NETS Seven Year Statement
May 2010

Executive Summary

Introduction

This 2010 National Electricity Transmission System Seven Year Statement (NETS SYS) is the sixth Statement to be produced since the British Electricity Trading and Transmission Arrangements (BETTA) came into effect on 1 April 2005. With the introduction of BETTA, National Grid, in its role as National Electricity Transmission System Operator (NETSO, formerly GBSO), is required to produce a single NETS SYS covering the whole of Great Britain on an annual basis. The two Scottish transmission licensees are required to assist National Grid in preparing the Statement pursuant to their licence obligations

This 2010 NETS SYS presents a wide range of information relating to the transmission system in Great Britain including demand, generation, plant margins, characteristics of the existing and planned national electricity transmission system, its expected performance and capability and other related information. Amongst other uses, this information is intended to assist existing and prospective new Users of the national electricity transmission system in assessing opportunities available to them for making new or further use of the national electricity transmission system in the competitive electricity market in Great Britain.

This Executive Summary provides a brief description of some of the key points contained in the main text. For a more complete picture on any particular topic, including the terminology used, the reader is advised to consult the relevant section of the main text. In particular, readers unfamiliar with BETTA are advised to refer to the chapter in the main text titled “Market Overview” (Chapter 10), which provides a high level overview of BETTA and also reports on related issues such as governance, institutional and contractual arrangements, and provides a link to the new Offshore Development Information Statement (ODIS).

It should be noted that the generation background, on which this document is based, is not National Grid’s forecast of the most likely developments over the next seven years (due to commercial confidentiality we are unable to show this level of detail on future generation project developments). The generation background is a factual list of existing and proposed generation projects that have a signed connection agreement. Consequently, care must be taken when interpreting the results as there is a degree of uncertainty associated with the number of generation projects opening or closing.

On the other hand, the main demand forecasts included in this document are National Grid’s own forecasts. Demand forecasts received from customers are also included for comparison purposes.

The data and results presented in this summary are correct as at 31 December 2009 (the data freeze date) and do not include changes in the contracted position since that date. Any subsequent changes to the contracted background will be published in the NETS SYS Updates.

The NETS SYS updates have now been included within the Transmission Networks Quarterly Connections Update, which is published at the following location:

http://www.nationalgrid.com/uk/Electricity/GettingConnected/gb_agreements/

The latest update was issued in April 2010, and includes contractual changes that have occurred since the data freeze date.

Electricity Demand (See Chapter 2)

The main forecasts of electricity demand to be met from the national electricity transmission system presented in this Statement are National Grid's own forecasts. These (NGET) forecasts are national projections for Great Britain. For comparison purposes, forecasts based on information submitted by Customers who take (or propose to take) electricity from the system are also presented. These 'User' based forecasts are based on the demands at individual Grid Supply Point demands.

Unless otherwise stated, all demand forecasts presented are in respect of the Average Cold Spell (ACS) winter peak and include transmission losses, distribution losses and exports to External Systems across External Interconnections. The forecasts are in respect of the time of simultaneous peak on the national electricity transmission system and are unrestricted (i.e. take no account of demand response/management by customers). This prudent approach in transmission planning is made on the basis that demand response/management by customers cannot be fully relied upon to be enacted at peak times.

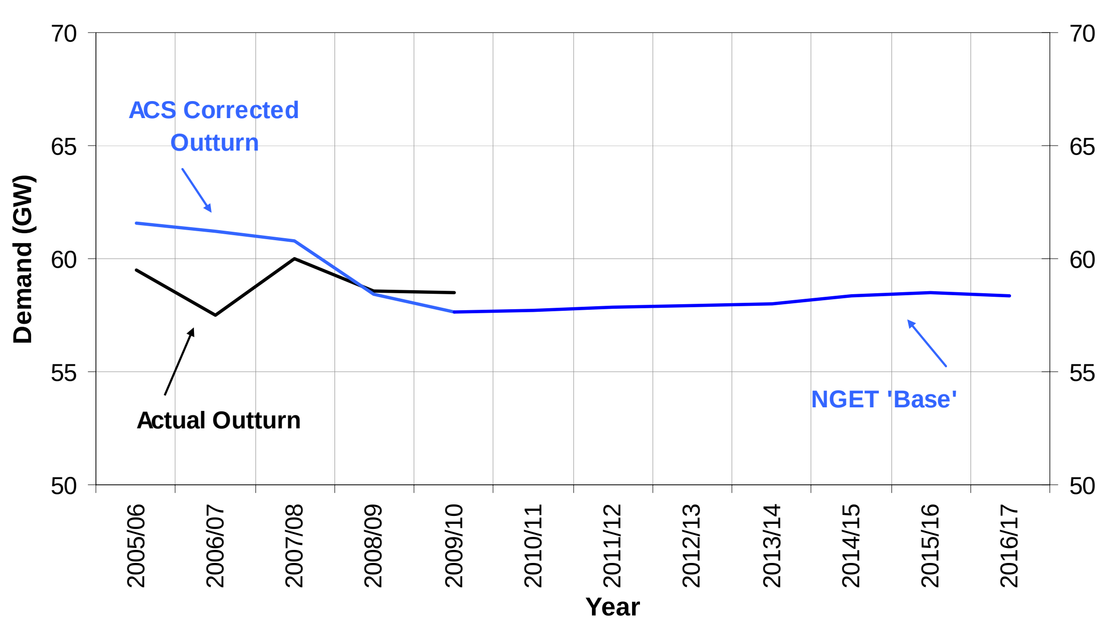
Outturn Peak Demand

Correcting historical actual demands to ACS conditions eliminates the weather effects and gives a better indication of the underlying pattern of annual peak demand. Correcting winter weekday peak demands in 2009/10 to ACS conditions yields a provisional 'unrestricted' peak of 58.2GW; a decline of 0.8GW on the previous winter's ACS peak.

The major factor in the decrease in demand over the last year has been the effect of the economic downturn. General energy efficiency measures such as energy saving light bulbs have also contributed to the decrease. The demand also includes a 100MW assumed interconnector export at peak to Northern Ireland.

Figure ES.1 includes recent outturns together with the current NGET 'Base' forecasts of ACS peak demand on the GB transmission system. Please note that the demands in Figure ES.1 are exclusive of station demand (0.6GW).

Figure ES.1 - Historical Outturn & NGET's 'Base' Peak Demand Forecast



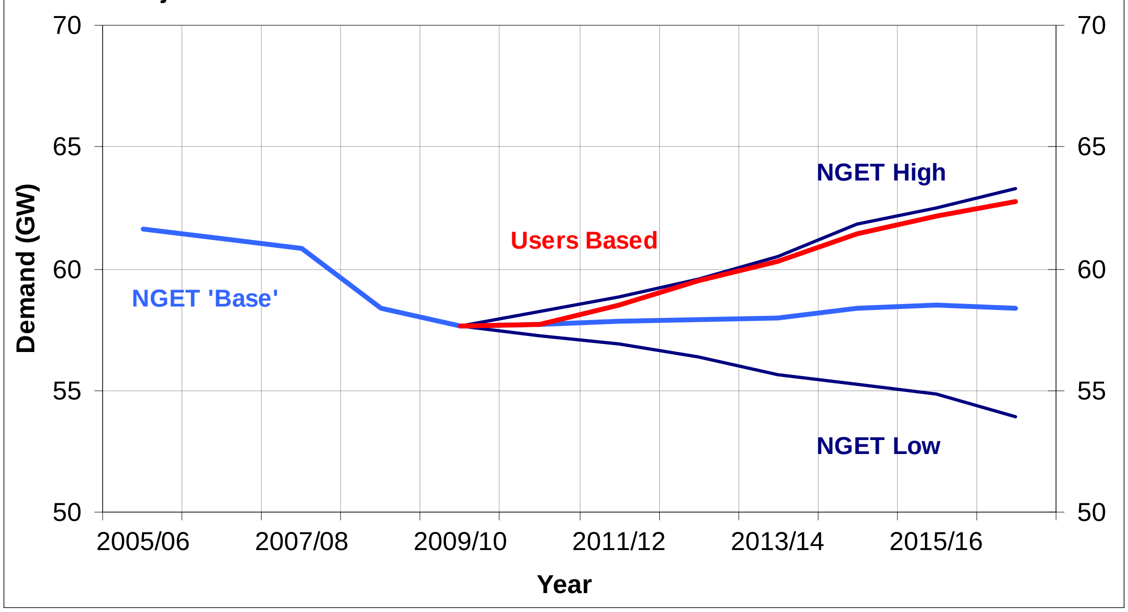
National Grid View of Demand Growth

As well as our own 'Base' forecast of peak demand and annual electricity requirements, we have also prepared 'High' and 'Low' transmission system demand scenarios. For the 'High' and 'Low' demand scenarios, combinations of favourable and adverse developments are assumed which yield high and low transmission system demands. For example, in the Low scenario better progress towards the government's 2010 targets and beyond for combined heat and power and renewables is assumed, resulting in stronger growth in embedded generation. In contrast, in the High demand scenario there is a much slower take-up of such schemes and hence embedded generation. These assumptions, along with variations for other factors such as economic growth and fuel prices, result in a fairly wide range of outcomes for transmission system demand.

Figure ES.2 compares our Base, High and Low demand forecasts with the User based forecasts. Under the 'Base' forecast the ACS 'unrestricted' peak demand shows slow average growth of 0.2% per annum from 57.6GW in 2009/10 to 58.4GW in 2016/17. Please note that the demands in Figure ES.2 are exclusive of station demand (0.6GW).

Figure ES.2 also includes actual and weather-corrected recent outturns of peak demand.

Figure ES.2 - Comparison of Users-Based Forecast and NGET's Projections



User Based Forecasts

Figure ES.2 also shows peak unrestricted demand on the national electricity transmission system in ACS (average cold spell) conditions, as projected by the system 'Users', which increases from the provisionally estimated outturn of 57.6GW in 2009/10 to 62.8GW by 2016/17. This represents an average growth rate of 1.2% per annum over the period as indicated in Figure ES.2.

Throughout the period covered by this year's forecast, the User based forecast is more optimistic than NGET's 'Base' forecast and is almost as high for all years as NGET's High growth scenario projections. In the past, the User based forecasts have tended to underestimate the likely impact of embedded generation on system demand, which results in higher demand forecasts. Furthermore, the User based forecasts were submitted last June based on demand seen in 2008/09. The NGET forecasts benefit from being based on demand seen in 2009/10, when peak demand fell against the background of an economic downturn.

In general, the level and location of generation remains the major factor in determining the need for transmission reinforcements. However, in some areas (e.g. where demand exceeds generation) it is demand that can exert the greater influence and as such there is an increasing need for accurate demand forecasts in terms of both level and location.

Generation (See Chapter 3)

Chapter 3 presents information on all sources of generation that are used to meet the ACS Peak Demand. Accordingly, this chapter reports on all power stations directly connected to the national electricity transmission system, whether they are classified as Large, Medium or Small, all directly connected External Interconnections with External Systems and all Large power stations, which are embedded within a User System (e.g. distribution system).

In recognition of the uncertainties associated with the future, unless otherwise stated the information presented relates to existing generation projects and only those proposed new generation projects which are classified as "transmission contracted". Hence the SYS generation background is a factual list of contracted sites and is not a forecast of which generators are expected to remain in operation or which proposed new generation projects are deemed most likely to proceed to completion.

Consequently, care must be taken when interpreting the overall capacity figures as a number of stations will close due to the Large Combustion Plant Directive (LCPD) and many of the proposed projects will not progress to a connection. In addition there may be some non-contracted projects not included within the SYS that may proceed to a connection during the seven years.

Figure ES.3 - Main Changes in Generation Capacity

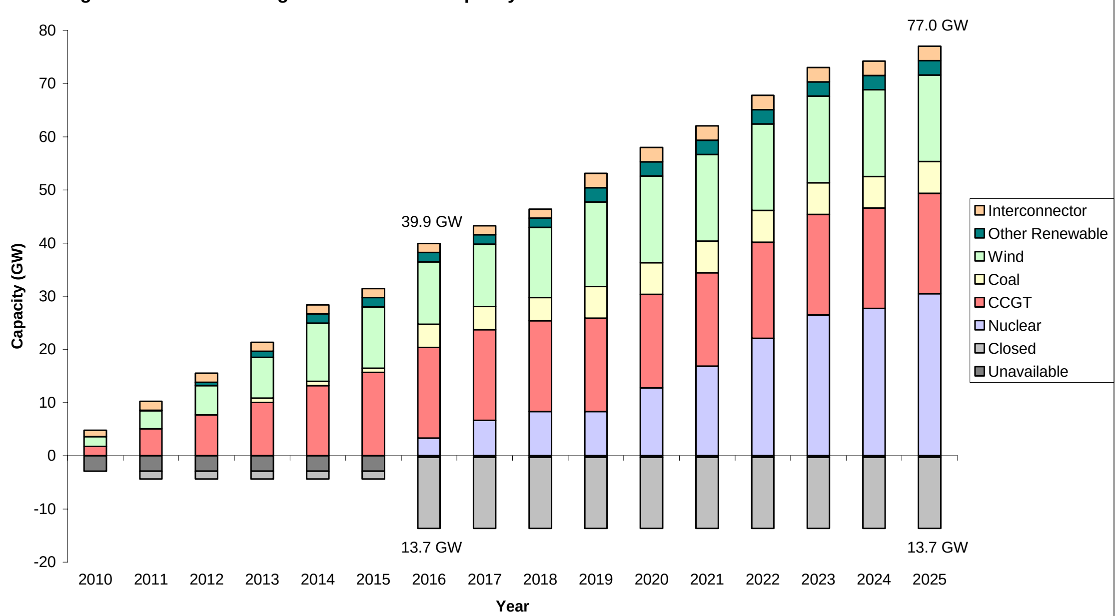


Figure ES.3 illustrates the reported increase in generation capacity from 2009/10 onwards. Notified reductions in capacity from plant closures and from plant being placed in reserve have been taken into account. The capacity of stations that will close on or before 31st December 2015 due to opting out of the LCPD amounts to 12GW of coal and oil capacity. These stations have been retained in the generation background up to and including 2015/16 because of the uncertainty over closure date and the potential for them to be available at peak in 2015/16 if the peak is prior to Christmas. The affected stations have however, been shown as closed from 2016/17 onwards, and this accounts for the step change in closed capacity in 2016 shown in Figure ES.3.

Figure ES.3 shows that over the seven years of this statement, from 2010/11 to 2016/17, there is a reported rise in new capacity of 39.9GW. Featuring in this increase are 17.1GW of CCGT, 11.7GW of wind, 4.4GW of new coal capacity, 1.7GW of other renewables (mainly biomass and biopower) and 1.7GW of interconnectors.

Although outside the scope of this statement, the level of contracted activity beyond 2016/17 is also depicted in Figure ES.3. Figure ES.3 shows that up to and including the year 2025, there is a reported increase in new capacity of 77.0GW. The effect of the proposed new nuclear generation can be seen in the later years, and accounts for 30.5GW of this total. The remainder is made up from 18.9GW of CCGT, 16.3GW of wind, 6.0GW of new coal capacity, 2.7GW of interconnectors and 2.7GW of other renewables (mainly biomass and biopower, but with some tidal and wave).

Further details of individual projects can be found in the Transmission Networks Quarterly Connections Update:

http://www.nationalgrid.com/uk/Electricity/GettingConnected/gb_agreements/

It is worth remembering, however, that, in the event, there may well be a more graded increase in activity over the years, than that shown in Figure ES.3. The fact that a project is currently 'transmission contracted' is not an absolute guarantee that the project will proceed to completion since there are other factors, which may also influence that outcome (e.g. financing, fuel prices, planning consents etc.).

Figure ES.4 - Installed Capacity and Peak Demand

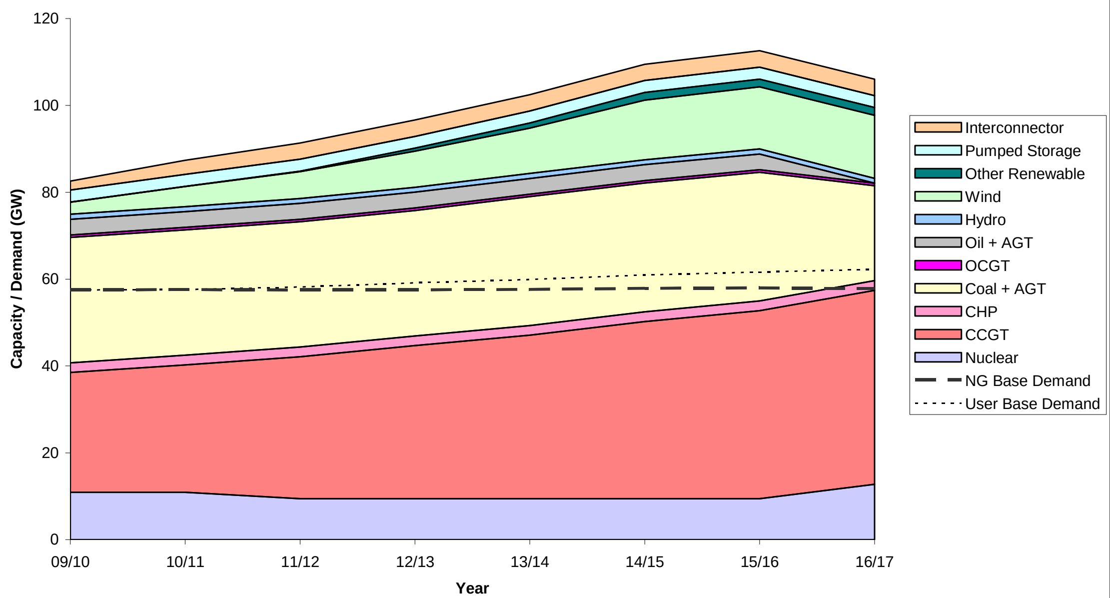


Figure ES.4 illustrates the main plant types of the contracted generation background over the period from 2009/10 to 2016/17 and includes both existing and proposed new transmission contracted generation. The aggregate power station capacity (TEC and/or 'Size of Power Station') is reported to rise from 82.6GW in 2009/10 to 109.1GW by 2016/17. This represents an overall increase of 26.6GW, or 30.4% of the 2009/10 total, over the period from the 2009/10 winter peak to the 2016/17 winter peak. This net increase is made of the following:

- an increase of 17.1GW (+19.5%) in CCGT capacity;
- an increase of 11.7GW (+13.4%) in wind capacity;
- a net increase of 1.85GW (+2.1%) in nuclear capacity;
- an increase of 1.7GW (+2.0%) in other renewables capacity (mainly biomass, biopower and woodchip generation) (shown collectively as biopwer in Figure ES.4);
- an increase of 1.7GW (+1.9%) in new import capability (+1.9%);
- a decrease of 3.6GW (-4.2%) in oil capacity (-4.2%);
- a net decrease of 3.9GW (-4.5%) in coal capacity.

The largest change is due to the 17.1GW increase in CCGT plant capacity over the period. On this basis, the CCGT plant has the potential to overtake coal as the predominant plant type in capacity terms. By 2016/17, CCGT capacity is reported to exceed coal capacity by 19.7GW and account for 40.1% of the total transmission contracted installed generation capacity. Please note that this growth in CCGTs of 17.1GW excludes those stations under construction that are contracted to connect in 2009/10, e.g. Severn Power Stage 1 and Staythorpe Stages 1, 2 & 3, amounting to a total of 1.7GW. In addition there are a number of other CCGTs under construction e.g. Severn Power Stage 2, Staythorpe Stage 4, West Burton Stages 1, 2 & 3 and Grain Stages 2 & 3, which amount to 3.4GW and are included in the 17.1GW figure.

The second largest reported increase is due to the growth in Wind generation, with onshore wind accounting for a 5.3GW increase and offshore wind accounting for a 6.4GW increase in overall capacity. Wind generation capacity (both onshore and offshore) is reported to rise to 14.5GW by 2016/17. Currently around 1.8GW of wind is under construction with 0.8GW due to connect in 2009/10 and 1GW contributing to the 11.7GW reported growth over 2009/10 to 2016/17.

The above capacities do not include the embedded Medium and Small generation and embedded External Interconnections with External Systems. The capacity of such embedded generation sources is the subject of Chapter 4 (Embedded and Renewable Generation).

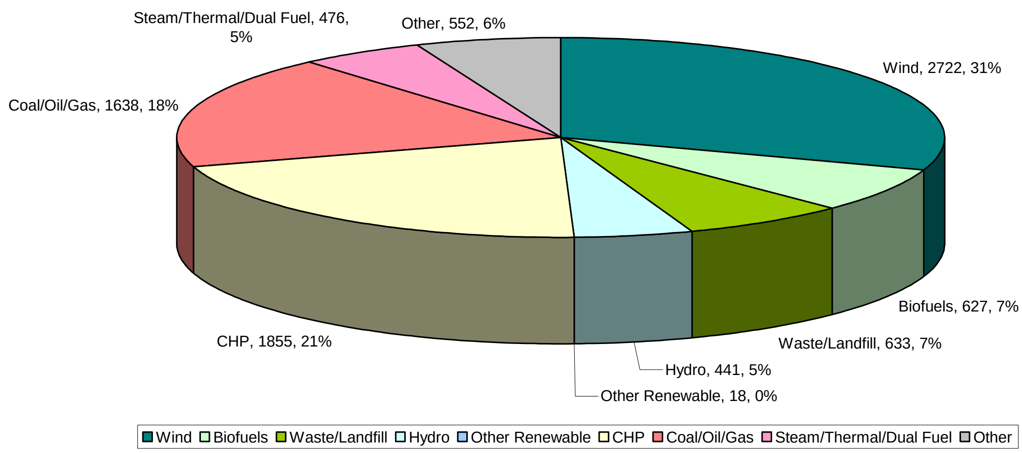
It should be remembered that the above figures reflect the current contracted position and take no account of future uncertainty. As mentioned previously, it is reasonable to suppose that further new applications for power station connections will be received and, at the same time, some existing contracts may be modified or terminated and some existing power stations will close.

Embedded and Renewable Generation (See Chapter 4)

The focus of this chapter is on embedded Medium and Small power stations and embedded External Interconnections with External Systems. Embedded Large power stations are reported in the previous chapter.

Much of the existing and future embedded generation is either in the form of combined heat and power (CHP) projects or in the form of renewable projects. This chapter considers these two types of generation source, their growth, the implications for the GB transmission system and other related issues. In so doing, the chapter also reports on non-embedded renewable sources of generation (e.g. wind farms). Figure ES.5 summarises the data presented in Chapter 4 in terms of the main plant and fuel types.

Figure ES.5 - Main Types of Embedded Generation (MW)



In Figure ES.4, the 2.7GW of wind capacity consists of 1.8GW of onshore wind and 0.9GW of offshore wind capacity. The 2.7GW of wind capacity shown in Figure ES.5 is in addition to the installed wind capacity reported under “Generation”. Please note that the output of embedded wind generation is seen by National Grid as negative demand and as a consequence is netted of the demand within the distribution networks.

National Grid recognises the importance of climate change issues and that the Government’s targets for growth in CHP and renewable generation are likely to lead to a continuing growth in embedded generation. It is important for National Grid to play its part in facilitating this growth by ensuring that any transmission issues arising are appropriately addressed. At present, no insurmountable transmission problems associated with accommodating new embedded generation projects are foreseen. Indeed, the properties of the interconnected transmission system are such as to facilitate embedded generation growth regardless of location.

Nevertheless, this does not preclude the potential need for reinforcements to the GB transmission system, the extent of which would be a function of the system location of the new plant. For example, the extent, and therefore cost, of GB transmission reinforcement would be a function of the volume of offshore wind located off the England and Wales coast or onshore wind located in Scotland.

National Grid’s responsibility in the Balancing Mechanism is to balance generation and demand and to resolve transmission constraints. The intermittent effect of wind (i.e. its output is naturally subject to fluctuation and unpredictability relative to the more traditional generation technologies) coupled with the expected significant diversity between regional variations in wind output means that, while the balancing task will become more onerous, the task should remain manageable. Provided that the necessary flexible generation and other balancing service providers remain available, there is no immediate technical reason why a large portfolio of wind generation cannot be managed in balancing timescales.

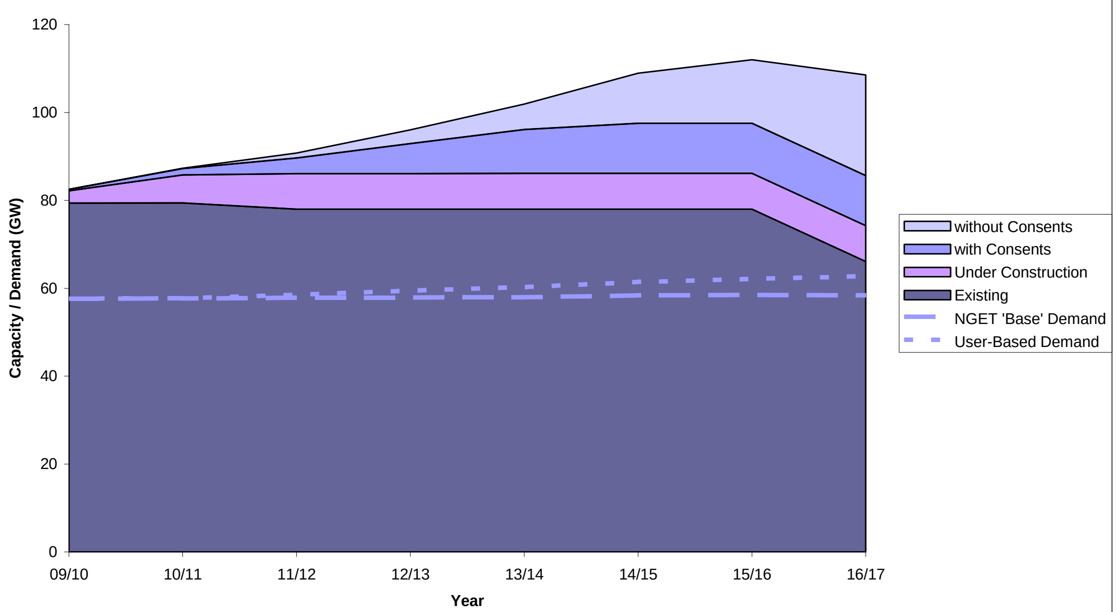
In the longer term, we do not think it likely that there will be a technical limit on the amount of wind that may be accommodated as a result of short term balancing issues, but economic and market factors will become increasingly important, most notably the potential impact of both the interim and enduring connect and manage regimes.

Plant Margin (See Chapter 5)

This chapter brings together information on generation capacity and forecast ACS unrestricted peak demand from previous chapters and examines the overall plant/demand balance on the national electricity transmission system by evaluating a range of potential future plant margins. The chapter concludes with a brief report on the related issue of gas and electricity market interaction.

It is emphasised that none of the plant margins presented in this chapter is intended to represent our forecast or prediction of the future position. The primary purpose is rather to provide sufficient information to enable the readers to make their own more informed judgements on the subject. The plant margins presented have been evaluated on the basis of a range of different backgrounds, as shown graphically in Figure ES.6.

Figure ES.6 - Capacity Totals and Peak Demands



In view of these uncertainties relating to the future generation position, four different generation backgrounds have been considered in Figure ES.6. Each has been selected in recognition of the different level of certainty relating to whether the proposed new transmission contracted plant will, in the event, proceed to completion.

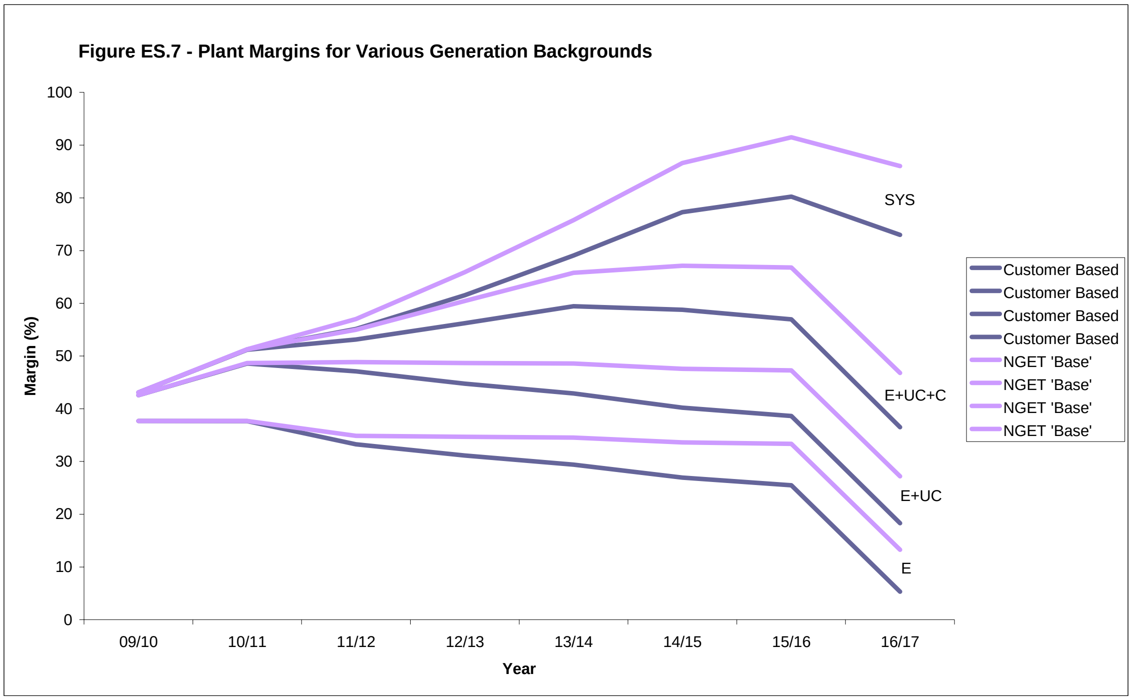
- Background 1: ‘Existing Background’ (E)
  This background includes all transmission contracted generation plant that is already constructed and connected to either the transmission network or a distribution network

- Background 2: ‘Existing or Under Construction Background’ (E+UC)
  This background includes all the generation included under background 1, plus all future generation plant under construction.

- Background 3: 'Consents Background' (C)
  A second useful indicator is whether plant has already been granted the necessary consents under Section 36 (S36) of the Electricity Act 1989 and (where applicable) Section 14 (S14) of the Energy Act 1976 (see Chapter 10: "Market Overview"). This background includes all existing plant, that portion of plant under construction that has obtained both S36 and S14 consent where relevant, and planned future plant that has obtained both S36 and S14 consent where relevant. Any 'contracted' generation not already existing that requires S36 and S14 consent but has not obtained both is excluded from this background.

- Background 4: 'SYS Background' (SYS)
  This background includes the existing generation and that proposed new generation for which an appropriate Bilateral Agreement is in place. The fact that a generation project may be classified as 'contracted' does not mean that the particular project is bound to proceed to completion. Nevertheless, the existence of the appropriate signed Bilateral Agreement does provide a useful initial indicator to the likelihood of this occurring.

Figure ES.7 compares plant margins derived from the customer based demand forecast with those derived from our own base view of future demand growth for the above four backgrounds; giving eight sensitivities in all.

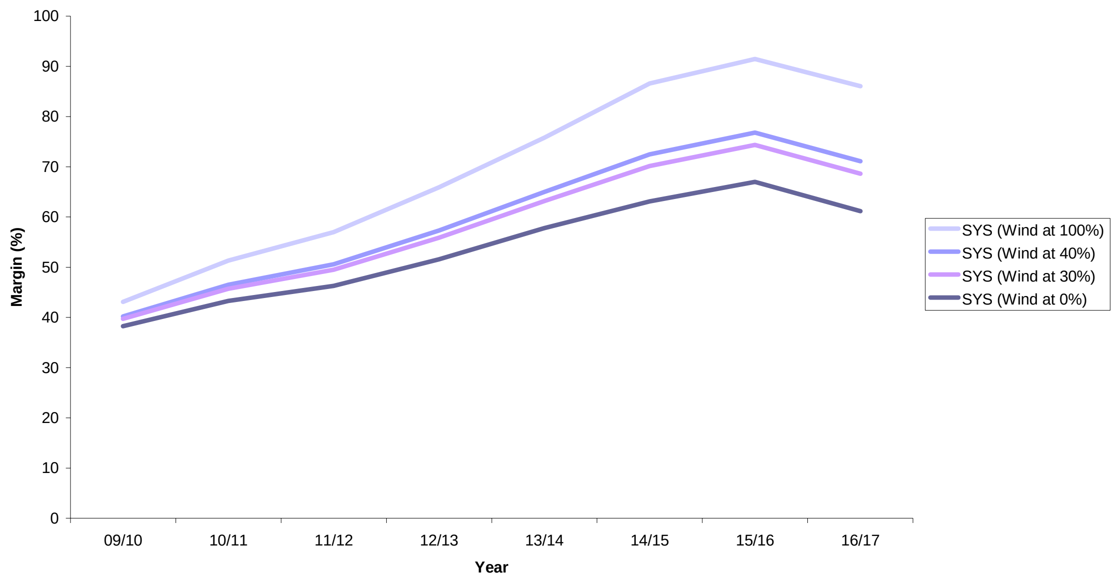


The main text considers a number of other factors, which can influence the value of plant margin. These include: as yet un-notified future generation disconnections (e.g. LCPD closures); the possible return to service of previously decommissioned plant (or the return to service of plant with TEC currently set at zero). The appropriate contribution towards the plant margin of generation output from wind farms is also considered as is the potential effect on the plant margin of exports (rather than imports) across External Interconnections and the sterilisation of generation capacity by virtue of its location behind a transmission constraint.

To illustrate this last point, additional plant margins have been calculated for a number of arbitrary assumptions relating to the availability of wind generation capacity at the time of the winter peak as per customer based forecasts. Figure ES.8 displays plant margins for wind capacity availability assumptions of 40%, 30% and 0%. The SYS background (i.e. with an inherent 100% wind capacity assumption) is also included for comparison.

To include the effect of wind availability in the final year margins in Figure ES.7 (i.e. 2016/17), we would consider the “Existing & Under Construction” (E+UC) Background, which is the second lowest scenario in Figure ES.7. The margins in 2016/17 for this background are 18% based on the customer based demand forecast, and 27% based on the NGET demand forecast. If we then incorporate wind at zero capacity, then these plant margins would fall from 18% to 13% and 27% to 22% respectively. Hence if the customer based demand forecasts did materialise then the current portfolio of generation and those under construction wouldn’t be enough to meet margin requirements and some additional new plant would be required; whereas, if National Grid’s demand forecasts did materialise then margins would be sufficient. This is based on a plant margin of 20% being an acceptable minimum for long-term planning purposes.

Figure ES.8 - Plant Margins for various Wind Generation Availability Assumptions (relative to SYS Background)



The margins displayed in Figure ES.7 and Figure ES.8 should not be taken at face value. The net result of the various uncertainties associated with the future plant/demand position is to produce a wide range of possible outcomes. In recognition of this, we have developed our own view of the likely developments into the future, which we consider alongside the SYS based backgrounds when undertaking our investment planning processes.

Transmission System Performance and Capability (See Chapters 6, 7 & 8)

The requirements placed on the transmission system depend on the size and geographical location of both generation and demand. However, it is generation that tends to exert the greater influence. However, more importantly, it is the generation actually used in meeting the demand on the day, which determines the power flows at any given time. The 'Generation Ranking Order', which is explained in Chapter 7 ("Transmission System Performance"), is used to determine which generation is operated for the study purposes of this Statement.

There are a number of boundaries on the national electricity transmission system that serve to illustrate the performance of the system. The main text of this Statement introduces 17 critical boundaries which, amongst other things, are used in determining the need or otherwise for transmission system reinforcement/investment. These boundaries relate to 17 SYS Study Zones, which are also identified in the main text.

It should be noted that the 17 boundaries used in this Seven Year Statement serve as useful indicators of system capability but the apparent capabilities derived are dependent on the precise generation and demand background used. Table 7.2 in Chapter 7 provides a useful reference overview of the power transfers, under the 'SYS Background', across each of the 17 main system boundaries. The transfers are based on the expected contributory generation plant rather than installed capacity.

However, it is recognised that the 'SYS Background' does not necessarily represent the most likely outturn. There is uncertainty associated with the demand forecasts and in particular with future generation developments. These factors will affect future power transfers, transmission system capabilities, the need or otherwise for transmission system reinforcements and the opportunities for making new or further use of the transmission system.

In view of this, we have presented the 'SYS Background' transfers and capabilities against the backdrop of a range of probabilistic transfers. These probabilistic transfers reflect our current views on the likelihood of the various generation and demand uncertainties. This presentation is intended to provide a more meaningful view of future transfers, promote a better appreciation of the future uncertainty we face in planning our system and enable the reader to make more informed judgements on the opportunities for making new or further use of the transmission system.

The main text of this Statement (see Chapter 8: "Transmission System Capability") includes probabilistic transfers for all 17 boundaries. As an example, the results for two key boundaries are given in Figure ES.9 and Figure ES.10. With the predominant high north to south power flows seen on our system, these two boundaries (i.e. the SPT to NGET boundary and Midlands to South boundary) are particularly important.

Figure ES.9 - Boundary Transfers and Capability
(Boundary B6: SPT - NGET)

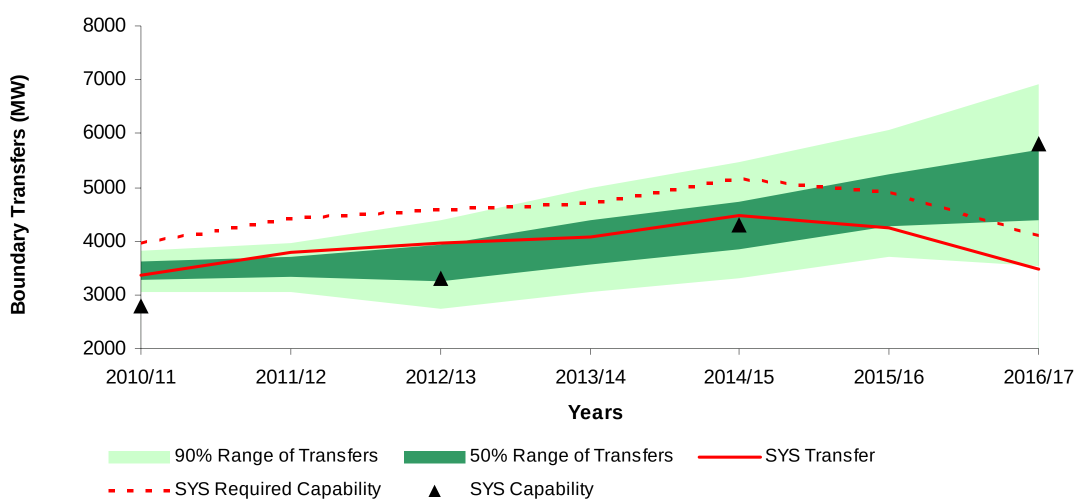


Figure ES.10 - Boundary Transfers and Capability (Boundary B9: Midlands - South)

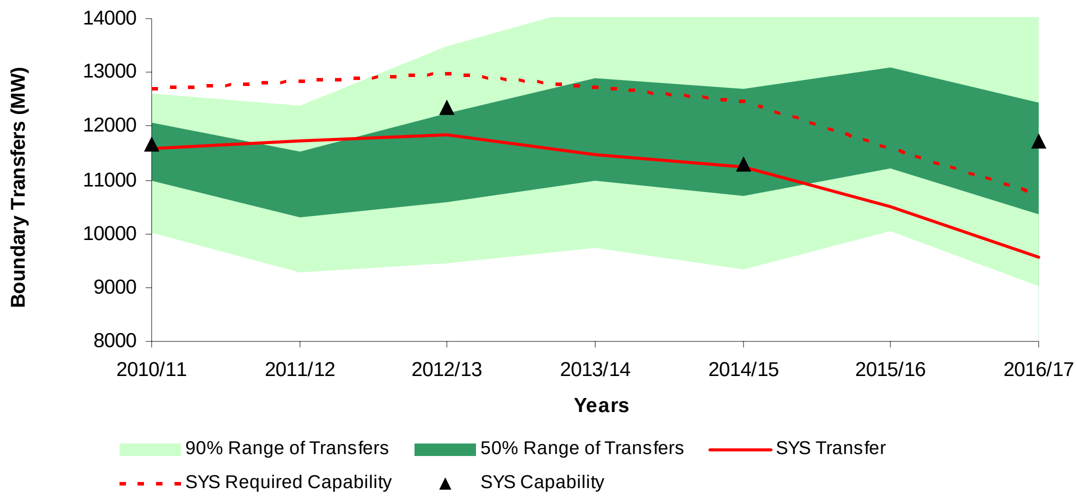


Figure ES.9 and Figure ES.10 show the boundary transfer (SYS Transfer), required capability (SYS Required Capability) and actual capability (SYS Capability); all derived on the basis of the 'SYS Background'. These are displayed against a backdrop (shaded areas) of our current view of the probable transfer range.

The required capability is simply the boundary transfer enhanced by an allowance for security (referred to as the Interconnection Allowance) to take some account of variations in weather, generating plant availability and demand forecasting error either side of the boundary.

For the SYS Capability, two types of capability have been analysed: thermal and voltage. Where the voltage capability is less than the thermal capability, the voltage capability is given. The boundary capability may be further reduced at other times for stability reasons.

Turning now to the probabilistic transfer ranges (shaded areas); the darker shaded central band extends (on the vertical axis) from the 25th to the 75th percentiles of the range of probabilistically derived transfers, and thus includes 50% of all such transfers across the boundary at the time of system peak. The wider area, encompassed by the lighter shaded bands runs from the 5th to the 95th percentile and thus, together with the dark band, includes 90% of transfers. The remaining 10% lie outside the shaded range. The fan of probabilistically derived transfers can be compared with the deterministic planned transfer for the single deterministic SYS background.

It does not follow that the probabilistic transfer arising from a background considered to be likely will necessarily be captured within the envelope range shown on the diagram. Nor does it follow that all the most commonly occurring transfers have highly probable backgrounds. In our Generation Uncertainty Model (GUM), all backgrounds are equally probable. Nevertheless, the range of transfers displayed in the fan diagram does provide a very useful indicator of the most probable future planned transfer across the boundary given the possible combined effects of the various sources of generation and demand uncertainty. GUM can then be interrogated to reveal the details of any background underlying any transfer (point on the fan diagram) for further detailed analysis.

In the example given in Figure ES.9, the SYS Planned Transfer lies towards the top of the probabilistic range of Planned Transfers up until 2014/15. There is therefore a chance of lower peak flows than suggested by the SYS background. The actual SYS capability however, is below the SYS Required Capability until 2014/15. Therefore significant reinforcements will nevertheless be required in the very near future to facilitate even the lower parts of the range of probabilistic transfers.

In the example given in Figure ES.10, the SYS Planned Transfer lies mainly within the range of the probabilistic transfers. At the same time, the SYS capability is lower than the SYS Required Capability up until 2014/15, which indicates a high probability of further reinforcements being required.

This presentation, which is reported in detail in Chapter 8 ("Transmission System Capability") in the main text, is useful for highlighting issues around the timing of transmission reinforcements and also for illustrating future opportunities. Please note that, whilst the 'SYS capabilities' displayed on Figure ES.9 and Figure ES.10 are appropriate for the 'SYS background' and 'SYS transfers', they do not necessarily correspond to the backgrounds covered by the probabilistic transfer range. Each background captured within the probabilistic analyses will have a unique set of boundary transfers and boundary capabilities.

The following provides a summary of the key indications for the future development of the GB transmission system taking account of the transfer levels and the boundary flows for the ‘SYS background’; however, these developments need to be considered in light of the probabilistic potential range of flows.

- The major Northern boundaries B1 (SHETL North West Export), B2 (North to South SHETL), B4 (SHETL to SPT), B5 (North to South SPT), B6 (SPT – NGET), B7 (Upper North) all show steady growth in power transfers over the SYS period due primarily to contracted renewable energy developments throughout Scotland. A sudden drop in power flow from north to south happens in 2016 when some LCPD closures are expected. Further increase in new renewable generation in the North will push the boundary transfers higher.

- Boundaries B8 (North to Midlands) and B9 (Midlands to South), B11 (Northeast & Yorkshire), (B12) South & Southwest import, B16 (Northeast, Trent & Yorkshire) and West Midlands import (B17) show mostly constant power flows with some fluctuation due to new generation connections and older generation closures.

- Central London imports (B14) show a trend of a steady increase in transfers reflecting gradually increasing demands and the lack of new generation projects within this zone;

- There is a general trend with reducing transfers across the South Coast import (B10), and South West import (B13) reflecting new plant that might be expected to commission in the South and Southwest in line with present contractual positions.

In view of the uncertainty associated with the ‘SYS background’, the timing of the construction of infrastructure reinforcements is managed such that investments are made to well defined system requirements. This means that, generally, construction is deferred as far as is practicable to avoid undertaking investments that may turn out to be unnecessary, e.g. where transmission contracted generation does not in the event proceed. At the same time, in recognition of the individual TOs' obligations relating to the facilitation of competition, flexibility is planned into the GB transmission system such that it does not unduly inhibit the development of future projects and more recently the potential developments associated with strategic investment which is discussed in more detail in Chapter 8. However, we do ensure that we can provide an efficient, co-ordinated and economic system, compliant with the security standards, as required by the Electricity Act 1989 and the Transmission Licences.

A number of significant connection and infrastructure reinforcements to the GB transmission system are currently planned. In addition to the construction of new overhead lines and substations, these include the use of devices that not only maximise the use of the existing transmission system thereby limiting environmental impact, but also enable rapid network modifications to meet changing system requirements. To this end we use, amongst other things, quadrature boosters, which are capable of being relocated at a later date together with Relocatable Static Var Compensators (RSVCs). We have also authorised the reprofiling (i.e. retensioning of the overhead line circuits to reduce the sag between towers) of strategic overhead line circuits to increase the permitted operating temperature and thereby increase their load carrying capability.

By exploiting the capability of the existing transmission system through the installation of quadrature boosters and reactive compensation and overhead line conductor re-profiling, we will continue to maximise the use of our existing lines. New technologies are also being investigated and planned for deployment on the transmission system to improve its performance including series reactive compensation and HVDC links.

Opportunities for New Generation and Demand (See Chapter 9)

Generation Opportunities

As in previous years, Figure ES.11 provides an indication of the opportunities for new generation across the 17 SYS Study Zones. The opportunities are interpreted as the ability to connect new generation without an associated need for major transmission reinforcement, which could in turn lead to delays caused by the need for planning consent and possible Public Inquiry.

Figure ES.10 separates the 17 SYS Study Zones into five opportunity groups, namely: VERY LOW, LOW, MEDIUM, HIGH and VERY HIGH. The figure also provides an indication of the capacity of new generation that can be accepted in the individual zones of each opportunity group without the need for major transmission reinforcement.

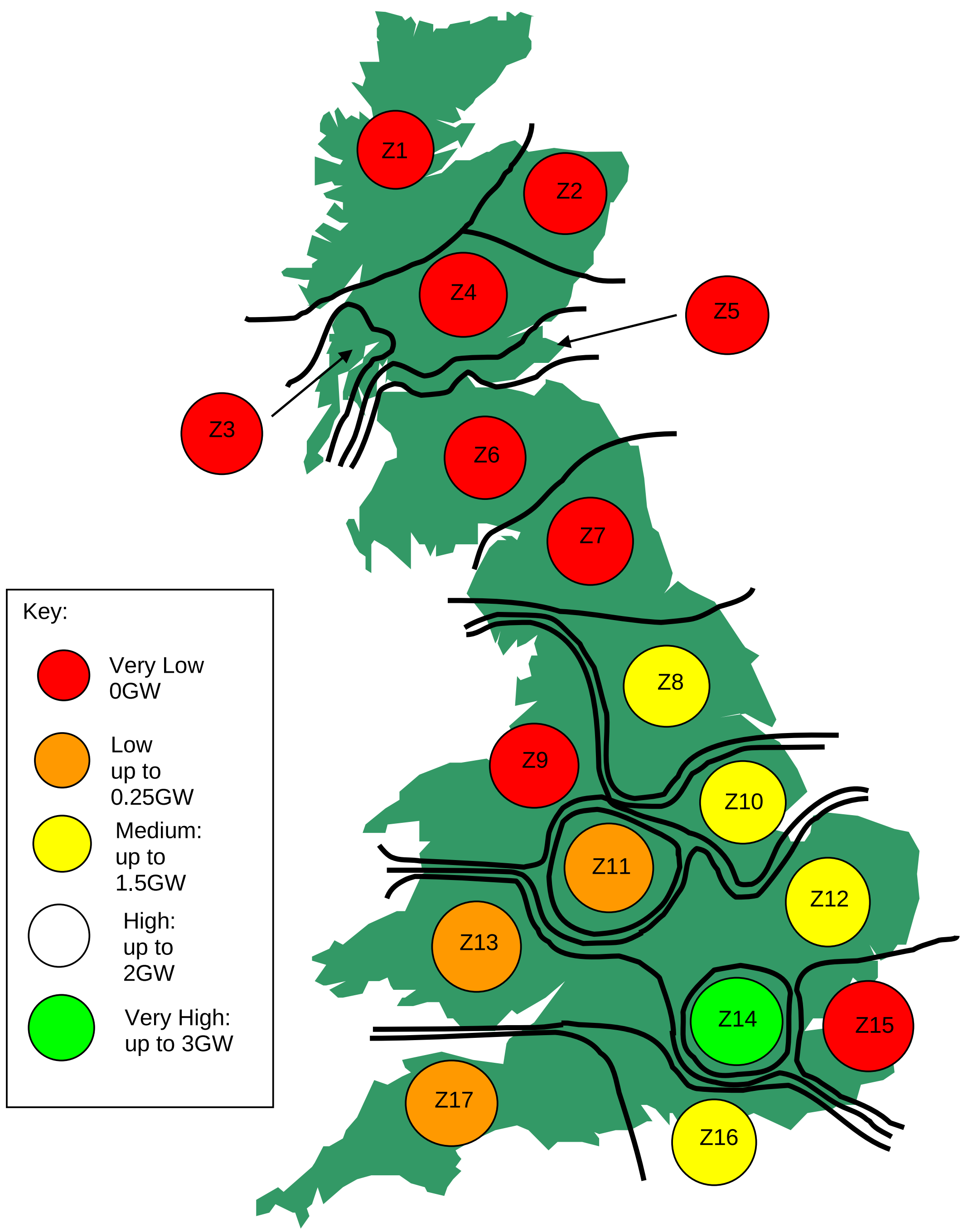
It does not follow that all the generation capacity within an opportunity group could be located at one site within a zone. In some zones, for example the London Zones, a considerable spread would be necessary. Nor does it follow that the capacities indicated for each zone within an opportunity group could be accepted together. Moreover, please note that there is little opportunity for further connections in the northern zones.

Whilst levels of opportunity have been attributed to the five opportunity groups, it does not follow that the full opportunity capacity indicated could be used up without further detailed consideration. For instance, whilst the Central South Coast (zone 16) falls into the ‘medium' opportunity category, any additional development might require major transmission reinforcement.

The proposed connection of a significant volume of new transmission contracted generation in the SHETL area, substantially made up of wind farms, is dependant on the completion of transmission reinforcements, including the proposed Beauly/Denny transmission reinforcement. The Beauly/Denny reinforcement is included as part of the SYS background for commissioning by 2013/14. Elements of this reinforcement have recently been the subject of a Public Inquiry. The project has now been approved by the Scottish Government subject to conditions. It should be borne in mind that any variation in the final commissioning date could impact on the opportunities.

The analyses of boundary power transfers show that, with an overall increase in installed generation capacity of 26.6GW reported between 2009/10 and 2016/17, the resultant power flows through the Scottish and English grid systems to the South would require significant reinforcement. On this basis, it would be unlikely that any new applications for generation projects in Scotland or the north of England can be accommodated within the seven year period covered by this Statement. However, the proposed new transmission access rules (see below) are expected to change the emphasis by providing an opportunity for earlier transmission access for new generation projects.

Figure ES.11 - GB Generation Connection Opportunities



The above guidance is necessarily general and emphasises the need to consider individual prospective generation developments on their merits at the time of application. A message arising from the guidance is that new generation located in the South is less likely to incur the need for major inter zonal transmission reinforcement and possible time delays than generation located in the North.

Notwithstanding the above opportunity messages, we will continue to comply with our licence obligations to make offers and will endeavour to meet our customers requirements including those relating to timescales.

Transmission Access Review

The current transmission access review is also relevant in the context of future opportunities for generation access to the national electricity transmission system. This review was announced in the Government's Energy White Paper 2007 and is being led by Ofgem and the Department for Energy & Climate Change (DECC). The review covers the present technical, commercial and regulatory framework for the delivery of new transmission infrastructure and the management of the existing grid capacity to ensure that they remain fit for purpose as the proportion of renewable generation on the system grows.

Access to the national electricity transmission system is provided through arrangements with National Grid, acting as NETSO, under the Connection and Use of System Code (CUSC). The CUSC sets out the contractual framework for connection to, and use of, the national electricity transmission system. The CUSC has applied across the whole of Great Britain since BETTA was introduced on 1 April 2005.

The review includes the consideration of different models of transmission access, and to support this part of the review, National Grid has raised a suite of CUSC amendments and charging methodology modifications which could be used as building blocks to implement a number of different access models. Each of these models could be expected to provide an opportunity for earlier transmission access to new generation projects.

Interim Connect and Manage

The red areas in Figure ES.11 would imply limited opportunity for connection in those zones given the level of transmission reinforcement required. Therefore, whilst Figure ES.11 correctly represents the opportunity for connection to a compliant network, it should be noted that in May 2009, Ofgem announced its intention to grant derogations from the requirements for the transmission infrastructure to comply with SQSS. This relaxation from the industry standards was introduced to facilitate generation projects connecting to the grid by accelerating their grid access dates. This was based on an interim 'connect and manage approach, under which any additional constraint costs incurred by the NETSO are socialised across all users.

As of April 2010, nearly 4GW of existing projects have had their connection dates advanced, with an additional 2.4GW of generation projects in the process of advancing their connection dates. In addition, this approach has allowed a further 6.4GW of new applications to be offered earlier connection dates than would have been the case under previous arrangements.

Enduring Arrangements

The Department of Energy and Climate Change (DECC) is currently progressing with formalising revised arrangements to the grid access regime. The preferred model would introduce Connect and Manage on an enduring basis. All constraint costs, including those arising from the advanced connection, would be socialised equally among all generators and suppliers on a per-MWh basis as they are at present under the Interim Connect and Manage arrangements.

Under Connect and Manage, new generators will able to access the network and start generating as soon as the local enabling works needed to connect them to the network are complete, without having to wait for all wider network reinforcement to be completed. NGET (acting in its role of NETSO) will take any necessary action to manage the resulting constraints on the network.

The second DECC consultation on Improving Grid Access closed on 14th April 2010. The final determination on the enduring arrangements will be announced by DECC in due course.

Strategic Investment

The information contained in this year's SYS reflects some of the recent work undertaken for the Energy Networks Strategy Group (ENSG) – Our Electricity Network – A Vision for 2020. The work carried out for ENSG identifies a set of transmission reinforcements to facilitate the connection of renewable generation to help meet the Government's 2020 climate change targets, there is still further work required to fully agree a revised regulatory regime to deal with this anticipated investment.

Funding has been agreed to undertake pre-construction works which are currently under way and well advanced for the projects needed soonest. A number of the strategic investment projects are now included as base projects in this SYS including the upgrading of the Hutton to Quernmore circuits, installation of series reactive compensation of the Anglo-Scottish circuits and the establishment of a new subsea HVDC circuit route from SPT to NGET. Further strategic investment projects are under development to be delivered beyond the SYS period to 2020 and later.

Demand Opportunities

New demand of up to 150MW could be connected within most zones without requiring major transmission reinforcement. An exception might be the introduction of such a step-change of load at certain points within or around some southern areas. For example, the London area has a large demand; approaching one tenth of the system peak demand. The London boundary is close to its thermal limit although planned work will ensure continued compliance. A large step-change in demand might, dependent on exact location, require major reinforcement. Each case again needs to be considered on its own merits.

Market Overview (see Chapter 10)

Chapter 10 provides an overview of BETTA and reports on related issues such as governance, institutional and contractual arrangements.

The Offshore Development Information Statement

The Offshore Development Information Statement (ODIS) is produced in accordance with Special Condition C4, and is available at the following location.

https://www.nationalgrid.com/uk/Electricity/ODIS/

The main purpose of the Statement is to facilitate the achievement of the coordinated development of the offshore and onshore electricity grid in Great Britain. The network solutions identified in the Statement represent a vision of how the offshore and onshore reinforcements could be developed; it is the responsibility of individual onshore/offshore network owners to develop detailed designs. In developing these detailed designs it is envisaged that this Statement will provide guidance in determining the optimum solutions.