*Confidential* *Presentation to:*

# EIA 30th Anniversary Conference

## Middle East oil demand and Lehman Brothers oil price outlook

Adam Robinson

**April 7, 2008**

LEHMAN BROTHERS

# Middle East oil demand

- Three pillars of Middle East oil demand
  - Petrodollar reinvestment
  - Purchasing power rise
  - Power sector constraints
- Natural gas shortages for power generation mean balance of risks to any Middle East oil demand forecast are firmly to the upside, adding to summer upside seasonality
- Lehman Brothers has pegged 3Q08 as the tightest quarter of the current oil cycle, with a possible turning point coming by the end of the year

# Putting the GCC economy in global context

- GCC = Saudi Arabia, UAE, Kuwait, Qatar, Bahrain, Oman
- GDP/capita in 2007: $19,000
  - Nearly 3x China and 5x India
- At $800 bn, GCC is a top 10 developing economy by size
- GCC real GDP grew 3% from 1998-2002, 7% since

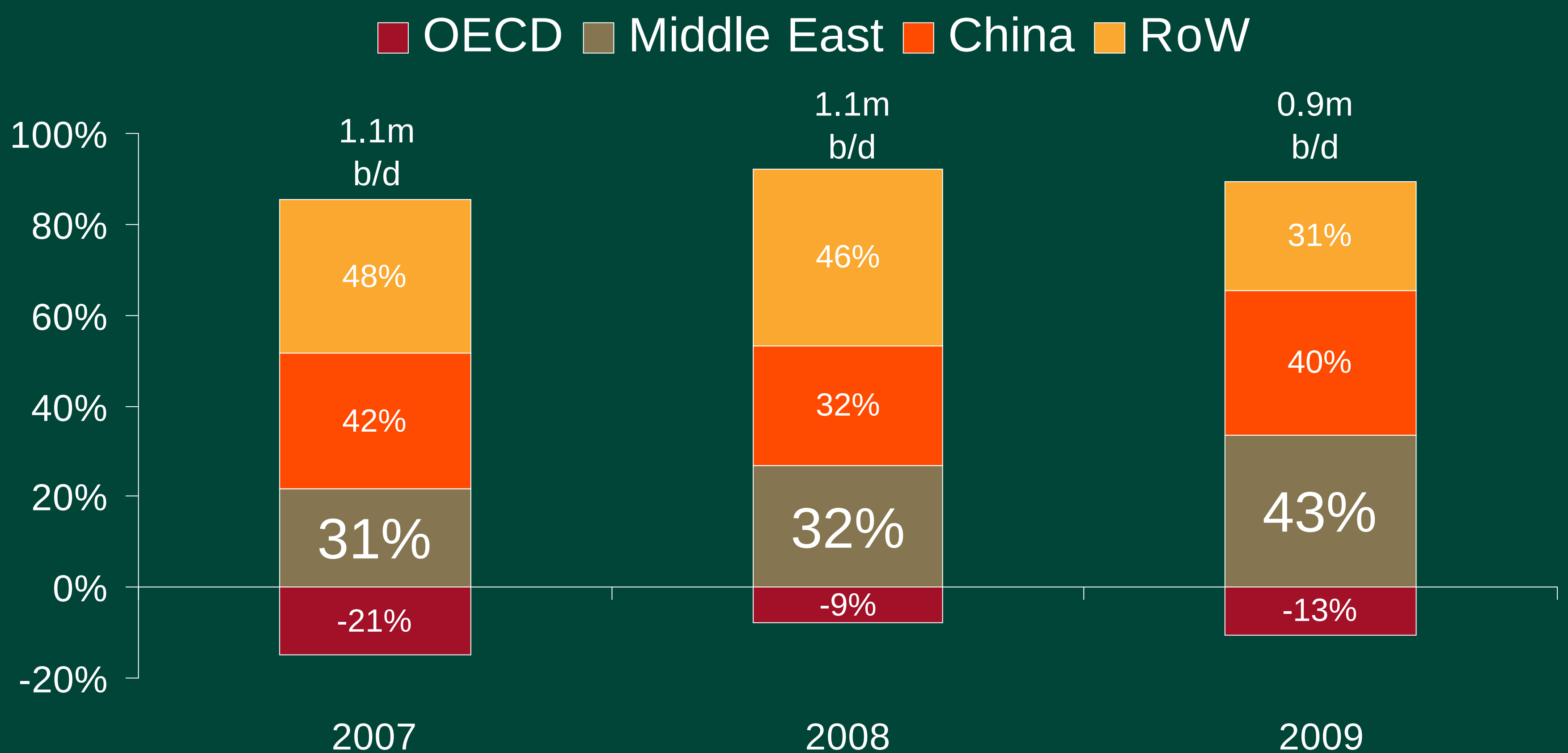
Other points:

- Saudi equity market larger than China's as recently as 2005
- Per capita steel consumption now double world average

# Conclusion up front: ME is critical to global demand growth

- GCC 36m people, oil demand now growing ~200k b/d pa
- Overall Middle East (ME) growing ~350k b/d pa

Middle East now accounts for at least 1/3 of global oil demand growth



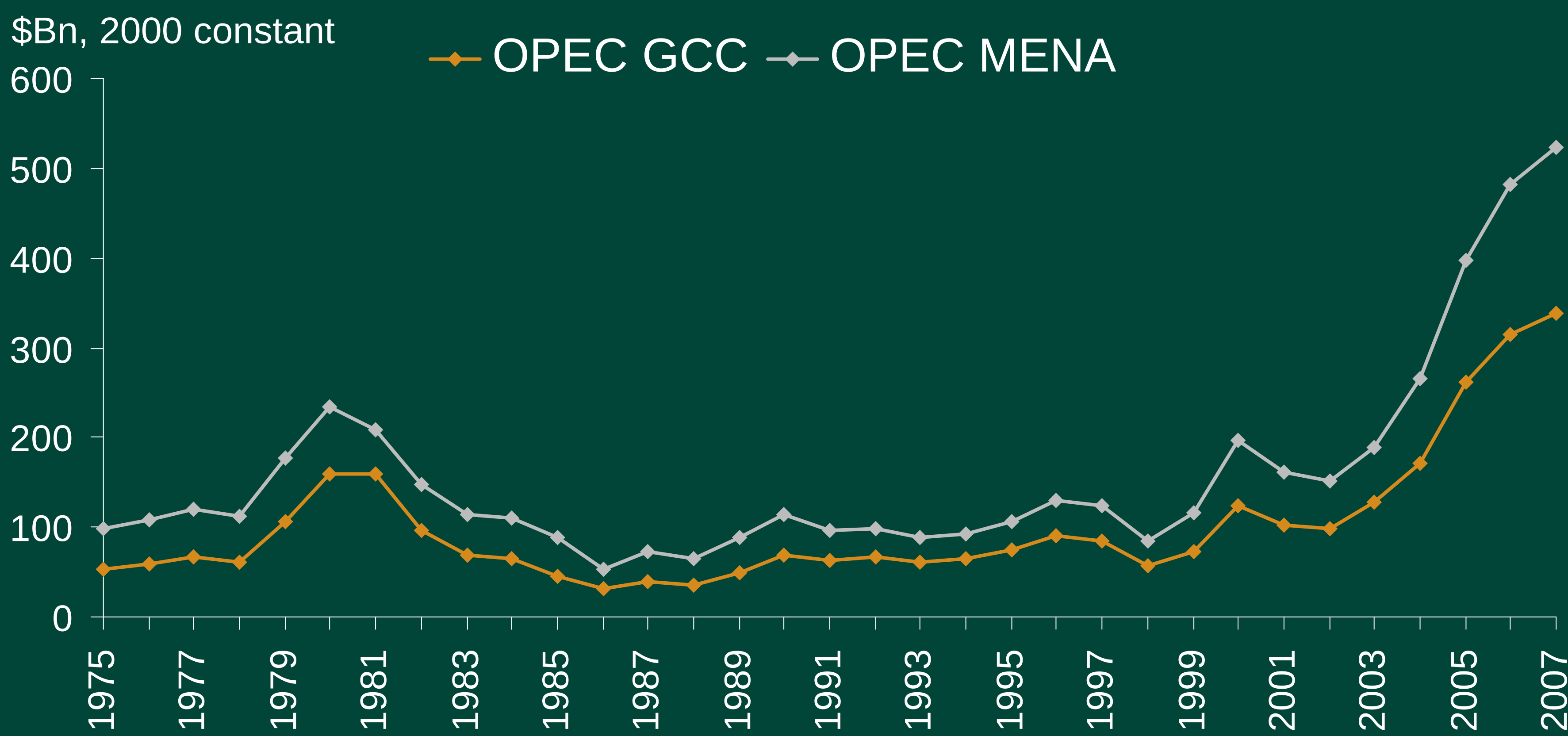

*Source: Lehman Brothers estimates*

# Pillar 1
# Petrodollar Reinvestment

# The Middle East petrodollar boom is unprecedented

**Is 300k+ b/d oil demand growth sustainable? Depends on where the petrodollars go…**

Oil revenue available for reinvestment




*Source: EIA*

# Population + 1980s oil collapse = desire to diversify

**To keep unemployment constant, Middle East as a whole must create 80m jobs over next 15 years**

Petrodollars

Deregulation

Energy access

$200 billion ANNUAL public and private investment growth, versus $67 billion in 2003

## Petrochemicals

- Saudi investment $100 bn
- Saudi global market share to rise 4% to 12% by 2010
- Energy only 7% of costs in SA, vs 38% in China

## Metals

- UAE building world's largest aluminum smelter
- China repeat but worse b/c power for metals output likely to be met by oil and gas-fired power gen

## Air transport

- Qatar: $5.5 bn to handle 50m passengers by 2015
- Dubai: $80 bn to handle 120m passengers by 2017
- Cargo capacity 3x bigger than FedEx in Memphis

*Source: National Bank of Kuwait estimates value of regional construction, industrial, energy and infrastructure projects to exceed $1.25 trillion over the next six years*

# How the growth will occur: Economic cities / free zones

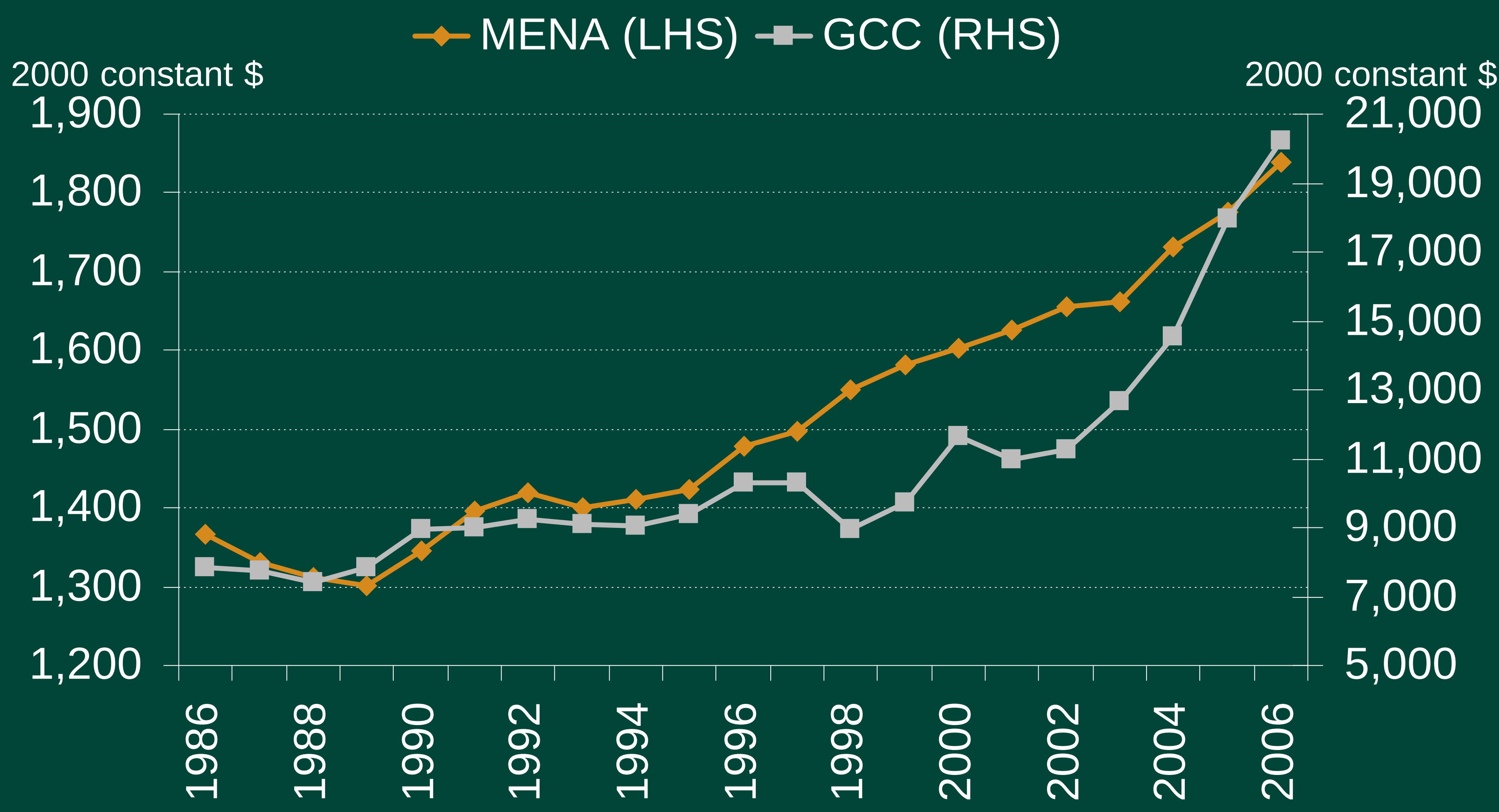
**Highly deregulated environments and preferential tax treatment attracts commerce, real estate investment and financial services**

- Saudi Arabia building six economic cities
  - Add $150 bn in GDP to the Saudi economy by 2020, 40% of today's GDP
  - Cities to cost $80 bn to build and specialize in steel, aluminum, fertilizer and petrochemicals
- King Abdullah Economic City
  - To create 1m jobs and house 2m residents
  - 2,500 private industrial firms to have operations there
  - Requires 6,500 MW of power, a seaport and rail links
  - 260k apartments, 56k villas, 11k hotel rooms to be constructed
- Jizan Economic City
  - Focus on refining, steel, copper and aluminum.
  - To create 500k jobs
- Abu Dhabi 2030
  - Real estate projects alone to cost $180 bn, 40% planned to be from the government

# Pillar 2
# Purchasing Power Increase

# Rising income…

Middle East GDP per capita taking off with oil prices

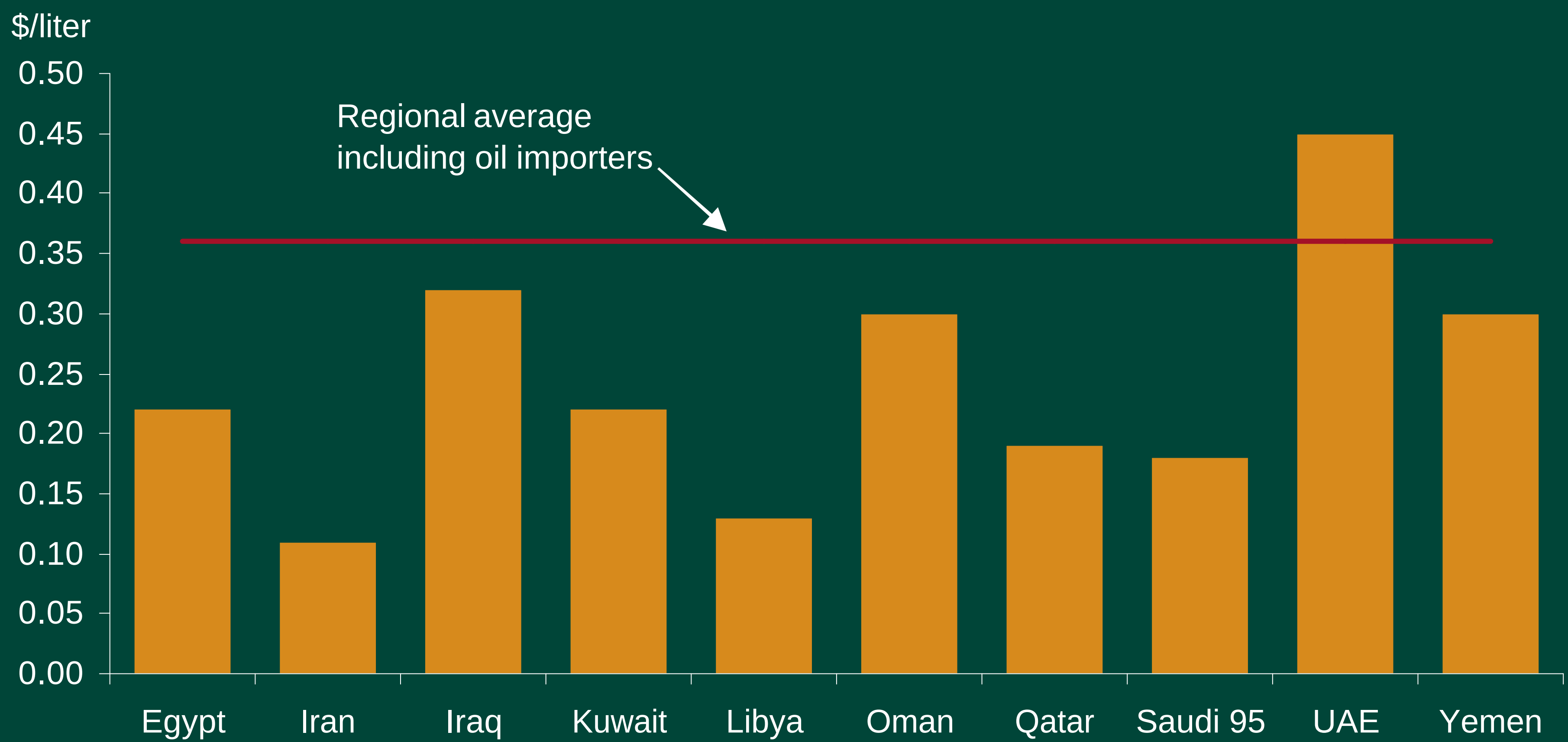



*Source: World Bank*

# Plus energy price subsidies…

- Jan 2008 average cost of gasoline in ME was 0.36/L versus 0.77/L in the US
- Subsidies are difficult to remove because citizens see cheap fuel as a birthright

Gasoline prices in the Middle East in 2008

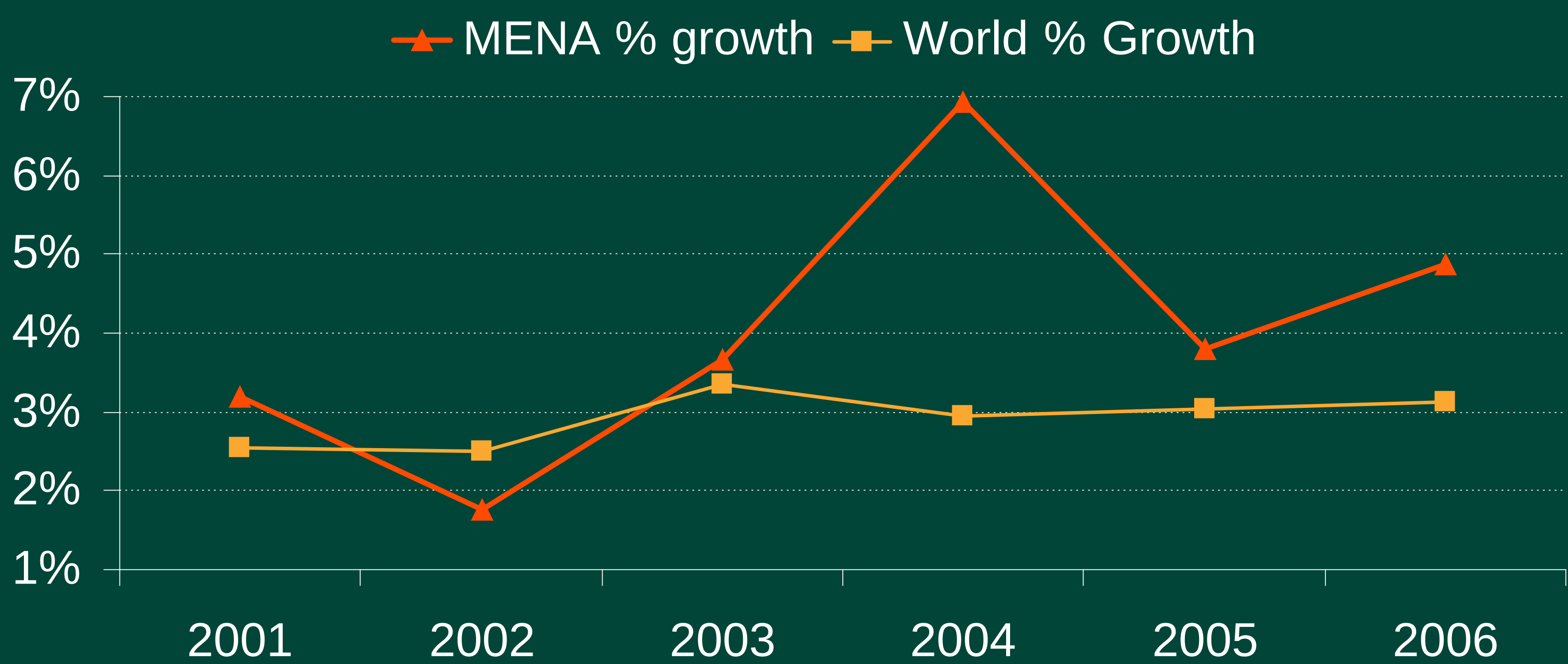



*Source: IEA, MEES*

# Equals more cars

- GCC vehicle penetration at 22% is twice the rest of the Middle East and 1.5x the global average
- But yet, auto fleet size rising twice as fast as globally since 2004

Auto fleet growth: Middle East vs. World

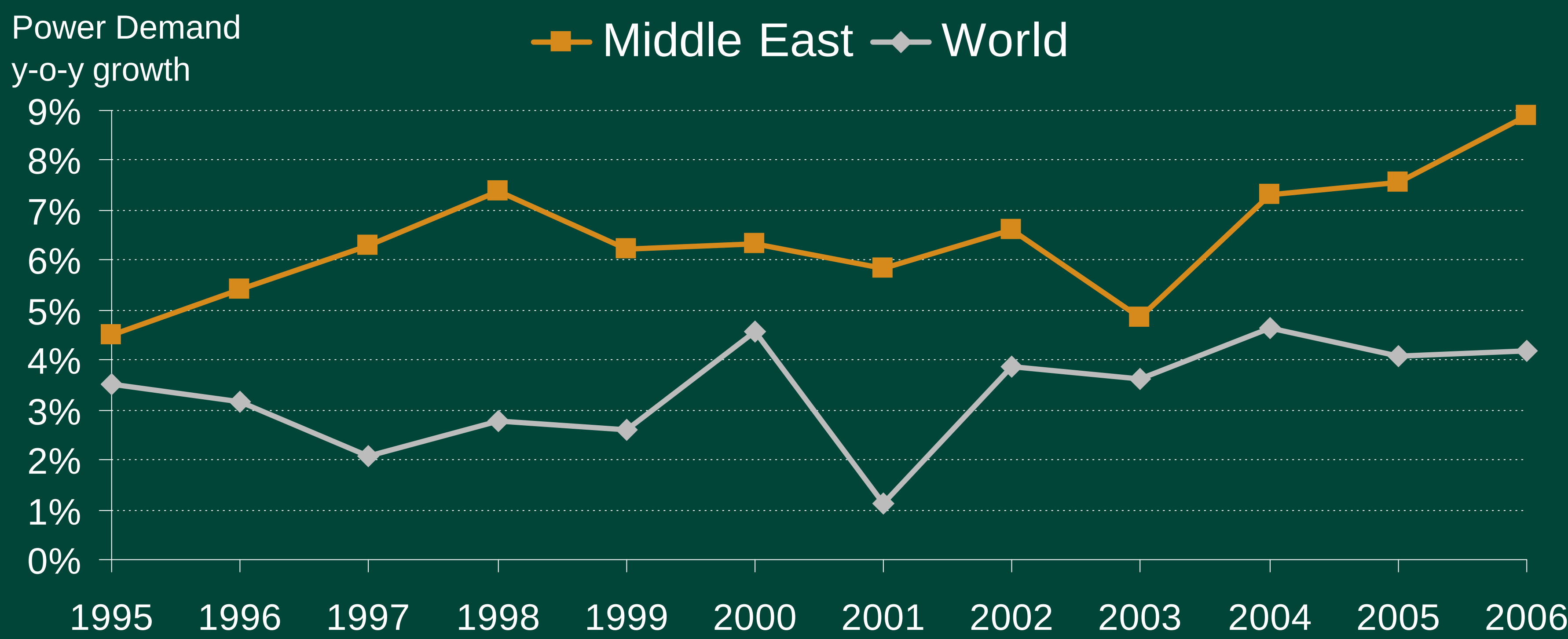



*Source: Ward's Automotive Group*

# Equals more demand for goods that need power

- Increased purchasing power means rising demand for AC, appliances and H2O
- Oil-fired generation serves over 1/3 of Middle East power load, 1.1m+ b/d
- In Oman, for instance, power is sold at 40% below cost
- Electricity demand in the MENA up 6.3% pa 2000-2006, now running 1/3 faster

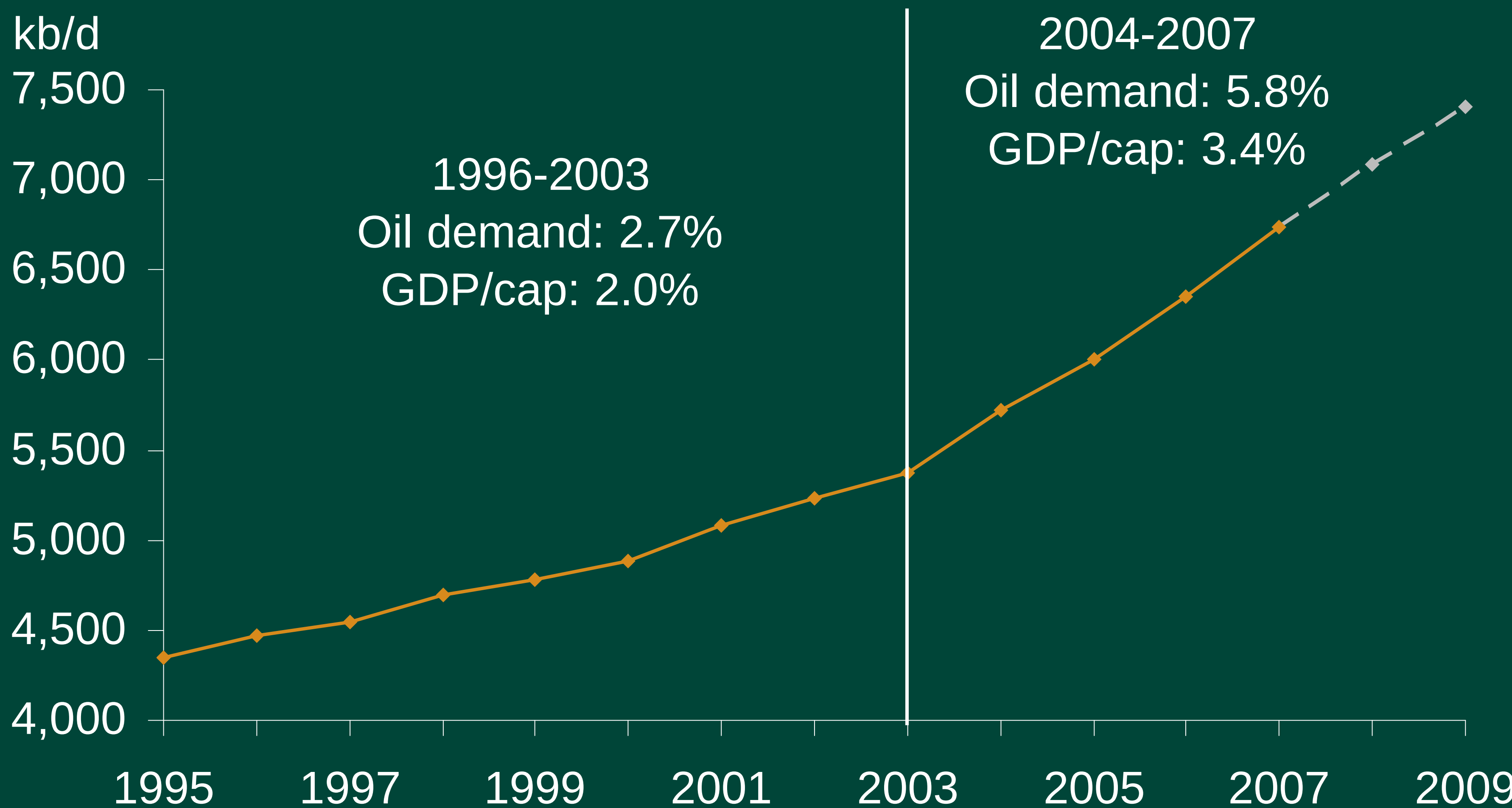
ME power demand climbing w/ income and as energy-intensive industries grow




*Source: BP Statistical Review of World Energy 2007, excludes North Africa*

# And thus equals higher oil demand growth

Middle East oil demand growth




*Source: IEA, Lehman Brothers estimates*

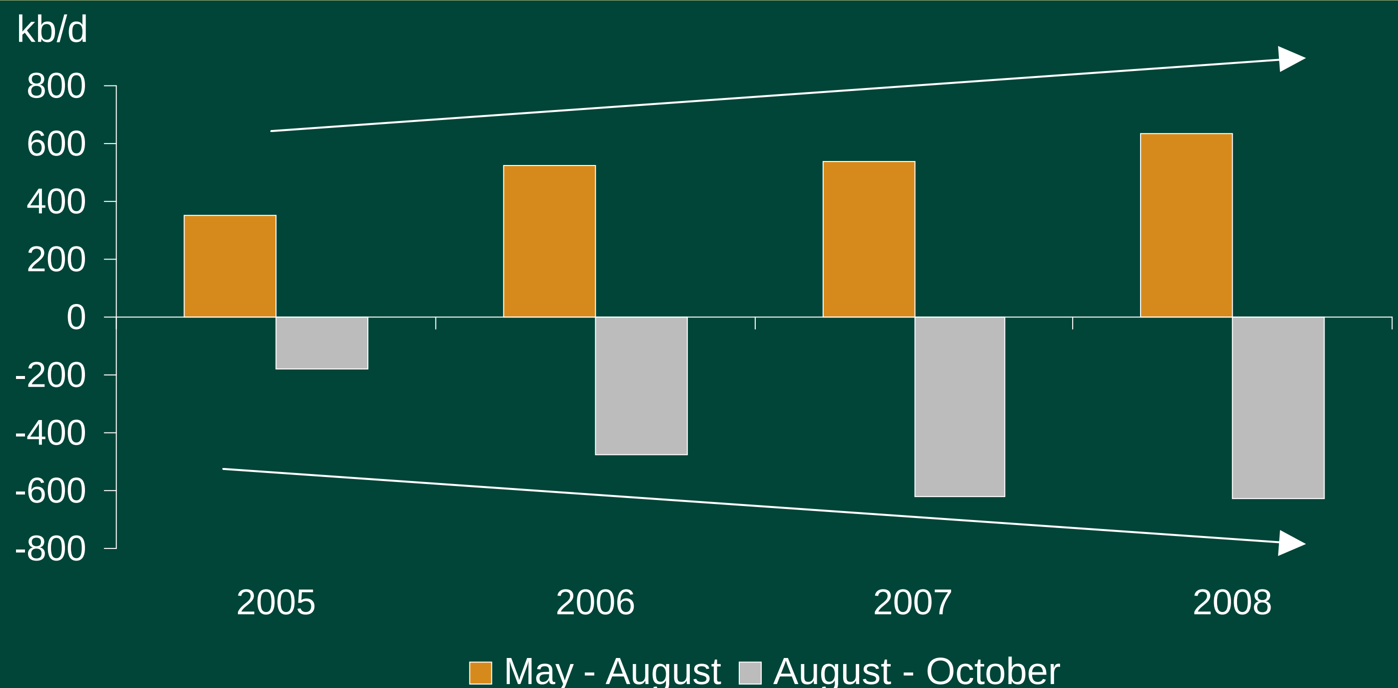
# Pillar 3
# Power Sector Constraints

# Not enough gas to meet power needs in the summer

## Until gas output rises, oil use in power gen to spike in summer

- It's critical for oil-rich Middle East rulers to keep the lights on
- Natural gas resources taking longer than expected to be developed
- Kuwait building regas capacity for summer power needs, asking consumers to conserve
- In the meantime, oil demand has spiked higher every summer since 2005

Middle East oil demand in May vs. August and August vs. October

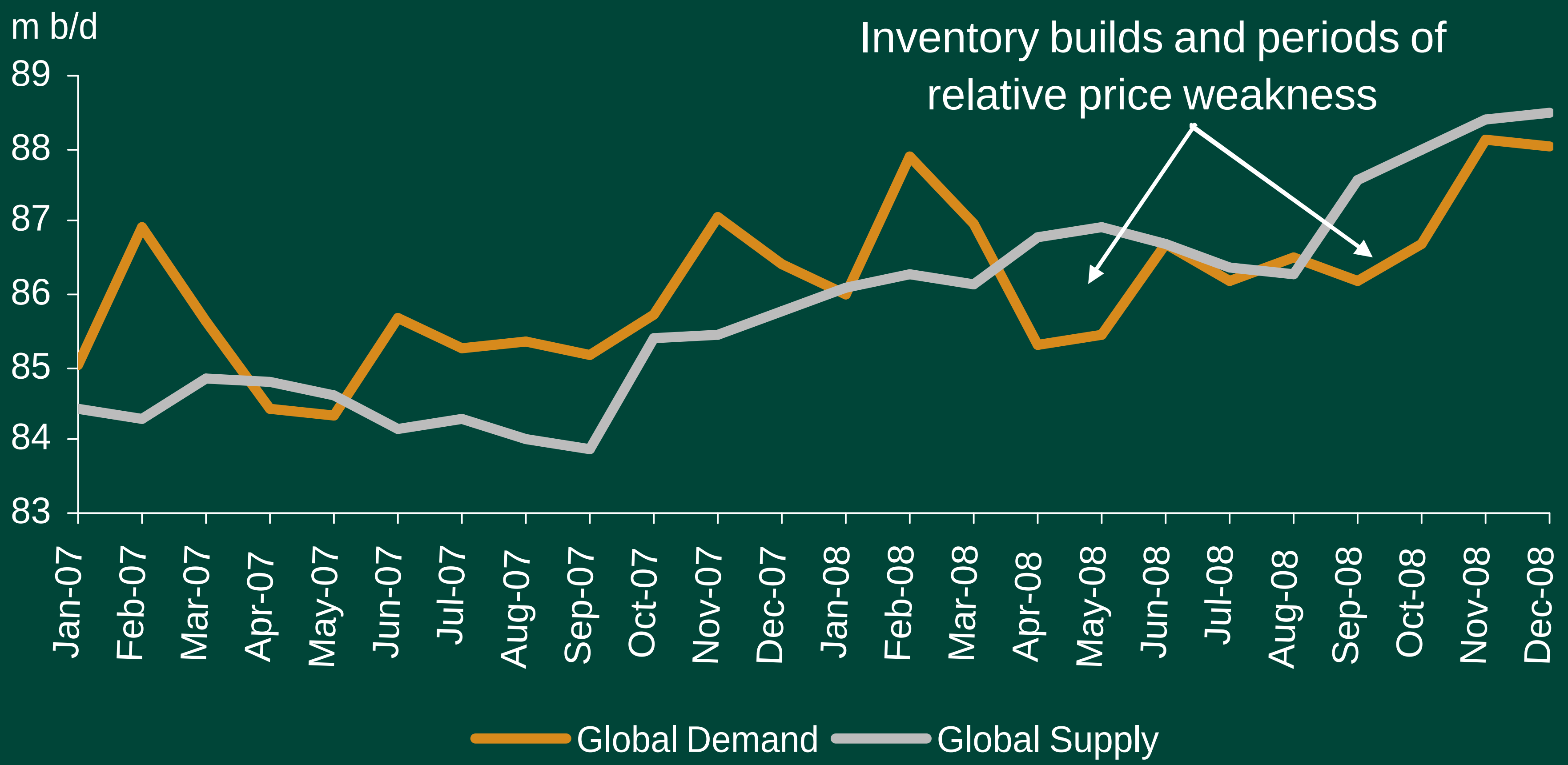



*Source: Lehman Brothers estimates*

# ME summer heat could cost the market 50-60m bbls

## Summer tightness to come from hurricane risks, North Sea maintenance, US fiscal stimulus, ME supply-demand shock

Lehman Brothers monthly oil supply-demand balance




*Source: Lehman Brothers.*

# But like everywhere, the ME demand outlook has risks

- As gas infrastructure built, power sector oil demand growth in the GCC could slow significantly
- Inflation and dollar depreciation
  - Inflation is rent and food, meaning de-pegging may not help
    - Petrodollar recycling has been core to US-Saudi alliance since the 1970s
  - Remittances eroded, causing strikes by ex-pat workers
    - Governments raising wages, could stoke inflation further
- Oil price collapse would undermine subsidies
- 40% of Suicide bombers in Iraq are Saudi – what if they go home?
- Once the US leaves Iraq, Saudi Arabia and Iran may not be as friendly

**For now, however, ME demand growth will likely remain strong as long as oil prices stay above budgeted levels, which are significantly lower than the OPEC basket is priced today**

# 4Q08 Turning Point?

# Why 4Q08 could be a turning point

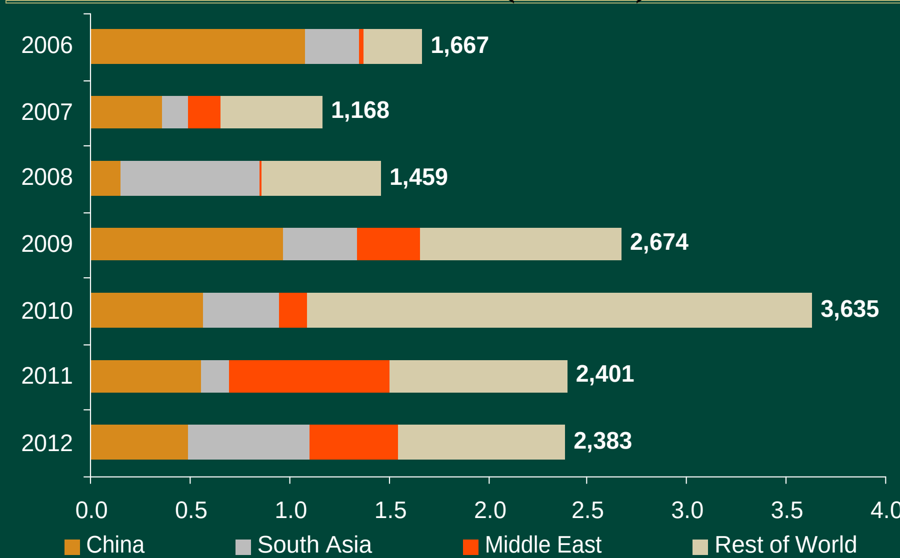
- We think longer-term fundamentals could be on the verge of a turning point
  - India/China/Saudi downstream capacity
  - Saudi/West Africa upstream capacity
  - Costs of F&D showing some flattening
  - Oil valued in the M&A market hasn’t risen in tandem with WTI
  - China could turn bearish versus expectations, adding to OECD oil demand malaise
- 4Q may also see the reversal of the oil and the dollar/inflation trade, if not before

# Refinery bottleneck appears to be eroding

## Refinery investment has stagnated for a generation, but 2009-10 could be a turning point, especially East of Suez

In the aftermath of the 2005 hurricanes we ran out of spare refining capacity, but investments made since oil prices began rising early this decade should cause refinery capacity additions to outpace demand growth in 2009 by as much as 2:1

### Global CDU Capacity Additions (k b/d)

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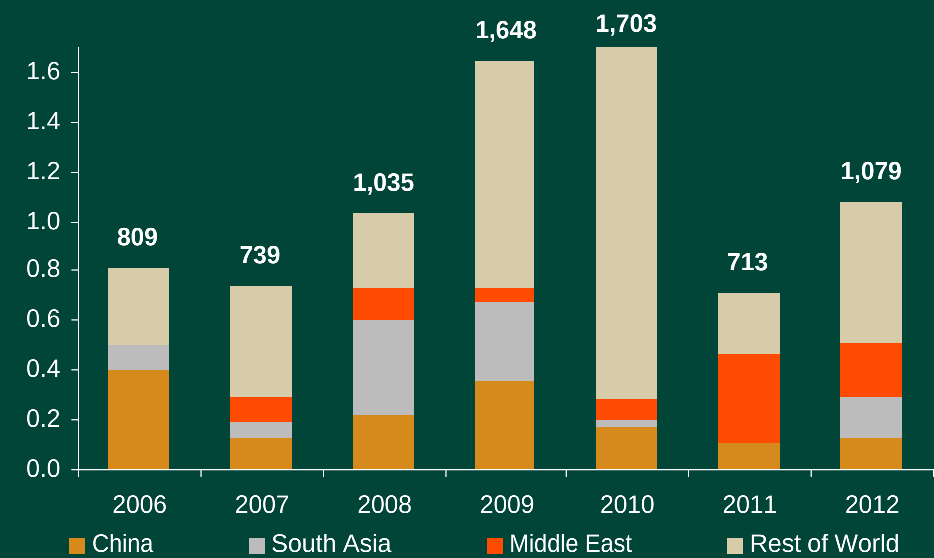


*Source: Lehman Brothers Estimates.*

*1. Includes coking, catalytic cracking, and hydrocracking units and expansions.*

# And OPEC capacity to grow faster than demand, for now…

## Major upstream producers show response to higher prices

- Saudi Arabia's capacity expansion through 2011-12 should underpin capacity additions outpacing demand
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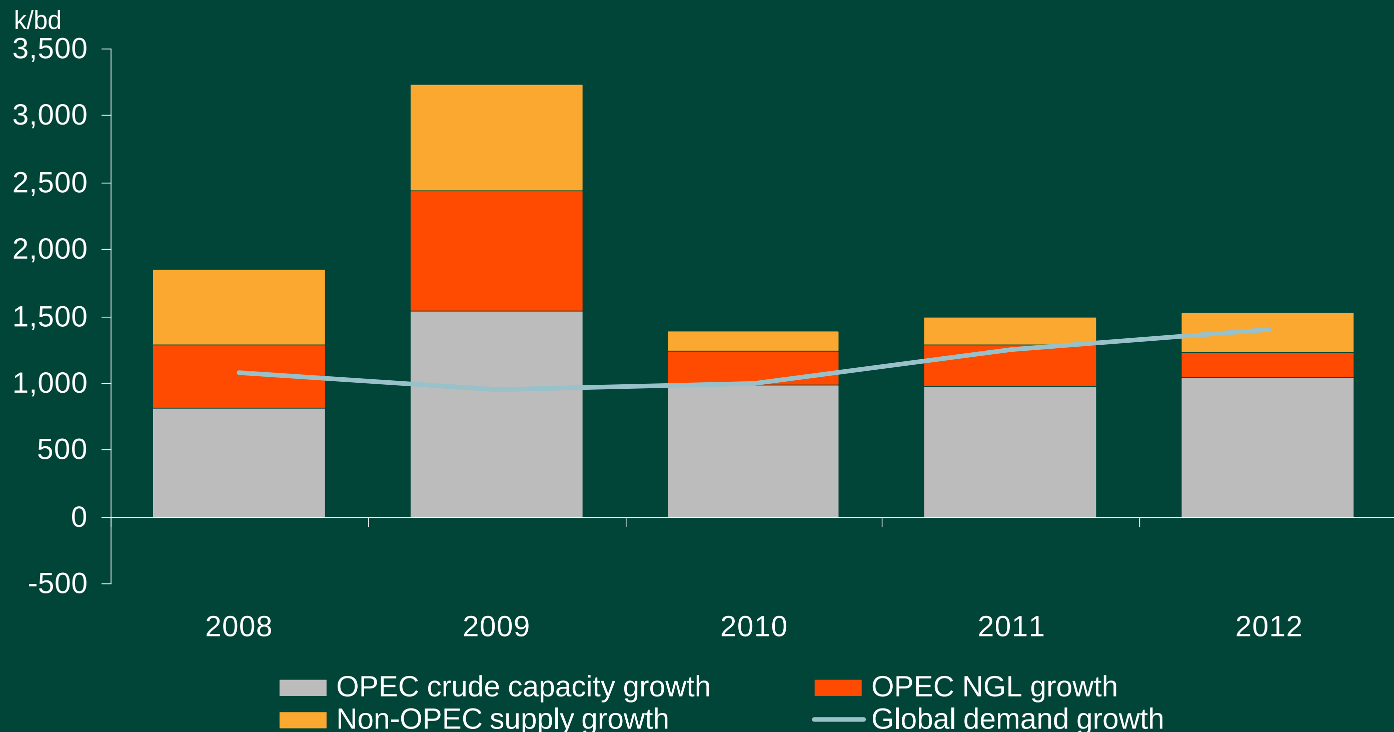
### Global production capacity growth vs. global oil demand growth

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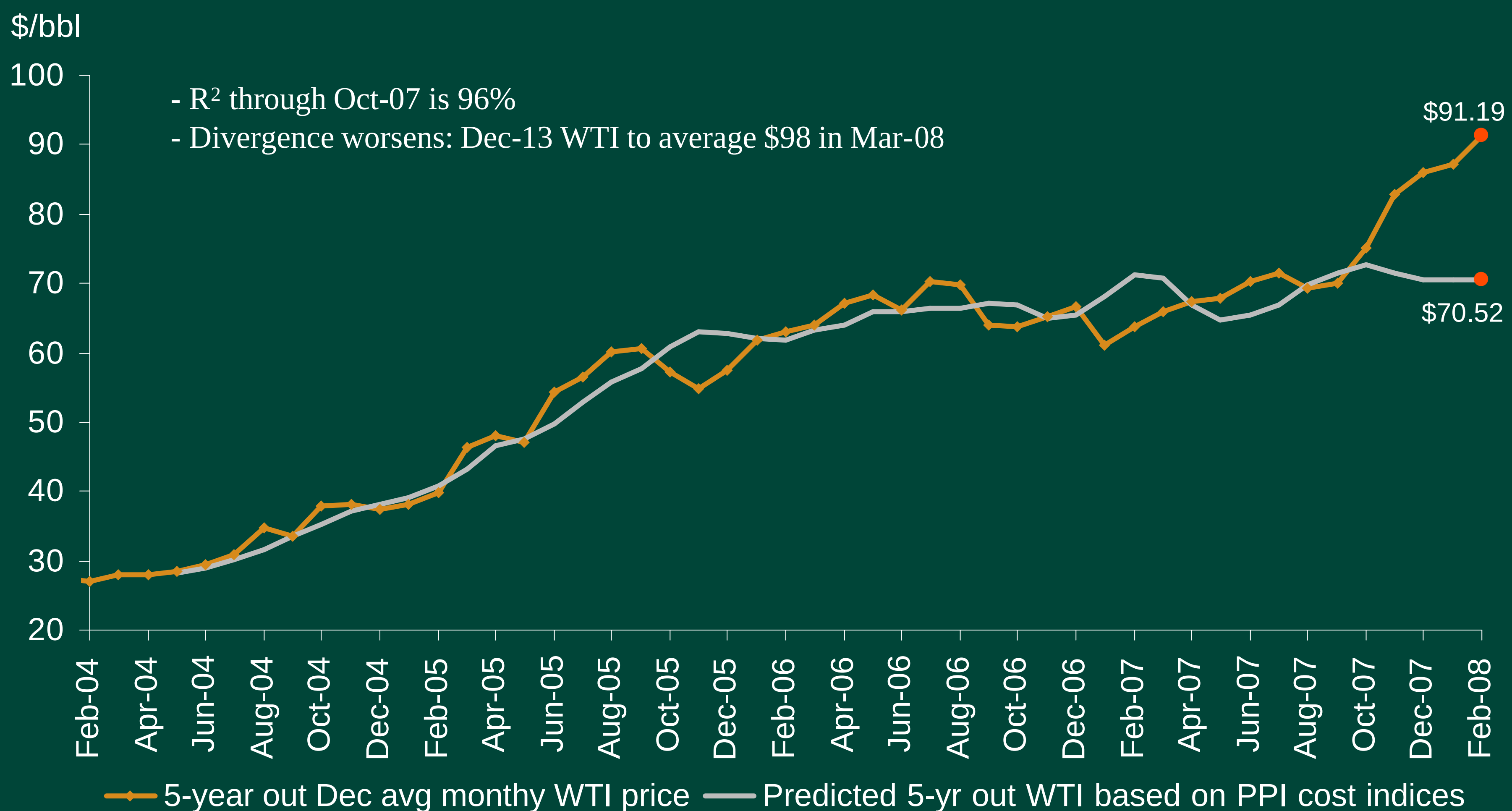
# That costs have flat-lined is a problem for NYMEX WTI

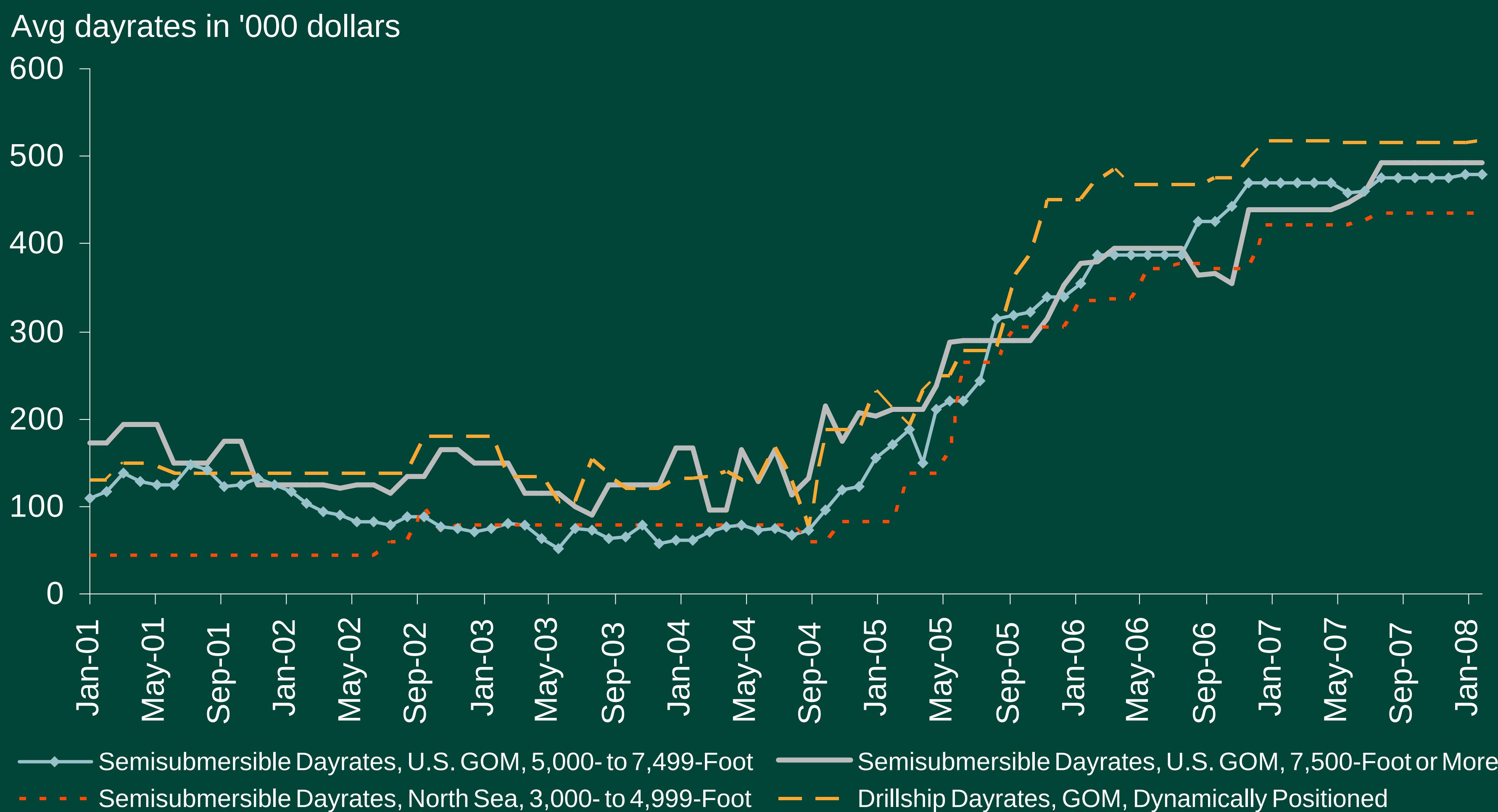
**Higher US costs appear to explain much of the rise in long-dated WTI prices until the divergence in October 2007.**

US monthly PPI data regressed against average monthly 5-yr out WTI prices



# Even deepwater drilling costs are flattening

## Deepwater Rig Day-Rates




*Source: ODS-Petrodata and Lehman Brothers Estimates*

# China could turn bearish versus expectations

**Via the trade and financial market channels, a period of extended US weakness could spread to emerging markets by 4Q08**

- Oil prices at $100+ assume demand growth won't slow in Asia
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- If US recession deepens, effect on Asia ex-Japan likely to be non-linear, with exports and financial market direct effects multiplied and growth dropping from 7.5% to 4-5%
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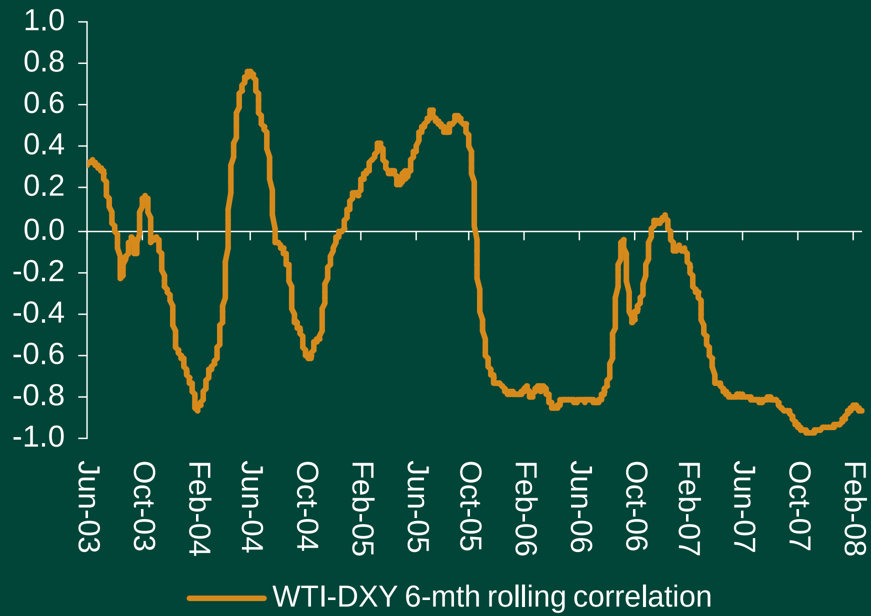
  - Pollution concerns combined with Olympics could be the catalyst for permanent closures and starting back toward less energy-intensive GDP growth seen in 1990s

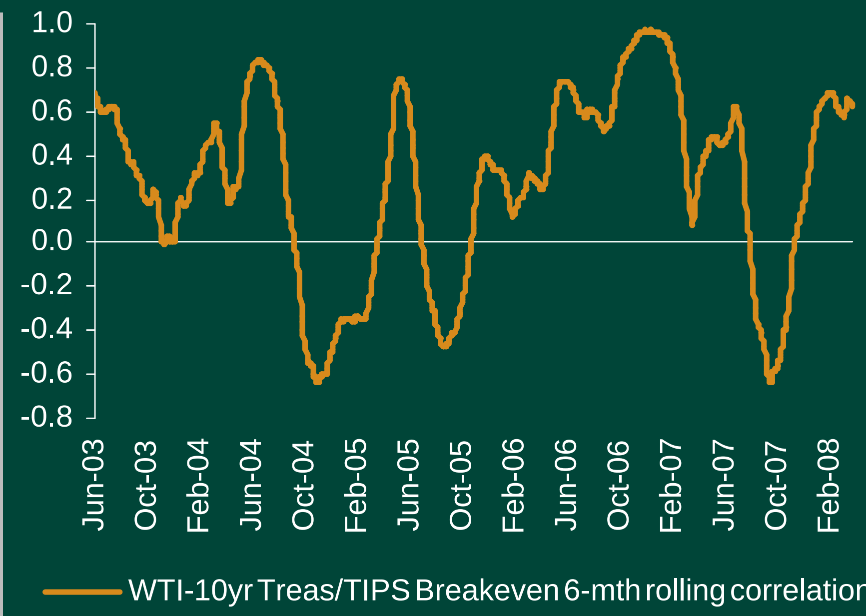
# The vicious cycle between commodities and inflation

## Strengthening rolling correlations between oil/dollar and oil/inflation expectations have created a self-fulfilling prophecy

### WTI 1M vs. DXY Index




### WTI 1M vs. Inflation*




**Inflation compensation as measured by the difference between 10-year treasuries and 10-year TIPS*
*Source: Bloomberg, Lehman Brothers Estimates*

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**Analyst Certification**

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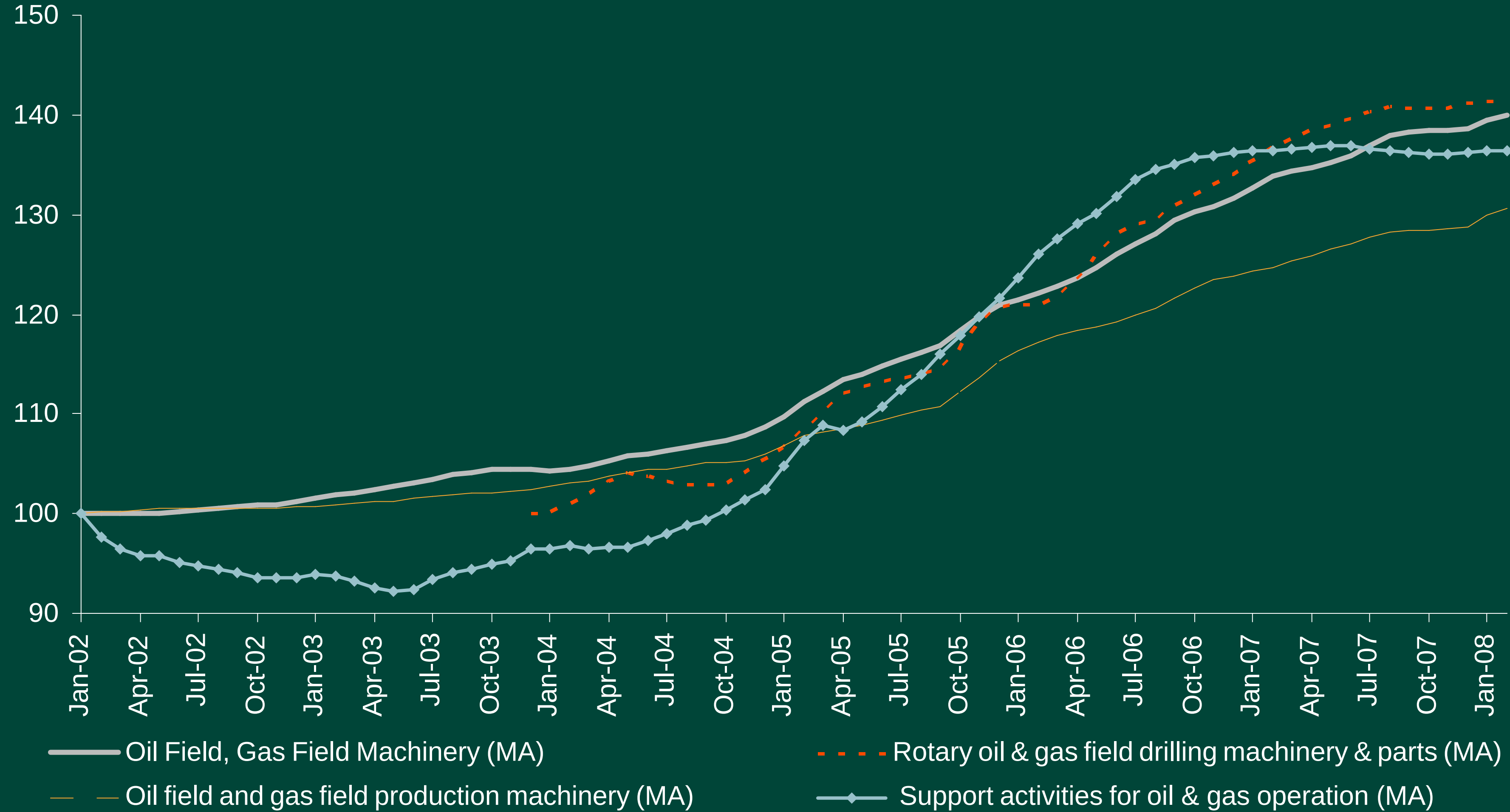
# Some have argued higher prices are justified by costs

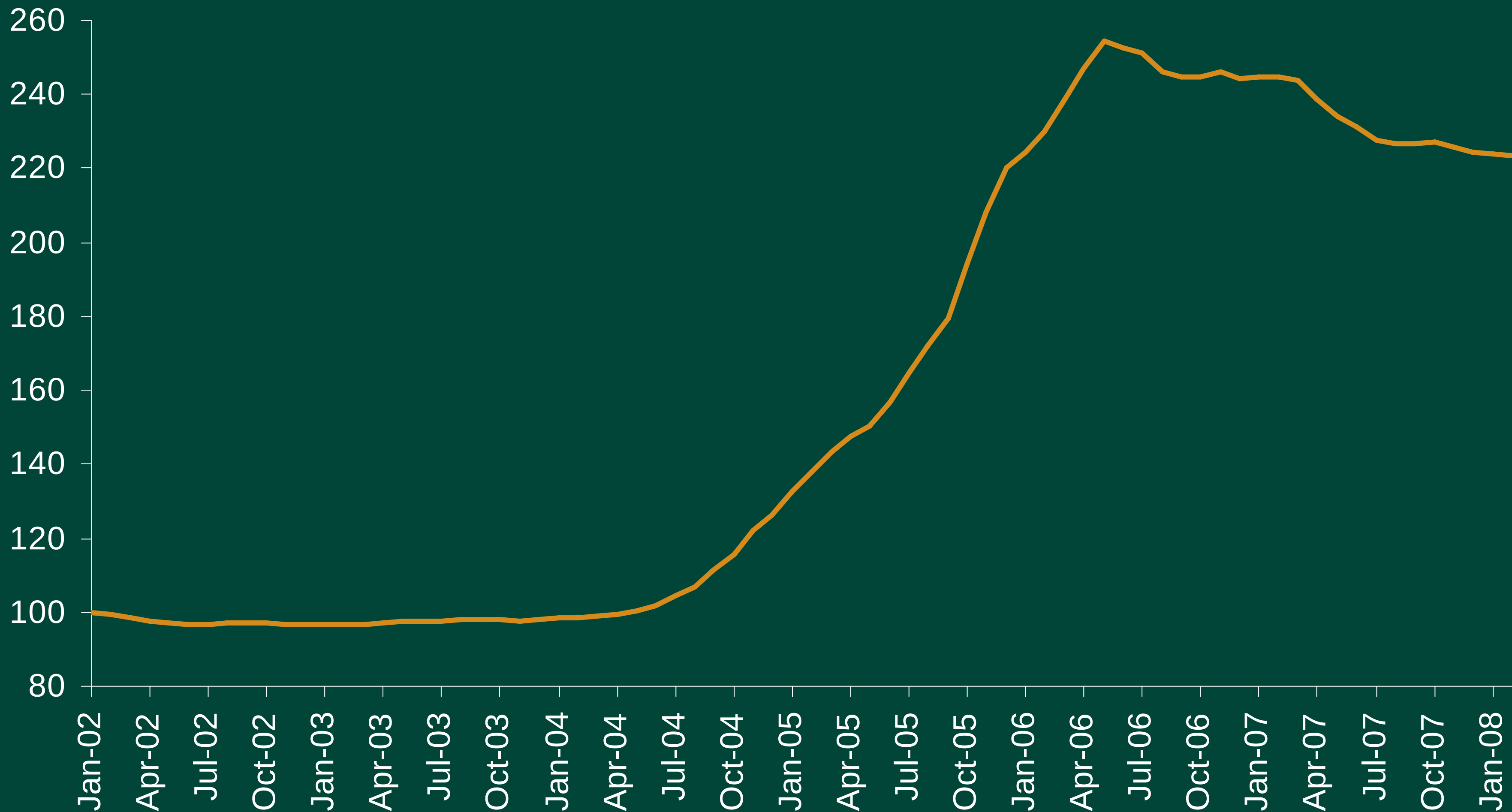
But US PPI Oil Producer Cost Indices are flattening (3-month moving average)




*Source: US Bureau of Labor Statistics*

# US drilling cost rise and fall even more stark

US Drilling cost PPI (3-month moving average)

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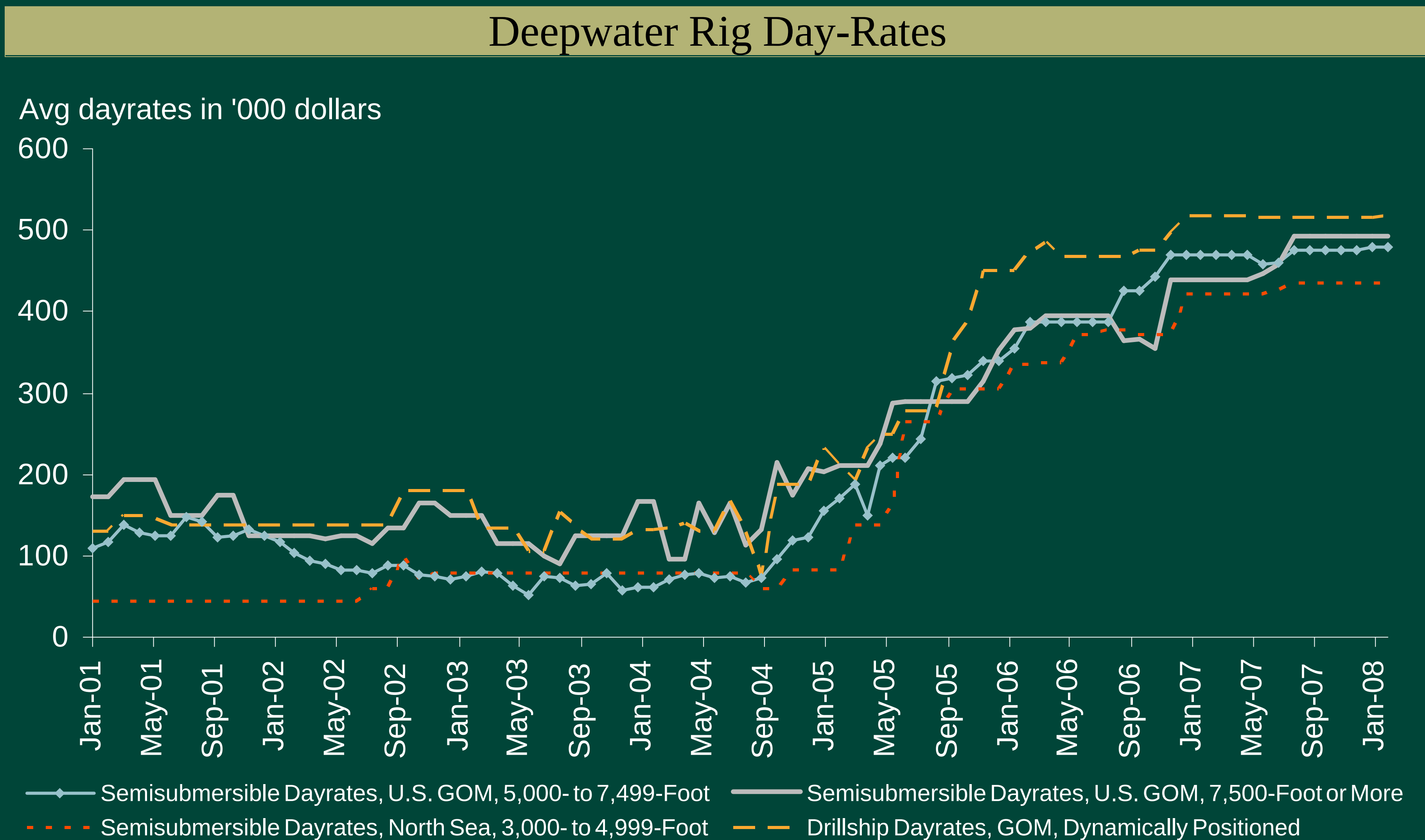


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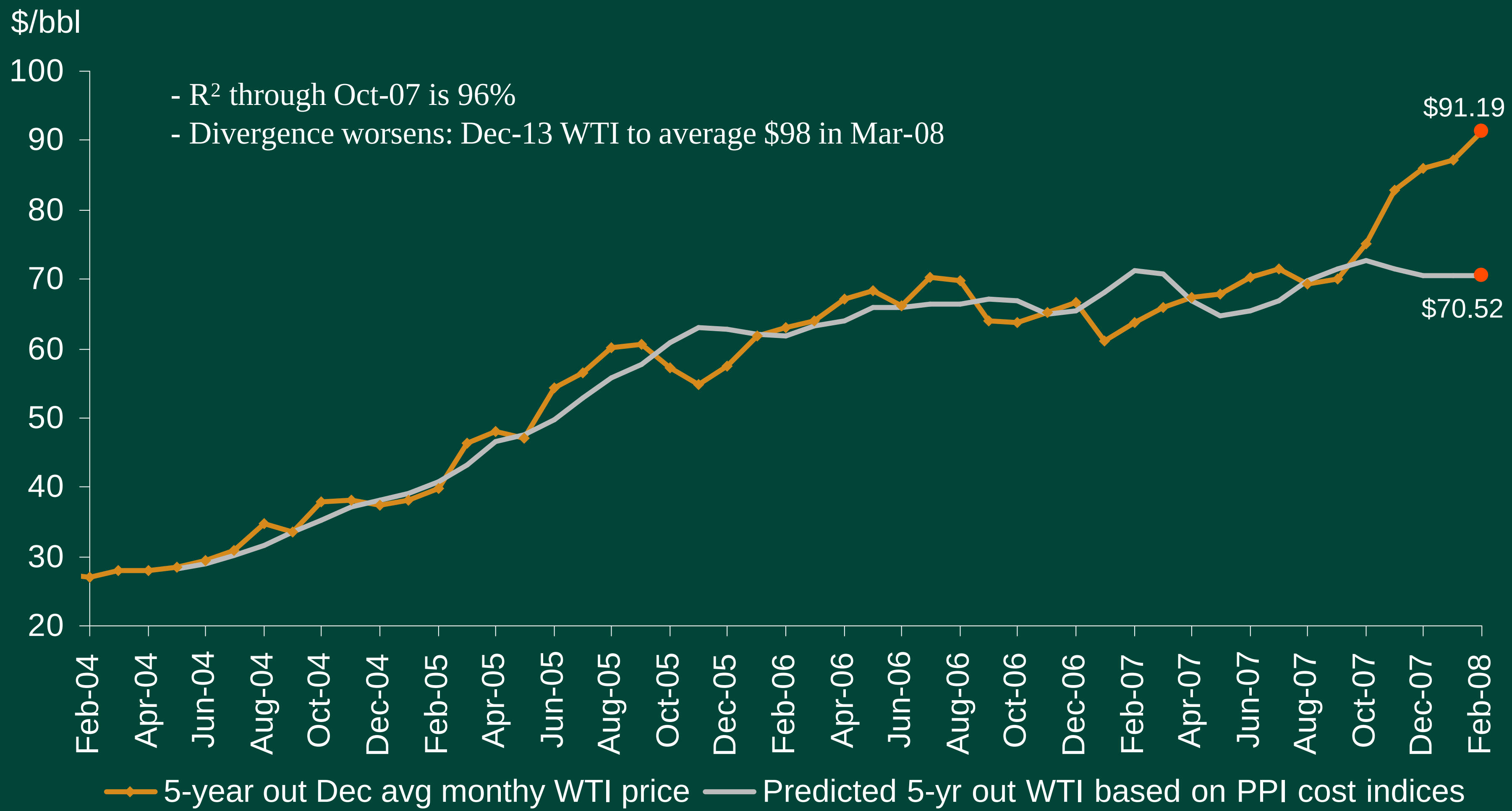
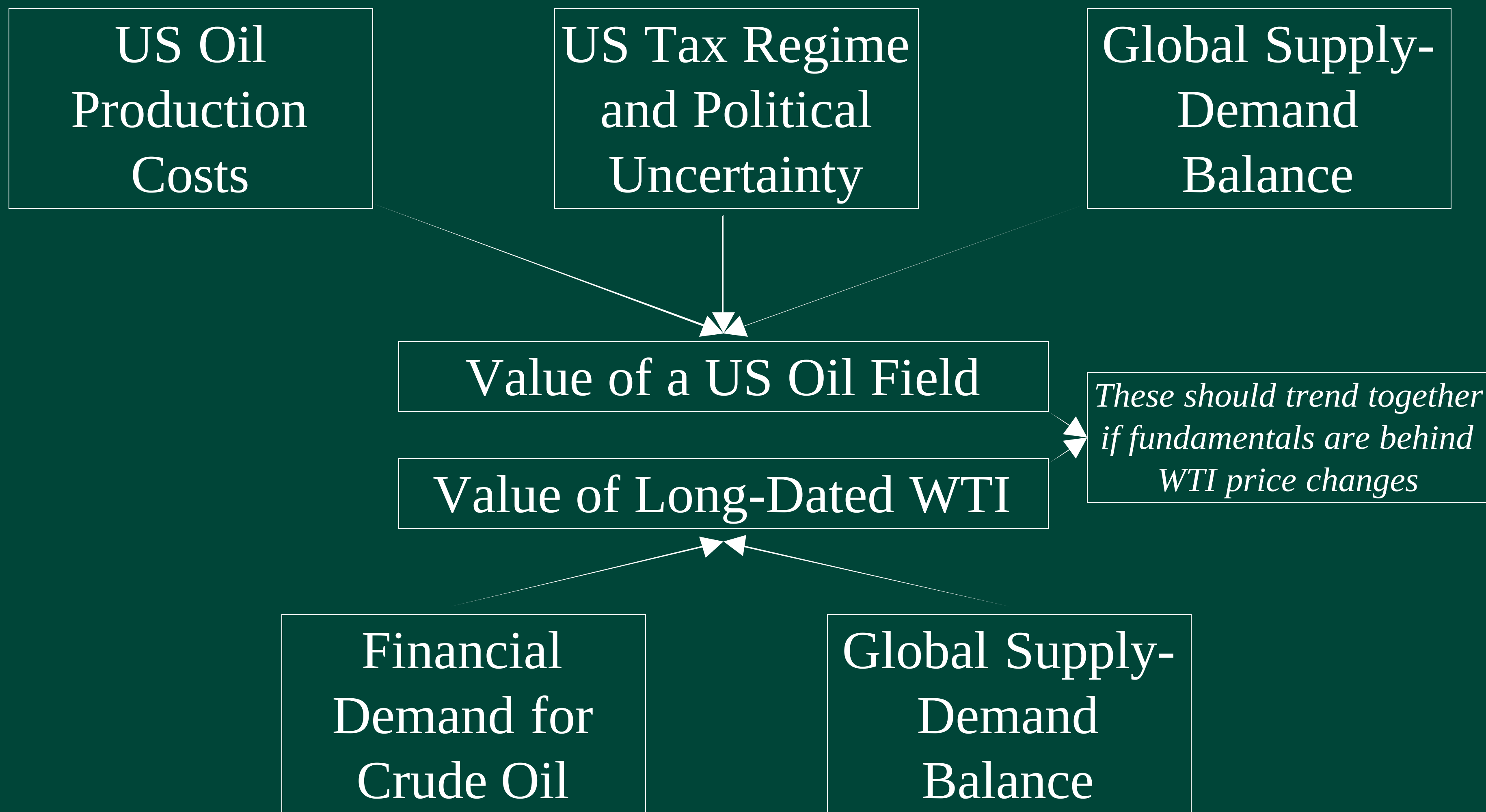


# Are fundamentals or flows driving oil prices?

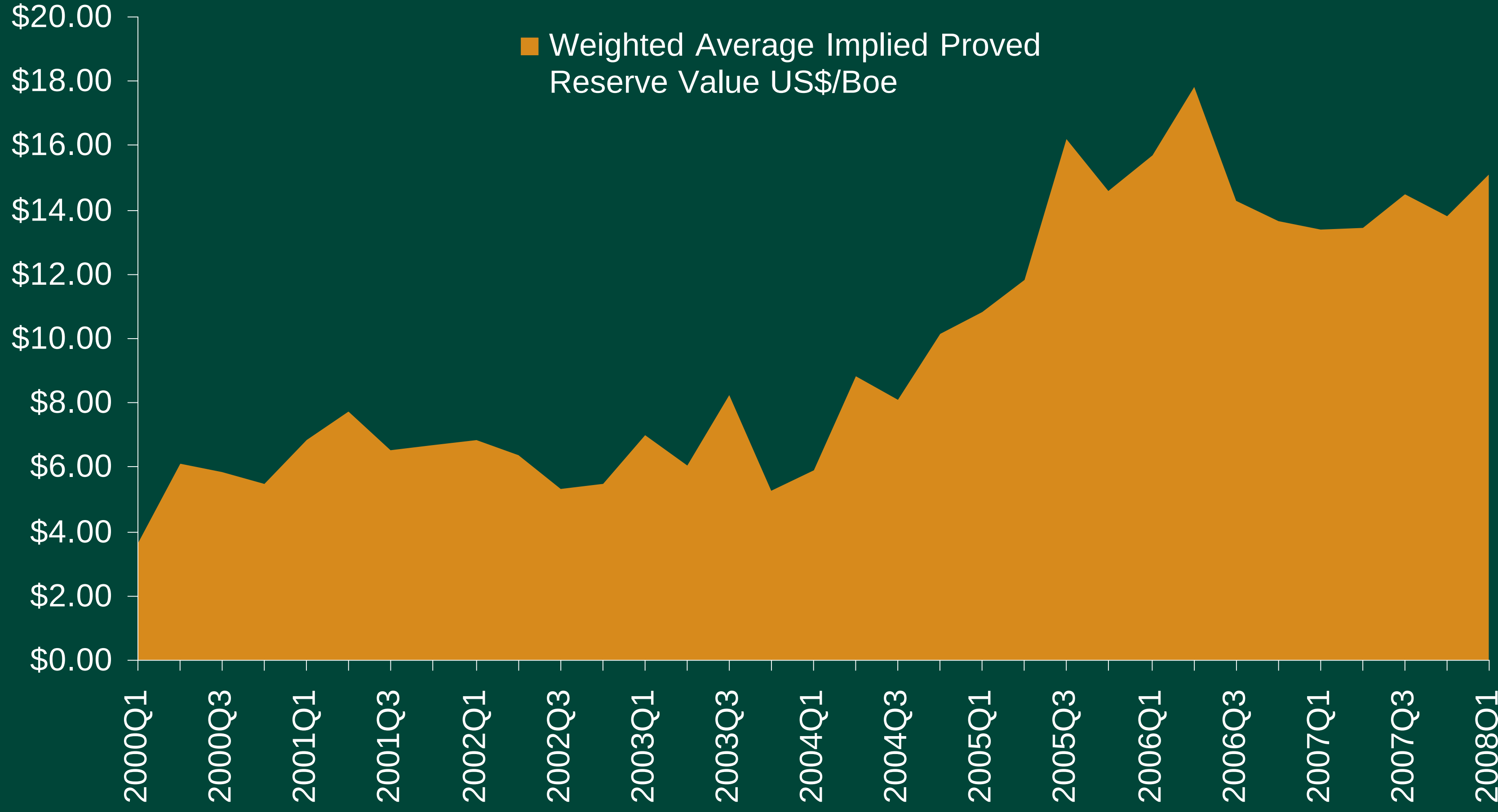
**The market for US oil assets provides another data point for long-dated crude oil prices, holding US costs and politics constant**



# US M&A market also doesn't buy the recent rise in prices

## Perhaps the difference is that portfolio diversifiers and dollar hedgers don't participate in the M&A market

Price of US reserves valued through US M&A activity




*Source: John S. Herold Upstream M&A Review*

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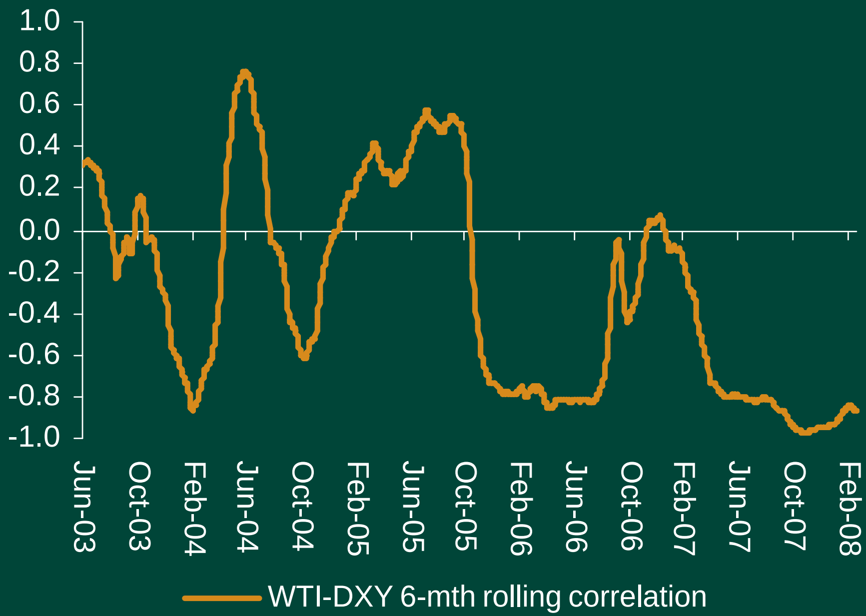


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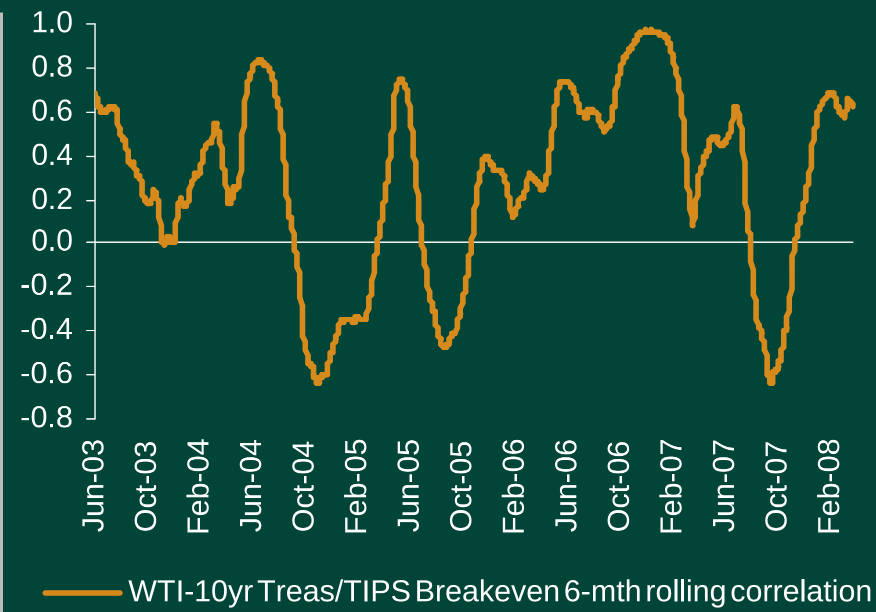


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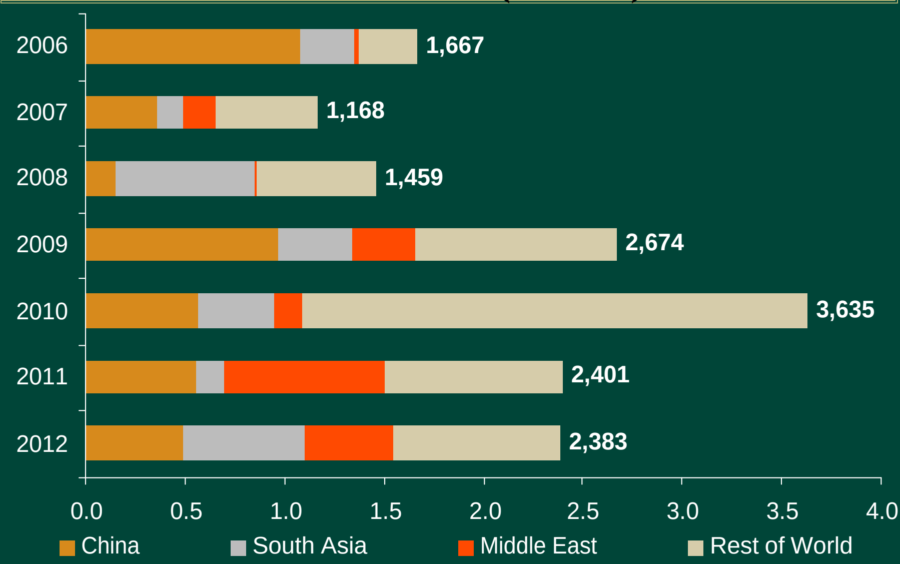


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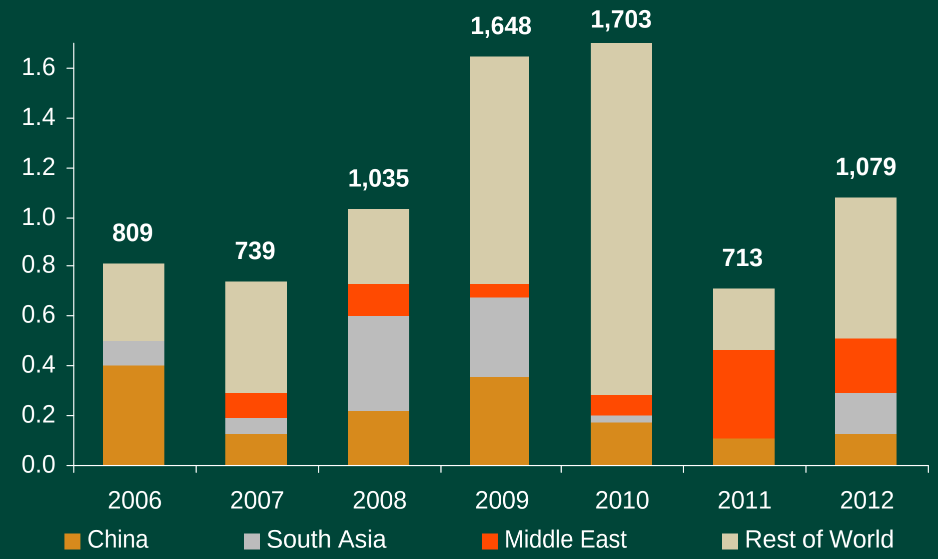


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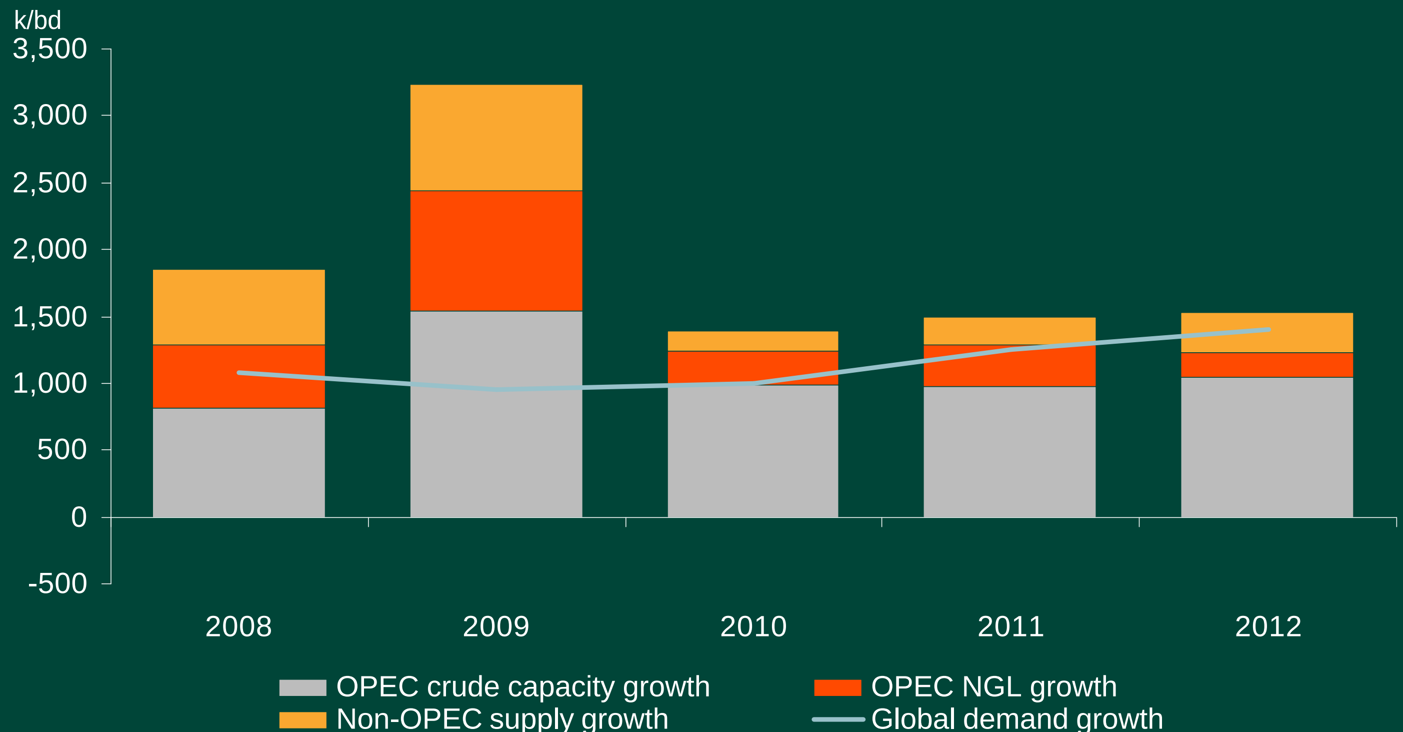


*Source: Lehman Brothers estimates*

# Lehman Brothers Oil Outlook

## Lehman Brothers Oil Price Outlook

| | 1Q07A | 2Q07A | 3Q07A | 4Q07A | 1Q08E | 2Q08E | 3Q08E | 4Q08E | 2006A | 2007A | 2008E | 2009E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brent ($ per barrel) | 58.62 | 68.66 | 74.61 | 88.53 | 96.31 | 90.00 | 105.00 | 80.00 | 66.15 | 72.60 | 93.00 | 83.00 |
| WTI-Brent differential | -0.16 | -3.45 | 0.47 | 1.98 | 1.51 | -1.00 | 1.00 | -1.00 | 0.34 | -0.29 | 0.00 | 0.00 |

## Lehman Brothers Oil Supply-Demand Balance

| | 1Q07 | 2Q07 | 3Q07 | 4Q07 | 1Q08 | 2Q08 | 3Q08 | 4Q08 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Global Demand** | 85.9 | 84.8 | 85.3 | 86.4 | 86.9 | 85.8 | 86.3 | 87.6 | 84.4 | 85.6 | 86.7 | 87.6 |
| **OECD** | 49.4 | 47.9 | 48.4 | 49.4 | 49.4 | 47.6 | 48.2 | 49.4 | 49.0 | 48.7 | 48.6 | 48.5 |
| USA | 20.9 | 20.7 | 20.8 | 20.8 | 20.5 | 20.5 | 20.5 | 20.7 | 20.7 | 20.8 | 20.5 | 20.6 |
| Europe | 15.2 | 15.0 | 15.4 | 15.6 | 15.4 | 15.0 | 15.5 | 15.6 | 15.6 | 15.3 | 15.4 | 15.3 |
| **Non-OECD** | 36.5 | 37.0 | 36.9 | 37.0 | 37.6 | 38.2 | 38.1 | 38.2 | 35.5 | 36.8 | 38.0 | 38.9 |
| China | 7.4 | 7.6 | 7.4 | 7.6 | 7.7 | 8.1 | 7.7 | 8.0 | 7.0 | 7.5 | 7.9 | 8.2 |
| Middle East | 6.6 | 6.7 | 7.1 | 6.6 | 6.9 | 7.0 | 7.4 | 6.9 | 6.4 | 6.7 | 7.1 | 7.5 |
| **Global Supply** | 84.5 | 84.5 | 84.1 | 85.5 | 86.2 | 86.8 | 86.7 | 88.3 | 84.8 | 84.7 | 87.0 | 89.0 |
| **Total Non-OPEC** | 50.5 | 50.2 | 49.7 | 49.9 | 50.3 | 50.5 | 50.6 | 51.1 | 49.7 | 50.1 | 50.6 | 51.4 |
| OECD | 20.1 | 19.9 | 19.5 | 19.6 | 19.7 | 19.6 | 19.5 | 19.8 | 20.0 | 19.8 | 19.6 | 19.6 |
| N. America | 14.3 | 14.3 | 14.1 | 13.9 | 14.0 | 14.1 | 14.0 | 14.1 | 14.1 | 14.1 | 14.1 | 14.4 |
| Europe | 5.3 | 5.0 | 4.7 | 5.0 | 4.9 | 4.7 | 4.6 | 4.7 | 5.3 | 5.0 | 4.7 | 4.3 |
| Non-OECD | 28.1 | 28.0 | 27.9 | 28.0 | 28.2 | 28.5 | 28.7 | 28.9 | 27.5 | 28.0 | 28.6 | 29.1 |
| FSU | 12.8 | 12.7 | 12.8 | 12.8 | 12.9 | 13.1 | 13.3 | 13.6 | 12.2 | 12.8 | 13.2 | 14.0 |
| Other (1) | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 2.4 | 2.4 | 2.5 | 2.2 | 2.3 | 2.4 | 2.7 |
| **OPEC Crude** | 29.8 | 30.0 | 29.9 | 31.1 | 31.2 | 31.7 | 31.2 | 31.9 | 31.0 | 30.2 | 31.5 | 31.8 |
| **OPEC NGLs** | 4.2 | 4.4 | 4.4 | 4.6 | 4.6 | 4.6 | 4.9 | 5.3 | 4.1 | 4.4 | 4.9 | 5.8 |
| **Inventory Change** | -1.3 | -0.3 | -1.2 | -0.9 | -0.8 | 1.0 | 0.5 | 0.7 | 0.4 | -0.9 | 0.3 | 1.4 |
| **Call on OPEC** | 31.1 | 30.3 | 31.2 | 31.9 | 32.0 | 30.7 | 30.8 | 31.2 | 30.7 | 31.1 | 31.2 | 30.4 |

*Source: Lehman estimates; (1) Other includes global processing gains, biofuels outside US, Brazil and Europe, GTL, CTL and unaccounted for new projects*

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**Analyst Certification**

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