V CONFERÊNCIA ANUAL DA RELOP
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"O MERCADO do PETRÓLEO e GÁS e o PAPEL da BACIA ATLÂNTICA"

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PARTEX
OIL AND GAS

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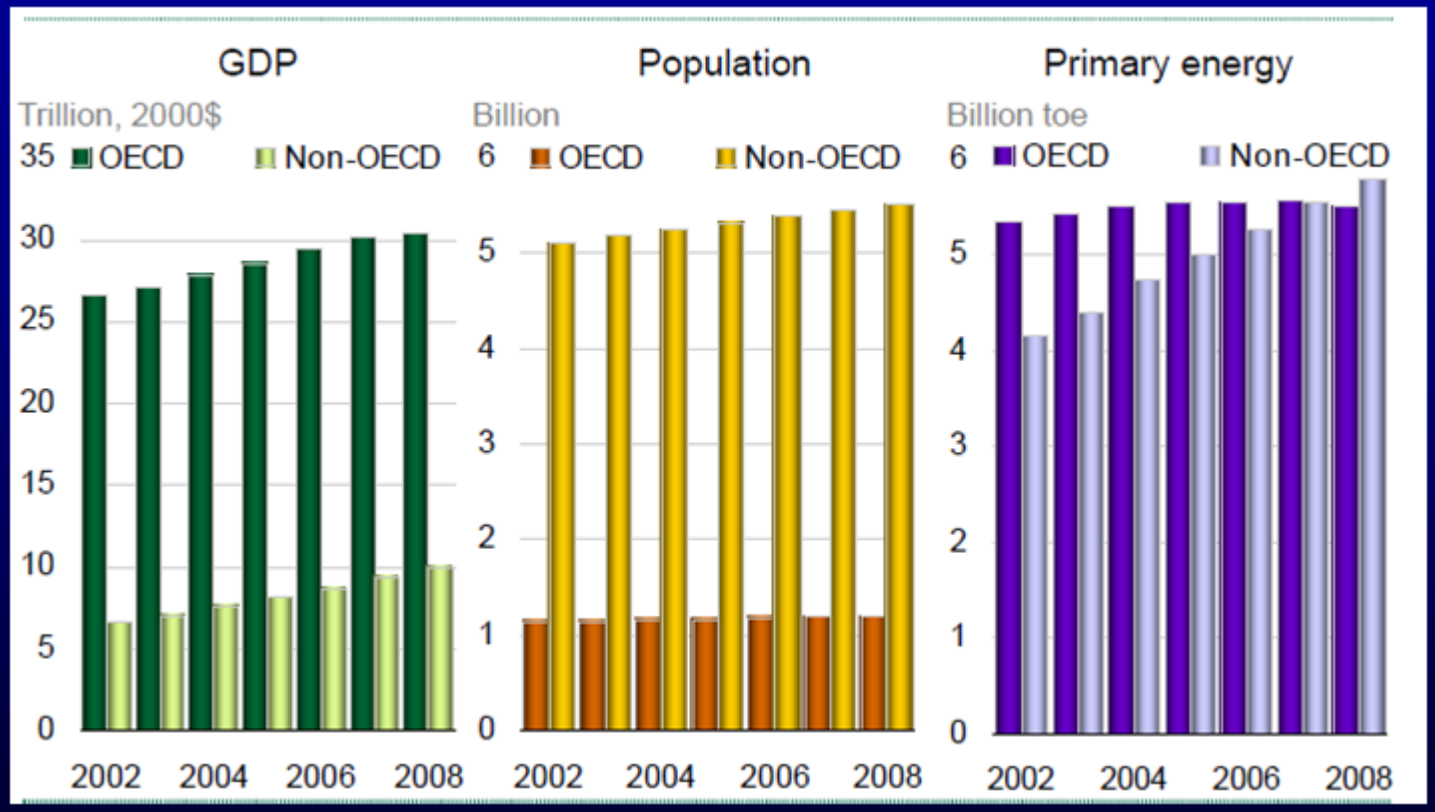
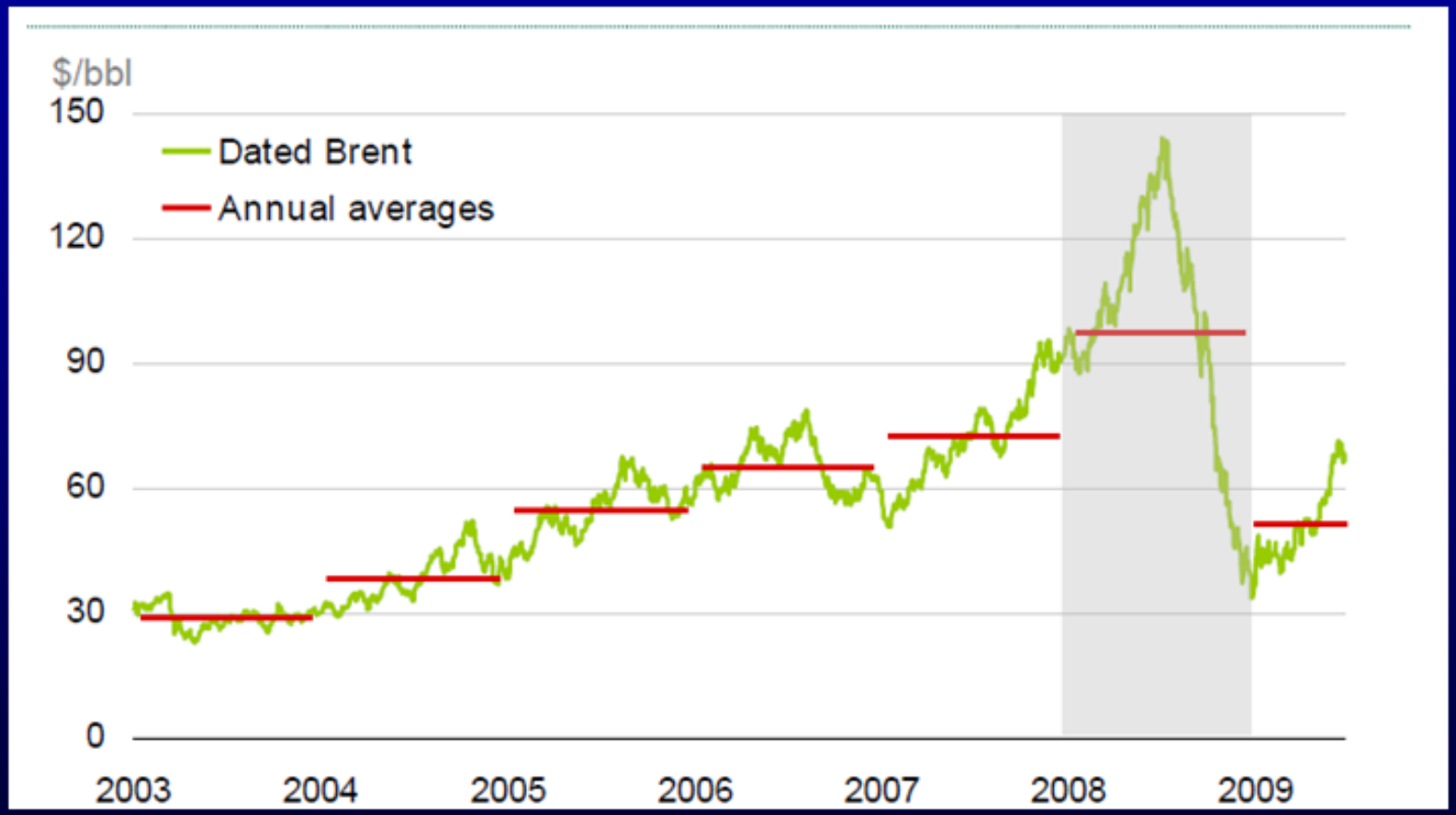
1. AS MUDANÇAS ESTRUTURAIS E ESTRATÉGICAS NO MERCADO DO PETRÓLEO E GÁS

GDP, Population and Primary Energy Consumption



Source: BP Statistical Review of World Energy June 2009

Crude Prices: What Happened?



Source: BP Statistical Review of World Energy June 2009

HIGH OIL PRICE EFFECTS in the Economy

GDP Drop (0.3% for each 8 US$/bbl increase in Euro zone)

Reduction of available income for families and enterprises

Higher Production Costs

Higher Commodity prices

Higher Inflation

Accelerates process of transference of wealth from developed countries to OPEC producers (980 billion US$ in 2008)

Aggravates fragile recovery of world economies

(average growth 3.3% in 2011 vs 3.9% in 2010)

HIGHER OIL IMPORT BILL

(more 95 billion US$ for each 10 US$ /bbl increase In EU)

Aggravation of recession sequels:

. Unemployment
. Loss of income
. Debt increase

Risk of changes of Central Bank policies:

. Increase of interest rates
. Abandon debt purchase
. Less financing available

OIL SHOCK 2007 - 2008 FEATURES

THE GLOBALIZATION OF OIL DEMAND

. From 2000-2007 85% of growth from developing countries

. Combined effects of INCOME and population growth

. Global demand increased 33% from 2004/2008

THE STAGNATION OF OIL SUPPLY

. Non-Opec supply decreased 33% (2004/2007)

. Failure of production to increase between 2005/2007

. Saudi decline in 2007

. Fears of resource depletion and cost inflation

OIL PRICE VOLATILITY

. Less than 40 US$/bbl in 2004

. 147 US$/bbl in July 2008

. Back to 32 US$/bbl in December 2008

ACCELERATION OF VERTICAL INTEGRATION DECLINE

. Refining sector under turmoil

. 20 largest oil producers refine 77% of their crude

FINANCIALIZATION OF OIL

. Became a financial asset and has taken "a second identity"

. Sarkozy/Brown call for a solution to "DESTRUCTIVE VOLATILITY"

. Speed and magnitude of price collapse led to the theory of SPECULATIVE Price Bubble (Masters)

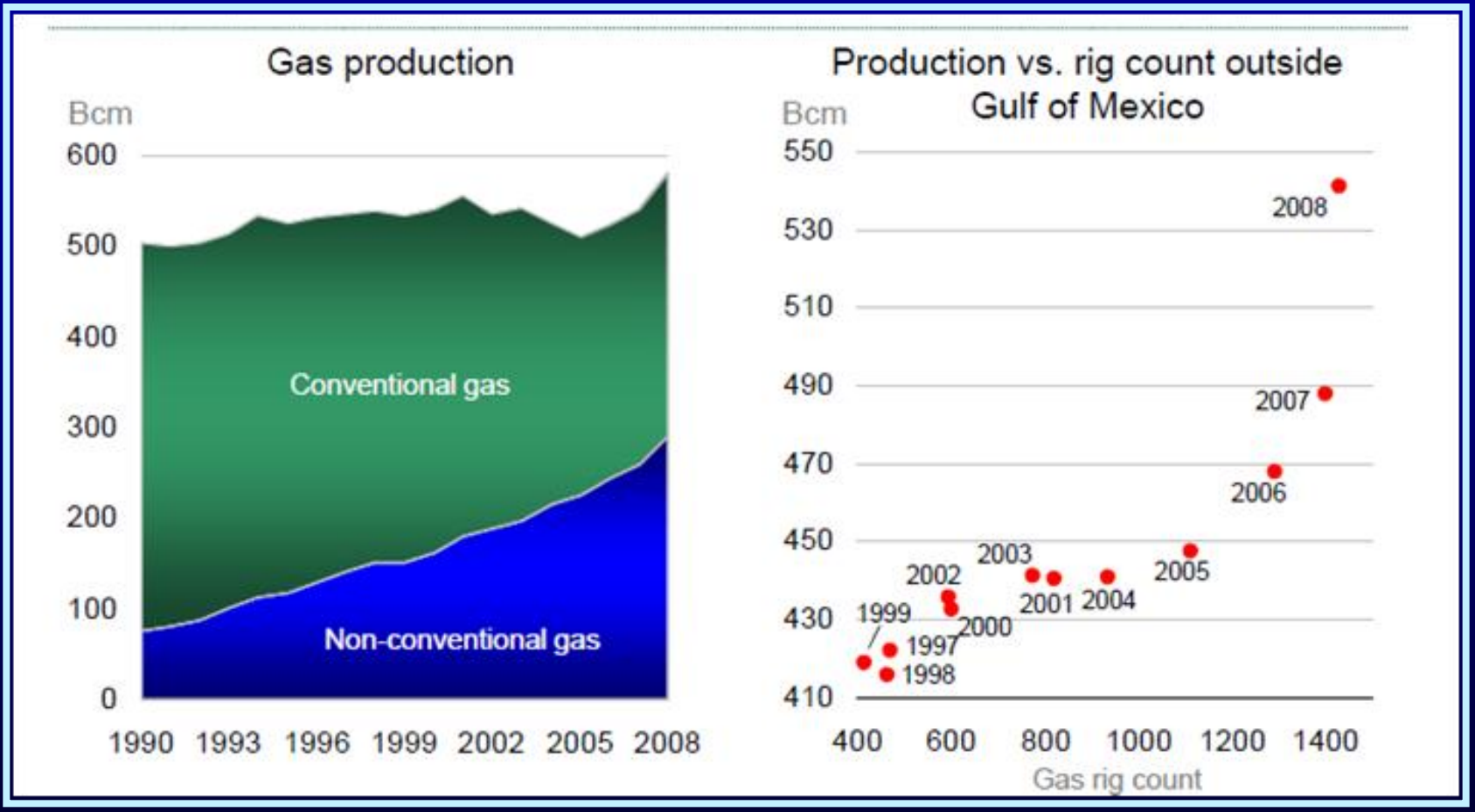
NEW ERA OF OIL PRICING DYNAMICS

. Extreme volatility

. Saudi erosion of spare capacity

. No mechanisms to smooth huge price swings

US Gas Production Changes



Source: BP Statistical Review of World Energy June 2009

Energy Game Changers in XXI Century?

Possible Game Changers	Possible Consequences / Effects
SHALE GAS	• Reserves may range from 60% to 250% of conventional • May dramatically change USA and Europe landscape • Implications for gas developments and supply in Europe • Available internal reserves • Obstacles: technology, environment, costs (tight gas)
BP'S MACONDO OIL SPILL	• Implications on safety and environmental issues • Regulations more tight • Impact on costs • Implications on long-term supply • Deep offshore safety and developments • Risk management
IRAQ'S UPSTREAM POTENTIAL	• Iraq plan to increase production 6 times to reach 12 MB/D in 5 years • Enormous challenges but potential is there • Implications of technical and political realities • Impact on OPEC policies and cohesion
SHIFTING OF POWER FROM ATLANTIC TO PACIFIC BASIN	• Tilt to the Pacific may trigger major implications on world balance of power • China development is sustainable? • Trade, finance and investment trends may change • What corporate policies for European companies? • Geopolitical strategy and potential emergence of new conflicts

WORLD TOTAL GAS RESERVES

Source: The Economist, 6th August 2011

TRENDS SHAPING THE GAS INDUSTRY

GAS RESERVES

- "The unconventional revolution"
- Shale Gas huge reserves
- 60% to 250% of conventional
- Developments in US world's big producer
- Implications for Middle East/Europe
- Feasible solution for Middle East domestic gas needs

LNG

- Exponential growth in trade (+22%) and consumption
- Major role in Japan crisis due to its flexibility

GAS INFRASTRUCTURE AND STORAGE

- Underinvestment
- Constraints may arise from current level of developments

WORLD ENERGY MATRIX

- Increasing share of gas
- In 2010 gas share 23.8%
- The highest on record
- Oil lost share last 11 years
- Gas: Future of Oil?

GAS PRODUCTION

- Rapidly increasing
- 7.3% growth in 2010

MARKETS AND PRICES

- Desindexation of gas from oil prices (Atlantic basin)
- Is this a permanent trend?
- Role of spot markets more significant
- Atlantic basin before Japan crisis split 50-50 (oil and non-oil indexed prices)

GAS CONSUMPTION

- Rapidly increasing
- 7.4% growth in 2010
- The most rapid increase since 1989

GAS TRADE

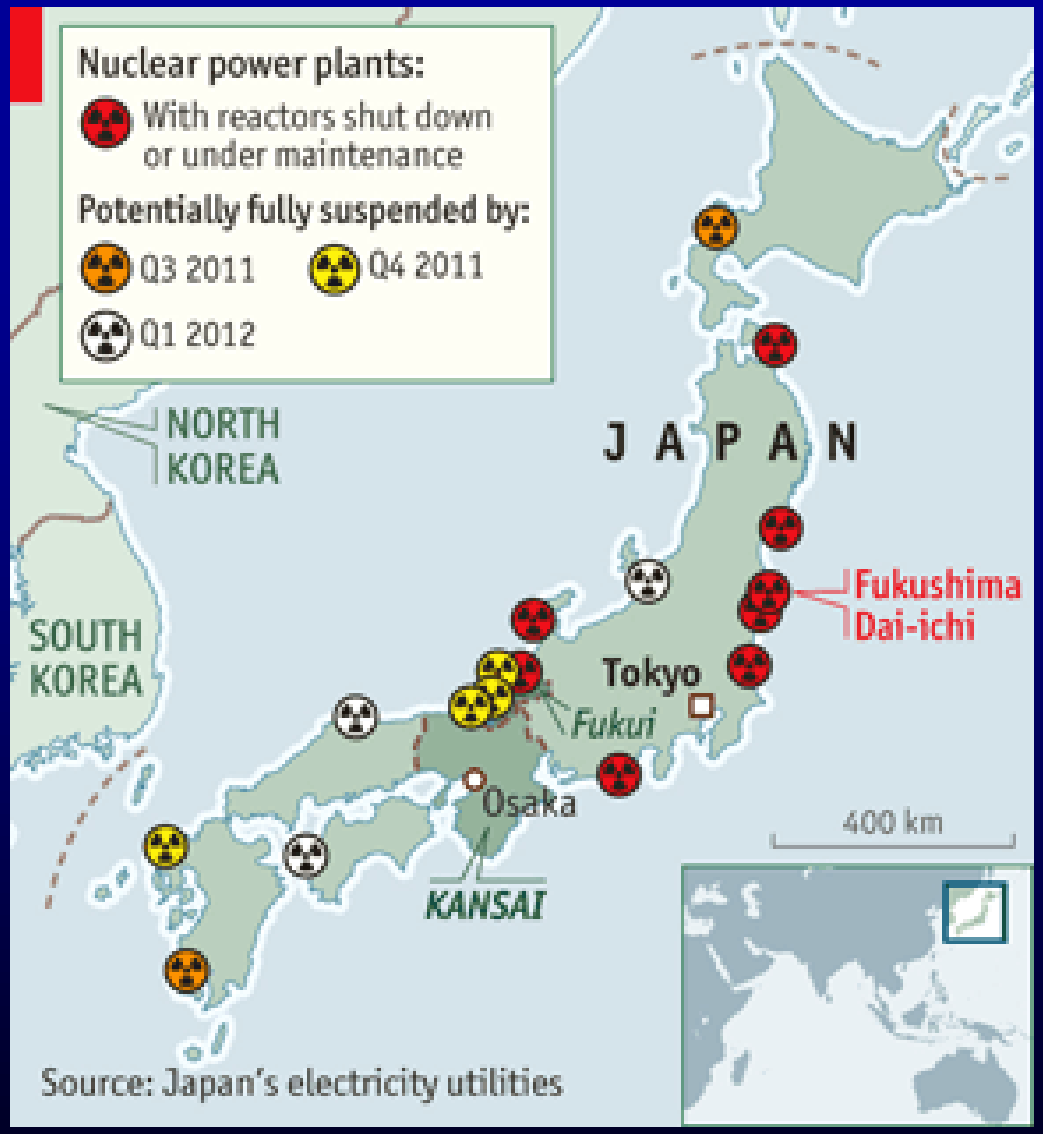
- 10.1% growth in 2010
- Driven by strong growth in LNG (22.6%)
- LNG accounts for 30.5% of global gas trade
- Pipeline shipments grew 5.4% led by Russia
- Europe and Eurasia account for 2/3 of pipeline gas trade

GAS TRANSPORTATION ROUTES

- Changes in structural patterns
- LNG flexibility and versatility
- Overcome difficulties with "Stranded Gas"
- Main threat from further congestion in key routes

TRENDS SHAPING THE GAS INDUSTRY

JAPAN'S ENERGY CRISIS A MATTER OF TRUST



Source: The Economist, 25 June 2011

THE GEOPOLITCS OF OIL

Provisions, production and problems

Bahrain
Tiny producer but significant because of proximity to Saudi Arabia's Eastern province, home of the world's largest oil fields. Could become caught up if tensions rise between Saudi Arabia and Iran
0.1

Tunisia
A small oil producer but traders are watching political developments after it was the first Arab government to collapse in 2011
0.4

Syria
Importance in global oil markets has fallen as production dropped in past 10 years. Traders keep an eye on it nonetheless because of political importance in the Arab world
2.5

Yemen
Key to global oil trade because of location on Bab el-Mandeb, mouth of the Red Sea and among the world's most strategic shipping lanes
3.0

Egypt
Suez Canal and Sumed pipeline linking Red Sea and Mediterranean make it critical for global oil trade
3.7

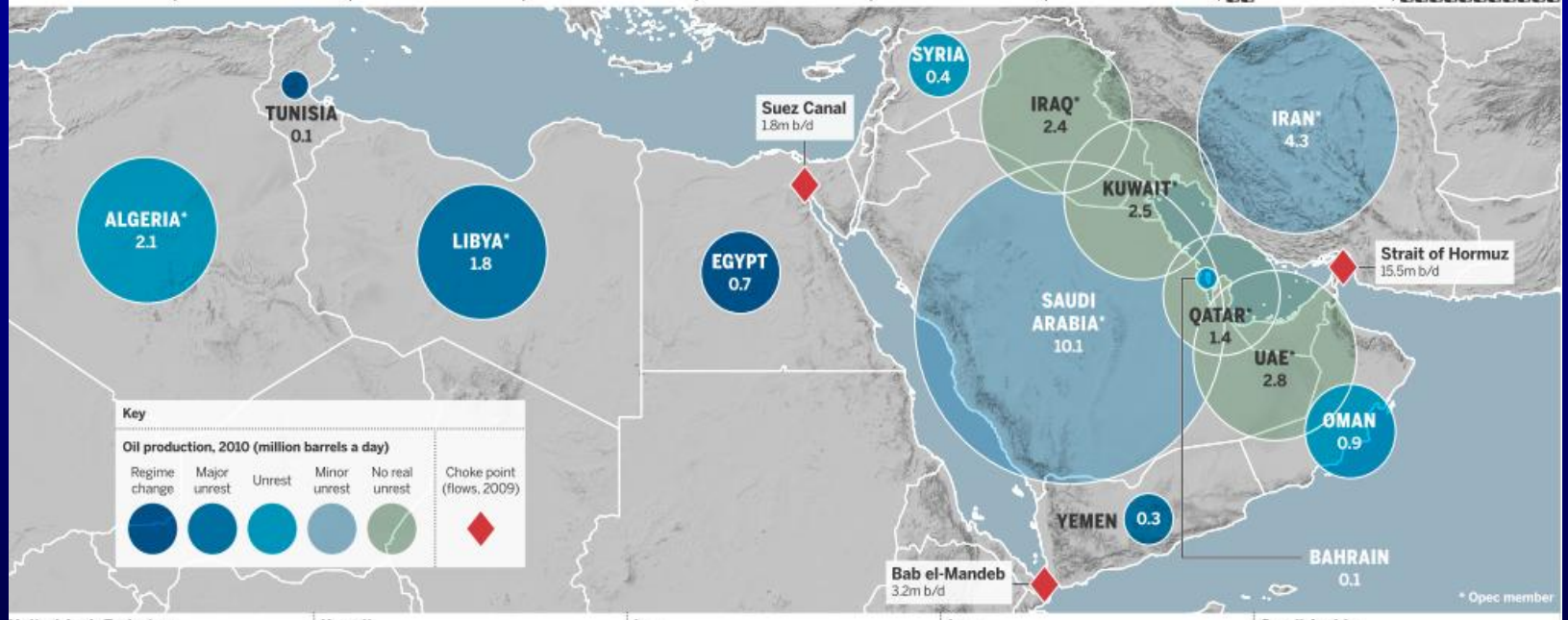
Oman
After years of steady decline in oil production, output has started to creep up with the help of international companies. It is the largest non-Opec Arab oil producer
5.5

Algeria
Proof that oil and natural gas production can continue amid fighting. The hydrocarbons sector did not suffer signifcantly during a 10-year civil war
12.2

Qatar
Small producer but as the world's largest exporter of liquefied natural gas – the fuel of choice for electricity generation – its role in the global energy market is important
25.4

Libya
Production has dropped to a trickle from pre-crisis levels of 1.6m barrels a day. But rebels are trying to return supplies to the international market with the help of Qatar
44.3

Crude oil proved reserves (bn barrels)



United Arab Emirates
Abu Dhabi, the capital, is the only oil-rich emirate and financially supports poorer members of the seven-state federation. Dubai, Sharjah and Ras al-Khaimah produce small quantities
98

Kuwait
Struggling to boost production following a decade of fighting off attempts by foreign oil companies to invest
104

Iraq
Plans to boost production from 2.5m b/d to 12m b/d within a decade, but the market is sceptical that it will be able to pump more than 5m-6m b/d
115

Iran
Production never recovered following strikes during the 1979 Islamic revolution that halted output. An important lesson for Libya – currently experiencing outages
138

Saudi Arabia
The world's largest oil exporter. Also holds the bulk of Opec's idle capacity, giving it a near-unique ability to replace others' outages
262

Sources: EIA; FT research

Source: FT, 30th March 2011

Effect on oil prices and Gulf economies

- Three competing effects
  - Damage, disruption and insecurity
  - High oil prices
  - Increased social spending and budgetary requirements

22

Source: 21st World Upstream Conference Global Pacific & Partners

GEOPOLITICAL AND STRUCTURAL CHANGES

- In Energy Markets
- In International Finance Markets
- Transfer and redistribution of wealth

GROWTH OF NATIONALISM ON RESOURCES

- Russia, Venezuela, Algeria, Ecuador, etc.
- Less efficiency in production
- Limitation of supply

Increase of Financial Power of Oil Producing Countries

- Revenues duplicated last 3 years
- 2008: 960 Billion US$ OPEC Revenues
- Action of Sovereign Funds

- NOC's control 80% of World Oil Reserves
- IOC's control directly 7%

DECLINE OF USA INFLUENCE

- USA vulnerabilities
- Geopolitical danger of USA deficit
- Focus on Iraq
- Vacuum of power in Asia
- Dollar weakness
- Financial pressures

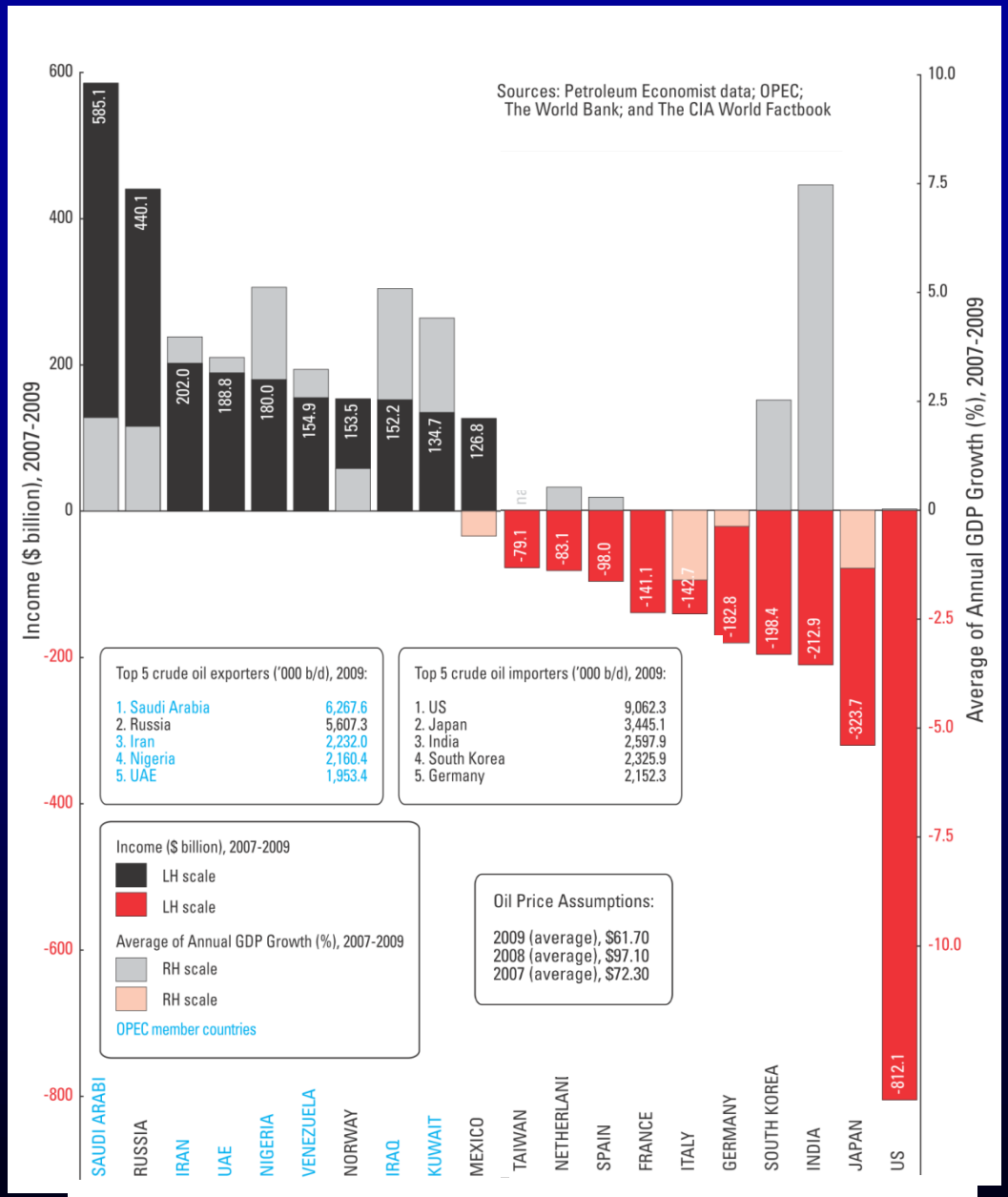
IOC's difficulties to access New Oil and gas reserves

Possibility of ALLIANCE between EMERGING and OIL PRODUCING COUNTRIES

- CHINA/INDIA/OPEC
- Role of RUSSIA and CENTRAL ASIA
- Resistance to USA hegemony
- CHINA monetary reserves

INCREASING DEPENDENCE ON OPEC

PETRO-DOLLARS: who's rich who's not



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OIL AND GAS

2. O PAPEL DA BACIA ATLÂNTICA

Para onde vai o Século XXI?

PORTUGAL NA ENCRUZILHADA: COMO ACTUAR NO MUNDO DE HOJE?

A GEOPOLÍTICA e a ECONOMIA

. Efeitos da globalização

. Declínio do Estado-Nação

. Emergência de Novos Actores

. Transferência parcial do poder financeiro

. Crise global do sistema capitalista

AS AMEAÇAS GLOBAIS

. Climática (migrações)

. Terrorismo

. Pirataria

. Estados falhados

. Colapso da ordem em zonas do Globo

. Proliferação Nuclear

. Armas de destruição maciça

OS RECURSOS

. Recursos cada vez mais escassos

. Intensificação da luta pelos recursos:

- Minerais
- Energéticos
- Alimentares
- Água

. Controle de matérias-primas estratégicas

WORLD CHALLENGES

2012

POPULATION
7 billion people

GDP
65 trillion US$

CAR FLEET
800 million cars

OIL USE in DEVELOPED WORLD
14 barrels/person/year

OIL USE in DEVELOPING WORLD
3 barrels/person/year

WORLD ENERGY MATRIX

. Oil Production is 5 times greater than in 1957
. Renewables have established a more secure foundation
. Oil/Coal /Natural Gas provide 80% of supply

ELECTRICITY
1,5 billion people without access

WATER
700 million people with scarce resources

2030

POPULATION
8,5 billion people

GDP
130 trillion US

CAR FLEET
3 billion cars

OIL USE
Billions of people with better incomes go from 3 barrels/person/year up to 3 or 4 times more

WORLD ENERGY MATRIX

. Dominance of Natural Gas?
. Consolidation of Renewables
. Solution for the transport system: (electric/biofuels/GTL//fuel-cells)?

ELECTRICITY
. Reduction or not of inequality?

WATER
. Reduction or not water access?

OIL ON THE EDGE

Break *Throughs – and High Prices – have opened up new frontiers for Petroleum*

TIGHT OIL

BACKGROUND Light crude oil that is bound tightly in **formations of relatively permeable shale.** Wells are drilled vertically and then horizontally into the shale layer. Hydraulic fracturing is used to break the rock underground, and oil flows up the well

ENVIRONMENTAL IMPACT Tight oil requires fracking, which involves **injecting millions of gallons of water mixed with chemicals deep into the ground.** There can be a risk of contamination to groundwater, though there have been no proven cases yet. Burning of excess methane from tight-oil wells can cause air pollution

RESERVES **Up to 300 billion** barrels globally

COST OF PRODUCTION **$50** per barrel

ARCTIC OFFSHORE

BACKGROUND As climate change melts Arctic sea ice, **vast areas of water that were once blocked are now opening for offshore drilling and oil shipping.** Call it the unexpected climate-change dividend

ENVIRONMENTAL IMPACT Even though the sea ice is melting, Arctic waters remain incredibly treacherous, with icebergs and storms threatening drilling ships. **Any oil spill would be much harder to clean up in the freezing water than in the warmth of the Gulf,** and the remoteness of the Arctic means that it would be difficult to stage a massive spill response

RESERVES Estimated **90 billion** barrels

COST OF PRODUCTION Unclear but likely **above $100** a barrel

PRESALT DEEPWATER

BACKGROUND Reservoirs of oil found **below thick layers of salt beneath the ocean floor that were deposited more than 150 million years ago.** Requires offshore drilling through nearly 3,000 m of water, additional rock and more than 1,500 m of salt

ENVIRONMENTAL IMPACT The presalt reservoirs represent some of the most technologically challenging offshore drilling. The wells are deeper than the Gulf of Mexico well that led to the BP oil spill in 2010. **A blowout would be incredibly difficult to control**

RESERVES **50 billion to 100 billion** barrels

COST OF PRODUCTION **$45 to $65** a barrel

OIL SHALE

BACKGROUND Shale that contains **a solid bituminous material called kerogen.** The rock has to be mined and then heated to a high temperature to separate the oil from the shale

ENVIRONMENTAL IMPACT **The cost of mining and processing oil shale is still too high to make the process worthwhile.** Oil shale requires significant amounts of land and water and produces toxic tailings. Oil-shale crude also has a larger greenhouse-gas footprint than conventional oil

RESERVES **800 billion** barrels, though estimates remain uncertain

COST OF PRODUCTION **Over $100** a barrel

OIL SANDS

BACKGROUND Loose sand or sandstone that's saturated with **a dense and viscous form of petroleum called bitumen.** The oil sands are exploited either through vast open-pit mines or through in situ wells that process the bitumen underground

ENVIRONMENTAL IMPACT Open-pit oil-sands mines **leave large piles of toxic tailings that can pollute nearby water sources.** Gasoline from oil sands results in **10% to 15% more greenhouse-gas emissions per barrel than conventional oil** because of the additional energy needed to refine it

RESERVES **169 billion** recoverable barrels

COST OF PRODUCTION **$50 to $75** per barrel

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OIL AND GAS