INFORMATION PAPER

5 year forecast of Transmission Network Use of System tariffs

December 2009

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1 Executive Summary

This paper is a forecast by National Grid of the movement in the Transmission Network Use of System (TNUoS) tariffs for the next five years due to changes in generation, demand and the transmission network. The objective is to give industry participants more understanding of the future trend of tariffs. This should aid the prediction of future TNUoS liabilities and hence lead to a better understanding of the underlying factors driving generation and demand tariffs.

The intention of this report is to focus on changes in the locational elements of the generation and demand tariffs. These locational elements will have the residual element added to calculate the final tariffs. Therefore users who wish to forecast next years tariffs need to take account of not only the locational element but **also changes to the residual component.**

The revenue recovered through the residual has been broadly consistent with increases allowed in each transmission licensee's price control, which are based on a RPI+2% revenue restriction (for the current price control). However, under the Offshore Transmission arrangements, the revenue recovered via the residual component will also depend upon each Offshore Transmission Operator's (OFTO) allowed revenue and the proportion of this revenue that is to be socialised. This will apply to both the generation and demand residuals and is likely to mean a **significant increase in Demand TNUoS charges. Section 8** of this paper provides further details on this impact.

It is also acknowledged that other proposals to change the commercial framework, such as that to implement locational BSUoS charging arrangements (GB ECM 08*) or those following DECC's Transmission Access Reform conclusions may have an effect on the final set of TNUoS tariffs if implemented. No assumptions on the Authority's future decisions relating to these proposals have been made. Accordingly, the analysis within this document has been based upon the current charging methodology.

Whilst a noticeable movement in some tariffs is expected to occur in the timeframe considered by this report, these relate to significant changes in the contracted background, such as changes in the generation base or significant network investments. A summary of the trend of the wider locational element of the tariffs over the next five years can be found in **Section 4**. This section highlights the dominant drivers behind tariff movements. The main drivers are:

2010/11	New generation at Griffin Wind, Carraig Gheal, Grain, Britned and Severn Power, and a reduction in demand in South Wales
2011/12	Commissioning of Pembroke Stages 1 & 2, and Kyle wind farm
2012/13	New generation connecting at Drakelow D, North Wales, Portbury, Scotland, and Pembroke Stage 3
2013/14	The commissioning of the new Beauly-Denny overhead line
2014/15	The commissioning of Eishken on the Isle of Lewis, Atlantic Array, Blyth and the completion of London Array.

A forecast of the movement in the wider locational element of next year's (2010/11) TNUoS tariffs can be found in **Section 5.1.** Changes to local substation and circuit tariffs are described in **Section 7.**

* http://www.nationalgrid.com/NR/rdonlyres/CF064BAF-E8AB-412F-A06B-AD52AE737F35/38612/AddendumtoLocBSUoS_cleandated26Nov2009.pdf

The data used in the report comes from the Seven Year Statement and all updates up to and including the October update. It indicates the latest contracted view. However, it will be subject to change depending on users' commercial decisions. If users wish to undertake their own analyses, **Section 6** demonstrates the sensitivity of the tariffs to differing scenarios. Multiple changes to the network produce broadly cumulative effects. Users can combine different scenarios as required.

As users are no doubt aware, there is a considerable amount of generation anticipated to connect in the near future. 2011/12 forecasts an increase in the contractual generation background by 5.8GW. As a consequence, several of the generation zones exceed the zoning criteria and these have been noted throughout the report.

2 Introduction

The underlying rationale behind TNUoS charges is that efficient economic signals are provided to users when services are priced to reflect the incremental costs of supplying them. Therefore, charges should reflect the impact that users of the transmission system at different locations would have on the costs of the Transmission Owners (TOs), if they were to increase or decrease their use of the system.

The wider TNUoS tariff comprises two separate elements. Firstly, a locationally varying element derived from the Direct Current Load Flow (DCLF) Investment Cost Related Pricing (ICRP) transport model to reflect the costs of capital investment in, and the maintenance and operation of, a transmission system to provide bulk transport of power to and from different locations. Secondly, a non-locationally varying element related to the provision of residual revenue recovery. The combination of both these elements forms the wider TNUoS tariff.

For generation users a local asset based charge is also levied. The substation element reflects the cost of providing infrastructure within the local substation to facilitate the connection of the generation to the Main Integrated Transmission System (MITS). Whilst the substation element is recalculated fully at the beginning of each price control period, it is indexed by RPI each year. The costs of providing infrastructure assets to connect the generation site to the MITS are also collected, via a local circuit charge. Like the locational element of the wider tariff, the local circuit tariff is calculated using the DCLF model.

In order to demonstrate the likely path of future locational generation and demand tariffs, this analysis concentrates predominantly on the locational elements of the TNUoS tariffs. This is because of uncertainties of the Tariff Model inputs that are used to determine the residual element of the tariffs. Most notably, this includes National Grid's maximum allowed revenue (including that of other transmission licensees) which has not yet been determined. Whilst this is the case, an initial view of the residual has been included in Section 8 to show the likely impact of the Offshore Transmission arrangements upon the residual tariff component and its future trend.

3 Methodology

The locational element of the TNUoS tariff has been forecast using the 2009/10 DCLF Transport and Tariff model. The Transport Model calculates the marginal cost of investment in the transmission system which would be required as a consequence of an increase in demand or generation at each connection point or node on the transmission system, based on a study of peak conditions. The ICRP concept uses MWkm as the measure of the costs of marginal investment. Hence, nodal marginal costs are estimated initially in terms of increases or decreases in units of kilometres (km) of the transmission system for a 1 MW injection to the system. These nodal costs are then grouped into zones and averaged on a capacity weighted basis. The zonal average marginal km is then multiplied by a security factor and expansion constant and adjusted to provide the correct Generation/Demand revenue split. A detailed explanation is available in Section 2 of the Statement of Use of System Charging Methodology.

The network, generation and demand data that has been used to populate the transport model has come from the 2009 Seven Year Statement (SYS) including all updates up to and including the October update. National Grid has sought to ensure that the forecast for 2010/11 tariffs is as close as possible to the final tariffs published at the end of January. To this end, the generation background used is sourced from the October update of the SYS. This reflects National Grid's contracted position with regard to the commissioning and decommissioning of generation.

In order to provide a consistent analysis of the path of future locational tariffs, the 'baseline' analysis assumes the existing TNUoS charging methodology throughout, which aims to recover 73% of maximum allowed revenue through zonal demand tariffs and the remaining 27% from zonal generation tariffs. **The implications of any potential future charging methodology modifications have not been included within this report.**

Further the current generation and demand zones have been kept constant throughout. Where the introduction of new generation has exceeded the zoning criteria, this is mentioned in the text.

The 2010/11 charging year represents the fourth year of a price control and as a result, the expansion constant will be inflated by RPI. For 2009/10, the expansion constant has been calculated as £10.768918/MWkm. For subsequent years, the expansion constant will also be inflated by RPI. However, for this analysis, only in the first year (2010/11) has the expansion constant been inflated[†] to £10.633241/MWkm. The expansion constant remains the same for all future years eliminating the 'stretching' effect on the tariffs that would result from an annual inflation by RPI. The analysis therefore illustrates the future path of the locational element of the tariffs resulting only from changes to the generation/demand background and updates to the DCLF Transport Model which reflect the system reinforcements contained in the SYS. The effects on the locational tariffs of inflating the expansion constant annually, by forecast RPI, are included as part of the sensitivity analysis contained in Section 6.

Similarly, the global locational security factor was recalculated for the 2007/8 charging year. This will not change until the next price control and therefore remains at 1.8 throughout the analysis.

The generation and demand charging bases have been assumed to be the volumes of generation and demand in the respective Transport Model studies throughout, and whilst this removes the major uncertainties of the Tariff Model, there does remain a small element of uncertainty in terms of the actual charging bases, which would feed through to the re-referencing quantity in the tariff model. Such uncertainty arises as the result of the potential for a user's demand to deviate from those levels forecast and the potential for a generator to amend its Transmission Entry Capacity (TEC) prior to the start of the relevant charging year.

Throughout the analysis the reference node has been fixed and is East Claydon (ECLA40_AQUL). The reference node is the notional centre of the transmission network and will shift as changes are applied to the network for the different years. Therefore when comparing only the locational element of the TNUoS tariff, it is necessary that the reference node is consistent year on year as this is the basis point for the calculation of marginal costs and determines the magnitude of the marginal costs, but not the relativity.

Offshore generation due to connect in the timeframe covered by this report has been modelled at the nearest onshore node(s) to give an indication of the relating effect on wider TNUoS tariffs. This excludes embedded Offshore Transmission connected generation that is

† Using the annual increase of May to October six monthly average RPI of ~-1.259891% from 2008 to 2009.

less than 100MW, which has not been modelled explicitly as the output is included within the modelled demand data which originated from the relevant Distribution Network Operator (DNO).

4 Summary of analysis of the wider locational tariff components

4.1 Baseline locational generation tariffs forecast

The following three figures show the forecast movement in generation tariffs, the dominant events that are driving the moments for the next 5 years, and where such events occur on the system. Further explanation of the yearly tariff changes can be found in section 5. The £/kW tariffs behind the tables can be found in the supplementary data section in the appendix at the end of this report.

For clarity the generation tariffs have been displayed on two separate graphs, as different zones have different drivers behind the tariff movements.

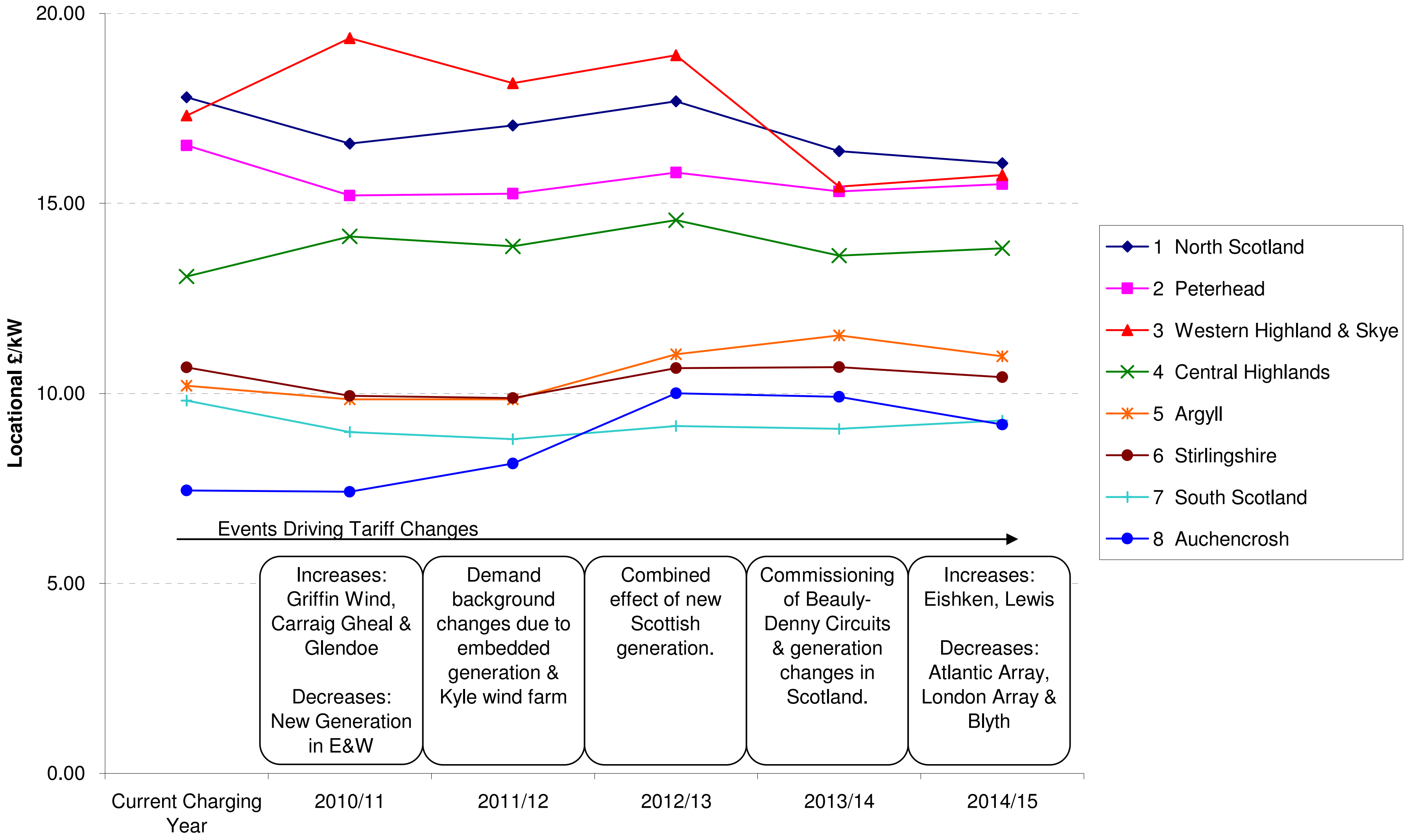


Figure 1 Forecast movements in the wider locational element of Scottish generation tariffs

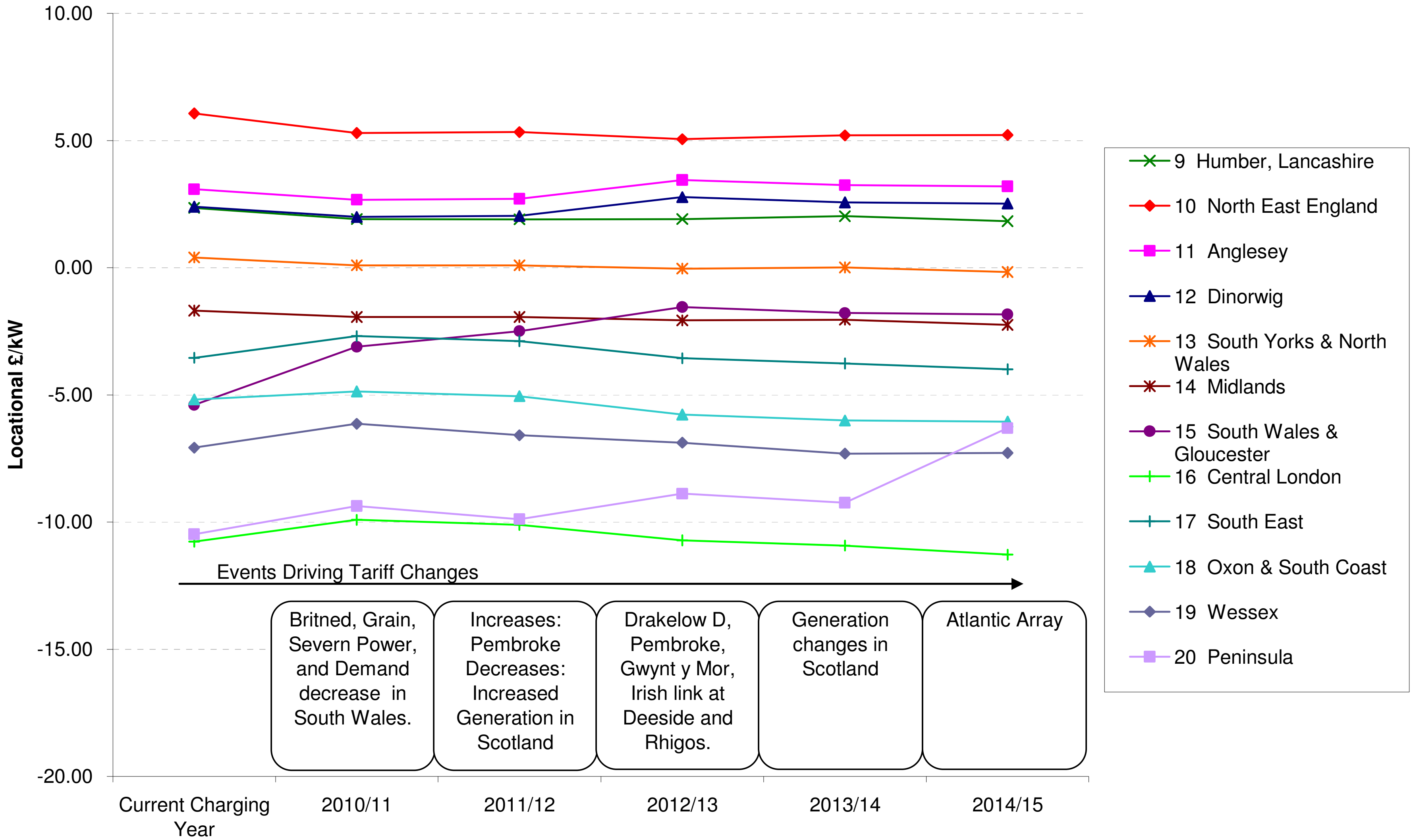


Figure 2 Forecast movements in the wider locational element of English and Welsh generation tariffs

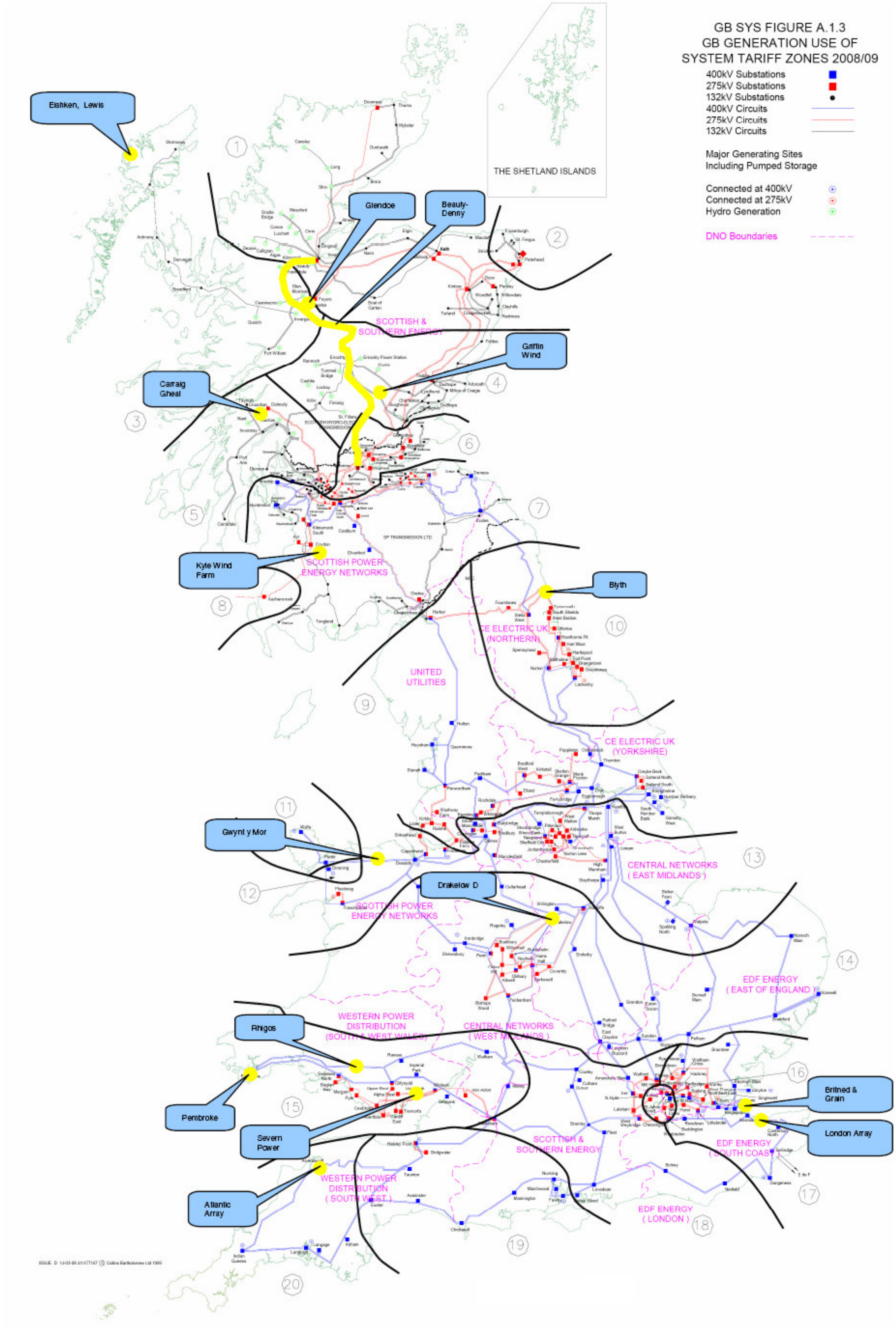


Figure 3 Generation and Demand zones with dominant events highlighted

The forecast changes to TNUoS tariffs are for the large part driven by changes to the generation background. The table below shows the contracted position for the yearly growth in the generation background. As can be seen from the table, there is a considerable amount of generation contracted to connect from 2010/11 onwards. Further to this, no generation is contracted to decommission. This reflects the current contractual background under which Users may relinquish their transmission access rights with a minimum of 5 days notice prior to 1st April each year. It is therefore subject to change based on the commercial decisions that individual parties will make. As a result the tariffs presented in this report should be used with caution. However, to enable readers to construct alternative scenarios, it is suggested that readers use the sensitivity analysis in Section 6.

Zone	Name	Current Tariffs MW	2010/11 Δ MW	2011/12 Δ MW	2012/13 Δ MW	2013/14 Δ MW	2014/15 Δ MW
1	North Scotland	697	-20	25	0	320	723
2	Peterhead	1,524	0	0	0	0	0
3	Western Highland & Skye	280	49	0	0	0	0
4	Central Highlands	200	204	0	0	0	0
5	Argyll	565	51	0	0	92	52
6	Stirlingshire	2,681	-33	72	0	0	0
7	South Scotland	4,240	153	1,149	570	160	133
8	Auchencrosh	329	0	0	0	0	20
9	Humber, Lancashire & SW Scotland	17,777	328	183	290	220	1,240
10	North East England	3,142	0	0	299	1,020	1,890
11	Anglesey	980	0	0	0	0	0
12	Dinorwig	1,644	0	0	0	0	0
13	South Yorks & North Wales	13,140	-123	2,235	1,224	3,046	0
14	Midlands	7,417	315	0	1,320	470	0
15	South Wales & Gloucester	4,981	425	1,600	699	950	0
16	Central London	144	0	0	0	0	0
17	South East	13,494	2,060	556	0	0	874
18	Oxon & South Coast	4,079	0	0	0	0	0
19	Wessex	3,500	0	0	0	0	0
20	Peninsula	1,045	0	0	0	0	1,512
	Total	**81,859**	**3,409**	**5,820**	**4,402**	**6,279**	**6,444**

Table 1 Contracted growth in zonal generation (MW)

4.2 Baseline locational demand tariffs forecast

The following figure shows the forecast movement in demand tariffs and the dominant events that drive the movements over the next 5 years.

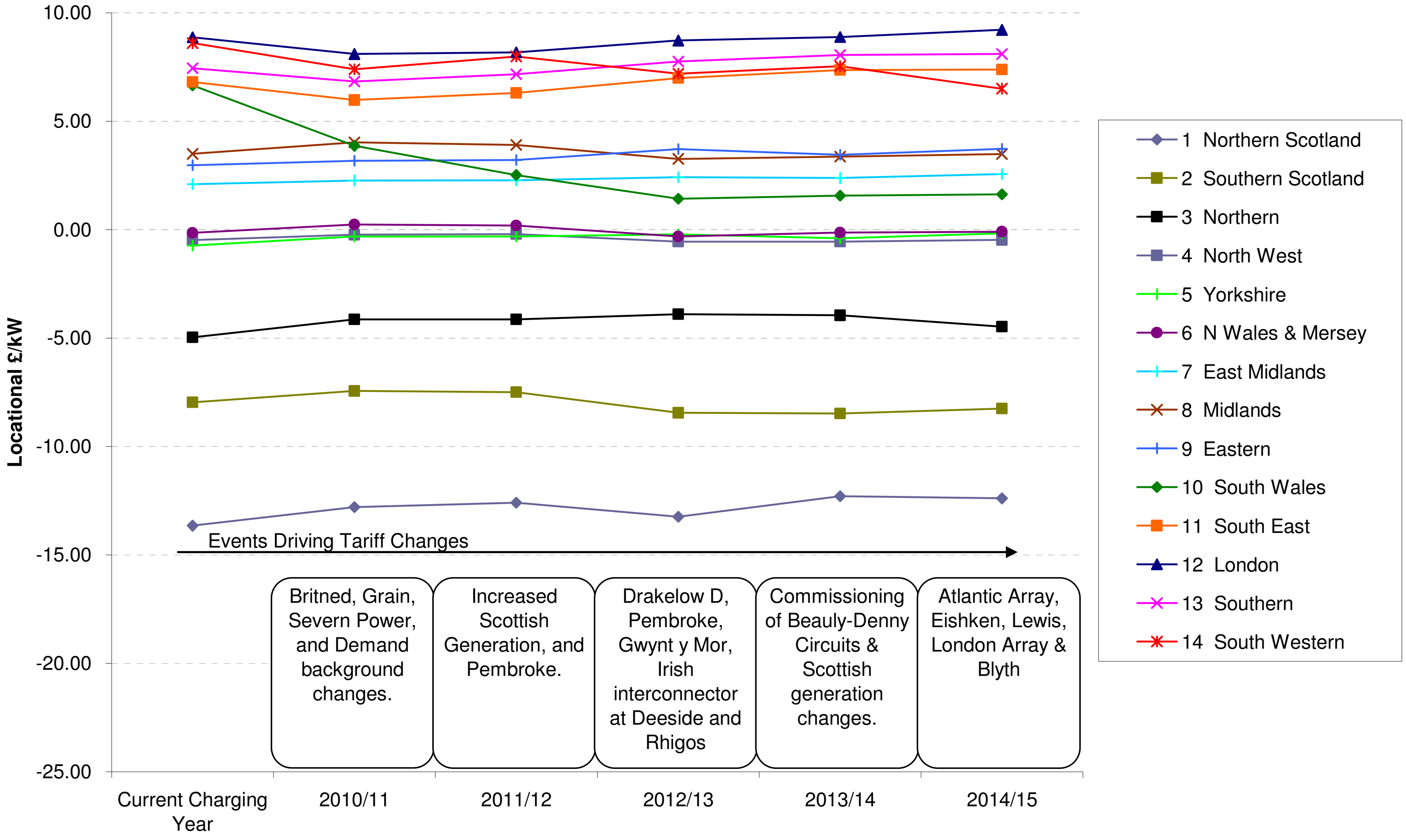


Figure 4 Forecast movements in locational element of demand tariffs

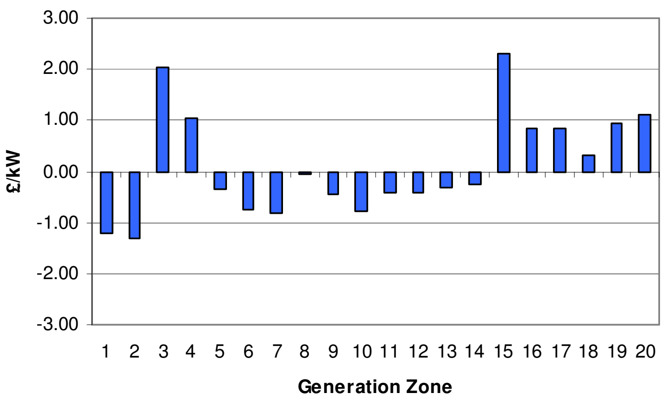
5 Indicative wider locational tariffs

The forecast tariffs below present only the wider locational element of the generation and demand tariffs. Changes in local tariffs are discussed in Section 7.

The wider locational element **will have the residual element added** to calculate the final 2010/11 zonal tariffs. For 2009/10 this was £16.94/kW for demand tariffs and £3.79/kW for generation tariffs. During the current Transmission price control period to date, the revenue recovered through the residual has been consistent with increases allowed in each transmission licensee's price control (currently based upon RPI+2%). However, due to the implementation of the Offshore Transmission arrangements, the value of the residual for 2010/11 tariffs will depend upon the level of socialisation of Offshore Transmission revenues. The effect of these revenues on the residual element is discussed in Section 8.

It is also worth noting that generally if there is a significant movement in generation tariffs, the reverse will be seen in the demand tariffs. This is because the ICRP model treats investments for incremental generation and demand as equal and opposite.

5.1 2010/11 Indicative wider locational tariffs



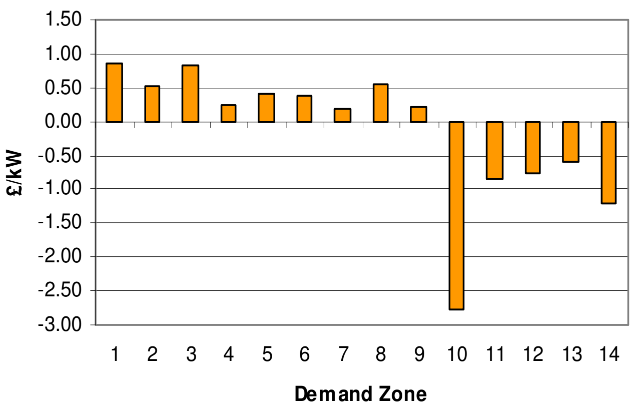


Figure 5 Locational changes to wider generation (left) and demand (right) tariffs

The above figure forecasts the changes to the locational element for 2010/11 generation and demand tariffs compared with the current 2009/10 tariffs. The most significant changes are:

i) the commissioning of Griffin Wind (204MW Zone 4) and Carraig Gheal (60MW Zone 5), and a 48.5MW TEC increase at Glendoe (Zone 3) increasing the generation tariff in Zone 3 by £2.04/kW and Zone 4 £1.06/kW;

ii) the combination of a 425MW TEC increase at Severn Power (Zone 15) and a 2.7% decrease in demand in South Wales increasing the generation tariff in Zone 15 by £2.29/kW and decreasing the demand tariff in zone 10 by £2.79/kW. This reverses the powerflows into South Wales by meeting demand with locally based generation, reducing the need for additional generation in the area; and

iii) a combination of additional generation in southern areas (e.g. 2060MW connecting at Grain) and changes in the demand background lead to an increase in generation tariffs in southern areas (by £1.10/kW in Zone 20), and a decrease in Northern England and Scotland (e.g. by £1.32/kW in Zone 2). This is largely due to the additional generation backing off North to South power flows within the DCLF model. This has a similar (but opposite) effect on demand tariffs (e.g. a decrease of £1.20/kW in Zone 14, and an increase of £0.86/kW in Zone 1)

Similar effects to those observed in (i) and (ii) above were reported in last year's condition 5 report. However the change in the zone 15 generation tariff is not as large as previously forecast, due to the delay in the commissioning of Pembroke (2000MW) until a later year.

5.1.1 Changes in the generation background

The table below identifies the changes in the generation background for the calculation of locational zonal generation tariffs for 2010/11, compared to the generation background used in 2009/10. The generation background for 2010/11 is as per the SYS October update section 2.6 and therefore will be the same as that used for final tariffs published at the end of January. This means that the movements above will be as close as possible to final tariffs for 2010/11.

Zone	Station Name	TEC (MW)	Node(s)	Comment
1	Kilbraur	47.5	STRB20	19.5MW TEC reduction
3	Glendoe	100	GLDO1G	48.5MW TEC increase
4	Griffin Wind Farm	102	GRIF1S	New Station
4	Griffin Wind Farm	102	GRIF1T	New Station
5	An Suidhe Wind Farm	20.7	ANSU10	9.3MW TEC reduction
5	Carraig Gheal	60	FERO10	New Station
6	Black Law	121	BLLA10	13MW TEC reduction
6	Longannet	2284	LOAN20	20MW TEC reduction
7	Andershaw	45	ANDE10	New Station
7	Earlshaugh Wind Farm	108	EHAU10	New Station
7	Hunterston	1074	HUER40	15MW TEC reduction
7	Torness	1215	TORN40	15MW TEC increase
9	Ormonde	150	HEYS40	New Station
9	Walney Offshore Wind I	178	HEYS40	New Station
13	Lincs Offshore Wind Farm	250	WALP40_EME	New Station
13	Rocksavage	810	ROCK40	62MW TEC increase
13	West Burton B	435	WBUR40	Removed from model due to revised connection date
14	Sheringham Shoal Offshore Windfarm	315	NORW40	New Station
15	Severn Power	850	USKM20	425MW TEC increase
17	Britned	1200	GRAI40	Staging of TEC
17	Grain	2215	GRAI40	860MW TEC increase

Table 2 2010/11 Changes in the Generation Background

5.1.2 Changes in the demand background

Similar to the generation data, whilst the SYS has been used as the demand background in the 2010/11 DCLF Transport Model, updates have been incorporated where advised by the relevant user. An alteration worth mentioning is 360MW of demand has been added at Auchencrosh (AUCH20) to account for the forecast demand taken by the interconnector at time of system peak once the generation at this node has been netted off.

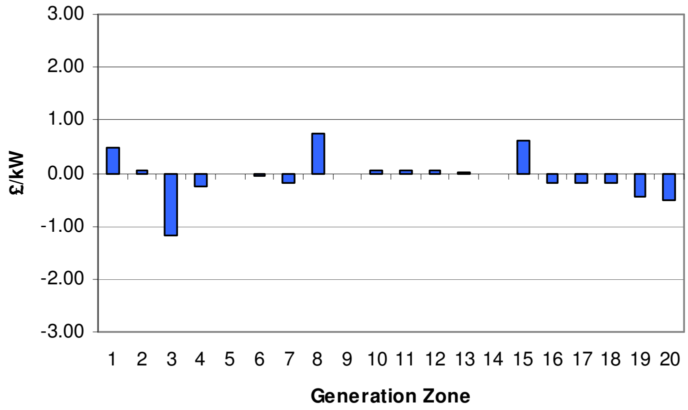
5.1.3 Network developments

The 2010/11 DCLF Transport Model has been updated to include the following network developments on the transmission system.

Licensee	Site	Works
NGET	Blyth	Reconfiguration of Circuits associated with Blyth, Stella West and Fourstones by removing the 275kV connections from Blyth to Fourstones and Stella West, replacing them with a 400kV double circuit from Blyth teeing into the Stella West to Eccles Circuit, and making the 275kV single circuit connection from Fourstones to Stella West a double circuit.
NGET	Cleve Hill	Addition of a new substation at Cleve Hill teeing into one of the Kemsley to Canterbury North 400kV circuits, and removal of quad boosters at Kemsley.
NGET	Stoke Bardolph	Addition of a new substation at Stoke Bardolph teeing into the Ratcliffe on Soar to High Marnham 400kV circuit.
NGET	City Road	Installation of an additional circuit between the two 400kV City Road substations.
NGET	Hirwaun (Rhigos)	Delay in connection of substation, so removed from model.
NGET	Tilbury	Addition of a new 400kV substation at Tilbury and adding in single circuit to West Thurrock.
NGET	Barking	Diversion of Barking to Northfleet East 400kV Circuits to West Thurrock and adding in additional 400kV double circuits to West Thurrock and Littlebrook.
NGET	Beddington	Addition of an additional 400/275kV transformer, an additional cable to Rowdown, and removal of the Rowdown node (creating two composite circuits to Littlebrook.
SPTL	Smeaton	Removal of unused nodes from the model due planned generation disapperaing from the background (e.g. Long Park).
SPTL	Essonside Tee	Connection of Windyhill to Partick 132kV circuit into Essonside Tee and additional Essonside Tee to Windyhill Connection to cope with additional demand.
SPTL	Aucencorth	Additional 132kV single cable circuit from Kaimes to Aucencorth, and addition of a 275/132kV transformer to facilitate the connection of Auchencorth Windfarm.
SPTL	Andershaw	Additional 132kV single composite circuit from Coalburn to Andershaw, to facilitate the connection of Andershaw Windfarm.
SHETL	Carolina Port	Replacement of the 132kV underground cable circuits between Carolina Port and Milton of Craigie.
SHETL	Griffin Wind	Connection of Griffin Wind farm into the circuits between Errochty and Burghmuir, and Errochty and Abernethy.
SHETL	Knocknagael	Addition of a new 275kV substation at Knocknagael, connecting to Beauly, Blackhillock, Foyers, and Inverness.
SHETL	Clayhills	Reconfiguration of circuits, so that Clayhills is connected via Redmoss instead of Willowdale (by changing the circuit on open standby).

Table 3 2010/11 Network Developments

5.2 2011/12 Indicative wider locational tariffs



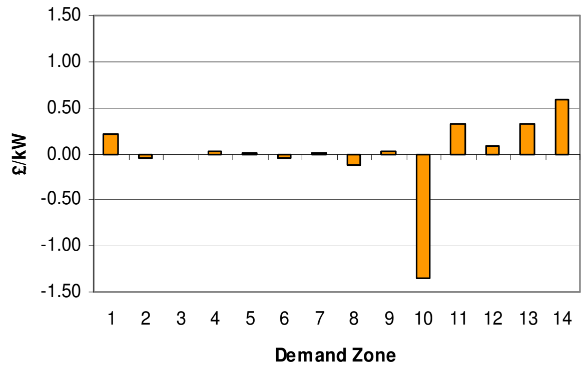


Figure 6 Locational changes to wider generation (left) and demand (right) tariffs

The above figure forecasts the changes to the locational tariff element for 20011/12 compared with 2010/11 tariffs.

The most significant changes are:

i) the commissioning of Pembroke stages 1 and 2 (1600MW, Zone 15) increases generation tariffs in zone 15 by £0.62/kW, decreases demand tariffs in zone 10 by £1.34/kW, and contributes to a number of decreases generation tariffs in Scotland. This is due to the generation creating power flows away from Pembroke and increasing those out of the South of Wales. This means that any additional generation increases the need for reinforcement in South Wales within the model and backs off the general North to South flows, reducing the need for reinforcements in other areas of the network;

ii) the commissioning of Kyle Windfarm (zone 7, 300MW) increasing generation tariffs in neighbouring zone 8 by £0.74/kW; and

iii) an overall increase in Scottish generation and changes in Scottish demand alter the network flows in a manner that reduce the generation tariff in zone 3 by £1.19/kW and increase the generation tariff in zone 1 by £0.60/kW. Whilst there is an increase in 1.2GW of generation in Scotland, the overall effect is somewhat diluted by a large amount of generation also connecting in England and Wales.

It is worth noting that the generation zoning criteria are breached in zone 15 due to the connected of Pembroke (1600MW); zone 7 due to the connection of Harestanes (140MW); and zone 1 due to the connection of Rosehall (25MW) at Shin.

5.2.1 Changes in the generation background

The table below identifies the contractual changes to the generation background for the calculation of locational zonal generation tariffs for 2011/12, compared to the generation background of 2010/11. The table is the current contractual position of generators due to connect 2011/12.

Zone	Station Name	TEC (MW)	Node(s)	Comment
1	Rosehall	25	SHIN10	New Station
6	Waterhead Moor	72	WAMR10	New Station
7	Clyde Wind Farm (Scotland) Ltd	519	CLYN2Q & CLYN2R	New Station

Zone	Station Name	TEC (MW)	Node(s)	Comment
7	Dersalloch	69	DESA1Q	New Station
7	Ewe Hill	66	EWEH1Q	New Station
7	Harestanes	140	HARE10	New Station
7	Harrows Law	55	HALA10	New Station
7	Kyle Wind Farm	300	KYLN10	New Station
9	Walney II Offshore Wind	183	STAH4A & STAH4B	New Station
13	Carrington Power Station	430	CARR40	New Station
13	Docking Shoal Wind Farm	500	WALP40_EME	New Station
13	West Burton B	1305	WBUR40	New Station
15	Pembroke	1600	PEMB40	New Station
17	Grain	2645	GRAI40	430MW increase in TEC
17	London Array	126	CLEV40	New Station

Table 4 2011/12 Changes in the Generation Background

5.2.2 Changes in the demand background

Similar to the generation data, whilst the SYS has been used as the demand background in the 2011/12 DCLF Transport Model, updates have been incorporated where advised by the relevant user.

5.2.3 Network developments

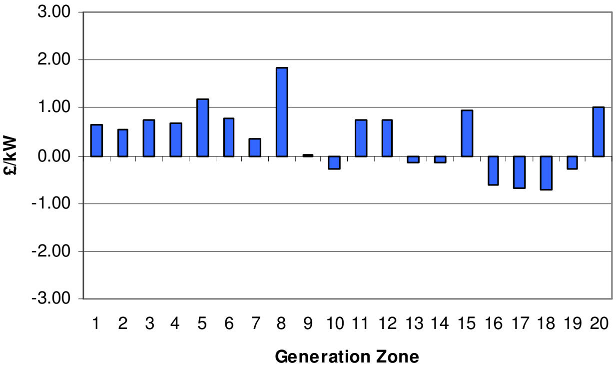
The 2010/11 DCLF Transport Model has been updated to include the following network developments on the transmission system.

Licensee	Site	Works
NGET	Hirwaun (Rhigos)	Establish a new 400kV substation to facilitate the connection of generation at Rhigos, connecting into the Pembroke to Walham and Pembroke to Cilfynydd circuits.
NGET	Swansea North	Reconfigure the Swansea North 400kV substation, so that it connects into a second Pembroke to Cilfynydd circuit and a Pembroke to Hirwaun (Rhigos) circuit.
NGET	Hatfield	Addition of a new 400kV substation at Hatfield connecting into the Keadby to Brinsworth 400kV circuit.
NGET	Carrington	Establish a new 400kV substation to facilitate the connection of generation at Carrington, connecting into the Kearsley to Daines 400kV circuit.
NGET	St Asaph	Addition of a new 400kV substation at St Asaph to facilitate the Connection of Gwynt y Mor Offshore windfarm. Connecting to 400kV double circuit teeing off the Pentir to Deeside circuits.
NGET	Stella West	Upgrade the 275kV circuits between Stella West, Spennymoor, and Norton to 400kV.
NGET	Hedon	Establish a new 275kV substation at Hedon, connecting between Saltend South and Creyke Beck 275kV substations, and to Creyke Beck via two 275/400kV transformers connecting to a 400kV double overhead line circuit.
NGET	Kemsley	Instal of quad boosters at Kemsley on the Kemsley to Cleve Hill and Kemsley to Cantebury North Circuits.
NGET	Tilbury	Addition of second 400kV composite circuit between Tilbury and West Thurrock.
SPTL	New Cumnock	Addition of a new 132kV substation at New Cumnock connecting to Coylton to facilitate connection of new generation.
SPTL	Dersalloch	Addition of a 132kV OHL circuit from New Cumnock to Dersalloch wind farm.

Licensee	Site	Works
SPTL	Devol Moor	Replace the single 132kV overhead line circuit between Erskine and Devol Moor with a double 132kV over head line circuit.
SPTL	Moffat	Establish a new 400kV/132kV substation at Moffat between Harker and Elvanfoot as to facilitate new generation projects.
SPTL	Earlshaugh	Addition of a 132kV composite circuit from Moffat to Earlshuagh wind farm.
SPTL	Harestanes	Addition of a 132kV cable from Moffat to Harestanes wind farm.
SPTL	Gretna	Addition of a 132kV composite circuits from Gretna to Ewe Hill wind farm and from Ewe Hill to Newfield wind farm.
SPTL	Devol Moor	Establish 132kV single ovehead line connection to Waterhead Moor wind farm.
SPTL	Kyle	Addition of a 132kV OHL circuit from New Cumnock to Kyle wind farm.
SPTL	Harrows Law	Establish a new 275/132kV substation between Kaimes and Wishaw, to facilitate the connection of Harrows Law wind farm.
SPTL	Meadowhead	Addition of a new 132kV circuit between Meadowhead and Kilmarnock South, and a new 275/132kV transformer at Kilmarnock South.

Table 5 2011/12 Network Developments

5.3 2012/13 Indicative wider locational tariffs



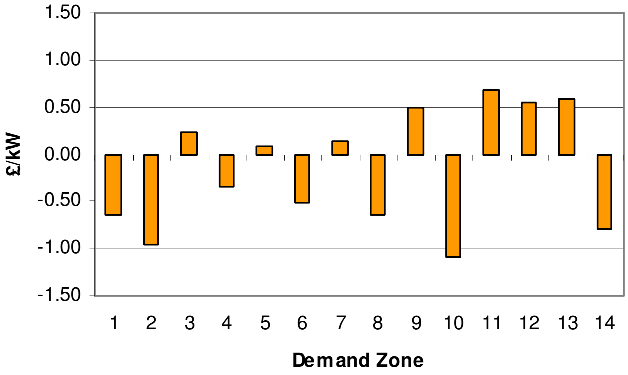


Figure 7 Locational changes to wider generation (left) and demand (right) tariffs

The above figure forecasts the changes to the locational tariff element for 2012/13 compared with 2011/12 tariffs. The most significant changes are:

i) The commissioning of generation at Pembroke (400MW), Rhigos (299MW), Drakelow (1320MW), and Gwynt y Mor Offshore Windfarm (294MW), and of the Irish interconnector connecting at Deeside (500MW), increase generation tariffs, in Wales and the South West (zones 11,12, 15 and 20), and decrease generation tariffs in the South East (zones 16-18). This is because the power flows from these areas to meet demand within the South East are increased, increasing the need for system reinforcements within the model. This is also responsible for the decreases in demand tariffs in zones 6,8,10 and 14, and increases in zones 9 and 11-13. The largest effect of this impact occurs in South Wales, where generation charges increase by £0.95/kW (zone 15) and demand charges increase by £1.09/kW (zone 10); and

ii) The combined effect of increases in Southern Scottish generation totalling 596MW (e.g. the connection of Ulzieside, Brockloch Rig, etc.) have increased generation tariffs in zones 1 to 8 (e.g. by £1.85/kW in zone 8) and decreased demand tariffs in zones 1 and 2 (e.g. by £0.96/kW in zone 2).

It is noticeable that the generation tariff for zone 8 will increase significantly between 2011 and 2013. In previous transport models, demand around Auchencrosh and Coylton has been met by power flows from Kilmarnock South, and any generation near to this demand region has backed-off these flows reducing the need for reinforcement and hence reduced the tariff. However, the increases in generation around the Coylton area planned for 2011/12 and 2012/13 reverse the power flows between Coylton and Kilmarnock South. This means that any additional generation in the Coylton and Auchencrosh area will (all other things being equal) increase the modelled need for reinforcement. Whilst this has an effect on tariffs in both Zones 7 and 8, Zone 8 only has 329MW of generation capacity, compared to Zone 7's 5,542MW, and because the tariff is a weighted average of the nodal prices within each zone, Zone 8's tariff is affected far more by the arrival of the new generation than Zone 7.

This year sees further breaching of the generation zoning criteria in zone 15 due to a 400MW TEC increase at Pembroke, and zone 7 due to the connection of Newfield wind farm (60MW).

5.3.1 Changes in the generation background

The table following identifies the contractual changes to the generation background for the calculation of locational zonal generation tariffs for 2012/13, compared to the generation background of 2011/12.

Zone	Station Name	TEC (MW)	Node(s)	Comment
7	Afton	77	BLAC10	New Station
7	Auchencorth	33	AUCC10	New Station
7	Brockloch Rig Wind Farm	60	DUNH1T	New Station
7	Hearthstanes B Wind Farm	81	HEAR10	New Station
7	Neilston	100	NEIW10	New Station
7	Newfield Wind Farm	60	NEWF1Q	New Station
7	Pencloe	62	DUNH1S	New Station
7	Ulzieside	69	GLGL1Q & GLGL1R	New Station
7	Whiteside Hill	27	GLGL1Q & GLGL1R	New Station
9	Drax Renewable Power Station	290	DRAX40	New Station
10	Tees Renewable Energy Plant	299	LACK40	New Station
13	Carrington Power Station	860	CARR40	430MW TEC increase
13	East-West Inteconnector	500	DEES40	New Station
13	Gwynt Y Mor Offshore Wind Farm	294	GWYN40	New Station
14	Drakelow D	1320	DRAK40	New Station
15	Pembroke (Stage 3)	2000	PEMB40	400MW TEC increase
15	Rhigos	299	HIRN40	New Station

Table 6 2012/13 Changes in the Generation Background

5.3.2 Changes in the demand background

Similar to the generation data, whilst the SYS has been used as the demand background in the 2012/13 DCLF Transport Model, updates have been incorporated where advised by the relevant user.

5.3.3 Network developments

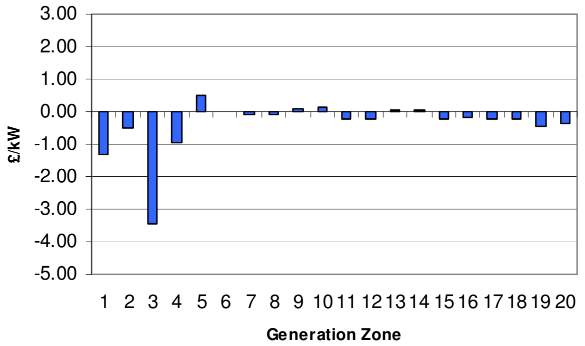
The 2011/12 DCLF Transport Model has been updated to include the following network developments on the transmission system.

Licensee	Site	Works
NGET	Amlwch	Establish a new 400kV substation at Amlwch teeing into Pentir to Wylfa double circuit.
NGET	Bustleholme	Installation of two 275/400kV transformers at Bustleholme and uprating the Bustleholme to Drakelow 275kV double circuit to 400kV.
NGET	Bramford	Connection of the Pelham to Sizewell 400kV circuit into Bramford.
NGET	Brine Field	Addition of a new 400kV substation at Brine Field connecting into the Lackenby to Norton 400kV circuit, to facilitate the connection of new generation.
SPTL	Black Hill	Establish a new 132kV substation at Black Hill connecting into New Cumnock via a 132kV double overhead line circuit.
SPTL	Dun Hill	Establish two 132kV Dun Hill substations and tee into the Black Hill to New Cumnock double circuit via a 132kV double cable circuit.

Licensee	Site	Works
SPTL	Glenglas	Establish two 132kV Glenglas substations connecting to the Black Hill substation via a 132kV double overhead circuit.
SPTL	Hearthstanes	Establish a 132kV substation at Heartstanes connecting to Earlshaugh via a 132kV single overhead line circuit.
SPTL	Neilston wind farm	Establish a new 132kV substation at Neilston Windfam connecting to Neilston 132kV substation via a 132kV single overhead line circuit. Disconnect the circuit between Kilmarnock South and Neilston 132kV substation, replacing it with a 132kV single overhead line circuit to Coylton, and install a single 132kV overhead line circuit between Neilston and Crookston.
SHETL	Beauly	Addition of a second 275kV circuit between Beauly and Dounreay, addition of quad boosters at Beauly 132kV on the double circuit to Moultaive (Alness/Shin tee), and installation of a second 132/275kV transformer at Dounreay.

Table 7 2012/13 Network Developments

5.4 2013/14 Indicative wider locational tariffs



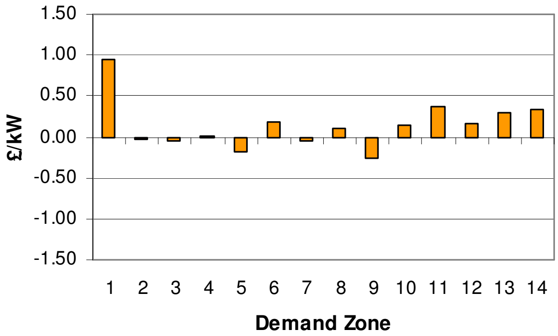


Figure 8 Locational changes to wider generation (left) and demand (right) tariffs

The above figure forecasts the changes to the locational tariff element for 2013/14 compared with 2012/13 tariffs. Note that the scale has been altered on the generation tariffs chart to show the full extent of the tariff changes.

The decreases to zonal generation tariffs in northern Scotland are due to the commissioning of the Beauly-Denny 400kV and 275kV circuits through this area. This alters the general pattern of the power flows which use the new 400kV shorter route rather than the longer 275kV east coast circuits. This makes the whole of Northern Scotland electrically closer to the centre of the network, thereby reducing the generation tariffs and increasing the demand tariff.

The largest change in tariff caused by the Beauly-Denny circuits commissioning is that in generation zone 3, where the generation tariff reduces by £3.46/kW. This is because the only route for which power generate in this area can flow is via the circuits upgraded from 132kV to 400kV, drastically reducing the cost of facilitating additional generation within the model.

However, the above assumes no cable in the route. If a substantial part of the route were cabled, the reduction to Scottish generation tariffs caused by Beauly-Denny would be less significant.

The remaining changes in tariff are related to changes in the generation background in Scotland.

5.4.1 Changes in the generation background

The table below identifies the contractual changes to the generation background for the calculation of locational zonal generation tariffs for 2013/14, compared to the generation background of 2012/13.

Zone	Station Name	TEC (MW)	Node(s)	Comment
1	Parc (Sth Lochs) Wind, Lewis	94	BEAU40	New Station
1	Strathy North & South Wind	226	STRW13	New Station
5	A'Chruach Wind Farm	49.9	ANSU10	New Station
5	Stacain Wind Farm	42.5	DALL20	New Station
7	Blacklaw Extension	34.5	LINM1Q	New Station
7	Blacklaw Extension	34.5	LINM1R	New Station

Zone	Station Name	TEC (MW)	Node(s)	Comment
7	Margree	70	MARG10	New Station
9	Carscreugh	21.25	CACR1Q & CACR1R	New Station
9	Humber Gateway Offshore Windfarm	220	HEDO20	New Station
10	Brine Field	1020	THOR40	New Station
13	Gwynt Y Mor Offshore Wind Farm - Stage 3	735	GWYN40	441MW TEC increase
13	Hatfield Power Station	800	THOM40	New Station
13	Race Bank Wind	500	WALP40_EME	New Station
13	Sutton Bridge B	1305	WALP40_EME	New Station
14	Barking Power Station C	470	BARK40	New Station
15	Abernedd Power Stage 1	435	BAGB20	New Station
15	Port Talbot Woodchip Power Station	350	MAGA20	New Station
15	Portbury	165	SEAB40	New Station

Table 8 2013/14 Changes in the Generation Backgrou

5.4.2 Changes in the demand background

Similar to the generation data, whilst the SYS has been used as the demand background in the 2013/14 DCLF Transport Model, updates have been incorporated where advised by the relevant user.

5.4.3 Network developments

The 2012/13 DCLF Transport Model has been updated to include the following network developments on the transmission system.

Licensee	Site	Works
NGET	Bramford	Reconfigure the Sizewell to Norwich Main circuit to connect into Bramford.
NGET	St. John's Wood	Decommission of 275kV double cable circuit to Tottenham West and installation of a 400kV single cable circuit to Hackney.
SPTL	Margree	Install a new 132kV substation at Margree connecting to New Cumnock via a single circuit 132kV overhead line. Additionally install a new 132kV substation at Black Craig Wind farm connecting to Margree via a single circuit 132kV overhead line.
SPTL	Carscreugh	Establish two 132kV overhead line connections to Carscreugh wind farm teeing into the Newton Stewart to Glenluce 132kV overhead line double circuit.
SPTL	Denny	Install a new 132kV, 275kV and 400kV substation at Denny. Replace the Bonnybridge to Braco 132kV circuits with a 275kV overhead line single circuit connecting to Braco and a 400kV overhead line single circuit connecting to Errochty. Connect the 275kV circuits from Longannet and Lambhill into Denny instead of Bonnybridge.
SHETL	Mid Hill	Connect a new GSP to facilitate the connection of Mid Hill Windfarm, teeing into the Kintore to Kincardine and Kintore to Tealing 275kV overhead line circuits.
SHETL	Strathy Wind	Install a new 275kV substation connecting into one of the two Beauley to Dounreay overhead line circuits, to facilitate the connection of Strathy North and South Wind farm via two 132kV cable circuits from the new substation.
SHETL	Beauly	Remove the 132kV circuits from Beauly to Braco via Fasnakyle, Fort Augustus and Errochty. Install 400kV substations at Beauly, Fort Augustus, and Errochty, connecting each with a 400kV single overhead line circuit. Install a 275kV single overhead line circuit from Beauly to new 275kV substations at Fasnakyle, Fort Augustus Errochty and Braco.

Table 9 2013/14 Network Developments

5.5 2014/15 Indicative wider locational tariffs

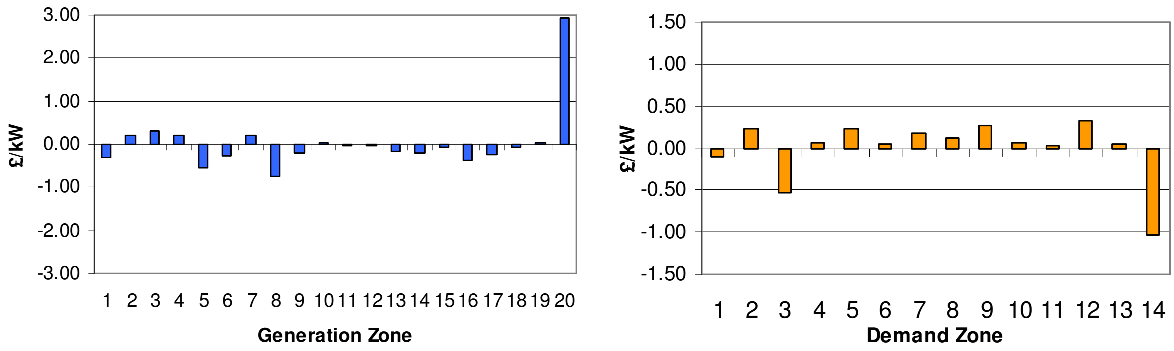


Figure 9 Locational changes to wider generation (left) and demand (right) tariffs

The above figure forecasts the changes to the locational tariff element for 2014/15 compared with 2013/14 tariffs.

The most significant change is the connection of Atlantic Array (1512MW in zone 20) which is the dominating factor behind a £2.94/kW increase in generation tariffs in zone 20 and a £1.03/kW decrease in demand tariffs in zone 14. This and other generation changes (including the commissioning of Blyth and London Array), also contribute to a number generation tariff decreases in Scotland (zones 1,5,6 and 8) and a decrease in the demand tariff in zone 3.

The connection of Eishken (300MW), on the Isle of Lewis via a HVDC to Beauly has predominantly driven the generation tariff increases in zones 2-4. As the current charging methodology does not currently cover HVDC island connections, both Eishken and North Nesting based on the Shetland Islands have been modelled at the connecting onshore node (Beauly and Blackhillock respectively) to provide an indication of their effects on wider tariffs. An analysis of their local charges is provided in section 7 of this paper.

5.5.1 Changes in the generation background

The table below identifies the contractual changes to the generation background for the calculation of locational zonal generation tariffs for 2014/15, compared to the generation background of 2013/14.

Zone	Station Name	TEC (MW)	Node(s)	Comment
1	Aultmore Wind Farm	60	AULW1S	New Station
1	Clashindarroch Wind	112.7	CLAS20	New Station
1	Eishken, Lewis	300	BEAU40	New Station
1	North Nesting Wind, Shetland	250	BLHI40	New Station
5	Shira Wind Farm	52	DALL20	New Station
7	Blackcraig Wind Farm	71.3	BLCW10	New Station
7	Calliacher Wind Farm	62.1	CALW20	New Station
8	Dunoon Wind Farm	20	DUNO1Q & DUNO1R	New Station
9	Immingham Renewable Power Station	290	KILL40	New Station
9	Wyre Power	950	STAH4A & STAH4B	New Station
10	Blyth	1600	BLYT40	New Station
10	Port of Tyne Renewable Power Station	290	SSHI20	New Station
17	London Array	1000	CLEV40	874MW TEC increase
20	Atlantic Array	1512	ALVE4A & ALVE4B	New Station

Table 10 2014/15 Changes in the Generation Background

5.5.2 Changes in the demand background

Similar to the generation data, whilst the SYS has been used as the demand background in the 2014/15 DCLF Transport Model, updates have been incorporated where advised by the relevant user.

5.5.3 Network developments

The 2013/14 DCLF Transport Model has been updated to include the following network developments on the transmission system.

Licensee	Site	Works
NGET	Teesport	Install new 400kV substations at Teesport and Saltholme. Connect the new Saltholme substation to the Brine Field to Norton 400kV circuit. Install a new 275/400kV transformer at Saltholme connecting the new substation into the 275kV Hartlepool to Lackenby circuit. Uprate the 275kV circuit from Saltholme to Lackenby and 275kV Tod Point substation to 400kV. Connect the new Teesport substation to the circuit connecting Lackenby and Tod Point.
NGET	Blyth	Install a new 275/400kV transformer at Blyth.
NGET	Rochdale	Install a new 275/400kV transformer at Rochdale.
SHETL	Clashindarroch	Establish a new 275kV substation connecting to one of the Kintore to Blackhillock 275kV overhead line circuits to facilitate the connection of new generation.
SHETL	Aultmore Wind Farm	Add a 132kV single circuit overhead line connection to Aultmore wind farm teeing into the existing 132kV single overhead line circuit to MacDuff.
SHETL	Calliacher Wind Farm	Establish a new 275kV substation connecting into the 275kV Errochty to Braco overhead line circuit to facilitate the connection of new generation.
SHETL	Blackhillock	Install a new 400kV substation at Blackhillock to facilitate a HVDC connection to generation based on the the Shetland Isles, and two 275/400kV transformers.
SHETL	Black Craig	Install a new 132kV substation at Black Craig to facilitate the connection of new generation, connecting to Inverkip via 132kV undersea cable. Install an additional 132kV circuit to Dunoon, which is to be left on open standby.
SPTL	Inverkip	Install a new 132kV substation at Inverkip and two 132/400kV transformers.

Table 11 2014/15 Network Developments

6 Sensitivity Analysis of Wider Locational Tariffs

6.1 Increasing the expansion constant by RPI

The baseline analysis presented in Sections 4 and 5 of this paper inflates the 2009/10 expansion constant by forecast RPI, to derive an expansion constant for 2010/11. The expansion constant is then maintained at the 2010/11 figure for the remaining four years of the analysis.

However, in accordance with the TNUoS charging methodology, the expansion constant and expansion factors that are calculated at the beginning of a price control period are increased by RPI for each subsequent year of the price control period. To illustrate the impact that inflation could have on locational tariffs over a five year period, a possible scenario of future inflation rates can be used to derive future expansion constants and these are presented in the table below. Note, the inflation figures provided do not represent National Grid's forecast of inflation. Alternative scenarios are possible and, against the background of the present economic uncertainty, these could vary significantly.

Year	RPI	Expansion Constant
2010/11	-1.3%	10.63
2011/12	2.4%	10.89
2012/13	3.0%	11.22
2013/14	3.0%	11.56
2014/15	3.0%	11.90

Table 12 Inflating the expansion constant by forecast RPI

The graphs below demonstrates the effects of increasing the expansion constant year on year by forecast RPI by plotting the deviation of the generation tariffs from those of the baseline scenario.

In summary, for both the generation and demand tariffs, the variances from the baseline analysis are proportional to the locational element of the zonal generation tariffs, with those generation zones with the largest locational tariffs impacted most significantly.

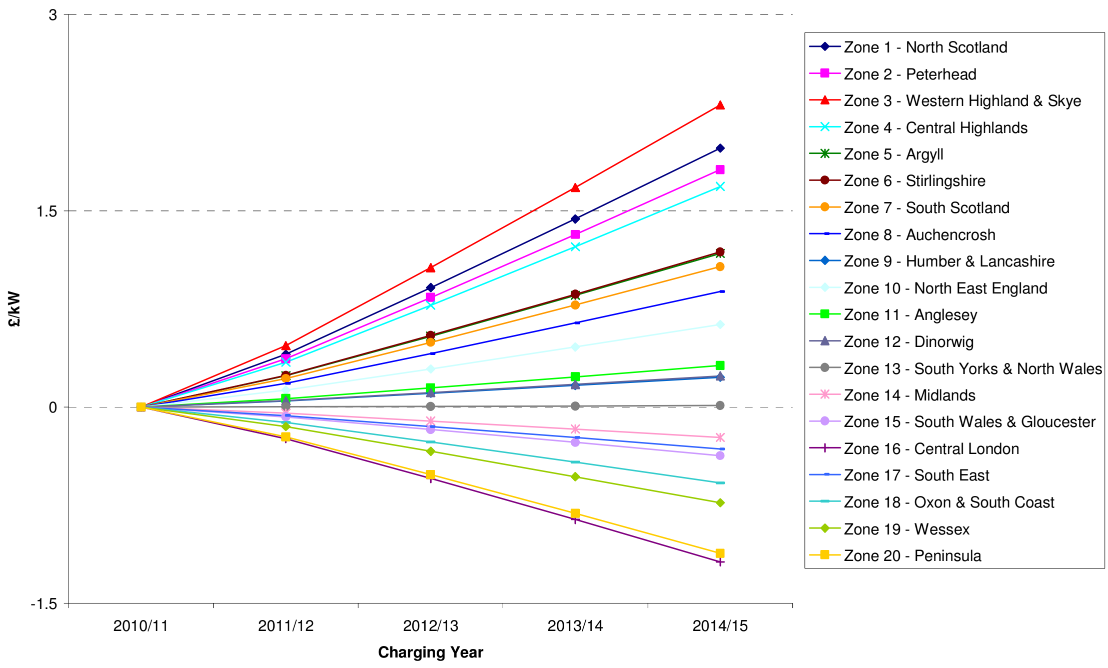


Figure 10 The effect of inflating the expansion constant by RPI on forecast generation tariffs

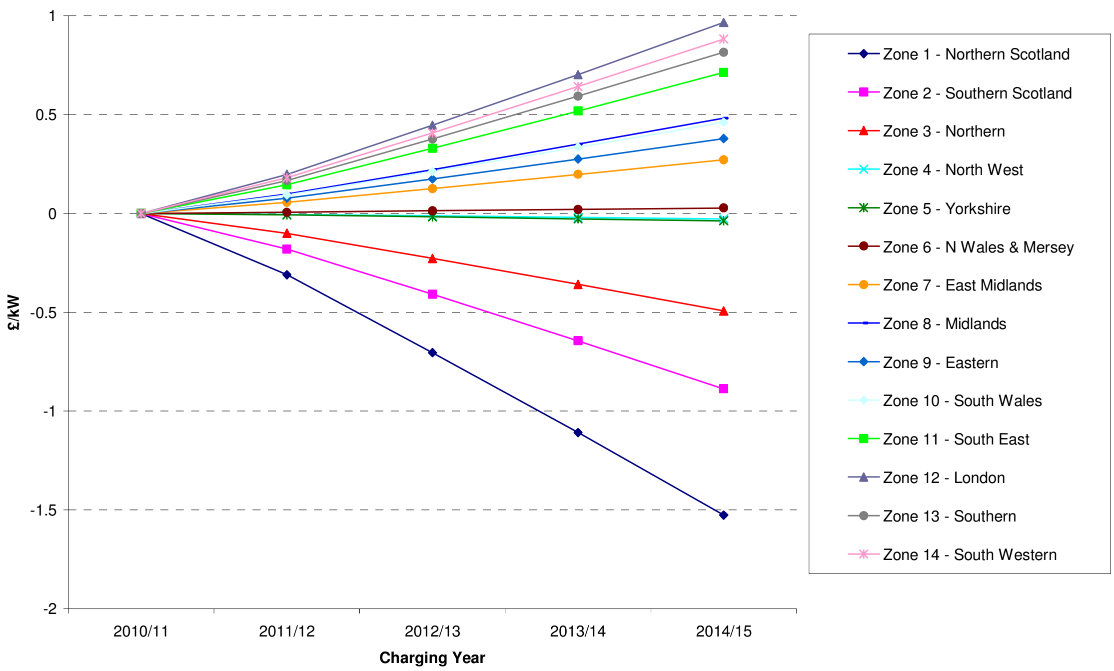


Figure 11 The effect of inflating the expansion constant by RPI on forecast demand tariffs

6.2 Increasing nodal generation

For the purpose of this analysis, 200MW, 500MW and 1000MW of generation was added to selected nodes located throughout SSE, SP and England and Wales respectively. The base model year used was 2010/11. For clarification, no further reinforcements to the DCLF Transport Model were made to accommodate the additional generation, other than those reinforcements already updated in accordance with the SYS.

The locations at which the generation was added are identified in the tables below and were chosen to reflect potential locations for new generation.

Zone	Zone Name	Location	DCLF Node
1	North Scotland	Beauly	BEAU
4	Central Highlands	Errochty	ERRO

Table 13 200MW Increase in generation

Zone	Zone Name	Location	DCLF Node
7	South Scotland	Coylton	COYL

Table 14 500MW Increase in generation

Zone	Zone Name	Location	DCLF Node
9	Humber, Lancashire & SW Scotland	Harker	HARK
10	North East England	Lakenby	LACK
13	South Yorks & North Wales	Walpole	WALP
14	Midlands	Drakelow	DRAK
15	South Wales & Gloucester	Pembroke	PEMB
17	South East	Grain	GRAI

Table 15 1000MW Increase in generation

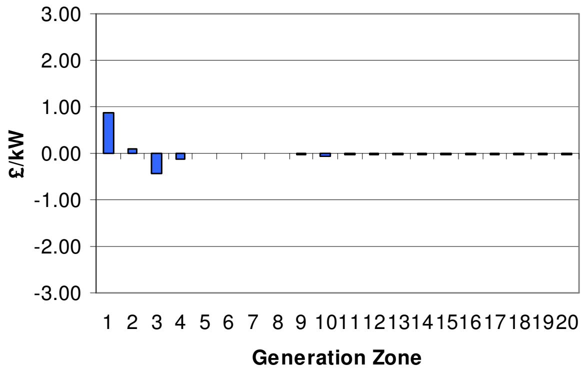
The following graphs identify the impact on the locational zonal generation and demand tariffs when additional generation is added to each of the relevant nodes identified in the table above.

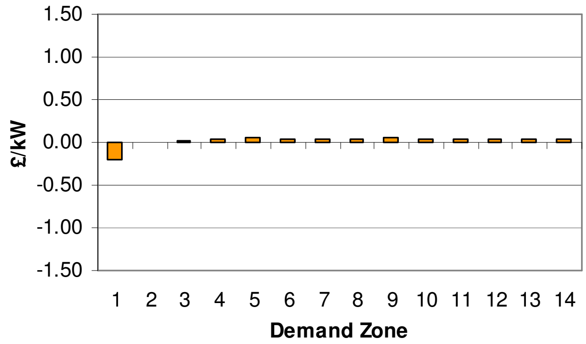
In most cases, when generation is added to a particular zone, the generation tariff will increase and the corresponding demand tariff will decrease. However, in a number of zones in England and Wales additional generation has been added with minimum effect. This is because there is already a considerable amount of generation in this zone and therefore the additional amount does not substantially alter the weighted average of nodal prices within that zone.

Furthermore if new generation connects to the 132kV network this generally produces a greater change in the generation tariffs than if the generation were connected to the 400kV or 275kV network. This is because the expansion factor for 132kV is higher than that for 400kV. Further generally the 132kV is in an electrically weaker part of the network. Therefore it is more likely for generation changes in such areas to affect the surrounding power flows. The net result is that generation changes at the 132kV generally produce greater swings in tariffs than if the corresponding generation connected at 275kV or 400kV.

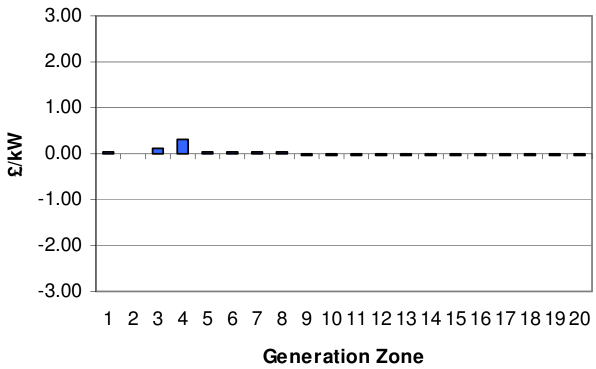
Where the results are different from these trends further explanation has been provided.

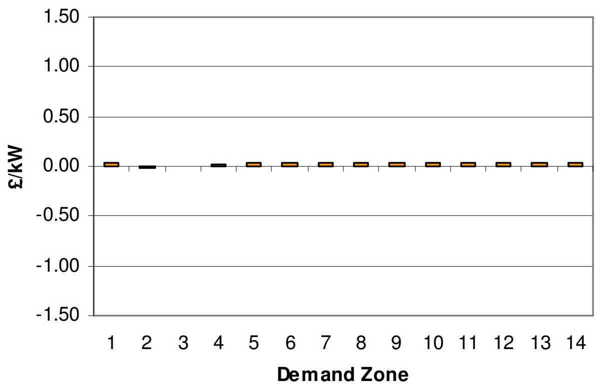
Additional 200MW at Beauly (BEAU), Zone 1





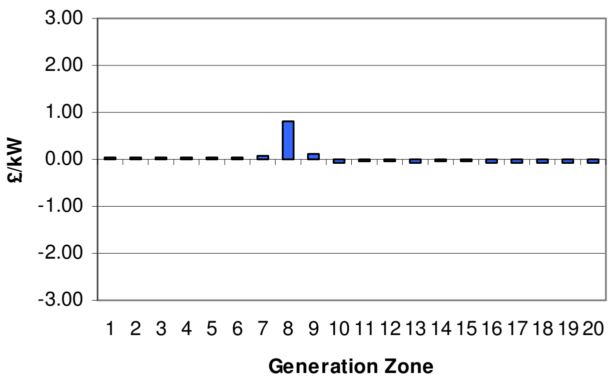
Additional 200MW at Errochty (ERRO), Zone 4

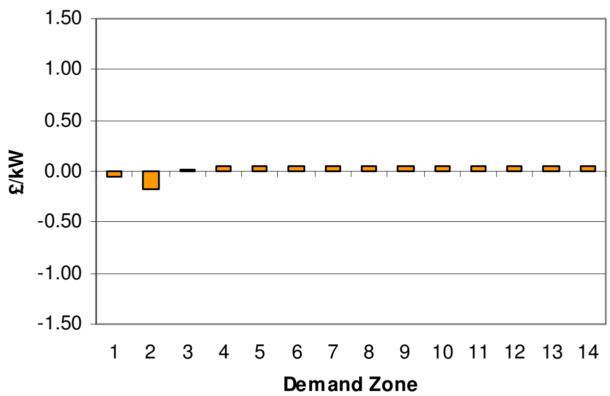




It is worth noting that increasing generation in zone 4 increases the tariffs in zone 3. This is because zone 3 is electrically close to zone 4. The extra generation in zone 4 is electrically proximate to zone 3. Therefore the extra generation increases all the nodal prices in the immediate vicinity, including those in Zone 3.

Additional 500MW at Coylton (COYL), Zone 7

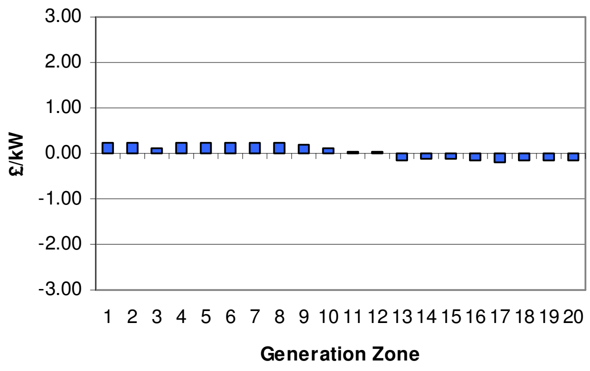


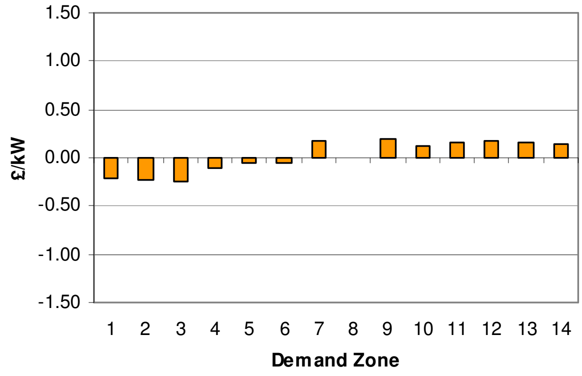


It is worth noting that Zone 8's tariff increases as it is electrically proximate to the extra generation as the extra generation increases all the nodal prices in the immediate vicinity, including those in Zone 8. Zone 8 has 329MW of generation capacity, Zone 7 has

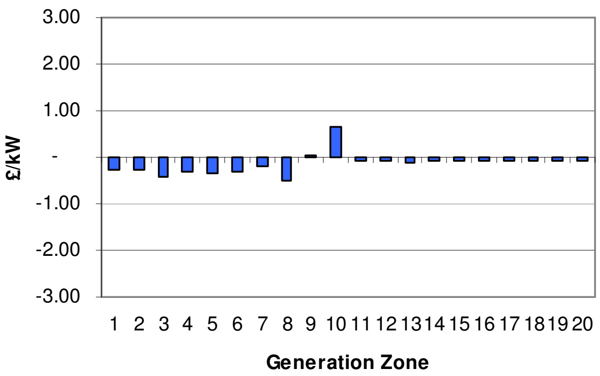
4,393MW. Therefore as the tariff is a weighted average of prices at each node within the zone, Zone 8's tariff is affected more by the extra generation.

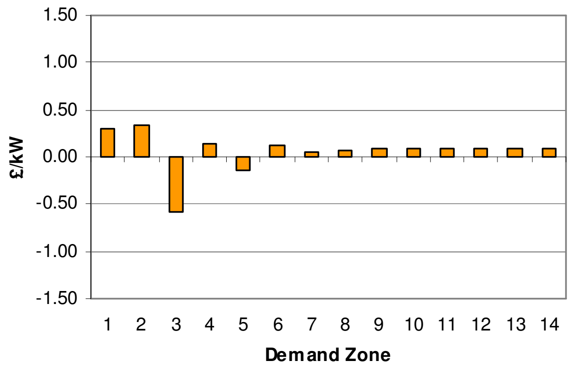
Additional 1000MW at Harker (HARK), Zone 9



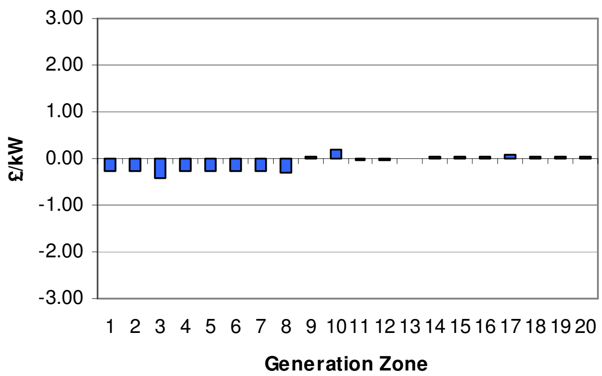


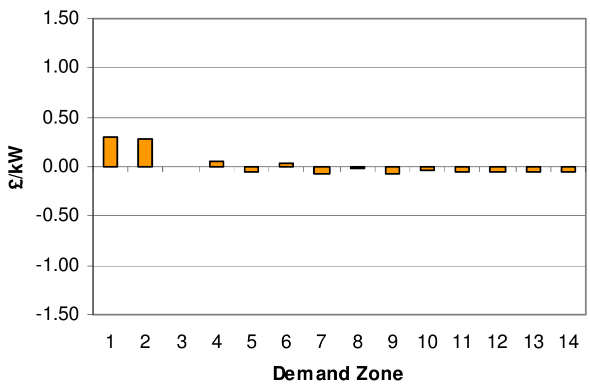
Additional 1000MW at Lackenby (LACK), Zone 10



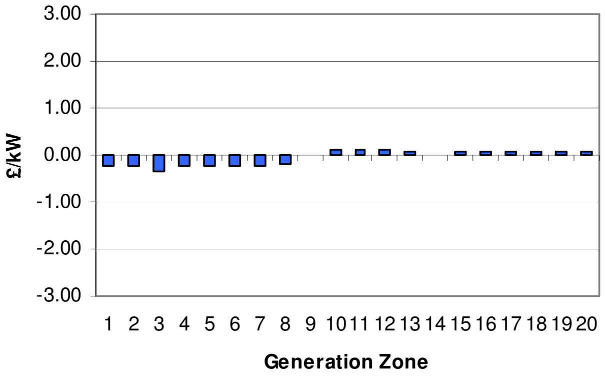


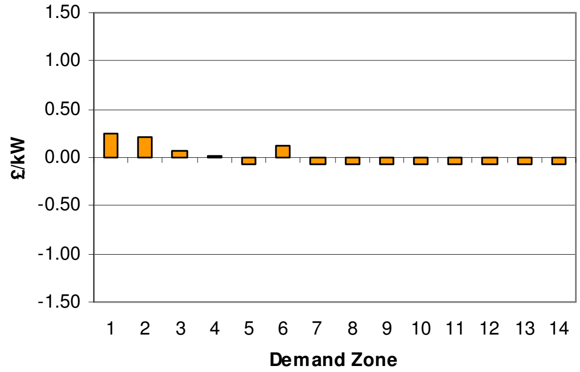
Additional 1000MW at Walpole, (WALP) Zone 13



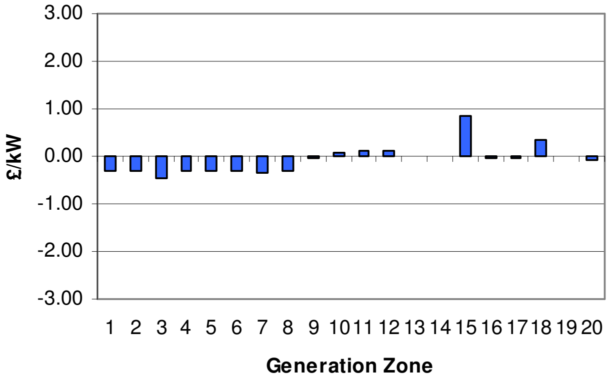


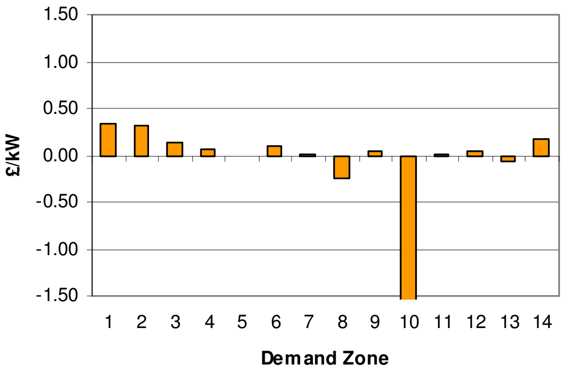
Additional 1000MW at Drakelow (DRAK), Zone 14





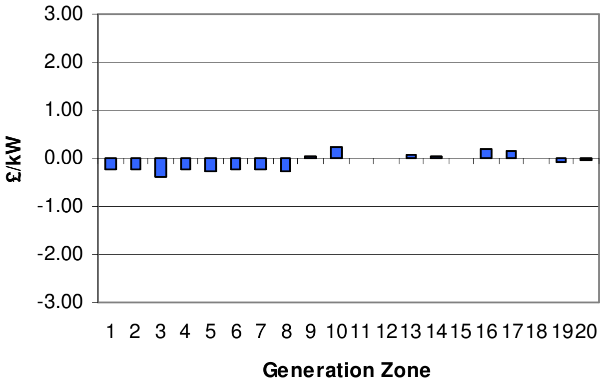
Additional 1000MW at Pembroke (PEMB), Zone 15

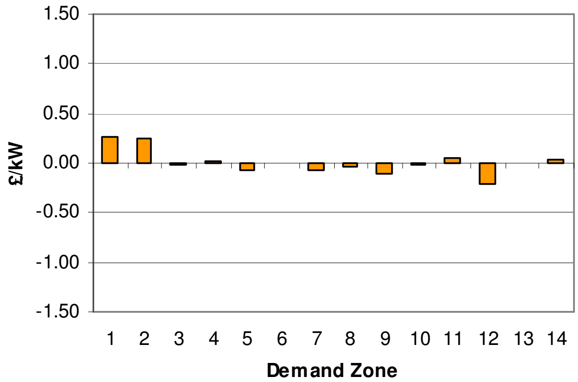




The addition of 1000MW at Pembroke increased the generation tariff in Zone 15 by £0.85/kW. The demand tariff in South Wales decreases by £1.73/kW. The zoning criteria are breached for Zone 15 following the addition of the extra generation.

Additional 1000MW at Grain (GRAI), Zone 17





6.3 Increasing/decreasing demand background

For the purpose of this analysis, zonal demand was uniformly increased and decreased by 5% in the 2009/10 DCLF Transport Model, updated to reflect those system reinforcements and generation backgrounds in the SYS. Again, no further reinforcements to the DCLF Transport Model were made to accommodate the increased/decreased demand, other than those reinforcements already updated in accordance with the SYS. The graphs below show the impact on the locational generation and demand tariff when increasing and decreasing demand by 5%.

The graphs show minimal change in the locational tariff element. This is because in the DCLF Transport model generation is scaled uniformly to meet demand. Therefore although the absolute level of the demand background is changed, the pattern of the power flows on the network will be the same. Hence the resulting locational element of the tariffs will be very similar. However this analysis does not include any changes to the residual element of the tariffs resulting from a change in charge base.

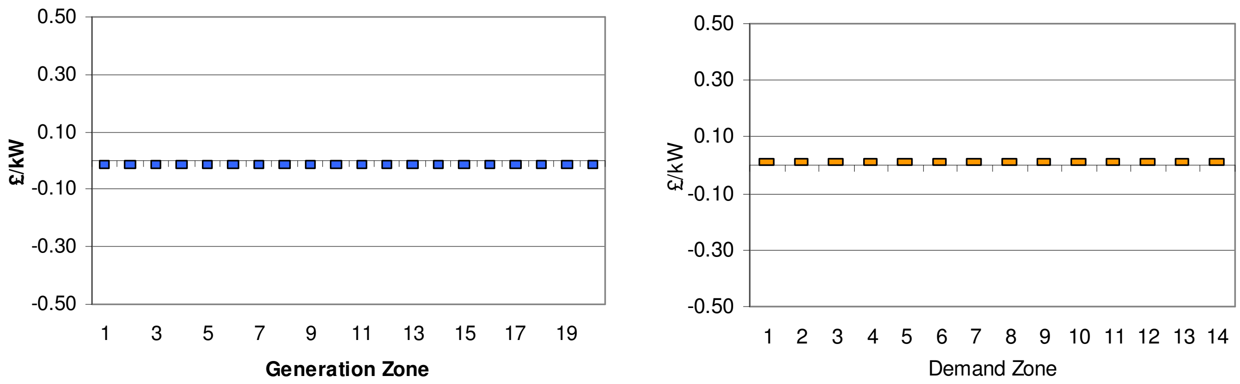


Figure 12 Demand background increased by 5%

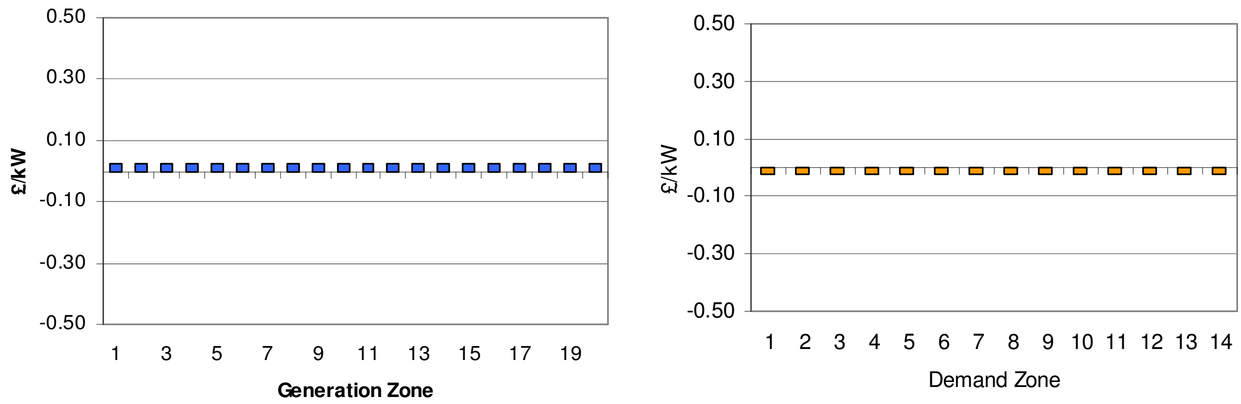


Figure 13 Demand background decreased by 5%

7 Forecast Local Generation Tariffs

Following the implementation of charging methodology modification GB ECM 11‡, generation TNUoS charges are disaggregated into local and wider components, so that costs associated with assets local to a specific generator are targeted appropriately.

Local charges are divided into Local Substation charges and Local Circuit Charges. This section considers how each of these will evolve for **onshore generation** over the next five years.

Local generation tariffs for offshore generation are dependent upon information relating to each individual offshore generation scheme, in particular, information on the assets that will connect the generation to the onshore network and the Offshore Transmission Owner's (OFTO) revenues, which will not be confirmed until the offshore tender process is completed in May.

National Grid has recently contacted developers of offshore generation to request a view of the asset information to enable tariff calculations. However, until this data is received it will not be possible to provide a reliable forecast of local generation tariffs. As a result, such forecasts will be provided to users once sufficient data is available.

7.1 Forecast Onshore Local Substation tariffs

Under the current charging methodology the Local Substation tariffs are recalculated for the first year of each price control period and indexed by RPI in each subsequent year.

As 2010-11 is the fourth year of a price period the tariffs will be indexed by RPI, and National Grid has forecast the Local Substation tariffs for the next five years on this basis, assuming the following RPI figures. Please note that these have been included purely for illustration and do not necessarily reflect National Grid's actual forecast of RPI:

Year	RPI
2010/11	-1.3%
2011/12	2.4%
2012/13	3.0%
2013/14	3.0%
2014/15	3.0%

Table 16 RPI figures used for local substation tariff analysis

Assuming that the underlying data used to calculate the 2012-13 tariffs, at the beginning of the next price control period, will be similar to that used to calculate the 2009-10 tariffs the following forecast should provide a fair reflection of the Local Substation tariffs for 2010-11 onwards.

‡ http://www.nationalgrid.com/NR/rdonlyres/27F920CA-C678-4D91-A3D1-701E909BDAFB/28281/GBECM11ConcReport_final_HR.pdf

			Local Substation Tariff (£/kW)		
Charging Year	**Sum of TEC at connecting substation**	**Connection Type**	**132kV**	**275kV**	**400kV**
2009-10	<1320 MW	No redundancy	0.135005	0.081631	0.065933
2010-11	<1320 MW	No redundancy	0.133304	0.080603	0.065102
2011-12	<1320 MW	No redundancy	0.137303	0.083021	0.067055
2012-13	<1320 MW	No redundancy	0.141422	0.085512	0.069067
2013-14	<1320 MW	No redundancy	0.145665	0.088077	0.071139
2014-15	<1320 MW	No redundancy	0.150035	0.090719	0.073273
2009-10	<1320 MW	Redundancy	0.304547	0.194659	0.156983
2010-11	<1320 MW	Redundancy	0.300710	0.192207	0.155005
2011-12	<1320 MW	Redundancy	0.309731	0.197973	0.159655
2012-13	<1320 MW	Redundancy	0.319023	0.203912	0.164445
2013-14	<1320 MW	Redundancy	0.328594	0.210029	0.169378
2014-15	<1320 MW	Redundancy	0.338452	0.21633	0.174459
2009-10	>=1320 MW	No redundancy	N/A	0.260591	0.210357
2010-11	>=1320 MW	No redundancy	N/A	0.257308	0.207707
2011-12	>=1320 MW	No redundancy	N/A	0.265027	0.213938
2012-13	>=1320 MW	No redundancy	N/A	0.272978	0.220356
2013-14	>=1320 MW	No redundancy	N/A	0.281167	0.226967
2014-15	>=1320 MW	No redundancy	N/A	0.289602	0.233776
2009-10	>=1320 MW	Redundancy	N/A	0.422807	0.340129
2010-11	>=1320 MW	Redundancy	N/A	0.417480	0.335844
2011-12	>=1320 MW	Redundancy	N/A	0.430004	0.345919
2012-13	>=1320 MW	Redundancy	N/A	0.442904	0.356297
2013-14	>=1320 MW	Redundancy	N/A	0.456191	0.366986
2014-15	>=1320 MW	Redundancy	N/A	0.469877	0.377996

Table 17 Forecast local substation tariffs for 2010-11 to 2014-15

7.2 Forecast Onshore Local Circuit tariffs

Onshore Local Circuit tariffs are calculated using the DCLF Transport and Tariff model. Using the same models utilised to forecast the wider locational wider tariffs presented in sections 4 and 5 of this paper, local circuit tariffs have been forecast for relevant generators.

It is worth noting that it is possible for offshore generators to have both an offshore and an onshore element to their local circuit charge. This will occur when the onshore connection point is a non-Main Integrated Transmission System (MITS) node. Greater Gabbard Offshore Windfarm is one such example, and for the avoidance of doubt, only the onshore element has been forecast in these cases.

Whilst the full set of Onshore Local Circuit tariffs can be found in the appendix, the following gives a summary of those tariffs which are forecast to change noticeably during the timeframe considered for reasons other than the indexation of the expansion constant by RPI:

Substation Name	Final Local Asset Tariff 2009-10 (£/kW)	Local Asset Tariff 2010-11 (£/kW)	Local Asset Tariff 2011-12 (£/kW)	Local Asset Tariff 2012-13 (£/kW)	Local Asset Tariff 2013-14 (£/kW)	Local Asset Tariff 2014-15 (£/kW)
Baglan Bay	0.061	0.062	0.109	0.109	0.556	0.556
Brine Field					0.003	0.268
Carrington			-0.120	-0.015	-0.015	-0.119
Cleve Hill			0.270	0.270	-0.029	0.270
Coryton	0.253	0.246	0.245	0.245	0.036	0.036
DunLaw	0.158	0.451	0.455	0.500	0.500	0.500
Fallago	0.141	0.256	0.258	0.258	0.258	0.258
Foyers	1.677	0.522	0.522	0.522	0.522	0.522
Gordonbush	1.285	1.163	1.163	1.529	0.910	0.910
Griffin Wind		1.974	-0.706	-0.698	-0.729	-0.729
Harrows Law			0.322	0.040	0.040	0.040
Hartlepool	0.389	0.383	0.404	0.404	0.405	0.403
Invergarry	1.020	-0.497	-0.497	-0.497	-0.497	-0.497
Lin Mill					0.596	-0.596
Luichart	2.999	0.812	0.812	0.812	0.812	0.812
Mossford	4.886	2.675	2.675	2.675	2.675	2.675
Orrin	2.177	0.000	0.000	0.000	0.000	0.000
Quoich	2.905	2.868	1.364	1.364	1.364	1.364
Saltend	0.251	0.248	0.322	0.322	0.322	0.322
Strathbora	1.030	1.034	1.034	1.353	0.811	0.811

Table 18 Forecast local circuit tariffs with significant changes between 2010-11 to 2014-15

7.2.1 Significant Changes in 2010-11 Onshore Local Circuit Tariffs

For 2010-11, the most noticeable changes are caused by the addition of a new GSP at Orrin to facilitate the connection of embedded generation, which makes this a MITS node. This therefore removes the local substation charge at Orrin, and reduces those at Luichart and Mossford. Similarly, the tariff at Foyers has been reduced due to the connection of the new Knocknagael 275kV MITS substation and relating circuit reconfiguration.

The local circuit tariff for generation connecting at Invergarry reduces in 2010-11, where any additional generation within the model now backs off the flow of energy on the Loch Lundie to Fort Augustus circuit to feed increased demand at Fort William, instead of contributing to flows towards Fort Augustus.

Finally, as part of the annual TNUoS charge setting process, National Grid has conducted a review of the local circuits associated with generation within the model, to ensure that the transport model contains the latest information available on connections. As a result, the security factor for the Fallago substation has been increased to reflect the redundancy in the associated local assets, and the local assets associated with Dun Law have been altered to reflect changes to the network in that area.

7.2.2 Significant Changes in 2011-12 Onshore Local Circuit Tariffs

In 2011-12, the local circuit tariff for Baglan Bay increases due to its close proximity to the additional generation added at Pembroke (1600MW). This means that any additional generation at Baglan Bay in the transport model would not have a smaller in reducing flows from Margam to feed demand at Swansea North as in previous years. Note that in 2013-14 the tariff increases further following the commissioning of Abernedd. The addition of this generation effectively reverses the flow on the Margam to Baglan Bay circuit such that power starts to flow away from Baglan Bay, meaning that any further generation would add to the need to reinforce this circuit.

Saltend also sees an increase in the local circuit tariff, due to reconfiguration of the network in preparation of additional generation connecting at Hedon. This effectively increases the number of local circuits associated with Saltend.

Similarly the local circuit tariff for Griffin wind turns negative in 2011-12 as the generator begins to back off flows from Errochty. Although the generation at this node adds to flows down other circuits, the net effect observed in the model is a reduction in the need to invest in the circuits local to the substation.

Another example of this effect occurring can be observed at Quoich, where the substation sees a reduction in local circuit tariff due to generation backing off flows between Loch Lundie and Fort Augustus.

7.2.3 Significant Changes in 2012-13 Onshore Local Circuit Tariffs

In 2012-13 the tariff at Carrington increases, as generation at the substation starts to contribute to flows on the Carrington to Kearsley circuit (following the addition of generation in North Wales), but remains negative due to it continuing to reduce flows along the Kearsley to Padiham circuit. It is worth noting that this change is reversed in 2014-15.

Also in this year the local circuit tariff at Harrow's Law is reduced, due to flows to Wishaw being reduced by additional generation connecting in generation zone 7.

Finally, the local circuit charge for Strathbora and Gordonbush Wind is increased, due to additional circuits added to the model in preparation of the connection of Strathy Wind North and South in 2013-14.

7.2.4 Significant Changes in 2013-14 Onshore Local Circuit Tariffs

As previously mentioned, 2013-14 sees the local circuit tariff at Baglan Bay increased due to the connection of Abernedd power station.

In addition, the commissioning of Sutton Bridge B and Barking C alter the flows in the South East, meaning that the Cleve Hill to Kemsley circuit reverses flow so that power flows towards Cleve Hill. This means that any generation from the London Array reduces the need to reinforce this circuit within the model, resulting in a negative tariff. However this effect is undone in 2014-15 by a 874MW TEC increase at London array, restoring the previous power flows.

The addition of Sutton Bridge B also reduces the local circuit tariff at Coryton, as the powerflows on the flow on the Coryton to Rayleigh circuit begin to flow towards Coryton.

Similarly, the addition of Strathy Wind North and South, reduces the tariff at Gordonbush and Strathbora, by effecting the powerflows between there and Dounreay.

7.2.5 Significant Changes in 2014-15 Onshore Local Circuit Tariffs

As previously mentioned 2014-15 sees the local circuit tariff at Carrington decrease as north to south power flows increase on the network following the addition of generation in more northerly parts of the network, so that the generation at Carrington begins to back off flows on the Carrington to Kearsley circuit.

In addition, the local circuit tariff for Lin Mill becomes negative, as the annual demand growth at this node leads to the modelled demand outweighing modelled generation. This means that the generation present at this node is considered as reducing the need to reinforce the local circuits to meet the increasing demand.

Finally, the local circuit charge for Brine Field increases, due to circuit reconfiguration around Saltholme, increasing the number of local circuits, to include those which are also local to Hartlepool.

7.3 Local Circuit tariffs for Island Connections

It is worth noting that in 2013-14 and 2014-15, Pairc (94MW) and Eishken (300MW) wind farms based on the Isle of Lewis, and North Nesting wind farm (250MW) based on the Shetland Islands are due to connect to the main GB transmission network via HVDC cables. In the analysis described so far in this paper, these generators have been modelled at the connecting onshore node (Beauly and Blackhillock respectively).

Whilst a charging methodology consultation on island connections is currently being consulted upon by the industry (GB ECM 20[§]), the current charging methodology does not currently cover HVDC island connections.

National Grid has therefore undertaken an analysis to calculate an estimate of the local charge for each of these stations, based on the methodology currently used for onshore local assets. This assumes the following:

i) the cost (and hence expansion constants) of the circuits are similar to that of 132kV underground cable onshore;

ii) the connections are single circuit and have a locational security factor of 1;

iii) the distance from Beauly to Eishken is 179km; and

iv) the distance from Blackhillock to North Nesting is 345km.

Using these assumptions Results in a local circuit tariff of £102/kW for North Nesting and £53/kW for Eishken and Pairc. However, it is worth noting that these may vary significantly depending upon the methodology, and the accuracy of assumptions above.

§ http://www.nationalgrid.com/NR/rdonlyres/5492DC2B-5A82-478A-8673-0EBAC44D2C69/38616/GBECM20Consultationv11.pdf

8 Offshore Transmission and Residual Tariffs

8.1 Forthcoming Changes in Residual Tariffs

Traditionally the revenue recovered through the residual component of TNUoS tariffs has been broadly consistent with increases allowed in each transmission licensee's price control, which are based on a RPI+2% revenue restriction (for the current price control). During the current Transmission price control period, the revenue recovered through the residual has been consistent with increases allowed in each transmission licensee's price control (currently based upon RPI+2%).

For 2009/10 the residual component was £16.94/kW for demand tariffs and £3.79/kW for generation tariffs. However, under the Offshore Transmission arrangements the revenue recovered via the residual component will also depend upon each Offshore Transmission Operator's (OFTO) allowed revenue.

Whilst a large share of OFTO revenues will be recovered through the local charging mechanism implemented under charging methodology modification GB ECM 08[**], an element will be socialised. In order to maintain the 27:73 split between the proportions of TO revenues recovered via Generation and Demand TNUoS charges, it is likely that a significant shift in the residual component will occur over the next five years. Note that this applies to both the generation and demand residuals and is likely to mean a **significant increase in Demand TNUoS charges.**

How the movement to the offshore charging regime will be handled is dependent upon the outcome of recent proposal to change the commercial framework to enable mid year tariff changes to implement the Offshore charging regime (GB ECM 21[††]).

Figures 14 and 15 on the following pages show how an increase in TNUoS revenues as a result of implementation of the Offshore Transmission Arrangements can have an effect on Residual Tariffs.

The precise magnitude of the change in the residual components of the TNUoS tariffs will depend upon the details of offshore schemes which are currently unclear, specifically the OFTO revenues and in the case of the generation residual, the level of socialisation.

8.2 Example of Future Residual Tariffs

For illustrative purposes, National Grid has conducted an analysis to show how the residual component may change over the timeframe covered by this report. This analysis has been conducted using the following assumptions (which were also used in the analysis in GB ECM 21):

i) Cost of Capital = 9% ETV

ii) Operating Costs = 5% ETV

iii) Unit Offshore Capital costs = £0.51m/MW

iv) No slippage in the Go-Live date of the Offshore Transmission arrangements; and

** http://www.nationalgrid.com/NR/rdonlyres/BB54C616-52B7-4DBC-80D4-41BCEAADCE9E/30891/GBECM8ConcReport_final.pdf

†† http://www.nationalgrid.com/NR/rdonlyres/CA5DA322-7179-4DCA-B063-1B30371F92DB/38697/GBECM21Consultation.pdf

v) 33% socialisation of Offshore Revenues.

Further to these assumptions, to ensure a like for like comparison, the charging bases within the tariff model for 2009-10 have been set to those demands and generation levels within the transport model (derived from the Seven Year Statement). In addition, no inflation has been taken into account and OFTO revenues are assumed to rise from ~£80m in 2010-11 to ~£580m in 2014-15. The results of the analysis can be seen in Figure 16.

In the scenario depicted, the demand residual tariff increases from £15.17/kW in 2009-10 to £20.68/kW in 2014-15. As the total revenue recovered via Demand TNUoS charges is fixed at 73% of the total TNUoS revenue, then all other things being equal, the demand residual component will always increase following growth in the amount recoverable, as occurs under the offshore arrangements with the commissioning of offshore generation schemes.

Alternatively, the generation residual tariffs decrease from £3.80/kW tin 2009-10 o £0.52/kW in 2014-15. Whilst the amount recoverable Generation TNUoS charges increases in line with the total TNUoS revenue over the period concerned, the majority of the offshore costs (67% in this example) are recovered through offshore local charges, resulting in a need to reduce the generation residual tariff to ensure that the 27% revenue recovery rate from generation charges is maintained.

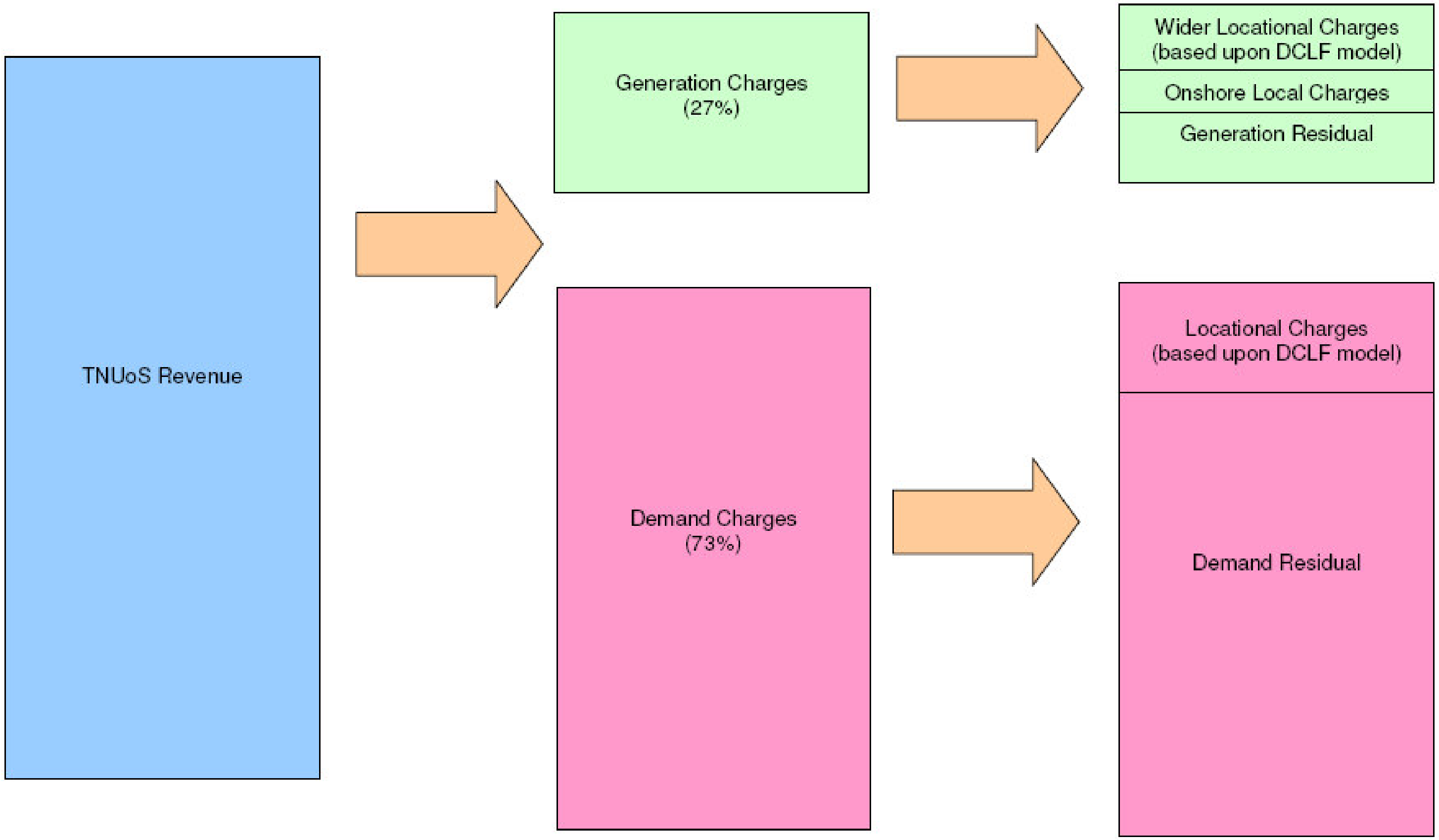


Figure 14 Recovery of TNUoS revenue prior to offshore transmission arrangements

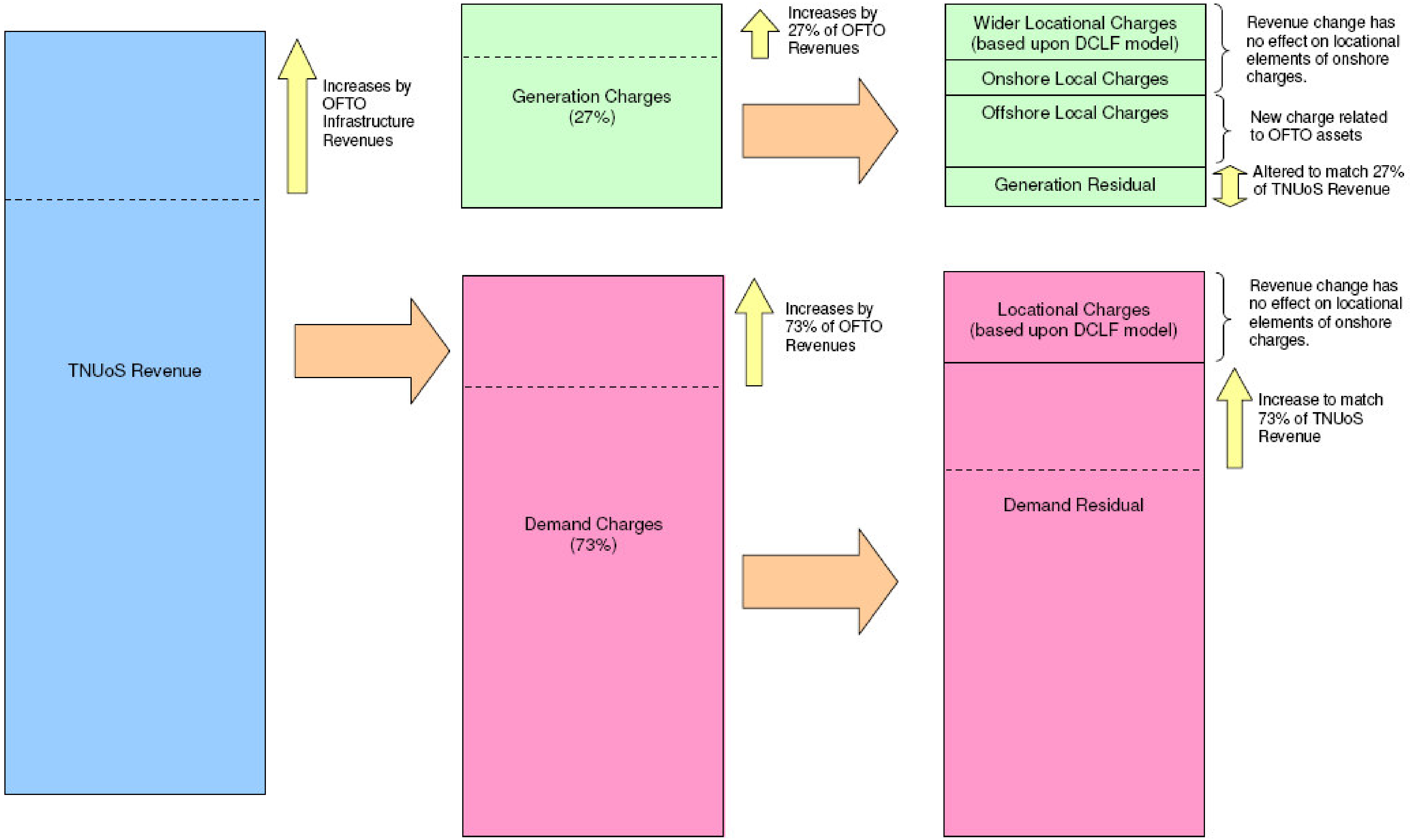


Figure 15 Impact of the offshore transmission arrangements on recovery of TNUoS revenues

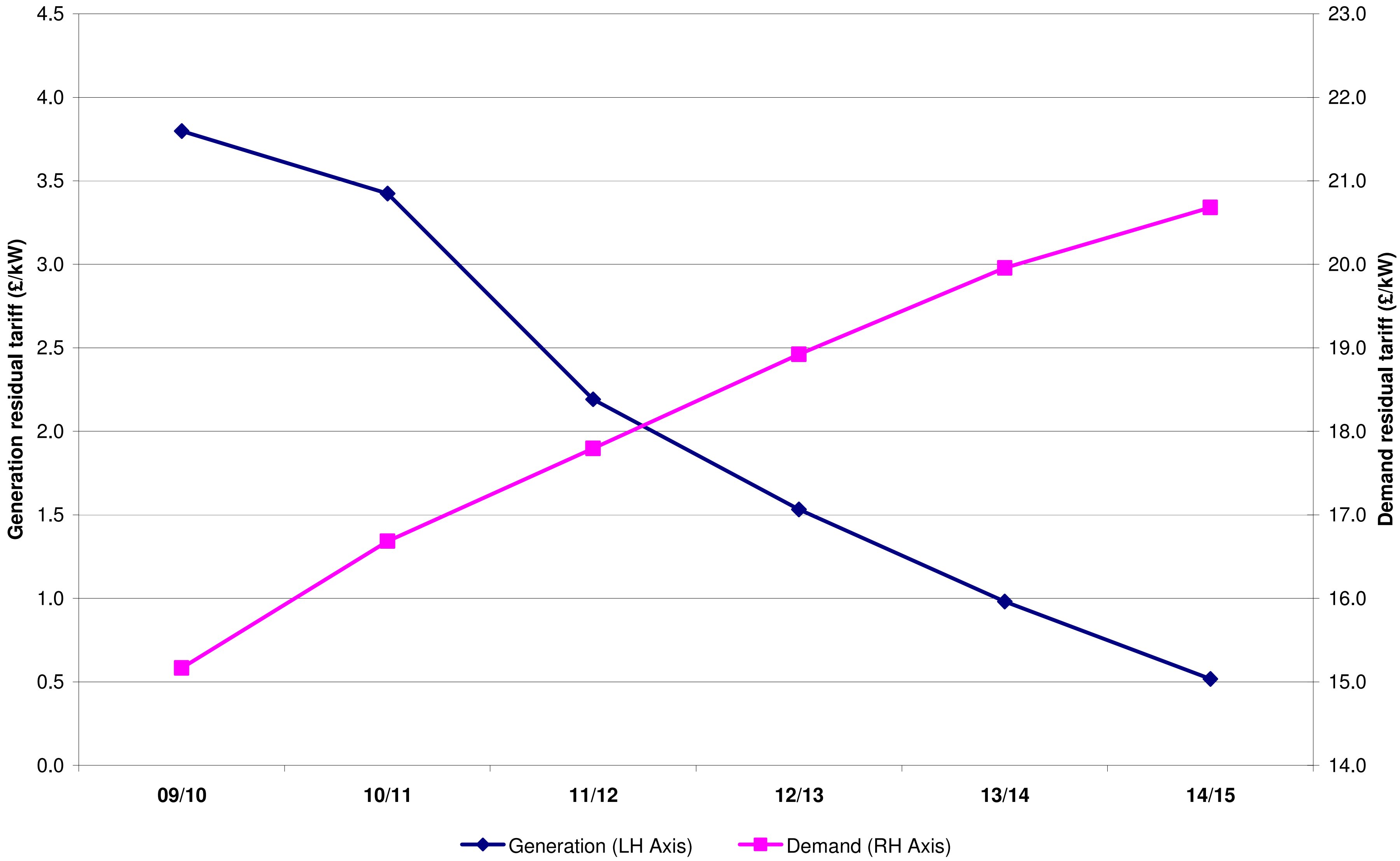


Figure 16 An example of the effect of the offshore transmission arrangements on the residual components of TNUoS tariffs

9 Data Availability

This paper considers only a limited range of sensitivities. National Grid will publish the DCLF Transport model data used in the analysis in Microsoft Excel format. The information will be made available on the National Grid charging website[7] shortly and will enable users to undertake their own sensitivity analysis.

10 Responses to this Information Paper

There will be an opportunity to discuss this information paper at a future Transmission Charging Methodologies Forum (TCMF).

National Grid welcomes all comments on this paper from interested parties, whether regarding the format, content or timing of the publication. If you wish to provide comments on this Paper electronically, please email them to:

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If you have further queries, please do not hesitate to contact Wayne on **01926 653999**.

[7] http://www.nationalgrid.com/uk/Electricity/Charges/gbchargingapprovalconditions/5

Appendix Supplementary data

Baseline locational wider generation and demand tariffs

Zone		Current tariffs £/kW	2010/11 £/kW	2011/12 £/kW	2012/13 £/kW	2013/14 £/kW	2014/15 £/kW
1	North Scotland	17.80	16.58	17.05	17.69	16.38	16.05
2	Peterhead	16.52	15.21	15.26	15.81	15.31	15.51
3	Western Highland & Skye	17.31	19.35	18.16	18.90	15.44	15.74
4	Central Highlands	13.08	14.13	13.87	14.56	13.62	13.82
5	Argyll	10.20	9.84	9.84	11.03	11.53	10.98
6	Stirlingshire	10.69	9.94	9.88	10.67	10.69	10.43
7	South Scotland	9.81	8.99	8.80	9.14	9.07	9.28
8	Auchencrosh	7.45	7.41	8.15	10.00	9.91	9.18
9	Humber, Lancashire	2.35	1.92	1.90	1.92	2.02	1.83
10	North East England	6.06	5.29	5.34	5.05	5.20	5.22
11	Anglesey	3.08	2.67	2.71	3.45	3.24	3.20
12	Dinorwig	2.40	2.00	2.03	2.78	2.57	2.53
13	South Yorks & North Wales	0.40	0.09	0.10	-0.04	0.01	-0.17
14	Midlands	-1.68	-1.94	-1.94	-2.07	-2.05	-2.25
15	South Wales & Gloucester	-5.40	-3.11	-2.49	-1.54	-1.78	-1.83
16	Central London	-10.77	-9.92	-10.11	-10.73	-10.92	-11.28
17	South East	-3.54	-2.69	-2.89	-3.56	-3.77	-3.99
18	Oxon & South Coast	-5.18	-4.86	-5.05	-5.78	-6.00	-6.06
19	Wessex	-7.08	-6.14	-6.59	-6.88	-7.31	-7.28
20	Peninsula	-10.48	-9.37	-9.89	-8.88	-9.24	-6.31

Table 19 Baseline wider locational generation tariffs

Zone		Current tariffs £/kW	2010/11 £/kW	2011/12 £/kW	2012/13 £/kW	2013/14 £/kW	2014/15 £/kW
1	Northern Scotland	-13.65	-12.80	-12.59	-13.23	-12.30	-12.39
2	Southern Scotland	-7.97	-7.44	-7.50	-8.45	-8.47	-8.25
3	Northern	-4.97	-4.14	-4.14	-3.90	-3.95	-4.48
4	North West	-0.49	-0.23	-0.20	-0.55	-0.55	-0.48
5	Yorkshire	-0.74	-0.32	-0.31	-0.22	-0.40	-0.17
6	N Wales & Mersey	-0.14	0.23	0.19	-0.32	-0.14	-0.09
7	East Midlands	2.10	2.27	2.28	2.42	2.38	2.56
8	Midlands	3.49	4.03	3.91	3.27	3.36	3.48
9	Eastern	2.97	3.17	3.21	3.71	3.46	3.73
10	South Wales	6.65	3.86	2.52	1.43	1.57	1.62
11	South East	6.81	5.97	6.30	6.99	7.36	7.38
12	London	8.87	8.10	8.18	8.72	8.89	9.22
13	Southern	7.44	6.83	7.17	7.75	8.05	8.10
14	South Western	8.60	7.40	7.99	7.20	7.54	6.50

Table 20 Baseline locational demand tariffs

Year on year changes to baseline locational wider generation and demand

Zone	Name	Current Tariffs MW	2010/11 Δ MW	2011/12 Δ MW	2012/13 Δ MW	2013/14 Δ MW	2014/15 Δ MW
1	North Scotland	697	-20	25	0	320	723
2	Peterhead	1,524	0	0	0	0	0
3	Western Highland & Skye	280	49	0	0	0	0
4	Central Highlands	200	204	0	0	0	0
5	Argyll	565	51	0	0	92	52
6	Stirlingshire	2,681	-33	72	0	0	0
7	South Scotland	4,240	153	1,149	570	160	133
8	Auchencrosh	329	0	0	0	0	20
9	Humber, Lancashire & SW Scotland	17,777	328	183	290	220	1,240
10	North East England	3,142	0	0	299	1,020	1,890
11	Anglesey	980	0	0	0	0	0
12	Dinorwig	1,644	0	0	0	0	0
13	South Yorks & North Wales	13,140	-123	2,235	1,224	3,046	0
14	Midlands	7,417	315	0	1,320	470	0
15	South Wales & Gloucester	4,981	425	1,600	699	950	0
16	Central London	144	0	0	0	0	0
17	South East	13,494	2,060	556	0	0	874
18	Oxon & South Coast	4,079	0	0	0	0	0
19	Wessex	3,500	0	0	0	0	0
20	Peninsula	1,045	0	0	0	0	1,512
	Total	**81,859**	**3,409**	**5,820**	**4,402**	**6,279**	**6,444**

Table 21 Baseline generation changes compared the background used to calculate current 2009/10 tariffs

Zone		Current Tariffs MW	2010/11 Δ MW	2011/12 Δ MW	2012/13 Δ MW	2013/14 Δ MW	2014/15 Δ MW
1	Northern Scotland	1,204	225	-51	4	-37	-73
2	Southern Scotland	4,026	127	-97	11	11	10
3	Northern	2,922	90	44	45	44	42
4	North West	3,807	60	-42	7	2	7
5	Yorkshire	5,351	243	36	42	31	33
6	N Wales & Mersey	3,397	-84	24	25	24	26
7	East Midlands	5,612	108	85	79	53	53
8	Midlands	5,122	-36	42	42	51	43
9	Eastern	7,143	268	94	104	69	70
10	South Wales	2,130	-57	20	20	21	21
11	South East	4,517	44	60	47	42	41
12	London	5,508	250	197	184	40	90
13	Southern	6,803	225	90	96	49	52
14	South Western	2,759	-80	25	28	28	28
	Total	**60,301**	**1,385**	**528**	**736**	**428**	**444**

Table 22 Baseline demand changes compared the background used to calculate current 2009/10 tariffs

Locational generation and demand tariffs with inflated expansion constant

Generation Zone	Zone Name	2010/11 Tariff (£/kW)	2011/12 Tariff (£/kW)	2012/13 Tariff (£/kW)	2013/14 Tariff (£/kW)	2014/15 Tariff (£/kW)
1	Zone 1 - North Scotland	16.58	16.98	17.49	18.01	18.55
2	Zone 2 - Peterhead	15.21	15.58	16.05	16.53	17.02
3	Zone 3 - Western Highland & Skye	19.35	19.82	20.42	21.03	21.66
4	Zone 4 - Central Highlands	14.13	14.48	14.91	15.36	15.82
5	Zone 5 - Argyll	9.84	10.08	10.38	10.69	11.01
6	Zone 6 - Stirlingshire	9.94	10.18	10.48	10.80	11.12
7	Zone 7 - South Scotland	8.99	9.20	9.48	9.76	10.06
8	Zone 8 - Auchencrosh	7.41	7.59	7.82	8.05	8.29
9	Zone 9 - Humber & Lancashire	1.92	1.96	2.02	2.08	2.14
10	Zone 10 - North East England	5.29	5.42	5.58	5.75	5.92
11	Zone 11 - Anglesey	2.67	2.74	2.82	2.90	2.99
12	Zone 12 - Dinorwig	2.00	2.05	2.11	2.17	2.23
13	Zone 13 - South Yorks & North Wales	0.09	0.10	0.10	0.10	0.10
14	Zone 14 - Midlands	-1.94	-1.98	-2.04	-2.10	-2.17
15	Zone 15 - South Wales & Gloucester	-3.11	-3.18	-3.28	-3.38	-3.48
16	Zone 16 - Central London	-9.92	-10.16	-10.46	-10.77	-11.10
17	Zone 17 - South East	-2.69	-2.76	-2.84	-2.93	-3.02
18	Zone 18 - Oxon & South Coast	-4.86	-4.98	-5.13	-5.28	-5.44
19	Zone 19 - Wessex	-6.14	-6.29	-6.47	-6.67	-6.87
20	Zone 20 - Peninsula	-9.37	-9.60	-9.89	-10.18	-10.49

Table 23 The effect of inflating the expansion constant by RPI on forecast generation tariffs

Demand Zone	Zone Name	2010/11 Tariff (£/kW)	2011/12 Tariff (£/kW)	2012/13 Tariff (£/kW)	2013/14 Tariff (£/kW)	2014/15 Tariff (£/kW)
1	Zone 1 - Northern Scotland	-12.80	-13.11	-13.50	-13.90	-14.32
2	Zone 2 - Southern Scotland	-7.44	-7.62	-7.85	-8.09	-8.33
3	Zone 3 - Northern	-4.14	-4.24	-4.37	-4.50	-4.63
4	Zone 4 - North West	-0.23	-0.24	-0.25	-0.26	-0.26
5	Zone 5 - Yorkshire	-0.32	-0.32	-0.33	-0.34	-0.35
6	Zone 6 - N Wales & Mersey	0.23	0.24	0.24	0.25	0.26
7	Zone 7 - East Midlands	2.27	2.33	2.40	2.47	2.54
8	Zone 8 - Midlands	4.03	4.13	4.25	4.38	4.51
9	Zone 9 - Eastern	3.17	3.25	3.35	3.45	3.55
10	Zone 10 - South Wales	3.86	3.96	4.08	4.20	4.32
11	Zone 11 - South East	5.97	6.12	6.30	6.49	6.69
12	Zone 12 - London	8.10	8.29	8.54	8.80	9.06
13	Zone 13 - Southern	6.83	7.00	7.21	7.43	7.65
14	Zone 14 - South Western	7.40	7.58	7.80	8.04	8.28

Table 24 The effect of inflating the expansion constant by RPI on forecast demand tariffs

Locational generation and demand tariffs in 2010/11 with nodal increases in generation

Zone	Name	+200MW in Zone 1 (BEAU) (£/kW)	+200MW in Zone 4 (ERRO) (£/kW)	+500MW in Zone 3 (COYL) (£/kW)	+1000MW in Zone 9 (HARK) (£/kW)	+1000MW in Zone 10 (LACK) (£/kW)	+1000MW in Zone13 (WALP) (£/kW)	+1000MW in Zone 14 (DRAK) (£/kW)	+1000MW in Zone 15 (PEMB) (£/kW)	+1000MW in Zone 17 (GRAI) (£/kW)
1	North Scotland	17.45	16.61	16.62	16.82	16.31	16.30	16.36	16.26	16.33
2	Peterhead	15.31	15.21	15.25	15.45	14.94	14.93	14.99	14.89	14.96
3	Western Highland & Skye	18.93	19.45	19.40	19.46	18.94	18.94	19.00	18.90	18.97
4	Central Highlands	13.99	14.44	14.18	14.37	13.83	13.85	13.92	13.82	13.88
5	Argyll	9.83	9.88	9.89	10.07	9.48	9.56	9.63	9.53	9.59
6	Stirlingshire	9.95	9.96	9.98	10.18	9.64	9.66	9.72	9.62	9.69
7	South Scotland	9.00	9.01	9.06	9.23	8.81	8.72	8.76	8.66	8.74
8	Auchencrosh	7.41	7.43	8.20	7.63	6.90	7.12	7.20	7.11	7.15
9	Humber, Lancashire & SW Scotland	1.87	1.88	2.04	2.12	1.95	1.94	1.93	1.88	1.97
10	North East England	5.24	5.25	5.23	5.40	5.95	5.48	5.41	5.37	5.51
11	Anglesey	2.63	2.64	2.62	2.72	2.58	2.65	2.77	2.78	2.68
12	Dinorwig	1.96	1.97	1.94	2.05	1.90	1.97	2.10	2.10	2.01
13	South Yorks & North Wales	0.05	0.06	0.04	-0.06	0.00	0.08	0.15	0.08	0.16
14	Midlands	-1.98	-1.97	-1.99	-2.07	-2.02	-1.89	-1.95	-1.92	-1.88
15	South Wales & Gloucester	-3.15	-3.14	-3.17	-3.24	-3.19	-3.06	-3.03	-2.26	-3.10
16	Central London	-9.96	-9.95	-9.97	-10.09	-10.00	-9.86	-9.84	-9.95	-9.74
17	South East	-2.74	-2.73	-2.75	-2.87	-2.78	-2.64	-2.62	-2.72	-2.55
18	Oxon & South Coast	-4.91	-4.90	-4.92	-5.02	-4.95	-4.81	-4.79	-4.52	-4.86
19	Wessex	-6.18	-6.17	-6.19	-6.28	-6.22	-6.09	-6.06	-6.13	-6.23
20	Peninsula	-9.42	-9.41	-9.43	-9.52	-9.45	-9.32	-9.30	-9.44	-9.43

Table 25 The effect of extra nodal generation against baseline 2010/11 generation tariffs

Zone	Name	+200MW in Zone 1 (BEAU) (£/kW)	+200MW in Zone 4 (ERRO) (£/kW)	+500MW in Zone 3 (COYL) (£/kW)	+1000MW in Zone 9 (HARK) (£/kW)	+1000MW in Zone 10 (LACK) (£/kW)	+1000MW in Zone13 (WALP) (£/kW)	+1000MW in Zone 14 (DRAK) (£/kW)	+1000MW in Zone 15 (PEMB) (£/kW)	+1000MW in Zone 17 (GRAI) (£/kW)
1	Northern Scotland	-13.01	-12.75	-12.84	-13.01	-12.50	-12.50	-12.56	-12.45	-12.53
2	Southern Scotland	-7.45	-7.47	-7.61	-7.68	-7.11	-7.16	-7.23	-7.13	-7.19
3	Northern	-4.13	-4.14	-4.12	-4.38	-4.72	-4.13	-4.08	-4.00	-4.16
4	North West	-0.20	-0.21	-0.18	-0.34	-0.09	-0.18	-0.22	-0.18	-0.22
5	Yorkshire	-0.27	-0.28	-0.26	-0.38	-0.46	-0.36	-0.38	-0.33	-0.39
6	N Wales & Mersey	0.27	0.26	0.28	0.17	0.36	0.27	0.35	0.34	0.23
7	East Midlands	2.32	2.31	2.33	2.44	2.33	2.21	2.20	2.29	2.20
8	Midlands	4.08	4.06	4.09	4.03	4.10	4.01	3.96	3.79	3.99
9	Eastern	3.22	3.21	3.23	3.36	3.26	3.11	3.10	3.22	3.08
10	South Wales	3.91	3.90	3.92	3.99	3.94	3.82	3.79	2.13	3.85
11	South East	6.02	6.01	6.03	6.14	6.06	5.92	5.90	5.97	6.03
12	London	8.14	8.13	8.15	8.27	8.18	8.04	8.02	8.13	7.89
13	Southern	6.88	6.87	6.89	6.99	6.92	6.78	6.76	6.77	6.84
14	South Western	7.44	7.43	7.45	7.54	7.48	7.35	7.32	7.57	7.43

Table 26 The effect of extra nodal generation against baseline 2010/11 tariffs

Locational generation and demand tariffs in 2010/11 with changes in demand

Zone	Name	Zonal Tariff (£/kW)	Zonal Tariff (5% Demand Increase) (£/kW)	Baseline Tariff Differential (£/kW)	Zonal Tariff (5% Demand Decrease) (£/kW)	Baseline Tariff Differential (£/kW)
1	North Scotland	16.58	16.60	0.02	16.55	-0.02
2	Peterhead	15.21	15.23	0.02	15.18	-0.02
3	Western Highland & Skye	19.35	19.38	0.02	19.33	-0.02
4	Central Highlands	14.13	14.16	0.02	14.11	-0.02
5	Argyll	9.84	9.86	0.02	9.81	-0.02
6	Stirlingshire	9.94	9.96	0.02	9.91	-0.02
7	South Scotland	8.99	9.01	0.02	8.96	-0.02
8	Auchencrosh	7.41	7.43	0.02	7.38	-0.02
9	Humber, Lancashire & SW Scotland	1.92	1.94	0.02	1.89	-0.02
10	North East England	5.29	5.32	0.02	5.27	-0.02
11	Anglesey	2.67	2.70	0.02	2.65	-0.02
12	Dinorwig	2.00	2.02	0.02	1.97	-0.02
13	South Yorks & North Wales	0.09	0.12	0.02	0.07	-0.02
14	Midlands	-1.94	-1.91	0.02	-1.96	-0.02
15	South Wales & Gloucester	-3.11	-3.08	0.02	-3.13	-0.02
16	Central London	-9.92	-9.89	0.02	-9.94	-0.02
17	South East	-2.69	-2.67	0.02	-2.72	-0.02
18	Oxon & South Coast	-4.86	-4.84	0.02	-4.89	-0.02
19	Wessex	-6.14	-6.11	0.02	-6.16	-0.02
20	Peninsula	-9.37	-9.35	0.02	-9.40	-0.02

Table 27 Changing the demand background compared against 2010/11 baseline generation tariffs

Zone	Name	Zonal Tariff (£/kW)	Zonal Tariff (5% Demand Increase) (£/kW)	Baseline Tariff Differential (£/kW)	Zonal Tariff (5% Demand Decrease) (£/kW)	Baseline Tariff Differential (£/kW)
1	Northern Scotland	-12.80	-12.82	-0.02	-12.77	0.02
2	Southern Scotland	-7.44	-7.47	-0.02	-7.42	0.02
3	Northern	-4.14	-4.16	-0.02	-4.11	0.02
4	North West	-0.23	-0.26	-0.02	-0.21	0.02
5	Yorkshire	-0.32	-0.34	-0.02	-0.29	0.02
6	N Wales & Mersey	0.23	0.21	-0.02	0.26	0.02
7	East Midlands	2.27	2.25	-0.02	2.30	0.02
8	Midlands	4.03	4.01	-0.02	4.06	0.02
9	Eastern	3.17	3.15	-0.02	3.20	0.02
10	South Wales	3.86	3.84	-0.02	3.89	0.02
11	South East	5.97	5.95	-0.02	6.00	0.02
12	London	8.10	8.07	-0.02	8.12	0.02
13	Southern	6.83	6.81	-0.02	6.86	0.02
14	South Western	7.40	7.37	-0.02	7.42	0.02

Table 28 Changing the demand background compared against 2010/11 baseline demand tariffs

Forecast Generation Onshore Local Circuit tariffs

Substation Name	Final Local Asset Tariff 2009/10 (£/kW)	Local Asset Tariff 2010/11 (£/kW)	Local Asset Tariff 2011/12 (£/kW)	Local Asset Tariff 2012/13 (£/kW)	Local Asset Tariff 2013/14 (£/kW)	Local Asset Tariff 2014/15 (£/kW)
Aigas	0.529	0.522	0.522	0.522	0.522	0.522
An Suidhe		0.982	0.982	0.982	0.982	0.982
Andershaw		2.206	2.206	2.206	2.206	2.206
Arecleoch	0.169	0.167	0.167	0.167	0.167	0.167
Auchencorth				4.659	4.659	4.659
Auchencrosh	-0.784	-0.774	-0.774	-0.774	-0.774	-0.774
Aultmore						1.151
Baglan Bay	0.061	0.062	0.109	0.109	0.556	0.556
Black Craig Wind farm						3.148
Black Hill				1.253	1.253	1.253
Black Law	2.427	2.559	2.559	2.559	2.559	2.559
Brine Field					0.003	0.268
Calliacher						0.409
Carraig Gheal		3.100	3.100	3.100	3.100	3.100
Carrington			-0.120	-0.015	-0.015	-0.119
Carscreugh					-3.017	-3.017
Cleve Hill			0.270	0.270	-0.029	0.270
Clyde			0.144	0.144	0.144	0.144
Coryton	0.253	0.246	0.245	0.245	0.036	0.036
Cruachan	1.226	1.210	1.209	1.209	1.210	1.210
Crystal Rig	0.029	0.031	0.033	0.033	0.033	0.033
Culligran	1.254	1.238	1.238	1.238	1.238	1.238
Dalmally					1.034	1.034
Deanie	2.060	2.035	2.035	2.035	2.035	2.035
Dersalloch			1.276	1.276	1.276	1.276
Didcot	0.589	0.584	0.583	0.585	0.585	0.585
Dinorwig	3.813	3.765	3.765	3.765	3.765	3.765
Dun Hill				1.213	1.213	1.213
DunLaw	0.158	0.451	0.455	0.500	0.500	0.500
Earlshaugh		2.149	2.132	2.132	2.133	2.132
Edinbane	4.835	4.774	4.774	4.774	4.774	4.774
Ewe Hill			2.023	2.023	2.023	2.023
Fallago	0.141	0.256	0.258	0.258	0.258	0.258
Farr	4.854	4.793	4.793	4.793	4.793	4.793
Ffestiniogg	0.190	0.188	0.188	0.188	0.188	0.188
Finlarig	0.226	0.223	0.223	0.223	0.223	0.223
Foyers	1.677	0.522	0.522	0.522	0.522	0.522
Glendoe	1.796	1.773	1.773	1.773	1.773	1.773
Glenglass				3.307	3.307	3.307
Glenmoriston	1.030	1.017	1.017	1.017	1.017	1.017
Gordonbush	1.285	1.163	1.163	1.529	0.910	0.910
Griffin Wind		1.974	-0.706	-0.698	-0.729	-0.729
Gwynt y Mor				0.369	0.369	0.369
Harrows Law			0.322	0.040	0.040	0.040
Hartlepool	0.389	0.383	0.404	0.404	0.405	0.403
Hearthstanes B				2.344	2.346	2.345
Hedon					0.306	0.306
Invergarry	1.020	-0.497	-0.497	-0.497	-0.497	-0.497
Killingholme	0.403	0.398	0.398	0.398	0.398	0.398

Substation Name	Final Local Asset Tariff 2009/10 (£/kW)	Local Asset Tariff 2010/11 (£/kW)	Local Asset Tariff 2011/12 (£/kW)	Local Asset Tariff 2012/13 (£/kW)	Local Asset Tariff 2013/14 (£/kW)	Local Asset Tariff 2014/15 (£/kW)
Kilmorack	0.158	0.156	0.156	0.156	0.156	0.156
Kyle			0.691	0.691	0.691	0.691
Langage	0.460	0.454	0.454	0.454	0.454	0.454
Leiston	0.879	0.868	0.868	0.868	0.868	0.868
Lin Mill					0.596	-0.596
Lochay	0.258	0.255	0.255	0.255	0.255	0.255
Luichart	2.999	0.812	0.812	0.812	0.812	0.812
Marchwood	0.382	0.377	0.377	0.377	0.377	0.377
Margree					2.845	2.845
Mark Hill		-0.598	-0.598	-0.598	-0.598	-0.598
Millennium	1.272	1.256	1.256	1.256	1.256	1.256
Mossford	4.886	2.675	2.675	2.675	2.675	2.675
Nant	1.805	1.782	1.782	1.782	1.782	1.782
Neilston Windfarm				0.900	0.900	0.900
Newfield				3.139	3.139	3.139
Oldbury-on-Severn	1.336	1.323	1.323	1.323	1.323	1.323
Orrin	2.177	0.000	0.000	0.000	0.000	0.000
Quoich	2.905	2.868	1.364	1.364	1.364	1.364
Rhigos				0.911	0.910	0.910
Rocksavage		0.012	0.012	0.012	0.012	0.012
Saltend	0.251	0.248	0.322	0.322	0.322	0.322
South Humber Bank	0.606	0.598	0.598	0.598	0.598	0.598
Spalding	0.228	0.223	0.223	0.224	0.226	0.226
Stanah						0.287
Strathbora	1.030	1.034	1.034	1.353	0.811	0.811
Strathy Wind					9.400	9.400
Teesside	0.084	0.083	0.083	0.083	0.083	0.083
Waterhead Moor			1.845	1.845	1.845	1.845
Whitelee	1.447	1.429	1.429	1.429	1.429	1.429

Table 29 Generation local circuit tariffs