



Stage 04: Final Modification Report

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 on the GB transmission system to generators and demand customers on a zonal basis, such that allocated costs better reflect the impact on total losses. A Transmission Loss Factor (TLF) would be calculated for each BSC Season and TLF Zone to achieve this.

P229 Alternative argues all participants would have real losses associated with their operation, so TLFs should be scaled such that, in principle, the best outcome for a participant is not to be allocated any costs associated with variable losses.



The Panel recommends **rejection** of both Proposed and Alternative Modification



High Impact: Generators, Suppliers, Licence Exemptable Generators and Interconnector users



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

P229
Modification Report

12 March 2010

Version 1.0

Page 1 of 37

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Contents

1	Summary	3
2	Why Change?	5
3	Solution	6
4	Alternative Solution	10
5	Cost Benefit Analysis	12
6	Load Flow Modelling	17
7	Implementation	18
8	The Case for Change	20
9	Initial Panel Discussions	24
10	Report Phase Consultation Responses	32
11	Final Panel Discussions	33
12	Recommendations	36
13	Further Information	37
	Attachment A : Detailed Assessment	37
	Attachment B : Legal Text Proposed	37
	Attachment C : Legal Text Alternative	37

About this document:

This document is the P229 Final Modification Report, which was sent to the Authority on 12 March 2010 on behalf of the Panel. The Authority will consider the Panel's recommendations, and decide whether or not this change should be made.



Any questions?

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P229
Modification Report

12 March 2010

Version 1.0

Page 2 of 37

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Why Change?

The Code allocates volumes (and therefore 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. It further contends that 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.

Solution

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

Alternative Solution

The P229 Alternative developed by the Group is the same as P229 Proposed, except that scaling factors would be calculated and applied to the TLFs. The aim is that the best result possible for a participant is to be allocated none of the costs of variable losses (instead of it being possible to be allocated negative losses and thereby effectively 'credited' energy, as under the Proposed).

Impacts & Costs

Implementation of P229 (Proposed or Alternative) by ELEXON 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, Suppliers and interconnectors 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 recommended Implementation Date for P229 (Proposed and Alternative) is:

- 1 October 2011 if approval is received from the Authority on or before 30 September 2010;
- 1 April 2012 if approval is received from the Authority after 30 September 2010 but on or before 31 March 2011; or
- 1 October 2012 if approval is received from the Authority after 31 March 2011 but on or before 30 September 2011.

The Case for Change

It is contended 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



P229 Rationale

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

reflective basis. This would lead to savings due to more efficient plant despatch due to the signals that would result from the calculation and application of TLFs.

A counterview is that introduction of P229 Proposed would cause windfall gains by some Parties and windfall losses by others, and that there is no cross subsidy at present but P229 Proposed would introduce one, which would be detrimental to competition. In addition it is argued that P229 Proposed is not more cost reflective and not all participants can respond to the signals of TLFs. It is also suggested P229 Proposed would introduce uncertainty and risk.

The argument for the P229 Alternative Modification is that it would retain some of the benefits of P229 Proposed while mitigating the distributional impacts on Parties and the uncertainty and risk. Some Modification 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, and it is consistent with the view that all participants on the Transmission System cause losses.

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

The Group's discussion of the responses to the P229 Assessment Procedure consultation can be found the Detailed Assessment of P229 (Attachment A). The views of respondents were in line with those of the Group. The majority of respondents believed that neither P229 Proposed nor P229 Alternative would better facilitate the Applicable BSC Objectives, but the majority believed the Alternative to be better than the Proposed.

Recommendations

The Panel's recommendation is that the P229 Proposed and Alternative Modifications should not be made because neither better facilitate the Applicable BSC Objectives compared with the existing baseline.

The Panel's **majority** view is that compared with the existing baseline P229 Proposed:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would not better facilitate Applicable BSC Objective (b);
- Would not better facilitate Applicable BSC Objective (c); and
- Would not better facilitate Applicable BSC Objective (d).

The Panel's **unanimous** view is that compared with the existing baseline P229 Alternative:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would not better facilitate Applicable BSC Objective (b);
- Would not better facilitate Applicable BSC Objective (c); and
- Would not better facilitate Applicable BSC Objective (d).

The Panel's majority view is that P229 Alternative would better facilitate the Applicable BSC Objectives compared with P229 Proposed.

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, and independent of location, 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 delivering (generating) Trading Units and 55% to offtaking (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 large amount 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 currently 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, particularly P82, which was approved and partly implemented before being rejected following judicial review.

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 injection at each Node would affect the total variable losses on 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 net 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?

Offshore nodes

As noted above, TLF Zones would be based on the geographical areas of GSP Groups. In June 2009 the BSC was amended to include provisions for offshore transmission networks (which fall outside the geographical area of any GSP Group) which will become effective at go-live in June 2010. 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.

The criteria for Panel determination of the allocation of offshore Nodes is not defined as part of the solution. The aim is that offshore Nodes are allocated to the onshore GSP Group to which they are connected. If there is any doubt over which Zone an offshore generator should be assigned to (i.e. because they are connected to an offshore transmission system which connects to the onshore Transmission System in more than one GSP Group area) the Panel shall decide, applying such criteria as it sees fit and requesting such information as required.

Offshore networks connected via a Distribution System

The P229 solution provides for situations where a Distribution System is situated between an Offshore Network and the Transmission System (a so-called 'DNO Sandwich'). Because losses over Distribution Systems are not Transmission Losses they would be excluded from TLF calculation.

This would be achieved by modelling the onshore connection point of an offshore network (which is connected to a Distribution System) as connected to the GSP via which that Distribution System is connected to the Transmission System. If the Distribution System is connected to the Transmission System via multiple GSPs the onshore connection point could be modelled as connected to multiple GSPs as appropriate, with a proportion of its flow allocated to each GSP. Assignment of onshore connection points to GSPs, and the allocation of proportions of their flows to these GSPs, would be done by the TLFA using Distribution System data provided by the pertinent LDSO.

Any LDSO to whose Distribution System an offshore network connects would be required to provide to ELEXON Distribution System data that identifies which GSP(s) the energy from the offshore system's onshore connection node(s) should be considered to flow to. This information would include an estimate of the percentage of the flow that goes to each GSP, i.e. a single assumed value for each Reference Year.

High Voltage DC networks

At present the Transmission System does not include any High Voltage DC (HVDC) networks. Such technology may be introduced in the future, as generation (e.g. wind farms) are built further from shore, and that the techniques used to model losses on such networks would differ from those used for the AC Transmission System. However, because it will be some years before any such HVDC system enters operation, the Group concluded it would be appropriate to consider this issue when and if required, when more information will be available on how such networks would be operated. Therefore offshore HVDC networks are not included in the P229 solution. A separate Modification would be needed to incorporate HVDC networks, when the date and nature of their introduction and the details of their operation and technical characteristics are known.

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 in comparison with P229 Proposed. 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 in the Sample Settlement Periods 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 to avoid BM Units being credited with energy due to the application of Zonal TLFs via their TLM. In practice the Alternative aims to achieve this on average, but will not achieve it in every circumstance (i.e. some relatively small credits will occur).

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 benefit compared with the main direction. This following equations show how the scaling factors β_j^+ and β_j^- are calculated to achieve the intent of P229 Alternative in a given Settlement Period (j):

$$\begin{aligned}\beta_j^+ &= \min(1, \alpha * VL_j / [\text{Max}(\text{TLF}) * \Sigma^+(\text{QM}) - \Sigma^+(\text{TLF} * \text{QM})]) \\ \beta_j^- &= \min(1, (1-\alpha) * VL_j / [\text{Min}(\text{TLF}) * \Sigma^-(\text{QM}) - \Sigma^-(\text{TLF} * \text{QM})]) \\ \beta_j &= \min(\beta_j^+, \beta_j^-)\end{aligned}$$

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;
- $\text{Max}(\text{TLF})$ and $\text{Min}(\text{TLF})$ are the maximum and minimum unscaled Zonal TLF values for any BM Unit in that period;
- $\Sigma^+(\text{QM})$ and $\Sigma^-(\text{QM})$ are the total metered volumes for BM Units in delivering and offtaking Trading Units respectively; and
- $\Sigma^+(\text{QM} * \text{TLF})$ and $\Sigma^-(\text{QM} * \text{TLF})$ are the sum of $\text{QM}_{ij} * \text{TLF}_{ij}$ 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 (i.e. in the event of division by a small number or zero, as might occur if the spread of TLFs was very small).

How would the Alternative solution work?

Each year the TLFA calculates a single average scaling factor for each Season to cover delivering 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 Units¹, 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).

¹ The volume data for each boundary node does not explicitly distinguish flows by BSC Trading Unit.

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 help them conduct a thorough assessment of P229 and would assist them 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 was done?

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

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, following the direction that impacts on the environment should be considered under the BSC Modification process. P229 was the first BSC Modification to include assessment of environmental impact.

Methodology

The P229 CBA covered both the P229 Proposed Modification and the 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 used the results of the modelling to quantify various impacts 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 a 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.



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.

The sensitivity scenarios examined were:

1. **Reference Scenario:** Most likely or 'central' scenario; P229 Seasonal zonal TLFs applied to the best-estimate of market developments.
2. **High Gas Price Scenario:** Increased gas prices; all other fuel prices and assumptions unchanged relative to the Reference scenario.
3. **Low Gas Price Scenario:** Decreased gas prices; all other fuel prices and assumptions unchanged relative to the Reference 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 Reference scenario.
5. **Aggressive Offshore Wind:** More Offshore generation added; all other assumptions unchanged relative to the Reference scenario.
6. **Alternative Nuclear:** Nuclear generators added; introduction of some non-nuclear generators were consequently delayed, all other assumptions unchanged relative to the Reference scenario.

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

The Group's views

The Group agreed that the CBA 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.

Though they agreed the CBA was robust and fit for purpose, a majority of the Group were concerned with two main areas of the CBA. First, they believed the Weighted Average Cost of Capital (WACC) value used to discount the modelled costs and benefits was too low. Second, the offshore generation developments applied in the CBA modelling were believed to be significantly underestimated. These Group members were concerned that the offshore generation modelled did not account for the full amount indicated for connection in Rounds 1 and 2 of offshore development, or the significantly larger developments planned for Round 3, in either the P229 Proposed Reference Change Case or the Aggressive Wind sensitivity Change Case.

The Group addressed the WACC concern by determining its own WACC value and applying it to the cost-benefit results. The CBA consultants noted the Group's offshore generation concern, and maintained that in their expert opinion the assumptions of the model were robust and, in their view, a realistic representation of future developments in their assessment and at the time of undertaking the analysis. Despite this the Group's concern remained, and they agreed that the best course was to document their concerns and the consultants' response in order that both can be considered as part of assessment of P229.

In response to the Group's continuing concern the CBA consultants acknowledged that there have been developments since the analysis, with the biggest being in the future development of offshore wind generation (as noted by the Group). However, in their opinion little truly solid new information is available. Although it is anticipated that a lot of offshore wind generation will be created, there is still considerable uncertainty around where new generators will actually connect, precisely when they will connect, what the generation profiles will be, etc. They believe that this cannot be considered to invalidate the CBA.

The consultants did note that, generally, the accuracy/usefulness of any analysis of this sort (i.e. using assumptions/estimations and forecast modelling) tends to decrease as real

world events enter the modelled period and actual circumstances align with the model or diverge from it. However, they did not believe that this effect was particularly pronounced with regard to the P229 CBA.

A Group member questioned the consultants' response, noting that they believed that the uncertainties identified could have been overcome early in the P229 Assessment Procedure (January 2009) and incorporated into the CBA. This member believed that the joint Crown Estate and National Grid report of December 2008 detailed where new generation will connect, that an equitable and transparent methodology could have been used to approximate when generation would connect and queried why generation profiles would be substantially different from those used for offshore generation included in the CBA.

The independent cost-benefit analysis was commissioned by the Group because they could not perform such analysis itself. Therefore the Group set out requirements for the CBA but left final decisions on methodology to the CBA consultant's independent expertise. The requirements specification agreed by the Group and used to procure the CBA consultant and set its terms of reference did not include a requirement to model a particular amount of offshore wind, but rather that the consultants should use their expertise and take into account all relevant information.

A minority of the Group was also concerned that future offshore HVDC infrastructure was not modelled as part of the CBA, since its development was indicated by the ENSG report and the P229 load flow modelling exercise (Task 10) indicated that offshore HVDC elements could have a significant impact on TLFs (notwithstanding that this was an approximation of offshore HVDC elements and not intended to be representative of actual developments).

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 Reference scenario (P229 Alternative). 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 types of participants, depending on their 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 over the analysed period. 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. This appears to indicate the emissions reductions are a consequence of the effect of a losses scheme on emitting generators in their current locations of generation, rather than a general result.

Note that the total benefits shown in the table below are the net present value of benefits over the ten year modelled period.

Total benefits associated with each CBA scenario (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 participant types in Northern regions and those in Southern regions. The figures for supply and generators are the amounts that would be 'paid'

collectively by some Parties and 'received' by other Parties. The **net** transfer would be zero (i.e. all money paid by one set of participants is received by the others).

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).

Note that the distributional impact values shown in the table below are annual (i.e. these values are calculated for the year 2001-12 but distributional impacts like this would occur each year).

Annual (2011-12) distributional impact of each CBA scenario (figures rounded to nearest £0.5m)							
	Proposed (reference)	High gas	Low gas	Volatile fuel	Wind	Nuclear²	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.

Page 16

² Distributional impact under nuclear scenario identical to Reference scenario as there is no difference between these two scenarios in the first year (2011 - 12) of the analysis period.

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 significant offshore developments (large offshore delivery, new interconnectors and offshore HVDC circuits).

Further details of these tasks can be found in the P229 Load Flow Modelling report, which is available on the [P229 webpage](#). ELEXON produced 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 HVDC links could have a large impact on TLFs.

Impacts

Implementation of P229 would impact a range of ELEXON 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, 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 A).

Full details of the responses to the P229 IA can be found on the [P229 webpage](#).

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 would 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 will be issued to the Authority in March 2010. 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.

Though they felt it was unlikely that a decision could be made by 1 October 2010, the Group wanted to allow the most flexibility possible in P229 implementation, so decided to include 1 October 2010 as a decision date. However, they also believed it would be prudent to include two other decision dates which they regard as feasible.

The Group therefore recommend the following Implementation Dates for P229 (Proposed and Alternative):

- 1 October 2011 if approval is received from the Authority on or before 30 September 2010;
- 1 April 2012 if approval is received from the Authority after 30 September 2010 but on or before 31 March 2011; or
- 1 October 2012 if approval is received from the Authority after 31 March 2011 but on or before 30 September 2011.

Group discussions

The detailed discussions of the Group can be found in Attachment A. The Group's discussions covered the analysis carried out to support assessment of P229, the impacts of P229 and responses to the P229 Assessment Procedure industry consultation, and the effect on the facilitation of the Applicable BSC Objectives. Details of the Group's initial views prior to consultation, the responses to the industry consultation and the Group's further discussions can be found in Attachment A.

This section summarises the final conclusions of the Group with regard to the impact of P229 on the Objectives.

Note that references to 'majority' or 'minority' in all the tables below apply to the view on whether the Applicable BSC Objective in question would benefit overall. The summaries capture all views provided by Group members, but not all Group members that ascribed to a particular view necessarily agreed with every argument put forward in support of that view.

Proposed vs baseline

The Group agreed by 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)	Majority: None identified Minority: <ul style="list-style-type: none"> Would remove discrimination in the current allocation of variable losses 	Majority: None identified Minority: <ul style="list-style-type: none"> Would introduce discrimination into the allocation of variable losses
(b)	Minority: <ul style="list-style-type: none"> 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 (as first bullet), also resulting in environmental benefit by reducing emissions 	Majority: <ul style="list-style-type: none"> Benefits due to P229 Proposed are uncertain and would be offset by the additional complexity it would introduce to the arrangements Inherent inaccuracies in the methodology for calculating TLFs (and hence TLMs) mean P229 Proposed would not be cost-reflective and would not give a more accurate and appropriate allocation of losses Locational signals are already provided by TNUoS charges and cost signals from P229 Proposed would interfere with this existing mechanism Would have a detrimental effect on investment, including investment in renewable generation projects, which would have a negative environmental impact Potential impact on security of supply

(c)	<p>Minority:</p> <ul style="list-style-type: none"> 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 	<p>Majority:</p> <ul style="list-style-type: none"> 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 cannot 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 Socialisation within zones unfairly increases the burden to existing generation when a new generator connects with high losses (as these are currently socialised amongst the entire GB) Negative impact on all investment due to introducing uncertainty and unpredictability into the allocation of transmission losses over the lifetime of the investment, which needs to be factored into investment decisions Negative impact on investment in renewables due to increased cost of investment in unfavourable zones Discriminates between new and existing generators Additional complexity creates a barrier to market entry
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(d)	None identified Minority: <ul style="list-style-type: none"> Neutral because no significant additional expenditure or complexity 	Majority: <ul style="list-style-type: none"> Implementation and operation would add cost and complexity to the administration of the Code No Code defect so any additional cost or complexity is not warranted
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Alternative vs baseline

The Group agreed by majority that P229 Alternative would not 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 - <u>additional</u> Pros and Cons under Alternative		
	Benefits	Disadvantages
(a)	No additional points identified	No additional points identified
(b)	Majority: No additional points identified One member: <ul style="list-style-type: none"> Benefits are uncertain but risk is managed by scaling methodology 	Majority: No additional points identified One member: <ul style="list-style-type: none"> Additional inaccuracy of scaling i.e. arbitrary adjustment of losses to avoid crediting energy to BM Units, means not cost-reflective
(c)	Majority: No additional points identified Minority: <ul style="list-style-type: none"> 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 	Majority: No additional points identified One member: <ul style="list-style-type: none"> Additional inaccuracy of scaling, i.e. arbitrary adjustment of losses to avoid crediting energy to BM Units, reduces the cost reflectivity of the allocation of losses
(d)	No additional points identified	No additional points identified

Alternative vs Proposed

The Group agreed by majority that P229 Alternative would better facilitate the Applicable BSC Objectives compared with P229 Proposed.

The Group agreed by majority that when comparing the Proposed and Alternative there would be a neutral impact on Objectives (a) and (d) and that the Alternative would better facilitate Objectives (b) and (c). Overall the Group by majority considered the Alternative better than the Proposed.

Applicable BSC Objectives - benefits of Proposed and Alternative		
	Arguments for Proposed	Arguments for Alternative
(a)	Majority: None identified	Majority: None identified One member: <ul style="list-style-type: none"> Alternative would be neutral whilst Proposed would introduce discrimination into the allocation of variable losses
(b)	Minority: <ul style="list-style-type: none"> 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 	Majority: <ul style="list-style-type: none"> 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 Negative impacts are reduced compared with the Proposed (particularly on model accuracy and investment)
(c)	Minority: <ul style="list-style-type: none"> 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 	Majority: <ul style="list-style-type: none"> 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, inappropriate allocation for some zones/times and uncertainty of benefits realisation under P229 Proposed Negative impacts are reduced compared with the Proposed (particularly on model accuracy and investment)
(d)	Majority: None identified One member: <ul style="list-style-type: none"> Proposed would be neutral whilst the Alternative would introduce the additional complexity of the scaling methodology for no benefit 	Majority: None identified One member: <ul style="list-style-type: none"> There is no defect in the Code, and while both Alternative and Proposed would not better facilitate (d) the effect of the Proposed would be to move further from the baseline

The Panel considered the P229 Assessment Report on 11 February 2010. The majority view of the P229 Group was that, with reference to the impact on the Applicable BSC Objectives, neither P229 Proposed nor P229 Alternative was better than the existing Code baseline. The Group therefore recommended in the Assessment Report that neither P229 Proposed nor Alternative should be made. By majority the Group considered P229 Alternative to be superior to P229 Proposed, though neither was better than the baseline.

After considering the Group's views and discussions, the views of respondents to the P229 Assessment phase consultation and Impact Assessment, and the results of the analysis conducted to support assessment of P229, the Panel agreed with the Group's recommendations by a strong majority.

Panel's consideration of Assessment Report

The Panel discussed the results of the P229 Cost Benefit Analysis and the modelling done for the CBA. A Panel member commented that a limitation of the modelling was that it was necessary for it to consider the actions of market participants as occurring in the environment of a 'perfectly competitive' market. The member acknowledged this was an unavoidable characteristic of modelling in this manner, but noted that it means contracts between participants are not taken into account. Contracts between participants would limit their ability to change their operations and despatch in response to the signals from TLFs, meaning participants will not always behave in the manner predicted by a perfectly competitive and unconstrained model. The member believed that because of this the CBA overestimated the benefits of P229, as the benefits are primarily due to improved despatch by participants.

A Panel member was intrigued that the effect of all the CBA sensitivity analysis scenarios was to lower the overall benefits of implementing P229. They would expect that some alternative scenarios around the central case to increase the benefits and others to decrease them. The member also noted that demand had reduced more than would have been predicted at the outset of the CBA modelling, and no sensitivity scenario covered this fall in demand.

Another member agreed, but noted that the overall benefits with the effect of SO_x/NO_x emissions excluded follow a more 'conventional' pattern, with most being of a comparable magnitude to those of the central scenario while some are greater and some smaller. The member believed that this implied the counterintuitive pattern was driven by the SO_x/NO_x element.

A Panel member considered the Group's discussions around the WACC value used in the calculation of the net present value of the forecast benefits, firstly noting that a huge WACC value would need to be applied to cause the benefits forecast by the CBA to switch from positive to negative (i.e. become costs/liabilities). Though most of the Group felt that the WACC value calculated and applied by the CBA consultants was far too low, the Panel member believed that the consultant's value was reasonable, though probably a little low. The member believed some of the WACC values suggested by Group members were much too high.

The Panel considered the Group's challenge of the amount of offshore wind generation included in the CBA modelling. Most of the Group believed that the amount of offshore wind generation was significantly too low, though the Group did agree that the CBA was fit for purpose. A Panel member noted that the CBA included analysis of a scenario with more offshore wind generation to assess the sensitivity of the CBA results to this factor,

which indicated the results were not disproportionately sensitive to the level of offshore wind generation. However, another member noted that the amount of offshore wind generation in the sensitivity scenario was still small compared with the amount now expected in Rounds 1, 2 and 3 of offshore development. The Panel was sympathetic to the views of Group members that more offshore wind generation should have been included in the P229 CBA, but also noted the lower level of information available at the time the CBA modelling was done and the continuing elements of uncertainty in this area. The Panel agreed with the Group that the P229 CBA was fit for the purpose of assisting the assessment of P229.

A Panel member commented that P229 would impact TNUoS charges by affecting energy volumes through the impact on despatch identified by the CBA. The Group had agreed such an effect was out of scope of P229 and it was not included in the CBA modelling or quantified in the P229 CBA. The Panel agreed that the consideration of any impact on TNUoS charging was outside the scope of the BSC, but noted that the Authority would need to consider this aspect, under of its wider regulatory remit, when deciding whether to approve P229.

A Panel member noted that the load flow modelling, which is part of P229 Proposed and Alternative solutions, involves incremental injections of power at system nodes in order to gauge the effect on variable losses on the system, and the use of a 'slack node' to absorb these injections. The member suggested that this approach may result in an allocation of variable losses that is not truly locational, though the member could not suggest an alternative approach that would deliver better results.

A Panel member commented that the trading site arrangements were intended to shelter participants from locational charges, and noted that trading sites had not been considered. The Panel noted that the Group had considered a similar effect in relation to embedded generators. The member also noted that P229 (Proposed or Alternative) would be more liable to have a negative impact on participants operating in a single zone than on larger companies with a diverse portfolio, who can choose how to operate different assets in various zones.

Panel's initial views against the Applicable BSC Objectives

A Panel member commented that they regarded the principle of locational allocation of variable losses as essentially a good thing. However, they believed that consideration of P229 should recognise that there are different ways that locational allocation could be achieved, and should also take into account the impact of applying a new scheme to the established arrangements. They noted that the impact of P229 (Proposed or Alternative) would not be as great as a more radical methodology for locational allocation of variable losses. For instance, the ex-ante, Seasonal zonal scheme proposed by P229 would not have as much effect as an approach using a nodal, daily and/or ex-post allocation methodology.

This member also believed that small Suppliers would not fully understand the P229 arrangements, and that this was a significant issue that should be taken into due consideration. The member felt that overall assessment of P229 had been dominated by the perspective of generators, with little recognition that operating on the Supply side of the market would be more complicated.

The member also questioned whether a real Code defect had been identified, and doubted that P229 would impact site location decisions. They believed that the example in Centrica's consultation response effectively illustrated that the benefits of P229 are

relatively modest but unintended consequences of the change could result in significant and unjustified disadvantages to some participants.

The member believed that Applicable BSC Objective (c) in particular would be negatively impacted by implementation of P229. They believed that the differential impact of zonally allocated variable losses would have an effect on competition, because integrated participants would be able to manage the impact on them via their diverse portfolios spread across various locations.

The member also agreed with the point raised in the Panel's discussions that the effect of generator's contracts would impact how they would operate and that could not be included in the CBA modelling. They believed that this had led to the benefits being overestimated.

The member also noted the significant wealth transfer between participants predicted by the CBA, believed that there would be a significant negative impact on investment, and believed that new participants would need to model the effects of the P229 at significant expense. They believed that all these areas would have a detrimental effect on competition in the market.

In summary, this member felt that implementation of both P229 Proposed and Alternative would result in relatively small benefits which had to be set against significant probable detriments. They therefore believed that both the Proposed and Alternative are inferior to the existing Code baseline. They believed that the Alternative is better than the Proposed.

Another member also stated that they believed that neither P229 Proposed nor P229 Alternative was better than the existing baseline. They were concerned that the locational effect of introducing P229 was uncertain due to the interactions with TNUoS charging. The member also felt that there was additional regulatory uncertainty in the industry, due to DECC's position and the issues raised by Ofgem in its recent announcement on Project Discovery, which should be considered when deciding whether P229 should be implemented.

This member also noted they gave weight to the arguments that existing Parties would not be less able to respond to P229 than new entrants, and that the transfers between participants would amount to windfall gains and losses, which would be detrimental to competition. Overall, they believed that neither P229 Proposed nor P229 Alternative would better facilitate achievement of Applicable BSC Objective (a), both would have a detrimental impact on the facilitation of Objectives (b) and (c), and neither would better facilitate achievement of Objective (d).

The member also questioned whether it had been demonstrated that there was a Code defect to address. This member declined to give a preference between the Proposed and Alternative Modifications, stating that it would serve no useful purpose since they believed both to be inferior to the baseline.

Another Panel member believed that aside from any benefit indicated by the analysis of P229 it had not been demonstrated that P229 Proposed or Alternative would remove the cross-subsidy contended by the Proposer. This member also felt that P229 would add uncertainty to investment decisions which would have a negative impact on investment and would disproportionately impact smaller participants for the reasons already described, i.e. its additional complexity and because smaller players are less able to mitigate the impact of TLF signals. This member believed that both P229 Proposed and P229 Alternative are inferior to the existing baseline, but the Alternative is better than the Proposed.

Another Panel member interpreted the assessment and analysis of P229 as showing superficially that implementation of either P229 Proposed or Alternative would have associated benefits, without recognising the difficulty of realising those benefits in practice. They also believed that the analysis of P229 benefits did not recognise that fundamentally the Transmission System exists to connect network assets, i.e. allocation of network losses should not distort the use of the network, and the prospective despatch benefits identified by the CBA would result from such an impact.

This member noted that P229 Proposed and Alternative would still socialise variable losses, just on a smaller scale (zonally instead of nationally). They which they viewed this as a drawback against Applicable BSC Objective (b) because socialisation on a smaller scale would increase the impacts on individual participants. They also believed there would be a negative impact against Objective (c) due to a detrimental impact on investment, contribution to plant exiting the market, inflation of cost of capital and distribution of wealth transfer between participants, as well as the competition arguments already expressed.

The member believed that believed that both the Proposed and Alternative are inferior to the existing Code baseline, but the Alternative is better than the Proposed.

Another Panel member stated that their views on the benefits of P229 were guided by the CBA figures excluding the effect of SOx/NOx emission reductions, which they believed should be treated with caution due to the way they were calculated from the CBA modelling results and the approach to assigning to them a monetary value. The member noted that this caution was reflected in responses to the P229 Assessment phase consultation, particularly noting that this was true of the response of RWE Npower (the Proposer of P229).

The member also noted that they believed the benefits identified by the analysis of P229 would not necessarily be passed on to consumers as savings, though they acknowledged that consideration of the impact on end customers was not within the scope of the BSC Modification process. However, they did believe it was relevant to note that demand could not respond to TLFs as generators would be able to.

This member believed the principal considerations were against Applicable BSC Objective (c). They agreed with the points raised by other members, noting that discrimination would result from the difference in the impact on individual generators and Parties with a portfolio of assets and that the significant complexity would be a barrier to market entry. The member also believed P229 would cause a transfer of wealth between participants that was unjustified and disproportionate to any benefits, and that it would have a disproportionate impact on renewables and on other types of generator that are unable to respond to TLF signals. These considerations led the member to believe that both P229 Proposed and Alternative would have a detrimental impact on Objectives (b) and (c).

The member believed that both the Proposed and Alternative are inferior to the existing Code baseline, but the Alternative is better than the Proposed.

Another member agreed with the points raised by other members, particularly noting that the ability of the demand side of the market to respond to TLF signals is limited compared with that of the generation side. They believed that both the Proposed and Alternative are inferior to the existing Code baseline, but the Alternative is better than the Proposed.

This member declined to express a preference between the Proposed and Alternative Modifications on the basis it would serve no useful purpose since they believed both to be inferior to the baseline.

Another Panel member believed that the P229 analysis indicated that both P229 Proposed and P229 Alternative were unlikely to have a measurable impact on plant location and would result in increased prices, along with increased complexity and significant wealth transfer between participants. They therefore questioned the aim of P229 and its ability to deliver an overall benefit, and suggested that some kind of grandfathering scheme might be more appropriate.

The member agreed with the arguments already put forward, and believed that both the Proposed and Alternative are inferior to the existing Code baseline, but the Alternative is better than the Proposed.

Another Panel member believed that both the Proposed and Alternative would just replace one form of socialising variable losses with another, by socialising on a zonal basis instead of nationally. This member also supported the argument that no participants should be allocated negative volumes of variable losses, and was concerned that the forecast benefits of P229 were relatively small and could easily be swept away by comparatively minor actions by participants or changes in market conditions.

This member also believed that P229 might have a significant impact on TNUoS charges that had not been explored and quantified; though they noted that any TNUoS impact was outside the scope of the BSC they believed the Authority would need to consider all possible impacts in this area. The member felt that TNUoS should be the main mechanism to reduce losses and any negative impact on or interference with TNUoS charges should be considered.

For both Proposed and Alternative this member identified no impact on Applicable BSC Objective (a). They believed there would be detrimental impacts on competition, i.e. against Objective (c), because large participants are naturally insulated against the negative impact of P229, and because the impacts of participants' operations on others within the same zone is more acute, because the effect is socialised only across that zone instead of being spread across the entire system. Objective (d) would be negatively impacted due to the additional complexity of the P229 arrangements.

The member believed that the Alternative was better than the Proposed against Objective (b) because in principle it would not allocate negative volumes of variable losses. They believed that though the Alternative mitigates the negative impacts to some extent, both the Proposed and Alternative are inferior to the existing Code baseline, but the Alternative is better than the Proposed.

The National Grid representative noted the Panel's considerations and commented that though National Grid are incentivised to reduce system losses, and TNUoS charging already exists, National Grid cannot influence where generators choose to locate on the system. The representative believed that P229 TLFs could provide a signal that could potentially influence the location of new generation, and this would allow minimisation of variable losses to be included in siting decisions, in addition to all other relevant factors. They believed this would be beneficial for the efficiency of the operation of the system.

The representative accepted that P229 would add complexity to the Code arrangements, but noted that the arrangements are already very complex and questioned whether the increase would be significant. They acknowledged that National Grid seek to reduce system losses, but believed that this did not mean that this responsibility must necessarily rest National Grid only.

Another Panel member noted that they agreed with all the points raised against implementation of P229 Proposed and Alternative. This member believed that both the

Proposed and Alternative would have particularly negative impacts on facilitation of Applicable BSC Objectives (b) and (c). The detriment against (b) were somewhat mitigated under the Alternative, but there were very significant drawbacks against Objective (c) under both Proposed and Alternative.

The member therefore believed that both the Proposed and Alternative are inferior to the existing Code baseline, but that the Alternative is better than the Proposed.

Another Panel member gave consideration to the basis of P229, stating that they did not believe that there was any reason in principle why delivery costs in the form of variable losses should not be reflected in participants costs. They believed that the benefit predicted by the CBA was relatively small compared with industry costs overall, but was significantly greater than those associated with the average Modification. The member also believed that thought the predicted benefits may have been over- or underestimated by the CBA, they remain large compared with the associated costs.

This member considered the windfall gains and losses, and questioned whether these would be within the remit of the Panel. They also believed that such gains and losses would not affect competition per se, though they may affect the equitability of the market. The member also commented that it was not possible for P229 to affect the cost of capital for investments.

On the basis of these considerations the member believed that P229 Proposed would have a positive impact on facilitation of Applicable BSC Objectives (b) and (c). However, they believed that the Alternative would reduce the benefits associated with the Proposed and would have additional complexity and inaccuracy associated with it due to its variable scaling methodology. Overall, the member felt that the cost associated with variable losses and it should be reflected to participants as much as possible.

This member therefore believed that P229 Proposed is better than the existing Code baseline but P229 Alternative is not.

Proposed compared with baseline

The Panel agreed by majority an initial view that P229 Proposed would not better facilitate the Applicable BSC Objectives overall compared with the current baseline.

The majority of the Panel supported the views of the majority of the P229 Modification Group, but put most weight against the arguments the Panel had detailed against Objectives (b) and (c). These included that P229 Proposed would add complexity to the Code arrangements, that the predicted benefits may not be realised and that it would result in windfall gains and losses that would be disproportionate to the potential benefits.

Based on these views and the considerations detailed above the majority of the Panel believed that P229 Proposed would not better facilitate the Applicable BSC Objectives overall and that (compared with the existing baseline) P229 Proposed:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would not better facilitate Applicable BSC Objective (b);
- Would not better facilitate Applicable BSC Objective (c); and
- Would not better facilitate Applicable BSC Objective (d).

A minority of the Panel, one member, believed that P229 Proposed would better facilitate the Applicable BSC Objectives overall. This member believed that P229 Proposed would have a positive impact against Objectives (b) and (c) due to the benefits predicted by the analysis of P229. The minority of the Panel therefore believed that (compared with the existing baseline) P229 Proposed:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would better facilitate Applicable BSC Objective (b);
- Would better facilitate Applicable BSC Objective (c); and
- Would not better facilitate Applicable BSC Objective (d).

Alternative compared with baseline

The Panel unanimously agreed an initial view that P229 Alternative would not better facilitate the Applicable BSC Objectives overall compared with the current baseline.

The Panel supported the views of the majority of the P229 Modification Group, but put most weight against the arguments the Panel had detailed against Objectives (b) and (c). These included that P229 Proposed would add complexity to the Code arrangements, that the predicted benefits may not be realised and that it would result in windfall gains and losses that would be disproportionate to the potential benefits.

Based on these views and the considerations detailed above the Panel all believed that P229 Alternative would not better facilitate the Applicable BSC Objectives overall and that (compared with the existing baseline) P229 Alternative:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would not better facilitate Applicable BSC Objective (b);
- Would not better facilitate Applicable BSC Objective (c); and
- Would not better facilitate Applicable BSC Objective (d).

Alternative compared with Proposed

The Panel agreed by majority an initial view that P229 Alternative would better facilitate the Applicable BSC Objectives overall compared with P229 Proposed.

The majority of the Panel supported the views of the majority of the P229 Modification Group, but put most weight against the mitigation of the negative impacts the Panel had detailed against Objectives (b) and (c). This included reduction of the windfall gains and losses that would result from implementation of P229.

Based on these views and the considerations detailed above the majority of the Panel believed that (compared with P229 Proposed) P229 Alternative:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would better facilitate Applicable BSC Objective (b);
- Would better facilitate Applicable BSC Objective (c); and
- Would be neutral with respect to Applicable BSC Objective (d).

A minority of the Panel, one member, believed that P229 Proposed would better facilitate the Applicable BSC Objectives overall compared with P229 Alternative. This member

believed that the Alternative would reduce the positive impact against Objectives (b) and (c) by reducing the benefits of P229 while also introducing additional complexity and inaccuracy due to its variable scaling methodology. A minority of the Panel therefore believed that (compared with P229 Alternative) P229 Proposed:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would better facilitate Applicable BSC Objective (b);
- Would better facilitate Applicable BSC Objective (c); and
- Would be neutral with respect to Applicable BSC Objective (d).

A minority of the Panel, two members, did not give their views on the effect on the Applicable BSC Objectives of P229 Alternative compared with P229 Proposed. These members did not believe that expressing a preference between the two would serve any useful purpose, because they believed both to be inferior to the existing baseline.

Panel's initial recommendations

Having considered the P229 Assessment Report, the Panel initially recommended:

- That Proposed Modification P229 should not be made;
- That Alternative Modification P229 should not be made;
- An initial Implementation Date for both Proposed Modification P229 and Alternative Modification P229 of:
 - 1 October 2011 if approval is received from the Authority on or before 30 September 2010; or
 - 1 April 2012 if approval is received from the Authority after 30 September 2010 but on or before 31 March 2011; or
 - 1 October 2012 if approval is received from the Authority after 31 March 2011 but on or before 30 September 2011.

10 Report Phase Consultation Responses

The following table summarises the responses received to the Report Phase Consultation. The majority of respondents agree with the recommendations made by the Panel.

Question		Responses
1	Do you agree with the Panel's initial view that the Proposed Modification should be rejected?	7 Yes 2 No
2	Do you agree with the Panel's initial view that the Alternative Modification should be rejected?	7 Yes 2 No
3	Do you agree with the Panel's initial view that, while both are inferior to the baseline, P229 Alternative is superior to P229 Proposed?	6 Yes 2 No 1 Neutral
4	Do you agree with the Panel's suggested Implementation Dates for P229 Proposed and P229 Alternative?	7 Yes 1 No 1 Neutral
5	Do you agree that the legal text for P229 Proposed and P229 Alternative delivers the intent of the Proposed and Alternative?	6 Yes 0 No 3 Neutral
8	Do you have any further comments on P229?	4 Yes 4 No

New arguments?

No arguments were raised in the responses to the Report Phase Consultation that had not already been considered by the P229 Modification Group or the Panel. All but one of the respondents had previously responded to the Assessment Consultation, and none of these respondents had changed their previously stated views or comments.

The respondent who had not commented during the Assessment Consultation supported the recommendations of the Panel. They argued that P229 ignores the fact that decisions on plant location are based on factors other than economic assessment, e.g. geographical constraints of renewable generation. They believed that by ignoring the existence of such constraints P229 would discourage renewable generation, and therefore P229 is inconsistent with public policy.

The Panel considered the P229 Draft Modification Report and the results of the Report phase industry consultation on 11 March 2010. The Panel's initial recommendations for consultation were that neither Proposed Modification P229 nor Alternative Modification P229 should be made. The Panel's initial majority view was that, with reference to the impact on the Applicable BSC Objectives, neither P229 Proposed nor P229 Alternative was better than the existing Code baseline, though P229 Alternative was better than P229 Proposed. These views corresponded with the majority view of the P229 Group as detailed in the P229 Assessment Report.

After considering the results of the Report phase industry consultation and the views of members of the Panel who were not present for the consideration of the P229 Assessment Report, the Panel confirmed, by majority, their initial recommendations.

Panel's consideration of Report phase consultation responses

Nine responses were received to the P229 Report phase consultation. The Panel noted that no new arguments had been raised, and that only one respondent had not previously commented on P229. The new respondent supported the Panel's recommendations.

The Panel noted that one respondent did not agree with the suggested Implementation Dates for P229 Proposed and Alternative. They did not support a 'within year' change in the settlement arrangements, and therefore did not support the first proposed implementation date of 1st October 2011. However, the Panel noted that no other respondents disagreed with the implementation dates and that the issue of 'within year' change had been discussed by the P229 Group. The Panel was therefore satisfied that the suggested implementation dates were appropriate.

The agreement of one respondent with the P229 legal text was subject to some minor corrections and clarifications. The Panel noted that the legal text for both P229 Proposed and Alternative had consequently been updated with minor typographical corrections. In addition the reporting requirements in the Alternative legal text had also been amended slightly so it fully reflects the requirements agreed by the P229 Group. The Panel accepted these amendments.

Panel's final views against the Applicable BSC Objectives

Panel members who had already given their views confirmed that they had nothing further to add, and that their final views on P229 corresponded with their initial views, as detailed in section 9, above. The Panel members who had not commented previously gave their views.

One Panel member stated that they were abstaining from voting on P229 because they had participated in the progression of P229 as a voting Panel member. However, they did observe that a report from Deutsche Bank had concluded that a number of countries, including the UK, had not currently achieved a level of certainty to encourage the desired amount of investment in renewable generation. The member considered that both P229 Proposed and P229 Alternative would, if approved, add uncertainty to the market and would thereby tend to discourage investment. The member commented that, though they were abstaining from voting, they did not believe either the Proposed or Alternative was better than the baseline, and therefore neither should be approved.

Another Panel member stated that they believed that P229 Proposed was better than the baseline, and should therefore be approved, but P229 Alternative was not. This member agreed with the views of the other Panel member who supported the Proposed but not the

Alternative. The member had some concerns around the modelling methodology, but overall believed that P229 Proposed was better than the baseline due to benefits against Objective (b), in the form of reduced losses and production cost savings, and (c), because it would remove existing discrimination and would be more cost-reflective.

Another Panel member commented that they believed that increasing cost reflectivity was generally beneficial, but that any such benefit under P229 was outweighed by the volatility and complexity that P229 would add to the arrangements. They also believed that P229 would have a disproportionate impact on some participants, such as those associated with renewable generators and those that operate only a single site (and therefore operate in a single zone). For these reasons the member believed that both P229 Proposed and P229 Alternative would be detrimental to the facilitation of Objectives (b) and (c). The member believed that it was acceptable for the modelling of variable losses to result in assignment of negative losses in some cases, and therefore believed that P229 Proposed was better than the Alternative.

Proposed compared with baseline

The Panel agreed by majority a final view that P229 Proposed would not better facilitate the Applicable BSC Objectives overall compared with the current baseline.

The majority of the Panel supported the views of the majority of the P229 Modification Group, but put most weight against the arguments the Panel had detailed against Objectives (b) and (c). These included that P229 Proposed would add complexity to the Code arrangements, that the predicted benefits may not be realised and that it would result in windfall gains and losses that would be disproportionate to the potential benefits.

Based on these views and the considerations detailed above the majority of the Panel believed that P229 Proposed would not better facilitate the Applicable BSC Objectives overall and that (compared with the existing baseline) P229 Proposed:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would not better facilitate Applicable BSC Objective (b);
- Would not better facilitate Applicable BSC Objective (c); and
- Would not better facilitate Applicable BSC Objective (d).

A minority of the Panel, two members, believed that P229 Proposed would better facilitate the Applicable BSC Objectives overall. These members believed that P229 Proposed would have a positive impact against Objectives (b) and (c) due to the benefits predicted by the analysis of P229, the removal of existing discrimination and increased cost-reflectivity. The minority of the Panel therefore believed that (compared with the existing baseline) P229 Proposed:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would better facilitate Applicable BSC Objective (b);
- Would better facilitate Applicable BSC Objective (c); and
- Would not better facilitate Applicable BSC Objective (d).

Alternative compared with baseline

The Panel unanimously agreed a final view that P229 Alternative would not better facilitate the Applicable BSC Objectives overall compared with the current baseline.

The Panel supported the views of the majority of the P229 Modification Group, but put most weight against the arguments the Panel had detailed against Objectives (b) and (c). These included that P229 Proposed would add complexity to the Code arrangements, that the predicted benefits may not be realised and that it would result in windfall gains and losses that would be disproportionate to the potential benefits.

Based on these views and the considerations detailed above the Panel all believed that P229 Alternative would not better facilitate the Applicable BSC Objectives overall and that (compared with the existing baseline) P229 Alternative:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would not better facilitate Applicable BSC Objective (b);
- Would not better facilitate Applicable BSC Objective (c); and
- Would not better facilitate Applicable BSC Objective (d).

Alternative compared with Proposed

The Panel agreed by majority a final view that P229 Alternative would better facilitate the Applicable BSC Objectives overall compared with P229 Proposed.

The majority of the Panel supported the views of the majority of the P229 Modification Group, but put most weight against the mitigation of the negative impacts the Panel had detailed against Objectives (b) and (c). This included reduction of the windfall gains and losses that would result from implementation of P229.

Based on these views and the considerations detailed above the majority of the Panel believed that (compared with P229 Proposed) P229 Alternative:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would better facilitate Applicable BSC Objective (b);
- Would better facilitate Applicable BSC Objective (c); and
- Would be neutral with respect to Applicable BSC Objective (d).

A minority of the Panel, three members, believed that P229 Proposed would better facilitate the Applicable BSC Objectives overall compared with P229 Alternative. These members believed that the Alternative would reduce the positive impact against Objectives (b) and (c) by reducing the benefits of P229 while also introducing additional complexity and inaccuracy due to its variable scaling methodology, and that the assignment of negative losses was appropriate in some cases. A minority of the Panel therefore believed that (compared with P229 Alternative) P229 Proposed:

- Would be neutral with respect to Applicable BSC Objective (a);
- Would better facilitate Applicable BSC Objective (b);
- Would better facilitate Applicable BSC Objective (c); and
- Would be neutral with respect to Applicable BSC Objective (d).

A minority of the Panel, two members, did not give a view on the effect on the Applicable BSC Objectives of P229 Alternative compared with P229 Proposed. These members did not believe that expressing a preference between the two would serve any useful purpose, because they believed both to be inferior to the existing baseline.

12 Recommendations

Having considered the P229 draft Modification Report, the BSC Panel recommends:

- That Proposed Modification P229 should not be made;
- That Alternative Modification P229 should not be made;
- An Implementation Date for both Proposed Modification P229 and Alternative Modification P229 of:
 - 1 October 2011 if approval is received from the Authority on or before 30 September 2010; or
 - 1 April 2012 if approval is received from the Authority after 30 September 2010 but on or before 31 March 2011; or
 - 1 October 2012 if approval is received from the Authority after 31 March 2011 but on or before 30 September 2011; and
- The proposed text for modifying the Code, as set out in the Modification Report.

13 Further Information

More information is available in:

Attachment A: Detailed Assessment

This includes details of impacts and costs, Modification Group membership and discussions, a summary of the P229 Cost-Benefit Analysis, the issues raised by the P229 Assessment Procedure consultation, the process followed for P229 and a glossary of terms.

Attachment B: Legal Text Proposed

Attachment C: Legal Text Alternative

Further information can be found on the P229 page of the ELEXON website ([P229 webpage](#)), including:

- Responses to the P229 Report phase consultation;
- The P229 Assessment Report;
- Responses to the P229 Assessment phase consultation and impact assessment;
- All P229 Modification documents including the Assessment Procedure Consultation; and
- The full P229 Load Flow Modelling report and P229 Cost-Benefit Analysis report.

All other P229 documentation and data should be considered in conjunction with this report, and all such material is part of the Assessment of P229.