

4th March 2008 – Portcullis House, London

Strategic Matters Arising in the Multi-Polar Energy World

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1 Basic trends: general global projections (IEA baseline)

- Oil & gas will remain the primary sources of energy and, together with coal, will supply 85% of global energy needs in 2030 – *incl. concentrated in fewer countries*
- By 2020, or perhaps sooner, energy consumption by the Developing World is expected to surpass that of the Industrialized World.
- Natural gas is predicted to be the fastest growing primary energy source, with coal & gas continuing to lead power generation growth.
- Fastest oil demand growth is Asia/Pacific region - transportation is main user of oil.
- Even with expected efficiency gains, the world will see total growth in energy demand of about 55% by 2030 - equivalent to more than 100 mbd, or about ten times Saudi Arabia's current oil production.
- The increase in China's energy demand between 2004 and 2007 was equivalent to Japan's current annual energy use. India is set to become the world's third largest oil importer after the US and China before 2025, overtaking Japan.

Strategically, demand will likely increase significantly in a tighter, sellers' market

Increasing Producer-Consumer Asymmetry + Consumer-Consumer Competition

A stark, 'hierarchy of choice' in a tight energy competition

Economic
Development

Sustainable
Development

1. *Access to energy*
2. *Security of supply*
3. *Cost efficiency*
4. *Natural resource efficiency*
5. *Social equity*

Secure energy

Affordable energy

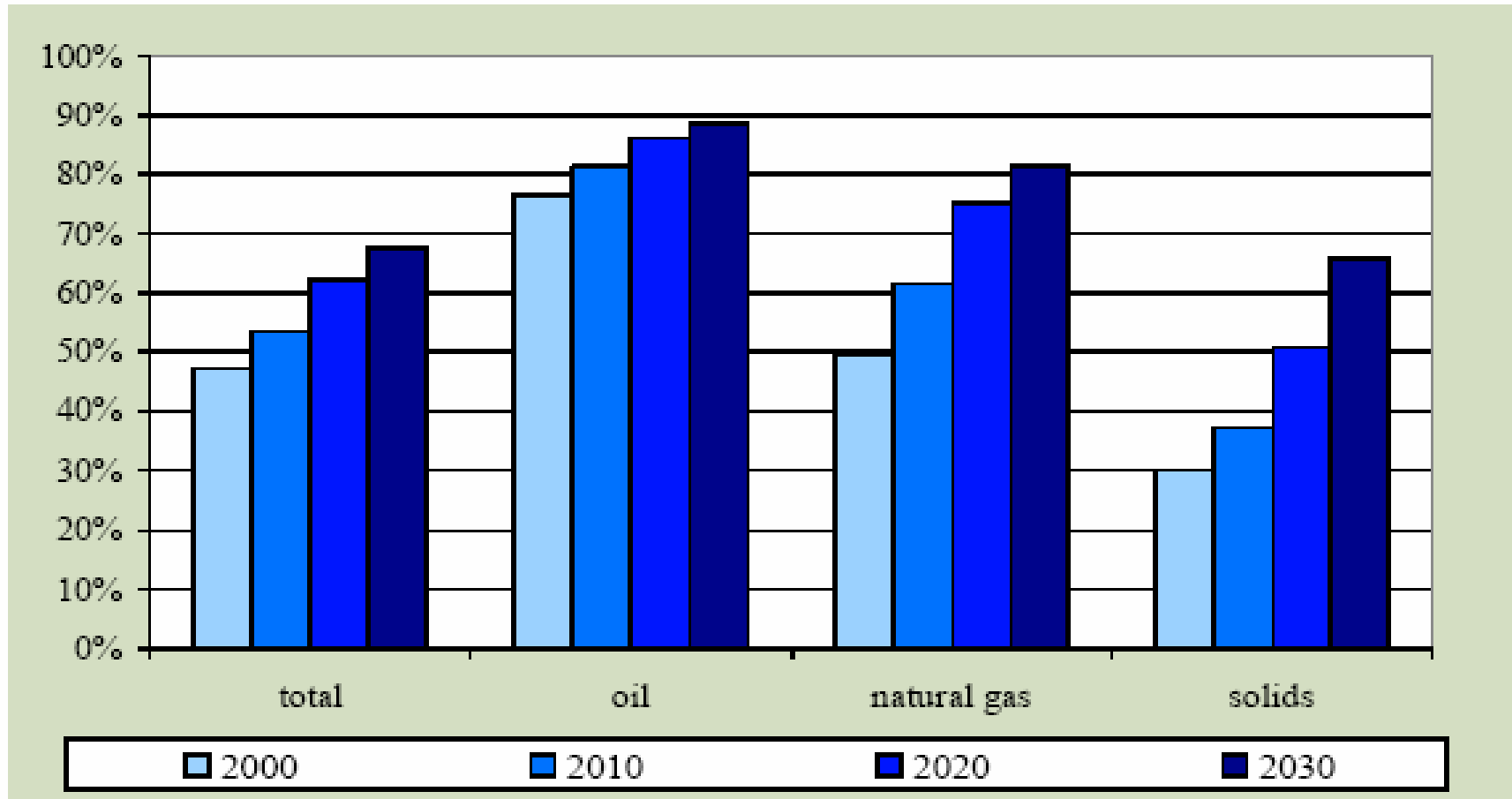
Climate Change

Q 1: As global energy competitions become more intense in future, will the world be able to tackle carbon reduction at the rate at which it is needed?

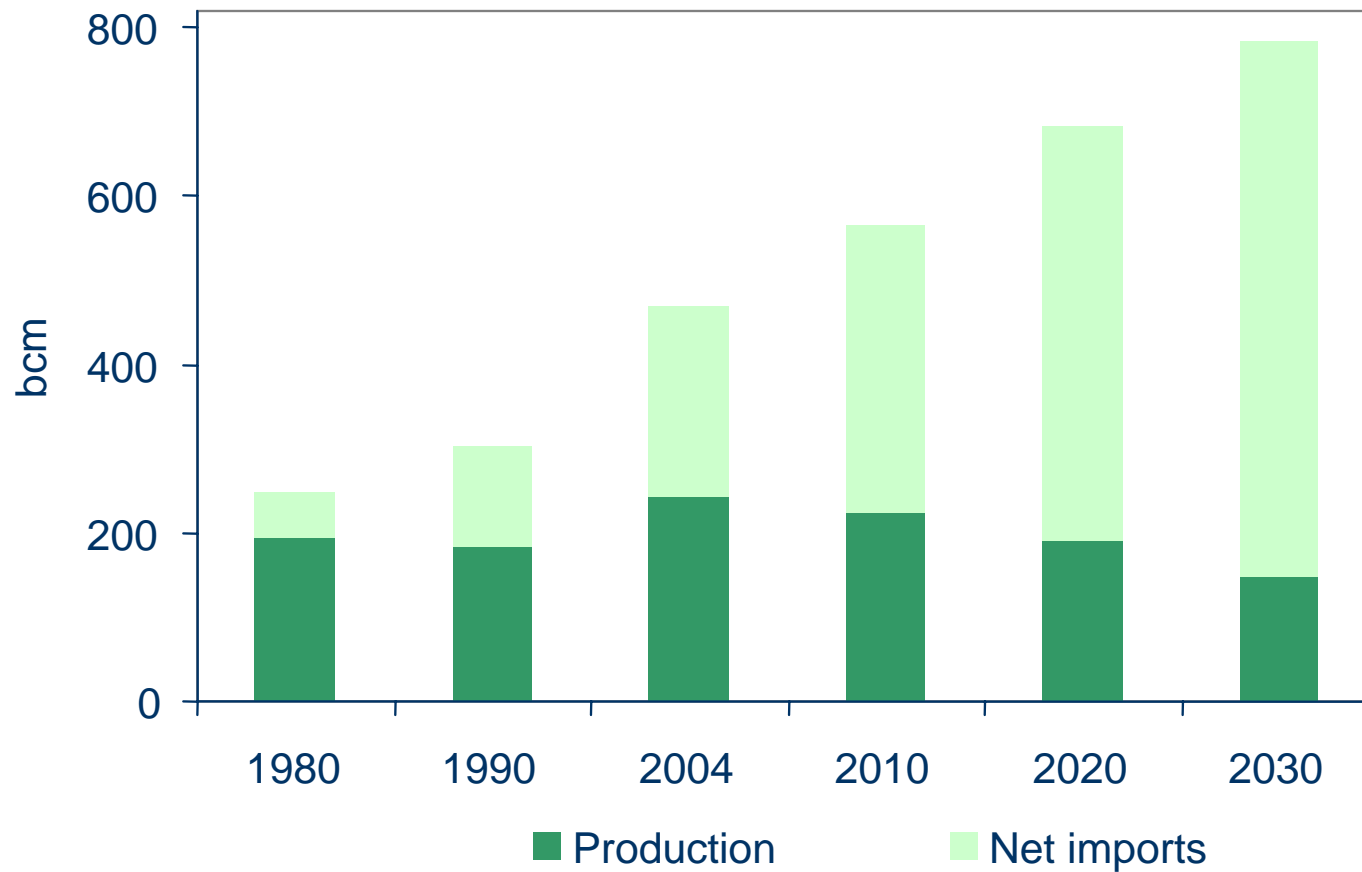
Reasonable assumptions about the future...

1. The current global energy trajectory is not sustainable in the long term
2. Energy prices will rise rapidly if massive and timely investment is not forthcoming
3. Energy security will deteriorate as oil and gas become concentrated among fewer suppliers susceptible to political risk
4. Environmental outcomes look set to worsen re. carbon & GHGs – policy can be expected to tighten as a result

Competition: EU 25 import dependency trend in %



EU Gas Supply Balance



Rising demand – mainly for power generation – and declining output will cause net imports to surge



2. Europe's new energy insecurity – the local issues

- Policy uncertainties mean investment defaults to short term, non-diverse option of gas-generation: will nuclear rebuild?
- Systems have become more efficient, and exposed, + still there are variable Govt attitudes to liberalization in the EU
- Internal geography is important – EU is not homogeneous
- Energy impacting on EU foreign & security thinking
- Energy security debate really about energy supply *insecurity*, ie fear of uncontrollable price impacts, fear of terrorism on key systems, statism v. EU liberalisation, and uncertainty re. EU's role in geopolitical intervention overseas
- There is now an urgency for a collective European energy agenda but EU States / companies look to themselves first

Q2: How strategically vulnerable is Europe, vs. other economic regions, on account of its strategic energy dependencies and internal competitions?

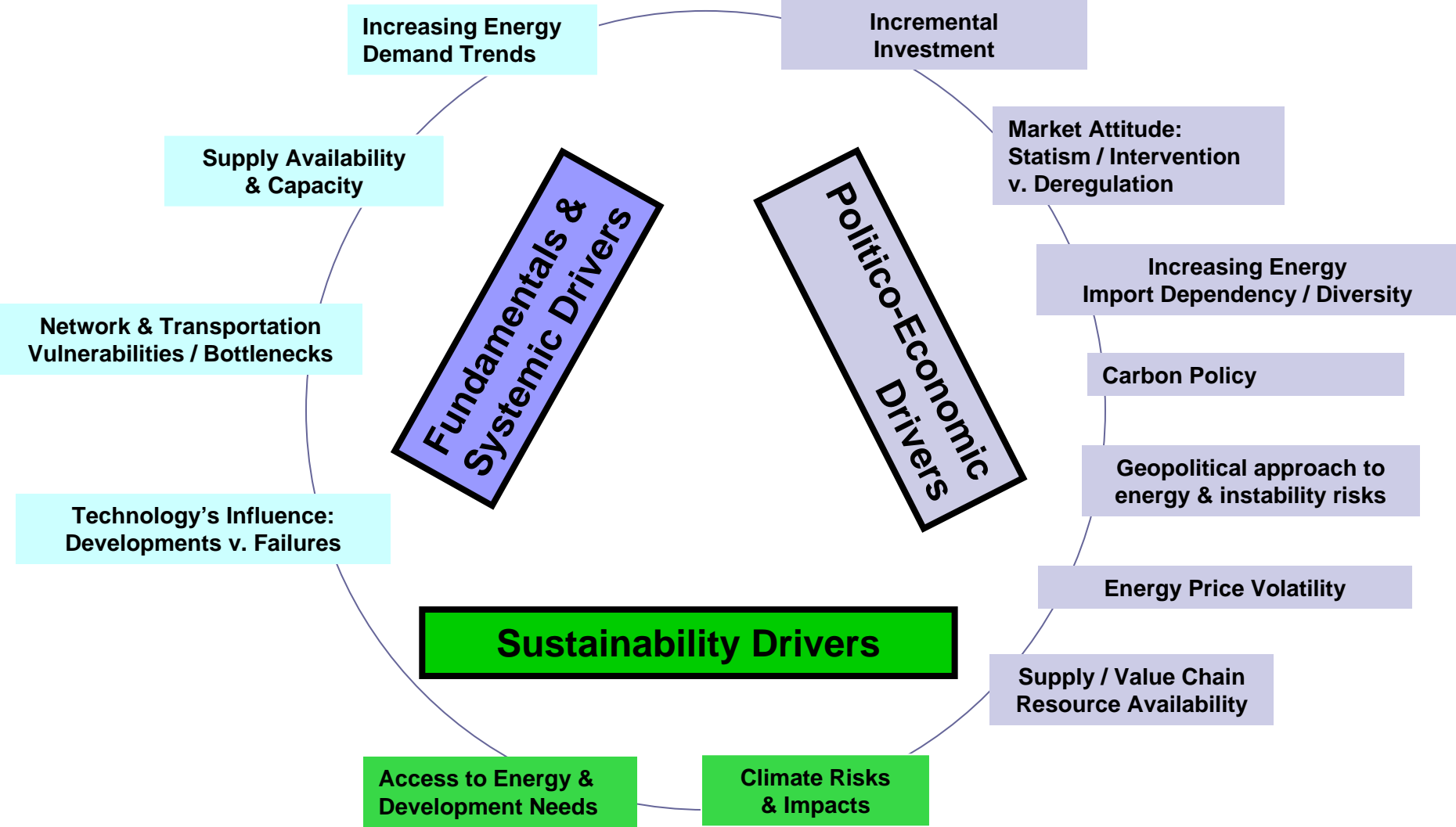
A need to think *differently*



EU energy security – viewing it as a risk portfolio

- Cannot guarantee safe, secure & affordable supplies, but you can mitigate exposure relative to political & economic status of competitors
- Europe's dependence on imports is not a strategic weakness in itself - "Energy security is not aimed at maximising Europe's energy self-sufficiency or minimising dependency but rather at reducing risks relating to dependency." (IEA)
- Minimising exposure of the global energy and capital markets to *volatility* is in everyone's interests – Europe has a role beyond the EU re. stability, trade, investment

Influences / Risk Contexts for the Multi-Polar Global Energy Landscape





3. What keeps you awake at night?

“The next phase of globalisation...will confront established powers with the reality of relative decline. We have reached a dangerous moment”

Philip Stephens (2006)

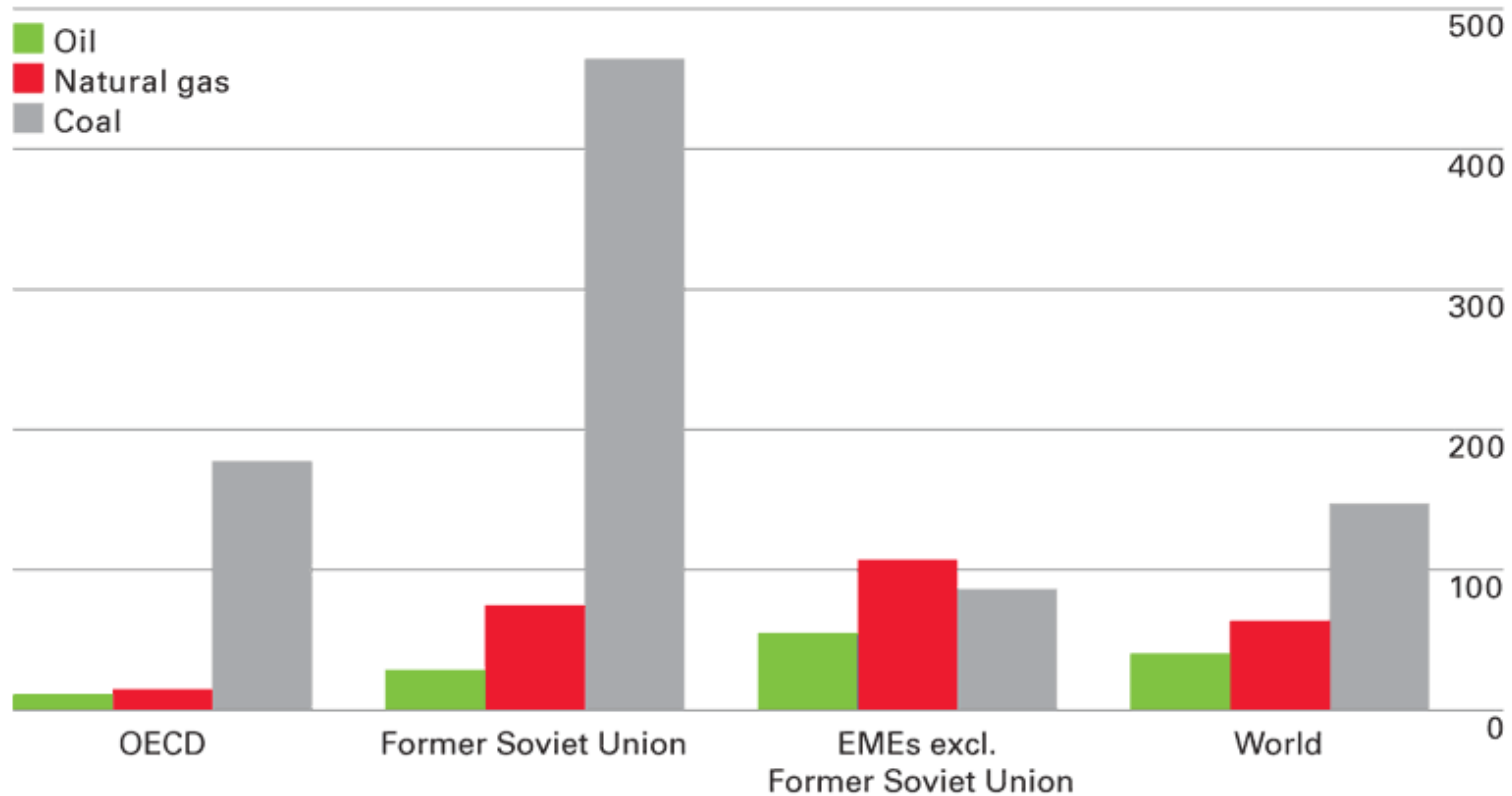
Five, very general issues to start with....

- Longevity of natural resources – what choices will we have?
- Ability to compete politically and economically for resources?
- Will investment deliver incremental supplies in time?
- Is nuclear power part of the answer? Who can we believe?
- How should my company face up to the risks / opportunities?

+ I can't spend my accumulating hydrocarbon wealth fast enough – can you help?

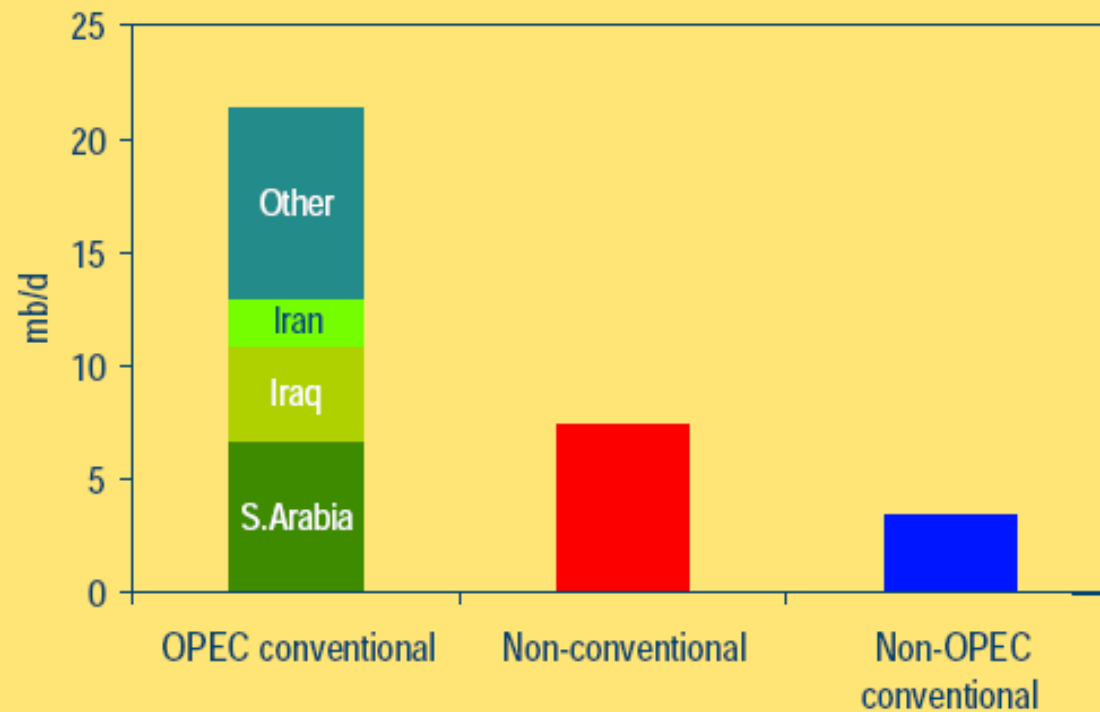
Fossil fuel reserves-to-production (R/P) ratios at end 2006 – BP Stat. Review 2007

Fossil fuel reserves-to-production (R/P) ratios at end 2006
Years



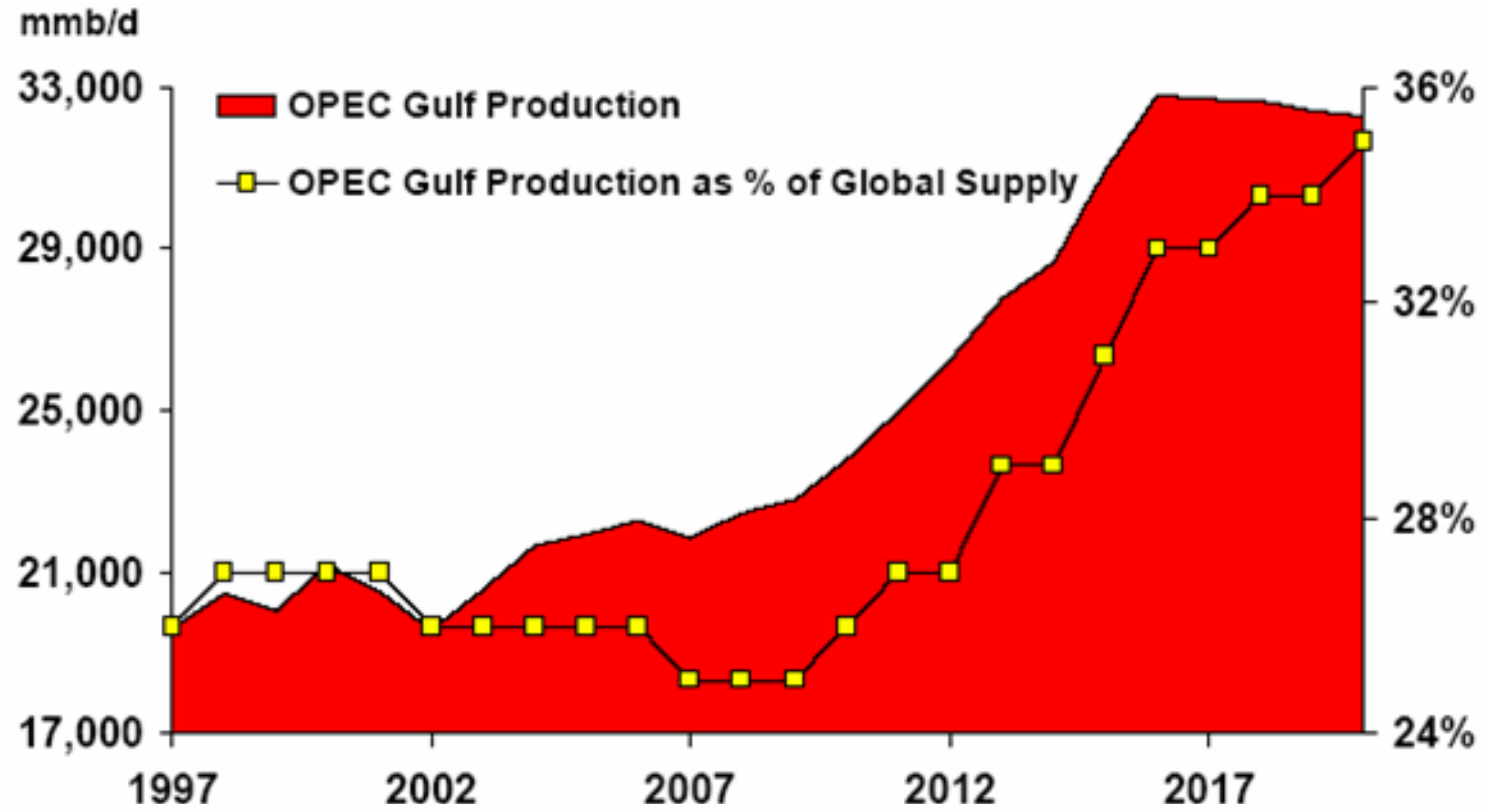
Coal remains the world's most abundant fossil fuel, with an R/P ratio of nearly 150 years. Coal reserves are located in the leading energy-consuming regions to a greater degree than oil or natural gas.

Reference Scenario: Increase in World Oil Supply, 2004-2030

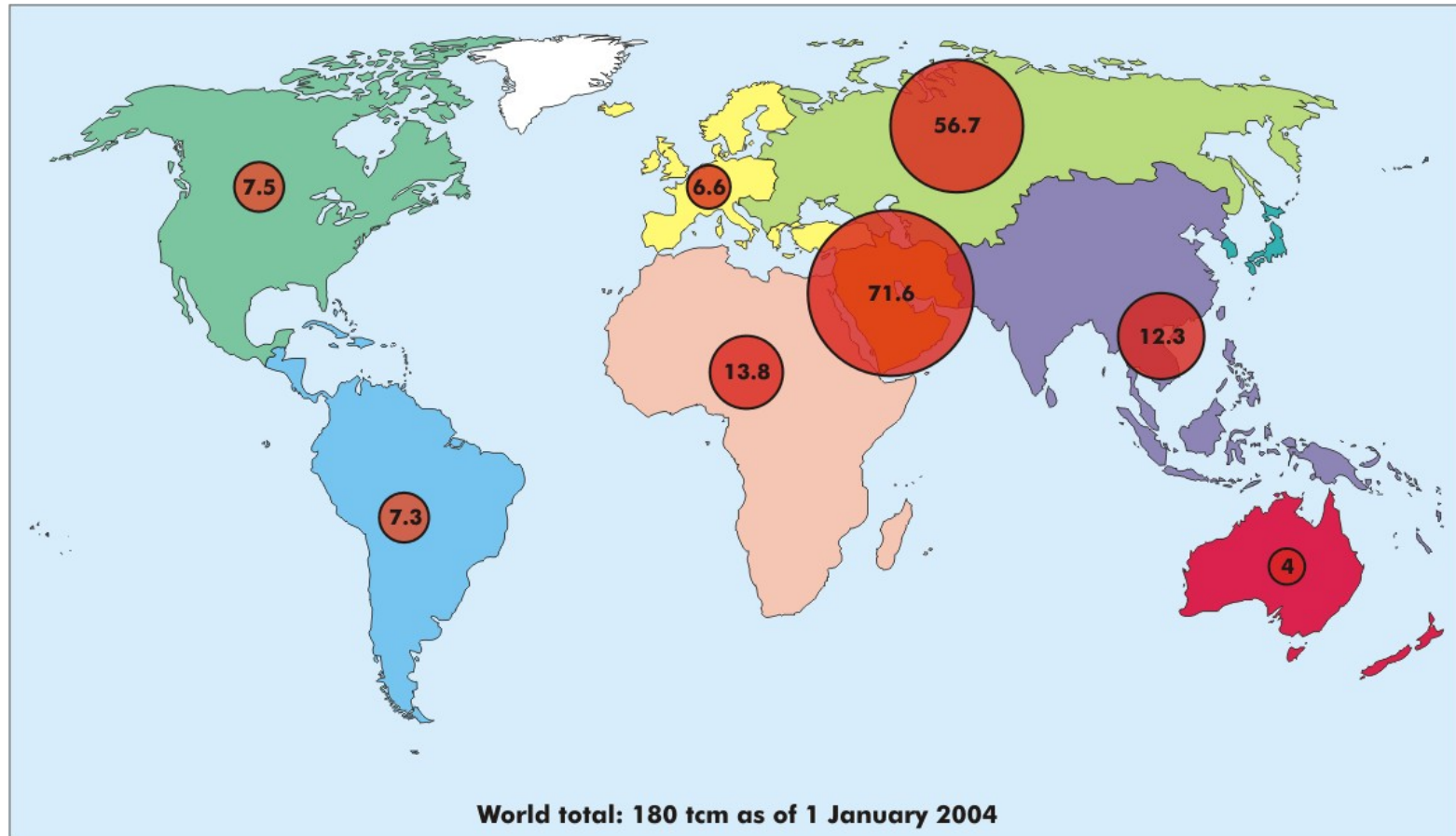


The share of OPEC in world oil supply increases sharply as conventional non-OPEC production peaks towards the middle of next decade

The Growing Dependency on the Gulf & OPEC for Oil



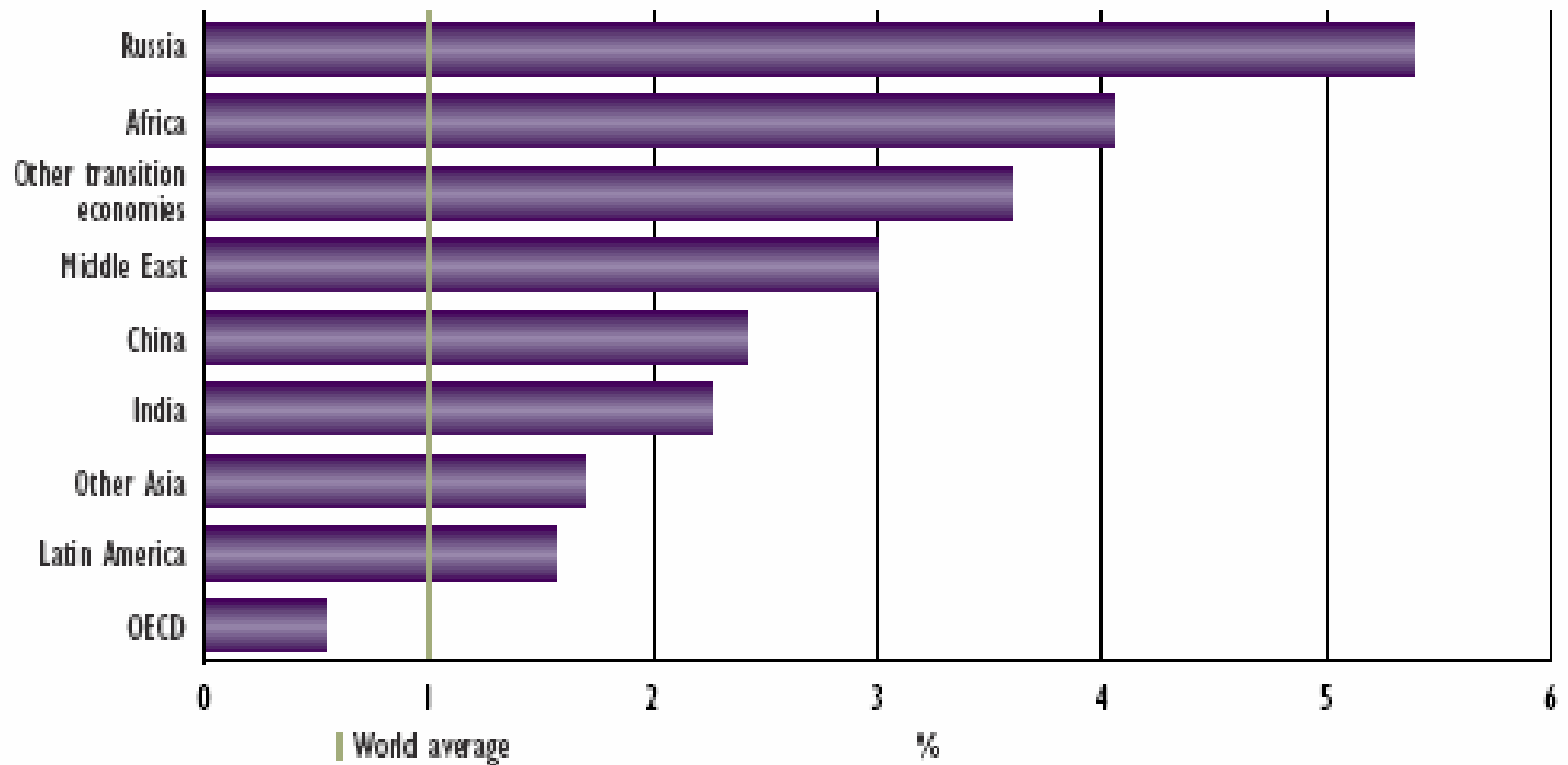
Proven Natural Gas Reserves



Gas reserves, concentrated in the Middle East & the transition economies, are equal to 66 years of current production

World Energy Investment Requirements – IEA baseline

Figure 1: Share of Energy Investment In Gross Domestic Product by Region (2001–2030)





Nuclear conclusions

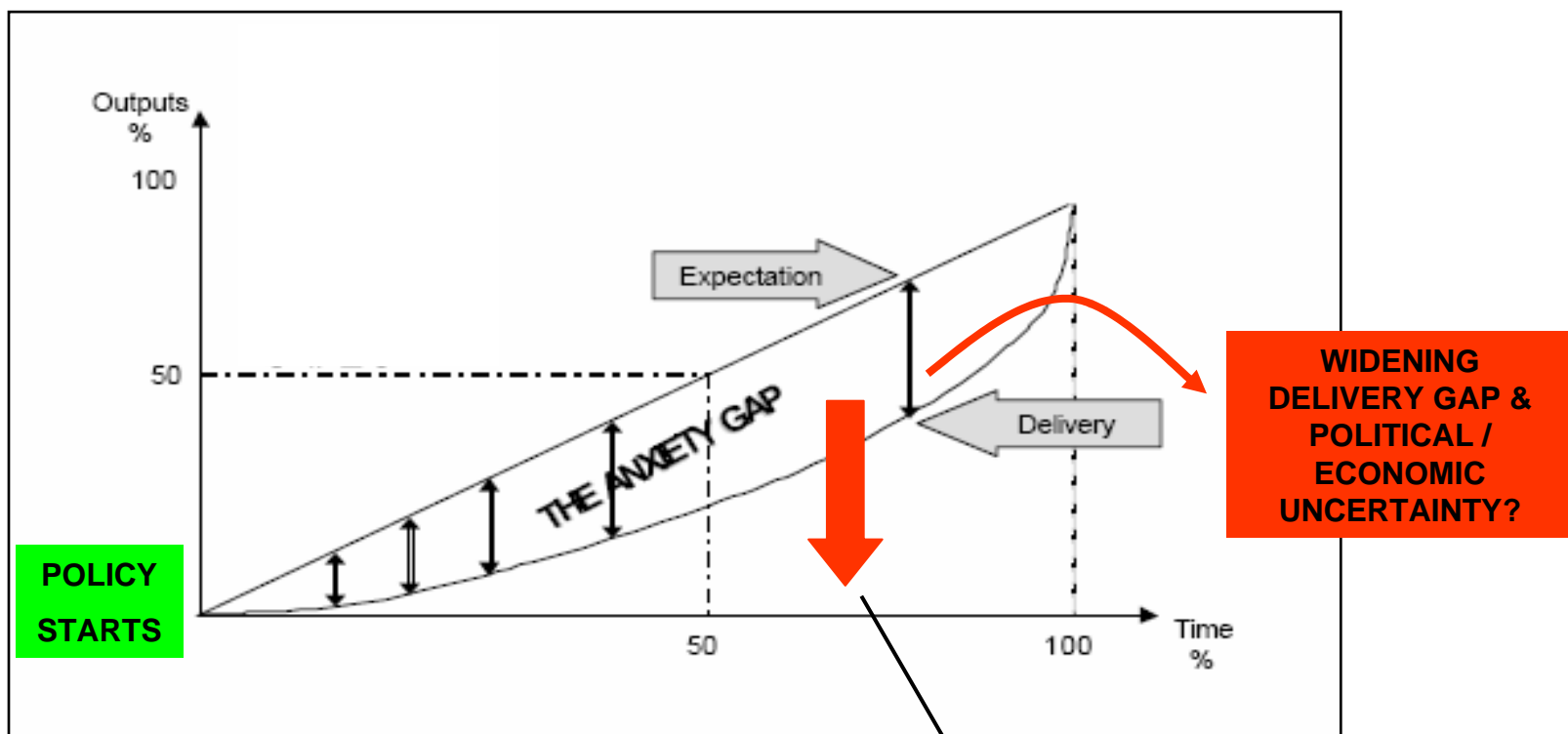
- ▶ **In the nuclear debate context is king**
- ▶ **What is the question being asked?**
 - ▶ Nuclear power in isolation performs poorly
 - ▶ Nuclear power as part of a mixed solution performs better
 - ▶ Safety is the key
- ▶ **Who is providing the answers?**
 - ▶ Nuclear industry is a mystery & presumed to be partial
 - ▶ Pressure groups are more trusted
- ▶ **Gender gap remains**
 - ▶ Women are noticeably more sceptical than men
- ▶ **Grudging acceptance rather than enthusiasm with significant numbers still undecided**



Key public confidence messages

- prioritise safety, security and the environment
- start now, but be flexible when moving forward
- be explicit about uncertainties and how they should be managed
- be open and transparent, and take seriously what you hear
- empower potential host communities

Risk = Energy Insecurity, and the creation of Anxiety & Delivery Gaps



Policies take varying lengths of times to deliver benefits
 Policy expectation is linear but delivery is curvilinear – they **should** meet *if* all goes according to plan, **BUT...**

Increasing downward drag on policy delivery: investor uncertainty, oil volatility, energy prices, carbon mkt, belief in Govt capacity: many policy aims, but many dynamic risks & pressures!

Increasing Competition & Strategic Energy Insecurity



What can companies do?

1. Employ energy efficiency measures across all practice areas
2. Take a longer and broader view of investment and strategic decisions about energy and carbon, putting them at the heart of corporate strategy throughout the value chain
3. Search out business transformation and diversification opportunities, including investment in clean energy funds
4. Encourage personal action among employees and the customer base
5. Declare ongoing gains as confidence measures and proof of benefit



Questions...?

Q1: As global energy competitions become more intense in future, will the world be able to tackle carbon reduction at the rate at which it is needed?

Q2: How strategically vulnerable is Europe, vs. other economic regions, on account of her multiple energy dependencies and her internal competitions?

Q3: Will demand-side measures deliver? Triggered by competition, or catastrophe?

Q4: How smooth will the necessary political, economic and technological transitions be in future as we head towards an ultra-competitive global energy economy?

Q5: What are you prepared to pay for what level of energy security, and by how much must you adjust your appetite for risk in future?

DISCUSS !



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