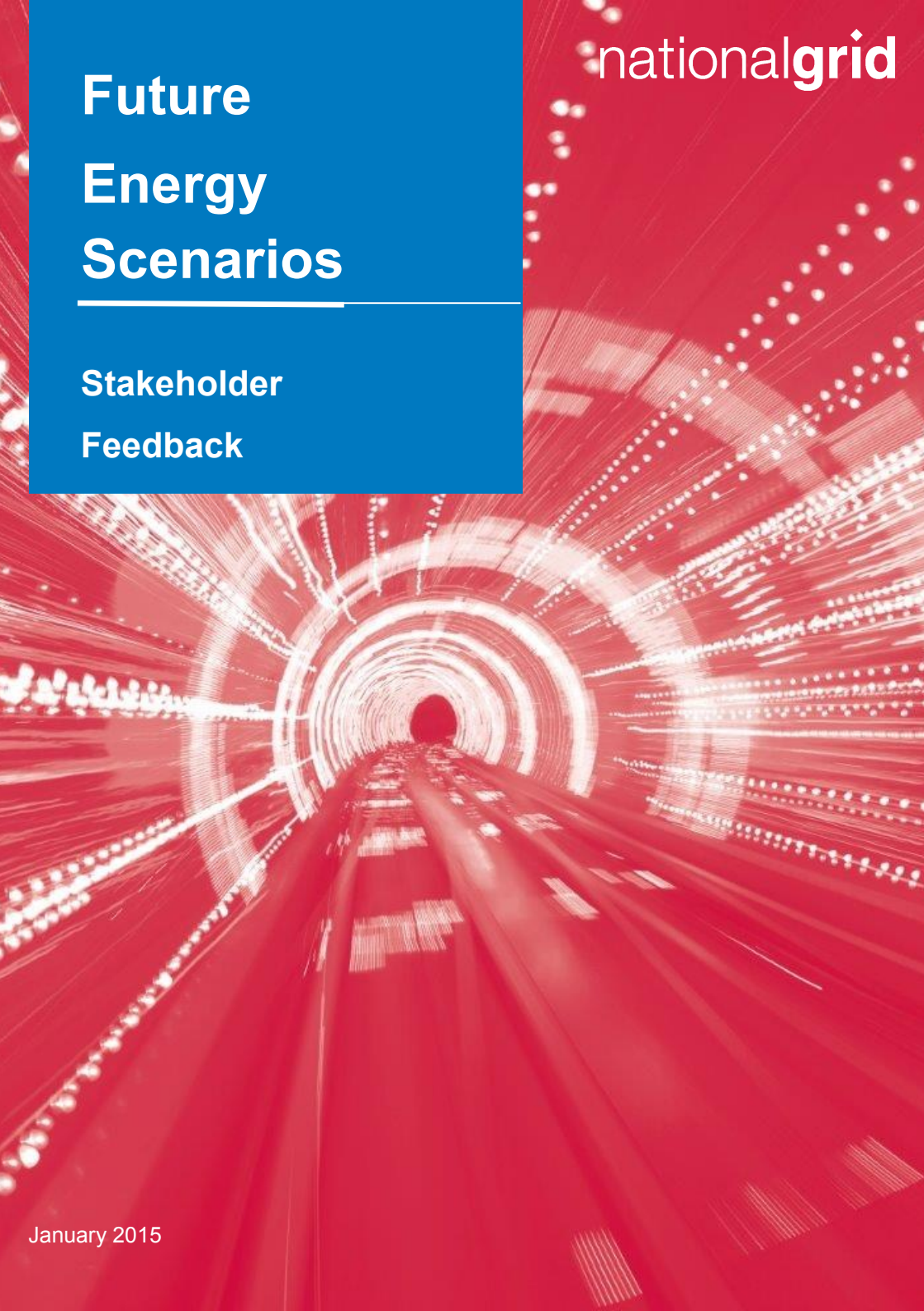
nationalgrid

Future Energy Scenarios

Stakeholder Feedback



January 2015

Introduction

Welcome to our 2015 Future Energy Scenarios (FES) Stakeholder Feedback document. This is the first document to be released by National Grid's Energy Strategy and Policy Team since I became head of the department, and I hope you find it useful.

The document summarises how we have engaged with you and what you have told us since the release of our 2014 scenarios in July. It describes how your views drive the creation and development of our new scenarios for 2015. I want you to see how your feedback has shaped our scenarios.

We are on a journey with the development of our FES: a journey that has only just started for me. I'm really excited to lead the team that develops our scenarios. I know a lot of our stakeholders have provided us with very positive feedback on our scenarios, as detailed in this document, but I know we can continue to improve them.

There are so many challenges and uncertainties facing the long term development of energy within Great Britain (GB). To really understand them, I know we need to improve our engagement with you, because it's your views, knowledge and insight into the energy scene that drive our scenarios.

I want to ensure that we continue to improve our engagement, to aid our understanding, to improve our scenarios and to make them of more value to you. To do that we need to understand how you use them and what you really value from us.

I hope you find this publication useful. I look forward to sharing our 2015 scenarios with you, and I hope that you will continue to work more closely with my team and myself.

Roisin Quinn
Head of Energy
Strategy & Policy

Contents

Purpose of document

The purpose of this document is to:

- summarise the views from interested parties on the 2014 FES and provide an explanation of how these responses were taken into account in the design of the 2015 FES;
- provide a deeper understanding of the consultation process undertaken in the development of the 2015 FES; and
- provide a summary of our 2015 FES that will be included within the 2015 Electricity and Gas Ten Year Statements.

Executive Summary

Low Carbon Life replaced with Consumer Power

We have redesigned and renamed Low Carbon Life into Consumer Power. High economic growth and less green ambition leads to consumers being focused on quality of life and high levels of consumerism. Whilst there is still an ambition for long term carbon reduction, there is a lack of political focus regarding decarbonisation solutions.

Axioms replaced with primary assumptions

We have replaced our 26 axioms from 2014 with 5 high level assumptions. Many of our stakeholders found 26 axioms too many and difficult to understand with no hierarchy or structure. Having five high level assumptions will provide clarity to our readers into what underpins our FES in driving the ranges of all inputs into our many models that create our scenarios.

Revised axes

We have replaced affordability and sustainability with prosperity and green ambition. The axis of more or less prosperity provides a much clearer linkage to economic growth, and green ambition allows for more or less carbon reduction as well as flexing renewables.

New industrial and commercial demand model

The new industrial and commercial demand model developed for us by Arup was commissioned with innovation funding to address the previous econometric model-ling and allow more granular detail for econometric analysis into sub-sector power and gas demands, on site generation and energy efficiencies. We will have more detail into the economics of fuel switching and self-generation, with underlying and system demands by both sub-sector and region.

"I must congratulate you for your 'Future Energy Scenarios' document. It is a great help for us to understand and analyse the UK Energy Market."

Supply Chain stakeholder

Background

Why we do scenarios...

There is great uncertainty regarding the future of energy for GB. Electricity Market Reform (EMR), the General Election in 2015, environmental legislation, technological developments, the economic climate and energy costs will all influence the energy pathway for GB. No one can forecast what that exact pathway will be over the next five years, let alone ten, twenty or more, but scenarios provide an approach to enable us to better understand these uncertainties. Our scenarios provide credible, plausible outcomes for the future of energy in GB. None of the scenarios will be identical to what actually happens, but by creating a believable scenario envelope, we can be confident that reality will be captured somewhere within that range.

> *Our Future Energy Scenarios provide a detailed analysis of a range of credible futures. They cover developments in electricity generation and demand, and gas supply and demand. We state the assumptions used in our analysis, highlighting new technologies, social and economic developments and progress against targets.*

Your role in the scenarios...

The role of stakeholders is fundamental in the development of our FES. Your views drive the range, content and development of our scenarios. We will continue to focus on improving our engagement so that our stakeholders have the opportunity to understand, debate and use our scenarios in detail.

This year there has been an important development in our stakeholder engagement and scenario development processes. Ofgem have modified National Grid Electricity Transmission's licence and require submission of our proposed scenarios by the end of January each year.

We welcome this opportunity to work with Ofgem throughout the FES consultation and development process. We believe this will provide them with a greater understanding of our FES process and provide confidence that we are continually improving in everything that we do, resulting in scenarios that are credible, robust and of real benefit to all our stakeholders.

This document represents our submission to Ofgem. It summarises our stakeholder engagement and how we have acted on them, our initial thoughts on our new suite of scenarios and also highlights how we have developed our analysis and modelling from last year.

Summary

Our scenarios are shaped by your views…

In July 2014, we released our 2014 FES and since then we have been working to understand your views on them. Your feedback is critical to the development of our next suite of FES: our output is are driven by the views of a broad range of stakeholders. This document provides a summary of those views and how we have acted on them to create this year's FES.

An evolutionary approach, but major revisions to one scenario...

Stakeholders' views were positive regarding our 2014 FES in terms of scope, content, process and delivery. We were told there was no requirement for radical changes so we have adopted an "evolutionary" approach to the development of our 2015 FES. They represent a logical progression from last year with improvements and revisions based on stakeholders' feedback.

Our Low Carbon Life scenario from 2014 received the most feedback. Stakeholders said it was difficult to understand because it was unclear, the underlying rationale was inconsistent and essentially did not work. Consequently, for 2015 we have made substantial changes to this scenario, which is now named Consumer Power. You can find more about this on page 22.

We have received a lot of positive feedback…

Last year, we produced four scenarios using the energy trilemma as a backdrop, flexing sustainability and affordability. Many stakeholders felt this trilemma based approach helped them understand and engage with the FES. In response to stakeholder feedback, for 2015 FES we have continued to use the energy trilemma as a foundation for our scenarios and vary prosperity and green ambition.

We received strong positive feedback on the production of four scenarios with stakeholders believing this is a fair reflection of the continued levels of uncertainty regarding the future of energy for GB. We also received positive feedback on the use of the two by two matrix, as this aided understanding of the key variables that impact the FES.

A focus on greater clarity…

Our stakeholders continue to ask for greater clarity of our FES. In addition some stakeholders stated that whilst our axioms or underlying assumptions did help understanding, 26 were too many and there was no hierarchy within them which was confusing. For 2015 we have maintained these titles and replaced the axioms with three rules and five high level primary assumptions, providing the ranges of all the modelling inputs to the four scenarios. You can find the rules and assumptions on page 14.

Constructive feedback helps us to improve...

Many of our stakeholders felt that the description of the axes were confusing. Take a look at page 15 to see how we have responded to this feedback.

In addition, it has been suggested that we should flex the security of supply standard rather than assume the reliability standard will be met in all the scenarios. We refer to this feedback on page 20. All four 2015 FES continue to meet the reliability standard. One of National Grid's primary reasons for creating scenarios is to identify strategic investment on the electricity and gas transmission systems and we believe our focus should remain on scenarios where security of supply is met.

Going forward…

Whilst our stakeholders were positive with regards to our 2014 scenarios, we are by no means complacent and realise we have more work to do. We will continue to work on our stakeholder engagement strategy and improve communication so that we can really understand what our stakeholders value. In the FES we want to capture all of our stakeholders views in an informative and transparent manner.

How is the FES used?

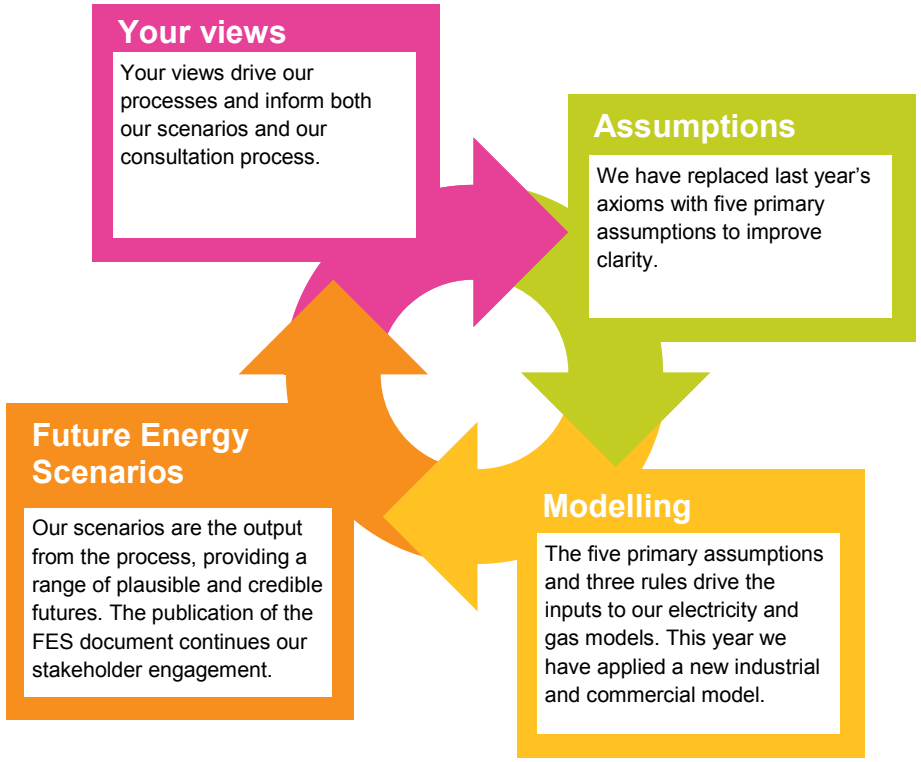
Our scenarios are used as a reference point for a range of modelling activities. Importantly, they are used for network analysis that enables National Grid to identify potential gas and electricity network investment requirements in the future, as highlighted in the Gas and Electricity Ten Year Statements (GTYS and ETYS).

Security of supply analysis has also become an important use for our scenarios. Decisions taken by the government under their EMR programme are being made based on our analysis presented in the Electricity Capacity Report. Ofgem's medium term Electricity Capacity Assessment Report and our own short term Winter Outlook Report are informed by FES. They were also used in analysis performed for assessing the requirement for procuring new balancing services, Demand Side Balancing Reserve (DSBR) and Supplemental Balancing Reserve (SBR), which are tools that are being used to manage short term security of supply risk.

Our FES is being used throughout the European energy industry. There are important interactions between our scenarios and the ENTSO-E and ENTSO-G Ten Year Network Development Plans and our stakeholder engagement activities are being used as a blueprint for work done in a number of other European countries.

Click on the images above to access the document online or go to Key Documents on page 30 for links

How and why we engage



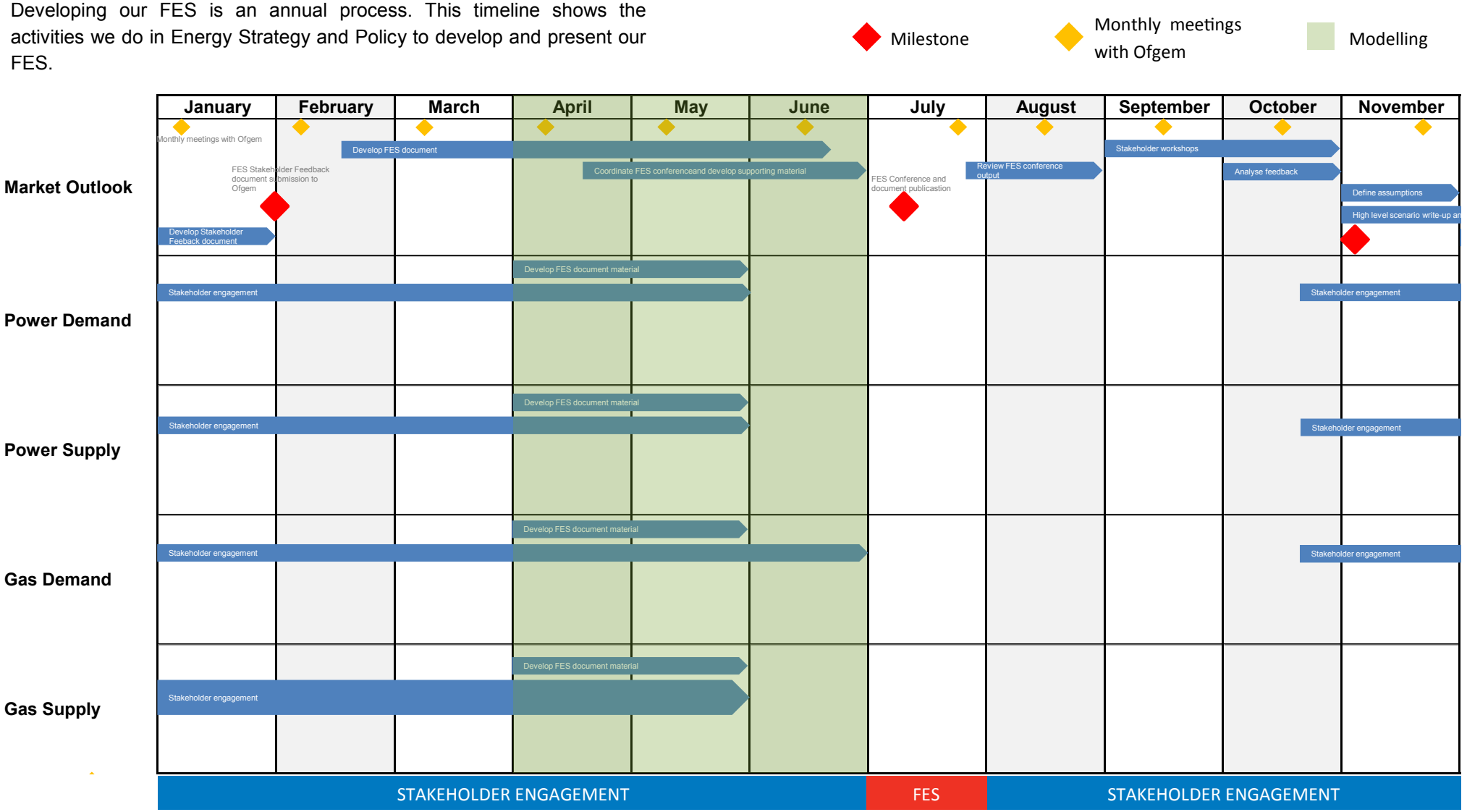
Feedback is **fundamental** to the development of our FES and over the last few years we have significantly increased the involvement of our stakeholders in their development.

With an improved understanding of all our stakeholders' views on the future of energy, we can develop a rich suite of energy scenarios that will enable us to address the long term strategic challenges facing the development of the gas and electricity transmission networks in GB.

Our stakeholders views are at the heart of the scenario creation process, from developing the primary assumptions and models inputs, through to the scope and content of our FES.

Timeline of FES 2015

Developing our FES is an annual process. This timeline shows the activities we do in Energy Strategy and Policy to develop and present our FES.

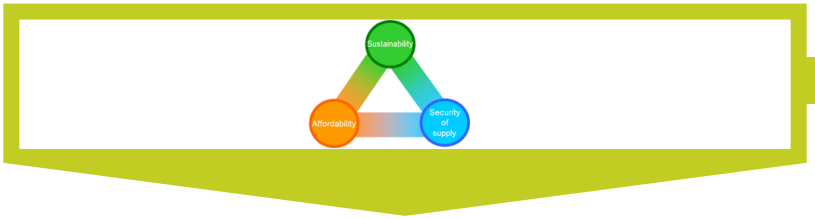


How stakeholder feedback shapes our scenarios

This section highlights how our stakeholders' views shape not only what scenarios we develop but also how we create them.

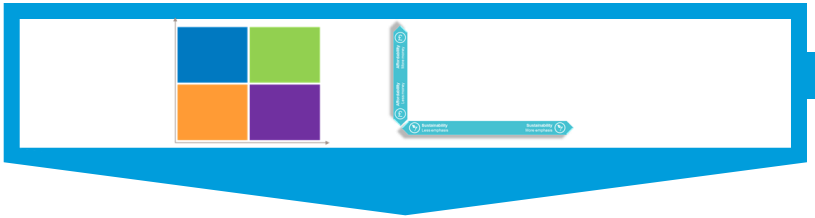
Our stakeholders' views

Our stakeholders' views continue to shape our scenarios: not only their content, but also their breadth, depth and the narrative around them. We will continue to focus on improving our engagement so that we have a better understanding of our stakeholders' views and needs and how they are changing.



The energy trilemma

We have continued to base our 2015 scenarios around the energy trilemma, in response to strong positive feedback from our stakeholders who felt it provided a common narrative for engagement across the energy industry. We will continue to flex sustainability and affordability. All four scenarios will continue to meet the reliability standard, as we believe producing scenarios where the standard is missed would be of little value in identifying potential network investment.



2 x 2 matrix & axes

We received positive feedback on the use of four scenarios in a matrix. However, we have revised the descriptions of the axes as some stakeholders felt the messaging was not clear.

Assumptions & rules

Some stakeholders stated that whilst our axioms did help understanding, 26 was too many and there was no hierarchy within them. Based on this feedback, for our 2015 scenarios we have replaced the axioms with five high level primary assumptions which will drive the ranges of all the modelling inputs to the four scenarios.

Scenarios

Our Low Carbon Life scenario from 2014 received the most constructive feedback. The scenario received a range of comments, including that it was difficult to understand, was confusing and unclear, the underlying rationale was not consistent and essentially did not really work. Consequently for 2015, we have substantially revised our blue scenario, which is now named Consumer Power.

Major changes for 2015

The three rules and five assumptions form the basis of our analysis.

> *When FES talks about Axioms do they really mean 'assumptions'?*
> *Consumer*

RULES

Levy Control Framework
Spend capped at £7.6 billion as agreed within LCF Trajectory out to 2020/21

Security of Supply (Electricity)
Abide by security standard as prescribed by Secretary of State (currently three hours loss of load expectation)

Security of Supply (Gas)
There will be sufficient capacity to ensure that the N-1 test will continue to be satisfied

ASSUMPTIONS

- **Economic Growth**
- **Energy User Behaviour**
- **Fuel Prices**
- **Policy**
- **Technology**

Last year, we did not have an explicit security of supply rule for gas. This year, based on stakeholder feedback we have included one based around the N-1 test, which assesses whether supply can meet demand with the loss of the single largest supply infrastructure component, for example a pipeline. We believe this will aid our stakeholders' understanding of the rules that apply to all of our four scenarios.

One of the top themes from this year's feedback was **lack of clarity on the scenario axes**. In response we have revised the axes:

Sustainability → **Green Ambition**

Affordability → **Prosperity**

We have moved from an affordability axis to **prosperity** to better reflect that this axis looks at how much money is available at a Government, consumer and business level for investment. This may be in terms of money being available for Government support for renewable generation, businesses having money to invest in new energy efficiency measures, or consumers having money to spend on new

The **Green Ambition** axis represents the importance that politicians place on going green in policy making based on how the focus changes in relation to today's position. Using electricity generation as an example, a high green ambition scenario is likely to have policies to drive high levels of renewable and low carbon generation.

Prosperity

Green Ambition

Your feedback on our scenarios...

...and how you use the FES

This section highlights the range of views we have received on our 2014 scenarios, and how our stakeholders, both internal and external to National Grid use them.

National Grid has a better range of scenarios now, and is looking at other possibilities...so you've listened.

I do love the publications, technically bang on and so approachable and easy to read. Great stuff.

...most transparent set of scenarios seen (across the industry).

The trilemma is a good way of showing how the different scenarios are flexed.

The increased number of scenarios for 2014 is more effective and useful in terms of assessing future uncertainty.

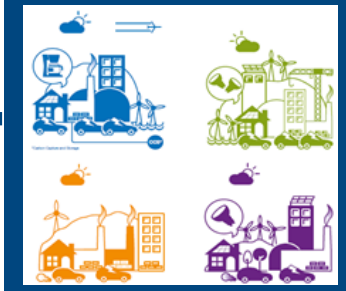
National Grid needs to build on the story/narrative as the scenarios need to be described as future outcomes dependent on events occurring, as opposed to backwards-generated scenarios.

Gone Green is no longer credible, I don't understand why National Grid continue with it.

65%

of our surveyed stakeholders agreed National Grid's 2014 Future Energy Scenarios provided a sufficiently broad range of scenarios

FES



We will continue to develop our understanding of how our stakeholders use our scenarios so that we can better meet our stakeholders' needs and continuously improve the quality of our scenarios.

Supply Chain

...we use the data from the FES to validate our own information and scenarios.

Energy Industry

...we use National Grid's scenarios as a base to do our scenarios.

Customers

...FES helps us to do our strategy planning.

National Grid

...we use the FES to plan the future map of the transmission network and to develop the Electricity and Gas Ten Year Statements (Network Strategy, TNS).

National Grid

...our Gone Green scenario is designed to hit all of the renewable and carbon targets on time, targets that are legally binding and which government policy is aimed at achieving. Whilst we admit it is challenging, it is still achievable, and by developing and analysing Gone Green we can highlight milestones and key decision points on its trajectory. (Energy Strategy and Policy, Market Operation).

You said, we did…

This section shows feedback from our stakeholders on power and gas demand, and flexible power sources. We explain under each point how we have responded to the feedback.

Power Demand

LED lighting is expensive. The uptake demonstrated in the scenarios needs explaining

LED is more expensive today but coming down in price and we will reflect the uptake across scenarios as the scenarios take into account legislative and economic effects.

Can you include information on the infrastructure available to support the gas and power demand in the FES?

We are unable to include it in the FES due to the level of detail required. However, separate publications such as the Electricity and Gas Ten Year Statement (ETYS and GTYS) are available online that provide more information on the network plan derived from our scenarios.

You should be more consistent in your electricity demand definitions

The demand definitions in FES, the Winter and Summer Outlooks, the Electricity Ten Year Statement and the Electricity Capacity Report are all slightly different but for good reasons. In the future we will ensure that we provide clearer narrative why we are using a particular definition, how that definition relates to others and where possible how that demand can be translated into others so that comparisons can be made.

Gas Demand

District heating would be more likely in Gone Green than Low Carbon Life

We agree and have changed Low Carbon Life to Consumer Power. District heating is likely to be driven by further government intervention which doesn't align itself to CP as well as GG. Therefore this year we've assumed district heating is highest in Gone Green.

Flexible Power Sources

Electricity storage may not be commercially viable now but it could be in future, so storage should be introduced in the later years of the scenarios

We do not currently have sufficient evidence to develop robust and credible scenarios on when storage will be seen at significant levels. In the 2014 scenarios we carried out a case study on the commercial viability of storage providing balancing services. We intend to develop our analysis further in our 2015 scenarios to help us build our evidence base, and seek further stakeholder views on when storage is likely to be rolled out on a commercial scale and what types.

Your electricity interconnection approach is conservative and could be more forward looking

We have reviewed our approach to electricity interconnector modelling within the scenarios and will develop our modelling approach in a phased way in the development of our 2015 and 2016 scenarios. There have also been a number of policy and regulatory developments since the 2014 scenarios such as the European Commission's aspirations on levels and Ofgem's Cap and Floor Regime. These will be taken into account in the 2015 scenarios.

National Grid's models should have disposable income built into the domestic model

We view growth in disposable income and the impact it could have on technology adoption and heating demand. However, we need to research current trends between drivers of heating demand such as smart thermostats, consumer perception of price and real disposable income.

Gas Demand

Micro CHP should be included in the scenarios

We have assessed a wider range of heating technologies including fuel cells, micro CHP and many more. We achieved this by increasing our data contacts and speaking to a wider range of stakeholders and are seeking to improve our outlook on district heating, CHP and retail prices. Our new scenarios will now contain a broader range of alternate heating technologies, resulting in richer, more credible scenarios.

You said, we did…

Power Supply

Fuel prices should feed into the power supply analysis

Fuel prices feed into the economic analysis and are reflected in the opening and closing of new build generation. For 2015 we are improving our economic analysis on power generation, of which fuel prices are a key input, by developing a new model that will enable us to undertake more sophisticated and robust analysis.

The onshore wind profile for Gone Green is optimistic and on the high side

Our Gone Green scenario is designed to hit all of the environmental targets on time. Both onshore and offshore wind are key technologies in meeting those targets and we believe we have a balanced, plausible and credible mix of renewable technologies in Gone Green. There are sufficient projects to achieve the required levels within Gone Green and we do not assume all the projects are successful.

National Grid should cost its scenarios

We do not cost our entire scenarios because there is too much uncertainty for any numbers to be credible. We have to make many assumptions in our modelling inputs and we believe any absolute number would be meaningless. We do however provide new generation costs and we will continue to review whether we can provide additional costing analysis that may be of benefit to our stakeholders.

Is it realistic to assume that the levy control framework will continue beyond 2020?

The scope of the Levy Control Framework beyond 2020 is undefined and there are many potential options regarding how the LCF will evolve. It is because of this and many other uncertainties that we have adopted a scenario-based approach rather than forecasting.

Gas Supply

National Grid's 2014 Low Carbon Life scenario showed 30bcm of shale by 2030 which seems very ambitious. Are the shale supply volumes and timings credible?

There is considerable uncertainty regarding shale production volumes within Great Britain. Following discussions with our stakeholders, we based our projections on information published in a report by the Institute of Directors, which was recommended by the UK Onshore Operators Group (UKOOG) and DECC's Office of Unconventional Gas and Oil. The approach used was very similar to the that for the analysis we carried in FES 2013. The timings for shale development were based on UKOOG's assessment. Our four scenarios for 2014 reflected the considerable uncertainty regarding Shale by having a very wide range of projections, with Low Carbon Life the highest and No Progression showing zero.

Bio-methane - quality of the gas is a barrier. One of our stakeholders has opened a large plant, many water companies also producing bio gas although much of this is being used to generate power rather than injection into the grid.

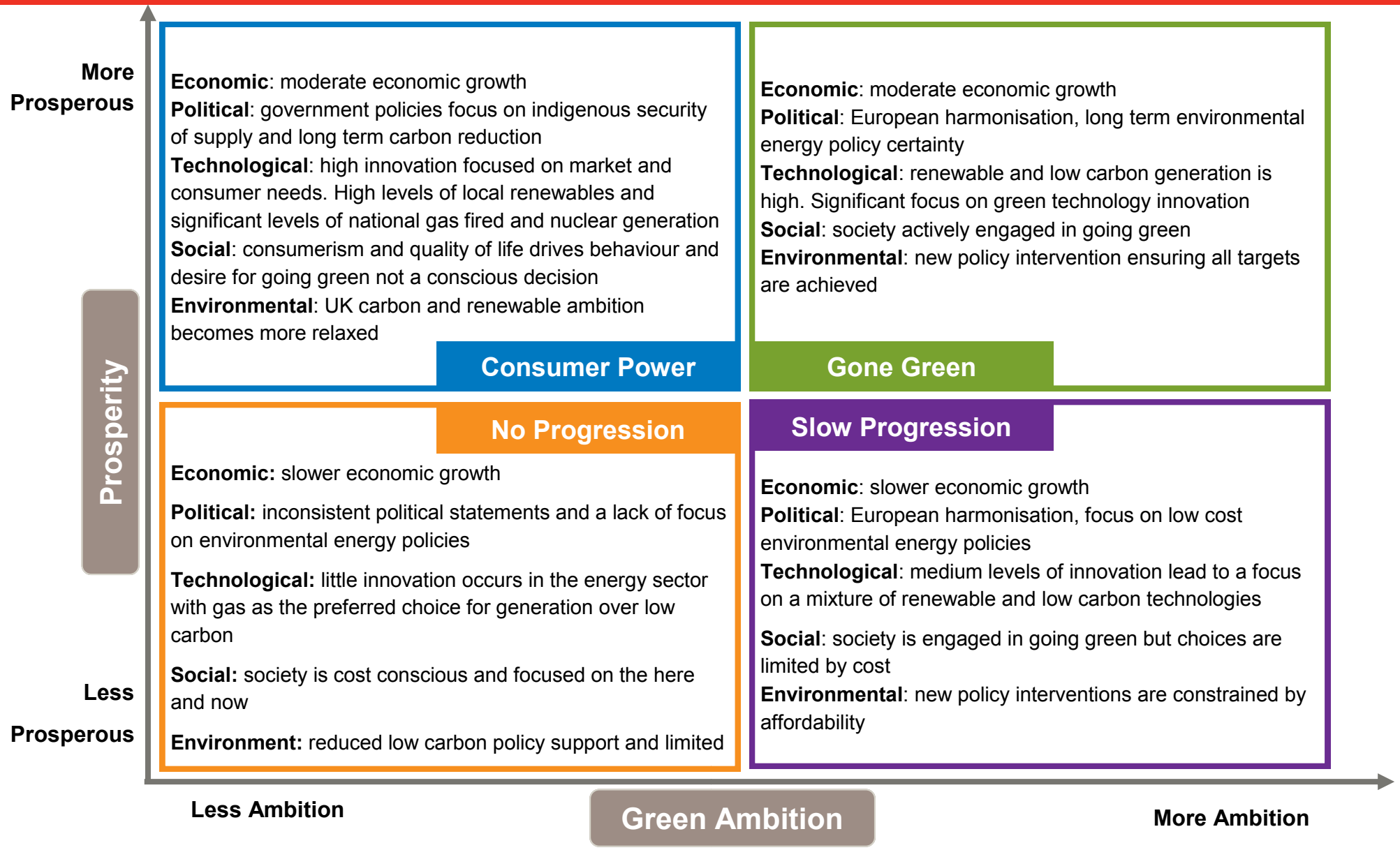
Our bio-methane projections are based on developers' projections and it has to be assumed that they are delivering gas of the required quality.

Power Supply

The CHP market is saturated unless something changes. Major energy users are not currently looking to invest in CHP as self generation is rarely cheaper.

We have received a wide range of views regarding the future uptake of CHP. We have reflected this by having a range of deployment. Consumer Power is at the high end of the spectrum, No Progression at the other, and our other two scenarios sit in between. Our scenario-based approach enables us to reflect this uncertainty.

FES 2015 at a high level



Team talk

In this section the Energy Strategy and Policy team, who are accountable for the creation of the Future Energy Scenarios, discuss developments and challenges for 2015.

Alice Etheridge
Strategy Development

There are many challenges for me and my team regarding FES. I want to achieve a step change in our stakeholder engagement. To do this I want to understand how you use our scenarios and what you really need from us. We can then build on this to produce more value adding output for you. I also want to understand where you disagree with our scenarios, and explore whether we are including all of our stakeholders views within our scenario envelope. We can help by making our whole process more transparent and visible for you, so that you can communicate with us when you want to and how you want to. I want to continue to reach out to new stakeholders in the energy arena, but also to seek out best practice in other spheres and to leverage value from it. By doing all of these I believe we can continue to highlight, explore and debate the critical long term energy debate.

In 2014 we received stakeholder feedback from the industry, DECC and Ofgem regarding our approach to interconnectors. We have since developed our approach, engaging stakeholders more and reflecting policy and regulatory developments. We feel our approach is evolving for the better and further steps can be taken and we look forward to hearing your thoughts.

Simon Geen
EMR Analytical Manager

Lilian Macleod
Power Supply

We are reflecting comments on solar and CCS so you should see changes there. In terms of more information we're keen to have more on distributed, CHP, CCS and new emerging technologies such as waste and marine. This year's challenge is developing our range on distributed generation and increasing our understanding on whether the generation supply chain can meet the deployment rates necessary to hit Gone Green. We are keen to hear from our stakeholders on this.

Russell Fowler
Power Demand

The major challenge in power demand is ensuring we have a credible **range of demand scenarios** for each year. Too narrow a range, we risk not capturing what will actually happen and too wide a range we risk demands not being credible or useable. In order to help us ensure we have a credible range of demand we have been asking Stakeholders, notably at the workshops in Glasgow and London, what are the key drivers behind demand, what could driver demand up or down? This feedback allowed us to have confidence we have considered all the key drivers for both increasing and decreasing demand.

Thank you for the great feedback we have received, your contributions really help us not only form our scenarios but to help us prioritise areas for continual improvement. Over the past 12 months we have made substantial changes to our approach in gas and power demand projections, bringing in new economic and technology models that drive our Industrial and Commercial energy demands, and help us understand the potential changes in residential heating technology. Next year we intend to review the emergence of heat networks and make improvements to our transport models, some of which we have already started to build into our outlook and I look forward to sharing with you our Future Energy Scenarios in 2015.

Steve Marland
Gas Demand

Simon Durk
Gas Supply

Our biggest focus this year is gathering information for our shale gas projections. This has always been a challenge and we recognise that this probably won't change much until more exploratory wells are drilled. In the past two years we have used production data from the US scaled to the ambition of UK developers, and a report published by the Institute of Directors, which took a similar approach but with more detail. We would like to supplement this with more input from UK developers and get a better idea of the likely extent and timing of shale gas production.

Future improvements

In this section we set out our goals and objectives for our Future Energy Scenarios for 2015 and beyond.

Smarter Engagement

Targeted

Ensure we are undertaking the right engagement for each of our stakeholders, realising that a "one size fits all" approach is not appropriate. We will explore new ways of engaging with our existing stakeholders and to encourage engagement with new stakeholders. We will also coordinate our engagement better across FES and our Winter and Summer Outlooks and other areas, to ensure we are more efficient.

Coordinated

Implement a stakeholder engagement plan that ensures that our engagement aids the development of primary assumptions and modelling inputs for our scenarios and also enables the creation of a detailed auditable record of how our stakeholders drive our scenarios.

Add Value

Learn from our mistakes. We could have asked better questions and captured more data from our workshops in 2014.

Deeper Engagement

Understand what our stakeholders really value in our FES, so that we can focus on providing a more valuable and efficient service. We want to understand how our stakeholders use our FES and supporting material. We also want to explore opportunities for more collaborative engagement to give richer, better data.

Broader Engagement

Build relationships with **new stakeholders** to develop richer, more robust scenarios.

Improve our scenarios by identifying **best practice** in scenario development and stakeholder engagement in the energy and other sectors, both in UK and in Europe.

For example, National Grid has consulted with GTS, the Dutch gas transporter for many years. For 2015, GTS is implementing its own scenario development programme to help identify potential network developments in the future. We intend to develop this relationship, not only to discuss energy developments across Europe, but also to investigate best practice in energy scenario development.

Value Added Outputs

Continue to develop our analysis by creating new models and techniques. In addition we intend to provide more value by undertaking more thought leadership based on our scenarios. Provide more context by focusing on the necessary **political**, **financial** and **technological** developments required for the scenarios to become reality.

Our stakeholders

The following is a list of the stakeholders we have consulted with for 2015 FES:

2Co Energy
44 Communications
AMDEA
ARUP
Association of UK Manufactures
Axpo
B&Q
Balfour Beatty
Barclays
Baringa
BBL
Blizzard Utilities
Bord Gais Group
BP
Brandenburg University of Technology
British Retail Consortium
British Sugar
Building Research Establishment Ventures
Calor Gas
Capgemini Consulting
Capital Dynamics
Carbon Brief
CentreForum Think Tank
Centrica
Centrica Storage
CES Energy
Challenge Energy
Chemical Industries Association
Chevron
Citigroup Global Markets
CNG Services
Combined Heat & Power Association
Committee on Climate Change
Community Energy Scotland
Confederation of British Industry
Conoco Phillips
Conservative Party
Cornwall Energy
Cuadrilla Resources
Cynnal Cymru
DECC
Delta-EE
Deutsche Bank
DNV GL
Dong Energy
Dragon LNG
Drax Power
Durham University
E.ON
Ebico Ltd
EDF Energy
EDF Suez
EirGrid
Electric Ireland
Electricity North West
Electricity Supply Board
Element Energy
Element Power
Elexon
Eneco
Energy and Climate Advisory
Energy and Utilities Alliance (EUA)
Energy for London
Energy Intelligence
Energy Networks
Energy Saving Trust
Energy Technical & Renewable Services
Energy Technologies Institute
Energy UK
Energy Utility Networks
Eni UK
Enstra Consulting
ENTSO-e
ENTSO-g
Enzen
EP&T
ESB International
Evercore
Experian
ExxonMobil
Fabien Society
Falck Group
Federation of Small Businesses
Fluor
Fluxys
Forewind
Fred Olsen Renewables
Gamesa Corporación Tecnológica
Gas Strategies
Gasunie Transport Services
Gazprom Energy
Gazprom Energy Marketing & Trading
GDF SUEZ
Gemserv
GEN Nederland
GERG
Goldman Sachs
GPS PE Pipe Systems
Greater London Authority
Greater London Authority
Green Alliance
GTC
Halite Energy Group
Hamworthy Heating
Harper Energy
Haven Power
Haymarket
Heating and Hotwater Industry Council
Helius Energy
HM Treasury
Holmwood Consulting
Horizon Nuclear Power
House of Lords
HSBC Global Research
Iberdrola
ICG
ICIS
IET
Imperial College London
Industrial and Commercial Energy Association
Institute of Public Policy Research
IUK Interconnector
IVITI Lighting
JX Nippon Exploration and Production
Koch Industries
Labour Party
Lefever Consulting LLC
Legal & General
Liberal Democrat Party
London Energy Consulting
London South Bank University
Macquarie
Major energy users council (MEUC)
Manchester University
Manufactorers association (EEF)
Marks & Spencer
Meygen
MLB Consultanting
Morten Frisch Consulting
Murphy Group
National Energy Action
National Energy Foundation
National Grid
Navigant
Newcastle University
Northern Gas Networks
Northern Power Grid
Northern Power Grids
Npower
Office for Low Emission Vehicles
Ofgem
Oil & Gas UK
Orchard Partners
Oxford Econometrics
Oxford Energy
Oxford Infrastructure Transitions Research Consortium (ITRC)
Parliament UK
Parliamentary Renewable & Sustainability Energy Group
Petronas Energy
Platts
Policy Connect
Policy Exchange
Poyry
Redburn
Renewable Energy Agency South West
Renewable Energy Association
Renewable Energy Systems Group
Renewable UK
Royal Academy of Engineers
Royal HaskoningDHV
RWE Npower
Scotia Gas Networks
Scottish and Southern Energy Power Distribution (South)
Scottish Hydro Energy Transmission Ltd
Scottish Power
Scottish Power Transmission
Senergy
Severn Trent
SGH Martineau
Shanks
Shell
Siemens
Skanska
Smart Energy Consumer
Smartest Energy
Smith Institute
Solar Trade Association
Sonatrach
South Hook Gas
SSE
Stag Energy
Statoil
Sustainability First
Swanbarton
Tata Steel
TGC Renewables
The Alvin Weinberg Foundation
The Crown Estate
The Scottish Government
The University of Manchester
Thomson Reuters
TNEI
Total
Total GP
TradeLink Solutions
Transport Research Laboratory
Tullow Oil
UK Energy
UK Energy Research Centre (ERC)
UK Onshore Oil and Gas (UKOOG)
UK Power Networks
UK Power Reserves
UK Trade & Investment
UKREP (Brussels)
Ultreia Energy
University of East Anglia
University of Loughborough
University of Ulster
University of Warwick
uSwitch
Wales & West Uitlities
Warwick Energy Group
Waters Wye Associates
Welch Power Consulting Ltd
Welsh Government
Western Power
Wipro
Wood Mackenzie
WWF
Zero Carbon Hub

Key Documents

1. Delivering EMR: http://www2.nationalgrid.com/UK/Our%20company/Electricity/Market%20Reform/Announcements/June%202014%20Auction%20Guidelines%20publication/
2. Gas Ten Year Statement: http://www2.nationalgrid.com/UK/Industry-information/Future-of-Energy/Gas-Ten-Year-Statement/
3. Electricity Ten Year Statement: http://www2.nationalgrid.com/UK/Industry-information/Future-of-Energy/Electricity-Ten-Year-Statement/
4. Winter Outlook Report: http://www2.nationalgrid.com/UK/Industry-information/Future-of-Energy/FES/Winter-Outlook/
5. Statutory Security of Supply Report: https://www.gov.uk/government/publications/statutory-security-of-supply-report-2014
6. ENTSO-e Ten Year Network Development Plan: https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-2014/Pages/default.aspx
7. ENTSO-g Ten Year Network Development Plan: http://www.entsog.eu/publications/tyndp
8. Our Electricity Transmission network: a vision for 2020: https://www.gov.uk/government/publications/our-electricity-transmission-network-a-vision-for-2020

We want to hear from you

Join the debate on the future of energy on Twitter at **#ukenergy** and our LinkedIn group "**National Grid Future of Energy**."

Email us with your views on this or any of our future of energy documents at: *transmission.ukfes@nationalgrid.com*

Access our current and past FES documents, data and multimedia at: *www.nationalgrid.com/fes*

Keep up to date on key issues relating to National Grid via our Connecting website: *www.nationalgridconnecting.com/*

You can write to us at:

Energy Strategy and Policy
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

"National Grid have done an excellent job in producing these scenarios. We need to acknowledge the importance of this work. I'd like to commend the efforts they've made."
Supply Chain stakeholder

"The scenarios are so much more than just electricity and gas now. It's good that you're looking at the broader range and impact on society"
Supply Chain stakeholder

National Grid plc
National Grid House,
Warwick Technology Park
Gallows Hill, Warwick,
CV34 6DA, United Kingdom

Registered in England and Wales
No: 4031152

www.nationalgrid.com