ofgem Promoting choice and value
for all gas and electricity customers

Risks to GB security of supply – Ofgem's Project Discovery

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TODAY'S PRESENTATION

WHAT IS PROJECT DISCOVERY?	A review of medium term security of supply for GB.
WHY DID YOU LAUNCH DISCOVERY?	Significant changes in landscape of GB energy and climate change.
WHEN DID YOU START?	Launched in March 2009 as Ofgem fast track project.
WHEN WILL YOU CONCLUDE?	Full options and recommendations to DECC and public in early 2010.
WHAT DID YOU PUBLISH?	Critical milestone: - We show our scenarios/data. - We want views.

CONSIDERED AND TIMELY

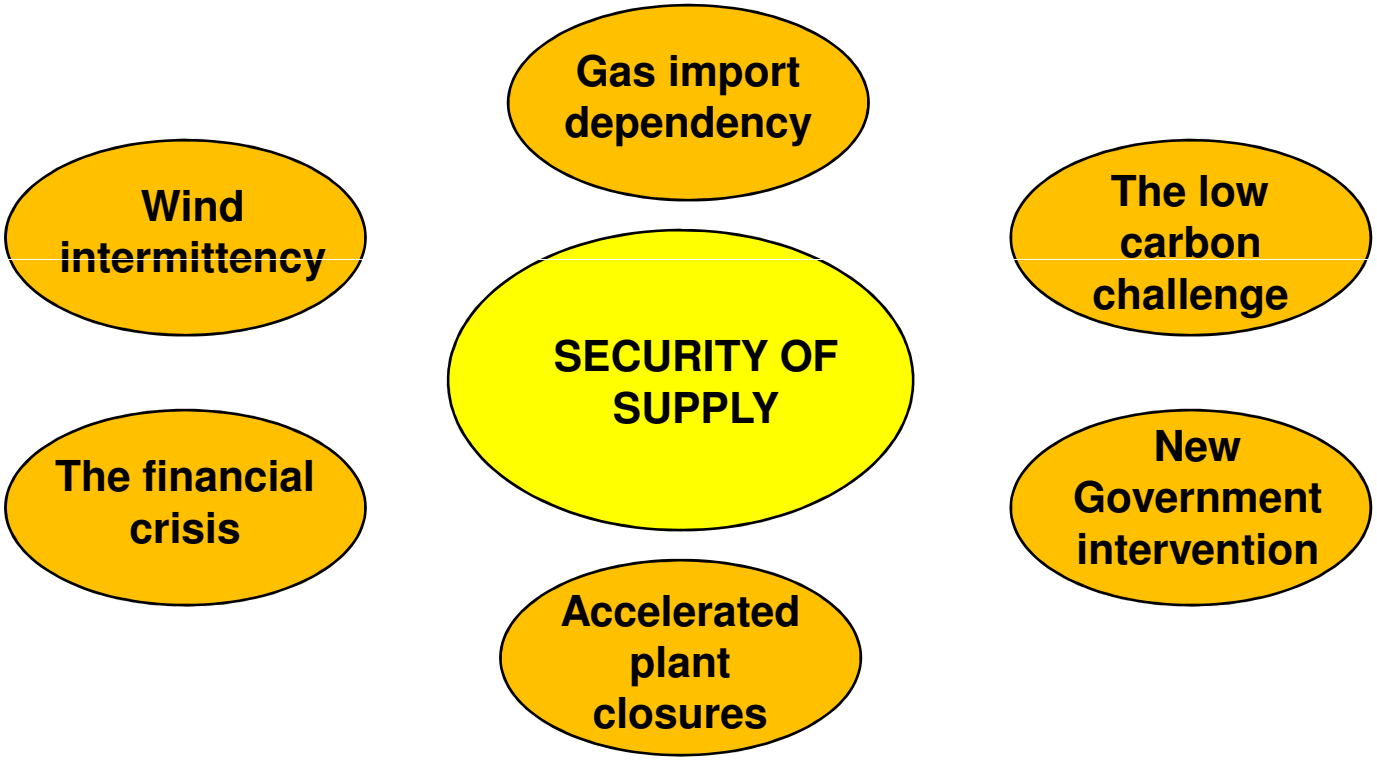
Why is Ofgem's Discovery different?

- Many voices: Government white paper, CCC report, Wicks, CBI and more.
- Independent and impartial – Ofgem represents consumers.
- Our remit comes from statute: S47/48 Electricity Act and S34/35 Gas Act.
- Our work informed by Sustainability duty.
- We consult on our analysis to ensure that any proposals we make are based on evidence.

FOCUS – ON HOW TO GET TO THE FUTURE

Project Discovery

Can GB markets deliver secure and sustainable energy supplies?



TESTS SEVERE AND COMPLEX

Insights from the scenario work

GB markets will be severely tested

- Each scenario shows that energy supplies can be maintained, but the analysis exposes real risks to supplies, potential price rises and varying carbon impacts.
- Investment needs to be **ramped** up - up to £200 billion may be required by 2020.
- Consumer bills are likely to be higher:
  - Carbon prices, fuel costs and occasional price spikes.
  - Investment requirements and environmental subsidies.
- We highlight some **specific risks** to secure and sustainable energy supplies.

- Maintaining gas supplies in a severe winter is the biggest risk we see.
- Investments need to be made in a timely fashion.
- Gas dependency and intermittency in power generation will present a challenge.
- Potential risks to meeting climate change objectives.

THERE IS A HUGE RANGE OF UNCERTAINTY

Our approach

We cannot predict the future!

- Our scenarios are intended to be **plausible** and **internally-consistent** but also **diverse**
- These are **not forecasts,** but an **exploration** of possible outcomes
- We **assume** that markets respond to price signals
  - So our scenarios do not by themselves tell you if markets can deliver
- We are interested in **resilience** so we need to explore shocks through "stress tests"
- Our scenarios are **not policy choices** but reflect a global context

UNCERTAINTY AND RISK ANALYSIS ARE AT THE HEART OF OUR METHODOLOGY

Ofgem's global scenarios

		Economic recovery	
		Rapid	**Slow**
Environmental action	**Rapid**	Green Transition	Green Stimulus
	Slow	Dash for Energy	Slow Growth

FOUR SCENARIOS REFLECTING KEY GLOBAL DRIVERS

Headline themes from four scenarios

Good news: Emissions down in all four (-12% ⟶ -43%, from 2005 levels).

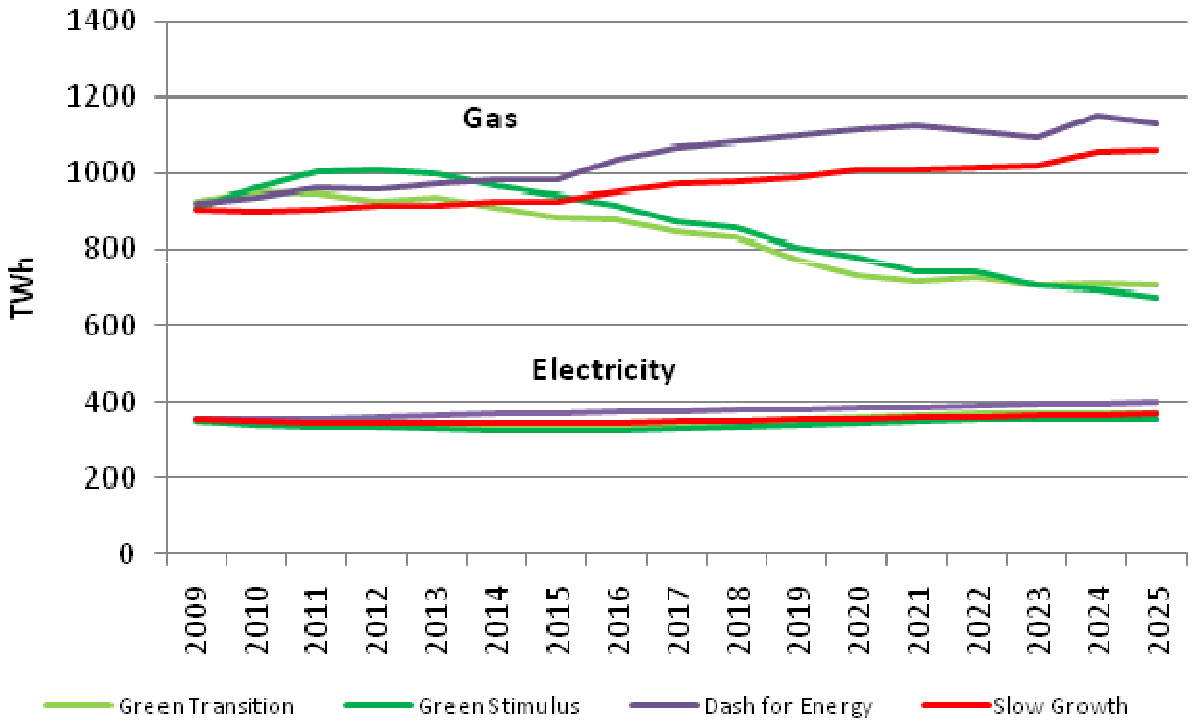
Bad news: Bills up in all four (domestic, by 2020: +14% ⟶ +25%, from 2009 levels – with the possibility of up to +60% in the interim).

Thematic news:

(1) Gas import dependence up in all four – but in two we have stable import demand from the middle of the next decade.
(2) Investment up in all four (£95bn - £200bn).
(3) In two out of four significant risk to 2020 climate change objectives and new nuclear not of much impact.
(4) The two Green Scenarios assume new nuclear and CCS are operational by 2020.
(5) Large uncertainty on gas demand.

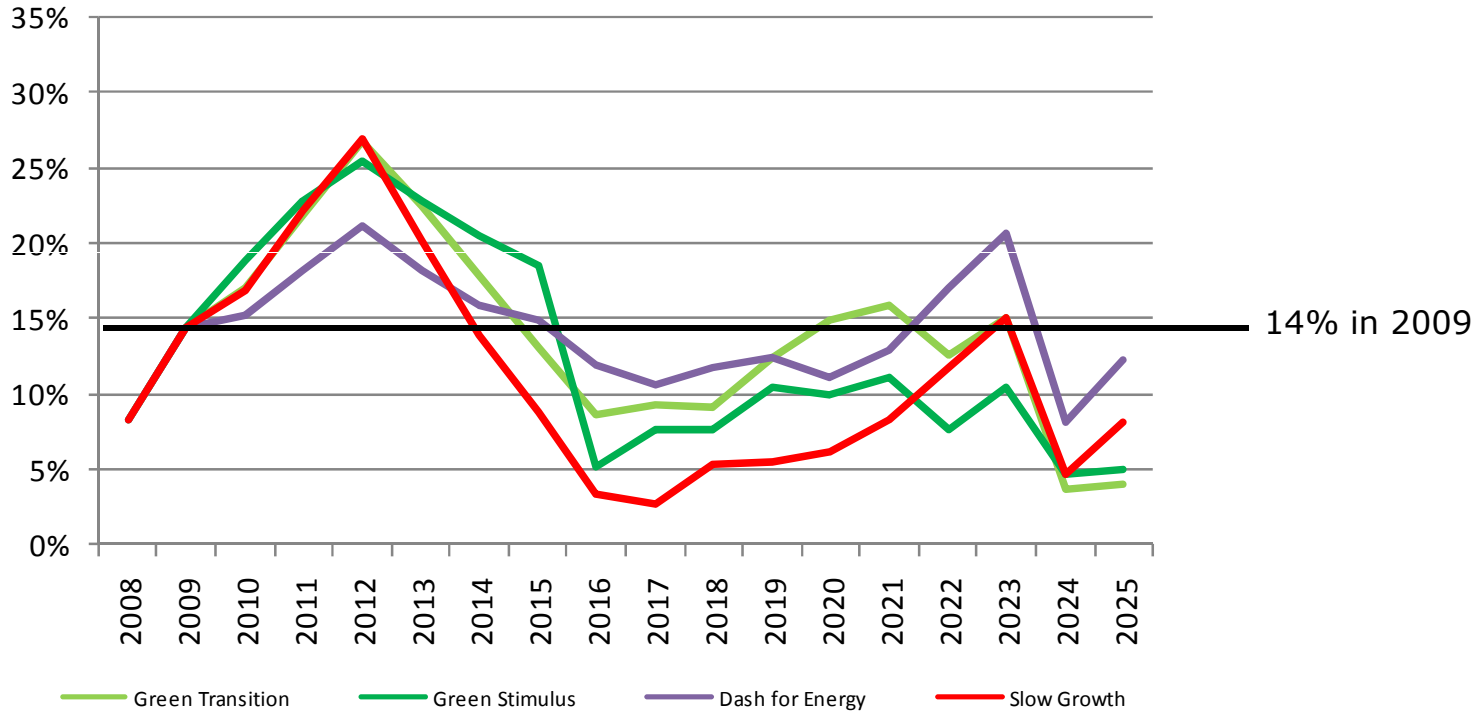
SEE APPENDICES

GB Energy Demand



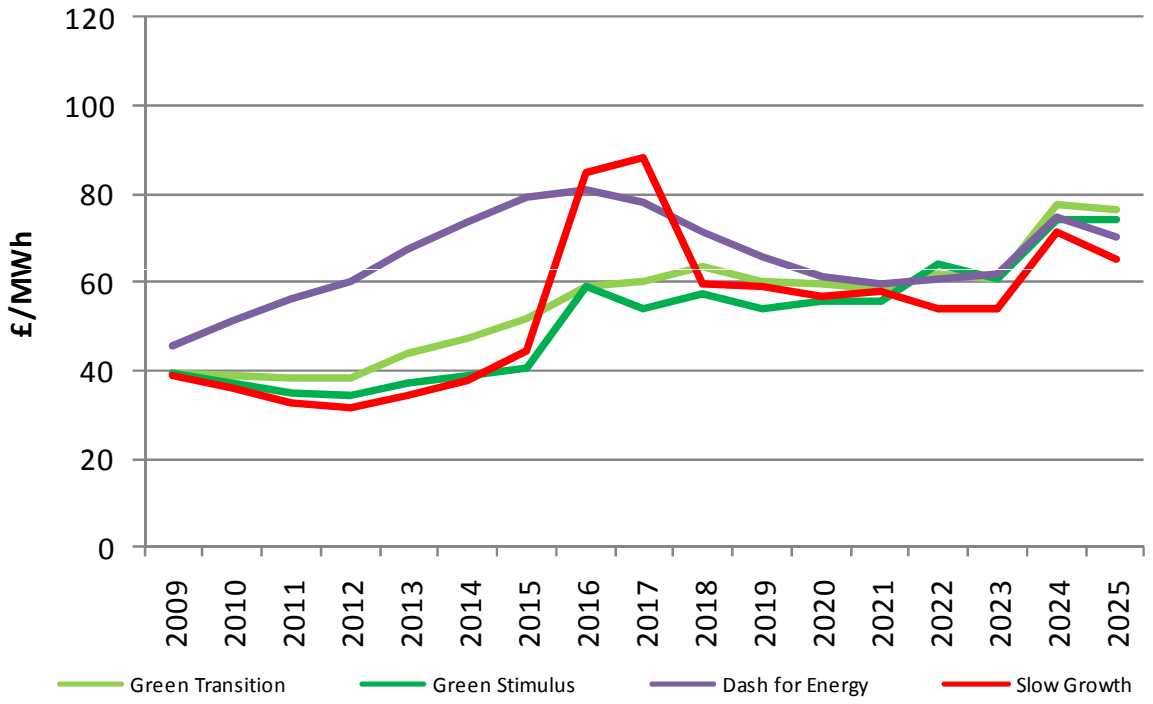
WIDE RANGE FOR GAS DEMAND

De-rated capacity margins (pre stress tests)



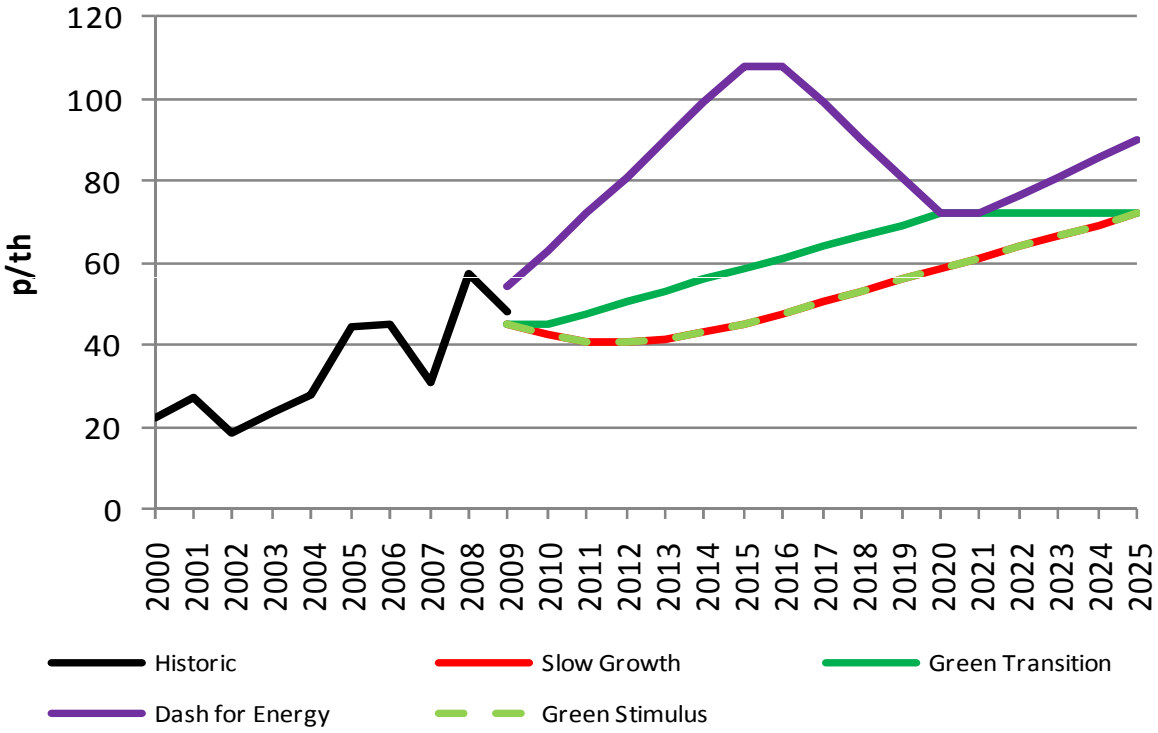
TIGHT MARGINS IN ELECTRICITY UNDER SOME SCENARIOS

Wholesale electricity prices



RISING PRICES A FEATURE – WITH A RISK OF PRICE SPIKES

Wholesale gas prices



FAILURE TO DEVELOP RENEWABLES COULD LEAD TO HIGH GAS DEPENDENCY

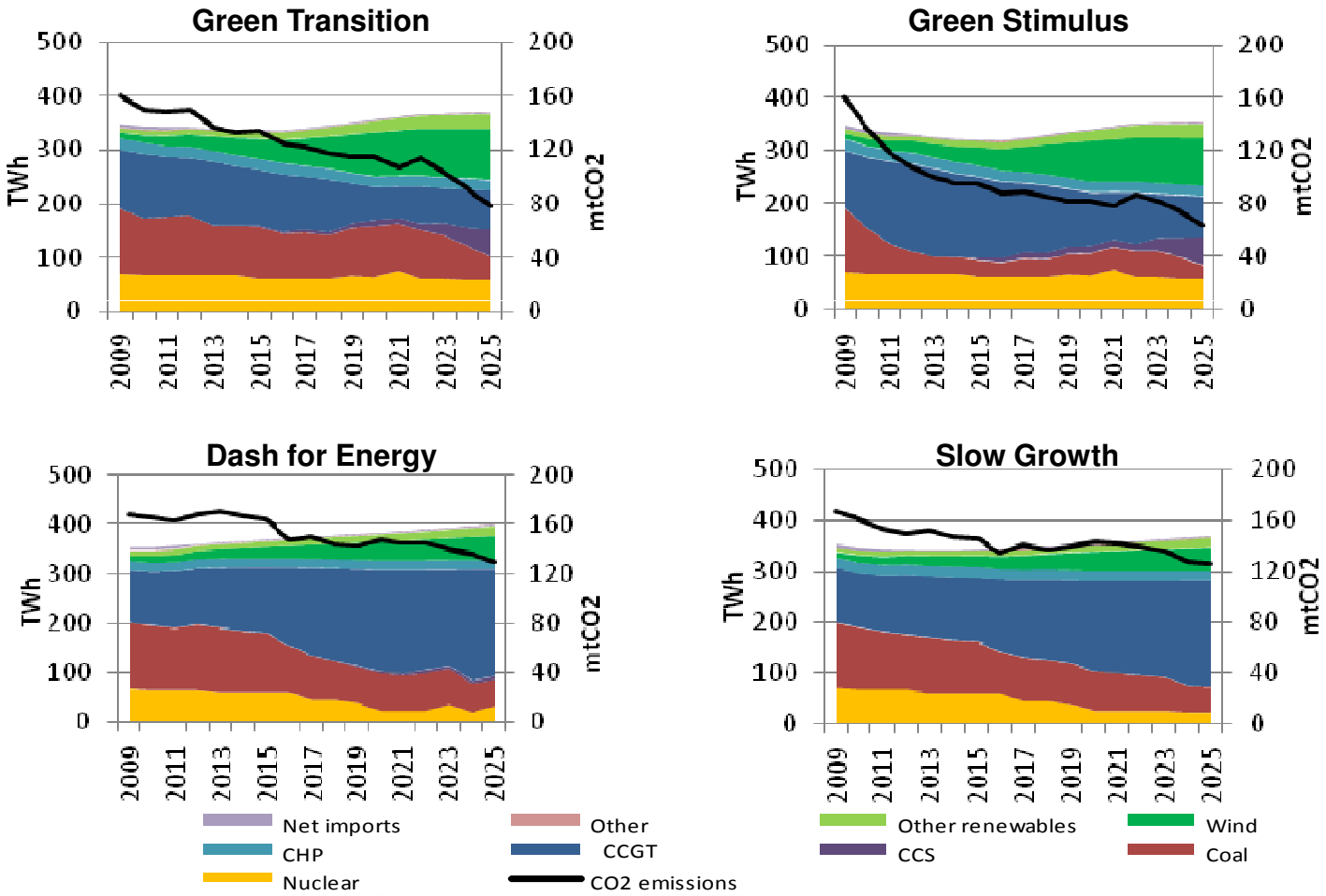
Domestic energy bills under the four scenarios

	By 2020
Green Transition	+23%
Green Stimulus	+14%
Dash for Energy	+25%
Slow Growth	+22%

Note: changes shown in real terms

THESE RISES MAY BE PARTIALLY OFFSET BY DEMAND SIDE RESPONSE

GB Generation output and carbon dioxide emissions from the generation sector



STRESS TESTS - TRAFFIC LIGHTS

Stress test	Period	Today	Green Transition	Green Stimulus	Dash for Energy	Slow Growth
Re-direction of LNG supplies	1-in-20 severe winter	🟢	🟡	🟡	🔴	🔴
Russia-Ukraine dispute	1-in-20 severe winter	🟡	🟡	🟡	🔴	🔴
Bacton outage	1-in-20 peak day	🟡	🟡	🟡	🟡	🟡
No wind output	1-in-20 peak day	🟢	🟡	🔴	🟢	🟢
Electricity interconnectors fully exporting	1-in-20 peak day	🟢	🔴	🔴	🟡	🟡

Low impact 🟢 Moderate impact 🟡 High impact 🔴

THE "REDS" CURRENTLY OUTWEIGH "GREENS"

There is no fundamental reason why appropriately designed markets cannot deliver secure and sustainable energy supplies. But .....

Given new interventions and sustainable canvas:

- Do our **current market arrangements** deliver the correct incentives?
- Even if they do, are there **practical reasons** why markets can't deliver security of supply by themselves?
- Can GB arrangements ensure security of supply when they are **dependent on global gas markets,** which may not operate in a way we like to do business?

THESE ARE THE KEY QUESTIONS BEING ASKED IN PROJECT DISCOVERY

What comes next?

- Are there shortcomings in current arrangements that need to be addressed?
- Are the structures in the current arrangements still "good enough"?
- Can market arrangements still function adequately in the light of current and expected interventions?
- Can market arrangements still function adequately under increased dependence on international markets?
- Given the lessons from financial markets, is it sufficient to entrust security of supply risks entirely to market participants?

WE EXPECT TO PUBLISH INITIAL FINDINGS EARLY NEXT YEAR

APPENDICES

Scenario Overview – Green Transition

In this scenario….

- There is a rapid economic recovery and significant new investment globally
- A global agreement on tackling climate change is reached
- Energy efficiency measures are effective
- New nuclear and CCS demonstration projects come on-line before 2020
- Gas prices are moderate, carbon prices are high, and coal prices are relatively low as demand is suppressed by the high carbon prices
- GB gas demand falls but electricity demand grows on the back of wider deployment of heat pumps and electric vehicles

Key features

- Gas imports increase until 2016 and then stabilise
- Diverse generation mix
- Risk from generation intermittency towards the end of the period due to high levels of wind
- 2020 renewables targets met: 30% electricity, 12% heat
- Carbon dioxide emissions from the electricity and gas sectors: down 33% from 2005 levels
- Domestic consumer bills: increase by about 23% by 2020
- Total investment costs 2009-2020: £200bn

Scenario Overview – Green Stimulus

In this scenario….

- There is a slow recovery from recession and restricted availability of finance
- A global agreement on tackling climate change is reached and governments implement 'green stimulus' measures
- Energy demand falls globally in the near term
- Fuel prices are relatively low
- The combination of relatively high carbon prices and direct government support to nuclear, CCS and large scale renewables promote rapid decarbonisation of the generation sector

Key features

- Gas imports increase until 2012 and then stabilise
- Lower gas prices favour gas-fired generation over coal
- Risk from generation intermittency towards the end of the period due to high levels of wind
- 2020 renewables targets met: 30% electricity, 12% heat
- Carbon dioxide emissions from the electricity and gas sectors: down 43% from 2005 levels
- Domestic consumer bills: increase by about 14% by 2020
- Total investment costs 2009-2020: £190bn

Scenario Overview – Dash for Energy

In this scenario….

- Global economies bounce back strongly
- Security of supply concerns prevail over environmental concerns: there is no global agreement on tackling climate change
- Gas supply is tight and fuel prices high
- Investment is forthcoming but not always timely
- Significant expansion of CCGT generation capacity
- ~~Planning and supply chain constraints prevent new nuclear plant becoming~~ operational before 2020
- Planning delays push back storage investment

Key features

- Sharp increase in gas import dependence
- Gas increases its share of the generation mix
- Shortage of gas storage coincides with peak energy prices in 2015
- 2020 renewables targets are not met: 15% electricity, 4% heat
- Carbon dioxide emissions from the electricity and gas sector: down 12% from 2005 levels – insufficient to meet carbon budgets
- Domestic consumer bills: rise with high and volatile commodity prices, increasing over 60% by 2016 before falling back
- Total investment costs between 2009-2020: £110bn

Scenario Overview – Slow Growth

In this scenario….

- Impact of recession and credit crisis continues
- Low levels of investment
- Low commodity and carbon prices, reducing incentives for renewables, nuclear and CCS
- Generation build is dominated by CCGTs
- Energy efficiency measures have limited impact but demand is low initially due to slow economic growth

Key features

- Increasing dependence on gas imports and gas-fired electricity generation
- Tight supply margins due to lack of investment when economic growth returns
- 2020 renewables targets are not met: 15% electricity, 4% heat
- Carbon dioxide emissions from the electricity and gas sector: down 18% from 2005 levels – insufficient to meet carbon budgets
- Domestic consumer bills: relatively low in early years but increase by about 22% by 2020 as market tightens
- Total investment costs between 2009-2020: £95bn.