

# Electricity Ten Year Statement

Half-year Update to ETYS 2014

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UK electricity transmission

# Introduction

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National Grid published the Electricity Ten Year Statement (ETYS) for the third time in November 2014 to provide you an insight into the future development and operability of the transmission system over the next twenty years.

The Electricity Ten Year Statement is produced by National Grid in our role as National Electricity Transmission System Operator (NETSO). Transmission Owners (TO) in Scotland – SHE Transmission and SP Transmission, and in England and Wales - the TO business within National Grid have also helped provide information to support the production of the document. We aim to provide you clarity and transparency on our decisions on the future network development of the GB Transmission system. The ETYS considers this development through strategic network modelling and design capability, while trying to capture future uncertainty with regards to the generation mix, operation of the network and technology development. Our analysis builds on the UK Future Energy Scenarios (FES) that are developed with our stakeholders.

The 2014 ETYS also included an outline of the National Grid Network Development Policy which defines how National Grid assesses the need to progress wider system reinforcements onshore in England and Wales to meet the requirements of our customers in an economic and efficient manner.

In response to your feedback we published more information in the last ETYS than in 2013, including information on our Operational Cost Assessment which forms one of our key inputs to the transmission investment decision-making process when assessing wider works.

Since last November, we have continued to develop the transmission system in accordance with strategy presented in the 2014 ETYS with some minor changes based on new information received. We therefore would like to provide you an update on the progress of a number of key transmission projects.

We would also like to share with you how feedback received to date has helped us shaped this year's document. Stakeholder feedback has been one of the key things considered when outlining the form of 2015 ETYS. We continue to welcome your views on how the Electricity Ten Year Statement could evolve to better meet your needs and your expectations.

# Key Updates

## Key Transmission Project Updates

Since we published the last ETYS in November 2014, we have continued to review the transmission system development. We would like to provide you an update on the progress of a number of key transmission projects.

- East Coast 400kV Upgrade, now East Coast Phase 1 Upgrade (asset reinforcement option 9, ETYS 2014)
- Western HVDC Link (asset reinforcement option 19, ETYS 2014)
- B6 Series and Shunt Compensation (asset reinforcement option 18, ETYS 2014)
- Penwortham Quad Boosters (asset reinforcement option, ETYS 2013)
- Trawsfynydd – Treuddyn Tee Reconductoring (asset reinforcement option 66, ETYS 2014)

### East Coast Phase 1 Upgrade

Project details: A joint SHE Transmission and SP Transmission project to upgrade the existing east coast overhead line circuit between Blackhillock and Kincardine by reprofiling existing overhead lines between Kintore and Kincardine and Tealing and Westfield for higher operating temperatures and reconductoring the overhead line section between Rothienorman and Kintore. Includes new substations at Rothienorman and Alyth and associated interface works required at Blackhillock substation.

<b>Current status</b>	Planning	<b>Primary boundary capability increase</b>	B4	800MW
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This option was published in 2014 ETYS as East Coast 400kV Upgrade. Since last November the scope of the project has been updated to reflect the latest requirements.

### B6 Series and Shunt Compensation

Project details: Install series compensation in the Harker-Hutton, Eccles-Stella West and Strathaven-Harker routes. Two 225MVar MSCs to be installed at Harker, one at Hutton, two at Stella West and one at Cockenzie. Upgrade the Strathaven-Smeaton route to 400kV and upgrade the Eccles 400kV cables at Torness. This effectively reduces the impedance of the Anglo-Scottish circuits improving their loading capability. The English stage of works can be completed in 2015 ahead of those in Scotland.

<b>Current status</b>	England: Commissioned Scotland: In construction	<b>Primary boundary capability increase</b>	B6	1000MW
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The English stage of B6 Series and Shunt Compensation was completed and commissioned in February 2015. The project improves capability to export power from Scotland to England and in the longer term help reduce potential constraint costs incurred across the main Scotland to England boundaries. The Scottish stage of works are planned to be delivered in 2016.

## Western HVDC Link

Project details: This is a new 2.4GW (short-term rating) submarine HVDC cable route from Deeside to Hunterston with associated AC network reinforcement works on both ends. At the northern end it will include construction of a Hunterston East 400kV GIS substation. Reconfiguration of the associated 400kV network will facilitate the decommissioning of Inverkip 400kV substation and the future rationalisation of the local overhead line network.

Current status	In construction	Primary boundary capability increase	B6	2200MW
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The Western HVDC Link is currently under construction. We anticipated a delivery date of 2016 in 2014 ETYS; however the latest information suggests a possible delay in delivery date to 2017.

## Penwortham Quad Boosters

Project details: Install a pair of 2750MVA quadrature boosters (QBs) on the double circuits which run from Penwortham to Padiham and Daines at the Penwortham 400kV substation. The pair of QBs will improve the capability to control the north to south power flows on the circuits connecting the North Midlands and the West Midlands, and hence improve the capability of the network to transport the excess generation from the north to demand centres in the south.

Current status	Commissioned	Primary boundary capability increase	B7a	400MW
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The Penwortham Quadrature Boosters (QBs) were completed and commissioned in December 2014. The project provides additional flexibility over the control of power flow around North West England. This will help reduce potential constraint costs to the network due to north to south flow limitations on the North West England circuits.

## Trawsfynydd – Treuddyn Tee Reconductoring

Project details: The route was constructed in 1961 and updated to 400kV in 1976. The latest proposal to reconductor the double circuit to GAP forms the first part of a suite of anticipatory investments in North Wales, designed to deliver increased transmission capacity in readiness for the first stages of nuclear and wind farm generation connecting in North Wales.

Current status	Commissioned	Primary boundary capability increase	NW3	2130MW
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The Trawsfynydd – Treuddyn Tee Reconductoring was completed and commissioned in October 2014. The project provides the additional capability required to export the power from North Wales as we see an increasing amount of new generation connecting to the region.

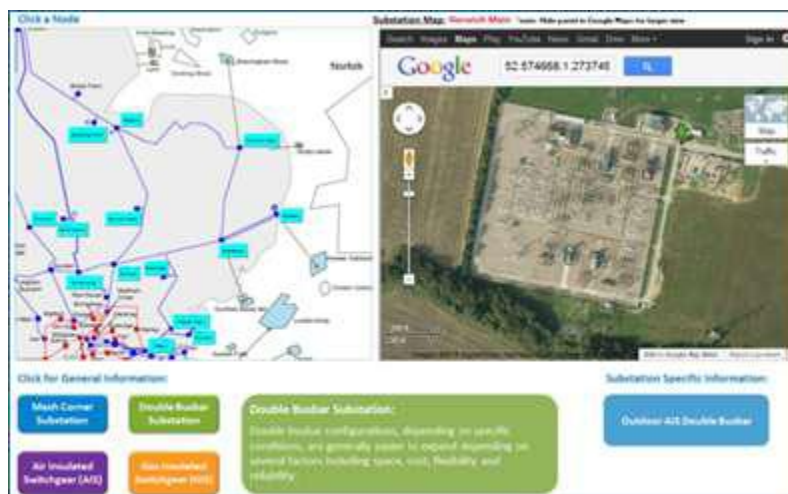
# Improving Your Experience

We have listened to what you told us over the last 6 months about improvements you would like to see in ETYS in the future through various engagement activities. This has included customer seminars held in London and Glasgow on the 26<sup>th</sup> February and 5<sup>th</sup> March respectively, an online questionnaire and provision of a dedicated contact e-mail address. In response to your feedback, we are currently working on a new interactive Customer Connection Interface Tool to provide you with user friendly access to connection application information. Furthermore, we are committed to publish the second System Operability Framework (SOF) report in November, which as a standalone document will allow us to provide you a better experience with more detailed information on the in-depth, year-round impact of FES on system operability.

Your feedback will help us shape our document in the future and focus our discussion on topics which you are most interested in. If you would like to tell us your views on ETYS, you can get in touch with us via e-mail to [transmission.ety@nationalgrid.com](mailto:transmission.ety@nationalgrid.com).

## Customer Connection Interface Tool

We understand having easy and quick access to the information most relevant to our customers in a user friendly way is important. National Grid has been working on an interactive tool which you can select certain areas of the NETS and display information in a user friendly way to assist in gaining a high level appreciation of current and future generation connection, site specific information and timeframes for connecting customers.



This interactive tool is not intended to be a complete decision making tool; instead it is meant to complement the current application process and provide user friendly access to information so that customers can be better informed ahead of the initial discussions with National Grid. The prototype tool has recently been presented at the Customer Seminars in London and Glasgow, receiving very positive comments and feedback encouraging its roll out. This prototype tool contains information of the East Anglia area and consists of three key elements:

- A graphical representation of capacity in the area through the Transmission Entry Capacity (TEC) Register Data, which represents contracted generation, and Future Energy Scenarios data to illustrate the envelope of plausible future scenarios

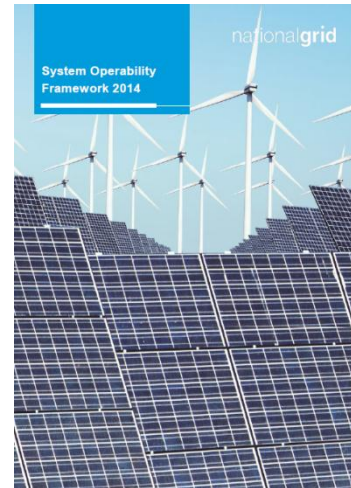
- Information about substations managed by National Grid in England and Wales
- A heat map colour coded depending on connection capacity and time frames

Our plan is to develop the tool further in stages to complement the ETYS.

## System Operability Framework (SOF)

In ETYS 2014 we published information of the high level impact of FES on system operation. The information we provided in ETYS duplicated the System Operability Framework (SOF) that had been developed to provide an in-depth assessment of future system operability. The first SOF<sup>1</sup> report was published in September 2014.

In response to the positive feedback we have received to our first SOF report, we are committed to publish the SOF report annually as part of our suite of “Future of Energy” documents. The second SOF report will be published in November 2015. We believe the standalone document will allow us to provide you a better experience with more detailed information on the in-depth, year-round impact of FES on system operability. It will also allow us to focus the discussion with you around the specific system operability topics that you are interested in. Therefore we intend on removing Chapter 5 (System Operation) from ETYS in 2015, which will let us focus on future system development in ETYS and on future system operability in SOF.



For more information or to get involved, please take a look at the System Operability Framework site at

<http://www2.nationalgrid.com/UK/Industry-information/Future-of-Energy/System-Operability-Framework/>

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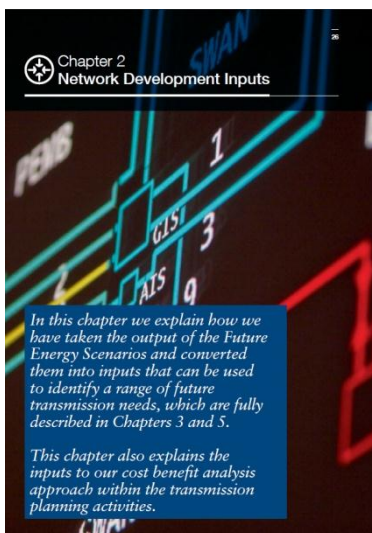
# Way Forward - ETYS 2015

The next Electricity Ten Year Statement will be published in November 2015. We have already started working on this year ETYS to ensure we will be providing you the information on future system development that meet your needs and expectations. We would like to take this opportunity to share with you our proposed form of 2015 ETYS prior to its publication in November.

As the consultation process of the Integrated Transmission Planning and Regulation (ITPR)<sup>2</sup> project is still underway, we are yet to confirm the final requirements and form of the Network Options Assessment (NOA) report. Depending on the final decision on the form of NOA report, some of the information that we currently publish in ETYS may be removed and published in NOA report instead to avoid repetition of messaging within these key industry documents.

## Chapter 1: Introduction

This section will provide an overview of the background to the document, its aims, the methodology used in its development and guidance on how to navigate the ETYS document.



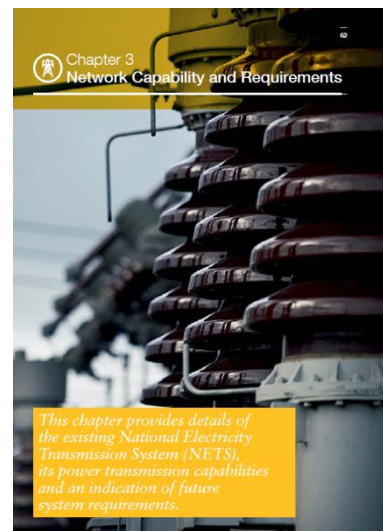
## Chapter 2: Network Development Inputs

This section will briefly describe the background information and scenarios used to guide the analysis work in this document. The scenarios will have been described in detail in the UK Future Energy Scenarios 2015 document (UKFES, the next edition is due to be published in July 2015) which will be referenced heavily in this section. An overview of how the UKFES is used to support system planning analysis is also included.

This section will also discuss how the Electricity Scenario Illustrator (ELSI) is utilised to support the operational cost assessment which aids the transmission investment decision-making process in England and Wales.

## Chapter 3: Network Capability and Requirements

This chapter will describe the capabilities of the onshore and offshore National Electricity Transmission System (NETS). It will also discuss how the different scenarios as described in Chapter 2 will affect the NETS at a local, regional and national level. Reporting of system capability will be by traditional boundary analysis, with future capability marked against SQSS driven boundary requirements for the different scenarios. Potential development of European interconnections will also be discussed in this chapter.



<sup>2</sup> For more information on ITPR project, please refer to Ofgem's website at <https://www.ofgem.gov.uk/publications-and-updates/integrated-transmission-planning-and-regulation-itpr-project-final-conclusions>

Chapter 4  
Network Development  
and Opportunities

*This chapter focuses on how the National Electricity Transmission System (NETS) can be developed in response to the drivers presented in the previous chapter. Potential solutions are presented and we consider possible opportunities for current and future users of the electricity transmission system.*



## Chapter 4: Network Development and Opportunities

This ETYS chapter will discuss the potential onshore and offshore NETS developments, as well as the various asset, operation and commercial options available that could be required in response to system performance against the different scenarios and sensitivities considered. This information will be presented in such a way as to allow readers to identify connection and usage opportunities of the NETS on a local, regional and wider basis. The supporting data will be available in the Appendices.

This chapter will also include a summary description of National Grid's Network Development Policy (NDP), which outlines the process for development and planning of the electricity transmission network in England and Wales. Using the scenarios and development options presented earlier, the conclusions from an NDP assessment will be presented in this chapter.

## Chapter 5: Way Forward

This section will set out the way forward following the publication of the 2015 ETYS, including a timetable outlining our proposed engagement activities in 2016.

## ETYS Appendices

The Appendices will contain all the detailed technical data and numeric data tables.

- System maps and schematics
- System data
- Power flow diagrams
- Fault level data
- Technology
- Generation data
- Demand data