Investing in generation assets under uncertain conditions: can the market ensure security of supply?

Duncan Sinclair
Director, Redpoint Energy
Sparks and Flames, 6th December 2007

Redpoint Overview

- Redpoint Energy is a specialist energy consultancy, advising clients on investments, strategy and regulation across Europe's liberalised power and gas markets
- Formed in October 2004
- Growing reputation based on depth of experience and innovative analytical approaches

Our team

Team of multi-disciplined energy professionals based in London

Our services

Market analytics
Investment analytics
Risk analytics
Energy policy and regulation

Our clients

Vertically integrated utilities
Independent generators
Producers
Lenders
Government and regulators

Introduction

REDPOINT

Can the market deliver sufficient investment in new generation capacity to maintain security of supply?

- In this talk we explore:
  - What drives investment in generation
  - History of investment in an example market
  - The key risks facing investors
  - The impact of risk on investor decision making and hence security of supply
  - Examples of the linkages between carbon market policy and renewables policy on generation diversity and security of supply
  - The future role of consumers
- Analysis is based on work undertaken to support the UK Government's 2007 Energy White Paper

What drives investment in generation?

REDPOINT

Economic drivers

- Fuel/carbon price
- Technology advantage
- Expectation of future scarcity
- Support mechanisms (e.g. renewables, capacity payments)
- 'Real' option value

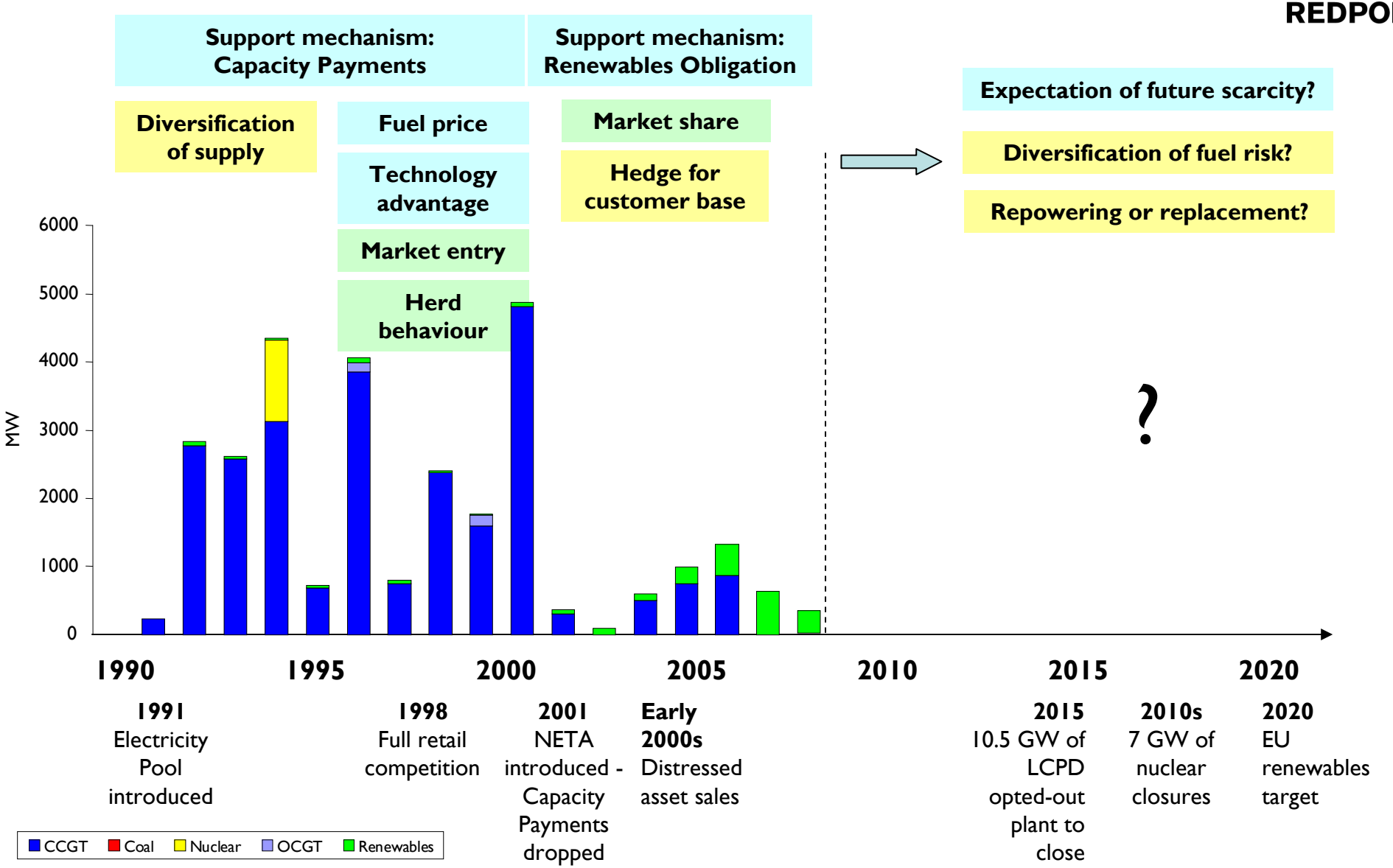
Portfolio drivers

- Hedge for customer base
- Diversification of fuel risk
- Diversification of supply
- Repowering or replacement

Strategic drivers

- Market entry
- Market share
- 'Herd' behaviour
- Brand image

Investment in Great Britain generation market



Key risks facing investors

REDPOINT

Market risks	Electricity price Fuel prices Carbon prices Supply/demand balance
Technical risks	Construction risk Operating costs Plant output/availability Fuel supply Resource availability Decomissioning costs (nuclear) Network connection
Policy risks	Future EU/Global carbon policy Future environmental legislation (SOx, NOx) Future renewables policy Future planning policy

Impact of risk on security of supply

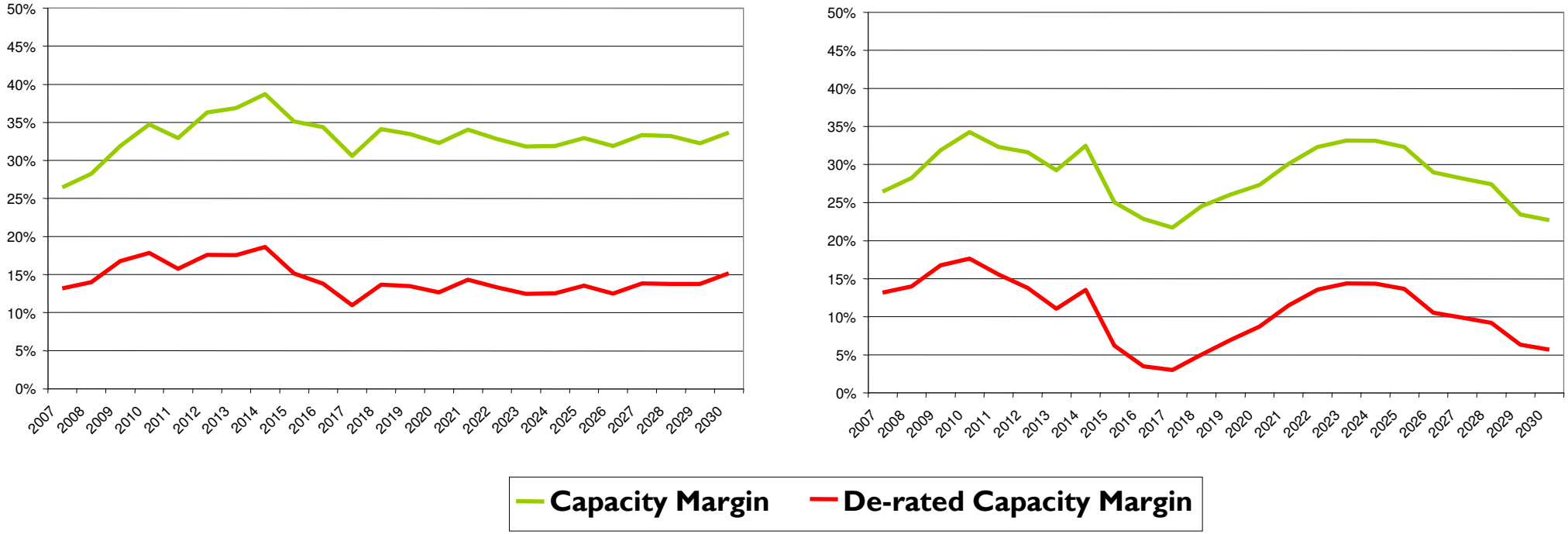
REDPOINT

Well Functioning Market

- Policy certainty
- Investors anticipating future scarcity

Imperfect Market

- Policy uncertainty
- Investors risk averse



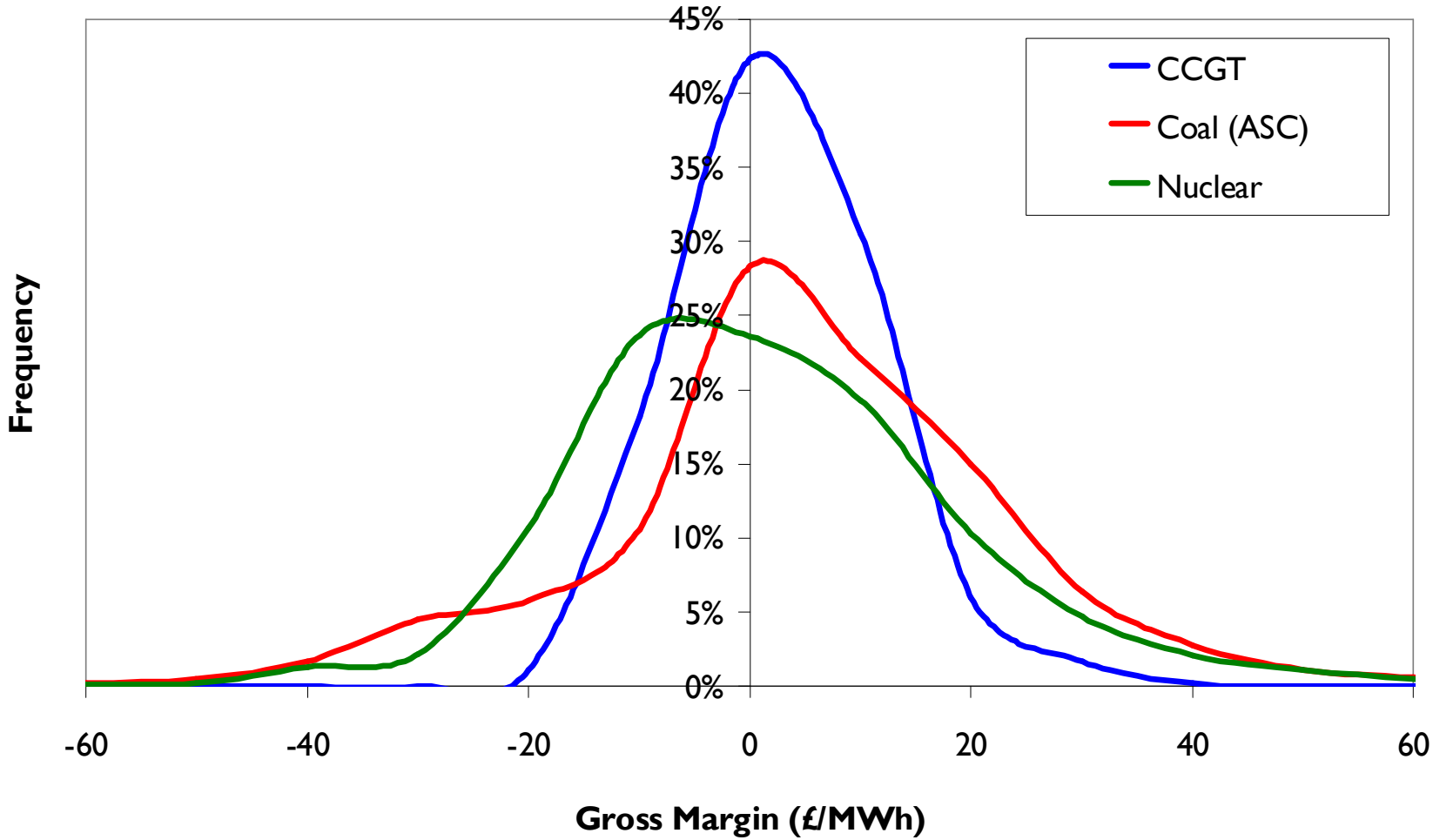
Source: Dynamics of GB Generation Investment: Prices, Security of Supply, CO_2 Emissions and Policy Options, May 2007, BERR 07/935

Impact of risk on different technologies (GB)

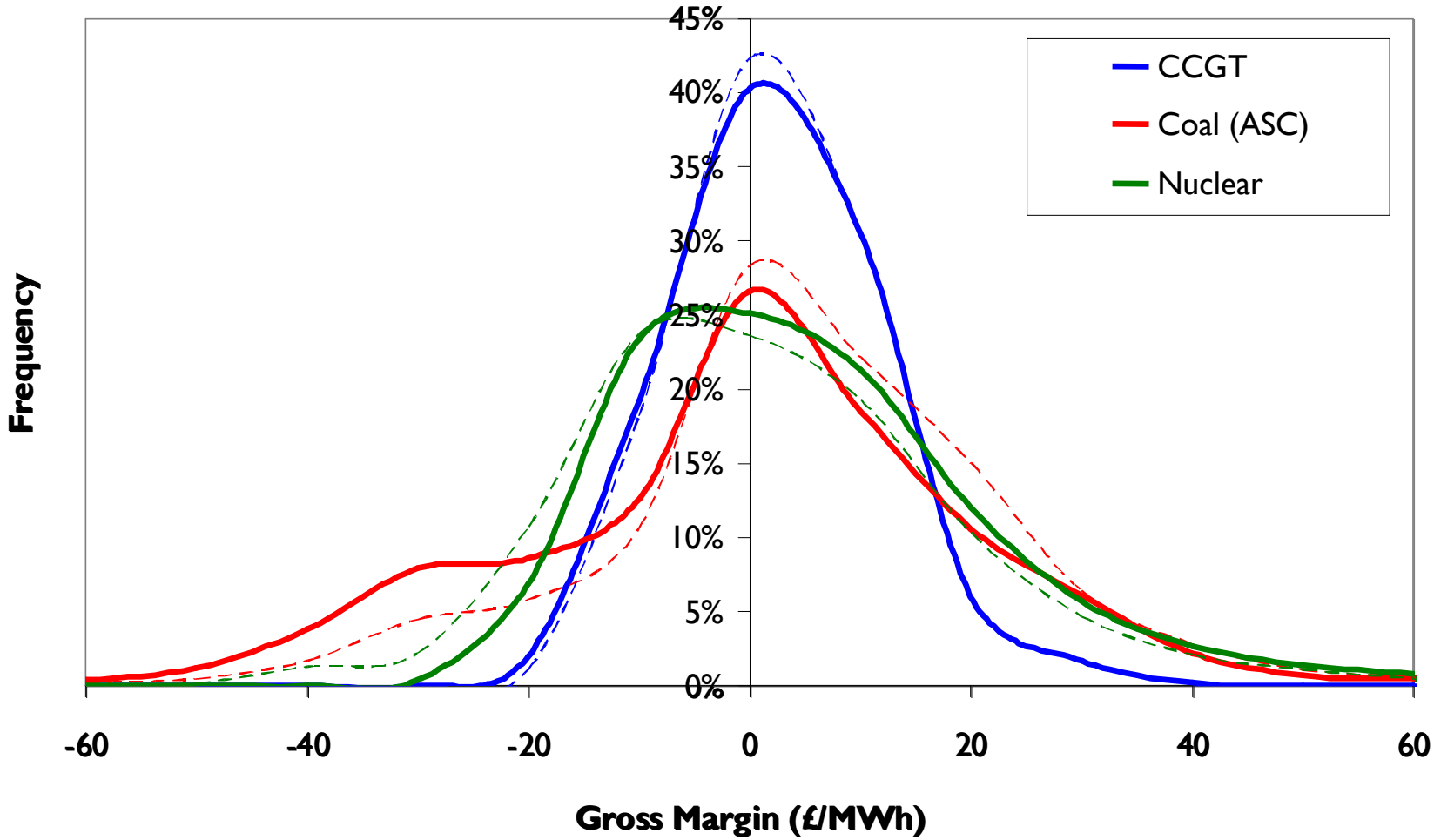
REDPOINT

	CCGT		Coal		Nuclear	
Market risk	Low	• Strong correlation between electricity price and gas price	Medium	• Lower correlation with electricity price • Load factor risk	High	• Generation costs uncorrelated with electricity price
Technical risk	Low	• Proven technology	Medium	• Newer technologies	High	• Less proven technologies • Decommissioning risk
Policy risk	Medium	• Reasonably neutral to carbon price (since factored into electricity price at CCGT conversion rate) • Directly exposed to carbon allocation policy	High	• Exposed to stronger future carbon policies • Directly exposed to carbon allocation policy	High	• Exposed to weaker future carbon policies • Exposed to planning uncertainties

Simulated levelised gross margin risk: carbon market uncertainty



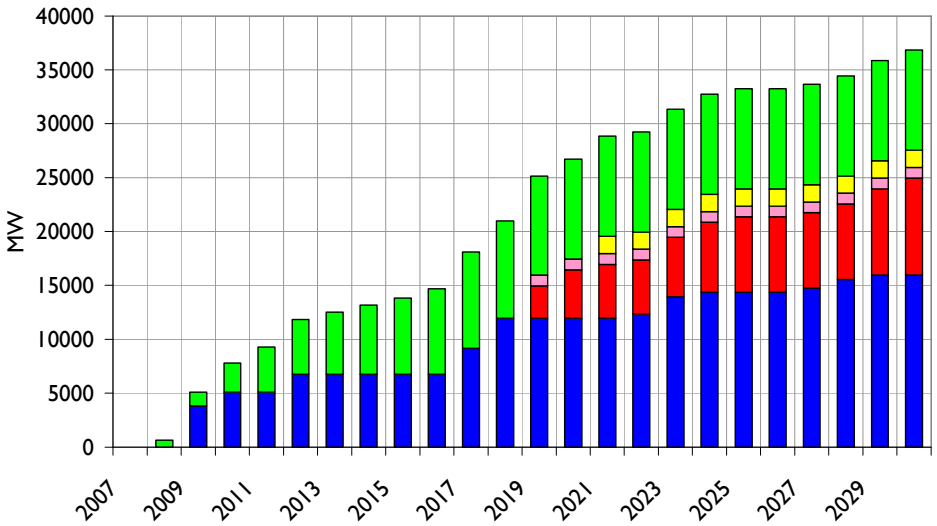
Simulated levelised gross margin risk: carbon market certainty



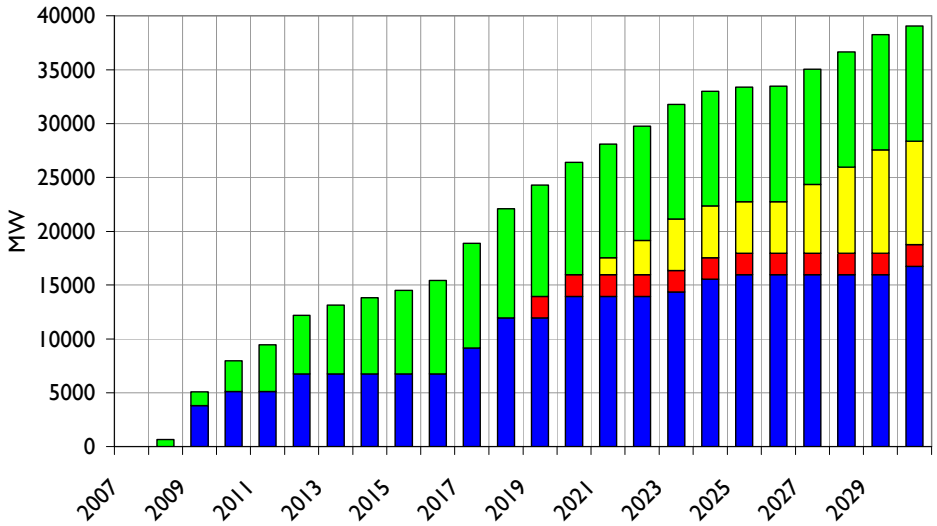
Impact of carbon market uncertainty on new plant build

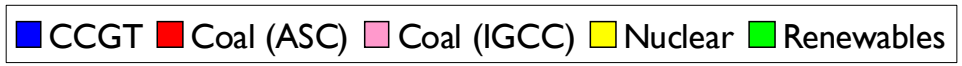
REDPOINT

Post-2013 Carbon Market Uncertainty



Post-2013 Carbon Market Certainty

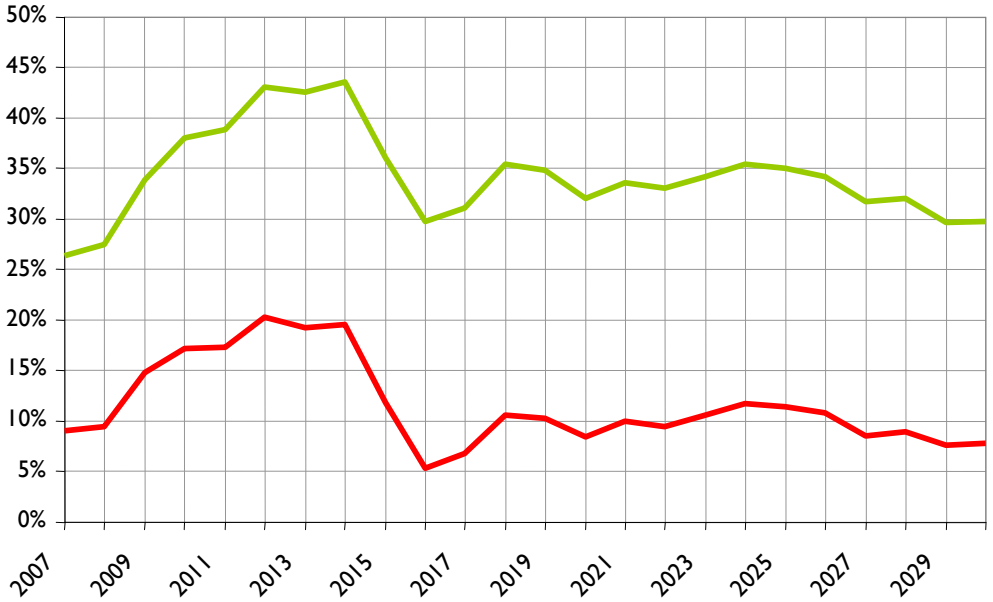




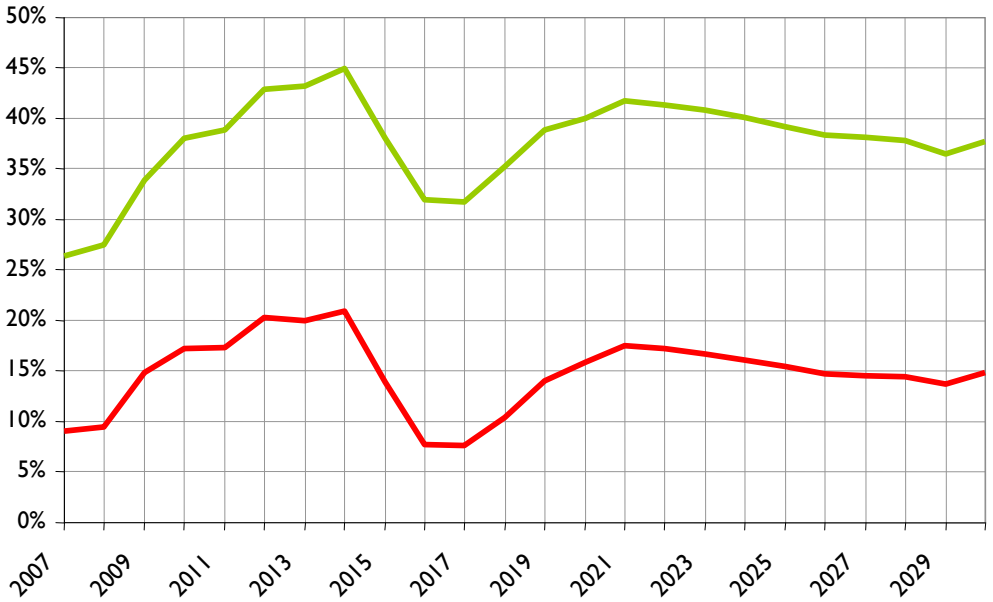
Impact of carbon allocation policy on capacity margins

REDPOINT

Full auctioning of allowances from 2013

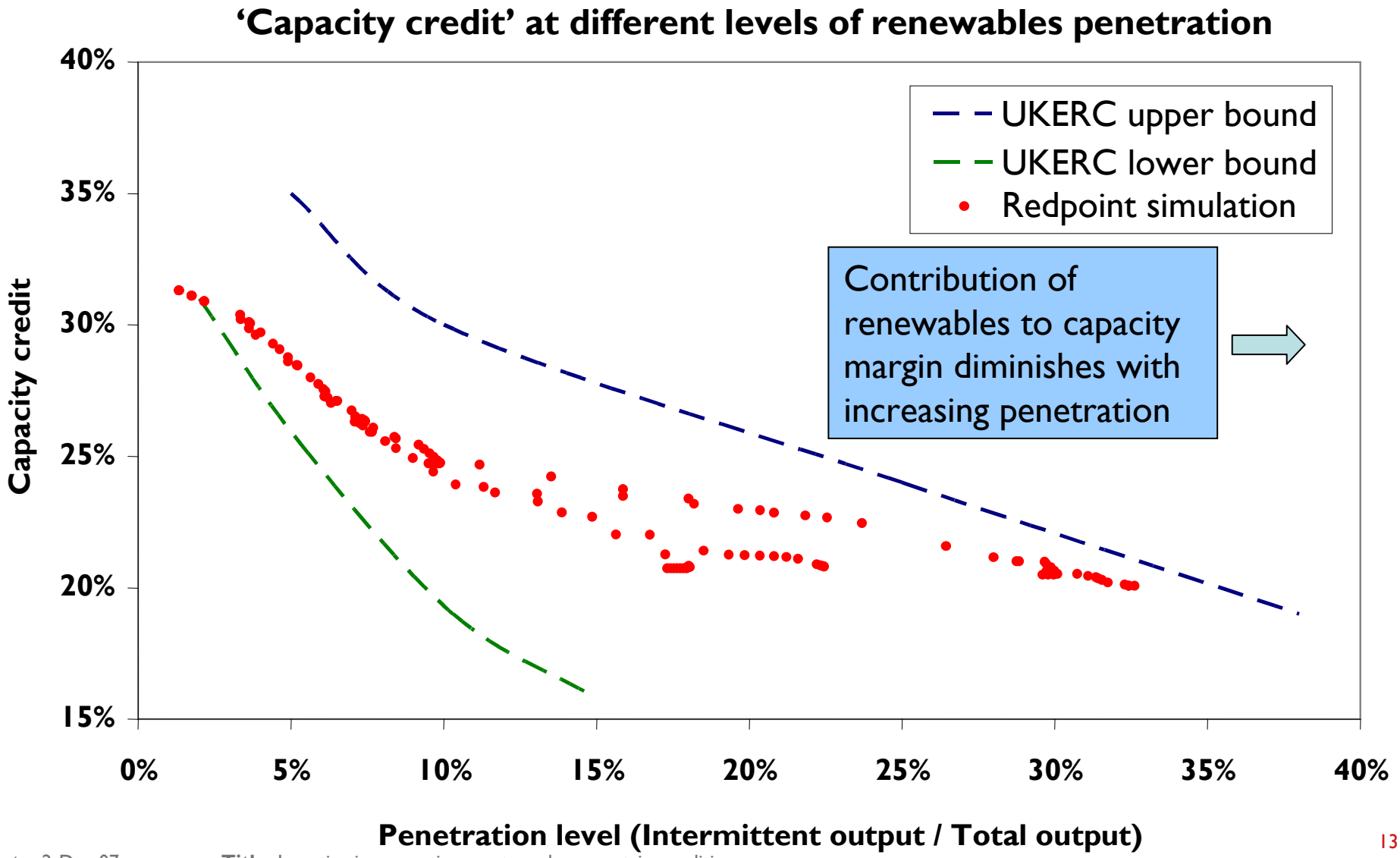


Free allocation of allowances from 2013

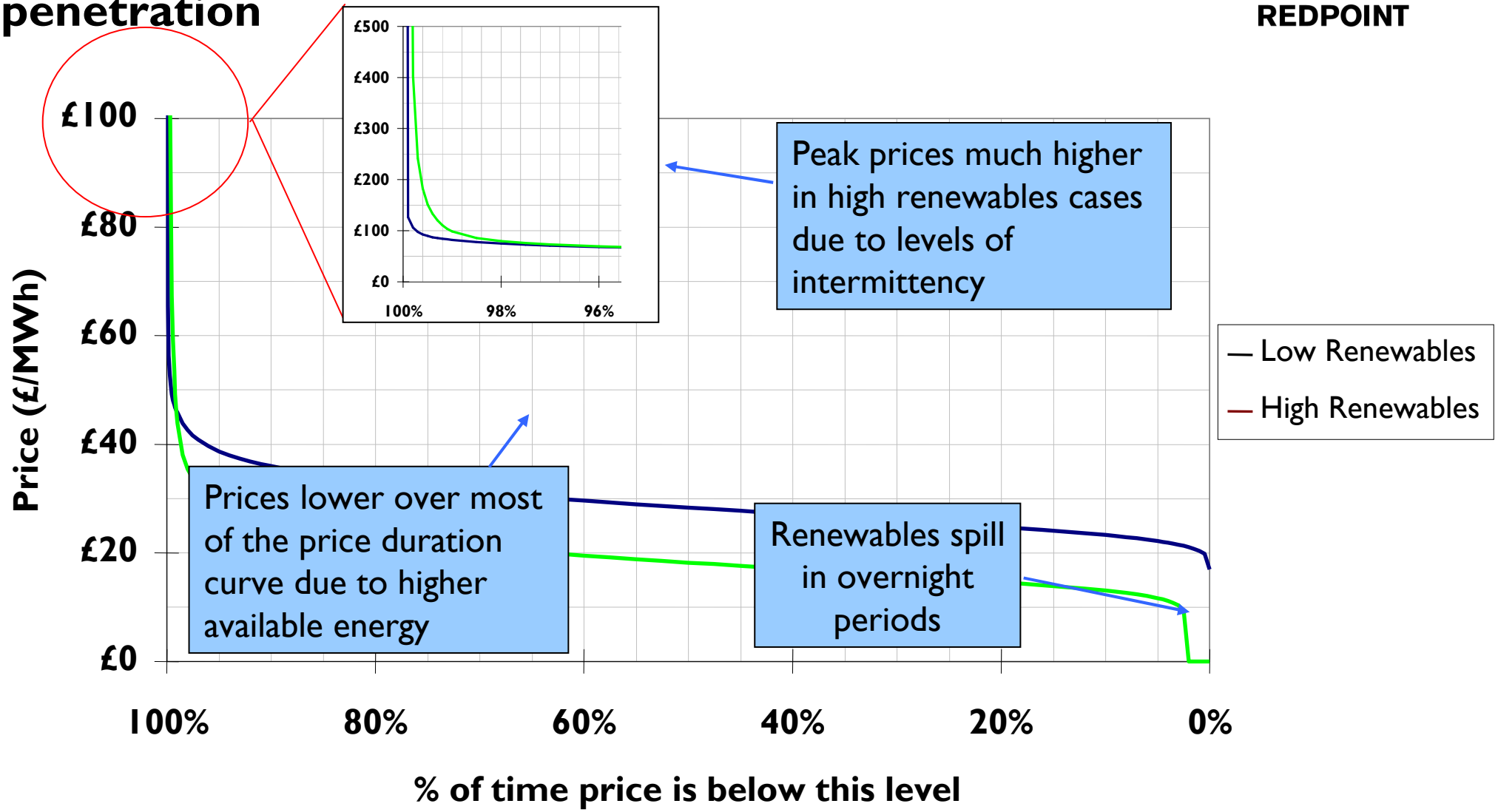


Capacity Margin — De-rated Capacity Margin

Impact of renewables on security of supply



Changing price signals under higher renewables penetration



Role of consumers

REDPOINT

	Historic	Current	Possible future
Industrial and Commercial	• One/two year fixed price contracts	• More proactive risk management • Indexed/fixed contracts • Short term demand side response	• Move to longer term contracts with flexible volumes terms? • Investment in generation (via consortia)
Domestic	• Tariffs from franchise suppliers	• Long term demand response to higher prices • Increasing awareness of source of generation	• Energy efficiency measures • Expansion of SMART meters – possible future role in demand side management

Conclusions

REDPOINT

- There are a number of significant challenges to security of supply moving forward
  - Continued upward pressure on demand
  - Enforced plant closures
  - Uncertainty surrounding future environmental policy
  - Growing importance of renewables in the generation mix
  - Resource availability
- The market will deliver new investment
- The implications for security of supply will depend on the type and timing of this investment which will depend on:
  - The perceived risk of investors
  - Resolution of policy uncertainties surrounding the carbon market and renewables targets
- Consumers may play an increasingly important role in managing the supply/demand balance in the future

Contact

duncan.sinclair@redpointenergy.com
Tel: +44 207 620 8484
Mob: +44 7887 500856