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## Chapter 3

### Generation

#### Introduction

This chapter presents information on all sources of generation, which are used to meet the ACS Peak Demand as defined in the on line Glossary and presented in Chapter 2 (Electricity Demand).

Information provided in this chapter relates to those generators who are "Transmission Contracted" i.e. they have a contract for either an existing or a new connection, hence **the SYS 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 some stations may close, and some of the proposed projects may 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. The "Transmission Contracted" generation capacities show a mix in terms of fuel type, geography and system disposition.

The "Transmission Contracted" SYS Background incorporates all existing and proposed projects with a signed bilateral agreement and only includes the closure of existing plant if we have been informed by the generator. Consequently, the Magnox plants at Oldbury and Wylfa, where closure dates have been published by BNFL Magnox Electric, are shown as closing over the period. It has also been assumed that plant that has opted out of the LCPD obligation will not generate from 2016 onwards.

An exception to the general rule of only including sites with bilateral agreements is Alcan's Lynemouth power station, which is embedded, Licence exempt and Large but currently has yet to sign a Bilateral Agreement. However, this power station does exist and is capable of spilling large amounts of power onto the system (circa 420MW). In consequence, it is subject to special treatment in this NETS SYS in that it is treated as "Transmission Contracted". Its capacity is not netted off the demand forecasts submitted by Users but, instead, is included as generation capacity used to meet the ACS Peak Demand.

Finally readers are advised that if they are not familiar with Generation terminology that they read Appendix H before studying this chapter. Appendix H explains the Generation terminology used in this chapter.

#### The SYS Background

The generation background presented in this chapter and the transmission background described in Chapter 2 (Electricity Demand) and Chapter 6 (The Transmission System) respectively, form the basis of the SYS background upon which most of the studies and analyses presented in this Statement are based. These three elements of the SYS background (namely: demand; generation; and transmission) are internally consistent. For example, the transmission background of Chapter 6 includes all transmission connection developments cited explicitly in the relevant Bilateral Agreement as being necessary to permit the connection of the generation contained in the generation background presented in this chapter. It is worth repeating, however, that the SYS background does not include any transmission development that may be needed to accommodate prospective projects (with the exception of the Western HVDC link as mentioned in Chapter 1) of new generation or demand that did not have an appropriate Bilateral Agreement in place on the Data Freeze Date of 31 December 2010.

## Consents (S36 and S14) and Under Construction Status

The requirements for generation projects to obtain the necessary consents (i.e. under Section 36 of the Electricity Act 1989 and Section 14 of the Energy Act 1976) is explained in Chapter 10 (Market Overview). Many of the tables giving information on generation introduced later in this chapter and also in Appendix F include an indication of whether that plant has obtained section 36 and/or section 14 (where appropriate) consents or not. This information is useful when considering the relative likelihood of a project proceeding to completion.

From 1 March 2010, the Infrastructure Planning Commission (IPC) became responsible for processing new planning applications under the Planning Act 2008. Section 36 applications received before 1 March 2010 will remain as part of the previous process as described above with new applications for consents having to go through the IPC for examination and decision.

## Commissioning Dates

The commissioning year given will normally correspond to both the 'contract' date and the assumed date of actual full commercial output from the plant in question. However, in some cases full commercial output may slip into the years following the contract date. In such cases, the assumed generation commissioning dates given reflect the advice of the relevant generator.

Rather than strict adherence to a formal transmission contracted position, pragmatic assumptions relating to commissioning dates in the earlier years were, where considered appropriate, adopted in previous Seven Year Statements in order to enhance the relevance of the information provided. Such assumptions were made without prejudice and were intended to recognise the extant consent status of the plant in question and the progress towards completion of the project.

## Generation Capacity

### Power Station Capacities

Table F.1 in Appendix F presents details of all power stations falling within the scope of this chapter including the output capacity of each from 2010/11 to 2017/18.

Table 10.2 in Chapter 10 shows the relationship between the different types of agreements and capacities. In Table F.1, where the type of Bilateral Agreement is either a BCA or a BEGA, the capacity for that station is a TEC value. Where the type of Bilateral Agreement is given as a BELLA, the station is included by virtue of its size. The capacities of new generation projects are shown as zero up until the year in which the project is contracted to commission.

**The information is presented on the basis of Licensee then on power station type. For ease of reference, the SYS Study Zone, in which each Power Station is located, is also given. The SYS Study Zones are explained in Chapter 6 under "SYS Boundaries and SYS Study Zones". Charging Zones are also now included in Appendix F Table F.1.**

Please note that the External Interconnection between Scotland and Northern Ireland (Moyle Interconnector Ltd) normally operates in export mode and this is reflected in Appendix F Table F.1 showing values of -500MW and -400MW over the study period. For the purposes of the 2011 NETS SYS interconnectors to mainland Europe are being treated as float, whereas the Irish interconnectors that are assumed to be exporting at time of system peak are shown as negative generation.

Appendix F Table F.4 shows the Generation Ranking Order, this is also described in Chapter 7 (Transmission System Performance). There are a number of differences between Table F.1, which is intended to provide information on the formal contracted (TEC) position, and Table F.4, which includes a number of informed pragmatic assumptions designed to reflect the likely operation of generation sources at peak for the purpose of power flow analyses.

The capacities in Table F.1 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 Table F.1 reflects the current contracted position and takes no account of future uncertainty.

### **Large Combustion Plant Directive**

The introduction of the Large Combustion Plants Directive (LCPD) has required large electricity generators to meet more stringent air quality standards since 1 January 2008. Plant that has “opted out” of this obligation will have to close by the end of 2015 or after 20,000 hours of operation from 1 January 2008, whichever is the sooner. This affects some 12 GW of coal and oil-fired generating plant which will therefore now close by 1<sup>st</sup> January 2016. However, the exact timing of these closures is a commercial matter for plant owners, taking into account factors such as other environmental restrictions and the state of repair of the plants. Consequently, it is not possible to predict with certainty the precise timing of the impact of the LCPD on generation capacity, particularly if a replacement station is planned to be constructed on the same site.

For the 2011 NETS SYS, it has been assumed that plant that has opted out of the obligation will not generate from 2016 onwards. For more detail on the LCPD please refer to the following link

([Defra, UK – The Environment > Environmental quality and pollution > Industrial emissions > EU directives and international agreements > Large Combustion Plant Directive](#)):

<http://www.defra.gov.uk/environment/quality/industrial/eu-international/lcpd/>

### **Generating Unit Capacities**

The power stations listed in Table F.1 are generally made up of individual generating units. The 'effective output' capacity of each Generating Unit is given in Table F.2 in Appendix F along with a range of additional data relevant to individual Generating Units or 'sets' within each power station. The 'effective output' is simply the Registered Capacity of each Generating Unit scaled down, where both appropriate and necessary, such that the aggregate output of all Generating Units at a power station is limited to the value of the relevant Power Station TEC. This would not be 'appropriate' for a generating unit covered by a Bilateral Embedded Licence Exemptible Large power station Agreement (BELLA), since a BELLA power station does not have a TEC. Nor would it be 'necessary' should the aggregate unit Registered Capacity at a power station be equal to or less than the station TEC. For ease of reference, the SYS Study Zone is again included. Table F.2 reflects the contracted position for the winter peak of 2010/11 as known at the data freeze date of 31 December 2010.

Three phase fault infeeds and reactive ranges are also given and these are at the interface between the Generating Unit and the National Electricity Transmission System (NETS) i.e. on the higher voltage side of the generator transformer. This information is supplied to us by Users as part of their Week 24 Grid Code submissions.

### **Generation Capacity Additions**

Table F.7 in Appendix F lists the changes in the contracted capacity of generation, which has either actually commissioned or is contracted to commission, over the period from the winter peak of 2005/06 to the winter peak of 2010/11. Please note that capacities up to and including the winter peak of 2002/03 were based on power station Registered Capacity (RC) while capacities for 2003/04 onwards are based on either power station Transmission Entry Capacity (TEC) or power station 'Size of Power station', as appropriate (TEC being appropriate for BCA and BEGA power stations and 'Size of Power Station' being appropriate for BELLA power stations).

Table F.7 does not include any subsequent increases or decreases in capacity of plant commissioned before 2005. Table F.7 also includes plant closures that have taken place from

2005/06 to 2010/11 inclusive. These closures are indicated by negative values of capacity, such as in the case of Dungeness A and Sizewell A. Both of these stations were actually closed on 31 December 2006, which is within the 2006/07 winter peak period.

However, as well as new (i.e. commissioned, or to be commissioned, from year 2005 onwards) transmission contracted generation, the table does also include increases due to plant being returned to service from reserve (or closure), increases in import capabilities from External Systems, and some minor proposed changes in TEC. For consistency between the various tables presented in this Statement, all generation expected to commission by the winter peak of 2010/11 is classified as either 'existing' or 'under construction'.

The net total of capacity is included in the penultimate line of Table F.7. This may be used as an indicator as to the level of activity over the period.

## **Disconnections**

Disconnection is normally the irreversible closure of a power station and requires formal notification to be given to us at least six months prior to the event. Table 3.5 lists notified generation disconnections (closures) from the year 2010/11 to 2017/18 inclusive. Please note that capacities up to and including the winter peak of 2002/03 are based on power station Registered Capacity (RC) while capacities for 2003/04 onwards are based on power station Transmission Entry Capacity (TEC). The year indicated on the table is the year of closure and normally implies that the power station will not be generating over the subsequent winter peak.

Due to the Large Combustion Plant Directive opted-out plant, comprising of 8.5GW of coal and 3.5GW of oil, some 12GW of closures will take place by 1<sup>st</sup> January 2016; however, due to the uncertainty of the closure dates and whether any TEC would be terminated no allowance has been made for these closures up to and including the winter peak of 2015/16. The affected stations are however, shown as closed from 2016/17 onwards.

## **Decommissioning**

Decommissioning also requires six months formal notification but is not irreversible. Generating Units with a notified Registered Capacity of zero are, for the purpose of this Statement, in the same category as decommissioned plant.

A Generator may wish to decommission or mothball a Generating Unit for a relatively long period for commercial reasons. In such an event the Generator may also wish to affect a corresponding reduction in the power station TEC in order to reduce the Use of System charges. At a later date, the customer may choose to 're-commission' the generating unit and return the Power Station TEC to its appropriate value.

As explained in PC.4.3.1 of the Grid Code, NGET use the TEC data (and CEC data for that matter) from the relevant Connection and Use of System Code (CUSC) Contract. The value of TEC is specified in Appendix C of the appropriate Bilateral Connection Agreement or Bilateral Embedded Generation Agreement. These are agreements entered into pursuant to paragraph 1.3.1 of the CUSC.

Paragraph 6.30 of the CUSC explains how revisions to the value of TEC may be made. TEC may be decreased provided that certain specified notice is given to National Grid. Generators are entitled to request an increase in TEC, up to a maximum of the relevant CEC, through the more protracted Modification Application process.

Where we have received notification from the Generator (in accordance with the CUSC requirements) that a particular generation source is to reduce its value of TEC, then the reduced value is accordingly attributed to that plant for the purpose of the power flow studies and analyses contained in this Statement. In the extreme, we may receive notification that a particular plant has reduced TEC to zero. This could, under certain circumstances, mean that additional transmission reinforcement work would be required before such plant is able to subsequently re-register TEC at a higher level and this may cause a delay. In view of this, the

Generator may choose to maintain the value of Power Station TEC throughout in order to avoid any subsequent delays. Increases in station TEC above the extant contracted value are not possible without an appropriate Modification Application from the generator to us to modify the site specific Bilateral Agreement.

Where the Generator has notified us that the Output Usable is zero (e.g. unavailable due to maintenance), the full value of station TEC is still attributed to that plant for the purpose of power flow and fault level studies. This ensures that no transmission reinforcement, and possible delay, will be necessary when the plant is repaired and returned to service.

Table 3.6 lists Generating Units which have either been formally notified by the owner as decommissioned (effectively RC=0) or simply notified zero Registered Capacity covering the seven year period of this Statement. In either event they may effectively be classed as unavailable. The year shown is the year in which the decommissioning took place. The capacity shown is the capacity prior to decommissioning. Please note that decommissioning is commonly on a generating unit basis for which the terms Registered Capacity or Connection Entry Capacity apply. Transmission Entry Capacity relates to the power station and does not exist on a unit basis. However, the values of RC given in Table 3.6 may be taken as an equivalent reduction in power station TEC.

To provide a more complete picture, Table 3.6 includes the effect of the LCPD closures detailed in Table 3.5. Closures are indicated by negative values in Table 3.6.

Table 3.6 shows that there is currently an overall reduction in potential power station capacity of some 2.9GW comprising: 534MW of OCGT plant; 2035MW of Oil plant; and 350MW of Coal plant. However, it is unlikely that all this capacity could be returned to service. Of the 2.9GW, perhaps some 500MW to 1GW has the greatest potential to return to service. Even then, it should also be borne in mind that, were individual plants to be re-commissioned/returned to service, the full previous capacities may not necessarily be realised.

## **Interconnections with External Systems**

The NETS currently has directly connected External Interconnections with the External Systems of France and Northern Ireland. The commissioning of an External Interconnection with the Netherlands system was completed in early 2011. The commissioning of an External Interconnection with the Republic of Ireland system is planned for 2011/12. The opportunities for making use of these External Interconnections are outlined in Chapter 9 (Opportunities). Appendix F Table F.13 sets out the notional import and export capabilities across each of the External Interconnections and the normal direction of flow.

### **Cross-Channel Link**

The cross-channel link with France is a DC link consisting of four pairs of cables connecting converter stations at Sellindge in Kent and Les Mandarins near Calais.

### **Northern Ireland Link**

The link between Scotland and Northern Ireland was commissioned in December 2001 with commercial operation commencing in January 2002. The interconnector is a DC link connecting converter stations at Auchencrosh in the 'South' zone of the SPT system, which corresponds to SYS Study Zone Z6, and Islandmagee in Northern Ireland. SYS Study Zones are explained under Chapter 6 under "SYS Boundaries and SYS Study Zones". The 500MW Auchencrosh converter station is supplied by a 275kV overhead line from Coylton substation.

Although this Interconnector can operate with power flows in either direction, the power flow has been predominantly from Scotland to Northern Ireland. While the link has both an export and import capability, it is normally used for export to Northern Ireland. An export (i.e. a demand) of 400MW may be assumed for the winter peak of each year for the purpose of power flow

analyses. This transfer to Northern Ireland may be treated as being equivalent to demand and has been taken into account in the demand forecasts of Chapter 2.

### Netherlands Link

A DC link for interconnection with the Netherlands electricity system was commissioned in early 2011. The link has a capacity of 1000MW, capable of bi-directional flow, and will be connected at Grain 400kV substation.

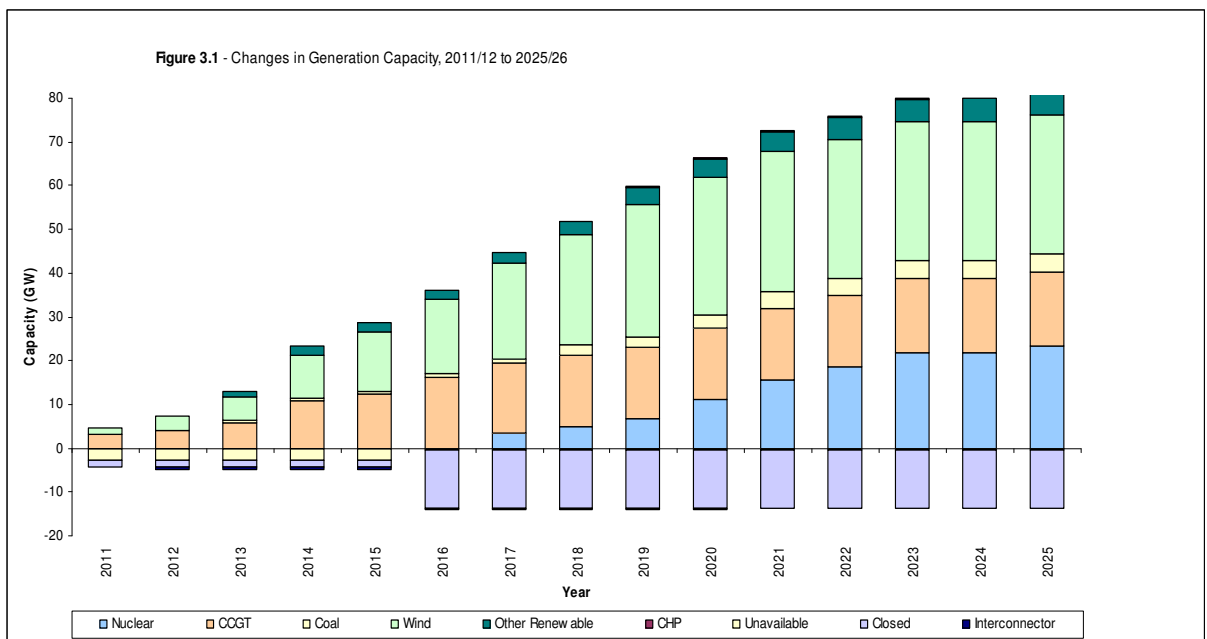
### Republic of Ireland Link

A DC link for interconnection with the Republic of Ireland electricity system is planned to commission by 2011. The link will be of capacity up to 500MW, capable of bi-directional flow, and will be connected at Deeside 400kV substation. At peak times it is expected that the link will normally be used for exports from the NETS.

### Generation Mix

Figure 3.1 illustrates the main changes, from 2010/11 onwards, in the generation capacity of transmission contracted plant. For the underlying detail please refer to appendix F, Table F.8 (New Power Station Capacity); Table 3.5 (closures); and Table 3.6 (unavailable plant). In including closures and unavailabilities, it should be noted that generators are not required to provide formal notification of disconnections or decommissioning until 6 months prior to the event.

An allowance has been included for those stations that will close on or before 31<sup>st</sup> December 2015 due to opting out of the LCPD.

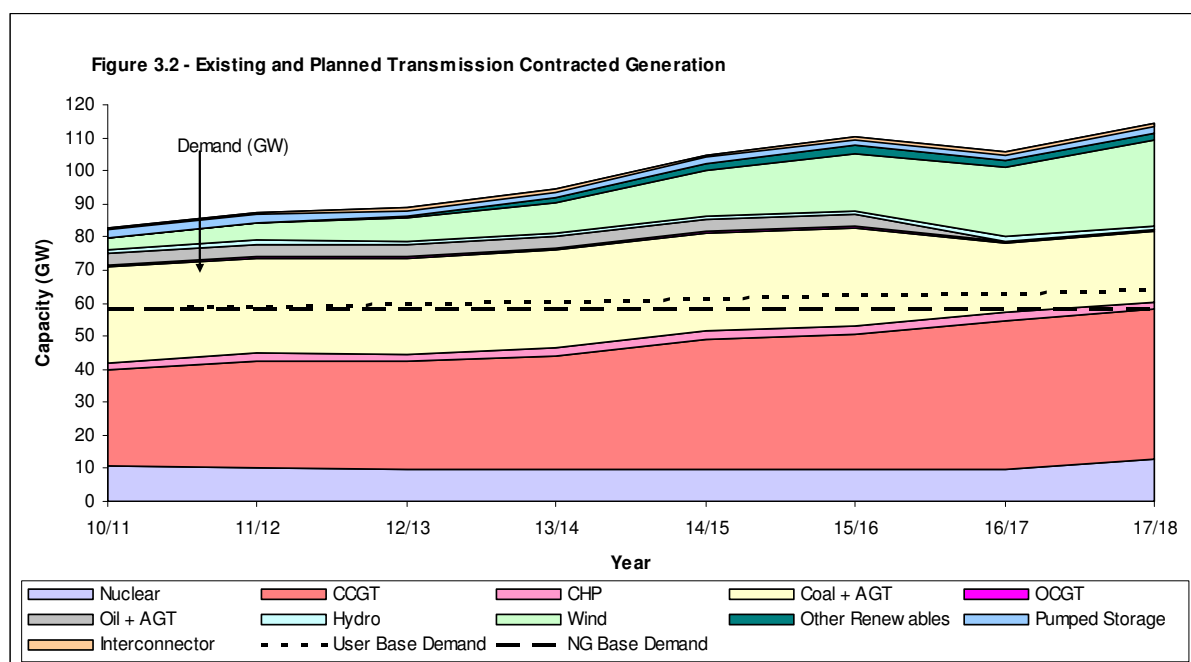


The effect of the LCPD closures can be seen in 2016, these closures are partially offset by three new coal plants namely Hatfield, Hunterston and Blythe.

The majority of the new capacity up to 2017/18 is made up of CCGT and wind generation. Due to the level of contracted activity beyond 2017/18, the capacities of new contracted generation projects up to 2025 have also been included. Details of individual projects can be found in Appendix F Table F.12, that lists generation projects for which an appropriate bilateral agreement is in place but which are scheduled to commission beyond the scope of this NETS SYS (i.e. after 2017/18).

As can be seen from Figure 3.1 new nuclear and wind capacity make up the bulk of the new capacity from 2017/18 onwards.

Figure 3.2 illustrates the generation mix from 2010/11 to 2017/18 and includes all transmission contracted generation whether existing or planned (i.e. the 'SYS background') based on appendix Table F.1. In Figure 3.2, the different fuel types are given in an illustrative order of operation. Please note, however, that this is indicative only and no account has been taken, for instance, of generation availability. Nevertheless, the figure does imply a variation in the type of marginal plant used to meet the demand over the seven years considered.



As can be seen from Figure 3.2 a reduction in coal capacity used to meet the demand in 2016/17, due to the effect of the assumed LCPD closures. The closure of Magnox plant by 2011/12 can also be seen. These closures are offset by growth in CCGT, onshore and offshore wind, other renewables (mainly biomass, biopower and woodchip).

In considering the above information it is important to note the following points:

- the generation capacity estimates do not take account of the possibility of modification of existing connection agreements, additional new connection agreements being signed, possible future closures which have not yet been formally notified to us for which only 6 months notice of closure is required or the return to service of plant held in reserve;
- the additional contracted generation capacity due to connect from 2010/11 onwards includes those projects that are under construction and those that are not under construction;

Figure 3.2 also includes the peak demand forecasts for 2010/11 to 2017/18, both for the NGET 'Base' forecast and the customer-based demand forecast, superimposed on the generation mix. This gives an indication of the apparent surplus of generation over demand, which is discussed further in Chapter 5 (Plant Margin). The peak demands shown in Figure 3.2 exclude station demand and also exclude exports, making them compatible with Table F.1, which includes exports as negative generation.

As a point of interest, Figure 3.3(a), Figure 3.3(b), Figure 3.3(c) and Figure 3.3(d) indicate how generation was actually used to meet demand on each of the four days referred to in Figure 2.2 of Chapter 2. These are the winter maximum (Tuesday, 07/12/10), typical winter (Wednesday,

17/11/10), minimum summer (Sunday, 18/07/10) and typical summer (Thursday, 10/06/10) respectively.

## Generation Disposition

Figure A.1.1 in Appendix A gives the geographical location of all transmission contracted Large power stations, whether directly connected or embedded within a distribution system that are existing as at the data freeze date of 31 December 2010. Directly connected Medium and Small power stations are also shown as are directly connected External Interconnections with External Systems. These generation sources form the generation background contained within the 'SYS background'. Large power stations which have been formally disconnected (closed) are not shown (see Table 3.5) but Large power stations with decommissioned Generating Units are shown (see Table 3.6). Embedded Medium and Small power stations and embedded External Interconnections are not shown.

The disposition of the above existing plant, and prospective future plant, in terms of its capacity and location around the system is particularly important when considering the performance (e.g. resultant power flows) of the transmission system, the need for transmission developments and the opportunities for connecting further generation (or demand) to the system. These topics are discussed further in Chapter 7 (Transmission System Performance), Chapter 8 (Transmission System Capability) and Chapter 9 (Opportunities), which present the results of the main system analysis undertaken for this statement.

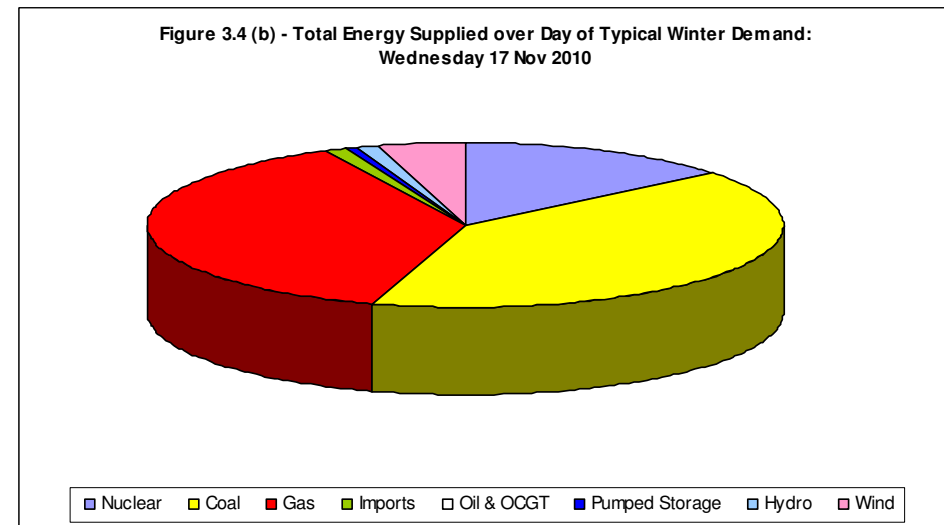
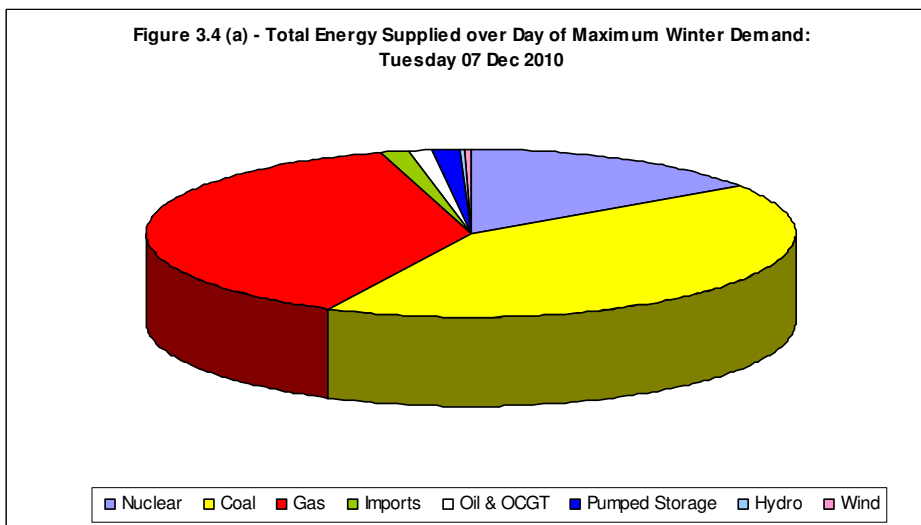
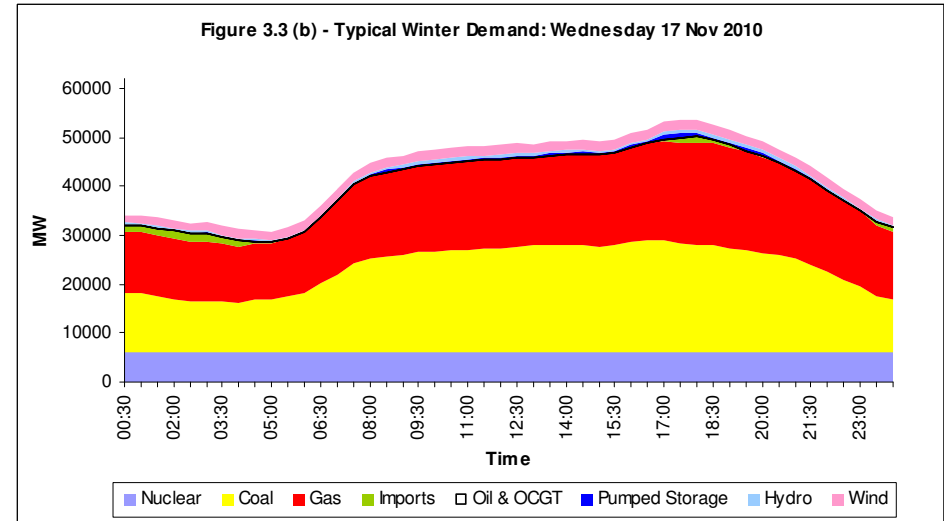
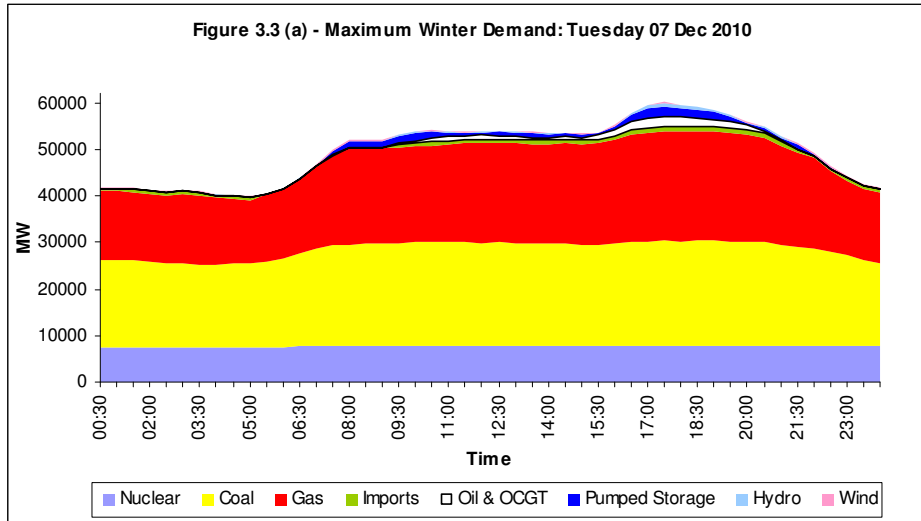
When considering bulk transfers of power around the system it is often useful to regard the transmission system as being made up of a number of zones. Such zones and the transmission boundaries between them are described in detail in Chapter 6 (The Transmission System). For consistency and ease of explanation, the generation dispositions described in the following paragraphs are also presented on a similar zonal basis.

Figure 3.8 and Figure 3.9 show the changes in generation capacity by plant type from 2010/11 to 2017/18. The table details the capacity changes on the basis of the SYS Study Zone Number described in Chapter 6 (The Transmission System) and referred to in Table 6.2.

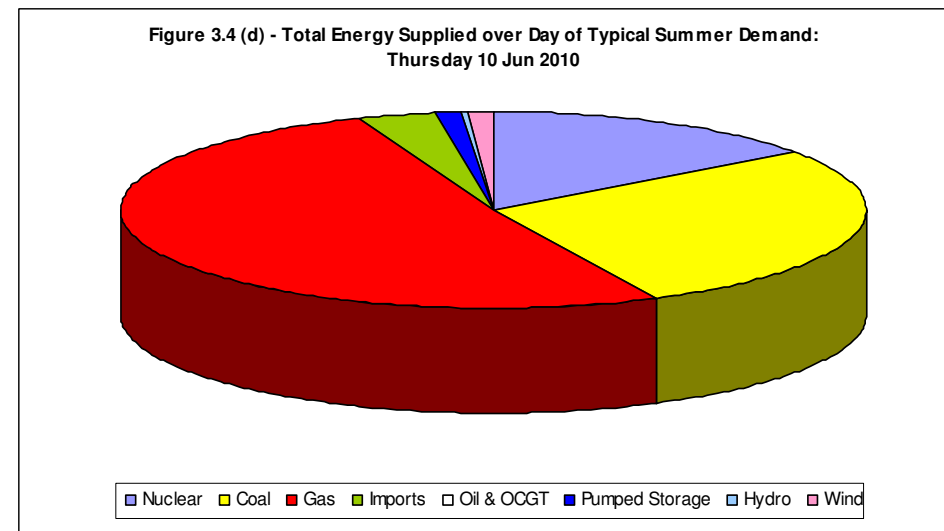
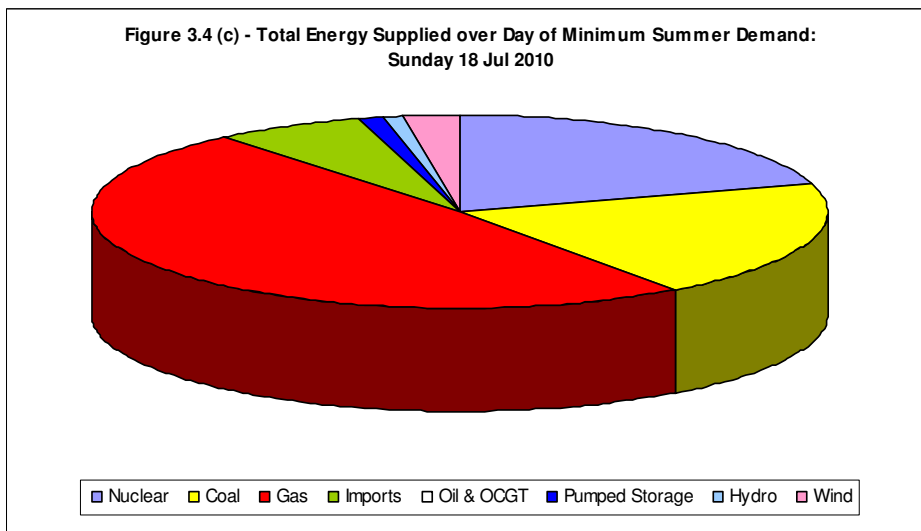
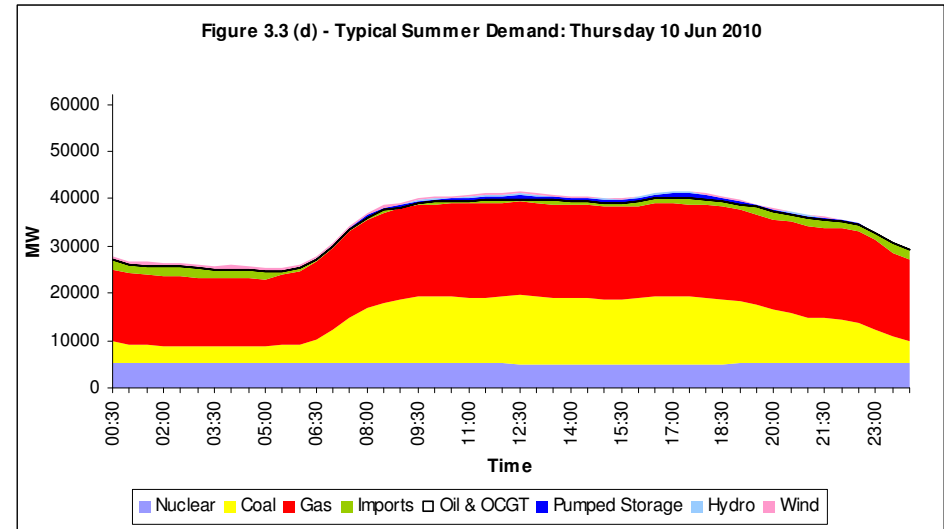
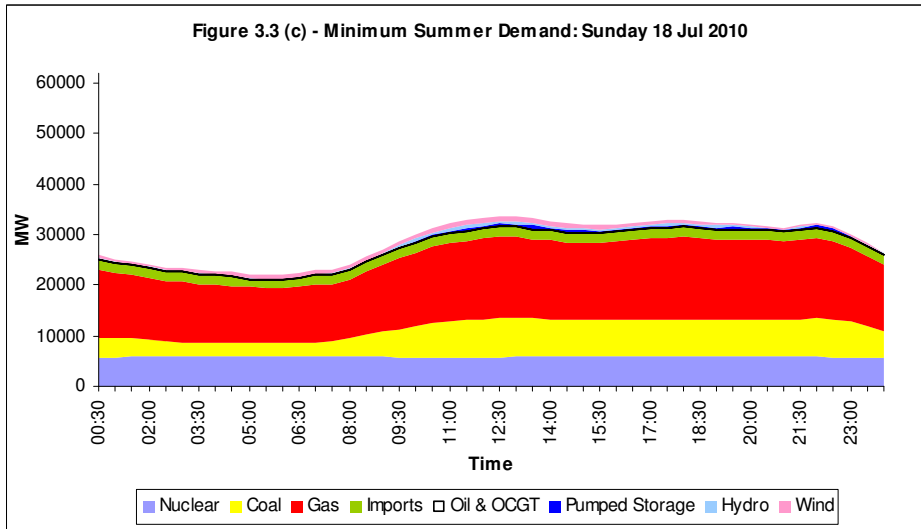
It is the generation actually used in meeting the demand on the day, which determines the power flows at any given time. The 'Generation Ranking Order', which is explained in Chapter 7 (Transmission System Performance), is used to determine which generation is operated for the study purposes of this Statement.

Additional information on generation location is given in Appendix F Tables F.9, F.10 and F.11 which show the detail behind Figures 3.8 and 3.9 and location of generation on the basis of SYS Study Zone and plant type for the years 2010/11 and 2017/18 respectively.

Winter Maximum / Typical Demand Days



**Summer Minimum / Typical Demand Days**



## Generation Analysis

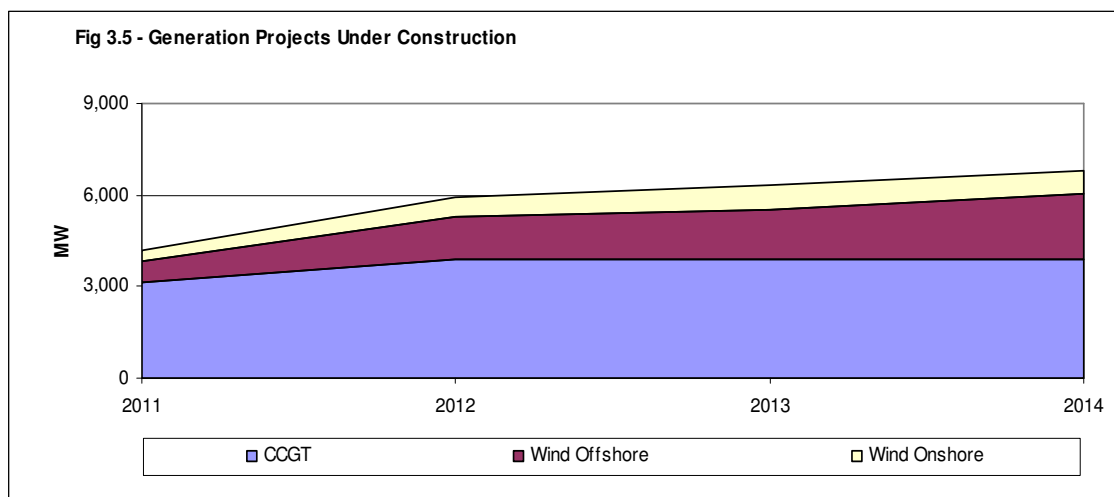
### Generation Projects under Construction

Table 3.1 lists power stations under construction, for which section 36 and/or section 14 consents have been given. The CCGT projects under construction in 2011 onwards are Grain Stage 3, Pembroke Stages 1 & 2, West Burton B and in 2012 onwards Pembroke Stage 3 totalling 3900MW in TEC. Table 3.2 lists power stations, not yet under construction, for which section 36 and/or section 14 consents have been given. The information in Table 3.1 and Table 3.2 is consistent with the TEC Register as at the main Data Freeze Date. The TEC Register can be viewed on the National Grid website:

<http://www.nationalgrid.com/uk/Electricity/GettingConnected/TEC+Register/>

Figure A.1.4 shows the location of National Parks in England, Wales and Scotland. Consents may be easier to obtain outside these areas.

Licensee	Plant Type	2011	2012	2013	2014
NGET	CCGT	3,150	3,900	3,900	3,900
NGET	Wind Offshore	708	1,359	1,644	2,156
SHETL	Wind Onshore	322	368	492	492
SPTL	Wind Onshore	-	270	270	270

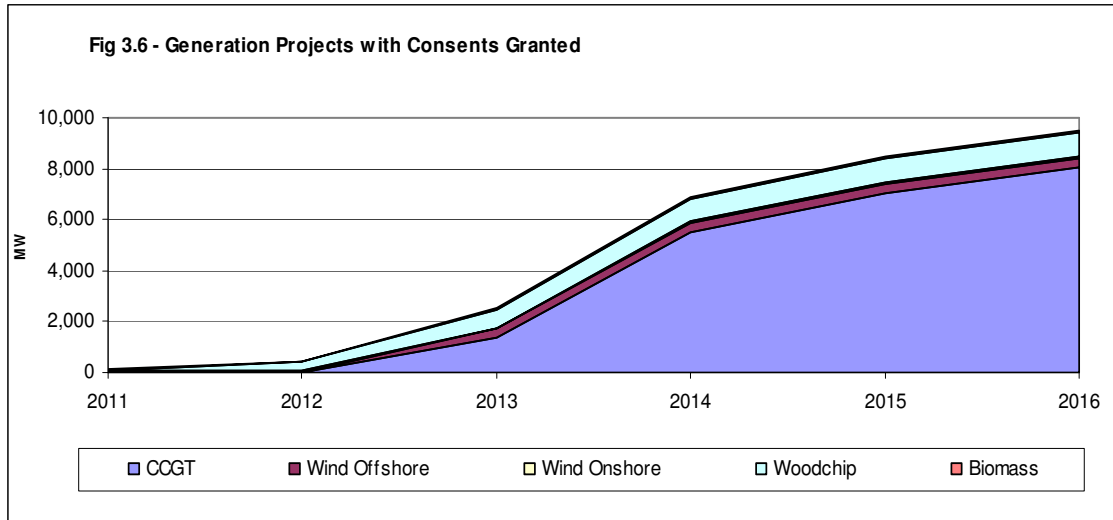


Please note that the data table previously included in this chapter which supports the above information and contains breakdown by Station Name and SYS Study Zone is now located in Appendix F, Table F.5

### Generation Projects with Consents Granted

Please note that Table 3.2 and Figure 3.6 look only at projects within the NETS SYS 2011 study period, from 2011 to 2017.

Licensee	Plant Type	2011	2012	2013	2014	2015	2016
NGET	CCGT	-	-	1,360	5,541	7,061	8,047
NGET	Wind Offshore	-	-	553	553	553	553
NGET	Woodchip	-	-	350	350	350	350
SHETL	Wind Onshore	45	185	350	412	412	426
SPT	Biomass	52	52	52	52	52	52
SPT	Wind Onshore	-	176	385	460	531	531



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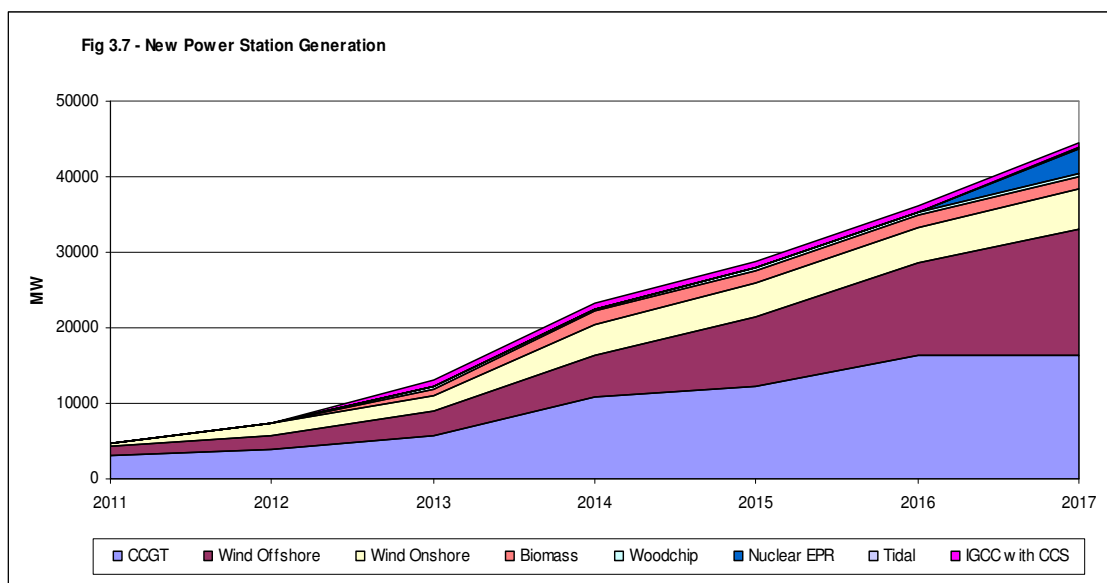
Please note that the data table previously included in this chapter which supports the above information and contains breakdown by Station Name and SYS Study Zone is now located in Appendix F, Table F.6

**New Power Station Capacity**

Table 3.3 lists the changes in the contracted capacity of generation, which are contracted to commission, over the period from the winter peaks of 2010/11 to 2017/18 inclusive.

Licensee	Plant Type	2011	2012	2013	2014	2015	2016	2017
NGET	CCGT	3150	750	1795	5021	1520	4000	-
NGET	IGCC with CCS	-	-	800	-	-	-	-
NGET	Wind Offshore	1208	651	1338	1489	2204	2324	2105
NGET	Wind Onshore	-	299	-	-	176	184	-
NGET	Biomass	-	-	754	879	-	-	-
NGET	Woodchip	-	-	350	-	-	-	-
NGET	Nuclear EPR	-	-	-	-	-	-	3340
NGET	Tidal	-	-	-	-	-	-	100
SHETL	Wind Onshore	366	185	319	1316	-	44	114
SHETL	Wind Offshore	-	-	-	400	1375	420	300
SHETL	Tidal	-	-	10	-	-	-	-
SPT	Wind Onshore	-	649	359	782	113	-	274
SPT	Wind Offshore	-	-	-	450	-	400	2225
SPT	Biomass	52	-	-	-	-	-	-

Plant Type	2011	2012	2013	2014	2015	2016	2017
CCGT	3150	3900	5695	10716	12236	16236	16236
IGCC with CCS	0	0	800	800	800	800	800
Wind Offshore	1208	1859	3197	5536	9115	12259	16889
Wind Onshore	366	1499	2177	4247	4564	4792	5180
Biomass	52	52	806	1685	1685	1685	1685
Woodchip	0	0	350	350	350	350	350
Nuclear EPR	0	0	0	0	0	0	3340
Tidal	0	0	10	10	10	10	110



### Overview of New Capacity

Table 3.4 complements Table 3.3 by providing an overview of the generation capacity additions over the period from 2010/11 to 2017/18 inclusive. Table 3.4 separately identifies the capacity of future plant by type and according to whether the necessary consents have been obtained.

Background	Plant Type	2011	2012	2013	2014	2015	2016	2017
Existing	-	0	0	0	0	0	0	0
<b>Total (1)</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Under Construction	CCGT	3,150	3,900	3,900	3,900	3,900	3,900	3,900
Under Construction	Wind Offshore	708	1,359	1,644	2,156	2,156	2,156	2,156
Under Construction	Wind Onshore	322	638	762	762	762	762	762
<b>Total (2)</b>		<b>4,180</b>	<b>5,897</b>	<b>6,306</b>	<b>6,818</b>	<b>6,818</b>	<b>6,818</b>	<b>6,818</b>
With Consents	Biomass	52	52	52	52	52	52	52
With Consents	CCGT	0	0	1,360	5,541	7,061	8,047	8,047
With Consents	Wind Offshore	0	0	553	553	553	553	553
With Consents	Wind Onshore	45	359	735	872	943	956	956
With Consents	Woodchip	0	0	350	350	350	350	350
<b>Total (3)</b>		<b>97</b>	<b>411</b>	<b>3,050</b>	<b>7,368</b>	<b>8,959</b>	<b>9,958</b>	<b>9,958</b>
Without Consents	Biomass	0	0	754	1,633	1,633	1,633	1,633
Without Consents	CCGT	0	0	435	1,275	1,275	4,289	4,289
Without Consents	Clean Coal	0	0	0	0	0	0	0
Without Consents	IGCC with CCS	0	0	800	800	800	800	800
Without Consents	Nuclear EPR	0	0	0	0	0	0	3,340
Without Consents	Tidal	0	0	10	10	10	10	110
Without Consents	Wave	0	0	0	0	0	0	0
Without Consents	Wind Offshore	500	500	1,000	2,827	6,406	9,550	14,180
Without Consents	Wind Onshore	0	502	680	2,640	2,858	3,073	3,461
<b>Total (4)</b>		<b>500</b>	<b>1,002</b>	<b>3,679</b>	<b>9,185</b>	<b>12,982</b>	<b>19,355</b>	<b>27,813</b>
<b>Total (1,2,3,4)</b>		<b>4,777</b>	<b>7,310</b>	<b>13,035</b>	<b>23,371</b>	<b>28,759</b>	<b>36,131</b>	<b>44,589</b>

Please note that the data table previously included in this chapter which supports the above information and contains breakdown by Station Name and SYS Study Zone is now located in Appendix F, Table F.8.

Licensee	Closure Year	Plant Type	Station	Set(s) Disconnected	Capacity (MW)
NGET	2011	Nuclear Magnox	Oldbury	1, 2	470
NGET	2011	Nuclear Magnox	Wylfa	1, 2, 3, 4	980
SPT	2016	Medium Unit Coal	Cockenzie	1, 2, 3, 4	1102
NGET	2016	Large Unit Coal	Didcot A	1, 2, 3, 4	2109
NGET	2016	Large Unit Coal	Didcot A	G1, G2, G3, G4	100
NGET	2016	Large Unit Coal + AGT	Ferrybridge C	1, 2, G5, G6	993
NGET	2016	Large Unit Coal + AGT	Ironbridge	1, 2, G1, G2	964
NGET	2016	Large Unit Coal + AGT	Kingsnorth	1, 2, 3, 4, G1, G4	1966
NGET	2016	Medium Unit Coal + AGT	Tilbury	7, 8, 9, 10, G7, G8, G9, G10	1131
NGET	2016	Oil	Fawley	1, 3, G1, G2, G3, G4	1036
NGET	2016	Oil	Grain	1, 2, 3, 4, G1, G2, G3, G4	1355
NGET	2016	Oil	Littlebrook	1, 2, 3, G1, G2, G3	1245
				<b>Total</b>	<b>13451</b>

Licensee	Year	Plant Type	Station Name	Unit(s)	Capacity (MW)	SYS Study Zone
NGET	1991	OCGT	Cottam	G2, G4	50	Z10
NGET	1991	OCGT	Ferrybridge C	G6, G7	34	Z8
NGET	1991	OCGT	Fiddlers Ferry	G1, G4	34	Z9
NGET	1991	OCGT	Kingsnorth	G2A, G3A	44	Z15
NGET	1991	OCGT	Ratcliffe on Soar	G1, G3	34	Z11
NGET	1994	OCGT	Cottam	G1, G3	50	Z10
NGET	1994	OCGT	Drax	G7	25	Z8
NGET	1994	OCGT	Eggborough	G6, G7	34	Z8
NGET	1994	Oil	Grain	2	675	Z15
NGET	1994	OCGT	Grain	G2A, G3A, G5A	87	Z15
NGET	1994	OCGT	Ironbridge B	G1, G2	34	Z11
NGET	1994	OCGT	Tilbury B	G7A	17	Z15
NGET	1994	OCGT	West Burton	G2, G3	40	Z10
NGET	1995	OCGT	Fawley	G2, G4	34	Z16
NGET	1995	Oil	Littlebrook D	3	685	Z14
NGET	1998	Oil	Grain	3	675	Z15
NGET	1998	OCGT	Tilbury B	G10A	17	Z15
NGET	1998	Medium Unit Coal	Tilbury B	7	350	Z15
NGET	2016	OCGT	Ferrybridge C	G6	-17	Z8
NGET	2016	OCGT	Kingsnorth	G2A, G3A	-44	Z15
NGET	2016	Oil	Grain	2	-675	Z15
NGET	2016	OCGT	Grain	G2A, G3A, G5A	-87	Z15
NGET	2016	OCGT	Ironbridge B	G1, G2	-34	Z11
NGET	2016	OCGT	Tilbury B	G7A	-17	Z15
NGET	2016	OCGT	Fawley	G2, G4	-34	Z16
NGET	2016	Oil	Littlebrook D	3	-685	Z14
NGET	2016	Oil	Grain	3	-675	Z15
NGET	2016	OCGT	Tilbury B	G10A	-17	Z15
NGET	2016	Medium Unit Coal	Tilbury B	7	-350	Z15
				<b>Total</b>	<b>284</b>	

**Growth and Generation Capacity (MW), 2010/11 to 2017/18**

Figure 3.8 shows the increase or in some cases decrease in TEC by SYS Study Zone between Year 0 (2010/11) and Year 7 (2017/18). For example the largest TEC increase within this period is located in Study Zone Z12 and is a total of 6,151MW.

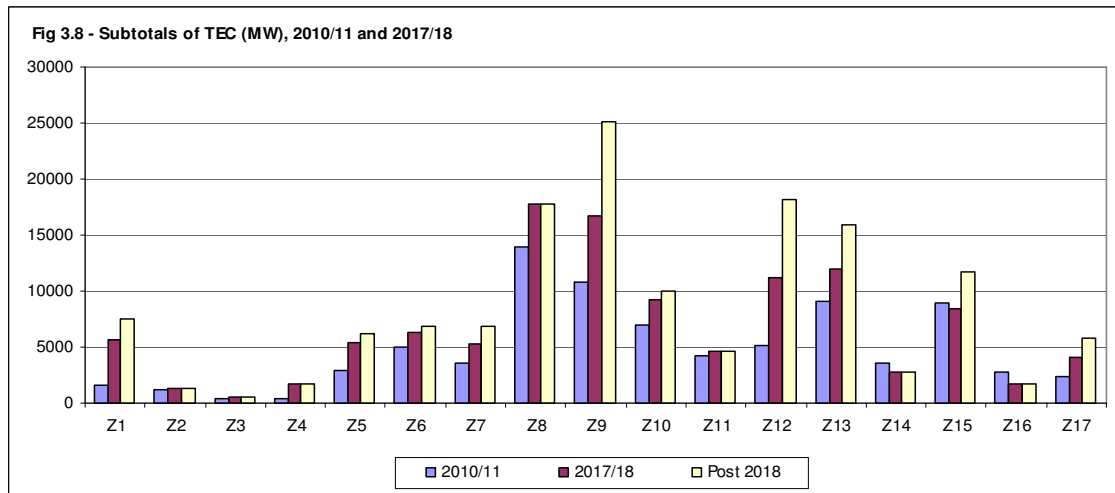
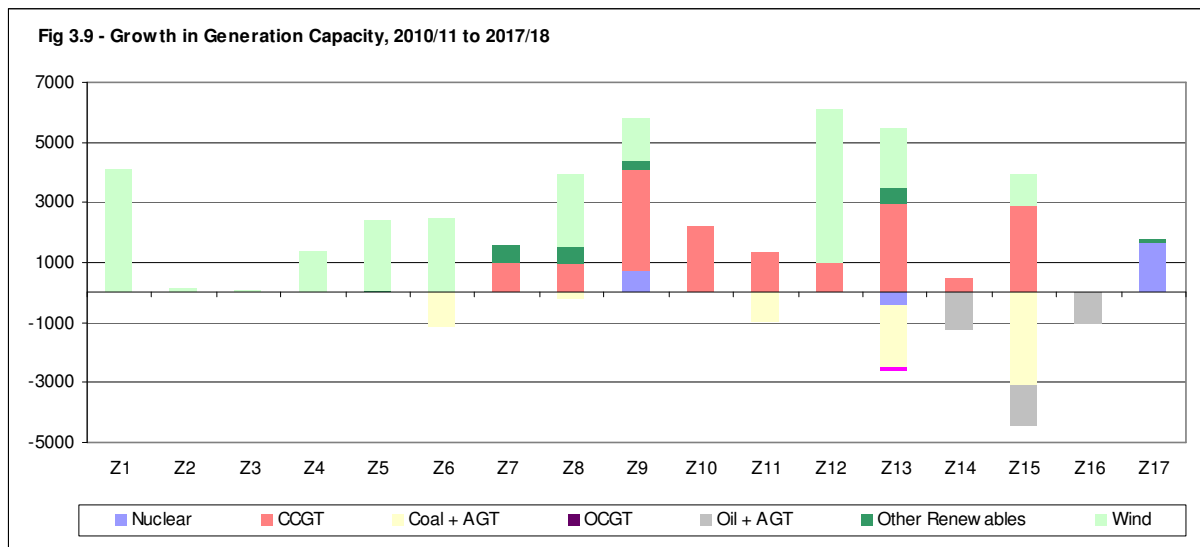


Figure 3.9 illustrates the split of the *net* total increase or decrease in TEC shown in Figure 3.8, for example the total increase shown for Study Zone Z6 is 1,355MW and Figure 3.9 shows that this is made up of an increase in wind of 2,457MW and a decrease in Coal + AGT of -1,102MW.

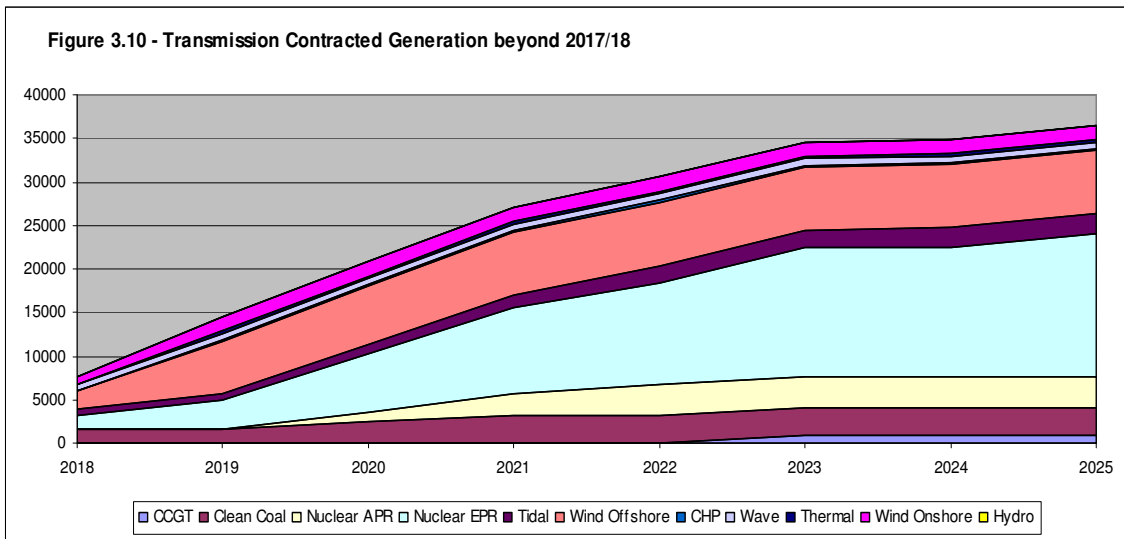


Please note that the data table previously included in this chapter which supports the above information and contains breakdown by Plant Type and SYS Study Zone is now located in Appendix F, Tables F.9, F.10 and F.11.

**Transmission Generation Contracted beyond 2017/18**

Table 3.7 and Figure 3.10 show the contracted generation only from 2018/19 to 2025/26.

<b>Table 3.7 - Transmission Contracted Generation beyond 2017/18</b>								
<b>Plant Type</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
CCGT	0	0	0	0	0	824	824	824
Clean Coal	1600	1600	2400	3200	3200	3200	3200	3200
Nuclear APR	0	0	1200	2400	3600	3600	3600	3600
Nuclear EPR	1670	3320	6590	9930	11580	14780	14780	16380
Tidal	600	800	1100	1400	2000	2000	2300	2300
Wind Offshore	2160	5920	6680	7280	7280	7280	7280	7280
CHP	0	250	250	250	250	250	250	250
Wave	700	722	722	722	722	722	722	722
Thermal	0	250	250	250	250	250	250	250
Wind Onshore	803	1650	1650	1650	1650	1650	1650	1650
Hydro	0	6	6	6	6	6	6	6
<b>Cumulative Total</b>	<b>7600</b>	<b>14519</b>	<b>20849</b>	<b>27089</b>	<b>30539</b>	<b>34563</b>	<b>34863</b>	<b>36463</b>



Please note that the data table previously included in this chapter which supports the above information and contains breakdown by Plant Type and SYS Study Zone is now located in Appendix F, Table F.12.