UK Future Energy Scenarios

Stakeholder Feedback

July 2012

nationalgrid

In November 2011 National Grid published our UK Future Energy Scenarios document which presented the assumptions behind our main scenarios used in the analysis and development of future energy scenarios.

Early in 2012 we sought feedback on our scenarios from our stakeholders in an annual consultation. This document provides a summary of the views that were expressed in this consultation process, highlighting the key themes and outlining our next steps.

Summary

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Stakeholder Consultation

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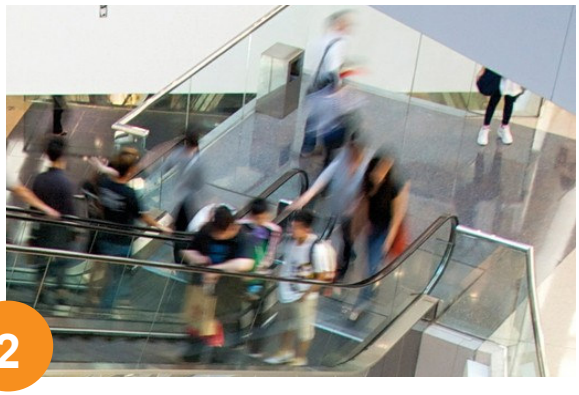
- In November 2011 National Grid published its UK Future Energy Scenarios document.
- Our scenarios provide a basis for detailed network analysis to enable the development of our network investment plans.
- In early 2012 we asked for your views and opinions on our scenarios.
- We conducted bilateral meetings with a broad range of our stakeholders and held workshops in London and Glasgow to gain a deeper understanding of our stakeholders' views.
- We have engaged with over 150 stakeholder organisations throughout our consultation process.



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Key themes

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- Stakeholders have shared their views with us on a range of subjects.
- There are a number of common themes that have come out of this process.
- These have been categorised as:

Macro Factors

Demand Uncertainty

Supply Uncertainty

General Feedback

- Each of these will be explored in further detail later in this document.

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Next Steps

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- Stakeholder feedback is helping us develop our 2012 set of UK Future Energy Scenarios.
- We will publish our 2012 UK Future Energy Scenarios document at our annual one day conference at One Great George Street, Westminster, London on 27 September 2012.
- We are also undertaking new analysis in specific areas based on stakeholder feedback. This work will enable us to develop more robust scenarios in the future.
- We will continue to improve our stakeholder engagement by developing the content and format of our bilateral meetings, workshops and documents.
- We will investigate innovative methods of stakeholder engagement to improve both stakeholders' understanding of our scenarios and the value of our scenarios to our stakeholders.

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Appendices

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- **Appendix 1.1** - Tomorrow's World
- **Appendix 1.2** - Questions
- **Appendix 1.3** - Scenario Axioms

Our 2011 Scenarios

The UK has legislation in place setting limits on the emissions of greenhouse gases, as well as legislation mandating a minimum level of renewable energy in 2020.

A single forecast of energy demand no longer gives a sufficiently rich picture of possible future developments so National Grid now carries out analysis based on three different scenarios: Gone Green, Slow Progression and Accelerated Growth.

Our scenarios are described in detail in our annual UK Future Energy Scenarios publication, which details the assumptions behind the scenarios, including:

- The economic background
- Power generation fleet
- Electricity demand, including high efficiency technologies such as lighting and the application of smart technologies for demand side management
- Energy demand for heat and transport
- Breakdown of electricity generation by fuel type, and its impact on total gas demand and supply
- Fuel prices
- Developments in the heating market, for example heat pumps
- Developments in transport, for example electric vehicles.

Gone Green 2011

- The renewable target for 2020 and the emissions targets for 2020, 2030 and 2050 are all met.
- Gone Green represents a balanced approach to meeting the environmental targets, with contributions from heat, transport and electricity generation sectors.

Slow Progression 2011

- Our 2011 Slow Progression scenario is more akin to the traditional forecast, based on econometric demand projections at a sector level.
- In our 2011 Slow Progression scenario, the environmental targets are achieved a number of years later than in our Gone Green scenario, in 2026.

Accelerated Growth 2011

- Our 2011 Accelerated Growth scenario uses the same demand as Gone Green but has a faster development of offshore generation.
- In our 2011 Accelerated Growth scenario, the environmental targets are met ahead of target dates.

1 Stakeholder Consultation

National Grid is committed to stakeholder engagement: listening to our stakeholders and acting on what they tell us. The views of our stakeholders are crucial as we enter a period where the energy industry has to meet the challenges of providing secure and affordable energy, replacing ageing assets and moving to low carbon sources of generation to meet environmental targets.

Only by working together with our stakeholders, listening to their views and acting on what they say, can we fully play our role in connecting new energy sources and reliably, safely and efficiently transport gas and electricity through our transmission networks to our consumers.

We will adopt the following principles to help us meet this commitment:

- We will seek to identify and understand the views and opinions of all our stakeholders.
- We will provide opportunities for engagement from the early stages of the process.
- We will endeavour to enable constructive debate to take place, creating open and two way communication processes.
- We will base the engagement around assumptions, drivers and outputs upon which stakeholders can make an informed decision.
- We will provide feedback on how views expressed have been considered and the outcomes of any engagement process or activity.

Why we have consulted:

It is important that we understand your views on these fundamental topics to allow us to develop a robust set of scenarios that capture as broad a range of potential outcomes as possible.

Our scenarios are used as a reference point for a range of modelling activities including detailed network analysis which enables National Grid to identify potential network investment requirements in the future.

Our consultation process:

In early 2012 we consulted with our stakeholders around our UK Future Energy Scenarios document; we sought feedback on our scenarios and the assumptions behind them.

Through workshops held in Glasgow and London and forty bilateral sessions with our stakeholders we have consulted, listened and taken into account the views and opinions expressed.

We have engaged with over 150 stakeholder organisations throughout our annual consultation process.

We used various means for consulting with you in order to capture a wide array of responses, thoughts and opinions. Our methods included:

- Bilateral meetings with our stakeholders
- Workshops that included:
  - Table discussions
  - Group activities
  - The use of voting buttons to enable anonymised voting on a wide range of topics.
- Questionnaires covering a wide range of stakeholders (Producers, Importers, Shippers, Storage Operators, Transporters and Consumers).
- Presentations followed by question and answer sessions.

Continuing the process:

Based on the feedback received from workshops and bilateral meetings it is evident that our stakeholders would like us to continue consulting with them. 98% of those that attended the workshops and expressed an opinion wanted National Grid to continue with the workshops. We have had some very positive feedback on our consultation process with the overwhelming response being that our stakeholders welcome the opportunity to engage with us on our scenarios and debate the individual elements and assumptions behind National Grid's work on future energy scenarios.

Going forwards:

The views expressed in this consultation process are helping shape our 2012 future scenarios analysis, our plans and future network investment decisions.

We will continue to engage with all our stakeholders on our future energy scenarios. We would like our consultation to be as wide-ranging, open and engaging as possible and would welcome your views and opinions on our engagement process.

We want our scenarios to be as relevant and useful as possible, both to National Grid and our stakeholders.

We welcome your comments on:

- Our stakeholder consultation process
- How useful you found this document

How to contact us:

Email: transmission.ukfes@nationalgrid.com

2 Key Themes

What you have told us:

Throughout our consultation process stakeholders have shared their views with us on a broad range of energy related topics. From what you have told us we have pulled together some of the key themes and messages: these are highlighted below. In addition we have outlined our response to these themes, indicating how we intend to take the views of our stakeholders forward where possible.

Macro Factors

You told us that there is a range of external factors which will have a considerable impact on the UK's energy future and result in a great deal of uncertainty when planning for the UK's energy future. This was a notable concern amongst many of our stakeholders. Issues around uncertainty covered a range of areas including:

- ***Government policy***, consisting of the impact of the Energy Market Reform, Green Deal, Renewable Heat Incentive and Feed in Tariffs. Many stakeholders believed that the UK will not achieve the target of 15% of total energy from renewable sources until some time after 2020.

- ***Costs***, in particular focusing on the costs of new technologies and whether these and emerging solutions will be economic, especially what the impact will be to end consumer bills.

- The ***economy*** provides a great deal of uncertainty specifically regarding the severity and length of the recession. Further to this you also highlighted the possible impact of broader economic difficulties within Europe.

- ***Fuel price*** uncertainty both in the short and long term. Current fuel prices have resulted in increased coal-fired generation, with gas-fired generation marginalised. In the longer term, there are a wide range of factors that may influence prices, including supply / demand fundamentals, the carbon price, the economic climate both regionally and globally and potential supply shocks.

Our response:

We believe that the high levels of uncertainty due to these macro factors are best accounted for by producing scenarios that span a broad range.

Our 2012 scenarios will have a broader range than those for 2011, for example:

- The 2012 Slow Progression scenario will be "slower"
- The 2012 Accelerated Growth scenario

will a more holistic scenario rather than a “faster Gone Green”

Demand Uncertainty

Another key issue from our stakeholder engagement was demand uncertainty:

- Stakeholders would like us to consider total electricity demand and not just transmission.
- Regarding gas demand it was clear that as well as focusing on domestic demand it would be helpful if more analysis was undertaken of industrial and commercial demand.
- It was also noted that smart grids could have a major impact on the size and profile of demand, with the potential to shift demand.

Our response:

Our 2012 scenarios will feature a broader range of demand assumptions, to reflect demand uncertainty.

We will engage with electricity Distribution Network Operators (DNOs) to develop a greater understanding of total electricity demand, for example embedded generation.

We will also be looking to work closely with our stakeholders on how we can develop our understanding of smart networks focusing on areas of shared interest for example demand side management.

The National Electricity Transmission System will be fundamentally changing in the future, moving from a relatively predictable generation and demand base to one that includes a significant level of renewable generation with more variable output and demand that will become increasingly flexible, smart and price sensitive. National Grid is continuing to assess the implications of these developments and the results will feed through into our scenarios.

It was evident from the feedback we received that consumer behaviour was a key area that needed to be addressed in greater detail as it resulted in considerable uncertainty going forward. Consumer behaviour was considered to be critical to achieving the long term CO2 reduction targets.

Our response:

We recognise consumer engagement within the changing energy landscape will be crucial to the environmental targets being met.

To develop our understanding of the potential impact of consumer behaviour on the UK’s energy future we are engaging more with experts in specific areas. For

Key Themes continued

example we are working with the Transport Research Laboratory (TRL) to benchmark our views on electric vehicles and to improve our knowledge of consumer behaviour with regard to road transport and electric vehicles in particular.

In addition for technologies which are critical to our scenarios, such as electric vehicles and heat pumps, we are undertaking more detailed analysis. For example, the Energy Networks Association, of which National Grid is a group member, has commissioned a study on future technology pathways for known and emerging heating technologies, including heat pumps, highlighting the behavioural impacts on customers.

Supply Uncertainty

You also told us that there is considerable uncertainty with respect to future energy supplies to the UK. The major supply issues you mentioned included:

- ***Nuclear energy*** is an area of debate and there is considerable uncertainty regarding government policy on nuclear generation along with uncertainty with respect to the technology, timing and funding of new nuclear stations.

- ***Timing*** regarding the commercialisation of new technologies, for example Carbon Capture and Storage (CCS) may be delayed, or never progress beyond the development stage, along with difficulties with planning permissions, public acceptance and financing.

- ***Technology***, whereby new technologies have difficulty transitioning from development to full scale commercial deployment, for example CCS and marine.

- ***Unknowns***, for example a potential breakthrough in new electricity energy storage devices.

- ***Geography***, in particular issues regarding planning permission, or concerns with the hostile environment for offshore wind turbines.

- **Alternative gas supplies**, for example shale gas, in particular uncertainty regarding Government policy, public acceptance, cost of production in UK, planning permission, environmental impact and the scale and timing of potential volumes.

Our response:

As with demand uncertainty, we believe that the best solution for dealing with high levels of supply uncertainty is to produce a set of scenarios that incorporates a broad range of supply options.

Changes to the power generation mix in our 2012 scenarios will include:

- Timings of nuclear new build
- Range for CCS
- Greater range for offshore wind
- Range for interconnection

Our 2012 scenarios will also include a wider range within our gas supply components.

We are collaborating with industry and academic institutions to develop our understanding of existing, emerging and innovative electricity and gas technologies, and their potential impact on our scenarios.

General Feedback

With regard to the feedback we received on our 2011 UK Future Energy Scenarios there was a broad range of views with some of our stakeholders feeling that the range was not broad enough whilst others felt it was too broad. In addition some believed that having three scenarios was not ideal as it meant the "middle" scenario Gone Green was perceived as a central case.

Our response:

We are continuing to develop three scenarios for 2012, and based on the majority of the feedback we have received we are broadening the range of our scenarios.

Over time our scenarios have become more detailed and complex. They are underpinned by a number of fundamental assumptions, which we have named Scenario Axioms. In the past some of these axioms have been implicit, but in the future we will publish the axioms in the Future Energy Scenarios document. This will ensure the development of more robust and transparent scenarios, highlighting the differences between them, leading to improved understanding and facilitating greater stakeholder engagement.
In addition, to help broaden the range of our scenarios we have produced a wider range in many of the axioms. For example, based on stakeholder feedback we have extended the range across many of the power generation axioms, including onshore and offshore wind and CCS, as well as revising our assumptions in other areas, such as insulation in domestic properties. Appendix 1.3 gives an example of one of the 2012 Scenario Axioms.

As well as broadening our scenarios we are also developing our 2012 Accelerated Growth scenario into a complete scenario by including a gas dimension (our 2011 Accelerated Growth was developed for electricity transmission purposes only and had no gas element). Our 2012 Accelerated Growth will also be based on a more credible ramp up rate for wind

Key Themes continued

development.

We intend to further develop our stakeholder engagement with a number of our stakeholders, including Ofgem, DECC and the Distribution Network Operators.

Following on from our bilateral meetings and workshops we are holding a number of follow-up meetings with a number of our stakeholders to further develop understanding and improve our work. Topics include understanding why domestic gas demand profiles have changed in recent winters, heat pump performance and the potential impact of the EU Industrial Emissions Directive.

We will undertake new, deeper analysis on a range of topics, for example the impact of domestic wet appliance demand, geo-demographic technology hotspots, and greater focus on a range of gas and electricity demand and supply issues, but with a particular focus on electricity demand, including, but not limited to:

- Smart meters, Time of Use tariffs and demand response.
- Electric vehicles, plug-in hybrids and range extended vehicles.
- Government policy.
- Behavioural change.
- Embedded generation.
- Analysis of historic industrial, commercial and domestic demand.

We will continue to participate in relevant cross-disciplinary research projects to increase our understanding of a broad range of technologies spanning electricity, heating and transport. We will engage with other organisations producing energy scenarios, to benchmark our own work and to continue to develop our expertise and knowledge.

3 Next Steps

What we are doing with the feedback:

Feedback from our UK Future Energy Scenarios consultation has been gathered from a wide range of stakeholders. The information has been collated and reviewed and forms a key input to the development of our 2012 scenarios. Whilst it is not possible to incorporate the views of all stakeholders on every issue, we believe our 2012 scenarios will reflect a greater proportion of our stakeholders' views and will be more robust.

In addition to helping shape our 2012 scenarios, feedback received in areas which we have currently not explored but we believe will add value, will be used to direct new areas of research and analysis which may feed into subsequent scenarios.

The 2012 scenarios will feed into our business plans and will be used to assess potential network investment requirements in the future.

Key milestones going forwards:

We will be holding a one day conference on 27 September 2012 at One Great George Street, Westminster, London, at which we will present our new 2012 scenarios and publish the 2012 UK Future Energy Scenarios document.

We will publish our Electricity Ten Year Statement (E-TYS) in November and our Gas Ten Year Statement (G-TYS) in December, both of which will feature our new scenarios and will highlight potential investment requirements in the electricity and gas transmission networks.

Future stakeholder engagement:

We will continue our focus on improving our stakeholder engagement. We will continue to discuss, listen and act on what our stakeholders tell us. We will continue to improve our stakeholder engagement by, for example, improving the content and format of our workshops, promoting more industry debate and providing greater value for stakeholders.

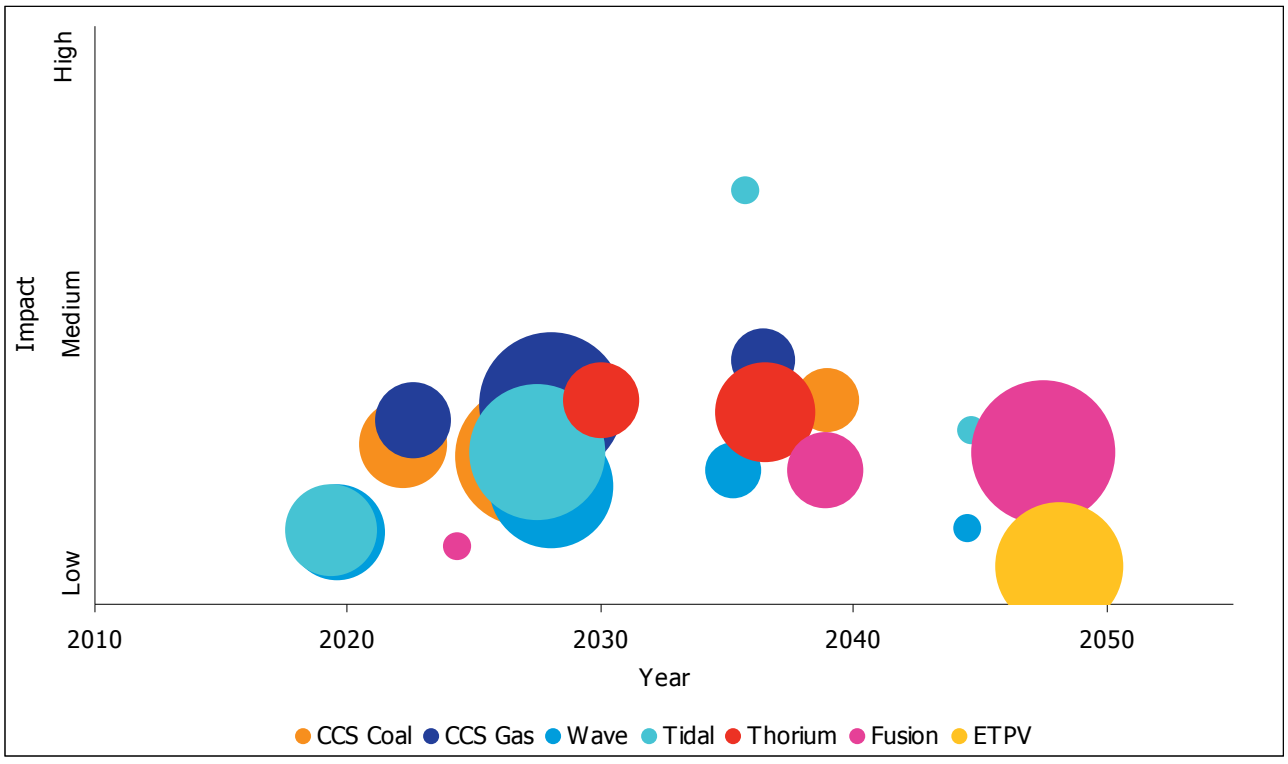
We will ask our stakeholders how we can add more value to our engagement, both in terms of content and format.

We will publish new "thought pieces", highlighting original, discrete pieces of analysis that we believe will foster debate and improve understanding of the UK's energy future.

4 Appendix 1.1 Tomorrow's World

One of the exercises we asked our stakeholders to undertake at the workshops held in London and Glasgow was entitled "Tomorrow's World". They were asked to identify the relative impact of various new and emerging technologies over the next four decades for two main sectors: power generation; and domestic heating and transport. Not surprisingly there was a wide range of views expressed at both sessions. The following charts summarise the results. The size of the circles indicates the number of stakeholders that expressed a view of the likely impact of a technology by a particular decade, the vertical axis shows the average impact that those stakeholders assigned to the technology and the horizontal axis shows the average position within the relevant decade.

Power Generation

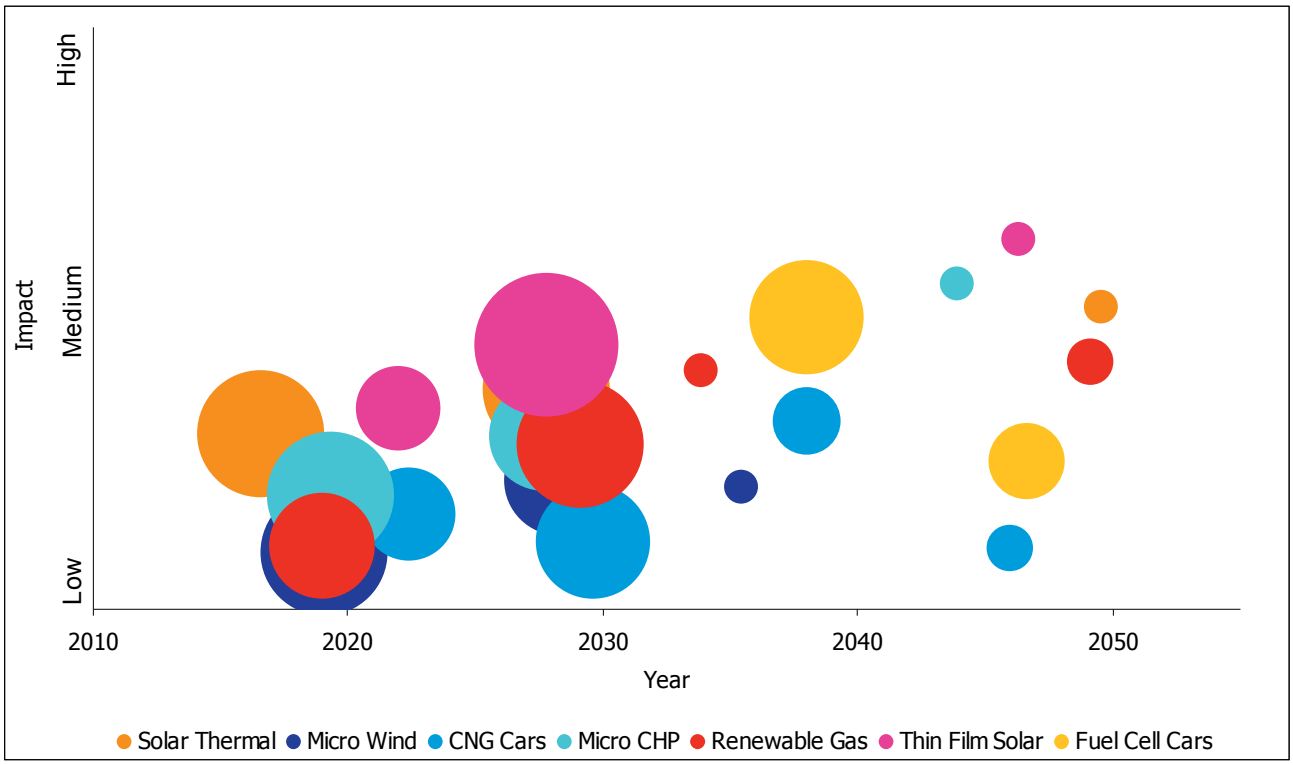


In the power generation market no one technology was seen as the dominant new technology with our stakeholders seeing the potential for most of the technologies to play a significant role in the market.

- Gas and coal stations fitted with CCS along with tidal and wave generation could all have a role in the UK power market by 2030.
- A number of stakeholders felt that thorium reactors could be developed by 2040.
- Nuclear fusion could have a role but was not likely until around 2050.

- Many felt that Extra Terrestrial Photo Voltaics (ETPV) was the least likely technology to have an impact and would not be until 2050.

Domestic and Transport



As with power generation, in the domestic and transport sectors no one technology was seen as being dominant, with all of the technologies assessed receiving some support from our stakeholders.

- Many technologies were seen as having an impact around 2020, including micro-CHP, renewable gas, micro wind, CNG cars, thin film solar and solar thermal.
- Solar thermal was the most likely technology to have an impact pre-2020.
- Thin film solar was seen as having the biggest potential impact by 2030.
- There was a broad spread of views regarding the likely timing of CNG cars with the biggest impact seen around 2040.
- Stakeholders felt that fuel cell cars were unlikely until 2040 but could be significant.

The results from the workshop are feeding into new analysis we are undertaking to better understand the impact of new and emerging technologies on our future energy scenarios and the implications for the development of the gas and electricity networks..

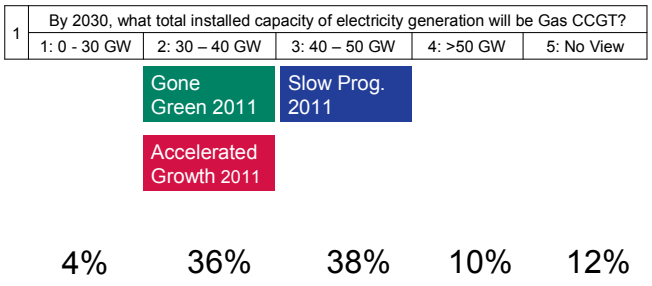
Appendix 1.2 Questions

The following charts show questions that were asked at our two workshops in London and Glasgow in February and March 2012. The percentages represent the aggregated results for stakeholder responses for both workshops. The charts also show where our 2011 Gone Green, Slow Progression and Accelerated Growth Scenarios sit within the various options for each question.

We have used the results to benchmark our 2011 scenarios, highlighting areas of agreement and disagreement, with the results also helping to shape the development of our 2012 scenarios. Feedback on this method of engagement with our stakeholders has been overwhelmingly positive, and we intend to continue to develop this approach, improving the format and structure of the questions to ensure we and our stakeholders gain maximum value.

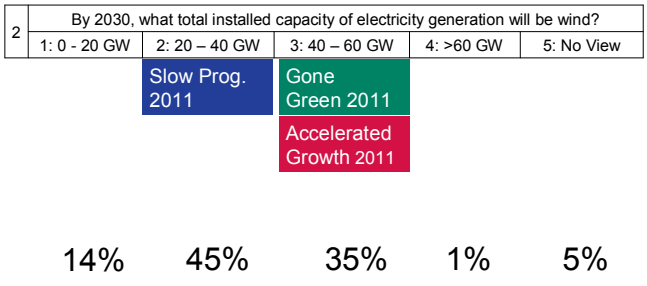
Question 1

Electricity Generation



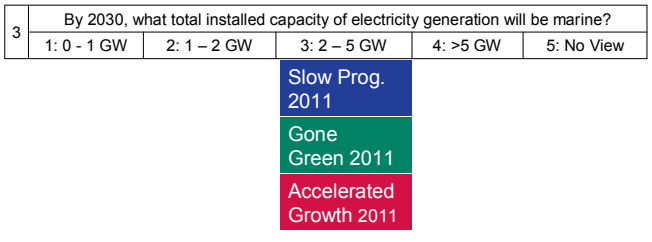
Question 2

Electricity Generation



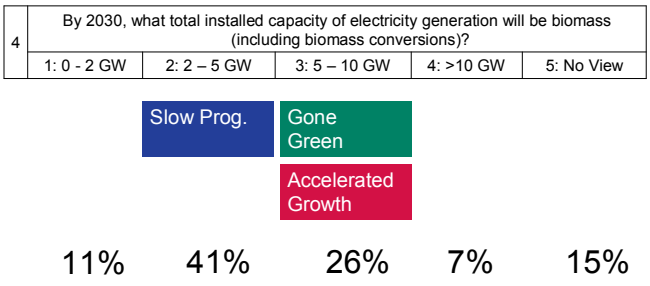
Question 3

Electricity Generation



Question 4

Electricity Generation



Question 5

Electricity Generation

5	In what year will the first new nuclear power station become operational in GB?				
	1: <2020	2: 2020 – 2025	3: >2025	4: Never	5: No View

Gone Green 2011
Slow Prog. 2011
Accelerated Growth 2011

7% 66% 15% 4% 8%

Question 6

Electricity Generation

6	By 2030, what total installed capacity of electricity generation will be new nuclear?				
	1: 0 - 5 GW	2: 5 – 10 GW	3: 10 – 15 GW	4: >15 GW	5: No View

Slow Prog. 2011
Gone Green 2011
Accelerated Growth 2011

18% 35% 32% 3% 12%

Question 7

Electricity Generation

7	In what year will the first large scale commercial (gas or coal) CCS station become operational in GB?					
	1: <2025	2: 2025 - 2030	3: 2030 - 2035	4: >2035	5: Never	6: No View

Slow Prog. 2011
Gone Green 2011
Accelerated Growth 2011

13% 39% 18% 4% 15% 11%

Question 8

Electricity Generation

8	By 2030, what total installed capacity of electricity generation will be CCS equipped?				
	1: 0 GW	2: 0 – 5 GW	3: 5 – 10 GW	4: >10 GW	5: No View

Slow Prog. 2011
Gone Green 2011
Accelerated Growth 2011

20% 43% 11% 5% 20%

Question 9

Electricity Generation

9	By 2030, what level of electricity interconnector capacity will be available to GB?				
	1: 0 - 5 GW	2: 5 – 10 GW	3: 10 – 20 GW	4: >20 GW	5: No View

Slow Prog. 2011
Gone Green 2011
Accelerated Growth 2011

3% 58% 21% 3% 15%

Question 10

Electricity Demand

10	In 2020, what will be the total annual electricity demand, when compared to 2011?					
	1: 20% lower	2: 10-20% lower	3: ±10% of 2011 levels	4: 10-20% higher	5: >20% higher	6: No View

Slow Prog. 2011
Gone Green 2011

1% 4% 80% 14% 0% 1%

Appendix 1.2 continued

Question 11

Electricity Demand

11	In 2030, what will be the total annual electricity demand, when compared to 2011?					
	1: 20% lower	2: 10-20% lower	3: ±10% of 2011 levels	4: 10-20% higher	5: >20% higher	6: No View
Slow Prog. 2011						
Gone Green 2011						
	1%	3%	26%	61%	6%	3%

Question 12

Electricity Demand

12	By 2030, what percentage of domestic households will participate in demand reduction through the use of electricity smart meters?					
	1: 0-10%	2: 10-20%	3: 20-30%	4: 30-40%	5: >40%	6: No View
Slow Prog. 2011						
Gone Green 2011						
Accelerated Growth 2011						
	14%	28%	24%	12%	11%	11%

Question 13

Electricity Demand

13	By 2030, what proportion of GB households will have electric heat pumps installed?					
	1: 0-5%	2: 5-10%	3: 10-15%	4: 15-20%	5: >20%	6: No View
Slow Prog. 2011						
Gone Green 2011						
Accelerated Growth 2011						
	16%	19%	28%	12%	5%	19%

Question 14

Electricity Demand

14	What would most need to happen to encourage the roll-out of heat pumps within the UK?				
	1: Competitive cost	2: Competitive performance	3: Awareness of technology	4: Ease of use	5: No View
Slow Prog. 2011					
Gone Green 2011					
Accelerated Growth 2011					
	59%	10%	11%	8%	12%

Question 15

Electricity Demand

1	By 2020, how many electric vehicles will there be on UK roads?				
5	1: 0-100,000	2: 100,000-500,000	3: 500,000-1 million	4: >1 million	5: No View
Slow Prog. 2011					
Gone Green 2011					
Accelerated Growth 2011					
	49%	29%	10%	7%	5%

Question 16

Gas Demand

16	In 2020, what will be the total annual gas demand, when compared to 2011?					
	1: >20% lower	2: 10-20% lower	3: ±10% of 2011 levels	4: 10-20% higher	5: >20% higher	6: No View
Gone Green 2011						
Slow Prog. 2011						
	1%	32%	58%	4%	0%	5%

Question 17

Gas Demand

17	In 2030, what will be the total annual gas demand, when compared to 2011?					
	1: >20% lower	2: 10-20% lower	3: ±10% of 2011 levels	4: 10-20% higher	5: >20% higher	6: No View
	Gone Green 2011		Slow Prog. 2011			
	14%	49%	24%	6%	3%	4%

Question 18

Gas Demand

18	Do you think the average domestic comfort levels (household internal temperatures) will be higher in 2020?					
	1: -2°	2: -1°	3: No change	4: +1°	5: +2°	6: No View
			Gone Green 2011	Slow Prog. 2011		
	3%	20%	43%	19%	0%	15%

Question 19

Gas Supply

19	Over the period to 2030, do you believe the annual volume of North Sea (UK & Norwegian supplies will?				
	1: Decline	2: Level off then decline	3: Stay about the same	4: Increase	5: No View
		Slow Prog. 2011 Gone Green 2011 Accelerated Growth 2011			
	53%	34%	3%	0%	10%

Question 20

Gas Supply

20	Given your previous answer, do you think in the period to 2030 the annual volume of supplies via continental Europe will:					
	1: Significantly decline	2: Slightly decline	3: Stay about the same	4: Slightly increase	5: Significantly increase	6: No View
			Accelerated Growth 2011	Gone Green 2011	Slow Prog. 2011	
	5%	5%	14%	49%	11%	16%

Question 21

Gas Supply

21	Given your previous answer, do you think in the period to 2030 the annual volume of LNG supplies to the UK will:					
	1: Significantly decline	2: Slightly decline	3: Stay about the same	4: Slightly increase	5: Significantly increase	6: No View
					Slow Prog. 2011 Gone Green 2011 Accelerated Growth 2011	
	0%	4%	5%	34%	47%	10%

Question 22

Gas Supply

22	Given your previous answer, do you think in the period to 2030 the annual volume of unconventional gas supplies in the UK will:					
	1: Significantly decline	2: Slightly decline	3: Stay about the same	4: Slightly increase	5: Significantly increase	6: No View
				Slow Prog. 2011 Gone Green 2011 Accelerated Growth 2011		
	1%	0%	7%	55%	25%	12%

Appendix 1.2 continued

Question 23

Gas Supply

	In the period to 2030, do you think the amount of gas storage will:					
23	1: Stay about the same	2: Increase slowly as the UK gas market evolves	3: Increase a lot due to import dependency	4: Increase a lot due to wind intermittency	5: Increase a lot due to imports & wind	6: No View
	4%	38%	22%	7%	16%	13%

Slow Prog. 2011
Gone Green 2011
Accelerated Growth 2011

Question 24

Gas Supply

	In 2020, which of the following statements will best reflect your view of gas prices?				
24	1: They will be dominated by oil linked contracts (spot prices will trend these)	2: They will reflect a mix of oil linked contracts and regional spot markets	3: They will have mostly decoupled from oil linked contracts with strong regional variations	4: They will have decoupled from oil linked contracts and a global gas or reference price will evolve	5: No View
	4%	35%	24%	17%	20%

Slow Prog. 2011
Accelerated Growth 2011
Gone Green 2011

Question 25

Energy Generation

	When will the UK achieve 15% of its energy requirements from renewable sources?				
25	1: <2020	2: 2020	3: 2021-2025	4: >2025	5: No View
	3%	12%	49%	30%	5%

Accelerated Growth 2011
Gone Green 2011
Slow Prog. 2011

Question 26

Scenarios

	National Grid's Future Scenarios provide a sufficiently broad range of future energy outcomes:					
26	1: Strongly agree	2: Agree	3: Neutral	4: Disagree	5: Strongly Disagree	6: No View
	4%	43%	25%	17%	4%	7%

Appendix 1.3 Scenario Axioms

An **axiom** is a premise or starting point of reasoning. In other words, an axiom is a logical statement assumed to be true. Our scenarios are based on a large number of axioms. By publishing the Scenario Axioms in subsequent UK Future Energy Scenarios documents we will provide you with greater transparency of the fundamental assumptions upon which the scenarios are developed, which should aid understanding and foster greater stakeholder engagement.

Below is an example of the axioms for our 2012 energy scenarios.

Offshore Wind	**2012 Slow Progression** Slow progress. Round 3 mainly post 2020	**2012 Gone Green** Round 3 delivers for 2020. Supply chain maintained post 2020	**2012 Accelerated Growth** Round 3 levelised cost towards £100 / MWh or lower Rapid build up

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