Stage 03: Assessment Consultation

What stage is this document in the process?

01 Initial Written Assessment

02 Definition Procedure

03 Assessment Procedure

04 Report Phase

P229: Introduction of a seasonal Zonal Transmission Losses scheme

P229 aims to allocate variable transmission losses across generators and demand customers on the GB transmission system such that allocated costs better reflect the source of losses. A Transmission Loss Factor (TLF) would be calculated for each BSC Season and TLF Zone to achieve this.

The potential Alternative solution argues that all participants contribute to losses, so TLFs should be scaled such that, in theory, the best outcome for a participant is not to be allocated any costs associated with variable losses.

The Modification Group initially recommends **rejection** of Proposed Modification P229 'Introduction of a seasonal Zonal Transmission Losses scheme'

High Impact:

Generators, Suppliers, Licence Exemptable Generators and Interconnector users

Medium Impact:

The Transmission Company, Central Data Collection Agent (CDCA), Central Registration Agent (CRA), Settlement Administration Agent (SAA), and Balancing Mechanism Reporting Agent (BMRA)

Contents

About this document:

The purpose of this Assessment Consultation is to obtain views or further evidence from BSC Parties and other interested parties on matters discussed in this document. The P229 Modification Group will then discuss the consultation responses before making its recommendations to the Panel on 14 January 2010.

There are 3 parts to the Assessment Consultation. This part is the Consultation document, which provides details of the solution, impacts, costs, benefits and the potential implementation activities associated with P229. The second part is the Detailed Assessment (Attachment A) which sets out the Modification Group's discussions which led to the solution. The third part is the Assessment Consultation Questions response form (Attachment B) which includes all the questions highlighted in the Consultation document.

1 Summary

Why Change?

The Code allocates costs associated with both fixed and variable transmission losses to Parties on a uniform basis, with no regard for the location of generators or demand customers in the network.

P229 contends that this method of allocation of transmission losses does not take account of the extent to which participants give rise to losses, which is an inherent and unjustified cross-subsidy in the existing arrangements. Customers in the North and generators in the South effectively pay part of the cost of transmitting electricity from Northern generators to Southern demand customers.

The rationale for P229 Proposed is that it would remove the cross-subsidy and allow costs associated with variable transmission losses to be allocated on a more cost-reflective basis.

P229 Rationale

The Proposer believes P229 will remove a cross-subsidy and allow variable transmission losses to be allocated cost-reflectively

Solution

P229 Proposed would introduce annual calculation of Seasonal Zonal TLFs that would be applied in Settlement to better reflect Parties' contribution to the costs associated with variable transmission losses.

The potential P229 Alternative developed by the Group is the same as P229 Proposed, except that scaling factors would be calculated and applied to the TLFs with the aim that the best result possible for a participant is to be allocated none of the costs of variable losses.

Impacts & Costs

Implementation of P229 (Proposed or Alternative) would be a significant project for ELEXON, and would involve procurement of a new BSC Agent, the TLFA, to conduct the Load Flow Modelling required by P229.

Introduction of P229 would affect generators and suppliers due to the distributional impact. The impact would vary across Parties, but most have identified impacts due to changing their systems and processes to reflect non-uniform allocation of losses.

Implementation

The Group's provisional recommended Implementation Date for P229 is:

- 1 October 2011 if approval is received from the Authority before 1 October 2010; or
- 1 April 2012 if approval is received from the Authority before 1 April 2011.

The Case for Change

The P229 Proposed Modification would remove the cross subsidy inherent in the current arrangements for transmission losses allocation. Under P229 Proposed the costs associated with variable transmission losses would be allocated to Parties on a cost reflective basis. This would lead to savings due to more efficient plant despatch.

The counterview is that introduction of P229 Proposed would cause windfall gains by some Parties and windfall losses by others, which would be detrimental to competition.

The argument for the potential P229 Alternative Modification is that it would retain some of the benefits of P229 Proposed while mitigating the distributional impacts on Parties. Some Group members believe the Alternative solution is more cost reflective than the Proposed because it would remove the current cross subsidy while avoiding introducing a new cross subsidy, i.e. the distributional impacts.

Other members reject this and believe the Alternative simply dilutes the benefits of the Proposed.

Recommendations

The P229 Group's provisional recommendation is that the P229 Proposed Modification should not be approved.

The Group's provisional majority view is that P229 Proposed:

- Would be neutral with respect to Applicable BSC Objective (a) and would have a minor negative impact on (d);
- Would better facilitate Applicable BSC Objective (b); but
- Would not better facilitate Applicable BSC Objective (c), and that the negative effect on (c) would outweigh the benefits under (b).

The Group's provisional view, by a narrow majority, is that the potential P229 Alternative would not better facilitate the Applicable BSC Objectives compared with P229 Proposed.

2 Why Change?

What are Transmission Losses?

When electricity is transmitted over the Transmission System some energy is 'lost'. This lost energy is 'transmission losses'. Transmission losses are comprised of two main elements, 'fixed' losses and 'variable' losses.

Fixed losses arise in Transformers and overhead lines and do not vary significantly with power flow. Variable losses are due to the heat caused by the flow of current and vary with current flow and length of the line in which it flows. The allocation of variable losses under the BSC is the focus of P229.

Existing Transmission Losses Arrangements

Under the existing Code provisions both fixed and variable transmission losses are allocated to Parties uniformly based on each Party's metered energy. The current allocation of transmission losses therefore does not take account of the extent to which individual Parties give rise to such losses.

A parameter for non-uniform allocation of transmission losses is included in the Code; the Transmission Loss Factor (TLF). But the value of the TLF parameter is currently set to zero, so it has no effect in practice. Details of the transmission losses arrangements in the Code, including the relevant calculations in Section T, can be found in Attachment A.

What is the Issue?

The current BSC arrangements allocate total transmission losses to Parties on a uniform basis, including variable losses. 45% of all losses are allocated to production (generation) Trading Units and 55% to consumption (demand) Trading Units. No account is taken of the location of generators or demand customers within the network.

P229 contends that this means the cost of variable losses is allocated amongst Parties with no regard to the extent to which they give rise to them. This means demand customers located close to an abundance of generation and generators situated near a surfeit of demand pay some of the costs of transmitting electricity from generators to demand customers that are isolated from one another.

In the context of the GB Transmission system, with a lot of generation based in the North and significant demand in the South, this means customers in the North and generators in the South pay part of the cost of transmitting electricity from Northern generators to Southern demand customers.

The Proposer believes this situation equates to an inherent and unjustified cross-subsidy in the existing arrangements. The rationale for the P229 Proposed Modification is that it would remove this cross-subsidy and enable the costs associated with variable transmission losses to be allocated on a more cost-reflective basis.

Where can I find more information?

The Detailed Assessment of P229 is Attachment A to this document. Further details of the types of transmission losses and the current Code arrangements for the allocation of transmission losses can be found in the Detailed Assessment. It also contains information on related changes and particularly P82, which was approved and partly implemented before being rejected after judicial review.

3 Proposed Solution

Summary

P229 proposes to change the arrangements for allocating transmission losses, and associated costs, across generators and demand customers on the GB transmission system. Under P229 TLF Zones would be created based on the 14 GSP Groups. Historical data would be used to annually calculate a TLF for each BSC season for each TLF Zone for the following year.

Two important points to note about P229 are the treatment of fixed losses and the absence of any mitigation:

- P229 would affect only the allocation of variable losses. **Fixed transmission losses** would continue to be allocated to Parties on a non-locational basis through the TLMO. The 45:55 split in the allocation of total transmission losses across generation and demand would be retained; and
- There would be **no mitigation** of the effects of P229. Unlike some previous losses proposals, there is no proposal for phased implementation or 'hedging' of exposure to the Zonal TLFs. The Zonal TLFs would take full effect from the first Settlement Period on the Implementation Date.

What is the P229 Proposed solution?

P229 is substantially the same as the solution proposed by P203. P229 uses Seasonal TLF values (not annual), does not include any transitional scheme/phased implementation and, unlike previous proposals, includes provisions for the treatment of offshore Transmission Systems. The P229 Proposed solution can be summarised as follows:

Load Flow Model

An electrical model of the Transmission System (the 'Load Flow Model') would be built, containing 'Nodes' to represent points where transmission circuits meet or energy flows on or off the Transmission System. Each Node would be identified by the Transmission Company, and allocated to a specific TLF Zone on the transmission network using a 'Network Mapping Statement' maintained by BSCCo. The TLF Zones would be set by the Panel, based on the geographic areas covered by GSP Groups. Since there are currently 14 GSP Groups, there would therefore be 14 TLF Zones.

TLF calculation

TLFs would be calculated on an ex-ante basis (i.e. calculated before the relevant year) for each BSC Year, using Metered Volumes and Network Data for Sample Settlement Periods from a preceding 12-month period (the 'Reference Year'). The required Metered Volumes and Network Data would be provided by the Central Data Collection Agent (CDCA) and the Transmission Company respectively.

Transmission Loss Factor Agent

Prior to the start of each BSC Year (1 April – 31 March), the Load Flow Model would be run by a Transmission Loss Factor Agent ('the TLFA'). The TLFA would calculate how an incremental increase in power at each Node would affect the total variable losses of the Transmission System. The output of the Load Flow Model would be a TLF value for each Node in each of the Sample Settlement Periods.

- Positive TLF values would be produced for Nodes where an incremental increase in generation (or reduction in demand) had the effect of decreasing variable losses.
- Negative TLF values would be produced for Nodes where an incremental increase in generation (or reduction in demand) had the effect of increasing variable losses.

For example, if an extra 1kWh injection at a Node increased variable losses by 0.02kWh, the TLF for the Node in that Settlement Period would be -0.02. The TLFA would average the Nodal TLFs across all Nodes in each TLF Zone by volume-weighted averaging, to give a Zonal TLF value for each TLF Zone for each Sample Settlement Period.

The TLFA would convert these Zonal TLF values to Seasonal Zonal TLFs by time-weighted averaging, calculating four Seasonal Zonal TLFs for each TLF Zone – one for each BSC Season, as defined in Section K of the Code:

- BSC Spring: 1 March – 31 May inclusive;
- BSC Summer: 1 June – 31 August inclusive;
- BSC Autumn: 1 September – 30 November inclusive; and
- BSC Winter: 1 December – 28 February inclusive (or 29 February in a leap year).

Adjusted Seasonal Zonal TLFs

The TLFA would adjust the Seasonal Zonal TLFs by a scaling factor of 0.5 such that the volume of energy allocated via the TLFs is comparable to the volume of variable losses calculated by the Load Flow Model. These Adjusted Seasonal Zonal TLFs would be published by BSCCo no less than three months prior to their use in the TLM Settlement calculation for the applicable BSC Season.

Treatment of BM Units

Each BM Unit would be allocated to a TLF Zone by BSCCo using the Network Mapping Statement. Any question or dispute over allocation would be resolved by the Panel. The TLFA would determine the TLF value to be applied to each BM Unit in the TLM Settlement calculation for the applicable BSC Season (i.e. the Adjusted Seasonal Zonal TLF value for the relevant TLF Zone). All BM Units in a Zone would receive the same TLF value for every Settlement Period in a BSC Season.

A positive TLF would increase the TLM value used to scale a BM Unit's Metered Volume, which would be a benefit to generators and a disadvantage to Suppliers. A negative TLF would decrease the TLM value, which would be a benefit to Suppliers and a disadvantage to generators.

BM Unit-Specific TLFs

The Adjusted Seasonal Zonal TLF that applies to, and is registered against, a particular BM Unit is referred to in this document as a 'BM Unit-Specific TLF'. Note that all BM Units in the same Zone and for a particular Season would be assigned the same BM Unit-Specific TLF.

The BM Unit-Specific TLFs calculated by the TLFA would be registered in BSC Systems by the Central Registration Agent (CRA). The BM Unit-Specific TLFs would be used by the Balancing Mechanism Reporting Agent (BMRA) in the Balancing Mechanism Reporting Service (BMRS) and the Settlement Administration Agent (SAA) in Settlement calculations.

What about offshore connections?

As noted above TLF Zones would be based on the geographical areas of GSP Groups. In June this year the BSC was amended to include provisions for offshore transmission networks, which fall outside the geographical area of any GSP Group. For these offshore Nodes (including both DC and AC offshore networks and offshore networks connected to distribution systems), which are part of the Transmission System, the onshore GSP Group to which the network is connected would be the basis for allocating Nodes to TLF Zones, subject to Panel determination using specific criteria.

Question 1
Would the Proposed Modification P229 help to achieve the Applicable BSC Objectives?

4 Alternative Solution

Summary

The Group developed a P229 Alternative solution with the aim of preserving the benefit of allocating transmission losses more cost reflectively, as under P229 Proposed, while reducing the distributional impact on Parties. The Alternative is the same as P229 Proposed, except for the addition of the calculation of a scaling factor for each Season.

Under the Proposed Modification, Seasonal Zonal TLFs are adjusted by a scaling factor which is fixed at 0.5. This means the volume of energy allocated via the TLFs is comparable to the volume of variable losses calculated by the Load Flow Model.

The Alternative solution replaces the fixed scaling factor of 0.5 with an annually calculated scaling factor '**β**' for each Season. This factor is applied to Seasonal zonal TLF values before they are used in Settlement.

Scaling factor, β

The intent of applying the '**β**' scaling factor is that no BM Units are credited with energy due to the application of Zonal TLFs via their TLM.

The Alternative does not alter the Code's treatment of BM Units in Trading Units whereby BM Units with opposite flow direction to the Trading Unit as a whole may receive a credit. This constraint is depicted by the following mathematical equations for calculating scaling factors $\boldsymbol{\beta}^{+}_{j}$ and $\boldsymbol{\beta}^{-}_{j}$ that will achieve the intent of P229 Alternative in a given Settlement Period (j):

$$\beta^{+}_{j} = \min(1, \alpha * VL_j / [\ \mathrm{Max(TLF)} * \Sigma^{+}(QM) - \Sigma^{+}(TLF*QM)\ ])$$

$$\beta^{-}_{j} = \min(1, (1-\alpha) * VL_j / [\ \mathrm{Min(TLF)} * \Sigma^{-}(QM) - \Sigma^{-}(TLF*QM)\ ])$$

Where:

- α is the parameter (equal to 0.45) defined in Section T2.2.1(b) of the Code;
- VL_j is the level of Variable Losses in the Settlement Period;
- Max(TLF) and Min(TLF) are the maximum and minimum unscaled Zonal TLF values for any BM Unit in that period;
- $\Sigma^{+}(QM)$ and $\Sigma^{-}(QM)$ are the total metered volumes for BM Units in delivering and offtaking Trading Units respectively; and
- $\Sigma^{+}(QM*TLF)$ and $\Sigma^{-}(QM*TLF)$ are the sum of $QM_{ij}*TLF_{ij}$ over delivering and offtaking Trading Units respectively.

The equations cap the scaling factors at 1, so that they would not scale up any zonal TLFs.

How would the Alternative solution work?

Each year the TLFA must calculate a single average scaling factor for each Season to cover delivery and offtaking BM Units. This calculation would be done ex-ante, similar to the annual process for calculation of zonal TLFs. So the TLFA can calculate and apply scaling factors, P229 Alternative requires that, in addition to the requirements of P229 Proposed, the following process is carried out:

1. TLFA estimates the total variable losses (in accordance with the methodology in the LFM Specification) in each Sample Settlement Period used for zonal TLF calculation (as part of the calculation of TLF values);

2. TLFA receives the total Metered Volumes for each Zone from ELEXON, split by delivering and offtaking Trading Units, to use in scaling factor calculation. Includes Zonal Delivering Metered Volume (QM^{+}_{Zj}) and Zonal Offtaking Metered Volume (QM^{-}_{Zj}) for each Zone and Sample Settlement Period. This information will be sent in a file to the TLFA (the data in the file will be sourced from the SAA-I014 Settlement Report which ELEXON receives from the SAA and loads into the TOMAS system);

3. TLFA determines a scaling factor for delivery and a scaling factor for offtake for each Sample Settlement Period based on the use of Seasonal zonal TLFs;

4. TLFA calculates four time-weighted average Seasonal scaling factors. These overall scaling factors are the average of the minimum of the two scaling factor values in each Sample Settlement Period, as described above (in point 3.); and

5. TLFA applies the scaling factors to Seasonal zonal TLFs before they are input into central systems. Note that because the scaling factors would be incorporated into TLF values before the values are provided to the CRA, there is no impact on central systems (e.g. CRA, SAA or BMRA).

Question 2

Would the Alternative Modification P229 help to achieve the Applicable BSC Objectives compared to the current baseline?

Question 3

Would the Alternative Modification P229 help to achieve of the Applicable BSC Objectives when compared to the Proposed Modification?

Question 4

Are there alternative solutions that the Modification Group has not identified which they should consider?

5 Cost Benefit Analysis

Why was it done?

Cost-benefit analysis was conducted by independent consultants to help the Group, the Panel and the industry to assess the merits of P229. The Group believed that an expert and independent analysis of the costs and benefits associated with P229 would ensure its assessment of P229 was appropriately robust and would be of assistance in considering P229's impact on facilitation of the Applicable BSC Objectives.

This section summarises what was done for the P229 CBA and gives an overview of the results; further information and description of the P229 CBA work can be found in Attachment A. The full P229 Proposed CBA Report and P229 Alternative CBA Annex are also available on the P229 Webpage.

What is cost-benefit analysis?

Appraising a proposal by quantifying and comparing its costs and benefits, in order to identify the best course of action.

The aim is to judge the worth of a proposal relative to the status quo.

What was done?

The Group agreed the requirements for the P229 CBA. These requirements addressed areas for improvement identified in the critique of the CBA for previous losses Modification Proposals, conducted by the Brattle Group on behalf of Ofgem.

A notable change from previous CBA was that a full, hourly modelling approach was used to produce evolved TLFs, in contrast with the 'snapshot' approach used previously. In addition the P229 CBA also considered environmental impacts; this follows the direction that impacts on the environment should be considered under the BSC Modification process, and is the first time environmental impact has been assessed in relation to a .

Methodology

The P229 CBA covered both the P229 Proposed Modification and the potential P229 Alternative solution. The CBA consisted of two main elements; Modelling evolved TLFs over a defined analysis period of ten years, and a CBA assessment which quantified the impact of introducing P229.

The CBA modelled:

- A **'base-case'** representing the development of the market over the ten-year analysis period without the introduction of P229 (i.e. based on the current uniform allocation of transmission losses with zero TLF values); and
- A **'change-case'** identical to the base-case except that it includes P229 Seasonal zonal TLFs.

The CBA consultants developed the assumptions and input information used in the modelling in accordance with the requirements specified by the Group. The impact of P229 Proposed was identified by comparing the results of the base- and change-cases; since the only difference between the two is the introduction of P229 Proposed, any difference in the results is ascribed to P229.

Scenarios

In addition to the central reference change-case, the CBA consultants modelled various scenarios designed to test the sensitivity of the CBA results to changes to key factors.

The reason for this is that it is unrealistic to expect that the market will develop exactly in line with the CBA consultant's best-estimate predictions. Examining the sensitivity of the CBA results to plausible variations in market conditions ('sensitivity scenarios') means the impact of deviations from the predicted development of the market can be better understood. This increases the robustness of the CBA and informs assessment of P229.

The sensitivity scenarios examined were:

1. **Reference Scenario**: Most likely or 'central' scenario; best-estimate of market developments with the addition of P229 Seasonal zonal TLFs.
2. **High Gas Price Scenario**: Increased gas prices; all other fuel prices and assumptions unchanged relative to the central scenario.
3. **Low Gas Price Scenario**: Decreased gas prices; all other fuel prices and assumptions unchanged relative to the central scenario.
4. **Volatile Fuel Price Scenario**: All fuel prices varied from year to year with no consistent pattern; all other assumptions unchanged relative to the central scenario.
5. **Aggressive Offshore Wind**: More Offshore generation added; all other assumptions unchanged relative to the central scenario.
6. **Alternative Nuclear**: Nuclear generators added; introduction of some non-nuclear generators were consequently delayed, all other assumptions unchanged relative to the central scenario.

Further details about these scenarios and why they were selected by the Group can be found in Attachment A. A P229 Alternative Reference scenario was also examined for the P229 Alternative CBA annex.

The Group's views

The Group agreed that the P229 fulfilled the Group's specified requirements and endorsed the CBA as robust and fit for the purpose of assisting the Group in its assessment of P229.

Notwithstanding this, a majority of the Group disagreed with two areas of the CBA; first the Weighted Average Cost of Capital (WACC) value used to discount the modelled costs and benefits, and second the offshore generation developments applied in the CBA modelling, specifically that developments planned for Round 3 of Offshore Connection were not included in full in either the P229 Proposed Reference Change Case or the Aggressive Wind sensitivity Change Case.

The CBA consultants noted the Groups concerns, but maintained that in their expert opinion the assumptions of the model were robust and, in their view, a realistic representation of future developments.

The Group addressed the WACC concern by determining its own WACC value and applying it to the cost-benefit results. With respect to offshore developments, the CBA consultant noted that the CBA requirements and the assumptions agreed by the Group did not include Round 3, and explained modelling Round 3 would be impractical and of little value due to the many unknown elements. Despite this the Group's concerns remained, and the Group agreed that the best course was to document the concerns and the consultants' response in order that both can be considered as part of assessment of P229.

Details of the Group's concerns and discussions, its alternative WACC value and resultant cost-benefits, and the CBA consultants' explanation of the offshore approach employed in the P229 CBA can all be found in Attachment A.

What did the CBA show?

The results of the CBA are covered in detail in Attachment A, and can be found in full in the P229 Proposed CBA Report and P229 Alternative CBA Annex on the P229 Webpage. This section summarises the key results and overall findings of the P229 CBA at a high level.

The table below shows the overall cost-benefit for the central Reference scenario (P229 Proposed), the five sensitivity scenarios and the P229 Alternative scenario. These figures were produced by applying cost-benefit analysis methods to the results of the modelled 10-year analysis period (2011-2021) and are net of all estimated implementation and operational costs.

The CBA figures are net present values produced by discounting the modelling results using the central post-tax WACC of 4.2%. The analysis indicated very significant benefits associated with reductions in NOx and SOx emissions, and the benefits are presented with and without these emissions effects, so Parties can consider how much weight to give them.

The distributional impacts on different participants, depending on their type and location, are not shown in the table below, and are covered separately.

LE concluded that the net benefits of Proposed Modification P229 would be positive and significant. Benefits associated with demand response were relatively small compared with the benefits of generation response. The cost-benefit was positive for all scenarios without the inclusion of benefits associated with reduced SOx/NOx emissions. Including SOx/NOx effects generally had the effect of significantly increasing the benefits of a scenario, except for the high gas price sensitivity scenario where inclusion of SOx/NOx causes the cost-benefit to become negative.

Benefits associated with each CBA scenario (all figures rounded to nearest £0.5m)

	Proposed (reference)	**High gas**	**Low gas**	**Volatile fuel**	**Wind**	**Nuclear**	**Alternative**
Benefits, £m (no SOx/NOx)	46	98	4	46.5	52	39	12.5
Benefits, £m (inc. SOx/NOx)	275	-20	73	173	266	222	76
Demand benefits, £m	2	3	0.5	1.5	2	2	0
Total benefits £m	**277**	**-17**	**73.5**	**174.5**	**268**	**224**	**76**

Further details of the elements that comprise the generation response benefits, the CBA conclusions and the methods used in the P229 CBA can be found in the summary in Attachment A and in the P229 CBA Report.

The table below shows the distributional impact of P229 under the various scenarios in terms of transfers between participants in Northern regions and those in Southern regions by type. The figures for supply and generators are the amounts that would be paid' by some Parties and 'received' by other Parties. The **net** transfer would be zero (i.e. all money paid by one participant is received by another).

However, the overall magnitude of transfer shown in this table is the **sum** of the magnitude of the amount paid *and* the magnitude of the amount received, for both supply and generators (magnitudes of transfers for supply and generators is shown in brackets beneath the total). Though it may appear to be 'double counting' the transfers, the reason for using this value is that the Group believes it best represents the true

distributional impact on Parties. This is because any amount paid by a group of participants is a disadvantage to them, and any amount received by a group of participants is a benefit to them.

Therefore the Group believes the measure of the relative benefits or disadvantages that Parties would experience is the total of the quantified benefit for some and the quantified disadvantage for others. This applies whether the distributional impact is regarded as removal of an existing cross-subsidy (i.e. a positive effect) or the introduction of windfall gains and losses (i.e. a negative effect).

Distributional impact of each CBA scenario (all figures rounded to nearest £0.5m)

	Proposed (reference)	**High gas**	**Low gas**	**Volatile fuel**	**Wind**	**Nuclear**[1]	**Alternative**
Supply, £m (South to North)	37	48	15.5	43	39	37	16
Generators, £m (North to South)	31	41	14	36	33	31	13
Magnitude of transfer, £m	**135** (74+61)	**178** (96+82)	**58** (31+27)	**158** (86+72)	**143** (78+65)	**135** (74+61)	**58** (32+26)

Details of the zones included in the 'North' and 'South' regions, and graphical representations of the distributional impacts, can be found in Attachment A.

Question 6

Do you have any views on the analysis undertaken on behalf of the Group or the Group's assessment of P229? For instance with respect to environmental impact, security of supply, offshore wind development (e.g. offshore Round 3) and investment in generation or the Transmission Systems.

Have these views had any impact on your consideration of P229?

Question 7

Do you have any views on the Group's assessment of the impact of P229 on the environment and the analysis of environmental impact in the P229 CBA? For instance any other environmental impacts the Group should consider or the analysis of emissions contained in the P229 CBA (i.e. the approach to CO2, NOx/SOx).

Have these views had any impact on your consideration of P229?

[1] Distributional impact under nuclear scenario identical to Reference scenario as there is no difference between these two scenarios in the first year of the analysis period.

6 Load Flow Modelling

Why was it done?

A Load Flow Modelling exercise was conducted for P229 in order to calculate Seasonal Zonal TLFs using the same methodology that would be applied in live operation of P229, based on actual network data and using historic metered volume data. The purpose of this was to establish baseline TLFs that could be used to test the CBA consultant's approach for modelling future TLFs, to assess the sensitivity of TLF calculation to a range of different factors and to identify any potential issues with the load flow modelling approach proposed by P229.

What was done?

The Load Flow Modeller first established baseline TLFs via defined load flow modelling procedures using network information provided by National Grid and Metered Volume data from ELEXON. Baseline TLFs are TLFs produced without any manipulation of the input data and simulate the production of TLFs operationally using actual data.

The modeller then calculated TLFs with various changes made to the modelling methodology, network information and/or Metered Volume data in order to examine how sensitive TLF production was to these changes. This was done by comparing them to the baseline TLF results. The sensitivities investigated were:

- Temporal variability of TLFs;
- Seasonal Average Nodal TLFs compared with Seasonal Average Zonal TLFs;
- Interconnector flows (French and Moyle);
- Participants responding to signals;
- Effect of demand/generation relocation on overall heating losses;
- Breakdown/withdrawal of plant;
- Intermittent generation;
- Inclusion of Offshore Transmission nodes; and
- Impact of large Offshore delivery.

Further details of these tasks can be found in the P229 Load Flow Modelling report, which is available on the P229 Webpage. ELEXON used the resultant TLFs to produce TLMs for selected modelling tasks.

What did the Load Flow Modelling show?

The results of the Load Flow Modelling were generally in line with intuitive expectations and the indications of previous modelling exercises. P229 would result in TLFs that vary on a geographic basis, which would cause TLMs to vary geographically also.

The new elements of investigation were the inclusion firstly of existing offshore nodes as part of the Transmission System, to simulate introduction of Offshore Transmission, and the inclusion of large scale offshore generation and offshore networks to approximate potential long term offshore developments.

The modelling results showed that approximating the inclusion of present levels of offshore generation as part of the Transmission System does not have a significant effect on TLFs. However, the modelling results indicated that the inclusion of large offshore generators, new interconnectors and High Voltage DC (HVDC) links could have a large impact on TLFs.

7 Implementation

Impacts

Implementation of P229 would be a substantial process for ELEXON, impacting a range of different departments including Change Implementation and various operational teams.

No significant impacts on existing BSC Agents have been identified, but implementation would involve some work by ELEXON service providers to effectively 'reinstate the partially implemented P82 functionality. Implementation of P229 would also include procurement of a new agent, the TLFA, which would be a significant and lengthy project, and the appointment of a Load Flow Model Reviewer.

Respondents to the P229 industry Impact Assessment noted that their systems and processes reflect the current uniform allocation of losses; changing these to reflect Transmission Losses allocation under P229 would be the source of most of the impacts upon them.

The estimated costs to ELEXON and BSC Parties to implement P229 are shown below. Further details of ELEXON activities, Party impacts and other impacts such as changes to the Code and other documentation, and the impact on the BSC Panel, can be found in the Detailed Assessment attachment.

Full details of the responses to the P229 IA can be found on the P229 Webpage on the ELEXON website.

Estimated Costs

ELEXON Cost		ELEXON Service Provider cost	**Total Cost**
Man days	Cost		
350	£84,000	£31,000	**£115,000**

Note that these estimated costs include procurement of the TLFA but not any implementation or operational costs directly applicable to the TLFA itself.

Indicative industry costs
11 Parties responded to the P229 industry Impact Assessment, identifying a range of impacts. Identified costs were generally around **£200,000 per Party** (where costs were estimated). Several Parties identified minimal impacts, the cost of which would be absorbed into the cost of **business as usual** activities. Two respondents identified significant system impacts; one of these estimated costs of around **£300,000 - £600,000**.

Implementation Approach

The Group agreed that P229 should be implemented on either 1 April, to coincide with Parties' annual contractual rounds, or 1 October in order to align with mid-yearly contract rounds. This will allow Parties to take into account the effect of TLFs in their contracts.

Seasonal TLFs must be made available to Parties at least 3 months before being used in Settlement and the results of the P229 Impact Assessment indicate that most Parties require 6-9 months to implement P229. Therefore an implementation lead time of 12 months in total would allow most participants to complete their own implementation activities prior to receiving the first TLFs.

A twelve month P229 implementation timescale would include TLFA procurement and Load Flow Model Reviewer appointment; establishment and adoption of the Load Flow Model by the TLFA; development of TLFA systems, processes and documentation; calculation of Adjusted Seasonal Zonal TLFs; and the publication of Adjusted Seasonal Zonal TLFs to Parties 3 months before they are used in Settlement. Parties would effectively have nine months to amend their own systems, processes and documentation before TLFs are first published.

Implementation of P229 would be not be 'phased' in any way, i.e. there would be no gradual linear introduction of non-zero TLFs, or 'grandfathering' scheme limiting application to above a certain volume of energy, as proposed for some previous Losses Modification Proposals.

The final P229 Modification Report is due to be issued to the Authority in February 2010. The Group acknowledges it is not feasible for the Authority to make a decision on P229 by 1 April 2010, which would enable implementation on 1 April 2011. The Group noted that a 1 October implementation of P229 would be more complicated than a 1 April implementation (though timescales would not be affected) due to the need to apply half the normal TLFs for the year, but the Group believed that this would not cause any material issues and that if it was determined that P229 is superior to the baseline it should be implemented as soon as is practicable.

The Group therefore agreed recommended Implementation Dates for P229 of:

- 1 October 2011 if approval is received from the Authority before 1 October 2010; or
- 1 April 2012 if approval is received from the Authority before 1 April 2011.

Question 5

Do you support the implementation approach described in the consultation document?

Group discussions leading to provisional views

The detailed discussions of the Group can be found in Attachment A. This section describes the conclusions of the Group on the basis of their discussions thus far, and their resultant provisional views for the purposes of this consultation.

Group voting on provisional views

The Modification Group developed and analysed a potential P229 Alternative Modification. It is a potential Alternative because the Group has not made a final decision on whether the Alternative solution better facilitates the Applicable BSC Objectives compared with P229 Proposed. For an Alternative Modification to be presented to the BSC Panel and the Authority a majority of the Group must believe that it better facilitates the Applicable BSC Objectives compared with the Proposed Modification. The Group is presenting the potential Alternative for consultation so they can obtain industry views which will help them make a fully informed final decision.

The Modification Group has set out its provisional views to help Parties assess P229 and respond to the consultation. The Group intends that its views will capture the arguments for and against P229, which respondents may use as the basis for expressing their own views against the Applicable BSC Objectives, along with any additional arguments they may identify. The Modification Group will vote to determine its final views before making a final recommendation to the Panel.

The Group voted to determine its provisional views after discussing the benefits and drawbacks of P229, both Proposed and Alternative. When comparing P229 Proposed and P229 Alternative to the current baseline, the majority of the Group believed that:

- The Proposed **would not** better facilitate the Applicable BSC Objectives; and
- The Alternative **would** better facilitate the Applicable BSC Objectives.

The Group also took a provisional vote on whether they believed the proposed Alternative Modification better facilitates the Applicable BSC Objectives when compared to the Proposed Modification. The majority of the Group believed that:

- The Alternative **would not** better facilitate the Applicable BSC Objectives **compared with the Proposed**.

This appears to produce an anomalous result. The provisional vote indicates that while the majority of the Group believe the potential P229 Alternative **is** better than the baseline, and P229 Proposed **is not**, as the voting stands the potential Alternative **would not** be presented to the Panel because the majority of the Group believe that the Proposed solution is better than the Alternative. This means the provisional recommendation of the Group is to reject P229 Proposed, with no P229 Alternative presented.

The cause of this apparent anomaly is that all Group members who believed the Proposed is better than the baseline also believed that the Alternative is better than the baseline, but that the Proposed is better than the Alternative, whereas none of the Group members who believed that the Alternative is better than the Proposed believed that the Proposed is better than the baseline.

In spite of these peculiarities in the voting results, all arguments and views expressed by the Group have been fully captured and presented in this industry consultation.

Proposed vs baseline

The Group provisionally agreed by a narrow majority that P229 Proposed would not better facilitate the Applicable BSC Objectives overall compared with the current baseline.

Applicable BSC Objectives - Pros and Cons		
	Benefits	**Disadvantages**
(a)	None identified	None identified
(b)	Majority: • More efficient despatch due to cost signals allowing variable losses to be taken into account • More efficient market entry/exit due to cost signals allowing variable losses to be taken into account in decisions on where to locate new plant or whether to continue/cease operation of existing plant (though a relatively small factor in such decisions) • Production savings and reduction in variable losses due to reduced generation because of more efficient despatch, also resulting in environmental benefit by reducing emissions	Minority: • Inherent inaccuracies in TLF calculation mean it would not deliver costs reflecting BM Unit impact on losses in every Settlement Period; therefore would not result in more accurate and appropriate allocation • Would discourage investment in wind generation in the North and encourage investment in the South, with a negative overall effect on investment, and therefore a negative environmental impact
(c)	Minority: • Removes cross-subsidy inherent in current uniform allocation of variable losses • Allocates variable losses on a more cost reflective basis than the baseline which would promote competition • Produces cost signals that would better reflect participants contribution to variable losses, which would enhance competition and reduce overall variable losses	Majority: • Causes distributional transfer between market participants based on type and location which are windfall gains and windfall losses, to the detriment of competition • Transfer is disproportionate to any benefit of P229 • Not cost reflective of contribution to variable losses because it allocates negative variable losses, whereas all participants on the system cause losses • Introduces a new cross-subsidy because some participants benefit from being credited with energy, while others would be penalised by being debited energy • Disproportionate impact on classes of participants who can not respond to signals: demand, renewables, combined heat and power (CHP) plant and nuclear generators • Inherent inaccuracies mean it does

		not guarantee more accurate and appropriate allocation, so rather than removing the existing cross subsidy, it would create a new, less transparent cross subsidy • Socialisation of losses within zones would give inappropriate market entry/exit signals • Negative impact on investment in renewables due to increased cost of investment in unfavourable zones • Discriminates between new and existing generators
(d)	Minority: • Neutral because no significant additional expenditure or complexity	Majority: • Adds additional complexity, but this must be measured against the benefits a particular change would bring • Added complexity not significant; considerations minor compared with those under (b) and (c)

Alternative vs baseline

The Group provisionally agreed by majority that P229 Alternative would better facilitate the Applicable BSC Objectives overall compared with the current baseline.

Arguments applied to the Proposed were generally applicable to the Alternative, but the magnitude of impacts (both benefits and drawbacks) is reduced. Therefore only the **additional** arguments applied to the Alternative are shown in the table below, though these should be considered in conjunction with the arguments above relating to the Proposed against the baseline.

Applicable BSC Objectives - additional Pros and Cons under Alternative		
	Benefits	**Disadvantages**
(a)	None identified	None identified
(b)	None identified	Additional inherent inaccuracy of arbitrary adjustment of losses to avoid crediting energy to BM Units
(c)	• **Partially** removes the cross-subsidy inherent in the current uniform allocation of variable losses • Risk of windfall gains/losses sufficiently mitigated by use of scaling factor to cap benefit for individual generators at zero allocation of variable losses; therefore a net benefit for competition	Additional inherent inaccuracy of arbitrary adjustment of losses to avoid crediting energy to BM Units
(d)	None identified	None identified

Alternative vs Proposed

The Group provisionally agreed by narrow majority that P229 Alternative would not better facilitate the Applicable BSC Objectives compared with P229 Proposed.

Applicable BSC Objectives - benefits of Proposed and Alternative		
	Proposed	**Alternative**
(a)	None identified	None identified
(b)	Majority: • More efficient operation of Transmission System due to better despatch • Benefits of reduced losses (i.e. savings due to reduced generation and environmental benefits) greater under P229 Proposed • Contains fewer sources of inaccuracy	Minority: • More cost reflective than the Proposed (i.e. reflects that all participants contribute to losses) which would lead to more efficient operation of Transmission System as decisions made on more cost-reflective basis
(c)	Majority: • More cost reflective and sends the right signals to participants (compared with the Alternative which sends diluted signals) • More properly allocates variable transmission losses to participants • Contains fewer sources of inaccuracy	Minority: • More cost reflective; reflects that all participants contribute to losses (so none should be allocated negative losses) and does not introduce new cross subsidies • Reduces magnitude of windfall gains/losses relative to Proposed • Mitigates risks of windfall gains/losses and uncertainty of benefits realisation under P229 Proposed
(d)	None identified	None identified

9 Further Information

More information is available in

Attachment A: Detailed Assessment.

This information includes details of impacts, Modification Group membership and discussions, a summary of the P229 Cost-Benefit Analysis and the process followed for P229 and a glossary of terms.

Attachment B: Consultation question response form

A complete version of the consultation and impact assessment responses received are available on the P229 page of the ELEXON website.

Attachment C: P229 Load Flow Modelling Report

Attachment D: P229 CBA Report: Proposed

Attachment E: P229 CBA Report Annex: Alternative

All attachments can also be found on the P229 webpage.