nationalgrid

FAQs

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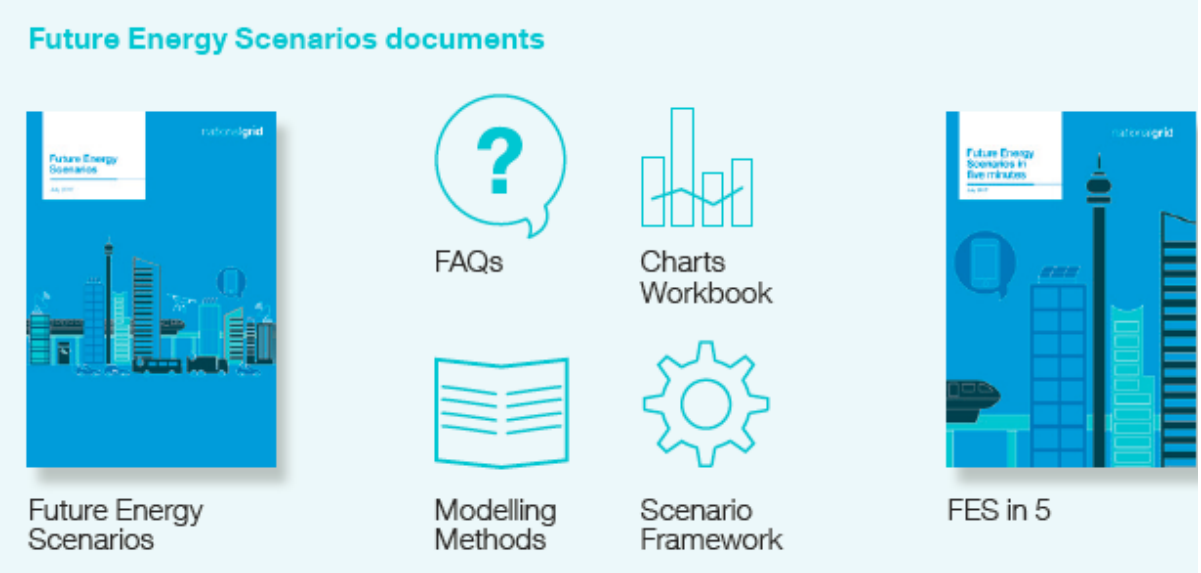
Our **FAQs** publication is just one of a suite of documents we produce as part of our Future Energy Scenarios (FES) process. A huge amount of work including modelling, analysis and interpretation goes into the production of the main document. For ease of use we only highlight significant changes to our modelling methods in the main **FES** document. Alongside this publication we have the **Scenario Framework** that details all the assumptions and levers that are used as input into our models. Our **Charts Workbook** contains all the outputs from the numerous models; the detailed tables, graphs and charts. We also publish a summary document **FES in 5** and our **Modelling Methods**. For more information and to view each of these documents visit our website: www.fes.nationalgrid.com



As new questions appear we will update this document, ensuring the latest question and answers are shared. As with our other FES documents we welcome your feedback, please contact us at: transmission.ukfes@nationalgrid.com

Contents

General questions

Q: How do I ask questions or seek further information about the Future Energy Scenarios (FES)?

A: Please send questions via email to transmission.ukfes@nationalgrid.com. We will answer your questions as soon as we can.

Q: FES looks different this year compared to last year. What has changed?

A: The main FES document is just one of a suite of documents we produce as part of our FES process. A huge amount of work including modelling, analysis and interpretation goes into the production of the main document. For ease of use we have not included all of that data in the main FES document.

Alongside it we have the **Scenario Framework** that details the assumptions and levers that are used as inputs into our models. Our **Charts Workbook** contains the outputs from the numerous models: the detailed tables, graphs and charts. We also publish information on our **Modelling Methods**, a summary document **FES in 5** and these **FAQs**.

For more information and to view each of these documents visit: http://fes.nationalgrid.com/

Q: Where can I find further information about the modelling used for FES?

A: Alongside FES 2017 we have the **Scenario Framework** that details all the assumptions and levers that are used as input into our models. We also publish information on our **Modelling Methods** in a separate document. For more information and to view each of these documents visit: www.fes.nationalgrid.com

Q: Where can I find the data published in the FES?

A: The FES charts and the associated data tables are available in the **Charts Workbook**, which can be accessed on our website http://fes.nationalgrid.com/fes-document/ . The charts are labelled as they are in the main document (e.g. Figure 3.1).

We have also published additional datasets in the Charts Workbook, containing data which supports the FES analysis. The Charts Workbook uses the following abbreviations:

CP: Commodity Prices
GD: Gas Demand
PD: Peak Demand
HT: Heating Technologies
TD: Transport Demand
ES: Electricity Supply
GS: Gas Supply

Q: What is the date format in the Charts Workbook?

A: All gas charts are in calendar years, with the exception of gas peak demand which is in gas years which run from 1st October to 30th September. All electricity charts are in financial years, with the exception of Figure 3.11 (Rollout of electricity smart meters, installations per year) which is in calendar years.

Demand

Q: What are your economic growth scenarios?

A: We used Oxford Economics data to feed into our Industrial and Commercial demand model. In this year's FES we have used four economic conditions which have differing growth rates of Gross Domestic Product (GDP). We believe that these four economic pathways provide enough flexibility to model the potential consequences of the UK leaving the EU. The average GDP growth rates over the FES period are shown in Table 3.1 of the FES document (see below).

FES Table 3.1: GDP average annual growth rate for each scenario

	Two Degrees	Slow Progression	Steady State	Consumer Power
Growth	2.1%	1.3%	1.0%	1.8%

Q: What definition of electricity demand do you use in FES?

A: In FES we consider underlying demand. That is end consumer demand, regardless of where (transmission, distribution or on site) that electricity is generated, plus network losses. Demand is weather-corrected to seasonal normal for annual and average cold spell (ACS) for peak. For clarity it does not include interconnector exports, station demand, pumping station demand or other forms of storage demand.

Q: How does this definition of electricity demand differ from other National Grid publications?

A: Other National Grid publications (the Electricity Ten Year Statement (ETYS), System Operability Framework (SOF), Network Options Assessment (NOA) and our Outlook documents) consider Transmission demand, as they look at future development of the transmission system and year ahead system security of supply.

Q: What definition of gas demand do you use in FES?

A: In FES we consider end consumer demand, regardless of whether customers are connected to the distribution or transmission network. FES shows annual totals so we do not include gas injected into storage, as gas flows into and out of storage will net to zero over a year. Demand is corrected to seasonal normal weather. In the demand and sensitivity chapters we include demand within GB; exports to Ireland and continental Europe are excluded. When matching gas supply to demand we include gas for export, losses on the distribution and transmission networks, and gas used in the operation of the system.

Demand Technologies

Q: How have you selected low carbon technologies in your scenarios and not selected others?

A: We carefully assess all potential new technologies that are publically available. We use a number of criteria to test whether any given technology should be included within the FES, this includes; technology maturity, supply chain potential, commercial readiness, support required, together with consumer and political interest. Each year, we reassess the technologies to ensure that we capture innovation and we test this through engagement with stakeholders. This year's FES includes spotlights which focus on particular technologies that could have a significant impact with future markets.

Q: Where can I find your numbers for installations of low carbon heating technologies?

A: In the charts workbook: Tabs HT1, HT2, HT3 and HT4 contain installations of the various technology types. GD11 counts the number of homes on district heating.

Q: Do you consider Vehicle to Grid (V2G)?

A: Vehicle to Grid (V2G) is not in the FES 2017 Scenarios. We are well aware V2G could be significant in providing demand side response services (Two Degrees has 25 million electric vehicles by 2050).

We will explore Vehicle to Grid further in an Energy Insights Thought Piece to be published in 2017. We will continue to reassess V2G as it develops against our criteria for new technology.

Q: Do you have profiles for heat pump and electric vehicle usage?

A: Our profiles are informed by data from "Low Carbon Network" projects, which were funded by Ofgem:

The "Customer Led Network Revolution" project library contains a wealth of information on different innovation project trials.
http://www.networkrevolution.co.uk/resources/project-library/

Searching for "Electric Vehicles" or "Heat Pump" will find the following datasets, as well as a number of reports and summaries on trial design and findings. Data is also available for residential solar panels, micro Combined Heat and Power (CHP) and demand side response trials.

CLNR-L078 Dataset TC6: Enhanced Profiling of Domestic Customers with Electric Vehicles CLNR-L075 Dataset TC3: Enhanced Profiling of Domestic Customers with Air Source Heat Pumps

Additional information is available from the "My Electric Avenue" which trialled over 100 Nissan Leafs for 18 months.

http://myelectricavenue.info/

Q: How do you account for demand side response in FES?

A: Because we are interested in the underlying demand within our FES figures, we only count where the consumer has shifted their usage. We do not include where a consumer has switched to another power source – such as a generator or battery storage. This is not a demand shift as their demand is still the same it is just being sourced differently. This figure would be captured in the supply side and,

if we were to include on the demand side, we would end up double counting the true generation that is available.

In FES we do not include industrial and commercial demand side response within our definition of peak (our definition is an “unrestricted” one), but we do incorporate residential demand shifts, because of time of use tariffs, as these are considered a behavioural shift rather than economically derived.

Supply

Q: Where can I find information on your projections for generation capacity?

A: In the Charts Workbook downloadable with the main document:

Tabs ES4, ES6, ES8, ES10 contain capacity figures (MW) for transmission connected, distribution connected and <1MW generation (contains micro-generation), as well as totals.

Tabs ES5, ES7, ES9, ES11 contain annual output figures (GWh) by the categories described above, as well as totals.

Q: Are network constraints (such as thermal constraints, or fault current constraints) taken into consideration when calculating the amount of generation that is going to connect to either the transmission or distribution network?

A: Our modelling is built up from the capacities on the network, but we don't take into account current operational unavailability. The impact on the network is assessed in the Electricity Ten Year Statement and the System Operability Framework. Both documents are published in the Autumn and are available at http://www2.nationalgrid.com/uk/industry-information/future-of-energy/

Q: How does hydrogen feature in your scenarios?

A: Hydrogen features in the latter period of our Two Degrees scenario. It is used to fuel HGVs via fuel cells. Hydrogen for heating is not yet commercially proven, so we have not included it in our core scenarios. However, it is an interesting area and we have described a possible hydrogen future in our Decarbonised Gas sensitivity.

Q: Why do you use generic imports for gas supplies?

A: The background and our thinking on the UK's gas supply sources are described on pages 79 onwards in the FES document. In summary, we build our gas supply scenarios by assessing the likelihood that various supply types come to GB. For example, UK Continental Shelf, shale or green gas (biogas or bio synthetic natural gas) are added to our supply sources first as they are indigenous. This is followed by Norwegian gas as some fields are directly connected to import terminals in GB and minimum levels of LNG are added as some LNG must flow due to boil-off requirements.

For some years our scenarios have included specific volumes of imported LNG and continental gas, as well as a volume of 'Generic Import', which could be LNG or continental gas or a mixture. This approach effectively provides ranges for LNG and continental gas imports in each scenario. Predicting LNG flows in the world market is challenging and you have told us that our approach is a sensible way of dealing with the uncertainty.

Version

Version number	Date of update	Description of update
1.0	13/07/17	First upload for FES 2017 launch on 13th July 2017

Please contact us at: transmission.ukfes@nationalgrid.com