



# The challenges for UK energy

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A presentation to 'Transporting Britain's Energy 2008'

David Cox

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# Pöyry Energy Consulting – our offices



- The leading advisor to the European energy sector
- A pan-European energy consultancy formed from the merger of five highly respected consultancies



- Over 250 energy market experts in 15 offices across Europe:
  - Copenhagen – Düsseldorf – Helsinki
  - Madrid – Milan – Moscow
  - Oslo – Oxford – Paris
  - Stockholm – Stavanger – Vienna
  - Villach – Zurich – London

# Pöyry Energy Consulting supports clients throughout the energy business



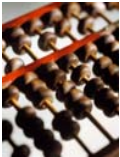
## Strategy

We help our clients to build stronger, more competitive, long-term positions throughout the energy value-chain, by focussing on the goals and activities that generate value



## Business Operation

We improve the performance and competitive position of our clients by developing and implementing innovative energy markets solutions



## Valuation & Financing

We apply our extensive expertise, projections and models to the valuation of businesses, projects and contracts to assist in the financing of our clients' energy market activities



## Sustainability

Delivering long term success increasingly requires companies to demonstrate environmental competence and social responsibility in their actions. Our experience helps us to find sustainable solutions for business and the wider environment

## Clients

Utilities  
Generating Companies  
Wholesalers  
Traders  
Distribution Companies  
Shippers  
Retailers  
Market Operators  
Independent System Operators  
Transmission Companies  
Governments  
Large Consumer  
Regulators  
Non-Governmental Organisations  
Financial Institutions  
Trade Associations  
Manufacturing Companies



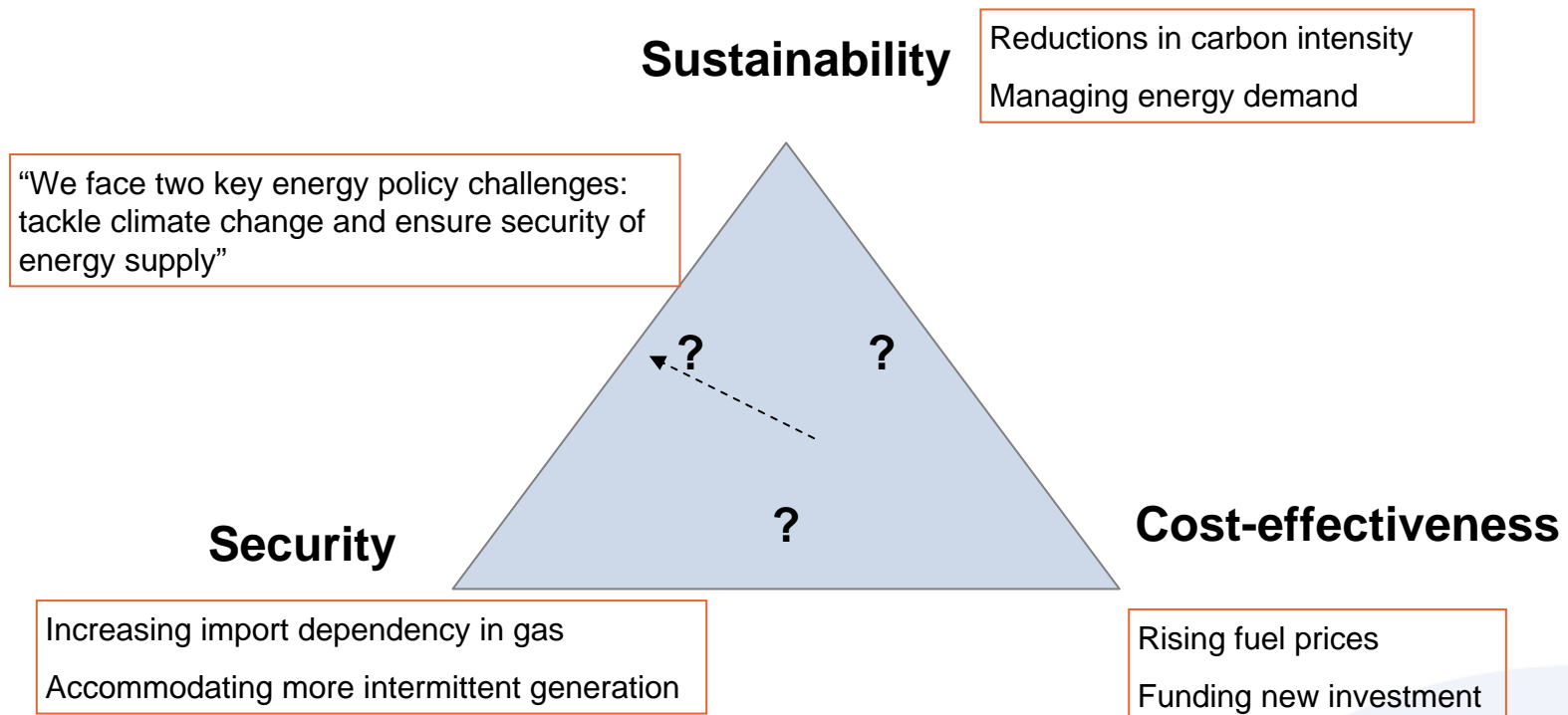
# Agenda

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1. > Setting the course for UK energy policy
2. External pressures
3. Rising to the challenge

# Setting the course for UK energy policy

No change to the high-level challenges in UK energy policy?



**How should/does the UK Government balance these three goals?**

# High-level energy goals underpinned by targets and aspirations

## Moving from the abstract to the measurable

- Deployment of renewable energy by 2020
  - EU: 20%
  - UK: 15%
- Reduction in emissions of carbon dioxide (compared to 1990 level)
  - EU: 20% (30%) by 2020
  - UK: 26% by 2020 and possibly up to 80% by 2050
- Improvements in energy efficiency
  - EU: 9% indicative energy saving target by 2016 (against BAU)
  - UK: aspiration of achieving 18% energy saving by 2016 (against BAU)
- Use of renewable fuels in transport
  - EU: 10% by 2020
- Eradication of fuel poverty
  - no households to be in fuel poverty in England by 2016

**List is illustrative rather than exhaustive!**

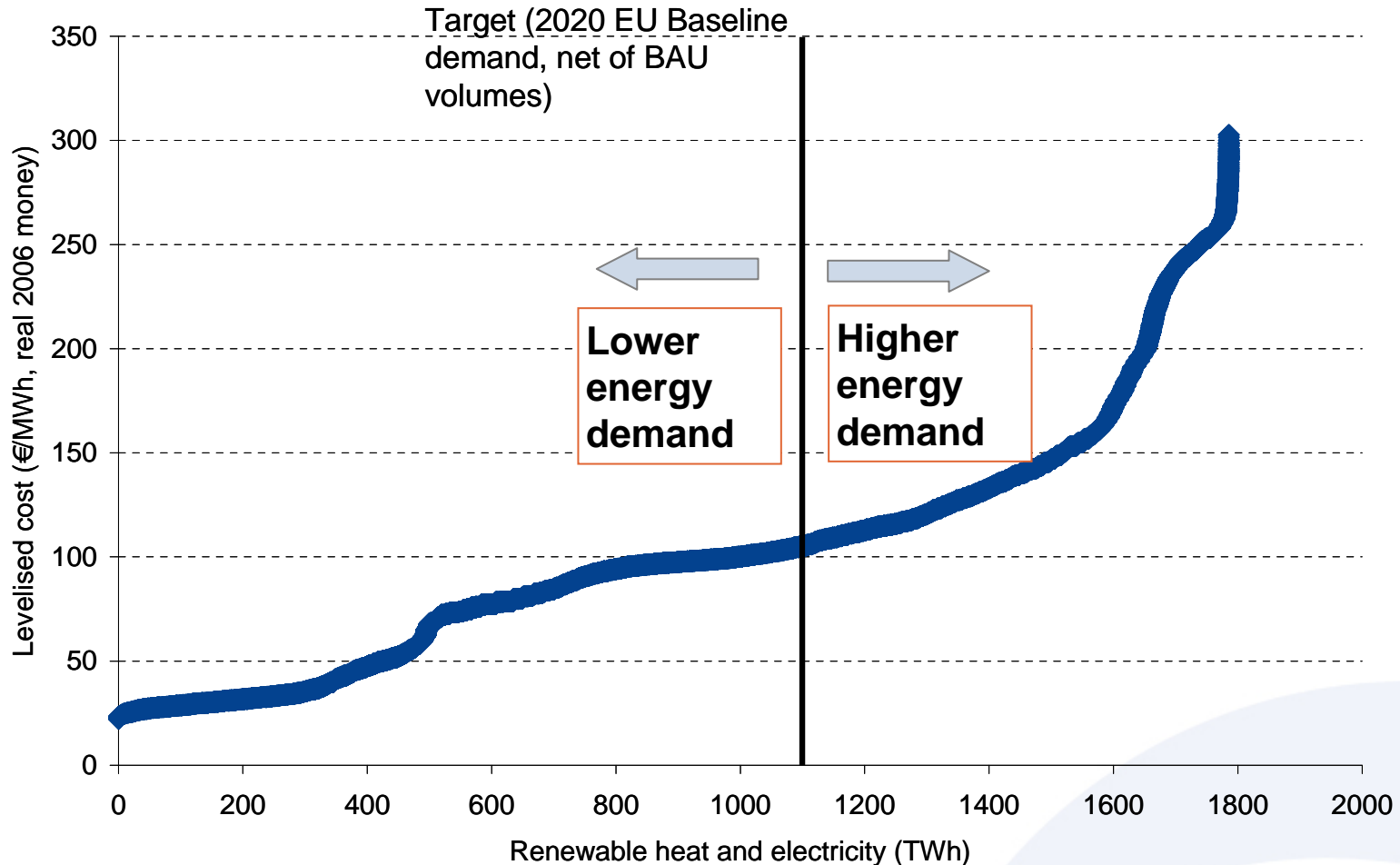
# How will the UK energy system need to change to meet targets?

Energy supply – how do BERR envisage us seeing 2020 renewable energy target?

Electricity	Heat	Transport
<ul style="list-style-type: none"><li>• 120 TWh (32%) of renewable electricity by 2020</li><li>• 8000km of new transmission cables required offshore to connect up 14 GW of offshore wind</li><li>• Need to deliver all planned onshore infrastructure projects</li></ul>	<ul style="list-style-type: none"><li>• 90 TWh (14%) of renewable heat by 2020</li><li>• More decentralised market than electricity</li><li>• Renewable sources to provide 16 TWh of heat at domestic level</li><li>• 7 million homes with solar thermal heating</li></ul>	<ul style="list-style-type: none"><li>• 55 TWh (10%) of renewable 'transport' by 2020 (exc aviation)</li><li>• Meeting the '10% transport target' is totally reliant on biofuels</li><li>• No potential for renewable fuels for aviation</li></ul>

Huge changes for all 3 sectors – electricity, heat and transport

# Cost of meeting EU renewable energy target for 2020



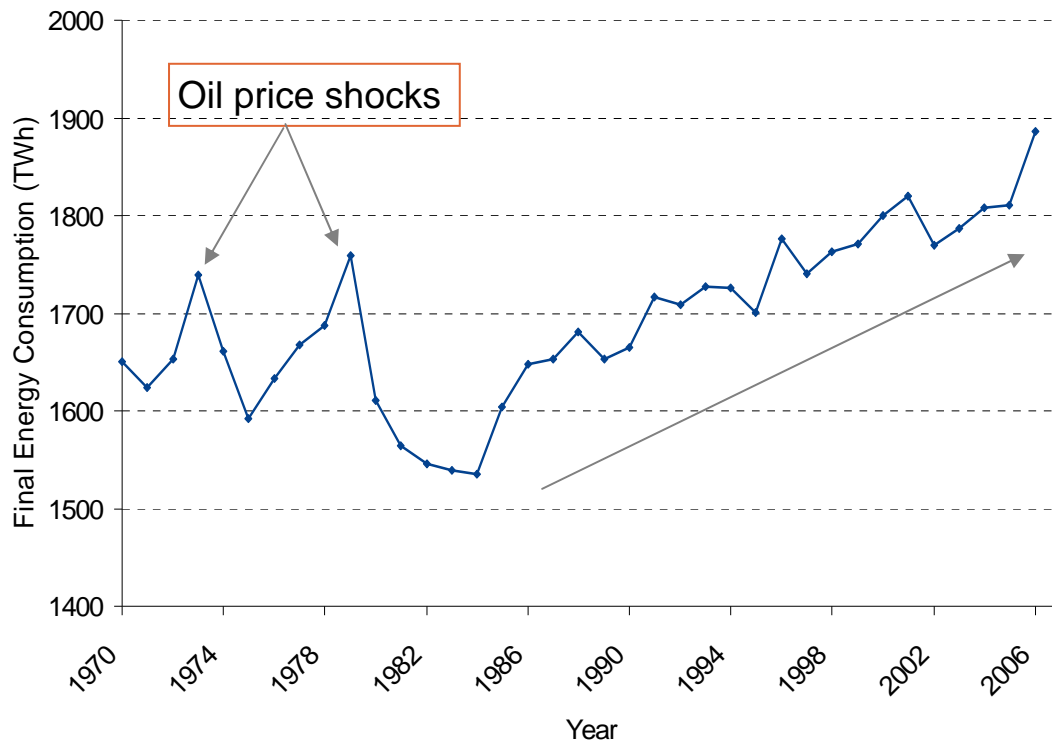
Source: Pöyry Energy Consulting

**Cost of UK target influenced by burden-sharing and trading mechanisms**

# How will the UK energy system need to change to meet targets?

## Delivering improvements in energy efficiency

### Final Energy Demand in UK



Source: 2007 Digest of UK Energy Statistics, BERR

- Can behavioural changes happen quickly and be sustained?
  - high fuel prices may help in the short-term
  - key is to lock in changes
- Who will deliver the required investment?
  - end-use appliances and technology
  - supporting infrastructure

**Energy efficiency delivered by changes in behaviour and in capital stock**

# How will UK energy system need to change to meet targets?

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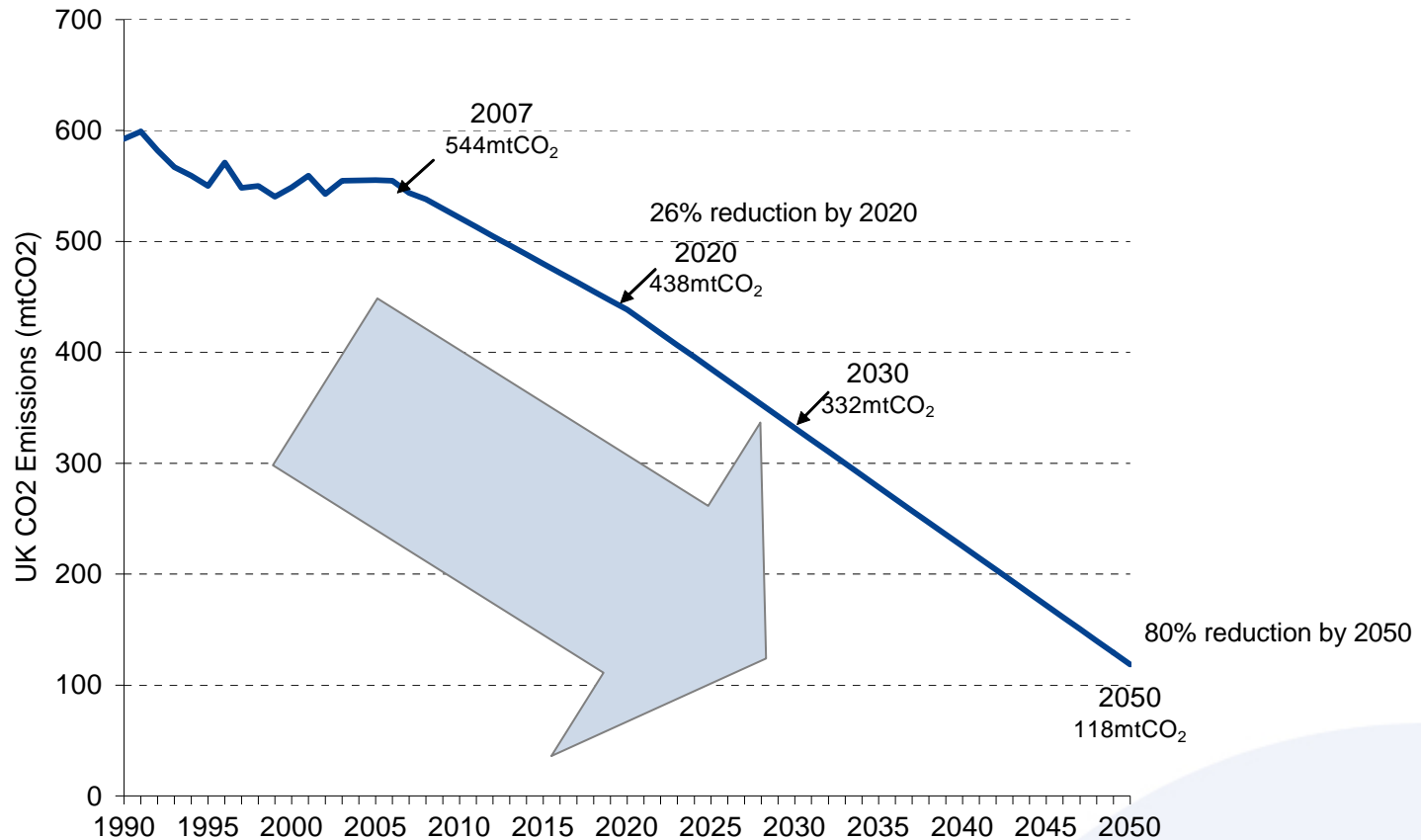
## Ending fuel poverty in England by 2016

- Upward pressure on future energy prices will come from a number of different sources
  - cost of developing and deploying renewable energy sources
    - BERR estimate that efforts required to meet renewable energy targets could increase residential gas bills by up to 37%
  - delivery of new transportation infrastructure
    - recovering revenue for ‘stranded’ network assets?
  - full auctioning of carbon allowances in power sector post 2012 (?)
  - costs of developing new technologies and supporting systems

**Background of sharp price rises in residential and business sectors**

# How will UK energy system need to change to meet targets?

## Reducing emissions of carbon dioxide



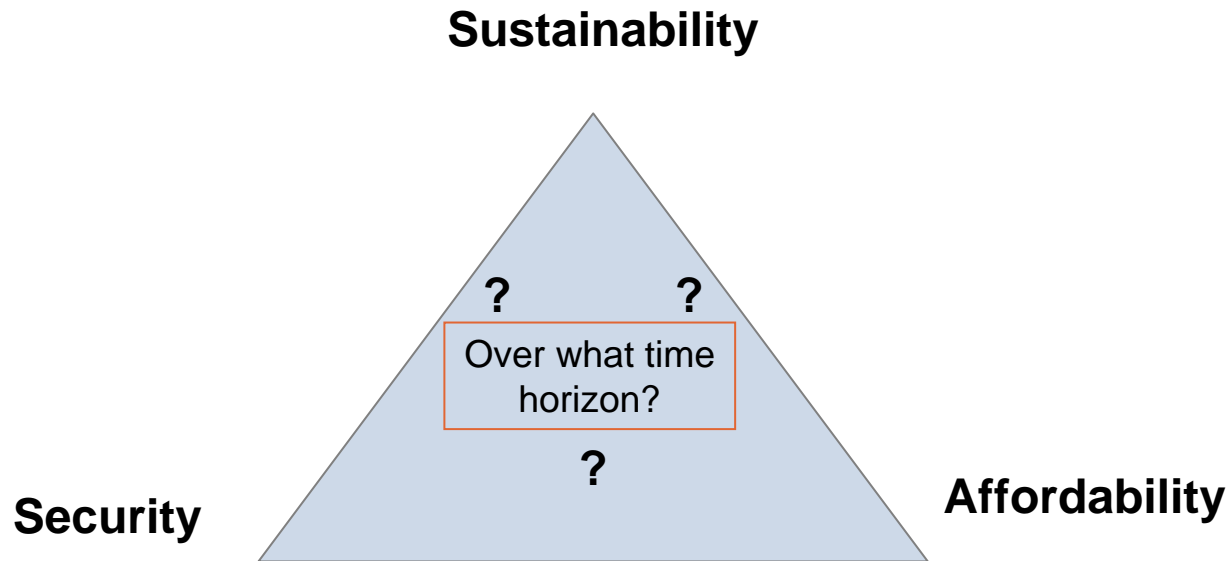
Source: Pöyry Energy Consulting

**No let-up after 2020**

**– need sustained reductions in carbon intensity and energy demand**

# Setting the course for UK energy policy

Need for clear policy statement on the desired balance between these goals



The balance between these three goals is a political decision

# Agenda

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# Outside world increases challenges for UK energy sector

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UK energy sector cannot act as if it was in splendid isolation

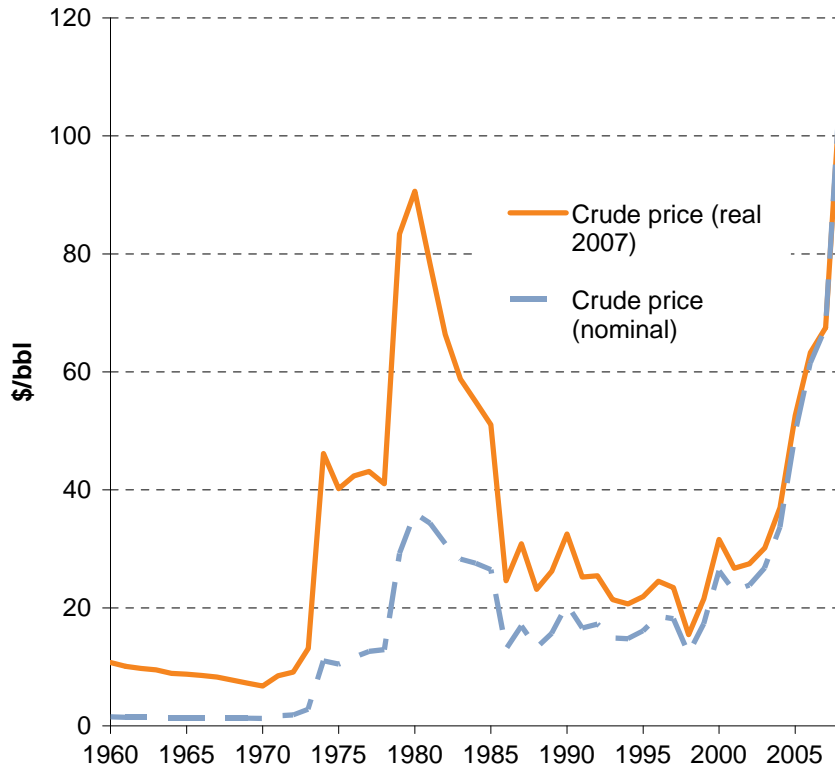
- Global market for physical and financial resources
  - land
    - fuel v food?
    - planning
  - rising prices of raw materials and intermediate goods
  - labour
    - how long will it take to build up skill and experience base for tomorrow's challenges?
    - committed to existing projects elsewhere in world
- Resource demand from global energy sector
  - IEA estimate that world energy demand could increase by over 50% by 2030 (driven by growth in China and India)

**Other EU members will also be striving to meet their energy challenges**

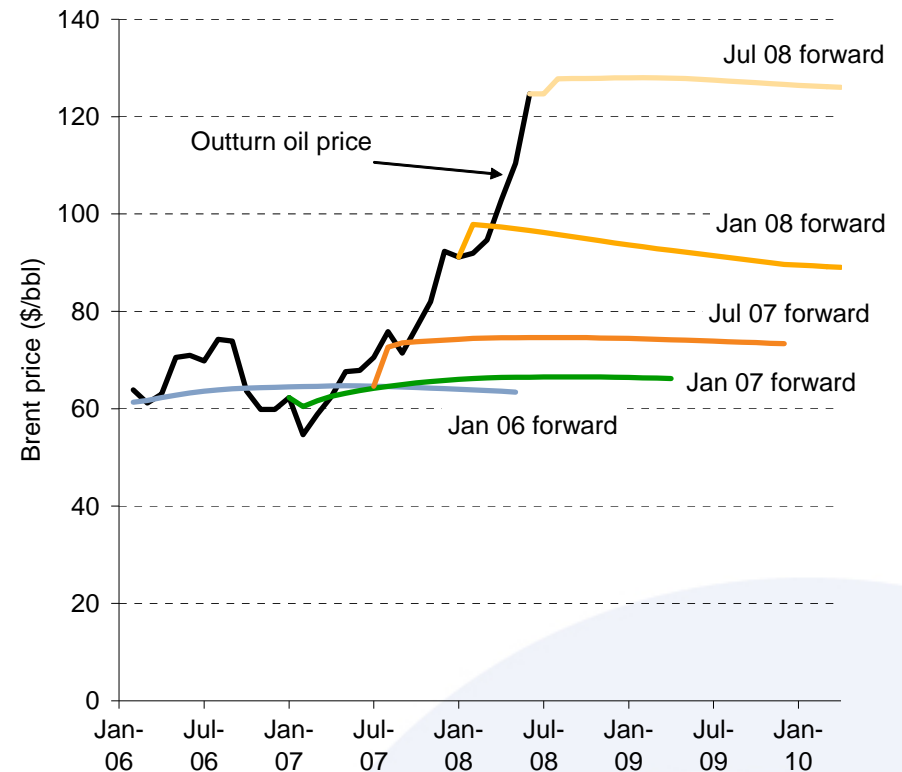
# Physical resources – rising oil prices

The price rises have been brutal, but seemingly entirely unforeseen by the market

## Brent prices since 1960



## Forward curve



## Physical resources – rising coal prices

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- Rising coal demand in China has helped drive up coal prices

**Rising Costs End Quest for Cleaner Coal Power in U.S.**

**Coal-fired power plant projects feel heat from rising costs**

- Cancellation of a number of planned coal-fired power stations in Germany over the past twelve months

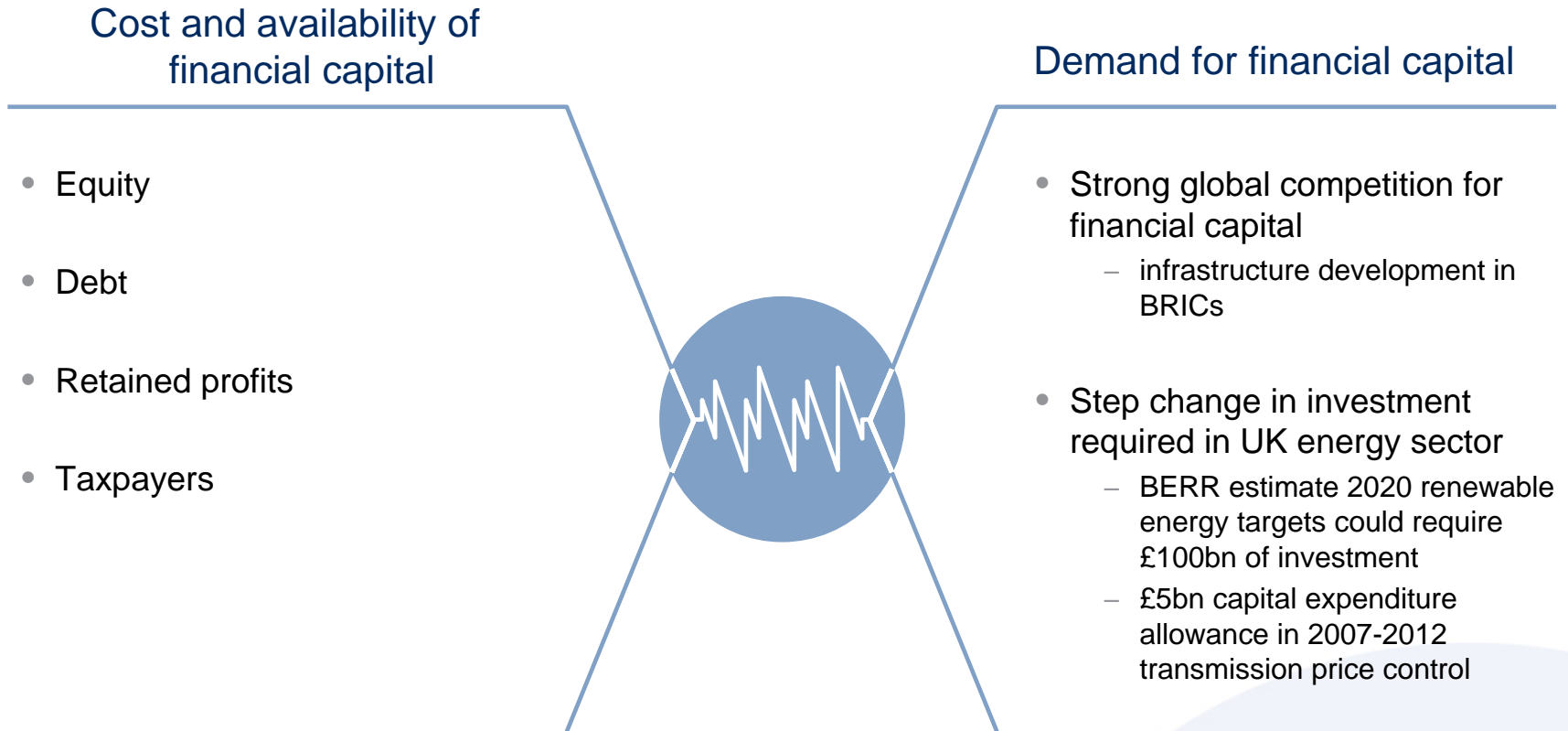
## Physical resources – rising construction costs

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- Prices of copper and aluminium alloys are at all-time highs
  - this has pushed up costs of wind turbines
  - over the past three years, offshore turbine costs have risen by 48% and onshore turbines have risen by 74%
- Steel producers in China reported to have agreed to a doubling of the price they will pay for iron ore
  - cost increases expected to be passed on upstream

# Financial resources – globalised capital markets

Pressures on the supply-side and the demand-side



**How does risk-reward profile for UK energy investments compare?**

# Financial resources – tighter supply

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All four main potential sources of financing raise difficulties

- Equity
  - global fall in stock market values (FTSE 100 has fallen 16% in 2008)
- Debt
  - credit crunch has led to tighter lending conditions and greater aversion to risk
    - typified by increase in LIBOR
    - central banks are concerned about inflationary pressure
    - impact of oil and food price shocks
- Retained profits
  - calls for a ‘windfall tax’ on energy companies
  - greater social obligations placed on energy suppliers
- Taxpayers
  - HM Treasury have forecast budget deficit of £10bn for 2008/09
  - Can tax revenue from energy be recycled within the sector?
    - SNP demands for tax revenue from oil be used to reduce prices for end consumers

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# Rising to the challenge – policy instruments

There are a number of different types of policy instruments and policy-making bodies

## Examples of policy instruments

	EU	UK Govt	Regulator
Command and control	LCPD	CERT	Licence conditions
'Market mechanisms	EU ETS	RO	Price control incentives
Fiscal support	Carbon tax (?)	Feed-in tariffs (?)	

- UK energy sector has moved from 'command and control' to a more market-based approach
- Numerous and complex interactions between policy instruments
  - can give rise to unintended consequences

**Would more be done with less?**

# Designing the policy framework

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- What is bigger risk for society– high costs or not delivering targets?
  - command and control focus on delivering quantity
  - market mechanisms and fiscal support designed to drive down price
- Prescriptive v decentralised
  - co-ordination problems?
  - flexibility?
  - extent of political capture?
  - each year of inaction means more must be done in each of subsequent years
- Overlapping jurisdictions – between BERR, Defra and Ofgem and others
  - Northern Rock affair highlights importance of having a clear division of policy responsibilities between different bodies

**We are not operating in an ideal world**

# The risk-reward profile for investments in new technology

Commercial investments are competing for funding with opportunities elsewhere

- Technology cost and risk can make commercial investments in new technologies unattractive without support mechanisms
  - e.g. renewable energy, CCS and demand-side technology
- Investment facilitated by credible long-term policy mechanisms
  - how best demonstrate commitments to targets?
    - plausibility v showing leadership
  - is it ‘better’ to stick to a ‘wrong’ decision or to ‘flip-flop’?
  - should policy mechanisms be broad or targeted?
    - incentive for lobbying
    - administrative burden
  - should we prize stability or predictability?
- What is the perceived risk of Government intervention?
  - e.g on social and environmental grounds

**Move to market-based mechanisms changes risk-reward profile**

# Setting the risk-reward profile for investments in new technology

How can residential consumers be engaged and empowered?

- Assessing the true costs (as perceived by consumer)
  - time is money
  - inconvenience
  - sensitivity is price changes not price levels?
- Addressing non-financial issues
  - information is key
- Use of agents to intermediate between consumers and government
  - overcome the problems of information and apathy?

**Residential consumers crucial to delivering renewable heat**

# Summary

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- The UK energy sector faces a set of immense and complex long-term challenges
  - balancing multiple policy goals will require some tough decisions
  - the key objective is to correct a perceived market failure eg climate change
  - this intervention means dramatic changes to be delivered over next twenty years and beyond
- Meeting these challenges is likely to be made harder by developments outside the UK energy sector
  - global energy demand
  - inflationary pressures and credit crunch
- No ‘optimal’ policy solution seems evident
  - therefore, important to understand key aims and risks embedded in what is a complex framework of policy instruments and targets

**Opportunities exist to deliver significant change  
– are we up to the challenge?**

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