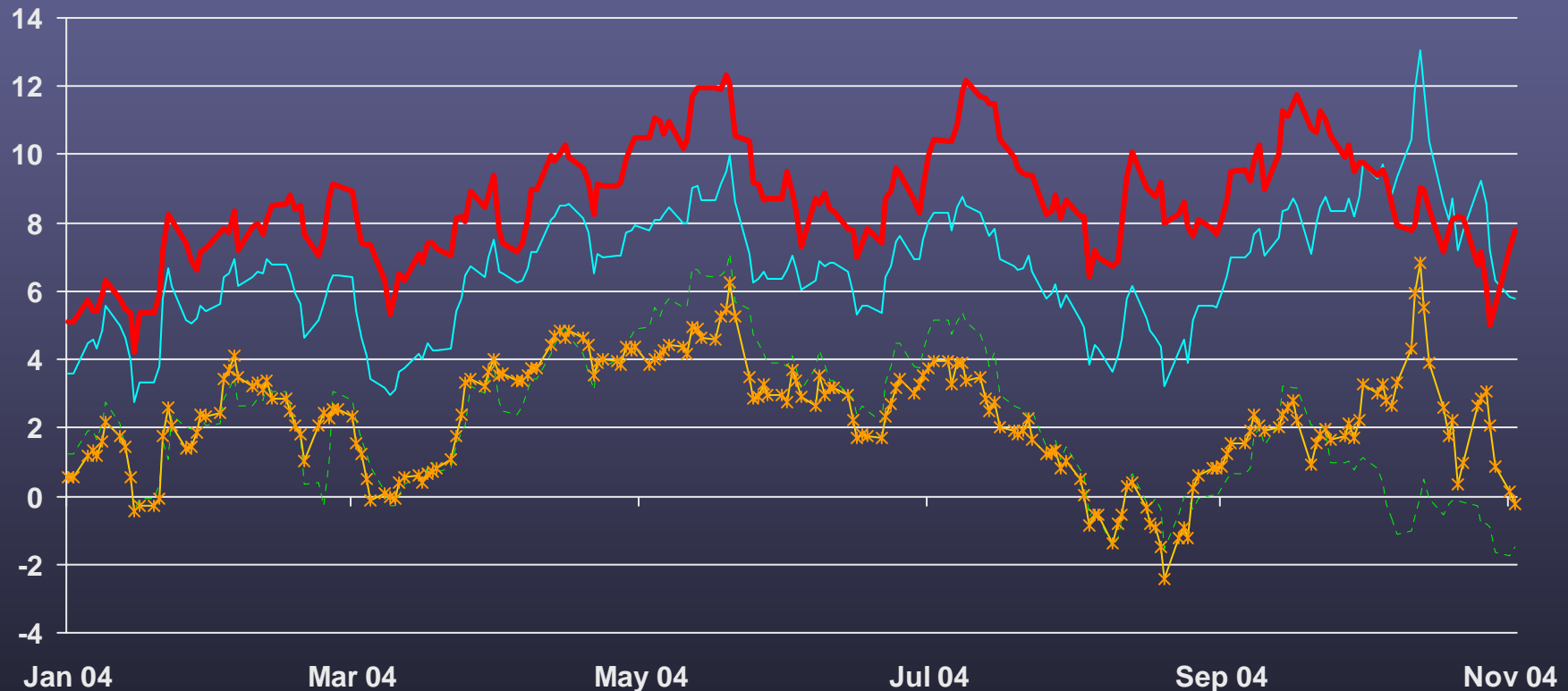
2004 Price Movements: widening sour discount



Gulf Coast margins show benefit of upgrading capacity this year

\$/bbl

US Gulf Coast Refining Margins



--- LLS Refining Margin (Cracking)

— Mars Refining Margin (Coking)

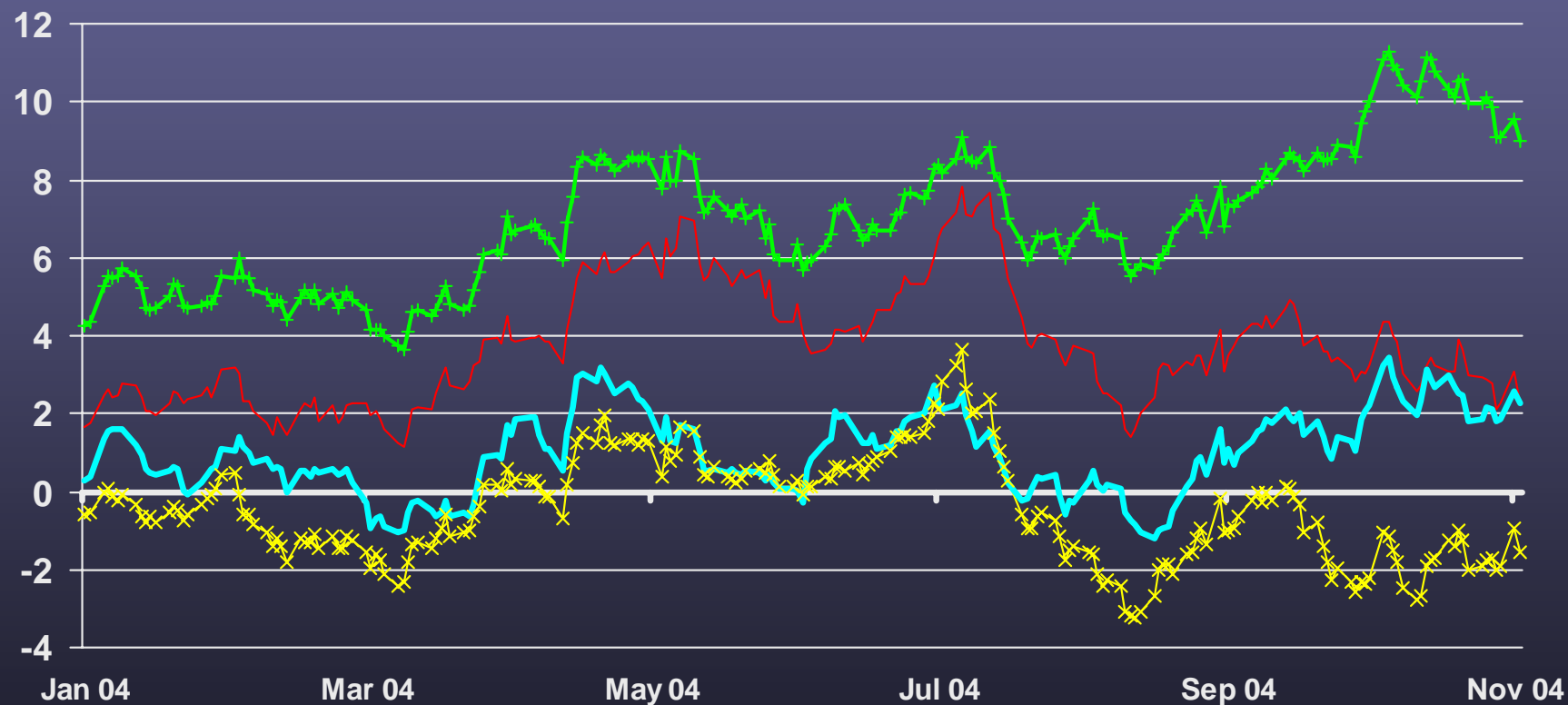
—* Mars Refining Margin (Cracking)

— Maya Refining Margin (Coking)

Persistently high Urals margins show limited upgrading capacity

\$/bbl

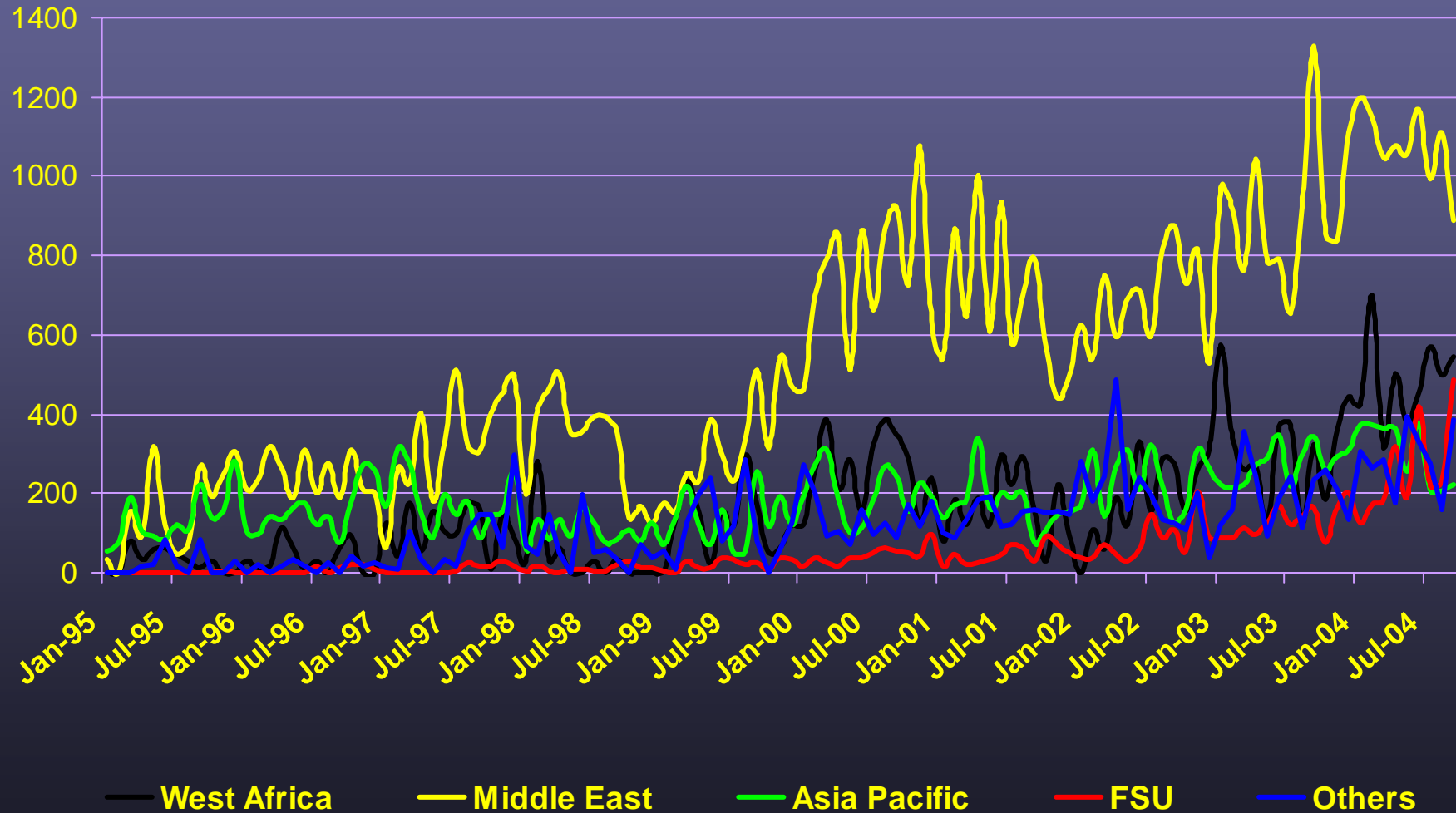
European Refining Margins



— Brent Cracking × Brent Hydroskimming — Urals Cracking — Urals Hydroskimming

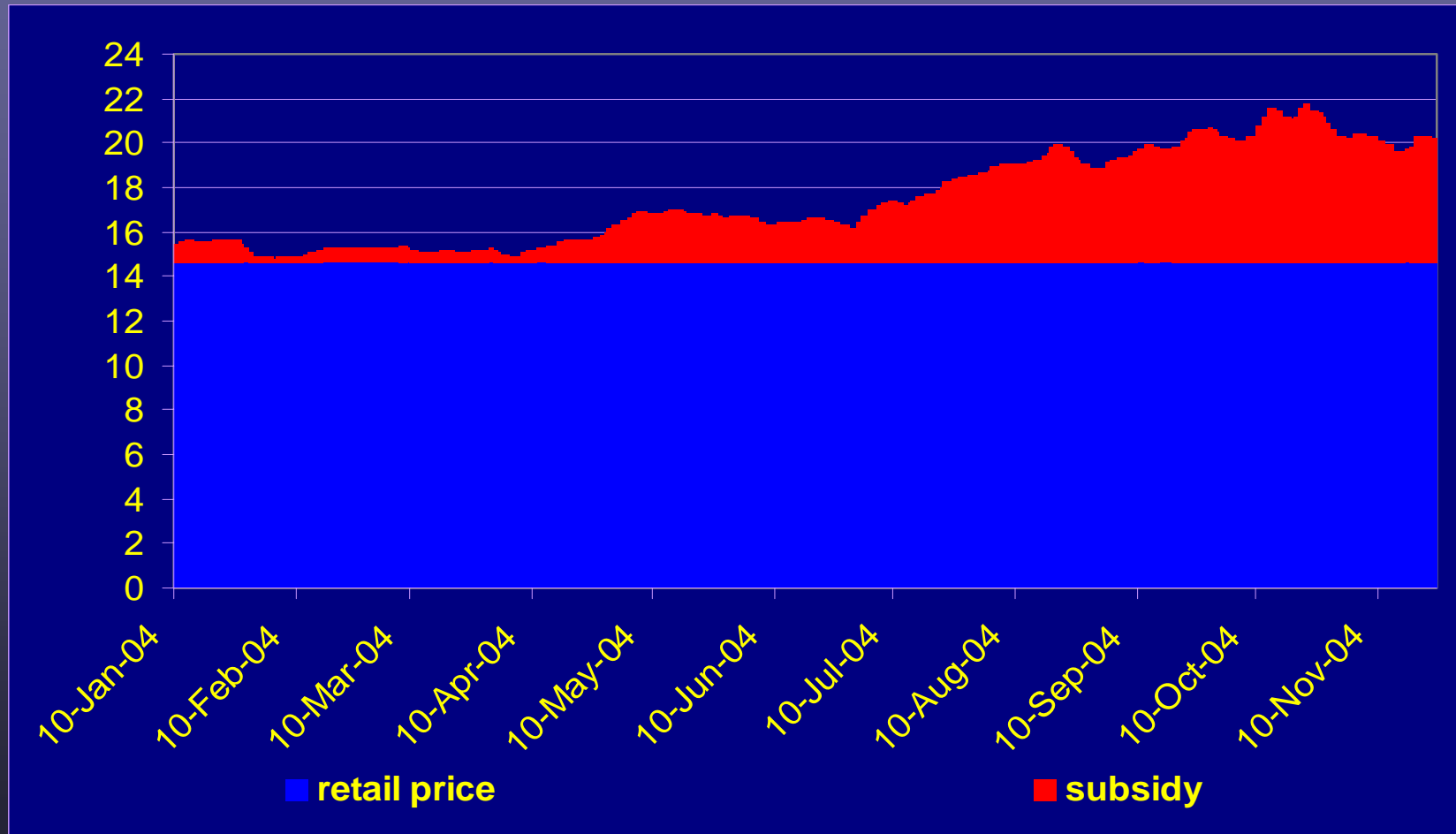
Chinese Crude Imports by Origin (kb/d)

Sour Dubai-linked grades still dominate



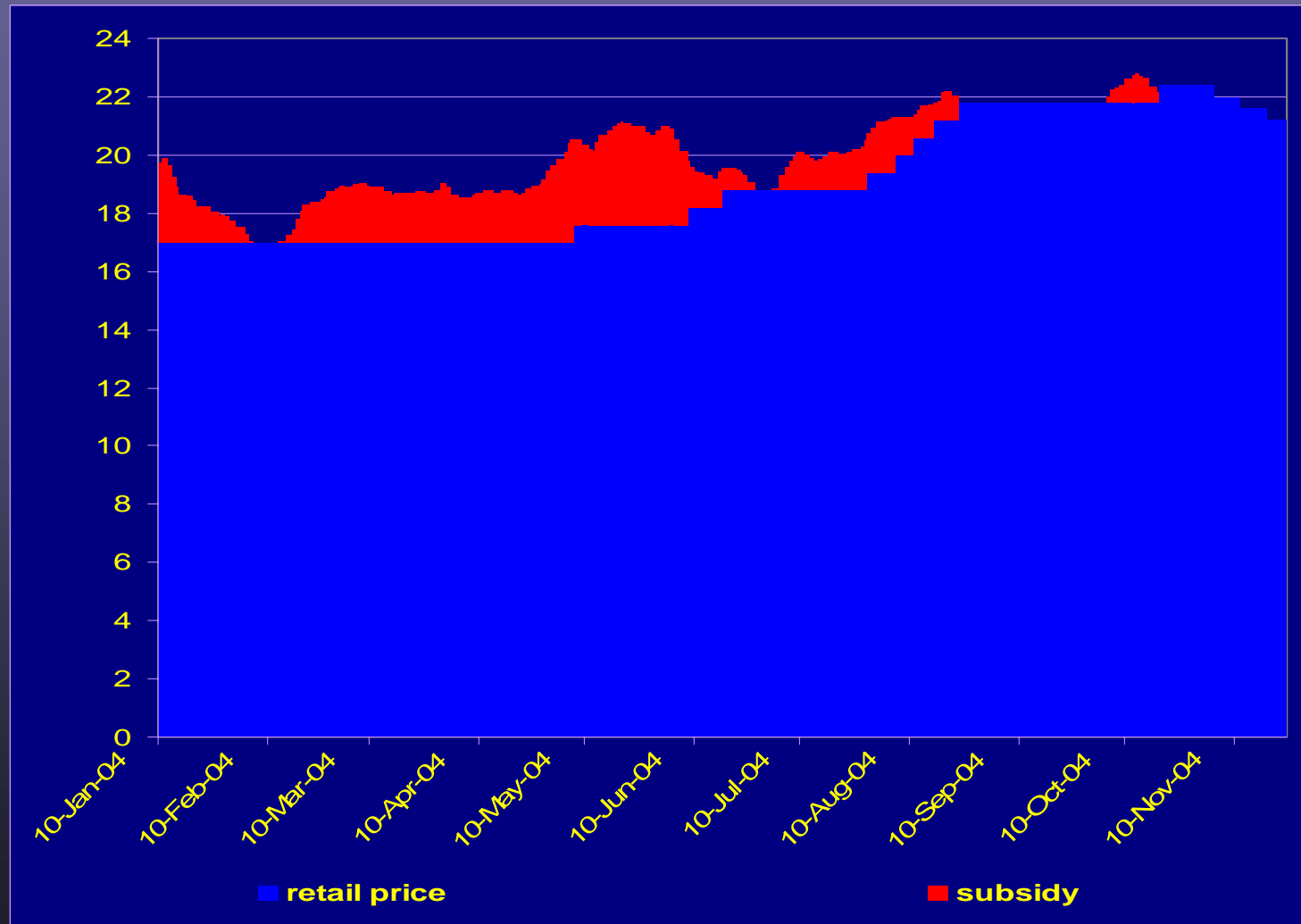
Thai Retail Oil Prices: high-speed diesel

Pump prices in Bangkok from 10 Jan 2004, baht/litre



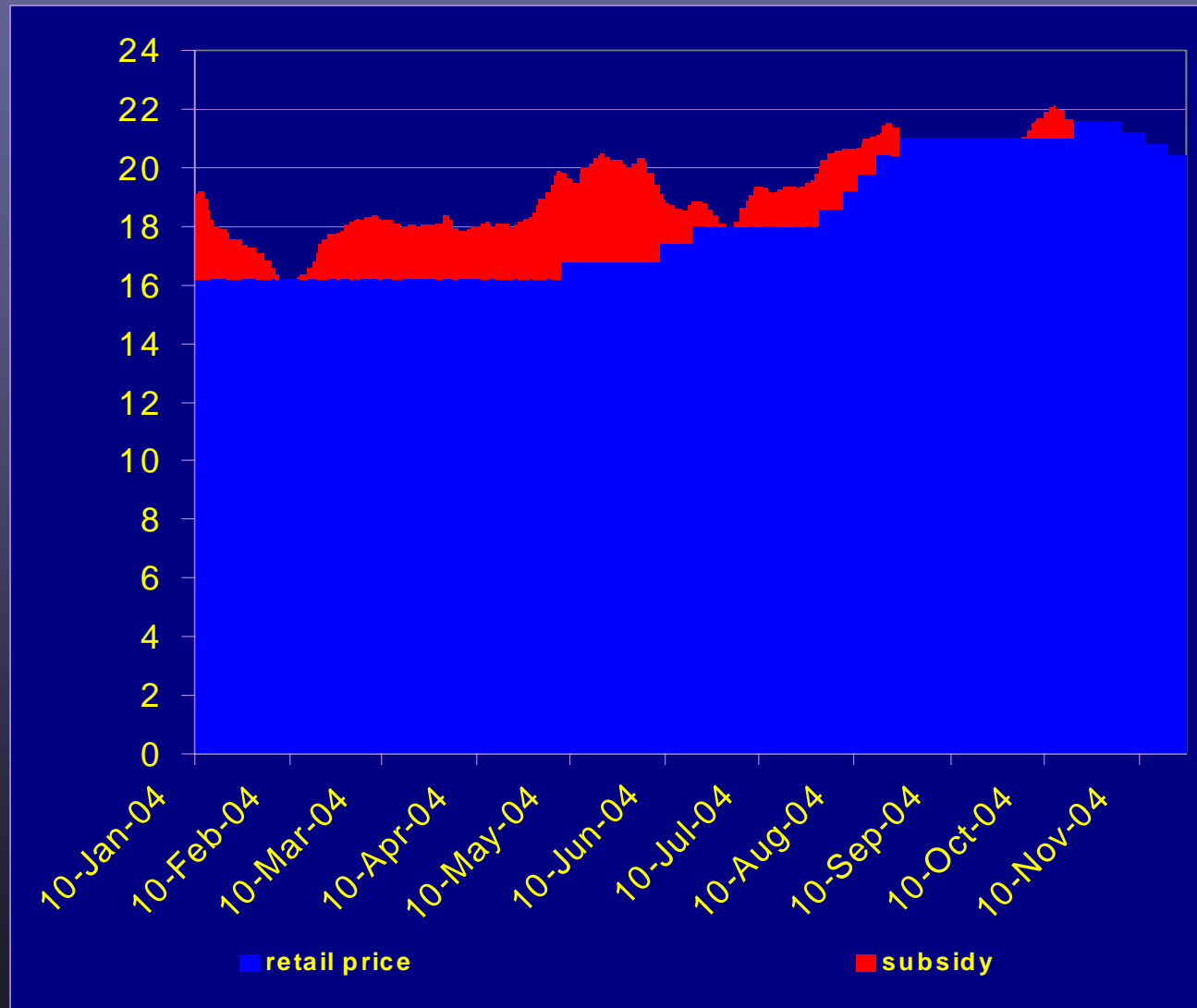
Thai Retail Oil Prices: premium unleaded gasoline (ULG 95)

Pump prices in Bangkok from 10/01/2004, baht/litre

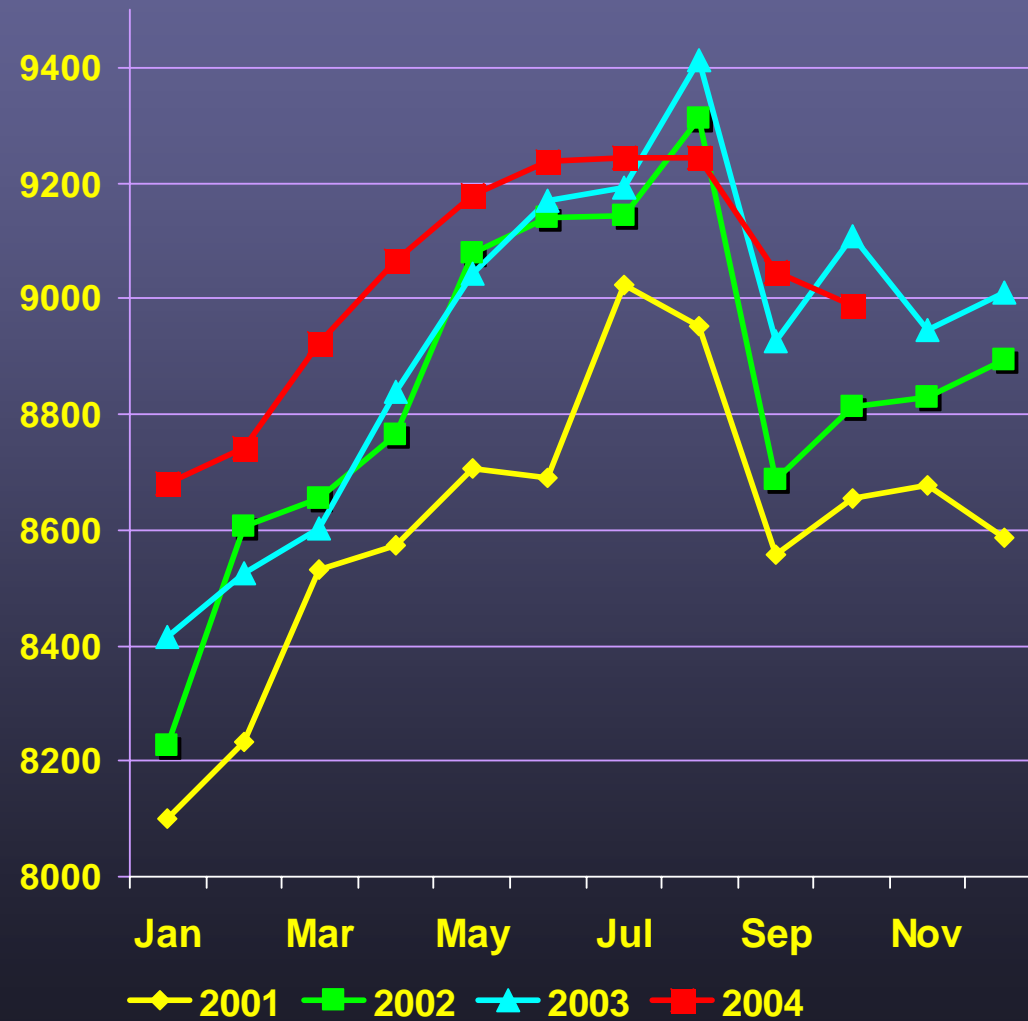


Thai Retail Oil Prices: UGR 91 gasoline

Pump prices in Bangkok from 10 Jan 2004, baht/litre

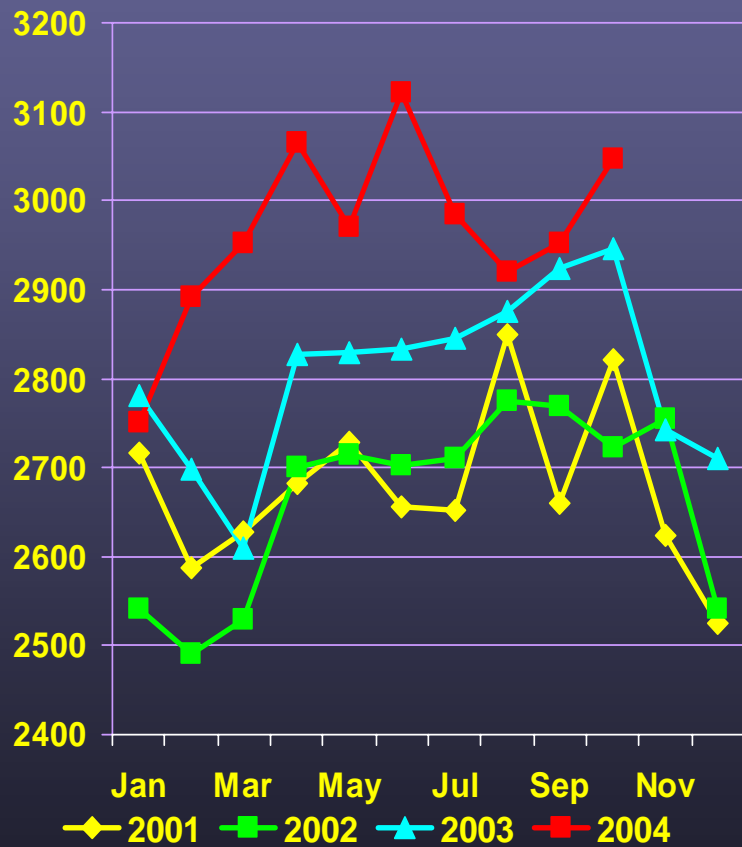


US Transport Fuel Demand: gasoline (kb/d)

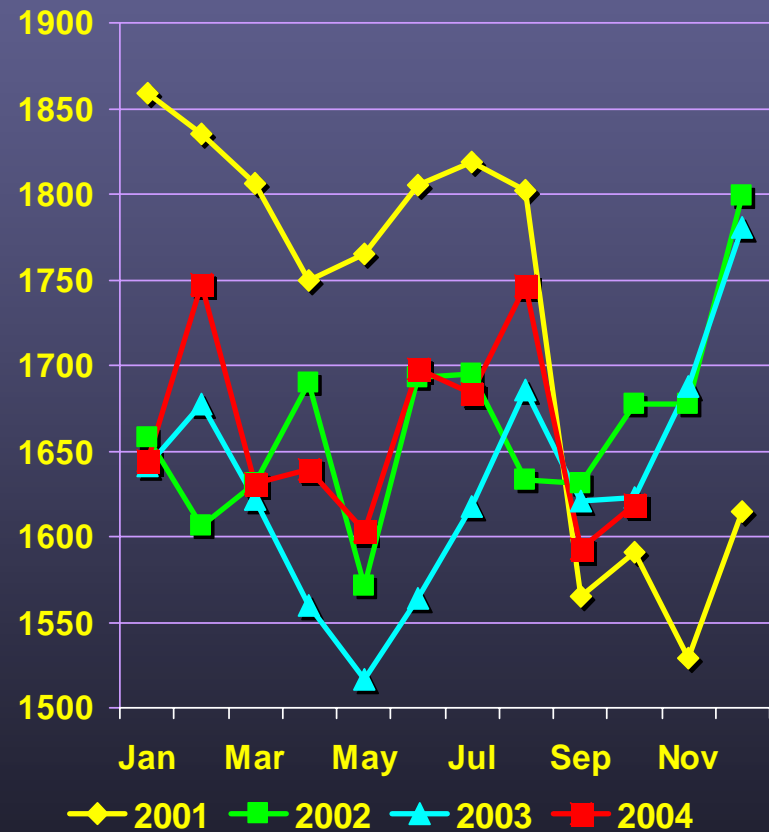


US Demand: other transportation fuels (kb/d)

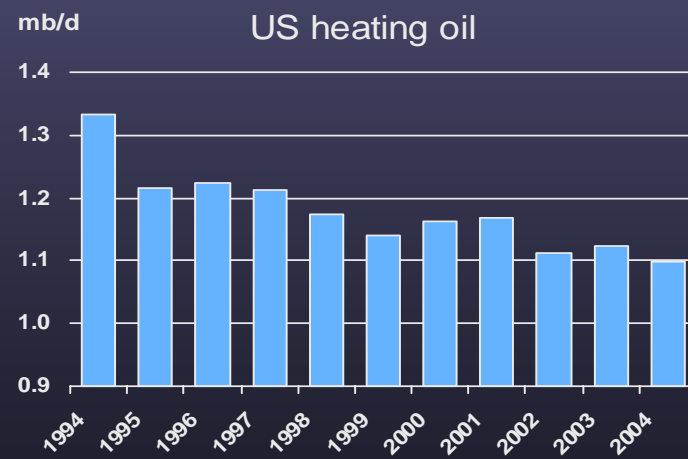
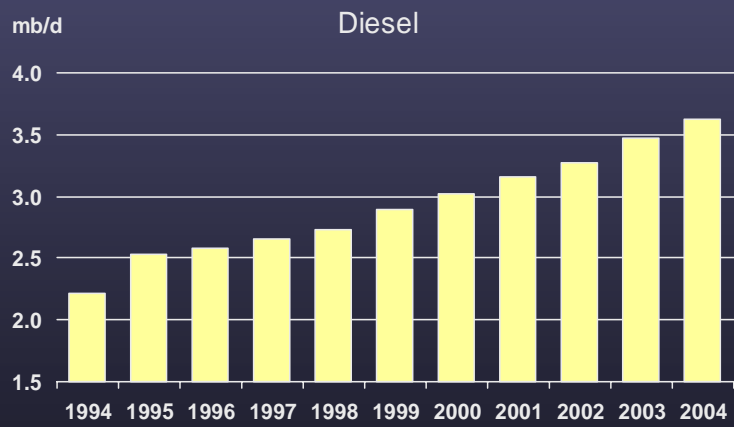
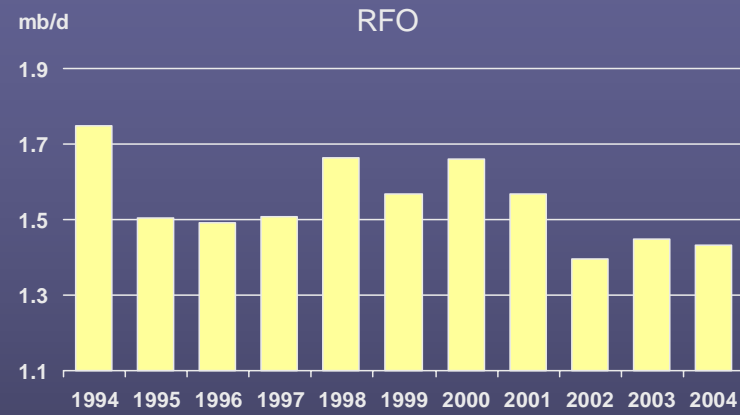
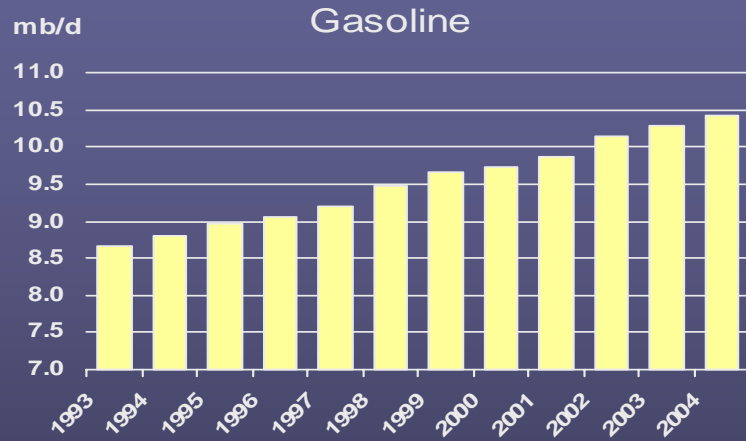
Diesel



Jet fuel/kerosene



North American Demand



Demand Growth Resilience: Is it sustainable?

▪ **The case of the US**

- Demand effects versus economic impact
 - Transportation demand resilient, to a limit
 - Long-term growth set to slow as price rekindles fuel efficiency concerns
 - Pocketbook effect hits consumer spending: demand resilience means immediate GDP impact
- Low interest rates are mitigating factor, but set to rise

▪ **The case of emerging Asia**

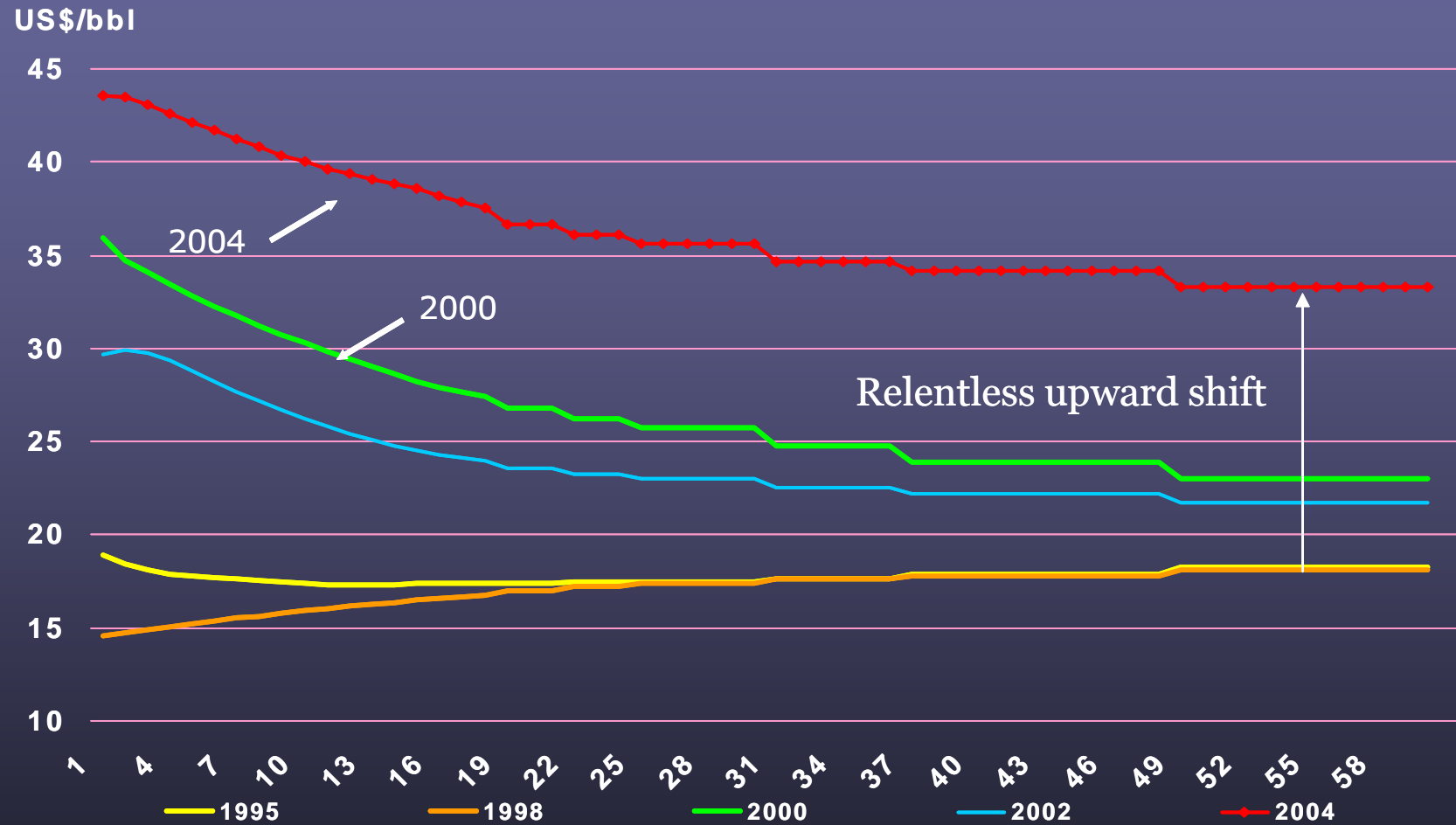
- Government cost of oil subsidies unsustainable: much depends on how long prices will stay high
- Budget effect hits government spending
- Policy impacts

Crude Prices: 'Paradigm Shift'?

- In emerging Asia, price effects have been delayed by price controls and government subsidies
- Such measures are unsustainable if high prices are prolonged
- Much depends on the price outlook – i.e., whether the latest rally reflects the top of a cycle or the beginning of a new, high-price era
 - Future markets reflect expectations of continued high prices, but have low predictive value
 - S/D fundamentals call for lower prices and are set to ease further
 - Spare capacity set to rebuild, OPEC seen producing above call
 - But scope for price drops may be limited, supply risks remain
 - Capital migration towards energy alters market dynamics

WTI NYMEX Futures - 60 months

(15 September per period)



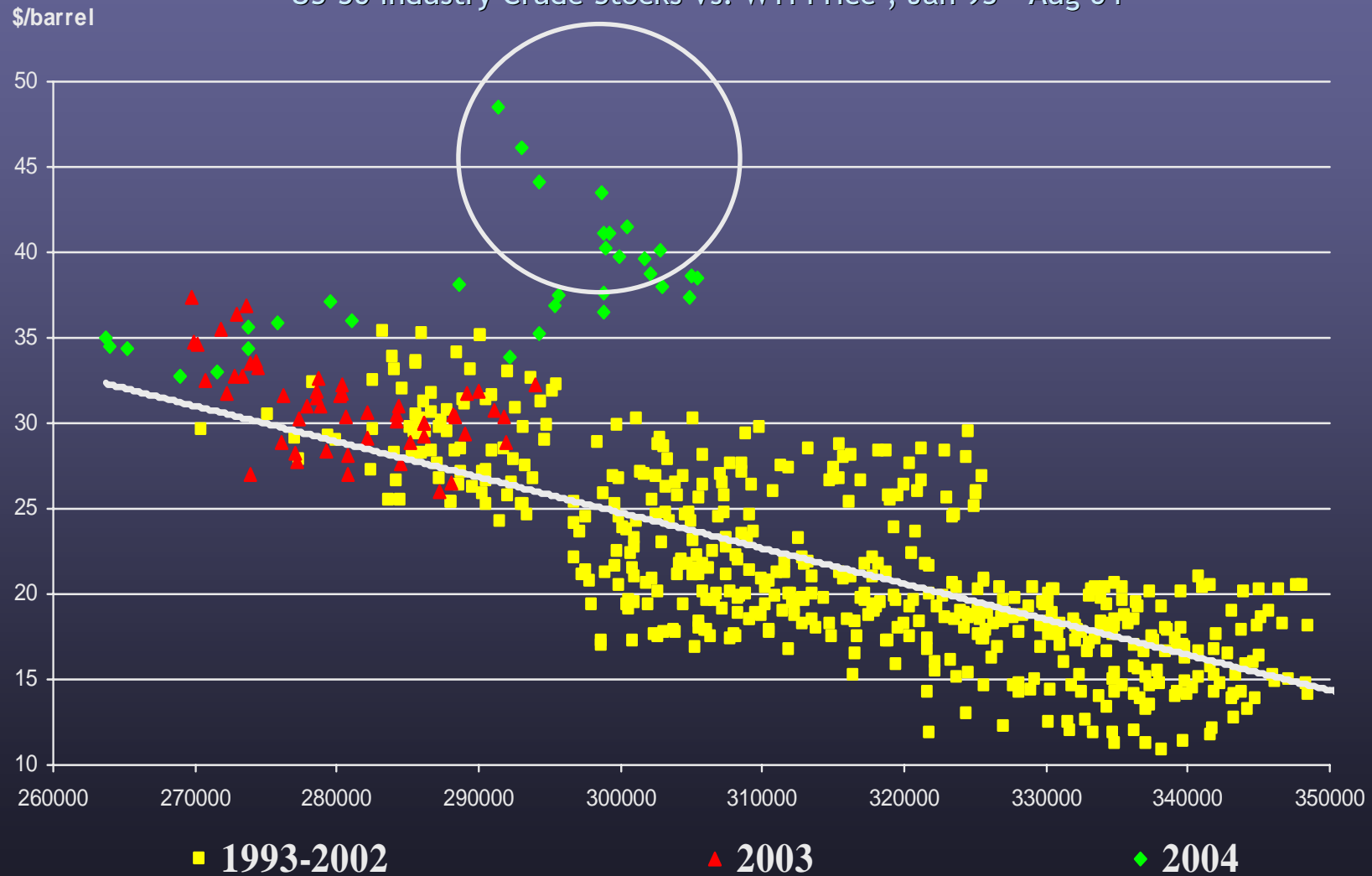
Current market expectation: higher average long-run prices

Caution: limited liquidity 60 months out

High Prices in Perspective

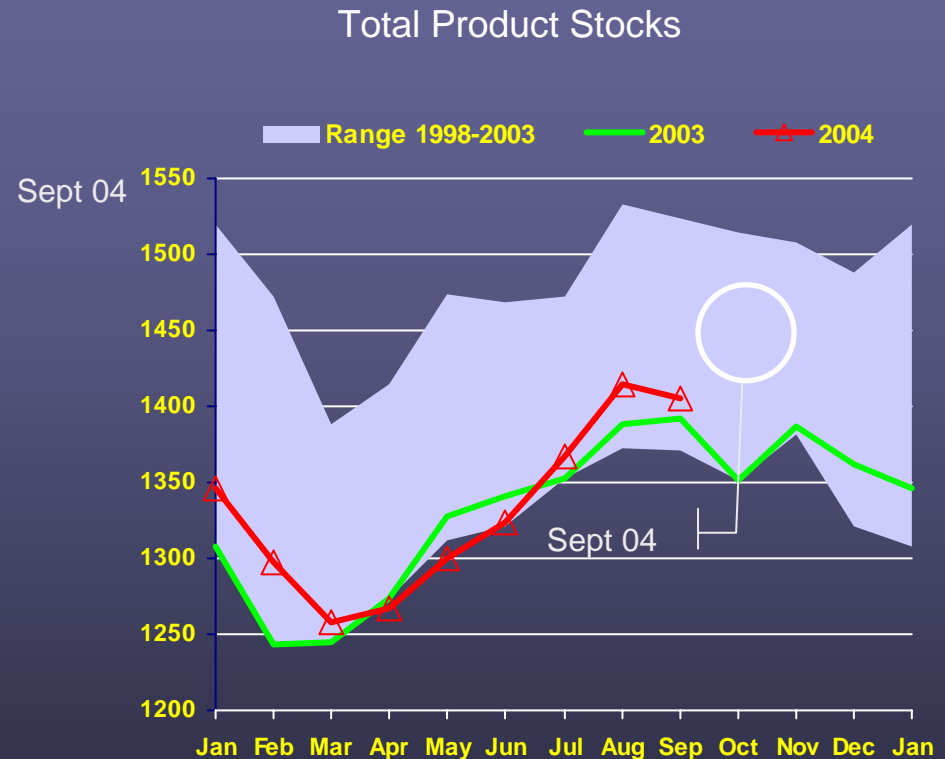
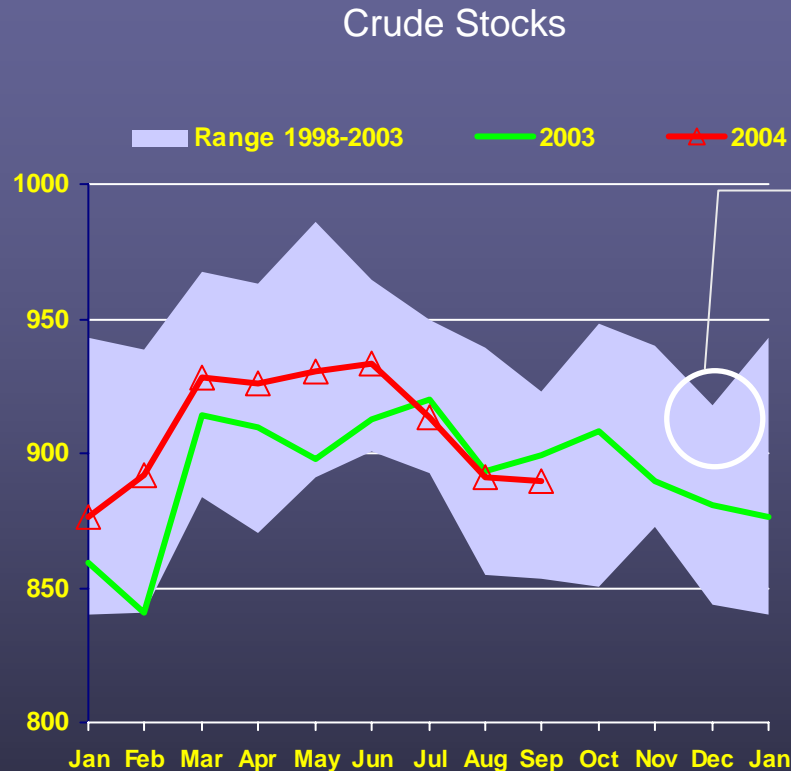
Prices vs fundamentals: shifting relationships

US-50 Industry Crude Stocks Vs. WTI Price , Jan 93 - Aug 04



OECD Industry Stocks 5-year Range (mb)

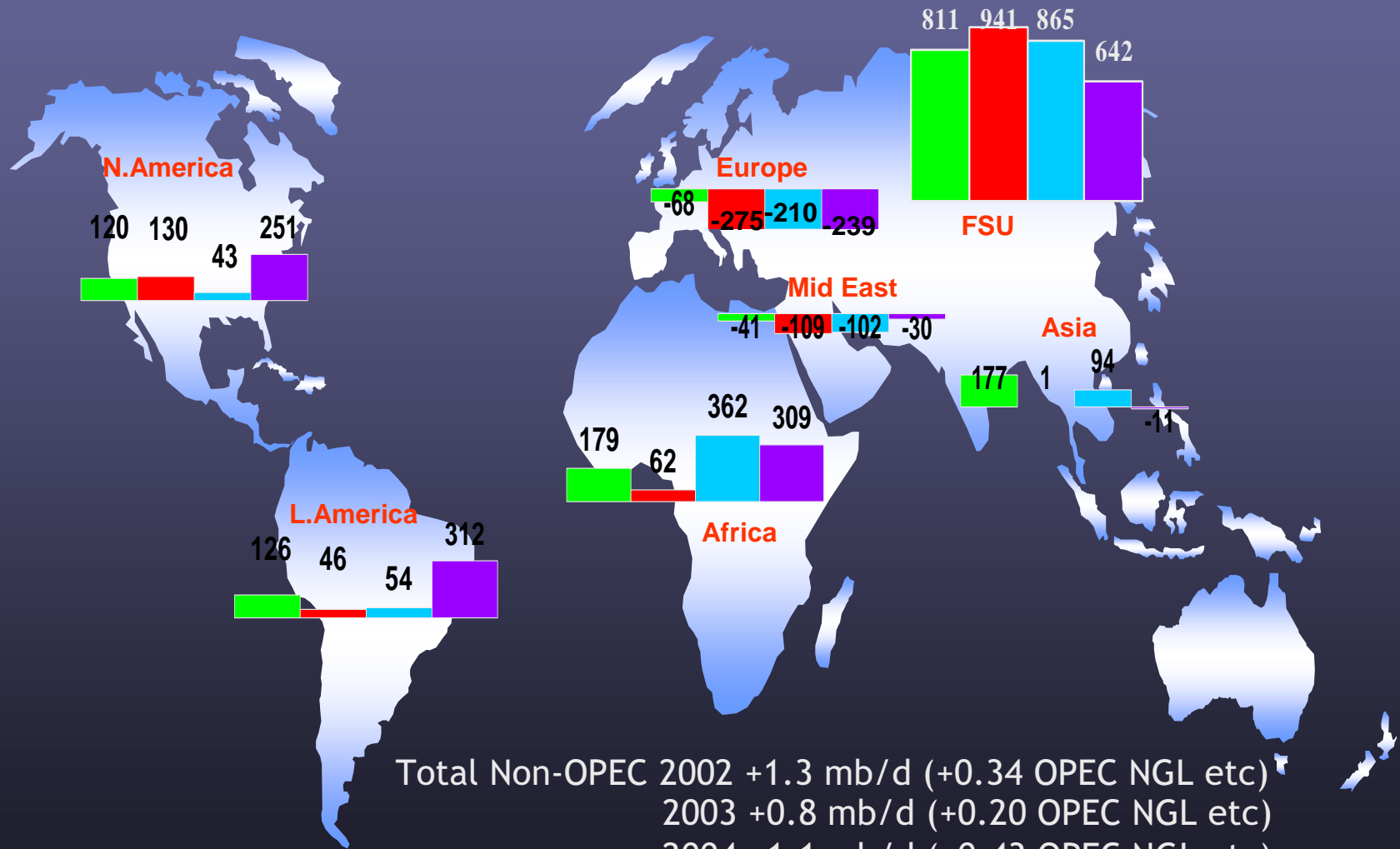
End-September 2004 Crude Vs Product Stocks



- **Crude Stocks** close September at comfortable levels, despite high refinery activity across regions and hurricanes in the Gulf of Mexico
- **Product stocks**, refinery high output whose capacities are stretched, rising seasonally, albeit from lower base but on strong gains in distillate products

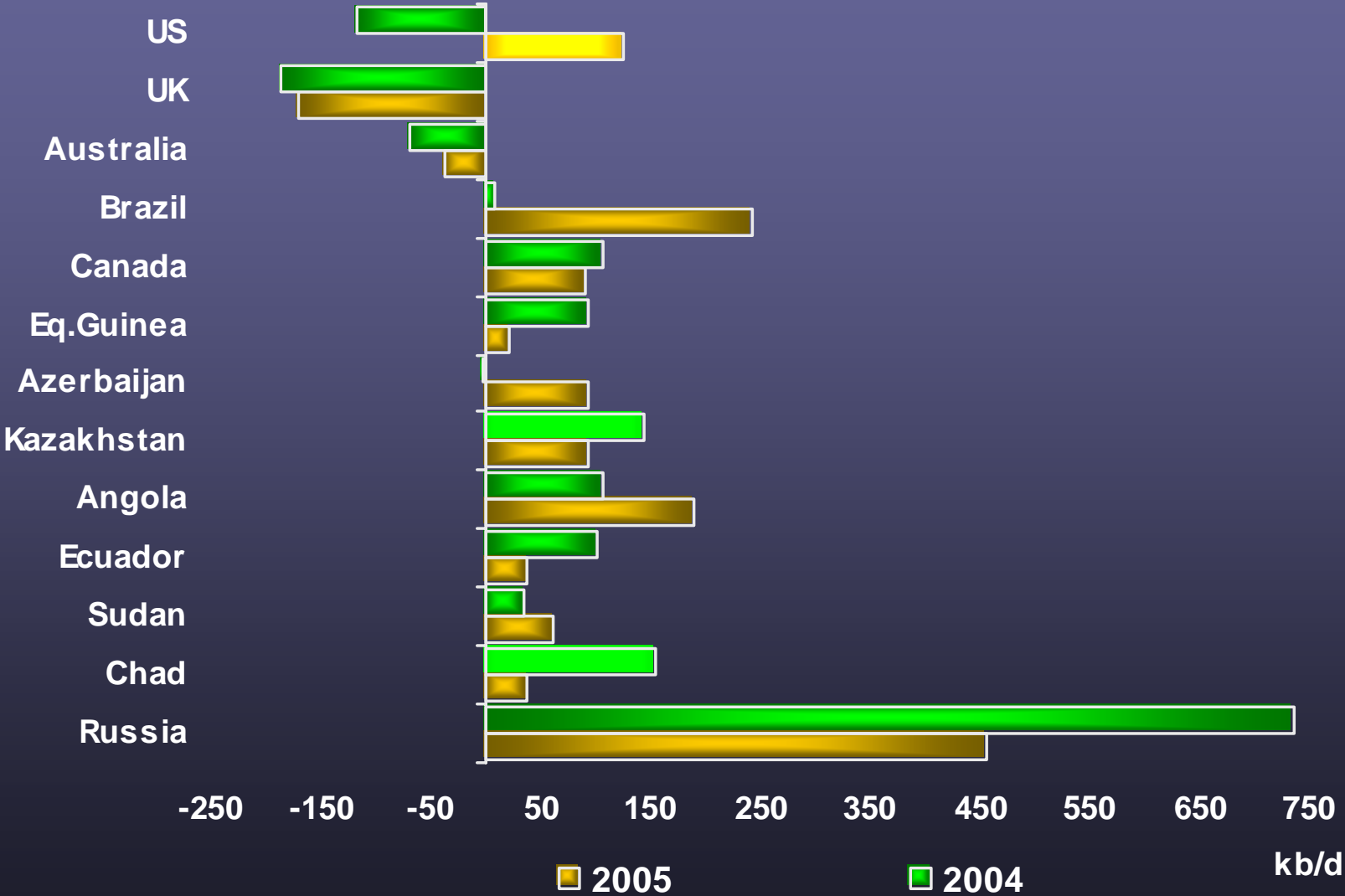
Main non-OPEC supply gains 2002/2003/2004/2005 (kb/d)

2005 growth looks geographically broader based

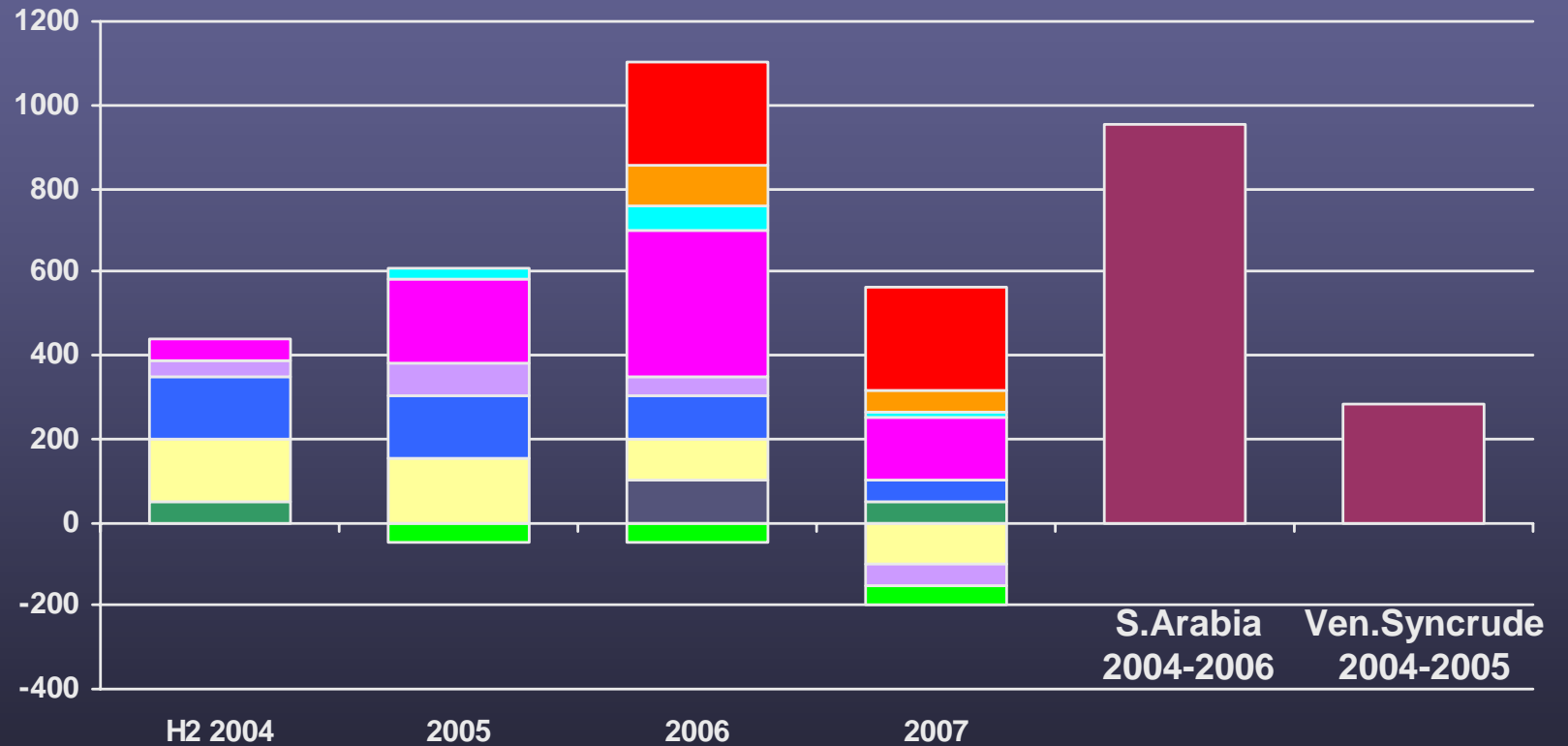


Total Non-OPEC 2002 +1.3 mb/d (+0.34 OPEC NGL etc)
 2003 +0.8 mb/d (+0.20 OPEC NGL etc)
 2004 +1.1 mb/d (+0.43 OPEC NGL etc)
 2005 +1.3 mb/d (+0.44 OPEC NGL etc)

Main Changes in Non-OPEC Supply 2004/2005

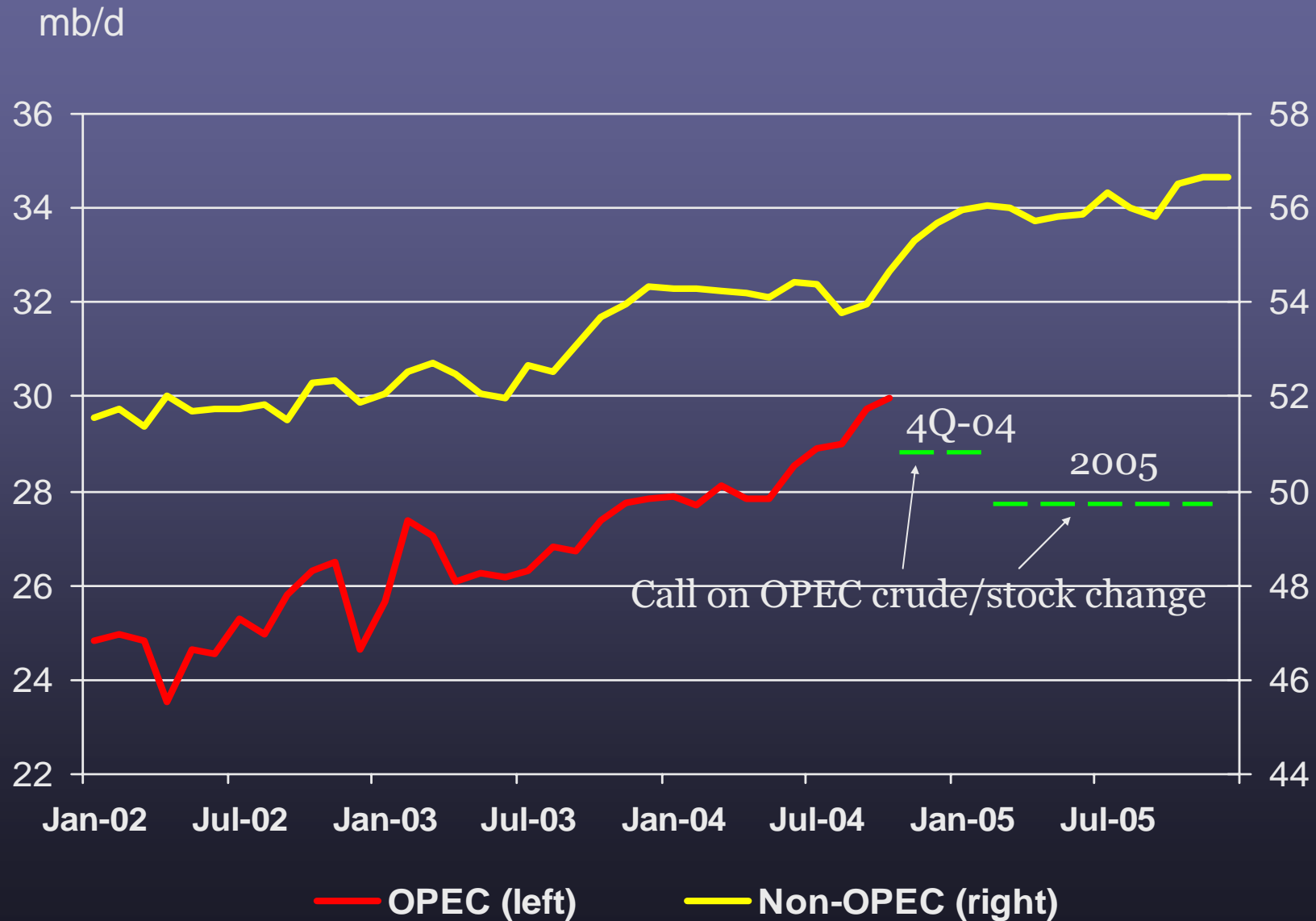


OPEC Production Capacity is Increasing. Expected New Investment (kb/d)



■ Algeria
 ■ Indonesia
 ■ Iran
 ■ Kuwait
 ■ Libya
 ■ Nigeria
 ■ Qatar
 ■ UAE
 ■ Venezuela
 ■ Iraq

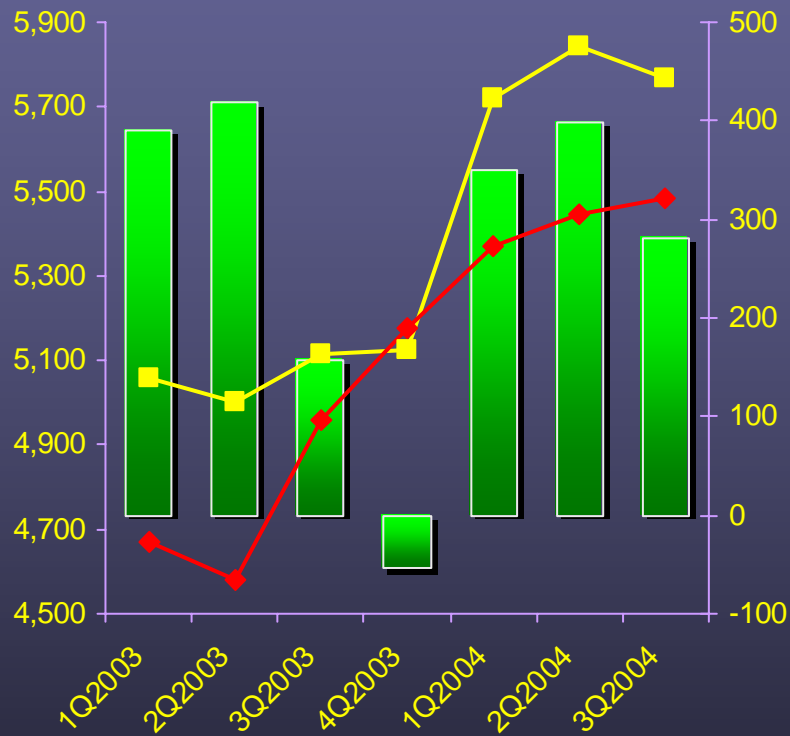
OPEC Producing Well Above 4Q & 2005's "Call"



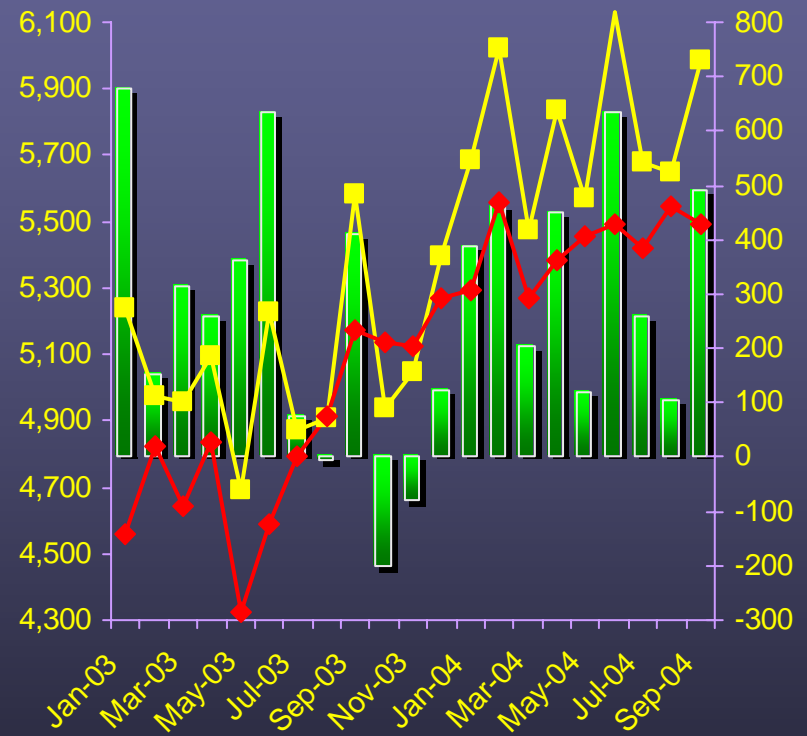
Short-term Demand Outlook: non-price related factors

- Prices may not be the key factor in shaping the outlook for 2005 Asian oil demand
- Infrastructure development is crucial
- 2Q2004 demand bulge: new baseline or one-off factor?
- Chinese power generation supply crunch
- Price sensitivity of policy
 - Chinese energy price guidance
 - Chinese economic policy
- FSU internal demand v. export bottlenecks
- US deficit/interest rates
- Transpacific trade
- Stockbuilding / strategic reserves

Apparent Chinese Crude Stockbuild (kb/d)



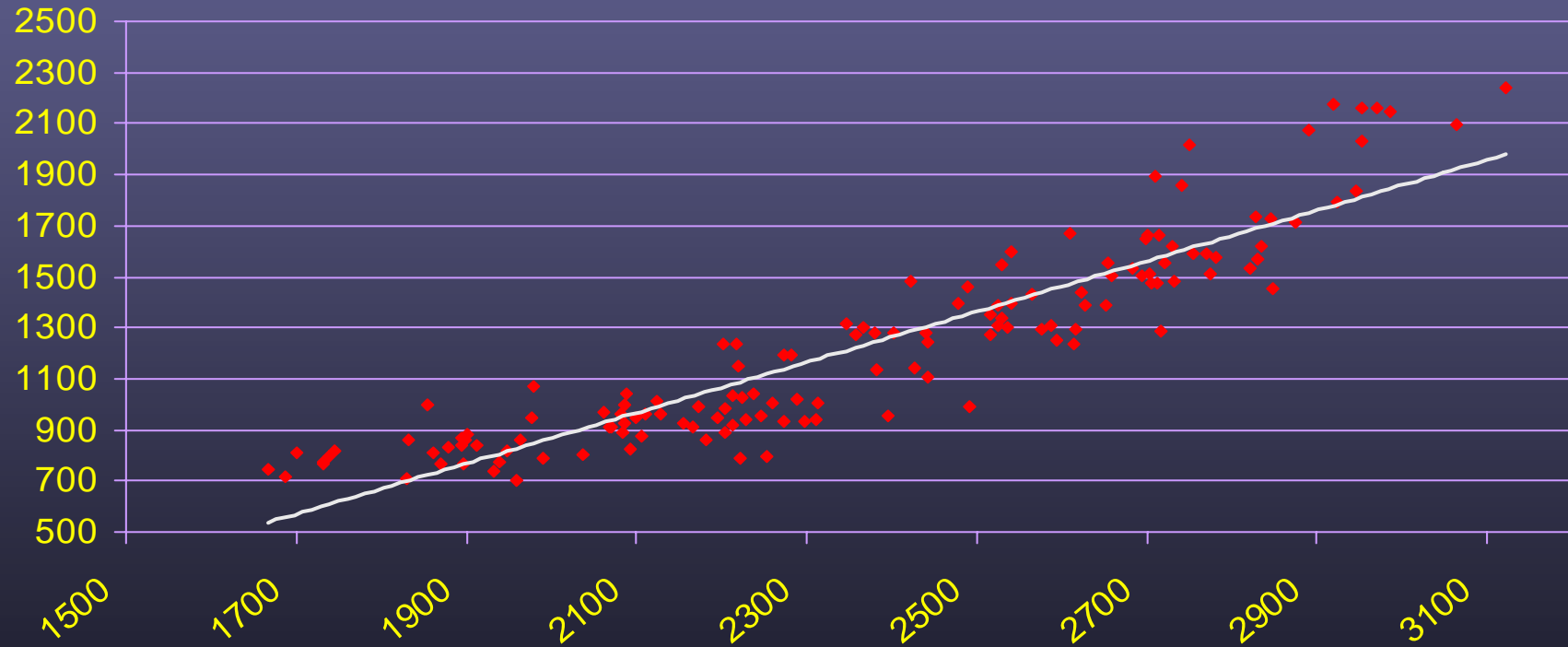
■ apparent stockbuild (right scale)



■ Crude supply (left) ◆ NSB crude runs (l.)

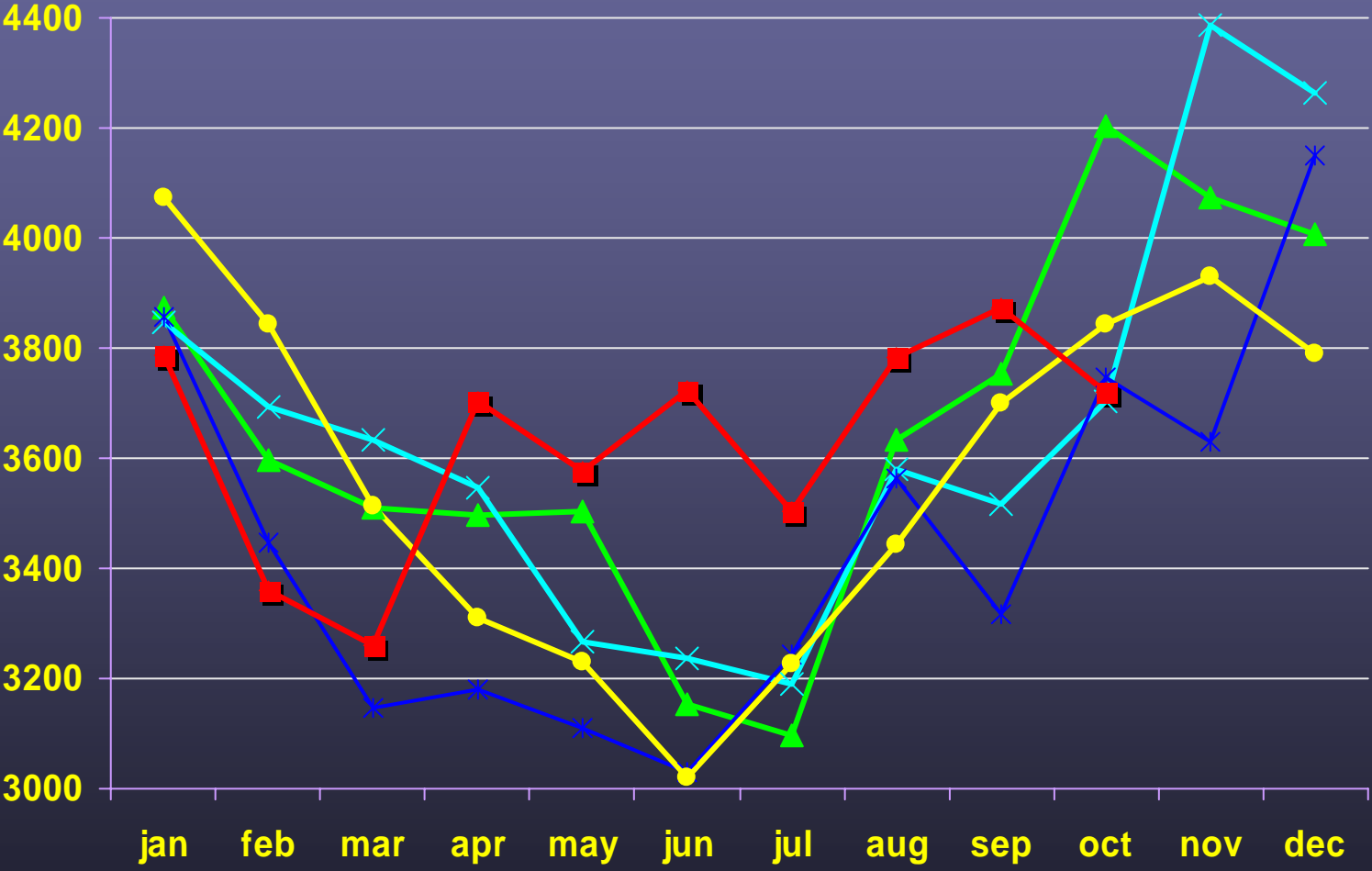
Pacific Basin Integration: trade impact on China and US distillate demand

US diesel v. China gasoil demand
Jan 1993-Sep 2004 (kb/d)



FSU Apparent Demand

Was 2Q-3Q Spike a One-Off?



▲ 2000 × 2001 * 2002 ● 2003 ■ 2004

Longer-term Demand Outlook

- Lagged, long-lasting policy impacts are to be expected
 - High prices coupled with demand surge spark concerns not only over costs, but also over supply security & import dependency
 - Renewed drive towards higher efficiency standards & fuel diversification
 - GTL, Coal-to-liquids, biofuels, etc
 - Impact on consumer behaviour
- Demand loss may not be reversed even in the event of lower prices
 - Asymmetrical price effects
- On balance, though, impact on Asian demand growth seen marginal
 - Asian economic expansion sets stage for continued demand surge
 - Key inflection points reached in China today, tomorrow in India and lesser-developed South & Southeast Asian economies
 - Alternative energy infrastructure takes time to build
 - Biofuels a factor at the margin, but large-scale development faces major hurdles – such as farmland scarcity and looming food shortage in China
- Something has to give